Your ref -
Our ref 214487/(HY/2011/09)/M45/630/Bab bb7

ARUP

By Mail

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The Environmental Impact Assessment
Ordinance Register Office
Environmental Protection Department
27/F., Southorn Centre
130 Hennessy Road
Wan Chai
Hong Kong

For the attention of Ms HO Yuen Han, Marlene

3 April 2014

Dear Madam

HyD Contract No. HY/2011/09
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill
Quarterly EM&A Report – June 2013 to August 2013

On behalf of HyD/HZMB Project Management Office (the Permit Holder), I submit herewith three hard copies and one electronic copy of Quarterly EM&A Report for June 2013 to August 2013 in accordance with Section 16.1.3 of the Updated EM&A Manual.

I confirm that this submission package has been certified by Environmental Team Leader and verified by Independent Environmental Checker.

Yours faithfully

Michael Chan
CRE / Supervising Officer's Representative

cc	HyD/HZMBHKPMO	-	Mr K Y Yung	w/e	–	CD only
	EPD	-	Ms Connie Wong	w/e	–	one hard copy
	AFCD	-	Mr C P Lam	w/e	–	one hard copy
	ENPO	-	Mr Y H Hui	w/e	–	one hard copy and one electronic copy
	IEC	-	Mr Antony Wong	w/o	–	By fax only
	Arup	-	Mr Eric Chan	w/e	–	CD only

Response required : No, thank you
Date required : -
Attachments : Yes

MC/DS/KY/et

#05604

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Registered Number: 1312453 | Registered Address: 13 Fitzroy Street London W1T 4BQ

Ref.: HYDHZMBEEM00_0_1825L.14 02 April 2014

ARUP By Fax (3767 5922) and By Post
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.4 for June 2013 to August 2013 (Revision 3)

Reference is made to the submission of Quarterly EM&A Report No.4 for June 2013 to August 2013 version 3.0 dated 28 March 2014 certified by the ET Leader provided to us *via* email on 28 March 2014.

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,

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. H F Chan (By Fax: 3107 1388)
DCVJV – Mr. Chu Chung Sing (By Fax: 3121 6688)

Internal: DY, YH, PL, 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 2013

(Version 3.0)

Certified By

Dr. H.F. Chan
Environmental Team Leader
(Date: 28 March 2014)

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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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURE

LIST OF APPENDICES

EXECUTIVE SUMMARY

Introduction

1. This is the 2nd 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 2013.

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	3rd, 7th, 13th, 19th, 25th and 28th June 2013 4th, 10th, 16th, 22th and 26th July 2013 1st, 7th, 13th, 19th, 23rd and 29th August 2013
24-hr TSP Monitoring	
Noise Monitoring	4th, 10th, 20th and 26th June 2013 2nd, 8th, 17th , 23rd and 29th July 2013 8th, 15th , 20th and 26th August 2013
Water Quality Monitoring	3rd, 5th, 7th, 10th, 13th, 15th, 17th, 19th, 21st, 24th, 26th and 28th June 2013 2nd, 4th, 6th, 8th, 10th, 12th, 15th, 17th, 19th, 22th, 24th, 26th, 29th and 31st July 2013 3rd, 5th, 7th, 9th, 12th, 16th, 19th, 21st, 23rd, 26th, 28th and 31st August 2013
Dolphin Monitoring (Line-transect Vessel Surveys)	6th and 17th June 2013 5th and 10th July 2013 21st and 26th August 2013
(1)(2) Construction-phase underwater Noise Monitoring	11th, 12th, 15th, 16th, 17th, 18th, 19th, 22nd, 23rd and 24th July 2013
(1) (2) Dolphin Behaviour Monitoring	8th, 9th, 10th, 11th, 12th, 13th, 15th, 17th, 18th, 19th, 23rd, 24th and 29th July 2013
(1)(2)Land-based Dolphin Behaviour and Movement Monitoring	9th, 11th, 12th, 15th, 16th, 17th, 18th, 22nd, 23rd, 24th, 25th and 26th July 2013
Environmental Site Inspection	4th, 11th, 18th and 28th June 2013 2nd, 9th, 16th, 23th and 30th July 2013

	6th, 13th, 20th and 29th August 2013
Archaeological Site Inspection	18th June 2013

Remark: (1) Dolphin-related monitoring was conducted in the reporting period. According to the EM&A Manual for HKLR, the dolphin-related monitoring was conducted during the bored piling activities (e.g. installation of permanent casting for bored piling activities) which presented in **Appendix A**.

(2)30days of construction-phase underwater noise monitoring, dolphin behavior monitoring and land-based dolphin behavior and movement monitoring have been completed in July 2013 according to EM&A Manual for HKLR. No additional Land-based Dolphin Behaviour and Movement Monitoring was conducted in August 2013.

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)	4	3	0	0
Underwater Noise	RMS sound pressure level re 1μPa	0	0	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. Summary of the environmental complaints of the reporting period is tabulated in **Table III**.

Table III Summary Table for Complaints Recorded in the Reporting Period

Complaint Log Ref.	Location	Received Date	Nature of Complaint
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	Noise

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 rebar cages
- Fabrication of temporary piling platforms

WA7

- Fabrication of rebar cages
- Loading and Unloading

Land Viaduct (P85 to P114)

- Set up of water treatment system
- Set up of piling platforms
- Set up of barriers
- Site clearance
- Forming of site access
- Marine landing access establishment work
- Land piling
- Slewing the tele-communication cable and AA's COM cable
- Tree felling/transplant
- Drainage and water main diversion

- Pre-drilling work

Marine Viaduct (P0 to P84)

- Piling works for temporary jetty
- Installation of piling jacket
- Installation of permanent casings
- Installation of temporary casings
- Pile excavation by Reverse Circulation Drilling (RCD) method
- Pile excavation by Kelly method
- Pre-drilling Work
- Setting up of silt-curtain
- Platform installation for pre-drilling works and bored piling works

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 2nd Quarterly EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme in the period between June to August 2013.

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, underwater 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 issue on 9 November 2011 for HKLR to the Highways Department as the Permit Holder. Subsequently, the Director of Environmental Protection amends the Environmental Permit (No. EP-352/2009/A) based on the Application No. VEP-409/2013 and the environmental Permit (Permit No. EP-352/2009/B) was issue on 1 August 2013.

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 (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. H.F Chan	2151 2088	3107 1388

2.8 ENVIRON Hong Kong Ltd. (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 2013:

(a) Diversion to existing 1350mm drainage pipe and the 600mm water main for construction of piling works of P106 to P108 is ready but still pending for tree felling permit and works permit from AA;
(b) 2 nos. wheel washing bays in Portion C were completed and are in operation;
(c) Installation of water-filled barrier and site clearance in Portion A along seawall was commenced with 60% completed. Forming of site access along the crest of the existing seawall are in progress;
(d) Land piling for P109, P110, P111 and P112 are in progress with 1 pile at P110 concreted in June. Mobilization the 2nd set of piling machine to P112 is in progress;
(e) CCTV inspection for existing condition of drainage started but was stopped by blockage at several manhole locations;
(f) Piling Jacket and permanent casing were installed at P71, P72 & P73;
(g) Pile excavation by RCD method at P71, P72 & P73 commenced and 7 nos. concreted in June;
(h) Piling works for the temporary jetty at P69 - P70 commenced and remains in progress (15% of piling completed);
(i) Installation of permanent casing at P74 & P78;
(j) Pile excavation by Kelly method at P74 & P78 commenced with 2 nos. pile at P74 and 2 no. of pile at P78 were concreted in June;
(k) Fabrication of piling platforms in PRC: all CP1 and CP4 were completed;
(l) Installation of temporary casings for the piling platform at P19, P46 and P47 are in progress;
(m) Piling platform were installed at P20 and in progress at P19;
(n) Pile excavation down to rockhead continued at P50 & P52 in early May butrock socket excavation in Western Water was suspended during the peak dolphin calving season;
(o) Assembly of the 3rd BG40 completed in June and the 4th BG40 arrived site before end June;
(p) Spoil disposal at Tuen Mun Area 38; mud disposal to East Sha Chau and Cheung Chau South.
(q) Rebar cages prefabrication for piles is in progress at WA4 and WA7 remains in progress;
(r) Set up of the floating concrete batching plants was completed and awaiting the approval of the VEP and operating license from Maine Department. Floating concrete batching plant 1602 was mobilized to Hong Kong and moored off WA4 on 17 May 2013;
(s) Pre-assembly of launching girder LG1 and the segment unloading gantry elements into 11m sections at Portion C was completed.

July 2013:

(a) Land piling works are in progress with 5 piles concreted in Portion C in this reporting period;
(b) Piling equipment was started mobilizing to seawall in Portion A. Water treatment system is on site;
(c) Installation of piling platform along seawall is in progress and 4 nos. of platforms will be completed in this reporting period;
(d) First batch of formworks for column of land viaduct was delivered to Portion C. Trial panel will be fabricated;
(e) Diversion to existing 1350mm drainage pipe and the 600mm water main for construction of piling works of P106 to P108 is ready but still pending for tree felling permit and works permit from AA;
(f) Installation of water-filled barrier and site clearance in Portion A along seawall was commenced with 70% completed. Forming of site access along the top of the existing seawall are in progress;
(g) One wheel washing bay for hual road at Portion A (near SE Quay) was completed and in use;
(h) Tracing of AA COM cables alignment and terminals was completed. A report will be submitted;
(i) Marine landing access establishment work near P82 was commenced;
(j) Piling works for the temporary jetty at P69 - P70 continued and 32% of piling completed;
(n) Pile excavation by RCD method at P53 was commenced and down to rockhead continued at P50, P72 & P73 in July;
(o) 14 nos. piles excavation by RCD method were concreted in July 13;
(p) Pile excavation by Kelly method at P74, P78, P0 and P20. 3 nos. pile at P74, 5 no. of pile at P78 and 1 no. of pile at P0 were cast in July;
(q) Temporary piles for P46, P47 were extracted;
(r) Installation of temporary casings for the piling platform at P43 and P45 are in progress;
(s) Piling platform at P19 was installed;
(t) 4th BG arrived and installation at P20 was completed.

August 2013:

Land Viaduct (P84 to Eastern Abutment) and Preparation Works

(a) Land piling works are in progress with 5 and 1 no of pile concreted in Portion C and Portion A respectively.
(b) Formation of piling platform along seawall is in progress. 10 nos. of platform (P98 to P107) were completed in this reporting period. Three other platforms (P95 to P97) were being filled up to level of +3mPD.
(c) First two batches of steel formworks for column of land viaduct were delivered to Portion C.
(d) Setting up of water-filled barrier along edge of carriageway at Portion A was completed. Site clearance was also completed except for areas pending for tree felling. Formation of site access along the top of the existing seawall is in progress.
(e) Telecommunication cable slewing (near P113) was completed. Concrete surround will be completed.
(f) Tracing of AA COM cables alignment and terminals was completed with report submitted. Cable terminals were also checked in the survey.

(g) Marine landing access establishment work near P82 is in progress.
(h) Diversion to existing 1350mm drainage pipe and the 600mm water main for construction of piling works of P106 to P108 is ready but still pending for tree felling permit with the Works Permit from AA received.

Marine Viaduct (P0 - P84)

(i) Piling works for the temporary jetty at P69 - P70 continued and remains in progress (57% of piling completed); Steel structure erection was started (6% completed);
(j) Installation of temporary casings at P47R, P71L & P54R is in progress.
(k) Piling Jacket were installed at P47L & P71L;
(l) Permanent casing were installed at P47R, P54R, P71L & P53R;
(m) Pile excavation by RCD method at P47, P50, P53, P54 and P71 in this reporting period with 11 piles concreted;
(n) 11 nos. piles using RCD method were concreted in this reporting period;
(o) Finished dismantle jacket at P52 & P50;
(p) Sonic Test carried out at P50L;
(q) Installation of piling platform at P43 and P45 were completed
(r) Installation of permanent casing at P43 was completed and is on-going at P19 & P45;
(s) Installation of temporary piles for piling platform at P16 was completed and is on-going at P40;
(t) Piling platforms at P74 and P78 were removed;
(u) Pile excavation by Kelly method at P0, P20, P43, P48 and P49 in this reporting period with 15 piles concreted;
(v) Progress of pile construction at P0 was affected by difficult ground conditions encountered, further investigation is required;
(w) Sonic test for the completed piles at P78 had been carried out.

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	• 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	• 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	--
	Construction-phase Underwater Noise	10 days from the start of the bored piling activities for the first three pier sites during the bored piling process in the first three sits in the waters to the west of Airport	R1 and R2	10 days underwater noise monitoring at first two pier sites was conducted during the bored piling activities in the reporting period

	Dolphin Behaviour Monitoring (Acoustic)	During bridge construction	West Lantau	12 days Dolphin Behaviour Monitoring was conducted during the bored piling activities in the reporting period
	Land-based Dolphin Behaviour and Movement Monitoring	30 days from the start of bored piling activities at the three pier sites	Sham Wat	13 days Land-based Dolphin Behaviour and Movement Monitoring was conducted during the bored piling activities in the reporting period

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, µg/m^3	Limit Level, µg/m^3
AMS1	381	500
AMS4	352	

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

Location	Action Level, µg/m^3	Limit Level, µg/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	***5.0***	***4.2*** except 5 for FCZ
	Bottom	***4.7***	***3.6***
Turbidity (NTU)	Depth average	***27.5*** and 120% of upstream control station's turbidity at the same tide of the same day	***47.0*** and 130% of turbidity at the upstream control station at the same tide of same day
Suspended Solids (mg/L)	Depth average	***23.5*** and 120% of upstream control station's SS at the same tide of the same day	***34.4*** 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 that 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)

Table 3.2f Action and Limit Levels for Underwater Construction Noise

Action Level	**Limit Level**
170 dB re 1μPa	180 dB re 1μPa

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 in according to the approved Acoustic Decoupling Measures Plan.

3.9 Dolphin exclusion zone was implemented by ET's trained dolphin observer in accordance with EP Condition 3.4. In addition, 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 (18th June 2013). 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/m3)		Action Level, µg/m^3	Limit Level, µg/m^3
		Average	Range		
June 2013	AMS1	51	17 - 86	381	500
	AMS4	57	18 - 99	352	
July 2013	AMS1	33	15 - 51	381	
	AMS4	37	23 - 56	352	
August 2013	AMS1	44	19 - 103	381	
	AMS4	44	19 - 68	352	

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

Month	Monitoring Station	Concentration (µg/m3)		Action Level, µg/m^3	Limit Level, µg/m^3
		Average	Range		
June 2013	AMS1	29	11 - 49	170	260
	AMS4	31	19 - 48	171	
July 2013	AMS1	15	6 - 20	170	
	AMS4	18	8 - 25	171	
August 2013	AMS1	25	9 - 50	170	
	AMS4	31	18 - 52	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	N/A
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 2013	NMS1	70	65 – 72	75 dB(A)
	NMS4	63	52 – 68	
July 2013	NMS1	68	64 – 69	
	NMS4	58	56 – 59	
August 2013	NMS1	71	69 – 72	
	NMS4	60	50 – 62	

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 near by 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 2013, 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 191.00 km of survey effort was collected, with 96.6% 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 126.37 km, while the effort on secondary lines was 64.63 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-1**.

4.10 During the six sets of monitoring surveys in June to August 2013, a total of 53 groups of 182 Chinese White Dolphins were sighted. All except seven sightings were made during on-effort search. Thirty-three on-effort sightings were made on primary lines, while another 13 on-effort sightings were made on secondary lines. Summary table of the dolphin sightings is shown in **Appendix II of Appendix F-1**.

Distribution

4.11 Distribution of dolphin sightings made during monitoring surveys in June to August 2013 is shown in **Figure 1 of Appendix F-1**. The dolphin groups were evenly distributed throughout the WL survey area, with higher concentrations near Kai Kung Shan, Peaked Hill and Fan Lau. It appeared that more dolphins were sighted in the southern portion of the survey area, and they were mostly absent from the inshore waters between Tai O Peninsula and Kai Kung Shan.

4.12 The sighting distribution of dolphins in the present quarter was largely similar to the one during baseline period, but it appears that more dolphins were sighted in the southern portion of WL survey area, especially between Peaked Hill and Fan Lau, in the present quarter.

4.13 Notably, quite a few sightings were made in the vicinity of western portion of the HKLR09 alignment in WL survey area. When examining the HKLR03 dolphin sighting data collected during the same quarter, dolphins also occurred along and near the eastern portion of the HKLR09 alignment in NWL survey area (**Figure 2 of Appendix F-1**). It appeared that dolphins occurred as frequently in the impact phase monitoring period as in the baseline monitoring period, and their distribution was not affected by the HKLR09 construction activities in the present quarter.

Encounter rate

4.14 During the three-month impact phase monitoring period, the encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data from the primary transect lines under favourable conditions (Beaufort 3 or below) from West Lantau survey area are shown in **Table 4.6**. The average encounter rates deduced from the six sets of surveys from June to August 2013 were also compared with the ones deduced from the baseline monitoring period (September – November 2011) (**Table 4.7**).

4.15 In WL survey area, the average dolphin encounter rates (both STG and ANI) in the present three-month study period were 63.7% and 56.7% higher than the ones recorded in the 3-month baseline period respectively, indicating the dolphin usage during this impact phase monitoring period in this survey area was even more intensive than during the baseline phase.

Table 4.6 Dolphin encounter rates (sightings per 100 km of survey effort) during the impact monitoring period (June - August 2013)

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 6, 2013)	17.9	35.9
	Set 2 (June 17, 2013)	21.2	52.9
	Set 3 (July 5, 2013)	38.7	159.5
	Set 4 (July 10, 2013)	35.8	153.5
	Set 5 (August 21, 2013)	9.3	41.7
	Set 6 (August 26, 2013)	38.5	125.0

Table 4.7 Comparison of average dolphin encounter rates from impact monitoring period (June – August 2013) 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 2013	September-November 2011	June - August 2013	September-November 2011
West Lantau	26.89 ± 12.46	16.43 ± 7.70	94.75 ± 57.61	60.50 ± 38.47

(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)

4.16 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 (second quarter of the impact phase), the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.111 and 0.965 respectively. Therefore, no significant difference in dolphin encounter rate was detected between the baseline period and the present quarter.

4.17 To facilitate the comparison with the AFCD long-term monitoring results, the encounter rates were also calculated for the present quarter (June-August 2013) using both primary and secondary survey effort. The encounter rates of sightings (STG) and dolphins (ANI) in WL were 24.9 sightings and 87.8 dolphins per 100 km of survey effort respectively.

Group size

4.18 Group size of Chinese White Dolphins ranged from 1-16 individuals per group in WL survey area between June and August 2013. The average dolphin group sizes from these three months were compared with the one deduced from the baseline period in September to November 2011, as shown in **Table 4.8**. The average dolphin group size in the WL region during June to August 2013 was slightly smaller than the ones recorded in the 3-month baseline period (**Table 4.8**).

Table 4.8 Comparison of average dolphin group sizes from impact monitoring period (June - August 2013) and baseline monitoring period (September-November 2011)

	Average Dolphin Group Size	
	June-August 2013	**September-November 2011**
West Lantau	3.43 ± 2.96 (n = 53)	3.63 ± 2.97 (n = 46)

4.19 Distribution of dolphins with larger group sizes (more than 5 animals per group) during June through August 2013 is shown in **Figure 3 of Appendix F-1**. These larger dolphin groups were mostly sighted near the HKLR09 alignment or toward the southern portion of WL survey area (**Figure 3 of Appendix F-1**). This was different from the baseline period, where more dolphin sightings with larger group sizes occurred near Tai O Peninsula.

Habitat use

4.20 From June to August 2013, the most heavily utilized habitats by the dolphins mainly concentrated near HKLR09 alignment, Kai Kung Shan, Peaked Hill and Fan Lau (**Figures 4a and 4b of Appendix F-1**). However, it should be noted 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.

4.21 When compared with the habitat use pattern recorded during the baseline period, it appears that dolphin densities were higher along and adjacent to the HKLR09 alignment as well as Fan Lau during the present impact phase monitoring period (**Figure 5 of Appendix F-1**). On the other hand, their densities were lower near Tai O Peninsula during the present quarter, where dolphin densities were the very high during the baseline period.

Mother-calf pairs

4.22 During the three-month impact phase monitoring period, a total of five unspotted calves and five unspotted juveniles (UJ) were sighted in WL survey area. These young calves comprised only 5.5% of all animals sighted, which was slightly lower to the percentage recorded during the baseline monitoring period (6.6%).

4.23 These young calves mainly occurred near the HKLR09 alignment, and scattered in the central and southern portions of WL survey area. Such distribution was different from the baseline period, where more frequent occurrence of calves near Tai O Peninsula was found (**Figure 6 of Appendix F-1**).

Activities and associations with fishing boats

4.24 A total of six and two dolphin sightings were associated with feeding and socializing activities respectively during the three-month impact monitoring period, comprising of 3.3% and 1.1% of the total number of dolphin sightings. Both percentages were much lower than the percentages recorded during the baseline period (feeding activity: 13.0%; socializing activity: 6.5%). The very low occurrence of these two activities recorded in the present quarter is of concern, and should be continuously monitored in the upcoming months.

4.25 Distribution of dolphins engaged in different activities during the three-month study period is shown in **Figure 7 of Appendix F-1**. The feeding and socializing activities were scattered in the northern and southern portions of WL survey area. This was very different from the baseline period, when most feeding and socializing activities were concentrated in the middle portion of the survey area between Tai O Peninsula and Kai Kung Shan (**Figure 7 of Appendix F-1**).

4.26 During the three-month period, only one sighting of a lone dolphin was found to be associated with an operating purse-seiner, comprising of 1.9% of all dolphin groups. This was much lower than the percentage recorded in baseline period (6.5%) in which all three sightings were associated with operating pair-trawlers. The exceptionally low percentage of fishing boat association during the present and previous impact phase monitoring quarters was probably related to the recent trawl ban being implemented in 2013 in Hong Kong waters.

Summary of photo-identification works

4.27 From June to August 2013, over 2,000 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.

4.28 In total, 48 individuals sighted 56 times altogether were identified (see summary table in **Appendix III of Appendix F-1** and photographs of identified individuals in **Appendix IV of Appendix F-1**). Most identified individuals were sighted only once or twice during the three-month period, with the exception of three individuals being sighted thrice (WL25, WL68 and WL124).

4.29 During the three-month period, eight females, including CH113, NL123, WL60, WL100, WL120, WL124, WL145 and WL159, were sighted to be accompanied with their calves during their re-sightings.

Individual range use

4.30 Ranging patterns of the 48 individuals identified during the three-month study period were determined by fixed kernel method, and are shown in **Appendix V of Appendix F-1**.

4.31 Among these 48 individuals, some of them were sighted near the HKLR09 alignment during the present impact monitoring period, and these individual dolphins focused their range use in either North Lantau waters (e.g. NL123, NL188, NL261, L296) or West Lantau waters (e.g. SL47, WL49, WL120, WL124)

4.32 Notably, the ranging patterns of several individuals (e.g. CH38, SL05, SL40, WL130) do not overlap with the HKLR09 alignment at all, but mostly located around the southwestern side of Lantau Island. It is likely that the impact of HKLR09 construction activities will be minimal to these individuals during the impact phase.

Conclusion

4.33 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, and the dolphin occurrence in West Lantau survey area remained the same as in the baseline period.

4.34 Nevertheless, dolphin usage in WL region should be continuously monitored, to examine whether it will be affected by the on-going construction activities in relation to the HZMB works.

Construction-phase Underwater Noise Monitoring

4.35 The noise monitoring results are summarized in **Table 4.9**. Detailed monitoring results and graphical presentations of noise monitoring are shown in **Appendix F-2**. The averaging period was in general from 9am to 6pm, depending on the availability of the data as the monitoring might have temporarily paused due to bad weather or to give way for barge movement.

Table 4.9 Summary Table of Underwater Noise Monitoring Results during the Reporting Quarter

Date	Pier No.	Station	Underwater Noise (dB re 1μPa)			Period
			Max	Average	Min	
11-Jul-13	0	R3	156.8	139.8	117.7	10-18
12-Jul-13	0	R3	164.6	139.7	115.4	9-18
15-Jul-13	0	R3	161.6	135.3	119.7	9-18
16-Jul-13	0	R3	153.9	133.6	120.5	9-18
17-Jul-13	0	R3	149.8	134.4	120.1	9-18
18-Jul-13	0	R3	149.9	138.4	122.5	9-18
19-Jul-13	0	R3	159.1	138.8	120.3	9-18
22-Jul-13	0	R3	155.2	140.0	122.2	9-18
23-Jul-13	0	R3	154.8	141.9	122.4	9-18
24-Jul-13	0	R3	155.1	141.2	120.8	9-18

Remarks: All underwater noise monitoring was conducted during the bored piling activities
Frequency: 70 Hz – 125 kHz

Dolphin Behaviour Monitoring (Acoustic)

4.36 In July 2013, a total of 12 days of acoustic monitoring surveys were conducted on the 9th, 11th, 12th, 15th, 16th, 17th, 18th, 22nd, 23rd, 24th, 25th and 26th, when bored piling activities were concurrently conducted. During those dates, 783.8 km of survey effort were conducted to search for dolphins in the western and northwestern waters of Lantau. A total of 46 groups, numbering 170 dolphins, were sighted during these surveys. In addition, 52 sound samples with 4.2 hours of recordings were taken from some of these dolphin groups.

Land-based Dolphin Behaviour and Movement Monitoring

4.37 In July 2013, a total of 13 sessions with 74.1 hours of theodolite tracking were conducted from Shum Wat shore-based station on the 8th, 9th, 10th, 11th, 12th, 13th, 15th, 17th, 18th, 19th, 23rd, 24th and 29th, when bored piling activities were concurrently conducted. More than 93% of effort was conducted in favourable weather conditions during those days. Dolphins were successfully tracked from shore on 12 of the 13 days of efforts, and a total of 57 dolphin groups were tracked. A total of 1,536 fixes of their positions were collected, and another 2,174 fixes were also made from locations of various vessels (e.g. fishing boats, high-speed ferries), to examine the level of vessel traffic in the study area.

4.38 30days of construction-phase underwater noise monitoring, dolphin behavior monitoring and land-based dolphin behavior and movement monitoring have been completed in July 2013 according to EM&A Manual for HKLR. Results analysis is being undertaken and the final results will be provided in a separate report in September 2013 tentatively.

Advice on the Solid and Liquid Waste Management Status

4.39 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.

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

Noise

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

Water Quality

5.4 There are 4 Action Level exceedances and 3 Limit Level exceedances were recorded for suspended solids.

5.5 According to the investigation, no pollution discharge from the marine works and no exceedances were recorded at the impact stations (i.e. IS1 to IS4) which are close to construction site. In addition, sediment plume due to natural fluctuation of shallow water was observed and water quality mitigation measures such as casing and silt curtains were properly implemented. Therefore, all exceedances are considered not due to the Contract.

Construction-phase Underwater Noise Monitoring

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

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**. All investigation reports for complaint of the Contract have been submitted to summarize the investigation results. The summary of environmental complaints is presented in **Table 5.1**.

Table 5.1 Summary of Environmental Complaints in the Reporting Period

Complaint Log Ref.	Location	Received Date	Nature of Complaint
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	Noise

Summary of Notification of Summons and Successful Prosecution

5.9 There was no prosecution or notification of summons received since the Contract commencement.

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 2013 in accordance with EM&A Manual.

6.2 No Action/Limit Level exceedance was recorded for air quality, noise and underwater noise.

6.3 For water quality monitoring, there are 4 Action Level exceedances and 3 Limit Level exceedances were recorded for suspended solids.

6.4 According to the investigation, no pollution discharge from the marine works and no exceedances were recorded at the impact stations (i.e. IS1 to IS4) which are close to construction site. In addition, sediment plume due to natural fluctuation of shallow water was observed and water quality mitigation measures such as casing and silt curtains were properly implemented. Therefore, 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, and the dolphin occurrence in West Lantau survey area remained the same as in the baseline period.

6.6 Environmental site inspection was conducted on 4th, 11th, 18th and 28th June 2013, 2nd, 9th, 16th, 23rd and 30th July 2013, 6th, 13th, 20th and 29th August 2013 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 18th June 2013. No access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment was observed.

6.8 There were one environmental complaint, no 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

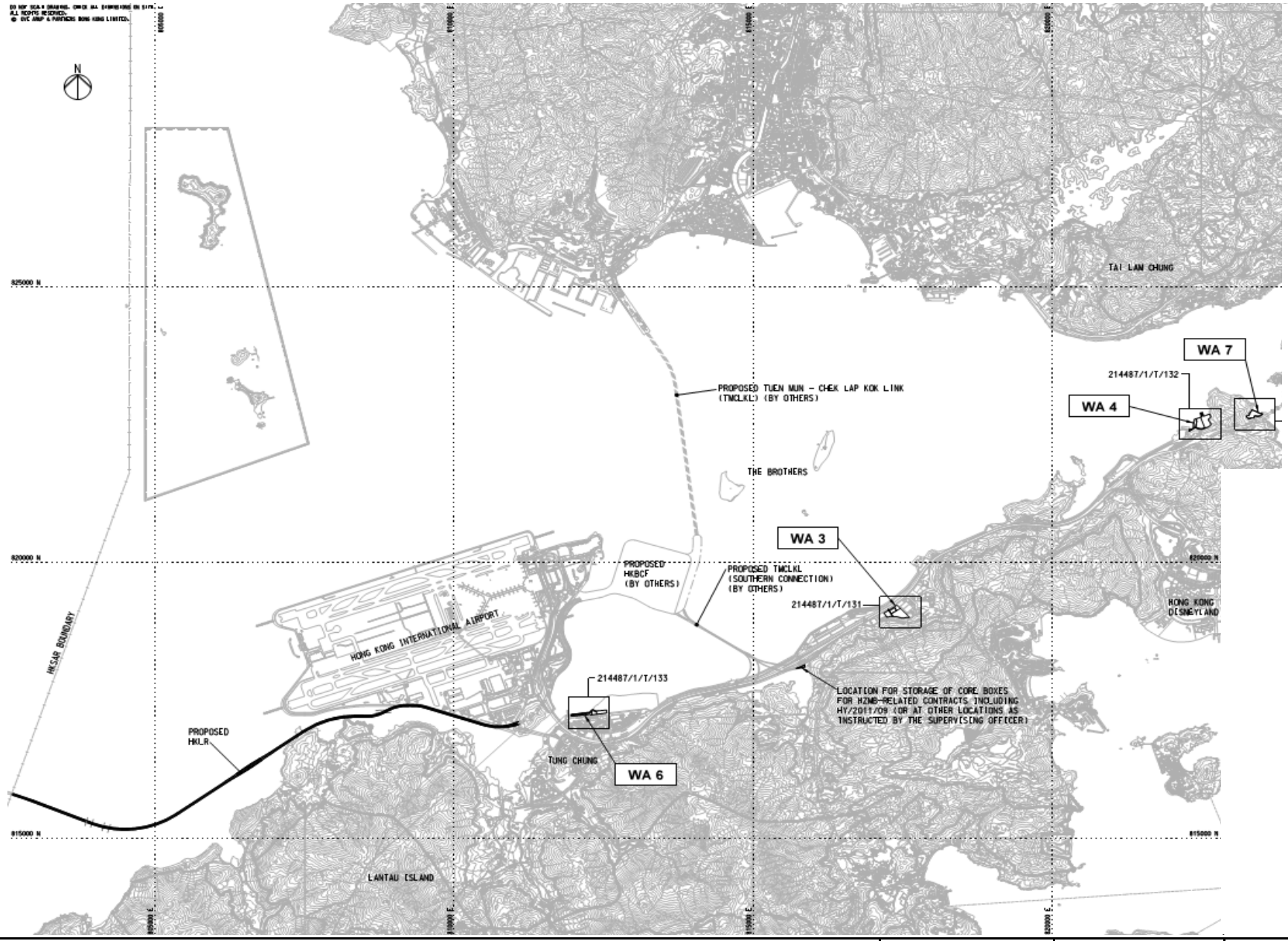
- To implement Spill Response Plan in the event of accidential spillage of or other hazardours chemicals.
- To implement Dolphin Exclusion Zone during the installation of bored pile casing located in the waters to the west of Airport.
- To implement Dolphin Watching Plan after the bored piling casing 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.

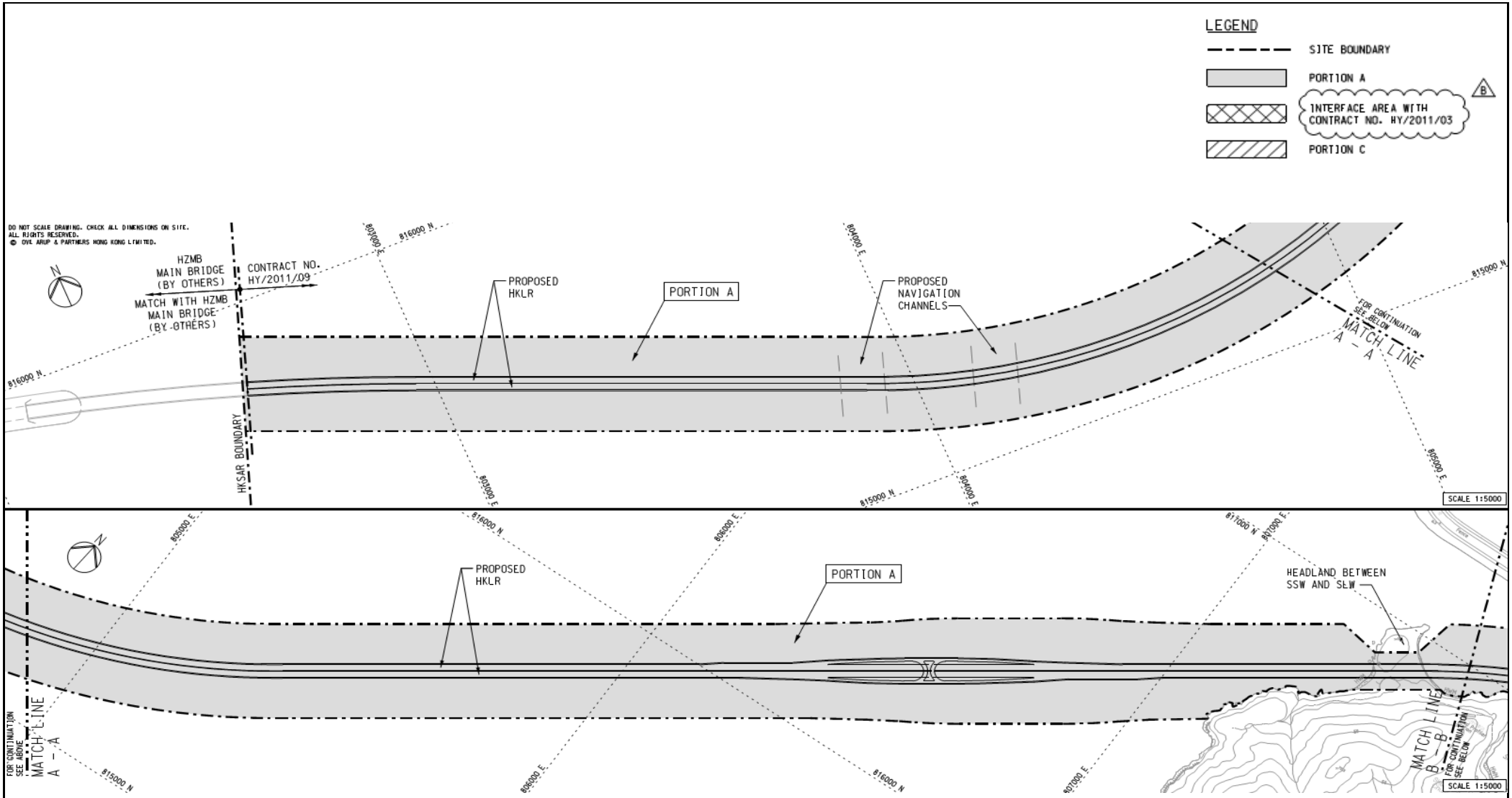
- To avoid improper handling or storage of oil drum on site.

FIGURE(S)



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 Date: Feb-13	Proposa No. MA12014 Figure: 1a

CINOTECH



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 (Portion A)	Scale: N.T.S Date: May-13	Proposa No.: MA12014 Figure: 1b

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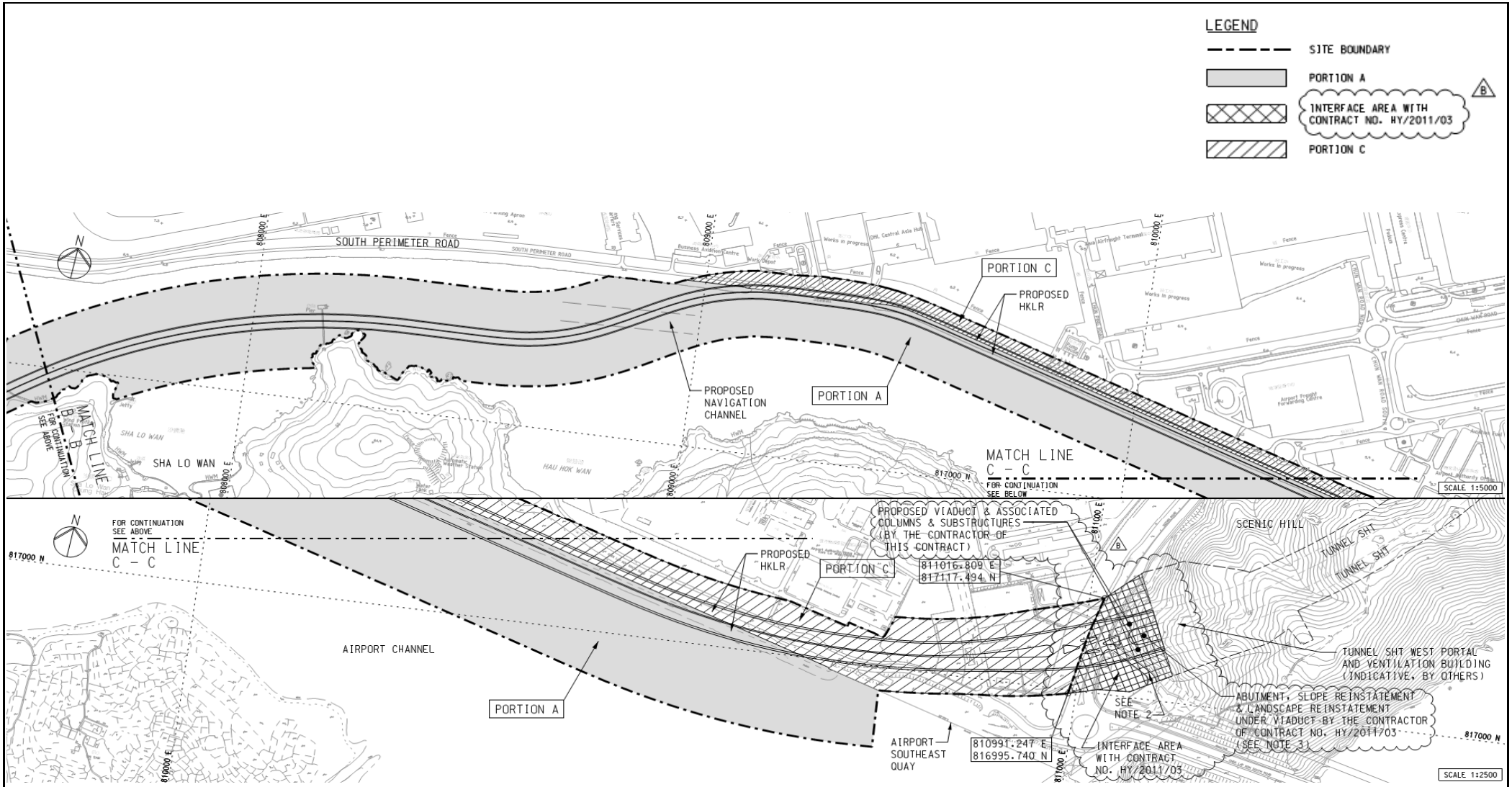
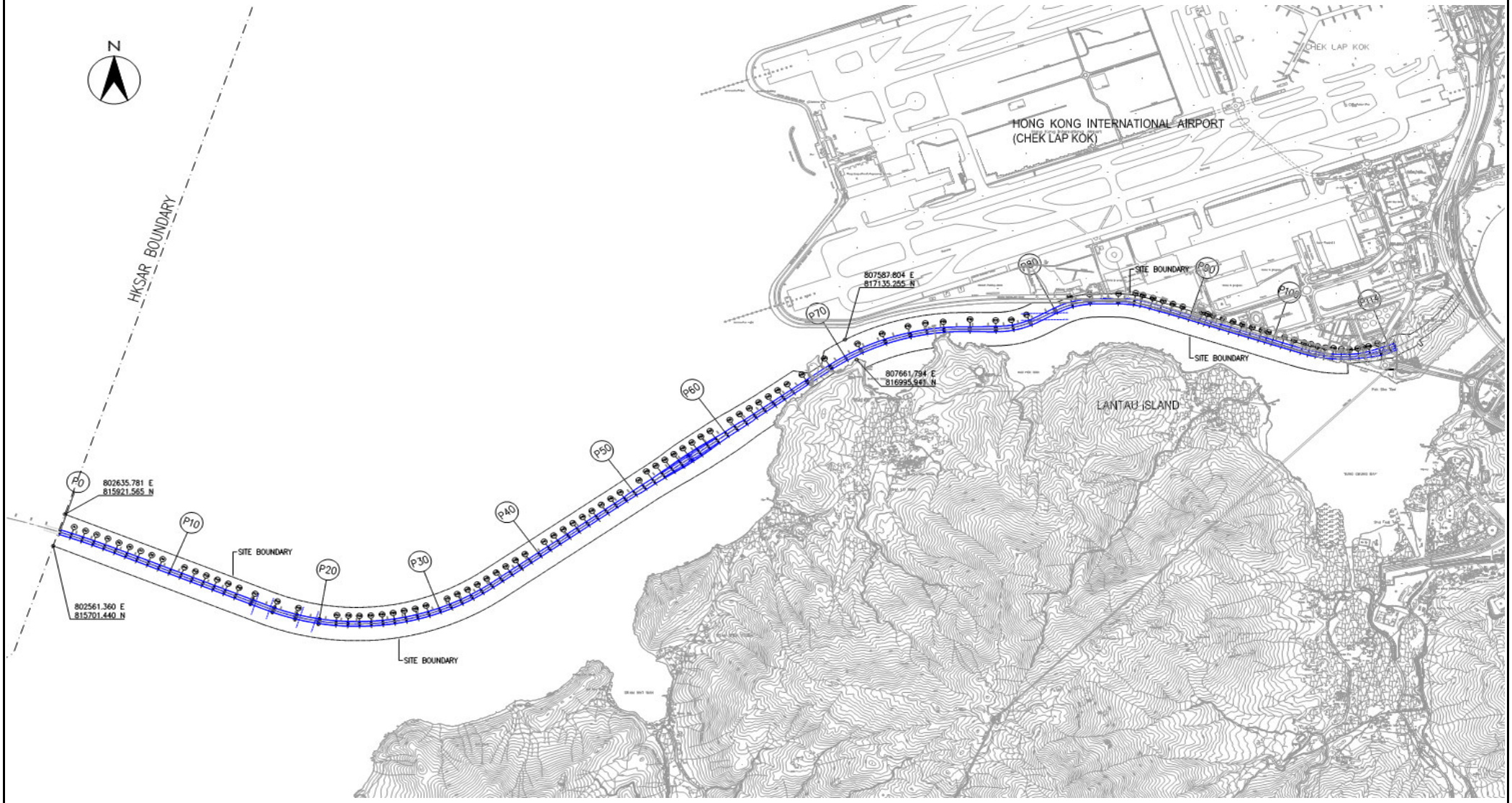


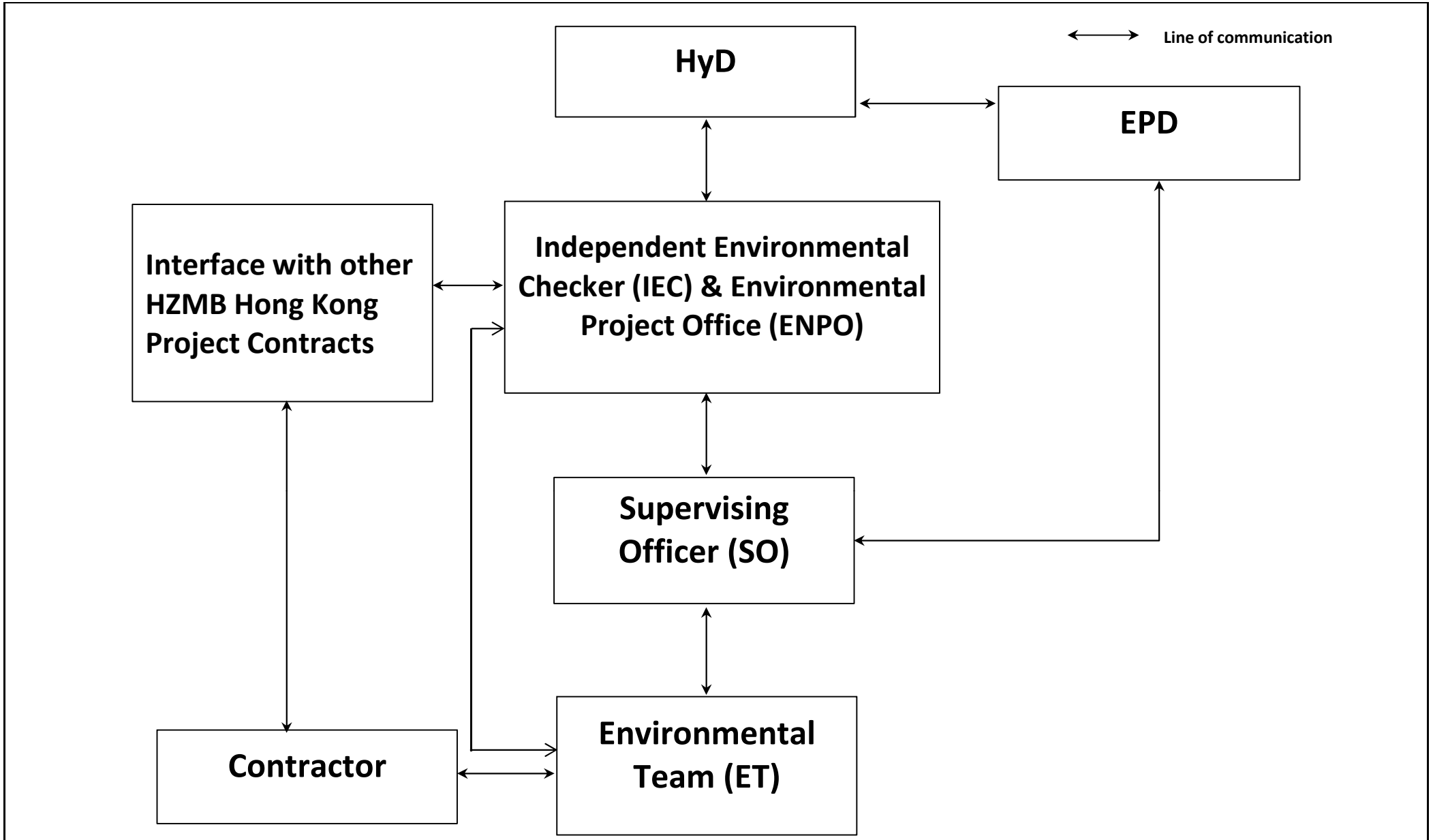
Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Site Layout Plan (Portion A and C)	Scale N.T.S Date May-13	Proposa No. MA12014 Figure 1c

