Your ref
Our ref 214487/(HY/2011/09)/M45/630/B 09459

ARUP

BY HAND

B09459

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Environmental Protection Department
Environmental Assessment Division
27th floor, Southorn Centre
130 Hennessy Road
Wan Chai
Hong Kong

For the attention of Ms HO Yuen Han, Marlene

8 August 2014

Dear Madam

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 – March to May 2014

On behalf of HyD/HZMB Project Management Office (the Permit Holder) of the captioned Environmental Permit (EP), I enclose three hard copies and one electronic copy of the Quarterly EM&A Report for period March to May 2014 in accordance with Section 16.1.3 of the Updated EM&A Manual.

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

Yours faithfully

Colin Meadows
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 CD
	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/mw

Ove Arup & Partners Hong Kong Ltd | Registered in England & Wales
Registered Number: 1359968 | Registered Address: 13 Fitzroy Street London W1T 4BQ

Ref.: HYDHZMBEEM00_0_2124L.14 7 August 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.5 for March to May 2014 (Revision 1)

Reference is made to the submission of Quarterly EM&A Report No.5 for March to May 2014 version 1.0 dated 7 August 2014 certified by the ET Leader provided to us *via* email on 5 August 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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Room 2403 Jubilee Centre, 18 Fenwick Street, Wan Chai, Hong Kong. Tel: 852 3465 2888 Fax: 852 3465 2899
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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

March to May 2014

(Version 1.0)

Certified By

Dr. H.F. Chan
Environmental Team Leader
(Date: 5 August 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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EXECUTIVE SUMMARY

Introduction

1. This is the 5th 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 March and May 2014.

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	5th, 11th, 17th, 21st and 27th March 2014 2nd, 8th, 14th, 17th, 23rd and 29th April 2014 5th, 9th, 15th, 21st, 27th and 30th May 2014
24-hr TSP Monitoring	
Noise Monitoring	6th, 12th , 18st and 24th March 2014 3rd, 9th , 15th , 22nd and 30th April 2014 7th , 16th , 22nd and 28th May 2014
Water Quality Monitoring	1st, 3th, 5th, 7th, 10th, 12th, 14th, 17th, 19th, 21st, 24th , 27th, 29th and 31st March 2014 2nd, 4th, 7th, 10th, 12th, 14th, 16th, 18th, 22nd, 24th , 26th, 28th and 30th April 2014 2nd, 5th, 7th, 10th, 12th, 14th, 16th, 19th, 21st, 23rd , 26th, 28th and 30th May 2014
Dolphin Monitoring (Line-transect Vessel Surveys)	12th and 26th March 2014 15th and 23rd April 2014 7th and 20th May 2014
Additional Land-based Dolphin Behaviour and Movement Monitoring	14th and 19th March 2014 16th and 25th April 2014 19th and 27th May 2014
Environmental Site Inspection	5th, 11th , 18th and 28th March 2014 1st, 8th , 15th, 25th and 29th April 2014 7th , 13th, 20th and 30th May 2014
Archaeological Site Inspection	21st March 2014

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	6	1	0	0
	Suspended Solids (SS)	24	6	0	0
Dolphin Monitoring	Line-transect Vessel Surveys	0	0	0	0

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

Complaint Log

5. 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-2014-03-001	Near Sha Lo Wan	5 March 2014	Chemical / Waste Management
Com-2014-03-002	In the vicinity of the waters outside Sha Lo Wan	11 March 2014	Noise
Com-2014-04-001	Construction marine works by the company Bauer Hong Kong in Tung Chung	14 April 2014	Ecology
Com-2014-05-001	At the shore of Sha Lo Wan	13 May 2014	Ecology

Com-2014-05-002	At the shore of Sha Lo Wan	27 May 2014	Ecology
Com-2014-05-003	Pier 39 to 50	29 May 2014	Water Quality and Waste Management

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 of rebar materials

Marine Viaduct (P0 to P80)

- Construction of the temporary jetty
- Installation of temporary casings, piling jackets, temporary piles, platform and permanent casings
- Dismantling of piling jacket
- Piling platform removal works
- Pile excavation by Reverse Circulation Drill (RCD) method method
- Pile excavation by Kelly method
- Inter-face coring test, full depth coring test, sonic test, friction test
- and load test
- Predrilling works
- Operation of floating concrete batching plants
- Trimming of pile head
- Grouting works
- Concreting for pile cap
- Driving of sheet piling
- Trial water cracking and trial shaft grouting
- Installation of recast shells and waterproofing works
- Advanced concrete breaking works inside the permanent steel casing
- Steel fixing to the column and formwork installation
- Kingpost installation for precast cap and associated steel welding works

Land Viaduct (P81 to P114)

- Land piling and concreting works
- Rebar threading for coupler
- Backfilling
- Tree transplant and maintenance works
- Installation of portal beam
- Excavation works and Earth Lateral Support (ELS)
- Pouring of pile cap and pile head breaking
- Formation works
- Pours of column
- Erection of side formwork for the portal and kickers
- Road diversion works
- Pre-drilling works, pile cap, column and portal construction
- Side formwork and wing slab soffit formwork
- Waling of ELS and backfill
- Steel fixing for bottom mat and side bars
- Carriageway diversion
- Tendon ducts
- Falsework erection
- Temporary carriageway for diversion at P82 & P83

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 5th Quarterly EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme in the period between March to May 2014.

Structure of the report

1.3 The structure of the report is as follows:

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

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

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

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

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

Section 6: **Conclusions and Recommendation**

2 CONTRACT INFORMATION

Background

2.1 The proposed Hong Kong - Zhuhai - Macao Bridge Hong Kong Link Road (HKLR) is 12km long connecting the Hong Kong-Zhuhai-Macao Bridge (HZMB) at the HKSAR Boundary with the Hong Kong Boundary Crossing Facilities (HKBCF) situated at the north eastern waters of the Hong Kong International Airport, opening a new and direct connection route between Hong Kong, Macao and the Western Pearl River Delta.

2.2 The HKLR comprises a 9.4km long viaduct section from the HKSAR boundary to Scenic Hill on the Airport Island; a 1km tunnel section to the reclamation formed along the east coast of the Airport Island and a 1.6km long at-grade road section on the reclamation connecting to the HKBCF. The tunnel section of HKLR will pass under Scenic Hill, Airport Road and Airport Railway to minimize the environmental and visual impacts to Tung Chung residents.

2.3 An application (No ESB-110/2003) for an Environmental Impact Assessment (EIA) Study Brief under Section 5(1) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by Highways Department (the Project Proponent) on 8 October 2003 with a Project Profile (No. No. PP-201/2003) for the Hong Kong - Zhuhai - Macao Bridge Hong Kong Section and North Lantau Highway Connection. The Hong Kong - Zhuhai - Macao Bridge Hong Kong Section and North Lantau Highway Connection has subsequently been renamed as HKLR. EPD issued an EIA Study Brief (No: ESB-110/2003) in November 2003 to the Project Proponent to carry out an EIA study.

2.4 An EIA Study (Reg. No. AEIAR-144/2009) has been undertaken to provide information on nature and extent of environmental impacts arising from the construction and operation of HKLR. The Environmental Permit was issued on 4 November 2009 (Permit No. EP-352/2009). Pursuant to Section 13 of the EIAO, the Director of Environmental Protection amends the Environmental Permit (No. EP-352/2009) based on the Application No. VEP-339/2011 and the environmental Permit (Permit No. EP-352/2009/A) was issued on 9 November 2011 for HKLR to the Highways Department as the Permit Holder. Subsequently, the Director of Environmental Protection amends the Environmental Permits (No. EP-352/2009/A and EP-352/2009/B) based on the Application No. VEP-409/2013 and VEP-411/2013 respectively. The environmental Permit (Permit No. EP-352/2009/C) was then issued on 5 September 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:

March 2014:

Land Viaduct (P81 to Eastern Abutment at SHT) and Preparation Works

(a) All land piling machines are carrying out piling works in Portion A and P114R due to pending the completion of diversion of existing drainage & watermain in Portion C.

(b) Piling works for P84 are in progress.

(c) Pile P114R completed.

(d) Predrilling at P108L carried out in this reporting period.

(e) 40 pours for column were completed with 9 pours in this reporting period, 12 columns completed to top level (3 gridlines).

(f) Rebar threading for coupler continues in Portion C.

(g) Carriageway diversion at P82 & P83 is in progress.

(h) Airport Authority (AA)'s permit for formations of piling platform at P82 & P83 is still pending for approval.

(i) Trees maintenance works are on-going.

(j) Drainage diversion works completed and remaining backfilling of abandoned pipe to be completed.

(k) Water main diversion completed and remaining backfilling of abandoned pipe to be completed.

(l) Sheet piles for pile cap construction at P111-L&R will be removed after completion of column construction.

(m) Portal P109 was concreted on 26 March 2014 and Portal P110 steel fixing and tendon ducts are in progress.

(n) Portal P112 falsework erection is in progress.

Marine Viaduct (P0 to P84)

RCD Method:

(a) Construction of temporary jetty for piling works atP68 is in progress.

(b) Piling jackets were installed at P27, P29, P58R & P77L.

(c) Piling jackets were dismantled at P14R, P56L, P57L & P61.

(d) Pile excavations and casing installation are in progress at P28, P58, P59, P61, P64, P70, P72 & P77 with 27 piles concreted in the reporting period.

(e) Inter-face coring tests were carried out at P51, P52 & P56.

(f) Full depth coring tests was carried out at P50.

(g) Sonic tests were carried out at P51, P52, P56, P57 & P59.

(h) Grouting works were carried out at P50, P51 & P56.

Kelly Method:

(i) Installation of temporary piles were carried out atP4, P29, P30, P31 & P32.

(j) Installation of platforms were carried out at P17, P30, P31 & P33.

(k) Installation of permanent casing were carried out at P16, P17, P30, P33 & P34.

(l) Piling platform removal and temporary pile extraction were carried out at P19, P35 & P36.

(m) Pile excavation by Kelly method are in progress at P17, P18, P34, P35, P36, & P41 with 18 piles concreted in the reporting period.

(n) Inter-face core test were carried out at P19, P34, P35, P36 & P38.

(o) Full depth coring tests for P42-R1 are in progress.

(p) Sonic tests were carried out at P20, P39, P40, P42, P45 & P78.

Pilecap Construction:

(a) 4 nos. precast cap shells were installed at P43 andP44.

(b) Waterproofing and stage 1 reinforced concrete works were carried out at P46, P48, P43 & P44.

(c) Stage 1 concreting was completed at P46, P48.

(d) Stage 2 reinforced concrete works were carried out at P47 & P48.

(e) Stage 2 concreting was completed at P47.

(f) Kingpost installation for precast cap and associated steel welding works were carried out at P20, P65, P44.

(g) Concrete trimming and advanced trimming (inside casing) works were carried out at P20, P44, P43, P49, P46, P65, P40, P66 and P45.

(h) Works with cofferdam:

- Driving of sheet piling and drilling for shear pin were completed at P71L.

- Driving of sheet piling were completed and drilling for shear pin is in progress at P71R.

- Driving of sheet piling at P73 is in progress.

Column Construction

(a) P0-L&R columns were cast on 4 March 2014.
(b) P47 steel fixing was completed and formwork installation commenced.

Deck Erection

(a) Preparatory works for erection equipment are underway:

- Lifting Frame LF2-1 fabrication continues in Dongguan.

- Modification for P109 Loading gantry continues at Portion C.

Precast Segment

(a) Progress of the precast concrete segment casting yard:

- Test and commissioning of the two load-out jetties are completed.

- All gantries, in total of 18 nos., were erected, tested and commissioned.

- Mould assembly for 1 no. Type B, 10 nos. Type A (including 2 no. SOP's), 2 nos. Type D, 4 nos. Type E, 2 no. Type CH2, 1 no. Type CH3 and 1 no. of CP (long span field segments and SOP) were assembled. Other Type CH and Type CP mould fabrication continues at the casting yard.

- Rebar jigs fabrication and installation continues with 29 of 30 nos. (6 in Line No. 1, 17 in Line No. 2, and 6 in Line No. 6) completed.

- Rebar and PT material delivery continues.

- A total of 84 segments were cast in this reporting period and up to end of the reporting period total 275 segments cast.

Precast Concrete Shell Casting

(a) 4 nos. CP1 (cumulative 16 nos.) precast shells and 1 no. CP4 (cumulative 2 nos.) precast shell were cast in the reporting period.

April 2014:

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

(a) Drainage and water main diversion in Portion C was completed, backfilling to the abandon pipes in progress;Piling works for P84 are in progress.

(b) CLKSR narrowing was completed.

(c) One set of piling machine has been mobilized back to Portion C to start the piling of P108R. Remaining land piling machines are carrying out piling works in Portion A.

(d) Pile excavations and casing installation are in progress at P84, P85, P86, P87, P88 & P89 with 6 piles concreted in the reporting period.

(e) 49 pours for column were completed with 7 pours in this reporting period, 16 columns completed to top level (6 gridlines - P105, P109 to P113).

(f) Construction of the temporary carriageway for diversion at P82 & P83 is in progress.

(g) Airport Authority (AA)'s permit for formations of piling platform at P82 & P83 received and works are in progress.

(h) Sheet piles for pile cap construction at P111-L&R removed and area backfilled for portal scaffolding erection.

(i) Temporary drainage diversion for the 700mm U-channel near P114R was installed.

(j) Portal P110 was concreted on 8 April 2014.

(k) Portal P112 falsework erection was completed and formwork erection is in progress.

(l) Portal P105 steel bracket system was erected on 4, 10 to 12 April 2014. Falsework erection on steel bracket support is in progress.

(m) Portal P111 blinding slab was cast and erection of falsework is in progress.

(n) Dismantling of formwork and the falsework system for Portal P109 is in progress.

Marine Viaduct (P0 to P84)

RCD Method:

(a) Construction of temporary platform for piling works at P68 is in progress.

(b) Piling jackets were installed at P13, P27, P29, P58L, P60 &P76L.

(c) Piling jackets were dismantled at P58R, P59 & P72.

(d) Pile excavations and casing installation are in progress at P27, P28, P29, P58, P60, P64, P69, P70, P72 & P77 with 33 piles concreted in the reporting period.

(e) Inter-face coring tests were carried out at P52, P53 & P72.

(f) No full depth coring tests was carried in this reporting period.

(g) Sonic tests were carried out at P52, P56 & P72.

(h) Grouting works were carried out at P51 & P52.

Kelly Method:

(i) Installation of temporary piles were carried out at P4, P21 & P31.

(j) Installation of platforms were carried out at P4, P30 & P31.

(k) Installation of permanent casing were carried out at P4, P16, P30 & P31.

(l) Piling platform removal and temporary pile extraction were carried out at P19, P20, P35, P36, P39 & P42.

(m) Pile excavation by Kelly method are in progress at P17, P18, P33, P34 & P41 with 23 piles concreted in the reporting period.

(n) Inter-face core test were carried out at P19, P35 & P41.

(o) Full depth coring test for P19-L3 was completed.

(p) Sonic tests were carried out at P19, P20, P38, & P41.

Pilecap Construction:

(a) No precast cap shell was installed in this reporting period.

(b) Stage 1 reinforced concrete and waterproofing works were carried out and completed at P43 & P44.

(c) Stage 2 concreting was completed at P46 & P48.

(d) Kingpost installation and associated steel welding works for precast shell installation are in progress at P20, P40, P44 & P49.

(e) Concrete trimming and advanced trimming (inside casing) works were carried out at P38, P39, P40, P42, P43, P45, P49, P50, P51, P65 & P66.

(f) Works with cofferdam.

- P71L: Installation of waling strut at 1st layer was completed and installation of waling strut at 2nd layer is in progress; Drilling for shear pin is in progress.

- P73: Driving of sheet piling was completed and installation of access platform is in progress.

Column Construction

(a) P47 L&R: 1st lift columns were cast in this reporting period.
(b) Column insert installation, mobilization and temporary works at P47, P48 & P46 are in progress.
(c) 1st lift construction: P46, P47 & P48.
(d) 2nd lift construction: P47.
(e) 3rd lift construction (Pier Head): Nil

Deck Erection

(a) Preparatory works for segment erection:

- Lifting Frame LF2-1 fabrication continues in Dongguan.

- Modification work to the Segment Unloading Frame continues at Portion C.

- Construction of the footing for the Segment Unloading Frame at the Southeast Quay commenced.

- Delivery and assembly of LG2 commenced at RTT.

Precast Segment

(a) Progress of the precast concrete segment casting yard:

- Mould assembly for 1 no. Type B, 10 nos. Type A (including 2 no. SOP's), 2 nos. Type D, 4 nos. Type E, 2 no. Type CH2, 1 no. Type CH3 and 1 no. of CP (long span field segments and SOP) were assembled. Other Type CH and Type CP mould fabrication continues at the casting yard.

