

30 November 2015

By Fax (3767 5922) and By Post

ARUP
Level 5, Festival Walk
80 Tat Chee Avenue
Kowloon Tong, Kowloon

Attention: Mr. Colin Meadows / Mr. Michael Chan

Dear Sirs,

**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**

**Contract No. HY/2011/09 HZMB Hong Kong Link Road –
Section between HKSAR Boundary and Scenic Hill
Quarterly EM&A Report No. 10 for June to August 2015**

Further to the captioned submission (version 1.0 dated 02 November 2015) certified by the ET Leader provided to us via email on 23 November 2015, please be advised that we have no adverse comments on the captioned report.

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

Yours sincerely,
For and on behalf of
Ramboll Environ Hong Kong Limited



Antony Wong
Independent Environmental Checker
Hong Kong Link Road

c.c.	HyD	Mr. Matthew Fung	(By Fax: 3188 6614)
	HyD	Mr. Y K Lam	(By Fax: 3188 6614)
	ARUP	Mr. Eric Chan	(By Fax: 2268 3970)
	Cinotech	Dr. Priscilla Choy	(By Fax: 3107 1388)
	DCVJV	Mr. Chu Chung Sing	(By Fax: 3121 6688)

Internal: DY, YH, LP, CL, ENPO Site

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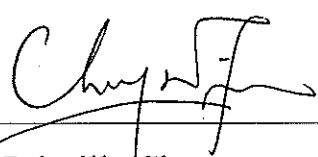
Dragages -China Harbour-VSL JV

**Contract HY/2011/09
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Link Road-Section between
HKSAR Boundary and Scenic Hill**

Quarterly EM&A Report

June to August 2015

(Version 1.0)

Certified By 
Dr. Priscilla Choy
Environmental Team Leader
(Date: 2 November 2015)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties

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EXECUTIVE SUMMARY**Introduction**

1. This is the 10th Quarterly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for the project “Contract No. HY/2011/09 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill” (hereinafter called the “Contract”). This report documents the findings of EM&A Works performed in the period between June and August 2015.

Environmental Monitoring and Audit Progress

2. A summary of the monitoring activities in this reporting period is listed in **Table I** below:

Table I Summary Table for Monitoring Activities in the Reporting Period

Parameter(s)	Monitoring Date(s)
1-hr TSP Monitoring	3 rd , 9 th , 15 th , 19 th , 25 th and 30 th June 2015
24-hr TSP Monitoring	6 th , 10 th , 16 th , 22 nd and 28 th July 2015 3 rd , 7 th , 13 th , 19 th , 25 th and 31 st August 2015
Noise Monitoring	4 th , 10 th , 16 th and 26 th June 2015 7 th , 17 th , 23 rd and 29 th July 2015 4 th , 14 th , 20 th and 26 th August 2015
Water Quality Monitoring	1 st , 3 rd , 5 th , 8 th , 10 th , 12 th , 15 th , 17 th , 19 th , 22 nd , 24 th , 26 th and 29 th June 2015 2 nd , 4 th , 6 th , 8 th , 10 th , 13 th , 15 th , 17 th , 20 th , 22 nd , 24 th , 27 th , 29 th and 31 st July 2015 3 rd , 5 th , 7 th , 10 th , 12 th , 14 th , 17 th , 19 th , 21 st , 24 th , 26 th , 28 th and 31 st August 2015
Dolphin Monitoring (Line-transect Vessel Surveys)	9 th and 18 th June 2015 6 th and 28 th July 2015 18 th and 26 th August 2015
Additional Land-based Dolphin Behaviour and Movement Monitoring	3 rd and 11 th June 2015 6 th and 16 th July 2015 13 th and 21 st August 2015
Environmental Site Inspection	4 th , 9 th , 16 th , 23 rd and 30 th June 2015 7 th , 14 th , 21 st and 28 th July 2015 4 th , 11 th , 18 th and 25 th August 2015
Archaeological Site Inspection	23 rd June 2015

Breaches of Action and Limit Levels

3. Summary of the environmental exceedances of the reporting period is tabulated in **Table II**.

Table II Summary Table for Events Recorded in the Reporting Period

Environmental Monitoring	Parameter	No. of Exceedance		No. of Exceedance related to the Construction Activities of this Contract	
		Action Level	Limit Level	Action Level	Limit Level
Air Quality	1-hr TSP	0	0	0	0
	24-hr TSP	0	0	0	0
Noise	L _{eq} (30min)	0	0	0	0
Water Quality	Dissolved Oxygen (DO) (Surface & Middle)	0	0	0	0
	Dissolved Oxygen (DO) (Bottom)	0	0	0	0
	Turbidity	0	0	0	0
	Suspended Solids (SS)	5	6	0	0
Dolphin Monitoring	Line-transect Vessel Surveys	0	0	0	0

4. Environmental monitoring works were performed in the reporting period and all monitoring results were checked and reviewed. The details of each exceedance were attached in the Monthly EM&A Reports.

Complaint Log

5. One environmental complaint was received in the reporting period.

Notification of Summons and Successful Prosecutions

6. No notification of summons and successful prosecution was received in the reporting period.

Reporting Changes

7. This report has been developed in compliance with the reporting requirements for the quarterly EM&A Summary Report as required by the EM&A Manual for Hong Kong Link Road (EM&A Manual).

Future Key Issues

8. Major site activities for the coming reporting month will include:

WA4

- Fabrication of lifting frames
- Deliveries of frame structures

WA7

- Fabrication of cofferdam frame structures
- Maintenance of Reverse Circulation Drill (RCD) equipment

Marine Viaduct (P0 to P80)

- Inter-face coring tests
- Full depth coring test
- Sonic test
- Grouting work
- Casing installation
- Installation of sheetpiles on cofferdam
- RCD excavation

Pile Cap Construction:

- Installation of precast cap shells
- Concreting
- Kingpost installation and associated steel welding works
- Concreting trimming
- Rock excavation
- Steel Fixing works of pile cap

Works with Cofferdam:

- Installation of waling strut
- Installation of sheet pile
- Installation of temporary working platform
- Installation of shear pin
- Installation of bored pile casing
- Excavation works and casting of concrete plug
- Dewatering works and sealing works
- Additional welding

Column Construction:

- Lifting works
- Lift concreting
- Pier head works
- Pier head concreting

Precast Column Erection

- Installation of base units and precast units
- Stressing of vertical nailing tendons

Deck Erection

- Setting up of equipment
- Segment erection

Precast Segment

- Segment casting

Land Viaduct (P81 to Abutment at Scenic Hill Tunnel (SHT))

- ELS excavation
- excavation works and waling installation
- Pile cap work
- Falsework erection
- soffit formwork
- Removal of steel bracket system
- Steel fixing
- Concreting
- Removal of formwork
- Casting of Portal
- Erection of steel bracket system

1 INTRODUCTION

- 1.1 Cinotech Consultants Limited (Cinotech) was appointed by Dragages -China Harbour-VSL JV (hereinafter called “the Contractor”) as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Contract No. HY/2011/09 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill” (hereinafter called the “Contract”) in accordance with EP Conditions 2.1.

Purpose of the report

- 1.2 This is the 10th Quarterly EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme in the period between June and August 2015.

Structure of the report

- 1.3 The structure of the report is as follows:

Section 1: **Introduction** - purpose and structure of the report.

Section 2: **Contract Information** - summarises background and scope of the Contract, site description, project organization and contact details, construction programme, the construction works undertaken and the status of Environmental Permits/Licenses during the reporting month.

Section 3: **Environmental Monitoring and Audit Requirements** - summarises the monitoring parameters, monitoring frequency, monitoring locations, Action and Limit Levels, Event / Action Plans, site audit summary and environmental mitigation measures.

Section 4: **Environmental Monitoring Results** - summarises the environmental monitoring results in terms of air quality, noise, water quality, dolphin and waste management.

Section 5: **Environmental Non-conformance** - summarises any monitoring exceedance, environmental complaints, environmental summons and successful prosecutions within the reporting period.

Section 6: **Conclusions and Recommendation**

2 CONTRACT INFORMATION

Background

- 2.1 The proposed Hong Kong - Zhuhai - Macao Bridge Hong Kong Link Road (HKLR) is 12km long connecting the Hong Kong-Zhuhai-Macao Bridge (HZMB) at the HKSAR Boundary with the Hong Kong Boundary Crossing Facilities (HKBCF) situated at the north eastern waters of the Hong Kong International Airport, opening a new and direct connection route between Hong Kong, Macao and the Western Pearl River Delta.
- 2.2 The HKLR comprises a 9.4km long viaduct section from the HKSAR boundary to Scenic Hill on the Airport Island; a 1km tunnel section to the reclamation formed along the east coast of the Airport Island and a 1.6km long at-grade road section on the reclamation connecting to the HKBCF. The tunnel section of HKLR will pass under Scenic Hill, Airport Road and Airport Railway to minimize the environmental and visual impacts to Tung Chung residents.
- 2.3 An application (No ESB-110/2003) for an Environmental Impact Assessment (EIA) Study Brief under Section 5(1) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by Highways Department (the Project Proponent) on 8 October 2003 with a Project Profile (No. No. PP-201/2003) for the Hong Kong - Zhuhai - Macao Bridge Hong Kong Section and North Lantau Highway Connection. The Hong Kong - Zhuhai - Macao Bridge Hong Kong Section and North Lantau Highway Connection has subsequently been renamed as HKLR. EPD issued an EIA Study Brief (No: ESB-110/2003) in November 2003 to the Project Proponent to carry out an EIA study.
- 2.4 An EIA Study (Reg. No. AEIAR-144/2009) has been undertaken to provide information on nature and extent of environmental impacts arising from the construction and operation of HKLR. The Environmental Permit was issued on 4 November 2009 (Permit No. EP-352/2009). Pursuant to Section 13 of the EIAO, the Director of Environmental Protection amends the Environmental Permit (No. EP-352/2009) based on the Application No. VEP-339/2011 and the environmental Permit (Permit No. EP-352/2009/A) was issued on 9 November 2011 for HKLR to the Highways Department as the Permit Holder. Subsequently, the Director of Environmental Protection amends the Environmental Permits (No. EP-352/2009/A, EP-352/2009/B, EP-352/2009/C) based on the Application No. VEP-409/2013, VEP-411/2013 and VEP-459/2014 respectively. The environmental Permit (Permit No. EP-352/2009/D) was then issued on 22 December 2014.
- 2.5 **Figure 1a-d** shows the layout of the Contract and the scope of the Contract works comprises the following major items:
 - a dual 3-lane carriageway in the form of viaduct from the HKSAR boundary (connecting with the HZMB Main Bridge) to the Scenic Hill (connecting with the tunnel under separate Contract No. HY/2011/03), of approximately 9.4km in length with a hard shoulder for each bound of carriageway and a utilities trough on the outer edge of each bound of viaducts;
 - a grade-separated turnaround facility located near San Shek Wan, composed of sliproads in the form of viaduct with single-lane carriageway bifurcated from the HKLR mainline with an elevated junction above the mainline;

- provision of ancillary facilities including, but not limited to, meteorological enhancement measures including the provisioning of anemometers and modification of the wind profiler station at hillside of Sha Lo Wan, provisioning of a compensatory marine radar, and provisioning of security systems; and
- associated civil, structural, geotechnical, marine, environmental protection, landscaping, drainage and highways electrical and mechanical (E&M) works, street lightings, traffic aids and sign gantries, marine navigational aids, ship impact protection system, water mains and fire hydrants, lightning protection system, structural health monitoring and maintenance management system (SHM&MMS), supervisory control and data acquisition (SCADA) system, as well as operation and maintenance provisions of viaducts, provisioning of facilities for installation of traffic control and surveillance system (TCSS), provisioning of facilities for installation of telecommunication cables/equipments and reprovisioning works of affected existing facilities/utilities.

Contract Organisation

2.6 Different parties with different levels of involvement in the Contract organization include:

- Supervising Officer’s Representative (SOR) – Ove Arup & Partners Hong Kong Limited (ARUP)
- Contractor –Dragages -China Harbour-VSL JV (DCVJV)
- Environmental Team (ET) – Cinotech Consultants Ltd. (Cinotech)

2.7 The proposed project organization and lines of communication with respect to the on-site environmental management structure are shown in **Figure 2**. The key personnel contact names and numbers are summarized in **Table 2.1**.

Table 2.1 Key Contacts of the Contract

Party	Position	Name	Phone No.	Fax No.
SOR (ARUP)	CRE	Mr. Michael Chan	3767 5803	3767 5922
		Mr. Colin Meadows	3767 5801	
ENPO/IEC (Ramboll Environ)	Environmental Project Office Leader	Mr. Y. H Hui	3465 2888	3465 2899
	Independent Environmental Checker	Mr. Antony Wong	3465 2888	3465 2899
Contractor (DCVJV)	Deputy Project Director	Mr. W.K Poon	3121 6638	3121 6688
	Environmental Officer	Mr. CHU Chung Sing	3121 6672	
	24-hour Hotline	--	6898 6161	--
ET (Cinotech)	Environmental Team Leader	Dr. Priscilla Choy	2151 2089	3107 1388

2.8 Ramboll Environ Hong Kong Limited (Ramboll Environ) is employed by the Highways Department as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Project.

Construction Programme

2.9 A copy of Contractor's construction programme is provided in **Appendix A**.

Summary of Construction Works Undertaken During Reporting Period

2.10 The major site activities undertaken in the reporting period included:

June 2015:

Land Viaduct (P85 to Abutment at SHT) & Marine Viaduct (P81 - P84)

- (a) P81L&R - pile cap were completed; 2 pours of column were completed in this reporting period.
- (b) P82L - ELS excavation was suspended due to settlement.
- (c) P82R - excavation works are in progress.
- (d) P83L - ELS excavation is in progress.
- (e) P83R - 4 pours of column were completed in this reporting period.
- (f) P84L&R - column head were completed.
- (g) Portal Works:

Pier Location	Progress
P84	Steel bracket and girders erection completed; Pier head construction is in progress
P86	Installation of steel bracket and girder system is in progress
P87	Removal of formwork & falsework is in progress
P88	Removal of falsework & steel bracket system was completed.
P89	Erection of soffit formwork was completed, formwork & falsework erection is in progress
P90	Steel fixing is in progress, target for concreting on 30 June 2015
P91	Portal was cast on 9 June 2015. Nailing work and removal of formwork is in progress
P92	Erection of formwork and kickers were completed; Steel fixing to start
P93	Removal of steel cross beams were completed

Marine Viaduct (P0 to P80)

Piling Testing, Coring and Grouting (locations other than P68 & P75):

- (a) Inter-face coring tests were carried out at D18.
- (b) Full depth coring test was carried at D20-L3.
- (c) Sonic test was carried out at D18.
- (d) Grouting work was carried out at D17.

Progress at P68

- (a) Casing installation at R3 to R5 and L2 & L5.
- (b) P68- L3, L4 and L6 were cast.
- (c) P68-L1 excavation was completed with installed rebar cage for concreting at the end of June 2015.
- (d) Two RCD were set up onto R5 and L5 casings at end of June 2015 for commencing of socket drilling.

Progress at P69

- (a) Setting up for cofferdam construction work was completed at early June and working platform construction was commenced.
- (b) Right hand side (RHS) working platform was completed and installation of sheetpiles on RHS cofferdam in progress.
- (c) Left hand side (LHS) working platform construction was completed at the end of June.

Progress at P75

- (a) RHS concrete plug was concreted.
- (b) RCD guide frame was installed on the RHS box.
- (c) RCD guide frame was installed on the RHS box.
- (d) RCD excavation is in progress at R2 and R4.
- (e) Excavation to formation at the LHS continued.

Disposal from Marine Works

- (a) The disposals in this reporting period are shown in below table.

Disposal Location	No of Trip	Type of Materials
TM38	0	Inert Materials
TMCLK	0	Inert Materials
HK Open Sea Mud Pits	0	Types II Marine Mud
Cross Boundary Disposal	0	Type I Marine Mud

Pilecap Construction:

- (a) Precast shells installed in this reporting period - two CP3 at P55; Four CP6 at P79 and P80; Four CP1 at P6 and P8; One CP12 at P26L.
- (b) Stage 1 concreting was completed at P11, P26R & P55.
- (c) Stage 1 works is in progress at P79.

- (d) Stage 2 concreting was completed at P2L, P7, P11, P13, P26R & P58L.
- (e) Stage 2 works is in progress at P55.
- (f) Kingpost installation and associated steel welding works for precast shell installation are in progress at P9.
- (g) Advanced concrete trimming (inside casing) works were carried out at P5, P6, P8, P9, P56 & P57 and concrete trimming (inside cap shell) at P55.
- (h) Submerged pile cap works with cofferdam:

Pier Location	Side	Progress
P73	L	Backfilling and removal of cofferdam completed on 19-Jun-15
	R	Backfilling and removal of cofferdam completed on 19-Jun-15
P74	L	Grouting works around bored pile is in progress
	R	Drilling of grouting holes is in progress
P75	L	Rock excavation is in progress
	R	Rock excavation is in progress

In-situ Column Construction

- (a) 1st lift works is in progress at P1, P3, P4, P7, P15, P23, P58 & P78.
- (b) 1st lift concrete was poured at P1, P3, P4, P23, P54, P53-Ramp, P59-Ramp, and P78.
- (c) 2nd lift works is in progress at P54, P53-Ramp, P59-Ramp and P78.
- (d) 2nd lift concrete was poured at P70.
- (e) Pier head works is in progress at P70.
- (f) Pier head concreting: NIL.

Precast Column Erection

Description	Location completed in this reporting period	Number of Units erected/ Number of Columns completed in this reporting period	Cumulative No. of Piers completed (up to 28th of each month)
Precast Column Segment	P25	2	20 (P21, P25, P27-P44)
Precast Column Pier Head	P28, P29	4	17 (P28-P44)
Vertical Tendons Stressed	P28, P29, P34	6	12.5 (P28, P29, P34, P35(1/2), P36-P44)
Grouting Vertical Tendons	P36, P37, P38, P39	8	9 (P36-P44)
Pier Head Concrete	P40, P41, P42	6	5 (P40-P44)

In-situ Double Blade Column Construction

Pier Location	Side	Progress
P17	L	1 st lift in progress
	R	1 st lift in progress
P18	L	Poured concrete up to 5 th lift and 6 th lift in progress
	R	Poured concrete up to 5 th lift and 6 th lift in progress
P72	L	Poured concrete to 2 nd lift and pierhead in progress
	R	Poured concrete to 2 nd lift and pierhead in progress
P77	L	Works commenced
	R	Works commenced
P77	L	1 st lift in progress
	R	Poured concrete to 1 st lift and 2 nd lift in progress

Marine Portal

- (a) Dismantling of scaffolding at Portal P52 completed. Removal of temporary supporting platform is in progress.
- (b) Temporary bearing wall of Portal P60 casted. Dismantling of soffit platform is in progress.

Deck Erection

- (a) Setting up of Equipment:

Type of Equipment	Status
Lifting Frames 1 (LF1)	Assembly of first set of LF1 almost completed. Assembly of the second to fourth set of LF1 is on-going at WA4; Steelwork for the 3 rd and 4 th set of Lifting Frames is under fabrication with some deliveries commenced.
Lifting Frames 3 (LF3)	Fabrication of LF3 in China is almost completed for 8 sets. Most of the major components have been completed and have been delivered to site. Assembly of the first 2 sets of LF3 is completed. The 3 rd and 4 th sets are almost completed at WA4. Assembly of the 5 th to 7 th sets have been commenced at WA4 and they are targeted to be completed by mid-July.
Launching Gantry 1 (LG1)	Segment erection to P112L & P111L completed in his reporting period, LG1 launching to P108.
Launching Gantry 2 (LG2)	Erection of P46 to P48 completed (120 segments in total), launching back and forward to P45.

- (b) Segment erection:

Type	Location of Segments erected in this reporting period	Number of Segments erected in this reporting period	Cumulative No. of Segments erected (up to 28th of each month)
LG1	P108R & P111L & P112L	22	242
LG2	P48	40	120
SOP	-	-	36

Precast Segment

(a) Segment Casting:

- Storage for long span & type D segments is still a key concern.
- Production affected by inclement weather (5 days).
- 2 nos. of type D & 4 nos. of type CH mould were suspended due to storage problem.

Item	Number in this reporting period	Cumulative No. of Precast Segment Completed (up to 28th of each month)
Segment Cast	172	2261

(b) Off-site Storage:

Area	No. in Off-site Storage
A1	134
A2	207
A3	236
A4	-

Remarks: A fourth off-site storage facilities was identified for long span segments and preparation works was completed. Segments are to be delivered.

Precast Concrete Shell Casting

(a) Summary of precast shell cast in the precast yard:

Type of Shell	Number of Precast Shell Cast in this reporting period	Cumulative No. of Precast Shell Completed (up to 28th of each month)
CP1	4	94
CP2	Completed	12
CP3	0	12
CP4	Completed	8
CP5	Completed	6
CP6	Completed	4
CP11	Completed	1
CP12	Completed	1
F1	1	1

Precast Column & Precast Pier Head Casting

(a) Progress of the precast column & precast pier head casting:

- All casting works for the based column were completed and the moulds were dismantled. 4 moulds (2 piers and 2 pier heads) are now in service for precasting works.
- Totally 25 precast elements (19 piers with 6m high, 3 monolithic pier heads and 3 pier heads with bearing support) were cast in this reporting period.

- All the 3m high piers were completed in this period (in total 39 elements).
- Cumulatively 254 precast elements were cast.

Delivery for Precast Concrete Elements (by barge)

(a) Precast Deck Segments:

- Number of additional barges engaged in this period: 0
- Cumulative number of barges: 13 (3 barges tied up on L/S storage)
- Number of deck segment deliveries in this period: 10 trips
- Cumulative number of deck segment deliveries: 95 trips

Segment Types	Segment Delivered in this reporting period	Cumulative No. of Precast Segment Delivered (up to 28th of each month)
A	42	172
B	0	0
C	0	0
D	0	0
E	10	262

(b) Precast column units:

- Number of additional barges engaged in this period: 0
- Cumulative number of barges: 2
- Number of column unit deliveries in this period: 3 trips
- Cumulative number of column unit deliveries: 30 trips

Unit Types	Number of units delivered in this reporting period	Cumulative No. of Precast Column Delivered (up to 28th of month)
3m	1	19
6m	17	73
PH1	0	20
PH2	4	14

(c) Temporary storage of long span segments:

- Barge #968 was not able to delivery long span segments at mid-June caused impacts on the scheduling of deliveries.

(d) General:

- Delays in the segment unloading has impacts on the delivery cycle time to the extent that there are number of barges overstayed for 14 days in Hong Kong.
- First delivery of long span segment for P20’s SOP (type CH) arrived in Hong Kong before end of June.

July 2015:**Land Viaduct (P85 to Abutment at SHT) & Marine Viaduct (P81 - P84)**

- (a) P81L&R - 3 pours of column were completed in this reporting period.
- (b) P82L - ELS excavation works are in progress.
- (c) P82R - excavation works and waling installation completed, pile cap work is in progress.
- (d) P83L - ELS excavation is in progress.
- (e) P83R - 4 pours of column were completed in this reporting period.
- (f) Portal Works:

Pier Location	Progress
P84	Falsework erection is in progress
P86	Erection of falsework and soffit formwork is in progress
P87	Removal of steel bracket system was completed
P89	Steel fixing is in progress
P90	Removal of formwork is in progress
P91	Removal of falsework is in progress
P92	Portal was concreted on 17 July 2015
P93	Erection of steel bracket system is in progress

Marine Viaduct (P0 to P80)**Piling Testing, Coring and Grouting (locations other than P68 & P75):**

- (a) Grouting work was carried out at P18 and P20.

Progress at P68

- (a) P68 - L1, L2, L4, R4 and R5 were cast, total 8 nos. complete.
- (b) One RCD was set up on R6 casing at end of July 2015 for socket drilling.

Progress at P69

- (a) Sheetpiling work at “R” and “L” side are in progress.

Progress at P75

- (a) P75 R- side - 4 piles were cast.
- (b) Excavation to formation at the L-side continues.

Pile Cap Construction

- (a) Precast shells installation - two CP3 at P57.
- (b) Stage 1 concreting was completed at P2R, P57, P79 & P80.
- (c) Stage 1 works is in progress at P26L.
- (d) Stage 2 concreting was completed at P55.
- (e) Stage 2 works is in progress at P57 & P79.
- (f) Kingpost installation and associated steel welding works for precast shell installation are in progress at P5R.
- (g) Advanced concrete trimming (inside casing) works were carried out at P5R, P9, D18-L, D18-R & P56 and concrete trimming (inside cap shell) at P2R, P6, P26L & P57.
- (h) Submerged pile cap works with cofferdam:

Pier Location	Side	Progress
P72	L	Backfilling and removal of cofferdam start on 21-Jul-15
	R	Backfilling and removal of cofferdam start on 21-Jul-15
P74	L	Grouting works around bored pile is in progress Trimming of concrete for extension of pile head is in progress
	R	Drilling of grouting holes is in progress Excavation around the footprint of pile cap is in progress
P75	L	Rock excavation is in progress
	R	Rock excavation is in progress

In-situ Column (Single) Construction

- (a) 1st lift works is in progress at P1, P7, P11 & P13.
- (b) 1st lift concrete was poured at P7, P15 & P58.
- (c) 2nd lift works is in progress at P58, P53-Ramp, P59-Ramp & P78.
- (d) 2nd lift concrete was poured at P53-Ramp, P54 & P59-Ramp.
- (e) Pier head works is in progress at P54 & P70.
- (f) Pier head concreting: NIL

Precast Column Erection

Description	Location completed in this reporting period	Number of Units erected/ Number of Columns completed in this reporting period	Cumulative No. of Piers completed (up to 28th of each month)
Commencement (ie. starting from 1st precast unit)	P16, P24	22 (P16, P21, P24, P25, P27-P44)	Commencement (i.e. starting from 1st precast unit)

Description	Location completed in this reporting period	Number of Units erected/ Number of Columns completed in this reporting period	Cumulative No. of Piers completed (up to 28th of each month)
Completion (i.e. completed installation of pier head unit)	Nil	17 (P28-P44)	Completion (i.e. completed installation of pier head unit)
Vertical Tendons Stressed	P30(50%), P32(50%), P33, P35 (50%)	15 (P28, P29, P30(1/2), P32(1/2), P33-P44)	Vertical Tendons Stressed
Grouting Vertical Tendons	P28, P34	11 (P28, P34, P36-P44)	Grouting Vertical Tendons
Pier Head Concrete	P39	6 (P39-P44)	Pier Head Concrete

In-situ Double Blade Column Construction

Pier Location	Side	Progress
P17	L	Poured concrete up to 2 nd lift and started to construct 3 rd lift
	R	Poured concrete up to 1 st lift and 2 nd lift in progress
P18	L	All cast in July 2015 during this reporting period, total 7 lifts
	R	Poured concrete up to 6 th lift and 7 th lift in progress
P72	L	All cast in July 2015, total 3 lifts (including pierhead)
P76	L	Poured concrete up to 1 st lift and 2 nd lift in progress
	R	Poured concrete up to 1 st lift and 2 nd lift in progress
P77	L	Poured concrete up to 1 st lift and 2 nd lift in progress
	R	Poured concrete up to 2 nd lift and started to construct 3 rd lift

Marine Portal

(a) Removal of temporary supporting platform at Portal P52 & P60 was completed.

Deck Erection

(a) Setting up of Equipment:

Type of Equipment	Status
Lifting Frames 1 (LF1)	Assembly of first set of LF1 at WA4 almost completed. Assembly of the second to fourth set of LF1 is on-going at WA4; Steelwork for the 3 rd and 4 th set of Lifting Frames is under fabrication with some deliveries commenced.
Lifting Frames 3 (LF3)	Fabrication of LF3 in China is completed for the 8 sets. Most of the major components have been delivered to site. Assembly of the first 4 sets of LF3 is completed and they have started operation at P64. Assembly of the 5th set is completed. The 6 th , 7 th and 8 th sets have been commenced at WA4 and they are targeted to be completed by mid-August.
Launching Gantry 1 (LG1)	Segment erection from P114 to P107 completed; Erection of P106 is in progress.
Launching Gantry 2 (LG2)	Erection of P45 to P48 completed (160 segments in total).

(b) Segment erection:

Type	Location of Segments erected in this reporting period	Number of Segments erected in this reporting period	Cumulative No. of Segments erected (up to 28th of each month)
LG1*	P108, P107 & P106	60	302
LG2	P45	40	160
LF3	P64	6	6
SOP	P42, P43 & P62	12	54
Long Span SOP	P20	6	6

* includes crane erection for P109

Precast Segment

(a) Segment Casting:

- Storage for all types of segments is still a key concern.
- Production affected by inclement weather (8 days).
- 2 nos. of type D & 4 nos. of type CH mould were suspended due to storage issue.
- 4 nos. type E, 10 nos. type A, 6 nos. type CH and 1 no. type B were suspended in Mid-July due to storage issue.
- 6 nos. of segments at storage line 3 were toppled on 13 July 2015. The incident is under investigation.

Item	Number in this reporting period	Cumulative No. of Precast Segment Completed (up to 28th of each month)
Segment Cast	101	2362

(b) Off-site Storage:

Area	No. in Off-site Storage
A1	134
A2	224
A3	174
A4	34 (I/S segment only)

Precast Concrete Shell Casting

(a) Summary of precast shell cast in the precast yard:

Type of Shell	Number of Precast Shell Cast in this reporting period	Cumulative No. of Precast Shell Completed (up to 28th of each month)
CP1	Completed	94
CP2	Completed	12

Type of Shell	Number of Precast Shell Cast in this reporting period	Cumulative No. of Precast Shell Completed (up to 28th of each month)
CP3	2	14
CP4	Completed	8
CP5	Completed	6
CP6	Completed	4
CP11	Completed	1
CP12	Completed	1
F1 & F1A	1	2
F2 & F2A	0	0

Precast Column & Precast Pier Head Casting

(a) Progress of the precast column & precast pier head casting:

- All casting works for the pier heads with bearing support were completed (total 30 units) and the mould was dismantled in this report period.
- 3 moulds (2 piers and 1 pier head) are now in service for precasting works.
- Totally 23 precast units (16 piers with 6m high, 4 monolithic pier heads and 3 pier heads with bearing support) were cast in this reporting period.
- Cumulatively 277 precast units were cast.

Delivery for Precast Concrete Elements (by barge)

(a) Precast Deck Segments:

- Number of additional barges engaged in this period: 0
- Cumulative number of barges: 14 (2 barges tied up on L/S storage)
- Number of deck segment deliveries in this period: 23 trips
- Cumulative number of deck segment deliveries: 116 trips

Segment Types	Segment Delivered in this reporting period	Cumulative No. of Precast Segment Delivered (up to 28th of each month)
A	57	224
B	0	0
C	2	6
D	3	4
E	74	342

(b) Precast column units:

- Number of additional barges engaged in this period: 0
- Cumulative number of barges: 2

- Number of column unit deliveries in this period: 3 trips
- Cumulative number of column unit deliveries: 33 trips

Unit Types	Number of units delivered in this reporting period	Cumulative No. of Precast Column Delivered (up to 28th of month)
3m	4	23
6m	13	86
PH1	2	22
PH2	0	14

(c) Temporary storage of long span segments:

- 3 barges have been unloaded at CCCC4 yard. 2 barges remain with long span stored with P20 +1, +2. These barges will not unload at CCCC4 and the segments will remain stored on the barges until required for delivery to Hong Kong which is estimated to be mid to late September 2015.

(d) General:

- Delays in the segment unloading continue to impact on the delivery cycle to the extent that there are number of barges overstayed for 14 days in Hong Kong.
- Loading and unloading was impacted by inclement weather (typhoon and heavy rain events).
- It has been necessary to deploy 2 additional barges to columns delivery in order to overcome storage issues and potential stoppages at MBEC precast yard.

August 2015:

Land Viaduct (P85 to Abutment at SHT) & Marine Viaduct (P81 - P84)

- (a) P81L&R - 5 pours of column were completed.
- (b) P82L - ELS excavation works is in progress.
- (c) P82R - Pile cap was completed, column work is in progress.
- (d) P83L - ELS excavation works is in progress.
- (e) P83R – Column works was completed.
- (f) Portal Works:

Pier Location	Progress
P84	Formwork erection is in progress
P85	Falsework and formwork erection is in progress
P86	Portal was concreted on 26 August 2015
P89	Portal was cast on 31 July 2015. Removal of formwork and falsework is in progress
P90	Portal was concreted on 30 June 2015 Removal of falsework and steel beams are in progress
P91	Portal was cast on 9 June 2015

Pier Location	Progress
	Removal of steel cross beams and brackets at L-side was completed
P92	Portal was concreted on 17 July 2015. Removal of falsework is in progress

Marine Viaduct (P0 to P80)

Progress at P68

- (a) P68 – R3 and R6 were cast, total 10 piles were complete.
- (b) One RCD was set up on R1 casing on 27 Aug 2015 for socket drilling.

Progress at P69

- (a) Sheetpiling works at R-side is in progress.
- (b) Sheetpiling works at L-side was completed. Shear pins in L-side is in progress. Fabrication of L-side 1st and 2nd layer waling and struts works are in progress.

Progress at P75

- (a) Excavation to formation at the L-side continues.

Pile Cap Construction

- (a) Precast shells installation – 6 CP1 at P5, P9, P10 and 2 CP3 at P56.
- (b) Stage 1 concreting was completed at P6, P8, P9 & P26L.
- (c) Stage 1 works is in progress at P5 and P56.
- (d) Stage 2 concreting was completed at P2R, P57, P79L and P80.
- (e) Stage 2 works is in progress at P6, P9 and P26L.
- (f) Kingpost installation and associated steel welding works for precast shell installation are in progress at D17L.
- (g) Advanced concrete trimming (inside casing) works were carried out at P10, D17R, D18L&R, D19L, D20L&R, concrete trimming (inside cap shell) were carried out at P6 and P56.
- (h) Submerged pile cap works with cofferdam:

Pier Location	Side	Progress
P72	L	Backfilling and removal of cofferdam completed on 20-Aug-15
	R	Backfilling and removal of cofferdam completed on 20-Aug-15
P74	L	Concreting works of pile cap completed on 21-Aug-15
	R	Excavation around the footprint of pile cap completed and additional of protection concrete wall was casted

Pier Location	Side	Progress
P72	L	Backfilling and removal of cofferdam completed on 20-Aug-15
	R	Backfilling and removal of cofferdam completed on 20-Aug-15
		Blinding layer was casted on 21-Aug-15 Trimming of pile head concrete is in progress
P75	L	Rock excavation is in progress
	R	Rock excavation is in progress

In-situ Column (Single) Construction

- (a) 1st lift works is in progress at P2 & P11.
- (b) 1st lift concrete was poured at P11, P13, P55, P54-Ramp & P58-Ramp.
- (c) 2nd lift works is in progress at P55, P54-Ramp & P58-Ramp.
- (d) 2nd lift concrete was poured at P78.
- (e) 3rd lift works is in progress at P78.
- (f) Pier head works is in progress at P54, P58 & P70.
- (g) Pier head concrete was poured at P58 & P70.

Precast Column Erection

Description	Location completed in this reporting period	Number of Units erected/ Number of Columns completed in this reporting period	Cumulative No. of Piers completed (up to 28th of each month)
Commencement (ie. starting from 1 st precast unit)	P14, P15	24 (P14-P16, P21, P24, P25, P27-P44)	Commencement (ie. starting from 1 st precast unit)
Completion (ie. completed installation of pier head unit)	P25, P27	19 (P25, P27-P44)	Completion (ie. completed installation of pier head unit)
Vertical Tendons Stressed	P30 (50%)	15.5 (P28, P29, P30, P32(1/2), P33-P44)	Vertical Tendons Stressed
Grouting Vertical Tendons	P29, P30, P35	14 (P28-P30, P34-P44)	Grouting Vertical Tendons
Pier Head Concrete	P36-P38	9 (P36-P44)	Pier Head Concrete

In-situ Double Blade Column Construction

Pier Location	Side	Progress
P17	L	Poured concrete up to 4 th lift and started to construct 5 th lift
	R	Poured concrete up to 4 th lift and started to construct 5 th lift
P76	L	Poured concrete up to 2 nd lift and 3 rd lift in progress
	R	Poured concrete up to 3 rd lift and started to construct pierhead
P77	L	Poured concrete up to 3 rd lift and started to construct pierhead
	R	Poured concrete up to 3 rd lift and started to construct pierhead
P79	L	Commenced in this reporting period
	R	Commenced in this reporting period

Deck Erection

(a) Setting up of Equipment:

Type of Equipment	Status
Lifting Frames 1 (LF1)	Assembly of first two sets of LF1 at WA4 almost completed. Assembly of the third and fourth set of LF1 is on-going at WA4. Completion of assembly is targeted by end of September
Lifting Frames 3 (LF3)	First set of LF3 has started operation at P64. Second set of machines is being assembled at WA4 and is targeted to be completed in early September
Launching Gantry 1 (LG1)	Segment erection from P114 to P106 completed
Launching Gantry 2 (LG2)	No segment erection since 27 July 2015 due to machine breakdown

(b) Segment erection:

Type	Location of Segments erected in this reporting period	Number of Segments erected in this reporting period	Cumulative No. of Segments erected (up to 28th of each month)
LG1*	P106	28	330
LG2	-	0	160
LF3	P64	25	32
Typical Span SOP	P41,P42, P49	12	56
Long Span SOP	P19	6	12

* includes crane erection for P109

Precast Segment

(a) Segment Casting:

- Production affected by inclement weather (5.5 days).
- L/S segments temporary stored at CCCC4's Machong yard.
- Off yard storage extension is in progress.
- All types of segment moulds (34nos) were resumed works on 27 Aug 15.
- 6 nos. of segments at storage line 3 were toppled on 13 July 2015. The 6 damaged segments were removed and re-casting of the new segments are in progress.
- Line 1 modification of L/S storage ground beam for MCH1 segment in progress.

Item	Number in this reporting period	Cumulative No. of Precast Segment Completed (up to 28th of each month)
Segment Cast	93	2455

(b) Off-site Storage:

Area	No. in Off-site Storage
A1	134 (A)
A2	206 (A)
A3	237 (A, B, E)
A4	116(L/S) & 16(D)

Precast Concrete Shell Casting

(a) Summary of precast shell cast in the precast yard:

Type of Shell	Number of Precast Shell Cast in this reporting period	Cumulative No. of Precast Shell Completed (up to 28th of each month)
CP1	Completed	94
CP2	Completed	12
CP3	Completed	14
CP4	Completed	8
CP5	Completed	6
CP6	Completed	4
CP11	Completed	1
CP12	Completed	1
F1 & F1A	0	2
F2 & F2A	1	1

Precast Column & Precast Pier Head Casting

(a) Progress of the precast column & precast pier head casting:

- All casting works for the 6m piers, monolithic pier heads were completed.
- Totally 16 precast units (10 piers with 6m high, 6 monolithic pier heads) were cast in this reporting period.
- Cumulatively 293 precast units were cast.
- Precast pier head 2-R-H would be re-cast around September.

Delivery for Precast Concrete Elements (by barge)

(a) Precast Deck Segments:

- Number of additional barges engaged in this period: 0
- Cumulative number of barges: 14 (2 barges tied up on L/S storage)
- Number of deck segment deliveries in this period: 21 trips
- Cumulative number of deck segment deliveries: 137 trips

Segment Types	Segment Delivered in this reporting period	Cumulative No. of Precast Segment Delivered (up to 28th of each month)
A	45	269
B	0	0
C	12	18
D	5	9
E	36	378

(b) Precast column units:

- Number of additional barges engaged in this period: 0
- Cumulative number of barges: 2
- Number of column unit deliveries in this period: 2 trips
- Cumulative number of column unit deliveries: 35 trips

Unit Types	Number of units delivered in this reporting period	Cumulative No. of Precast Column Delivered (up to 28th of month)
3m	0	23
6m	8	94
PH1	4	26
PH2	0	14

(c) Temporary storage of long span segments:

- 2 barges remain with long span stored with P20 +1, +2. These barges will not unload at CCCC4 and the segments will remain stored on the barges until required for delivery to Hong Kong which is estimated to be mid to late September 2015.

(d) General:

- Delivery to LG2 has been interrupted by mechanical failure of support jacks during this period.

Status of Environmental Licences, Notification and Permits

2.11 The valid environmental licenses and permits were attached in the Monthly EM&A Reports.

3 ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

Monitoring Parameters and Monitoring Locations

3.1 The EM&A Manual designates locations for the ET to monitor environmental impacts in terms of air quality, noise, underwater noise, water quality and dolphin to the Contract. The monitoring locations are depicted in **Figures 3 to 6**. The details of monitoring requirements are presented in **Table 3.1**.

Table 3.1 Summary of Impact EM&A Requirements

Type of Monitoring	Parameter	Frequency	Location	Remarks
Air Quality	1-hr TSP	Three times / 6 days	AMS1 – Sha Lo Wan AMS4 – San Tau	While the highest dust impact was expected
	24-hr TSP	Once / 6 days		--
Noise	L _{10(30 min.)} dB(A) L _{90(30 min.)} dB(A) L _{eq(30 min.)} dB(A) (as six consecutive L _{eq, 5min} readings)	Once per week	NMS1 – Sha Lo Wan NMS4 – San Tau	Daytime on normal weekdays (0700-1900 hrs)
Water Quality	<ul style="list-style-type: none"> • Temperature(°C) • pH(pH unit) • turbidity (NTU) • water depth (m) • salinity (ppt) • dissolved oxygen (DO) (mg/L and % of saturation) • suspended solids (SS) (mg/L) 	Impact monitoring: 3 days per week, at mid-flood and mid-ebb tides (within ± 1.75 hour of the predicted time) during the construction period of the Contract	IS1, IS2, IS3 IS4, CS1, CS2, SR1, SR2, SR3, SR6, ST1, ST2, ST3, SRA	<ul style="list-style-type: none"> • 3 water depths: 1m below sea surface, mid-depth and 1m above sea bed. • If the water depth is less than 3m, mid-depth sampling only. • If water depth less than 6m, mid-depth may be omitted.
Dolphin	Line-transect Methods	Twice per month	West Lantau	--

3.2 The wind speed and wind direction were recorded by the installed Wind Anemometer set at AMS4. The location is shown in **Figure 3**.

Monitoring Methodology and Calibration Details

3.3 Monitoring works/equipments were conducted/calibrated regularly in accordance with the EM&A Manual. Copies of calibration certificates are attached in the appendices of the Monthly EM&A Reports.

Environmental Quality Performance Limits (Action and Limit Levels)

3.4 The environmental quality performance limits, i.e. Action and Limit Levels were derived from the baseline monitoring results (except the Action and Limit Levels for underwater noise monitoring). Should the measured environmental quality parameters exceed the Action/Limit Levels, the respective action plans would be implemented. The Action/Limit Levels for each environmental parameter are given in **Table 3.2a-f**.

Table 3.2a Action and Limit Levels for 1-Hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AMS1	381	500
AMS4	352	

Table 3.2b Action and Limit Levels for 24-Hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AMS1	170	260
AMS4	171	

Table 3.2c Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A) *

Noted: If works are to be carried during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

(*) reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

Table 3.2d Action and Limit Levels for Water Quality

Parameter (unit)	Water Depth	Action Level	Limit Level
Dissolved Oxygen (mg/L) (surface, middle, bottom)	Surface and Middle	<u>5.0</u>	4.2 except 5 for FCZ
	Bottom	<u>4.7</u>	3.6
Turbidity (NTU)	Depth average	<u>27.5</u> and 120% of upstream control station's turbidity at the same tide of the same day	<u>47.0</u> and 130% of turbidity at the upstream control station at the same tide of same day
Suspended Solids (mg/L)	Depth average	<u>23.5</u> and 120% of upstream control station's SS at the same tide of the same day	<u>34.4</u> and 130% of SS at the upstream control station at the same tide of same day and 10mg/L for WSD Seawater Intakes

Note:

- (1) Depth-averaged is calculated by taking the arithmetic means of reading of all three depths
- (2) For DO, non-compliance of the water quality limit occurs when monitoring result is lower than the limit.
- (3) For SS & turbidity non-compliance of the water quality limits occur when monitoring result is higher than the limits.
- (4) All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary.
- (5) The 1%-ile of baseline data for dissolved oxygen (surface and middle) and dissolved oxygen (bottom) are 4.2mg/L and 3.6mg/L respectively.

Table 3.2e Action and Limit Levels for Dolphin Line Transect Monitoring

	West Lantau
Action Level	STG < 60% of baseline & ANI <60% of baseline
Limit Level	STG < 45% of baseline & ANI <45% of baseline

Derived Value of Action Level (AL) and Limit Level (LL):

	West Lantau
Action Level	STG < 9.8 & ANI <36.3
Limit Level	STG < 7.4 & ANI <27.2

Remarks:

1. STG means quarterly encounter rate of number of dolphin sightings
2. ANI means quarterly encounter rate of total number of dolphins
3. Baseline value: 16.4 for ER (STG) and 60.5 for ER (ANI)

Event and Action Plan

- 3.5 Should non-compliance of the criteria occur, action in accordance with the Action Plan in **Appendix G** shall be carried out.

Implementation Status of Environmental Mitigation Measures

- 3.6 Relevant mitigation measures as recommended in the EIA report have been stipulated in the EM&A Manual for the Contractor to implement. The implementation status of environmental mitigation measures (EMIS) is given in **Appendix H**.
- 3.7 Regular marine travel route for marine vessels were implemented properly in accordance with the submitted plan and relevant records were kept properly.
- 3.8 Acoustic decoupling measures for the stationary equipment (generators, winch generators and air compressors) mounted on boards were adopted according to EP Condition 3.7 and EM&A Manual, Section 10.2.18.
- 3.9 Dolphin exclusion zone and dolphin watching plan according to EM&A Manual, Section 10.2.12 and EP Condition 3.5 was implemented by DCVJV's trained dolphin watcher.
- 3.10 Spill kits and booms are ready on site for the event of accidental spillage of oil or other hazardous chemicals from construction activities including vessels operating for the Contract.

Site Audit Summary

- 3.11 Site audits were carried out by ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Contract site. The observations and recommendations made during the reporting period are summarized in **Appendix I**.
- 3.12 According to EP condition 4.7 and EM&A Manual, periodic monitoring (every three months) of construction works shall be conducted to ensure the avoidance of any impacts on Sha Lo Wan (West) Archaeological Site. Access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment is not allowed. One inspection to the Sha Lo Wan (West) Archaeological Site was conducted in the reporting period (23rd June 2015). No access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment was observed. The photographic records of the inspection to the Sha Lo Wan (West) Archaeological Site are shown in the Monthly EM&A Reports.

Status of Waste Management

- 3.13 The amount of wastes generated by the activities of the Contract during the reporting month is shown in **Appendix J**.

4 ENVIRONMENTAL MONITORING RESULTS

Air Quality Monitoring Results

4.1 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in **Table 4.1 and 4.2** respectively. Graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendices B and C** respectively.

Table 4.1 Summary Table of 1-hour TSP Monitoring Results during the Reporting Period

Month	Monitoring Station	Concentration (µg/m ³)		Action Level, µg/m ³	Limit Level, µg/m ³
		Average	Range		
June 2015	AMS1	32	14 – 181	381	500
	AMS4	27	14 – 98	352	
July 2015	AMS1	34	7 – 213	381	
	AMS4	43	11 – 279	352	
August 2015	AMS1	48	14 – 207	381	
	AMS4	39	14 – 131	352	

Table 4.2 Summary Table of 24-hour TSP Monitoring Results during the Reporting Period

Month	Monitoring Station	Concentration (µg/m ³)		Action Level, µg/m ³	Limit Level, µg/m ³
		Average	Range		
June 2015	AMS1	15	9 – 27	170	260
	AMS4	21	5 – 39	171	
July 2015	AMS1	42	21 – 74	170	
	AMS4	25	17 – 35	171	
August 2015	AMS1	54	18 – 101	170	
	AMS4	53	23 – 103	171	

4.2 According to our field observations, the major dust source identified at the designated air quality monitoring stations in the reporting period are as follows:

Table 4.3 Observation at Dust Monitoring Stations

Monitoring Station	Major Dust Source
AMS1	Exhaust from marine traffic
AMS4	N/A

4.3 The wind data monitoring results were attached in the Monthly EM&A Reports

Noise Monitoring Results

- 4.4 The noise monitoring results are summarized in **Table 4.4**. Graphical presentations of noise monitoring are shown in **Appendix D**.

Table 4.4 Summary Table of Noise Monitoring Results during the Reporting Period

Month	Monitoring Station	Noise Level, $L_{eq(30min)}$ dB(A)		Limit Level
		Average	Range	
June 2015	NMS1	69	68 - 69	75 dB(A)
	NMS4	62	54 - 64	
July 2015	NMS1	70	67 - 71	
	NMS4	58	52 - 63	
August 2015	NMS1	71	70 - 72	
	NMS4	52	51 - 53	

Remark: +3dB(A) Façade correction included

- 4.5 According to our field observations, the major noise source identified at the designated noise monitoring stations in the reporting period are as follows:

Table 4.5 Observation at Noise Monitoring Stations

Monitoring Station	Major Noise Source
NMS1	Air traffic & marine traffic noise
NMS4	Air traffic & marine traffic noise

Water Quality Monitoring Results

- 4.6 The graphical presentation of water quality at the monitoring stations is shown in **Appendix E**.
- 4.7 Water quality impact sources during the water quality monitoring were the construction activities of the Contract, nearby construction activities by other parties and nearby operating vessels by other parties.

Dolphin Monitoring (Line-transect Vessel Survey)*Summary of survey effort and dolphin sightings*

- 4.8 During the period of June to August 2015, six sets of systematic line-transect vessel surveys were conducted to cover all transect lines in WL survey area twice per month.
- 4.9 From these surveys, a total of 199.77 km of survey effort was collected, with 86.2% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). The total survey effort conducted on primary lines was 133.76 km, while the effort on secondary lines was 66.01 km.

Survey effort conducted on primary and secondary lines were both considered as on-effort survey data. Summary table of the survey effort is shown in **Appendix I of Appendix F**.

- 4.10 During the six sets of monitoring surveys in June to August 2015, a total of 27 groups of 116 Chinese White Dolphins were sighted. All except one sightings were made during on-effort search. Eighteen on-effort sightings were made on primary lines, while the other on-effort sightings were made on secondary lines. Summary table of the dolphin sightings is shown in **Appendix II of Appendix F**.

Distribution

- 4.11 Distribution of dolphin sightings made during monitoring surveys in June to August 2015 is shown in **Figure 1 of Appendix F**. The dolphin groups were mainly clustered near Tai O Peninsula, Peaked Hill and Fan Lau. It appeared that they have avoided the waters between Tai O Peninsula and Kai Kung Shan (**Figure 1 of Appendix F**).
- 4.12 Sighting distribution of dolphins in the present quarter was generally similar to the one during the baseline period, but with some subtle differences. Dolphins occurred less frequently between Tai O Peninsula and Peaked Hill during the present impact phase period. Moreover, two dolphin groups were sighted to the north of the HKLR09 alignment during the present quarter, where no dolphin was sighted during the baseline period (**Figure 1 of Appendix F**).
- 4.13 Two of the 27 dolphin groups was sighted near the HKLR09 alignment in WL survey area during the present quarter (**Figure 2 of Appendix F**).
- 4.14 Distribution patterns of dolphin sightings in the past three summer quarters of 2013, 2014 and 2015 were also compared (**Figure 3 of Appendix F**). Much fewer dolphins occurred between Tai O Peninsula and Kai Kung Shan, as well as around Fan Lau in 2015. On the other hand, after a decline in dolphin usage to the north of Tai O Peninsula in 2014, their usage has rebounded in 2015. Overall, there appeared to be fewer dolphins utilizing WL survey area in summer 2015 than during the previous two summer periods.

Encounter rate

- 4.15 During the three-month impact phase monitoring period (June – August 2015), 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) from West Lantau survey area are shown in **Table 4.6**. The average encounter rates deduced from the six sets of surveys from present quarter were also compared with the ones deduced from the baseline monitoring period (September – November 2011) (**Table 4.7**).

Table 4.6 Dolphin encounter rates (sightings per 100 km of survey effort) during the impact monitoring period (June – August 2015)

Survey Area	Dolphin Monitoring	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
West Lantau	Set 1 (June 9 th)	15.8	121.2
	Set 2 (June 18 th)	6.5	38.9
	Set 3 (July 6 th)	13.1	74.5
	Set 4 (July 28 th)	13.2	66.0
	Set 5 (August 18 th)	20.5	61.5
	Set 6 (August 26 th)	5.0	5.0

Table 4.7 Comparison of average dolphin encounter rates from impact monitoring period (June – August 2015) and baseline monitoring period (September-November 2011)

	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)	
	June - August 2015	September- November 2011	June - August 2015	September- November 2011
West Lantau	12.36 ± 5.81	16.43 ± 7.70	61.19 ± 38.63	60.50 ± 38.47

4.16 Notably, the dolphin encounter rates from the present summer quarter of 2015 was much lower than the ones recorded from previous summers of 2014 (ER(STG): 22.90 and ER(ANI): 101.41) and 2015 (ER(STG): 26.89 and ER(ANI): 94.75). Such temporal trend should be continuously monitoring to detect any further decline, even though the Action or Limit Level has not been triggered under the Event and Action Plan.

4.17 A one-way ANOVA was conducted to examine whether there were any significant differences in the average encounter rates between the baseline and impact monitoring periods. For the comparison between the baseline period and the present quarter (i.e. tenth quarter of the impact phase), the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.325 and 0.892 respectively. Therefore, no

significant difference in dolphin encounter rate was detected between the baseline period and the present quarter.

- 4.18 Another comparison was made between the baseline period and the cumulative quarters in the impact phase (i.e. first ten quarters of the impact phase), and the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.976 and 0.998 respectively. As a result, no significant difference was found in the dolphin encounter rates between the baseline period and the cumulative quarters in the impact phase.

Group size

- 4.19 Group size of Chinese White Dolphins ranged from 1-20 individuals per group in WL survey area between June to August 2015. The average dolphin group size in the WL region during the present quarter was higher than the one recorded in the three-month baseline period (Table 4). About half of the groups were composed of 1-2 dolphins, while there were nine groups with more than 5 animals per group, and two groups with more than 10 animals per group.

Table 4.8 Comparison of average dolphin group sizes from impact monitoring period (June – August 2015) and baseline monitoring period (September-November 2011)

	Average Dolphin Group Size	
	June – August 2015	September to November 2014
West Lantau	4.30 ± 4.28 (n = 27)	3.63 ± 2.97 (n = 46)

- 4.20 Distribution of dolphins with the larger groups during June to August 2015 is shown in **Figure 4 of Appendix F**. These groups were scattered from the bridge alignment to Fan Lau waters with no particular concentration, and a number of these large groups were located along the western territorial boundary (**Figure 4 of Appendix F**). The distribution of larger dolphin groups was very different from the baseline period, when they mostly occurred to the northwest of Tai O Peninsula (near the bridge alignment) as well as near Kai Kung Shan and Peaked Hill (**Figure 4 of Appendix F**).

Habitat use

- 4.21 From June to August 2015, the most heavily utilized habitats by the dolphins were mainly found near Tai O Peninsula, Kai Kung Shan and Fan Lau, which is similar to the previous monitoring quarters (**Figures 5a and 5b of Appendix F**). However, it should be cautioned that the amount of survey effort collected in each grid during the three-month period was fairly low (6 units of survey effort for most grids), and therefore the habitat use pattern derived from the three-month dataset should be treated with caution. A more complete picture of dolphin habitat use pattern will be presented when more survey effort for each grid will be collected throughout the impact phase monitoring programme.

- 4.22 When compared with the habitat use pattern recorded during the baseline period, it appears that the overall dolphin densities were lower in West Lantau waters during the present impact phase period, especially the waters near Kai Kung Shan and Fan Lau. Moreover, distribution of dolphins was patchier in the present impact phase quarter with a number of grids recorded the absence of dolphin sightings (**Figure 6 of Appendix F**).

Mother-calf pairs

- 4.23 During the three-month impact phase monitoring period, five unspotted juveniles (UJ) were sighted in WL survey area. The young calves comprised 4.3% of all animals sighted, which was lower than the percentage recorded during the baseline monitoring period (6.6%).
- 4.24 The five mother-calf pairs were sighted near the bridge alignment, Kai Kung Shan and Fan Lau (**Figure 7 of Appendix F**). This was in stark contrast to the baseline period when calf occurrence was more frequent and concentrated near Tai O Peninsula at the northern portion of WL waters (**Figure 7 of Appendix F**).

Activities and associations with fishing boats

- 4.25 During the three-month impact monitoring period, three dolphin sightings were associated with feeding activities between near the HKLR09 bridge alignment and Fan Lau (**Figure 8 of Appendix F**), comprising 11.1% of the total number of dolphin sightings. This percentage was very similar to the percentage recorded during the baseline period (13.0%).
- 4.26 Moreover, three dolphin sightings were associated with socializing activity near the HKLR09 bridge alignment, Peaked Hill and Fan Lau (**Figure 8 of Appendix F**), while no dolphin group was engaged in traveling or milling/resting activity during the present quarter.
- 4.27 Distribution of feeding and socializing activities during the present impact phase monitoring period was somewhat different from the one during the baseline period, with the main concentration of these activities occurred between Tai O and Peaked Hill during the baseline period. On the contrary, the occurrence of these activities was more wide-spread in different parts of the WL survey area during the impact phase period (**Figure 8 of Appendix F**).
- 4.28 During the three-month monitoring period, only one of the 27 dolphin groups was associated with an operating purse-seiner near Fan Lau.

Summary of photo-identification works

- 4.29 From June to August 2015, over 2,500 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.
- 4.30 In total, 64 individuals sighted 77 times altogether were identified (see summary table in

Appendix III of Appendix F and photographs of identified individuals in **Appendix IV of Appendix F**. Almost all identified individuals were sighted only once or twice during the three-month period, with the exception of three individuals (NL120, NL140 and WL214) being sighted thrice.

Individual range use

- 4.31 Ranging patterns of the 64 individuals identified during the three-month study period were determined by fixed kernel method, and are shown in **Appendix V of Appendix F**.
- 4.32 Notably, a number of individual dolphins (NL136, NL210, NL242, NL261, NL280, NL284, NL295 and WL11) that primarily centered their range use in North Lantau were found extending their ranges to the southern part of West Lantau waters, further expanding their range use away from North Lantau waters (**Appendix V of Appendix F**).
- 4.33 On the contrary, most individuals that primarily centered their range use in West Lantau were sighted within their normal range during the present quarterly period **Appendix V of Appendix F**).