CINOTECH

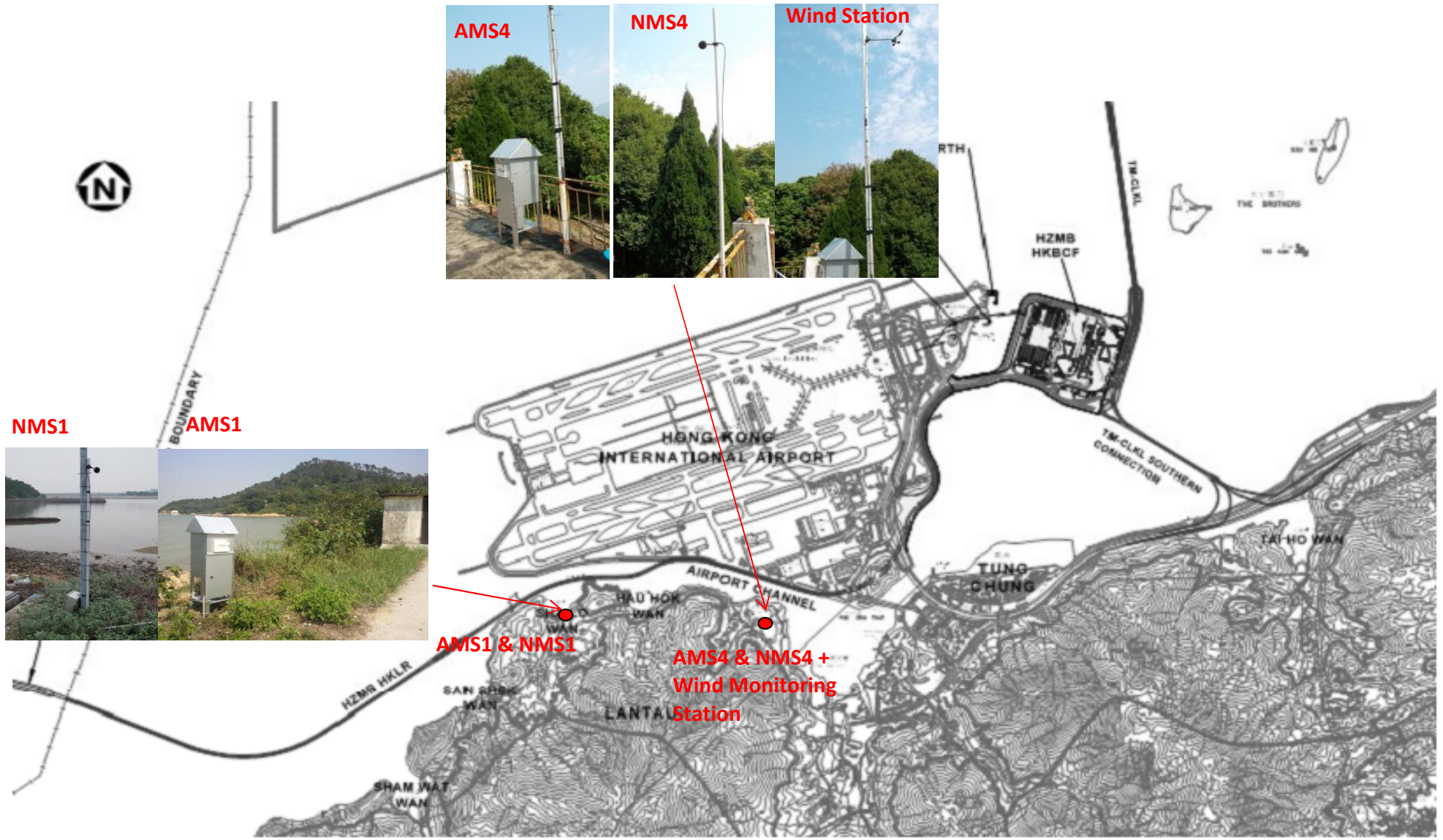


Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Site Layout Plan (Pier(s) Site)	Scale: N.T.S Date: Feb-13	Proposa No. MA12014 Figure: 1d

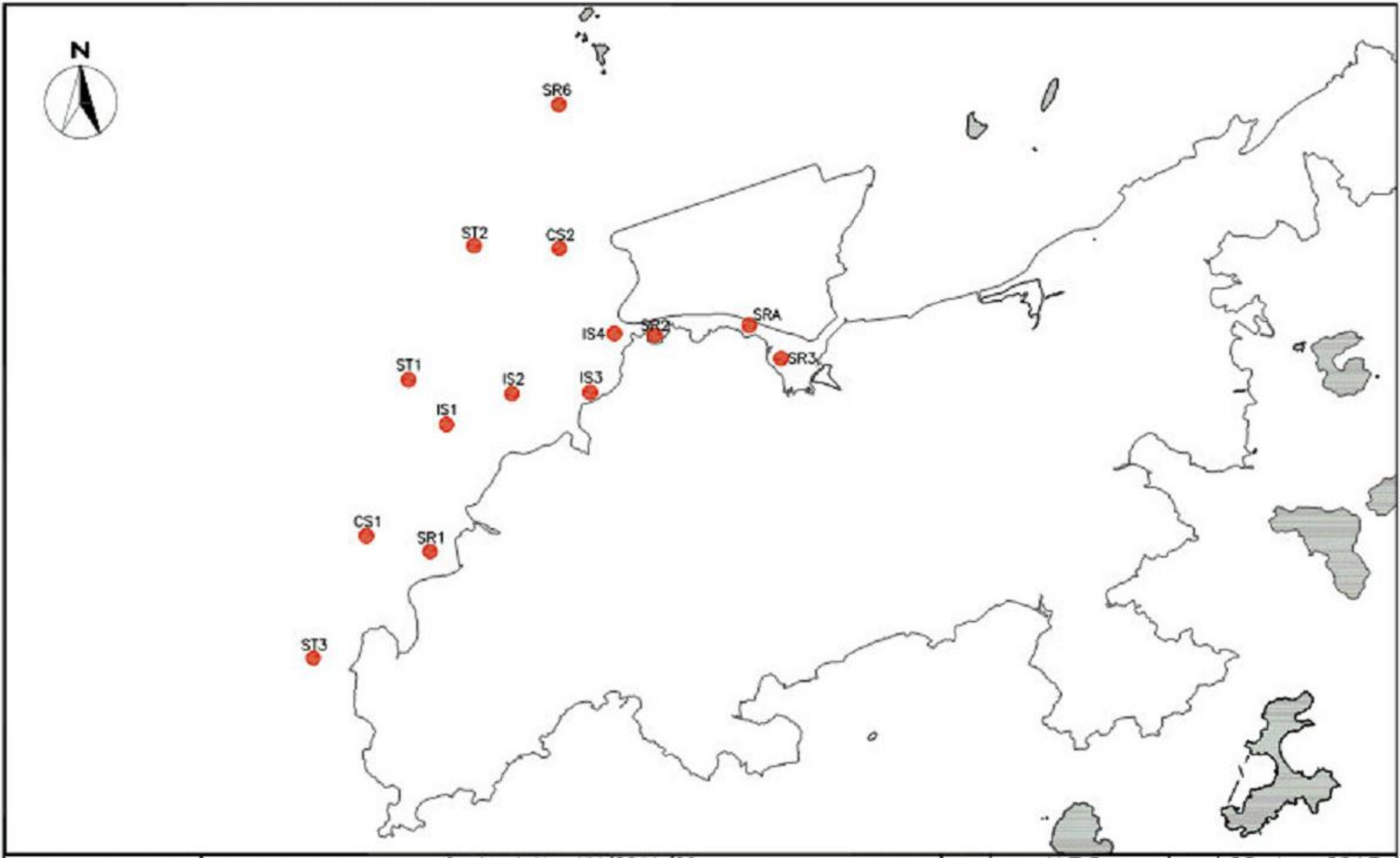
CINOTECH



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	Proposa No. MA12014 Figure 2	CINOTECH



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

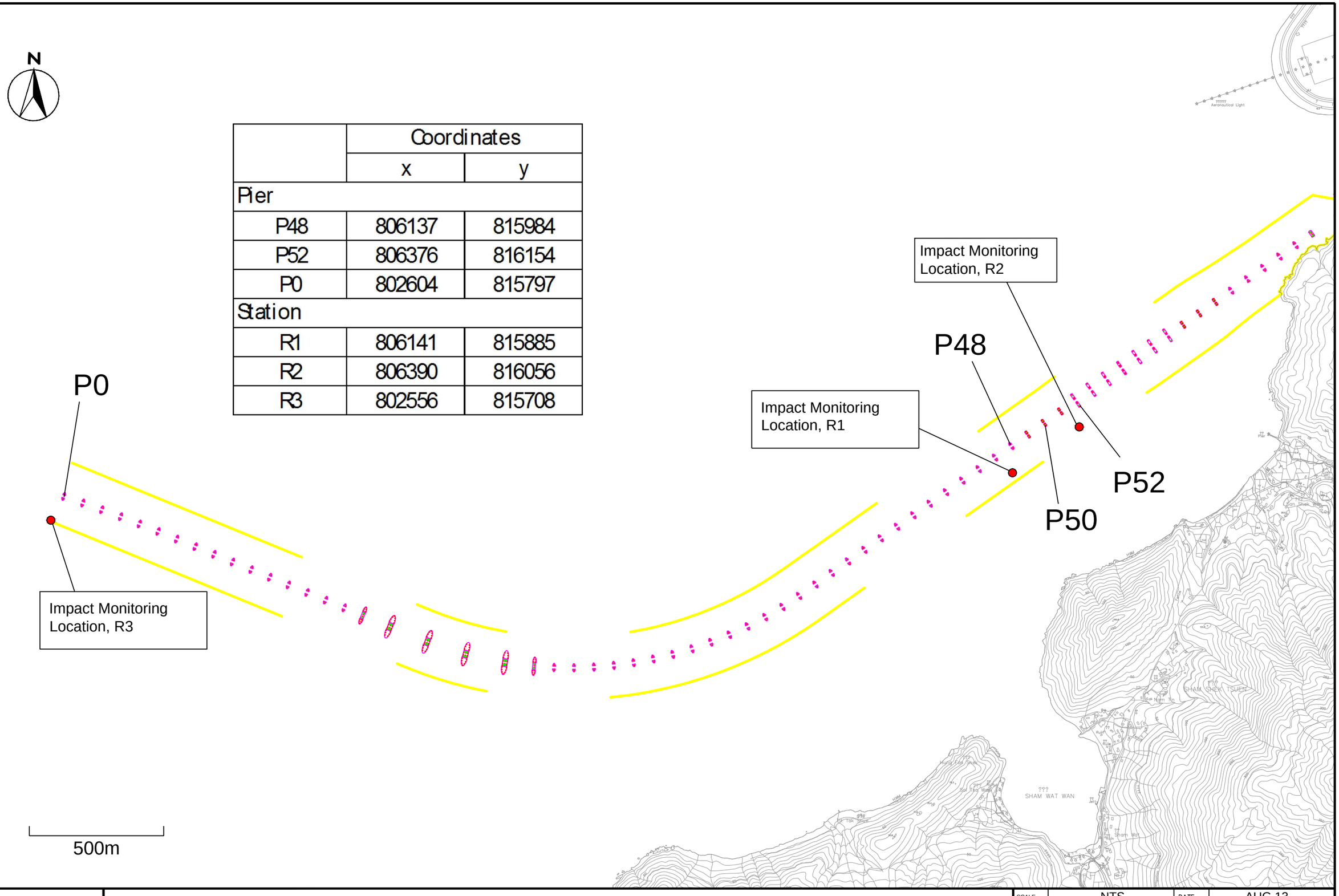


CINOTECH
Cinotech Consultants Limited

Contract No. HY/2011/09
Hong Kong–Zhuhai–Macao Bridge Hong Kong Link Road – Section Between HKSAR Boundary and Scenic Hill
Locations of Marine Water Quality Monitoring Stations

SCALE	N.T.S	DATE	28 Jan 2013
CHECK	PC	DRAWN	IT
PROJECT NO.	MA12014	FIGURE NO.	4
		REV	–

	Coordinates	
	x	y
Pier		
P48	806137	815984
P52	806376	816154
P0	802604	815797
Station		
R1	806141	815885
R2	806390	816056
R3	802556	815708

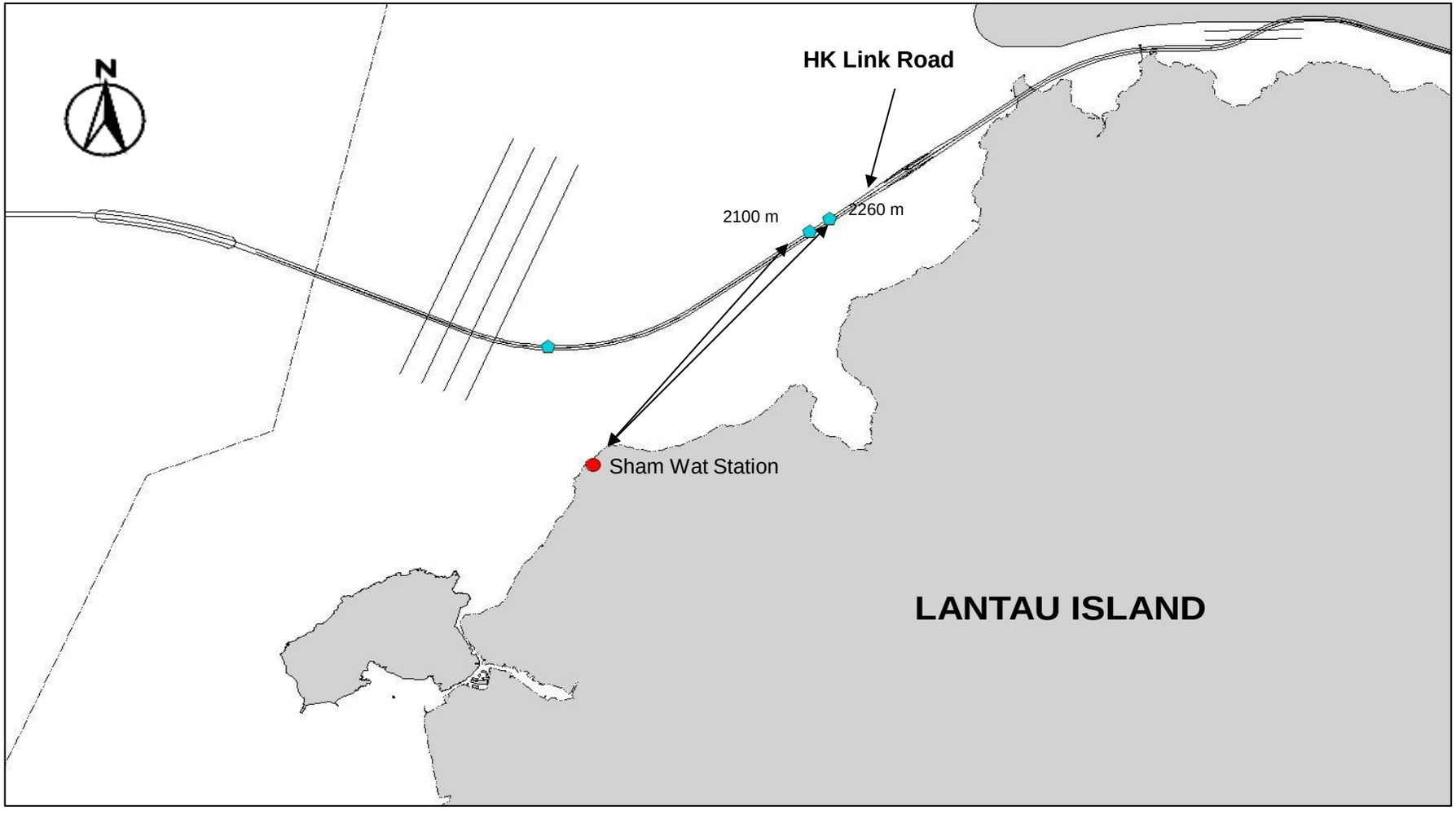


Contract No. HY/2011/09 Hong Kong Link Road - Section between HKSAR Boundary & Scenic Hill

Location of Underwater Noise Monitoring Stations

Cinotech Consultants Limited

SCALE	NTS	DATE	AUG 13
CHECK	KW	DRAWN	BC
JOB No.	MA12014	DRAWING No. 5	REV -



Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Location of Land-based Dolphin Behaviour and Movement Monitoring Station	Scale: N.T.S Date: Apr-13	Project No.: MA12014 Figure: 6

CINOTECH

APPENDIX A
CONSTRUCTION PROGRAMME

Bored Piling Activities at P0, P48, P50 & P52 conducted in July 2013

Date	Location	Bored Piling Activities
8-Jul-13	Pier 0	P0-R1 Bored pile excavation works by BG40.
	Night	P0-R1 Excavation works reached Founding Level by BG40.
		P0-L3 Excavation works by BG40.
	Pier 50	Excavation for bored pile P50-R2 by RCD.
		Splicing of permanent casing to bored pile P50-R3.
	Night	Set up RCD to bored pile P50-R1.
	Pier 52	Set up RCD to bored pile P52-L4.
		Excavation for bored pile P52-L1 by RCD.
	Night	Set up RCD to bored pile P52-L4.
		Excavation for bored pile P52-L1 by RCD.
9-Jul-13	Pier 0	P0-R1 Air-lifting & preparation work for Koden test.
	Night	Tidy up and maintenance drilling bit.
	Pier 50	Excavation for bored pile P50-R1 by RCD.
		Set up RCD to bored pile P50-R3.
	Night	Excavation for bored pile P50-R1 by RCD.
		Set up RCD to bored pile P50-R3.
	Pier 52	Set up RCD and excavation for bored pile P52-R4.
	Night	Installation of steel cage for bored pile P52-L4.
10-Jul-13	Pier 0	P0-R1 Remedial works
	Night	Tidy up and maintenance drilling bit.
	Pier 50	Excavation for bored pile P50-R4 by RCD.
	Night	Excavation for bored pile P50-R4 by RCD.
	Pier 52	Concreting to bored pile P52-L4.
	Night	Excavation for bored pile P52-R4 by RCD.
		Shifting of RCD from bored pile P52-R4 to P52-R2.
		Concreting to bored pile P52-L4.
11-Jul-13	Pier 0	P0-R1 placing concrete for Remedial works.
	Night	P0-R1 placing concrete for Remedial works.
		Tidy up and maintenance work.
	Pier 50	Excavation for bored pile P50-R4 by RCD.
		Splicing of permanent casing to bored pile P50-R2.
	Night	Excavation for bored pile P50-L1 by RCD.
	Pier 52	Air-lifting, Koden test and installation of steel cage for bored pile P52-R4.
	Night	Installation of steel cage for bored pile P52-R4.
12-Jul-13	Pier 0	P0-R1 Remedial works
	Night	Tidy up and maintenance work.
	Pier 50	Excavation for bored pile P50-L1 by RCD.
	Night	Excavation for bored pile P50-L1 by RCD.
	Pier 52	Installation of steel cage and concreting to bored pile P52-R4.
	Night	Concreting to bored pile P52-R4.
		Excavation for bored pile P52-L1 by RCD.
13-Jul-13	Pier 0	Tidy up & maintenance on CP1 platform.
	Night	P0-L3 excavation works by BG40.
	Pier 50	Installation of steel cage for bored pile P50-R4.
	Night	No site activity.
	Pier 52	Excavation for bored pile P52-L1 by RCD.
	Night	Excavation for bored pile P52-R2 by RCD.
14-Jul-13	Pier 0	No site activity on Sunday.
	Night	No site activity on Sunday.
	Pier 50	Installation of steel cage for bored pile P50-R4.
	Night	Installation of steel cage for bored pile P50-R4.
	Pier 52	No site activity on Sunday.
	Night	No site activity on Sunday.

Bored Piling Activities at P0, P48, P50 & P52 conducted in July 2013

Date	Location	Bored Piling Activities
15-Jul-13	Pier 0	P0-R1 excavation works by BG40.
	Night	P0-R1 excavation works by BG40.
	Pier 50	Installation of steel cage and concreting to bored pile P50-R4.
	Night	Concreting to bored pile P50-R4.
		General cleaning and tidying on barge.
	Pier 52	Excavation for bored pile P52-R2 by RCD.
	Night	Installation of steel cage for bored pile P52-L1.
16-Jul-13	Pier 0	P0-L3 excavation works by BG40.
		P0-R1 placing concrete for Remedial works.
	Night	Tidy up and maintenance drilling bit.
	Pier 50	Installation of steel cage for bored pile P50-L1.
		Set up RCD to bored pile P50-R1.
	Night	Installation of steel cage for bored pile P50-L1.
	Pier 52	Installation of steel cage and concreting to bored pile P52-L1.
	Night	Concreting to bored pile P52-L1.
		Set up RCD to bored pile P52-R2.
17-Jul-13	Pier 0	P0-L3 excavation works by BG40.
		P0-R1 Re-excavation works for infill concrete by BG40.
	Night	P0-R1 Re-excavation works for infill concrete by BG40.
	Pier 50	Installation of steel cage for bored pile P50-L1.
	Night	Installation of steel cage and tremie pipe for concreting for bored pile P50-L1.
	Pier 52	Set up RCD to bored pile P52-L3.
	Night	Preparation work of installation of steel cage for bored pile P52-R2.
18-Jul-13	Pier 0	P0-R1 Re-excavation works for infill concrete by BG40.
	Night	P0-R1 Re-excavation works for infill concrete by BG40.
	Pier 50	Concreting to bored pile P50-L1.
	Night	No site activity.
	Pier 52	Set up RCD to bored pile P52-L3.
		Installation of rebar cage for bored pile P50-R2.
	Night	Air-lifting for bored pile P52-L3.
		Installation of rebar cage for bored pile P52-R2.
19-Jul-13	Pier 0	P0-R1 Re-excavation works for infill concrete by BG40.
	Night	P0-R1 Re-excavation works for infill concrete by BG40.
	Pier 50	Excavation for bored pile P50-R1 and P50-R3 by RCD.
	Night	Excavation for bored pile P50-L3 by RCD.
	Pier 52	Installation of rebar cage for bored pile P52-R2 and P52-L3.
	Night	Installation of rebar cage for bored pile P52-R2 and P52-L3.
22-Jul-13	Pier 0	P0-R1 Re-excavation works for infill concrete by BG40.
	Night	P0-R1 Re-excavation works for infill concrete by BG40.
	Pier 50	Excavation for bored pile P50-R1 by RCD.
		Installation of rebar cage and concreting to bored pile P50-L3.
	Night	Excavation for bored pile P50-R1 by RCD.
		Concreting to bored pile R50-L3.
	Pier 52	Preparation work for removal of Jacket Platform (LHS and RHS).
	Night	No site activity.
23-Jul-13	Pier 0	P0-R1 Re-excavation works for infill concrete by BG40.
		P0-L3 Excavation works by BG40.
	Night	P0-L3 Excavation works by BG40.
	Pier 50	Excavation for bored pile P50-R1 by RCD.
	Night	Excavation for bored pile P50-R1 by RCD.
	Pier 52	Preparation work for removal of Jacket Platform (LHS and RHS).
	Night	No site activity.

Bored Piling Activities at P0, P48, P50 & P52 conducted in July 2013

Date	Location	Bored Piling Activities
24-Jul-13	Pier 0	P0-R1 Re-excavation works by BG40.
	Night	P0-R1 Exchange bentonite.
	Pier 50	Excavation for bored pile P50-R3 by RCD.
	Night	Excavation for bored pile P50-R3 by RCD.
	Pier 52	Preparation work for removal of Jacket Platform (LHS and RHS).
	Night	No site activity.
25-Jul-13	Pier 0	P0-R1 air-lifting.
	Night	P0-R1 Exchange bentonite.
	Pier 50	Excavation for bored pile P50-R3 by RCD.
		Installation of rebar cage to bored pile P50-R1.
	Night	Installation of rebar cage to bored pile P50-R1.
	Pier 52	Removal of pin piles of Jacket Platform (LHS and RHS).
		No site activity.
26-Jul-13	Pier 0	P0-R1 air-lifting.
	Night	P0-R1 installation works of steel cage.
	Pier 50	Excavation for bored pile P50-R2 by RCD.
		Installation of rebar cage to bored pile P50-R1.
	Night	Excavation for bored pile P50-R3 by RCD.
		Installation of rebar cage to bored pile P50-R1.
	Pier 52	Removal of pin piles of Jacket Platform (LHS and RHS).
		No site activity.
29-Jul-13	Pier 0	P0-R1 installation works of steel cage.
	Night	P0-R1 installation works of steel cage.
	Pier 48	P48-L3 Excavation work by BG40.
	Night	No site activity.
	Pier 50	Splicing of permanent casing and set up RCD for bored pile P50-R3.
	Night	Excavation for bored pile P50-R3 by RCD.

Dragages - China Harbour - VSL Joint Venture 寶嘉 - 中國港灣 - 威勝利聯營

HKZB Hong Kong Link Road - 3 Months Rolling Programme 1309 (Based on DWP_01a)

Design and Design Checking of the Works

Detailed Design Approval (DDA)

Foundation

Western Water

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
DDA02.01-20	Comment Design DDA - ML02L/R	35	0	29/06/13 A	07/09/13 A
DDA04.01-20	Comment Design DDA - ML04L/R	35	0	22/06/13 A	22/08/13 A
DDA04.01-30	Resubmit Design DDA with DC Certificate - ML04L/R	21	0	23/08/13 A	29/08/13 A
DDA04.01-40	Approve Design DDA - ML04L/R	35	4	30/08/13 A	01/10/13
DDA05.01-30	Resubmit Design DDA with DC Certificate - ML05L/R	21	0	23/07/13 A	29/07/13 A
DDA05.01-40	Approve Design DDA - ML05L/R	35	0	30/07/13 A	02/09/13 A
DDA08.01-40	Approve Design DDA - ML08L/R (with Trunaround)	35	0	01/06/13 A	08/07/13 A
DDA09.01-40	Approve Design DDA - ML09L/R	35	0	29/06/13 A	08/08/13 A

Airport Channel

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
DDA10.01-30	Resubmit Design DDA with DC Certificate - ML10L/R	25	0	03/07/13 A	04/07/13 A
DDA10.01-40	Approve Design DDA - ML10L/R	35	0	05/07/13 A	22/08/13 A
DDA12.01-30	Resubmit Design DDA with DC Certificate - ML12L/R	25	0	08/06/13 A	28/06/13 A
DDA12.01-40	Approve Design DDA - ML12L/R	35	0	29/06/13 A	21/08/13 A
DDA13.01-30	Resubmit Design DDA with DC Certificate - ML13L/R	25	0	06/07/13 A	29/08/13 A
DDA13.01-40	Approve Design DDA - ML13L/R	35	7	30/08/13 A	04/10/13
DDA14.01-20	Comment Design DDA - ML14L/R	35	7	30/08/13 A	04/10/13

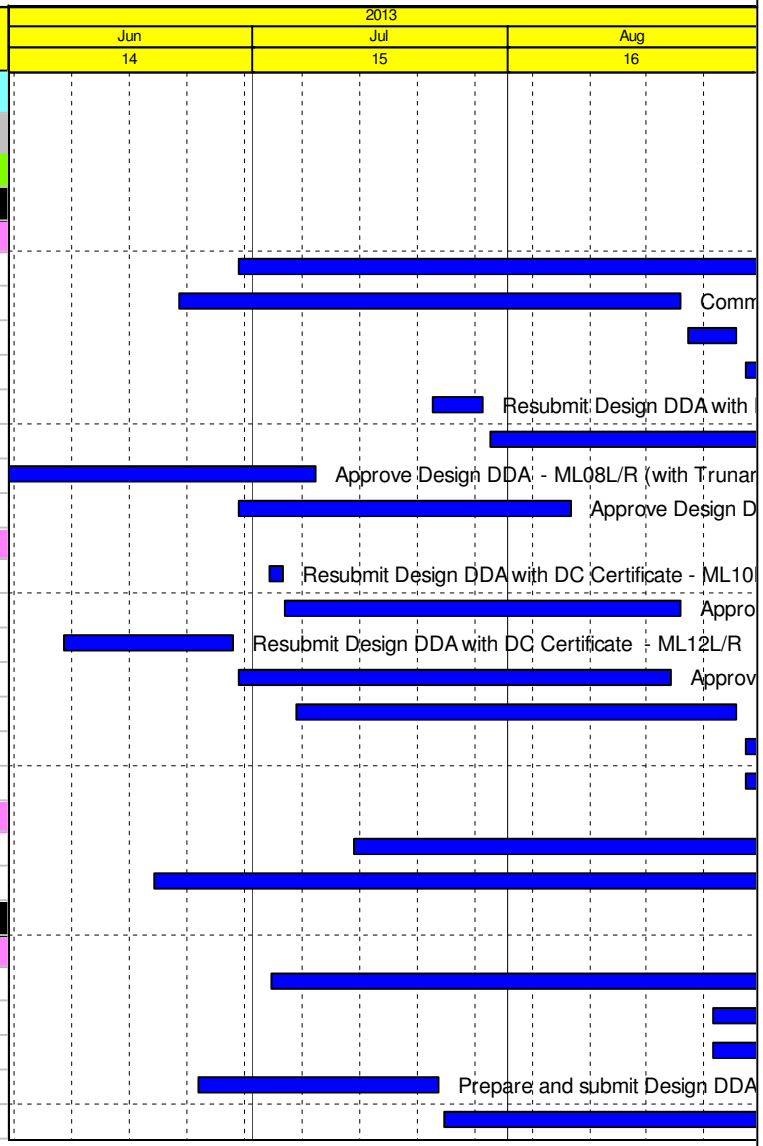
Airport Island

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
DDA15.01-20	Comment Design DDA - ML15L/R	35	1	13/07/13 A	28/09/13
DDA16.01-20	Comment Design DDA - ML16L/R	35	0	19/06/13 A	11/09/13 A

Substructure

Western Water

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
DDA01.02-30	Resubmit Design DDA with DC Certificate - ML01L/R	25	1	03/07/13 A	28/09/13
DDA02.02-10	Prepare and submit Design DDA - ML02L/R	30	0	26/08/13 A	26/09/13 A
DDA04.02-10	Prepare and submit Design DDA - ML04L/R	30	0	26/08/13 A	26/09/13 A
DDA05.02-10	Prepare and submit Design DDA - ML05L/R	30	0	24/06/13 A	23/07/13 A
DDA05.02-20	Comment Design DDA - ML05L/R	35	0	24/07/13 A	28/09/13

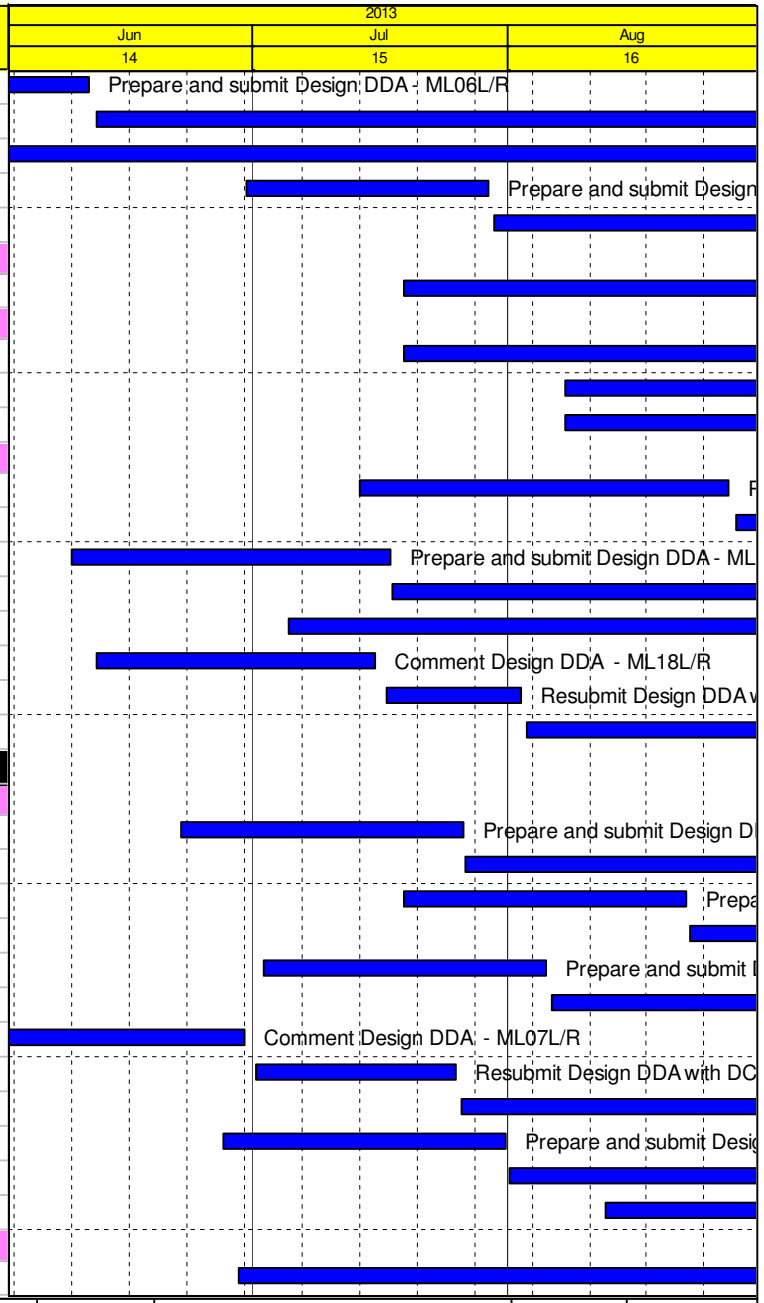


Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining ...
Milestone

Rolling programme for Quarterly EMA Report

Date	Revision	Checked	Approved
08/10/13	EM&A Quarterly report	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
DDA06.02-10	Prepare and submit Design DDA - ML06L/R	30	0	01/06/13 A	11/06/13 A
DDA06.02-20	Comment Design DDA - ML06L/R	35	0	12/06/13 A	28/09/13
DDA08.02-20	Comment Design DDA - ML08L/R (with trunaround)	35	0	01/06/13 A	28/09/13
DDA09.02-10	Prepare and submit Design DDA - ML09L/R	30	0	30/06/13 A	29/07/13 A
DDA09.02-20	Comment Design DDA - ML09L/R	35	0	30/07/13 A	28/09/13
Navigation Channel					
DDA03.02-30	Resubmit Design DDA with DC Certificate - ML03L/R (with	25	0	19/07/13 A	28/09/13
Airport Channel					
DDA12.02-20	Comment Design DDA - ML12L/R	35	0	19/07/13 A	28/09/13
DDA13.02-20	Comment Design DDA - ML13L/R	35	0	08/08/13 A	28/09/13
DDA14.02-10	Prepare and submit Design DDA - ML14L/R	46	0	08/08/13 A	23/09/13 A
Airport Island					
DDA15.02-10	Prepare and submit Design DDA - ML15L/R	40	0	14/07/13 A	28/08/13 A
DDA15.02-20	Comment Design DDA - ML15L/R	35	5	29/08/13 A	02/10/13
DDA16.02-10	Prepare and submit Design DDA - ML16L/R	35	0	09/06/13 A	17/07/13 A
DDA16.02-20	Comment Design DDA - ML16L/R	35	0	18/07/13 A	28/09/13
DDA17.02-20	Comment Design DDA - ML17L/R	35	0	05/07/13 A	28/09/13
DDA18.02-20	Comment Design DDA - ML18L/R	35	0	12/06/13 A	16/07/13 A
DDA18.02-30	Resubmit Design DDA with DC Certificate - ML18L/R	25	0	17/07/13 A	02/08/13 A
DDA18.02-40	Approve Design DDA - ML18L/R	35	0	03/08/13 A	28/09/13
Superstructure					
Western Water					
DDA01.03-10	Prepare and submit Design DDA - ML01L/R	35	0	22/06/13 A	26/07/13 A
DDA01.03-20	Comment Design DDA - ML01L/R	35	0	27/07/13 A	29/09/13
DDA05.03-10	Prepare and submit Design DDA - ML05L/R	35	0	19/07/13 A	22/08/13 A
DDA05.03-20	Comment Design DDA - ML05L/R	35	0	23/08/13 A	28/09/13
DDA06.03-10	Prepare and submit Design DDA - ML06L/R	35	0	02/07/13 A	05/08/13 A
DDA06.03-20	Comment Design DDA - ML06L/R	35	0	06/08/13 A	28/09/13
DDA07.03-20	Comment Design DDA - ML07L/R	35	0	01/06/13 A	30/06/13 A
DDA07.03-30	Resubmit Design DDA with DC Certificate - ML07L/R	25	0	01/07/13 A	25/07/13 A
DDA07.03-40	Approve Design DDA - ML07L/R	35	0	26/07/13 A	28/09/13
DDA08.03-10	Prepare and submit Design DDA - ML08L/R	35	0	27/06/13 A	31/07/13 A
DDA08.03-20	Comment Design DDA - ML08L/R	35	0	01/08/13 A	28/09/13
DDA09.03-10	Prepare and submit Design DDA - ML09L/R	35	0	13/08/13 A	13/09/13 A
Navigation Channel					
DDA03.03-20	Comment Design DDA - ML03L/R	35	0	29/06/13 A	28/09/13

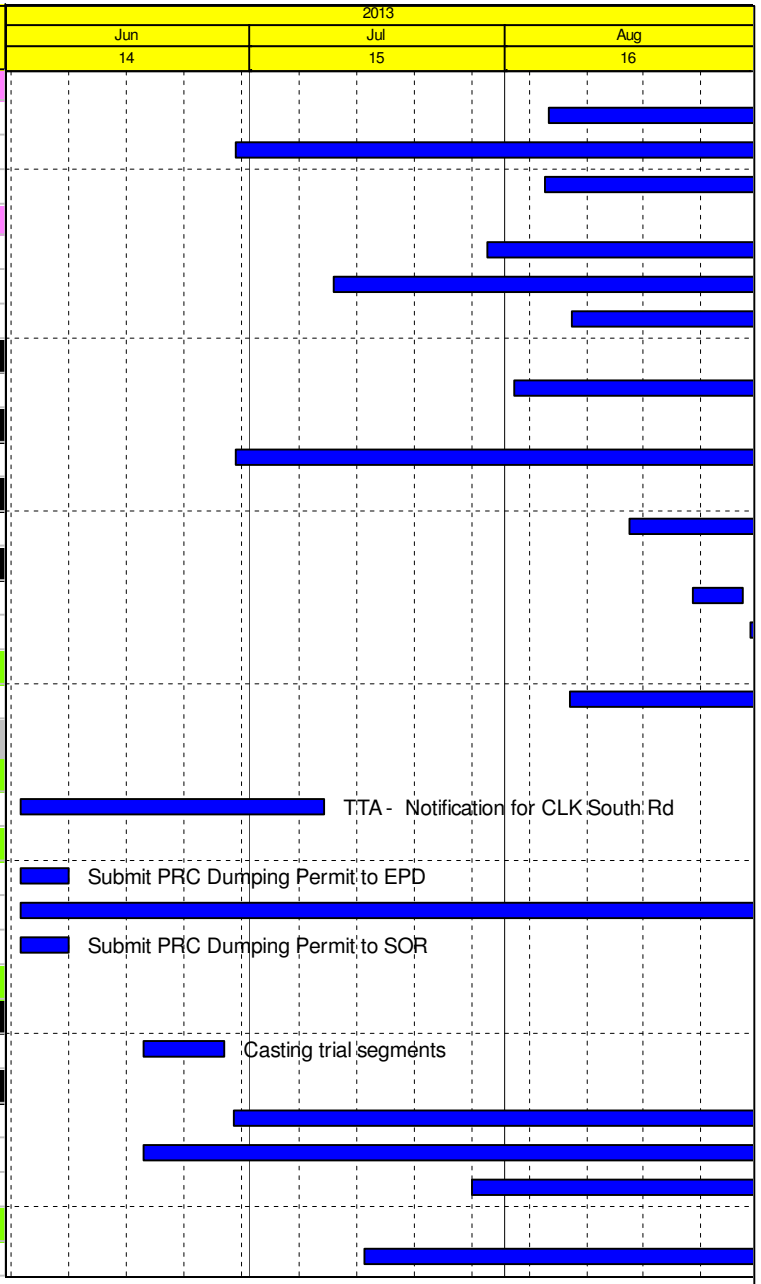


Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining ...
Milestone

Rolling programme for Quarterly EMA Report

Date	Revision	Checked	Approved
08/10/13	EM&A Quarterly report	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
Airport Channel					
DDA10.03-20	Comment Design DDA - ML10L/R	35	0	06/08/13 A	28/09/13
DDA11.03-20	Comment Design DDA - ML11L/R	35	0	29/06/13 A	28/09/13
DDA13.03-10	Prepare and submit Design DDA - ML13L/R	48	0	06/08/13 A	28/09/13
Airport Island					
DDA17.03-10	Prepare and submit Design DDA - ML17L/R	70	0	30/07/13 A	13/09/13 A
DDA18.03-20	Comment Design DDA - ML18L/R	35	0	11/07/13 A	28/09/13
DDA19.03-20	Comment Design DDA - ML19L/C/R	35	0	09/08/13 A	28/09/13
TCSS and E&M					
DDAEM-20	Comment Design DDA - TCSS & E&M	35	0	02/08/13 A	28/09/13
Geotechnical Works					
DDAGEO-20	Comment Design DDA- Geotechnical Works	35	0	29/06/13 A	28/09/13
Landscaping					
DDALA-20	Comment Design DDA - Landscaping	35	0	16/08/13 A	28/09/13
Remaining Works					
DDAREW-30	Resubmit Design DDA with DC Certificate - Remaining Worl	35	0	24/08/13 A	30/08/13 A
DDAREW-40	Approve Design DDA - Remaining Works (barrier walls/ ane	35	6	31/08/13 A	03/10/13
Detail Segment Drawing					
SD1060	Submit and Approve Detail Segment drawing for ML07	75	25	09/08/13 A	22/10/13
Project General Submission					
TTA for CLK South Rd					
PGS1520	TTA - Notification for CLK South Rd	28	0	03/06/13 A	10/07/13 A
Cross-boundary Disposal of Marine Sediment (if necessary)					
PGS1810	Submit PRC Dumping Permit to EPD	7	0	03/06/13 A	09/06/13 A
PGS1820	Obtained Marine Dumping Permit fm EPD	60	0	03/06/13 A	19/09/13 A
PGS1830	Submit PRC Dumping Permit to SOR	7	0	03/06/13 A	09/06/13 A
Segment Casting Yard					
Precast Area (Typical & Land Span)					
CPY1305	Casting trial segments	38	0	18/06/13 A	28/06/13 A
Segment Moulds					
PGS2305	Fabrication & 3rd Deliver segment mould (Typical span)	175	32	29/06/13 A	29/10/13
PGS2335	Fabrication & 3rd Deliver segment mould (Long End span)	146	31	18/06/13 A	28/10/13
PGS2345	Fabrication & Deliver segment mould (Land Viaduct)	91	59	28/07/13 A	26/11/13
Major Method Statement					
PGS2405	Prepare MS for SOP Installation	60	0	15/07/13 A	28/09/13

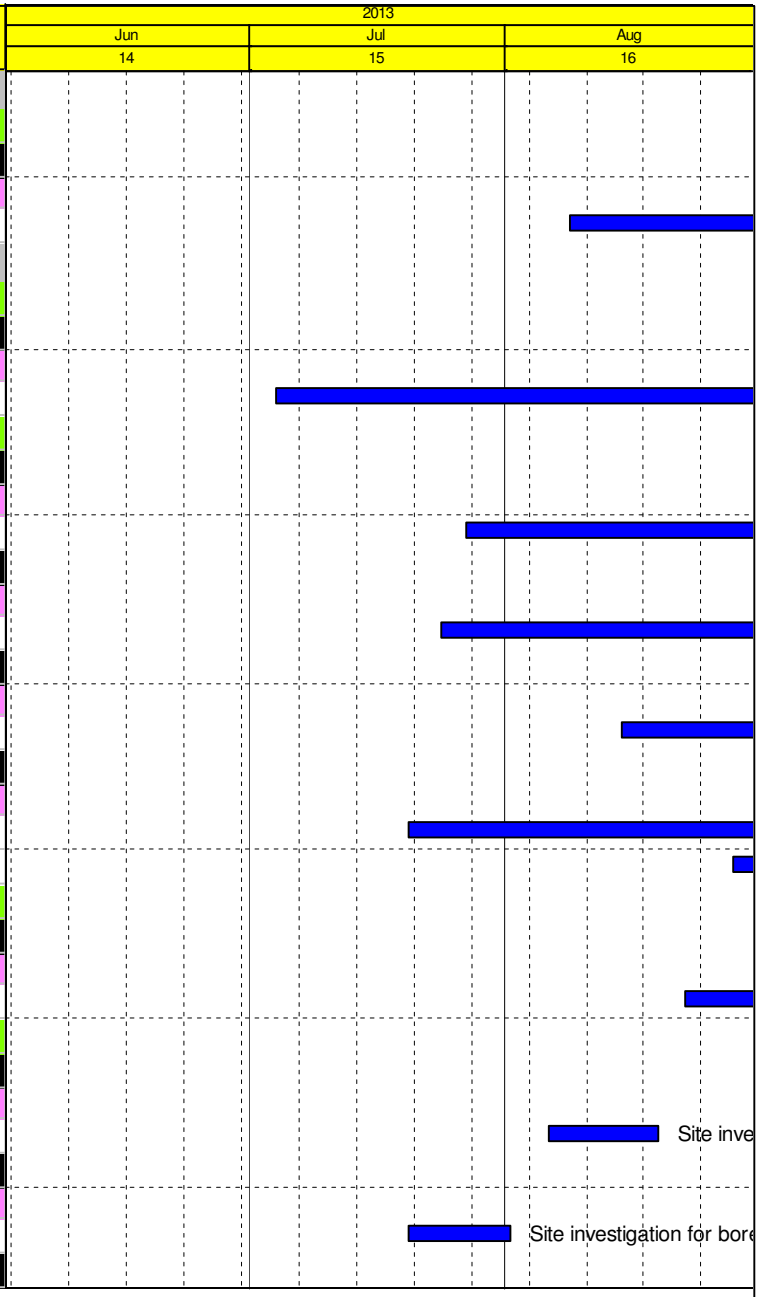


Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining ...
Milestone

Rolling programme for Quarterly EMA Report

Date	Revision	Checked	Approved
08/10/13	EM&A Quarterly report	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
Procurement and Fabrication					
Segment Casting					
Type B Segment (Total 1 set Mould)					
Turnaround					
SC2140	Segment casting -P52N/S	60	60	09/08/13 A	23/04/14
Viaduct between HKSAR Boundary and Landing Point on Airport Island					
ML01L/R 75mx8 - Stage 1 of Works					
Pier P0L/R					
Foundation - Bored Pile					
WW1030	Construct bored piles P0 After Dolphin Season	28	0	04/07/13 A	10/09/13 A
ML03L/R 109.661m+150mx3+109.661m Navigation Channel - Stage 4 of Works					
Pier P17L/R					
Site Investigation					
NC1140	Site investigation for bored pile P17 (Upstream Dolphin)	8	0	27/07/13 A	28/09/13
Pier P18L/R					
Site Investigation					
NC1260	Site investigation for bored pile P18 (Upstream Dolphin)	8	0	24/07/13 A	28/09/13
Pier P19L/R					
Site Investigation					
NC1380	Site investigation for bored pile P19 (Upstream Dolphin)	8	0	15/08/13 A	12/09/13 A
Pier P20L/R					
Foundation - Bored Pile					
NC1520	Construct bored piles P20 - 12 nos. (Bridge) (Learning)	51	22	20/07/13 A	29/10/13
NC1530	Construct bored piles P20 - 4 nos. (Upstream Dolphin)	8	4	29/08/13 A	02/11/13
ML05L/R 74.5mx8 - Stage 4 of Works					
Pier P36L/R					
Site Investigation					
WW6130	Site investigation for bored pile P36	9	3	23/08/13 A	21/10/13
ML06L/R 74.5mx8 - Stage 4 of Works					
Pier 38L/R					
Site Investigation					
WW6290	Site investigation for bored pile P38	9	0	06/08/13 A	19/08/13 A
Pier 40L/R					
Site Investigation					
WW6450	Site investigation for bored pile P40	9	0	20/07/13 A	01/08/13 A
Pier 41L/R					