- Rebar jigs fabrication and installation continues with 29 of 30 nos. (6 in Line No. 1, 17 in Line No. 2, and 6 in Line No. 6 completed).

- A total of 118 segments were cast in this reporting period and up to end of the reporting period total 395 segments cast.

Precast Concrete Shell Casting

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

Type of Shell	Number of Precast Shell Cast in this reporting period	Cumulative No. of Precast Shell Completed (up to 28th of each month)
CP1	6	22
CP2	1	1
CP4	1	2

May 2014:

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

(a) Drainage and water main diversion and backfill in Portion C was completed.

(b) Last three piles at P106L, P107L & P108R in Portion C were completed.

(c) Pile construction is in progress at grid line P84 and P90. 8 piles concreted in this reporting period.

(d) Total 57 pours for column were completed with 8 pours in this reporting period; 21 columns was completed to top level (12 gridlines – P103 to P105, P109 to P113 + P106L, P107L & L108R).

(e) Construction of the temporary carriageway for road diversion at P82 & P83 is in progress.

(f) Piling platform erection at P83 in progress.

(g) Piling platform erection at P90 was completed and platform at P91 is in progress.

(h) Portal P111 side formwork erection is in progress.

(i) Portal P113 falsework erection was completed; soffit formwork is in progress.

(j) Portal P105 formwork erection and bearing installation was completed; steel fixing is in progress.

(k) Portal P112 was concreted on 24 May 2014.

(l) Dismantling of falsework system for Portal P110 is in progress.

Marine Viaduct (P0 to P84)

RCD Method:

(a) Construction of temporary platform for piling works at P68 is in progress.

(b) Piling jackets were installed at P13, P15, P24, P25, P26 & P79.

(c) Piling jackets were dismantled at P27, P58, P60, P64, P76 & P77.

(d) Pile excavations and casing installation are in progress at P13, P15, P24, P26, P29, P58, P60, P69, P76 & P77 with 16 nos. piles concreted in the reporting period.

(e) Inter-face coring tests were carried out at P14, P53, P55, P70, P72 & P77.

(f) Full depth coring tests was carried at P53, P54 & P56.

(g) Sonic tests were carried out at P53, P54, P55, P70, P72 & P77.

(h) Grouting works were carried out at P52, P70 & P72.

Kelly Method:

(i) Installation of temporary piles were carried out at P11, P12 & P21.

(j) Installation of platforms were carried out at P11 & P21.

(k) Installation of permanent casing were carried out at P4 & P21.

(l) Piling platform removal and temporary pile extraction were carried out at P18, P35, P39, P41 & P42.

(m) Pile excavation by Kelly method are in progress at P4, P16, P17 & P33 with 4 piles concreted in the reporting period.

(n) Inter-face core test were carried out at P18 & P34.

(o) No Full depth coring test was conducted in this reporting period.

(p) Sonic tests were carried out at P19, P34, P35, P36 & P37.

Pilecap Construction:

(a) 8 precast cap shells were installed at P40, P45, P42 & P49.

(b) No Stage 1 concreting was done in this reporting period.

(c) Stage 1 rebar fixing has commenced at P40.

(d) Stage 2 concreting was completed at P44.

(e) Stage 2 re-bar fixing at P43.

(f) Kingpost installation and associated steel welding works for precast shell installation are in progress at P38, P39, P40, P42, P45, P49, P50 & P51.

(g) Concrete trimming and advanced trimming (inside casing) works were carried out at P19, P20(F1), P37, P38, P39, P40, P41, P42, P45, P49, P50 & P51.

(h) Works with cofferdam:

- P71L: Installation of waling strut at 2nd layer was completed and excavation is in progress.
- P71R: Installation of shear pin (84 nos.) was completed. Installation of waling strut at 1st layer is in progress.
- P72R: Installation of temporary working platform was completed. Installation of sheet-pile is in progress
- P73L: Driving of sheet piling was completed and installation of access platform is in progress. Installation of waling strut at 2nd layer is in progress
- P73R: Installation of shear pin (38 nos.) was completed. Temporary working platform shall be removed

Column Construction

(a) P48, P46 L&R: 1st lift columns were cast in this reporting period.
(b) P47 L&R: 2nd lift columns were cast in this reporting period.
(c) Column insert installation, mobilization and temporary works were carried out at P44 & P43.

Deck Erection

(a) Preparatory works for segment erection:

- Lifting Frame fabrication continues in Dongguan.
- Modification works to the Segment Unloading Frame (SUF) continues at Portion C.
- Pouring of the footing for the Segment Unloading Frame at the Southeast Quay was completed.
- Delivery and assembly of Launching Gantry 2 (LG2) continues at River Trade Terminal (RTT).
- Delivery and assembly of Lifting Frames 2 (LF2) commenced at RTT.

Precast Segment

(a) Progress of the precast concrete segment casting yard:

- Mould assembly for 1 no. Type B, 10 nos. Type A (including 2 no. Segments on Pier (SOP)'s), 2 nos. Type D, 4 nos. Type E, 2 no. Type CH2, 2 no. Type CH3, 1 no. CH4 and 1 no. CP (long span SOP) were assembled. Other Type CH and Type CP mould fabrication continues at the casting yard.

- Rebar jigs fabrication and installation with 30 out of 30 nos. completed (6 in Line No. 1, 18 in Line No. 2, and 6 in Line No. 6 completed).

- A total of 129 segments were cast in this reporting period and up to end of the reporting period total 524 segments cast.

Precast Concrete Shell Casting

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

Type of Shell	Number of Precast Shell Cast in this reporting period	Cumulative No. of Precast Shell Completed (up to 28th of each month)
CP1	5	27
CP2	2	3
CP4	0	2

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	--

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)

Event and Action Plan

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

Implementation Status of Environmental Mitigation Measures

3.6 Relevant mitigation measures as recommended in the EIA report have been stipulated in the EM&A Manual for the Contractor to implement. The implementation status of environmental mitigation measures (EMIS) is given in **Appendix H**.

3.7 Regular marine travel route for marine vessels were implemented properly in accordance with the submitted plan and relevant records were kept properly.

3.8 Acoustic decoupling measures for the stationary equipment (generators, winch generators and air compressors) mounted on boards were adopted according to the submitted Acoustic Decoupling Measures Plan.

3.9 Dolphin exclusion zone and dolphin watching plan according to EM&A Manual, Section 10.2.12 and EP Condition 3.5 was implemented by DCVJV's trained dolphin watcher.

3.10 Spill kits and booms are ready on site for the event of accidental spillage of oil or other hazardous chemicals from construction activities including vessels operating for the Contract.

Site Audit Summary

3.11 Site audits were carried out by ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Contract site. The observations and recommendations made during the reporting period are summarized in **Appendix I**.

3.12 According to EP condition 4.7 and EM&A Manual, periodic monitoring (every three months) of construction works shall be conducted to ensure the avoidance of any impacts on Sha Lo Wan (West) Archaeological Site. Access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment is not allowed. One inspection to the Sha Lo Wan (West) Archaeological Site was conducted in the reporting period (21st March 2014). 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		
March 2014	AMS1	46	17 - 79	381	500
	AMS4	38	19 - 82	352	
April 2014	AMS1	46	18 - 114	381	
	AMS4	39	18 - 66	352	
May 2014	AMS1	32	14 - 89	381	
	AMS4	27	14 - 104	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		
March 2014	AMS1	71	30 - 118	170	260
	AMS4	68	29 - 103	171	
April 2014	AMS1	39	18 - 62	170	
	AMS4	44	21 - 60	171	
May 2014	AMS1	22	13 - 35	170	
	AMS4	29	10 - 65	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	1) Exhaust from marine traffic 2) Other construction site nearby
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	
March 2014	NMS1	72	69 – 74	75 dB(A)
	NMS4	63	61 – 65	
April 2014	NMS1	72	71 – 72	
	NMS4	61	59 – 62	
May 2014	NMS1	71	65 – 74	
	NMS4	61	59 – 63	

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 March to May 2014, 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 192.12 km of survey effort was collected, with 82.2% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). The total survey effort conducted on primary lines was 127.56 km, while the effort on secondary lines was 64.56 km.

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

4.10 During the six sets of monitoring surveys in March to May 2014, a total of 25 groups of 120 Chinese White Dolphins were sighted. All sightings were made during on-effort search. Seventeen on-effort sightings were made on primary lines, while another eight on-effort sightings were made on secondary lines. Summary table of the dolphin sightings is shown in **Appendix II of Appendix F**.

Distribution

4.11 Distribution of dolphin sightings made during monitoring surveys in March to May 2014 is shown in **Figure 1 of Appendix F**. The dolphin groups were evenly distributed throughout the WL survey area, with higher concentrations between Kai Kung Shan and Fan Lau. The only areas where dolphins were rarely sighted included the northern end of the survey area. (i.e. near and to the north of HKLR09 alignment)

4.12 Sighting distribution of dolphins in the present quarter was quite different from the one during the baseline period, with fewer dolphins being sighted in the northern portion of the survey area between the bridge alignment and Kai Kung Shan in the present impact monitoring quarter

4.13 Notably, only one sighting was made along the HKLR09 alignment in WL survey area during the present quarter (**Figure 1 of Appendix F)**. There appeared to be a general shift in dolphin distribution further south of the WL survey area in the present quarter, and they rarely occurred at the juncture between NWL and WL survey areas. (**Figure 2 of Appendix F)**

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 March to May 2014 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 in the present three-month study period was slightly lower in ER (STG) (STG) but slightly higher in ER (ANI) 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 were more or less than same when compared to the baseline phase.

Table 4.6 Dolphin encounter rates (sightings per 100 km of survey effort) during the impact monitoring period (March – May 2014)

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 (March 12, 2014)	14.8	84.0
	Set 2 (March 26, 2014)	28.4	132.8
	Set 3 (April 15, 2014)	23.4	58.6
	Set 4 (April 23, 2014)	0.0	0.0
	Set 5 (May 7, 2014)	9.2	32.3
	Set 6 (May 20, 2014)	10.5	83.8

Table 4.7 Comparison of average dolphin encounter rates from impact monitoring period (March – May 2014) 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)	
	March-May 2014	September-November 2011	March-May 2014	September-November 2011
West Lantau	14.40 ± 10.28	16.43 ± 7.70	65.23 ± 46.13	60.50 ± 38.47

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 (fifth quarter of the impact phase), the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.706 and 0.873 respectively. Therefore, no significant difference in dolphin encounter rate was detected between the baseline period and the present quarter.

4.17 Another comparison was made between the baseline period and the cumulative quarters in the impact phase (i.e. first four quarters of the impact phase), and the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.784 and 0.969 respectively. As a result, no significant difference was found in the dolphin encounter rates between the baseline period and the cumulative quarters in the impact phase.

4.18 To facilitate the comparison with the AFCD long-term monitoring results, the encounter rates were also calculated for the present quarter (March to May 2014) using both primary and secondary survey effort. The encounter rates of sightings (STG) and dolphins (ANI) in WL were 15.2 sightings and 70.9 dolphins per 100 km of survey effort respectively.

Group size

4.19 Group size of Chinese White Dolphins ranged from 1-13 individuals per group in WL survey area between March to May 2014. 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 March to May 2014 was higher than the ones recorded in the 3-month baseline period (**Table 4.8**). About half of the dolphin groups were composed of 1-2 dolphins, but there were also 11 groups with more than 5 animals per group, and four groups with 10 animals or more per group. One of the larger groups was associated with an operating purse-seiner.

Table 4.8 Comparison of average dolphin group sizes from impact monitoring period (March – May 2014) and baseline monitoring period (September-November 2011)

	Average Dolphin Group Size	
	March to May 2014	**September – November 2011**
West Lantau	4.80 ± 4.08 (n = 25)	3.63 ± 2.97 (n = 46)

4.20 Distribution of dolphins with these 11 larger groups during March to May 2014 is shown in **Figure 3 of Appendix F**. These groups were evenly distributed between Tai O Peninsula and Fan Lau, but were generally far away from the HKLR09 alignment.

Habitat use

4.21 From March to May 2014, the most heavily utilized habitats by the dolphins mainly concentrated near Tai O Peninsula, Kai Kung Shan, Peaked Hill and Fan Lau (**Figures 4a and 4b of Appendix F**). 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.

4.22 When compared with the habitat use pattern recorded during the baseline period, it appears that dolphin densities were lower between the HKLR09 alignment and Tai O Peninsula during the present impact phase monitoring period (**Figure 5 of Appendix F**).

Mother-calf pairs

4.23 During the three-month impact phase monitoring period, two unspotted calves and seven unspotted juveniles (UJ) were sighted in WL survey area. These young calves comprised 7.5% of all animals sighted, which was slightly higher than the percentage recorded during the baseline monitoring period (6.6%).

4.24 The occurrence of these young calves were scattered between the bridge alignment and Peaked Hill, which was in stark contrast to the baseline period when calf occurrence was more frequent near Tai O Peninsula (**Figure 6 of Appendix F**).

Activities and associations with fishing boats

4.25 A total of two dolphin sightings were associated with feeding activities near Fan Lau (**Figure 7 of Appendix F)**, comprising of 8% of the total number of dolphin sightings. This percentage was much lower than the percentage recorded during the baseline period (13.0%). Only one of the 25 sightings was associated with socializing activity near the artificial island in Chinese waters (**Figure 7 of Appendix F)**.

4.26 Although traveling activities were rarely observed during the baseline period and previous impact monitoring periods, three sightings of this type of activities were recorded during the present 3-mont period, which were located near Peaked Hill and Kai Kung Shan (**Figure 7 of Appendix F**). One sighting of dolphins engaged in milling/resting was also recorded near Peaked Hill (**Figure 7 of Appendix F**).

4.27 During the three-month period, only one dolphin group was associated with an operating purse-seiner.

Summary of photo-identification works

4.28 From March to May 2014, over 2,500 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.

4.29 In total, 55 individuals sighted 74 times altogether were identified (see summary table in **Appendix III of Appendix F** and photographs of identified individuals in **Appendix IV of Appendix F**. The majority of identified individuals were sighted only once or twice during the three-month period, but three individuals (CH108, WL62 and WL86) were sighted thrice.

4.30 During the three-month period, ten recognizable females, including CH105, NL33, NL98, NL264, NL304, WL28, WL86, WL98, WL118 and WL224, were sighted to be accompanied with their calf during her re-sighting. Notably, NL33, NL98 and NL264 spent most of their time in North Lantau waters in the past.

Individual range use

4.31 Ranging patterns of the 55 individuals identified during the three-month study period

were determined by fixed kernel method, and are shown in **Appendix V of Appendix F**.

4.32 Among these 55 individuals, eight of them (NL33, NL98, NL182, NL264, NL288, NL295, WL04 and WL05) occurred primarily in North Lantau and ventured into West Lantau during the three-month period, while five other individuals (NL156, NL304, WL15, WL46 and WL179) split their time between North and West Lantau waters. The other 42 individuals centered their range use in West Lantau waters. (**Appendix V of Appendix F)**

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.

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

Additional Land-based Dolphin Behaviour and Movement Monitoring

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

Table 4.9 Progress Record of Additional Land-based Dolphin Behaviour and Movement Monitoring (March to May 2014)

Date	Time	Weather		Number of Staff	Number of Dolphin Sighting
		Beaufort	Visibility		
14/03/2014	09:30 – 15:04	2 – 3	2.5	3	2
19/03/2014	09:16 – 14:30	1	2.5 - 3	3	4
16/4/2014	09:05 - 14:49	2-3	2.5-3	3	2
25/4/2014	09:08 - 14:47	2-4	2	3	0
19/5/2014	09:43 - 15:07	2-4	1	3	2
27/5/2014	09:04 - 14:32	1-3	1.5-2.5	3	1

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

Advice on the Solid and Liquid Waste Management Status

4.37 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.

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

5 ENVIRONMENTAL NON-CONFORMANCE (EXCEEDANCES)

Summary of Exceedances

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

Air Quality

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

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

Noise

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

Water Quality

5.5 There are 24 Action Level exceedances and 6 Limit Level exceedances were recorded for suspended solids. 6 Action Level exceedance and 1 Limit Level exceedances for turbidity were recorded in the reporting period.

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

1) No pollution discharge was observed from the site;
2) Sediment plume due to natural fluctuation of shallow water and movement of vessel in the monitoring area; and
3) The exceeded results were similar or within the ranges baseline monitoring results.