Conclusion

- 4.34 During the present quarter of dolphin monitoring, no adverse impact from the activities of the HKLR09 construction project on Chinese White Dolphins was noticeable from general observations.
- 4.35 Nevertheless, the dolphin usage in WL region should be continuously monitored, to further examine whether it has been significantly affected by the on-going construction activities in relation to the HZMB works.

Additional Land-based Dolphin Behaviour and Movement Monitoring

- 4.36 Additional land-based dolphin behavior and movement monitoring were conducted in the reporting period. The progress of the monitoring is summarized in the **Table 4.9**.

Table 4.9 Progress Record of Additional Land-based Dolphin Behaviour and Movement Monitoring (June to August 2015)

Date	Time	Weather		Number of Staff	Number of Dolphin Sighting
		Beaufort	Visibility		
03/06/15	09:12 - 14:43	2- 4	1	3	2
11/06/15	09:05 - 14:30	2	2	3	0
06/07/15	09:22 - 14:53	2	2-3	3	3
16/07/15	09:28 - 14:44	2	2	3	2
13/08/15	09:05 - 14:31	3	2	3	0
21/08/15	09:02 - 14:16	2-3	2	3	1

4.37 Detailed monitoring methodology and results will be provided in a separate report after the completion of full set of additional land-based dolphin behavior and movement monitoring.

Advice on the Solid and Liquid Waste Management Status

4.38 The Contractor was advised to minimize the wastes generated through the recycling or reusing. All mitigation measures stipulated in approved waste management plan shall be fully implemented.

4.39 The amount of wastes generated by the activities of the Contract during the reporting month is shown in **Appendix J**.

5 ENVIRONMENTAL NON-CONFORMANCE (EXCEEDANCES)

Summary of Exceedances

5.1 Summary of exceedance is provided in **Appendix K**. The details of the exceedances were attached in the Monthly EM&A Report.

Air Quality

5.2 For 1-hour TSP monitoring, no Action/Limit Level exceedance was recorded in the reporting period.

5.3 For 24-hr TSP monitoring, no Action/Limit Level exceedance was recorded in the reporting period.

Noise

5.4 No Action/Limit Level exceedance was recorded in the reporting period.

Water Quality

5.5 There are 5 Action Level exceedances and 6 Limit Level exceedances were recorded for suspended solids. No Action/Limit Level exceedance for turbidity were recorded in the reporting period.

5.6 According to the investigation, the exceedances are considered not due to the Contract due to the following reasons:

- 1) No pollution discharge was observed from the site;
- 2) Adverse water quality outside the site boundary and dispersion of sediment plume to the monitoring stations from the area outside the site boundary (i.e. works area not under and related to HY/2011/09) was observed; and
- 3) Sediment plume due to natural fluctuation of shallow water.

Dolphin Monitoring (Line-transect Vessel Survey)

5.7 No Action/Limit Level exceedance was recorded in the reporting period.

Summary of Environmental Complaint

5.8 One environmental related complaint was received in the reporting period. The Complaint Log is attached in **Appendix L**.

Summary of Notification of Summons and Successful Prosecution

5.9 There was one prosecution or notification of summons received since the Contract commencement. Summary of successful prosecution is attached in **Appendix M**.

6 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 6.1 This Quarterly Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken in the period between June and August 2015 in accordance with EM&A Manual.
- 6.2 No Action/Limit Level exceedance was recorded for air quality and noise.
- 6.3 For water quality monitoring, there are 5 Action Level exceedances and 6 Limit Level exceedances were recorded for suspended solids. No Action/Limit Level exceedance was for turbidity were recorded in the reporting period.
- 6.4 According to the investigation, all exceedances are considered not due to the Contract.
- 6.5 During this quarter of dolphin monitoring, no adverse impact from the activities of the HKLR09 construction project on Chinese White Dolphins was noticeable from general observations.
- 6.6 Environmental site inspection was conducted on 4th, 9th, 16th, 23rd and 30th June 2015, 7th, 14th, 21st and 28th July 2015, 4th, 11th, 18th and 25th August 2015 by ET in the reporting month. All deficiencies identified during the site inspection have already rectified / improved during the follow-up audit session.
- 6.7 The inspection to the Sha Lo Wan (West) Archaeological Site was conducted on 23rd June 2015. No access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment was observed.
- 6.8 There was no environmental complaint, notification of summons and successful prosecution received in the reporting period.
- 6.9 The ET will keep track on the EM&A programme to ensure compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Recommendations

- 6.10 According to the environmental audit performed in the reporting month, the following recommendations were made:

Air Quality Impact

- To regularly maintain the quality of machinery and vehicles on site.
- To implement dust suppression measures on all haul roads, stockpiles, dry surfaces and excavation works.
- To provide hoarding along the entire length of that portion of the site boundary.

Noise Impact

- To inspect the noise sources inside the site.

- To space out noisy equipment and position the equipment as far away as possible from sensitive receivers.
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers, if necessary.

Water Impact

- To prevent any surface runoff discharge into any stream course and sea.
- To review and implement temporary drainage system.
- To identify any wastewater discharges from site.
- To ensure properly maintenance for de-silting facilities.
- To clear the silt and sediment in the sedimentation tanks.
- To review the capacity of de-silting facilities for discharge.
- To divert all the water generated from construction site to de-silting facilities with enough handling capacity before discharge.
- To avoid accumulation of stagnant and ponding water on site.

Ecology Impact

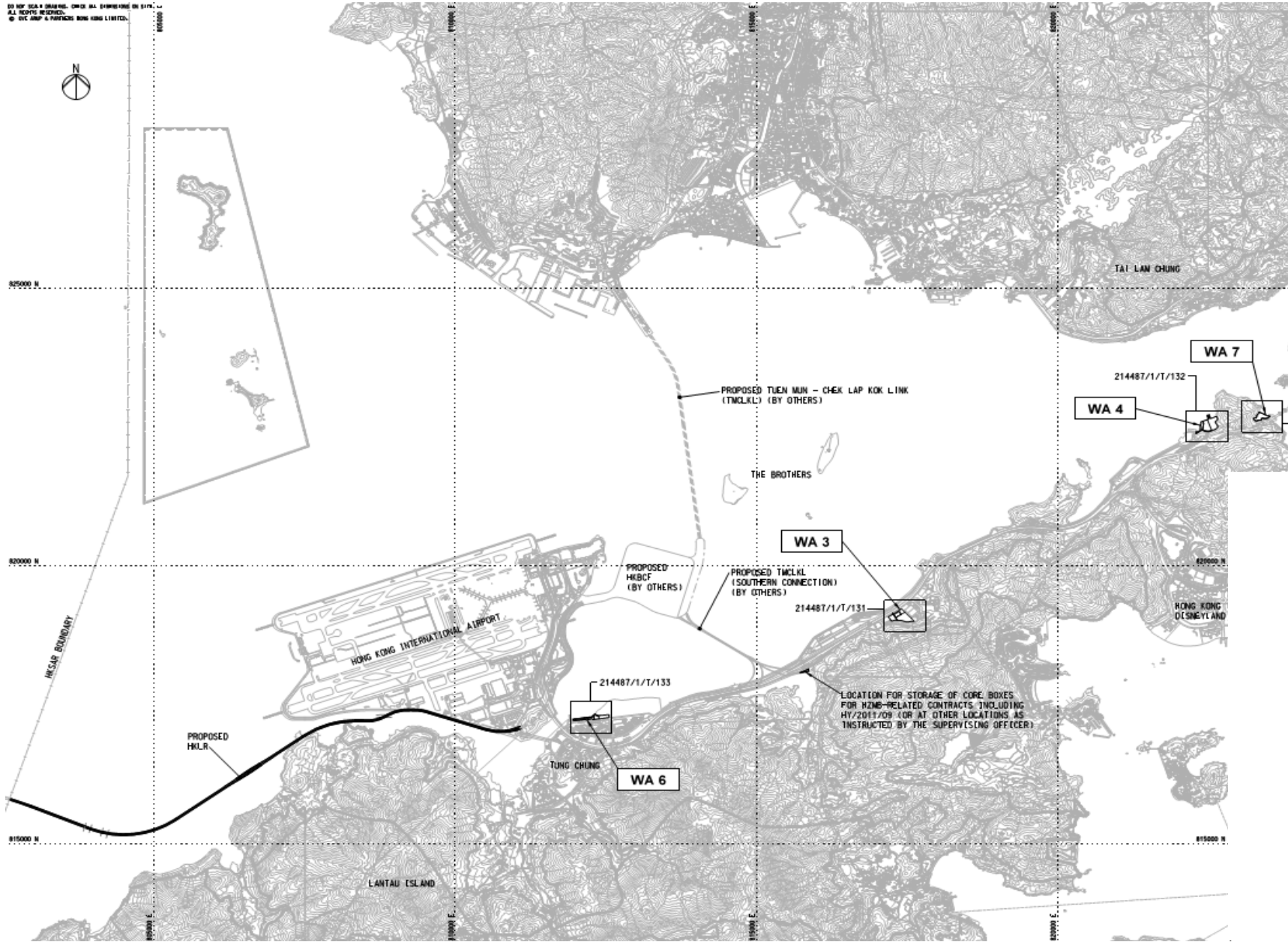
- To implement Spill Response Plan in the event of accidental spillage of or other hazardous chemicals.
- To implement Dolphin Exclusion Zone during the installation of bored pile casing located in the waters to the west of Airport.
- To implement Dolphin Watching Plan after the bored piling casing is installed.
- To ensure the acoustically-decoupled measures were implemented for air compressors and other noisy equipment mounted on construction vessels according to acoustic decoupling measures plan.

Waste/Chemical Management

- To check for any accumulation of waste materials or rubbish on site.
- To ensure the performance of sorting of C&D materials at source (during generation);
- To carry out inspection of dump truck at site exit to ensure inert and non-inert C&D materials are properly segregated before removing off site.
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the site.
- To avoid improper handling or storage of oil drum on site.

FIGURE(S)

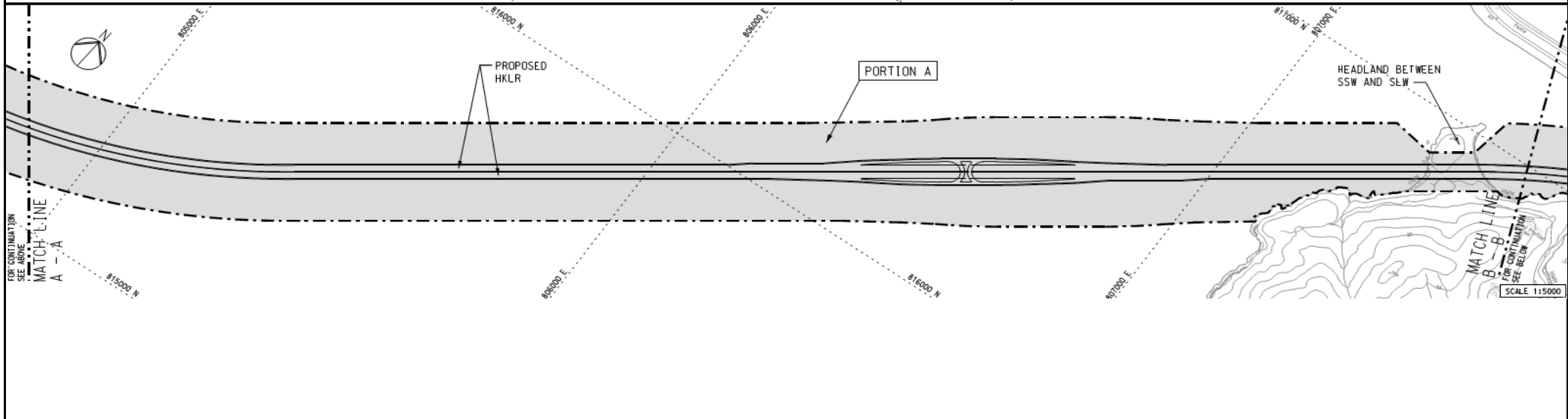
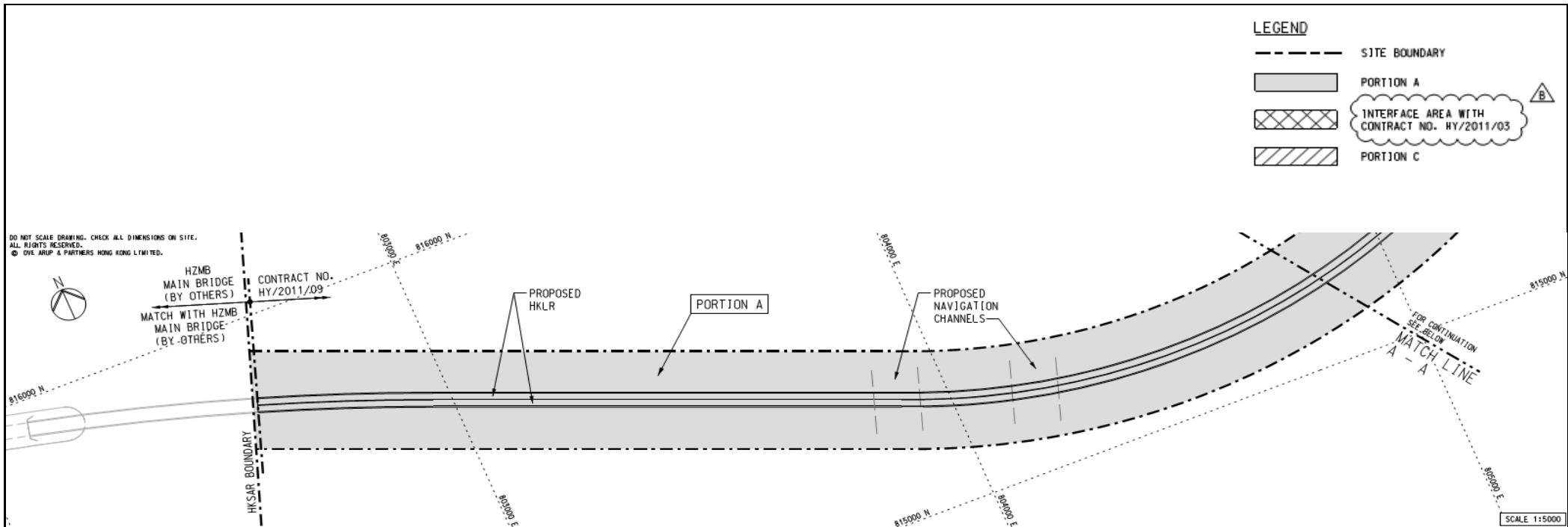
BY THE SCALE DRAWING, ONLY THE DIMENSIONS ON SITE
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Title
 Contract No. HY/2011/09
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill
 Site Layout Plan (WA3, WA4, WA6 and WA7)

Scale	N.T.S	Propose No.	MA12014
Date	Feb-13	Figure	1a

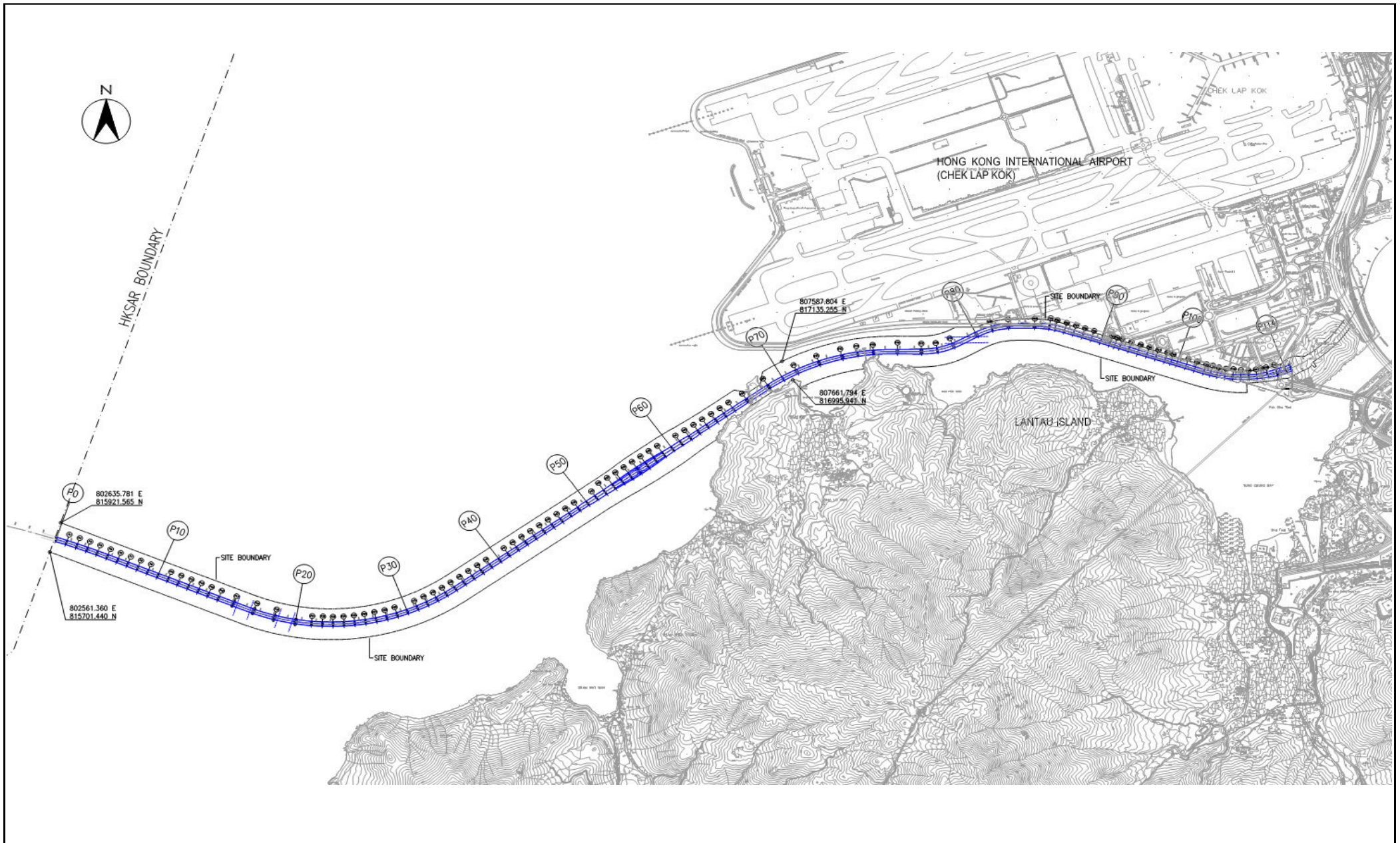




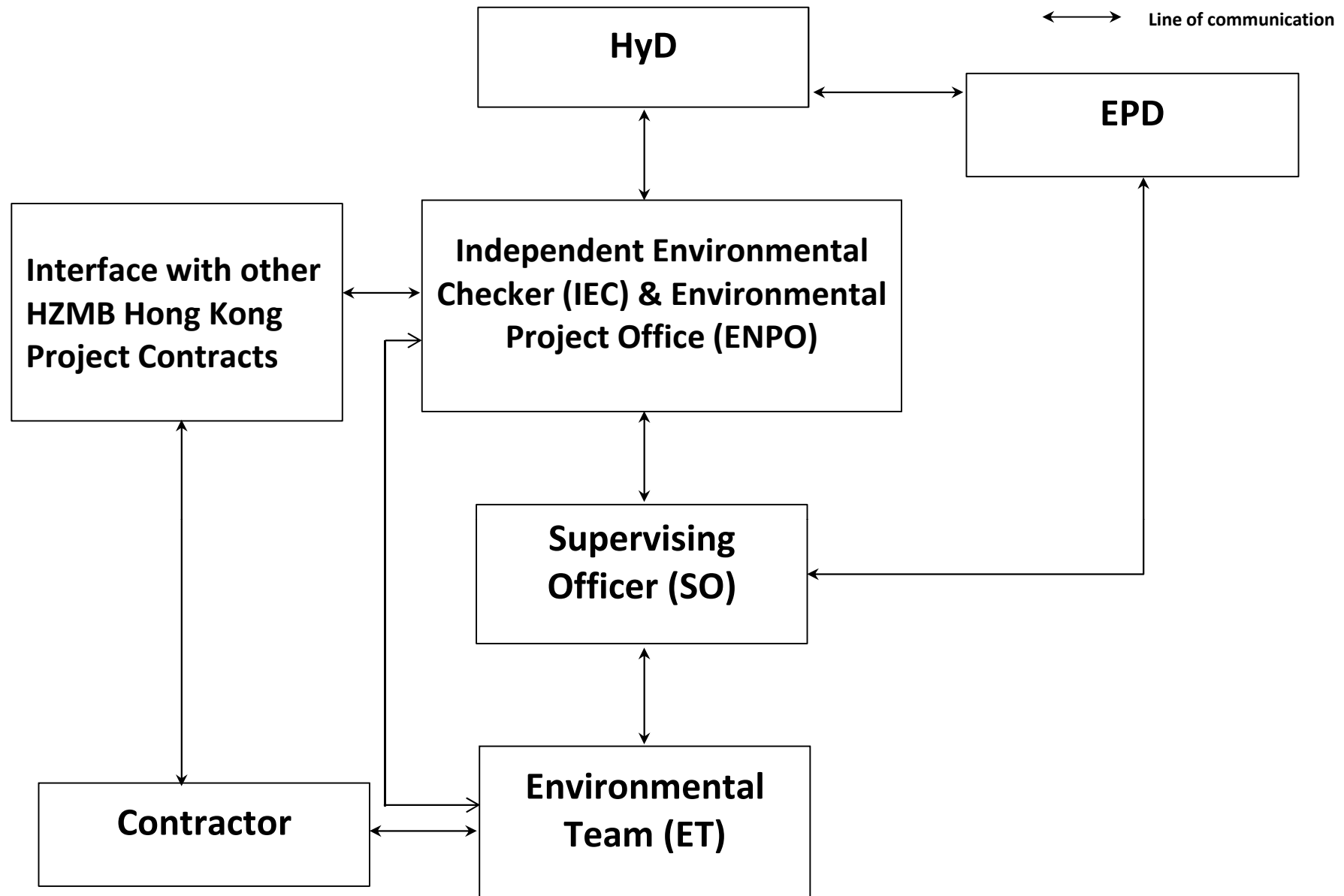
LEGEND

- SITE BOUNDARY
- PORTION A
- ▨ INTERFACE AREA WITH CONTRACT NO. HY/2011/03
- ▧ PORTION C

Title	Contract No. HY/2011/09		Scale	Propose	CINOTECH
	Hong Kong-Zhuhai-Macao Bridge		N.T.S	No. MA12014	
Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill			Date	Figure	
Site Layout Plan (Portion A)			May-13	1b	



Title	Contract No. HY/2011/09		Scale	Propose	CINOTECH
	Hong Kong-Zhuhai-Macao Bridge		N.T.S	No. MA12014	
	Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill		Date	Figure	
	Site Layout Plan (Pier(s) Site)		Feb-13	1d	

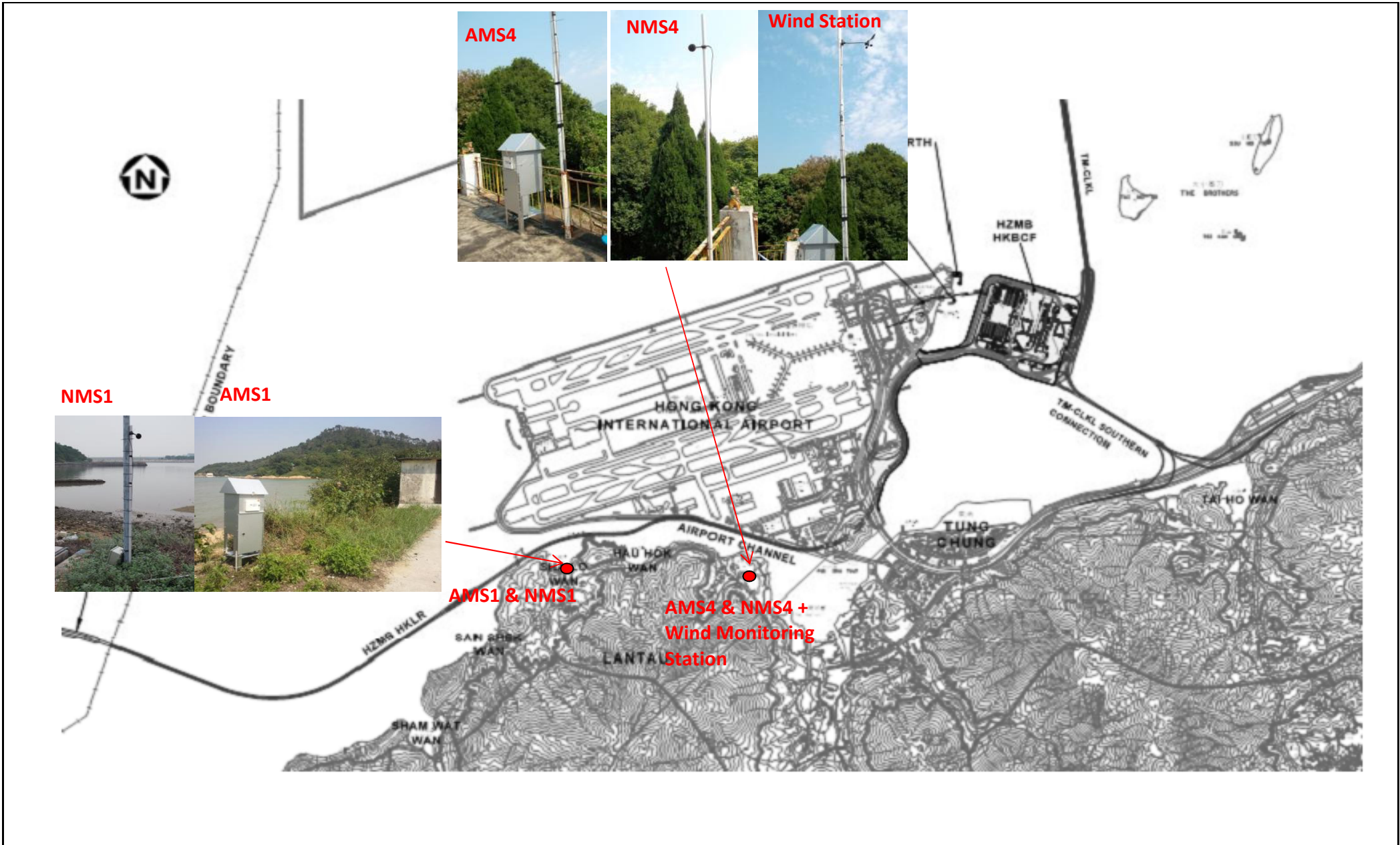


Title Contract No. HY/2011/09
 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between
 HKSAR Boundary and Scenic Hill
 Project Organisation for Environmental Works

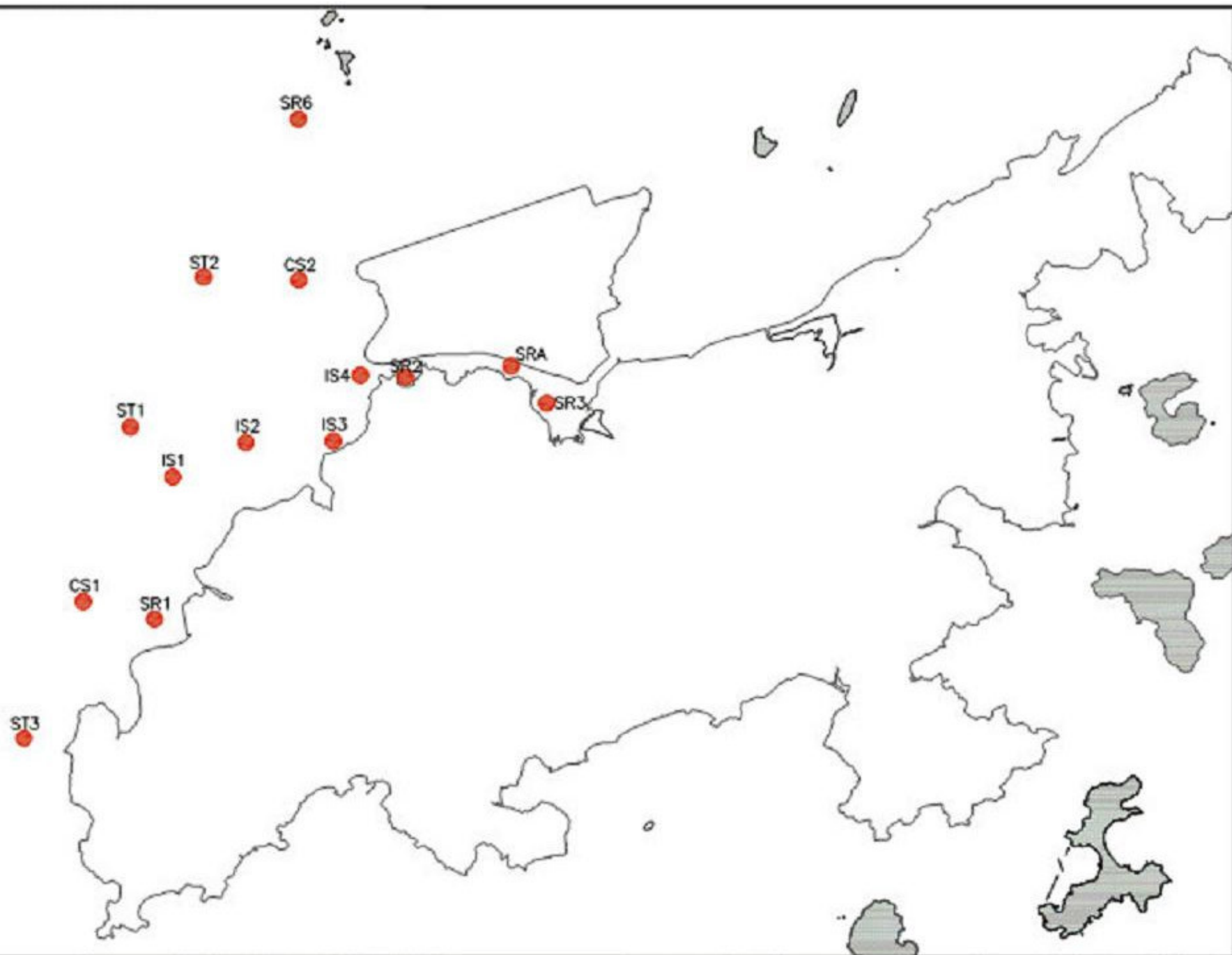
Scale N.T.S
 Date Feb-13

Propose No. MA12014
 Figure 2





Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill		Scale	N.T.S	Propose No.	MA12014	CINOTECH
	Locations of Air Quality and Noise Monitoring Stations		Date	Feb-13	Figure	3	



**APPENDIX A
CONSTRUCTION PROGRAMME**



- SECTION BETWEEN HKSAR BOUNDARY AND SCENIC HILL

Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish	Total Float	2015		
								Jun	Jul	Aug
HKZB Hong Kong Link Road - 3 Months Rolling Programme 1509 (based on DWP_01_f Fi										
Procurement and Fabrication										
PGS2505	Fabrication & Deliver Lift Frames LF3_A/C/D	66	0	100%	1/7/15 A	2/9/15 A				
Pile Cap Shell Casting										
PC1520	Pile cap shell casting for P56 - 2nos.	30	0	100%	17/6/15 A	7/7/15 A				
PC1700	Pile cap shell casting for P17 dolphin - 2nos.	45	0	0%	4/6/15 A	7/8/15 A				
PC1710	Pile cap shell casting for P18 dolphin - 2nos.	45	0	0%	20/7/15 A	30/8/15 A				
Column Casting										
PC1750	Precast Column & Columnhead P2	5	0	100%	8/6/15 A	15/6/15 A				
Segment Casting										
Type A Segment (2 set SOP, 8 set Field Seg.)										
SC5208	Segment Casting for P26 SOP	14	7	100%	8/8/15 A	3/12/15	-441			
SC5228	Segment Casting for P27 SOP	14	7	100%	16/7/15 A	12/11/15	-441			
SC5248	Segment Casting for P28 SOP	14	7	100%	16/6/15 A	5/11/15	-441			
SC5318	Segment Casting for P31 field segment	30	16	100%	29/6/15 A	24/10/15	-392			
SC5338	Segment Casting for P32 field segment	30	15	100%	24/8/15 A	16/10/15	-402			
SC5828	Segment Casting for P58 SOP	14	7	0%	1/7/15 A	31/12/15	-409			
Type B Segment (1 set)										
SC6169	Segment Casting for P57 field segment	108	81	89%	29/8/15 A	17/12/15	-468			
Type E Segment (4 set for E & 2 set for EV)										
SC6398	Segment Casting for P95 field segment	27	8	100%	30/7/15 A	5/11/15	-423			
SC6418	Segment Casting for P97 field segment	54	31	100%	31/8/15 A	29/10/15	-459			
SC6428	Segment Casting for P98 field segment	27	3	100%	13/7/15 A	30/9/15	-423			
SC6438	Segment Casting for P99 field segment	9	0	100%	3/7/15 A	16/7/15 A				
SC6448	Segment Casting for P100 field segment	27	0	100%	3/6/15 A	8/7/15 A				
Type CH&CHV Segment (2 set SOP & 10 set Field Seg.)										
ML03 (P17 TO P20)										
SC1498	Segment Casting for P18L CH14' to CH19' (MCH5)	17	0	100%	23/6/15 A	22/8/15 A				
SC1678	Segment Casting for P17L CH14' to CH19' (MCH5)	17	0	100%	31/8/15 A	28/9/15 A				
ML11 (P71 TO P73)										
SC1728	Segment Casting for P71L CH17 to CH22 (MCH5)	17	0	100%	1/6/15 A	10/7/15 A				
SC1768	Segment Casting for P71R CH13' to CH16' (MCH4)	15	0	100%	30/6/15 A	13/8/15 A				
SC1828	Segment Casting for P71R CH13 to CH16 (MCH4)	15	0	100%	20/6/15 A	8/7/15 A				
SC1868	Segment Casting for P71L CH8' to CH12' (MCH3)	17	0	100%	17/6/15 A	10/7/15 A				
SC1878	Segment Casting for P71L CH13' to CH16' (MCH4)	15	0	100%	28/8/15 A	18/9/15 A				
SC1948	Segment Casting for P72L CH17 to CH22 (MCH5)	17	0	100%	18/8/15 A	16/9/15 A				
SC1988	Segment Casting for P72R CH13' to CH16' (MCH4)	15	0	100%	21/8/15 A	11/9/15 A				
SC2078	Segment Casting for P72L CH4' to CH7' (MCH2)	18	0	100%	5/6/15 A	6/9/15 A				
SC2148	Segment Casting for P73L CH8 to CH12 (MCH3)	17	0	100%	28/6/15 A	22/8/15 A				
SC2198	Segment Casting for P73R CH8' to CH12' (MCH3)	17	3	100%	28/8/15 A	1/10/15	-548			
SC2258	Segment Casting for P73R CH8 to CH12 (MCH3)	17	0	100%	26/8/15 A	17/9/15 A				
ML12 (P75 TO P77)										
SC3008	Segment Casting for P76L CH1 to CH3 (MCH1)	13	0	100%	13/6/15 A	3/7/15 A				
SC3058	Segment Casting for P76R CH1' to CH3' (MCH1)	13	0	100%	10/6/15 A	29/6/15 A				
SC3068	Segment Casting for P76R CH4' to CH7' (MCH2)	18	0	100%	14/8/15 A	1/9/15 A				
SC3218	Segment Casting for P77L SOP (MSOP)	30	15	100%	16/7/15 A	26/11/15	-563			

■ Actual Work ■ Critical Remaining W...
■ Remaining Work ◆ Milestone

HKLR EMA report (Jun 15 to Aug 15)

Date	Revision	Checked	Approved
8/10/15	EM&A Report Jun 15 to Aug 15	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish	Total Float	2015		
								Jun	Jul	Aug
SC3328	Segment Casting for P77R SOP (MSOP)	30	15	100%	11/8/15 A	26/11/15	-563			
Viaduct between HKSAR Boundary and Landing Point on Airport Island										
ML01L/R 75mx8 - Stage 2 of Works										
Pier P1L/R										
Column Construction										
WW1140	Construct column P1 - 2 nos. (in-situ section)	12	0	0%	10/6/15 A	23/6/15 A				
ML01L/R 75mx8 - Stage 4 of Works										
Pier P2L/R										
Column Construction										
WW1220	Construct column P2 - 2 nos. (in-situ section)	12	0	0%	31/8/15 A	16/9/15 A				
Pier P3L/R										
Column Construction										
WW1300	Construct column P3 - 2 nos. (in-situ section)	12	0	0%	5/6/15 A	18/6/15 A				
Pier P5L/R										
Pile Cap Construction										
WW1450	Construct pile cap P5 - 2 nos.	30	0	83.33%	4/8/15 A	19/9/15 A				
Pier P6L/R										
Pile Cap Construction										
WW1530	Construct pile cap P6 - 2 nos.	30	0	100%	26/6/15 A	28/8/15 A				
Pier P7L/R										
Column Construction										
WW1620	Construct column P7 - 2 nos. (in-situ section)	12	0	58.33%	14/7/15 A	26/7/15 A				
ML02L/R 75mx8 - Stage 4 of Works										
Pier P8L/R (M.J.)										
Pile Cap Construction										
WW1690	Construct pile cap P8 - 2 nos.	30	0	100%	28/6/15 A	9/9/15 A				
Pier P9L/R										
Pile Cap Construction										
WW1770	Construct pile cap P9 - 2 nos.	30	0	100%	30/7/15 A	6/9/15 A				
Pier P10L/R										
Pile Cap Construction										
WW1850	Construct pile cap P10 - 2 nos.	30	0	100%	27/8/15 A	26/9/15 A				
Pier P11L/R										
Column Construction										
WW1940	Construct column P11 - 2 nos. (in-situ section)	12	0	100%	4/8/15 A	17/8/15 A				
Pier P13L/R										
Column Construction										
WW2100	Construct column P13 - 2 nos. (in-situ section)	12	0	100%	24/7/15 A	5/8/15 A				
Pier P14L/R										
Column Construction										
WW9180	Install base precast column segment at P14	1	0	100%	4/8/15 A	4/8/15 A				
WW9182	Align & cast stitch for base column segment at P14	8	0	100%	10/8/15 A	17/8/15 A				
Pier P15L/R										
Column Construction										
WW2260	Construct column P15 - 2 nos. (in-situ section)	12	0	100%	16/6/15 A	30/6/15 A				
WW9200	Install base precast column segment at P15	1	0	100%	1/8/15 A	1/8/15 A				
WW9202	Align & cast stitch for base column segment at P15	8	0	100%	1/8/15 A	7/8/15 A				
WW9204	Install remain precast column & column head segment at P15	3	2	100%	21/8/15 A	28/10/15				
ML03L/R 109.661m+150mx3+109.661m Navigation Channel - Stage 4 of Works										
Pier P16L/R (M.J.)										
Column Construction										
NC1102	Install base precast column segment at P16	1	0	100%	11/7/15 A	11/7/15 A				

Actual Work
 Critical Remaining W...
 Remaining Work
 Milestone

Date	Revision	Checked	Approved
8/10/15	EM&A Report Jun 15 to Aug 15	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish	Total Float	2015		
								Jun	Jul	Aug
NC1103	Align & cast stitch for base column segment at P16	8	0	100%	11/7/15 A	22/7/15 A				
Pier P17L/R										
Column Construction										
NC1220	Construct column P17 - 4 nos.	101	14	84.16%	29/6/15 A	22/10/15	-268			
Pier P19L/R										
Pier Segment Construction										
NC1468	Prepare works for precast SOP P19 - 6 nos.	6	0	100%	14/7/15 A	10/8/15 A				
NC1470	Install precast SOP P19 - 6 nos.	6	0	100%	11/8/15 A	23/8/15 A				
NC1472	Insitu works for SOP P19 - 6 nos.	54	43	100%	24/8/15 A	25/11/15	-394			
Pier P20L/R										
Pier Segment Construction										
NC1590	Install precast SOP P20 - 6 nos.	6	0	100%	30/6/15 A	25/7/15 A				
NC1592	Insitu works for SOP P20 - 6 nos.	54	35	100%	27/7/15 A	16/11/15	-373			
ML04L/R 74.5mx8 - Stage 4 of Works										
Pier P24L/R										
Column Construction										
WW9300	Install base precast column segment at P24	1	0	100%	2/7/15 A	2/7/15 A				
WW9302	Align & cast stitch for base column segment at P24	8	0	100%	3/7/15 A	7/7/15 A				
WW9304	Install remain precast column & column head segment at P24	3	0	100%	16/7/15 A	1/9/15 A				
Pier P25L/R										
Column Construction										
WW9320	Install base precast column segment at P25	1	0	100%	12/6/15 A	12/6/15 A				
WW9322	Align & cast stitch for base column segment at P25	8	0	100%	12/6/15 A	18/6/15 A				
WW9324	Install remain precast column & column head segment at P25	3	0	100%	30/6/15 A	26/8/15 A				
WW9330	Prestress works & infill concrete at P25	34	32	77.94%	31/8/15 A	20/11/15	-245			
Pier P27L/R										
Column Construction										
WW9370	Prestress works & infill concrete at P27	34	29	100%	21/8/15 A	7/11/15	-292			
Pier P28L/R										
Column Construction										
WW9390	Prestress works & infill concrete at P28	40	10	100%	9/6/15 A	14/10/15	-283			
ML05L/R 74.5mx8 - Stage 4 of Works										
Pier P29L/R (M.J.)										
Column Construction										
WW9410	Prestress works & infill concrete at P29	40	10	100%	16/6/15 A	14/10/15	-273			
ML06L/R 74.5mx8 - Stage 4 of Works										
Pier 39L/R										
Pier Segment Construction										
WW6428	Prepare works for precast SOP P39 - 4 nos.	11	0	100%	17/8/15 A	9/9/15 A				
Pier 40L/R										
Pier Segment Construction										
WW6508	Prepare works for precast SOP P40 - 4 nos.	11	0	100%	10/8/15 A	28/8/15 A				
WW6510	Install precast SOP P40 - 4 nos.	3	0	100%	29/8/15 A	31/8/15 A				
Pier 41L/R										
Pier Segment Construction										
WW6588	Prepare works for precast SOP P41 - 4 nos.	11	0	100%	24/7/15 A	8/8/15 A				
WW6590	Install precast SOP P41 - 4 nos.	3	0	100%	11/8/15 A	12/8/15 A				
WW6592	Insitu works for SOP P41 - 4 nos.	8	3	100%	14/8/15 A	6/10/15	-387			
Pier 42L/R										
Pier Segment Construction										
WW6668	Prepare works for precast SOP P42 - 4 nos.	11	0	100%	13/7/15 A	27/7/15 A				
WW6670	Install precast SOP P42 - 4 nos.	3	0	100%	29/7/15 A	30/7/15 A				
WW6672	Insitu works for SOP P42 - 4 nos.	11	3	100%	3/8/15 A	3/10/15	-397			

■ Actual Work ■ Critical Remaining W...
■ Remaining Work ◆ Milestone

Date	Revision	Checked	Approved
8/10/15	EM&A Report Jun 15 to Aug 15	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish	Total Float	2015		
								Jun	Jul	Aug
Pier 43L/R										
Pier Segment Construction										
WW6748	Prepare works for precast SOP P43 - 4 nos.	11	0	100%	18/6/15 A	3/7/15 A				
WW6750	Install precast SOP P43 - 4 nos.	3	0	100%	4/7/15 A	6/7/15 A				
WW6752	Insitu works for SOP P43 - 4 nos.	11	0	100%	7/7/15 A	2/9/15 A				
ML07L/R 73.396mx8 - Stage 4 of Works										
Pier P49L/R										
Pier Segment Construction										
WW8688	Prepare works for precast SOP P49 - 4 nos.	11	0	100%	17/7/15 A	30/7/15 A				
WW8690	Install precast SOP P49 - 4 nos.	4	0	100%	1/8/15 A	3/8/15 A				
WW8692	Insitu works for SOP P49 - 4 nos.	7	3	100%	4/8/15 A	17/10/15				-372
Pier P50L/R										
Pier Segment Construction										
WW8698	Prepare works for precast SOP P50 - 4 nos.	11	0	100%	28/8/15 A	14/9/15 A				
ML08L/R 70mx6 - Stage 4 of Works										
Pier P53L/R (M.J.)										
Column Construction										
WW8720	Construct column P53N/S (Turnaround Facility) - 2 nos.	36	0	100%	8/6/15 A	26/7/15 A				
Pier P54L/R										
Column Construction										
WW10177	Construct column head P54 - 2 nos. (insitu)	21	0	100%	14/8/15 A	11/9/15 A				
WW9912	Construct column P54N/S (Turnaround Facility) - 2 nos.	36	4	100%	1/8/15 A	6/10/15				-332
Pier P55L/R										
Column Construction										
WW10187	Construct column P55 - 2 nos. (insitu)	12	1	100%	1/8/15 A	30/9/15				-338
Pier P56L/R										
Pile Cap Construction										
WW7740	Construct pile cap P56 - 2 nos.	35	0	100%	1/8/15 A	28/9/15 A				
Pier P57L/R										
Pile Cap Construction										
WW7820	Construct pile cap P57 - 2 nos.	35	0	100%	29/6/15 A	25/8/15 A				
Pier P58L/R										
Column Construction										
WW10247	Construct column P58 - 2 nos. (insitu)	12	0	100%	2/7/15 A	14/7/15 A				
WW10257	Construct column head P58 - 2 nos. (insitu)	21	0	100%	4/8/15 A	27/8/15 A				
WW9992	Construct column P58N/S (Turnaround Facility) - 2 nos.	32	0	100%	12/8/15 A	22/9/15 A				
ML09L/R 73.396Mx8 - Stage 4 of Works										
Pier P59L/R (M.J.)										
Column Construction										
WW8780	Construct column P59N/S (Turnaround Facility) - 2 nos.	24	0	100%	3/6/15 A	26/6/15 A				
Pier P62L/R										
Pier Segment Construction										
WW8238	Prepare works for precast SOP P62 - 4 nos.	15	0	100%	29/6/15 A	16/7/15 A				
WW8240	Install precast SOP P62 - 4 nos.	4	0	100%	18/7/15 A	28/7/15 A				
WW8242	Insitu works for SOP P62 - 4 nos.	27	18	100%	29/7/15 A	26/10/15				-396
ML10L/R 115m+180m+115m - Stage 4 of Works										
Pier P68L/R										
Foundation - Bored Pile										
AC1090	Pile testing P68L	28	11	100%	30/7/15 A	9/10/15				-505
Pier P69L/R										
Temporary Works										
AC1135	Install cofferdem for pile cap construction - P69 - 2 nos.	90	50	94.44%	2/7/15 A	2/12/15				-387

█ Actual Work █ Critical Remaining W...
█ Remaining Work ◆ Milestone

HKLR EMA report (Jun 15 to Aug 15)
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Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish	Total Float	2015		
								Jun	Jul	Aug
ML11L/R 109m+165mx2+109m - Stage 4 of Works										
Pier P70L/R (M.J.)										
Column Construction										
AC1206	Construct column head P70 - 2 nos. (insitu)	21	0	100%	2/7/15 A	3/8/15 A				Construct column head P70
Pier P71L/R										
Pier Segment Construction										
AC1308	Prepare works for precast SOP P71 - 6 nos.	6	0	100%	23/6/15 A	27/8/15 A				Pr
AC1310	Install precast SOP P71 - 6 nos.	6	0	100%	28/8/15 A	7/9/15 A				
Pier P72L/R										
Temporary Works										
AC1340	Remove cofferdem for pier P72	18	0	100%	21/7/15 A	20/8/15 A				Remove
ML12L/R 109m+165mx2+109m - Stage 4 of Works										
Pier P74L/R (M.J.)										
Pile Cap Construction										
AC1560	Construct pile cap P74 - 2 nos.	60	1	100%	18/7/15 A	30/9/15	-269			
Pier P75L/R										
Foundation - Bored Pile										
AC2736	Construct bored piles P75 - 8 nos.	90	36	75.56%	18/6/15 A	28/12/15	-405			
Pier P76L/R										
Column Construction										
AC1750	Construct column P76 - 4 nos.	74	9	98.65%	4/7/15 A	14/10/15	-321			
Pier P77L/R										
Column Construction										
AC1830	Construct column P77 - 4 nos.	76	0	100%	19/6/15 A	16/9/15 A				
ML13L/R 115m+180m+115m - Stage 4 of Works										
Pier P78L/R (M.J.)										
Column Construction										
AC2696	Construct column P78 - 2 nos. (insitu)	48	12	0%	5/6/15 A	31/10/15	-238			
Pier P79L/R										
Pile Cap Construction										
AC1990	Construct pile cap P79 - 2 nos.	60	0	100%	1/6/15 A	10/8/15 A				Construct pile cap P79
Pier P80L/R										
Pile Cap Construction										
AC2070	Construct pile cap P80 - 2 nos.	60	0	100%	2/6/15 A	28/8/15 A				C
ML14L/R 115m+180m+100.561m - Stage 4 of Works										
Pier P81L/R (M.J.)										
Column Construction										
AC2716	Construct column P81 - 2 nos. (insitu)	60	0	89.17%	3/6/15 A	25/8/15 A				Con
AC2726	Construct column head P81 - 2 nos. (insitu)	21	11	0%	26/8/15 A	15/10/15	-253			
Pier P82L/R										
Pile Cap Construction										
AC2260	Construct pile cap P82 - Marine side	35	0	100%	7/7/15 A	1/8/15 A				Construct pile cap P82 - Mar
Column Construction										
AC2270	Construct column P82 - 4 nos.	74	59	0%	10/8/15 A	20/1/16	-294			
Pier P83L/R										
Column Construction										
AC2370	Construct column P83 - 4 nos.	74	37	10.64%	4/6/15 A	23/11/15	-306			
Deck Construction between HKSAR Boundary and Landing Point on Airport Channel										
Segment Erection - Launching Girder										
Launching Girder No.2										
DC1105	Segment erection P48	14	0	100%	8/6/15 A	27/6/15 A				Segment erection P48

█ Actual Work █ Critical Remaining W...
█ Remaining Work ◆ Milestone

Date	Revision	Checked	Approved
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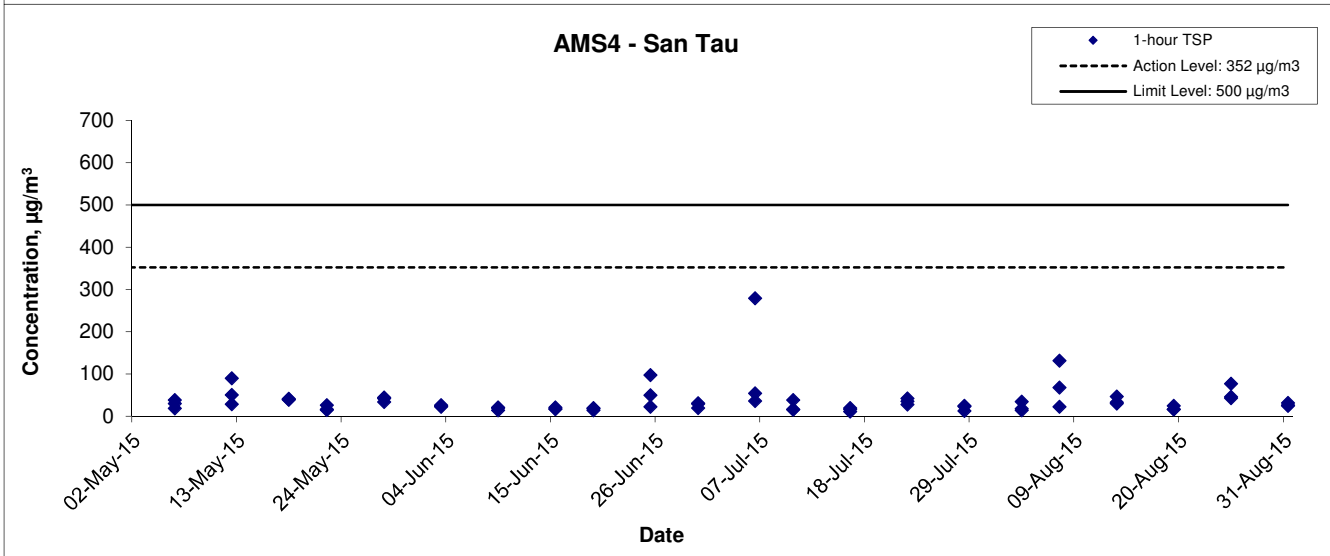
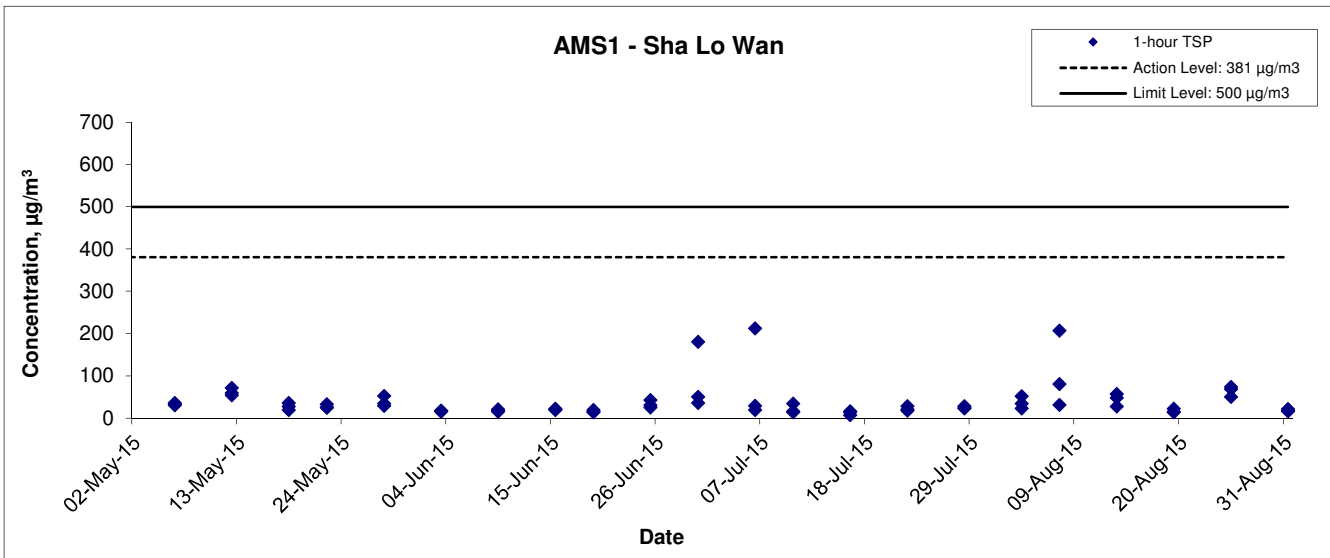
Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish	Total Float	2015		
								Jun	Jul	Aug
DC1110	Segment erection P45 MJ	16	0	100%	4/7/15 A	27/7/15 A				
DC1120	Segment erection P44	16	0	100%	31/8/15 A	19/9/15 A				
Segment Erection - Lifting Frame										
Lifting Frame Type 3_A/C										
DC1860	Segment erection P64 (Learning)	36	0	100%	16/7/15 A	12/9/15 A				
Viaduct between Landing Point on Airport Island and Scenic Hill										
ML15L/R 43m+65mx6+37m - Stage 5 of Works										
Pier P85L/R										
In-situ Portal/T-pier Construction										
AI1150	In-situ portal P85 - 1 nos.	60	0	71.46%	22/7/15 A	22/9/15 A				
Pier P86L/R										
In-situ Portal/T-pier Construction										
AI1220	In-situ portal P86 - 1 nos.	60	0	85%	24/6/15 A	26/8/15 A				
Pier P89L/R										
In-situ Portal/T-pier Construction										
AI1430	In-situ portal P89 - 1 nos.	60	0	100%	9/6/15 A	31/7/15 A				
Deck Construction between Landing Point on Airport Island and Scenic Hill										
Segment Erection										
Segment Erection - Launching Girder										
Launching Girder No.1										
DC5046	Launch LG1 to P108	13	0	100%	11/6/15 A	26/6/15 A				
DC5060	Segment erection P107	8	0	100%	2/7/15 A	27/7/15 A				
DC5070	Segment erection P106	8	0	100%	23/7/15 A	20/8/15 A				
DC5080	Segment erection P105	8	0	100%	31/8/15 A	23/9/15 A				