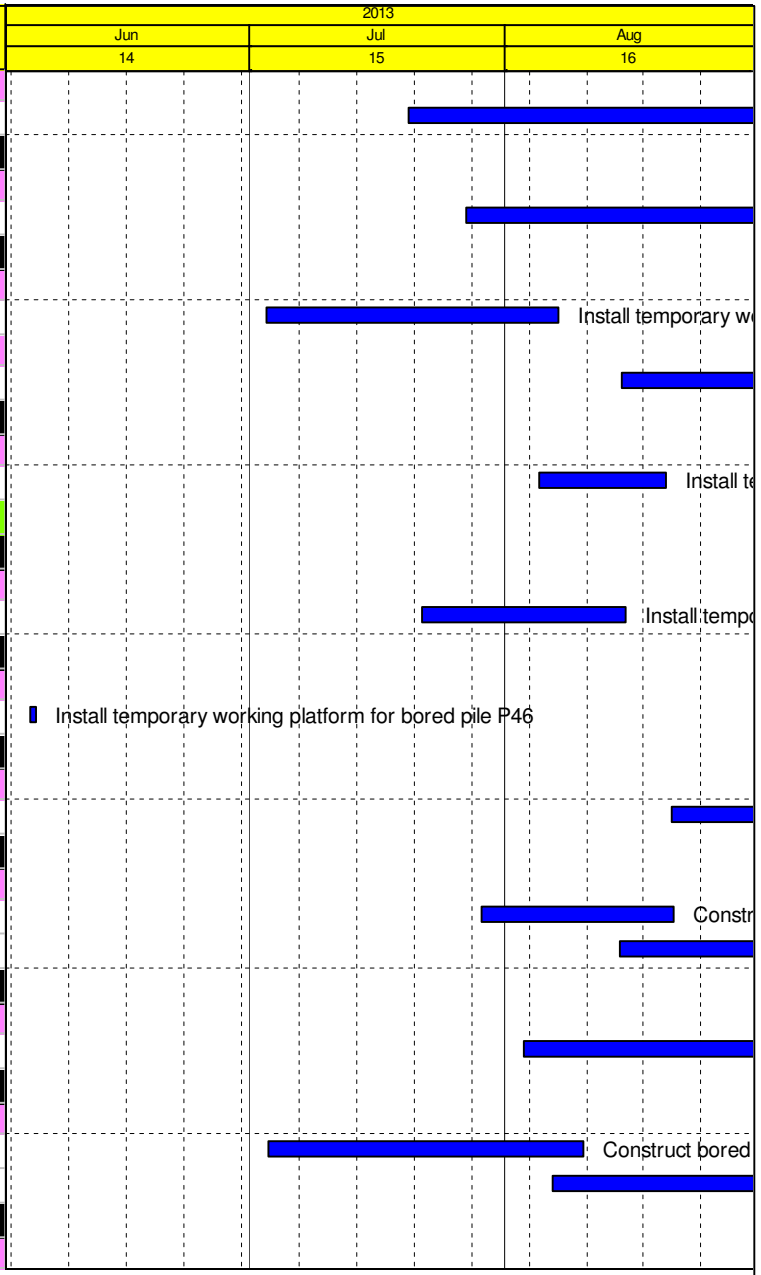


Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining ...
Milestone

Rolling programme for Quarterly EMA Report

Date	Revision	Checked	Approved
08/10/13	EM&A Quarterly report	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
	Site Investigation				
WW6530	Site investigation for bored pile P41	9	4	20/07/13 A	03/10/13
	Pier 42L/R				
	Site Investigation				
WW6610	Site investigation for bored pile P42	9	0	27/07/13 A	17/09/13 A
	Pier 43L/R				
	Temporary Works				
WW6680	Install temporary working platform for bored pile P43	12	0	03/07/13 A	07/08/13 A
	Foundation - Bored Pile				
WW6710	Construct bored piles P43 - 6 nos.	18	3	15/08/13 A	02/10/13
	Pier 44L/R				
	Temporary Works				
WW6760	Install temporary working platform for bored pile P44	12	0	05/08/13 A	20/08/13 A
	ML07L/R 73.396mx8 - Stage 4 of Works				
	Pier P45L/R (M.J.)				
	Temporary Works				
WW6840	Install temporary working platform for bored pile P45	12	0	22/07/13 A	15/08/13 A
	Pier P46L/R				
	Temporary Works				
WW6920	Install temporary working platform for bored pile P46	12	0	04/06/13 A	05/06/13 A
	Pier P47L/R				
	Foundation - Bored Pile				
WW7030	Construct bored piles P47 - 6 nos.	23	0	21/08/13 A	19/09/13 A
	Pier P48L/R				
	Foundation - Bored Pile				
WW7112	Construct bored piles P48 After Dolphin Season	14	0	29/07/13 A	21/08/13 A
WW7120	Pile testing P48	28	14	15/08/13 A	12/10/13
	Pier P49L/R				
	Foundation - Bored Pile				
WW7190	Construct bored piles P49 - 6 nos.	30	0	03/08/13 A	03/09/13 A
	Pier P50L/R				
	Foundation - Bored Pile				
WW7270	Construct bored piles P50 After Dolphin Season	45	0	03/07/13 A	10/08/13 A
WW7280	Pile testing P50	29	9	07/08/13 A	06/10/13
	Pier P52L/R				
	Foundation - Bored Pile				

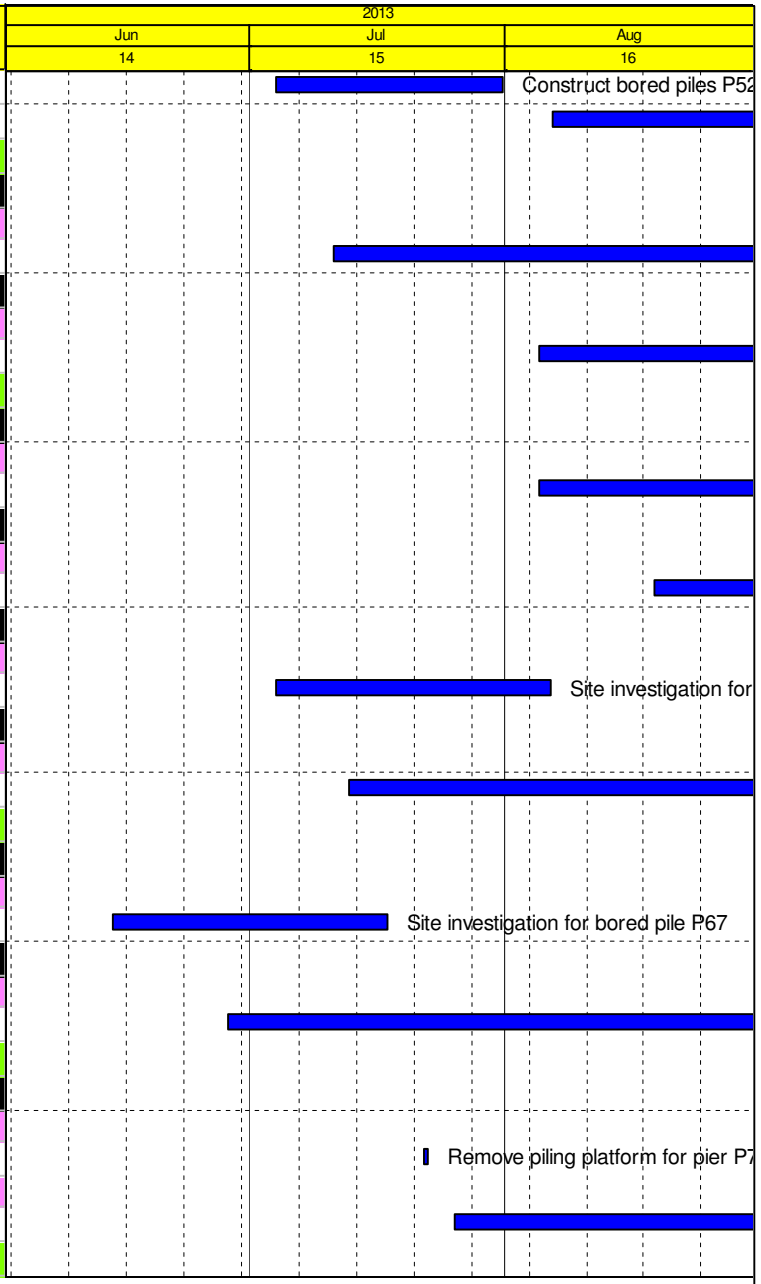


Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining ...
Milestone

Rolling programme for Quarterly EMA Report

Date	Revision	Checked	Approved
08/10/13	EM&A Quarterly report	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
WW7410	Construct bored piles P52- 8 nos. After Dolphin Season	20	0	04/07/13 A	31/07/13 A
WW7420	Pile testing P52	28	8	07/08/13 A	05/10/13
ML08L/R 70mx6 - Stage 4 of Works					
Pier P53L/R (M.J.)					
Foundation - Bored Pile					
WW7480	Construct bored piles P53 - 10 nos.	44	22	11/07/13 A	29/10/13
Pier P54L/R					
Foundation - Bored Pile					
WW7560	Construct bored piles P54 - 10 nos.	64	32	05/08/13 A	09/11/13
ML09L/R 73.396Mx8 - Stage 4 of Works					
Pier P60L/R					
Site Investigation					
WW8010	Site investigation for bored pile P60	24	9	05/08/13 A	10/10/13
Pier P61L/R					
Site Investigation					
WW8090	Site investigation for bored pile P61	24	9	19/08/13 A	10/10/13
Pier P65L/R					
Site Investigation					
WW8420	Site investigation for bored pile P65	24	0	04/07/13 A	06/08/13 A
Pier P66L/R					
Site Investigation					
WW8500	Site investigation for bored pile P66	24	8	13/07/13 A	09/10/13
ML10L/R 115m+180m+115m - Stage 4 of Works					
Pier P67L/R (M.J.)					
Site Investigation					
AC1000	Site investigation for bored pile P67	24	0	14/06/13 A	17/07/13 A
Pier P69L/R					
Temporary Works					
AC1120	Install temporary jetty for pier P69 to P70	60	17	28/06/13 A	23/10/13
ML12L/R 109m+165mx2+109m - Stage 4 of Works					
Pier P74L/R (M.J.)					
Temporary Works					
AC1492	Remove piling platform for pier P74	4	0	22/07/13 A	22/07/13 A
Foundation - Bored Pile					
AC1550	Pile testing P74	28	1	26/07/13 A	28/09/13
ML13L/R 115m+180m+115m - Stage 4 of Works					



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Date	Revision	Checked	Approved
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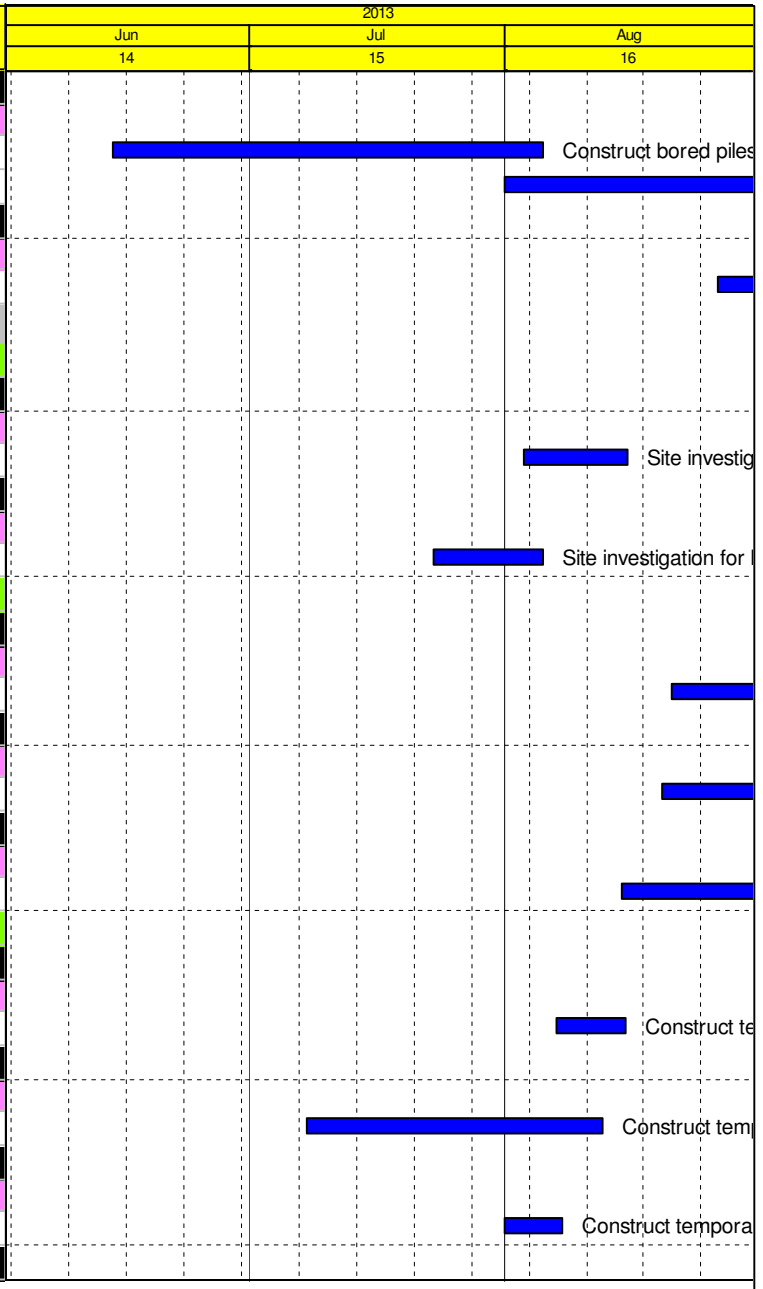
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
Pier P78L/R (M.J.)					
Foundation - Bored Pile					
AC1890	Construct bored piles P78 - 6 nos.	37	0	14/06/13 A	05/08/13 A
AC1900	Pile testing P78	28	0	01/08/13 A	28/09/13
Pier P79L/R					
Site Investigation					
AC1950	Site investigation for bored pile P79	30	15	27/08/13 A	21/10/13
Viaduct between Landing Point on Airport Island and Scenic Hill					
ML15L/R 43m+65mx6+37m - Stage 5 of Works					
Pier P90L/R					
Site Investigation					
AI1450	Site investigation for bored pile P90	10	0	03/08/13 A	16/08/13 A
Pier P91L/R					
Site Investigation					
AI1520	Site investigation for bored pile P91	10	0	23/07/13 A	05/08/13 A
MI16L/R 37m+65mx5+43m - Stage 5 of Works					
Pier P95L/R					
Temporary Works					
AI1790	Construct temporary piling platform for bored pile P95	40	40	21/08/13 A	24/12/13
Pier P97L/R					
Temporary Works					
AI1930	Construct temporary piling platform for bored pile P97	40	40	20/08/13 A	19/11/13
Pier P98L/R					
Temporary Works					
AI2000	Construct temporary piling platform for bored pile P98	40	40	15/08/13 A	24/12/13
ML17L/R 43m+65mx3+47m - Stage 5 of Works					
Pier P99L/R (M.J.)					
Temporary Works					
AI2070	Construct temporary piling platform for bored pile P99	40	0	07/08/13 A	15/08/13 A
Pier P100L/R					
Temporary Works					
AI2140	Construct temporary piling platform for bored pile P100	40	0	08/07/13 A	13/08/13 A
Pier P101L/R					
Temporary Works					
AI2210	Construct temporary piling platform for bored pile P101	40	0	01/08/13 A	08/08/13 A
Pier P102L/R					



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Rolling programme for Quarterly EMA Report

Date	Revision	Checked	Approved
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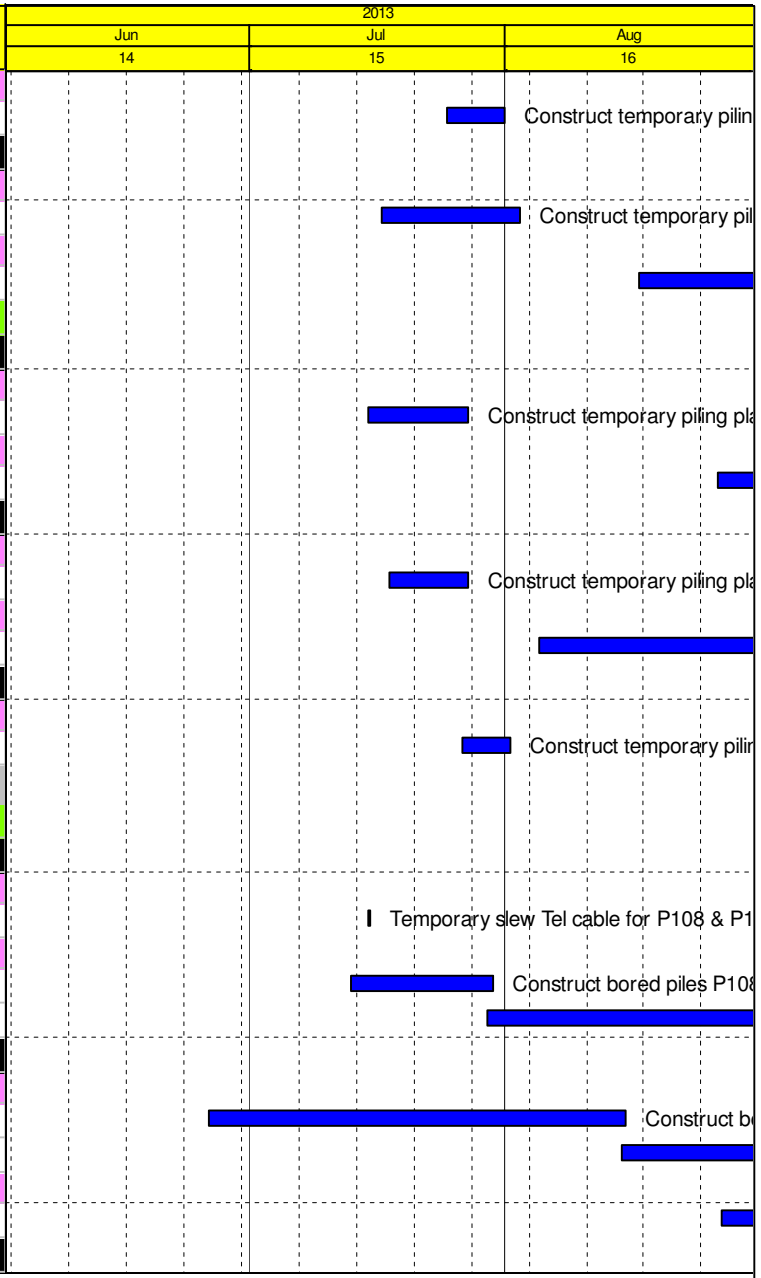
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
	Temporary Works				
AI2280	Construct temporary piling platform for bored pile P102	40	0	25/07/13 A	01/08/13 A
	Pier P103L/R				
	Temporary Works				
AI2350	Construct temporary piling platform for bored pile P103	40	0	17/07/13 A	03/08/13 A
	Foundation - Bored Pile				
AI2370	Construct bored piles P103 - 2 nos.	23	12	17/08/13 A	14/01/14
	ML18L/R 47m+55mx5+35m - Stage 5 of Works				
	Pier P104L/R (M.J.)				
	Temporary Works				
AI2420	Construct temporary piling platform for bored pile P104	40	0	15/07/13 A	27/07/13 A
	Foundation - Bored Pile				
AI2440	Construct bored piles P104 - 2 nos.	20	20	27/08/13 A	30/12/13
	Pier P105L/R				
	Temporary Works				
AI2490	Construct temporary piling platform for bored pile P105	40	0	18/07/13 A	27/07/13 A
	Foundation - Bored Pile				
AI2510	Construct bored piles P105 - 2 nos.	22	11	05/08/13 A	04/12/13
	Pier P106L/R				
	Temporary Works				
AI2560	Construct temporary piling platform for bored pile P106R	30	0	27/07/13 A	01/08/13 A
	Land Viaduct P108 to P114				
	ML18L/R 47m+55mx5+35m - Stage 5 of Works				
	Pier P108L/R				
	Utilities Diversion				
AI3540	Temporary slew Tel cable for P108 & P109	45	0	15/07/13 A	15/07/13 A
	Foundation - Bored Pile				
AI2710	Construct bored piles P108L - 1 nos.	11	0	13/07/13 A	30/07/13 A
AI2720	Pile testing P108L	28	0	30/07/13 A	28/09/13
	Pier P109L/R				
	Foundation - Bored Pile				
AI2780	Construct bored piles P109 - 2 nos.	22	0	26/06/13 A	15/08/13 A
AI2790	Pile testing P109	28	0	15/08/13 A	28/09/13
	Column Construction				
AI2800	Construct column P109 - 2 nos.	38	38	27/08/13 A	11/12/13
	Pier P110L/R				



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Rolling programme for Quarterly EMA Report

Date	Revision	Checked	Approved
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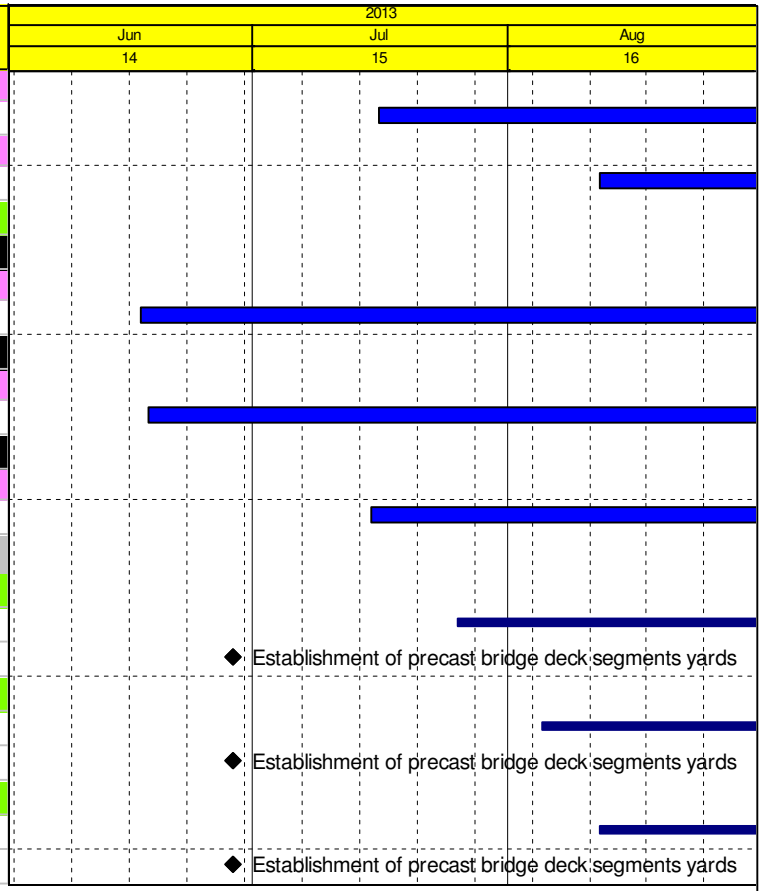
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
	Foundation - Bored Pile				
AI2840	Pile testing P110	28	0	16/07/13 A	28/09/13
	Column Construction				
AI2860	Construct column P110 - 2 nos.	36	36	12/08/13 A	11/12/13
	ML19L/C/R 40m+65mx2 Stage 5 of Works				
	Pier P111L/C/R				
	Foundation - Bored Pile				
AI2890	Construct bored piles P111L/R - 4 nos.	43	0	17/06/13 A	10/09/13 A
	Pier P112L/C/R				
	Foundation - Bored Pile				
AI2950	Construct bored piles P112 - 4 nos.	42	0	18/06/13 A	14/09/13 A
	Pier P113 L/C/R				
	Utilities Diversion				
AI3570	Temporary slew Tel cable for P113	30	0	15/07/13 A	28/09/13
	Milestones schedule				
	Marine Viaduct at chainage 4+260.000 to 11+800.000 approximate				
CC33-1040	Piles	612	589	26/07/13 A	09/05/15
CC33-1100	Establishment of precast bridge deck segments yards	0	0		28/06/13 A
	Viaduct above Seawall				
CC41-1010	Piles	429	425	05/08/13 A	26/11/14
CC41-1060	Establishment of precast bridge deck segments yards	0	0		28/06/13 A
	Land Viaduct				
CC42-1020	Bridge piers	288	315	12/08/13 A	08/08/14
CC42-1040	Establishment of precast bridge deck segments yards	0	0		28/06/13 A



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Rolling programme for Quarterly EMA Report

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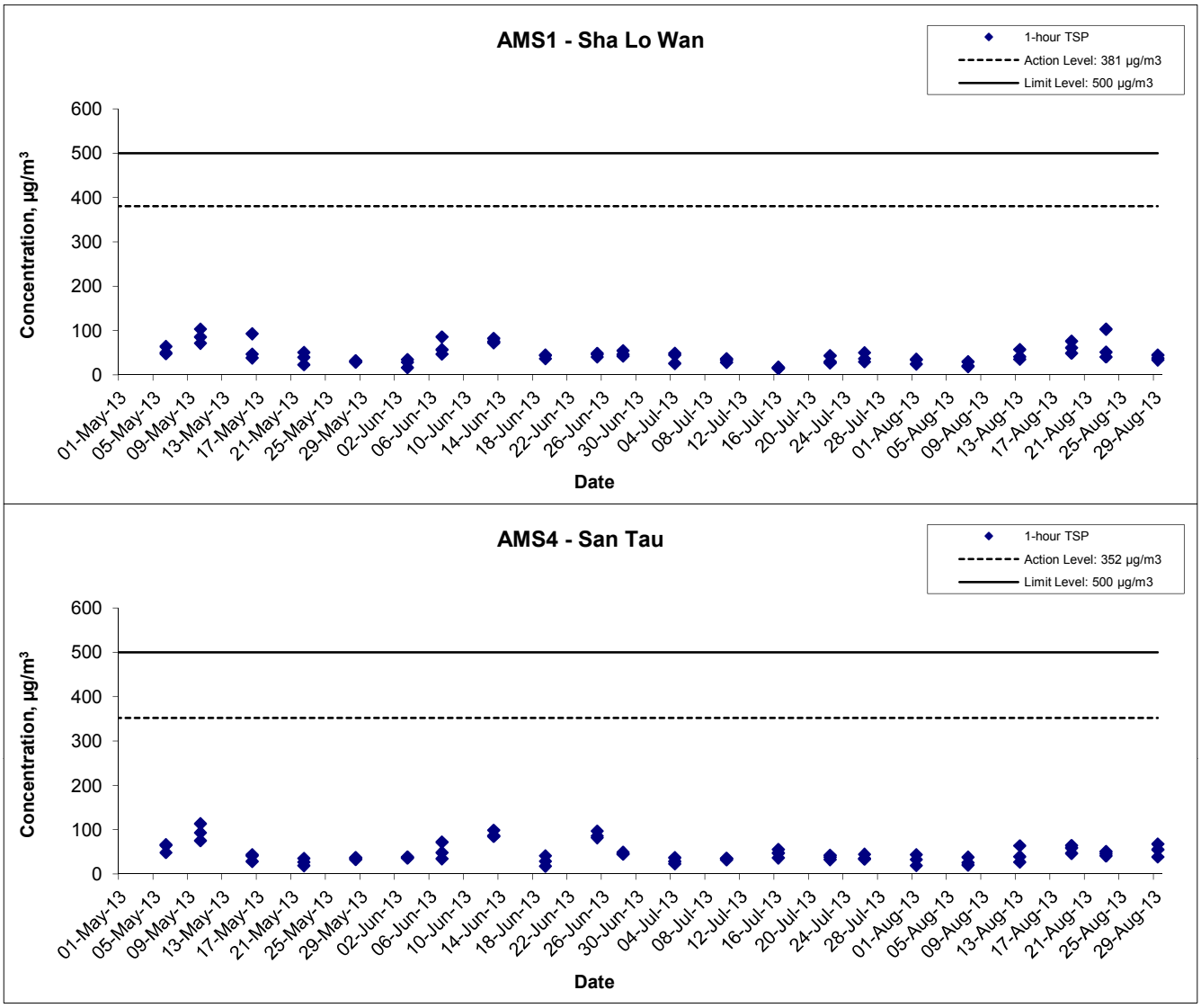
08/10/13	EM&A Quarterly report	Tim	

APPENDIX B
GRAPHICAL PRESENTATION OF 1-HOUR TSP MONITORING RESULTS

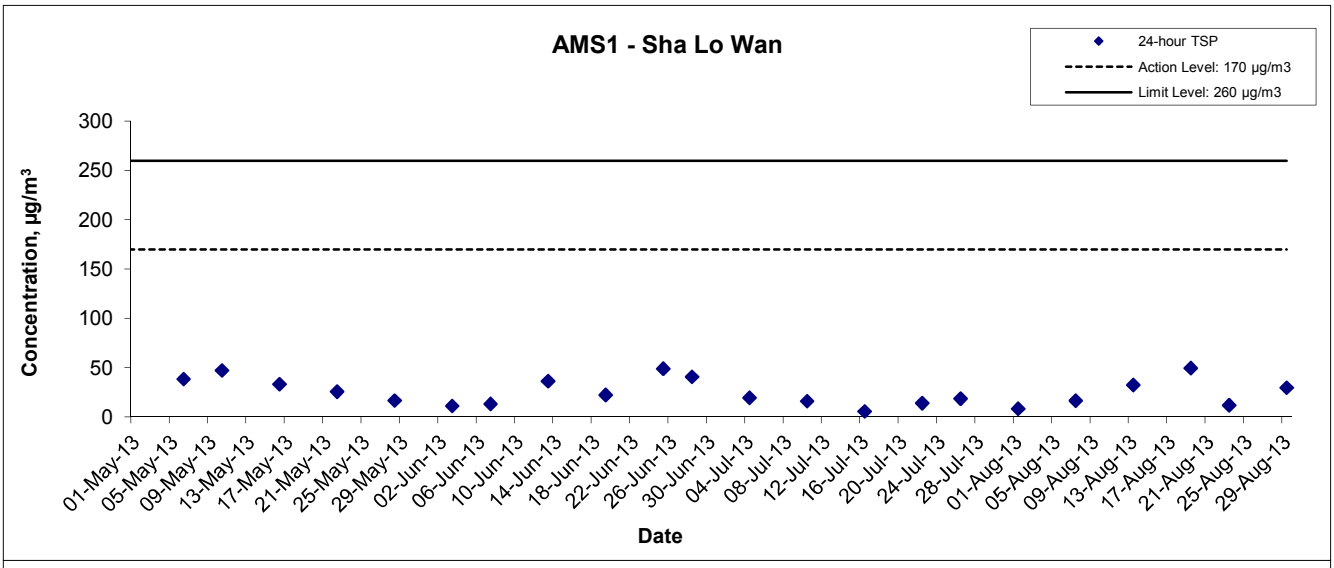
1-hour TSP Concentration Levels

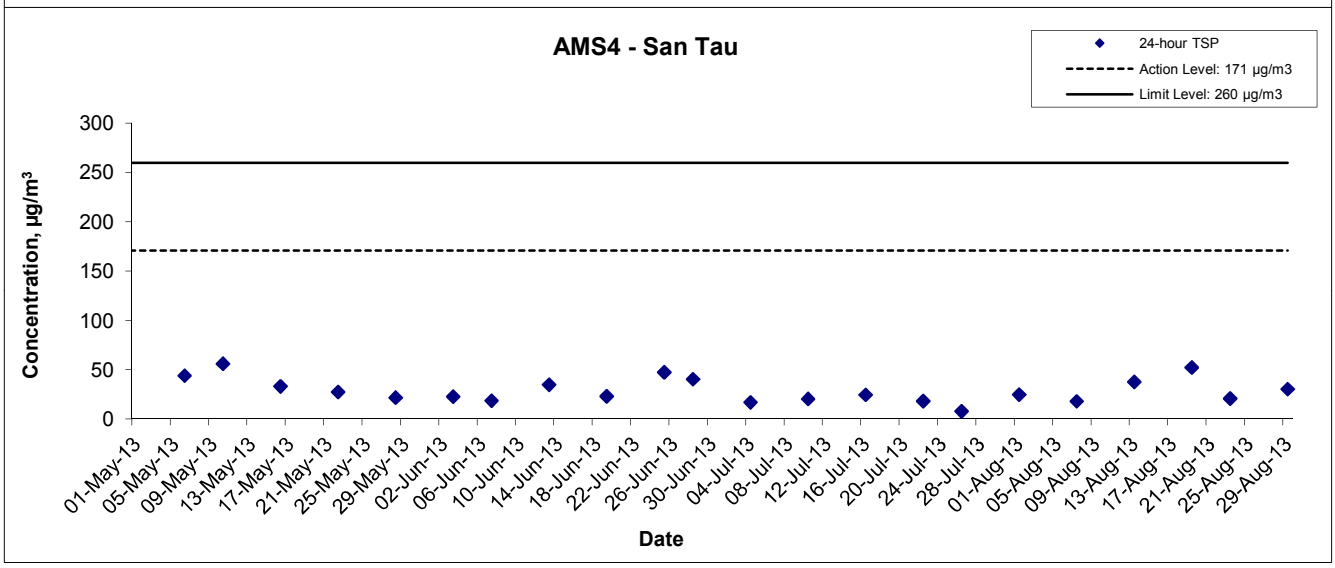


Title: Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Graphical Presentation of 1-hour TSP Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
	Date: Aug 13	Appendix: B	

APPENDIX C
GRAPHICAL PRESENTATION OF 24-HOUR TSP MONITORING RESULTS

24-hour TSP Concentration Levels

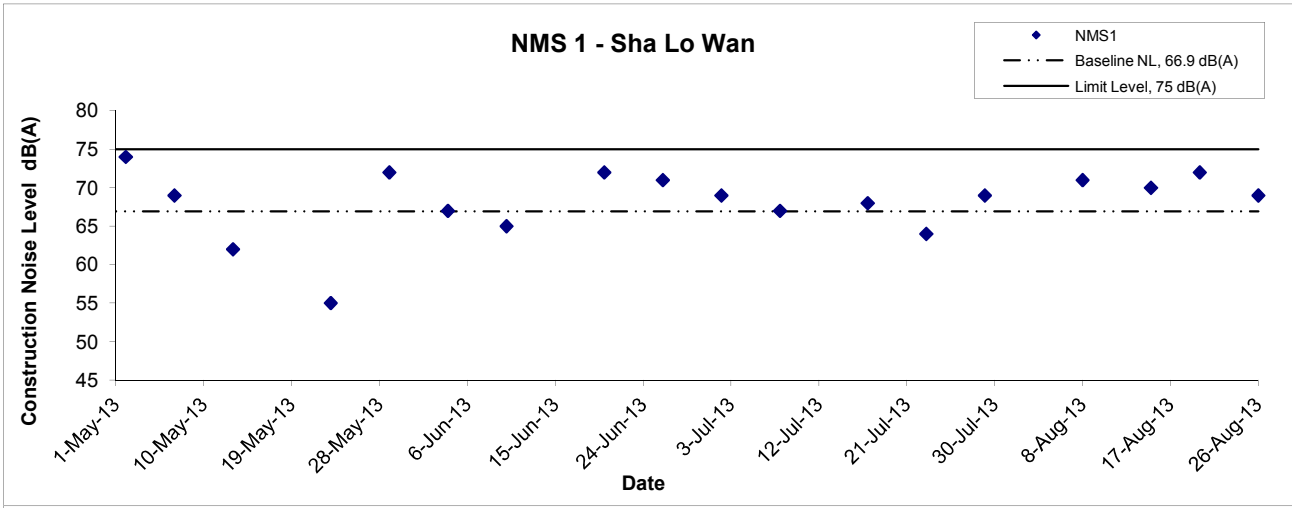


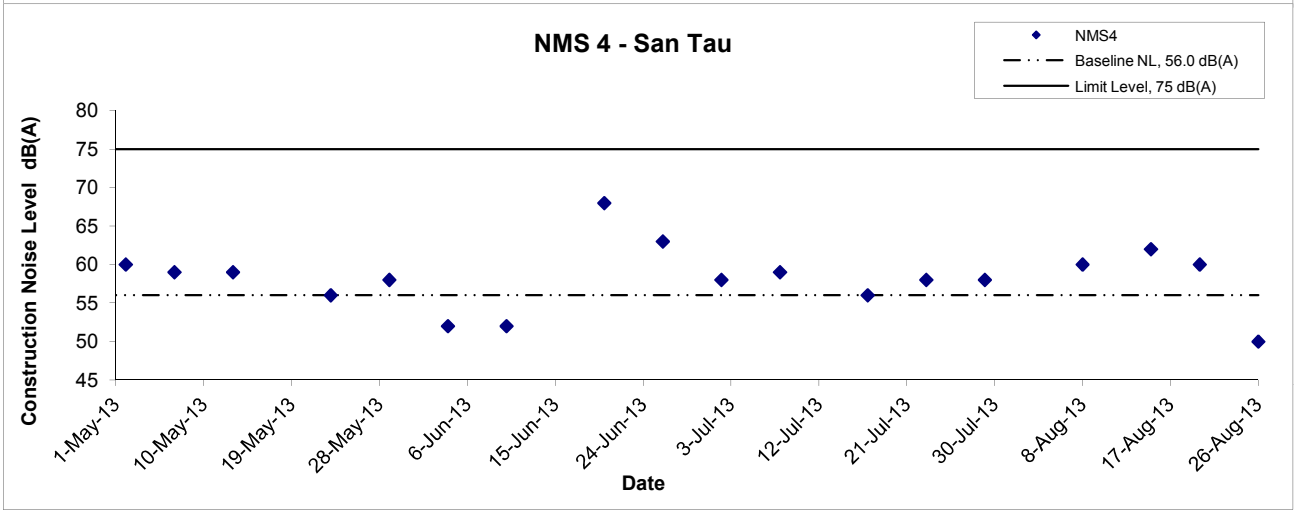


Title: Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Graphical Presentation of 24-hour TSP Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
	Date: Aug 13	Appendix: C	

APPENDIX D
GRAPHICAL PRESENTATION OF NOISE MONITORING RESULTS

Noise Levels

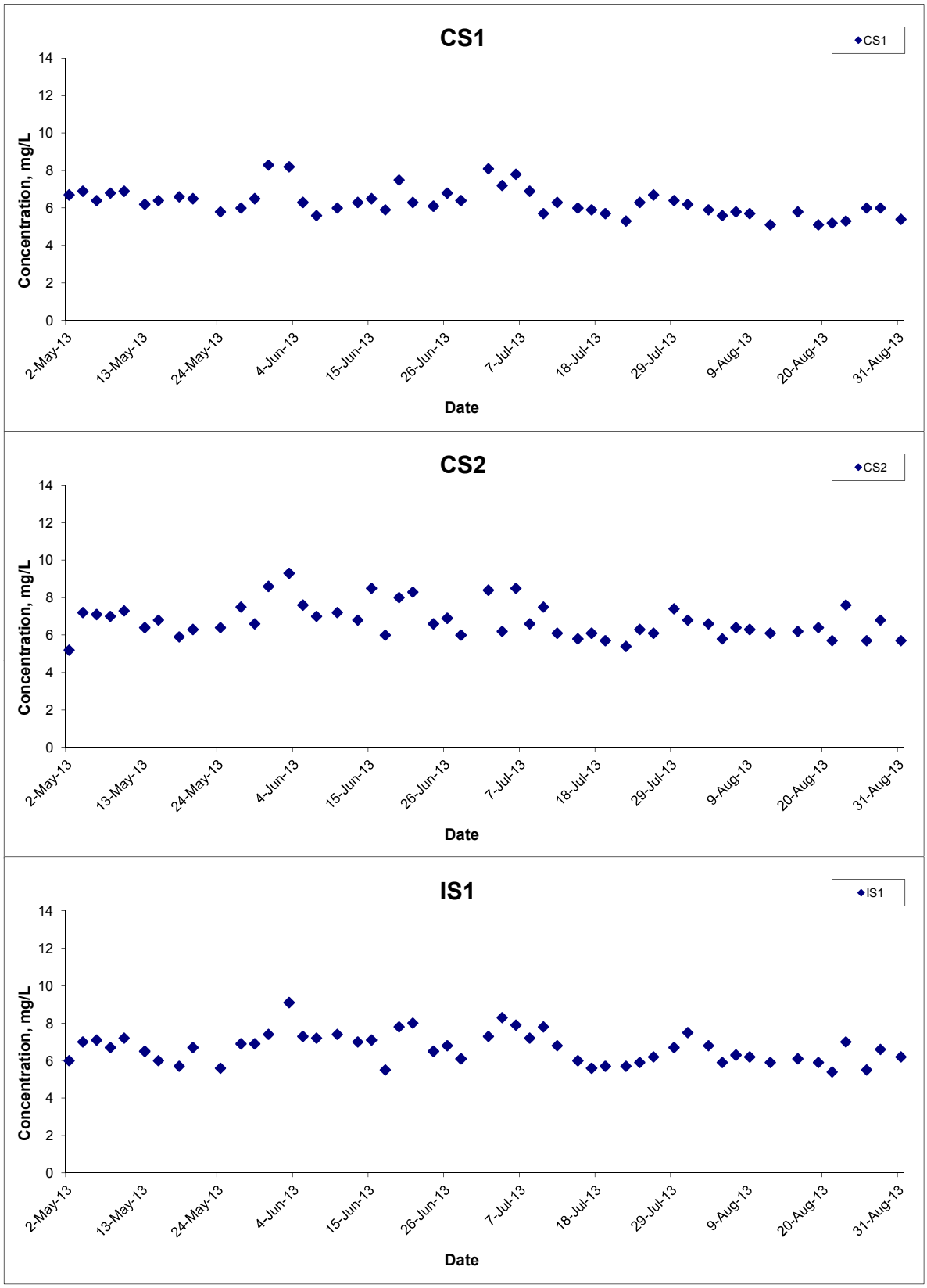




Title: Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
	Date: Aug 13	Appendix: D	

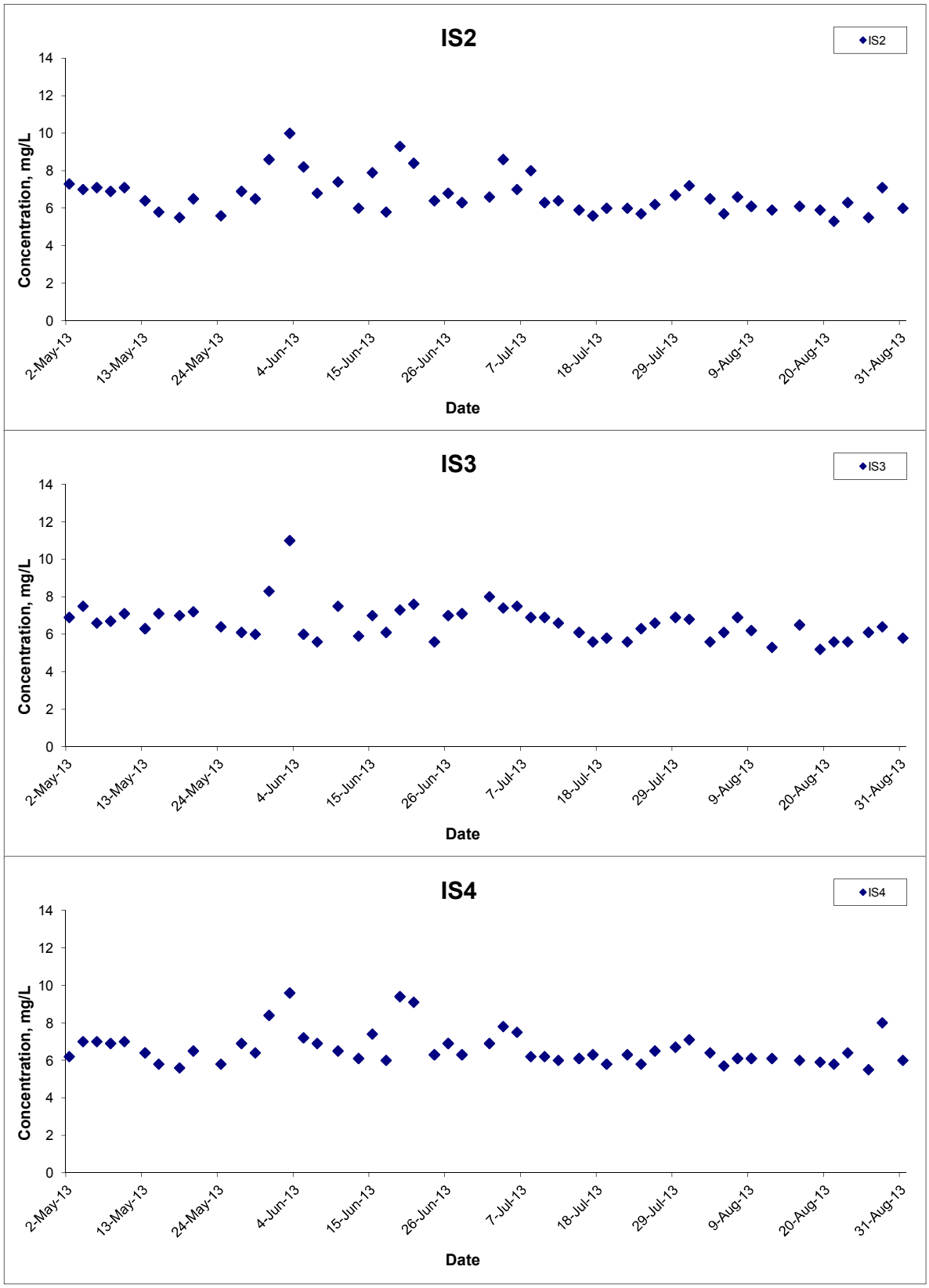
APPENDIX E
GRAPHICAL PRESENTATION OF WATER QUALITY MONITORING RESULTS

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	Project No.: MA12014	CINOTECH
		Date: Aug 13	Appendix: E	

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



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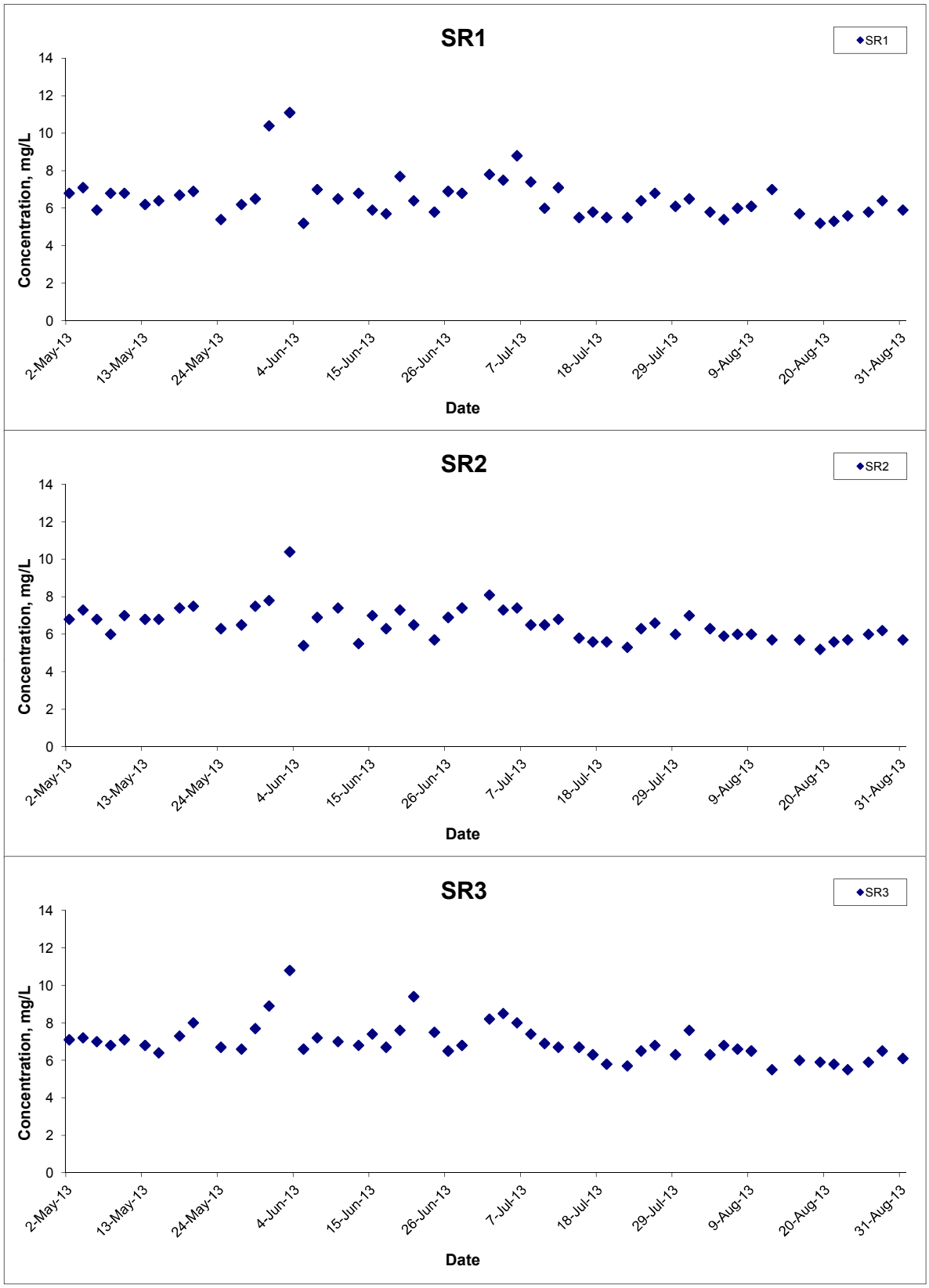
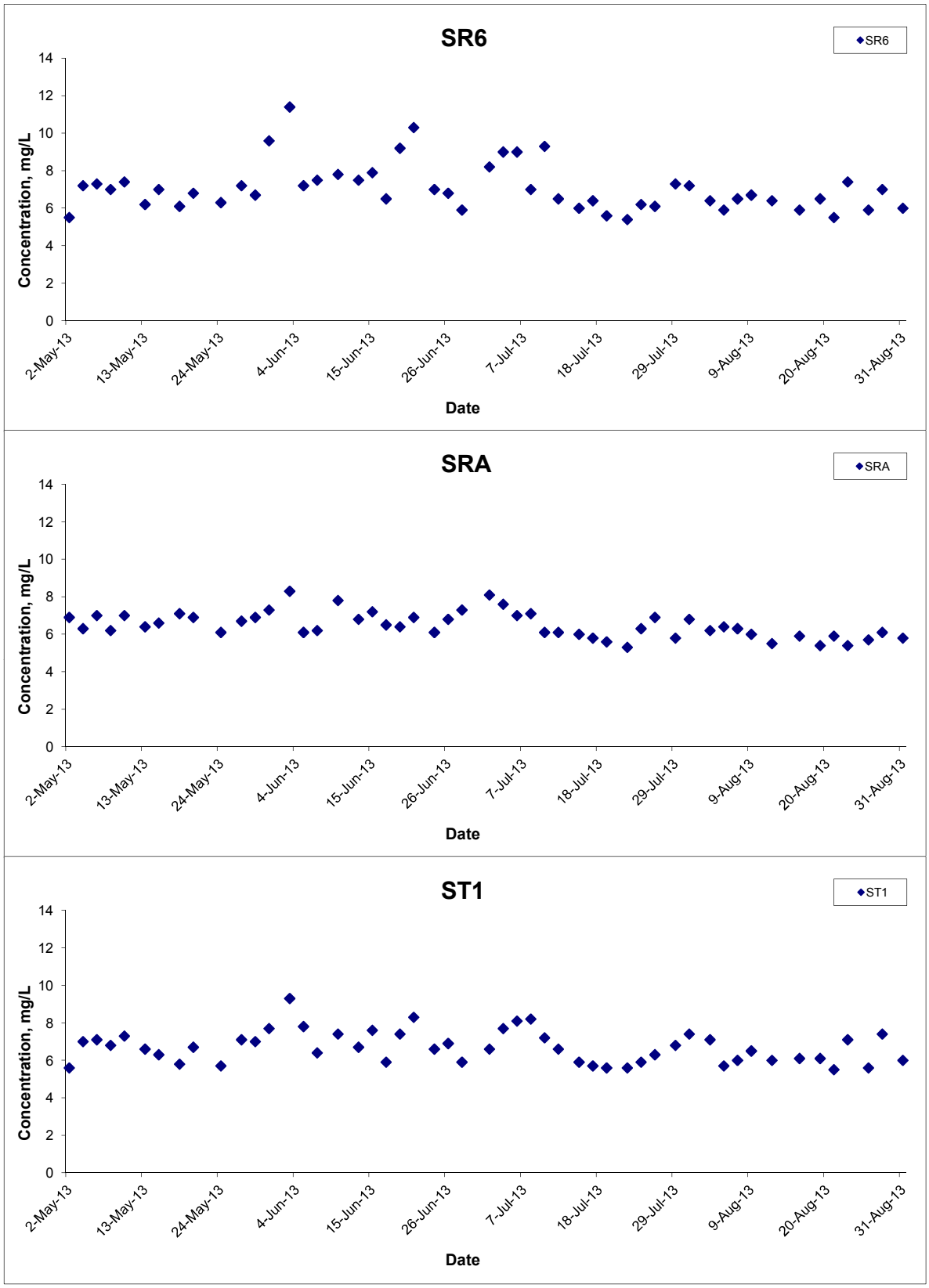
		Date: Aug 13	Appendix: E	