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 Six environmental related complaints were 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-2014-03-001	Near Sha Lo Wan	5 March 2014	Chemical / Waste Management
Com-2014-03-002	In the vicinity of the waters outside Sha Lo Wan	11 March 2014	Noise
Com-2014-04-001	Construction marine works by the company Bauer Hong Kong in Tung Chung	14 April 2014	Ecology
Com-2014-05-001	At the shore of Sha Lo Wan	13 May 2014	Ecology
Com-2014-05-002	At the shore of Sha Lo Wan	27 May 2014	Ecology
Com-2014-05-003	Pier 39 to 50	29 May 2014	Water Quality and Waste Management

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 March and May 2014 in accordance with EM&A Manual.

6.2 No Action/Limit Level exceedance was recorded for noise.

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

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

6.5 For water quality monitoring, there are 24 Action Level exceedances and 6 Limit Level exceedances were recorded for suspended solids. 6 Action Level exceedance and 1 Limit Level exceedances for turbidity were recorded in the reporting period.

6.6 According to the investigation, all exceedances are considered not due to the Contract.

6.7 During this quarter of dolphin monitoring, no adverse impact from the activities of the HKLR09 construction project on Chinese White Dolphins was noticeable from general observations.

6.8 Environmental site inspection was conducted on 5th, 11th, 18th and 28th March 2014, 4th, 8th, 15th, 25th and 29th April 2014, 7th, 13th, 20th and 30th May 2014 by ET in the reporting month. All deficiencies identified during the site inspection have already rectified / improved during the follow-up audit session.

6.9 The inspection to the Sha Lo Wan (West) Archaeological Site was conducted on 21st March 2014. No access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment was observed.

6.10 There were six environmental complaints, no notification of summons and successful prosecution received in the reporting period.

6.11 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

6.12 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.

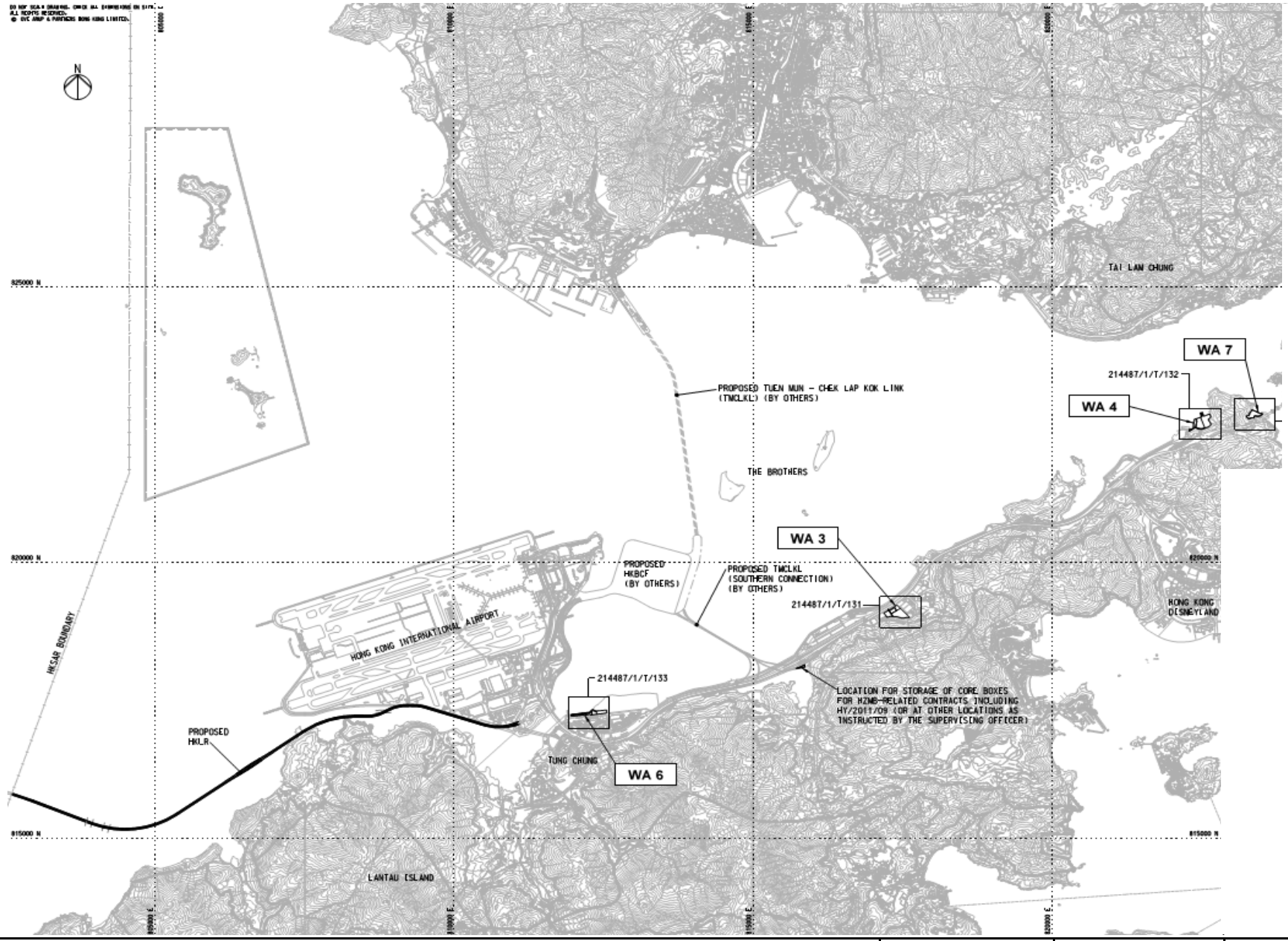
Ecology Impact

- 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

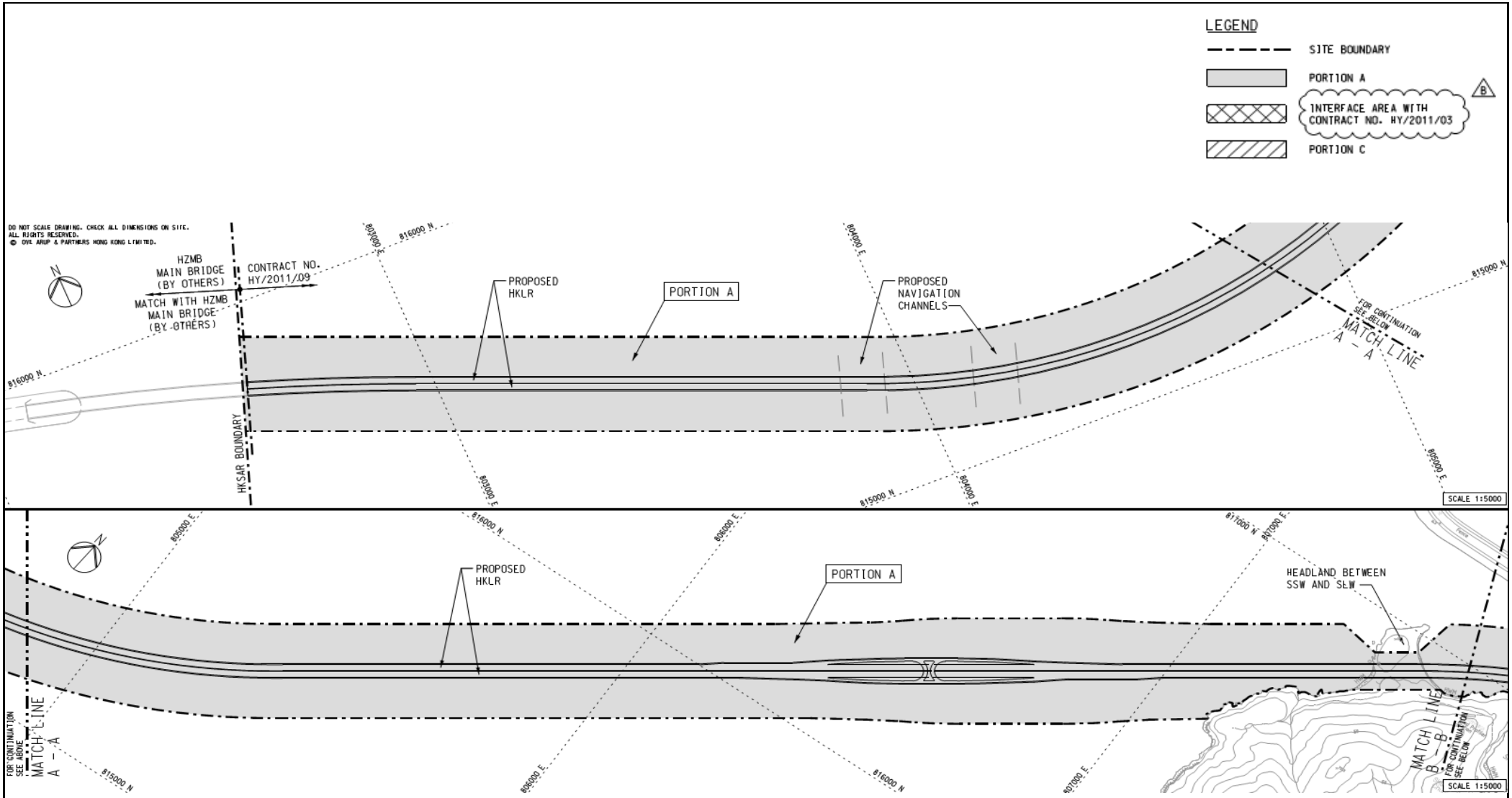
- To check for any accumulation of waste materials or rubbish on site.
- To ensure the performance of sorting of C&D materials at source (during generation);
- To carry out inspection of dump truck at site exit to ensure inert and non-inert C&D materials are properly segregated before removing off site.
- 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)



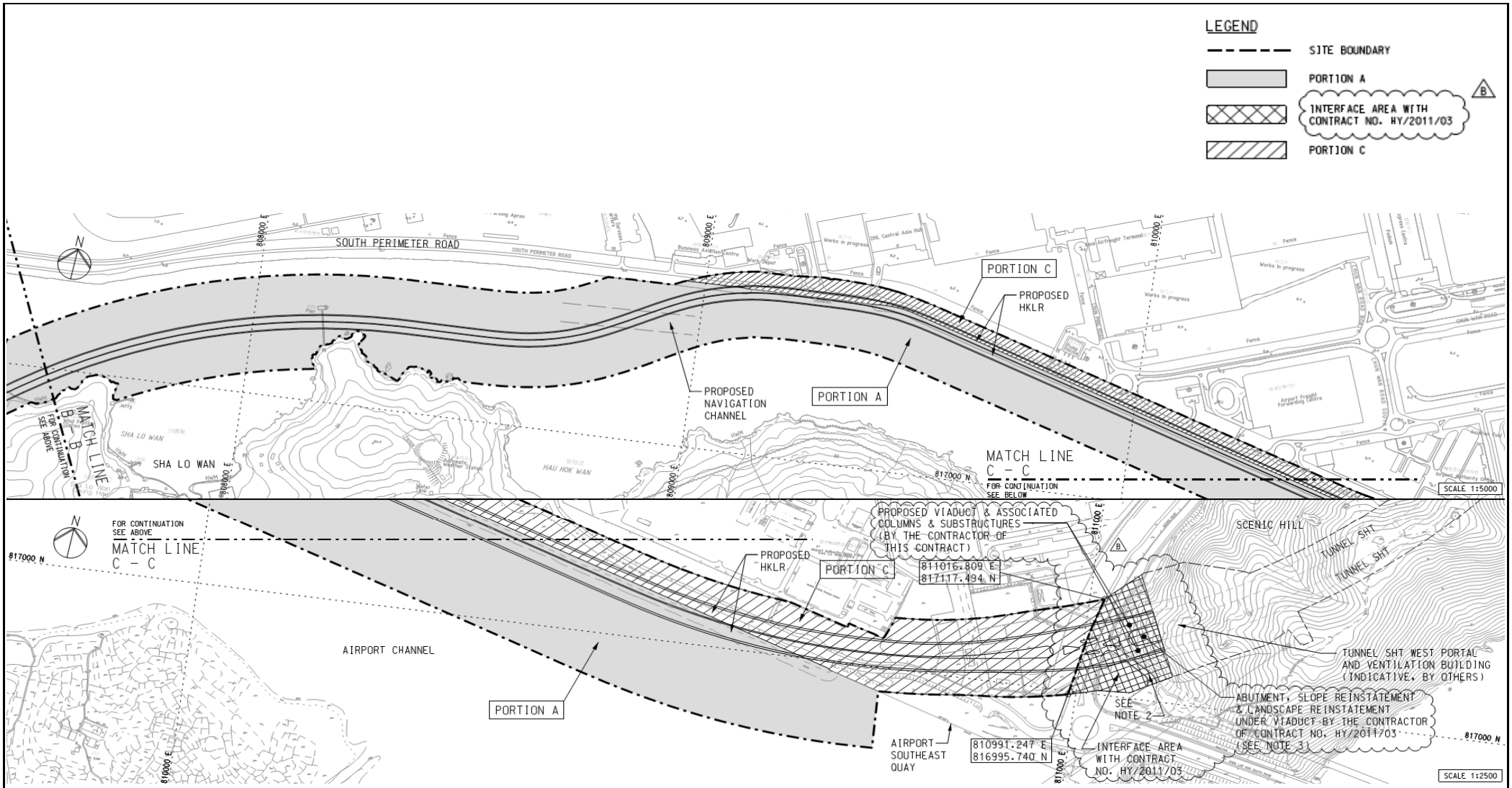
Title		Scale	Proposa
Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill		N.T.S	No. MA12014
Site Layout Plan (WA3, WA4, WA6 and WA7)		Date Feb-13	Figure 1a

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

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 and C)	Scale N.T.S Date May-13	Proposa No. MA12014 Figure 1c

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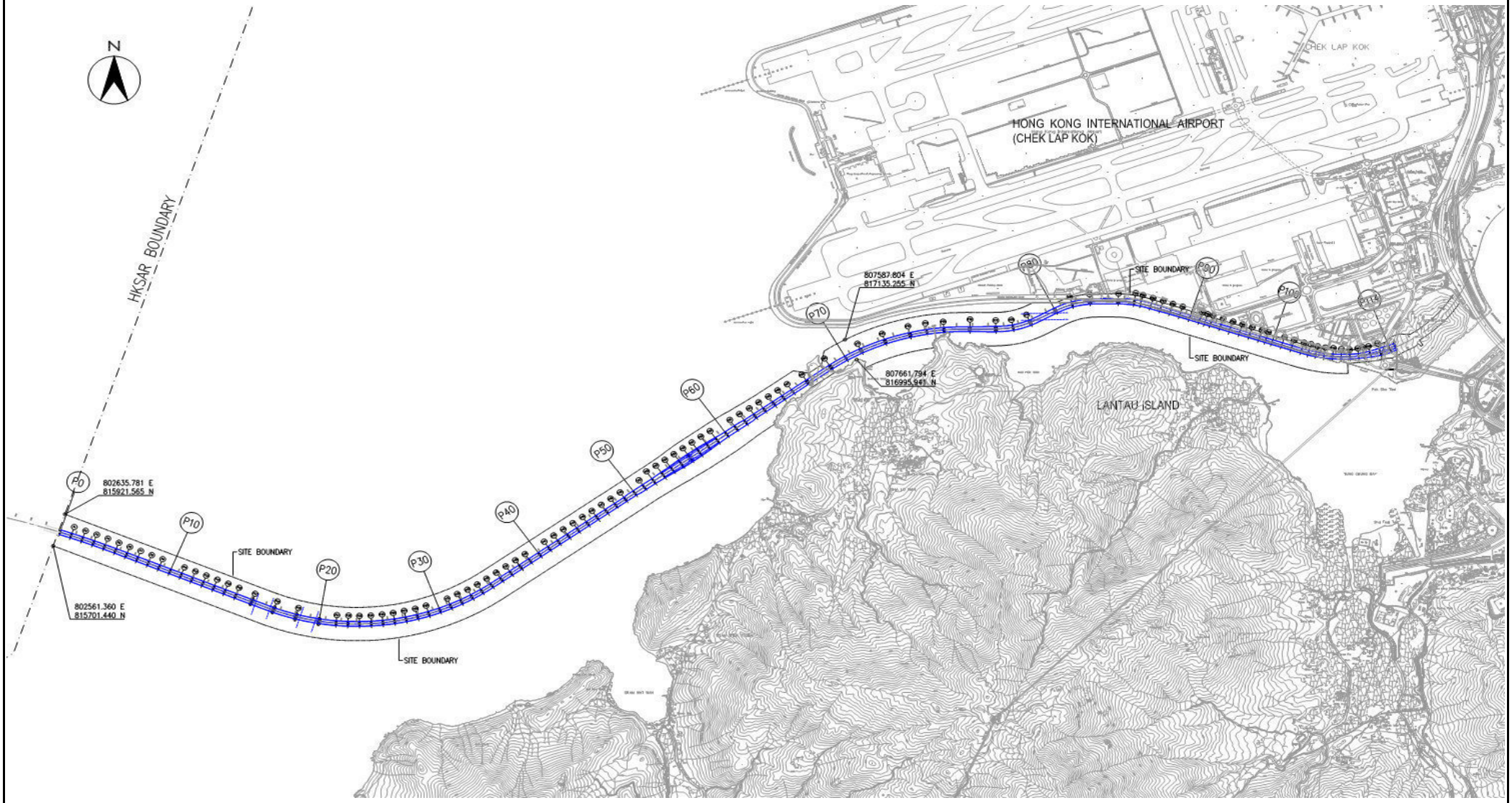

Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Site Layout Plan (Pier(s) Site)	Scale: N.T.S Date: Feb-13	Proposa No. MA12014 Figure: 1d

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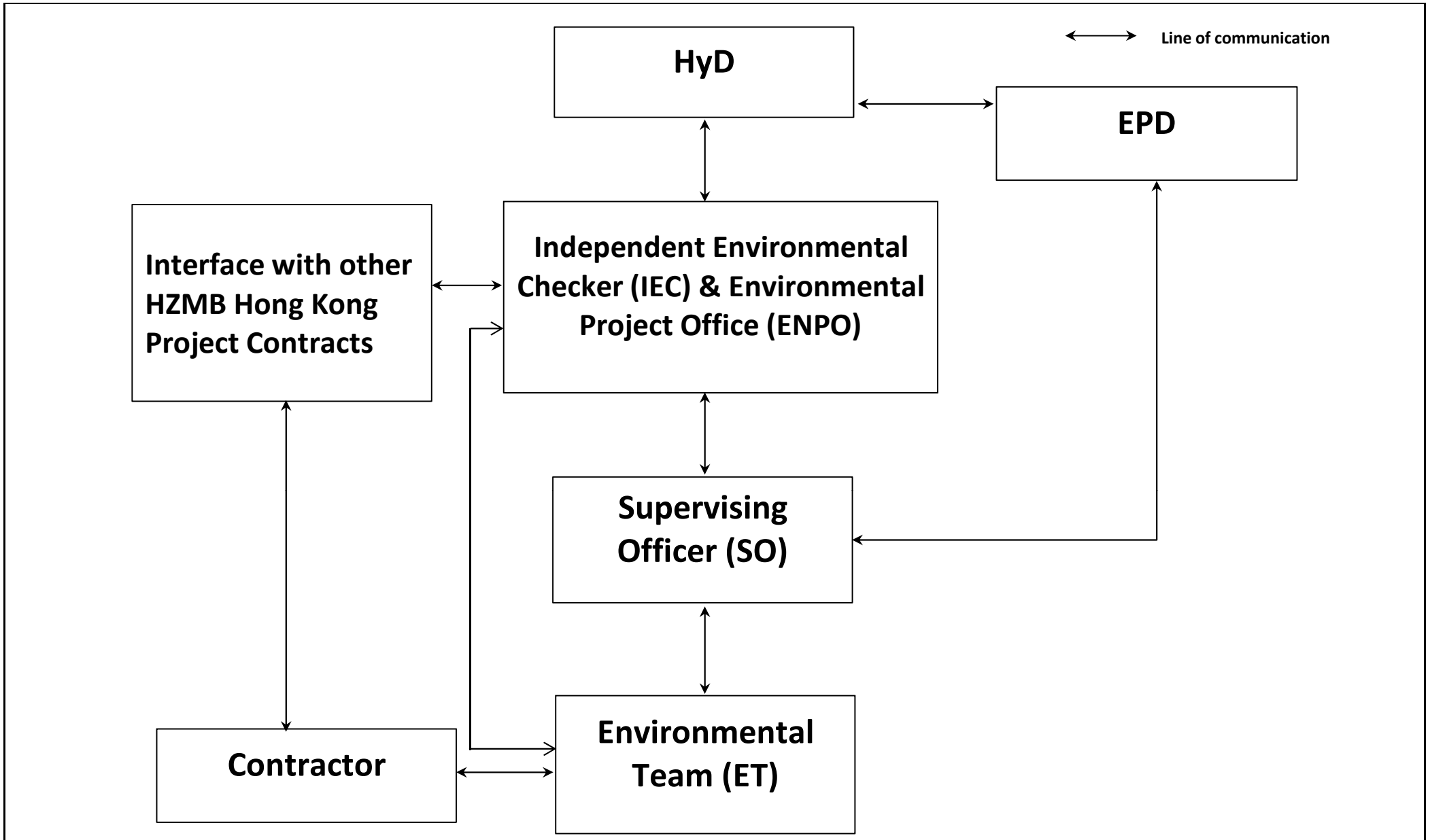
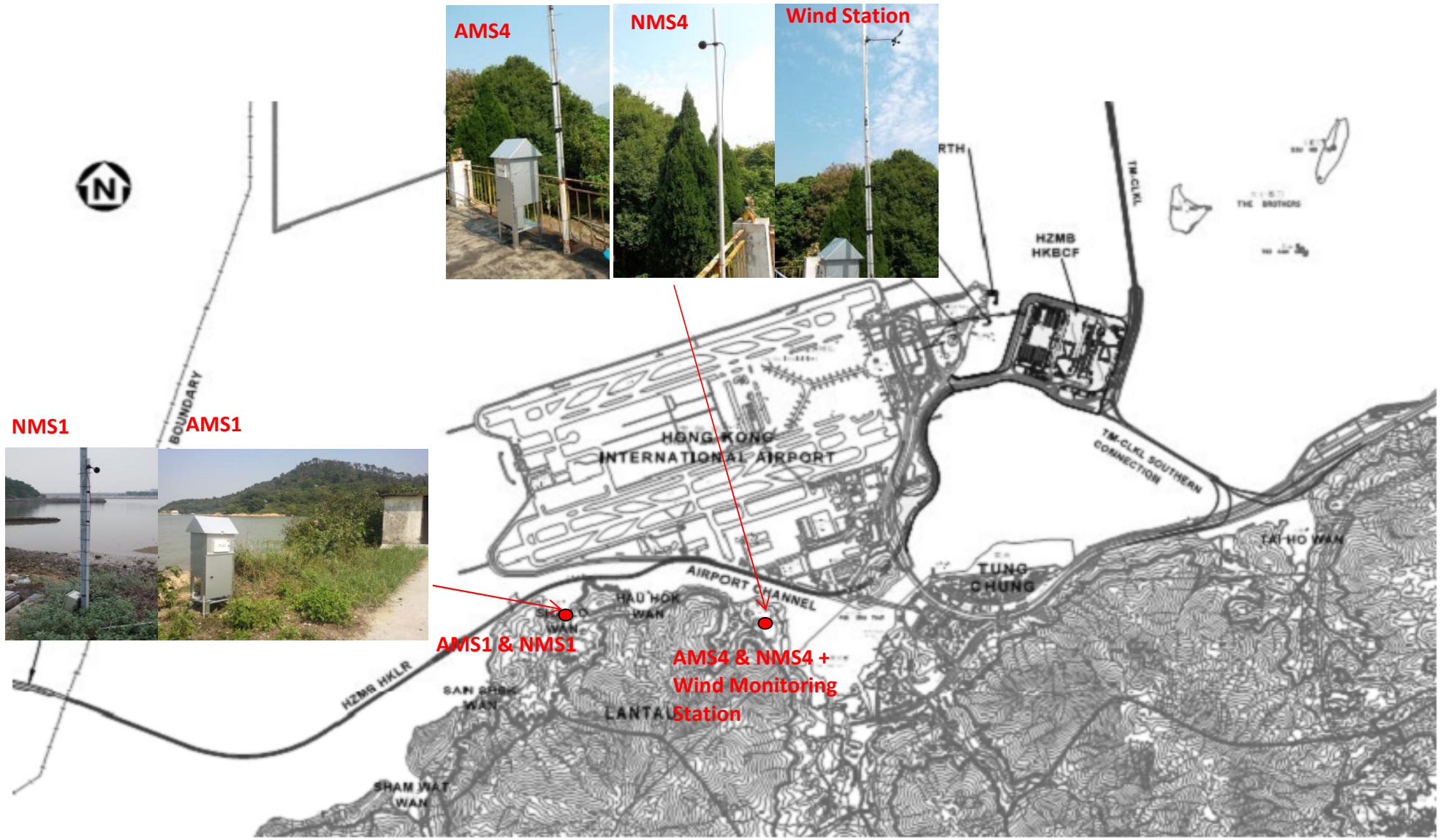
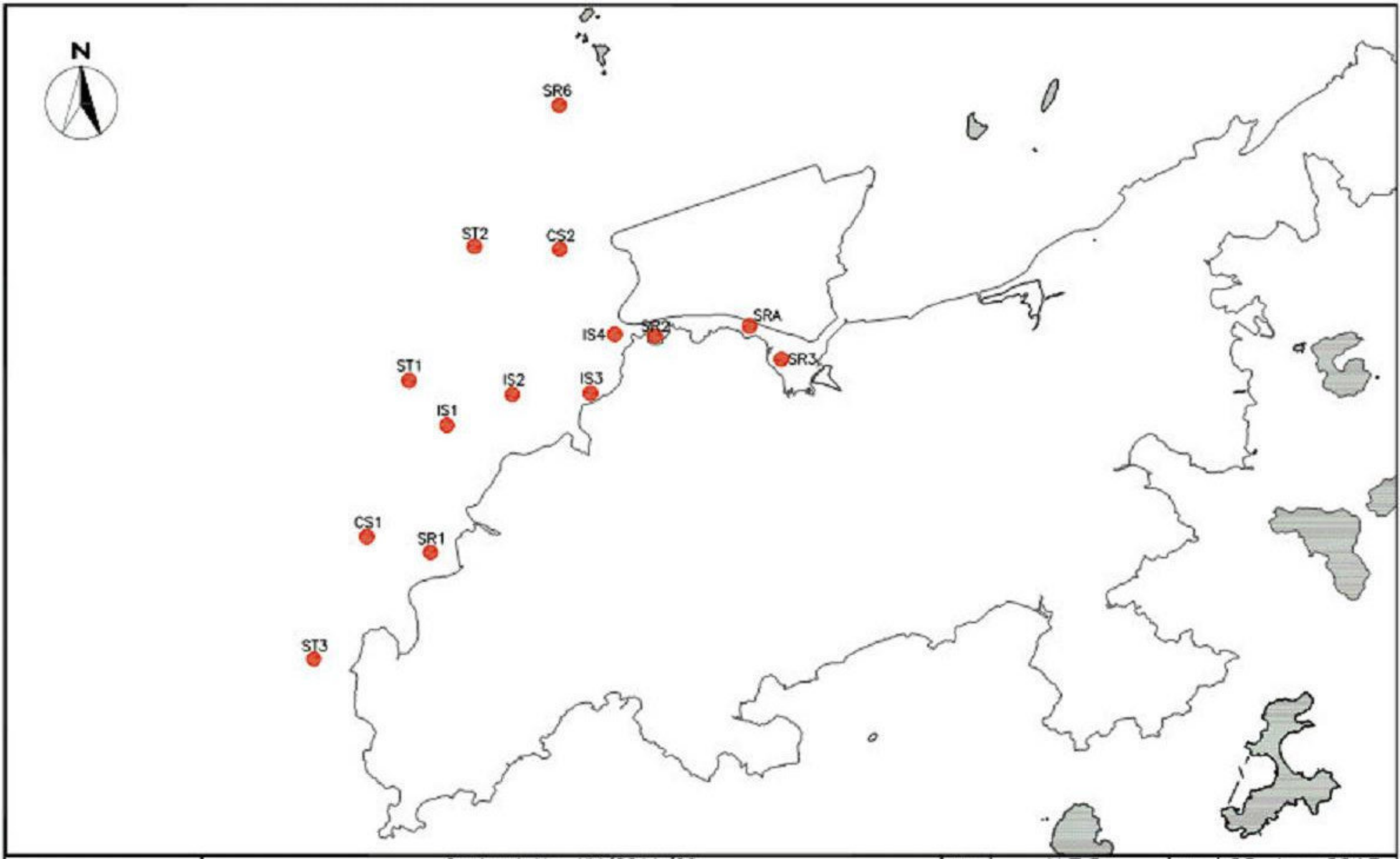


Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Project Organisation for Environmental Works	Scale N.T.S Date Feb-13	Proposa No. MA12014 Figure 2	CINOTECH



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	Proposal No.: MA12014 Figure: 3

CINOTECH



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Cinotech Consultants Limited

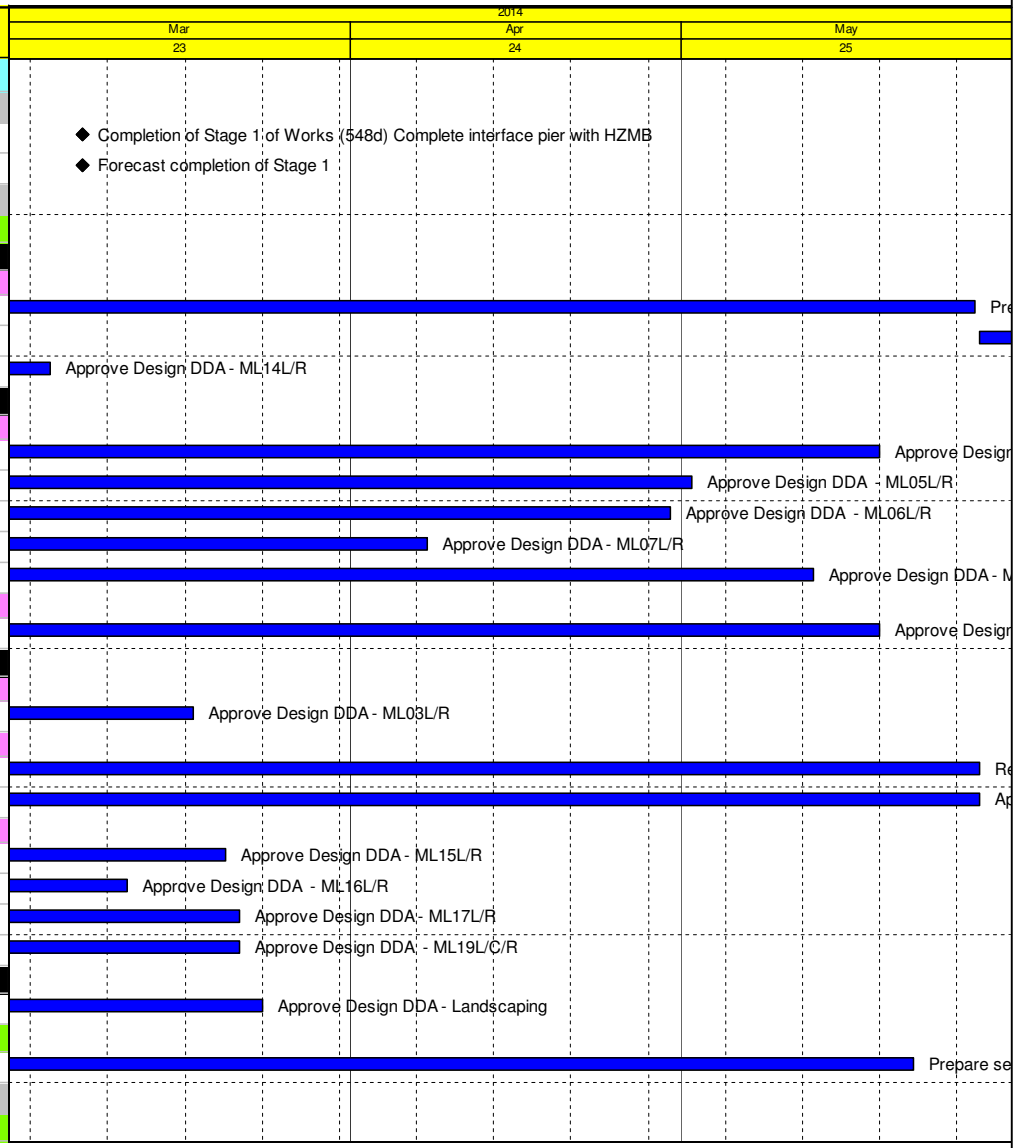
Contract No. HY/2011/09
Hong Kong–Zhuhai–Macao Bridge Hong Kong Link Road – Section Between HKSAR Boundary and Scenic Hill
Locations of Marine Water Quality Monitoring Stations