█ Actual Work █ Critical Remaining W...
█ Remaining Work ◆ Milestone

Date	Revision	Checked	Approved
8/10/15	EM&A Report Jun 15 to Aug 15	Tim	

**APPENDIX B
GRAPHICAL PRESENTATION OF 1-
HOUR TSP MONITORING RESULTS**

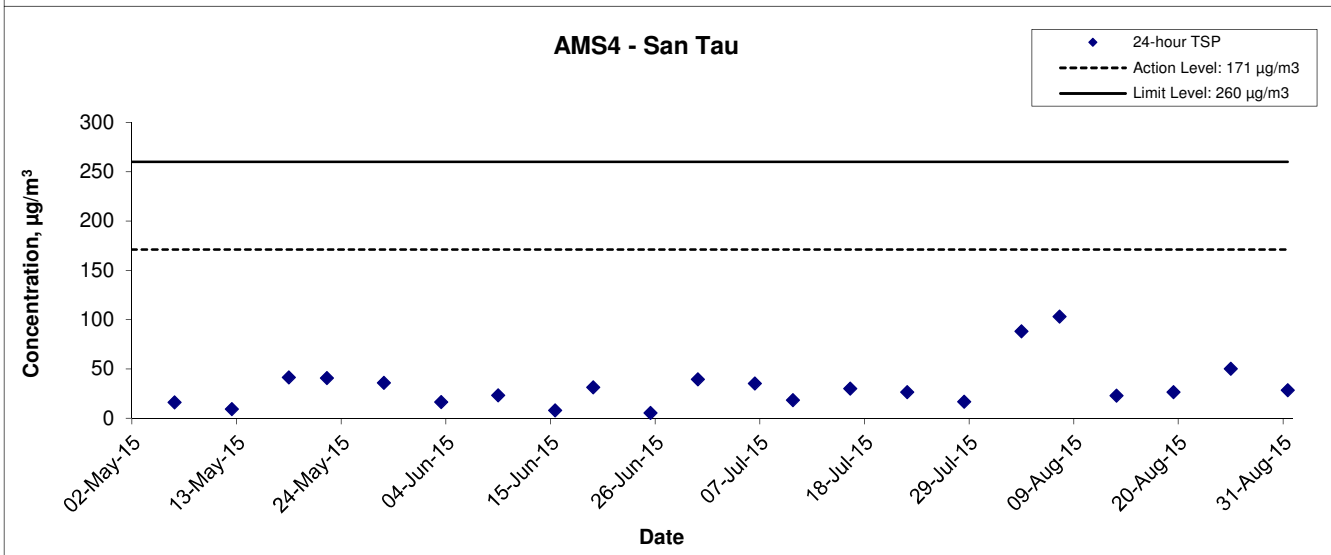
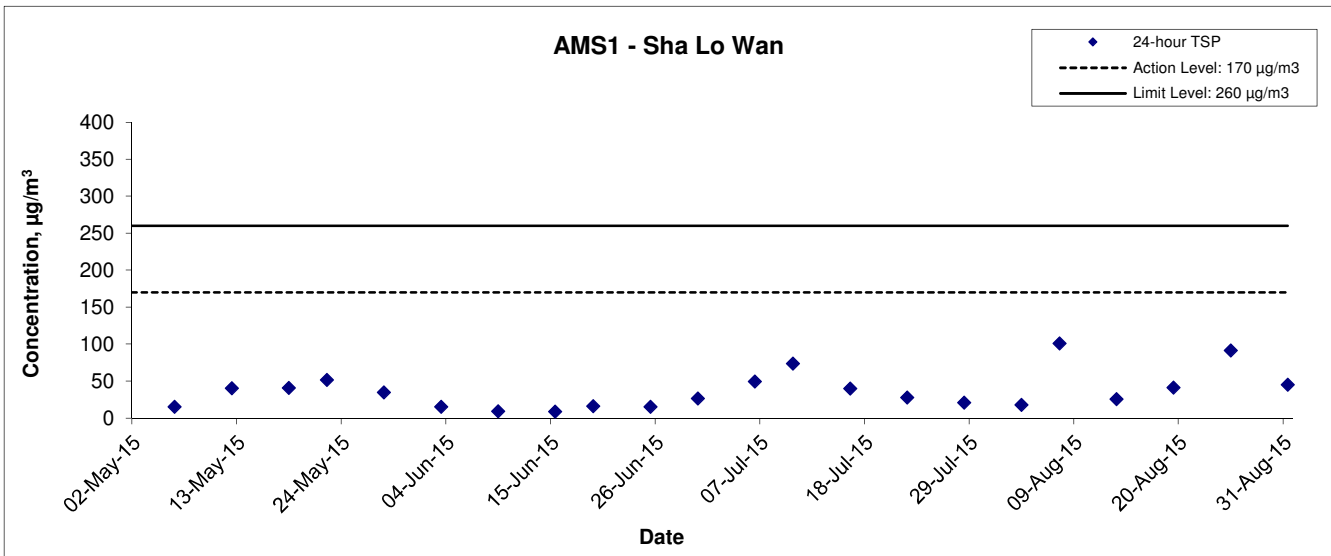
1-hour TSP Concentration Levels



Title Contract No. 11/2011/03 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Graphical Presentation of 1-hour TSP Monitoring Results	Scale N.T.S	Project No. MA12014	
	Date Aug 15	Appendix B	

**APPENDIX C
GRAPHICAL PRESENTATION OF 24-
HOUR TSP MONITORING RESULTS**

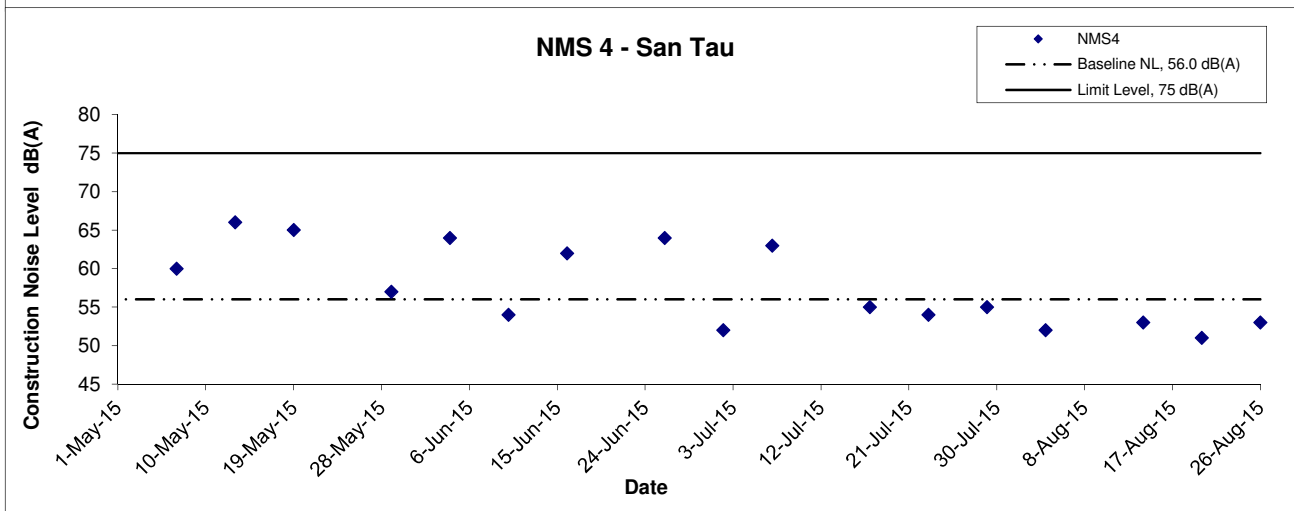
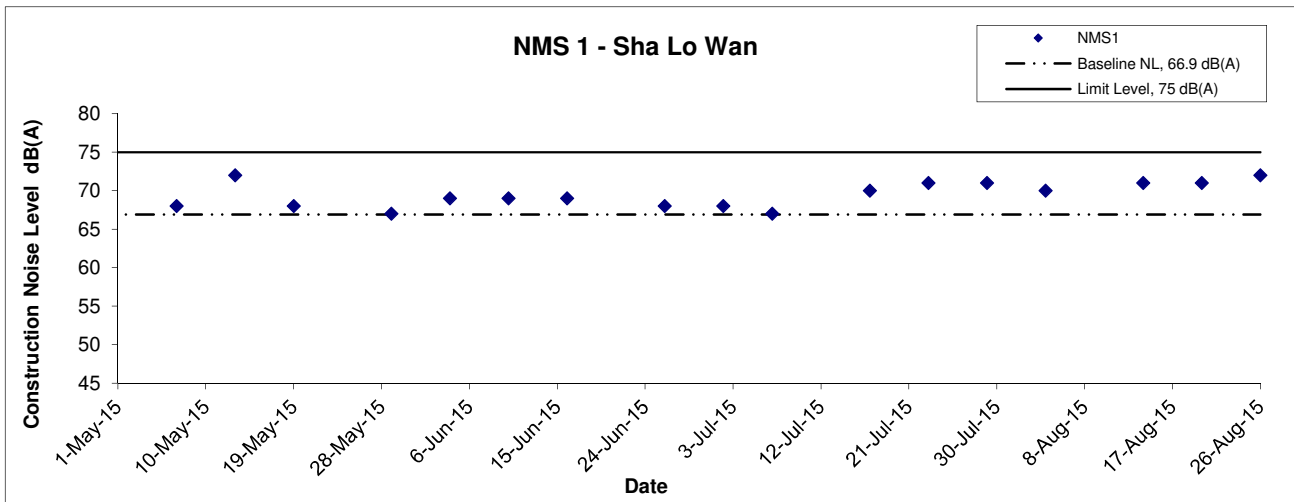
24-hour TSP Concentration Levels



Title Contract No. 11/2011/03 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Graphical Presentation of 24-hour TSP Monitoring Results	Scale N.T.S	Project No. MA12014	CINOTECH
	Date Aug 15	Appendix C	

**APPENDIX D
GRAPHICAL PRESENTATION OF
NOISE MONITORING RESULTS**

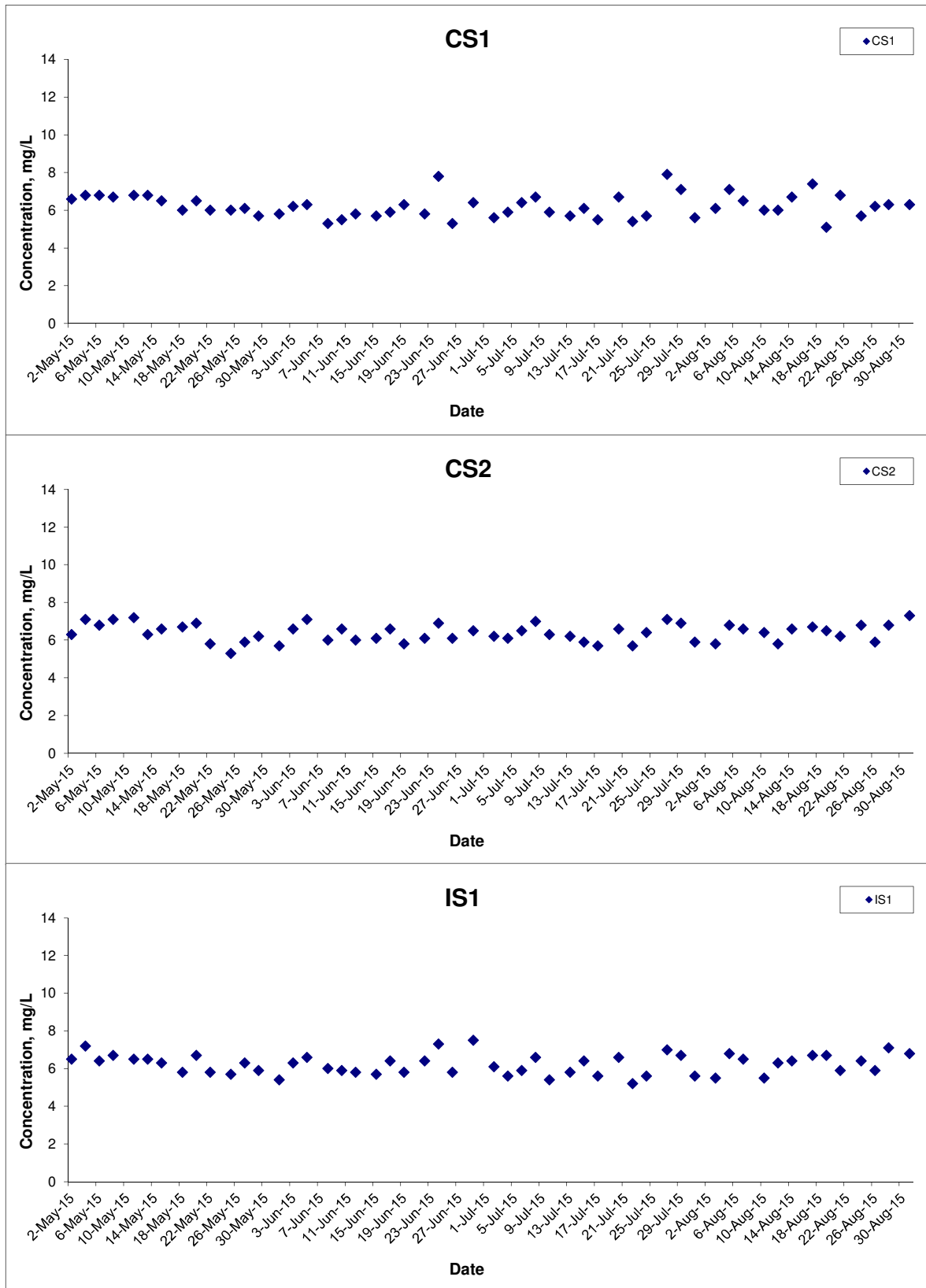
Noise Levels



Title Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Construction Noise Monitoring Results	Scale	N.T.S	Project No.	MA12014	CINOTECH
	Date	Aug 15	Appendix	D	

**APPENDIX E
GRAPHICAL PRESENTATION OF
WATER QUALITY MONITORING
RESULTS**

Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



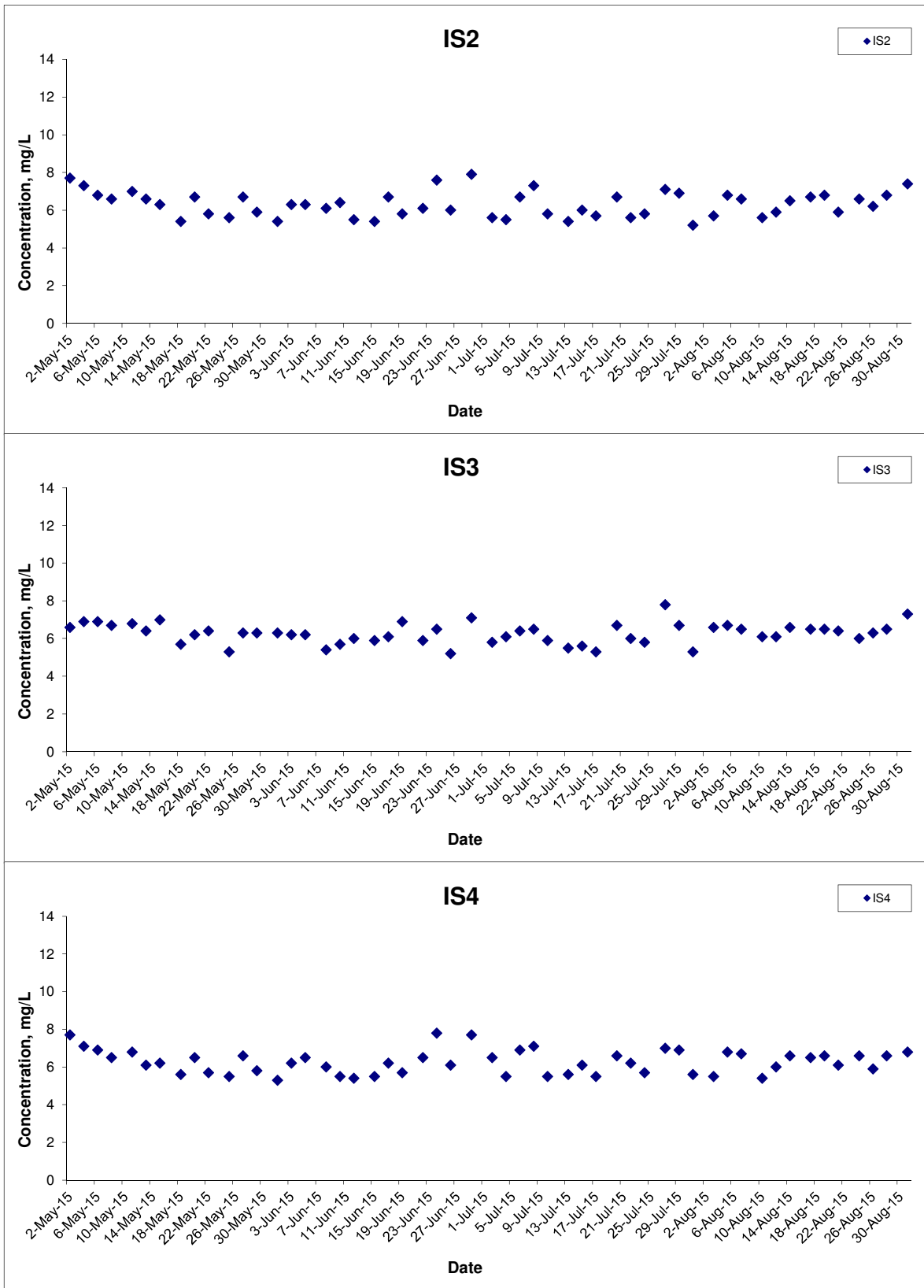
Title Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
 Results

Scale N.T.S
 Date Aug 15

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 Appendix E



Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



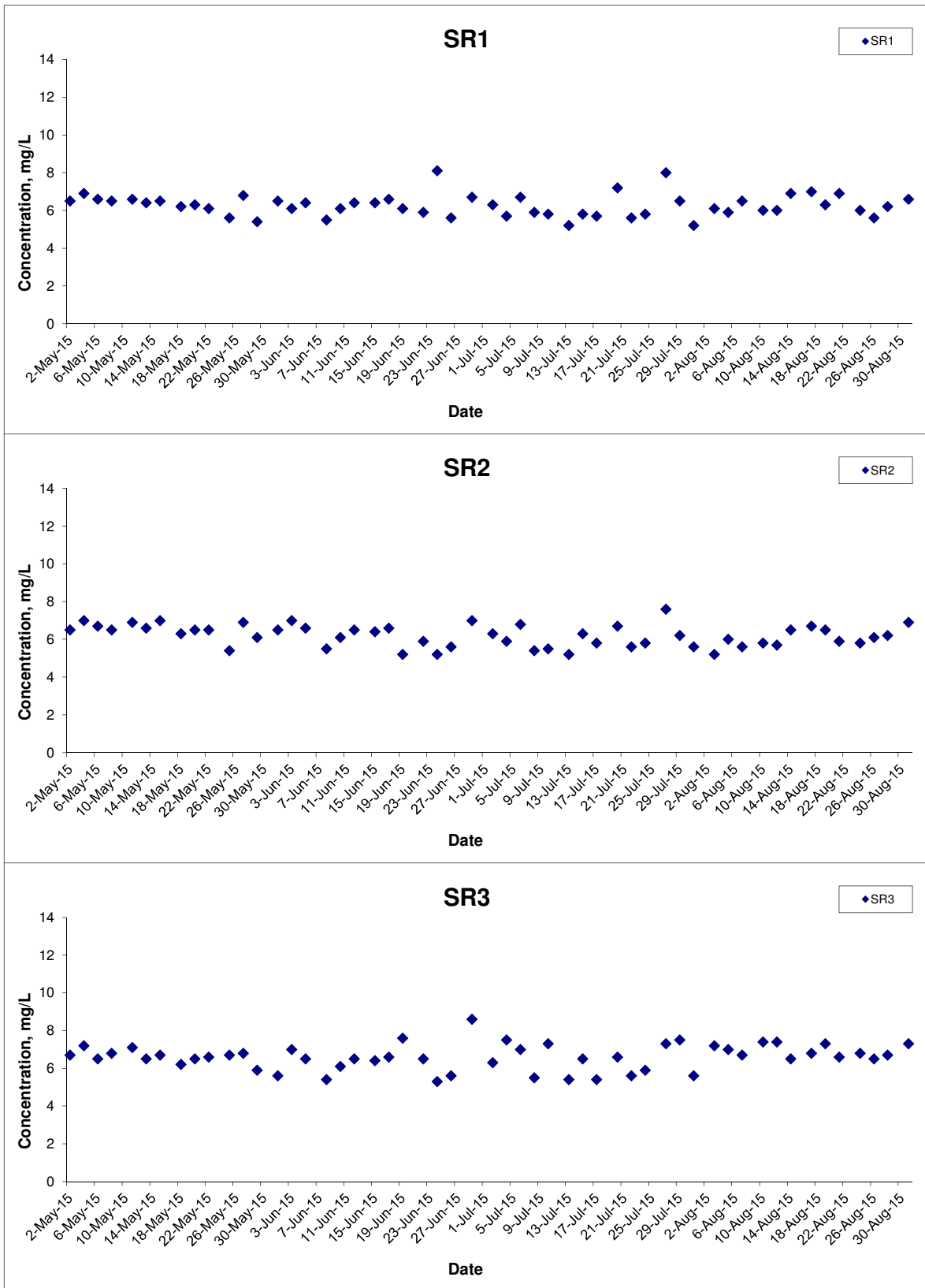
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 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
 Results

Scale N.T.S
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 E



Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



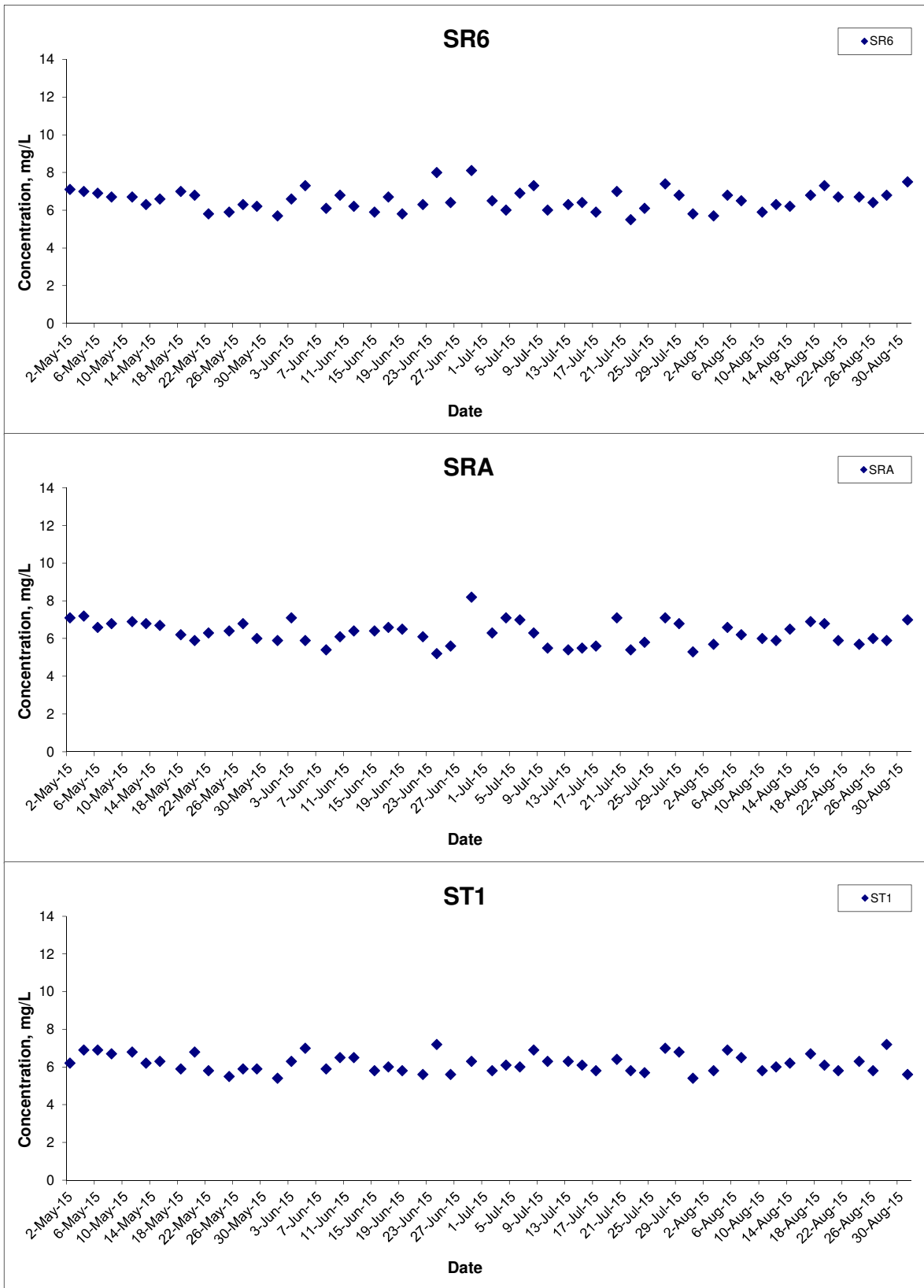
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 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
 Results

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Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



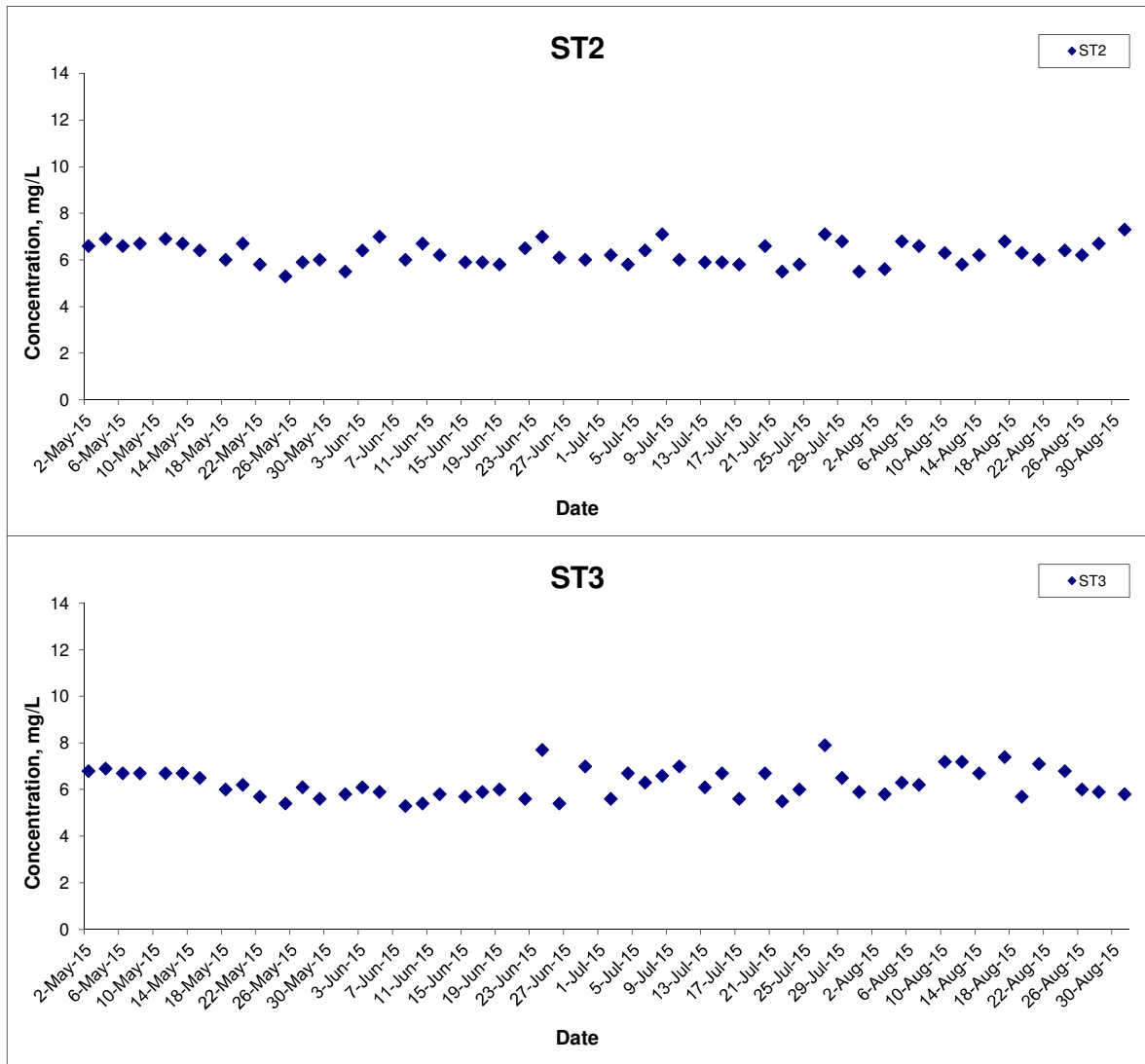
Title Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
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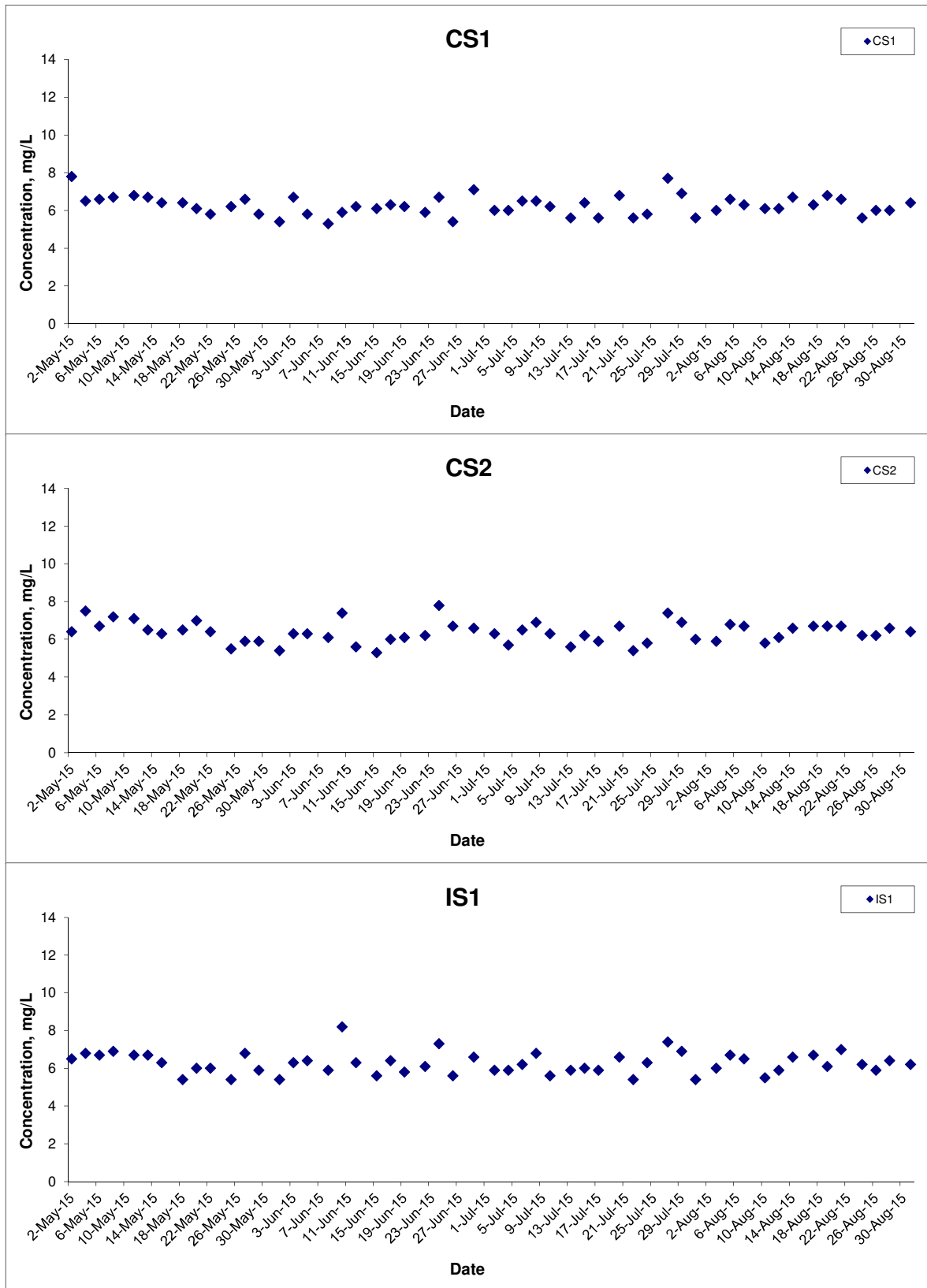


Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill	Scale	N.T.S	Project No.	MA12014	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results	Date	Aug 15	Appendix	E	

Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



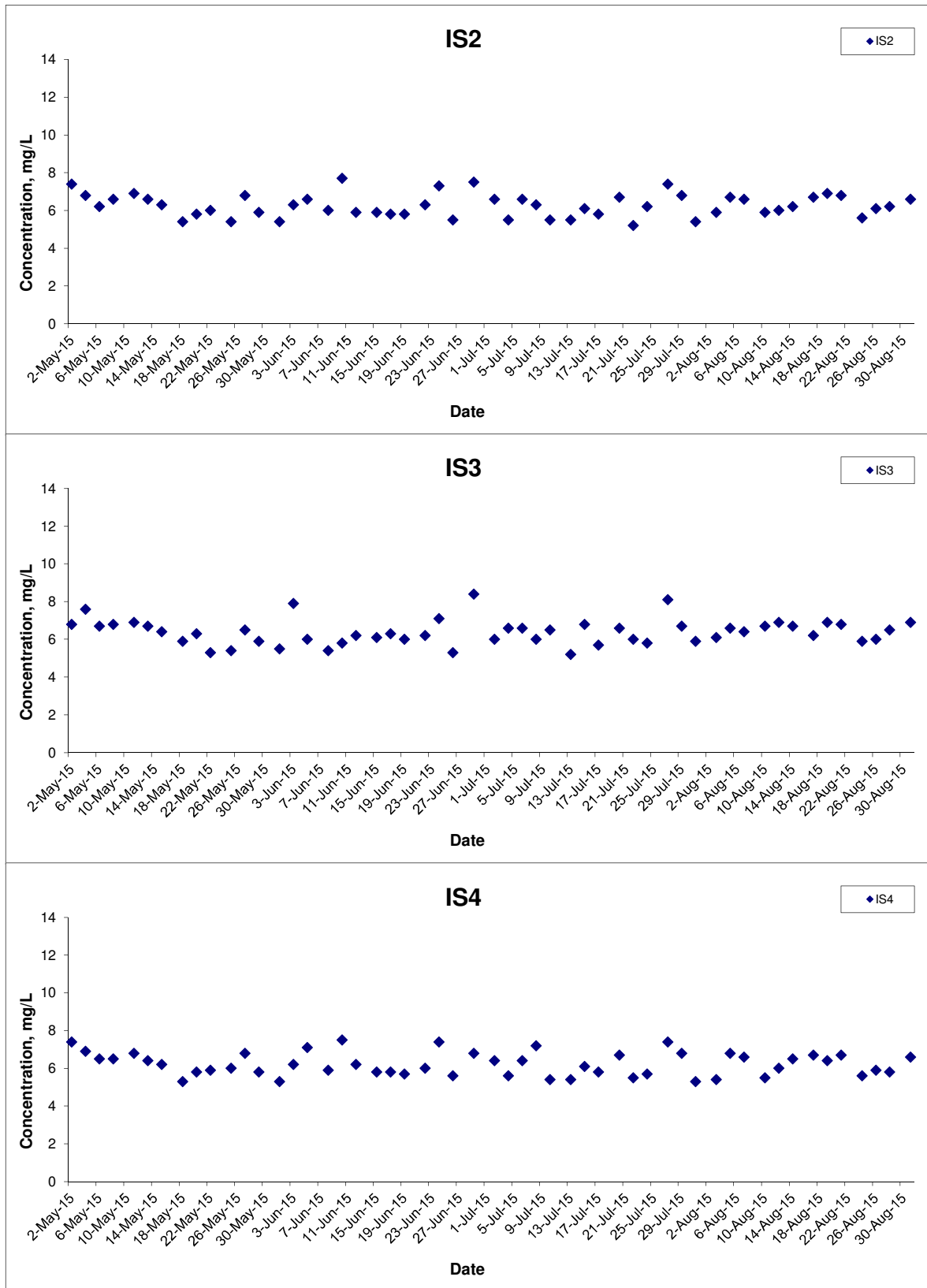
Title Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
 Results

Scale N.T.S
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Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



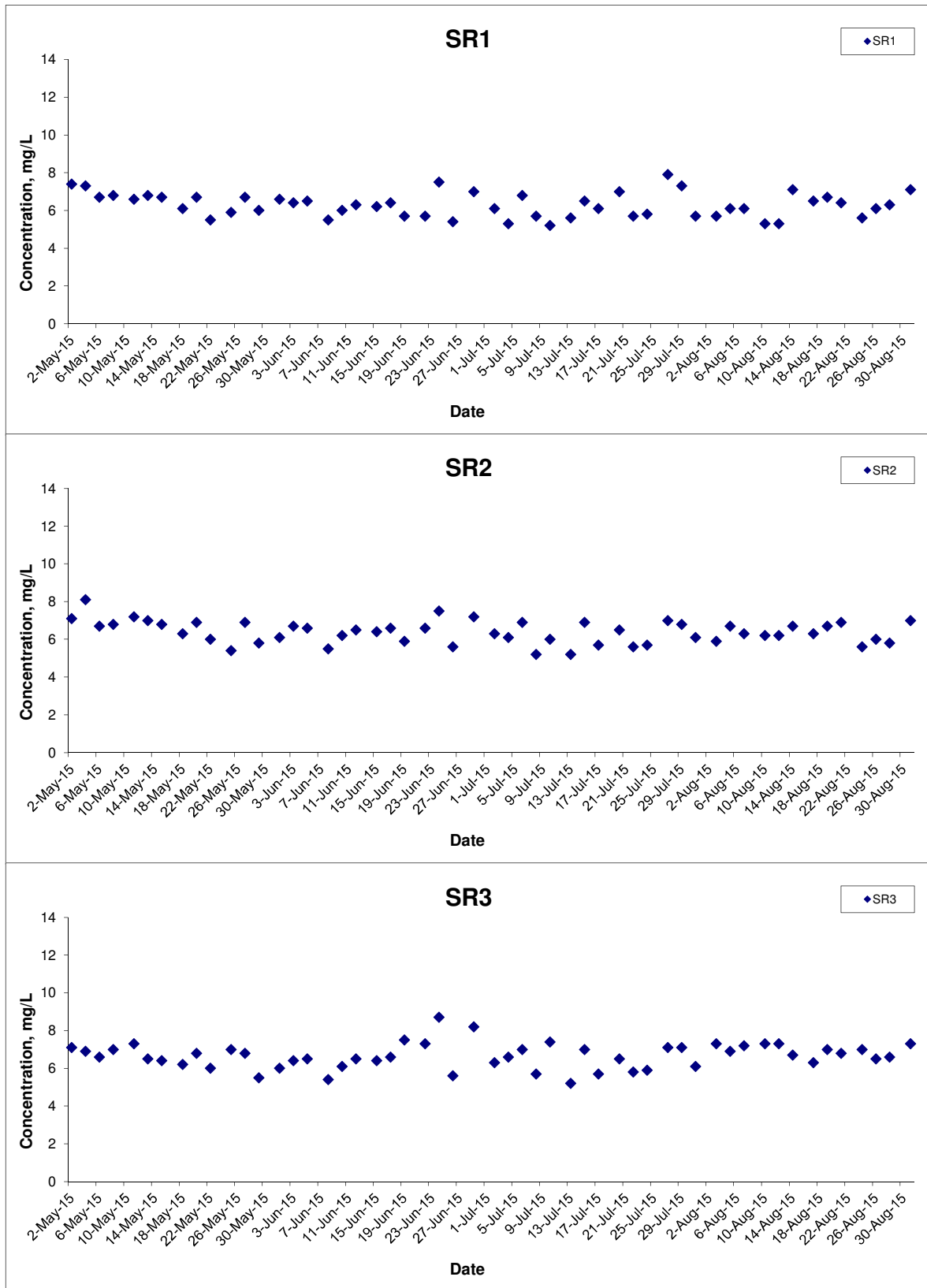
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 Hong Kong Link Road-Section between
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Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



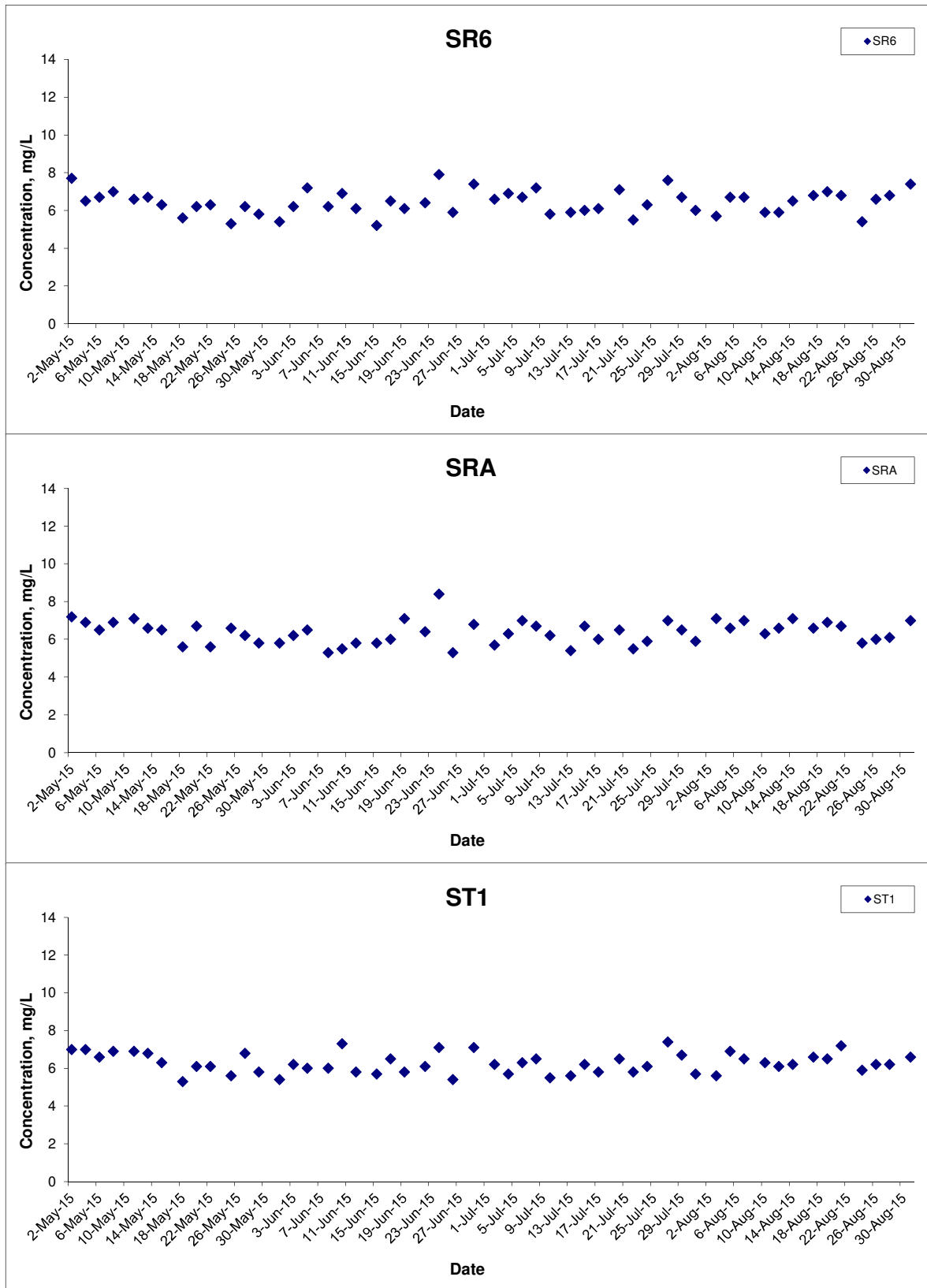
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 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
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Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



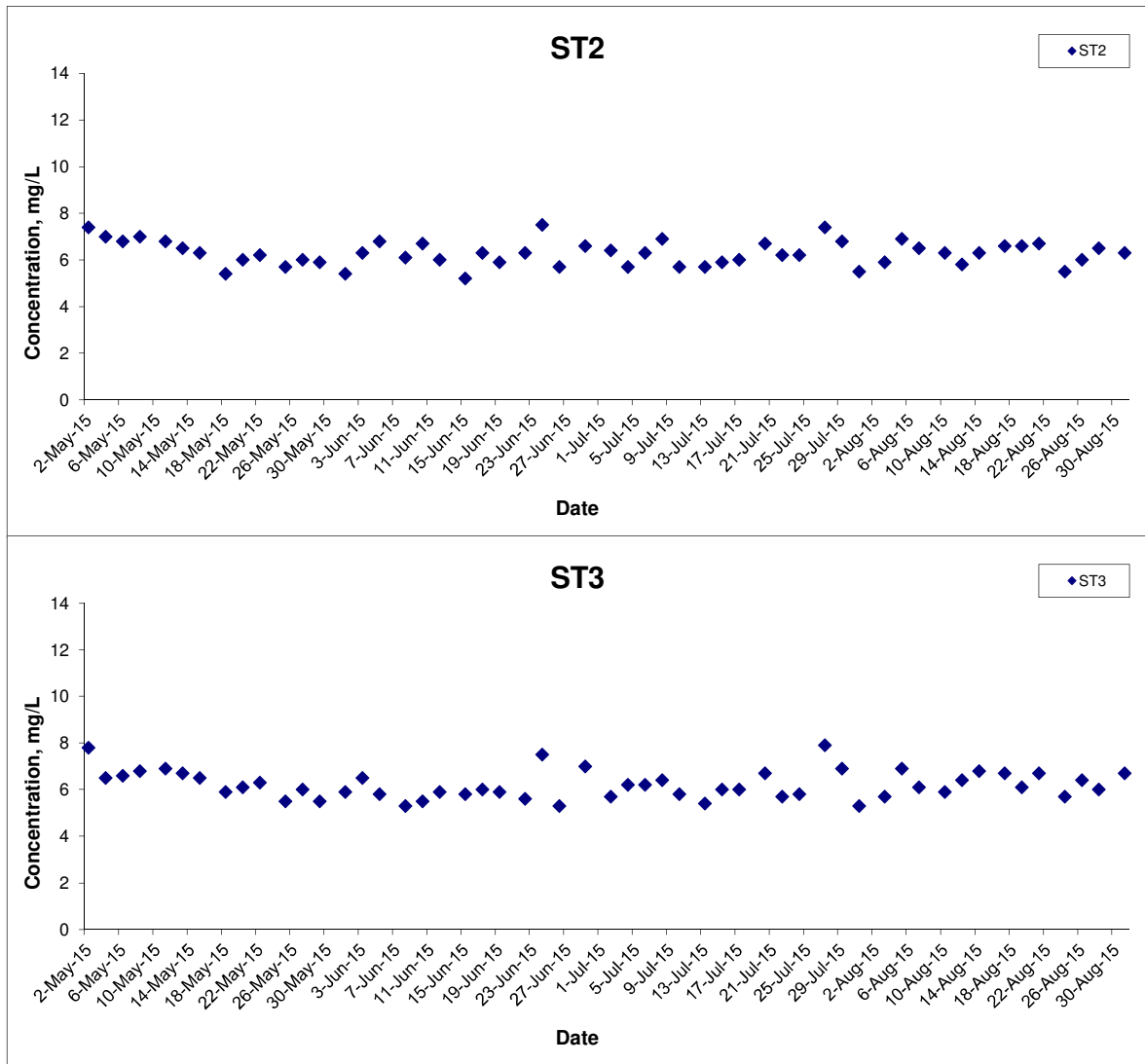
Title Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
 Results

Scale N.T.S
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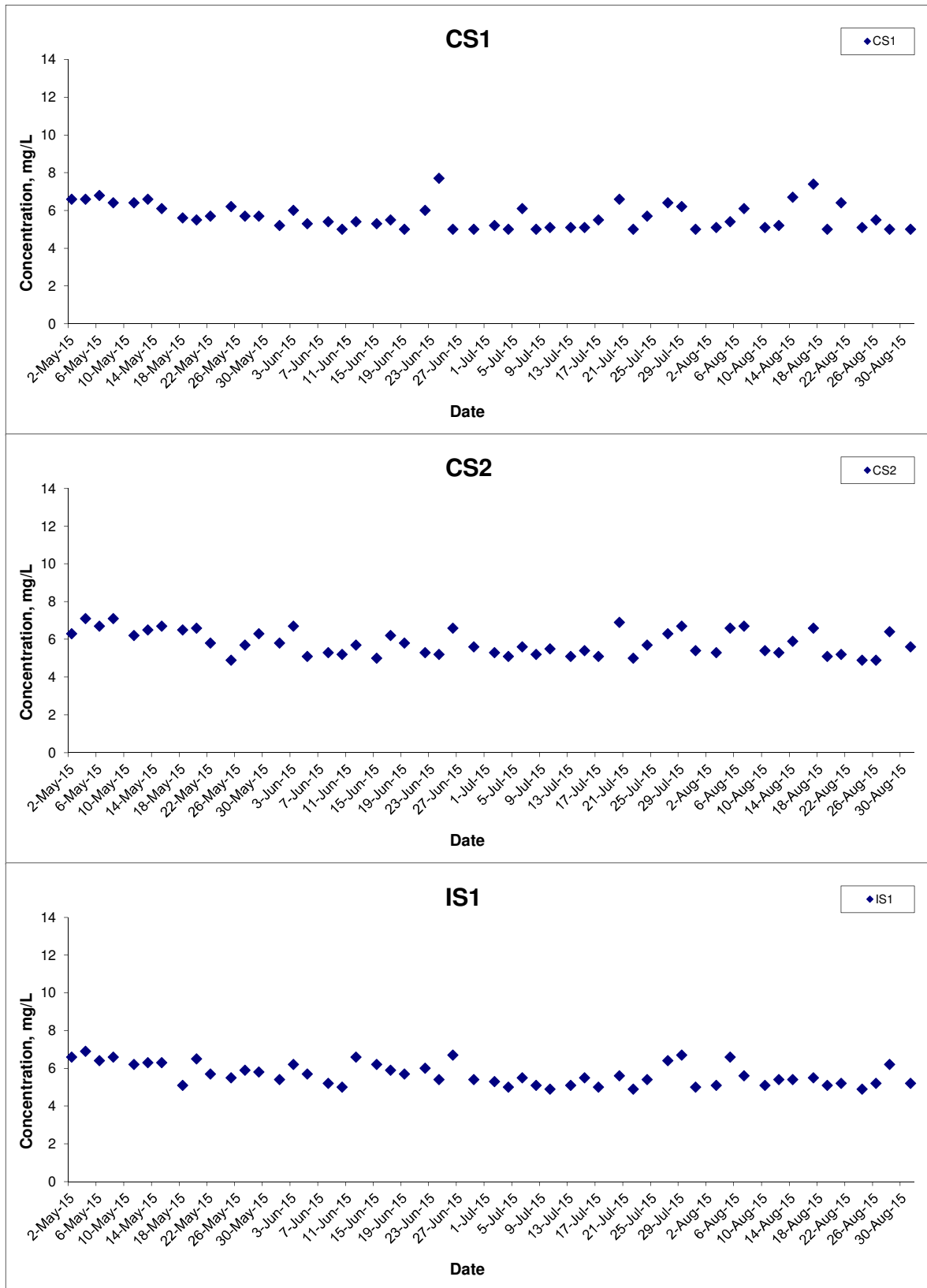


Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill	Scale	N.T.S	Project No.	MA12014	CINOTECH
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Dissolved Oxygen (Bottom) at Mid-Ebb Tide



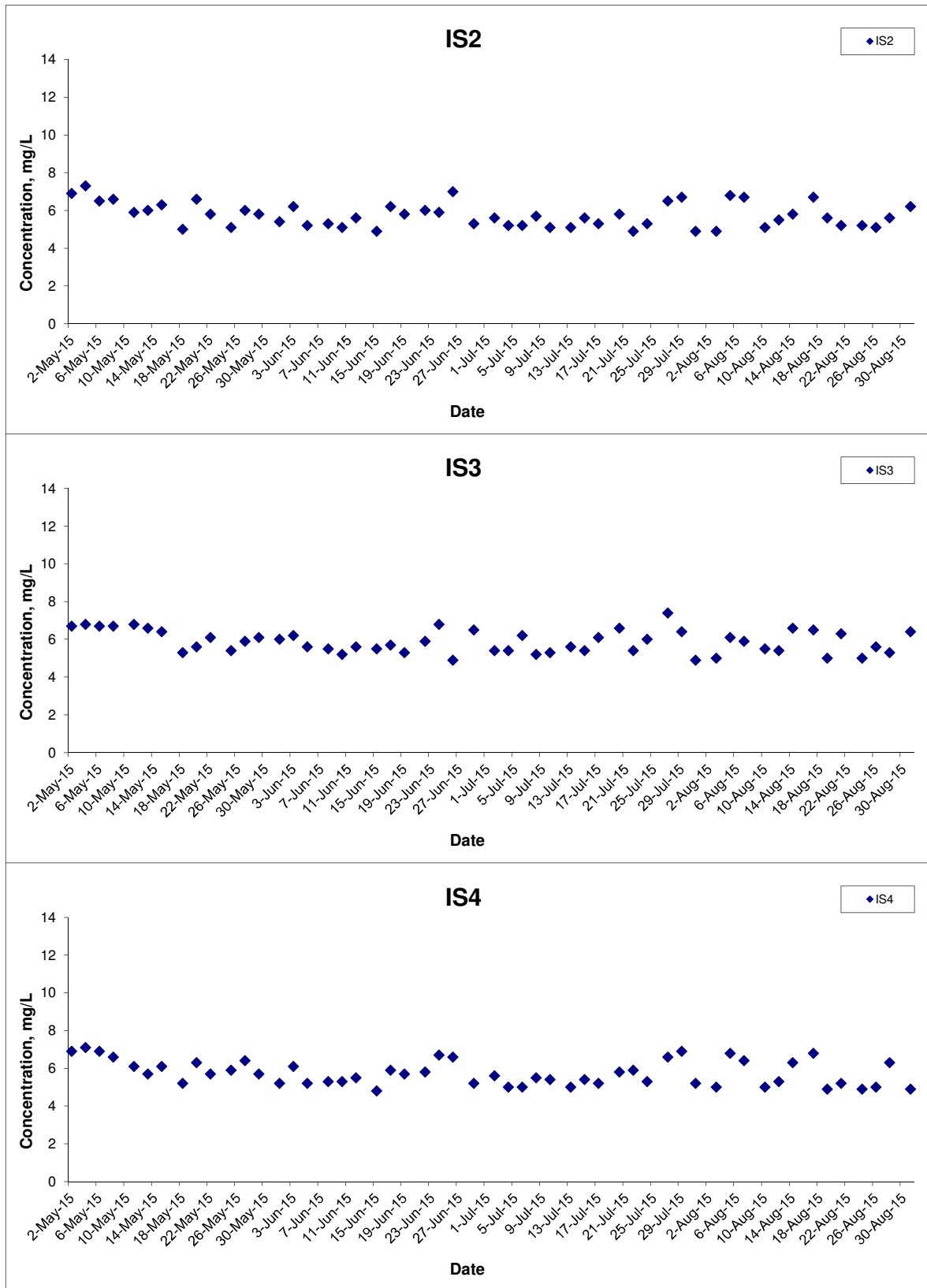
Title Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Link Road-Section between
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 Appendix E



Dissolved Oxygen (Bottom) at Mid-Ebb Tide



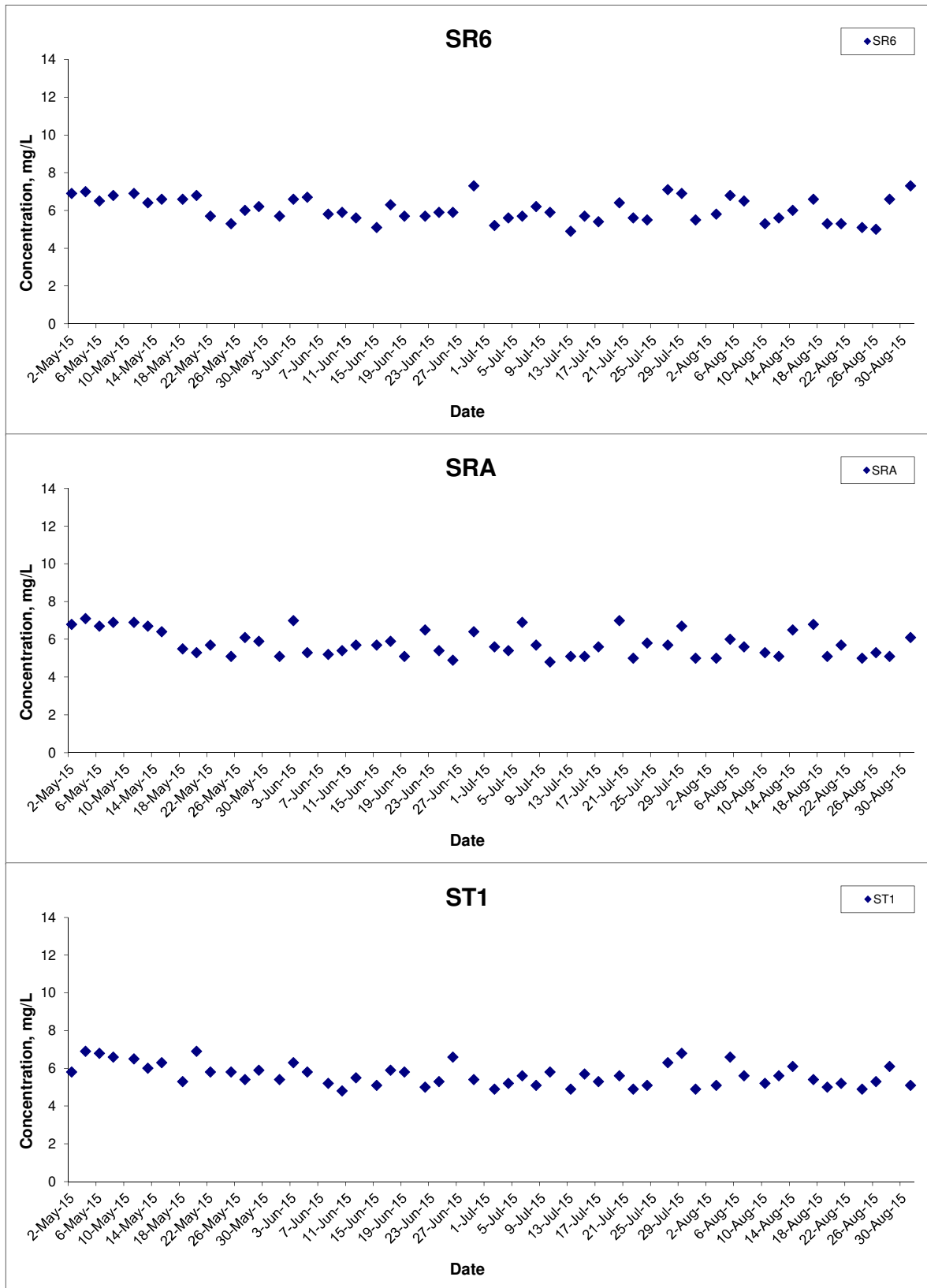
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 Hong Kong Link Road-Section between
 HKSAR Boundary and Scenic Hill
 Graphical Presentation of Water Quality Monitoring
 Results