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	Project No.: MA12014	CINOTECH
		Date: Aug 13	Appendix: E	

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	Project No.: MA12014	CINOTECH
		Date: Aug 13	Appendix: E	

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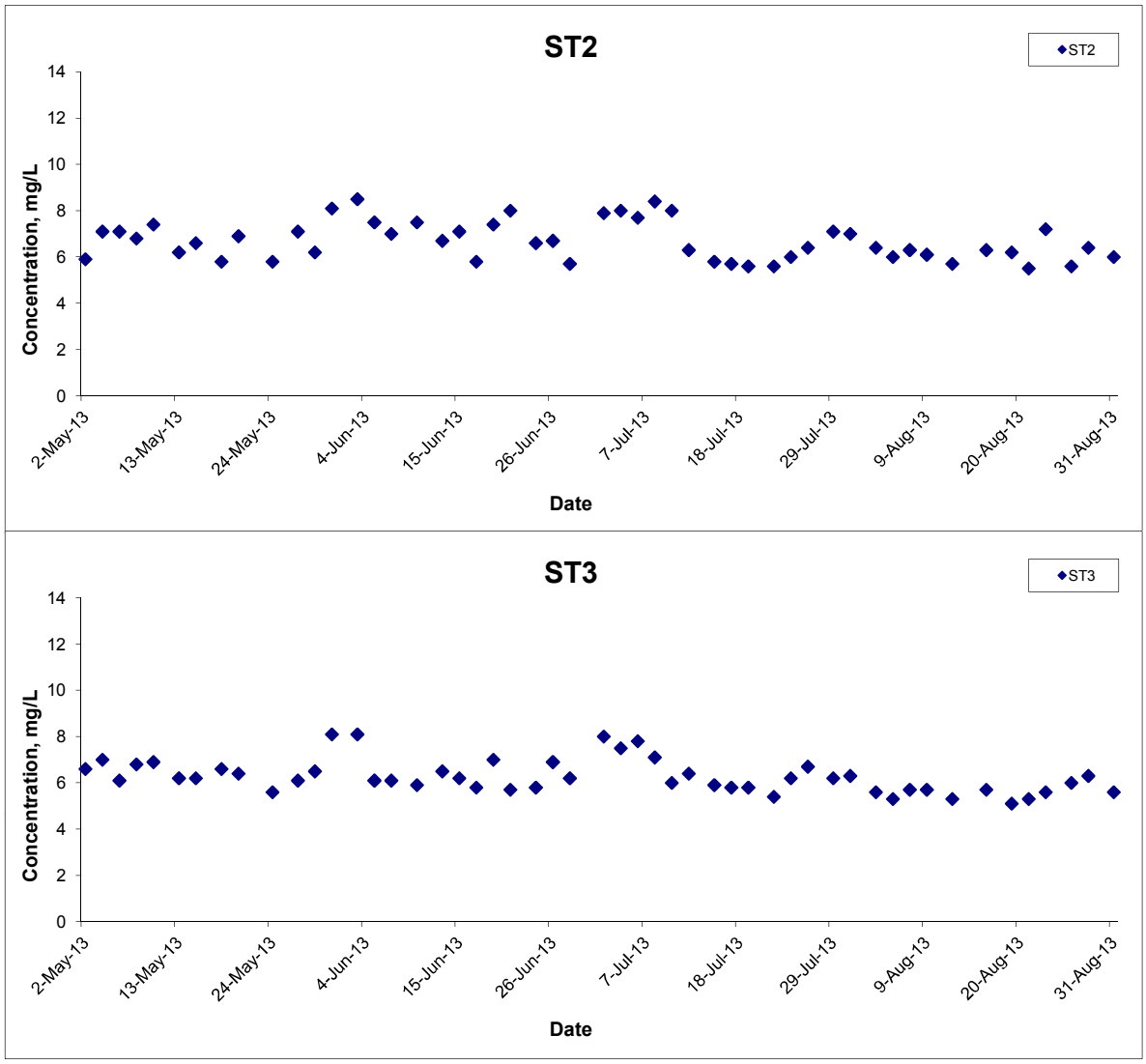

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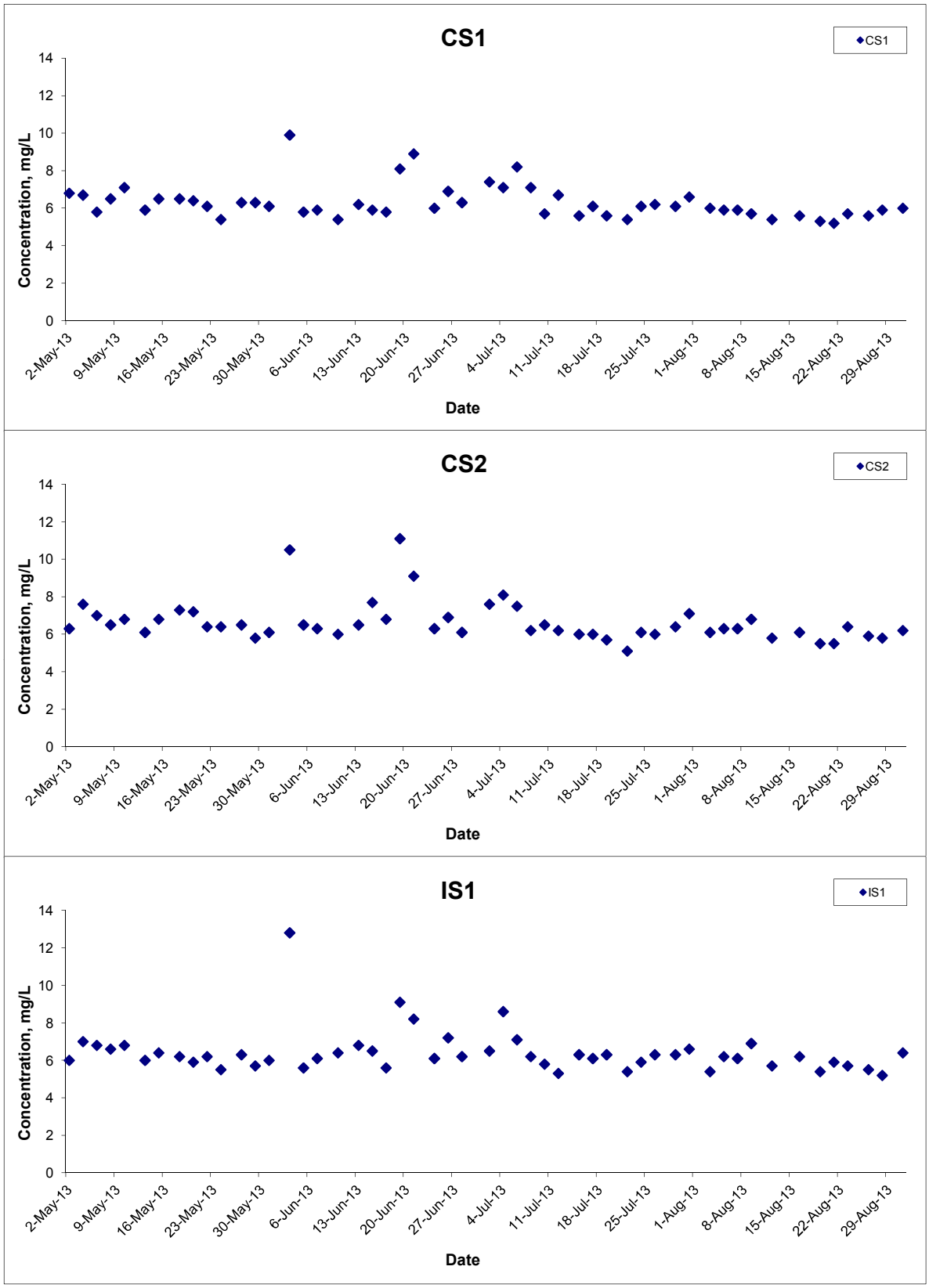
		Date: Aug 13	Appendix: E	

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



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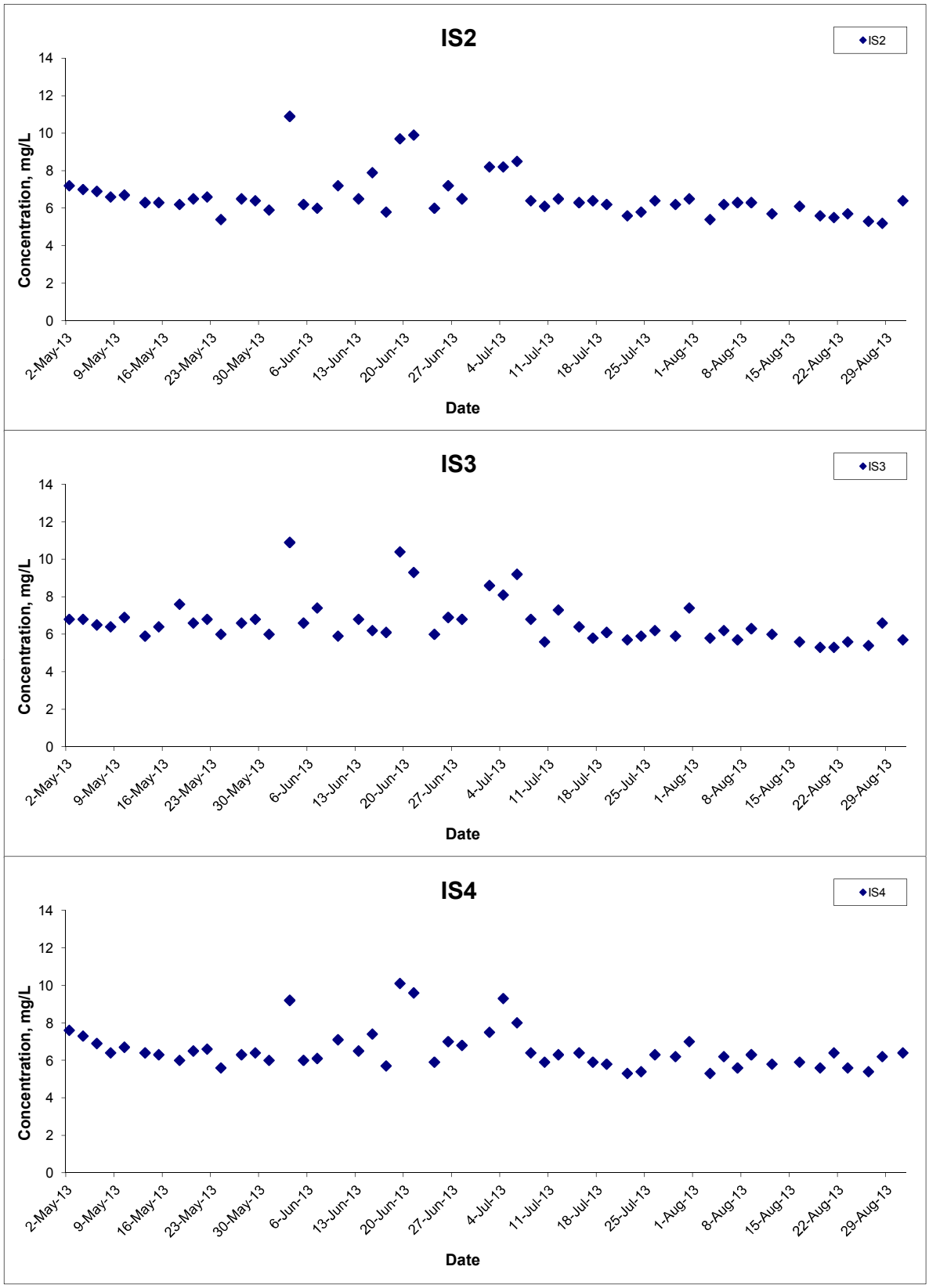
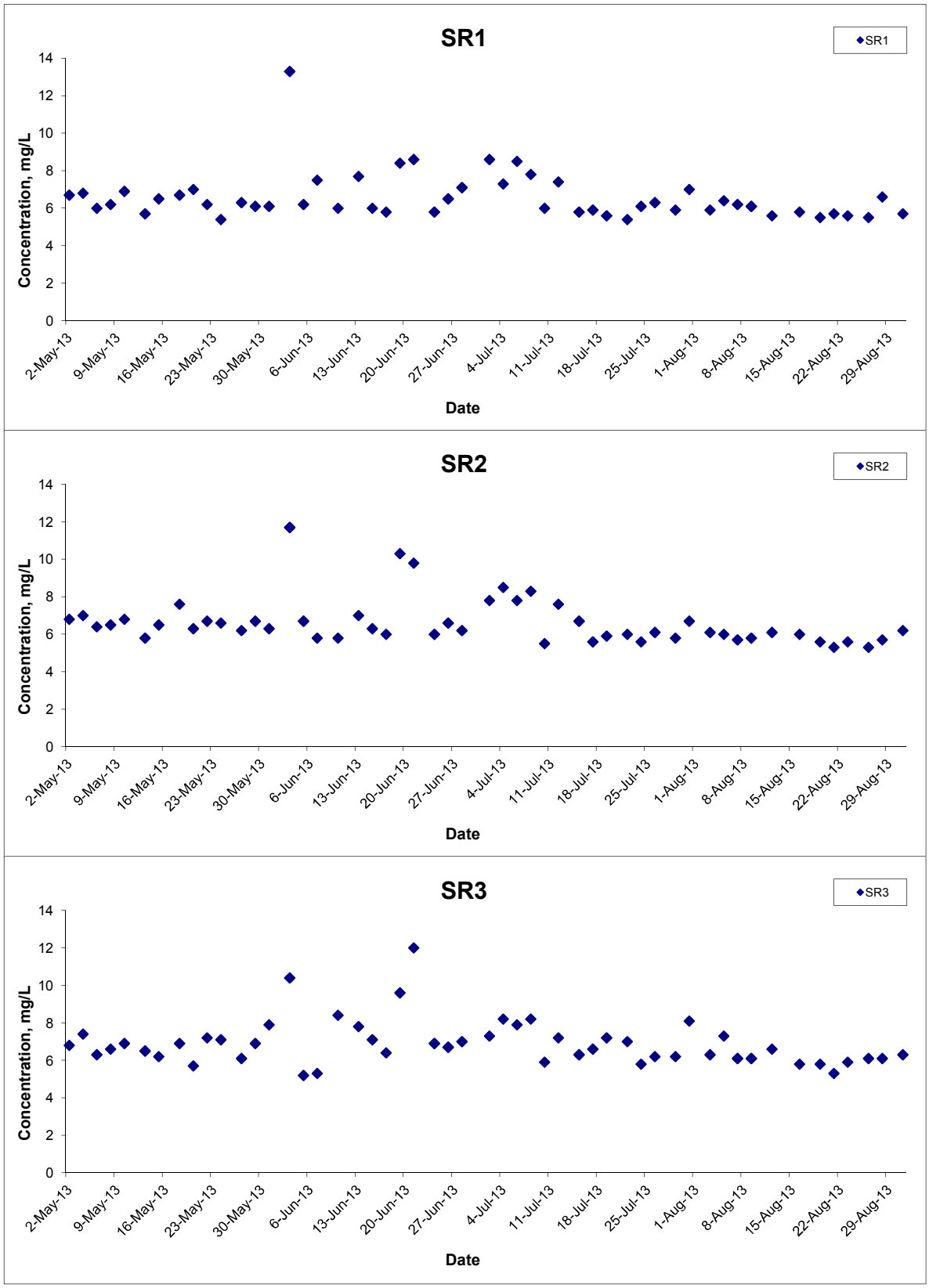
		Date: Aug 13	Appendix: E	

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	Project No.: MA12014	CINOTECH
		Date: Aug 13	Appendix: E	

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



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		Date Aug 13	Appendix E	

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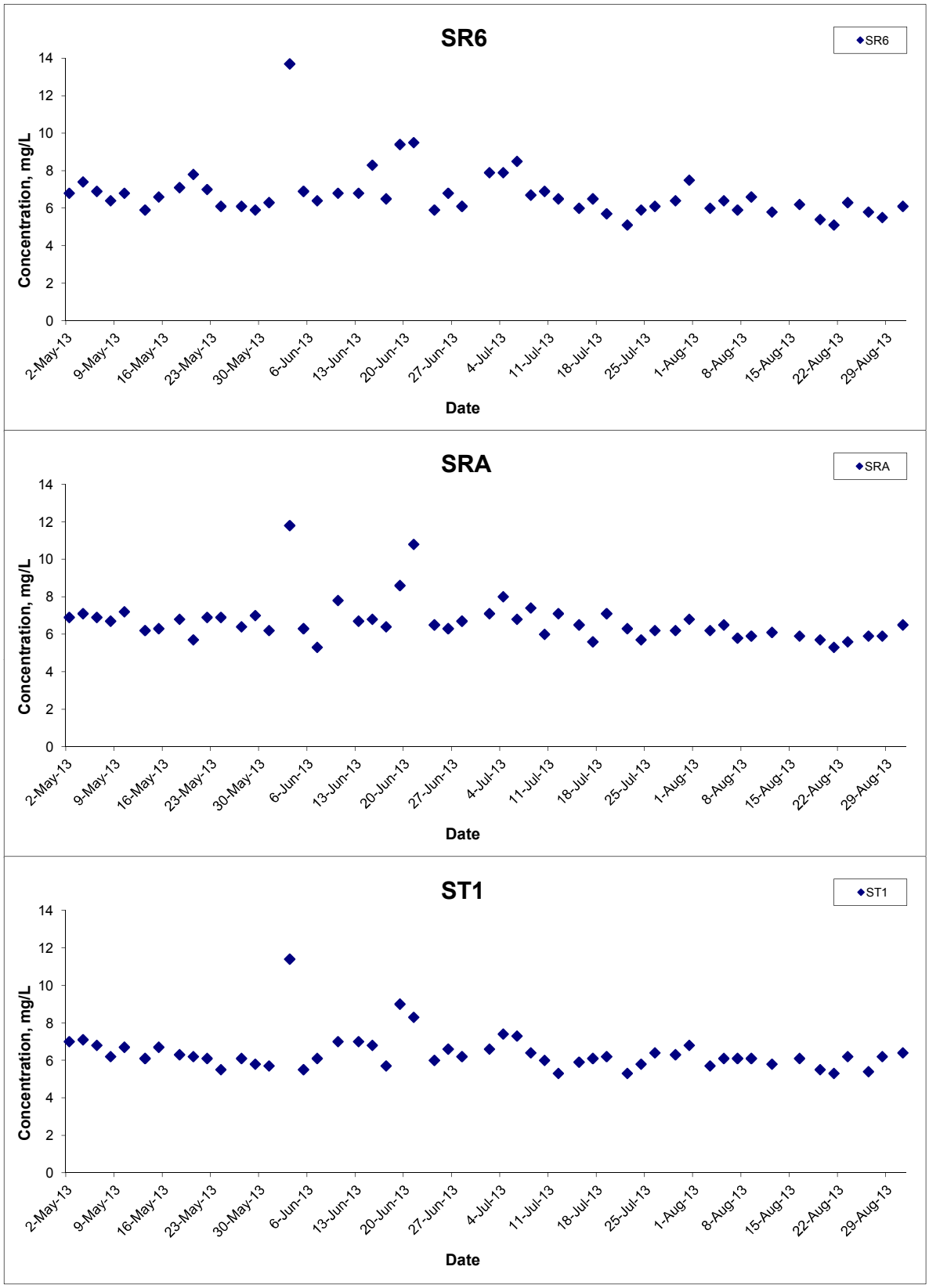

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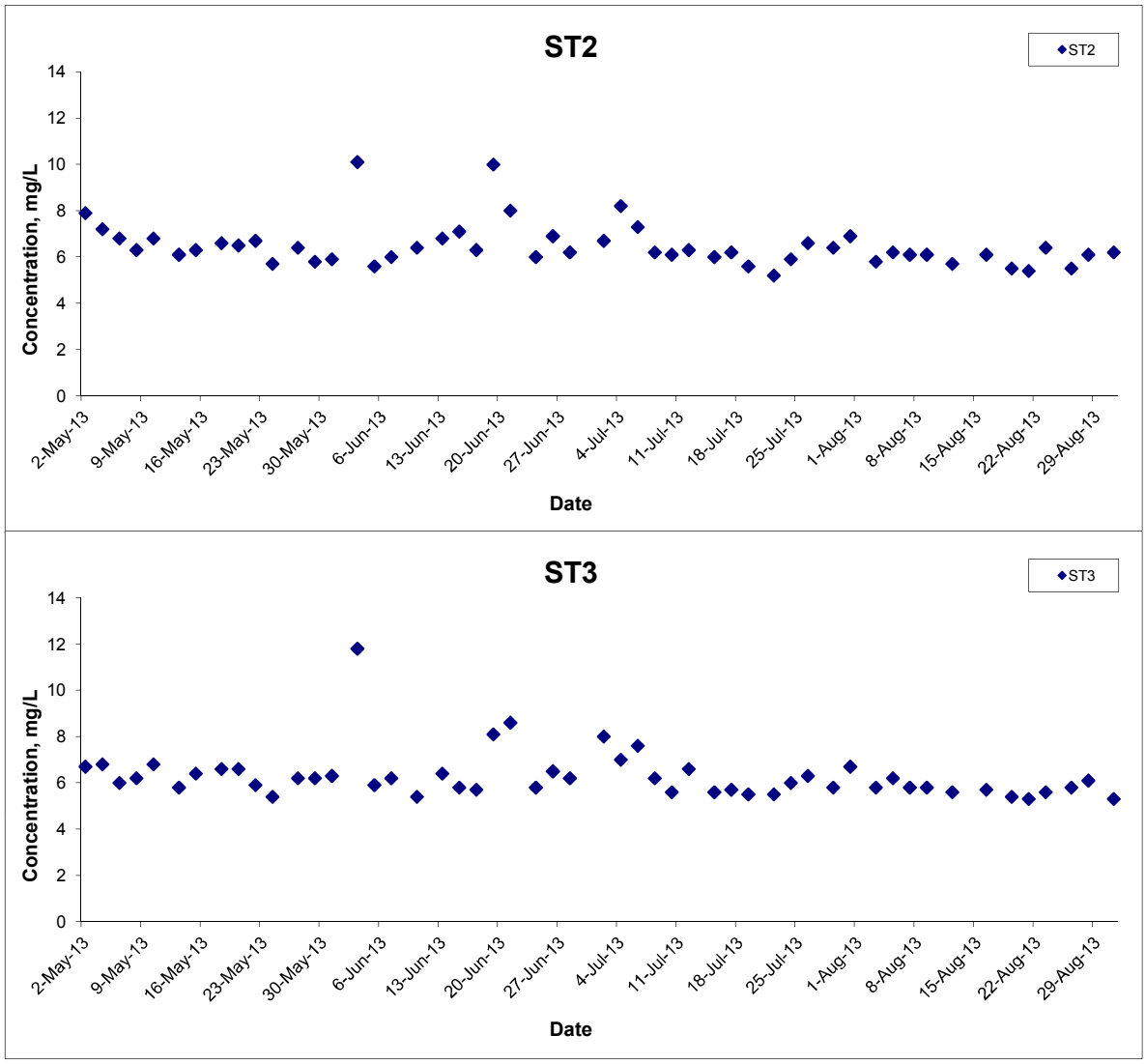
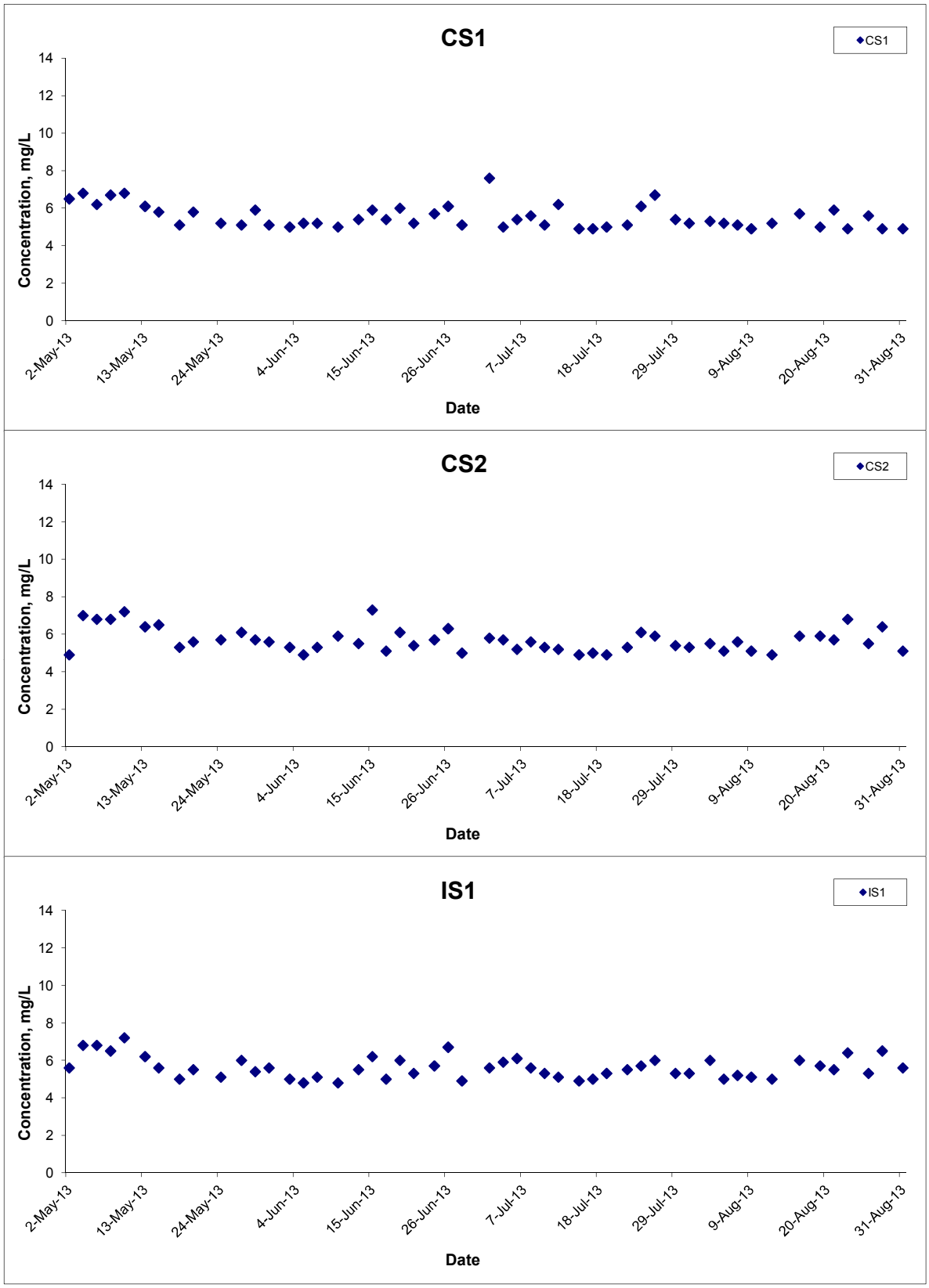
		Date: Aug 13	Appendix: E	

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



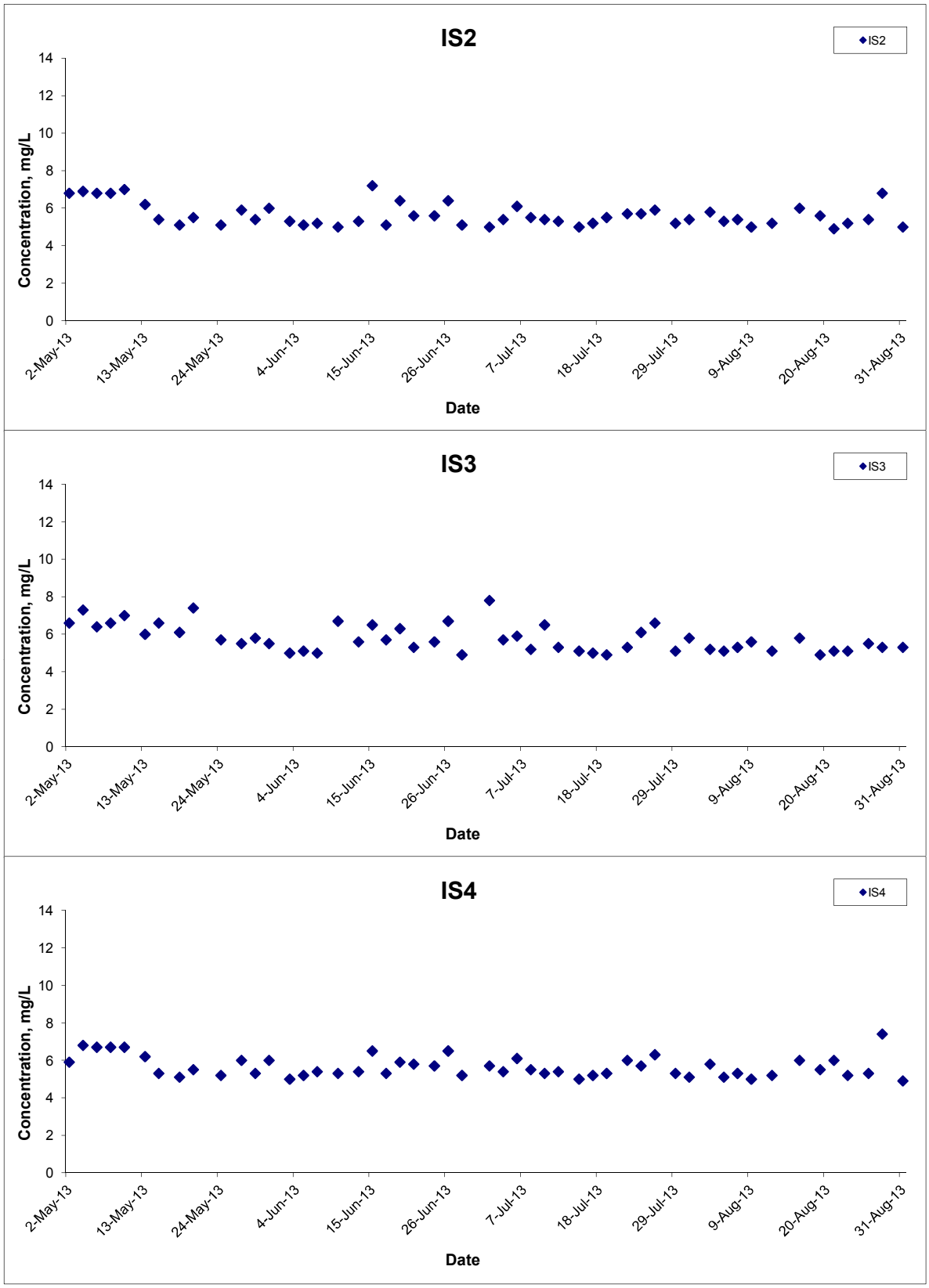
Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S Date: Aug 13	Project No.: MA12014 Appendix: E	CINOTECH

Dissolved Oxygen (Bottom) 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	Project No.: MA12014	CINOTECH
		Date: Aug 13	Appendix: E	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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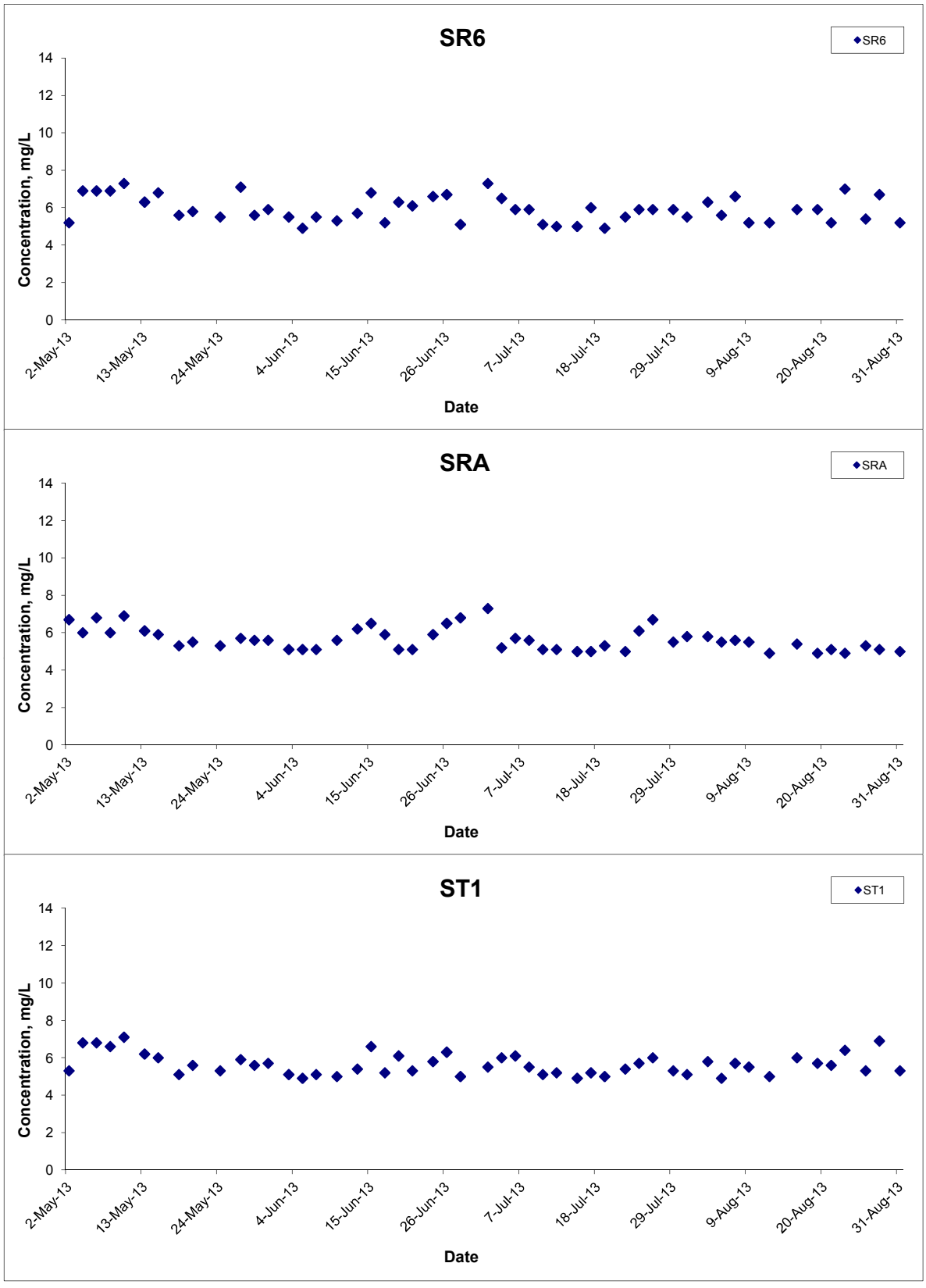
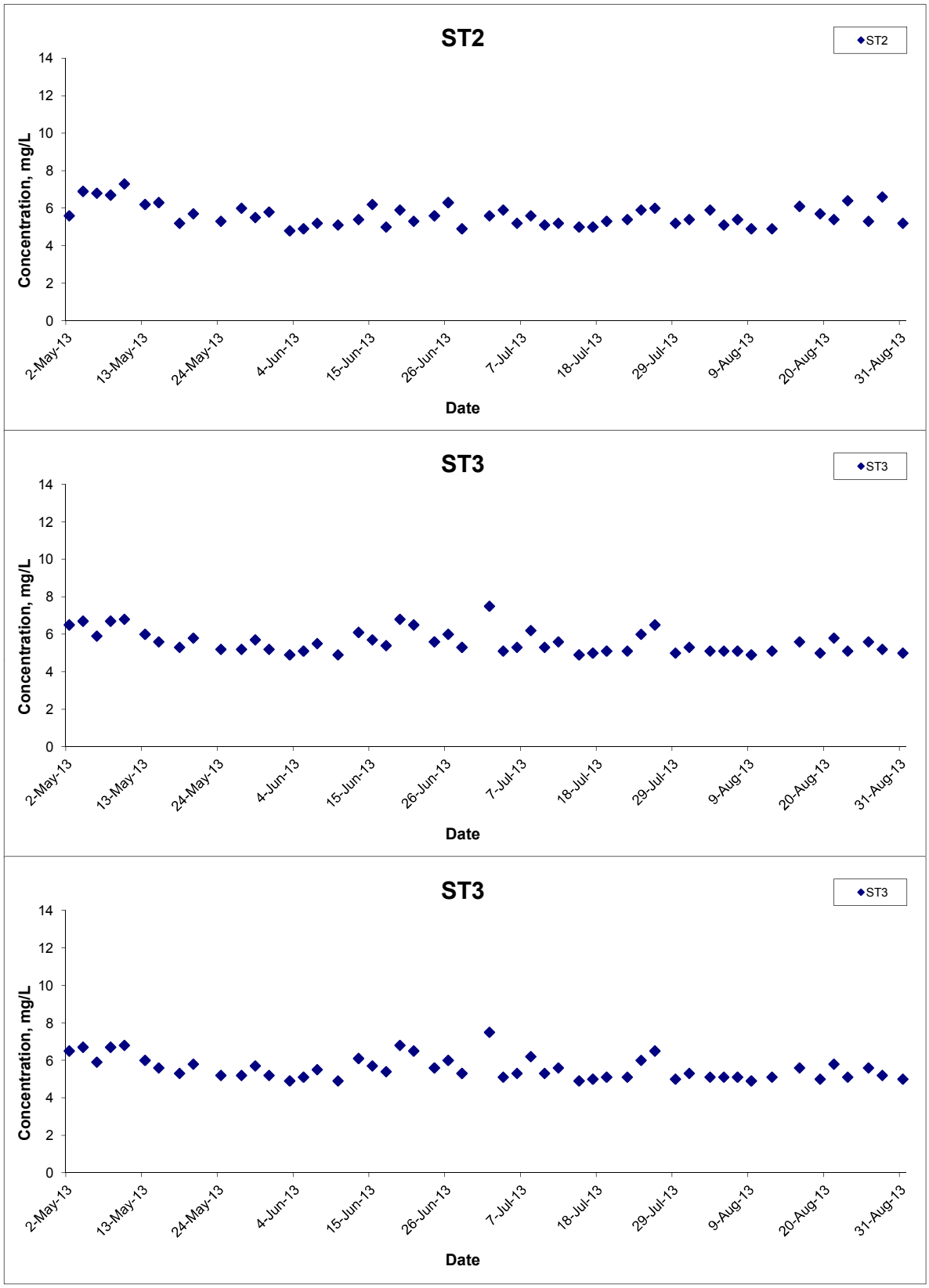
		Date: Aug 13	Appendix: E	

Dissolved Oxygen (Bottom) 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 13	Project No.: MA12014 Appendix: E	CINOTECH

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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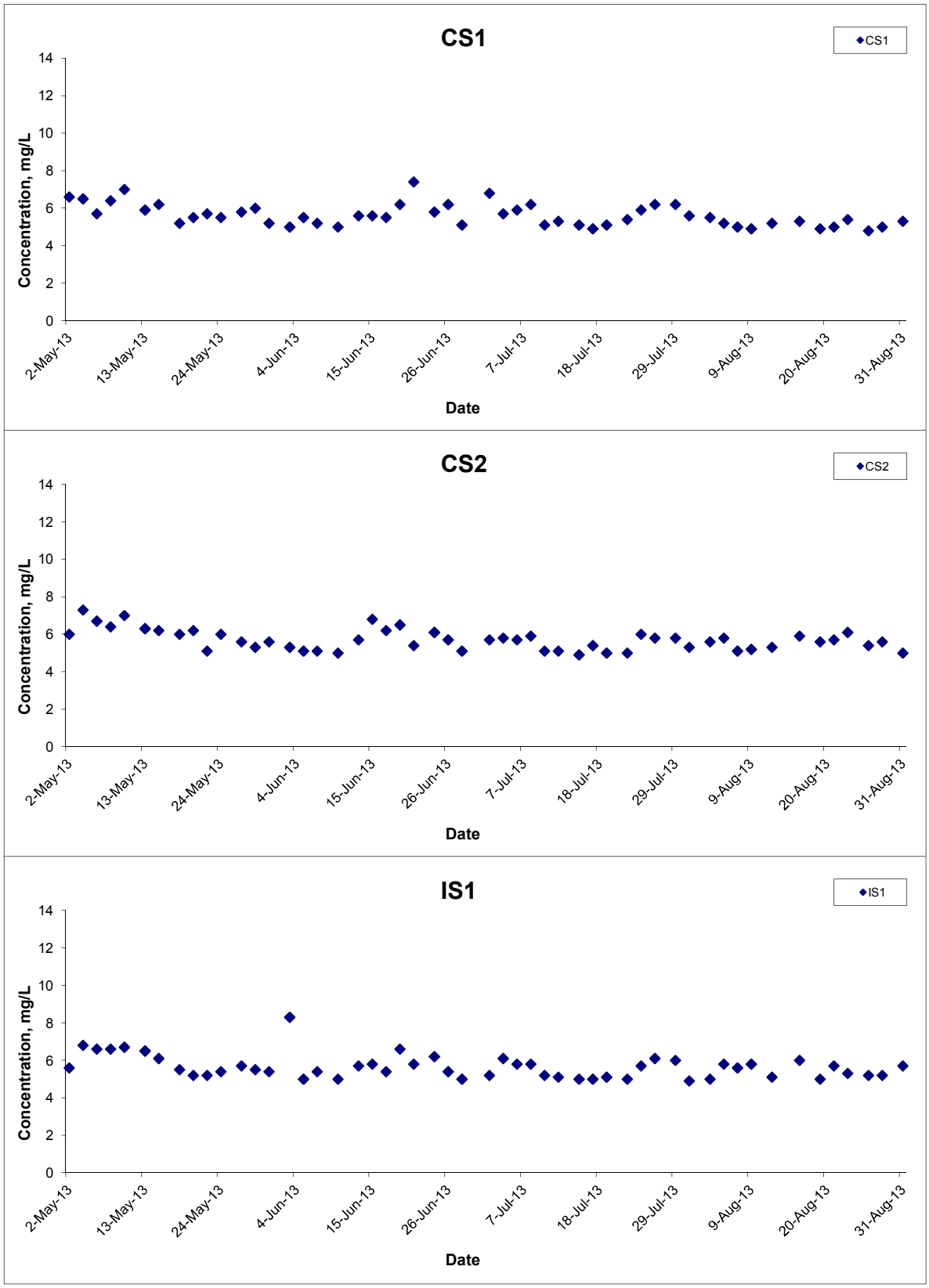
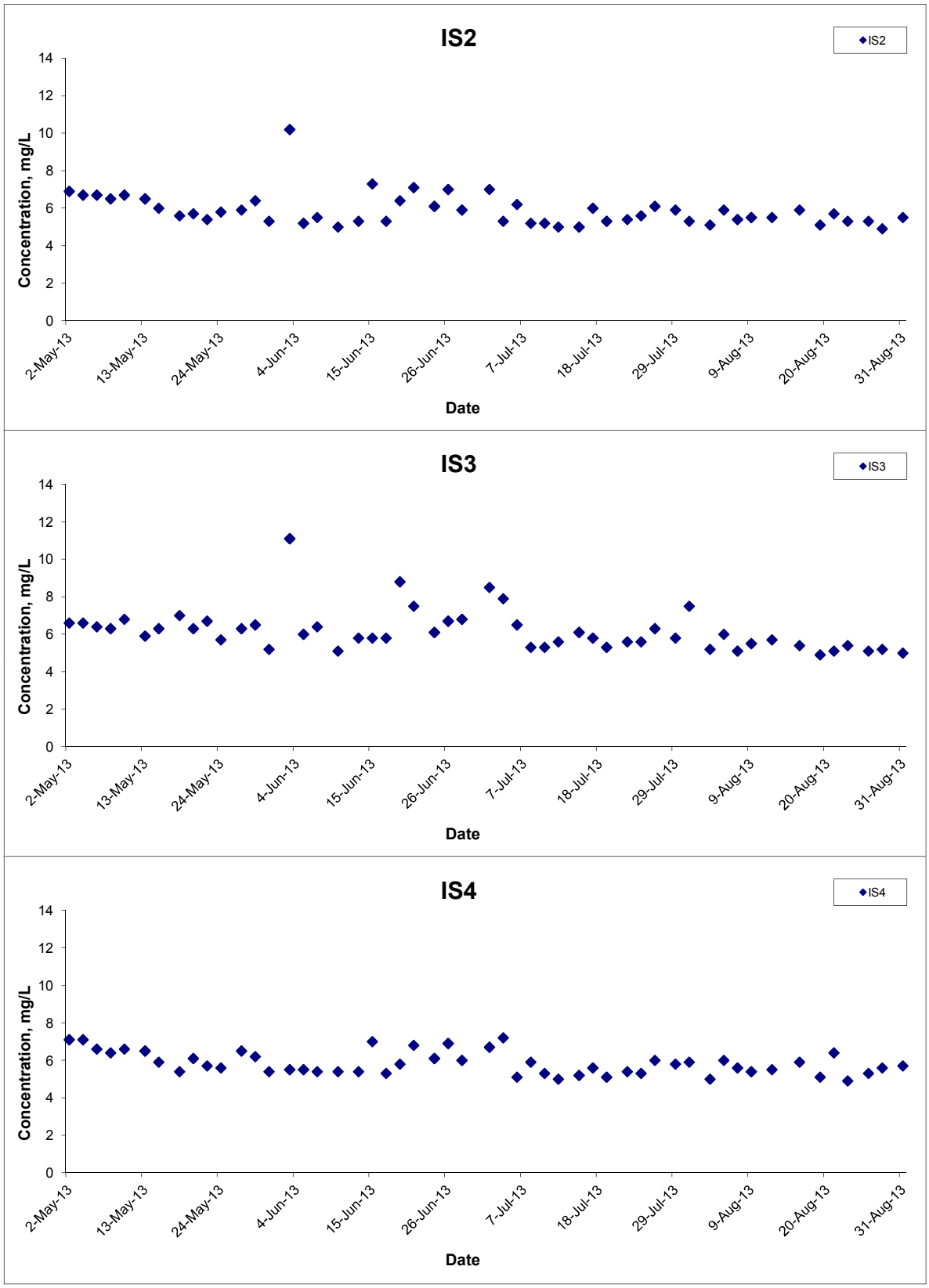
		Date Aug 13	Appendix E	

Dissolved Oxygen (Bottom) 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	Project No.: MA12014	CINOTECH
		Date: Aug 13	Appendix: E	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