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

APPENDIX A
CONSTRUCTION PROGRAMME

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

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
HKZB Hong Kong Link Road - 3 Months Rolling Programme 1406 (Based on DWP_01b)					
Project Key Dates					
KD1007	Completion of Stage 1 of Works (548d) Complete interface	0	0		07/03/14 A
KD1010	Forecast completion of Stage 1	0	0		07/03/14 A
Design and Design Checking of the Works					
Detailed Design Approval (DDA)					
Foundation					
Airport Channel					
DDA12.01-50	Prepare and re-submit Design DDA - ML12L/R P75	45	0	23/08/13 A	27/05/14 A
DDA12.01-80	Approve Design DDA - ML12L/R P75	35	3	28/05/14 A	01/07/14
DDA14.01-40	Approve Design DDA - ML14L/R	35	0	24/12/13 A	04/03/14 A
Substructure					
Western Water					
DDA04.02-40	Approve Design DDA - ML04L/R	35	0	25/01/14 A	19/05/14 A
DDA05.02-40	Approve Design DDA - ML05L/R	35	0	15/01/14 A	02/05/14 A
DDA06.02-40	Approve Design DDA - ML06L/R	35	0	16/01/14 A	30/04/14 A
DDA07.02-40	Approve Design DDA - ML07L/R	35	0	12/01/14 A	08/04/14 A
DDA09.02-40	Approve Design DDA - ML09L/R	35	0	15/02/14 A	13/05/14 A
Navigation Channel					
DDA03.02-40	Approve Design DDA - ML03L/R (with Dolphin)	35	0	17/01/14 A	19/05/14 A
Superstructure					
Navigation Channel					
DDA03.03-40	Approve Design DDA - ML03L/R	35	0	15/01/14 A	17/03/14 A
Airport Channel					
DDA14.03-30	Resubmit Design DDA with DC Certificate - ML14L/R	25	0	25/02/14 A	28/05/14 A
DDA14.03-40	Approve Design DDA - ML14L/R	35	0	25/02/14 A	28/05/14 A
Airport Island					
DDA15.03-40	Approve Design DDA - ML15L/R	35	0	25/02/14 A	20/03/14 A
DDA16.03-40	Approve Design DDA - ML16L/R	35	0	25/02/14 A	11/03/14 A
DDA17.03-40	Approve Design DDA - ML17L/R	35	0	25/02/14 A	22/03/14 A
DDA19.03-40	Approve Design DDA - ML19L/C/R	35	0	20/02/14 A	22/03/14 A
Landscaping					
DDALA-40	Approve Design DDA - Landscaping	35	0	29/01/14 A	24/03/14 A
Segment Catalog					
SD1060	Prepare segment catalog for ML07	60	0	23/07/13 A	22/05/14 A
Project General Submission					
Utilities Diversion Schedule					



Remaining Level of Effort
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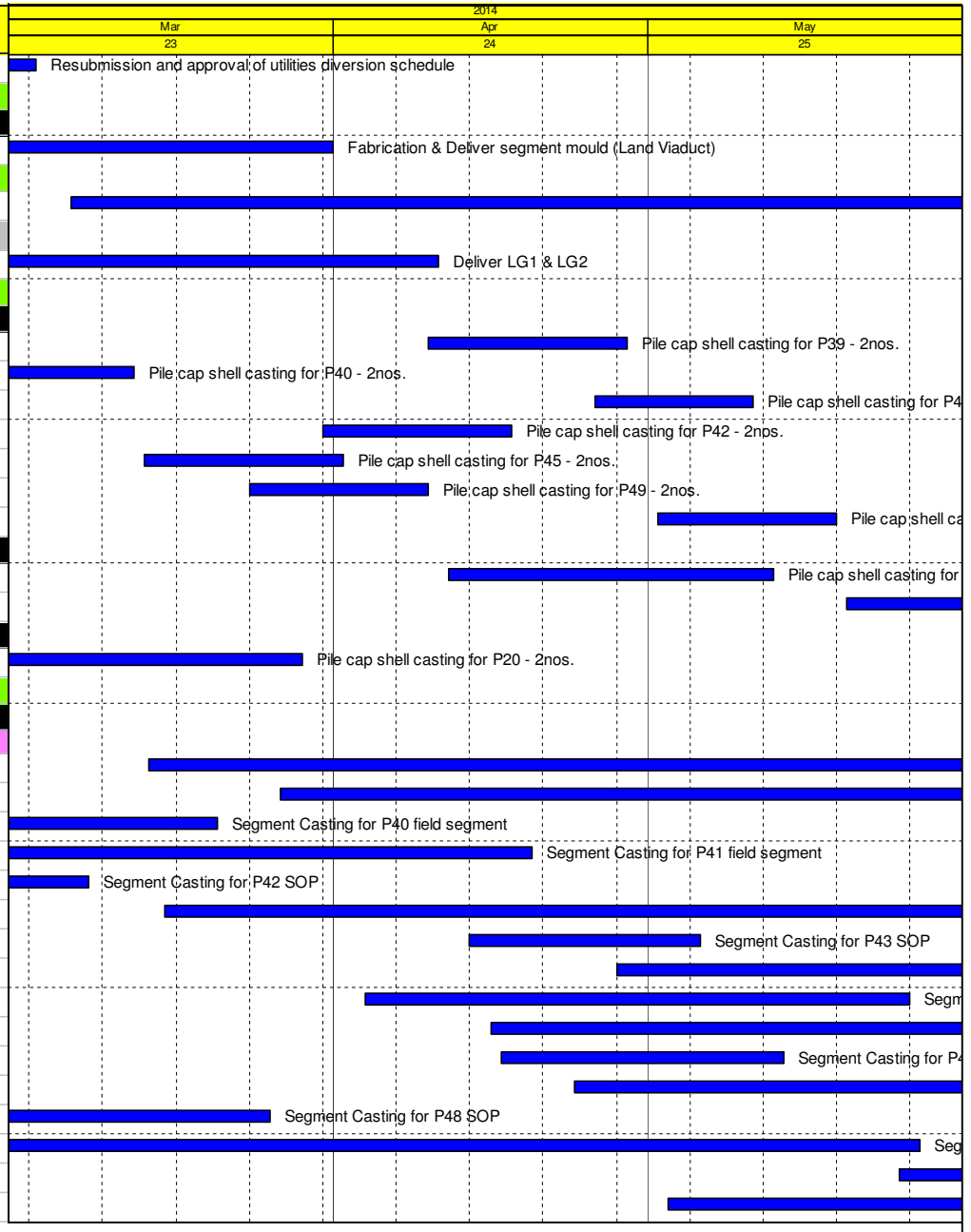
Quarterly EMA Report (03/14-05/14)

Date	Revision	Checked	Approved
21/07/14	EM&A Quarterly report (03/14-05/14)	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
PGS2255	Resubmission and approval of utilities diversion schedule	21	0	01/10/13 A	03/03/14 A
Segment Casting Yard					
Segment Moulds					
PGS2345	Fabrication & Deliver segment mould (Land Viaduct)	91	0	14/10/13 A	01/04/14 A
Interface Contract					
PGS1950	Complete deck erection by Mainland section at P0	243	98	07/03/14 A	03/10/14
Procurement and Fabrication					
PGS2186	Deliver LG1 & LG2	120	0	30/11/13 A	11/04/14 A
Pile Cap Shell Casting					
Type CP1 & CP5					
PC1350	Pile cap shell casting for P39 - 2nos.	7	0	10/04/14 A	29/04/14 A
PC1360	Pile cap shell casting for P40 - 2nos.	7	0	20/02/14 A	13/03/14 A
PC1370	Pile cap shell casting for P41 - 2nos.	7	0	26/04/14 A	11/05/14 A
PC1380	Pile cap shell casting for P42 - 2nos.	7	0	31/03/14 A	18/04/14 A
PC1410	Pile cap shell casting for P45 - 2nos.	7	0	14/03/14 A	02/04/14 A
PC1450	Pile cap shell casting for P49 - 2nos.	7	0	24/03/14 A	10/04/14 A
PC1610	Pile cap shell casting for P65 - 2nos.	7	0	02/05/14 A	19/05/14 A
Type CP2, CP3, CP3A & CP3B					
PC1470	Pile cap shell casting for P51 - 2nos.	7	0	12/04/14 A	13/05/14 A
PC1480	Pile cap shell casting for P52 - 2nos.	7	0	20/05/14 A	05/06/14 A
Type CP4 & CP6A					
PC1670	Pile cap shell casting for P20 - 2nos.	40	0	06/01/14 A	29/03/14 A
Segment Casting					
Type A, C, D Segment (Total 12 set Moulds)					
Type A Segment (Western Water Typical Span)					
SC5468	Segment Casting for P39 SOP	8	4	14/03/14 A	02/07/14
SC5478	Segment Casting for P39 field segment	40	20	27/03/14 A	21/07/14
SC5498	Segment Casting for P40 field segment	40	0	12/12/13 A	21/03/14 A
SC5518	Segment Casting for P41 field segment	40	0	20/12/13 A	20/04/14 A
SC5528	Segment Casting for P42 SOP	8	0	19/02/14 A	08/03/14 A
SC5538	Segment Casting for P42 field segment	40	1	16/03/14 A	28/06/14
SC5548	Segment Casting for P43 SOP	8	0	14/04/14 A	06/05/14 A
SC5558	Segment Casting for P43 field segment	40	0	28/04/14 A	10/06/14 A
SC5568	Segment Casting for P44 SOP	8	0	04/04/14 A	26/05/14 A
SC5578	Segment Casting for P44 field segment	40	20	16/04/14 A	21/07/14
SC5608	Segment Casting for P46 SOP	8	0	17/04/14 A	14/05/14 A
SC5618	Segment Casting for P46 field segment	40	9	24/04/14 A	09/07/14
SC5648	Segment Casting for P48 SOP	8	0	21/10/13 A	26/03/14 A
SC5658	Segment Casting for P48 field segment	40	0	05/11/13 A	27/05/14 A
SC5748	Segment Casting for P54 SOP	8	4	25/05/14 A	04/07/14
SC5828	Segment Casting for P58 SOP	8	4	03/05/14 A	16/07/14



Remaining Level of Effort
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Quarterly EMA Report (03/14-05/14)

Date	Revision	Checked	Approved
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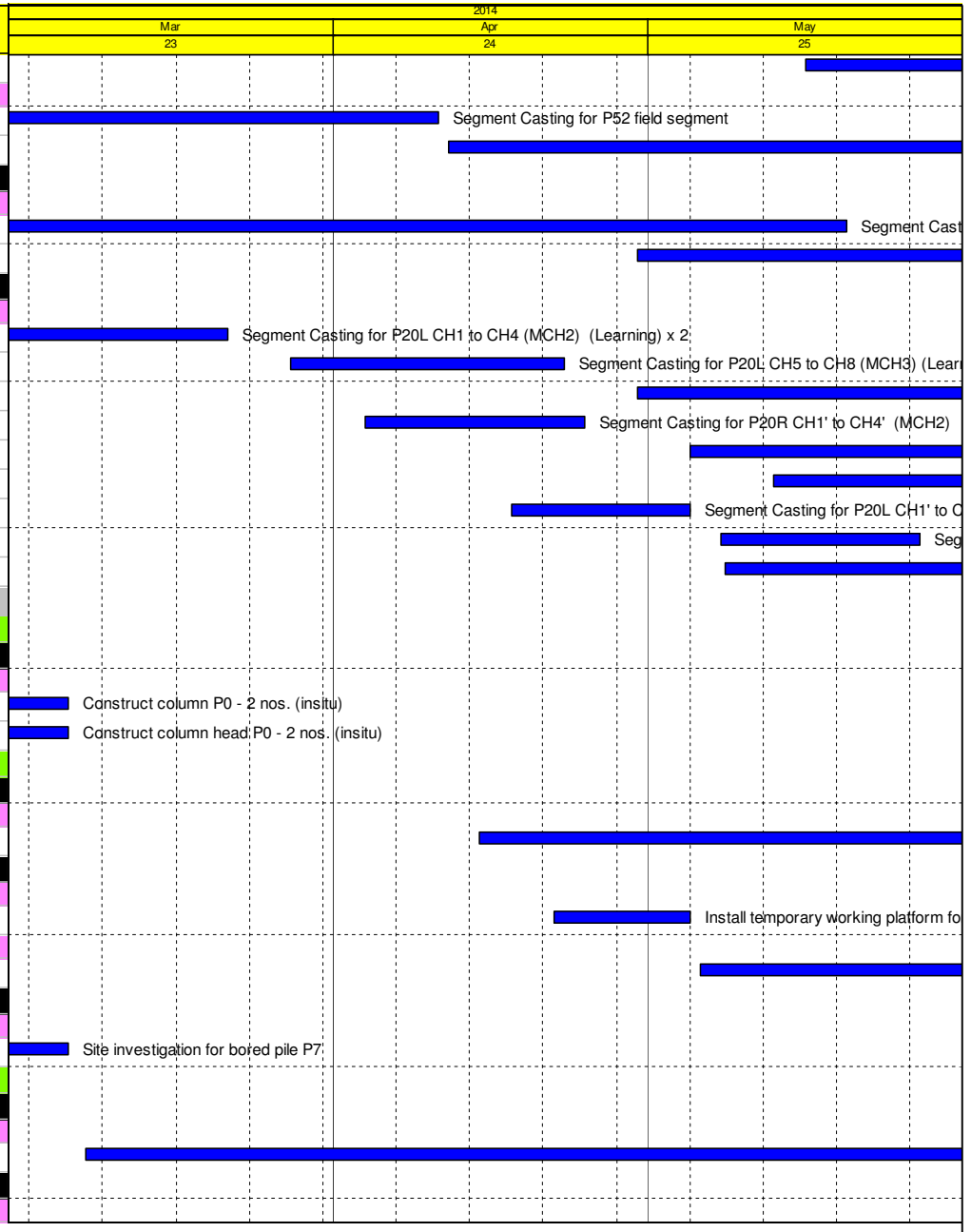
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
SC5968	Segment Casting for P65 SOP	8	0	16/05/14 A	08/06/14 A
Type D Segment (P49 to P63)					
SC6068	Segment Casting for P52 field segment	30	0	11/12/13 A	11/04/14 A
SC6078	Segment Casting for P60 field segment	30	6	12/04/14 A	04/07/14
Type E Segment (Total 5 set Moulds)					
Land Viaduct (P85 to Easternmost Abutment)					
SC6538	Segment Casting for P109 field segment x 1.5 Learning	32	0	28/02/14 A	20/05/14 A
SC6548	Segment Casting for P110 field segment	28	2	30/04/14 A	30/06/14
Type CH Segment (Total 12 set Moulds)					
ML03 (P16 TO P21)					
SC1010	Segment Casting for P20L CH1 to CH4 (MCH2) (Learning	32	0	26/02/14 A	22/03/14 A
SC1020	Segment Casting for P20L CH5 to CH8 (MCH3) (Learning)	24	0	28/03/14 A	23/04/14 A
SC1030	Segment Casting for P20L CH9 to CH13 (MCH4) (Learning	30	27	30/04/14 A	29/07/14
SC1042	Segment Casting for P20R CH1' to CH4' (MCH2)	16	0	04/04/14 A	25/04/14 A
SC1044	Segment Casting for P20R CH5' to CH8' (MCH3)	12	3	05/05/14 A	01/07/14
SC1068	Segment Casting for P20R CH1 to CH4 (MCH2) (Learning	32	16	13/05/14 A	16/07/14
SC1108	Segment Casting for P20L CH1' to CH4' (MCH2)	16	0	18/04/14 A	05/05/14 A
SC1158	Segment Casting for P19L CH1 to CH4 (MCH2)	16	0	08/05/14 A	27/05/14 A
SC1328	Segment Casting for P18L SOP (MSOP)	21	18	08/05/14 A	18/07/14
Viaduct between HKSAR Boundary and Landing Point on Airport Island					
ML01L/R 75mx8 - Stage 1 of Works					
Pier P0L/R					
Column Construction					
WW1060	Construct column P0 - 2 nos. (insitu)	7	0	10/02/14 A	06/03/14 A
WW1062	Construct column head P0 - 2 nos. (insitu)	10	0	10/02/14 A	06/03/14 A
ML01L/R 75mx8 - Stage 4 of Works					
Pier P2L/R					
Site Investigation					
WW1170	Site investigation for bored pile P2	12	0	15/04/14 A	05/06/14 A
Pier P4L/R					
Temporary Works					
WW10437	Install temporary working platform for bored pile P4 (for fric	12	0	22/04/14 A	05/05/14 A
Foundation - Bored Pile					
WW1350	Construct bored piles P4 - 6 nos.	30	0	06/05/14 A	07/06/14 A
Pier P7L/R					
Site Investigation					
WW1570	Site investigation for bored pile P7	12	0	21/02/14 A	06/03/14 A
ML02L/R 75mx8 - Stage 4 of Works					
Pier P8L/R (M.J.)					
Site Investigation					
WW1650	Site investigation for bored pile P8	12	0	08/03/14 A	07/06/14 A
Pier P14L/R					
Foundation - Bored Pile					