Scale N.T.S
 Date Aug 15

Project No. MA12014
 Appendix E



Dissolved Oxygen (Bottom) at Mid-Ebb Tide



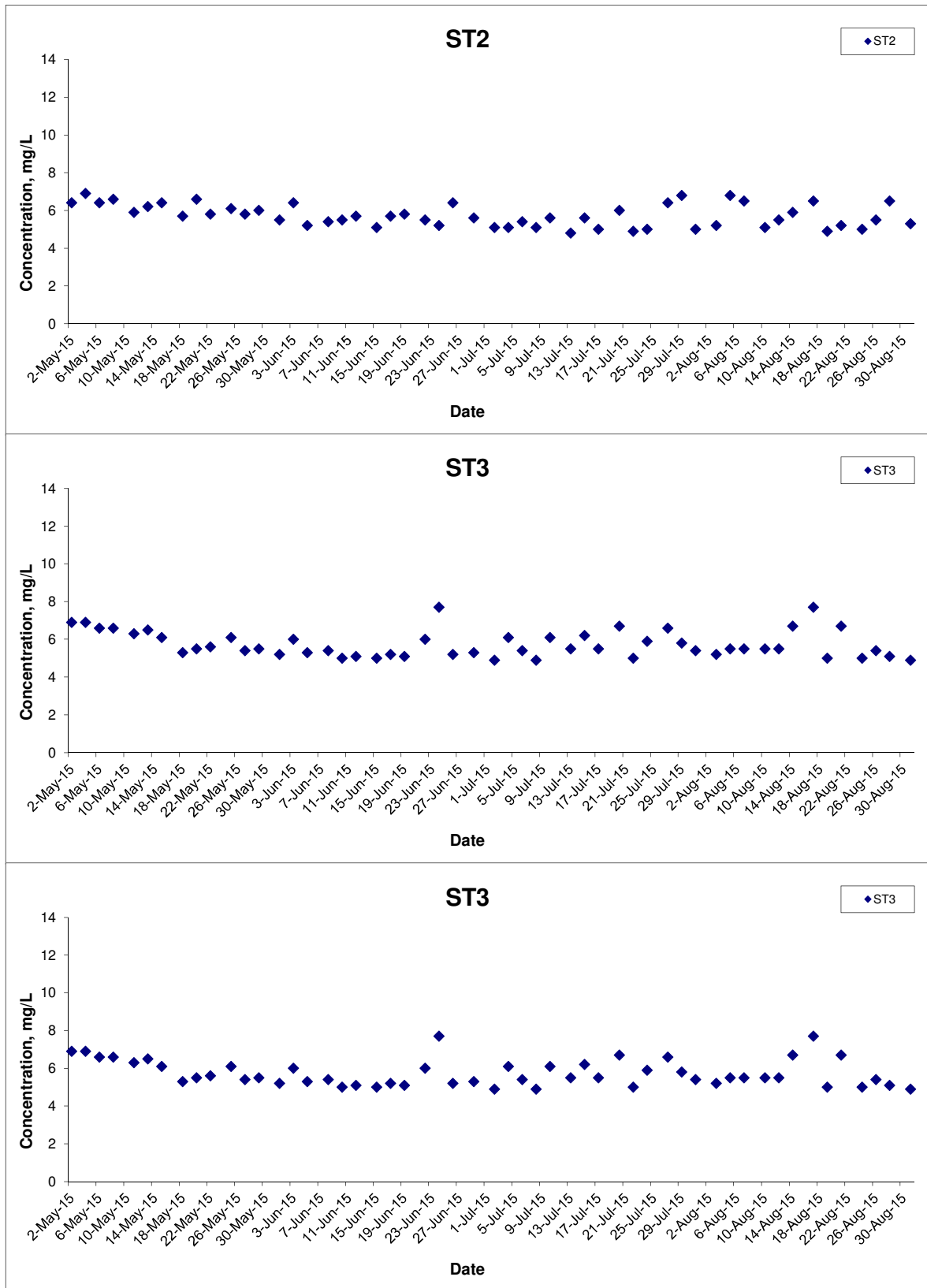
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Scale N.T.S
 Date Aug 15

Project No. MA12014
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Dissolved Oxygen (Bottom) at Mid-Ebb Tide



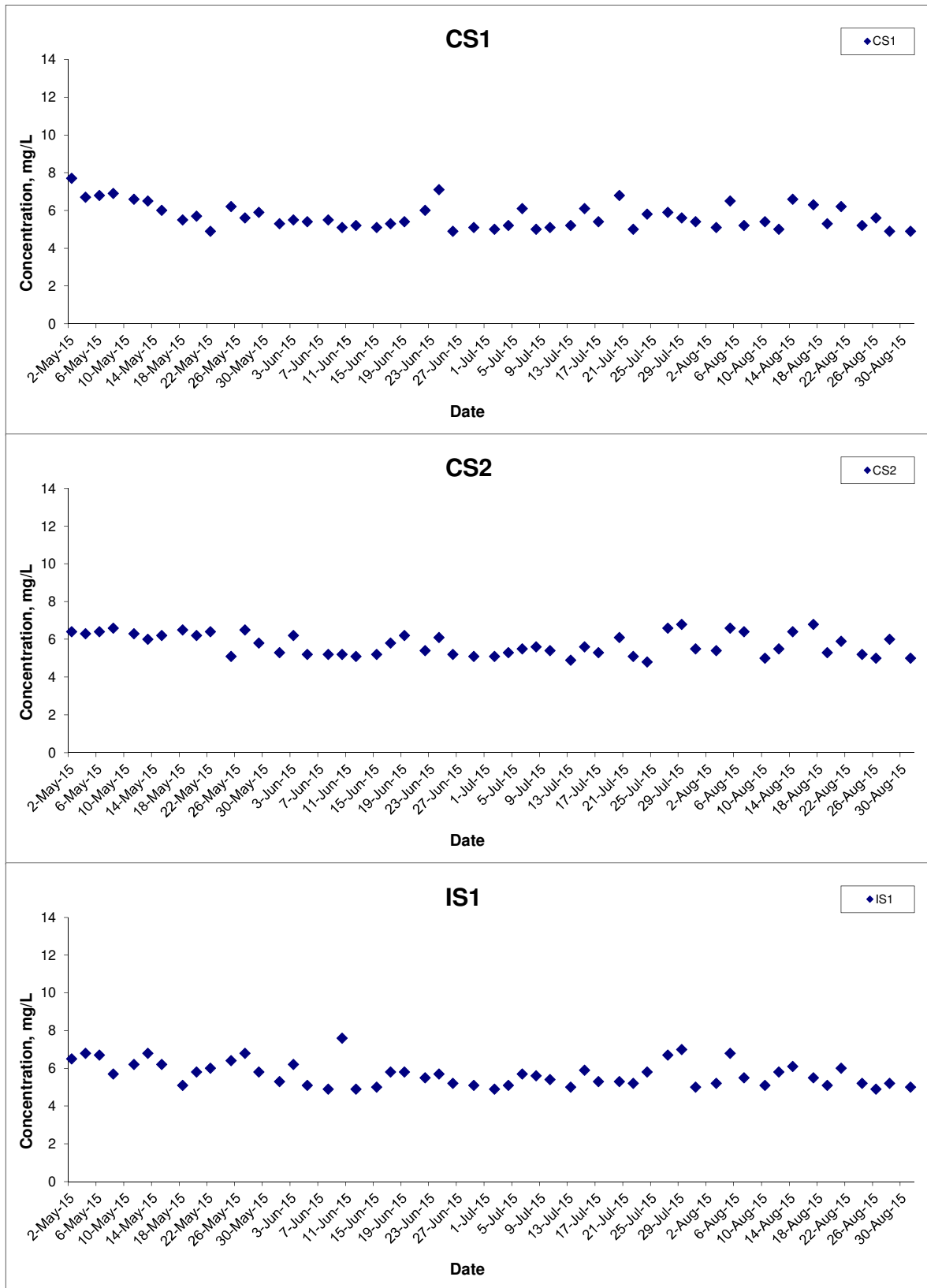
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Scale N.T.S
 Date Aug 15

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 Appendix E



Dissolved Oxygen (Bottom) at Mid-Flood Tide



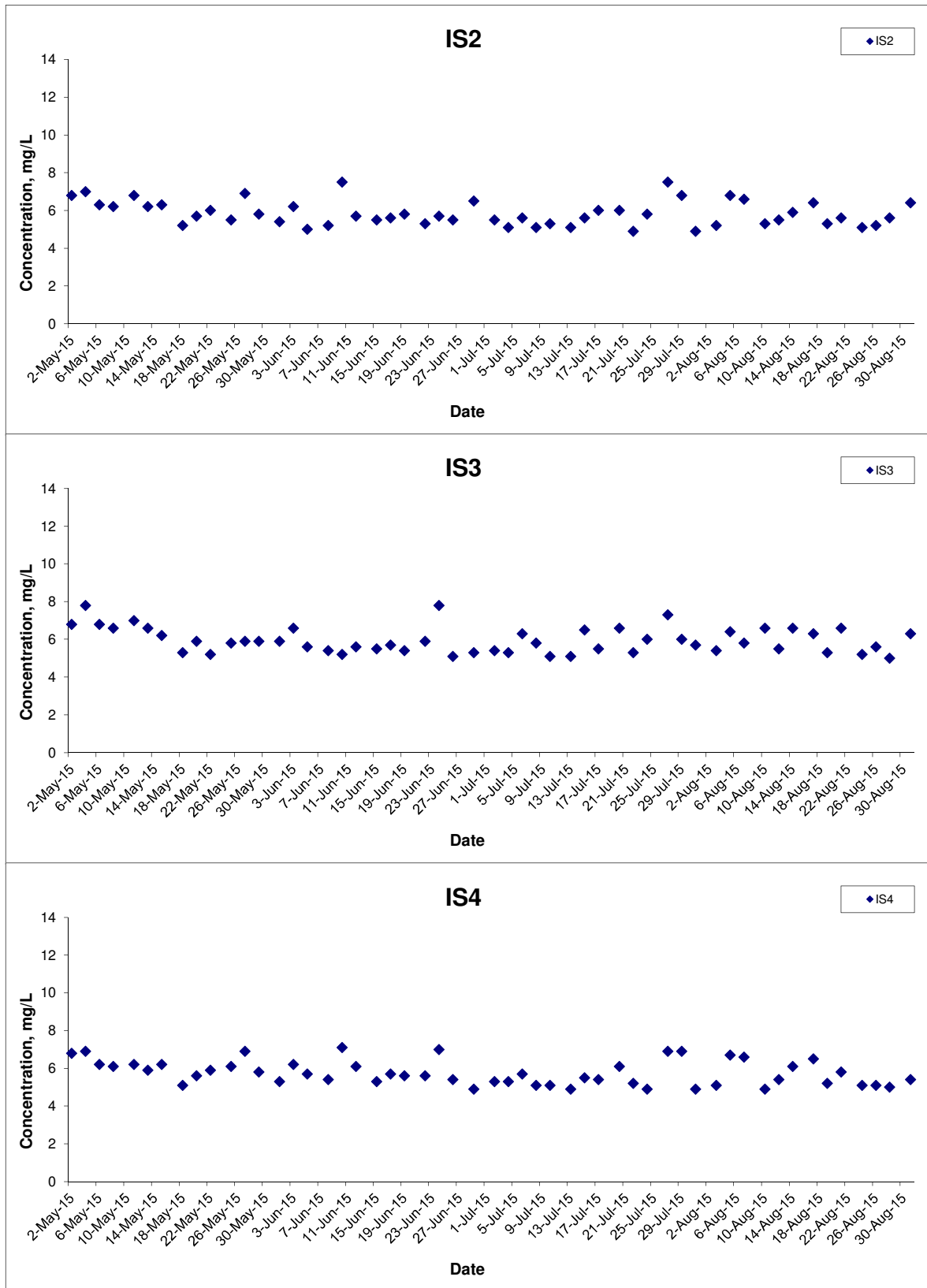
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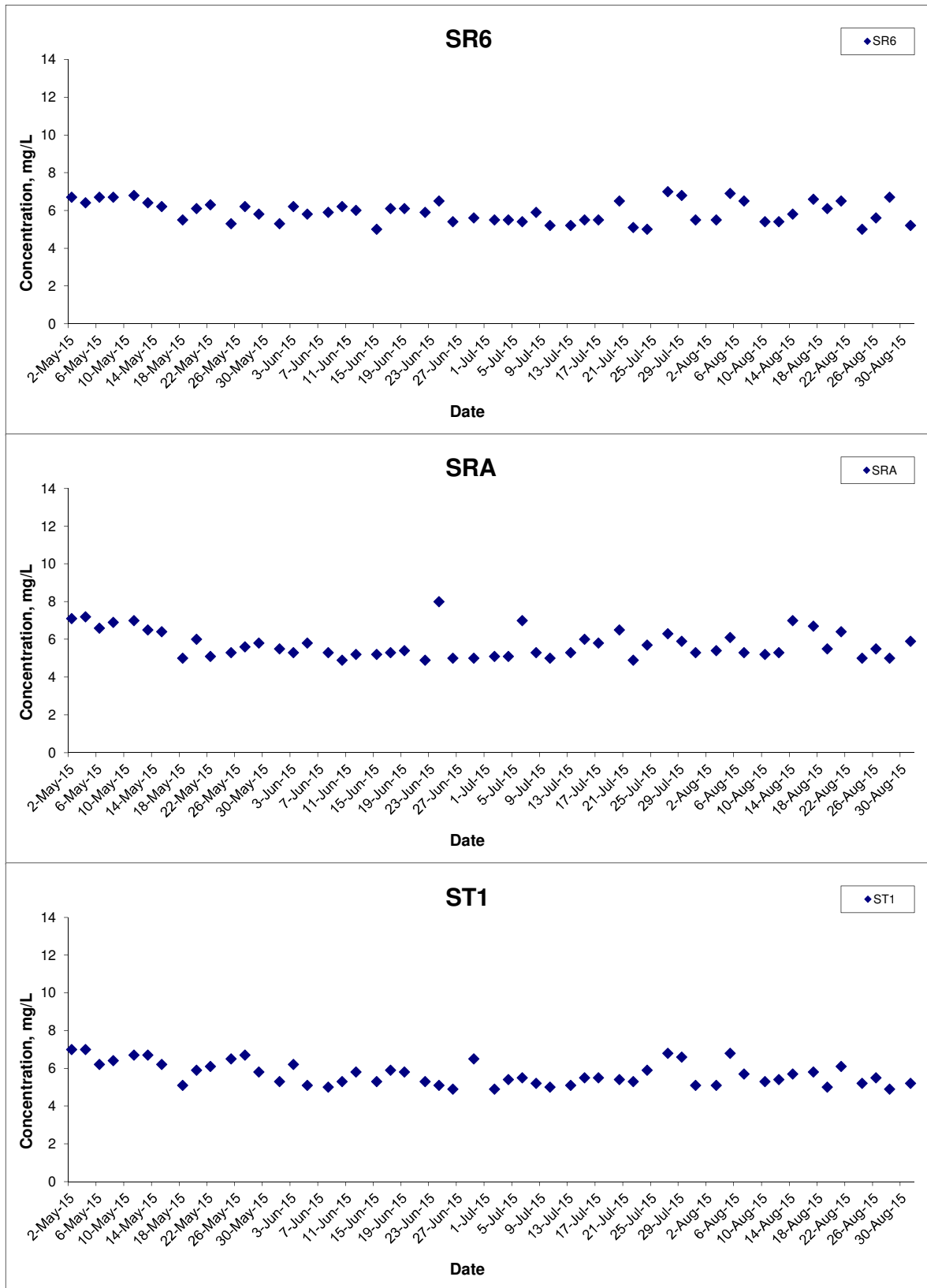
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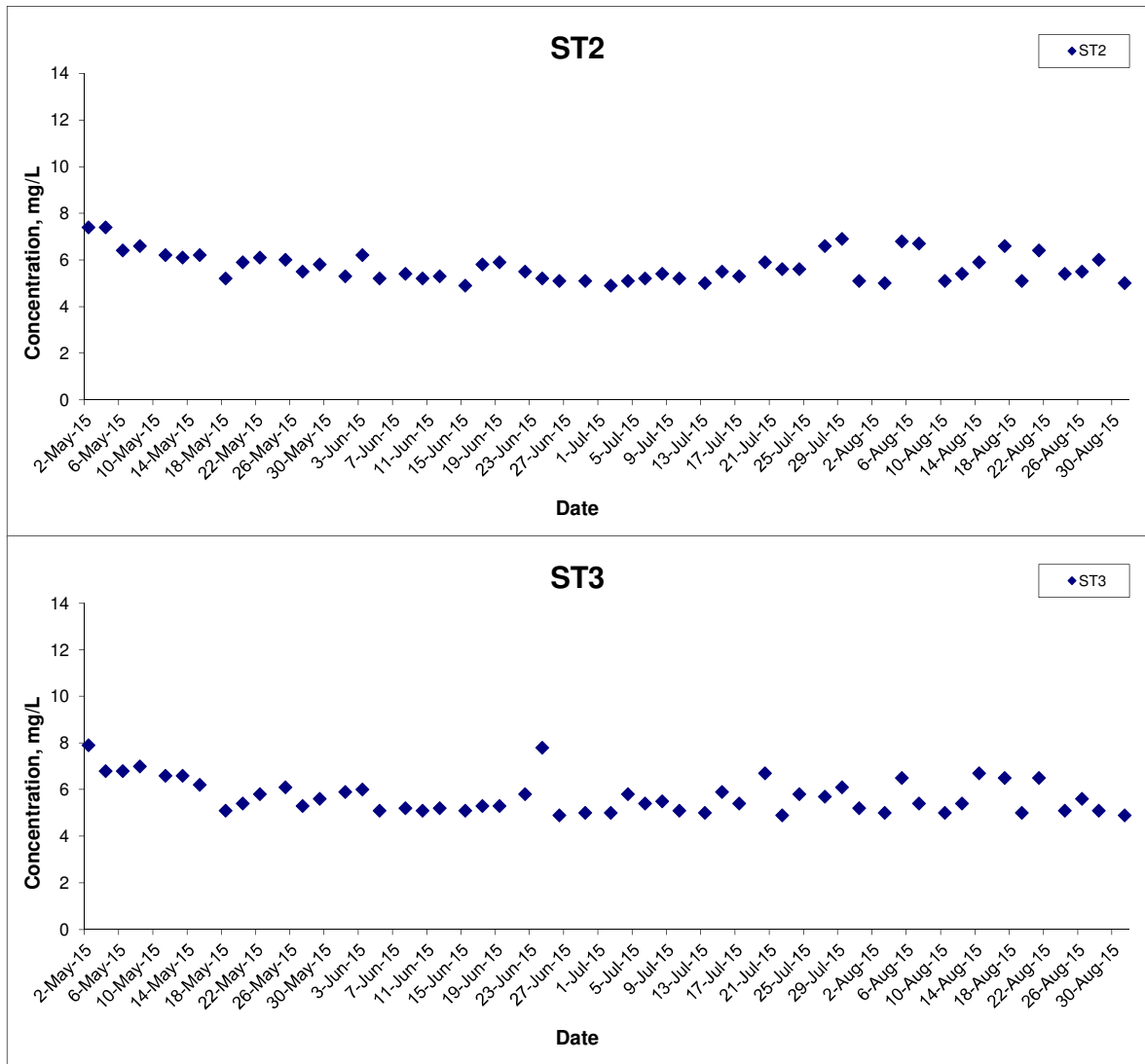
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Dissolved Oxygen (Bottom) at Mid-Flood Tide



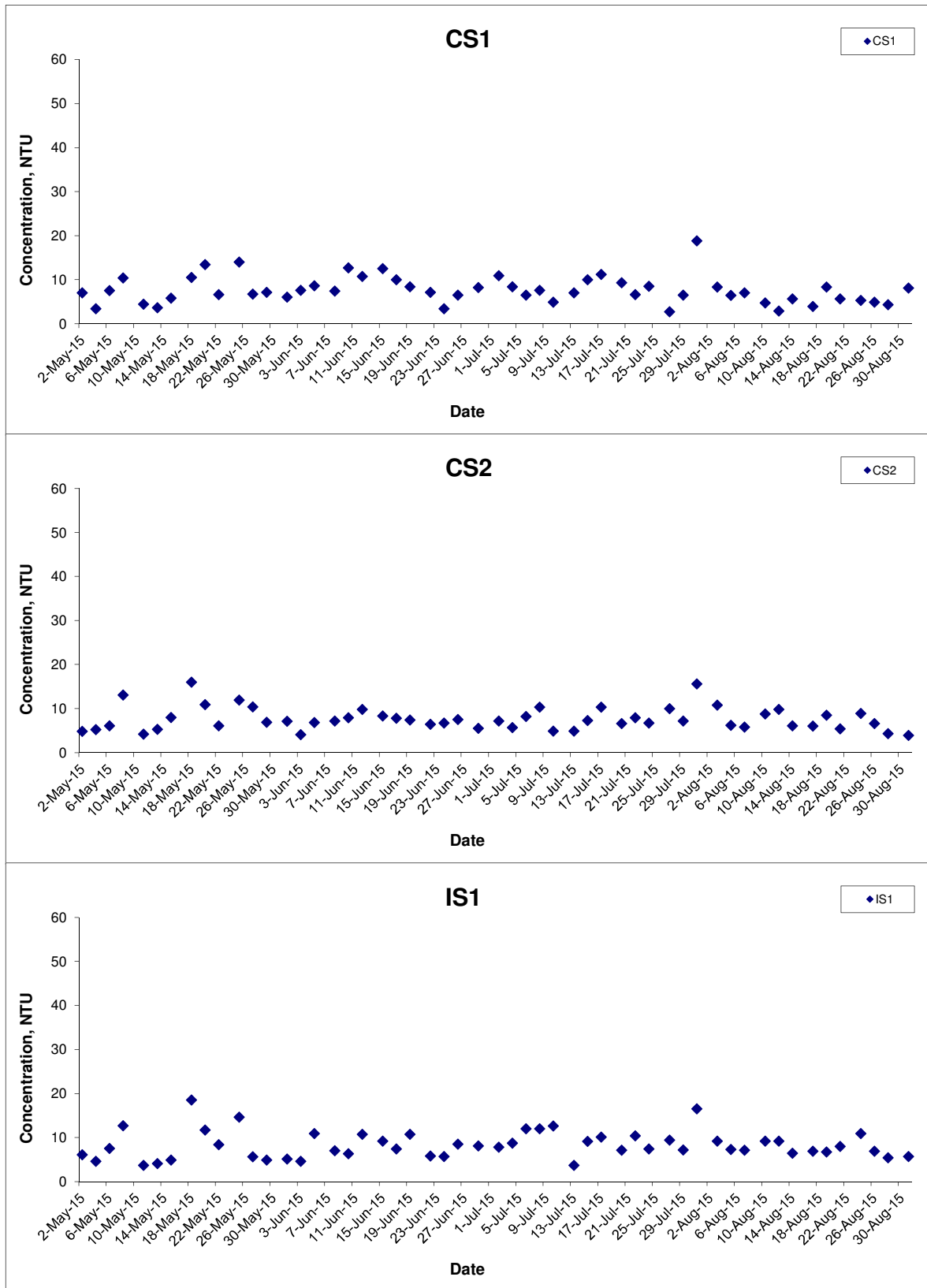
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Scale N.T.S
 Date Aug 15

Project No. MA12014
 Appendix E



Turbidity (Depth-averaged) at Mid-Ebb Tide



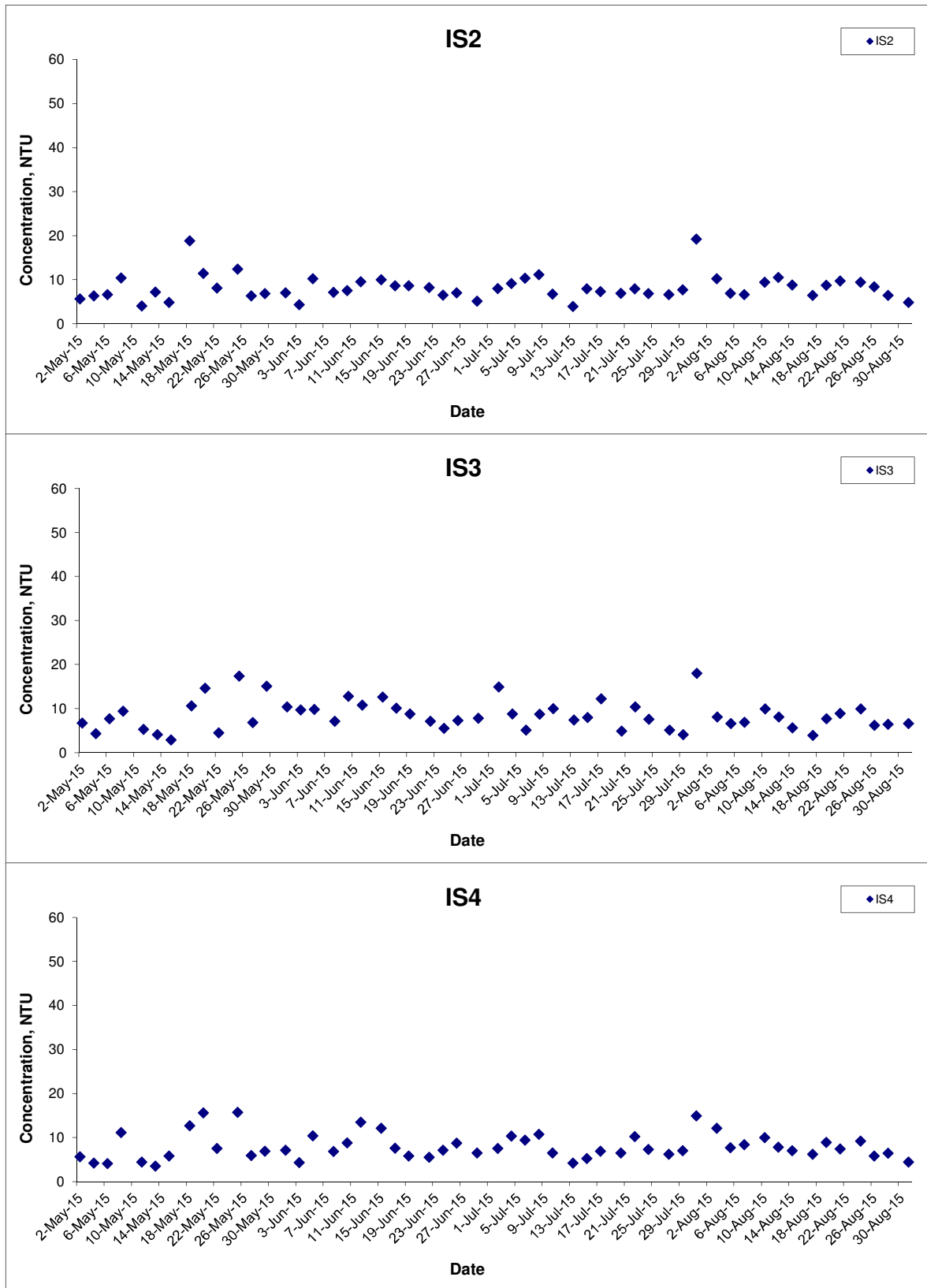
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Scale N.T.S
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Turbidity (Depth-averaged) at Mid-Ebb Tide



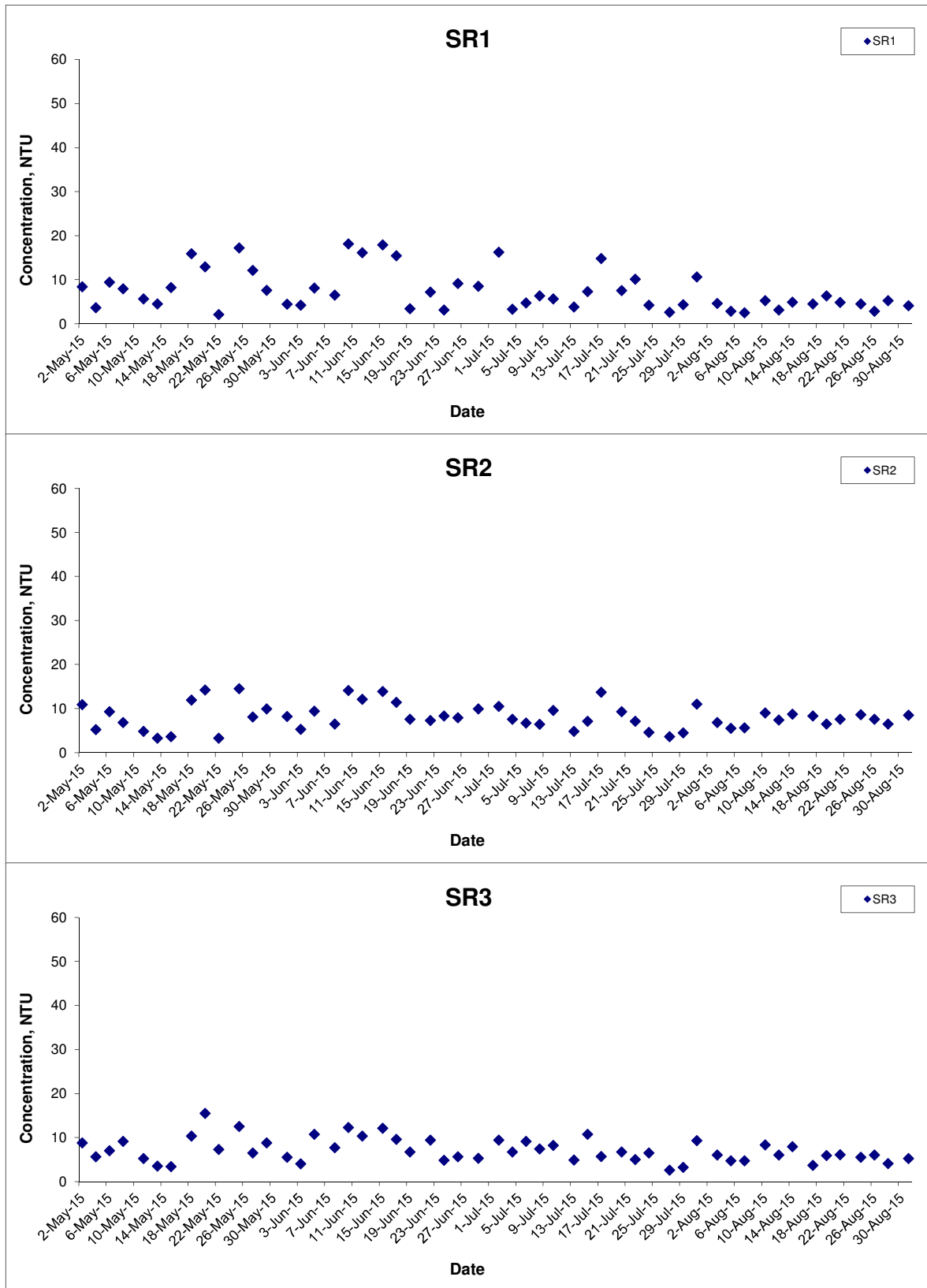
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Turbidity (Depth-averaged) at Mid-Ebb Tide



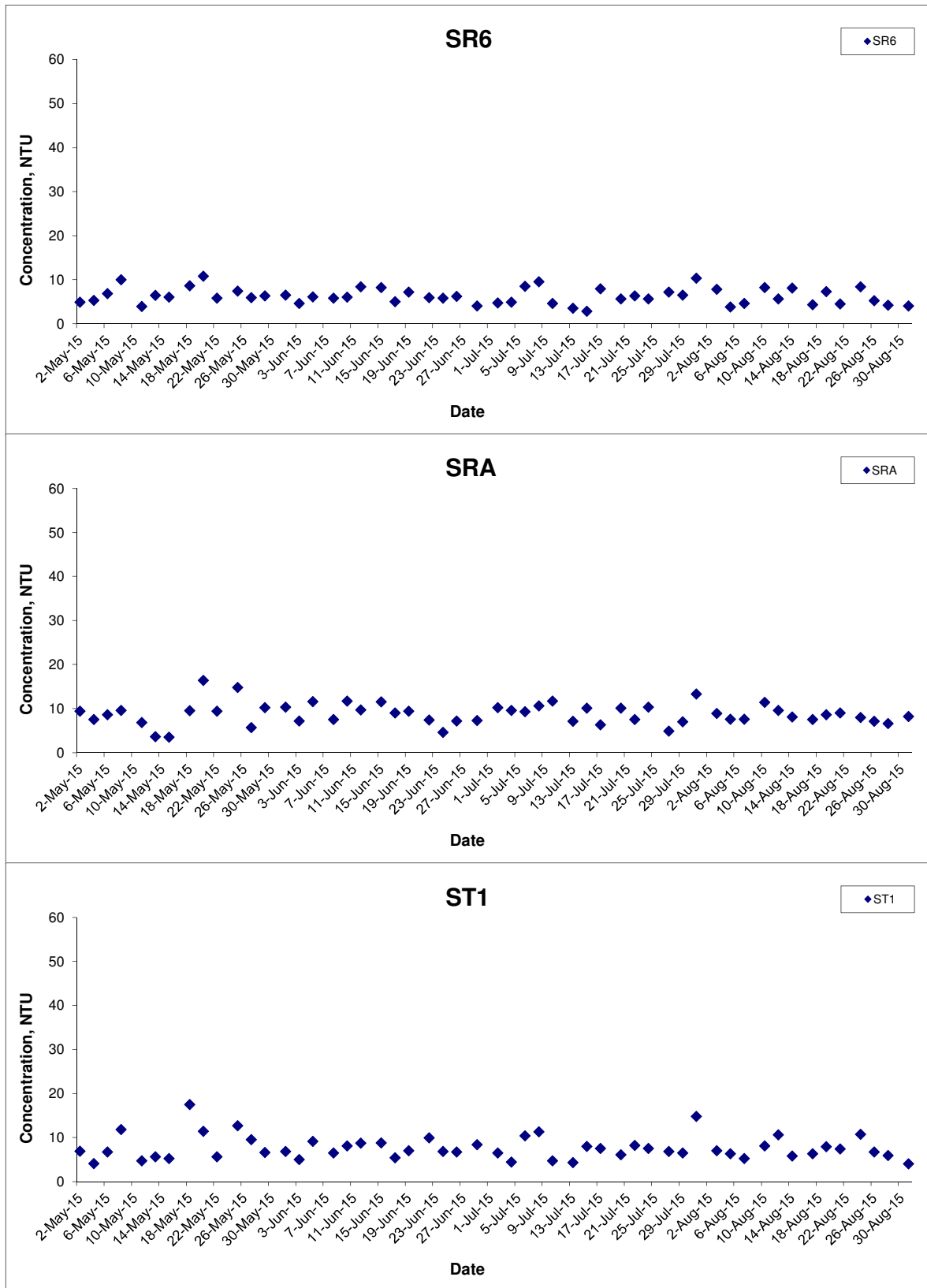
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Turbidity (Depth-averaged) at Mid-Ebb Tide



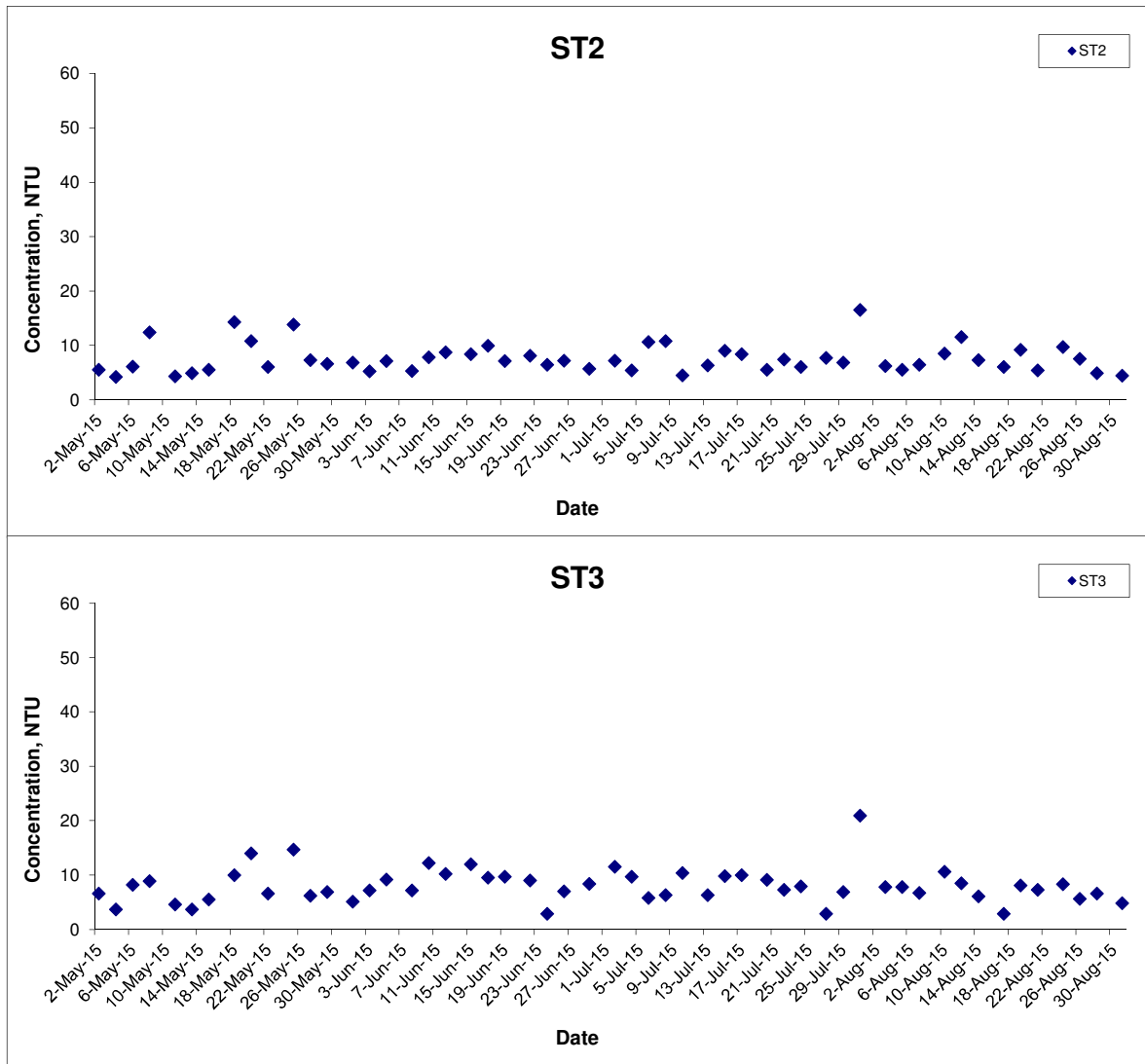
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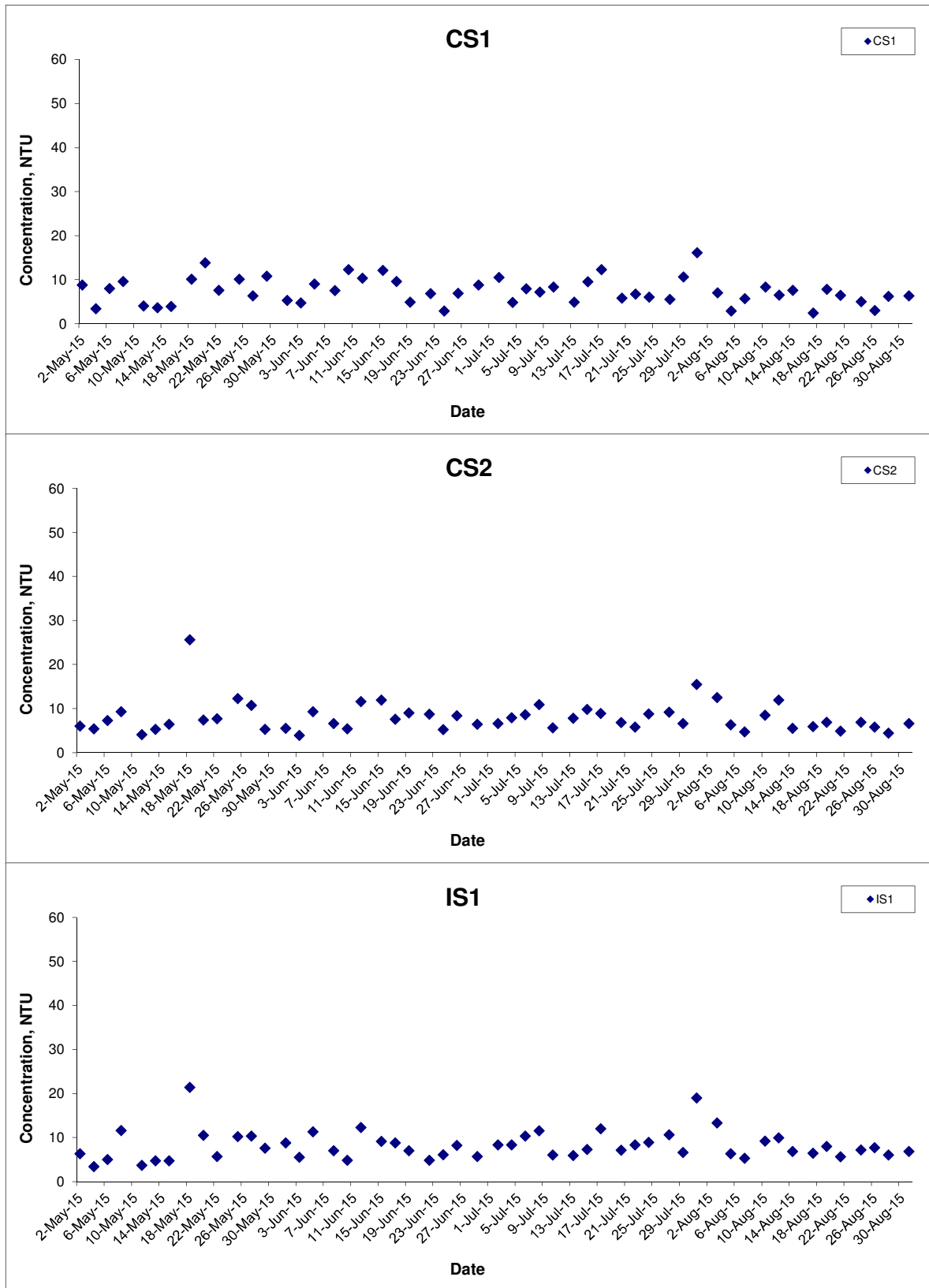
Turbidity (Depth-averaged) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill	Scale	N.T.S	Project No.	MA12014
	Graphical Presentation of Water Quality Monitoring Results	Date	Aug 15	Appendix	E



Turbidity (Depth-averaged) at Mid-Flood Tide



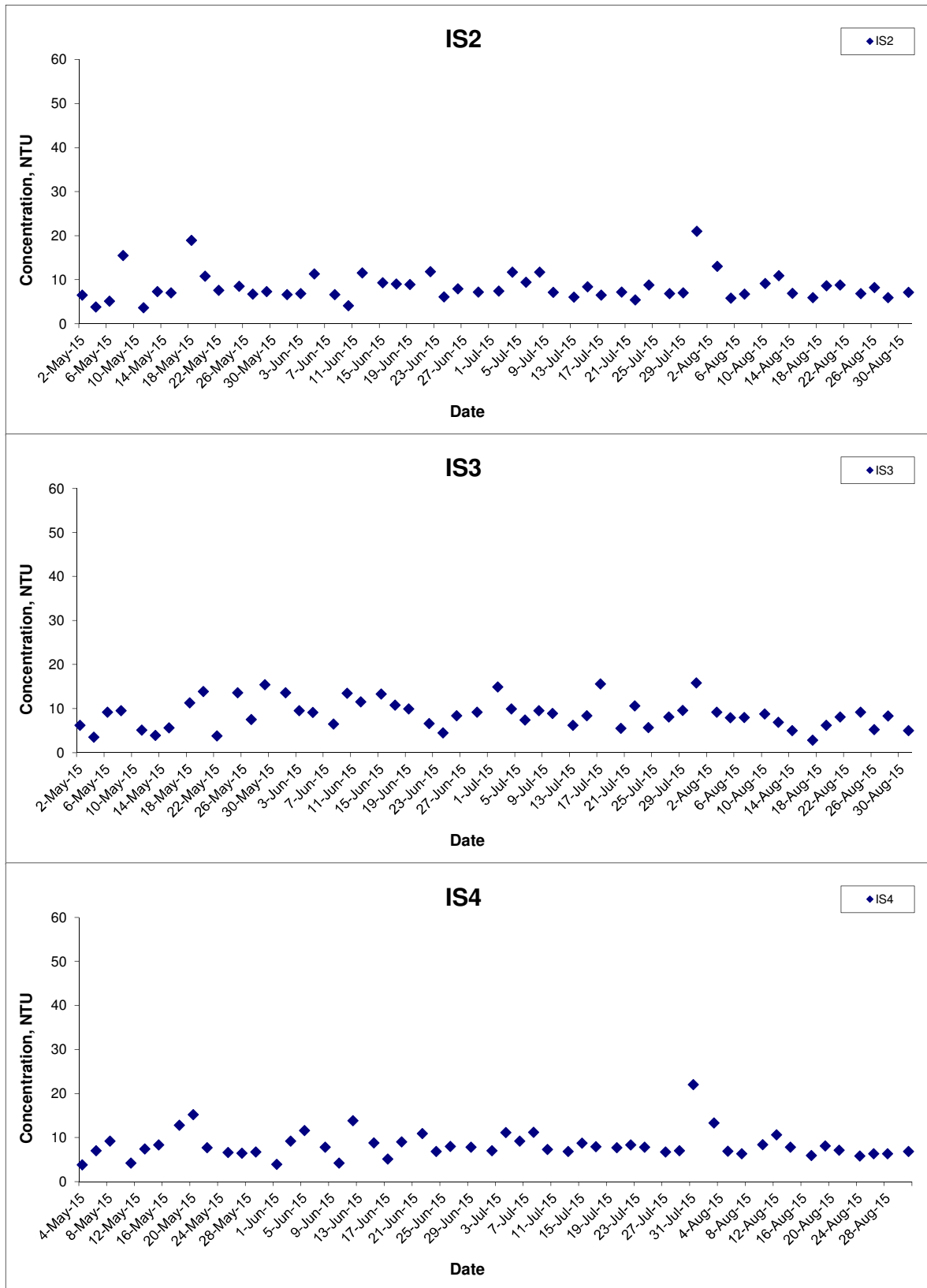
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Turbidity (Depth-averaged) at Mid-Flood Tide



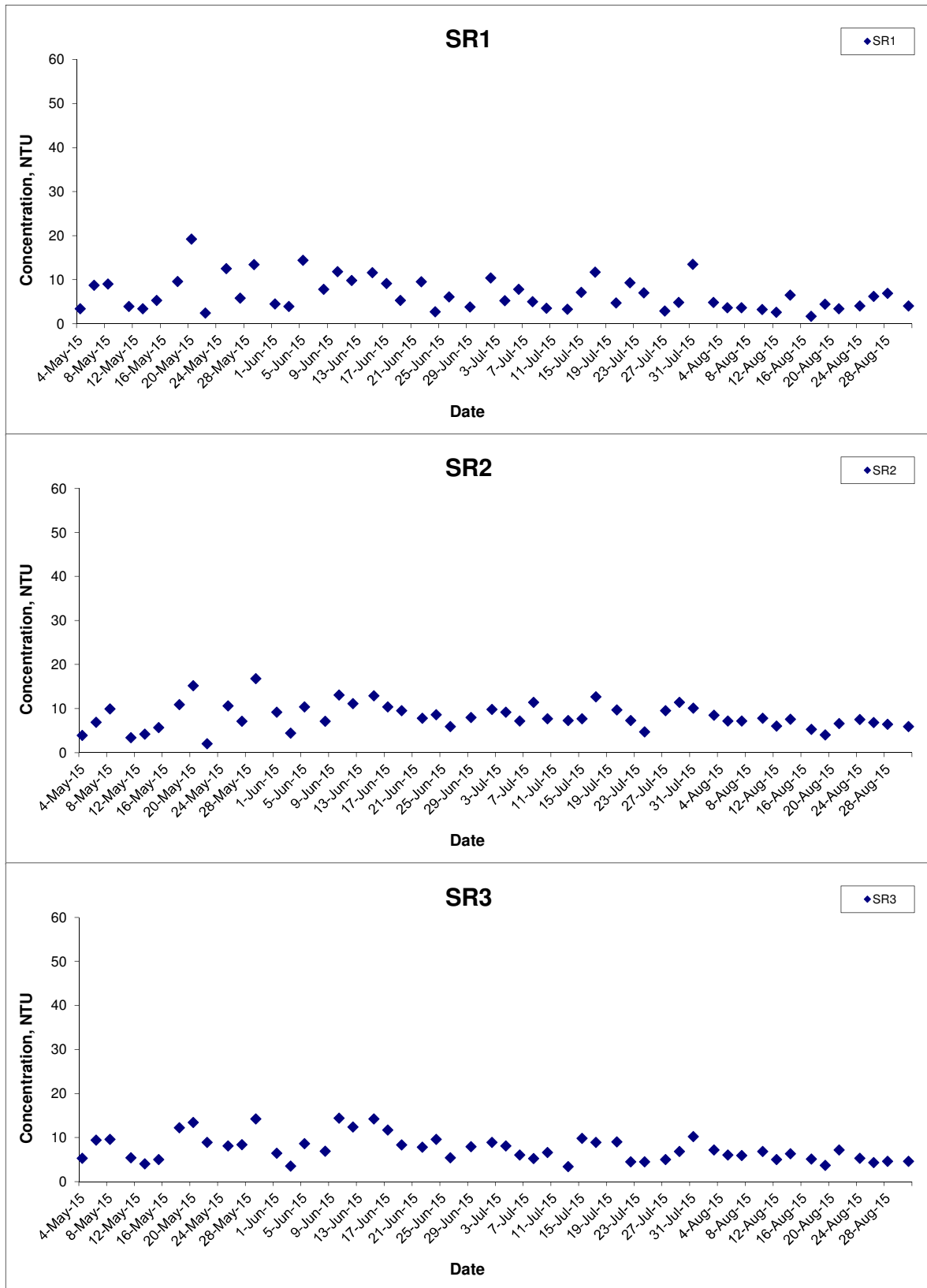
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Project No. MA12014
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Turbidity (Depth-averaged) at Mid-Flood Tide



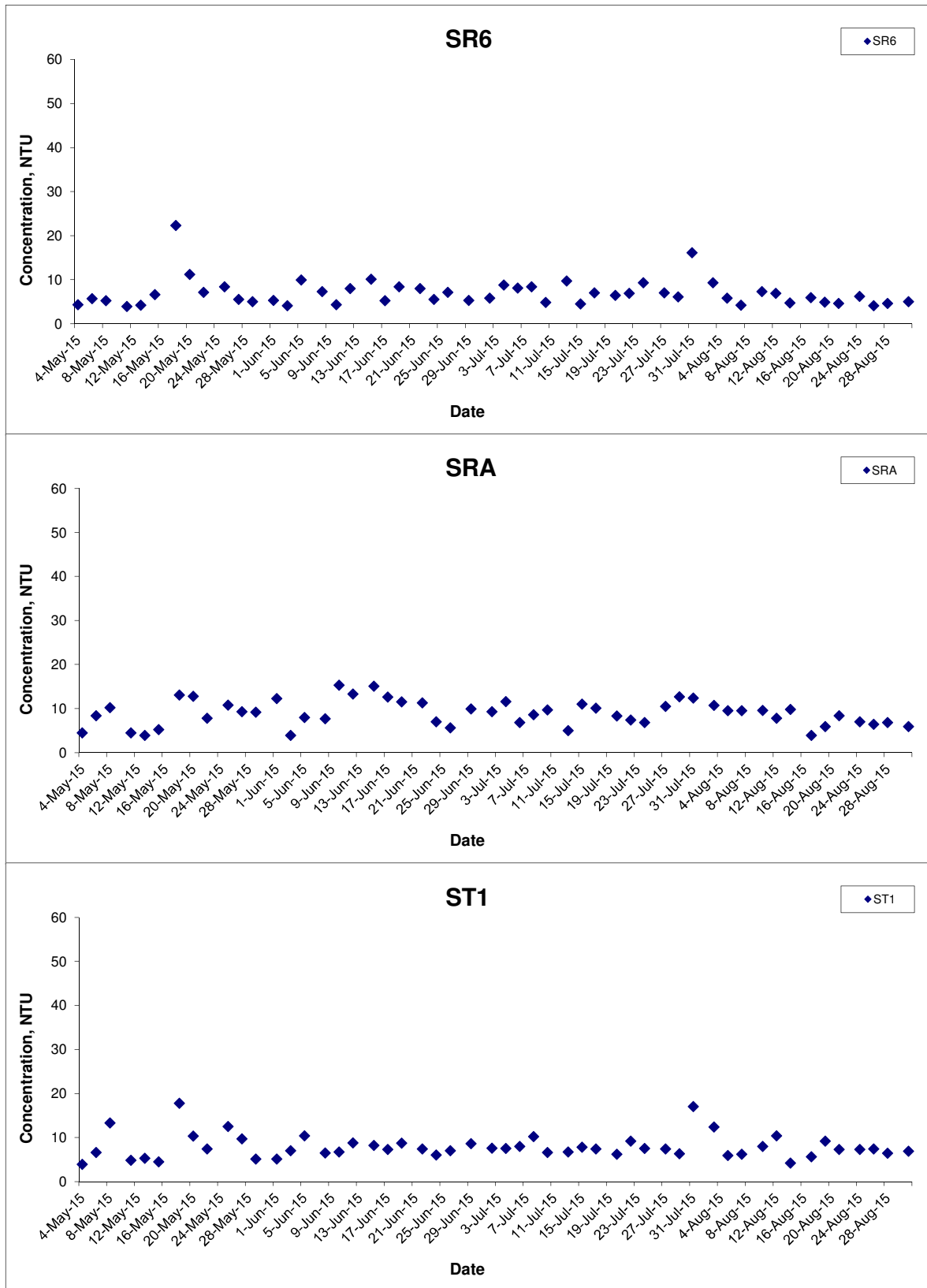
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Turbidity (Depth-averaged) at Mid-Flood Tide



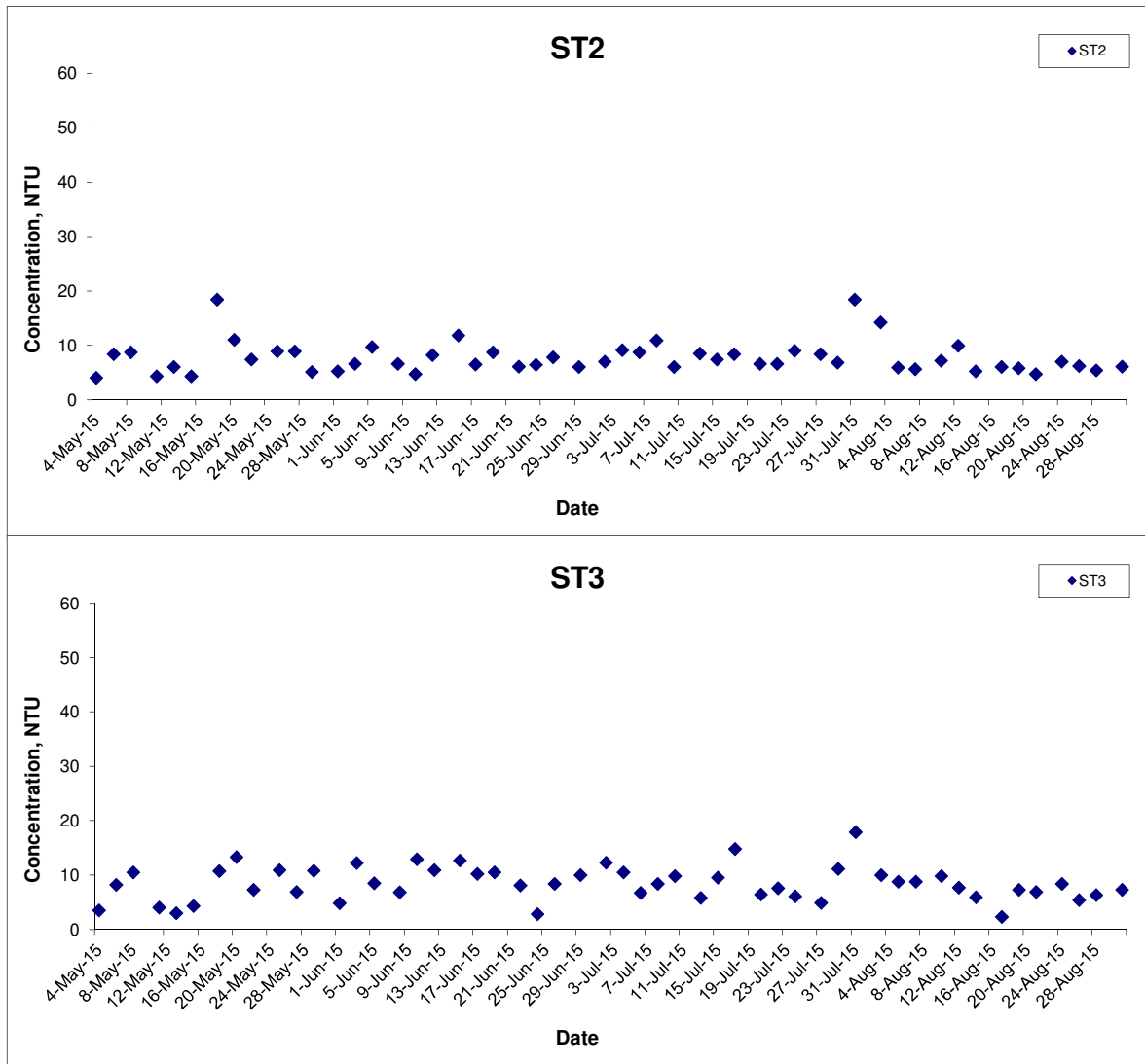
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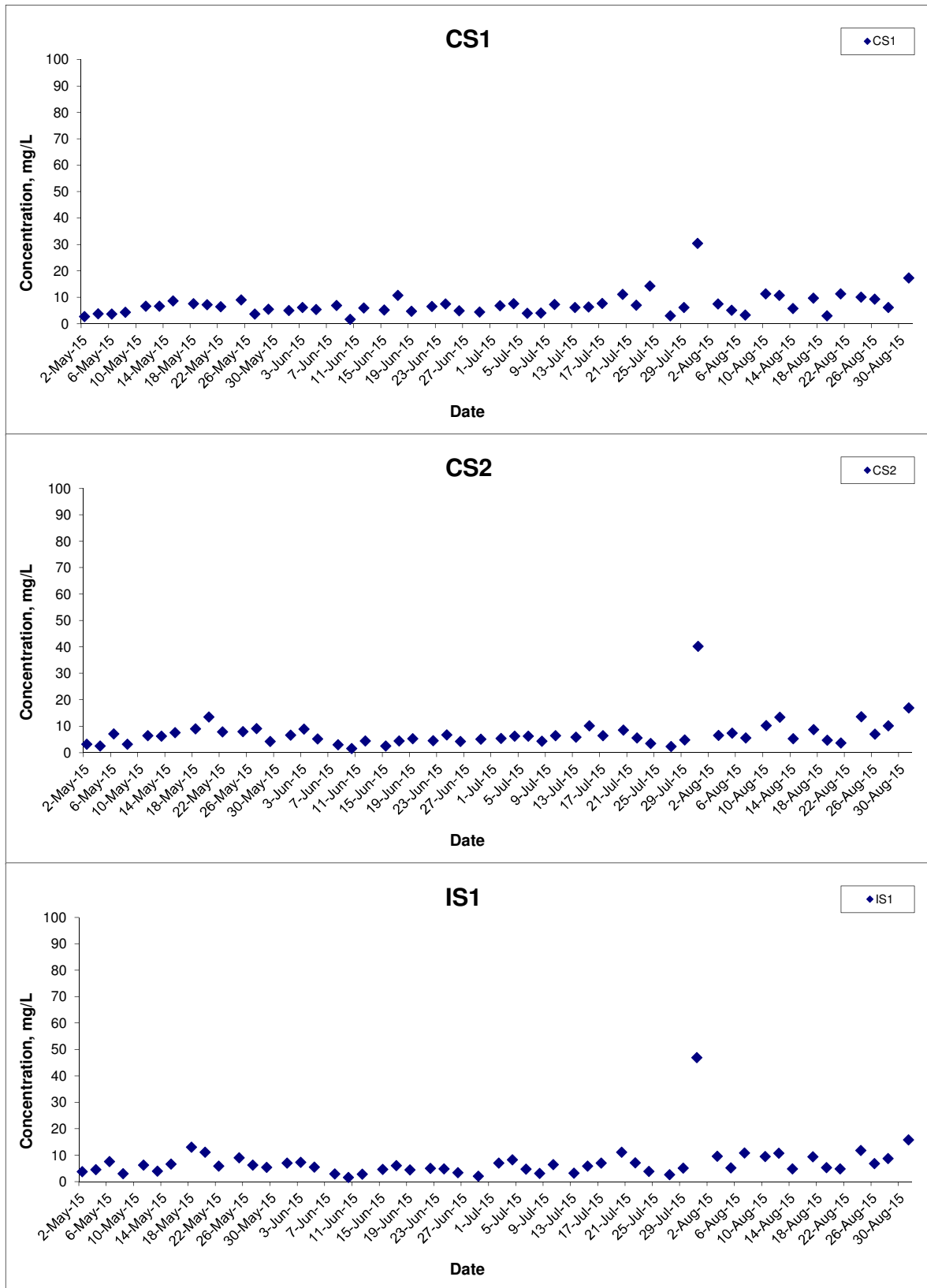