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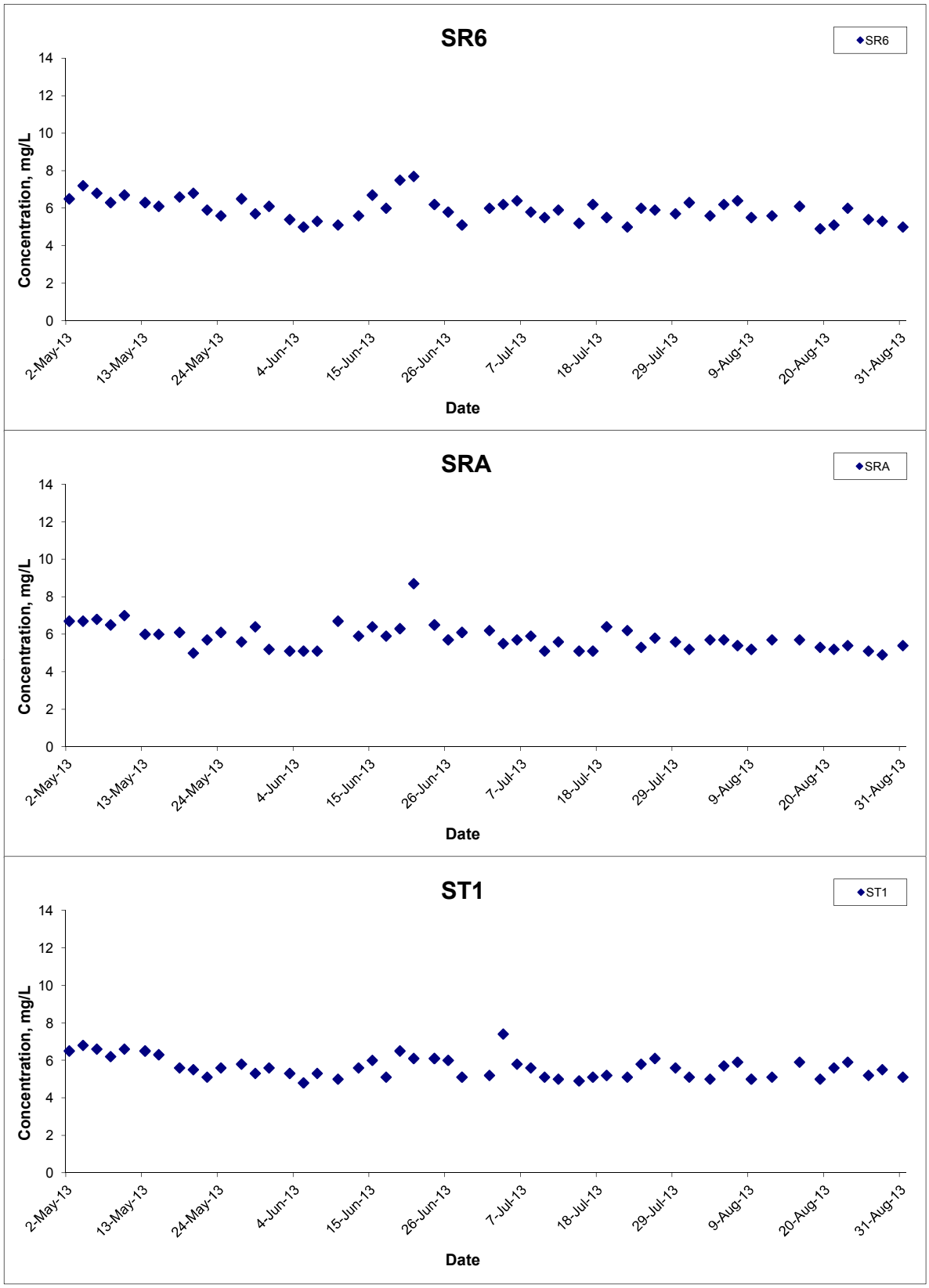
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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		Date: Aug 13	Appendix: E	

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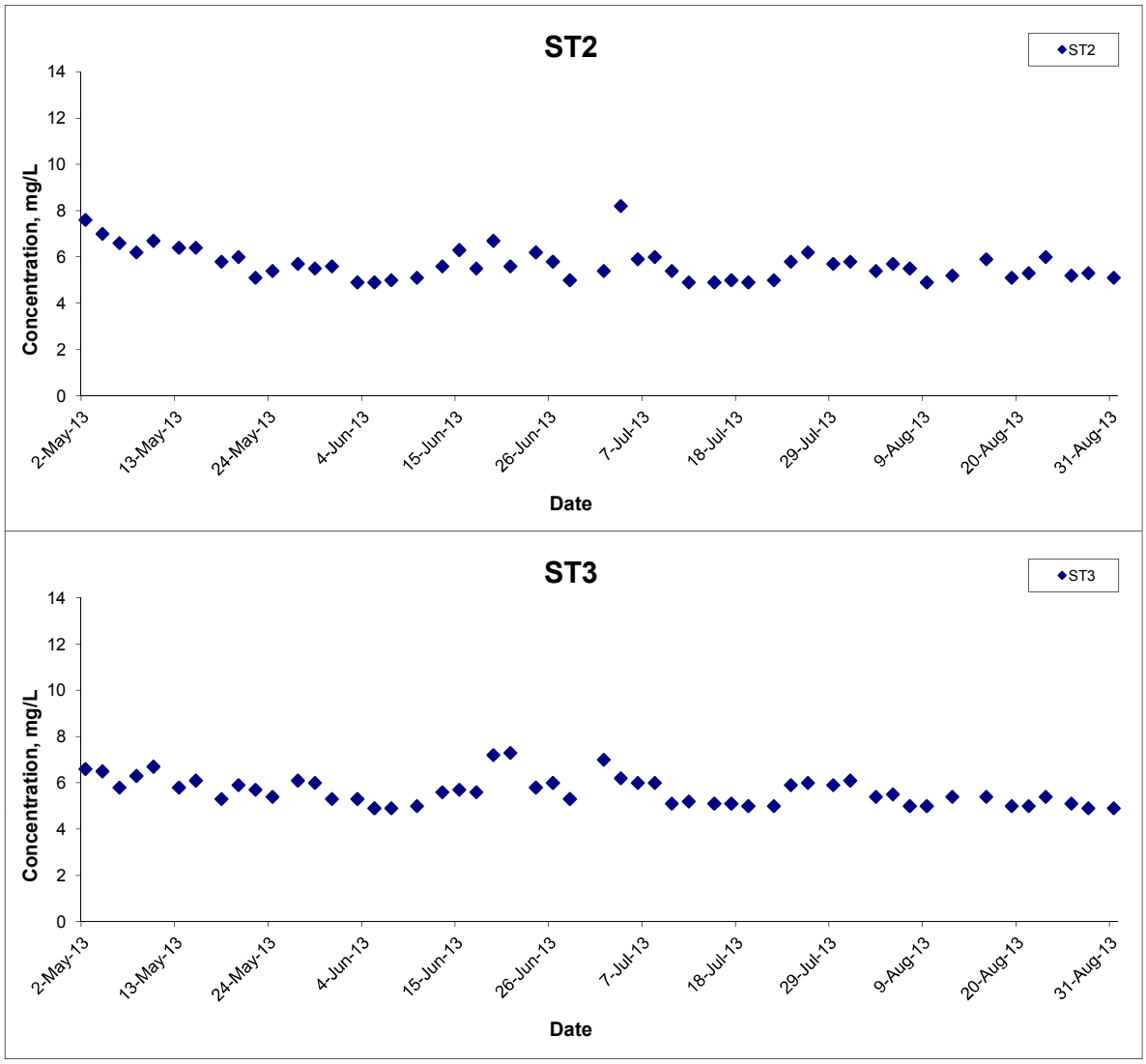

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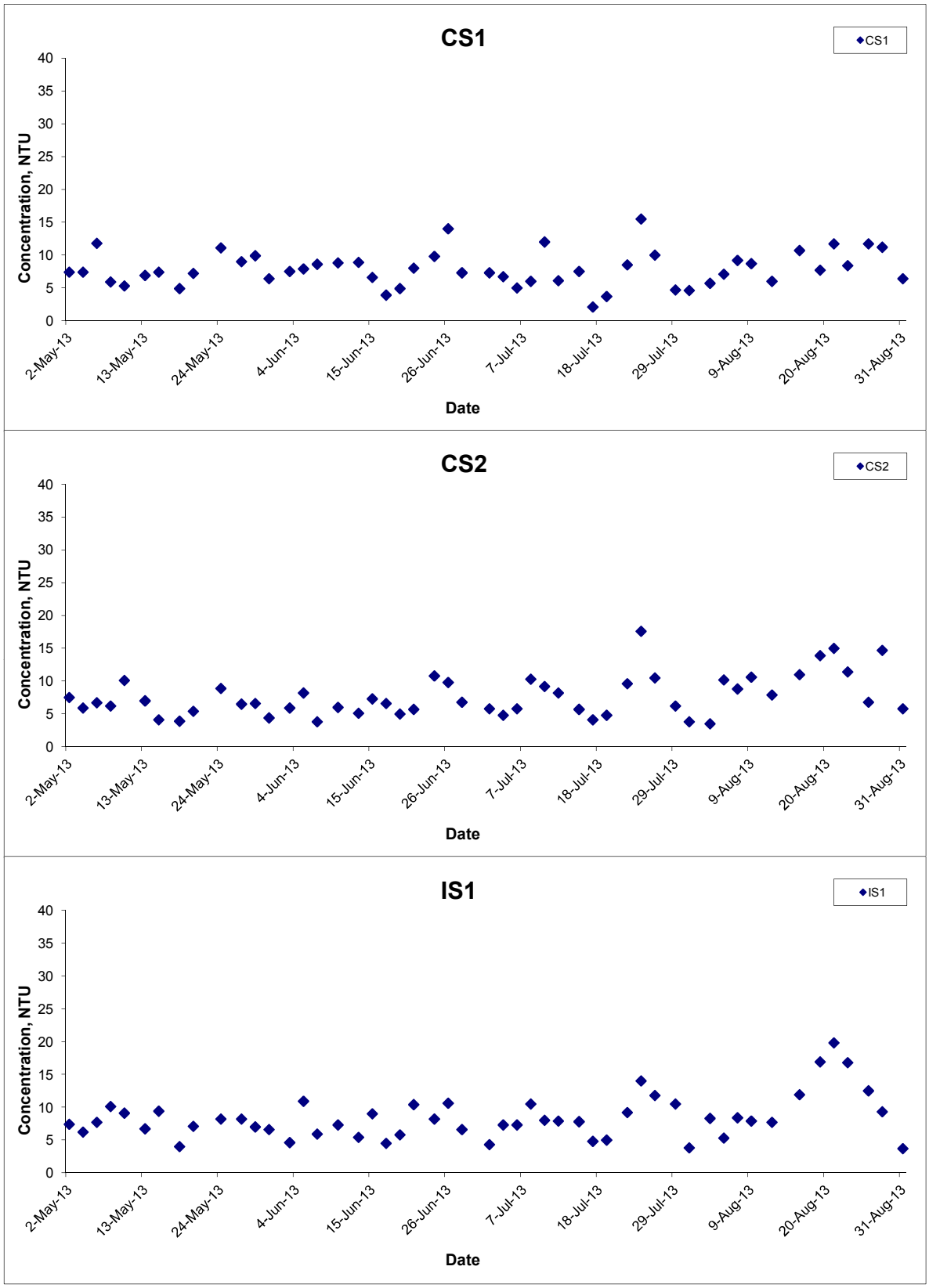
		Date: Aug 13	Appendix: E	

Turbidity (Depth-averaged) at Mid-Ebb Tide



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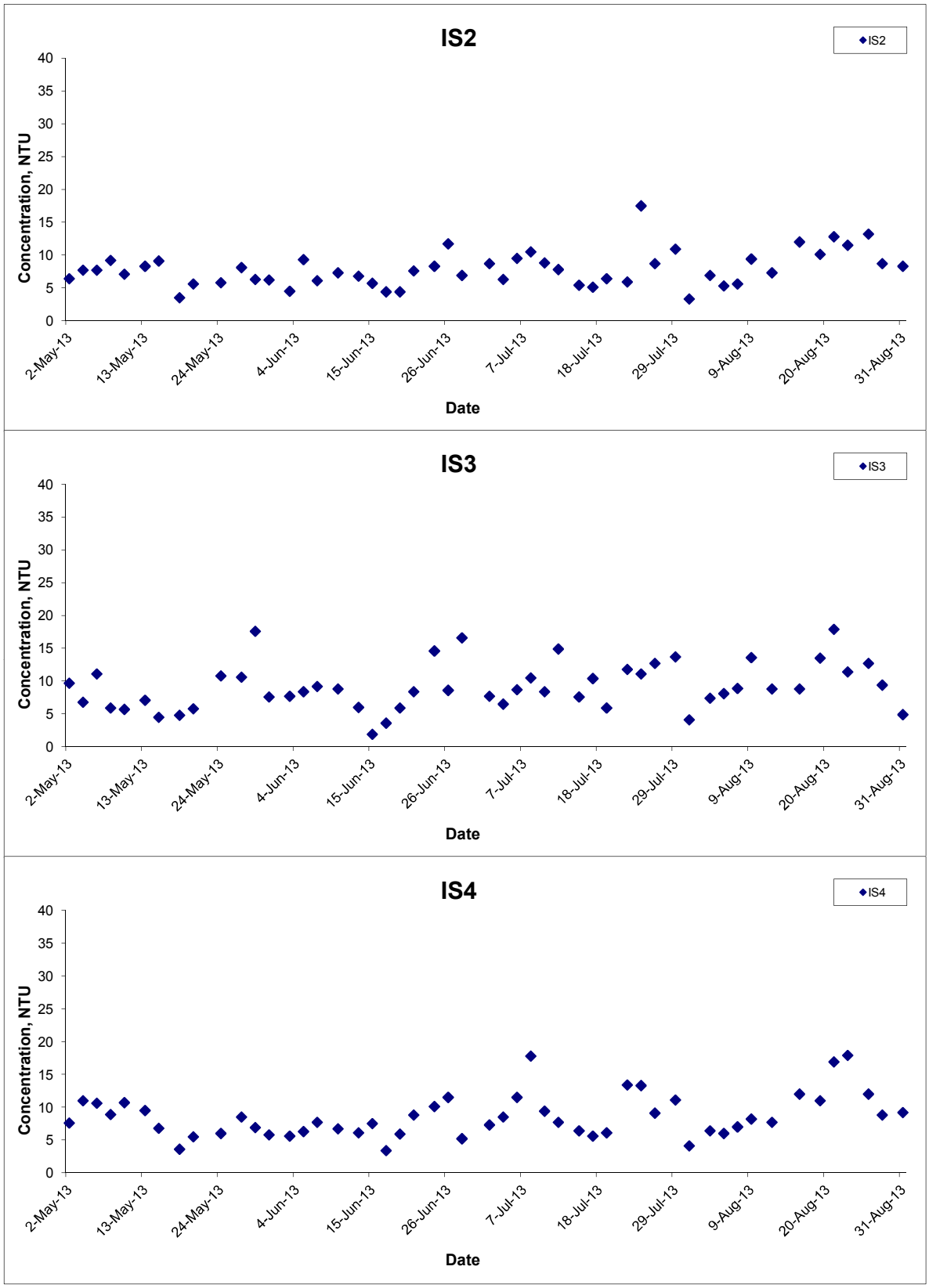

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		Date: Aug 13	Appendix: E	

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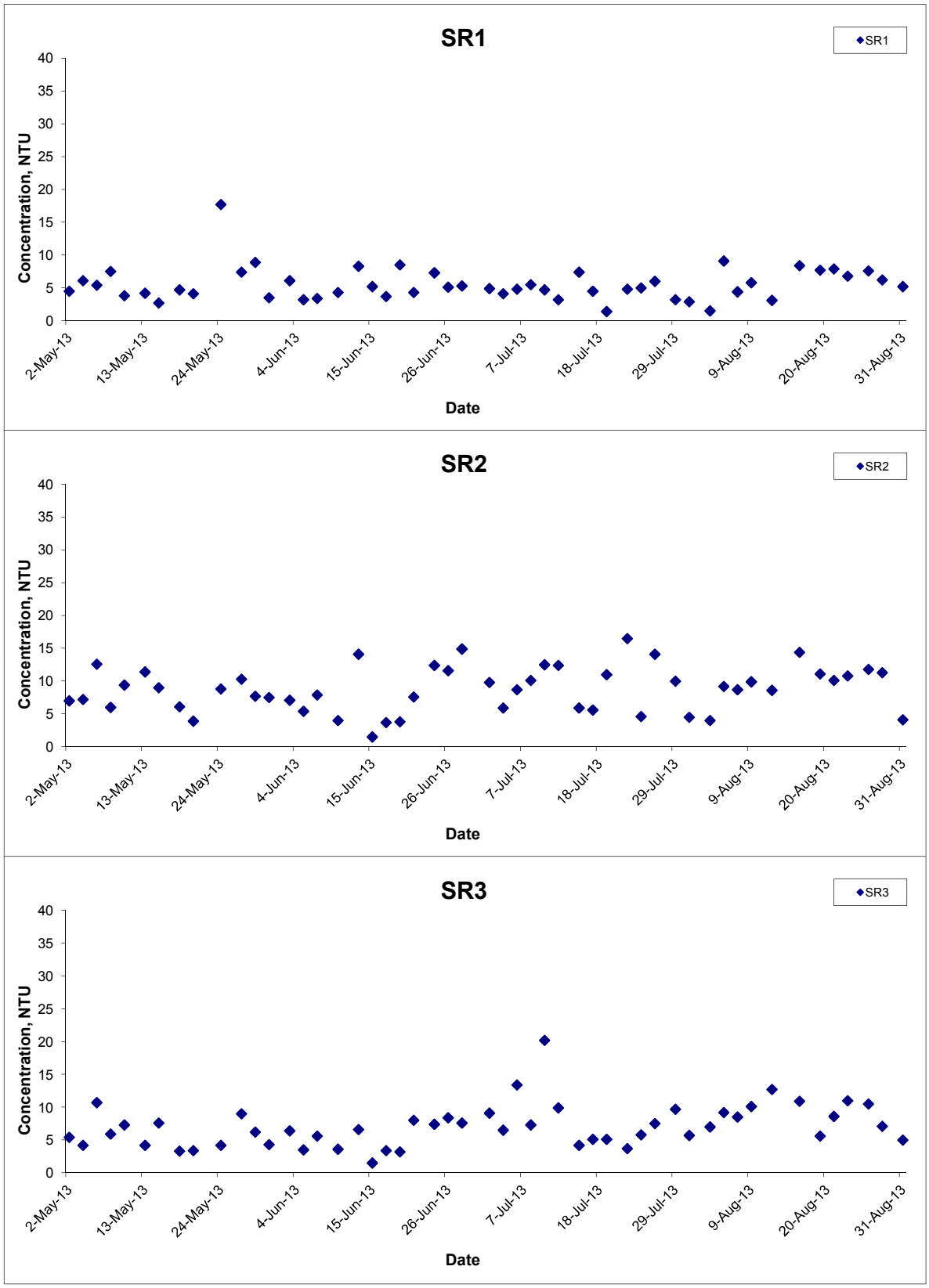

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		Date: Aug 13	Appendix: E	

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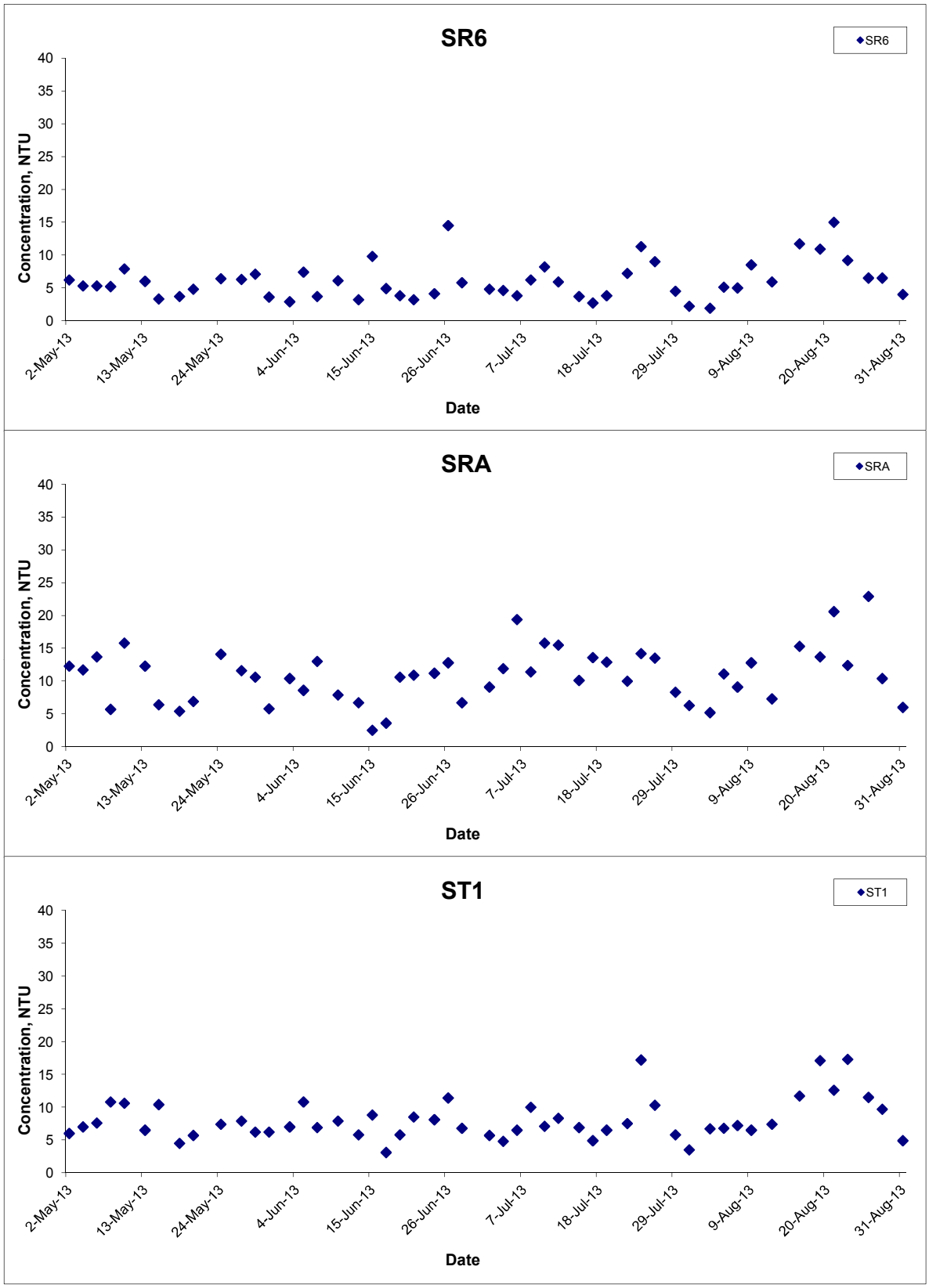

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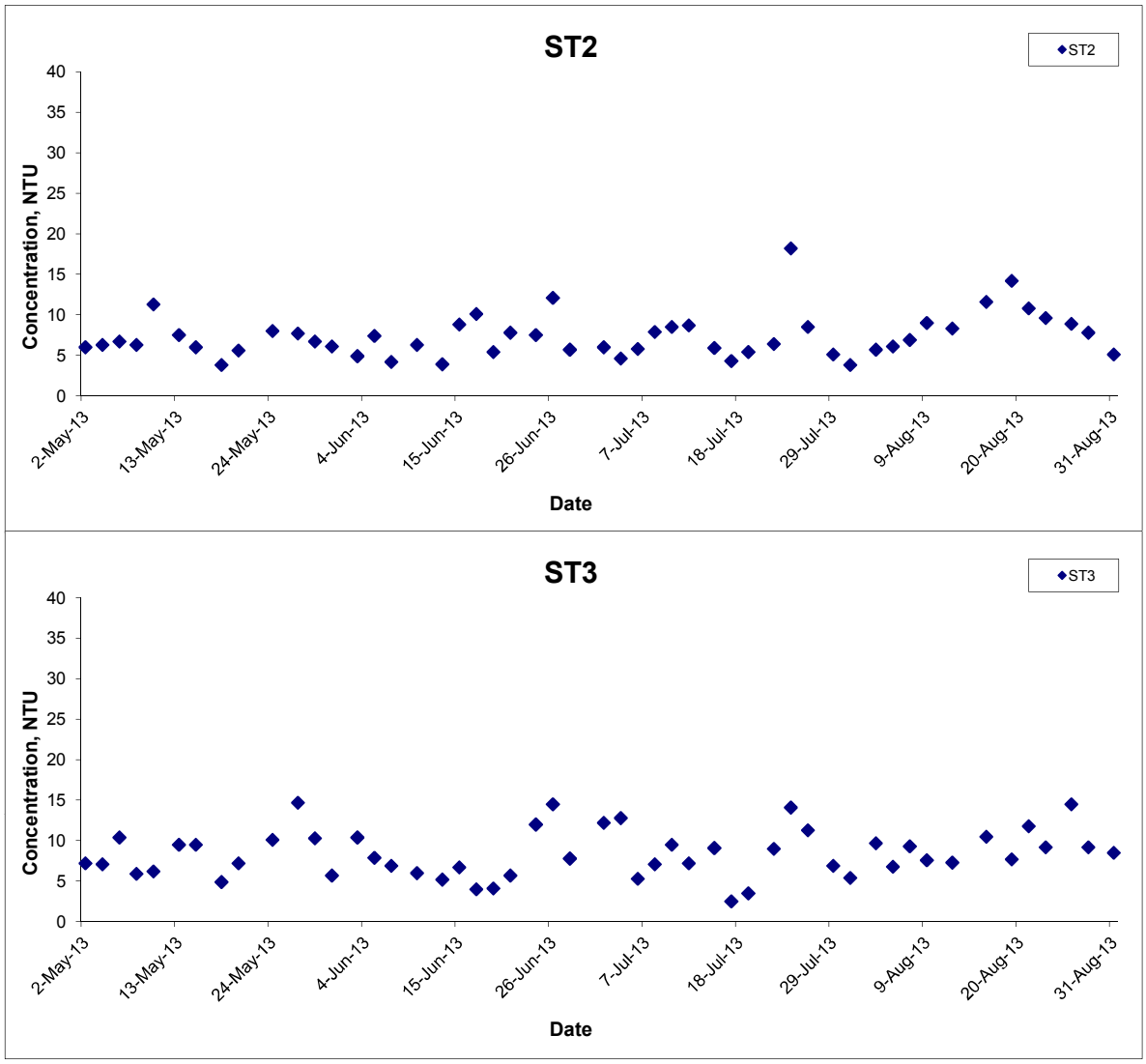
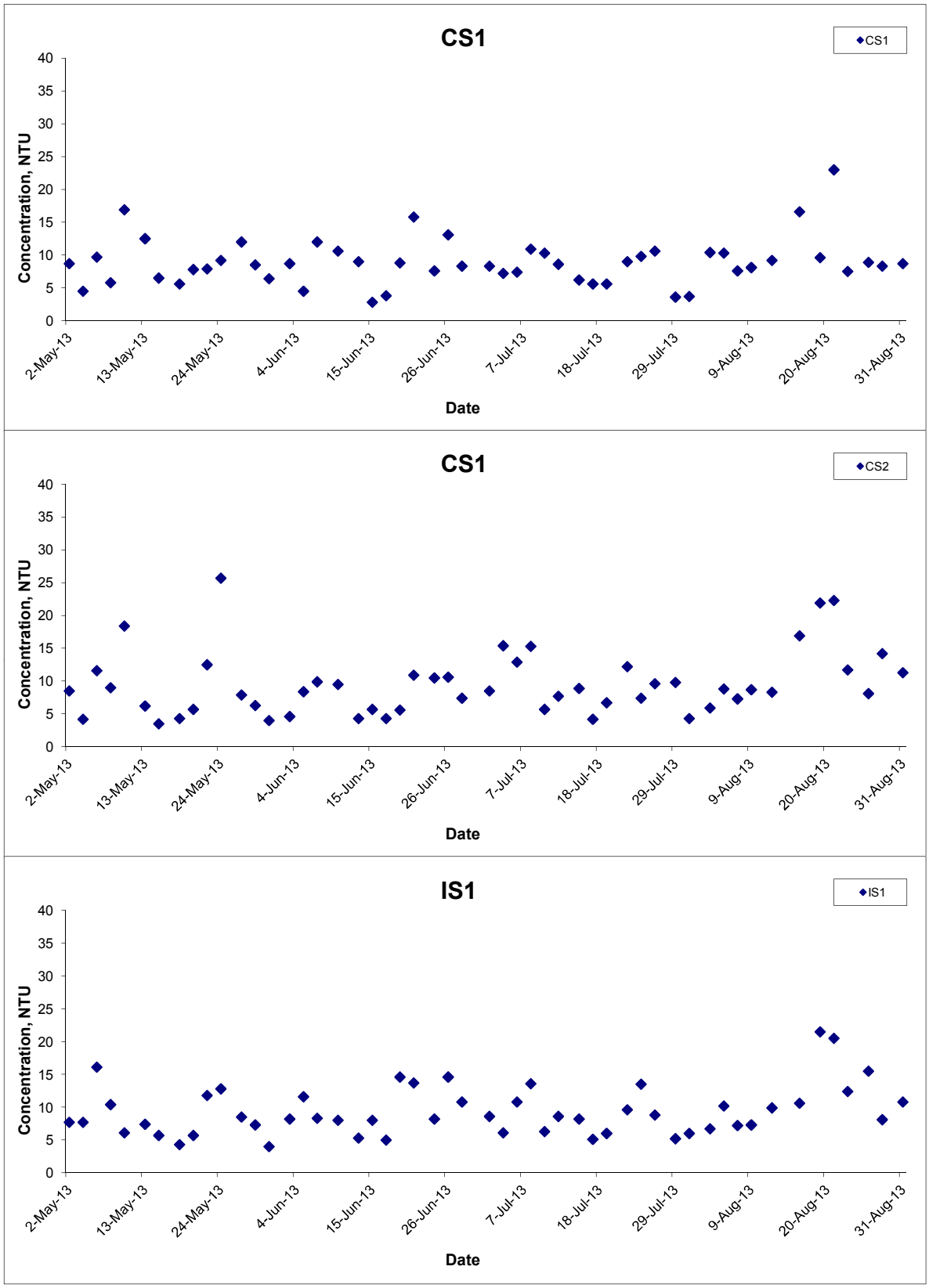
		Date: Aug 13	Appendix: E	

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 Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S Date: Aug 13	Project No.: MA12014 Appendix: E	CINOTECH

Turbidity (Depth-averaged) at Mid-Flood Tide



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		Date Aug 13	Appendix E	

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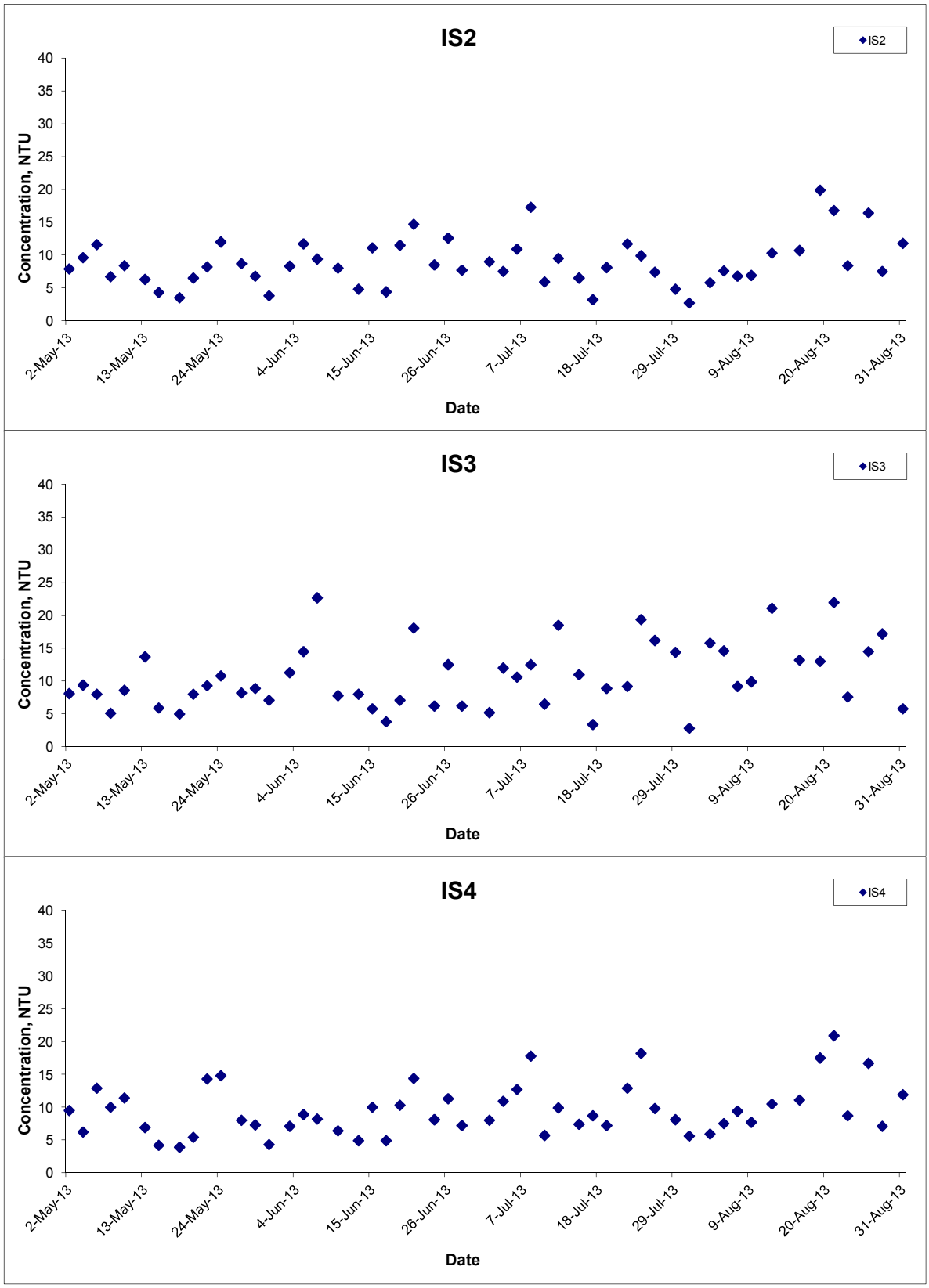

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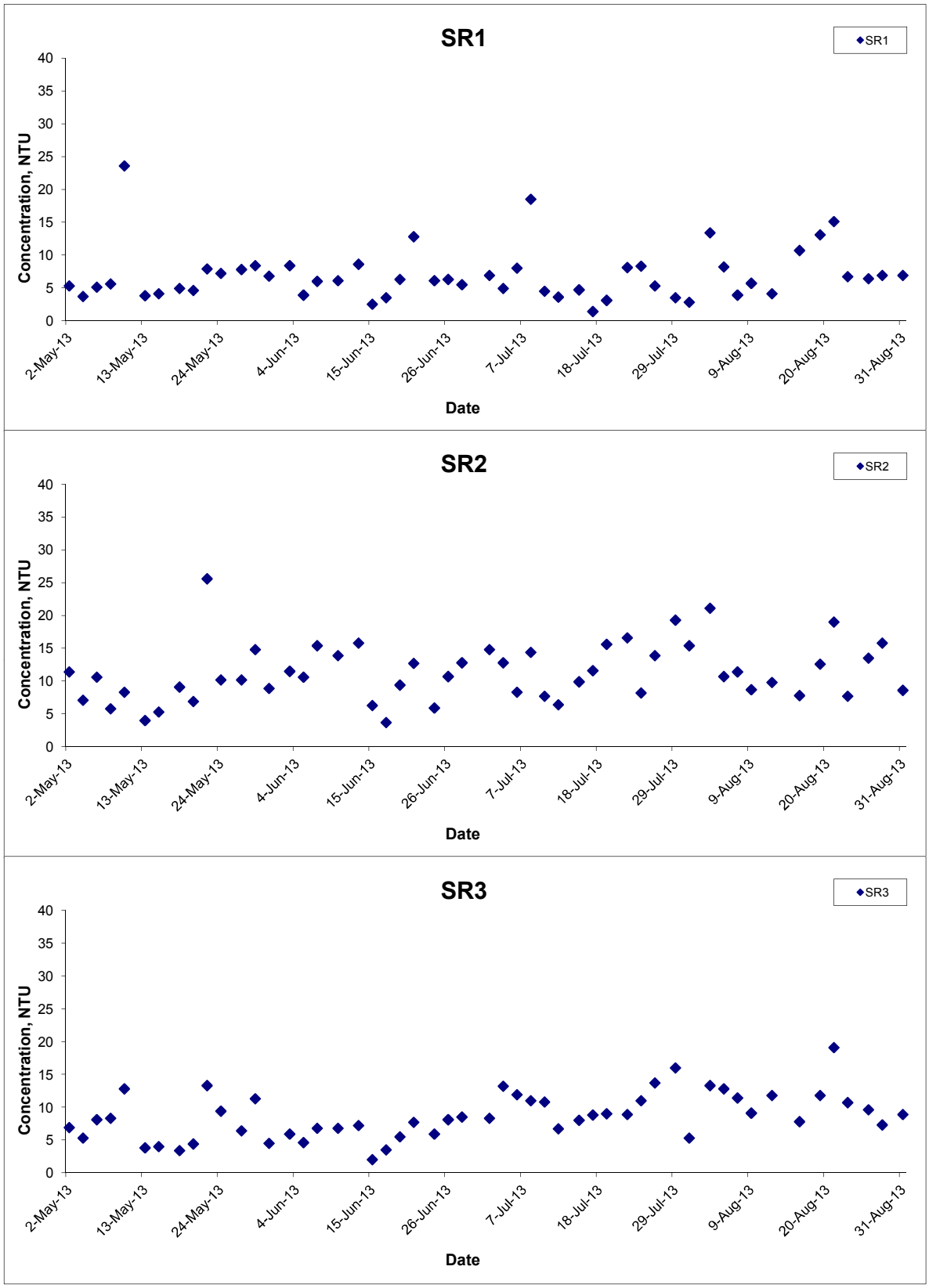

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		Date: Aug 13	Appendix: E	

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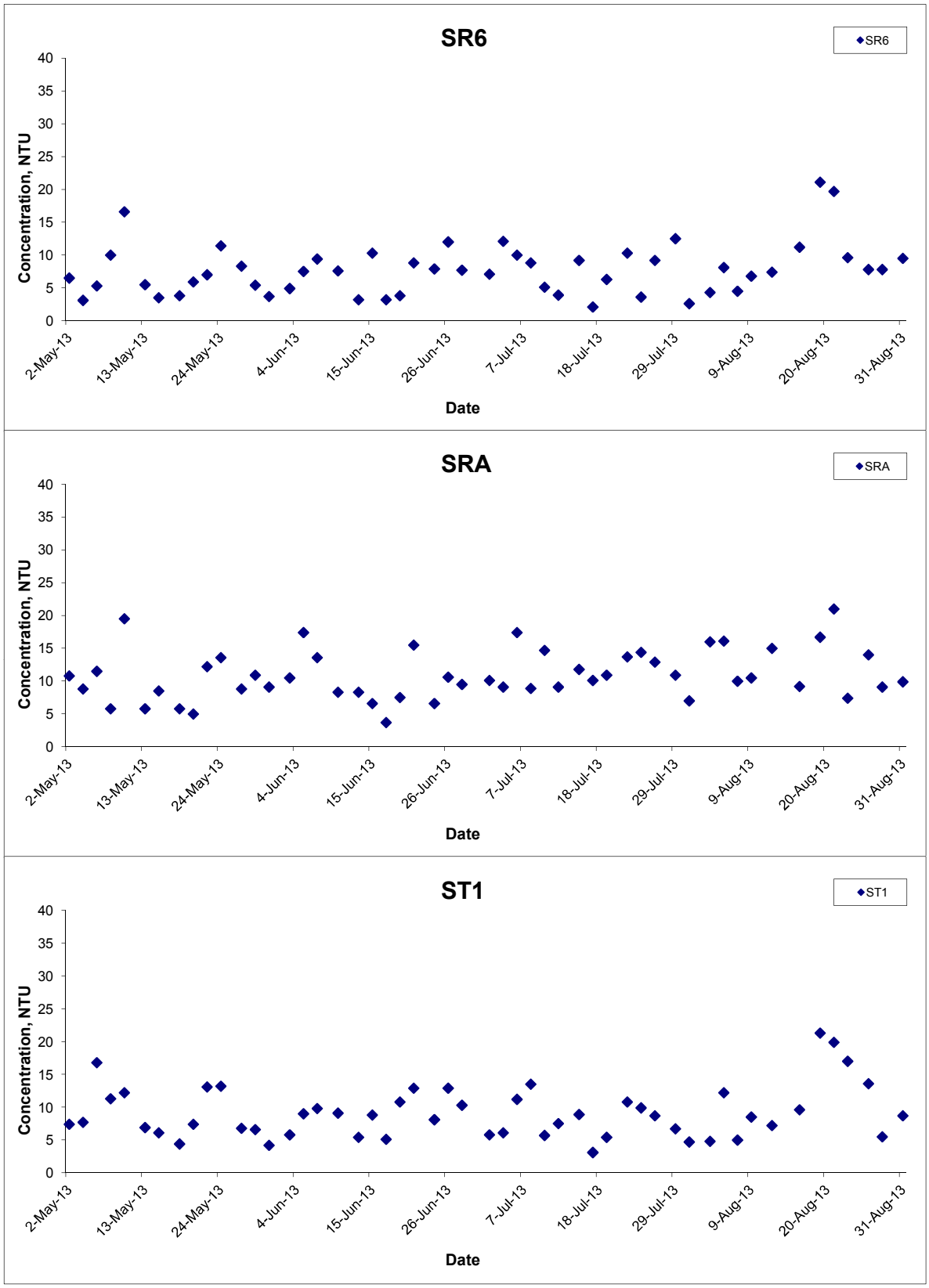

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		Date: Aug 13	Appendix: E	

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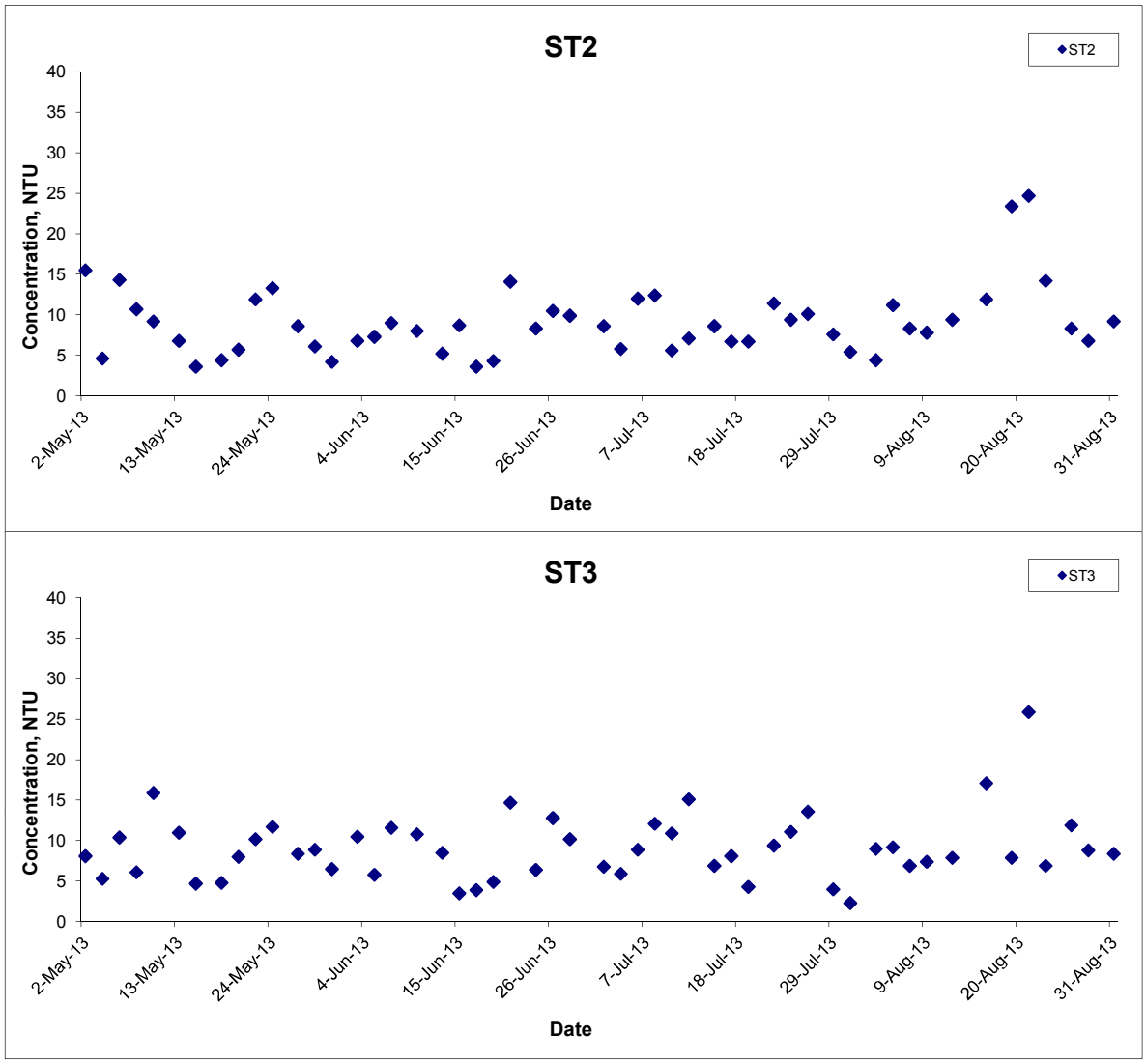

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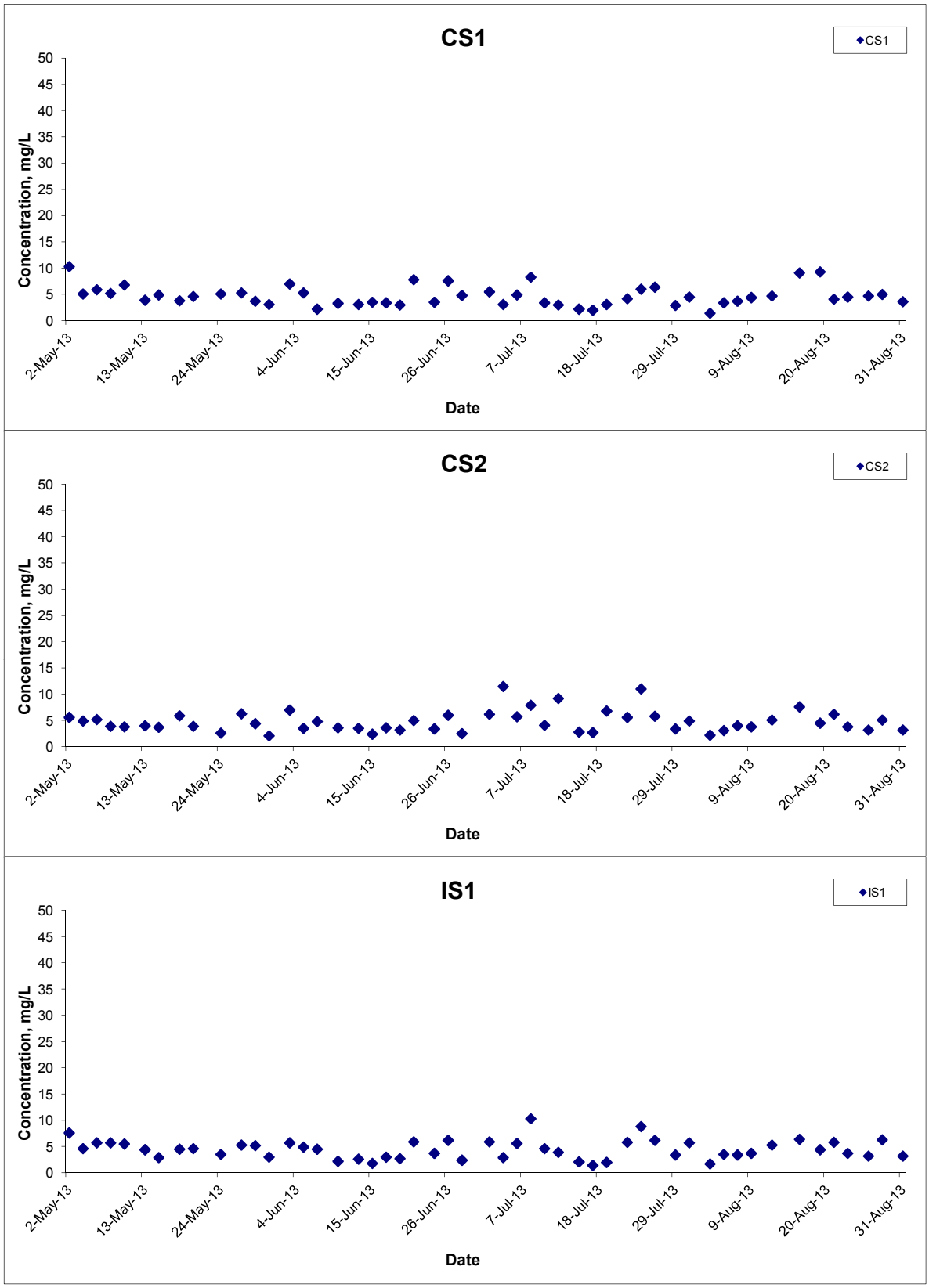
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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		Date: Aug 13	Appendix: E	