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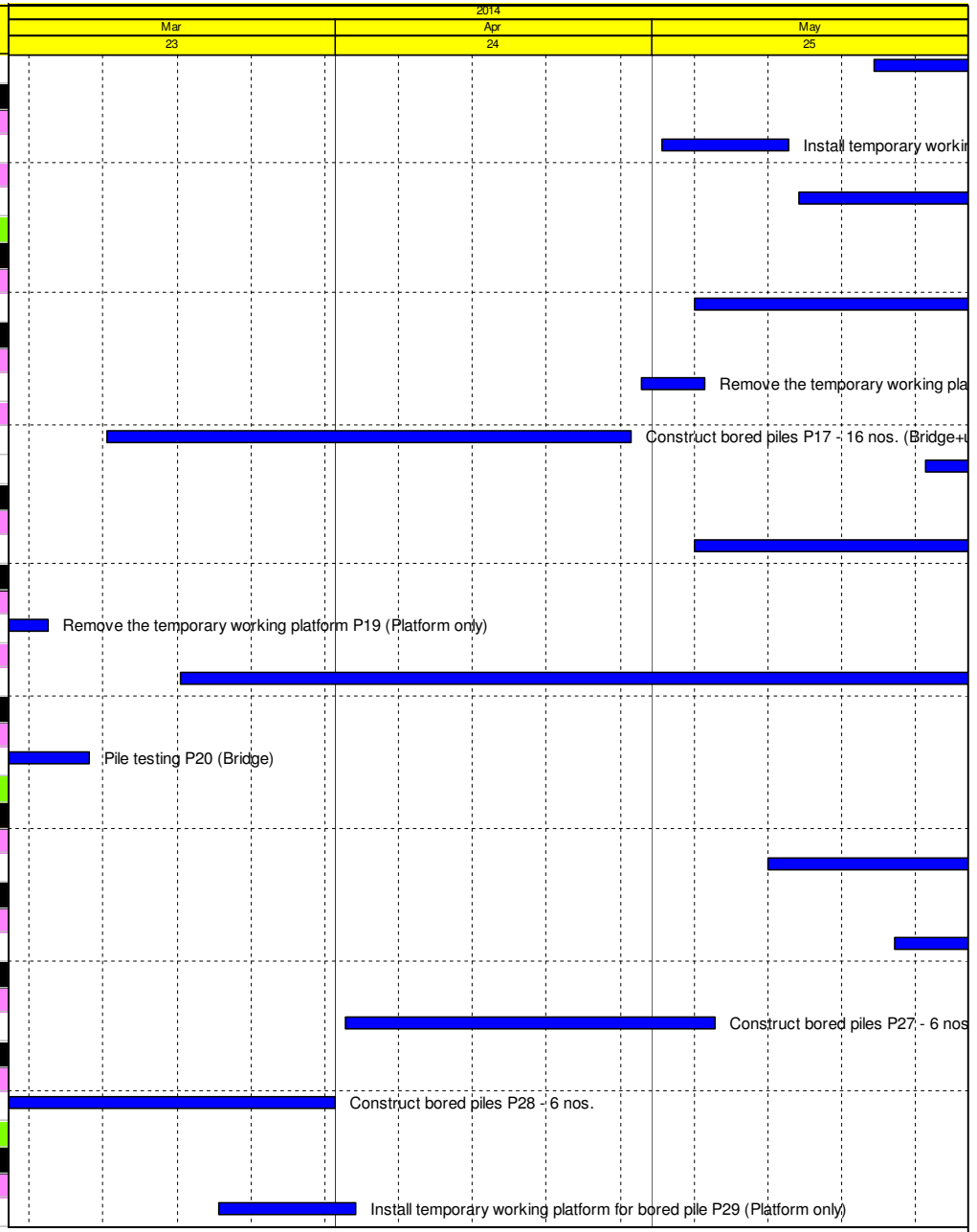
Date	Revision	Checked	Approved
21/07/14	EM&A Quarterly report (03/14-05/14)	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
WW2160	Pile testing P14	28	0	22/05/14 A	20/06/14 A
Pier P15L/R					
Temporary Works					
WW10497	Install temporary working platform for bored pile P15 (Platfc	12	0	02/05/14 A	14/05/14 A
Foundation - Bored Pile					
WW2230	Construct bored piles P15 - 6 nos.	37	35	15/05/14 A	10/11/14
ML03L/R 109.661m+150mx3+109.661m Navigation Channel - Stage 4 of Works					
Pier P16L/R (M.J.)					
Foundation - Bored Pile					
NC1040	Construct bored piles P16 - 6 nos. (Friction Piles)	90	45	05/05/14 A	02/09/14
Pier P17L/R					
Temporary Works					
NC1150	Remove the temporary working platform P17 (Platform only	6	0	30/04/14 A	06/05/14 A
Foundation - Bored Pile					
NC1160	Construct bored piles P17 - 16 nos. (Bridge+uptream dolph	61	0	10/03/14 A	29/04/14 A
NC1180	Pile testing P17 (Bridge)	28	25	27/05/14 A	23/07/14
Pier P18L/R					
Foundation - Bored Pile					
NC1300	Pile testing P18 (Bridge)	28	13	05/05/14 A	10/07/14
Pier P19L/R					
Temporary Works					
NC1390	Remove the temporary working platform P19 (Platform only	6	0	03/01/14 A	04/03/14 A
Foundation - Bored Pile					
NC1420	Pile testing P19 (Bridge)	28	1	17/03/14 A	29/06/14
Pier P20L/R					
Foundation - Bored Pile					
NC1540	Pile testing P20 (Bridge)	28	0	29/10/13 A	08/03/14 A
ML04L/R 74.5mx8 - Stage 4 of Works					
Pier P24L/R					
Foundation - Bored Pile					
WW5190	Construct bored piles P24 - 6 nos.	43	32	12/05/14 A	15/08/14
Pier P26L/R					
Foundation - Bored Pile					
WW5349	Construct bored piles P26 - 6 nos.	37	28	24/05/14 A	08/08/14
Pier P27L/R					
Foundation - Bored Pile					
WW5430	Construct bored piles P27 - 6 nos.	40	0	02/04/14 A	07/05/14 A
Pier P28L/R					
Foundation - Bored Pile					
WW5509	Construct bored piles P28 - 6 nos.	37	0	22/02/14 A	01/04/14 A
ML05L/R 74.5mx8 - Stage 4 of Works					
Pier P29L/R (M.J.)					
Temporary Works					
WW5560	Install temporary working platform for bored pile P29 (Platfc	12	0	21/03/14 A	03/04/14 A



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Quarterly EMA Report (03/14-05/14)

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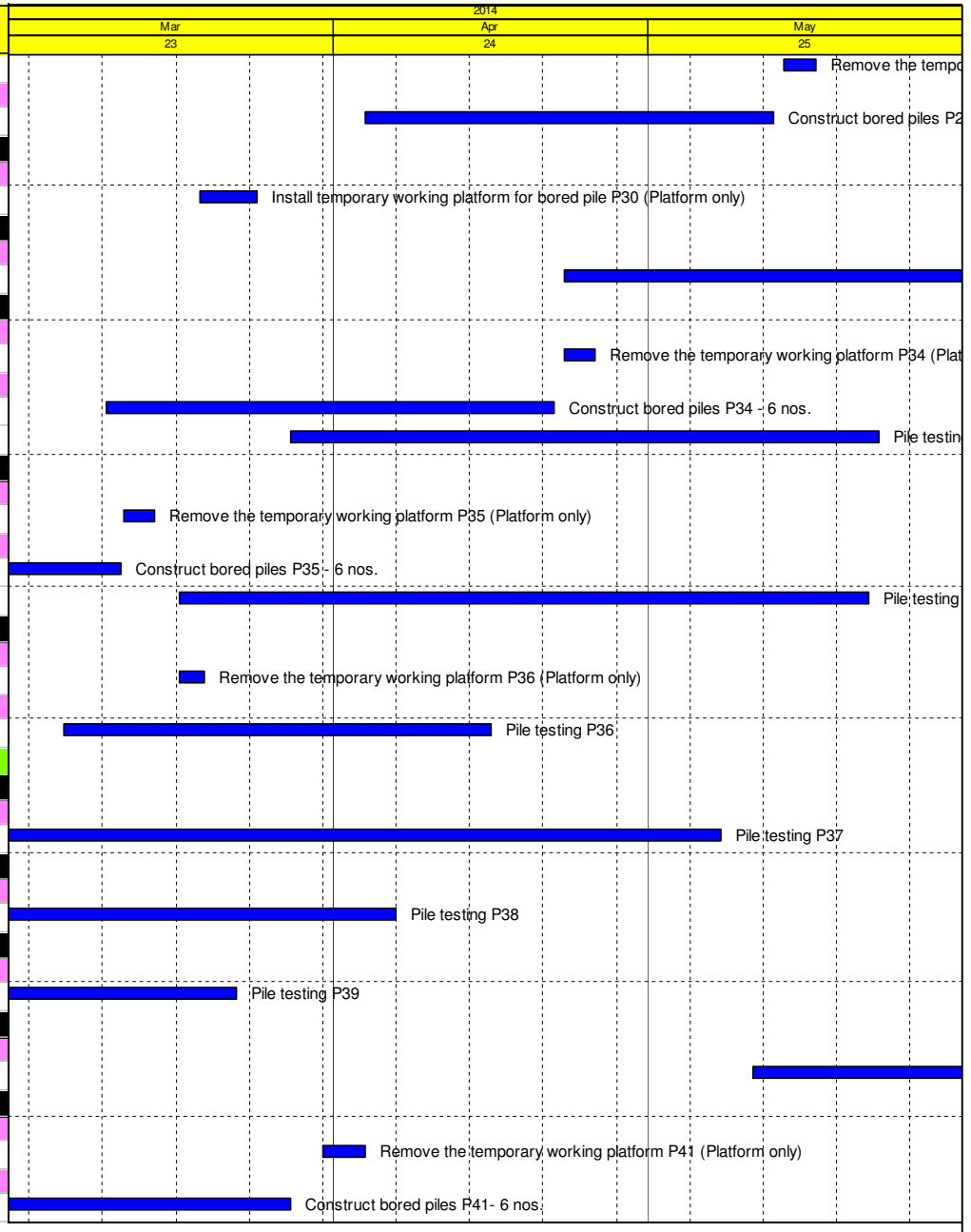
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
WW5580	Remove the temporary working platform P29 (Platform only	4	0	14/05/14 A	17/05/14 A
Foundation - Bored Pile					
WW5590	Construct bored piles P29 - 6 nos.	28	0	04/04/14 A	13/05/14 A
Pier P30L/R					
Temporary Works					
WW5640	Install temporary working platform for bored pile P30 (Platfc	12	0	19/03/14 A	24/03/14 A
Pier P33L/R					
Foundation - Bored Pile					
WW5910	Construct bored piles P33 - 6 nos.	32	21	23/04/14 A	30/07/14
Pier P34L/R					
Temporary Works					
WW5980	Remove the temporary working platform P34 (Platform only	4	0	23/04/14 A	26/04/14 A
Foundation - Bored Pile					
WW5990	Construct bored piles P34 - 6 nos.	32	0	10/03/14 A	22/04/14 A
WW6000	Pile testing P34	28	0	28/03/14 A	23/05/14 A
Pier P35L/R					
Temporary Works					
WW6060	Remove the temporary working platform P35 (Platform only	4	0	12/03/14 A	15/03/14 A
Foundation - Bored Pile					
WW6070	Construct bored piles P35 - 6 nos.	39	0	22/01/14 A	11/03/14 A
WW6080	Pile testing P35	28	0	17/03/14 A	22/05/14 A
Pier P36L/R					
Temporary Works					
WW6140	Remove the temporary working platform P36 (Platform only	4	0	17/03/14 A	19/03/14 A
Foundation - Bored Pile					
WW6160	Pile testing P36	28	0	06/03/14 A	16/04/14 A
ML06L/R 74.5mx8 - Stage 4 of Works					
Pier P37L/R (M.J.)					
Foundation - Bored Pile					
WW6240	Pile testing P37	28	0	28/01/14 A	08/05/14 A
Pier 38L/R					
Foundation - Bored Pile					
WW6320	Pile testing P38	28	0	27/02/14 A	07/04/14 A
Pier 39L/R					
Foundation - Bored Pile					
WW6400	Pile testing P39	28	0	06/02/14 A	22/03/14 A
Pier 40L/R					
Pile Cap Construction					
WW6490	Construct pile cap P40 - 2 nos.	30	14	11/05/14 A	17/07/14
Pier 41L/R					
Temporary Works					
WW6540	Remove the temporary working platform P41 (Platform only	4	0	31/03/14 A	04/04/14 A
Foundation - Bored Pile					
WW6550	Construct bored piles P41- 6 nos.	26	0	30/10/13 A	28/03/14 A



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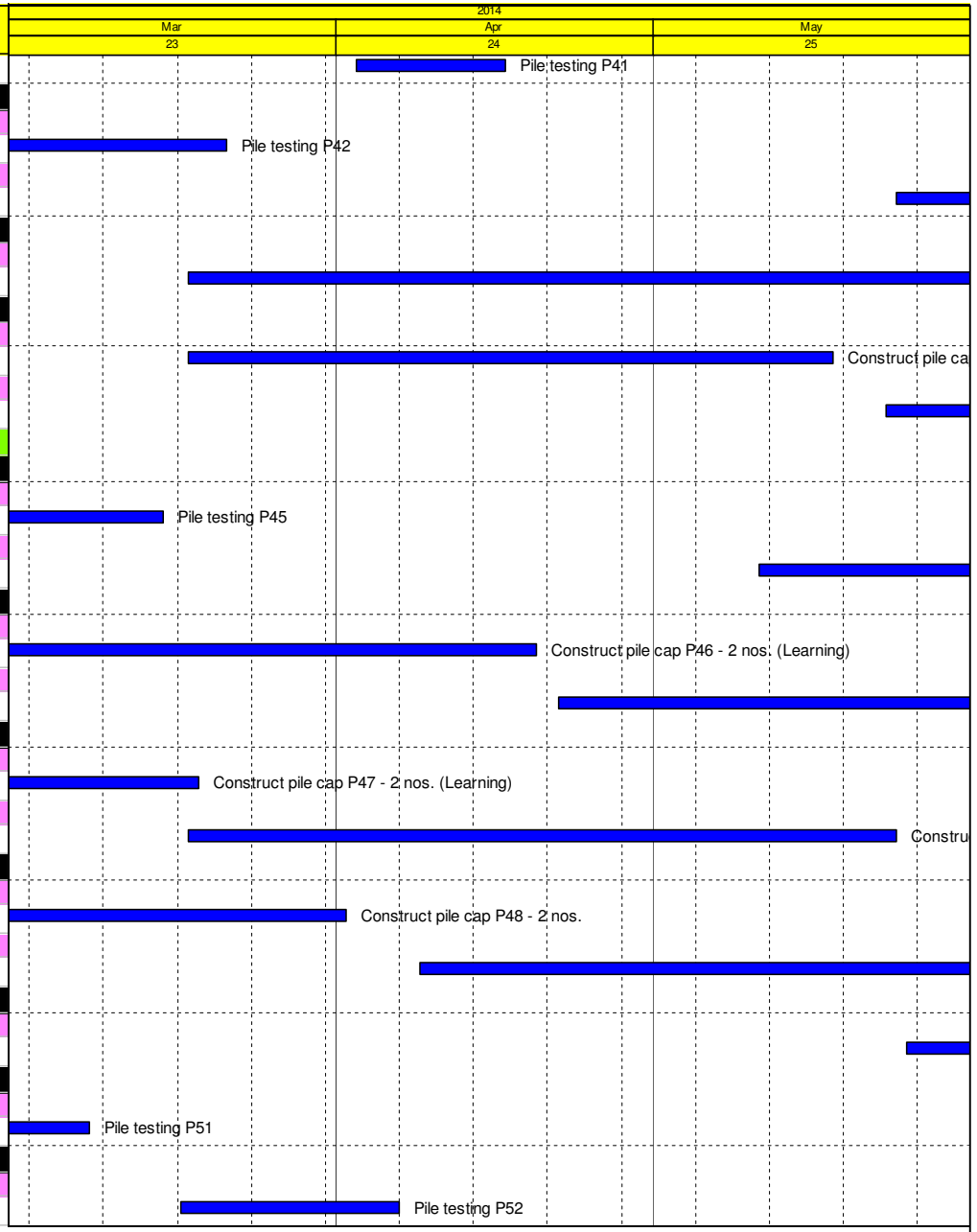
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
WW6560	Pile testing P41	28	0	03/04/14 A	17/04/14 A
Pier 42L/R					
Foundation - Bored Pile					
WW6640	Pile testing P42	28	0	22/01/14 A	21/03/14 A
Pile Cap Construction					
WW6650	Construct pile cap P42 - 2 nos.	30	15	24/05/14 A	05/08/14
Pier 43L/R					
Pile Cap Construction					
WW6730	Construct pile cap P43 - 2 nos.	30	0	18/03/14 A	06/06/14 A
Pier 44L/R					
Pile Cap Construction					
WW6810	Construct pile cap P44 - 2 nos.	30	0	18/03/14 A	18/05/14 A
Column Construction					
WW6820	Construct column P44 - 2 nos. (in-situ section)	10	9	23/05/14 A	10/07/14
ML07L/R 73.396mx8 - Stage 4 of Works					
Pier P45L/R (M.J.)					
Foundation - Bored Pile					
WW6880	Pile testing P45	28	0	22/01/14 A	15/03/14 A
Pile Cap Construction					
WW6890	Construct pile cap P45 - 2 nos.	30	12	11/05/14 A	15/07/14
Pier P46L/R					
Pile Cap Construction					
WW6970	Construct pile cap P46 - 2 nos. (Learning)	40	0	13/01/14 A	20/04/14 A
Column Construction					
WW10007	Construct column P46 - 2 nos. (insitu)	17	0	22/04/14 A	18/06/14 A
Pier P47L/R					
Pile Cap Construction					
WW7050	Construct pile cap P47 - 2 nos. (Learning)	40	0	03/01/14 A	19/03/14 A
Column Construction					
WW10027	Construct column P47 - 2 nos. (insitu) (Learning)	32	0	18/03/14 A	24/05/14 A
Pier P48L/R					
Pile Cap Construction					
WW7130	Construct pile cap P48 - 2 nos.	30	0	22/01/14 A	02/04/14 A
Column Construction					
WW10047	Construct column P48 - 2 nos. (insitu)	17	4	09/04/14 A	04/07/14
Pier P49L/R					
Pile Cap Construction					
WW7210	Construct pile cap P49 - 2 nos.	30	15	25/05/14 A	18/07/14
Pier P51L/R					
Foundation - Bored Pile					
WW7350	Pile testing P51	28	0	14/11/13 A	08/03/14 A
Pier P52L/R					
Foundation - Bored Pile					
WW7420	Pile testing P52	28	0	17/03/14 A	07/04/14 A