Turbidity (Depth-averaged) at Mid-Flood Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill	Scale	N.T.S	Project No.	MA12014	CINOTECH
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Suspended Solids (Depth-averaged) at Mid-Ebb Tide



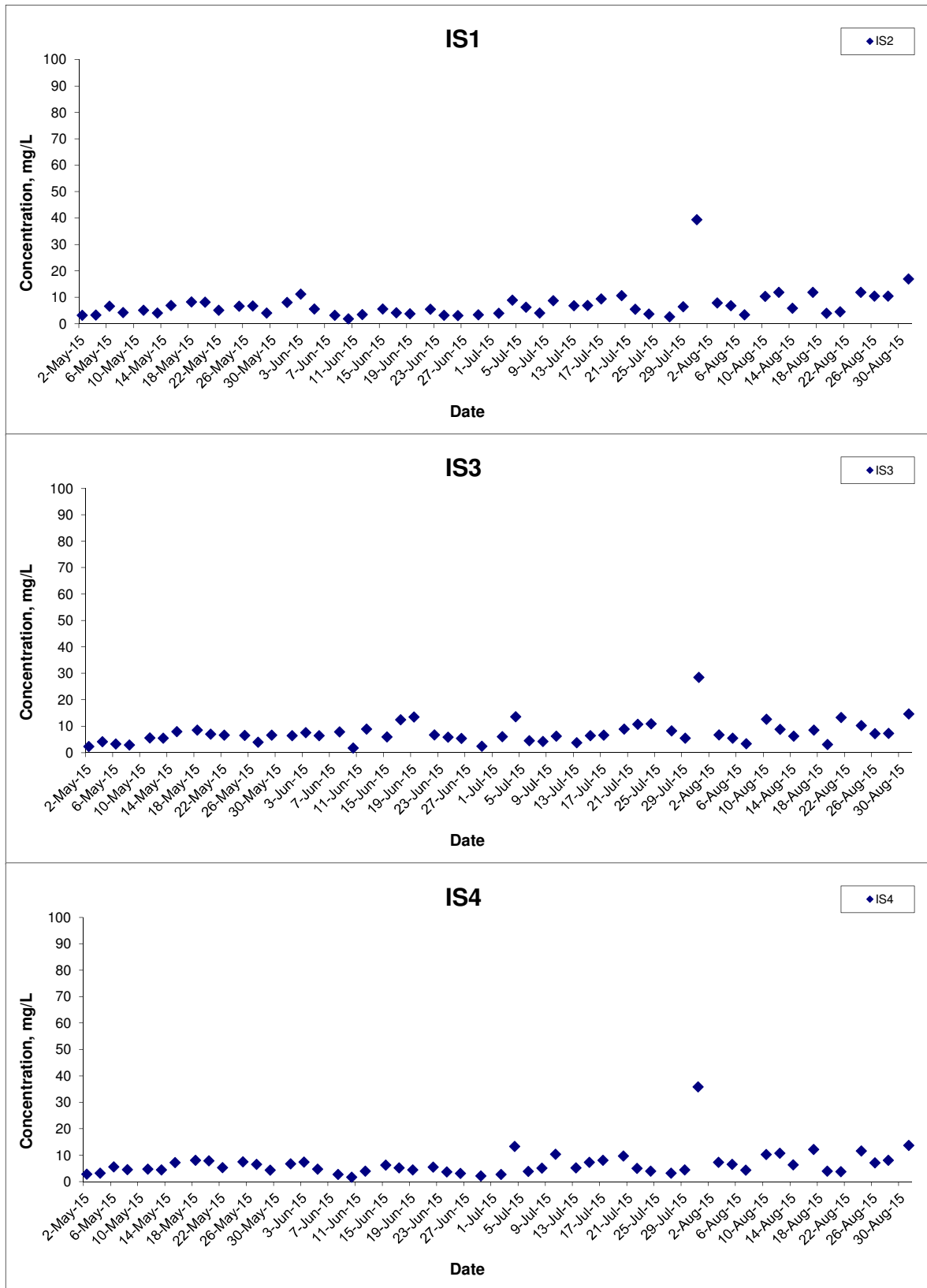
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Scale N.T.S
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Project No. MA12014
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Suspended Solids (Depth-averaged) at Mid-Ebb Tide



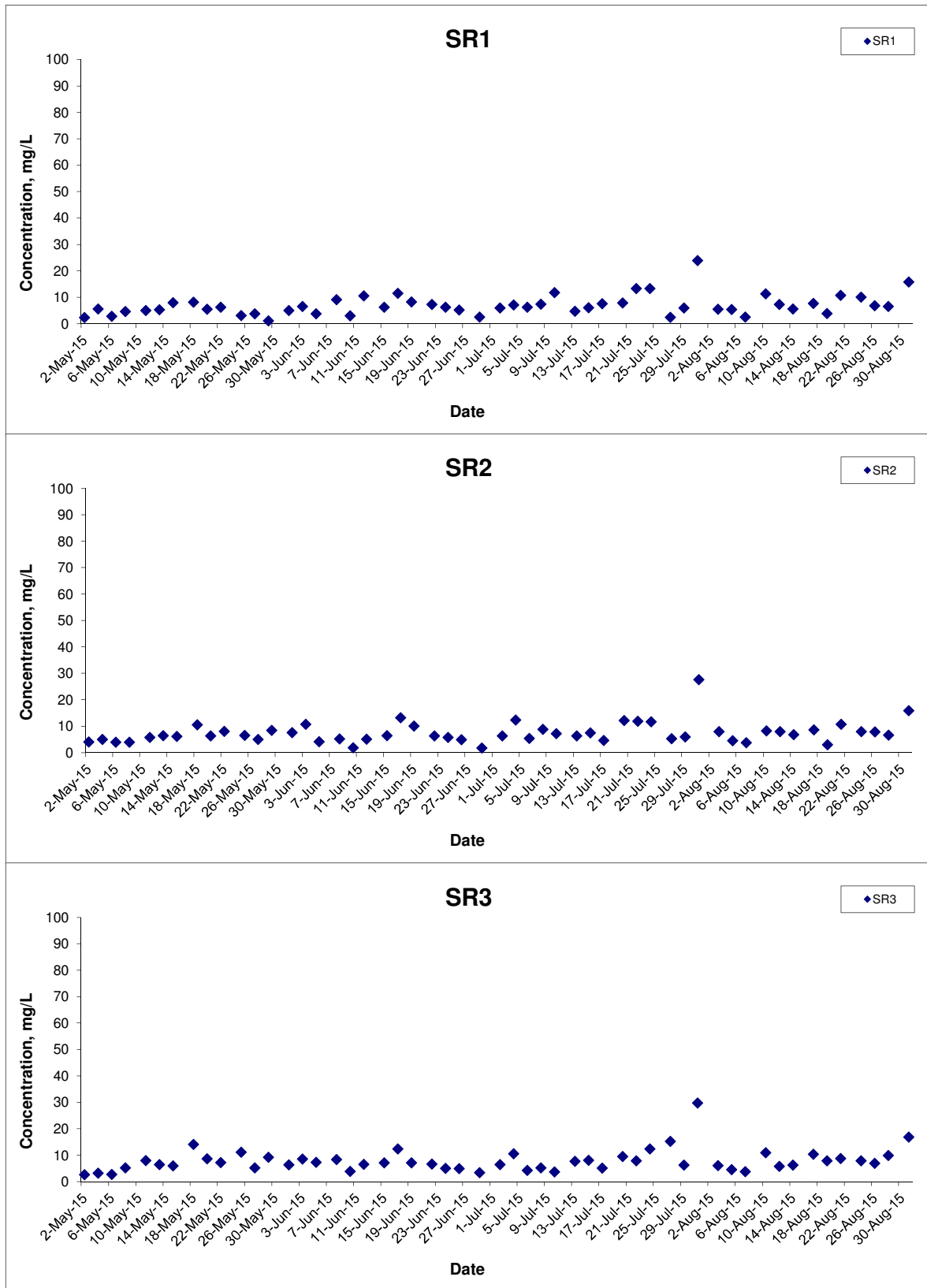
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Scale N.T.S
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Suspended Solids (Depth-averaged) at Mid-Ebb Tide



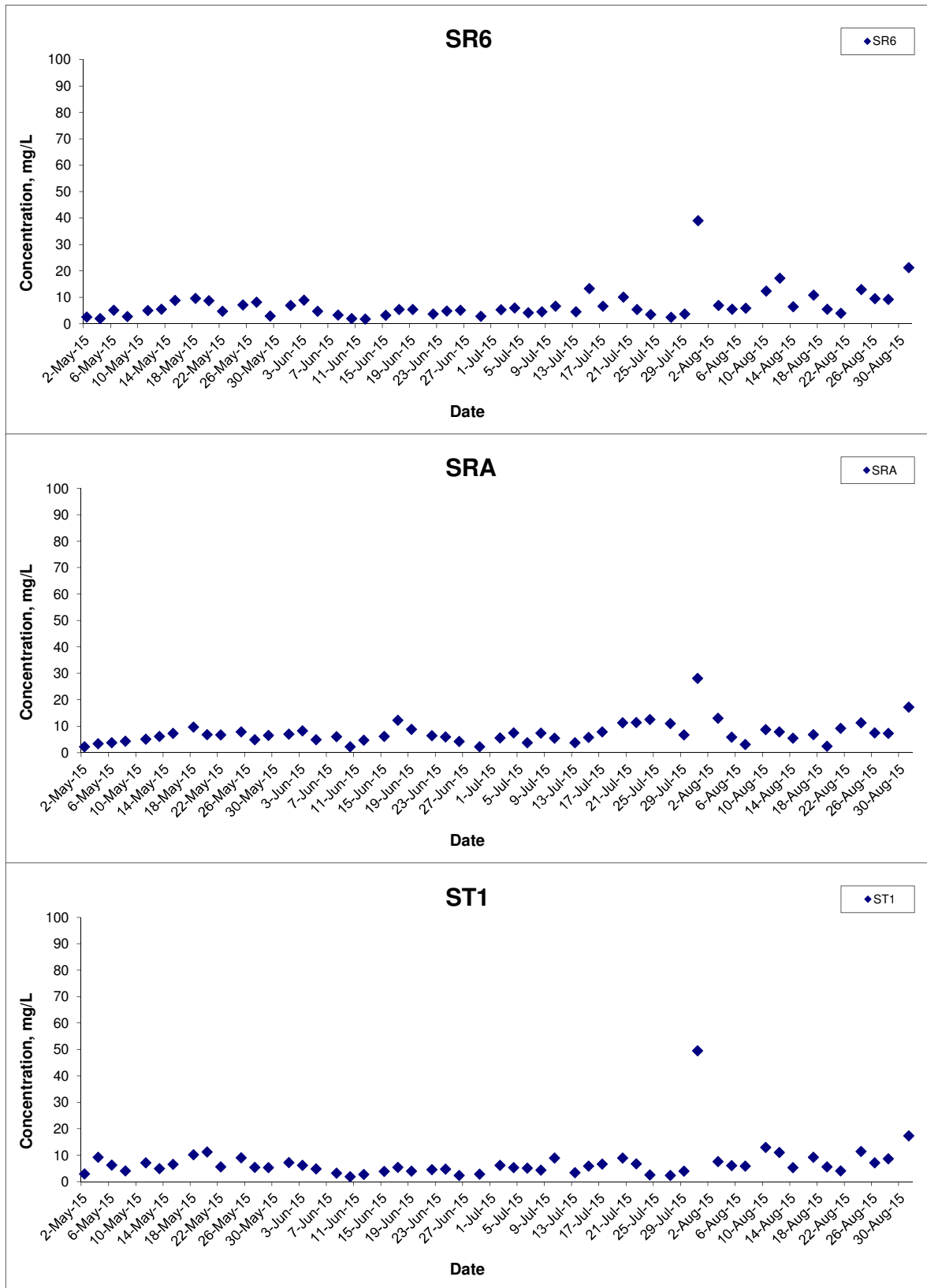
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Suspended Solids (Depth-averaged) at Mid-Ebb Tide



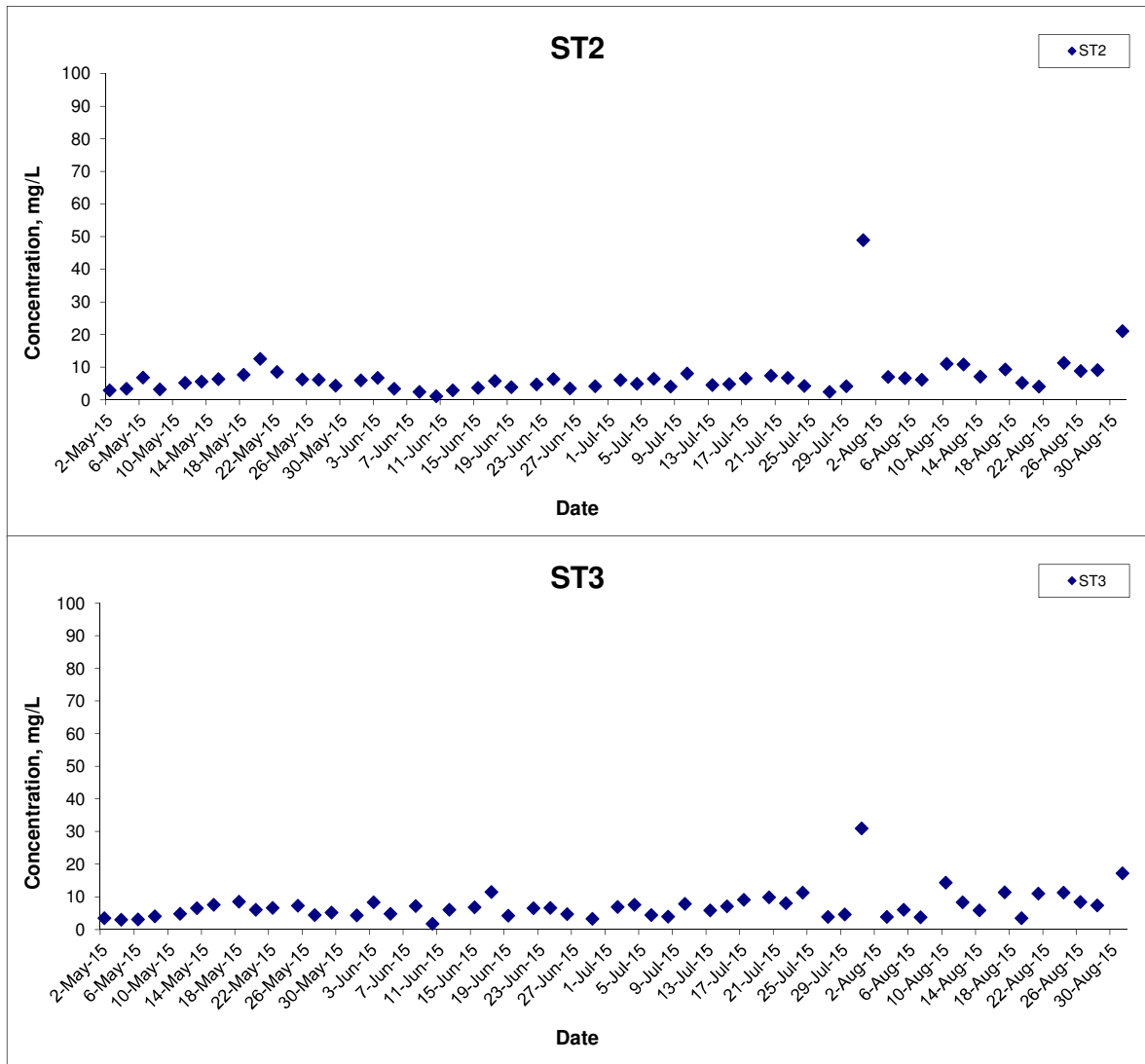
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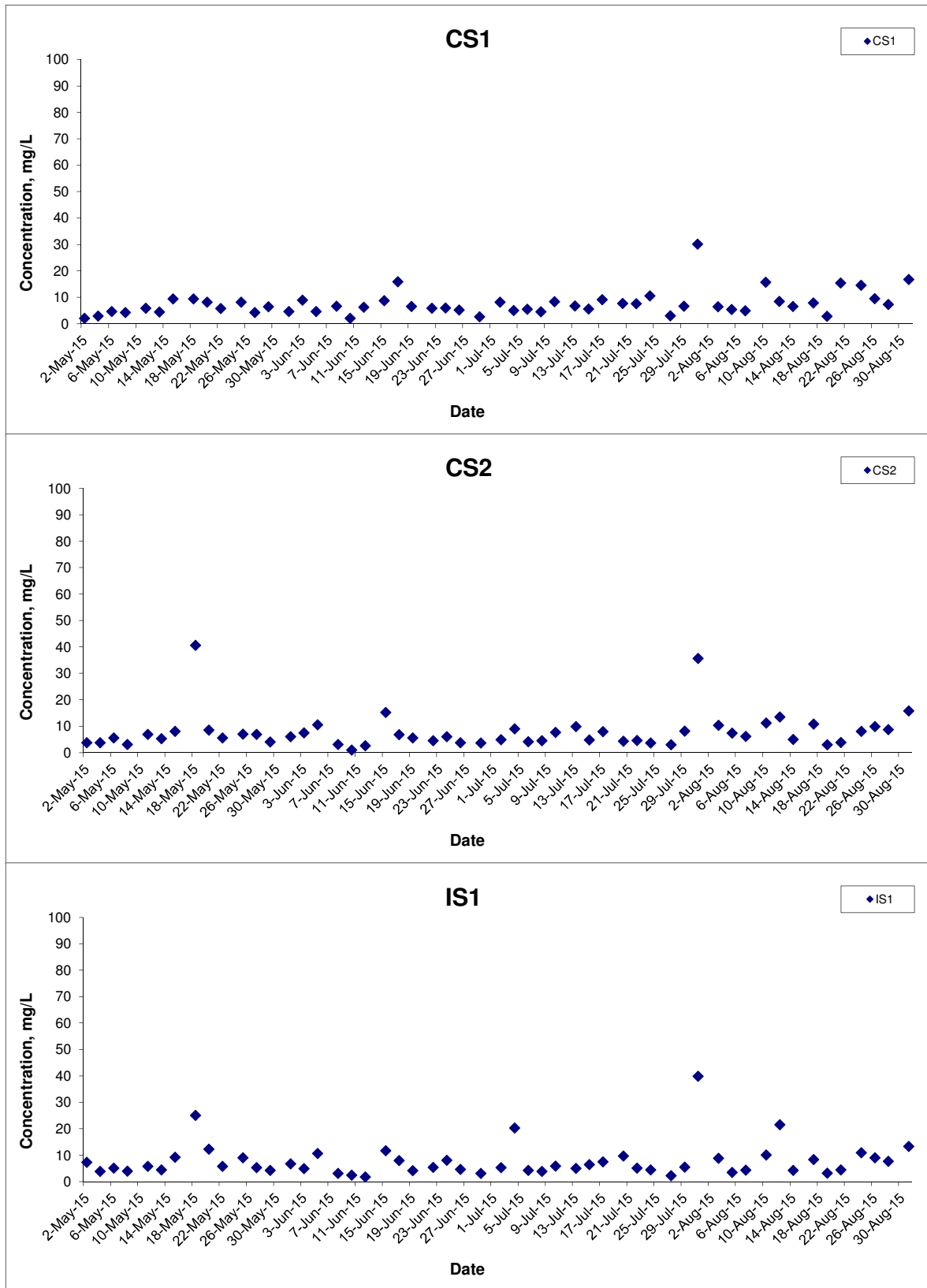


Suspended Solids (Depth-averaged) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill	Scale	N.T.S	Project No.	MA12014	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results	Date	Aug 15	Appendix	E	

Suspended Solids (Depth-averaged) at Mid-Flood Tide



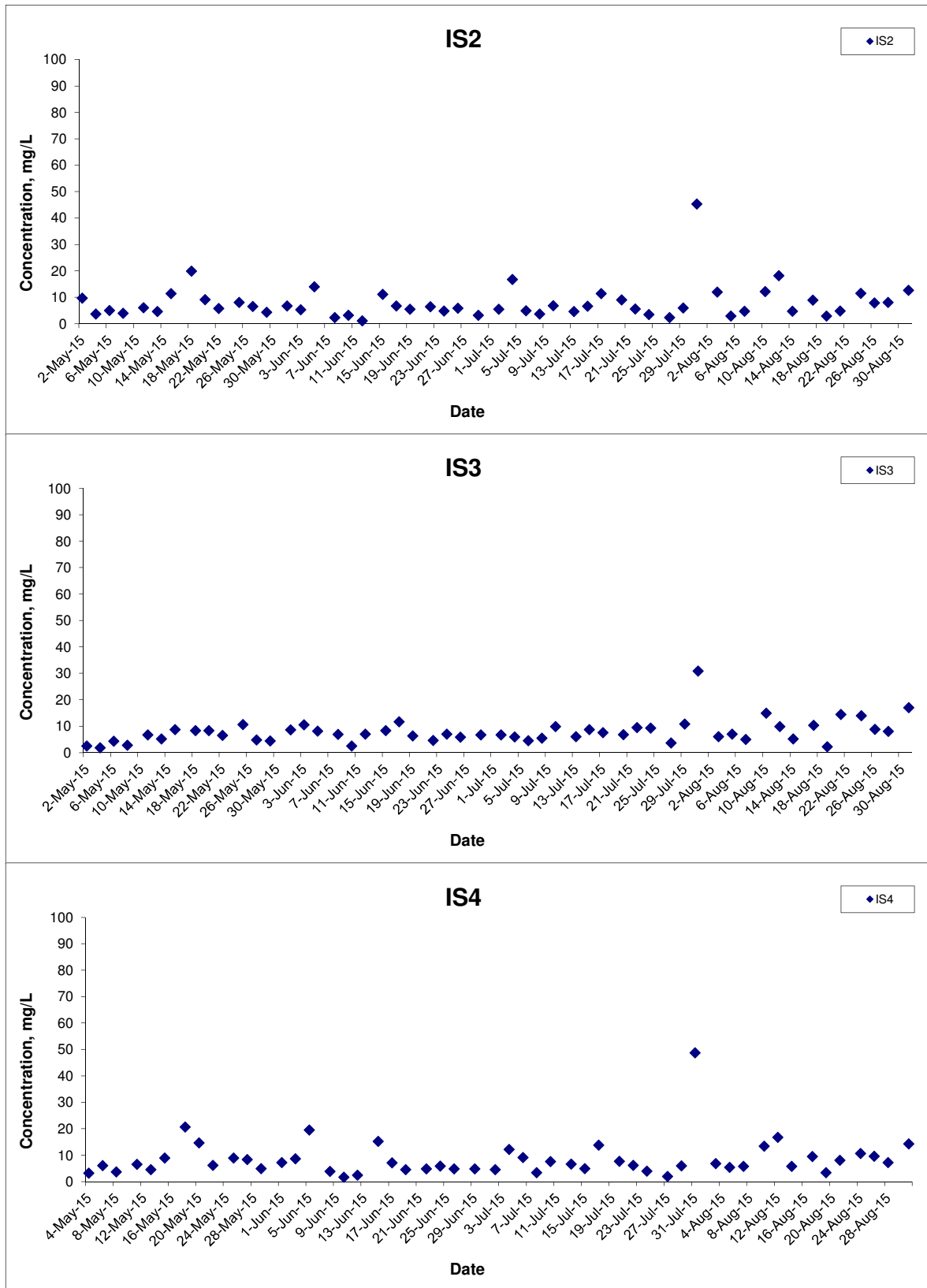
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Suspended Solids (Depth-averaged) at Mid-Flood Tide



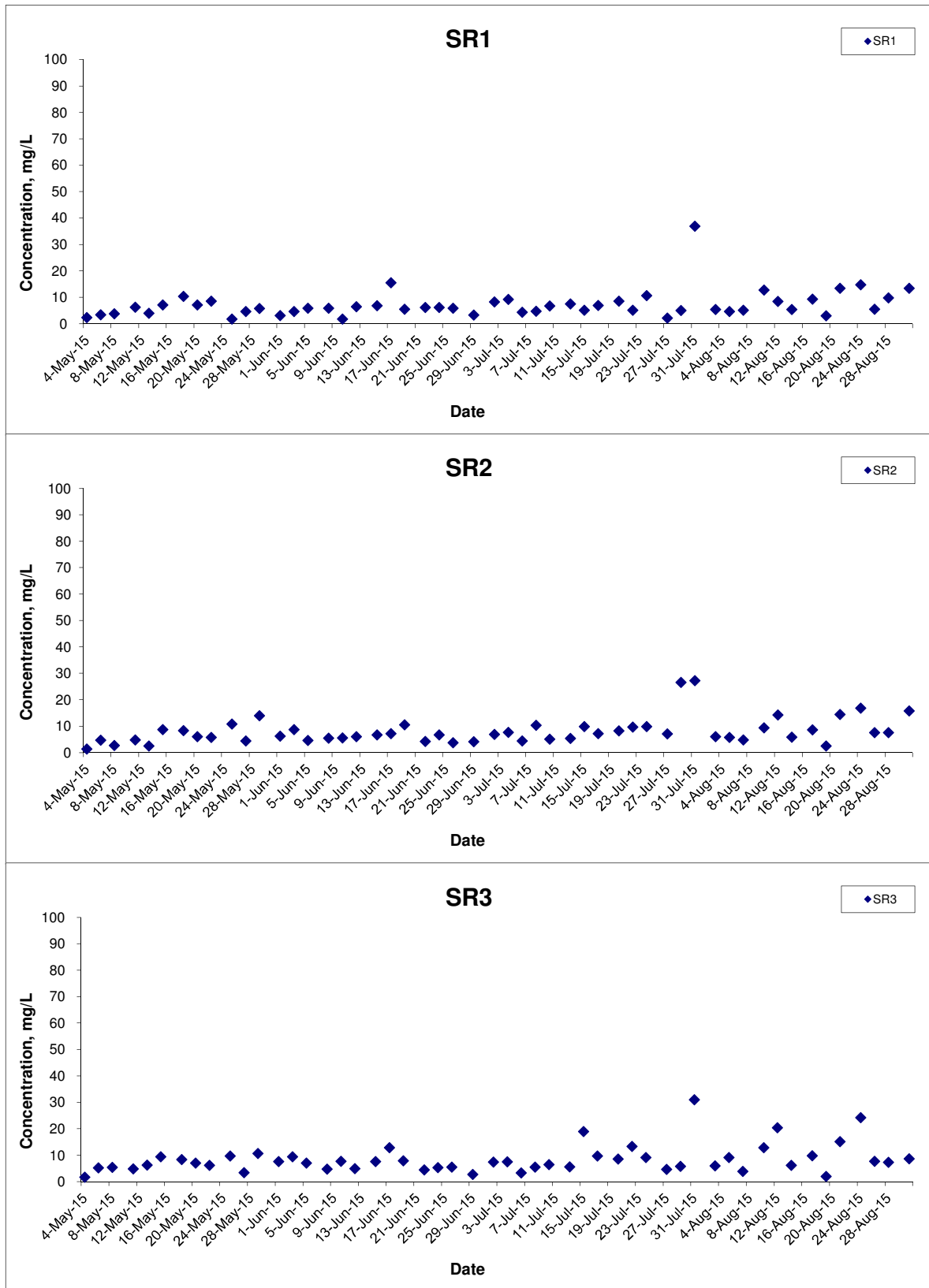
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Suspended Solids (Depth-averaged) at Mid-Flood Tide



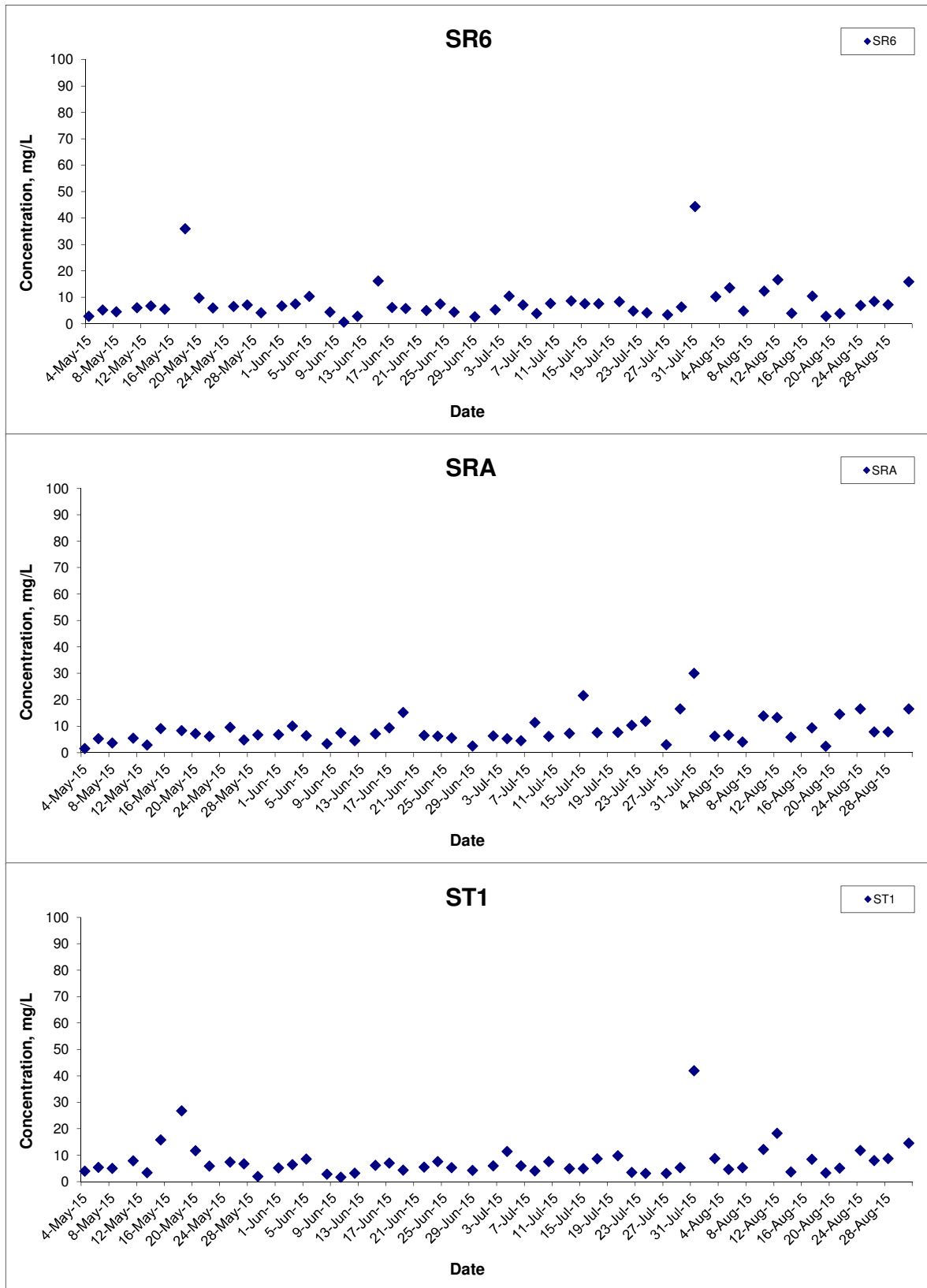
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Suspended Solids (Depth-averaged) at Mid-Flood Tide



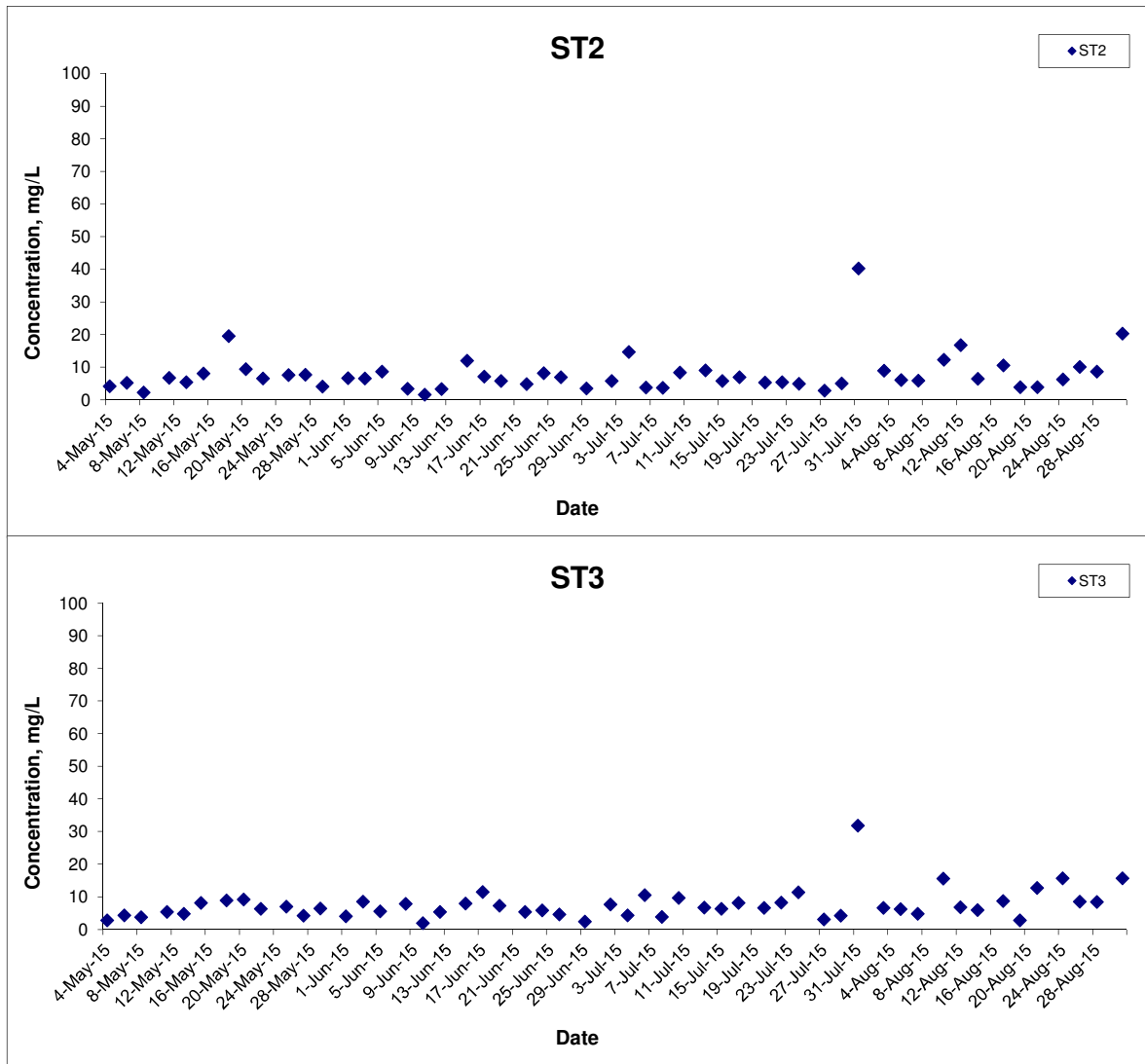
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Suspended Solids (Depth-averaged) at Mid-Flood Tide



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**APPENDIX F
DOLPHIN MONITORING REPORT
(LINE TRANSECT)**

Contract No. HY/2011/09
Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road –
Section between HKSAR Boundary and Scenic Hill Dolphin
Monthly Monitoring

10th Quarterly Progress Report (June-August 2015)

Submitted by

Samuel K.Y. Hung, Ph.D., Hong Kong Cetacean Research Project

23 September 2015

1. Introduction

- 1.1. The Hong Kong Link Road (HKLR) serves to connect the Hong Kong-Zhuhai-Macao Bridge (HZMB) Main Bridge at the Hong Kong Special Administrative Region (HKSAR) Boundary and the HZMB Hong Kong Boundary Crossing Facilities (HKBCF) located at the northeastern waters of the Hong Kong International Airport.
- 1.2. According to the updated Environmental Monitoring and Audit (EM&A) Manual (for HKLR), monthly line-transect vessel surveys for Chinese White Dolphin should be conducted to cover the West Lantau survey area as in AFCD annual marine mammal monitoring programme.
- 1.3. Since November 2012, Hong Kong Cetacean Research Project (HKCRP) has been commissioned by Dragages – China Harbour – VSL JV (DCVJV) to conduct this 34-month dolphin monitoring study in order to collect data on Chinese White Dolphins during the construction phase (i.e. impact period) of the HKLR09 project in West Lantau (WL) survey area, and to analyze the collected survey data to monitor distribution, encounter rate, abundance, activities and occurrence of dolphin calves. Photo-identification will also be collected from individual Chinese White Dolphins to examine their individual range patterns and core area use.
- 1.4. From the monitoring results, any changes in dolphin occurrence within the study area will be examined for possible causes, and appropriate actions and additional mitigation measures will be recommended as necessary.

1.5. This report is the tenth quarterly progress report under the HKLR09 construction phase dolphin monitoring programme submitted to DCVJV, summarizing the results of the surveys findings during the period of June-August 2015.

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 WL survey area (see Figure 1) twice per month throughout the entire construction period. The co-ordinates of all transect lines are shown in Table 1.

Table 1. Co-ordinates of transect lines in WL survey area

Line No.	Easting	Northing		Line No.	Easting	Northing	
1	Start Point	803750	818500	7	Start Point	800200	810450
1	End Point	803750	815500	7	End Point	801400	810450
2	Start Point	803750	815500	8	Start Point	801300	809450
2	End Point	802940	815500	8	End Point	799750	809450
3	Start Point	802550	814500	9	Start Point	799400	808450
3	End Point	803700	814500	9	End Point	801430	808450
4	Start Point	803120	813600	10	Start Point	801500	807450
4	End Point	801640	813600	10	End Point	799600	807450
5	Start Point	801100	812450	11	Start Point	800300	806500
5	End Point	802900	812450	11	End Point	801750	806500
6	Start Point	802400	811500	12	Start Point	801760	805450
6	End Point	800660	811500	12	End Point	800700	805450

2.1.2. The 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 17 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2013).

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° and 90° (in relation to the bow, which is defined as 0°). 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, position (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 being 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 survey areas around Lantau Island (Hung 2013). Therefore, primary and secondary survey effort were both 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 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. One to two professional digital cameras (*Canon* EOS 7D and/or 60D models), each 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 West Lantau (WL) survey area in relation to the amount of survey effort conducted during each month of monitoring survey. 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, and only data collected under Beaufort 3 or below condition would be used for encounter rate analysis. 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 West 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 West 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 impact phase monitoring period were plotted onto 1-km² grids in WL survey area on GIS. Sighting densities (number of on-effort sightings per km²) and dolphin densities (total number of dolphins from on-effort sightings per km²) 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 sightings per 100 units of survey effort. In addition, the derived unit for actual dolphin density was termed DPSE, representing the number of dolphins per 100 units of survey effort. Among the 1-km² 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-km² grid within the study area:

$$\text{SPSE} = ((S / E) \times 100) / \text{SA\%}$$

$$\text{DPSE} = ((D / E) \times 100) / \text{SA\%}$$

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, milling/resting, traveling, socializing) 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 three-month impact 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 June to August 2015, six sets of systematic line-transect vessel surveys were conducted to cover all transect lines in WL survey area twice per month.

3.1.2. From these surveys, a total of 199.77 km of survey effort was collected, with 86.2% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). The total survey effort conducted on primary lines was 133.76 km, while the effort on secondary lines was 66.01 km. Survey effort conducted on primary and secondary lines were both considered as on-effort survey data. A summary table of the survey effort is shown in Appendix I.

3.1.3. During the six sets of monitoring surveys in June to August 2015, a total of 27 groups of 116 Chinese White Dolphins were sighted. All except one sighting were made during on-effort search. Eighteen on-effort sightings were made on primary lines, while the other eight on-effort sightings were made on secondary lines. A summary table of the dolphin sightings is shown in Appendix II.

3.2. Distribution

3.2.1. Distribution of dolphin sightings made during HKLR09 monitoring surveys during June to August 2015 is shown in Figure 1. The dolphin groups were mainly clustered near Tai O Peninsula, Peaked Hill and Fan Lau. It appeared that they have avoided the waters between Tai O Peninsula and Kai Kung Shan (Figure 1).

3.2.2. Sighting distribution of dolphins in the present quarter was generally similar to the one during the baseline period, but with some subtle differences. Dolphins occurred less frequently between Tai O Peninsula and Peaked Hill during the present impact phase period. Moreover, two dolphin groups were sighted to the north of the HKLR09 alignment during the present quarter, where no

dolphin was sighted during the baseline period (Figure 1).

3.2.3. Two of the 27 dolphin groups were sighted near the HKLR09 alignment in WL survey area during the present quarter (Figure 2). When pooling the data from HKLR03 monitoring surveys from the same summer quarter of 2015, dolphins occurred more or less the same along the HKLR09 alignment in the present quarter (including the section in NWL survey area) when compared to the baseline monitoring period (i.e. autumn of 2011) (Figure 2).

3.2.4. In the past monitoring quarters, avoidance of the HKLR09 alignment was consistently recorded, but that was not the case for the present impact monitoring quarter, which is an encouraging sign. Disturbance arisen from the HKLR09 construction activities on the dolphins may have diminished in recent months since most piling works at sea have been completed, and the dolphins may start to utilize the water in the vicinity of the bridge alignment again. This should be continuously monitored in the upcoming quarters.

3.2.5. Distribution patterns of dolphin sightings in the past three summer quarters of 2013, 2014 and 2015 were also compared (Figure 3). Much fewer dolphins occurred between Tai O Peninsula and Kai Kung Shan, as well as around Fan Lau in 2015. On the other hand, after a decline in dolphin usage to the north of Tai O Peninsula in 2014, their usage has rebounded in 2015. Overall, there appeared to be fewer dolphins utilizing WL survey area in summer 2015 than during the previous two summer periods.

3.3. *Encounter rate*

3.3.1. During the present three-month impact phase monitoring period (June – August 2015), 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) from West Lantau survey area are shown in Table 2. The average encounter rates deduced from the six sets of surveys from the present quarter were also compared with the ones deduced from the baseline monitoring period (September – November 2011) (Table 3).

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 WL were 12.8 sightings and 57.5 dolphins per 100 km of survey effort respectively during the present quarter.

Table 2. Dolphin encounter rates (sightings per 100 km of survey effort) during the impact monitoring period (June-August 2015)

Survey Area	Dolphin Monitoring	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
West Lantau	Set 1 (June 9 th)	15.8	121.2
	Set 2 (June 18 th)	6.5	38.9
	Set 3 (July 6 th)	13.1	74.5
	Set 4 (July 28 th)	13.2	66.0
	Set 5 (August 18 th)	20.5	61.5
	Set 6 (August 26 th)	5.0	5.0

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (June to August 2015) and baseline monitoring period (September to November 2011) (Note: the encounter rates deduced from the baseline monitoring period have been recalculated based only on the survey effort and on-effort sighting data made along the primary transect lines under favourable conditions)

	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)	
	June-August 2015	September-November 2011	June-August 2015	September-November 2011
West Lantau	12.36 ± 5.81	16.43 ± 7.70	61.19 ± 38.63	60.50 ± 38.47

3.3.3. Notably, the dolphin encounter rates from the present summer quarter of 2015 was much lower than the ones recorded from previous summers of 2014 (ER(STG): 22.90 and ER(ANI): 101.41) and 2015 (ER(STG): 26.89 and ER(ANI): 94.75). Such temporal trend should be continuously monitoring to detect any further decline, even though the Action or Limit Level has not been triggered under the Event and Action Plan.

3.3.4. A one-way ANOVA was conducted to examine whether there were any significant differences in the average encounter rates between the baseline and impact monitoring periods. For the comparison between the baseline period and the present quarter (i.e. tenth quarter of the impact phase), the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.325 and 0.892 respectively. Therefore, no significant difference in dolphin encounter rate was detected between the baseline period and the present quarter.

3.3.5. Another comparison was made between the baseline period and the cumulative

quarters in the impact phase (i.e. first ten quarters of the impact phase), and the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.976 and 0.998 respectively. As a result, no significant difference was found in the dolphin encounter rates between the baseline period and the cumulative quarters in the impact phase.

3.4. *Group size*

3.4.1. Group size of Chinese White Dolphins ranged from 1-20 individuals per group in WL survey area between June to August 2015. The average dolphin group size for the three-month period was compared with the one deduced from the baseline period in September to November 2011, as shown in Table 4.

Table 4. Comparison of average dolphin group sizes from impact monitoring period (June-August 2015) and baseline monitoring period (September-November 2011)

	Average Dolphin Group Size	
	June – August 2015	September – November 2011
West Lantau	4.30 ± 4.28 (n = 27)	3.63 ± 2.97 (n = 46)

3.4.2. The average dolphin group size in the WL region during the present quarter was higher than the one recorded in the three-month baseline period (Table 4). About half of the groups were composed of 1-2 dolphins, while there were nine groups with more than 5 animals per group, and two groups with more than 10 animals per group.

3.4.3. Distribution of dolphins with the larger groups during June to August 2015 is shown in Figure 4. These groups were scattered from the bridge alignment to Fan Lau waters with no particular concentration, and a number of these large groups were located along the western territorial boundary (Figure 4). The distribution of larger dolphin groups was very different from the baseline period, when they mostly occurred to the northwest of Tai O Peninsula (near the bridge alignment) as well as near Kai Kung Shan and Peaked Hill (Figure 4).

3.5. *Habitat use*

3.5.1. From June to August 2015, the most heavily utilized habitats by the dolphins were mainly found near Tai O Peninsula, Kai Kung Shan and Fan Lau, which is similar to the previous monitoring quarters (Figures 5a & 5b). However, it should be cautioned that the amount of survey effort collected in each grid during the three-month period was fairly low (6 units of survey effort for most

grids), and therefore the habitat use pattern derived from the three-month dataset should be treated with caution. A more complete picture of dolphin habitat use pattern will be presented when more survey effort for each grid will be collected throughout the impact phase monitoring programme.

- 3.5.2. When compared with the habitat use pattern recorded during the baseline period, it appears that the overall dolphin densities were lower in West Lantau waters during the present impact phase period, especially the waters near Kai Kung Shan and Fan Lau. Moreover, distribution of dolphins was patchier in the present impact phase quarter with a number of grids recorded the absence of dolphin sightings (Figure 6).
- 3.6. *Mother-calf pairs*
 - 3.6.1. During the three-month impact phase monitoring period, five unspotted juveniles (UJ) were sighted in WL survey area. The young calves comprised 4.3% of all animals sighted, which was lower than the percentage recorded during the baseline monitoring period (6.6%).
 - 3.6.2. The five mother-calf pairs were sighted near the bridge alignment, Kai Kung Shan and Fan Lau (Figure 7). This was in stark contrast to the baseline period when calf occurrence was more frequent and concentrated near Tai O Peninsula at the northern portion of WL waters (Figure 7).
- 3.7. *Activities and associations with fishing boats*
 - 3.7.1. During the three-month impact monitoring period, three dolphin sightings were associated with feeding activities between near the HKLR09 bridge alignment and Fan Lau (Figure 8), comprising 11.1% of the total number of dolphin sightings. This percentage was very similar to the percentage recorded during the baseline period (13.0%).
 - 3.7.2. Moreover, three dolphin sightings were associated with socializing activity near the HKLR09 bridge alignment, Peaked Hill and Fan Lau (Figure 8), while no dolphin group was engaged in traveling or milling/resting activity during the present quarter.
 - 3.7.3. Distribution of feeding and socializing activities during the present impact phase monitoring period was somewhat different from the one during the baseline period, with the main concentration of these activities occurred between Tai O and Peaked Hill during the baseline period. On the contrary, the occurrence of these activities was more wide-spread in different parts of the WL survey area during the impact phase period (Figure 8).

3.7.4. During the three-month monitoring period, only one of the 27 dolphin groups was associated with an operating purse-seiner near Fan Lau.

3.8. *Summary of photo-identification works*

3.8.1. From June to August 2015, over 2,500 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.

3.8.2. In total, 64 individuals sighted 77 times altogether were identified (see the summary table in Appendix III and photographs of identified individuals in Appendix IV). Almost all identified individuals were sighted only once or twice during the three-month period, with the exception of three individuals (NL120, NL140 and WL214) being sighted thrice.

3.8.3. Notably, four of these 64 individuals (i.e. NL247, NL293, WL05 and WL124) were also sighted in North Lantau waters during the HKLR03 monitoring surveys in the same three-month period, showing some movements across the HKLR09 bridge alignment.

3.8.4. As in previous quarters, many individuals that were consistently sighted in North Lantau waters in the past were identified in West Lantau waters (e.g. NL120, NL136, NL150, NL188, NL261). It is possible that some of these identified dolphins have shifted their range use into West Lantau due to the increased disturbance of HZMB-related construction works in North Lantau region, as documented in Hung (2015).

3.9. *Individual range use*

3.9.1. Ranging patterns of the 64 individuals identified during the three-month study period were determined by fixed kernel method, and are shown in Appendix V.

3.9.2. Notably, a number of individual dolphins (NL136, NL210, NL242, NL261, NL280, NL284, NL295 and WL11) that primarily centered their range use in North Lantau were found extending their ranges to the southern part of West Lantau waters, further expanding their range use away from North Lantau waters (Appendix V).

3.9.3. On the contrary, most individuals that primarily centered their range use in West Lantau were sighted within their normal range during the present quarterly period (Appendix V).

4. Conclusion

- 4.1. During the present quarter of dolphin monitoring, no adverse impact from the activities of the HKLR09 construction project on Chinese White Dolphins was noticeable from general observations.
- 4.2. Nevertheless, the dolphin usage in WL region should be continuously monitored, to further examine whether it has been significantly affected by the on-going construction activities in relation to the HZMB works.