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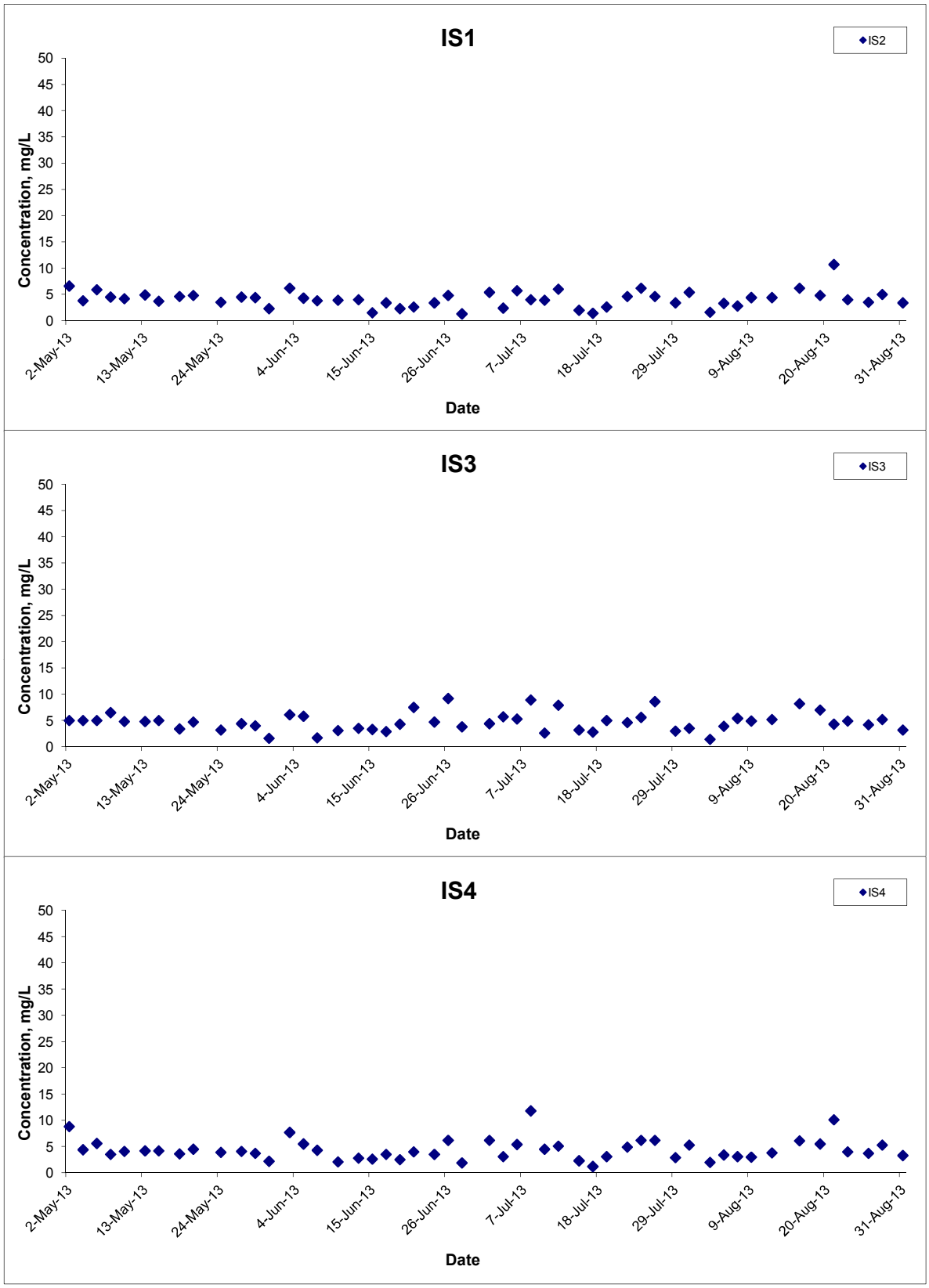

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		Date: Aug 13	Appendix: E	

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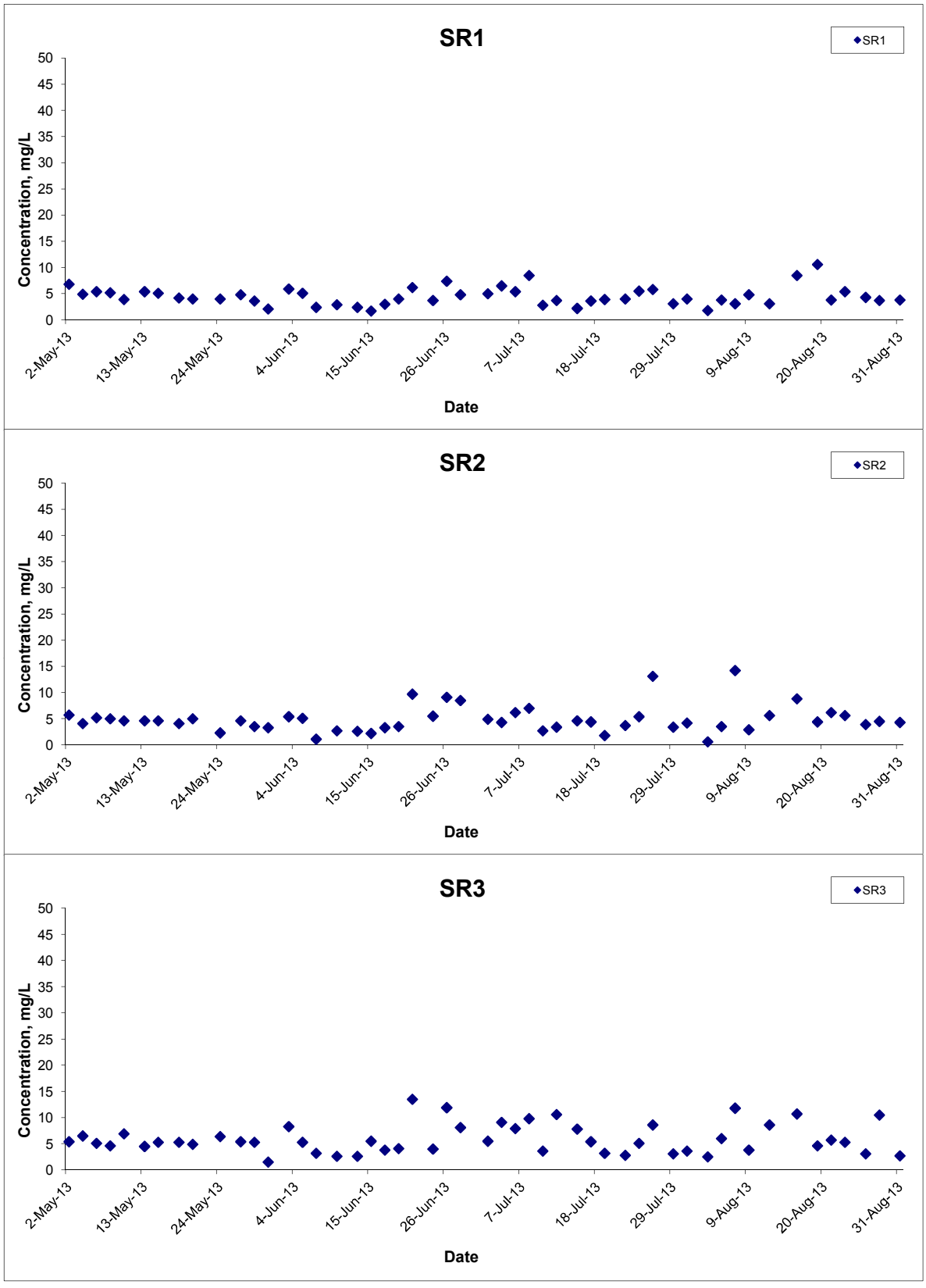

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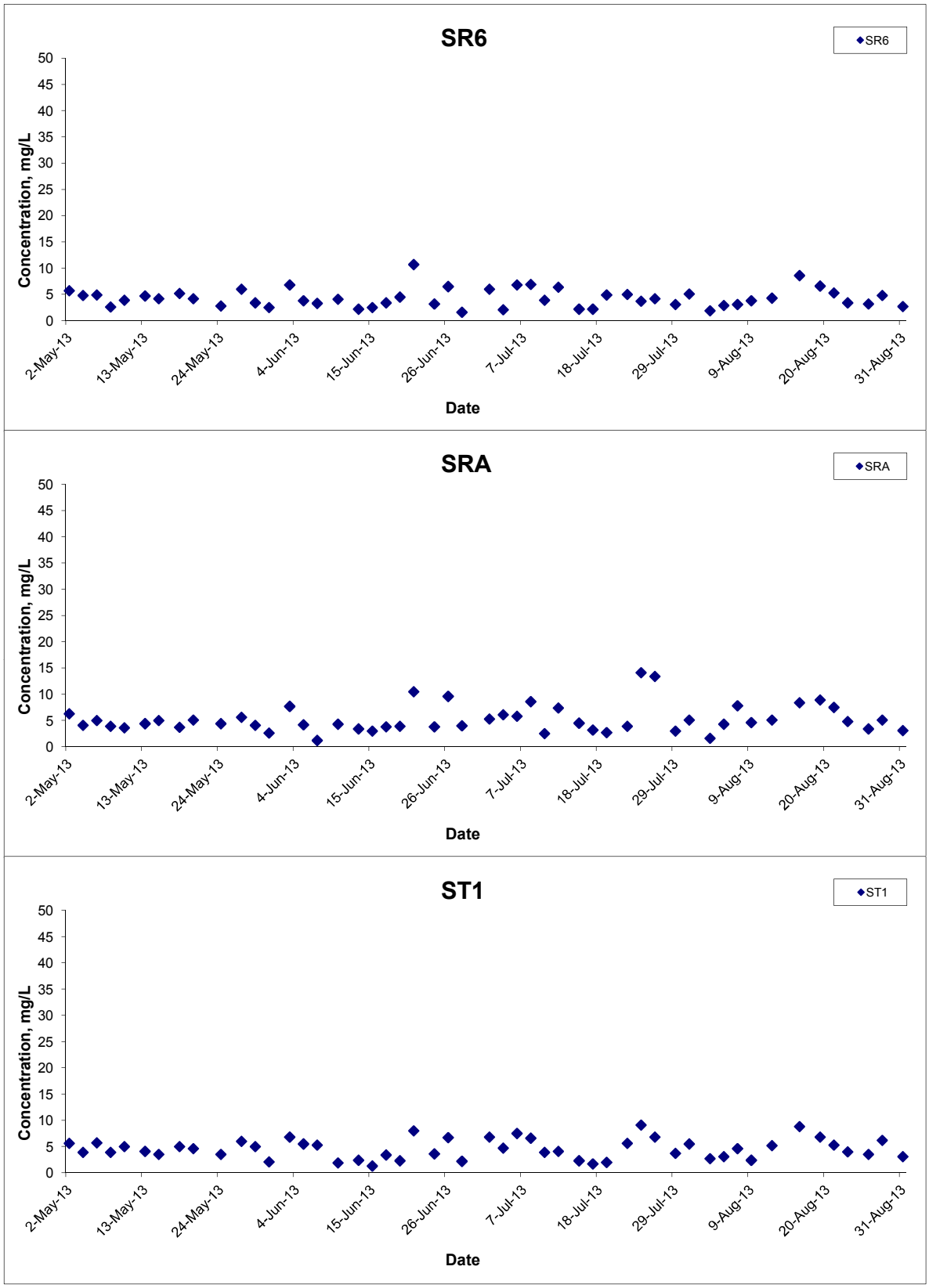

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		Date: Aug 13	Appendix: E	

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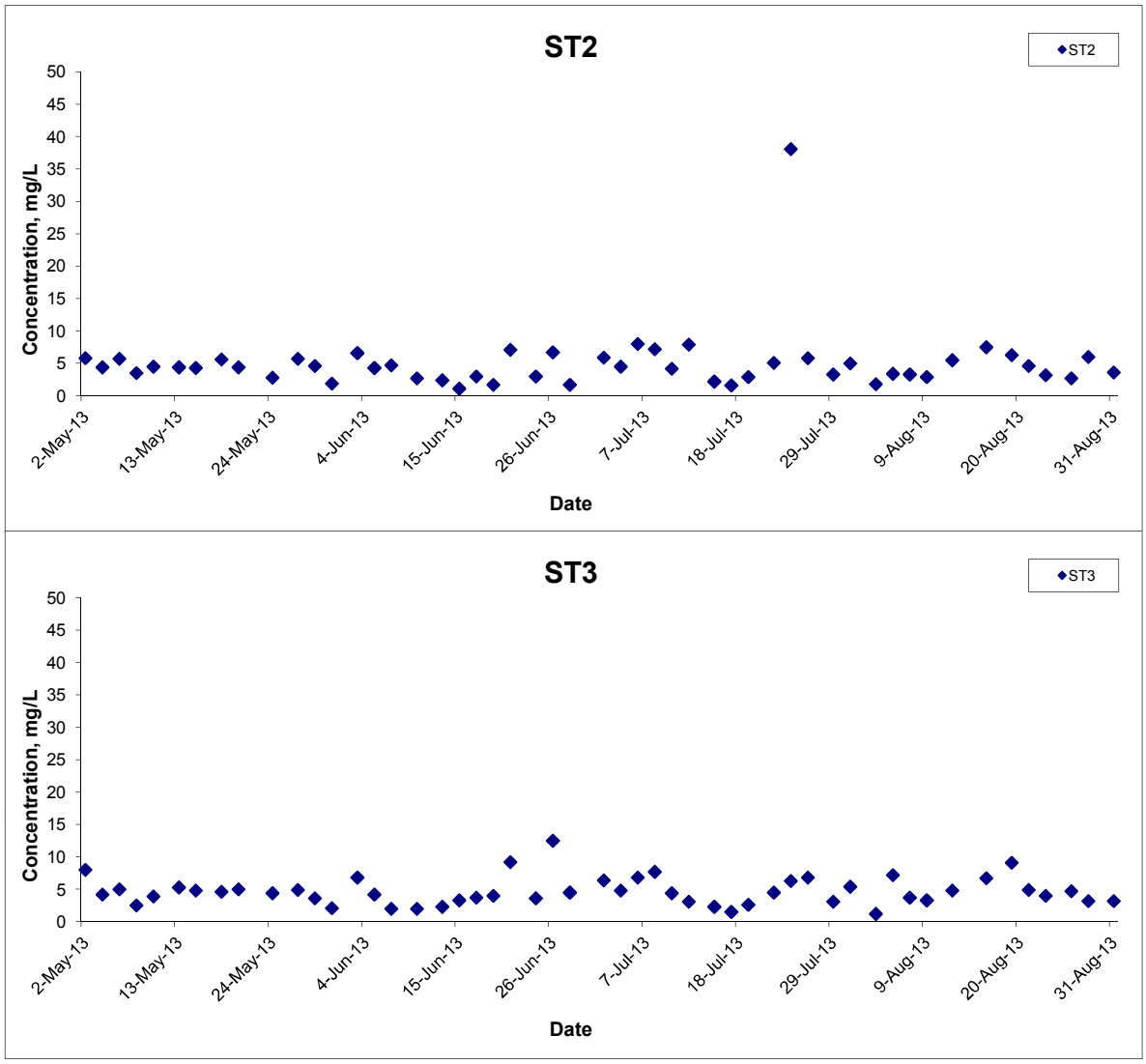

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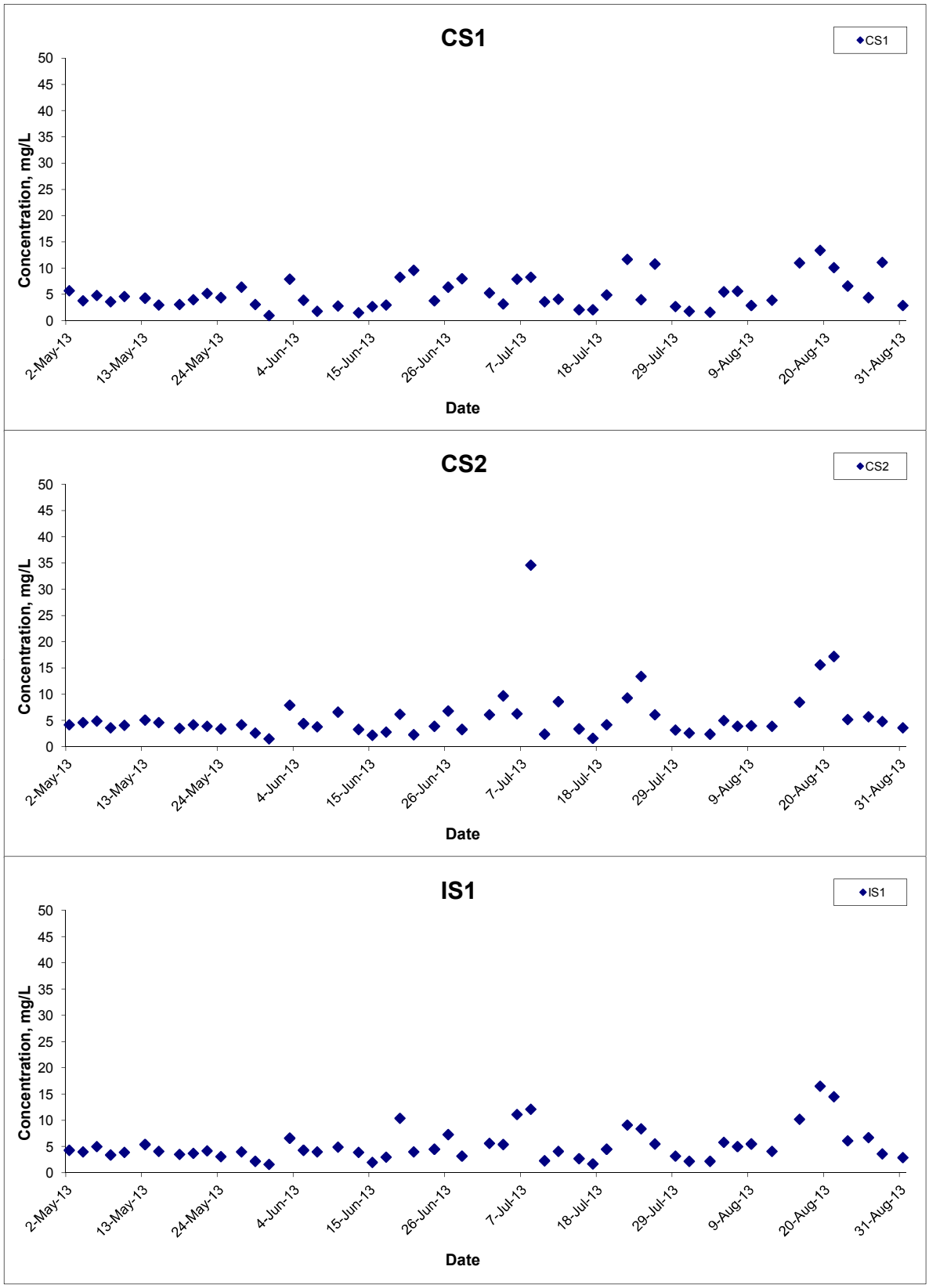
		Date: Aug 13	Appendix: E	

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



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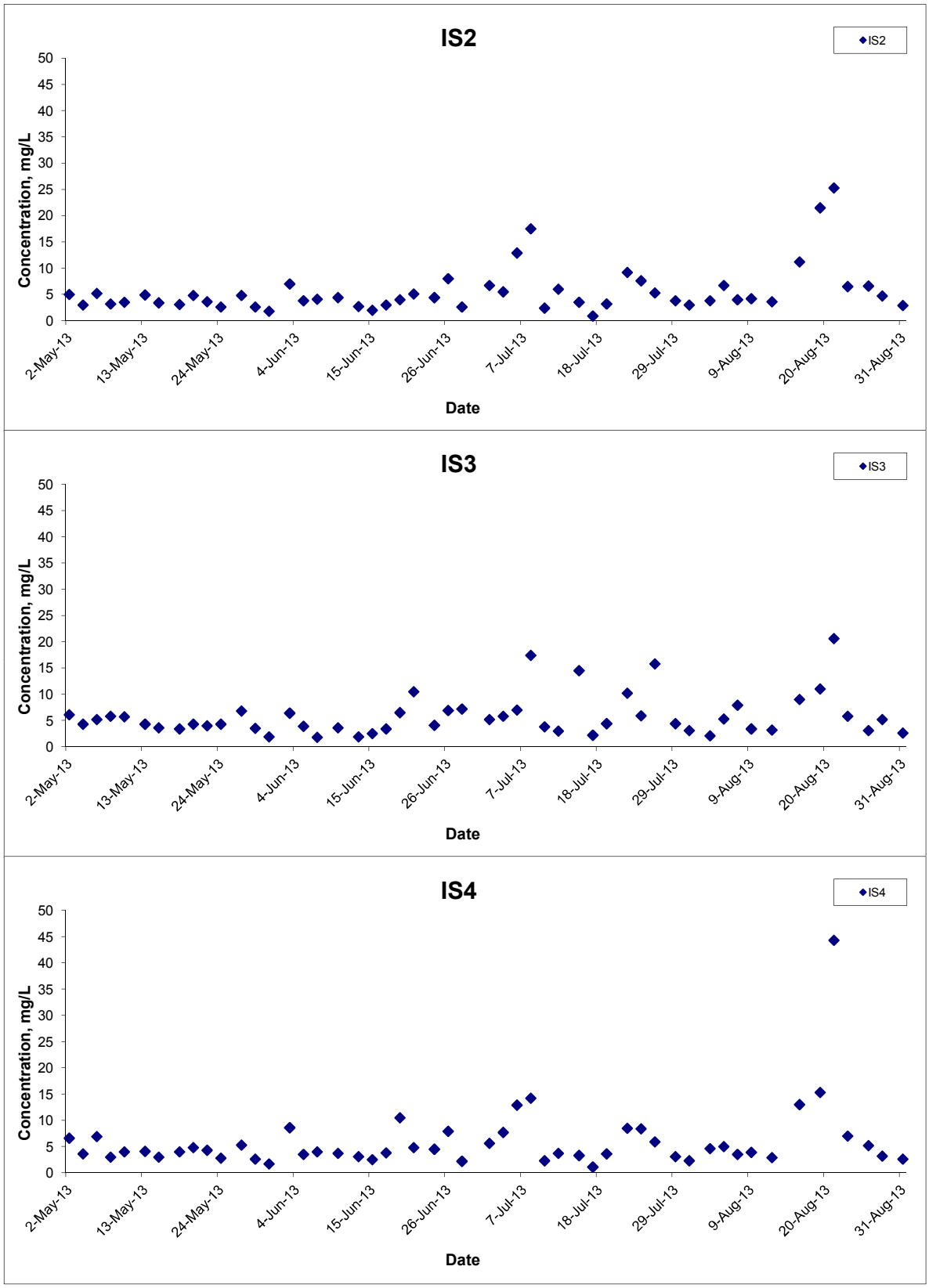

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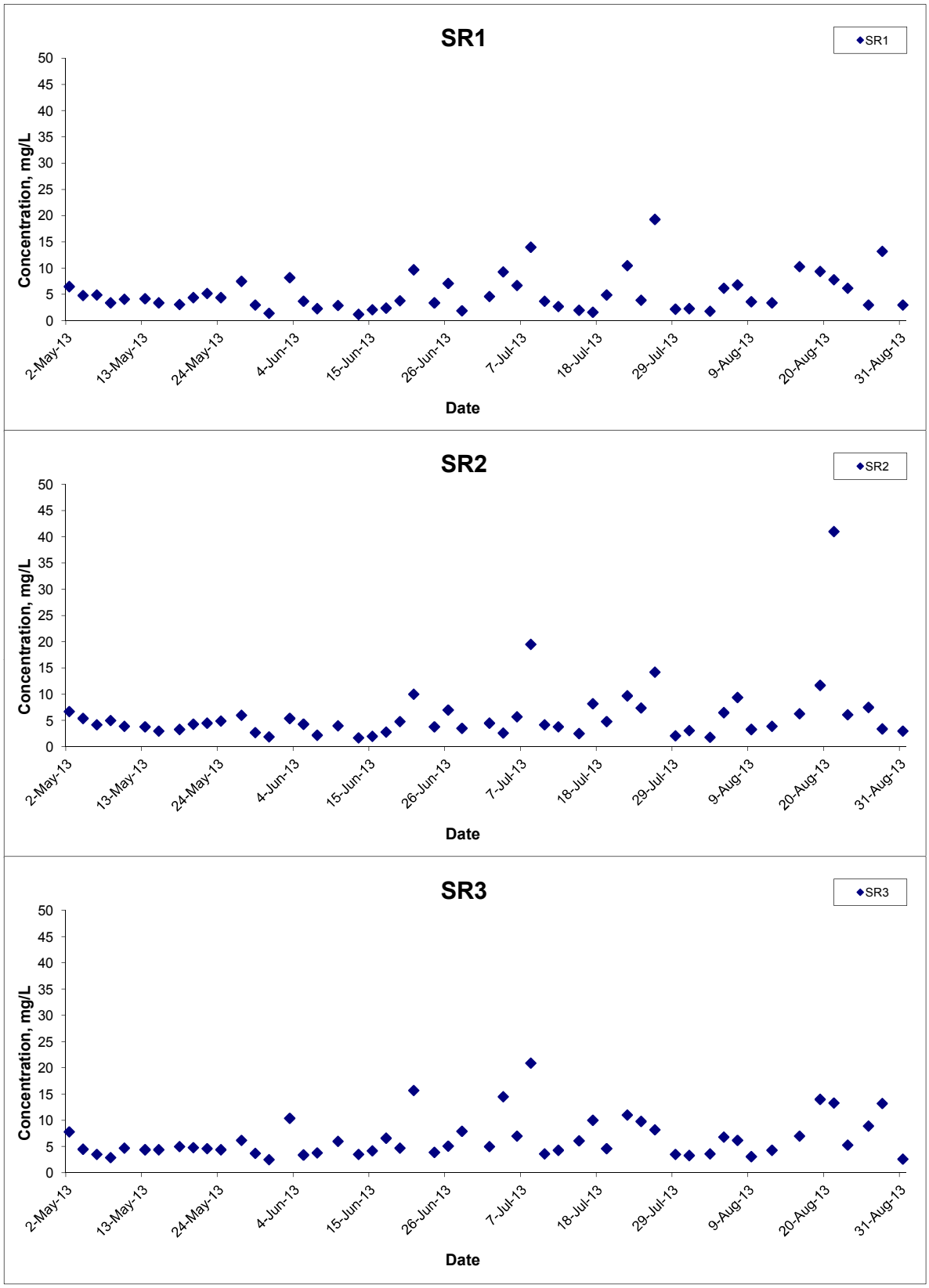

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	Date: Aug 13	Appendix: E	

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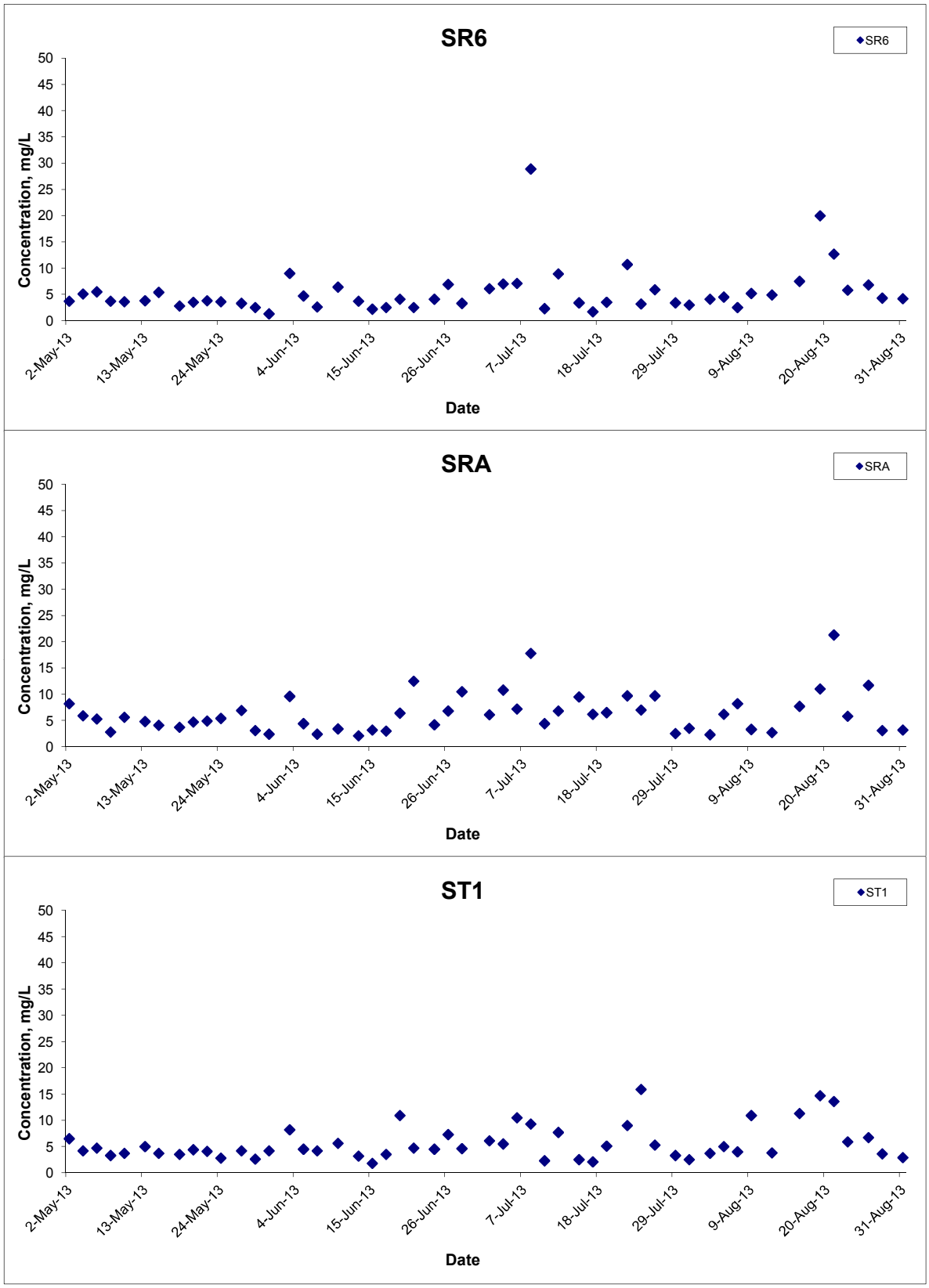

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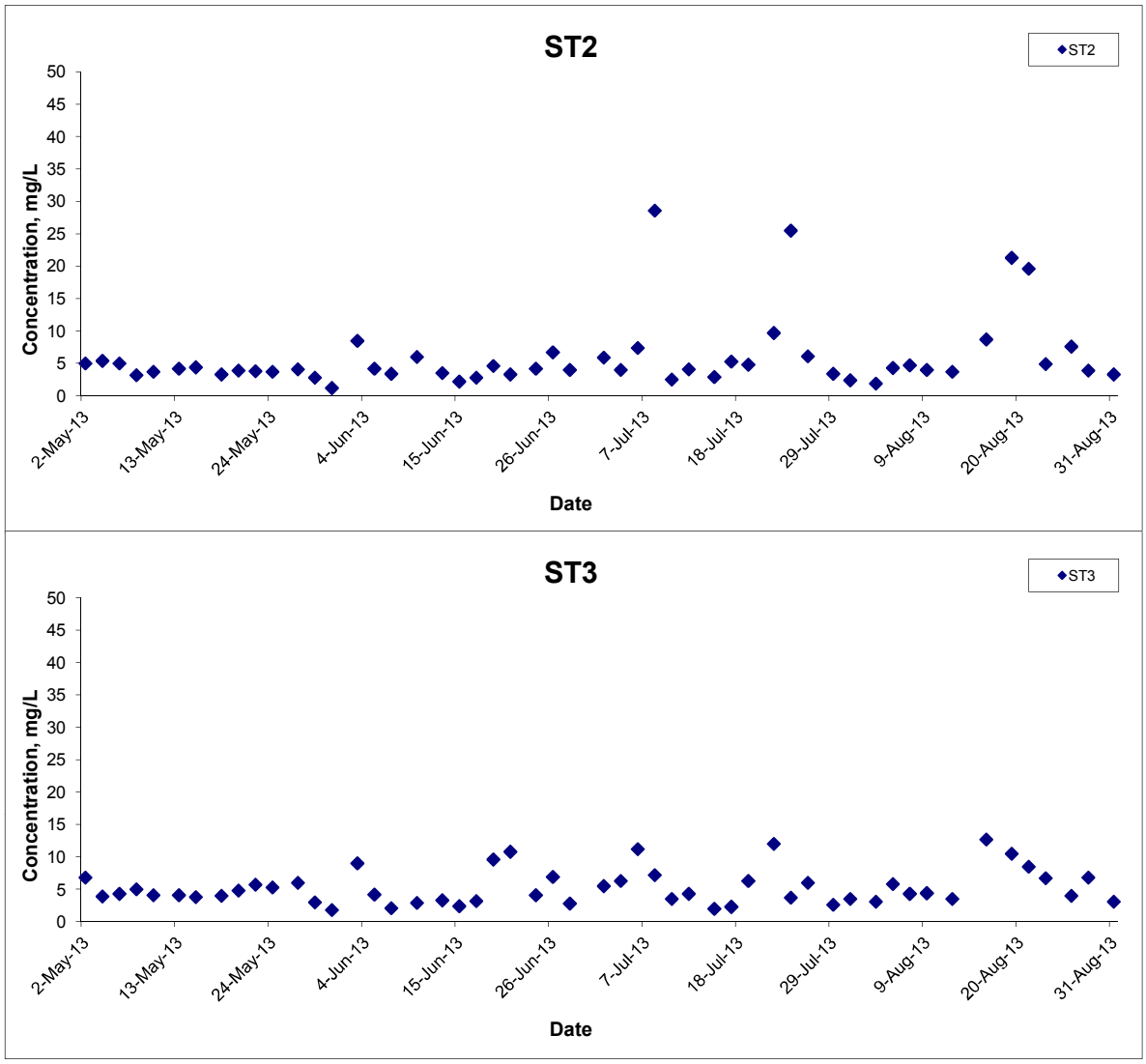

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APPENDIX F-1
DOLPHIN MONITORING REPORT
(LINE TRANSECT)

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

Quarterly Progress Report (June – August 2013)

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

23 September 2013

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. In 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 second 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 to August 2013.

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		□asting	Nort□ing		Line No		□asting	Nort□ing
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 16 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2012). For each monitoring vessel survey, a 15-m inboard vessel (*Standard* 31516) 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 *Steiner* marine binoculars. Both observers searched the sea ahead of the vessel, between 270^{o} and 90^{o} (in relation to the bow, which is defined as 0^{o}). One to two additional experienced observers were available on the boat to work in shift (i.e. rotate every 30 minutes) in order to minimize fatigue of the survey team members. All observers were experienced in small cetacean survey techniques and identifying local cetacean species.

2.1.4. During on-effort survey periods, the survey team recorded effort data including time, 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. Two professional digital cameras (*Canon* EOS 7D and 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 entire quarterly period (i.e. June-August 2013).

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-km^2 grids in WL survey area on GIS. Sighting densities (number of on-effort

sightings per km^2) and dolphin densities (total number of dolphins from on-effort sightings per km^2) were then calculated for each 1 km by 1 km grid with the aid of GIS. Sighting density grids and dolphin density grids were then further normalized with the amount of survey effort conducted within each grid. The total amount of survey effort spent on each grid was calculated by examining the survey coverage on each line-transect survey to determine how many times the grid was surveyed during the study period. For example, when the survey boat traversed through a specific grid 50 times, 50 units of survey effort were counted for that grid. With the amount of survey effort calculated for each grid, the sighting density and dolphin density of each grid were then normalized (i.e. divided by the unit of survey effort).

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

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

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

2.3.4. Behavioural analysis – When dolphins were sighted during vessel surveys, their behaviour was observed. Different activities were categorized (i.e. feeding, 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 3-month baseline 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 2013, 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 191.00 km of survey effort was collected, with 96.6% 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 126.37 km, while the effort on secondary lines was 64.63 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.

3.1.3. During the six sets of monitoring surveys in June to August 2013, a total of 53 groups of 182 Chinese White Dolphins were sighted. All except seven sightings were made during on-effort search. Thirty-three on-effort sightings were made on primary lines, while another 13 on-effort sightings were made on secondary lines. Summary table of the dolphin sightings is shown in Appendix II.

3.2. Distribution

3.2.1. Distribution of dolphin sightings made during monitoring surveys in June to August 2013 is shown in Figure 1. The dolphin groups were evenly distributed throughout the WL survey area, with higher concentrations near Kai Kung Shan, Peaked Hill and Fan Lau. It appeared that more dolphins were sighted in the southern portion of the survey area, and they were mostly absent from the inshore waters between Tai O Peninsula and Kai Kung Shan.

3.2.2. The sighting distribution of dolphins in the present quarter was largely similar to the one during baseline period, but it appears that more dolphins were

sighted in the southern portion of WL survey area, especially between Peaked Hill and Fan Lau, in the present quarter.

3.2.3. Notably, quite a few sightings were made in the vicinity of western portion of the HKLR09 alignment in WL survey area. When examining the HKLR03 dolphin sighting data collected during the same quarter, dolphins also occurred along and near the eastern portion of the HKLR09 alignment in NWL survey area (Figure 2). It appeared that dolphins occurred as frequently in the impact phase monitoring period as in the baseline monitoring period, and their distribution was not affected by the HKLR09 construction activities in the present quarter.

3.3. Encounter rate

3.3.1. During the three-month impact phase monitoring period, the encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data from the primary transect lines under favourable conditions (Beaufort 3 or below) from West Lantau survey area are shown in Table 2. The average encounter rates deduced from the six sets of surveys from June to August 2013 were also compared with the ones deduced from the baseline monitoring period (September – November 2011) (Table 3).

Table 2. Dolphin encounter rates (sightings per 100 km of survey effort) during the impact monitoring period (June-August 2013)

S□r□e□ □rea	**□o□□in Monitoring**	**□nco□nter rate □S□□ □no□of on□effort do□□□in sig□tings □er □□□ □□ of s□r□e□ effort□**	**□nco□nter rate □□N□□ □no□of do□□□ins fro□ a□□on□effort sig□tings □er □□□ □□ of s□r□e□ effort□**
		□ri□ ar□ Lines □n□□	**□ri□ ar□ Lines □n□□**
West Lantau	Set 1 (June 6, 2013)	17.9	35.9
	Set 2 (June 17, 2013)	21.2	52.9
	Set 3 (July 5, 2013)	38.7	159.5
	Set 4 (July 10, 2013)	35.8	153.5
	Set 5 (August 21, 2013)	9.3	41.7
	Set 6 (August 26, 2013)	38.5	125.0

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (June-August 2013) and baseline monitoring period (September-November 2011) (Note: the encounter rates deduced from the baseline monitroing period have been recalculated based only on the survey effort and on-effort sighting data made along the primary transect lines under favourable conditions)

	□nco□nter rate □S□□ □ (no. of on-effort dolphin sightings per 100 km of survey effort)		**□nco□nter rate □□N□□** (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	□□ne □ □□g□st □□□□	**Se□te□ □er□ No□e□ □er □□□□**	**□□ne □ □□g□st □□□□**	**Se□te□ □er□ No□e□ □er □□□□**
□ est Lanta□	26.89 ± 12.46	16.43 ± 7.70	94.75 ± 57.61	60.50 ± 38.47

3.3.2. In WL survey area, the average dolphin encounter rates (both STG and ANI) in the present three-month study period were 63.7% and 56.7% higher than the ones recorded in the 3-month baseline period respectively, indicating the dolphin usage during this impact phase monitoring period in this survey area was even more intensive than during the baseline phase.

3.3.3. 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 (second quarter of the impact phase), the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.111 and 0.965 respectively. Therefore, no significant difference in dolphin encounter rate was detected between the baseline period and the present quarter.

3.3.4. To facilitate the comparison with the AFCD long-term monitoring results, the encounter rates were also calculated for the present quarter (June-August 2013) using both primary and secondary survey effort. The encounter rates of sightings (STG) and dolphins (ANI) in WL were 24.9 sightings and 87.8 dolphins per 100 km of survey effort respectively.

3.4. Group size

3.4.1. Group size of Chinese White Dolphins ranged from 1-16 individuals per group in WL survey area between June and August 2013. The average dolphin group sizes from these three months were compared with the one deduced from the baseline period in September to November 2011, as shown in Table 4. The average dolphin group sizes in the WL region during June to August 2013 was slightly smaller than the ones recorded in the 3-month baseline period (Table 4).

Table 4. Comparison of average dolphin group sizes from impact monitoring period (June-August 2013) and baseline monitoring period (September-November 2011)

	Average Dolphin Group Size	
	August	September-November
West Lantau	3.43 ± 2.96 (n = 53)	3.63 ± 2.97 (n = 46)

3.4.2. Distribution of dolphins with larger group sizes (more than 5 animals per group) during June through August 2013 is shown in Figure 3. These larger dolphin groups were mostly sighted near the HKLR09 alignment or toward the southern portion of WL survey area (Figure 3). This was different from the baseline period, where more dolphin sightings with larger group sizes occurred near Tai O Peninsula.

3.5. Habitat use

3.5.1. From June to August 2013, the most heavily utilized habitats by the dolphins mainly concentrated near HKLR09 alignment, Kai Kung Shan, Peaked Hill and Fan Lau (Figures 4a and 4b). However, it should be noted 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 dolphin densities were higher along and adjacent to the HKLR09 alignment as well as Fan Lau during the present impact phase monitoring period (Figure 5). On the other hand, their densities were lower near Tai O Peninsula during the present quarter, where dolphin densities were the very high during the baseline period.

3.6. Mother-calf pairs

3.6.1. During the three-month impact phase monitoring period, a total of five unspotted calves and five unspotted juveniles (UJ) were sighted in WL survey area. These young calves comprised only 5.5% of all animals sighted, which was slightly lower to the percentage recorded during the baseline monitoring period (6.6%).

3.6.2. These young calves mainly occurred near the HKLR09 alignment, and scattered in the central and southern portions of WL survey area. Such distribution was different from the baseline period, where more frequent

occurrence of calves near Tai O Peninsula was found (Figure 6).

3.7. Activities and associations with fishing boats

3.7.1. A total of six and two dolphin sightings were associated with feeding and socializing activities respectively during the three-month impact monitoring period, comprising of 3.3% and 1.1% of the total number of dolphin sightings. Both percentages were much lower than the percentages recorded during the baseline period (feeding activity: 13.0%; socializing activity: 6.5%). The very low occurrence of these two activities recorded in the present quarter is of concern, and should be continuously monitored in the upcoming months.

3.7.2. Distribution of dolphins engaged in different activities during the three-month study period is shown in Figure 7. The feeding and socializing activities were scattered in the northern and southern portions of WL survey area. This was very different from the baseline period, when most feeding and socializing activities were concentrated in the middle portion of the survey area between Tai O Peninsula and Kai Kung Shan (Figure 7).

3.7.3. During the three-month period, only one sighting of a lone dolphin was found to be associated with an operating purse-seiner, comprising of 1.9% of all dolphin groups. This was much lower than the percentage recorded in baseline period (6.5%) in which all three sightings were associated with operating pair-trawlers. The exceptionally low percentage of fishing boat association during the present and previous impact phase monitoring quarters was probably related to the recent trawl ban being implemented in 2013 in Hong Kong waters.

3.8. Summary of photo-identification works

3.8.1. From June to August 2013, over 2,000 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.

3.8.2. In total, 48 individuals sighted 56 times altogether were identified (see summary table in Appendix III and photographs of identified individuals in Appendix IV). Most identified individuals were sighted only once or twice during the three-month period, with the exception of three individuals being sighted thrice (WL25, WL68 and WL124).

3.8.3. During the three-month period, eight females, including CH113, NL123, WL60, WL100, WL120, WL124, WL145 and WL159, were sighted to be accompanied with their calves during their re-sightings.

3.9. Individual range use

3.9.1. Ranging patterns of the 48 individuals identified during the three-month study period were determined by fixed kernel method, and are shown in Appendix V.

3.9.2 Among these 48 individuals, some of them were sighted near the HKLR09 alignment during the present impact monitoring period, and these individual dolphins focused their range use in either North Lantau waters (e.g. NL123, NL188, NL261, L296) or West Lantau waters (e.g. SL47, WL49, WL120, WL124)

3.9.4. Notably, the ranging patterns of several individuals (e.g. CH38, SL05, SL40, WL130) do not overlap with the HKLR09 alignment at all, but mostly located around the southwestern side of Lantau Island. It is likely that the impact of HKLR09 construction activities will be minimal to these individuals during the impact phase.

4. Conclusion

4.1. 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, and the dolphin occurrence in West Lantau survey area remained the same as in the baseline period.

4.2. Nevertheless, dolphin usage in WL region should be continuously monitored, to examined whether it will be affected by the on-going construction activities in relation to the HZMB works.