Remaining Level of Effort
Actual Level of Effort
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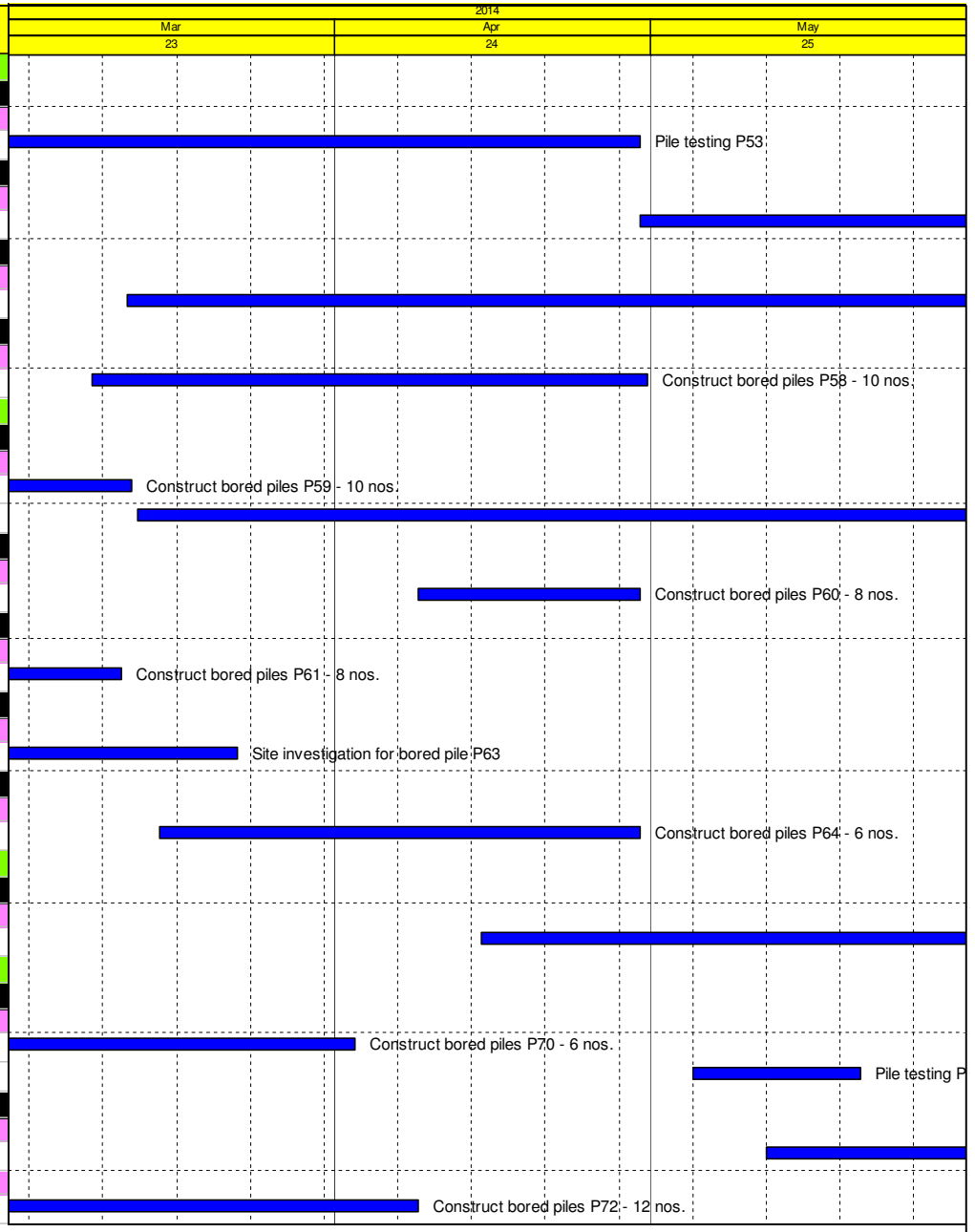
Quarterly EMA Report (03/14-05/14)

Date	Revision	Checked	Approved
21/07/14	EM&A Quarterly report (03/14-05/14)	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
ML08L/R 70mx6 - Stage 4 of Works					
Pier P53L/R (M.J.)					
Foundation - Bored Pile					
WW7490	Pile testing P53	28	0	27/08/13 A	30/04/14 A
Pier P55L/R					
Foundation - Bored Pile					
WW7650	Pile testing P55	28	13	30/04/14 A	10/07/14
Pier P56L/R					
Foundation - Bored Pile					
WW7730	Pile testing P56	28	18	12/03/14 A	16/07/14
Pier P58L/R					
Foundation - Bored Pile					
WW7880	Construct bored piles P58 - 10 nos.	50	0	09/03/14 A	30/04/14 A
ML09L/R 73.396Mx8 - Stage 4 of Works					
Pier P59L/R (M.J.)					
Foundation - Bored Pile					
WW7960	Construct bored piles P59 - 10 nos.	76	0	06/01/14 A	12/03/14 A
WW7970	Pile testing P59	28	20	13/03/14 A	17/07/14
Pier P60L/R					
Foundation - Bored Pile					
WW8030	Construct bored piles P60 - 8 nos.	29	0	09/04/14 A	30/04/14 A
Pier P61L/R					
Foundation - Bored Pile					
WW8110	Construct bored piles P61 - 8 nos.	33	0	20/02/14 A	11/03/14 A
Pier P63L/R					
Site Investigation					
WW8260	Site investigation for bored pile P63	24	0	24/02/14 A	22/03/14 A
Pier P64L/R					
Foundation - Bored Pile					
WW8360	Construct bored piles P64 - 6 nos.	41	0	15/03/14 A	30/04/14 A
ML10L/R 115m+180m+115m - Stage 4 of Works					
Pier P69L/R					
Foundation - Bored Pile					
AC2480	Construct bored piles P69 - 12 nos.	64	26	15/04/14 A	04/08/14
ML11L/R 109m+165mx2+109m - Stage 4 of Works					
Pier P70L/R (M.J.)					
Foundation - Bored Pile					
AC1190	Construct bored piles P70 - 6 nos.	34	0	15/02/14 A	03/04/14 A
AC1200	Pile testing P70	28	0	05/05/14 A	21/05/14 A
Pier P72L/R					
Temporary Works					
AC1320	Install cofferdem for pile cap construction - P72 - 2 nos.	60	36	12/05/14 A	19/08/14
Foundation - Bored Pile					
AC1360	Construct bored piles P72 - 12 nos.	57	0	13/05/13 A	09/04/14 A



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Quarterly EMA Report (03/14-05/14)

Date	Revision	Checked	Approved
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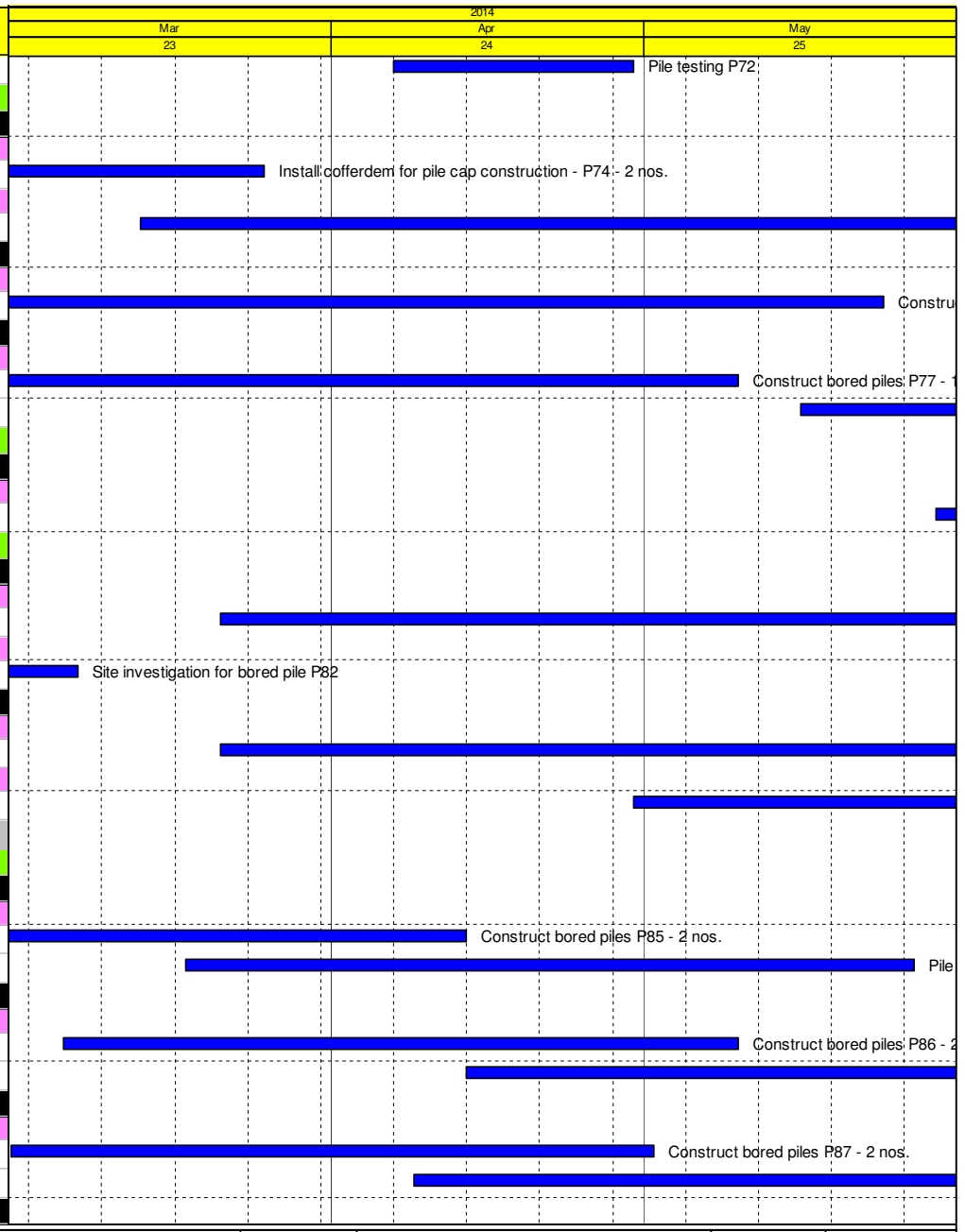
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
AC1370	Pile testing P72	28	0	07/04/14 A	30/04/14 A
ML12L/R 109m+165mx2+109m - Stage 4 of Works					
Pier P74L/R (M.J.)					
Temporary Works					
AC1500	Install cofferdem for pile cap construction - P74 - 2 nos.	45	0	28/01/14 A	25/03/14 A
Pile Cap Construction					
AC1560	Construct pile cap P74 - 2 nos.	60	48	13/03/14 A	04/09/14
Pier P76L/R					
Foundation - Bored Pile					
AC1720	Construct bored piles P76 - 8 nos.	37	0	09/01/14 A	24/05/14 A
Pier P77L/R					
Foundation - Bored Pile					
AC1800	Construct bored piles P77 - 12 nos.	53	0	06/11/13 A	10/05/14 A
AC1810	Pile testing P77	28	17	16/05/14 A	14/07/14
ML13L/R 115m+180m+115m - Stage 4 of Works					
Pier P79L/R					
Foundation - Bored Pile					
AC1970	Construct bored piles P79 - 12 nos.	56	34	29/05/14 A	14/08/14
ML14L/R 115m+180m+100.561m - Stage 4 of Works					
Pier P82L/R					
Utilities Diversion					
AC2460	1200mm Drainage diversion for P82	60	60	21/03/14 A	06/09/14
Site Investigation					
AC2210	Site investigation for bored pile P82	30	0	29/01/14 A	07/03/14 A
Pier P83L/R					
Utilities Diversion					
AC2470	300 & 450mm Drainage diversion for P83	60	60	21/03/14 A	06/09/14
Temporary Works					
AC2290	Remove existing seawall & prepare platform for P83 land s	90	0	30/04/14 A	12/06/14 A
Viaduct between Landing Point on Airport Island and Scenic Hill					
ML15L/R 43m+65mx6+37m - Stage 5 of Works					
Pier P85L/R					
Foundation - Bored Pile					
AI1110	Construct bored piles P85 - 2 nos.	27	0	20/02/14 A	14/04/14 A
AI1120	Pile testing P85	28	0	18/03/14 A	27/05/14 A
Pier P86L/R					
Foundation - Bored Pile					
AI1180	Construct bored piles P86 - 2 nos.	33	0	06/03/14 A	10/05/14 A
AI1190	Pile testing P86	28	0	14/04/14 A	12/06/14 A
Pier P87L/R					
Foundation - Bored Pile					
AI1250	Construct bored piles P87 - 2 nos.	34	0	01/03/14 A	02/05/14 A
AI1260	Pile testing P87	28	0	09/04/14 A	09/06/14 A
Pier P88L/R					