5. References

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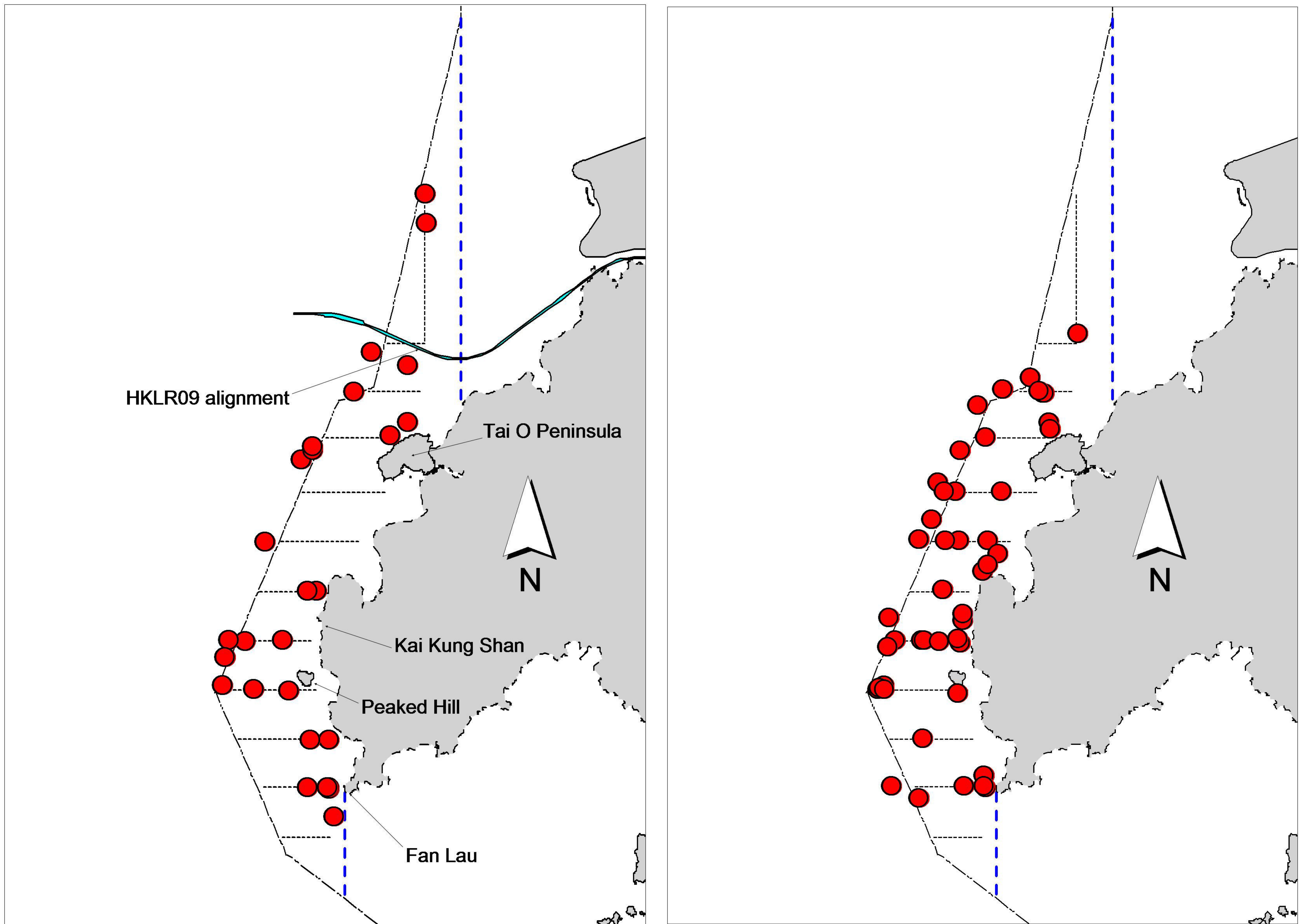


Figure 1. Distribution of Chinese white dolphin sightings in West Lantau during HKLR09 impact phase (left: June – August 2015) and baseline monitoring surveys (right: September – November 2011)

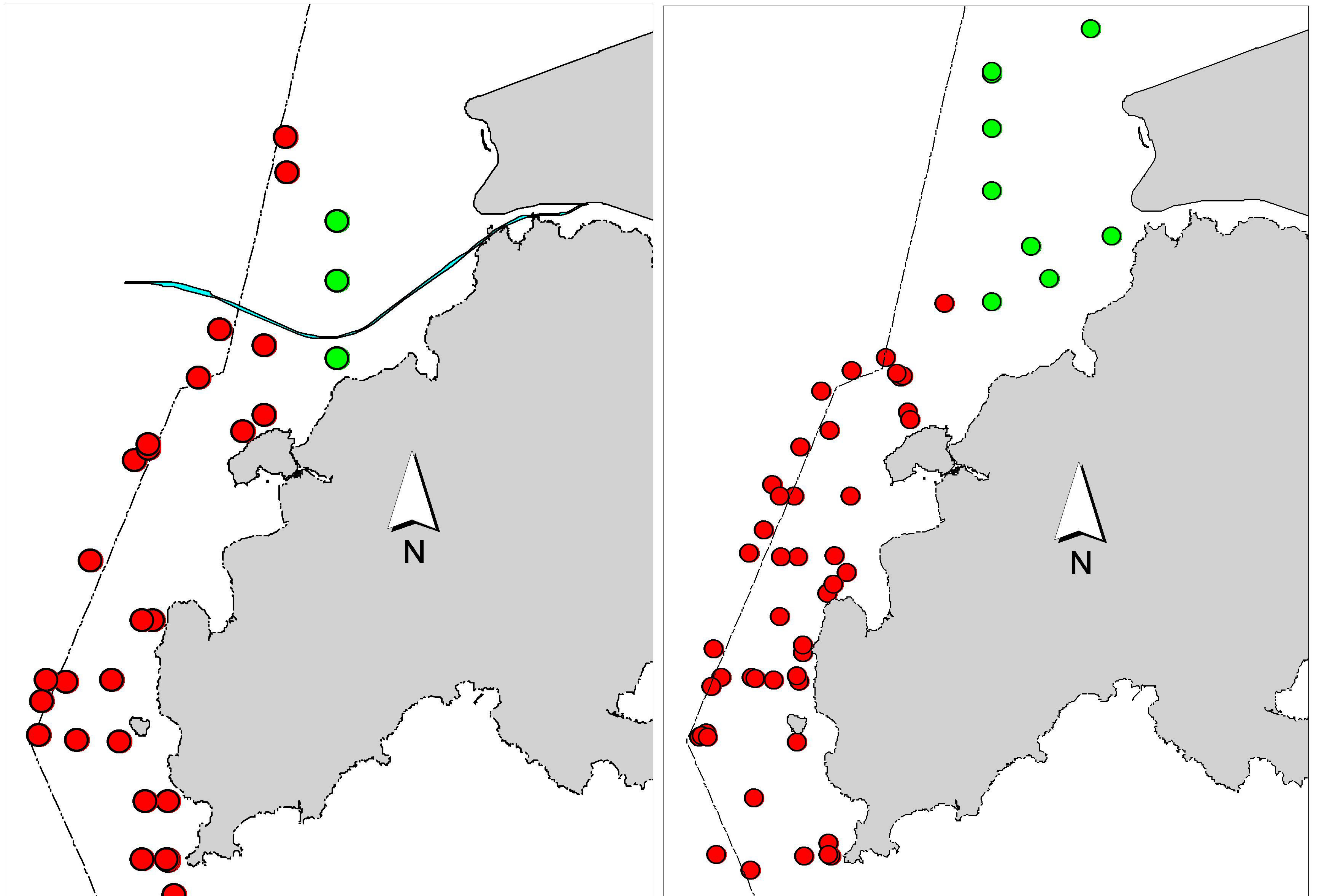


Figure 2. Distribution of Chinese white dolphin sightings from HKLR03 (in green) and HKLR09 surveys (in red) near the HKLR09 alignment during impact phase (left: June – August 2015) and baseline monitoring surveys (right: September – November 2011)

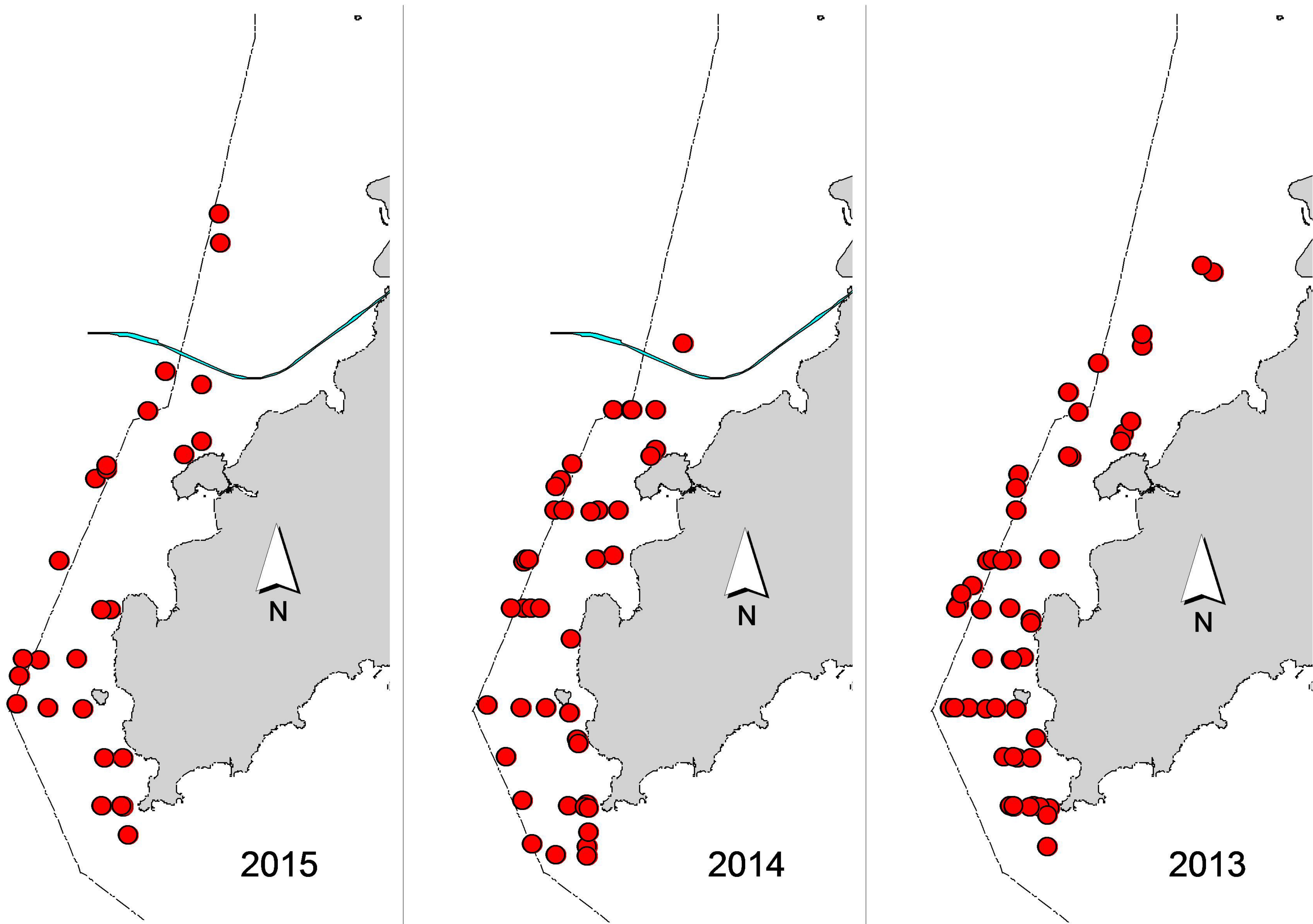


Figure 3. Comparisons on distribution of Chinese white dolphin sightings in West Lantau in the summer months (June – August) of 2013, 2014 and 2015 during HKLR09 impact phase

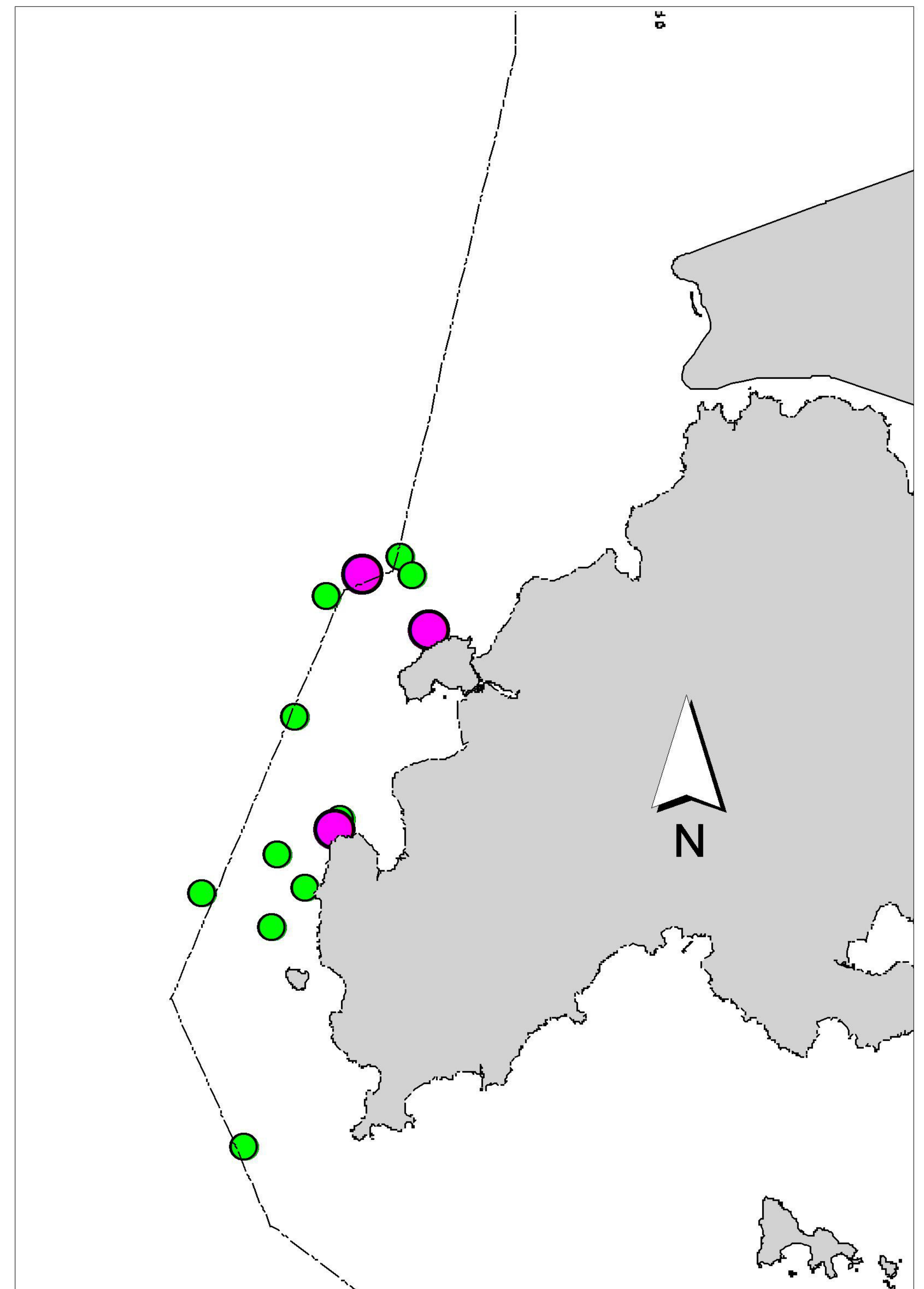
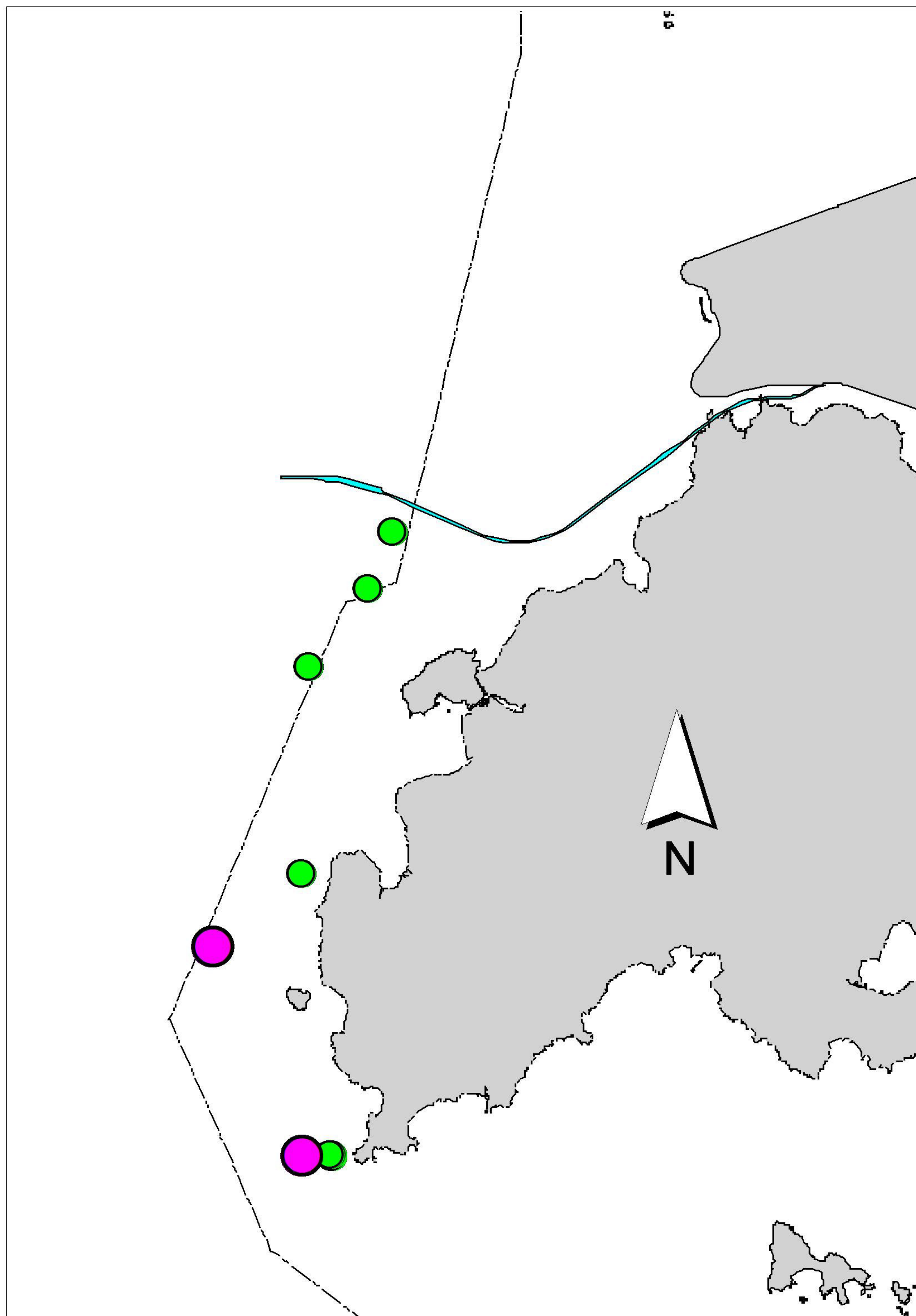


Figure 4. Distribution of Chinese white dolphins with larger group sizes during HKLR09 impact phase (left: June – August 2015) and baseline monitoring surveys (right: September – November 2011) (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

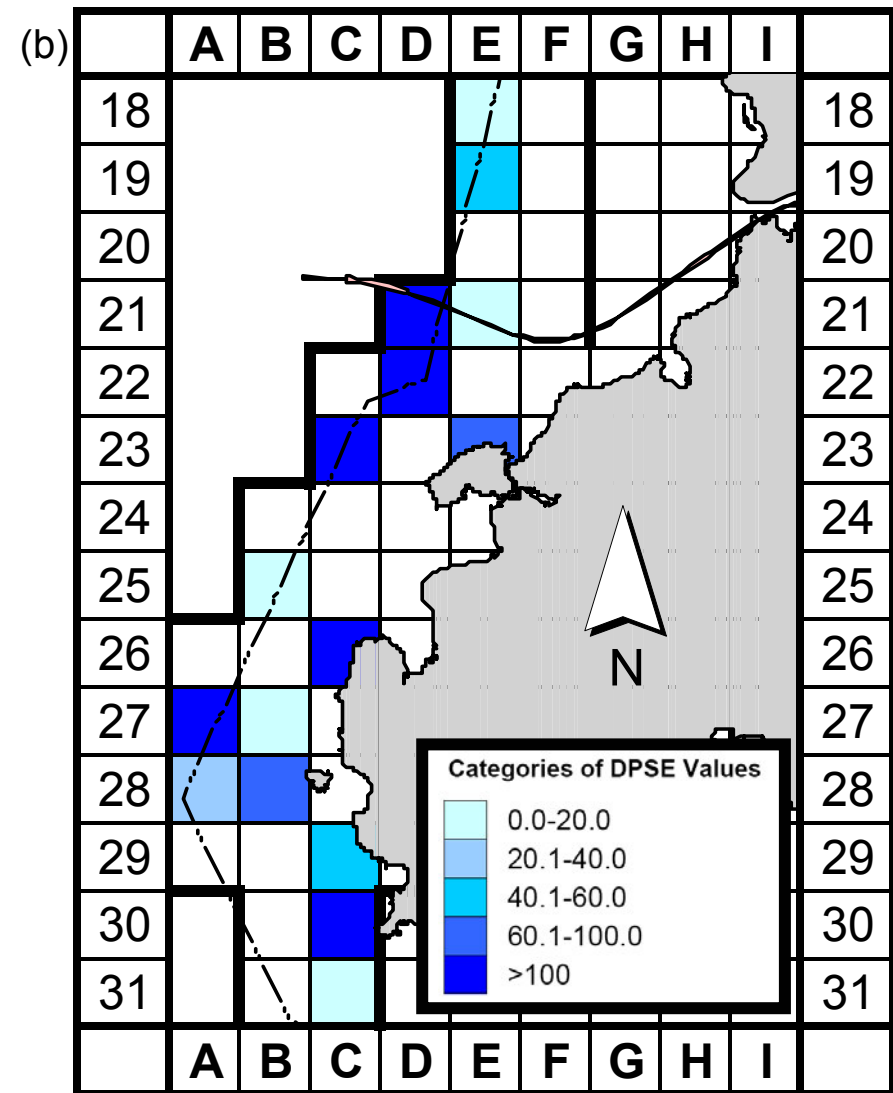
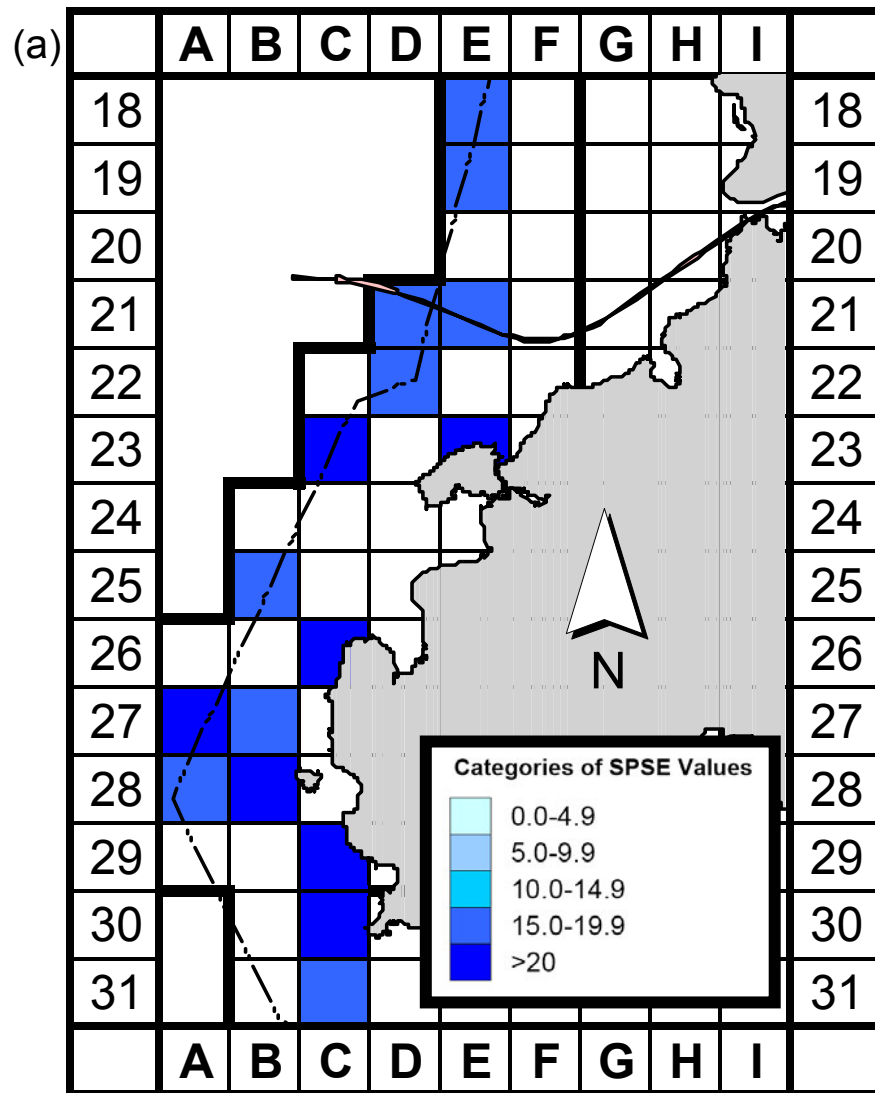


Figure 5a. Sighting density of Chinese white dolphins with corrected survey effort per km² in West Lantau survey area, using data collected during HKLR09 impact monitoring period (Jun-Aug 15) (SPSE = no. of on-effort sightings per 100 units of survey effort)

Figure 5b. Density of Chinese white dolphins with corrected survey effort per km² in West Lantau survey area, using data collected during HKLR09 impact monitoring period (Jun-Aug 15) (DPSE = no. of dolphins per 100 units of survey effort)

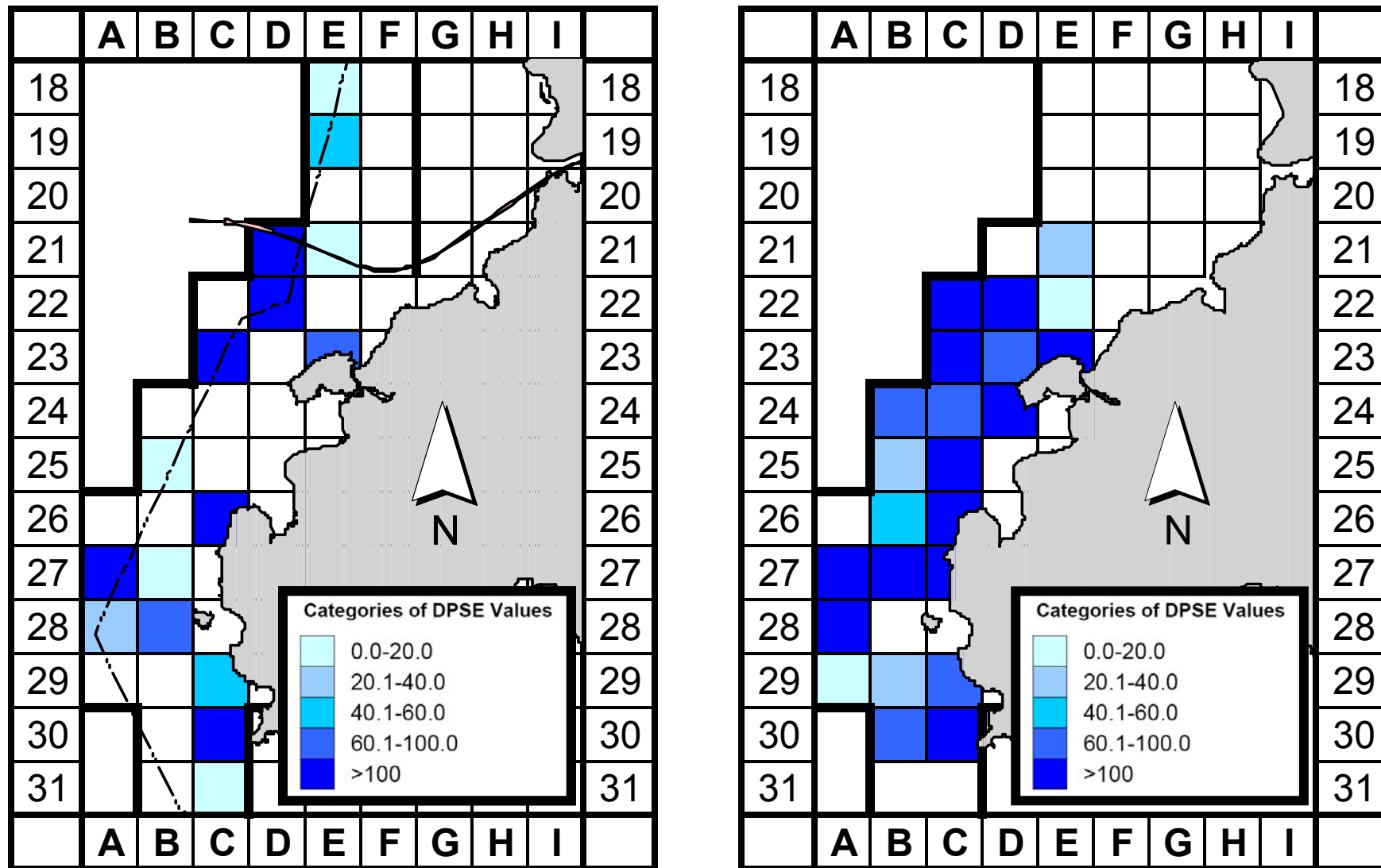


Figure 6. Comparison of density of Chinese white dolphins with corrected survey effort per km² in West Lantau survey area between the impact monitoring period (June-August 2015; left) and baseline monitoring period (September-November 2011; right) (DPSE = no. of dolphins per 100 units of survey effort)

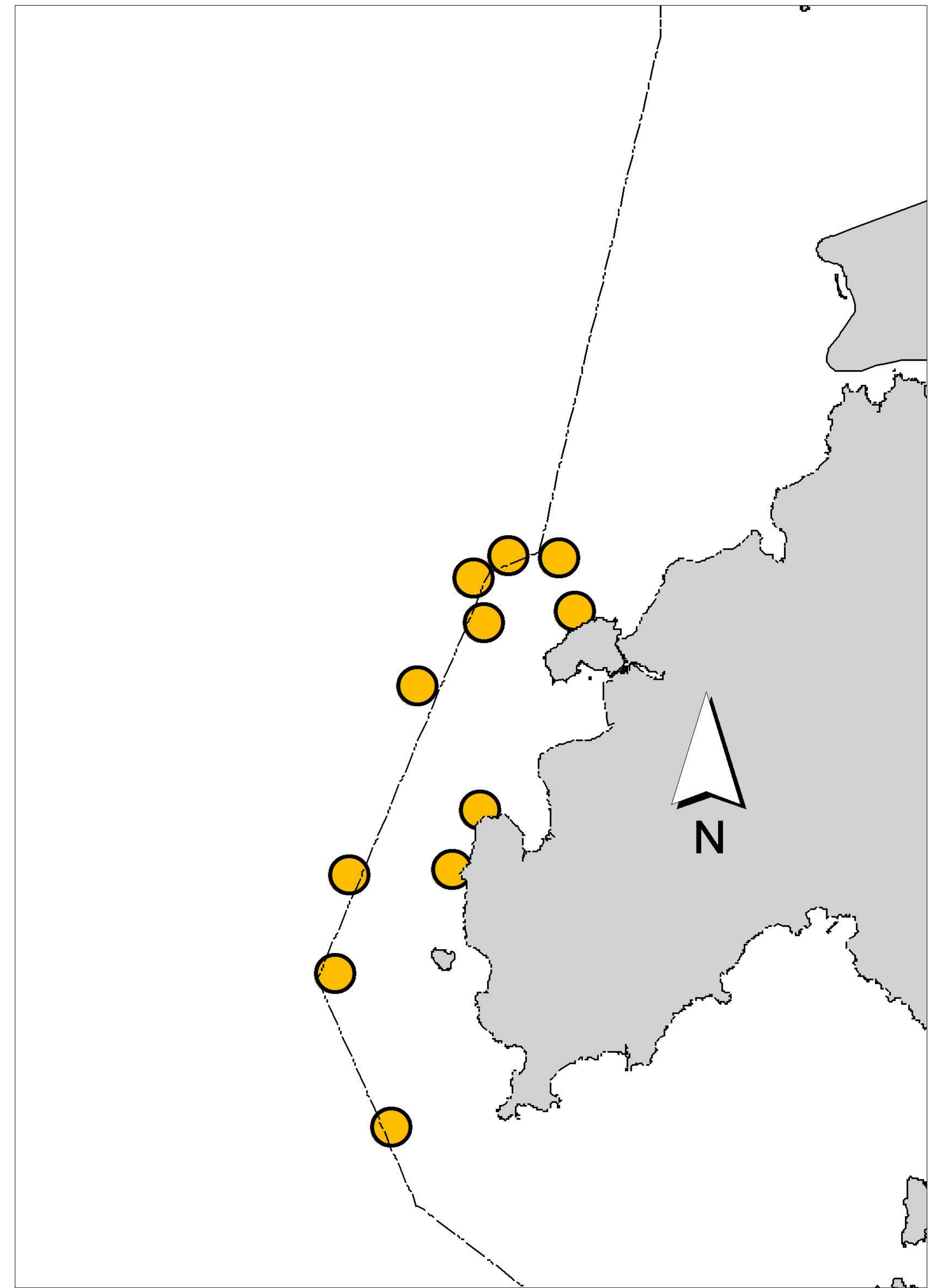
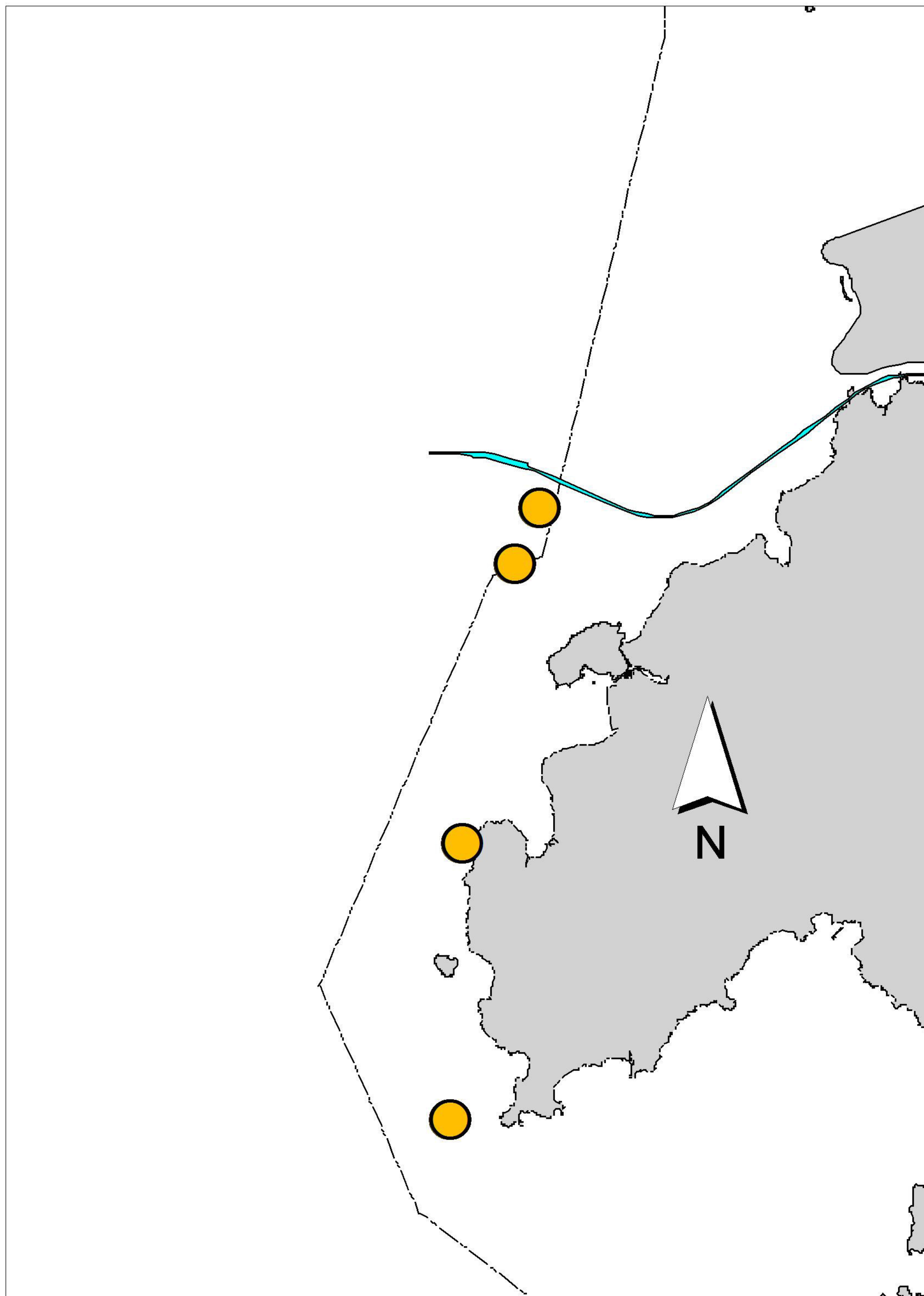


Figure 7. Distribution of young calves of Chinese white dolphins during HKLR09 impact phase (left: June – August 2015) and baseline monitoring surveys (right: September – November 2011)

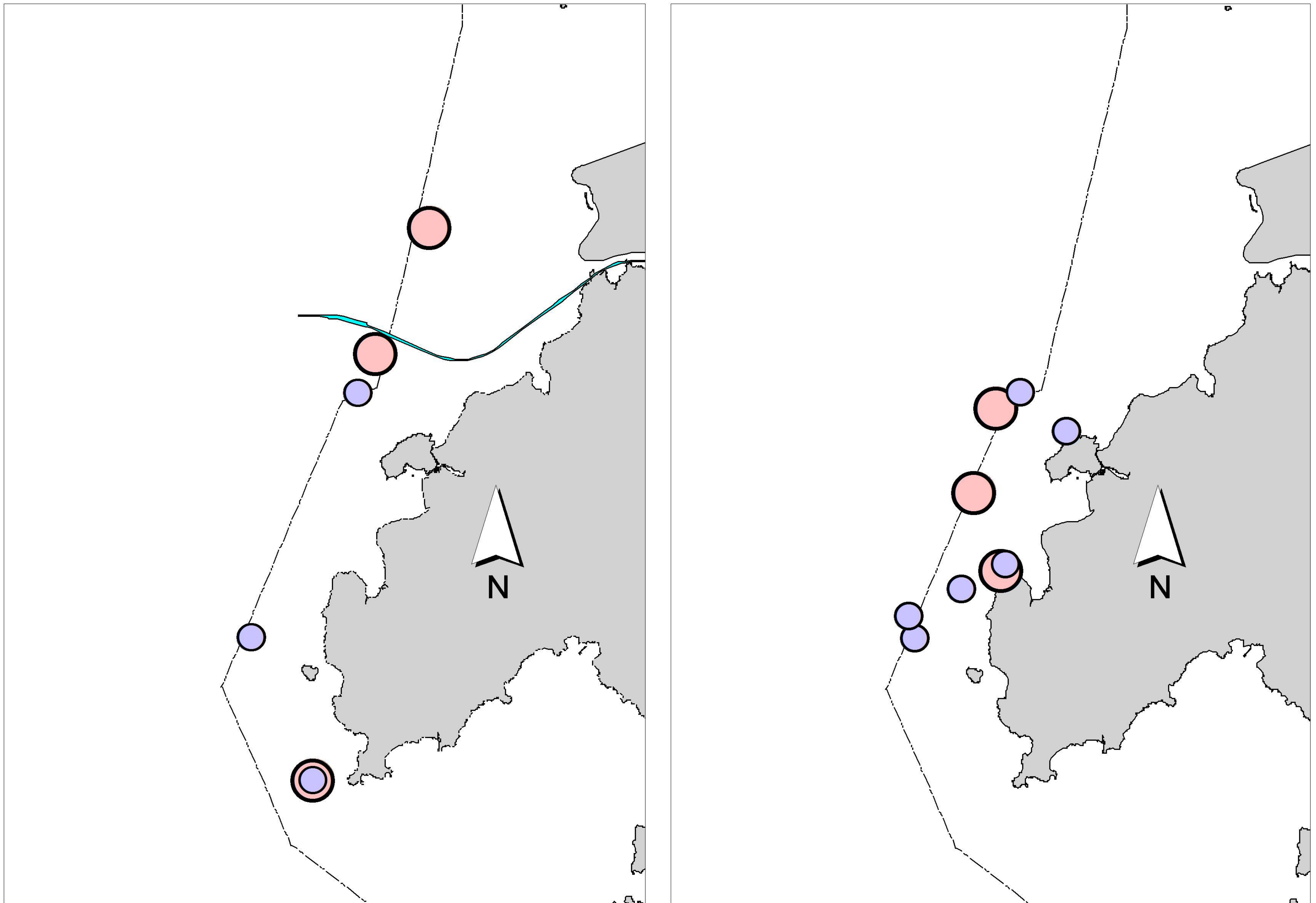


Figure 8. Distribution of dolphins engaged in feeding (in purple) and socializing (in pink) activities during HKLR09 impact phase (left: June – August 2015) and baseline monitoring surveys (right: September – November 2011)

Appendix I. HKLR09 Survey Effort Database (June-August 2015)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
9-Jun-15	W LANTAU	3	18.97	SUMMER	STANDARD31516	HKLR	P
9-Jun-15	W LANTAU	4	2.86	SUMMER	STANDARD31516	HKLR	P
9-Jun-15	W LANTAU	2	1.34	SUMMER	STANDARD31516	HKLR	S
9-Jun-15	W LANTAU	3	6.77	SUMMER	STANDARD31516	HKLR	S
9-Jun-15	W LANTAU	4	3.50	SUMMER	STANDARD31516	HKLR	S
18-Jun-15	W LANTAU	3	15.42	SUMMER	STANDARD31516	HKLR	P
18-Jun-15	W LANTAU	4	5.88	SUMMER	STANDARD31516	HKLR	P
18-Jun-15	W LANTAU	5	0.96	SUMMER	STANDARD31516	HKLR	P
18-Jun-15	W LANTAU	3	6.78	SUMMER	STANDARD31516	HKLR	S
18-Jun-15	W LANTAU	4	4.17	SUMMER	STANDARD31516	HKLR	S
6-Jul-15	W LANTAU	2	10.13	SUMMER	STANDARD31516	HKLR	P
6-Jul-15	W LANTAU	3	12.70	SUMMER	STANDARD31516	HKLR	P
6-Jul-15	W LANTAU	4	0.50	SUMMER	STANDARD31516	HKLR	P
6-Jul-15	W LANTAU	2	7.16	SUMMER	STANDARD31516	HKLR	S
6-Jul-15	W LANTAU	3	2.63	SUMMER	STANDARD31516	HKLR	S
6-Jul-15	W LANTAU	4	1.60	SUMMER	STANDARD31516	HKLR	S
28-Jul-15	W LANTAU	2	2.12	SUMMER	STANDARD31516	HKLR	P
28-Jul-15	W LANTAU	3	20.60	SUMMER	STANDARD31516	HKLR	P
28-Jul-15	W LANTAU	4	0.23	SUMMER	STANDARD31516	HKLR	P
28-Jul-15	W LANTAU	2	2.63	SUMMER	STANDARD31516	HKLR	S
28-Jul-15	W LANTAU	3	5.68	SUMMER	STANDARD31516	HKLR	S
28-Jul-15	W LANTAU	4	1.88	SUMMER	STANDARD31516	HKLR	S
18-Aug-15	W LANTAU	2	2.75	SUMMER	STANDARD31516	HKLR	P
18-Aug-15	W LANTAU	3	16.75	SUMMER	STANDARD31516	HKLR	P
18-Aug-15	W LANTAU	4	1.32	SUMMER	STANDARD31516	HKLR	P
18-Aug-15	W LANTAU	3	9.86	SUMMER	STANDARD31516	HKLR	S
18-Aug-15	W LANTAU	4	1.10	SUMMER	STANDARD31516	HKLR	S
26-Aug-15	W LANTAU	2	13.95	SUMMER	STANDARD31516	HKLR	P
26-Aug-15	W LANTAU	3	6.11	SUMMER	STANDARD31516	HKLR	P
26-Aug-15	W LANTAU	4	2.51	SUMMER	STANDARD31516	HKLR	P
26-Aug-15	W LANTAU	2	8.05	SUMMER	STANDARD31516	HKLR	S
26-Aug-15	W LANTAU	3	1.74	SUMMER	STANDARD31516	HKLR	S
26-Aug-15	W LANTAU	4	1.12	SUMMER	STANDARD31516	HKLR	S

Appendix II. HKLR09 Chinese White Dolphin Sighting Database (June-August 2015)

(Abbreviations: 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 Line)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
9-Jun-15	1	1140	2	W LANTAU	3	72	ON	HKLR	810449	801414	SUMMER	NONE	P
9-Jun-15	2	1157	20	W LANTAU	3	466	ON	HKLR	809423	799885	SUMMER	NONE	P
9-Jun-15	3	1239	1	W LANTAU	3	4	ON	HKLR	809435	799535	SUMMER	NONE	P
9-Jun-15	4	1241	2	W LANTAU	3	19	ON	HKLR	809103	799441	SUMMER	NONE	S
9-Jun-15	5	1325	1	W LANTAU	4	84	ON	HKLR	805864	801795	SUMMER	NONE	S
18-Jun-15	1	1051	2	W LANTAU	3	56	ON	HKLR	813866	803390	SUMMER	NONE	S
18-Jun-15	2	1130	1	W LANTAU	4	271	ON	HKLR	811448	800313	SUMMER	NONE	P
18-Jun-15	3	1145	7	W LANTAU	4	171	ON	HKLR	810449	801238	SUMMER	NONE	P
18-Jun-15	4	1254	6	W LANTAU	3	424	ON	HKLR	806440	801673	SUMMER	NONE	P
6-Jul-15	1	1034	1	W LANTAU	2	325	ON	HKLR	815029	803372	SUMMER	NONE	P
6-Jul-15	2	1114	4	W LANTAU	2	132	ON	HKLR	813601	803008	SUMMER	NONE	P
6-Jul-15	3	1136	4	W LANTAU	3	298	ON	HKLR	813118	801100	SUMMER	NONE	S
6-Jul-15	4	1151	2	W LANTAU	2	ND	OFF	HKLR	813306	801338	SUMMER	NONE	
6-Jul-15	5	1320	12	W LANTAU	3	266	ON	HKLR	806463	801219	SUMMER	PURSE-SEINE	P
28-Jul-15	1	1045	9	W LANTAU	3	412	ON	HKLR	814478	802217	SUMMER	NONE	P
28-Jul-15	2	1129	6	W LANTAU	3	19	ON	HKLR	813384	801328	SUMMER	NONE	S
28-Jul-15	3	1232	2	W LANTAU	3	98	ON	HKLR	808437	800079	SUMMER	NONE	P
28-Jul-15	4	1245	4	W LANTAU	3	81	ON	HKLR	808413	800832	SUMMER	NONE	P
28-Jul-15	5	1326	6	W LANTAU	4	503	ON	HKLR	806451	801693	SUMMER	NONE	P
18-Aug-15	1	1038	1	W LANTAU	2	652	ON	HKLR	818483	803751	SUMMER	NONE	P
18-Aug-15	2	1046	3	W LANTAU	3	73	ON	HKLR	817908	803791	SUMMER	NONE	P
18-Aug-15	3	1240	2	W LANTAU	3	0	ON	HKLR	808538	799388	SUMMER	NONE	S
18-Aug-15	4	1257	1	W LANTAU	3	92	ON	HKLR	807425	801685	SUMMER	NONE	S
18-Aug-15	5	1303	2	W LANTAU	3	27	ON	HKLR	807426	801273	SUMMER	NONE	P
18-Aug-15	6	1334	6	W LANTAU	3	122	ON	HKLR	806451	801662	SUMMER	NONE	P
26-Aug-15	1	1034	8	W LANTAU	2	717	ON	HKLR	815275	802600	SUMMER	NONE	S
26-Aug-15	2	1222	1	W LANTAU	3	19	ON	HKLR	809432	800679	SUMMER	NONE	P

Appendix III. Individual dolphins identified during HKLR09 monitoring surveys in June-August 2015

ID#	DATE	STG#	AREA
CH12	18/06/15	4	W LANTAU
CH113	18/06/15	1	W LANTAU
NL98	09/06/15	2	W LANTAU
NL120	09/06/15	2	W LANTAU
	28/07/15	5	W LANTAU
	18/08/15	6	W LANTAU
NL136	28/07/15	3	W LANTAU
NL145	26/08/15	1	W LANTAU
NL150	09/06/15	2	W LANTAU
	28/07/15	1	W LANTAU
	28/07/15	2	W LANTAU
NL165	26/08/15	1	W LANTAU
NL188	06/07/15	5	W LANTAU
NL210	09/06/15	2	W LANTAU
NL224	18/06/15	3	W LANTAU
	26/08/15	1	W LANTAU
NL242	09/06/15	2	W LANTAU
NL247	09/06/15	2	W LANTAU
	18/06/15	3	W LANTAU
NL256	28/07/15	2	W LANTAU
NL260	09/06/15	2	W LANTAU
NL261	09/06/15	2	W LANTAU
NL262	09/06/15	2	W LANTAU
NL264	26/08/15	1	W LANTAU
NL279	06/07/15	2	W LANTAU
NL280	28/07/15	1	W LANTAU
NL284	09/06/15	2	W LANTAU
NL288	26/08/15	1	W LANTAU
NL293	18/06/15	3	W LANTAU
NL295	09/06/15	2	W LANTAU
NL296	09/06/15	2	W LANTAU
NL299	18/06/15	3	W LANTAU
NL300	28/07/15	1	W LANTAU
	28/07/15	2	W LANTAU
NL302	28/07/15	1	W LANTAU
NL307	28/07/15	1	W LANTAU
NL311	09/06/15	2	W LANTAU
	28/07/15	5	W LANTAU
NL312	26/08/15	1	W LANTAU
SL51	18/08/15	5	W LANTAU
	18/08/15	6	W LANTAU

ID#	DATE	STG#	AREA
SL54	06/07/15	5	W LANTAU
SL55	06/07/15	5	W LANTAU
WL05	26/08/15	1	W LANTAU
WL11	09/06/15	2	W LANTAU
WL28	26/08/15	1	W LANTAU
WL42	18/08/15	6	W LANTAU
WL44	18/06/15	4	W LANTAU
WL46	18/06/15	3	W LANTAU
WL50	09/06/15	2	W LANTAU
WL79	18/08/15	2	W LANTAU
WL94	06/07/15	5	W LANTAU
WL118	06/07/15	5	W LANTAU
WL124	09/06/15	1	W LANTAU
WL130	06/07/15	5	W LANTAU
WL165	18/06/15	4	W LANTAU
WL166	28/07/15	5	W LANTAU
WL186	06/07/15	5	W LANTAU
WL189	06/07/15	2	W LANTAU
WL208	28/07/15	4	W LANTAU
	28/07/15	5	W LANTAU
WL214	09/06/15	2	W LANTAU
	18/06/15	3	W LANTAU
	28/07/15	4	W LANTAU
WL216	28/07/15	4	W LANTAU
WL217	09/06/15	2	W LANTAU
	18/06/15	1	W LANTAU
WL225	18/06/15	4	W LANTAU
WL228	06/07/15	3	W LANTAU
WL231	28/07/15	1	W LANTAU
WL232	06/07/15	5	W LANTAU
WL234	18/08/15	5	W LANTAU
WL236	18/06/15	4	W LANTAU
WL241	06/07/15	5	W LANTAU
WL243	06/07/15	5	W LANTAU
WL253	06/07/15	5	W LANTAU
WL254	18/08/15	6	W LANTAU

Appendix IV. Sixty-four individual dolphins that were identified during June to August 2015 under HKLR09 impact phase monitoring surveys



Appendix IV. (cont'd)

NL136



NL145



NL150



NL165



Appendix IV. (cont'd)

NL188



NL210



NL224



NL242



Appendix IV. (cont'd)

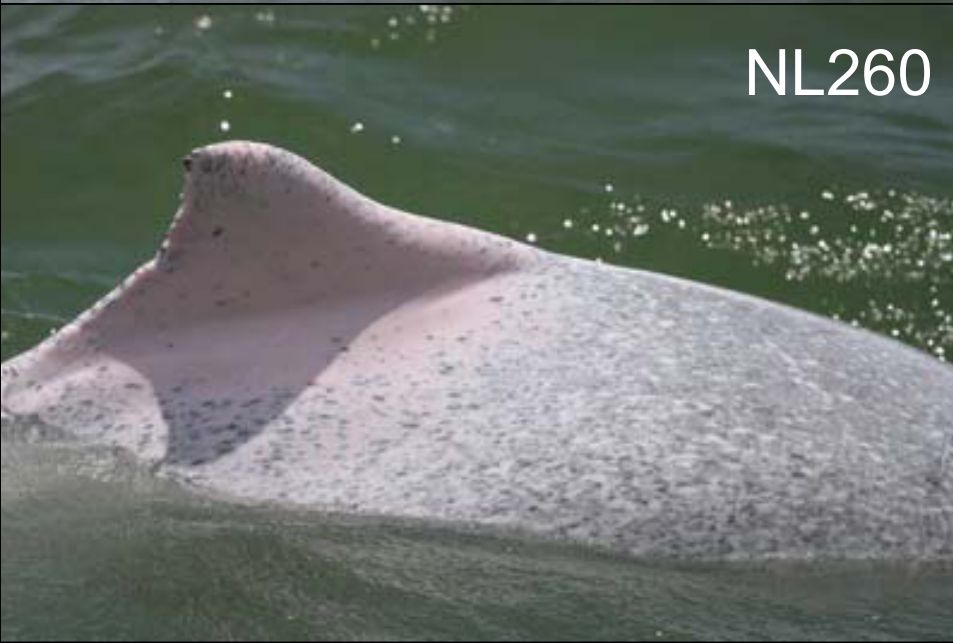
NL247



NL256



NL260



NL261



Appendix IV. (cont'd)



Appendix IV. (cont'd)

NL284



NL288



NL293



NL295



Appendix IV. (cont'd)

NL296



NL299



NL300



NL302



Appendix IV. (cont'd)

NL307



NL311



NL312



SL51



Appendix IV. (cont'd)



Appendix IV. (cont'd)

WL28



WL42



WL44



WL46



Appendix IV. (cont'd)

WL50



WL79



WL94



WL118



Appendix IV. (cont'd)



Appendix IV. (cont'd)

WL186



WL189



WL208



WL214



Appendix IV. (cont'd)



Appendix IV. (cont'd)

WL231



WL232



WL234



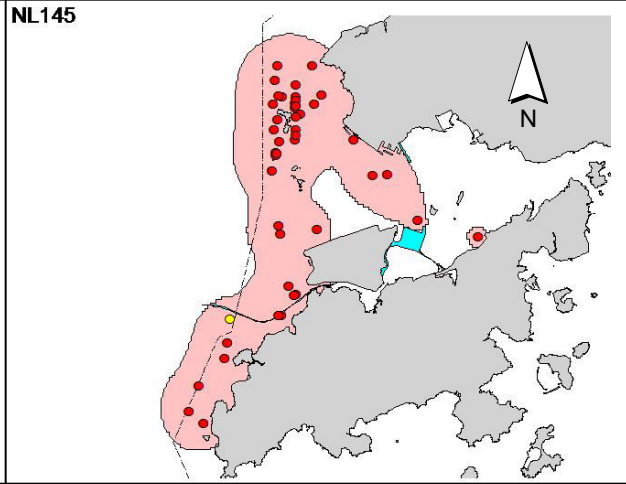
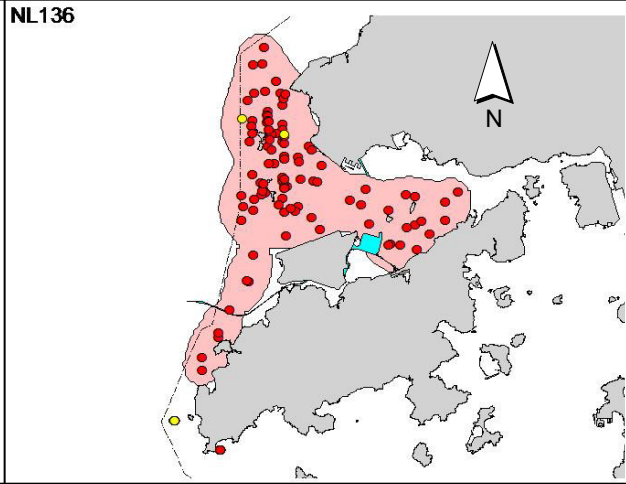
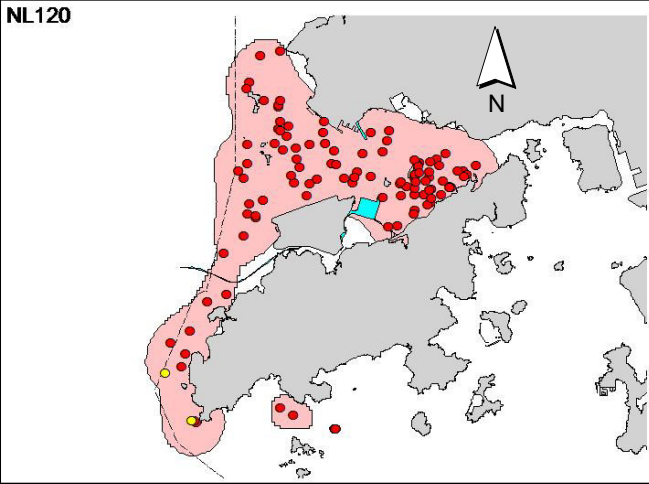
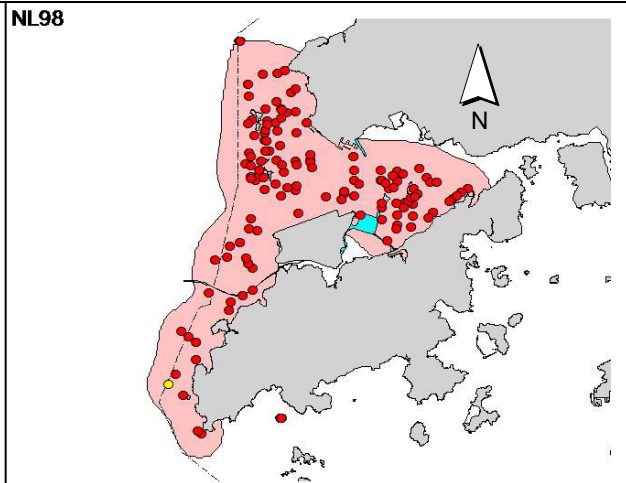
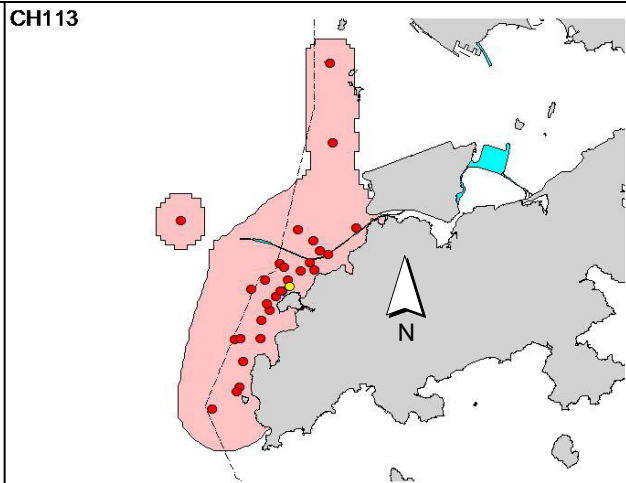
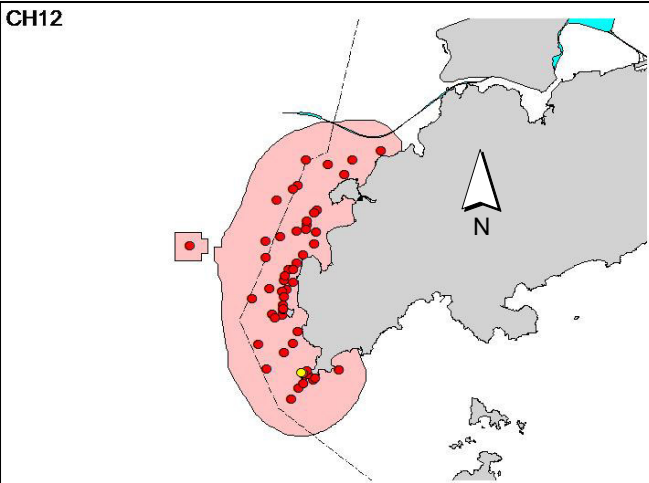
WL236