5. References

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

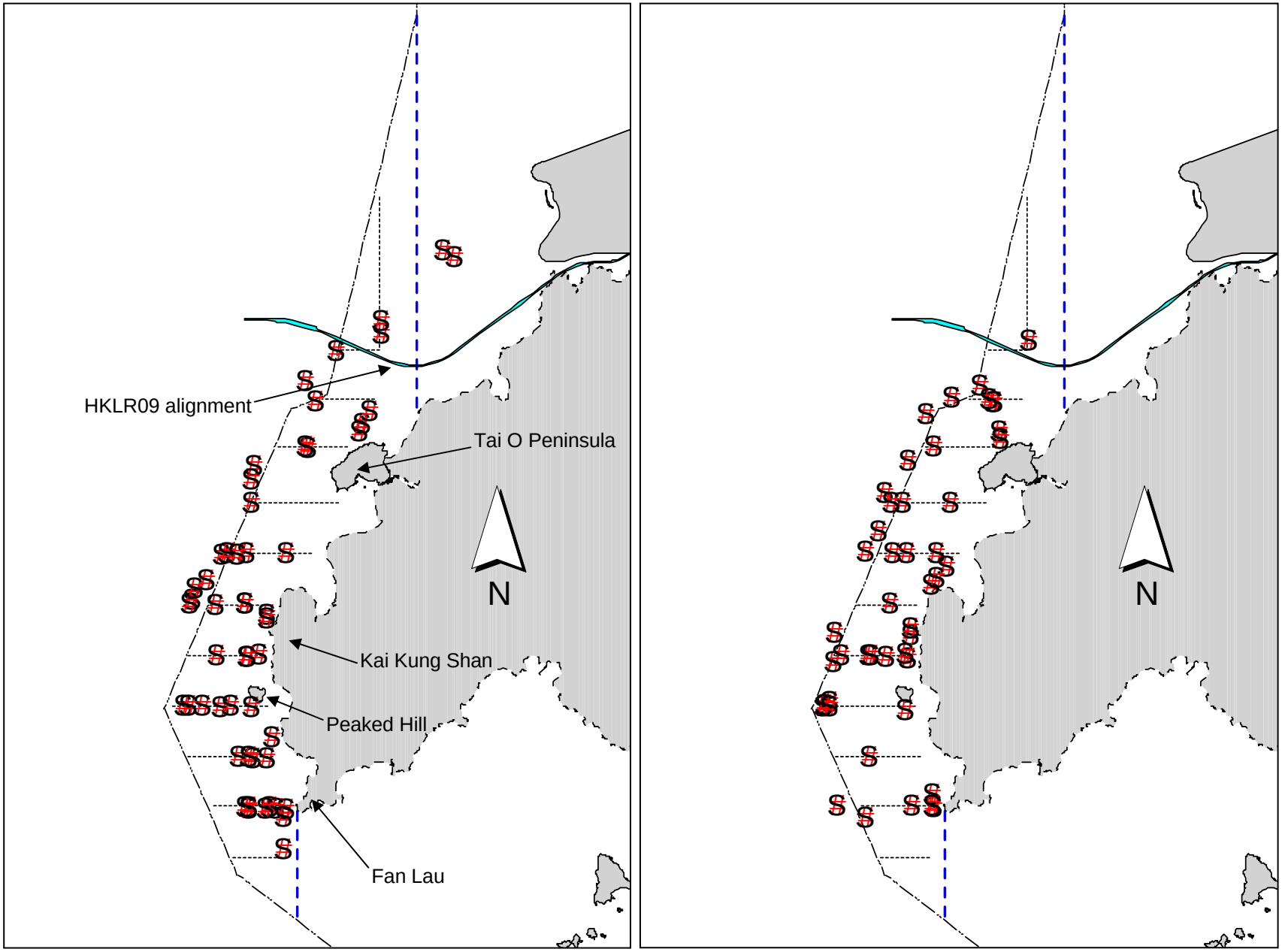

Figure 1. Distribution of Chinese white dolphin sightings in West Lantau during HKLR09 impact phase (left: June-August 2013) and baseline monitoring surveys (right: September-November 2011)

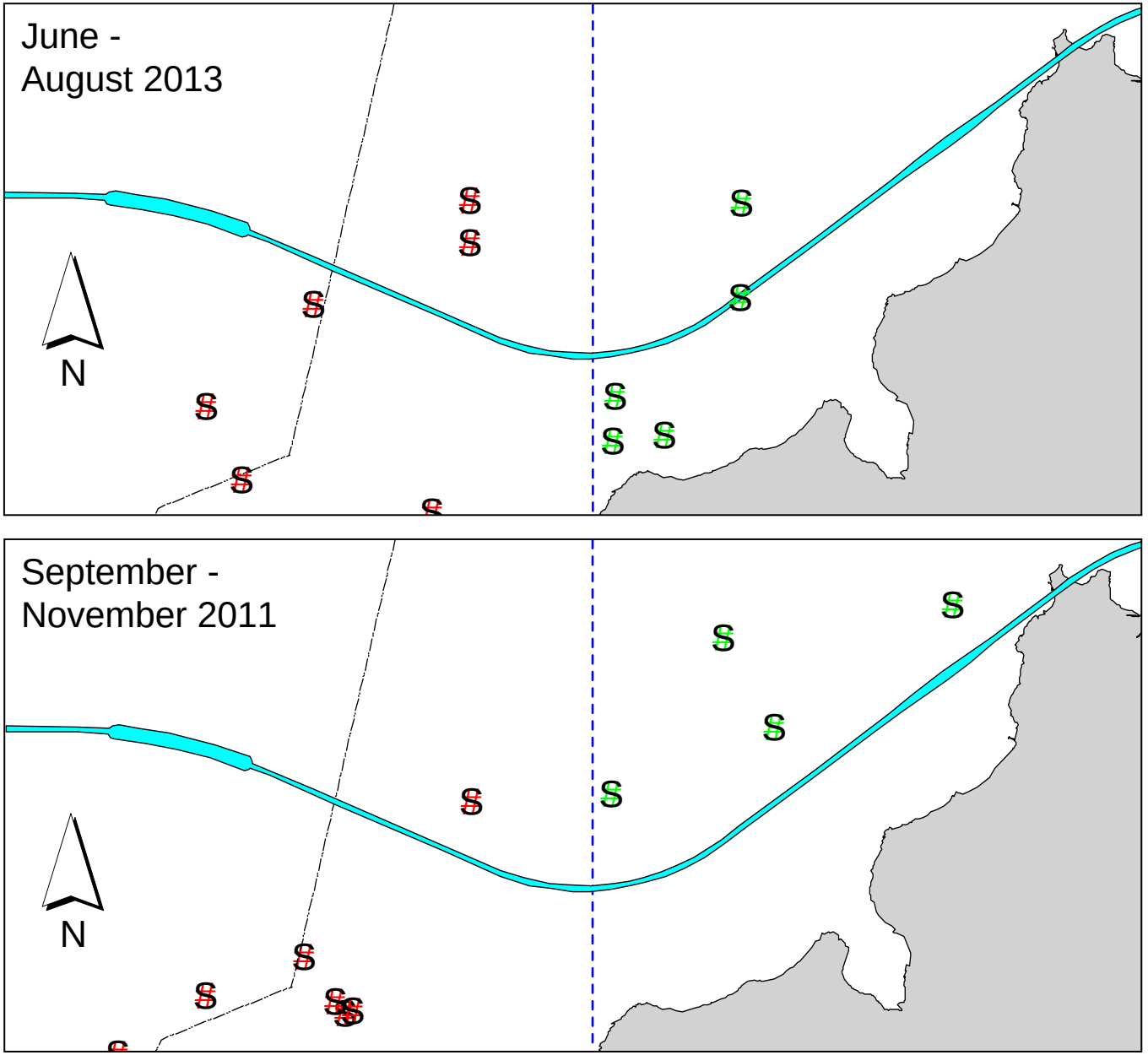

Figure 2. Distribution of Chinese white dolphin sightings near the HKLR09 alignment during baseline (September-November 2011) and impact phases (June-August 2013) (red dots: sightings from HKLR09 monitoring surveys in WL survey area; green dots: sightings from HKLR03 monitoring surveys in NWL Survey area)

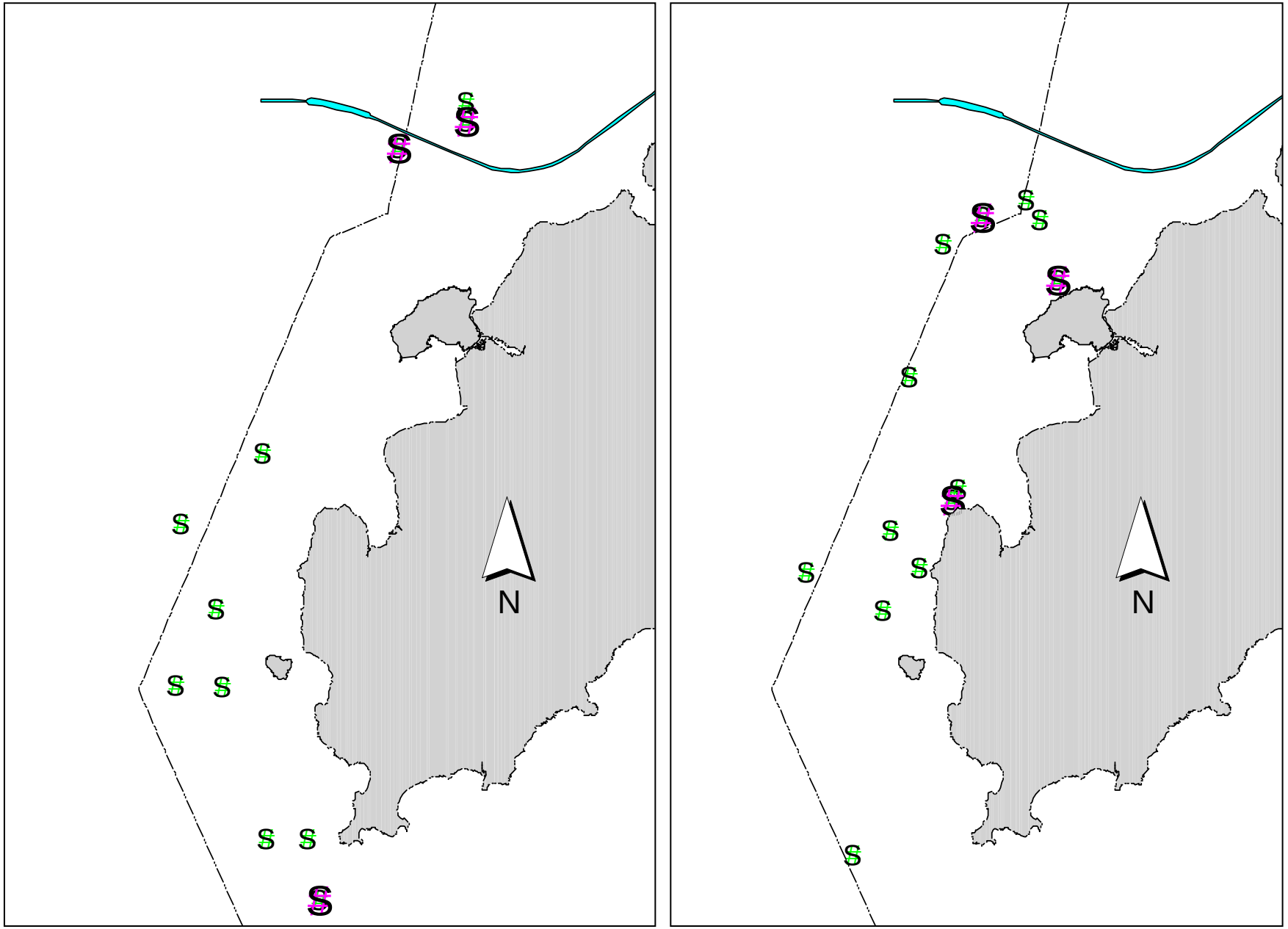

Figure 3. Distribution of Chinese white dolphins with larger group sizes during HKLR09 impact phase (left: June-August 2013) and baseline monitoring surveys (right: September-November 2011) (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

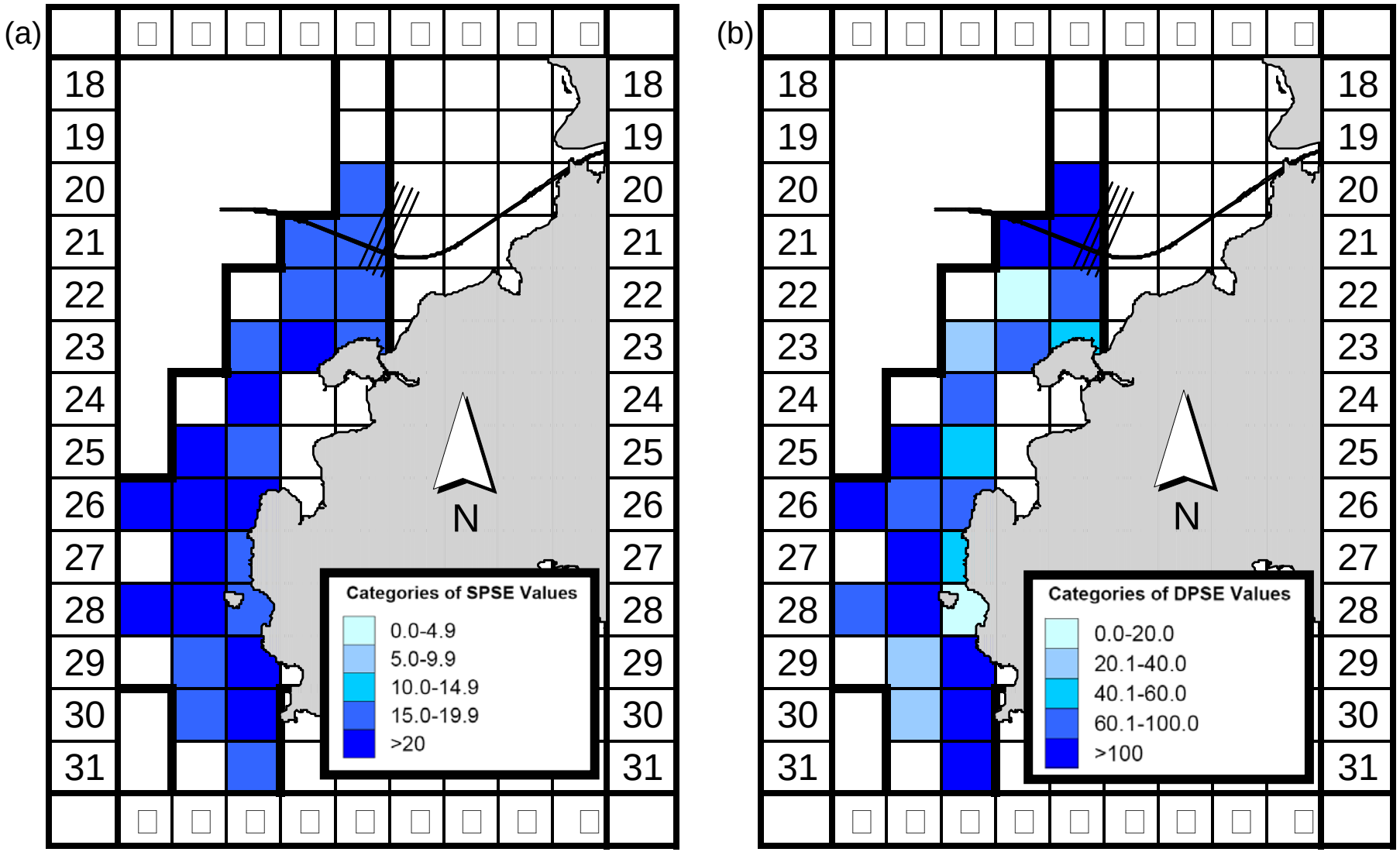

Figure 4a. Sighting density of Chinese white dolphins with corrected survey effort per km^2 in West Lantau survey area, using data collected during HKLR09 impact monitoring period (June-August 2013) (SPSE = no. of on-effort sightings per 100 units of survey effort)

Figure 4b. Density of Chinese white dolphins with corrected survey effort per km^2 in West Lantau survey area, using data collected during HKLR09 impact monitoring period (June-August 2013) (DPSE = no. of dolphins per 100 units of survey effort)

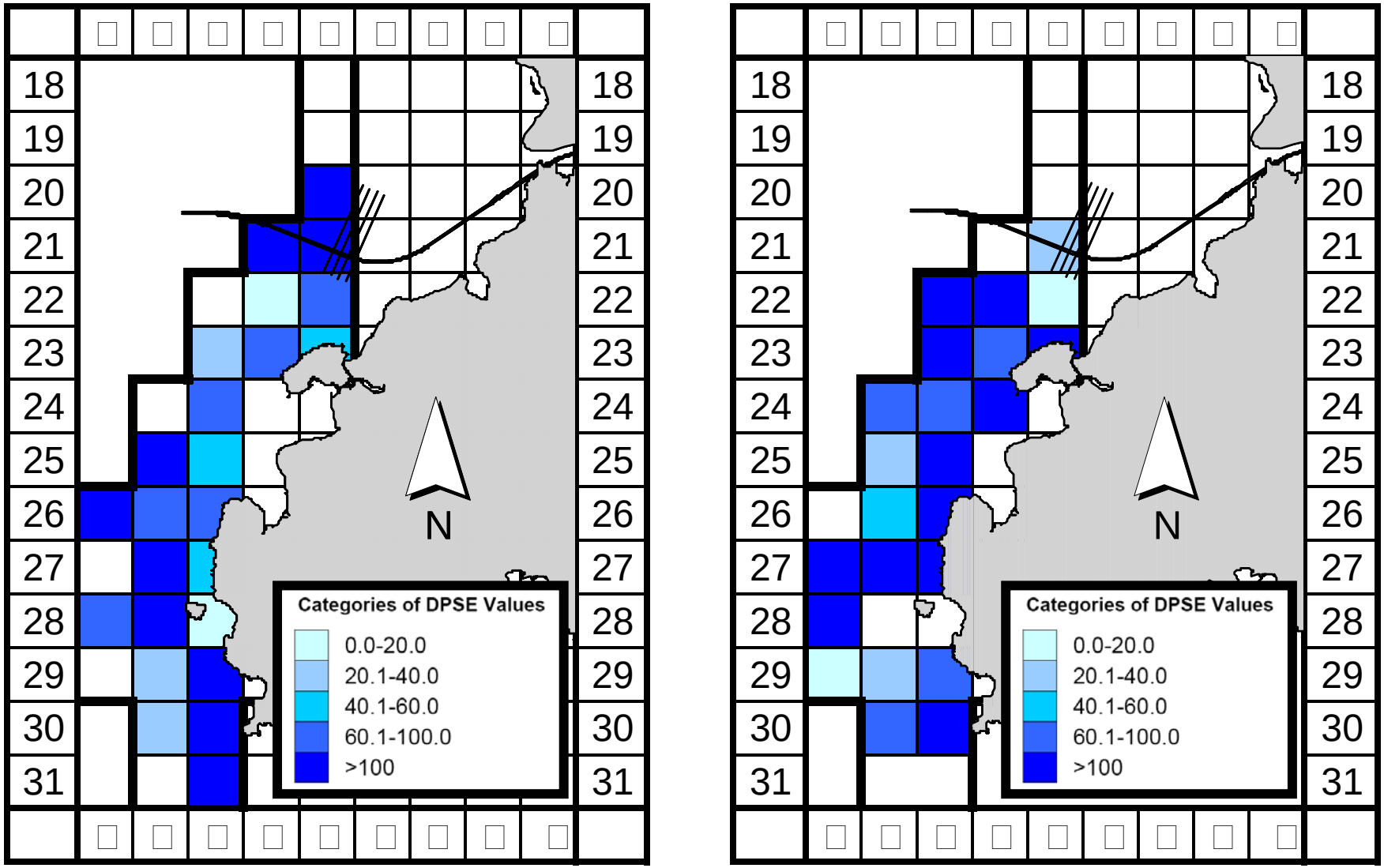

Figure 5. Comparison of density of Chinese white dolphins with corrected survey effort per km^2 in West Lantau survey area between the impact monitoring period (June-August 2013; left) and baseline monitoring period (September-November 2011; right)
(DPSE = no. of dolphins per 100 units of survey effort)

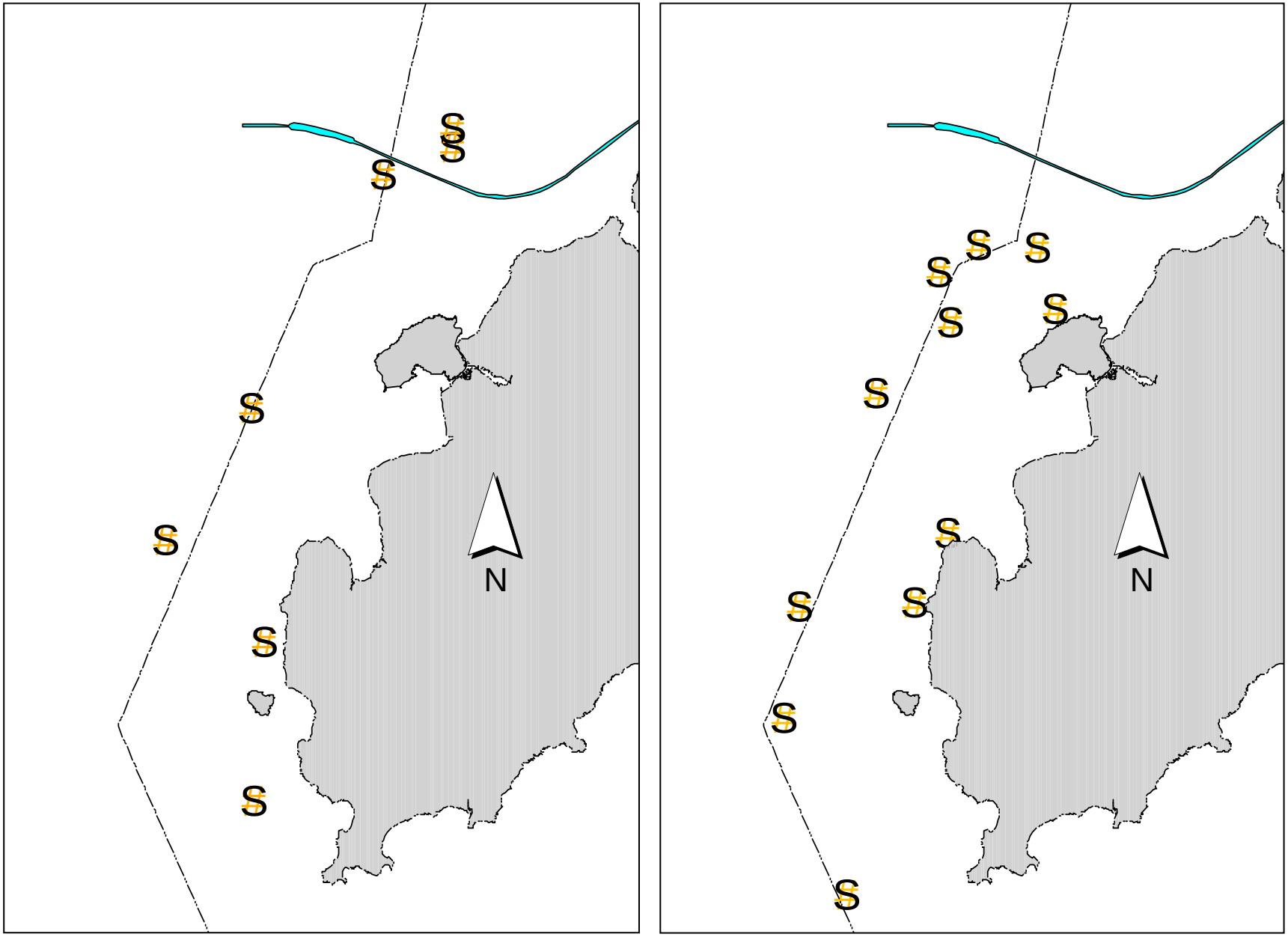

Figure 6. Distribution of young calves of Chinese white dolphins during HKLR09 impact phase (left: June-August 2013) and baseline monitoring surveys (right: September-November 2011)

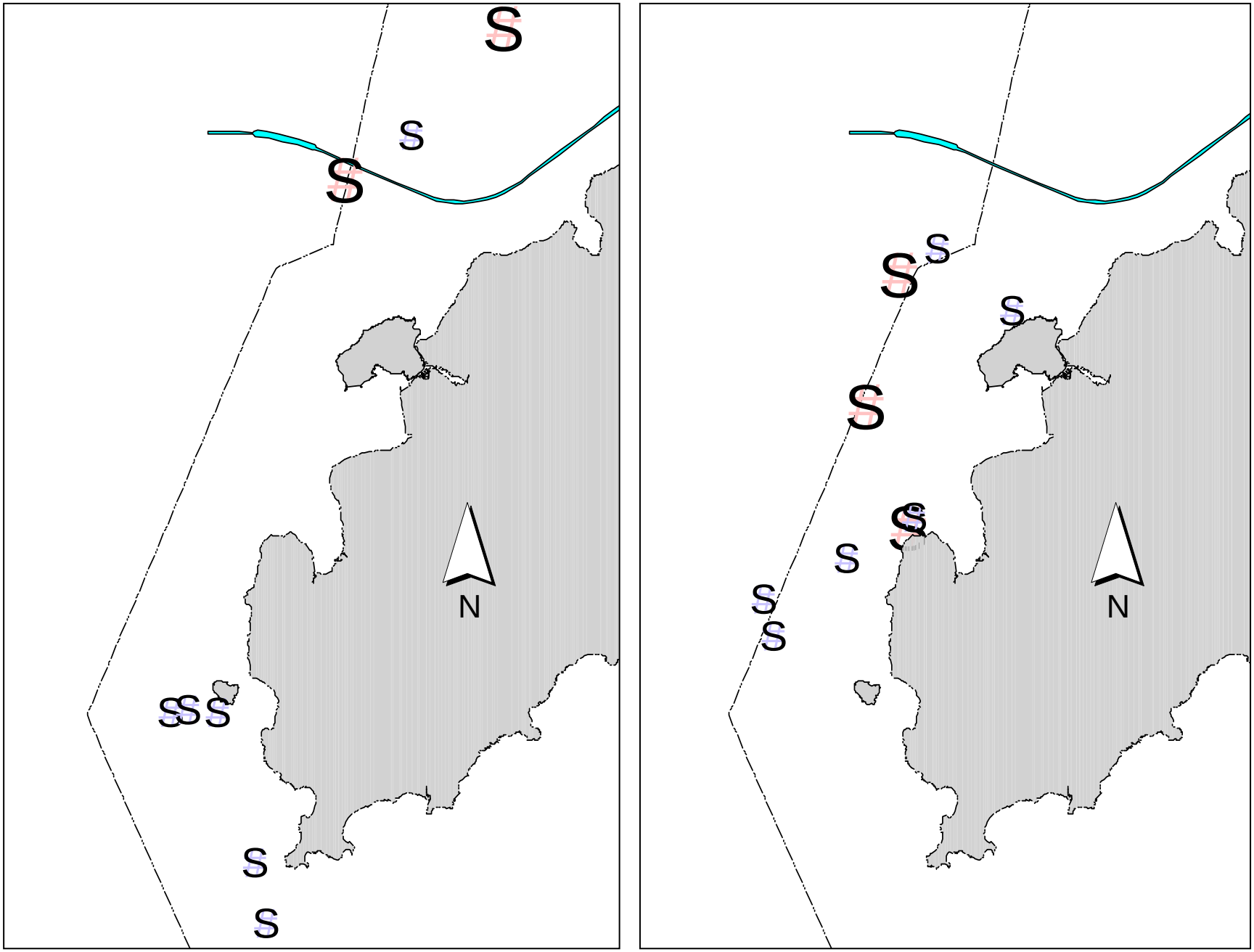

Figure 7. Distribution of Chinese white dolphins engaged in feeding (purple dots) and socializing (pink dots) activities during HKLR09 impact phase (left: June-August 2013) and baseline monitoring surveys (right: September-November 2011)

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

DATE	AREA	BEA U	EFFORT	S□□S□N	□□SS□L	TYPE	□□S
6-Jun-13	W LANTAU	2	8.75	SUMMER	STANDARD31516	HKLR	P
6-Jun-13	W LANTAU	3	13.51	SUMMER	STANDARD31516	HKLR	P
6-Jun-13	W LANTAU	2	7.29	SUMMER	STANDARD31516	HKLR	S
6-Jun-13	W LANTAU	3	3.92	SUMMER	STANDARD31516	HKLR	S
17-Jun-13	W LANTAU	2	2.50	SUMMER	STANDARD31516	HKLR	P
17-Jun-13	W LANTAU	3	16.40	SUMMER	STANDARD31516	HKLR	P
17-Jun-13	W LANTAU	4	2.60	SUMMER	STANDARD31516	HKLR	P
17-Jun-13	W LANTAU	2	2.00	SUMMER	STANDARD31516	HKLR	S
17-Jun-13	W LANTAU	3	5.50	SUMMER	STANDARD31516	HKLR	S
17-Jun-13	W LANTAU	4	3.90	SUMMER	STANDARD31516	HKLR	S
5-Jul-13	W LANTAU	2	7.25	SUMMER	STANDARD31516	HKLR	P
5-Jul-13	W LANTAU	3	13.44	SUMMER	STANDARD31516	HKLR	P
5-Jul-13	W LANTAU	2	2.87	SUMMER	STANDARD31516	HKLR	S
5-Jul-13	W LANTAU	3	7.79	SUMMER	STANDARD31516	HKLR	S
10-Jul-13	W LANTAU	1	3.35	SUMMER	STANDARD31516	HKLR	P
10-Jul-13	W LANTAU	2	11.31	SUMMER	STANDARD31516	HKLR	P
10-Jul-13	W LANTAU	3	4.88	SUMMER	STANDARD31516	HKLR	P
10-Jul-13	W LANTAU	1	1.00	SUMMER	STANDARD31516	HKLR	S
10-Jul-13	W LANTAU	2	8.45	SUMMER	STANDARD31516	HKLR	S
21-Aug-13	W LANTAU	1	5.50	SUMMER	STANDARD31516	HKLR	P
21-Aug-13	W LANTAU	2	15.90	SUMMER	STANDARD31516	HKLR	P
21-Aug-13	W LANTAU	3	0.20	SUMMER	STANDARD31516	HKLR	P
21-Aug-13	W LANTAU	1	1.60	SUMMER	STANDARD31516	HKLR	S
21-Aug-13	W LANTAU	2	9.40	SUMMER	STANDARD31516	HKLR	S
26-Aug-13	W LANTAU	1	8.13	SUMMER	STANDARD31516	HKLR	P
26-Aug-13	W LANTAU	2	12.66	SUMMER	STANDARD31516	HKLR	P
26-Aug-13	W LANTAU	1	6.19	SUMMER	STANDARD31516	HKLR	S
26-Aug-13	W LANTAU	2	4.72	SUMMER	STANDARD31516	HKLR	S

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

□□□□	S□□ □	□□M□	□□□ S□	□□□□	□□□U	□S□	□□□□ □□	□□□□	N□ □□□□N□	□□S□N□	S□□S□N	□□□□ □SS□ □□	□□S
6-Jun-13	1	1148	12	W LANTAU	3	411	ON	HKLR	805631	801743	SUMMER	NONE	S
6-Jun-13	2	1216	2	W LANTAU	2	9	ON	HKLR	806462	801456	SUMMER	NONE	P
6-Jun-13	3	1239	4	W LANTAU	3	580	ON	HKLR	807427	801087	SUMMER	NONE	P
6-Jun-13	4	1247	2	W LANTAU	2	735	ON	HKLR	807835	801501	SUMMER	NONE	S
6-Jun-13	5	1259	1	W LANTAU	2	775	ON	HKLR	808438	799646	SUMMER	NONE	P
6-Jun-13	6	1330	1	W LANTAU	3	104	ON	HKLR	810461	800919	SUMMER	NONE	P
6-Jun-13	7	1342	2	W LANTAU	2	92	ON	HKLR	810928	800116	SUMMER	NONE	S
17-Jun-13	1	1040	4	W LANTAU	4	ND	OFF	HKLR	814866	802187	SUMMER	NONE	N/A
17-Jun-13	2	1142	5	W LANTAU	3	100	ON	HKLR	811458	800962	SUMMER	NONE	P
17-Jun-13	3	1228	2	W LANTAU	4	ND	OFF	HKLR	808437	800048	SUMMER	NONE	N/A
17-Jun-13	4	1236	1	W LANTAU	3	288	ON	HKLR	808423	801069	SUMMER	PURSE SEINE	P
17-Jun-13	5	1254	2	W LANTAU	3	218	ON	HKLR	807438	800809	SUMMER	NONE	P
17-Jun-13	6	1313	2	W LANTAU	3	156	ON	HKLR	806464	800941	SUMMER	NONE	P
5-Jul-13	1	1047	16	W LANTAU	2	149	ON	HKLR	815804	803786	SUMMER	NONE	P
5-Jul-13	2	1131	2	W LANTAU	3	ND	OFF	HKLR	814033	803391	SUMMER	NONE	N/A
5-Jul-13	3	1216	1	W LANTAU	3	49	ON	HKLR	811448	800437	SUMMER	NONE	P
5-Jul-13	4	1222	6	W LANTAU	3	187	ON	HKLR	810541	799826	SUMMER	NONE	S
5-Jul-13	5	1238	1	W LANTAU	3	20	ON	HKLR	810452	800321	SUMMER	NONE	P
5-Jul-13	6	1249	3	W LANTAU	3	263	ON	HKLR	809464	801226	SUMMER	NONE	S
5-Jul-13	7	1304	1	W LANTAU	3	43	ON	HKLR	809420	800947	SUMMER	NONE	P
5-Jul-13	8	1318	5	W LANTAU	3	13	ON	HKLR	808437	799759	SUMMER	NONE	P
5-Jul-13	9	1328	6	W LANTAU	2	246	ON	HKLR	808425	800409	SUMMER	NONE	P
5-Jul-13	10	1347	2	W LANTAU	2	182	ON	HKLR	807426	801397	SUMMER	NONE	P
5-Jul-13	11	1357	2	W LANTAU	2	ND	OFF	HKLR	807438	801005	SUMMER	NONE	N/A
5-Jul-13	12	1417	1	W LANTAU	3	105	ON	HKLR	806395	801786	SUMMER	NONE	P
10-Jul-13	1	1008	4	W LANTAU	1	ND	OFF	HKLR	817317	805325	SUMMER	NONE	N/A
10-Jul-13	2	1037	8	W LANTAU	3	1085	ON	HKLR	816047	803787	SUMMER	NONE	P
10-Jul-13	3	1130	4	W LANTAU	2	29	ON	HKLR	814265	803556	SUMMER	NONE	S
10-Jul-13	4	1143	3	W LANTAU	3	839	ON	HKLR	813548	802256	SUMMER	NONE	P
10-Jul-13	5	1152	2	W LANTAU	2	284	ON	HKLR	813174	801121	SUMMER	NONE	S
10-Jul-13	6	1201	3	W LANTAU	2	236	ON	HKLR	812465	801058	SUMMER	NONE	P
10-Jul-13	7	1224	3	W LANTAU	2	163	ON	HKLR	811467	801787	SUMMER	NONE	P
10-Jul-13	8	1235	1	W LANTAU	2	1079	ON	HKLR	811459	800550	SUMMER	NONE	P

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□□□□	S□□ □	□□M□	□□□ S□	□□□□	□□□U	□S□	□□□□ □□	□□□□	N□□□□□N□	□□S□N□	S□□S□N	□□□□ □SS□□□	□□S
10-Jul-13	9	1251	3	W LANTAU	2	47	ON	HKLR	810239	801393	SUMMER	NONE	S
10-Jul-13	10	1318	4	W LANTAU	3	491	ON	HKLR	808446	800646	SUMMER	NONE	P
10-Jul-13	11	1359	8	W LANTAU	2	53	ON	HKLR	806429	801590	SUMMER	NONE	P
21-Aug-13	1	1106	3	W LANTAU	2	147	ON	HKLR	806273	801734	SUMMER	NONE	S
21-Aug-13	2	1116	2	W LANTAU	2	341	ON	HKLR	806418	801363	SUMMER	NONE	P
21-Aug-13	3	1126	7	W LANTAU	2	6	ON	HKLR	806430	801013	SUMMER	NONE	P
21-Aug-13	4	1243	3	W LANTAU	2	ND	OFF	HKLR	810464	799764	SUMMER	NONE	N/A
21-Aug-13	5	1258	3	W LANTAU	2	180	ON	HKLR	810774	799889	SUMMER	NONE	S
26-Aug-13	1	1009	3	W LANTAU	2	ND	OFF	HKLR	817451	805067	SUMMER	NONE	N/A
26-Aug-13	2	1048	10	W LANTAU	2	346	ON	HKLR	815451	802837	SUMMER	NONE	P
26-Aug-13	3	1113	1	W LANTAU	1	226	ON	HKLR	814444	802402	SUMMER	NONE	P
26-Aug-13	4	1127	3	W LANTAU	1	132	ON	HKLR	813855	803339	SUMMER	NONE	S
26-Aug-13	5	1137	1	W LANTAU	1	30	ON	HKLR	813559	802194	SUMMER	NONE	P
26-Aug-13	6	1145	1	W LANTAU	1	484	ON	HKLR	812930	801069	SUMMER	NONE	S
26-Aug-13	7	1209	2	W LANTAU	1	872	ON	HKLR	811447	800756	SUMMER	NONE	P
26-Aug-13	8	1222	2	W LANTAU	1	376	ON	HKLR	810461	800940	SUMMER	NONE	P
26-Aug-13	9	1232	2	W LANTAU	2	74	ON	HKLR	810183	801393	SUMMER	NONE	S
26-Aug-13	10	1239	3	W LANTAU	2	322	ON	HKLR	809409	800989	SUMMER	NONE	P
26-Aug-13	11	1254	6	W LANTAU	2	297	ON	HKLR	809433	800329	SUMMER	NONE	P
26-Aug-13	12	1337	1	W LANTAU	2	100	ON	HKLR	806452	801003	SUMMER	NONE	P

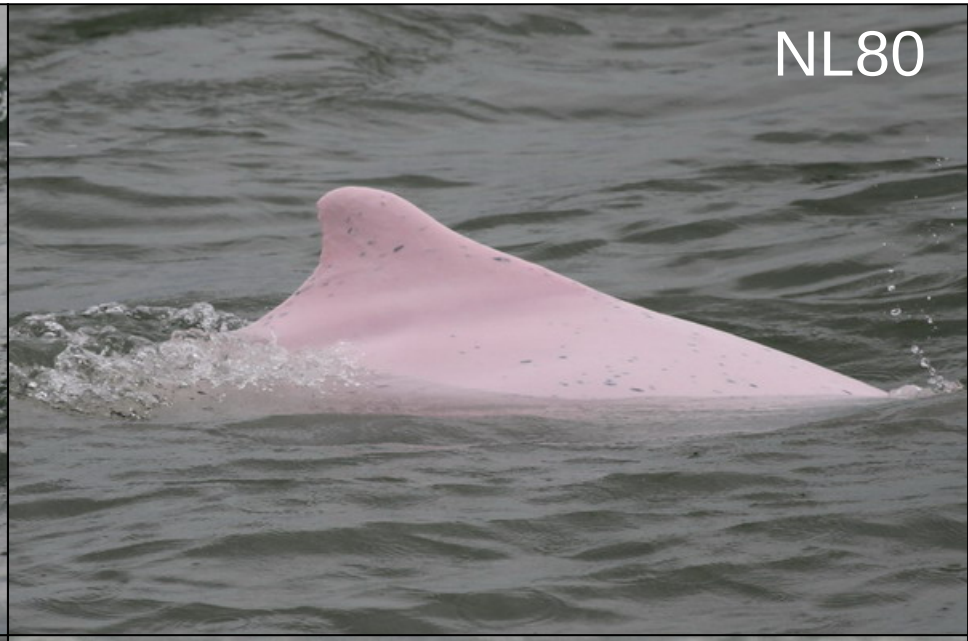
□□endi□ III. □ndi□id□a□do□□ins identified d□ring HK L R09 □onitoring s□r□e□s in □□ne- □□g□st 2013

ID#	DATE	STG □	AREA
CH12	2013-07-10	10	W LANTAU
CH38	2013-07-10	11	W LANTAU
CH108	2013-07-10	6	W LANTAU
CH113	2013-06-17	2	W LANTAU
CH153	2013-08-26	2	W LANTAU
NL80	2013-07-10	2	W LANTAU
NL103	2013-07-10	2	W LANTAU
NL123	2013-08-26	1	W LANTAU
NL188	2013-08-26	2	W LANTAU
NL247	2013-06-17	1	W LANTAU
NL261	2013-08-26	1	W LANTAU
NL285	2013-08-26	1	W LANTAU
NL293	2013-07-10	11	W LANTAU
NL296	2013-08-26	2	W LANTAU
NL298	2013-06-17	1	W LANTAU
SL05	2013-06-06	1	W LANTAU
SL35	2013-08-21	3	W LANTAU
SL40	2013-07-10	11	W LANTAU
	2013-08-21	4	W LANTAU
SL47	2013-07-05	1	W LANTAU
SL49	2013-07-05	1	W LANTAU
WL04	2013-07-05	8	W LANTAU
WL25	2013-07-05	9	W LANTAU
	2013-07-10	11	W LANTAU
	2013-08-26	10	W LANTAU
WL46	2013-07-05	1	W LANTAU
WL60	2013-07-05	1	W LANTAU
WL61	2013-07-10	11	W LANTAU
WL68	2013-06-17	6	W LANTAU
	2013-08-21	3	W LANTAU
	2013-08-26	9	W LANTAU
WL73	2013-08-21	3	W LANTAU
WL76	2013-08-26	3	W LANTAU
WL86	2013-07-10	10	W LANTAU
WL93	2013-06-06	1	W LANTAU
WL100	2013-07-10	6	W LANTAU
WL114	2013-06-17	6	W LANTAU
WL118	2013-07-05	9	W LANTAU
WL120	2013-08-26	2	W LANTAU
WL123	2013-07-10	11	W LANTAU
WL124	2013-07-05	6	W LANTAU
	2013-07-10	2	W LANTAU
	2013-08-26	2	W LANTAU
WL130	2013-06-06	1	W LANTAU

ID#	DATE	STG □	AREA
WL131	2013-07-10	10	W LANTAU
WL142	2013-06-06	1	W LANTAU
WL145	2013-07-05	4	W LANTAU
WL152	2013-07-10	10	W LANTAU
WL159	2013-07-05	1	W LANTAU
WL166	2013-08-26	11	W LANTAU
WL178	2013-07-05	10	W LANTAU
WL179	2013-07-05	4	W LANTAU
WL199	2013-08-21	3	W LANTAU
	2013-08-26	10	W LANTAU
WL208	2013-08-26	11	W LANTAU
WL213	2013-07-05	1	W LANTAU

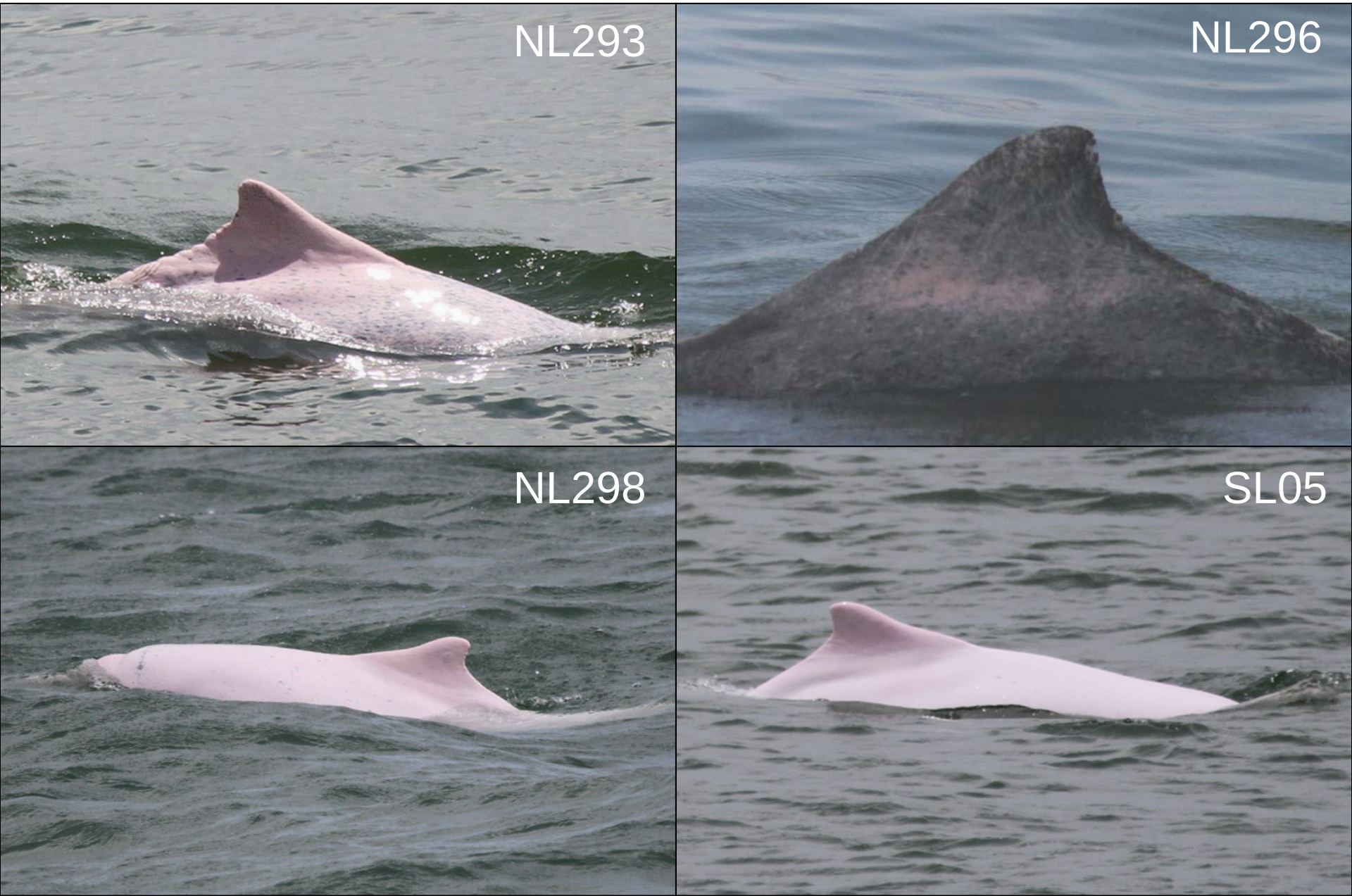
Appendix IV. Forty-eight individual dolphins that were identified during June-August 2013 under HKLR09 impact phase monitoring surveys

Appendix IV. (cont'd)



Appendix IV. (cont'd)

Appendix IV. (cont'd)



Appendix IV. (cont'd)

Appendix IV. (cont'd)

Appendix IV. (cont'd)

Appendix IV. (cont'd)

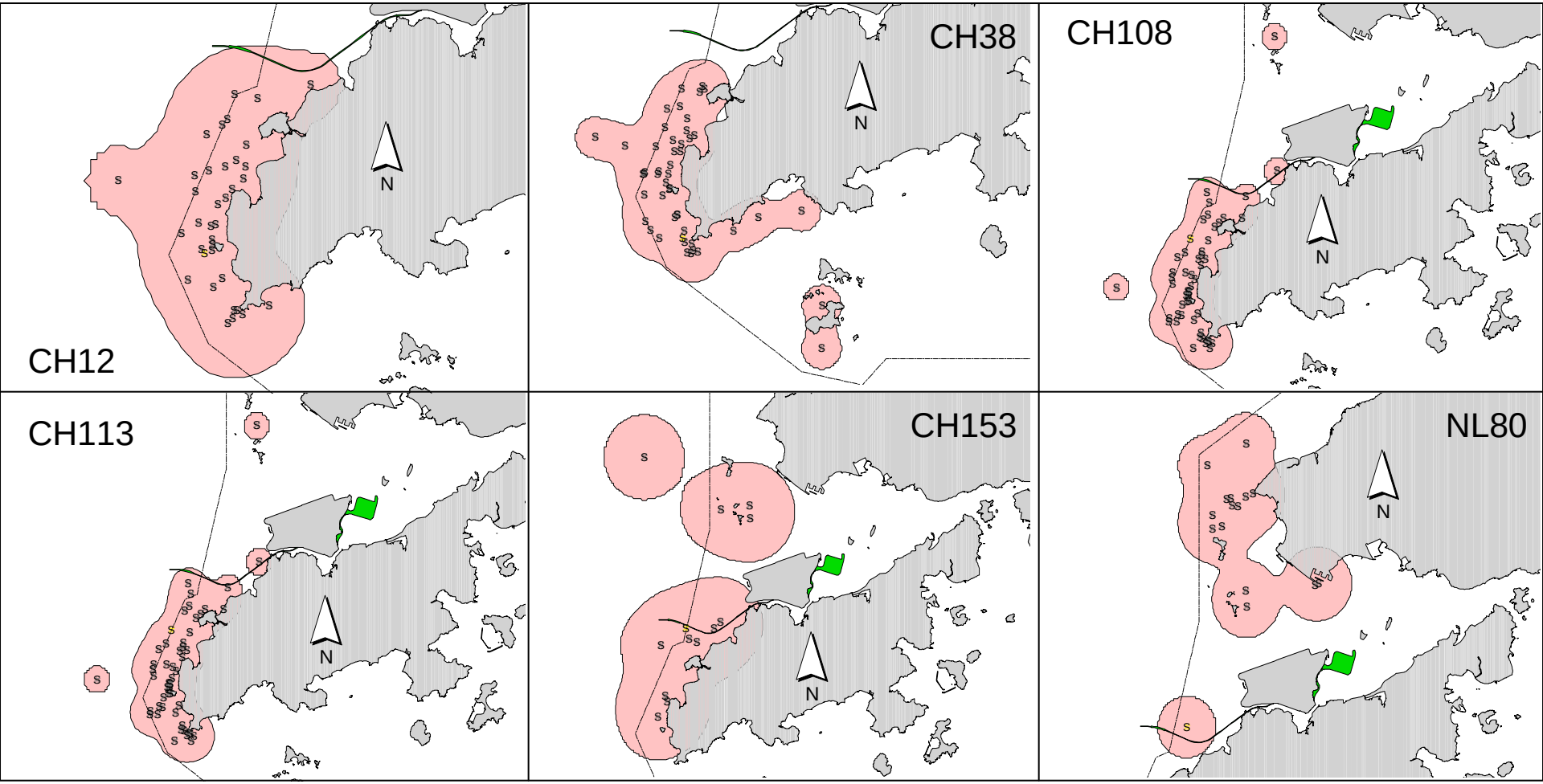
Appendix IV. (cont'd)

Appendix IV. (cont'd)