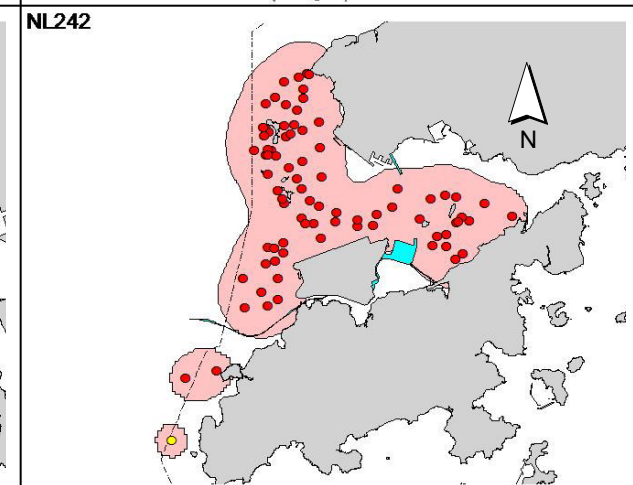
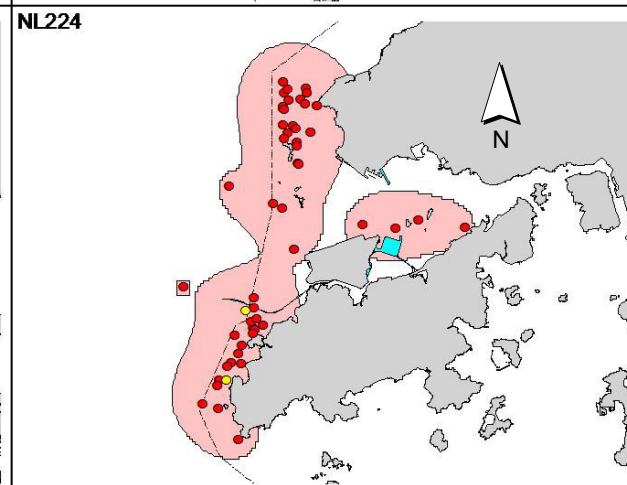
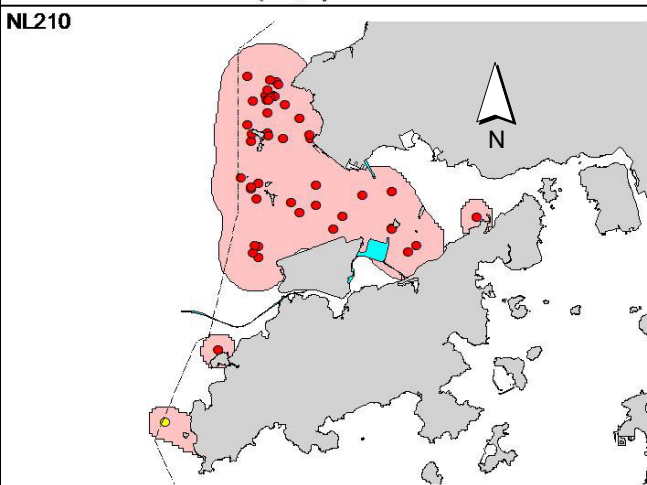
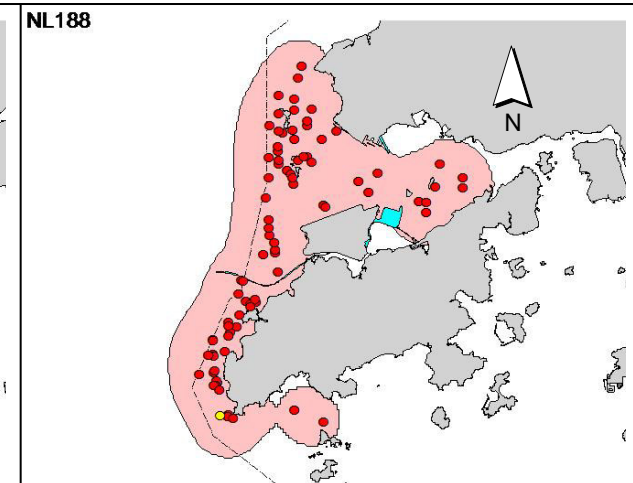
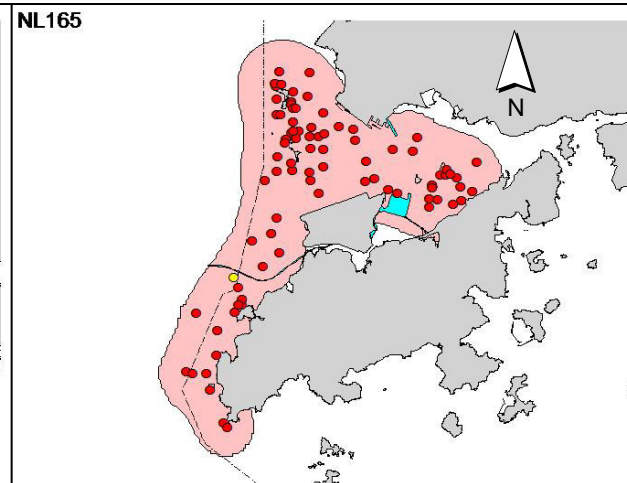
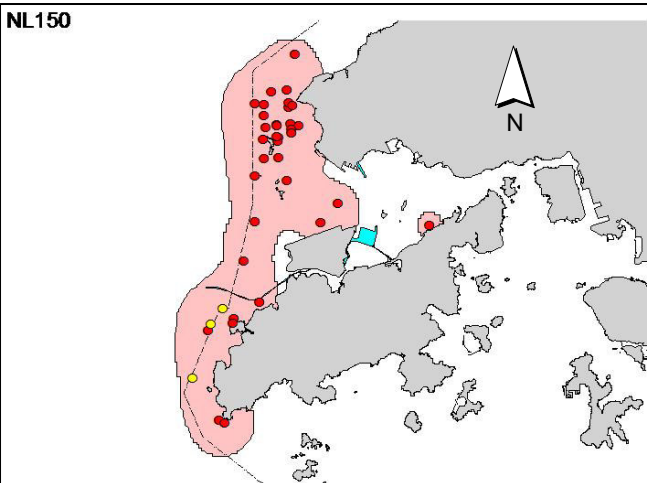
Appendix IV. (cont'd)



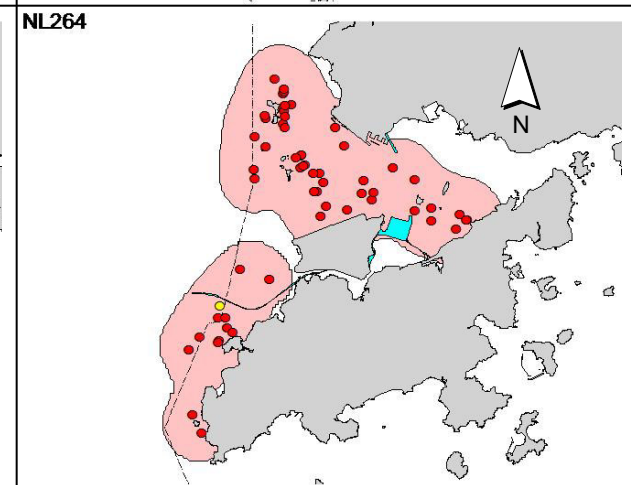
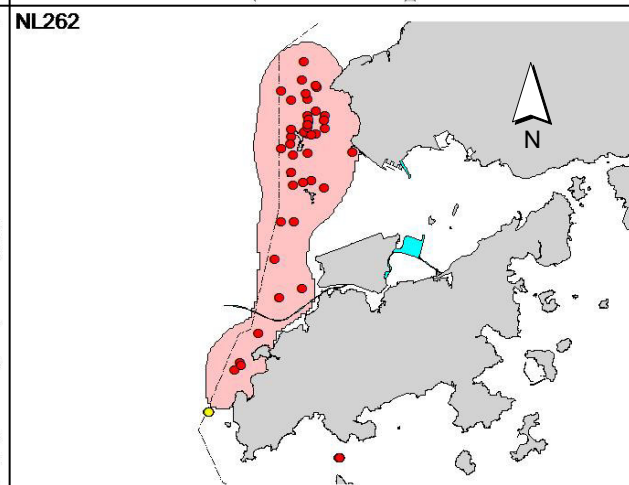
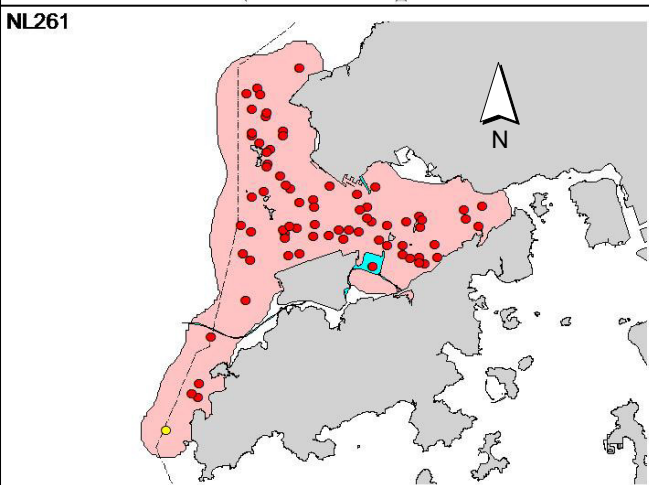
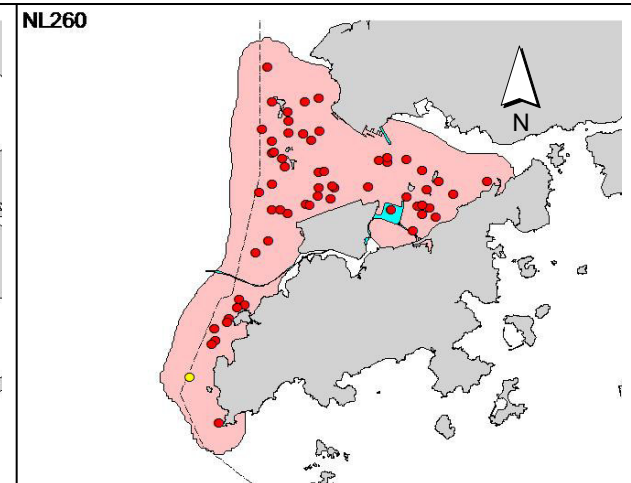
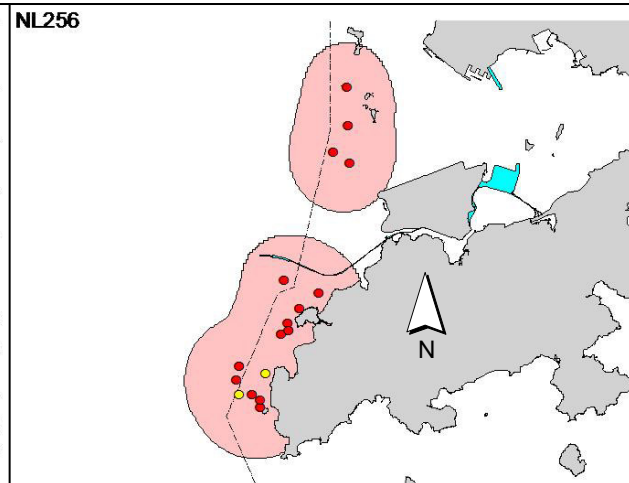
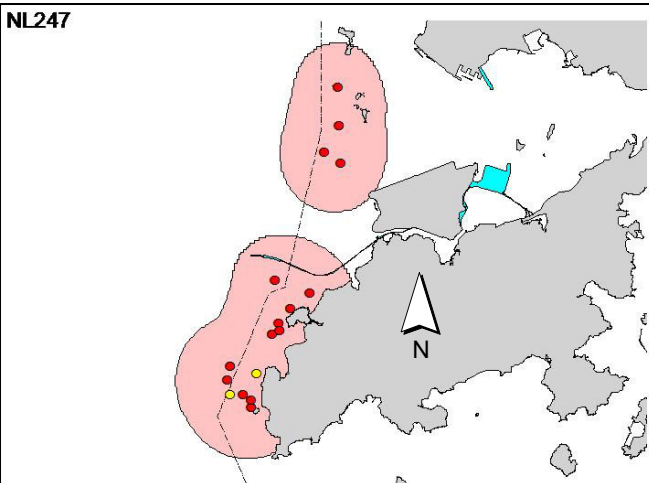
Appendix V. Ranging patterns (95% kernel ranges) of 64 individual dolphins that were sighted during HKLR09 impact phase monitoring period (note: yellow dots indicates sightings made in June – August 2015)



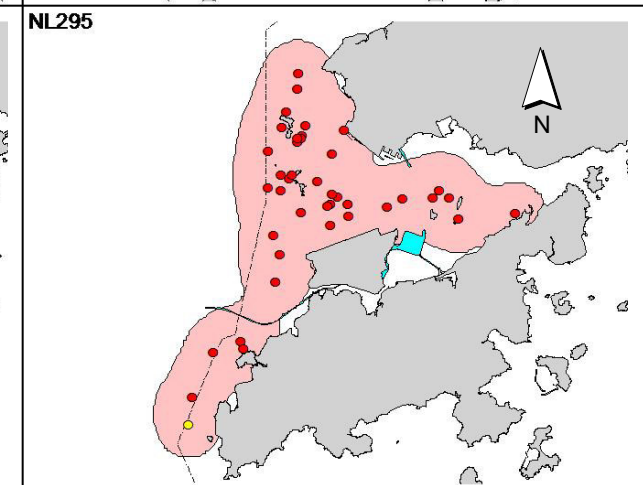
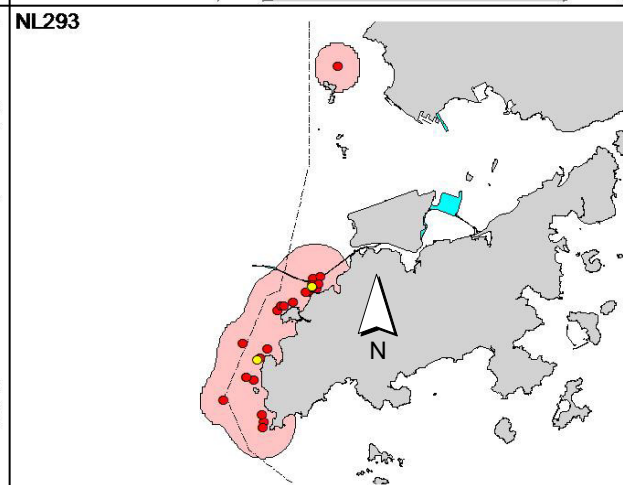
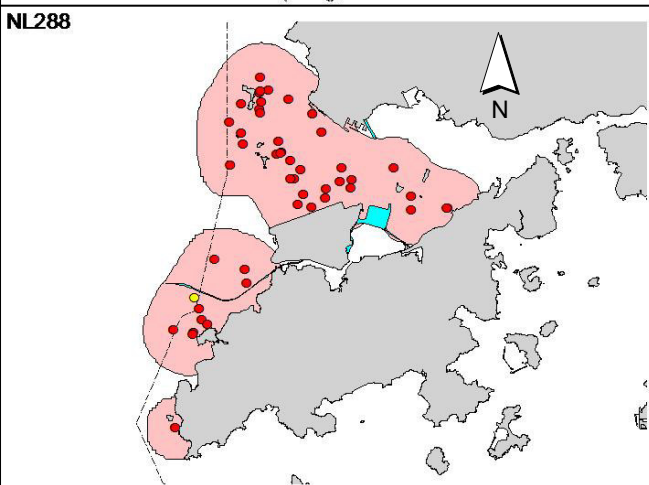
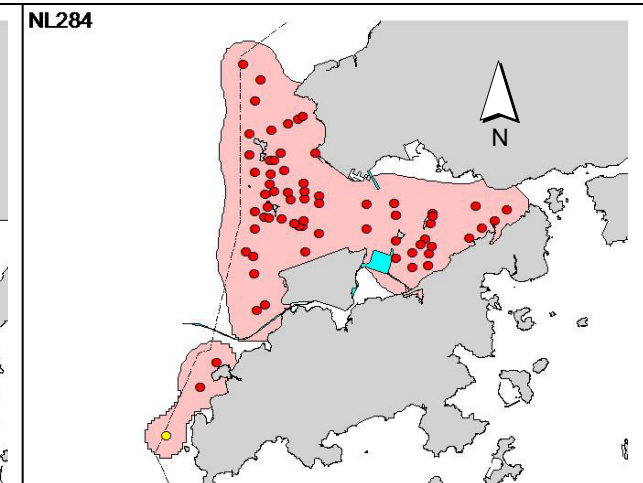
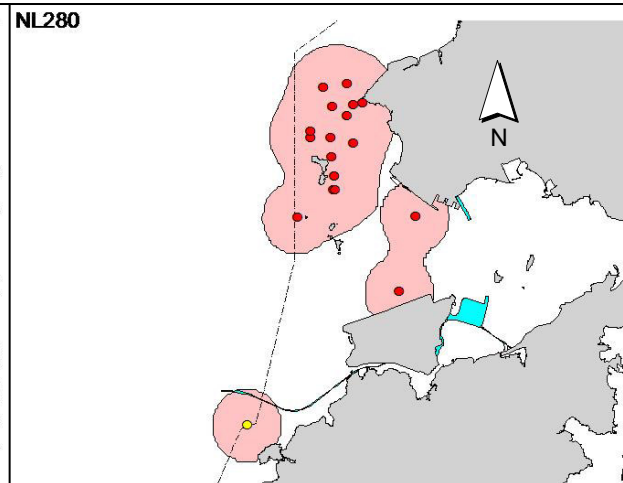
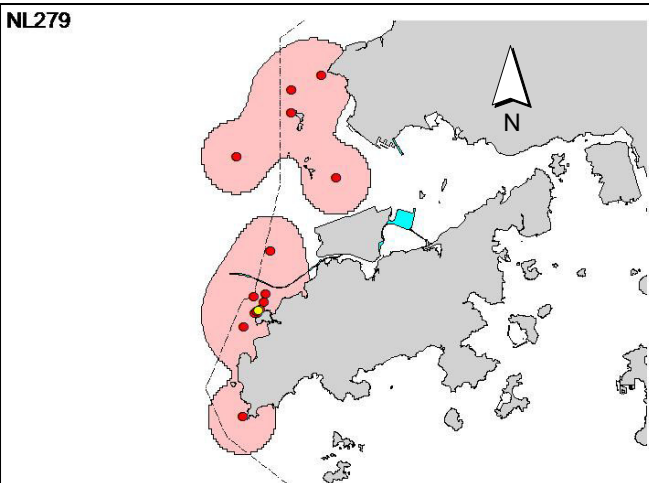
Appendix V. (cont'd)



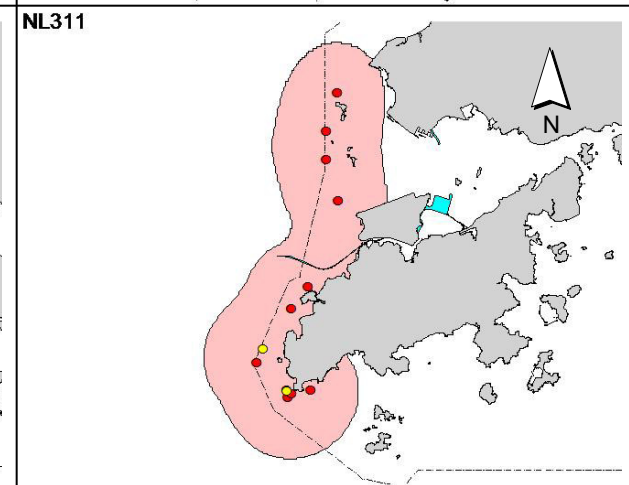
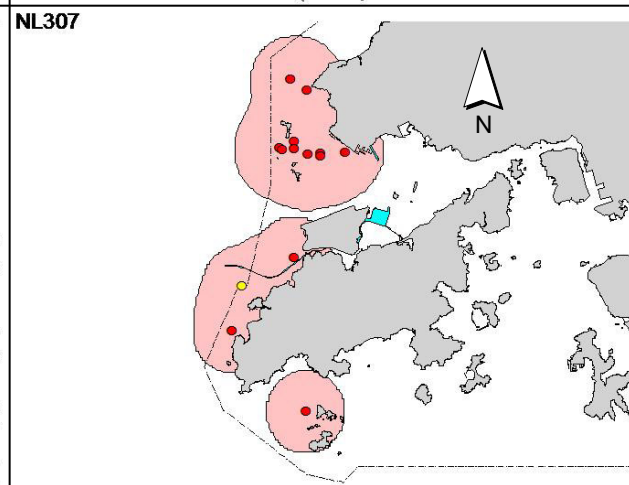
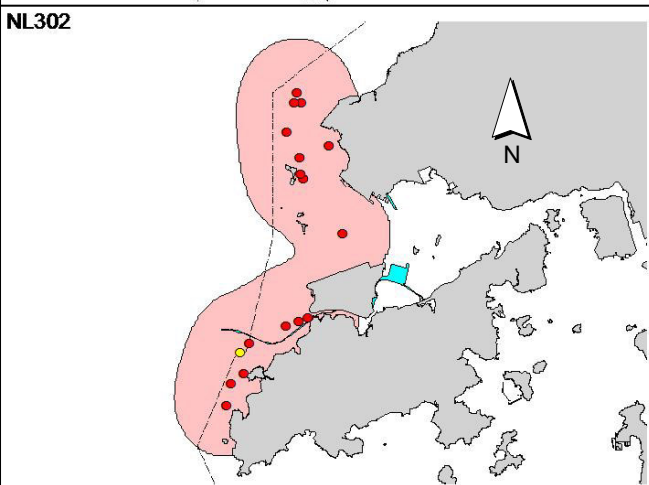
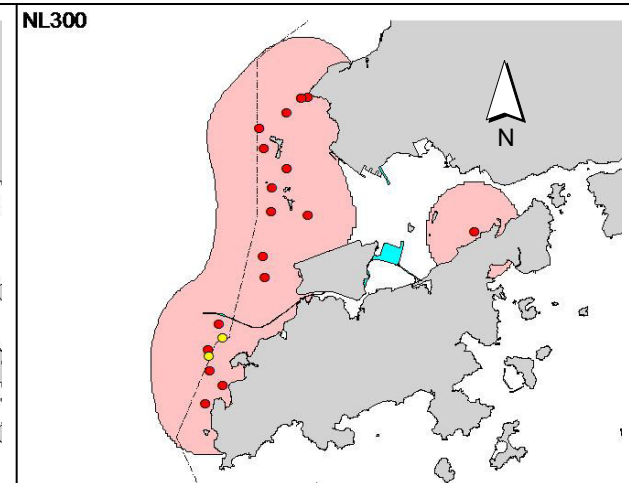
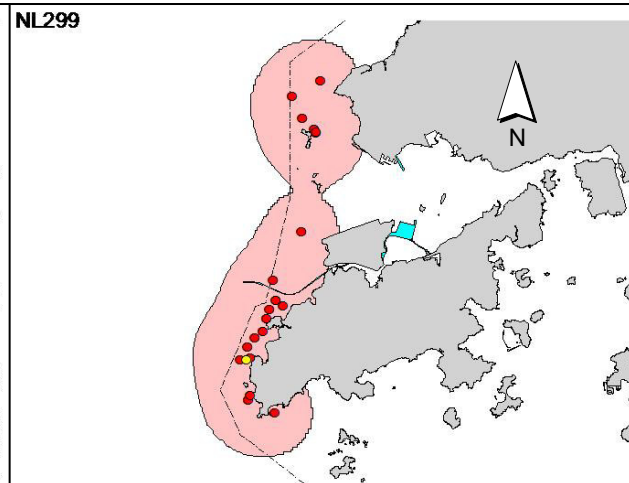
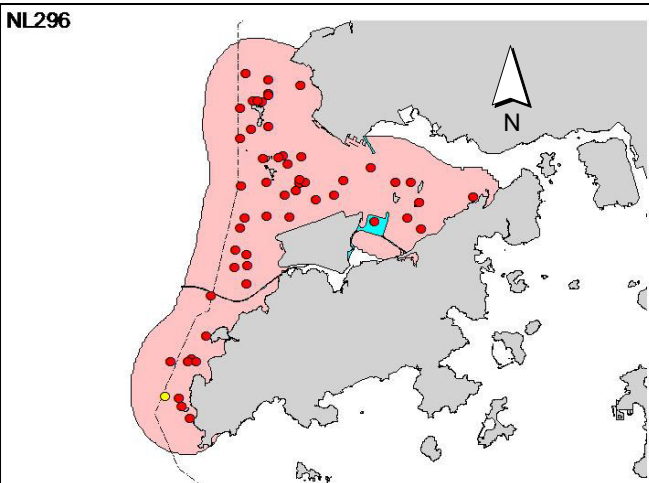
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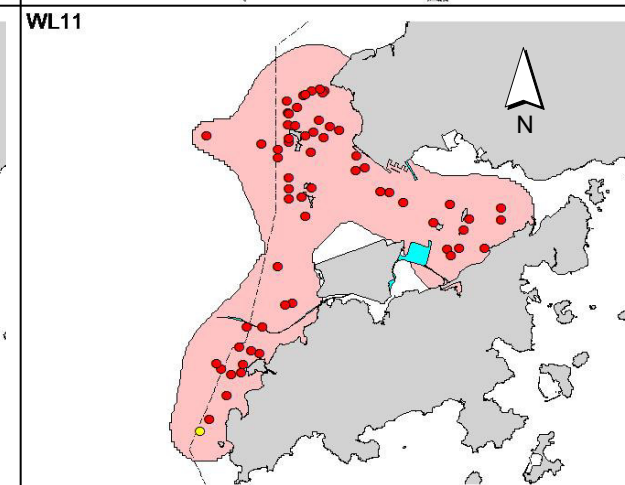
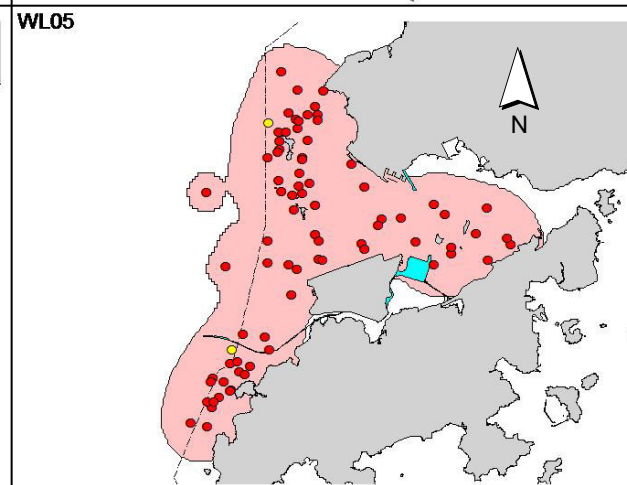
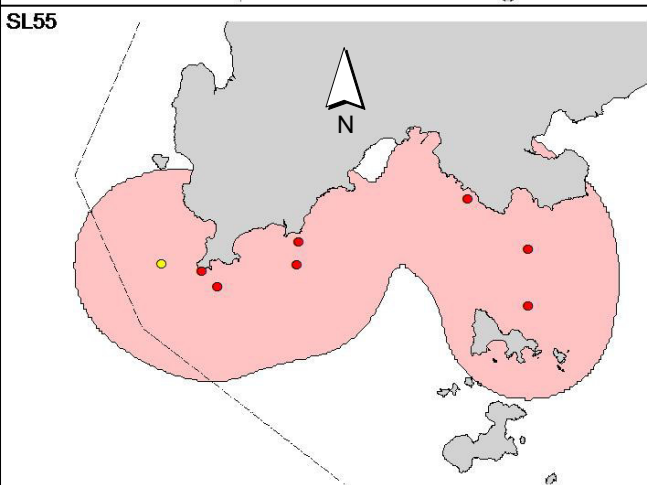
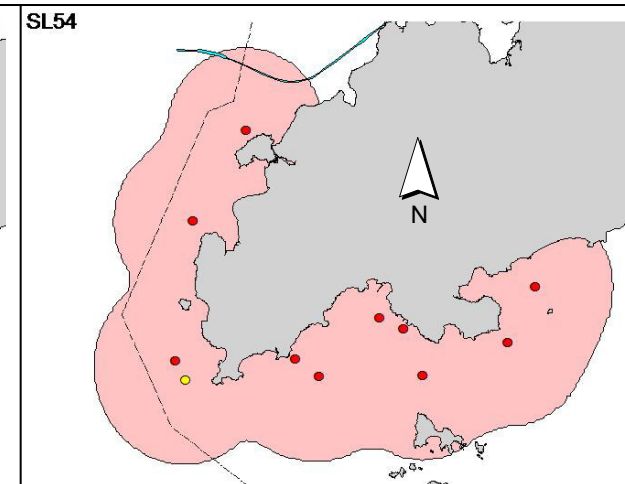
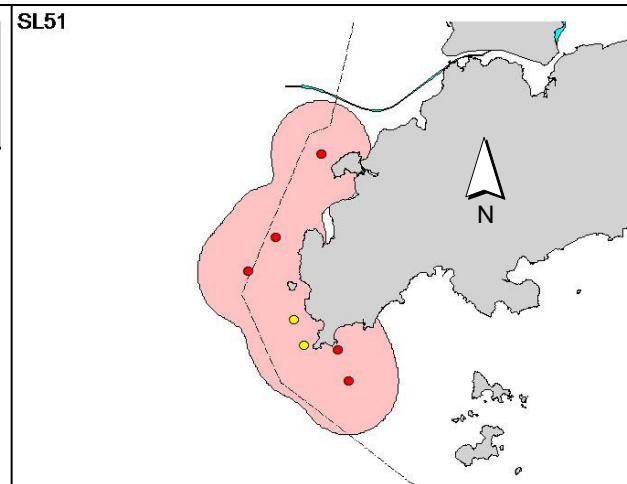
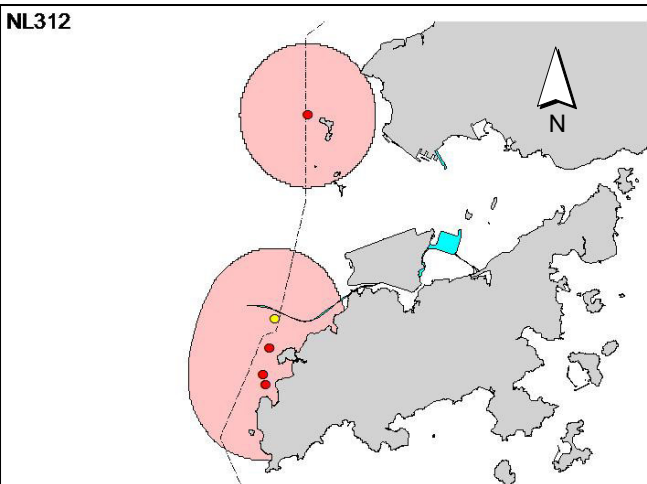
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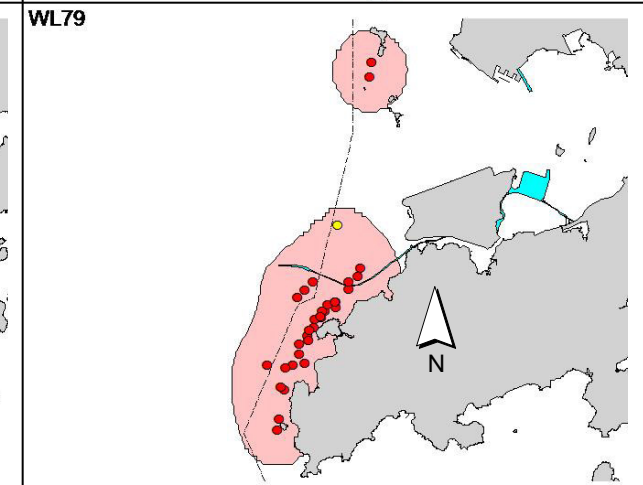
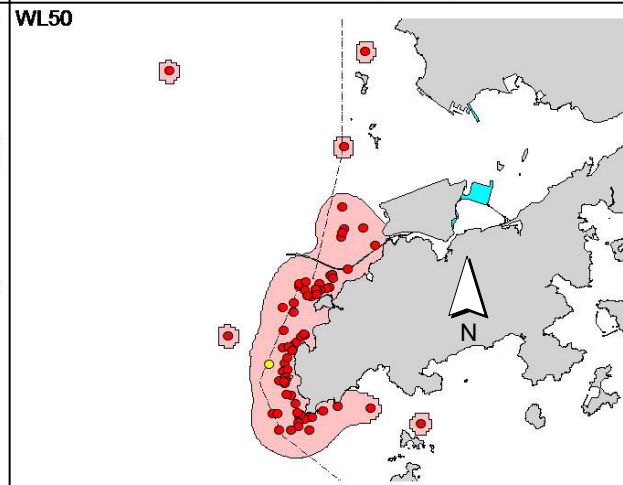
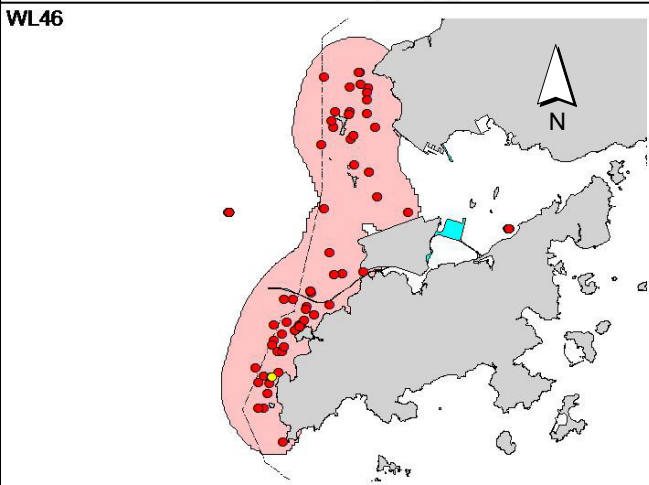
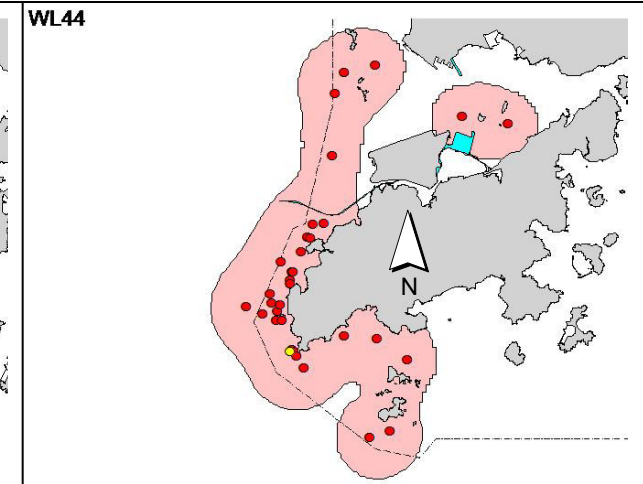
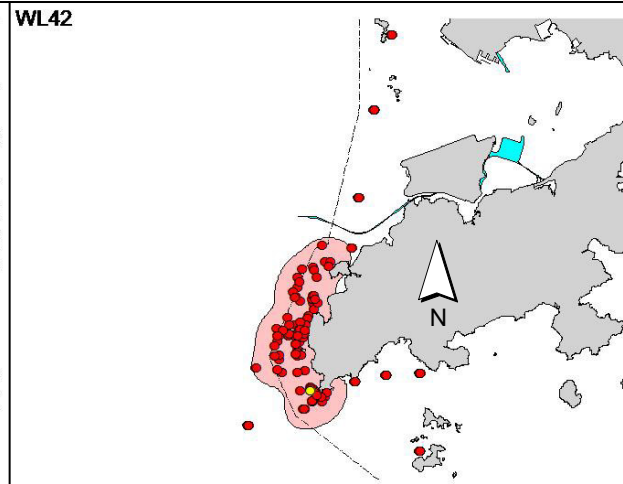
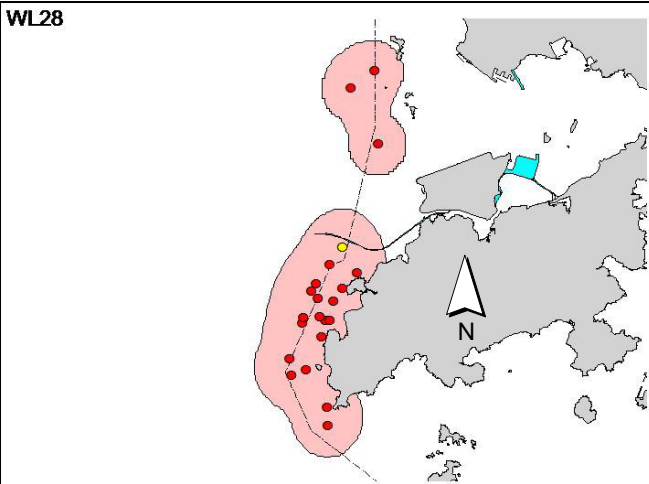
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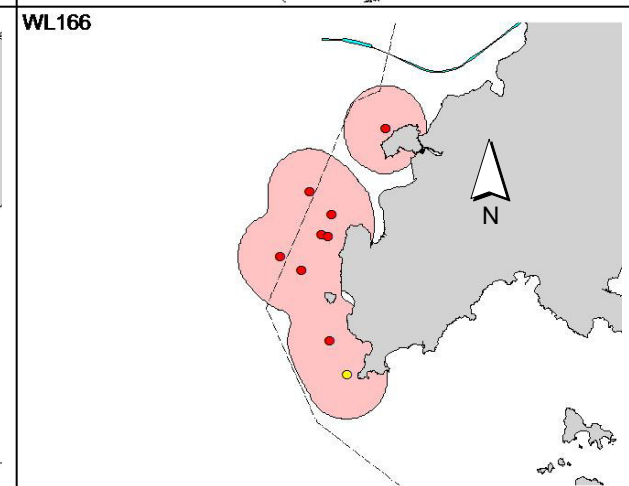
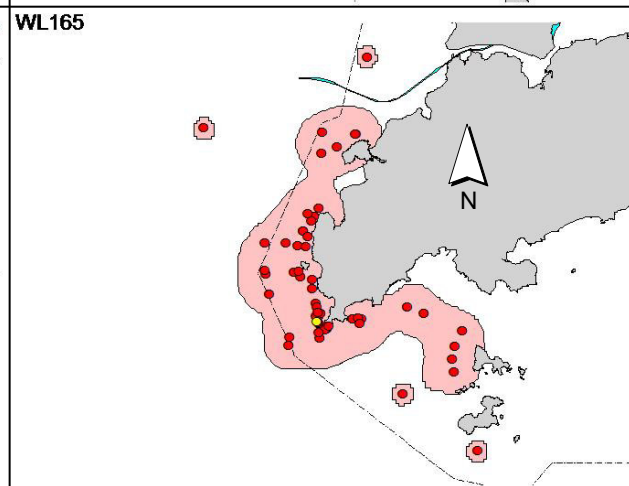
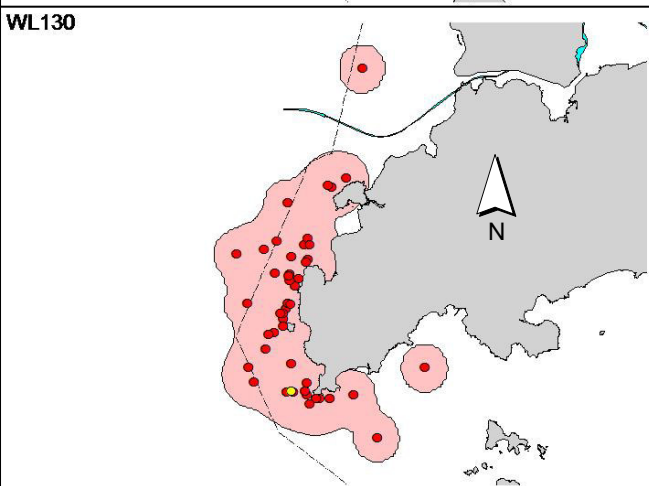
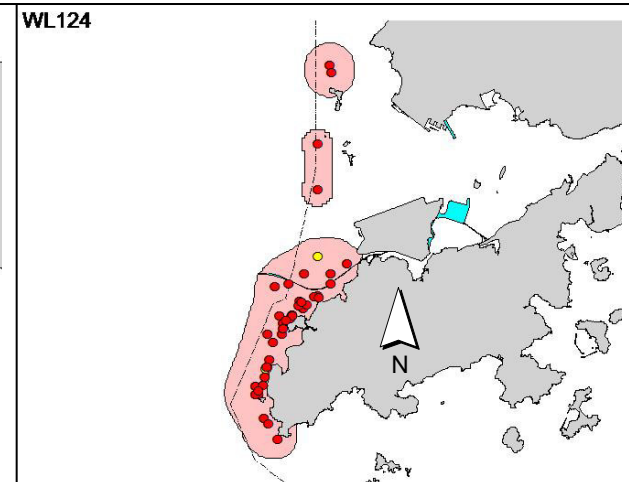
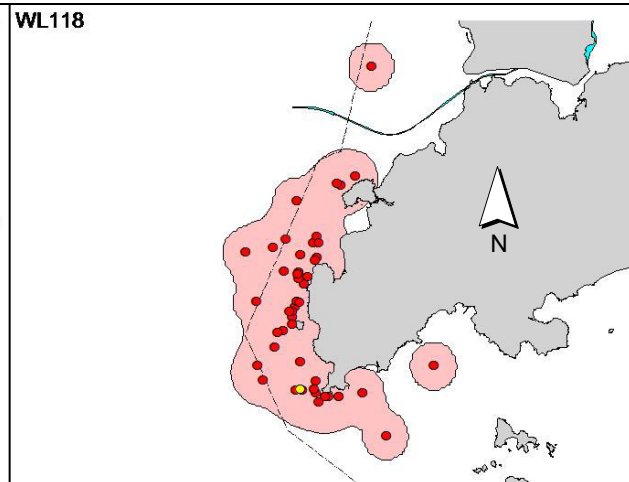
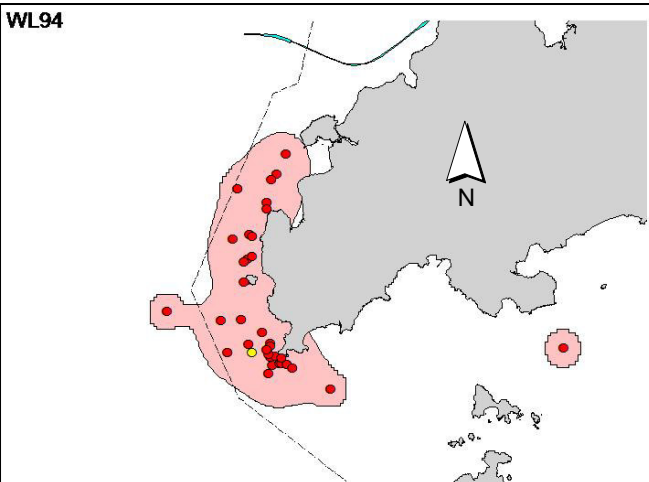
Appendix V. (cont'd)



Appendix V. (cont'd)

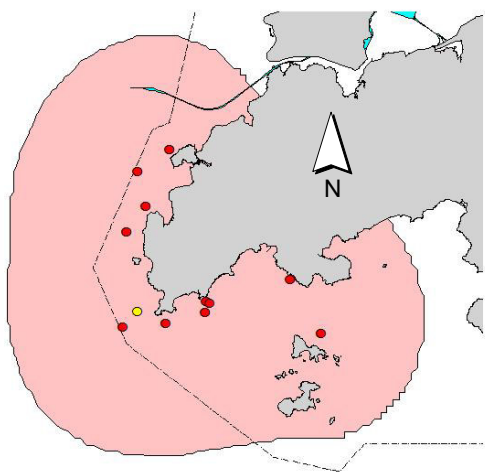


Appendix V. (cont'd)

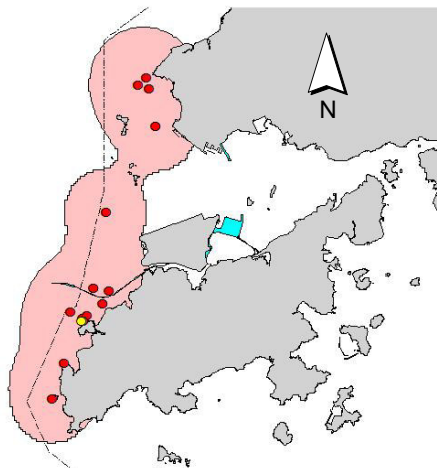


Appendix V. (cont'd)

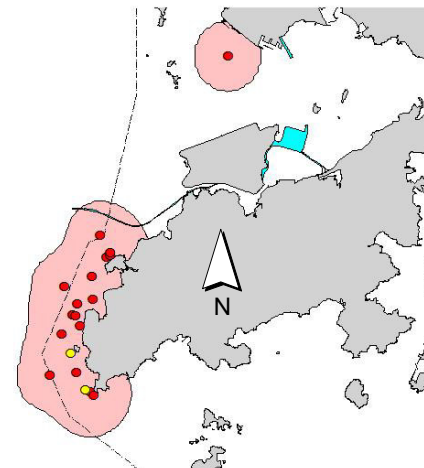
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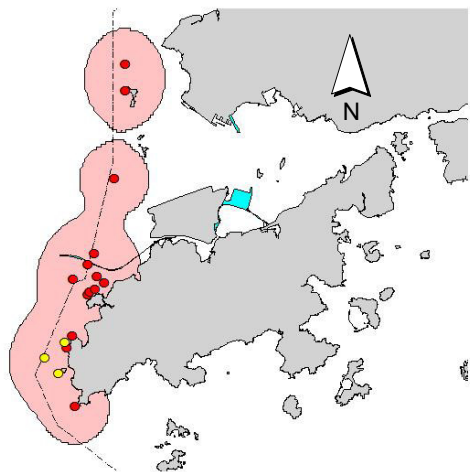
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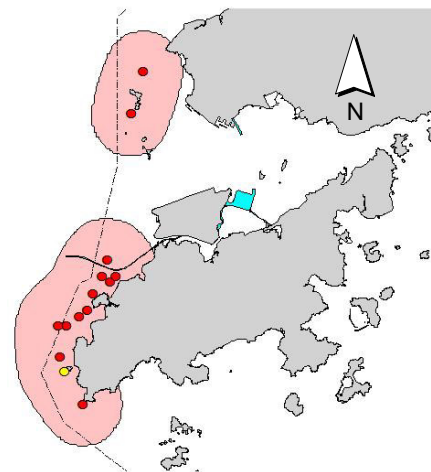
WL208



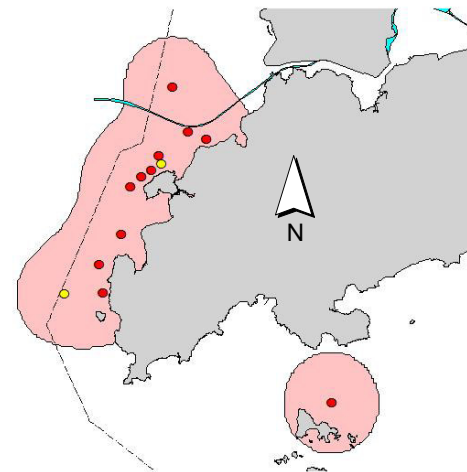
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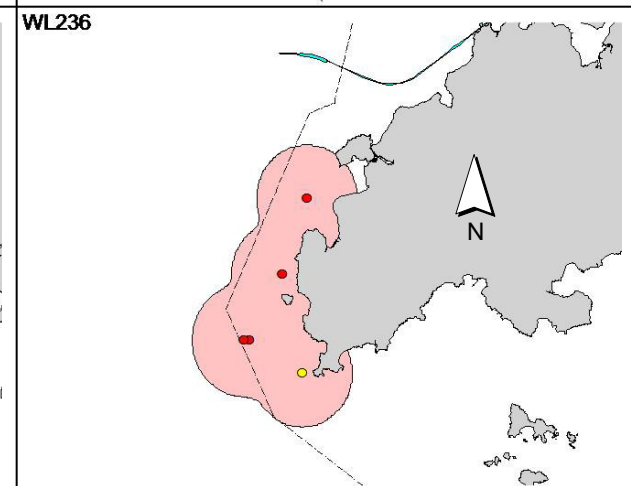
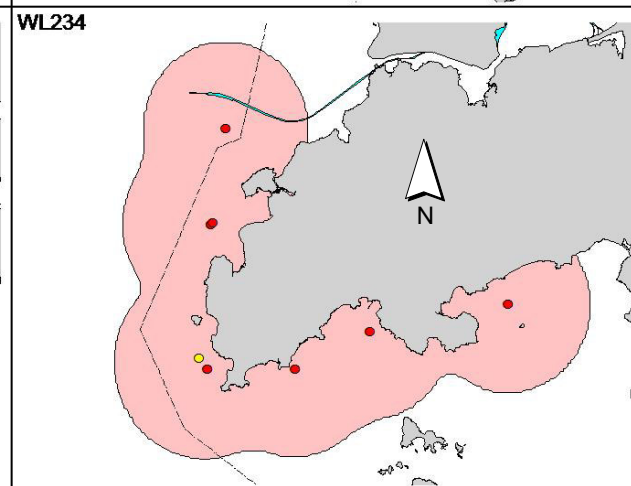
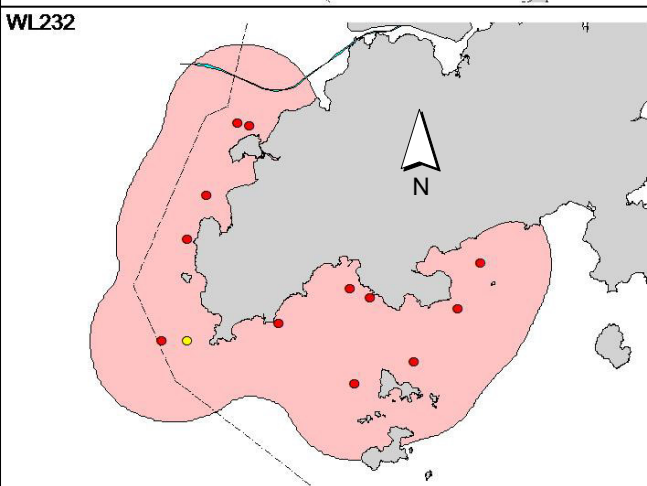
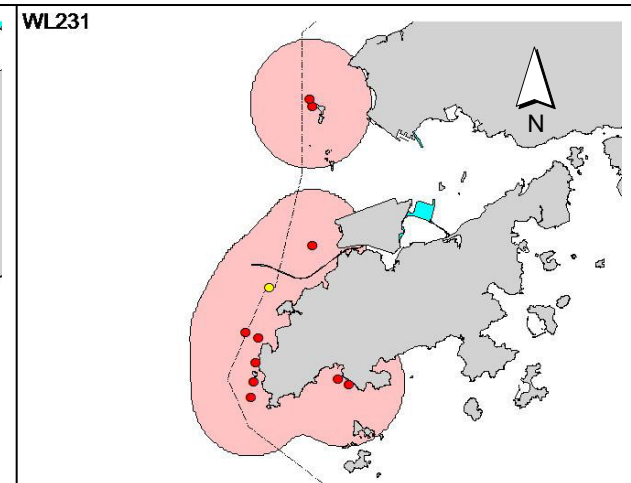
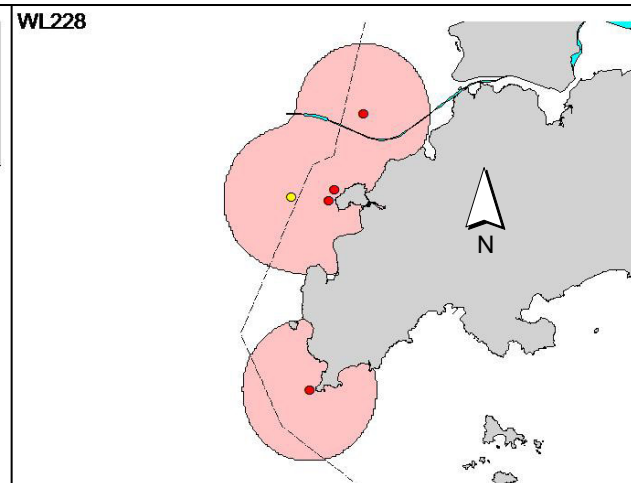
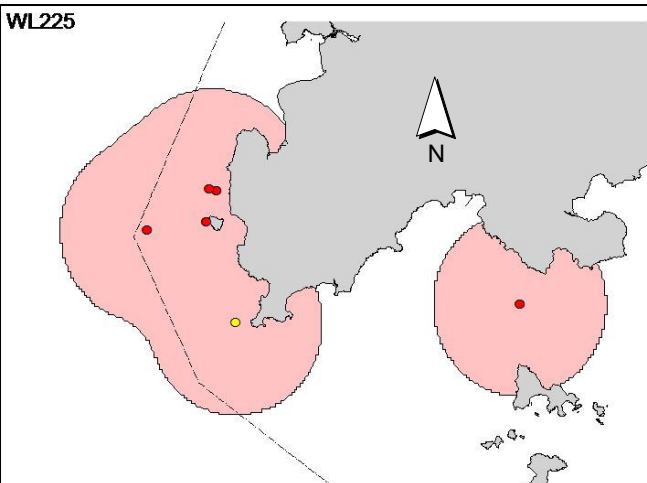
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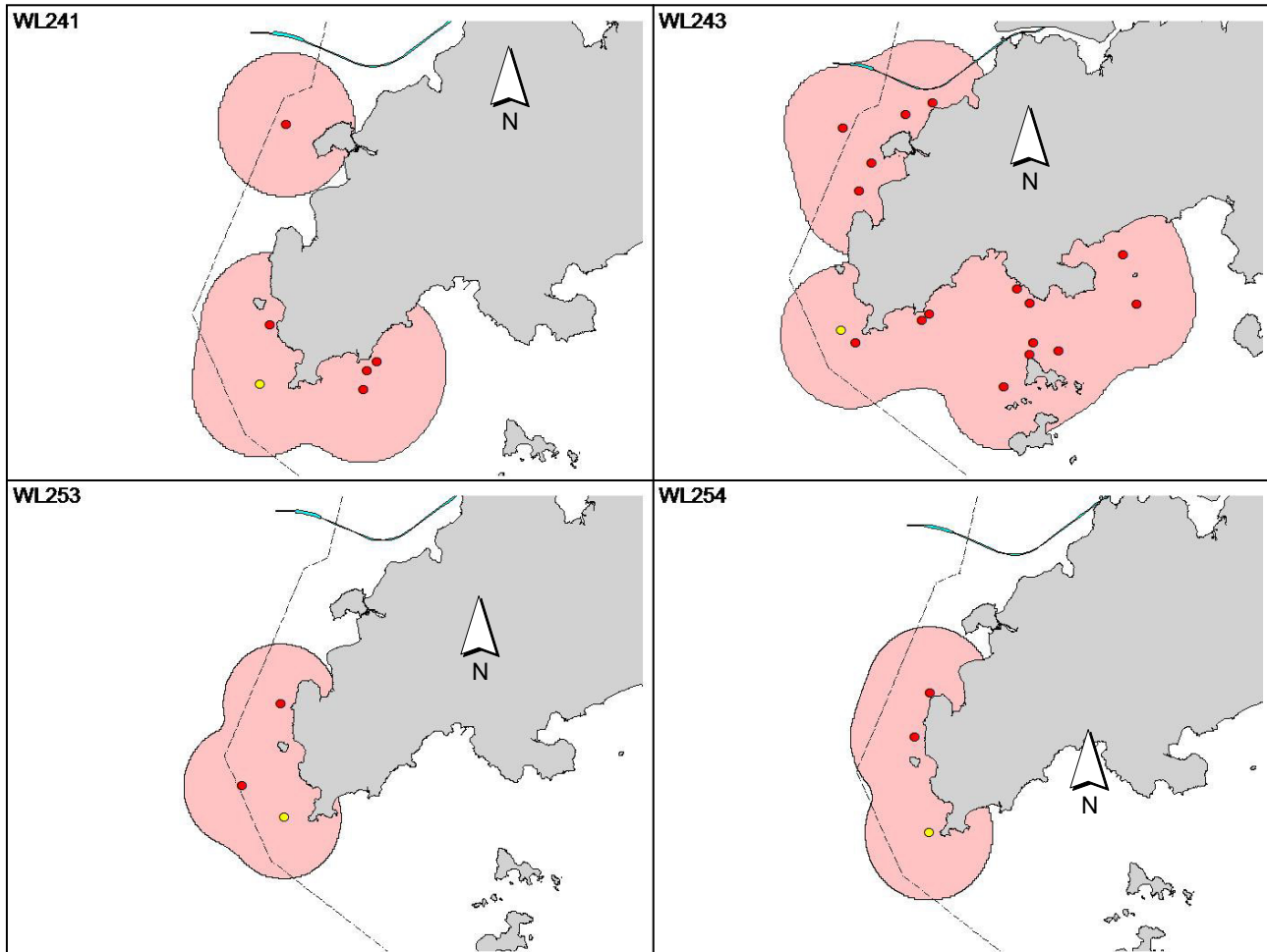
WL217



Appendix V. (cont'd)



Appendix V. (cont'd)



APPENDIX G
EVENT ACTION PLANS

Event / Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	SO	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and SO; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and SO; 3. Advise the SO on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and SO; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 	<ol style="list-style-type: none"> 1. Submit proposals for remedial to SO within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

LIMIT LEVEL				
1.Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform SO, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the SO on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
2.Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify IEC, SO, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and SO to discuss 	<ol style="list-style-type: none"> 1. Discuss amongst SO, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the SO accordingly; 3. Supervise the implementation of 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the SO until the exceedance

	<p>the remedial actions to be taken;</p> <p>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results;</p> <p>8. If exceedance stops, cease additional monitoring.</p>	<p>remedial measures.</p>	<p>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</p>	<p>is abated.</p>
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Abbreviations: ET – Environmental Team, IEC – Independent Environmental Checker, SO – Supervising Office

Event / Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	SO	CONTRACTOR
Action Level	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Notify IEC and Contractor; 3. Report the results of investigation to the IEC, SO and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the SO accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC, SO, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 	<ol style="list-style-type: none"> 1. Discuss amongst SO, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the SO accordingly; 3. Supervise the implementation of 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals;

EVENT	ACTION			
	ET	IEC	SO	CONTRACTOR
	<p>6. Inform IEC, SO and EPD the causes and actions taken for the exceedances;</p> <p>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results;</p> <p>8. If exceedance stops, cease additional monitoring.</p>	<p>remedial measures.</p>	<p>noise problem;</p> <p>4. Ensure remedial measures properly implemented;</p> <p>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</p>	<p>4. Resubmit proposals if problem still not under control;</p> <p>5. Stop the relevant portion of works as determined by the SO until the exceedance is abated.</p>

Event and Action Plan for Water Quality

Event	ET Leader	IEC	SO	Contractor
Action level being exceeded by one sampling day	<p>Repeat <i>in situ</i> measurement on next day of exceedance to confirm findings;</p> <p>Identify source(s) of impact;</p> <p>Inform IEC, contractor and SO;</p> <p>Check monitoring data, all plant, equipment and Contractor's working methods.</p>	<p>Check monitoring data submitted by ET and Contractor's working methods.</p>	<p>Confirm receipt of notification of non-compliance in writing;</p> <p>Notify Contractor.</p>	<p>Inform the SO and confirm notification of the non-compliance in writing;</p> <p>Rectify unacceptable practice;</p> <p>Amend working methods if appropriate.</p>
Action level being exceeded by two or more consecutive sampling days	<p>Repeat measurement on next day of exceedance to confirm findings;</p> <p>Identify source(s) of impact;</p> <p>Inform IEC, contractor, SO and EPD;</p> <p>Check monitoring data, all plant, equipment and Contractor's working methods;</p> <p>Ensure mitigation measures are implemented;</p> <p>Increase the monitoring frequency to daily until no exceedance of Action level;</p>	<p>Check monitoring data submitted by ET and Contractor's working method;</p> <p>Discuss with ET and Contractor on possible remedial actions;</p> <p>Review the proposed mitigation measures submitted by Contractor and advise the SO accordingly;</p> <p>Supervise the implementation of mitigation measures.</p>	<p>Discuss with IEC on the proposed mitigation measures;</p> <p>Ensure mitigation measures are properly implemented;</p> <p>Assess the effectiveness of the implemented mitigation measures.</p>	<p>Inform the Supervising Officer and confirm notification of the non-compliance in writing;</p> <p>Rectify unacceptable practice;</p> <p>Check all plant and equipment and consider changes of working methods;</p> <p>Submit proposal of additional mitigation measures to SO within 3 working days of notification and discuss with ET, IEC and SO;</p> <p>Implement the agreed mitigation measures.</p>
Limit level being exceeded by one sampling day	<p>Repeat measurement on next day of exceedance to confirm findings;</p> <p>Identify source(s) of impact;</p> <p>Inform IEC, contractor, SO and EPD;</p> <p>Check monitoring data, all plant, equipment and Contractor's working methods;</p> <p>Discuss mitigation measures with IEC, SO and Contractor;</p>	<p>Check monitoring data submitted by ET and Contractor's working method;</p> <p>Discuss with ET and Contractor on possible remedial actions;</p> <p>Review the proposed mitigation measures submitted by Contractor and advise the SO accordingly.</p>	<p>Confirm receipt of notification of failure in writing;</p> <p>Discuss with IEC, ET and Contractor on the proposed mitigation measures;</p> <p>Request Contractor to review the working methods.</p>	<p>Inform the SO and confirm notification of the non-compliance in writing;</p> <p>Rectify unacceptable practice;</p> <p>Check all plant and equipment and consider changes of working methods;</p> <p>Submit proposal of mitigation measures to SO within 3 working days of notification and discuss with ET,</p>

Event	ET Leader	IEC	SO	Contractor
				IEC and SO.
Limit level being exceeded by two or more consecutive sampling days	<p>Repeat measurement on next day of exceedance to confirm findings;</p> <p>Identify source(s) of impact;</p> <p>Inform IEC, contractor, SO and EPD;</p> <p>Check monitoring data, all plant, equipment and Contractor's working methods;</p> <p>Discuss mitigation measures with IEC, SO and Contractor;</p> <p>Ensure mitigation measures are implemented;</p>	<p>Check monitoring data submitted by ET and Contractor's working method;</p> <p>Discuss with ET and Contractor on possible remedial actions;</p> <p>Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the SO accordingly;</p> <p>Supervise the implementation of mitigation measures.</p>	<p>Discuss with IEC, ET and Contractor on the proposed mitigation measures;</p> <p>Request Contractor to critically review the working methods;</p> <p>Make agreement on the mitigation measures to be implemented;</p> <p>Ensure mitigation measures are properly implemented;</p> <p>Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.</p>	<p>Take immediate action to avoid further exceedance;</p> <p>Submit proposal of mitigation measures to SO within 3 working days of notification and discuss with ET, IEC and SO;</p> <p>Implement the agreed mitigation measures;</p> <p>Resubmit proposals of mitigation measures if problem still not under control;</p> <p>As directed by the Supervising Officer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.</p>

Event Action Plan for Dolphin Monitoring

Event	ET Leader	IEC	ER / SOR	Contractor
Action Level	<ol style="list-style-type: none"> 1. Repeat statistical data analysis to confirm findings. 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences. 3. Identify source(s) of impact. 4. Inform the IEC, ER/SOR and Contractor, 5. Check monitoring data. 6. Review to ensure all the dolphin protective measure are fully and properly implemented and advise on additional measures if necessary. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET and Contractor. 2. Discuss monitoring results and findings with the ET and the Contractor. 	<ol style="list-style-type: none"> 1. Discuss monitoring data with the IEC and any other measures proposed by the ET. 2. If ER/SOR is satisfied with the proposal of any other measures, ER/SOR to signify the agreement in writing on the measures to be implemented. 	<ol style="list-style-type: none"> 1. Inform the ER/SOR and confirm notification of the non-compliance in writing. 2. Discuss with the ET and the IEC to propose measures to the IEC and the ER/SOR. 3. Implement the agreed measures.