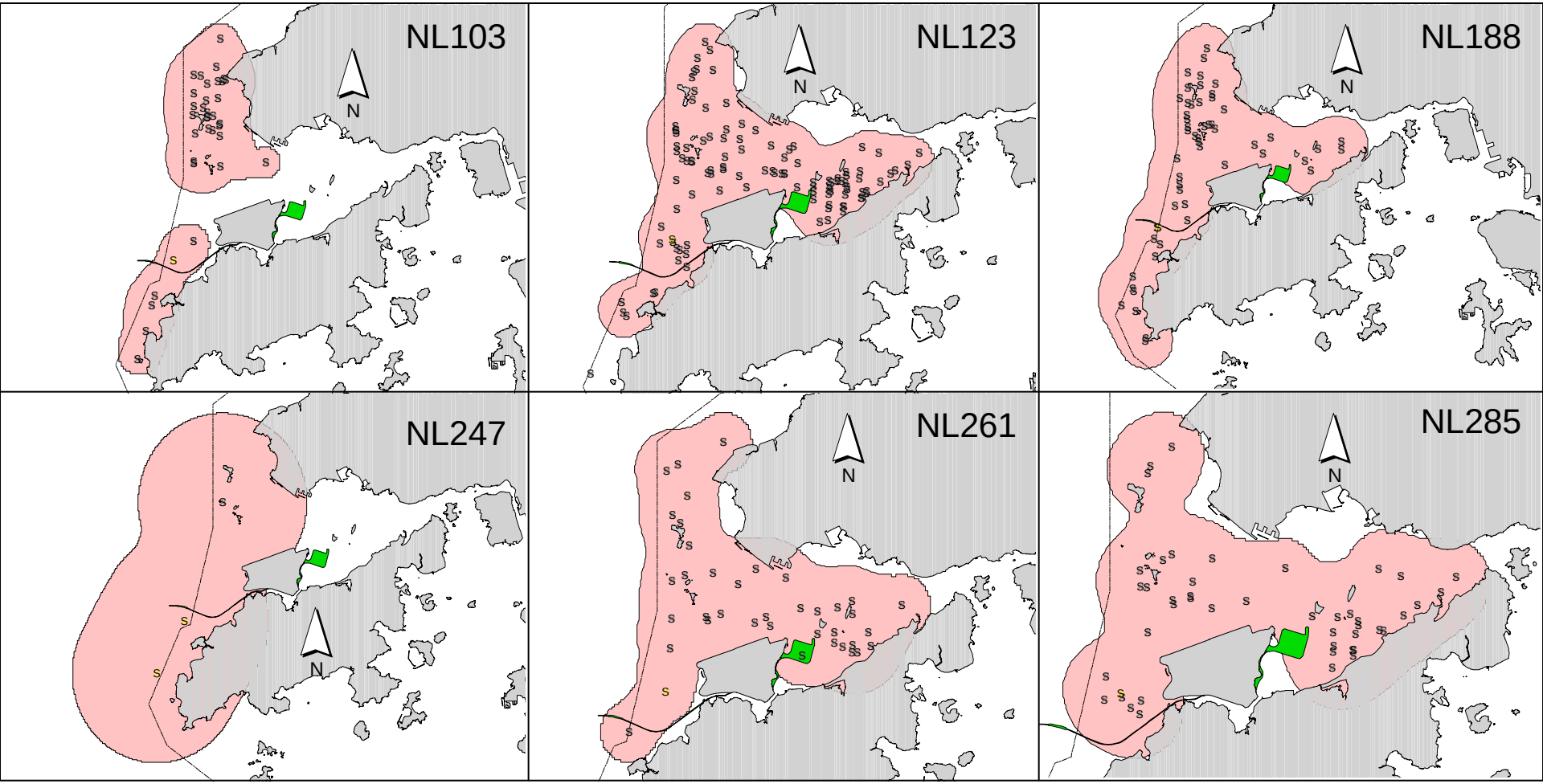
Appendix IV. (cont'd)

Appendix IV. (cont'd)

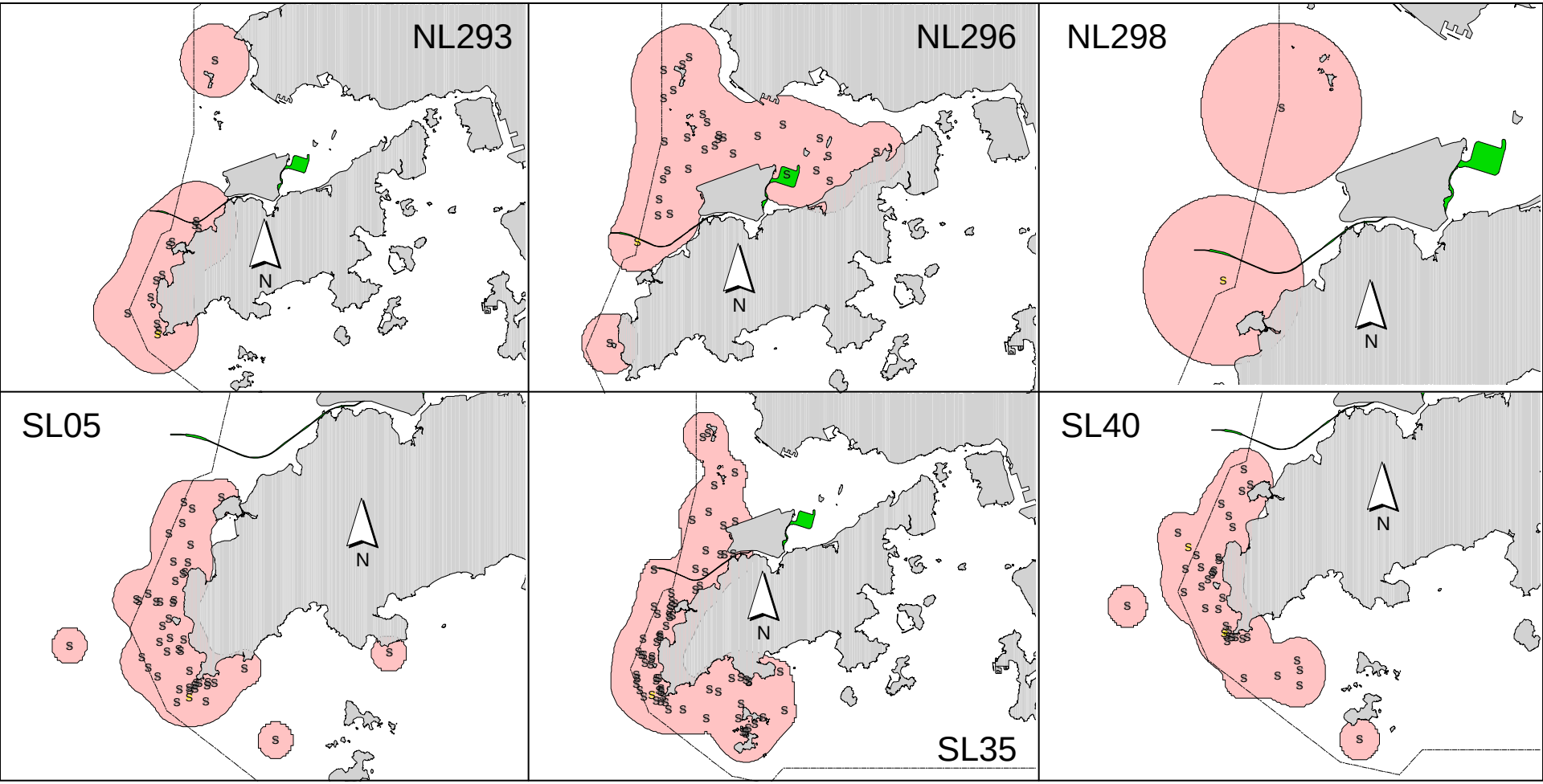
Appendix V. Ranging patterns (95% kernel ranges) of 48 individual dolphins that were sighted during HKLR09 impact phase monitoring period (note: yellow dots indicates sightings made in June – August 2013)



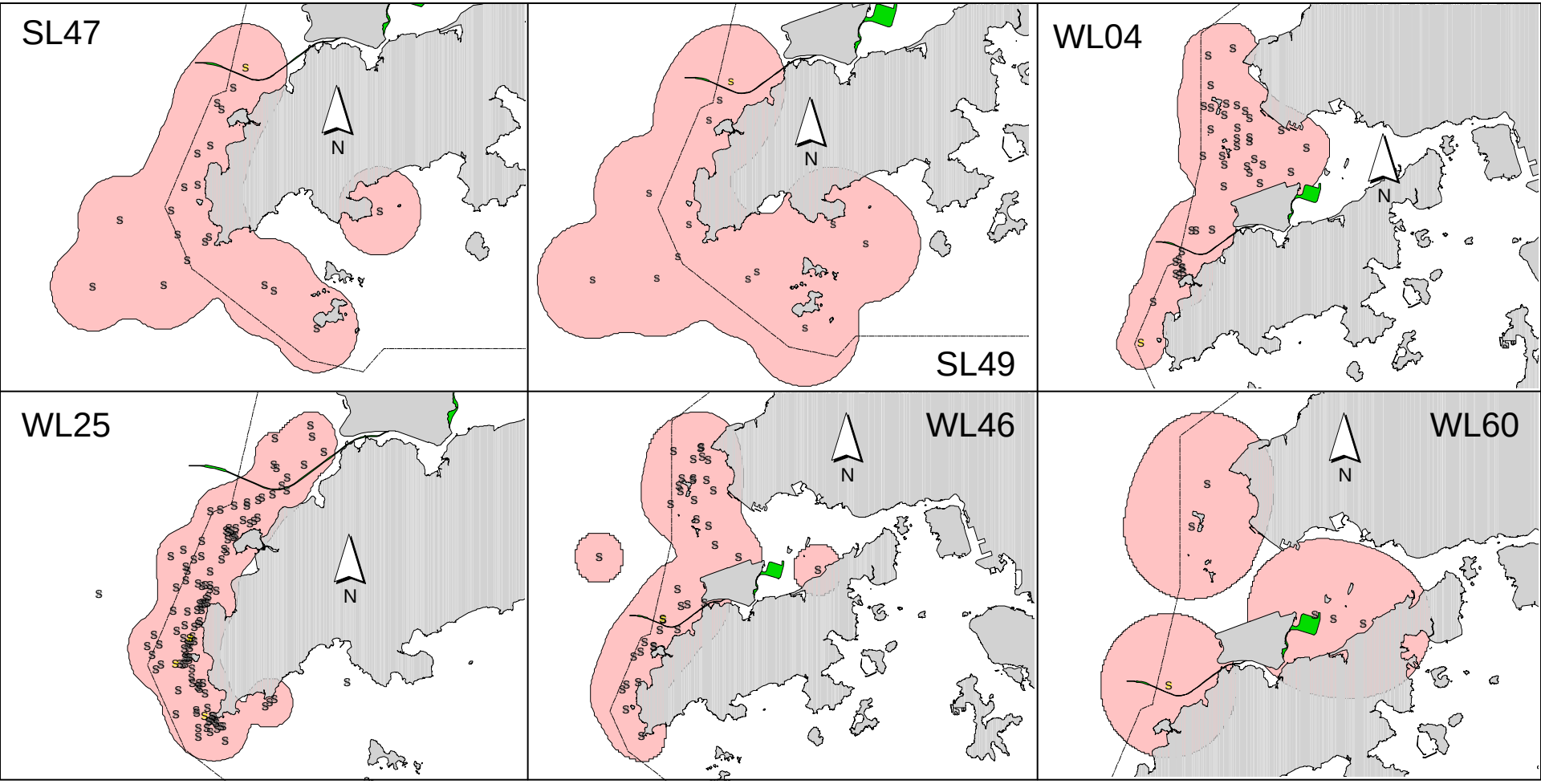
Appendix V. (cont'd)



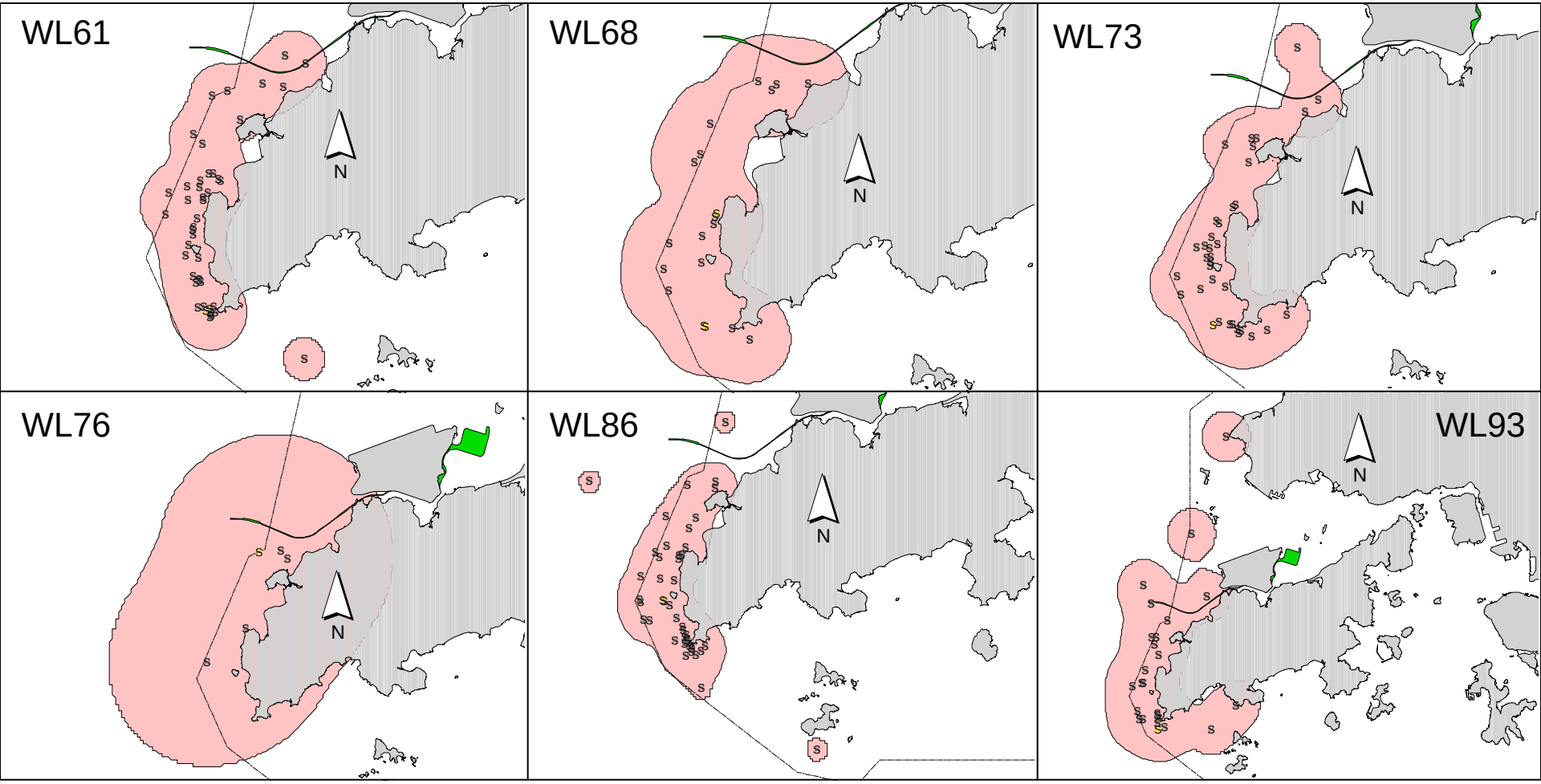
Appendix V. (cont'd)



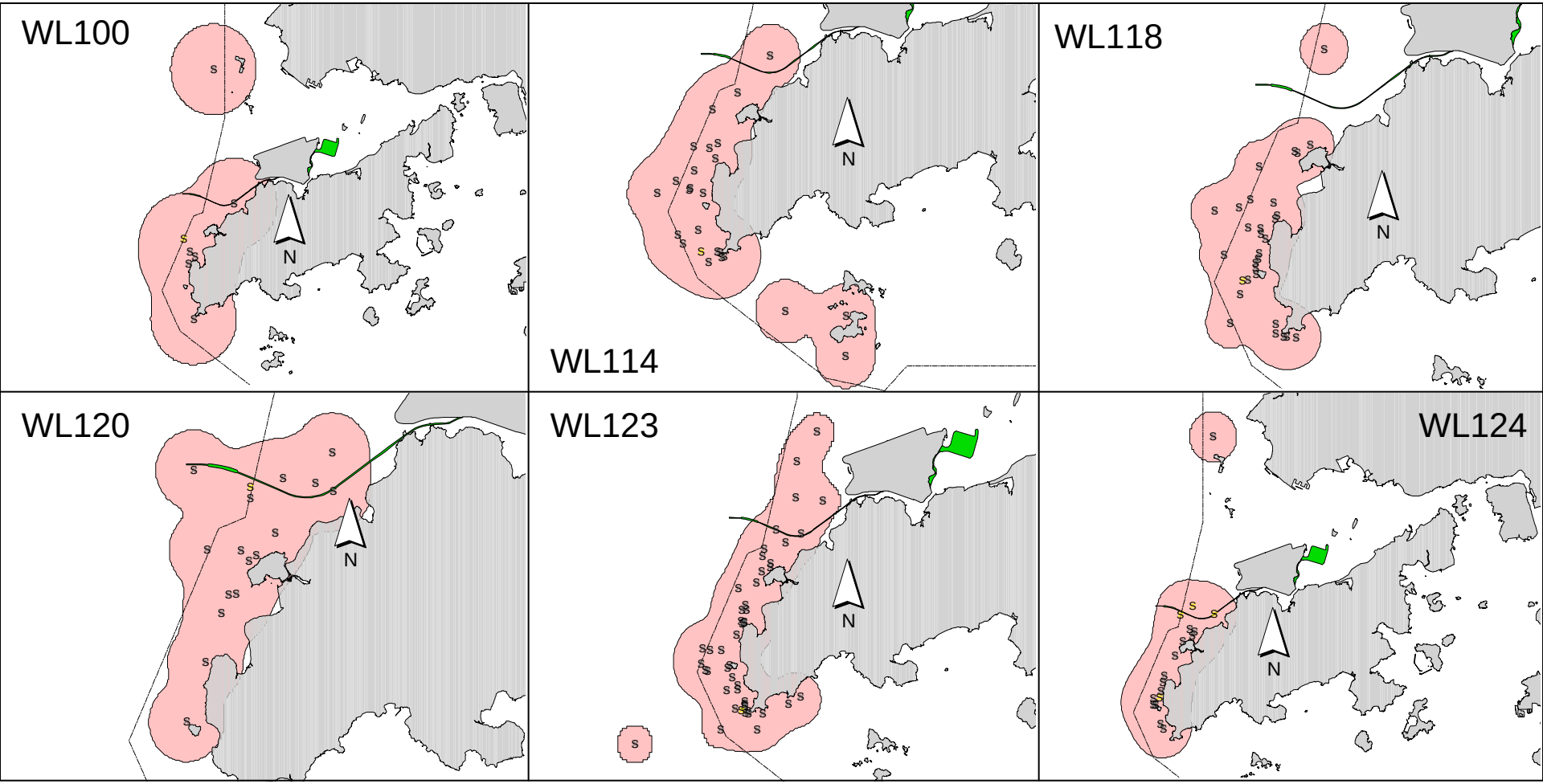
Appendix V. (cont'd)



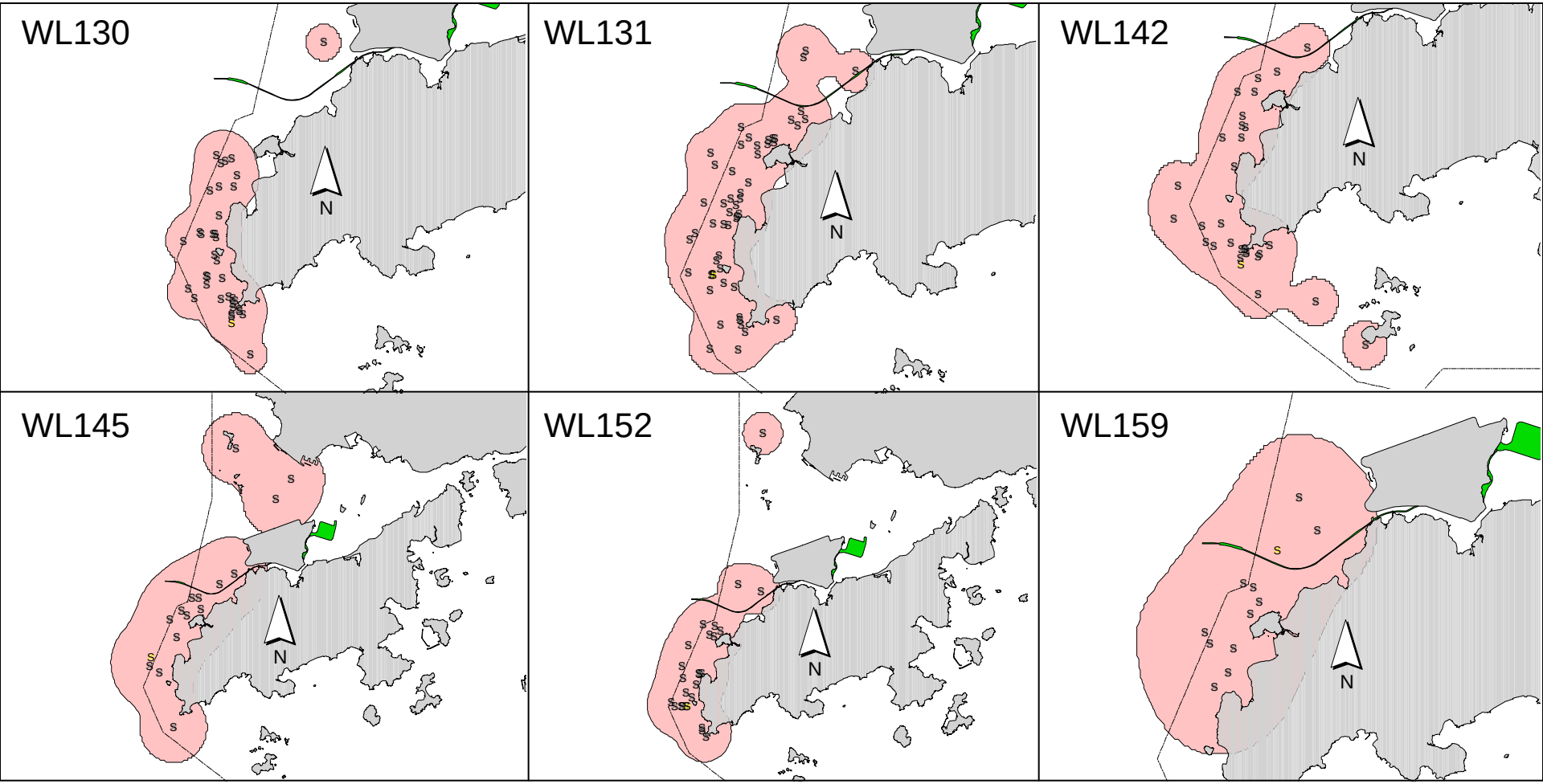
Appendix V. (cont'd)



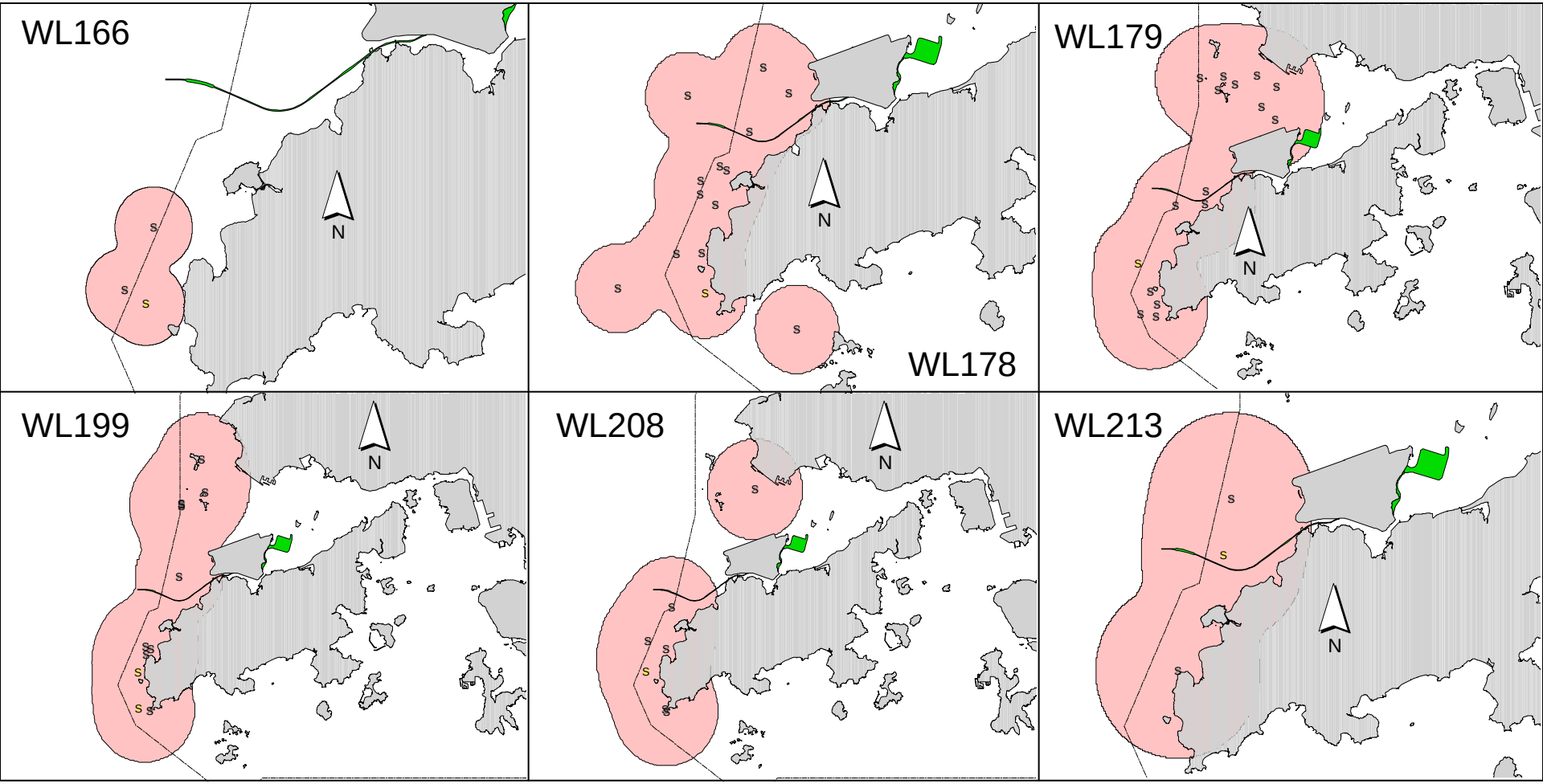
Appendix V. (cont'd)



Appendix V. (cont'd)



Appendix V. (cont'd)



APPENDIX F-2
UNDERWATER NOISE MONITORING RESULTS

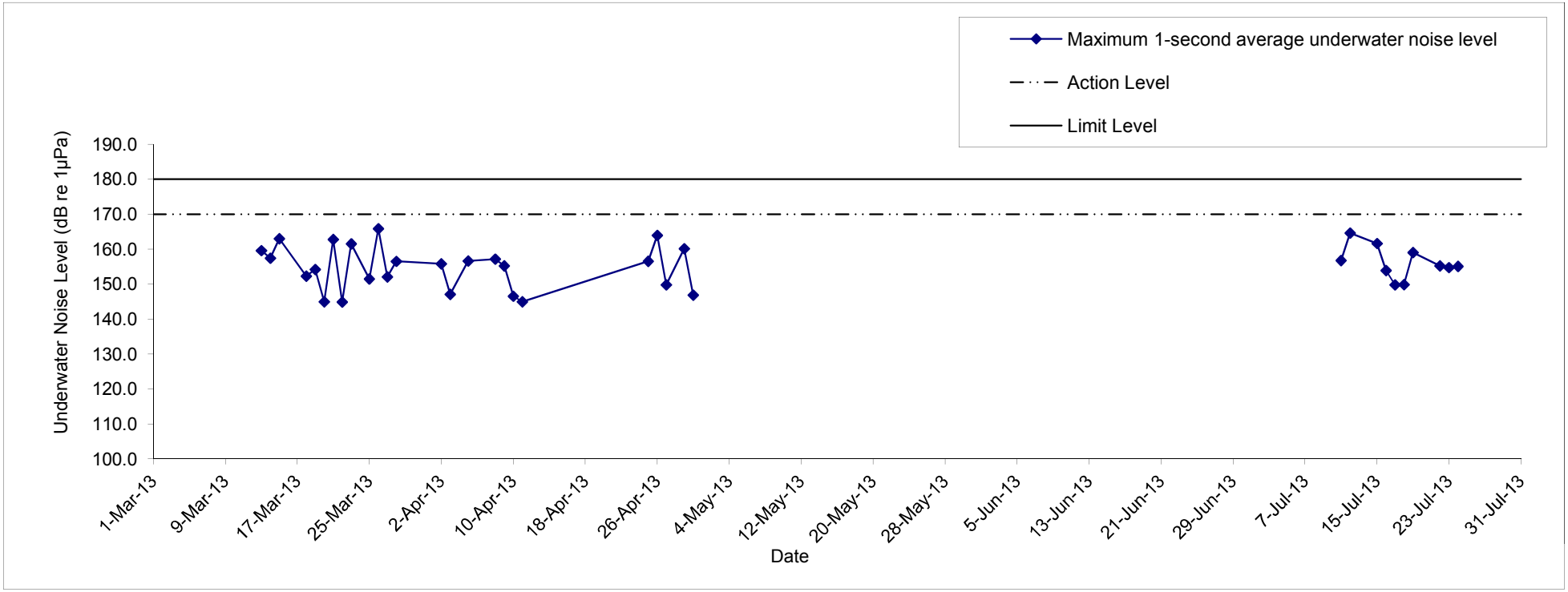
Underwater Noise Monitoring in July 2013

Date	Station	Hourly Average Underwater Noise (dB re 1μPa)									Daily Average (dB re 1μPa)
		9	10	11	12	13	14	15	16	17	
11-Jul-13	R3	-	139.5	129.0	138.3	141.4	141.4	141.4	142.9	144.8	139.8
12-Jul-13	R3	142.1	142.7	138.0	131.0	137.7	140.9	142.7	141.4	140.9	139.7
15-Jul-13	R3	131.4	132.7	137.8	138.7	132.0	126.0	137.4	141.7	140.3	135.3
16-Jul-13	R3	140.0	133.7	131.8	139.7	134.6	132.3	126.6	128.3	135.4	133.6
17-Jul-13	R3	145.1	143.2	137.8	129.5	136.0	134.9	129.0	126.9	127.1	134.4
18-Jul-13	R3	144.3	143.2	143.1	142.6	136.9	136.1	135.2	133.2	131.5	138.4
19-Jul-13	R3	141.2	143.5	143.3	141.6	139.9	132.0	131.8	137.7	138.2	138.8
22-Jul-13	R3	135.6	140.0	141.4	141.8	144.3	144.7	143.8	138.9	129.7	140.0
23-Jul-13	R3	140.3	137.2	140.7	142.0	143.1	144.9	146.6	144.3	138.0	141.9
24-Jul-13	R3	142.4	136.9	135.6	140.2	141.4	143.8	144.3	144.3	141.8	141.2

Fequency: 70 Hz - 125 kHz

Station	Pier No.
R3	0

* Daily average is calculated from all hourly average for that day.
* Underwater noise monitoring would be temporarily paused due to bad weather or to give way for barge movement.



Fequency: 70 Hz - 125 kHz

Title Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Construction Underwater Noise Monitoring Results	Scale N.T.S Date Jul13	Project No. MA12014 Appendix F-2	CINOTECH

APPENDIX G
EVENT ACTION PLANS

Event / Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	SO	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	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.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2.Exceedance for two or more consecutive samples	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.	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.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor;	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	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.	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.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	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	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	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	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;	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

	the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results; 8. If exceedance stops, cease additional monitoring.	remedial measures.	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.	is abated.

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	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.	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.	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	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	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;	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	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed	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**
	6. Inform IEC, SO and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results; 8. If exceedance stops, cease additional monitoring.	remedial measures.	noise problem; 4. Ensure remedial measures properly implemented; 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.	4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the SO until the exceedance is abated.

Event and Action Plan for Water Quality

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

Event	ET Leader	IEC	SO	Contractor
				IEC and SO.
Limit level being exceeded by two or more consecutive sampling days	Repeat measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor, SO and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, SO and Contractor; Ensure mitigation measures are implemented;	Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the SO accordingly; Supervise the implementation of mitigation measures.	Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Ensure mitigation measures are properly implemented; 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.	Take immediate action to avoid further exceedance; Submit proposal of mitigation measures to SO within 3 working days of notification and discuss with ET, IEC and SO; Implement the agreed mitigation measures; Resubmit proposals of mitigation measures if problem still not under control; 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.

Event / Action Plan for Underwater Construction Noise

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action level triggered	1. Inform the IEC, ER and Contractor; 2. Advise Contractor of dolphin protection zone coverage. 3. Continue to monitor underwater noise level.	1. Check monitoring data submitted by ET.	1. Inform Contractor.	1. Review the piling sequence or method; 2. Implement the mitigation measure to lower the underwater noise level to below action limit within 30 minutes; 3. Implement protection zone. 4. Closely liaise with the ET on the progress.
Limit level triggered	1. Instruct the Contractor to stop construction work; 2. Inform the IEC and ER; 3. Discuss with IEC, ER and Contractor on noise reduction proposal; 4. Assess effectiveness of Contractor's proposal and keep IEC and ER informed.	1. Check monitoring data submitted by ET. 2. Discuss amongst ER, ET and Contractor on the potential remedial actions.	1. Review the proposal by Contractor; 2. Make agreement on the measures to be implemented.	1. Stop construction work 2. Inform the ER 3. Review the piling sequence or method in order to reduce the underwater noise levels to no higher than 170 dB. 4. Submit noise reduction proposal to the ER for endorsement. 5. Implement the agreed measures. 6. Re-submit proposals if problem still not under control; 7. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Event Action Plan for Dolphin Monitoring

Event	ET Leader	IEC	ER / SOR	Contractor
Action Level	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.	1. Check monitoring data submitted by ET and Contractor. 2. Discuss monitoring results and findings with the ET and the Contractor.	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.	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	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	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.	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.	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.			

Event and Action Plan on Dolphin Movement and Behaviour

EVENT	ACTION			
	ET Leader	**IEC**	**SO**	**Contractor**
Action Level With the numerical values presented in Tables 7.1-7.2 of Baseline Environmental Monitoring Report, any of the response variable for dolphin movement patterns (speed, inter-breath interval, reorientation rate & linearity) and behaviour (proportion of time spent in each behavioural state) recorded in the construction phase monitoring is **20% higher or lower** than that recorded in the baseline monitoring, action level should be triggered	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data to ascertain if differences are as a result of natural variation or seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, SO and Contractor; 5. Check monitoring data; 6. Carry out audit to ensure all dolphin protective measures are implemented fully and additional measures be proposed if necessary	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring with the ET and the Contractor;	1. Discuss with the IEC the repeat monitoring and any other measures proposed by the ET; 2. Make agreement on measures to be implemented.	1. Inform the SO and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the SO; 3. Implement the agreed measures.
Limit Level With the numerical values presented in Tables 7.1-7.2 of Baseline Environmental Monitoring Report, any of the response variable for dolphin movement patterns (speed, inter-breath interval, reorientation rate & linearity) and behaviour (proportion of time spent in each behavioural state) recorded in the construction phase monitoring is **40% higher or lower** than that recorded in the baseline monitoring, limit level should be triggered	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data to ascertain if differences are as a result of natural variation or seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, SO and Contractor; 5. Check monitoring data; 6. Carry out audit to ensure all dolphin protective measures are implemented fully and additional measures be proposed if necessary 7. Discuss additional dolphin monitoring and any other potential mitigation measures (e.g. consider to	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring with the ET and the Contractor; 3. Review proposals for additional monitoring and any other measures submitted by the Contractor and advise ER accordingly.	1. Discuss with the IEC the repeat monitoring and any other measures proposed by the ET; 2. Make agreement on measures to be implemented.	1. Inform the SO and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the SO; 3. Implement the agreed measures.

	temporarily stop relevant portion of construction activity) with the IEC and Contractor.			

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

Event and Action Plan on Dolphin Acoustic Behaviour

EVENT	ACTION			
	ET Leader	**IEC**	**SO**	**Contractor**
Action Level With the numerical values presented in Table 8.1 of Baseline Environmental Monitoring Report, when any of the response variable for dolphin acoustic behaviour recorded in the construction phase monitoring is **20% lower or higher** than that recorded in the baseline monitoring, or when there is a shift of **3 hours or more** in peak occurrence at B2 Site (i.e. 00:00 – 01:00), the action level should be triggered	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data to ascertain if differences are as a result of natural variation or seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, SO and Contractor; 5. Check monitoring data; 6. Carry out audit to ensure all dolphin protective measures are implemented fully and additional measures be proposed if necessary	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring with the ET and the Contractor;	1. Discuss with the IEC the repeat monitoring and any other measures proposed by the ET; 2. Make agreement on measures to be implemented.	1. Inform the SO and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the SO; 3. Implement the agreed measures.
Limit Level With the numerical values presented in Table 8.1 of Baseline Environmental Monitoring Report, when any of the response variable for dolphin acoustic behaviour recorded in the construction phase monitoring is **40% lower or higher** than that recorded in the baseline monitoring, or when there is a shift of **6 hours or more** in peak occurrence at B2 Site (i.e. 00:00 – 01:00), the limit level should be triggered	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data to ascertain if differences are as a result of natural variation or seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, SO and Contractor; 5. Check monitoring data; 6. Carry out audit to ensure all dolphin protective measures are implemented fully and additional measures be proposed if necessary 7. Discuss additional dolphin monitoring and any other potential mitigation measures (e.g. consider to temporarily stop relevant portion of construction activity) with the IEC and Contractor.	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring with the ET and the Contractor; 3. Review proposals for additional monitoring and any other measures submitted by the Contractor and advise ER accordingly.	1. Discuss with the IEC the repeat monitoring and any other measures proposed by the ET; 2. Make agreement on measures to be implemented.	1. Inform the SO and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the SO; 3. Implement the agreed measures.

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

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: • 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	• 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
		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; • 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;	practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.		sites	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
S5.5.6.2	A2	• 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 ^ ^
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: • 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	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
		materials should be carried out in totally enclosed system; • 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.	monitoring stations to ensure compliance with relevant criteria throughout the construction period.		monitoring station		N/A N/A N/A N/A N/A N/A N/A
S5.5.2.7	A7	The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point: • 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	N/A N/A N/A N/A
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
		following: • 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	*Construction and Demolition Material* The following mitigation measures should be implemented in handling the waste: • 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	^ ^ ^ ^ ^

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
		the disposal of C&D materials are properly documented and verified; and • 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					^ ^
S8.3.9 - S8.3.11	WM2	*C&D Waste* • 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	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	^ ^

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
		areas of the sites should be considered for such segregation and storage.					
S8.2.12-S8.3.15	WM3	<u>*Chemical Waste*</u> • 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	Control the chemical waste and ensure proper storage, handling and disposal.	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
		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	*Sewage* • 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	*General Refuse* • 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
		plastic bottles etc., should be provided. • 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	• 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
		taking account of the Contractor's proposed actual locations of his initial period of dredging work. • silt curtain shall be fully maintained throughout the works. 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. • 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;					^ 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
		• 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.					^ ^
S9.11.1.3	W2	*Land Works* 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: • 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	^ 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
		specifically at the onset of and after each rainstorm; • temporary access roads should be surfaced with crushed stone or gravel; • rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system; • open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms; • manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers; • discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system; • all vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit; • wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain; • the section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel;					^ ^ ^ ^ ^ ^ * ^ ^

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
		• 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.					^ ^ * ^ ^ ^
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	• 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
		• Reinstate works areas in Scenic Hill • Avoid stream modification in Scenic Hill	Frog in Scenic Hill				N/A ^
S10.7	E2	• 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	• 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	• Dolphin Exclusion Zone; • Dolphin watching plan	Minimize temporary marine habitat loss impact to dolphins	Contractor	Marine works	During marine works	^ ^
S10.7	E7	• 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
		• Temporal suspension of drilling bored pile casing in rock during peak dolphin calving season in May and June					N/A
S10.7	E8	• 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	• 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	• 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	• 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	Mitigate both Landscape and Visual Impacts • 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
		• 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).					N/A N/A N/A N/A N/A N/A N/A
S14.3.3.3	LV3	<u>Mitigate Visual Impacts</u> • 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.					^ ^

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)

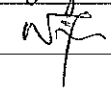
APPENDIX I
SITE AUDIT SUMMARY

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130604
Date	4 June 2013 (Tuesday)
Time	9:30 – 12:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
130604-R01	• Clear the discarded leaves at the temporary drainage channel at Portion C.	B4
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• N o environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
	• No environmental deficiency was identified during site inspection.	
	F. Permits/Licences	
130604-R02	• To display the Environmental Permit conspicuously at Portion C.	G5
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 130531), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		4 June 2013
Checked by	Dr. Priscilla Choy		4 June 2013

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130611
Date	11 June 2013 (Tuesday)
Time	9:25 – 11:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
130611-R03	• Clear the sand and silt at the deck of barge at P71.	B20
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
130611-R01	• Properly check the generator at P71 to avoid emitting dark smoke.	D19
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
130611-R02	• Provide the plug for the drip tray at P71.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 130604), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		11 June 2013
Checked by	Dr. Priscilla Choy		11 June 2013

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130618
Date	18 June 2013 (Tuesday)
Time	9:30 – 11:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
130618-R01	• Clear the stagnant water for the material skip at Portion C and the drip tray at WA4.	B8
	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	
	• 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. 130611), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		18 June 2013
Checked by	Dr. Priscilla Choy		18 June 2013

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

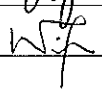
Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130628
Date	28 June 2013 (Friday)
Time	13:30 – 15:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
130628-R02	• To seal the gap at the platform at Pier 74 to avoid leakage of muddy water to the sea.	B22
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
130628-R01	• To check the air compressor at Pier 73 to avoid emitting dark smoke.	D19
	D. Noise	
130628-R03	• To implement acoustic decoupling measures for the air compressor at Pier 74.	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. 130618), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		28 June 2013
Checked by	Dr. Priscilla Choy		28 June 2013

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130702
Date	2 July 2013 (Tuesday)
Time	9:30 – 11:15

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
130702-R01	• To review the sedimentation process of the surface runoff at Portion C.	B3
	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	
	• 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. 130628), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		2 July 2013
Checked by	Dr. Priscilla Choy		2 July 2013

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130709
Date	9 July 2013 (Tuesday)
Time	9:30 – 11:20

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
130709-R01	• To clear the water at wheel washing bay at Portion C.	B10iv.
130709-R02	• To clear the sand and silt settled at the drain at Portion C.	B4
	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	
	• 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. 130702), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

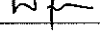
	Name	Signature	Date
Recorded by	Ivy Tam		9 July 2013
Checked by	Dr. Priscilla Choy		9 July 2013

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130716
Date	16 July 2013 (Tuesday)
Time	9:30 – 11:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
130716-R03	• To clear the sediment at the deck of flap-top work barge at P50.	B20
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
130716-R02	• To check the air compressor at P50 to avoid emitting grey smoke.	D19
	D. Noise	
130716-R01	• To close the door of air compressor which is in operation at P50.	E9
	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. 130709), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

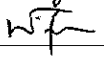
	Name	Signature	Date
Recorded by	Ivy Tam		16 July 2013
Checked by	Dr. Priscilla Choy		16 July 2013

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130723
Date	23 July 2013 (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	
	• No environmental deficiency was identified during site inspection.	
	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	
130723-R01	• To seal the hole of the drip tray near the office containers at Portion C.	F9
130723-R02	• To remove the construction materials which were placed at near the tree at Portion C.	F4ii.
130723-R03	• Clear the deposit silt and sediment at the site exit and drainage channel at Portion C.	F6
130723-R04	• Clear the oil stain at near the Pontoon at WA4.	F8
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 130716), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

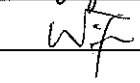
	Name	Signature	Date
Recorded by	Ivy Tam		23 July 2013
Checked by	Dr. Priscilla Choy		23 July 2013

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130730
Date	30 July 2013 (Tuesday)
Time	13:30 – 15:00

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	
	• 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	
130730-R01	• To remove the construction materials which were placed at near the tree at Portion C.	F4ii.
130730-R02	• Clear the deposit silt and sediment at the drainage channel at Portion C.	F6
130730-R03	• To seal the hole of the drip tray near the office containers at Portion C.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 130723), follow up action is needed for the item 130723-R01 and 130723-R02 and renamed as 130730-R03 and 130730-R01 respectively.	

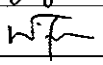
	Name	Signature	Date
Recorded by	Ivy Tam		30 July 2013
Checked by	Dr. Priscilla Choy		30 July 2013

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130806
Date	6 August 2013 (Tuesday)
Time	9:30 – 11:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
130806-R03	• To review the sedimentation process at Portion C.	B4
	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	
130806-R01	• To remove the construction materials which at near the trees at Portion A and C.	F4ii.
130806-R02	• To clear the drainage channels at Portion C.	F6
130806-R04	• To seal the hole of the drip tray and clear the oil leakage at near the office containers at Portion C.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 130730), follow up action is needed for the item 130730-R01, 130730-R02 & 130730-R03 and renamed as 130806-R01, 130806-R02 and 130806-R04 respectively.	

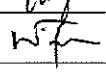
	Name	Signature	Date
Recorded by	Ivy Tam		6 August 2013
Checked by	Dr. Priscilla Choy		6 August 2013

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130813
Date	13 August 2013 (Tuesday)
Time	9:30 – 11:15

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
130813-R01	• Clear or replace the damage sand bag at Southeast Quay.	B16
130813-R03	• Provide sand bag bund at the water barrier near the pile at Portion C to prevent leakage of muddy water to the public road.	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	
130813-R02	• Remove the construction materials at near the trees at Portion A (near P106) and C.	F4ii.
130813-R04	• Clear the general refuse at near P102 at Portion A.	F1iii.
	•	
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 130806), follow up action is needed for the item 130806-R01 which is renamed as 130813-R02.	

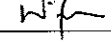
	Name	Signature	Date
Recorded by	Ivy Tam		13 August 2013
Checked by	Dr. Priscilla Choy		13 August 2013

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130820
Date	20 August 2013 (Tuesday)
Time	9:00 – 11:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
130820-R01	• To replace the damage sand bags at P20.	B20
130820-R02	• To reinforce the sand bag bund at P49.	B22
	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	
	• 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. 130813), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		20 August 2013
Checked by	Dr. Priscilla Choy		20 August 2013

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

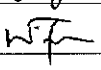
Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	130829
Date	29 August 2013 (Thursday)
Time	13:30 – 15:00

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	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
130829-R01	• To close the door of the air compressor at P54.	E9
	E. Waste / Chemical Management	
130829-R02	• To seal the hole of the drip tray at P54.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 130820), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		29 August 2013
Checked by	Dr. Priscilla Choy		29 August 2013

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 2013 (Year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	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)
Jan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.150
Feb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.072
Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.091
Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.410	0.000	0.000	0.098
May	1.436	0.000	0.000	0.000	1.436	0.000	0.000	0.465	0.000	0.000	0.117
Jun	5.335	0.000	0.000	0.000	5.335	0.000	0.000	0.426	0.000	0.000	0.111
Sub-Total	6.771	0.000	0.000	0.000	6.771	0.000	0.000	1.676	0.000	0.000	0.637
Jul	12.438	0.000	0.280	0.000	5.896	6.262	0.000	0.447	0.000	0.000	0.117
Aug	12.107	0.000	0.000	0.000	4.646	7.461	0.000	0.552	0.000	1.784	0.124
Sep											
Oct											
Nov											
Dec											
Total	31.316	0.000	0.280	0.000	17.313	13.723	0.000	2.675	0.000	1.784	0.878

Forecast of Total Quantities of C&D Materials to be Generated from the Contract [10]										
Total Quantity Generated	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)
145.054	0.000	0.000	121.054	2.000	22.000	0.000	9.681	0.000	64.224	2.940

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 m^3. (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/m^3.

(7) According to the EIA Appendix 8B, the density of soil (bulked) is 1.8 tonnes/m^3.

(8) Assuming the loading quantities of a 30-tonne truck is 8.0m^3.

(9) Assuming the loading quantities of a 24-tonne truck is 6.5m^3.

(10) The forcast of C&D materials to be generated from the Contract is sourced from the works program in December 2012.

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 (1 hour TSP)
(NIL in the reporting period)

(B) Exceedance Report for Air Quality (24 hours TSP)
(NIL in the reporting period)

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

(D) 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)	4	3	0	0

(E) Exceedance Report for Underwater Construction Noise
(NIL in the reporting period)

(F) 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	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	Closed

			WA6 at around 13:00 on 1 May 2013 (Wednesday).	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.	
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 (around8:45a.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:- • To place wooden planks or rubber	Closed

				mats on ground for loading and unloading heavy or metal objects; and • To deploy professional personnel to supervise the works.	
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 April 2013 (Com-2013-04-001). 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.	After receiving the complaint, additional site inspection was conducted at near Tung Chung New Development Pier on 30 May 2013 to investigate whether oil 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. The following mitigation measures have been implemented by DCVJV: • 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	Closed

				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 17th July 2013. According to the EPD's letter, the complainant was concerned for the noise nuisance generated from the operation of concrete lorry mixers during evening and night-time period at Southeast Quay of Chek Lap Kok.	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. 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. 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. On 30 July 2013, no tug boat and concrete lorry mixers were observed during the inspection.	Closed

				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. 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 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. 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.	