Event	ET Leader	IEC	ER / SOR	Contractor
Limit Level	<ol style="list-style-type: none"> 1. Repeat statistical data analysis to confirm findings. 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences. 3. Identify source(s) of impact. 4. Inform the IEC, ER/SOR and Contractor of findings, 5. Check monitoring data. 6. Repeat reviewing to ensure all the dolphin protective measure are fully and properly implemented and advise on additional measures if necessary. 7. If the ET proves that the source of impact is caused by any of the construction activity by the works contract, the ET to arrange a meeting to discuss with IEC, ER/SOR and Contractor for necessity of additional dolphin monitoring, and/or any other potential mitigation measures (eg, consider to modify the perimeter silt curtain or consider to control/temporarily stop relevant construction activities...etc), and submit to the IEC a proposal of additional dolphin monitoring and/or 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and findings with the ET and the Contractor; 3. Attend the meeting to discuss with ET, ER/SOR and Contractor the necessity of additional dolphin monitoring and other potential mitigation measures. 4. Review proposals for additional monitoring and any other mitigation measures submitted by ET and Contractor, and advise ER/SOR of the results and findings accordingly. 5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures, and advise ER/SOR of the results and findings accordingly. 	<ol style="list-style-type: none"> 1. Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 2. If ER/SOR is satisfied with proposals for additional dolphin monitoring and/or any other mitigation measures submitted by the ET and Contractor and verified by the IEC, ER/SOR to signify the agreement in writing on such proposals and any other mitigation measures. 3. Supervise the implementation of additional monitoring and/or any other mitigation measures. 	<ol style="list-style-type: none"> 1. Inform the ER/SOR and confirm notification of the non-compliance in writing; 2. Attend the meeting to discuss with ET, IEC and ER/SOR the necessity of additional dolphin monitoring and any other potential mitigation measures. 3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary. 4. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.

	mitigation measures where necessary.			
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**APPENDIX H
UPDATED ENVIRONMENTAL
MITIGATION IMPLEMENTATION
SCHEDULE (EMIS)**

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
Air Quality							
S5.5.6.1	A1	1) The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	^
S5.5.6.2	A2	2) Proper watering of exposed spoil should be undertaken throughout the construction phase: <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; 	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	^ ^ ^ ^
S5.5.6.2	A2	<ul style="list-style-type: none"> • When there are open excavation and reinstatement works, hoarding 	Good construction site	Contractor	All construction	Construction	*

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		<p>of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period;</p> <ul style="list-style-type: none"> • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; 	<p>practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.</p>		sites	stage	<p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">^</p> <p style="text-align: center;">*</p>

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
S5.5.6.2	A2	<ul style="list-style-type: none"> Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	N/A N/A N/A
S5.5.6.3	A3	3) The Contractor should undertake proper watering on all exposed spoil (with at least 8 times per day) throughout the construction phase.	Control construction dust	Contractor	All construction sites	Construction stage	^
S5.5.6.4	A5	5) Implement regular dust monitoring under EM&A programme during the construction stage.	Monitor the 24 hr and 1hr TSP levels at the representative dust monitoring stations to ensure compliance with relevant criteria throughout the construction period.	Contractor	Selected representative dust monitoring station	Construction stage	^
S5.5.7.1	A6	The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant: <ul style="list-style-type: none"> Loading, unloading, handling, transfer or storage of any dusty 	Monitor the 24 hr and 1hr TSP levels at the representative dust	Contractor	Selected representative dust	Construction stage	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		<p>materials should be carried out in totally enclosed system;</p> <ul style="list-style-type: none"> All dust-laden air or waste gas generated by the process operations should be properly extracted and vented to fabric filtering system to meet the emission limits for TSP; Vents for all silos and cement/pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system; The materials which may generate airborne dusty emissions should be wetted by water spray system; All receiving hoppers should be enclosed on three sides up to 3m above unloading point; All conveyor transfer points should be totally enclosed; All access and route roads within the premises should be paved and wetted; and Vehicle cleaning facilities should be provided and used by all concrete trucks before leaving the premises to wash off any dust on the wheels and/or body. 	<p>monitoring stations to ensure compliance with relevant criteria throughout the construction period.</p>		monitoring station		<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>
S5.5.2.7	A7	<p>The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point:</p> <ul style="list-style-type: none"> All road surface within the barging facilities will be paved; Dust enclosures will be provided for the loading ramp; Vehicles will be required to pass through designated wheels wash facilities; and Continuous water spray at the loading points. 	Control construction dust	Contractor	All construction sites	Construction stage	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
Construction Noise (Air borne)							
S6.4.10	N1	1) Use of good site practices to limit noise emissions by considering the	Control construction airborne	Contractor	All construction	Construction	

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		<p>following:</p> <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, mobile container site officer and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 	noise by means of good site practices		sites	stage	^ ^ ^ ^ ^
S6.4.11	N2	2) Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	Reduce the construction noise levels at low-level zone of NSRs through partial screening.	Contractor	All construction sites	Construction stage	^
S6.4.12	N3	3) Install movable noise barriers (typically density @14kg/m ²), acoustic mat or full enclosure close to noisy plants including air compressor, generators, saw.	Screen the noisy plant items to be used at all construction sites	Contractor	For plant items listed in Appendix 6D of the EIA report at all construction sites	Construction stage	*
S6.4.13	N4	4) Select "Quiet plants" which comply with the BS 5228 Part 1 or TM	Reduce the noise levels of	Contractor	For plant items	Construction	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		standards.	plant items		listed in Appendix 6D of the EIA report at all construction sites	stage	
S6.4.14	N5	5) Sequencing operation of construction plants where practicable.	Operate sequentially within the same work site to reduce the construction airborne noise	Contractor	All construction sites where practicable	Construction stage	^
	N6	6) Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected representative noise monitoring station	Construction stage	^
Waste Management (Construction Waste)							
S8.3.8	WM1	<u>Construction and Demolition Material</u> The following mitigation measures should be implemented in handling the waste: <ul style="list-style-type: none"> Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; Carry out on-site sorting; Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; Implement a trip-ticket system for each works contract to ensure that 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	^ ^ ^ N/A ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		<p>the disposal of C&D materials are properly documented and verified; and</p> <ul style="list-style-type: none"> Implement an enhanced Waste Management Plan similar to ETWBTC (Works) No. 19/2005 – “Environmental Management on Construction Sites” to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get its approval before implementation 					<p style="text-align: center;">*</p> <p style="text-align: center;">^</p>
S8.3.9 - S8.3.11	WM2	<p><u>C&D Waste</u></p> <ul style="list-style-type: none"> Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different 	<p>Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal</p>	Contractor	All construction sites	Construction stage	<p style="text-align: center;">^</p> <p style="text-align: center;">^</p>

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		<p>areas of the sites should be considered for such segregation and storage.</p>					
<p>S8.2.12- S8.3.15</p>	<p>WM3</p>	<p><u>Chemical Waste</u></p> <ul style="list-style-type: none"> • Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated. • Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical 	<p>Control the chemical waste and ensure proper storage, handling and disposal.</p>	<p>Contractor</p>	<p>All construction sites</p>	<p>Construction stage</p>	<p>^</p> <p>^</p> <p>^</p> <p>^</p>

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.					
S8.3.16	WM4	<u>Sewage</u> <ul style="list-style-type: none"> • Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state, which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly. 	Proper handling of sewage from worker to avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	^
S8.3.17	WM5	<u>General Refuse</u> <ul style="list-style-type: none"> • General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. • Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor. In addition, waste separation facilities for paper, aluminum cans, 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	* ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		<p>plastic bottles etc., should be provided.</p> <ul style="list-style-type: none"> • Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes. 					*
Water Quality (Construction Phase)							
S9.11.1 – S9.11.1.2	W1	<ul style="list-style-type: none"> • Mitigation during the marine works to reduce impacts to within acceptable levels have been recommended and will comprise a series of measures that restrict the method and sequencing of dredging/backfilling, as well as protection measures. Details of the measures are provided below and summarised in the Environmental Mitigation Implementation Schedule in EM&A Manual. • Export for dredged spoils from NWWCZ avoiding exerting high demand on the disposal facilities in the NWWCZ and, hence, minimise potential cumulative impacts; • For the marine viaducts of HKLR, the bored piling will be undertaken within a metal casing; • where public fill is proposed for filling below -2.5mPD, the fine content in the public fill will be controlled to 25%; • single layer silt curtains will be applied around all works; • during the first two months of dredging work for HKLR, the silt-removal efficiency of the silt-curtains shall be verified by examining the results of water quality monitoring points. The water quality monitoring points to be selected for the above shall be those close to the locations of the initial period of dredging work. Details in this regard shall be determined by the ENPO to be established, 	To control construction water quality	Contractor	During seawall dredging and filling	Construction stage	^ ^ N/A ^ N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		<p>taking account of the Contractor's proposed actual locations of his initial period of dredging work.</p> <ul style="list-style-type: none"> • silt curtain shall be fully maintained throughout the works. <p>In addition, dredging operations should be undertaken in such a manner as to minimise resuspension of sediments. Standard good dredging practice measures should, therefore, be implemented including the following requirements which should be written into the dredging contract.</p> <ul style="list-style-type: none"> • trailer suction hopper dredgers shall not allow mud to overflow; • use of Lean Material Overboard (LMOB) systems shall be prohibited; • mechanical grabs shall be designed and maintained to avoid spillage and should seal tightly while being lifted; • barges and hopper dredgers shall have tight fitting seals to their bottom openings to prevent leakage of material; • any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes; • loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved; • adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; 					<p style="text-align: center;">*</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">*</p> <p style="text-align: center;">^</p>

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		<ul style="list-style-type: none"> all vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and the works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. 					<p style="text-align: center;">^</p> <p style="text-align: center;">*</p>
S9.11.1.3	W2	<p><u>Land Works</u></p> <p>General construction activities on land should also be governed by standard good working practice. Specific measures to be written into the works contracts should include:</p> <ul style="list-style-type: none"> wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters; sewage effluent and discharges from on-site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided; storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks; silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including 	To control construction water quality	Contractor	During seawall dredging and filling	Construction stage	<p style="text-align: center;">*</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">^</p> <p style="text-align: center;">*</p>

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		<ul style="list-style-type: none"> • wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects; • vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal; • the contractors shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately; • waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance; • all fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank; and • surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system. 					<p style="text-align: center;">^</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">*</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p>
S9.14	W3	Implement a water quality monitoring programme	Control water quality	Contractor	At identified monitoring location	During construction period	^
Ecology (Construction Phase)							
S10.7	E1	<ul style="list-style-type: none"> • Good site practices to avoid runoff entering woodland habitats in Scenic Hill 	Avoid potential disturbance on habitat of Romer's Tree	Designer; Contractor	Scenic Hill	During construction	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		<ul style="list-style-type: none"> Reinstate works areas in Scenic Hill Avoid stream modification in Scenic Hill 	Frog in Scenic Hill				N/A ^
S10.7	E2	<ul style="list-style-type: none"> Use closed grab in dredging works. Install silt curtain during the construction. Limit dredging and works fronts. Good site practices Strict enforcement of no marine dumping. Site runoff control Spill response plan 	Minimise marine water quality impacts	Contractor	Seawall,	During construction	^ ^ ^ ^ ^ ^
S10.7	E3	<ul style="list-style-type: none"> Reprovision of replacement Artificial Reefs (of the same volume as the existing ARs inside Marine Exclusion Zone) 	Mitigate water quality impacts on the existing ARs	Project proponent	To be determined	Construction phase or operation phase	N/A
S10.7	E4	Watering to reduce dust generation; prevention of siltation of freshwater habitats; Site runoff should be desilted, to reduce the potential for suspended sediments, organics and other contaminants to enter streams and standing freshwater	Prevent Sedimentation from Land-based works areas	Contractor	Land-based works areas	During construction	^
S10.7	E5	Good site practices, including strictly following the permitted works hours, using quieter machines where practicable, and avoiding excessive lightings during night time	Prevent disturbance to terrestrial fauna and habitats	Contractor	Land-based works areas	During construction	^
S10.7	E6	<ul style="list-style-type: none"> Dolphin Exclusion Zone; Dolphin watching plan 	Minimize temporary marine habitat loss impact to dolphins	Contractor	Marine works	During marine works	^ ^
S10.7	E7	<ul style="list-style-type: none"> Decouple compressors and other equipment on working vessels Avoidance of percussive piling Marine underwater noise monitoring 	Minimise marine noise impacts on dolphins	Contractor	Marine works	During marine works	^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		<ul style="list-style-type: none"> Temporal suspension of drilling bored pile casing in rock during peak dolphin calving season in May and June 					N/A
S10.7	E8	<ul style="list-style-type: none"> Control vessel speed Skipper training. Predefined and regular routes for working vessels; avoid Brothers Islands. 	Minimise marine traffic disturbance on dolphins	Contractor	Marine traffic	During marine works	^ ^ ^
S10.10	E9	<ul style="list-style-type: none"> Dolphin vessel monitoring 	Minimise marine traffic disturbance on dolphins	Contractor	North Lantau and West Lantau	Prior to construction, during construction, and 1 year after operation	^
Fisheries							
S11.7	F1	<ul style="list-style-type: none"> Reprovision of replacement Artificial Reefs(of the same volume as the existing ARs inside Marine Exclusion Zone) 	Mitigate water quality impacts on the existing ARs	Project proponent	To be determined	Construction phase or operation phase	N/A
S11.7	F2	<ul style="list-style-type: none"> Reduce re-suspension of sediments Limit dredging and works fronts. Good site practices Strict enforcement of no marine dumping Spill response plan 	Minimise marine water quality impacts	Contractor	Seawall,	During construction	^ ^ ^ ^ ^
Landscape & Visual (Construction Phase)							
S14.3.3.3	LV2	<p>Mitigate both Landscape and Visual Impacts</p> <ul style="list-style-type: none"> G1. Grass-hydroseed bare soil surface and stock pile areas. 	Minimise visual & landscape impact	Contractor	HKLR	Construction stage	N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		<ul style="list-style-type: none"> • G2. Add planting strip and automatic irrigation system if appropriate at some portions of bridge or footbridge to screen bridge and traffic. • G3. For HKLR, providing aesthetic design on the viaduct, tunnel portals, at-grade roads (e.g. subtle colour tone and slim form for viaduct, featured form of tunnel portals, roadside planting along at-grade roads and landscape berm on) to beautify the HKLR alignment. • G5. Vegetation reinstatement and upgrading to disturbed areas. • G6. Maximize new tree, shrub and other vegetation planting to compensate tree felled and vegetation removed. • G7. Provide planting area around peripheral of and within HKLR for tree screening buffer effect. • G8. Plant salt tolerant native tree and shrubs etc along the planter strip at affected seawall. • G9. Reserve of loose natural granite rocks for re-use. Provide new coastline to adopt “natural-look” by means of using armour rocks in the form of natural rock materials and planting strip area accommodating screen buffer to enhance “natural-look” of the new coastline (see Figure 14.4.2 for example). 					<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
S14.3.3.3	LV3	<p><u>Mitigate Visual Impacts</u></p> <ul style="list-style-type: none"> • V1.Minimize time for construction activities during construction period. • V2.Provide screen hoarding at the portion of the project site / works areas / storage areas near VSRs who have close low-level views to the Project during HKLR construction. 					<p>^</p> <p>^</p>

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
EM&A							
S15.2.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	^
S15.5 - S15.6	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Contractor	All construction sites	Construction stage	^ ^ ^

Remarks: ^ Compliance of mitigation measure
 * Recommendation was made during site audit but improved/rectified by the contractor
 N/A Not Applicable at this stage as no such site activities were conducted in the reporting month (e.g. concrete batching plan, barging point, seawall dredging and filling, bored piling, landscaping works etc)

**APPENDIX I
SITE AUDIT SUMMARY**

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge



Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150604
Date	4 June 2015 (Thursday)
Time	9:15-11:50 and 13:15 - 15:15

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150604-R01	• To repair / replace the damage silt curtain for excavation works at P75.	B25
	B. Ecology	
150604-R02	• Clear the construction wastes / materials at near the trees near P113.	C31
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150604-R03	• Clear the mixture of chemical oil and stagnant water which is nearly overflow at the drip tray for generator at near P108.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150526), follow up action is required for the item(s) 150526-R02.	

	Name	Signature	Date
Recorded by	Ivy Tam		4 June 2015
Checked by	Dr. Priscilla Choy		4 June 2015

Hong Kong-Zhuhai-Macao Bridge


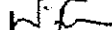
Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150609
Date	9 June 2015 (Tuesday)
Time	9:15-11:50 and 13:30 - 15:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150609-R02	• Provide mitigation measures to avoid the cement materials falling into the sea through the gap of the platform at P53.	B22
150609-R04	• Properly deploy the silt curtain to avoid the gap at between P102 and P101.	B25
	B. Ecology	
150609-R07	• Clear the construction wastes / materials at near the trees at P113.	C31
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150609-R01	• Provide drip tray for the generator and oil containers at P53.	F9
150609-R03	• Clear the oil spillage around the generator at P108.	F8
150609-R05	• Clear the construction wastes at the seawall area at between P100 and P99.	F4i.
150609-R06	• Remove the oil container at the seawall area at between P96 and P97.	F2ii.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150604), follow up action is required for the item(s) 150604-R01, 150604-R02 and 150604-R03 which are renamed as 150609-R07 and 150609-R03 respectively.	

	Name	Signature	Date
Recorded by	Ivy Tam		9 June 2015
Checked by	Dr. Priscilla Choy		9 June 2015

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge


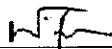
Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150616
Date	16 June 2015 (Tuesday)
Time	13:30 - 16:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	B. Ecology	
150616-R01	• Clear the construction wastes / materials at near the trees at P113.	C31
	C. Air Quality	
150616-R04	• To repair the damage hoarding at near between P110 and P111.	D12
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150616-R03	• Clear the chemical oil which is nearly overflow at the drip tray for generator at near P108.	F9
	F. Permits/Licences	
150616-R02	• To remove the invalid construction noise permits at the entrance of Portion C (near P112).	G1
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150609), follow up action is required for the item(s) 150604-R01, 150609-R03 and 150609-R07 which are renamed as 150616-R03 and 150616-R01 respectively.	

	Name	Signature	Date
Recorded by	Ivy Tam		16 June 2015
Checked by	Dr. Priscilla Choy		16 June 2015

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge


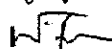
Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150623
Date	23 June 2015 (Tuesday)
Time	9:15 - 11:50 and 13:30 - 15:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150623-R02	• Properly deploy the silt curtain at P68.	B25
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150623-R01	• Provide drip tray for the oil containers at the barge at P63.	F9
150623-R03	• Clear the construction wastes at the seawall area at P81.	F4ii.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150616), follow up action is required for the item 150604-R01 only.	

	Name	Signature	Date
Recorded by	Ivy Tam		23 June 2015
Checked by	Dr. Priscilla Choy		23 June 2015

Contract HY/2011/09



Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary
Inspection Information

Checklist Reference Number	150630
Date	30 June 2015 (Tuesday)
Time	9:30 - 11:55

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150630-R04	<ul style="list-style-type: none">To repair the damage silt curtain at P69.	B25
	B. Ecology	
	<ul style="list-style-type: none">No environmental deficiency was identified during site inspection.	
	C. Air Quality	
150630-R01	<ul style="list-style-type: none">To carry out maintenance of excavator which emitted heavy smoke at between P81 and P82.	D19
	D. Noise	
	<ul style="list-style-type: none">No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150630-R02	<ul style="list-style-type: none">Clear the waste materials at the seawall area at between P81 and P82.	F4ii.
150630-R03	<ul style="list-style-type: none">Clear the oil stains at the platform at P69-P70.	F8
	F. Permits/Licences	
	<ul style="list-style-type: none">No environmental deficiency was identified during site inspection.	
	G. Others	
	<ul style="list-style-type: none">Follow-up on previous site audit session (Ref. No. 150623), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		30 June 2015
Checked by	Dr. Priscilla Choy		30 June 2015

Contract HY/2011/09



Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary
Inspection Information

Checklist Reference Number	150707
Date	7 July 2015 (Tuesday)
Time	9:15 - 11:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150707-R01	• To repair the damaged silt curtain at P74.	B25
150707-R04	• Muddy sediment was observed discharged into the sea at P75. The Contractor was reminded to dispose it properly.	B21
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
150707-R02	• To provide proper shelter (3 sides and on top) for dusty materials at P74.	D7
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150707-R03	• Clear the oil stains at P74.	F8
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150630), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		7 July 2015
Checked by	Dr. Priscilla Choy		7 July 2015

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge


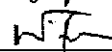
Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150714
Date	14 July 2015 (Tuesday)
Time	9:30 - 11:50 and 13:45 - 15:15

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150714-R01	• Clear the waste materials at the platform at P20 to avoid falling into the sea.	B20
150714-R05	• Provide mitigation measures to avoid the leakage of water from site to the public road (near P111).	B16
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150714-R02	• Provide tarpaulin sheet at underneath of pressure relief joint to avoid oil spillage at P20.	F8
150714-R03	• Provide drip tray for the generator at P20.	F9
150714-R04	• Clear the rubbish at near container office (P113).	F1iii.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150707), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		14 July 2015
Checked by	Dr. Priscilla Choy		14 July 2015

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge



Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150721
Date	21 July 2015 (Tuesday)
Time	9:30 - 11:50

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150721-R01	• Provision of sedimentation facilities according to effluent discharge license at P81 and P82.	B3i.
150721-R02	• Provide mitigation measures to avoid muddy water directly discharge to the gullies at between P82 and P83.	B4
	B. Ecology	
150721-R04	• To remove the construction wastes at near the trees at P90.	C31
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150721-R03	• Clear the accumulated construction wastes at P84 and P85.	F4ii.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150714), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		21 July 2015
Checked by	Dr. Priscilla Choy		21 July 2015

Hong Kong-Zhuhai-Macao Bridge



Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150728
Date	28 July 2015 (Tuesday)
Time	9:30 - 11:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150718-R01	• Provide mitigation measures to avoid the fine materials falling into the sea through the gap at the platform at P7.	B22
150728-R04	• Clear the loose material at the platform at P78.	B20
150728-R05	• Properly repair the damaged part of silt curtain at P78.	B25
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
150728-R02	• Provide noise emission label for the air compressor at P7.	E8
150728-R03	• Provide acoustic decoupling measures for the generator on barge at P7.	E7
150728-R06	• Ensure the noise enclosure is fully enclosed the equipment at P78.	E7
	E. Waste / Chemical Management	
	• No environmental deficiency was identified during site inspection.	
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150721), follow up action is required for the item(s) 150721-R01.	

	Name	Signature	Date
Recorded by	Ivy Tam		28 July 2015
Checked by	Dr. Priscilla Choy		28 July 2015

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge



Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150804
Date	4 August 2015 (Tuesday)
Time	9:15 - 11:45 and 13:30 - 15:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150804-R03	• To repair the damaged silt curtain at P69.	B25
150804-R04	• Properly deploy the silt curtain at P68.	B25
150804-R07	• Clear the foam box and wooden board within the silt curtain at near P107.	B21
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection	
	E. Waste / Chemical Management	
150804-R01	• To store and dispose the empty chemical containers at P70 properly.	F2ii.
150804-R02	• Clear the oil spillage at P70.	F8
150804-R05	• Clear the accumulated rubbish at near the site entrance (P111).	F1i. & iii.
150804-R06	• Properly repair the scissor platform (segment carrier) to avoid oil leakage at near P108.	F8
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150728), follow up action is required for the item(s) 150721-R01.	

	Name	Signature	Date
Recorded by	Ivy Tam		4 August 2015
Checked by	Dr. Priscilla Choy		4 August 2015



Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary
Inspection Information

Checklist Reference Number	150811
Date	11 August 2015 (Tuesday)
Time	9:15 - 11:30 and 13:30 - 16:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150811-R02	• Provide bund at the boundary of WA4 to avoid the muddy water discharging into the sea.	B16
150811-R06	• Clear the rubbish at the seawall area near P98.	B21
150811-R07	• Properly deploy the silt curtain at P68 and P69.	B25
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection	
	E. Waste / Chemical Management	
150811-R01	• Provide drip tray for the chemical container at WA4 and Portion C.	F9
150811-R03	• Clear the oil spillage at near P112.	F8
150811-R04	• Properly repair the scissor platform (segment carrier) to avoid oil leakage at near P108.	F8
150811-R05	• Clear the accumulated rubbish at near P107.	F1i.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150804), follow up action is required for the item(s) 150721-R01, 150804-R03, 150804-R04 and 150804-R06.	

	Name	Signature	Date
Recorded by	Ivy Tam		11 August 2015
Checked by	Dr. Priscilla Choy		11 August 2015

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge



Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150818
Date	18 August 2015 (Tuesday)
Time	9:30 - 11:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150818-R02	• Clear the concrete debris at P17 and P20.	B20
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
150818-R06	• Provide noise emission label for the air compressor at P20.	E8
	E. Waste / Chemical Management	
150818-R01	• Clear the oil leakage and provide drip tray for the oil container at P17.	F8 & F9
150818-R03	• Clear the rubbish at the ro-ro barge next to P17.	F1iii.
150818-R04	• Clear the oil spillage at the ro-ro barge next to P17.	F8
150818-R05	• Provide drip tray for the chemical containers at P20.	F9
150818-R07	• Clear the stagnant water at the drip tray at P20.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150811), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		18 August 2015
Checked by	Dr. Priscilla Choy		18 August 2015

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge



Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150825
Date	25 August 2015 (Tuesday)
Time	9:30 - 11:50

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150825-R01	• Clear the loose material which hanging at the boundary of P54.	B20
150825-R04	• Clear the concrete materials at the platform and repair the iron wire gauze at P58.	B20
150825-R06	• Properly deploy the silt curtain at P74.	B25
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150825-R02	• Clear the rubbish at the barge next to P58.	F1iii.
150825-R03	• Provide drip tray for the chemical containers at the barge next to P58 and at P58.	F9
150825-R05	• Clear the oil spillage as chemical waste at the barge next to P58.	F8
150825-R07	• Clear the contaminated sand around the generator at P74.	F8
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150818), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		25 August 2015
Checked by	Dr. Priscilla Choy		25 August 2015

**APPENDIX J
WASTE GENERATION IN THE
REPORTING PERIOD**



Appendix: C6 Monthly Summary Waste Flow Table

Name of Department: HyD

Contract No.: HY/2011/09

Monthly Summary Waste Flow Table for 2015 (Year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated ¹¹	Hard Rock and Large Broken Concrete ⁶	Reused in the Contract ^{8,9}	Reused in other Projects ^{5,8,9}	Disposed as Public Fill ⁷	Imported Fill ^{6,7,8,9}	Metals ¹²	Paper/ cardboard packaging	Plastics ³	Chemical Waste	Others, e.g. general refuse ^{8,9}
	(in '000 m ³)	(in '000 m ³)	(in '000 m ³)	(in '000 m ³)	(in '000 m ³)	(in '000 m ³)	(in '000 m ³)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 m ³)
Jan	4.101	0.000	0.000	0.000	4.101	0.000	0.070	0.485	0.000	0.000	0.566
Feb	3.823	0.000	0.000	0.000	3.823	0.000	0.000	0.550	0.000	0.000	0.241
Mar	0.681	0.000	0.000	0.000	0.681	0.000	0.096	0.729	0.000	0.793	0.299
Apr	0.406	0.000	0.000	0.000	0.406	0.000	0.049	0.909	0.000	0.000	0.202
May	0.176	0.000	0.000	0.000	0.176	0.000	0.005	1.096	0.000	0.000	0.267
Jun	0.287	0.000	0.000	0.000	0.287	0.000	0.095	1.146	0.000	0.000	0.234
Sub-Total	9.472	0.000	0.000	0.000	9.472	0.000	0.314	4.915	0.000	0.793	1.807
Jul	0.293	0.000	0.000	0.000	0.293	0.000	0.071	1.064	0.000	2.378	0.280
Aug	0.764	0.000	0.000	0.000	0.764	0.000	0.020	1.031	0.000	0.000	0.273
Sep											
Oct											
Nov											
Dec											
Total	10.529	0.000	0.000	0.000	10.529	0.000	0.406	7.010	0.000	3.171	2.360



Forecast of Total Quantities of C&D Materials to be Generated from the Contract ¹⁰										
Total Quantity Generated ¹¹	Hard Rock and Large Broken Concrete ⁶	Reused in the Contract ^{8,9}	Reused in other Projects ^{5,8,9}	Disposed as Public Fill ⁷	Imported Fill ^{6,7,8,9}	Metals	Paper/ cardboard packaging	Plastics ³	Chemical Waste	Others, e.g. general refuse ^{8,9}
(in '000 m ³)	(in '000 m ³)	(in '000 m ³)	(in '000 m ³)	(in '000 m ³)	(in '000 m ³)	(in '000 m ³)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 m ³)
229.311	0.000	3.200	73.111	100.000	53.000	4.000	30.000	0.000	10.000	8.000

- Notes:
- (1) The performance targets are given in ER Appendix 8J Clause 14 and the EM&A Manual.
 - (2) The waste flow table shall also include C&D materials to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (ER Part 8 Clause 8.8.5 (d) (ii) refers).
 - (5) The materials reused in other Project shall not be treated as waste under the Waste Disposal Ordinance (CAP354).
 - (6) According to the EIA Appendix 8B, the density of rock (bulked) is 2.0 tonnes/m³.
 - (7) According to the EIA Appendix 8B, the density of soil (bulked) is 1.8 tonnes/m³.
 - (8) Assuming the loading quantities of a 30-tonne truck is 8.0m³.
 - (9) Assuming the loading quantities of a 24-tonne truck is 6.5m³.
 - (10) The forecast of C&D materials to be generated from the Contract is sourced from the works program in December 2014.
 - (11) The volume of Total Quantity Generated means the volume of Hard Rock and Large Broken Concrete+Disposed as Public Fill+Imported Fill-Reused in the Contract-Reused in other Projects.
 - (12) The density of metal is 7,850 kg/m³.

APPENDIX K
SUMMARY OF EXCEEDANCE

Contract No. HY/2011/09

**Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road –
Section between HKSAR Boundary and Scenic Hill**

Exceedance Report

(A) Exceedance Report for Air Quality

Environmental Monitoring	Parameter	No. of Exceedance		No. of Exceedance related to the Construction Activities of this Contract	
		Action Level	Limit Level	Action Level	Limit Level
Air Quality	1-hr TSP	0	0	0	0
	24-hr TSP	0	0	0	0

**(B) Exceedance Report for Construction Noise
(NIL in the reporting period)**

(C) Exceedance Report for Water Quality

Environmental Monitoring	Parameter	No. of Exceedance		No. of Exceedance related to the Construction Activities of this Contract	
		Action Level	Limit Level	Action Level	Limit Level
Water Quality	Dissolved Oxygen (DO) (Surface & Middle)	0	0	0	0
	Dissolved Oxygen (DO) (Bottom)	0	0	0	0
	Turbidity	0	0	0	0
	Suspended Solids (SS)	5	6	0	0

**(D) Exceedance Report for Line-transect Vessel Surveys
(NIL in the reporting period)**

**APPENDIX L
COMPLAINT LOG**

Appendix L - Complaint Log

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
Com-2013-04-001	Near Tung Chung New Development Pier	8 April 2013	EPD received the complaint on 8 April 2013. The complainant complained about oil was dumped from various vessels operating for Hong Kong-Zhuhai-Macao Bridge Hong Kong (HZMB HK) Projects near Tung Chung New Development Pier over the past few months.	1) The vessels photos in the complainant's photo are not the working vessels under Contract No. HK/2011/09. 2) No oil dumped from Contract No. HK/2011/09's working vessels was observed according to ET's site inspection conducted on 9 April 2013 at near Tung Chung New Development Ferry Pier. 3) Joint site inspection (DCVJV and ARUP) was conducted on 10 April 2013 and confirmed that Contract No. HY/2011/09's vessels are not involved the complaint case. 4) DCVJV will keep remind their boat crews not discharging contaminated effluent directly into the sea.	Closed
Com-2013-05-001	WA6	2 May 2013	ARUP received the complaint on 2 May 2013. The complainant alleged the noise nuisance was generated from the Works Area WA6 at around 13:00 on 1 May 2013 (Wednesday).	The site diary report was reviewed and confirmed that no works were carried out at WA6 on 1 May 2013. In addition, no noise was heard from WA6 according to the security guard who on duty at WA6 on 1 May 2013. Based on the information provided, the complaint regarding the construction noise at WA6 is not considered justifiable.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
Com-2013-05-002	WA6	18 May 2013	ARUP received the complaint on 18 May 2013. The complainant advised that the noise nuisance due to loading of metal parts at barge near the seawall of Works Area WA6 early morning (around 8:45a.m) on 18 May 2013 (Saturday).	Based on the record of site activities at WA6 on 18 May 2013, 4 metal plates and 2 oxygen-acetylene set were lifted onto a derrick boat “Chiu Kee” by a crane near seawall at WA6 in the morning on that day. Such operation was commenced around 8:40a.m and completed in 10 minutes during the normal construction working hour (0700 – 1900 Monday to Saturday). However, the duration of aforesaid activities is very short and infrequent. Nevertheless, the Contractor was reminded to strengthen their site supervision and provide training for the workers regularly to increase awareness of their environmental responsibilities to minimize the noise impact to the nearby residents and the specific mitigation measures for the complaint including but not limited to:- <ul style="list-style-type: none"> •To place wooden planks or rubber mats on ground for loading and unloading heavy or metal objects; and •To deploy professional personnel to supervise the works. 	Closed
Com-2013-05-003	Near Tung Chung New Development Pier	18 May 2013	EPD received the public complaint on 18 May 2013. This complaint was a follow-up of a previous complaint received by EPD on 8	After receiving the complaint, additional site inspection was conducted at near Tung Chung New Development Pier on 30 May 2013 to investigate whether oil	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			<p>April 2013 (Com-2013-04-001).</p> <p>The complainant complained again about the oil was dumped from various vessels operating for Hong Kong-Zhuhai-Macao Bridge Hong Kong (HZMB HK) Projects near Tung Chung New Development Pier over the past months.</p>	<p>dumped was due to Contract No. HY/2011/09's vessels. During the site inspection, three working vessels under Contract No.HY/2011/09 was anchored off near Tung Chung New Development Pier. No oil dumped from Contract No. HY/2011/09's vessels were observed and the water around the vessels was clear.</p> <p>The following mitigation measures have been implemented by DCVJV:</p> <ul style="list-style-type: none"> • DCVJV has sent the letter to the shipping agent to remind them to ensure the vessels under Contract No. HY/2011/09 are in good condition and any oil dumped to sea should be avoided to prevent water pollution. • Provide training to the vessel skippers for prevention of pollution from ships. • DCVJV requested vessel skippers to provide engine oil disposal records The vessel skippers assured to us that all waste lubricants were sent to waste collectors regularly and no oil discharge into seawater. 	
Com-2013-07-001	Southeast Quay of Chek Lap Kok near the junction of Chek Lap Kok South Road and Scenic Road	17 July 2013	The complaint was received by EPD on 17 th July 2013. According to the EPD's letter, the complainant was concerned for the noise nuisance generated from the	In response to the complaint, ET conducted two times site inspections at Southeast Quay at Chek Lap Kok between 18:45 and 20:30 hours on 23 July 2013 and 20:30 to 22:30 hours on 30 July 2013.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			<p>operation of concrete lorry mixers during evening and night-time period at Southeast Quay of Chek Lap Kok.</p>	<p>During the inspections, the Ro-Ro barge was observed anchored off Southeast Quay at Chek Lap Kok but no concrete lorry mixer was observed throughout the inspection.</p> <p>On 23 July 2013, at about 19:35, one tug boat was observed travelling to Southeast Quay, Chek Lap Kok and left at about 19:40.</p> <p>On 30 July 2013, no tug boat and concrete lorry mixers were observed during the inspection.</p> <p>According to the Contractor, there was no concreting works for the pier sites on 23 July 2013 and therefore no loading and unloading operation at Southeast Quay at Chek Lap Kok.</p> <p>Concreting works were performed at Pier 0 on 30 July 2013. As the Contractor anticipated the arrival time of tug boat and flap-top barge at Southeast Quay will exceed 23:00 hours after the concreting works, they decided to arrange the tug boat and flap-top barge with concrete</p>	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				<p>lorry mixers anchored off around Pier 66 after 23:00 hours. So, no loading and unloading operation at Southeast Quay at Chek Lap Kok was observed.</p> <p>Further night time site inspection was conducted on 22 August 2013 during the loading and unloading operation at Southeast Quay of Chek Lap Kok, the construction works conducted under Contract No. HY/2011/09 complied with the conditions in the CNP No. GW-RS0895-13.</p>	
Com-2013-11-001	Chek Lap Kok (CLK) South Road	16 November 2013	The complaint was received by project customer services on 16 th November 2013 regarding the dust problem at Chek Lap Kok (CLK) South Road.	<p>After receiving the complaint, ET conducted the site inspection on 19 and 29 November 2013 to check the appropriate environmental protection and pollution control measures which are properly implemented by the Contractor under HY/2011/09 (DCVJV). The observation are summarized as below:-</p> <ul style="list-style-type: none"> • Dust generation works was conducted by the other Contractor at South East Quay • Proper watering of haul road to avoid dust generation during vehicle / plant equipment movement. • Vehicle washing facilities provided 	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				<p>at every site exit at CLK South Road and South Perimeter Road.</p> <ul style="list-style-type: none"> No dark smoke was observed emitting from the plant equipments. <p>Based on the information collected, the complaint of dust problem at Check Lap Kok South Road is considered not related to Contract No. HY/2011/09 as dust suppression measures has been properly implemented by the Contractor on site to prevent dust nuisance from the construction activities.</p>	
Com-2014-01-001	Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09)	3 January 2014	The complaint was received by EPD on 3 rd January 2014. According to the EPD’s letter, a resident in Tai O District was concerned for the noise nuisance occasionally arising from the hammering or hitting of metals from Contract No. HY/2011/09.	<p>In response to the complaint, ET conducted an ad hoc night time site inspection at P0, P18 and P19 on 14 January 2014 between around 23:00 and 00:30 hours of 15 January 2014.</p> <p>In accordance with the site activities record and site inspections, the construction works conducted under Contract No. HY/2011/09 complied with the conditions in the CNP No. GW-RS1108-13.</p> <p>Nevertheless, the Contractor was advised to strictly follow the conditions of the permit because any deviation from the</p>	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				<p>conditions may lead to cancellation of the permit, subsequent prosecution action and the Authority’s refusal to issue further permit.</p> <p>In addition, the following environmental mitigation measures were recommended:</p> <ul style="list-style-type: none"> • Review and adjust the lighting directions of the barge, under safety consideration, to avoid potential visual impacts to residents in vicinities; • To ensure the equipment are maintaining in good operation condition; and • To strengthen site supervision and provide training for the workers regularly to increase awareness of their environmental responsibilities to minimize the noise impact to the nearby residents and the specific mitigation measures. 	
Com-2014-01-002	Hong Kong-Zhuhai-Macao Bridge	16 January 2014	The complaint was received by HyD’s PR Team on 16 January 2014 that the complainant advised that the heavy exhaust fume affecting Tung Chung Crescent.	After receiving the complaint, ET conducted the site inspection on 21 January 2014 to check all the plant equipments which were operated for the construction works and air quality	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				<p>mitigation measures.</p> <p>Based on the information collected, the complaint of heavy exhausts affecting Tung Chung Crescent is considered not related to Contract No. HY/2011/09 due to the following reason(s):-</p> <ol style="list-style-type: none"> 1) The work sites at Portion C and South East Quay at Portion A under Contract No. HY/2011/09 are approximately 800m from Tung Chung Crescent. Any unpleasant smell of exhaust fume would not be anticipated. 2) No heavy smoke was observed emitting from plants / equipment during the site inspection on 21 January 2014. 3) The vehicles and equipments were switched off while not in use. 4) All plant and equipment were well maintained and in good operating condition. 5) Air quality mitigation measures has been properly implemented by the Contractor on site to prevent dust nuisance from the construction activities. 	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
Com-2014-03-001	Oil Spillage at near Sha Lo Wan	5 March 2014	The complaint was received by EPD on 5 March 2014. The complainant suspected the oil leakage from the works area of Contract No. HY/2011/09 near Sha Lo Wan	Based on ET site inspection, no oil spillage from the works area under Contract No. HY/2011/09 at near Sha Lo Wan was observed. In addition, spill kits are ready on site in order to dealing with spillage cases promptly. Nevertheless, DCVJV was also recommended the mitigation measures as below: <ul style="list-style-type: none"> • Provide training for the workers regularly regarding the mitigation measures on waste / chemical management. • Provide sufficient chemical spillage kit (e.g. oil absorbent) to all vessels and working platform. • Regular check the condition of vessels and plant equipments to ensure no leakage of oil. 	Closed
Com-2014-03-002	Construction Noise in the vicinity of the waters outside Sha Lo Wan	11 March 2014	The complaint was received by EPD on 11 March 2014. According to the EPD's letter, the complainant was concerned for the mobile crane which operating in the vicinity of the waters outside Sha Lo Wan after 23:00.	In accordance with an ad hoc site inspection on 18 March 2014, no construction works were conducted during the restricted hours. The 1 st investigation report has been submitted to EPD on 21 March 2014 and the 2 nd investigation report was submitted to EPD on 26 June 2014. The Contractor was advised to strictly	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				<p>follow the conditions of the permit because any deviation from the conditions may lead to cancellation of the permit, subsequent prosecution action and the Authority’s refusal to issue further permit. Nevertheless, the Contractor was reminded to take sufficient noise mitigation measures to minimize the environmental impact on the nearby community:</p> <ul style="list-style-type: none"> · To space out noisy equipment and position it as far away as possible from the sensitive receivers; · To avoid concurrent uses of noisy equipment near the sensitive area; · To ensure the equipment are maintaining in good operation condition; · To turned off any idle equipment on site; and · To enclose the noisy part of the machine by acoustic insulation material if feasible. · To arrange tailor-made training for the Production Team including the management and foremen to explain to them the conditions and requirements listed on the CNP. · To delegate one Engineer for ensuring that all construction activities and PMEs used are in full compliance with the CNP 	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				and legislative requirements.	
Com-2014-04-001	Construction marine works by the company Bauer Hong Kong in Tung Chung	14 April 2014	The complaint was received by Agriculture, Fisheries and Conservation Department (AFCD) on 14 April 2014, the complainant complained that the dead dolphin was found under a platform at construction marine works by the company Bauer Hong Kong in Tung Chung (Macau Bridge Piling Works)	<p>In accordance with the photos showing a date of 27 November 2013 (08:00 – 08:25a.m.) which provided by the complainant, the dolphin was observed has been dead for some time and shows signs of decomposition. It was difficult to determine the cause of death of the deceased dolphin based on the photographs and the dead dolphin was found a few months ago. By examining the photos, it is found that the body was beside a barge, not under a working platform.</p> <p>In addition, the dead dolphin was found in the early morning in which the marine construction works have not been commenced. Therefore, from the above information the dead dolphin is considered to be washed to the work site. However, there is no significant increase of cetacean stranding were found in Hong Kong since the commencement of Contact No. HY/2011/09.</p> <p>In regard to the complaint, the following recommendations were made:</p>	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				<ul style="list-style-type: none"> ➤ In case stranded cetaceans are found, the AFCD shall be contacted immediately and provide the following information to facilitate AFCD’s investigation: <ol style="list-style-type: none"> 1. Name and telephone number; 2. Date and time of discovery; 3. Location (as specific as possible); 4. Status of the stranded animal (i.e. alive, freshly dead, slightly decomposed, rotten, mummified); 5. Type and size of the stranded animal. ➤ To implement Dolphin Exclusion Zone during the installation of bored pile casing located in the waters to the west of Airport. ➤ To implement Dolphin Watching Plan after the bored piling casing is installed. 	
Com-2014-05-001	At the shore of Sha Lo Wan	13 May 2014	The complaint was received by EPD on 13 May 2014. According to the EPD’s email, the complainant was concerned about the sand material that was excavated on the shore of Sha Lo Wan for the construction of Hong Kong -	After receiving the complaint from a Sha Lo Wan’s village resident, the sub-contractor was instructed to stop the sand excavation and leave immediately. In addition, all sands excavated from the shore of Sha Lo Wan were returned back to the original area on 13 May 2014.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			Zhuhai - Macao Bridge (HZMB) Project on 11 May 2014.	<p>Nevertheless, the Contractor was advised to arrange tailor-made training for Production Team including the management and foremen to explain to them the conditions and requirements listed on the Environmental Permit.</p> <p>In addition, indicative poles and flags are recommended to put within the site boundary to identify the extent of land areas in Sha Lo Wan / Sha Lo Wan (West) Archaeological site.</p>	
Com-2014-05-002	At the shore of Sha Lo Wan	27 May 2014	The complaint was received by EPD on 27 May 2014. According to the EPD's email, the complainant was concerned about the dumping rubbles along the shore area of Sha Lo Wan on 27 May 2014.	<p>The complaint investigation report for the complaint of dumping rubbles along the shore area of Sha Lo Wan was submitted to EPD on 4 June 2014.</p> <p>EPD and AFCD provided their comments on 5 and 9 June 2014 respectively.</p> <p>A meeting among DCVJV, ARUP, IEC, ET, EPD and AFCD was held on 17 June 2014. According to the meeting, further information is required to include in the complaint investigation report and the report was submitted to EPD on 4 March 2015.</p>	Complaint investigation report is under review by EPD

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Com-2014-05-003	Pier 39 to 50	29 May 2014	ARUP received the complaint on 29 May 2013. The complainant advised that the workers disposed hundreds of kg of waste spoils (concrete and earth) into the sea every day in the existing locations of HZMB site area.	Based on the investigation findings, the waste spoils (concrete and earth) were disposed to HY/2010/02 Project according to approved WMP. The following recommendations were made: <ul style="list-style-type: none"> • To check for any accumulation of waste spoils (concrete and earth) on site. • To cover the wastes skip with waste spoils before removing from site. • To carry out inspection of pier(s) regularly to ensure the frontline staff loads inert materials to approved barge properly. • To clean the waste storage areas regularly and do not cause dust nuisance. 	Closed
Com-2014-08-001	Near Sha Lo Wan	27 August 2014	ARUP received the complaint on 27 August 2013. The complainant was concerned about the dust on the surface of the roro-barge.	Based on the investigation findings, dusty materials at the ro-ro barge at P63 and dust generation when vehicles passing by at the roro-barge at Southeast Quay were observed. The following recommendations were made: <ul style="list-style-type: none"> • To check for any accumulation of dusty materials at roro-barge. • To cover the stockpile of dusty materials before removing from site. • To clean the surface of roro-barge 	Closed

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				regularly and do not cause dust and water quality nuisance. <ul style="list-style-type: none"> • To maintain the surface of ro-ro-barge wet especially during the vehicle movements. Water misting is considered an acceptable measure to control dust emissions. • To check and replace the worn sand bags at the surface of ro-ro-barge to prevent the turbid water from entering to the sea when watering the barge surface. 	
Com-2014-11-001	HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09)	11 November 2014	The complaint was received by EPD on 11 November 2014. According to the EPD’s email, the complaint was received from one of the green groups Sea Shepherd. They complained that the residual concrete had been washed off from the deck surface of a flat-top barge into the sea, and marine littering had been spotted by a worker of HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09)	Based on the investigation findings, residue concrete or wastewater contaminated with concrete overflowing/spilling into the sea from the ro-ro barge and marine littering were suspected. The following recommendations were made: <ul style="list-style-type: none"> ➤ Properly clear the concrete stains on the three ro-ro barges (e.g. hand-held equipments such as shovel etc). Tarpaulin sheet is also recommended to provide when clearing the concrete stains at the edge of ro-ro barge to prevent these removed materials from getting into the sea. 	Closed
Com-2014-11-002	HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill	18 November 2014	The complaint was received by EPD on 18 November 2014. According to the EPD’s email, it was alleged that residual concrete	The worker should also pay special care to remove the concrete stains to	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
	(Contract No. HY/2011/09)		had been poured out directly from the concrete lorry mixers on a ro-ro barge into the sea during night-time by the workers of HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09)	minimize the water quality nuisance. <ul style="list-style-type: none"> ➤ Keep cleanliness of the surface of ro-ro-barge and do not cause water quality nuisance. ➤ To check and reinforce the concrete / sand bag bund between baffles erected near the edge of the three ro-ro barges to avoid accidental leakage of wastewater from the deck regularly. ➤ Keep all debris/ aggregate away from the edge of ro-ro barge to prevent them from falling into the sea. ➤ Provide sufficient skips for temporary storage of concrete residue/wastewater. ➤ To check for any accumulation of residual waste concrete at the waste skip on ro-ro-barge. ➤ Provide spare and sufficient sand bags at each ro-ro barges to confine the concerned area in the event of accidental spillage of concrete when discharge the concrete from the concrete lorry mixers to pump truck. ➤ Provide absorptive materials to absorb the wastewater in case of accidental spillage of wastewater 	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				during washing concrete lorry mixers or other equipments. ➤ Assign trained staff to ensure proper management of environmental matters on each of the ro-ro barges in particular the handling of concrete residue/wastewater generated during operation. ➤ Keep record for collection of skip or temporary storage tank for wastewater and excess concrete. ➤ Ensure sufficient garbage bag / rubbish bin are provided at working barge / pier site. ➤ Provide training for the workers regularly regarding the water quality mitigation measures and waste management to increase their awareness of environmental protection.	
Com-2014-11-003	Floating Concrete Batching Plant (FCBP)	28 November 2014	The complaint was received by EPD on 28 November 2014. The complaint was received from one of the green groups Green Lantau Association. They complained about the hauling of the floating concrete batching plant (FCBP) by the tug boat to the site of Contract No. HY/2011/09 from the north-	Based on the information collected, the following conclusions were drawn: 1) It is suspected that the wake following the FCBP was resulted from disturbance to the bottom sediment when it was traveling during the lowest tide on that day. 2) The FCBP was traveling within the	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			<p>east side had disturbed the seabed causing an increase of turbidity in marine waters at around noon of 15 November 2014.</p>	<p>site area and the maximum number of movement of a floating plant (and therefore tug boat) is two times per day. Average duration of each movement is around 1 hour/day. Therefore, the disturbance to the bottom sediment is considered temporary, localized and infrequent.</p> <p>3) No illegally discharge of wastewater or domestic wastewater to the sea from FCBP.</p> <p>4) Relevant environmental mitigation measures as shown in EP-352/2009/C were properly implemented.</p> <p>5) No deterioration of marine water quality based on the marine water quality monitoring results on 15 November 2014.</p> <p>Nevertheless, DCVJV was also recommended the mitigation measures as below:</p> <ul style="list-style-type: none"> • The vessel skipper should pay special care about the movement of deep draught vessel to avoid seabed disturbance. (e.g. speed restrictions) • In case of sediment plume was found behind vessel, the vessel skipper 	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				should further reduce vessel speed. • Minimum clearance of 0.6m should be maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash. (Reference: EIA-081/2002 - Construction of Lung Kwu Chau Jetty)	
Com-2014-12-001	Shores of Po Chue Tam and Shek Tsai Po, Tai O	7 December 2014	The complaint was received from one of the green groups Green Lantau Association. They complained about some waste materials (including a number of grey plastic mats and buoys) suspected in relation to the HZMB works have recently washed up on the shores of Po Chue Tam and Shek Tsai Po, Tai O	The owner of objects found on the shores could not be identified. DCVJV has taken initiative to remove these materials after receiving the complaint. Nevertheless, DCVJV was also recommended the mitigation measures as below: • Gather up and remove debris to keep the work site orderly. • Maintain site housekeeping. Designate areas for waste materials and provide containers. • Secure loose or light material that is stored on open floors. • Do not permit rubbish to fall freely from any level of the pier sites. • Provide training for the workers	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				regularly regarding the water quality mitigation measures and waste management to increase their awareness of environmental protection.	
Com-2014-12-002	Site Office of HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill	2 December 2014	Highways Department (HyD) received a public complaint from a resident of Le Bleu Duex on 2 December 2014. According to the email from ARUP dated 3 December 2014, the complainant advised that the noise nuisance due to the metal parts were dropped onto the ground by people repetitively and loading or unloading a boat at the pier. The complaint was quoted, “A resident living in Le Bleu Duex addressed a complaint to CE of HyD at about 20:04 hrs last night. He complained about the noise nuisance coming from site office since 19:30 hrs last night. Repetitively metal parts had been dropped on the ground by people who seem to	Based on the information collected, the noise generated is considered due to the metal parts were dropped onto the ground at the seashore area near Le Bleu Duex. The metal pipe was unloaded at non-designated area and no powered mechanical equipment was used for unloading works at WA6 during restricted hour. The Contractor was reminded to take sufficient noise mitigation measures to minimize the environmental impact on the nearby community as recommended in the approved EIA report and the specific mitigation measures for the complaint including but not limited to:- <ul style="list-style-type: none"> • To place wooden planks or rubber mats on ground for loading and unloading heavy or metal objects; and • To deploy professional personnel to 	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			<i>be loading or unloading a boat at the pier. Noise was still going on right now at 20:04.”</i>	supervise the works.	
Com-2014-12-003	Along the shore from Yat Tung to Tai O	24 December 2014	The complainant was concerned about the increase of marine refuse (water bottles and debris) along the shore from Yat Tung to Tai O suspected in relation to the HZMB works.	<p>The owner of marine refuse found on the shores could not be identified. DCVJV has taken initiative to remove these wastes after receiving the complaint. DCVJV will also take the initiative to clear the marine refuse along the shore from Yat Tung to Tai O, if necessary.</p> <p>Nevertheless, DCVJV was also recommended the mitigation measures as below:</p> <ul style="list-style-type: none"> • Gather up and remove debris to keep the work site orderly. • Maintain site housekeeping. Designate areas for waste materials and provide containers. • Secure loose or light material that is stored on open floors. • Do not permit rubbish to fall freely from any level of the pier sites. • Provide training for the workers regularly regarding the water quality mitigation measures and waste management to increase their awareness of environmental 	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				protection.	
Com-2015-06-001	The sea side at WA6 vertical seawall	6 June 2015	A resident living in Le Bleu Duex complained about noise from a barge which unloading materials at about 21:00 hrs last Saturday i.e. 6 June 2015	<p>Based on the information collected, the noise generated is considered due to the unloading of steel casings to the seashore area opposite to the China State Site Office.</p> <p>The person-in-charge of the barge has been reprimanded by the Contractor for causing noise nuisance to resident nearby. In addition, the Contractor had also reminded their subcontractors to avoid unloading of materials during restricted hours (i.e. 19:00 to 07:00 hours on any day and any time on public holidays including Sundays) without Construction Noise Permit (CNP).</p> <p>The Contractor was reminded to obtain Construction Noise Permit (CNP) for PME use in restricted hours.</p> <p>The Contractor was reminded again to take sufficient noise mitigation measures to minimize the environmental impact on the nearby community as recommended in the approved EIA report and the specific mitigation measures for the complaint including but not limited to:-</p> <ul style="list-style-type: none"> • To place wooden planks or rubber 	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				mats on ground for loading and unloading heavy or metal objects; and <ul style="list-style-type: none"> • To deploy professional personnel to supervise the works. 	

**APPENDIX M
SUMMARY OF SUCCESSFUL
PROSECUTION**

Appendix M - Summary of Successful Prosecution

Date of Successful Prosecution	Details of the Successful Prosecution	Status	Follow Up
20 October 2014	The non-compliance of construction noise permit (CNP) numbered GW-RS1217-13 that use of powered mechanical equipment not permitted in the CNP on 15 March 2014 between the hours of 7p.m. and 7a.m. at Pier 72.	The subcontractor was fined.	To ensure the construction works would comply with the CNP during restricted hours, a Permit-to-work system was formulated to control daily operation of the CNPs.