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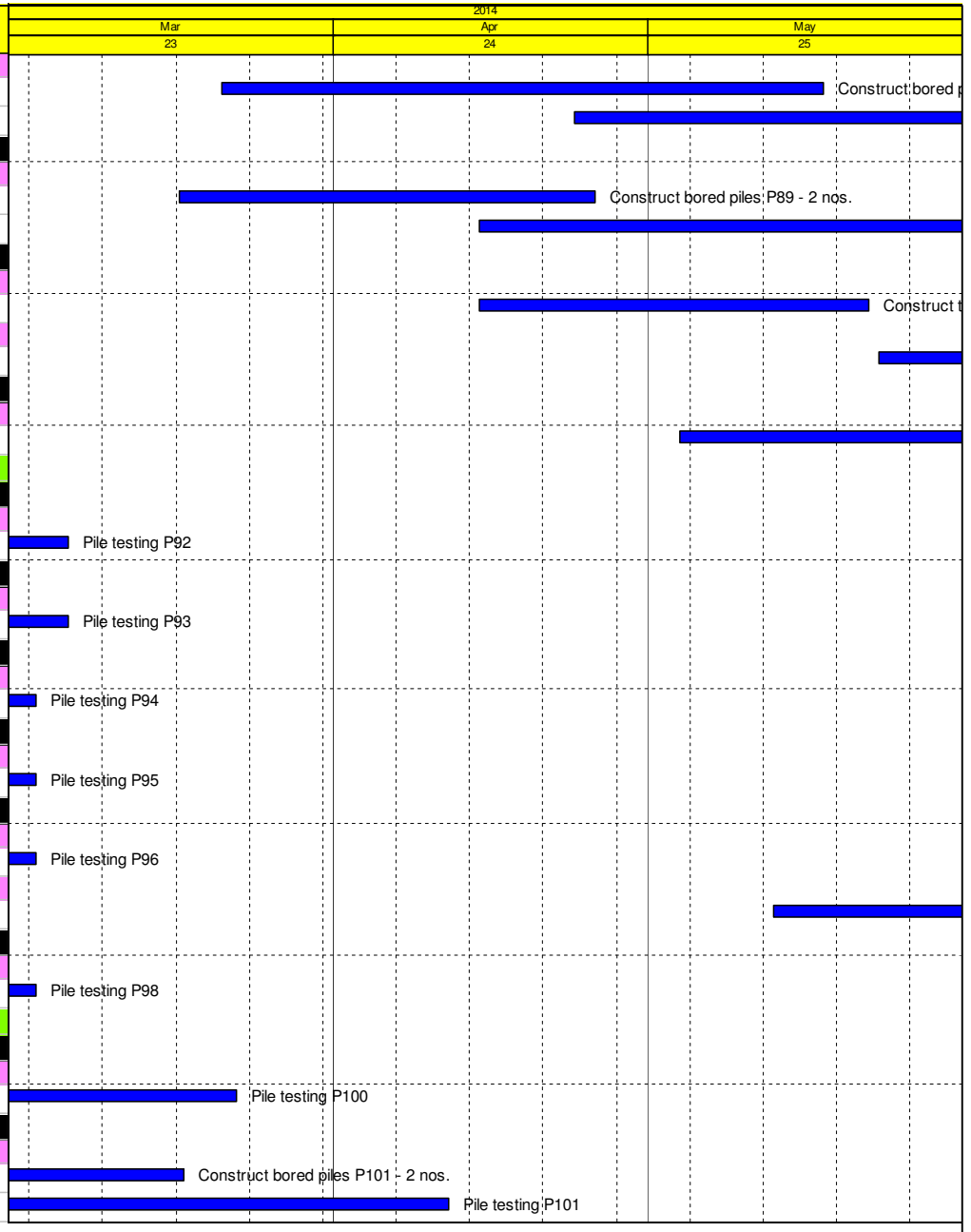
Quarterly EMA Report (03/14-05/14)

Date	Revision	Checked	Approved
21/07/14	EM&A Quarterly report (03/14-05/14)	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
	Foundation - Bored Pile				
AI1320	Construct bored piles P88 - 2 nos.	30	0	21/03/14 A	17/05/14 A
AI1330	Pile testing P88	28	0	24/04/14 A	12/06/14 A
	Pier P89L/R				
	Foundation - Bored Pile				
AI1390	Construct bored piles P89 - 2 nos.	27	0	17/03/14 A	26/04/14 A
AI1400	Pile testing P89	28	0	15/04/14 A	12/06/14 A
	Pier P90L/R				
	Temporary Works				
AI1440	Construct temporary piling platform for bored pile P90	40	0	15/04/14 A	22/05/14 A
	Foundation - Bored Pile				
AI1460	Construct bored piles P90 - 2 nos.	31	0	23/05/14 A	24/06/14 A
	Pier P91L/R				
	Temporary Works				
AI1510	Construct temporary piling platform for bored pile P91	40	0	04/05/14 A	12/06/14 A
	Ml16L/R 37m+65mx5+43m - Stage 5 of Works				
	Pier P92L/R (M.J.)				
	Foundation - Bored Pile				
AI1610	Pile testing P92	28	0	28/02/14 A	06/03/14 A
	Pier P93L/R				
	Foundation - Bored Pile				
AI1680	Pile testing P93	28	0	26/02/14 A	06/03/14 A
	Pier P94L/R				
	Foundation - Bored Pile				
AI1750	Pile testing P94	28	0	31/12/13 A	03/03/14 A
	Pier P95L/R				
	Foundation - Bored Pile				
AI1820	Pile testing P95	28	0	04/01/14 A	03/03/14 A
	Pier P96L/R				
	Foundation - Bored Pile				
AI1890	Pile testing P96	28	0	14/12/13 A	03/03/14 A
	Column Construction				
AI1910	Construct column P96 - 2 nos.	38	25	13/05/14 A	01/08/14
	Pier P98L/R				
	Foundation - Bored Pile				
AI2030	Pile testing P98	28	0	30/12/13 A	03/03/14 A
	ML17L/R 43m+65mx3+47m - Stage 5 of Works				
	Pier P100L/R				
	Foundation - Bored Pile				
AI2170	Pile testing P100	28	0	21/10/13 A	22/03/14 A
	Pier P101L/R				
	Foundation - Bored Pile				
AI2230	Construct bored piles P101 - 2 nos.	36	0	17/12/13 A	17/03/14 A
AI2240	Pile testing P101	28	0	18/01/14 A	12/04/14 A



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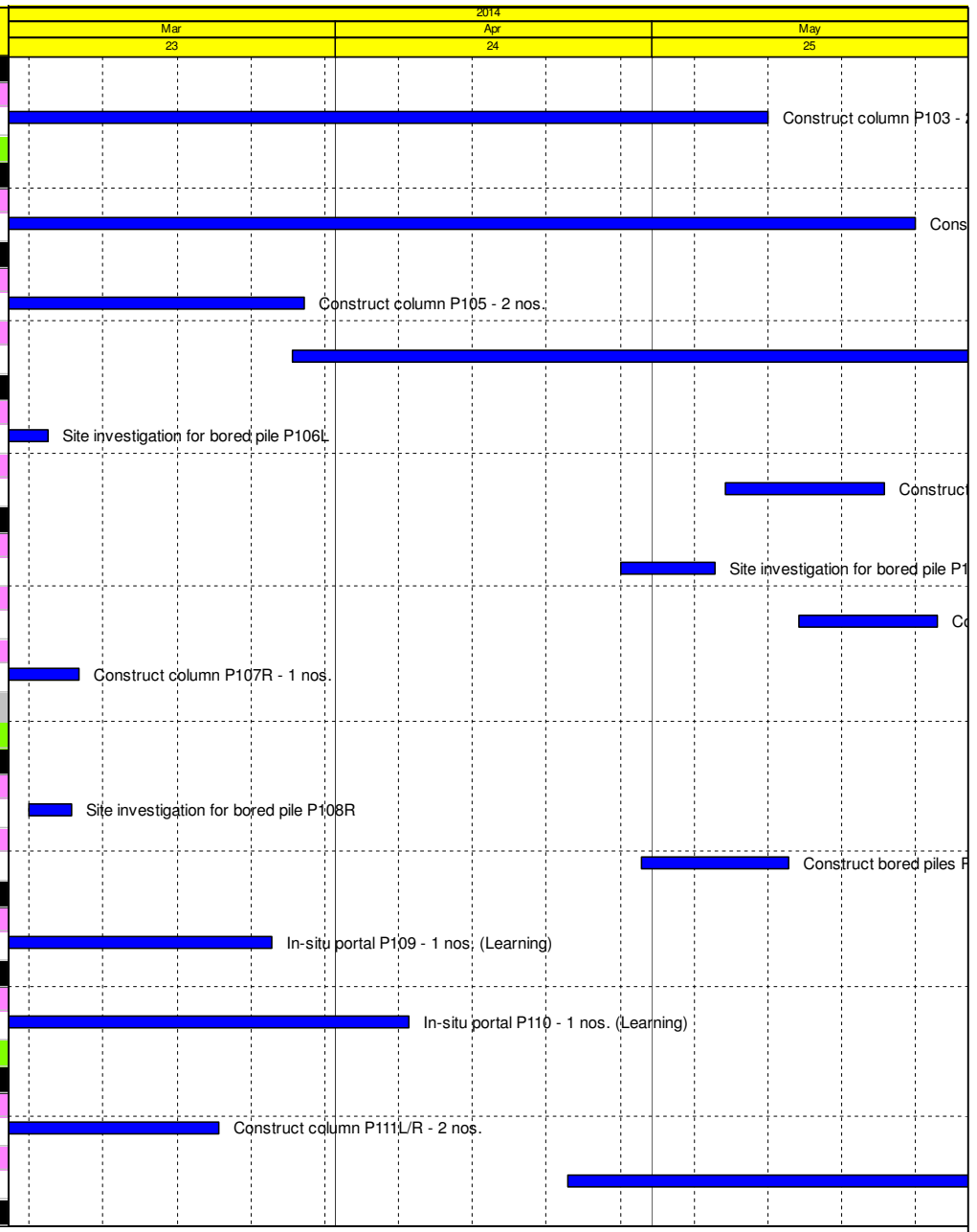
Quarterly EMA Report (03/14-05/14)

Date	Revision	Checked	Approved
21/07/14	EM&A Quarterly report (03/14-05/14)	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
Pier P103L/R					
Column Construction					
AI2400	Construct column P103 - 2 nos.	44	0	13/01/14 A	12/05/14 A
ML18L/R 47m+55mx5+35m - Stage 5 of Works					
Pier P104L/R (M.J.)					
Column Construction					
AI2470	Construct column P104 - 2 nos.	66	0	16/01/14 A	26/05/14 A
Pier P105L/R					
Column Construction					
AI2540	Construct column P105 - 2 nos.	66	0	24/12/13 A	29/03/14 A
In-situ Portal/T-pier Construction					
AI2550	In-situ portal P105 - 1 nos.	60	24	28/03/14 A	31/07/14
Pier P106L/R					
Site Investigation					
AI3190	Site investigation for bored pile P106L	10	0	21/02/14 A	04/03/14 A
Foundation - Bored Pile					
AI3170	Construct bored piles P106L - 1 nos.	10	0	08/05/14 A	23/05/14 A
Pier P107L/R					
Site Investigation					
AI3220	Site investigation for bored pile P107L	10	0	28/04/14 A	07/05/14 A
Foundation - Bored Pile					
AI3230	Construct bored piles P107L - 1 nos.	10	0	15/05/14 A	28/05/14 A
Column Construction					
AI2680	Construct column P107R - 1 nos.	22	0	23/11/13 A	07/03/14 A
Land Viaduct P108 to P114					
ML18L/R 47m+55mx5+35m - Stage 5 of Works					
Pier P108L/R					
Site Investigation					
AI3160	Site investigation for bored pile P108R	10	0	03/03/14 A	07/03/14 A
Foundation - Bored Pile					
AI3120	Construct bored piles P108R - 1 nos.	14	0	30/04/14 A	14/05/14 A
Pier P109L/R					
In-situ Portal/T-pier Construction					
AI2810	In-situ portal P109 - 1 nos. (Learning)	80	0	09/12/13 A	26/03/14 A
Pier P110L/R					
In-situ Portal/T-pier Construction					
AI2870	In-situ portal P110 - 1 nos. (Learning)	80	0	22/12/13 A	08/04/14 A
ML19L/C/R 40m+65mx2 Stage 5 of Works					
Pier P111L/C/R					
Column Construction					
AI2920	Construct column P111L/R - 2 nos.	36	0	11/01/14 A	21/03/14 A
In-situ Portal/T-pier Construction					
AI2930	In-situ portal P111 - 1 nos.	60	30	23/04/14 A	08/08/14
Pier P112L/C/R					



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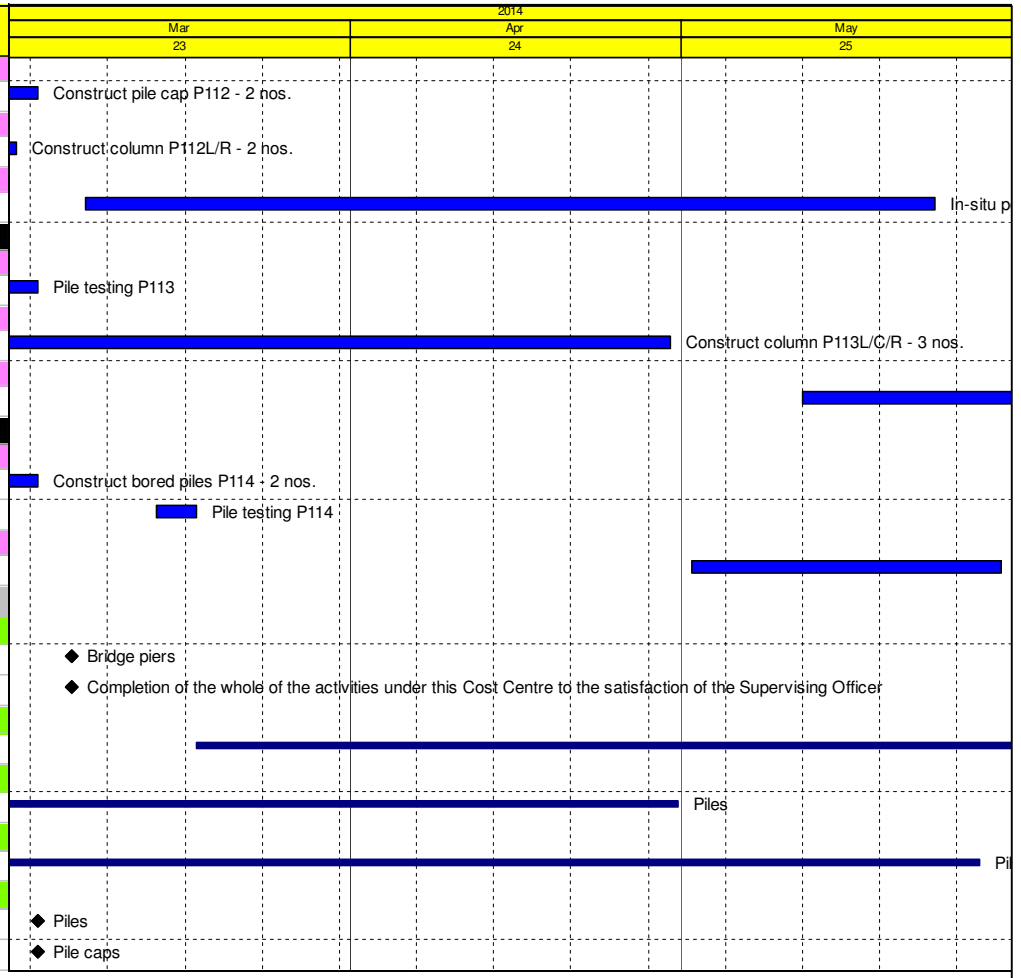
Quarterly EMA Report (03/14-05/14)

Date	Revision	Checked	Approved
21/07/14	EM&A Quarterly report (03/14-05/14)	Tim	

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
Pile Cap Construction					
AI2970	Construct pile cap P112 - 2 nos.	50	0	31/12/13 A	03/03/14 A
Column Construction					
AI2980	Construct column P112L/R - 2 nos.	32	0	21/01/14 A	01/03/14 A
In-situ Portal/T-pier Construction					
AI2990	In-situ portal P112 - 1 nos.	60	0	08/03/14 A	24/05/14 A
Pier P113 L/C/R					
Foundation - Bored Pile					
AI3020	Pile testing P113	28	0	10/10/13 A	03/03/14 A
Column Construction					
AI3030	Construct column P113L/C/R - 3 nos.	54	0	27/02/14 A	30/04/14 A
In-situ Portal/T-pier Construction					
AI3040	In-situ portal P113 - 1 nos.	60	51	12/05/14 A	09/09/14
Pier P114 L/C/R					
Foundation - Bored Pile					
AI3060	Construct bored piles P114 - 2 nos.	18	0	07/01/14 A	03/03/14 A
AI3070	Pile testing P114	28	0	14/03/14 A	18/03/14 A
Column Construction					
AI3080	Construct column P114L/C/R - 2 nos.	48	0	02/05/14 A	30/05/14 A
Milestones schedule					
Interface Piers at chainage 4+200.000 approximate					
CC31-1020	Bridge piers	0	0		06/03/14 A
CC31-1030	Completion of the whole of the activities under this Cost Ce	0	0		06/03/14 A
Marine Viaduct at chainage 4+260.000 to 11+800.000 approximate					
CC33-1080	Bridge piers	709	680	18/03/14 A	07/05/16
Turnaround					
CC34-1000	Piles	152	0	11/07/13 A	30/04/14 A
Land Viaduct					
CC42-1000	Piles	388	0	16/05/13 A	28/05/14 A
Interface Span with Contract No. HY/2011/03					
CC43-1000	Piles	0	0		03/03/14 A
CC43-1010	Pile caps	0	0		03/03/14 A



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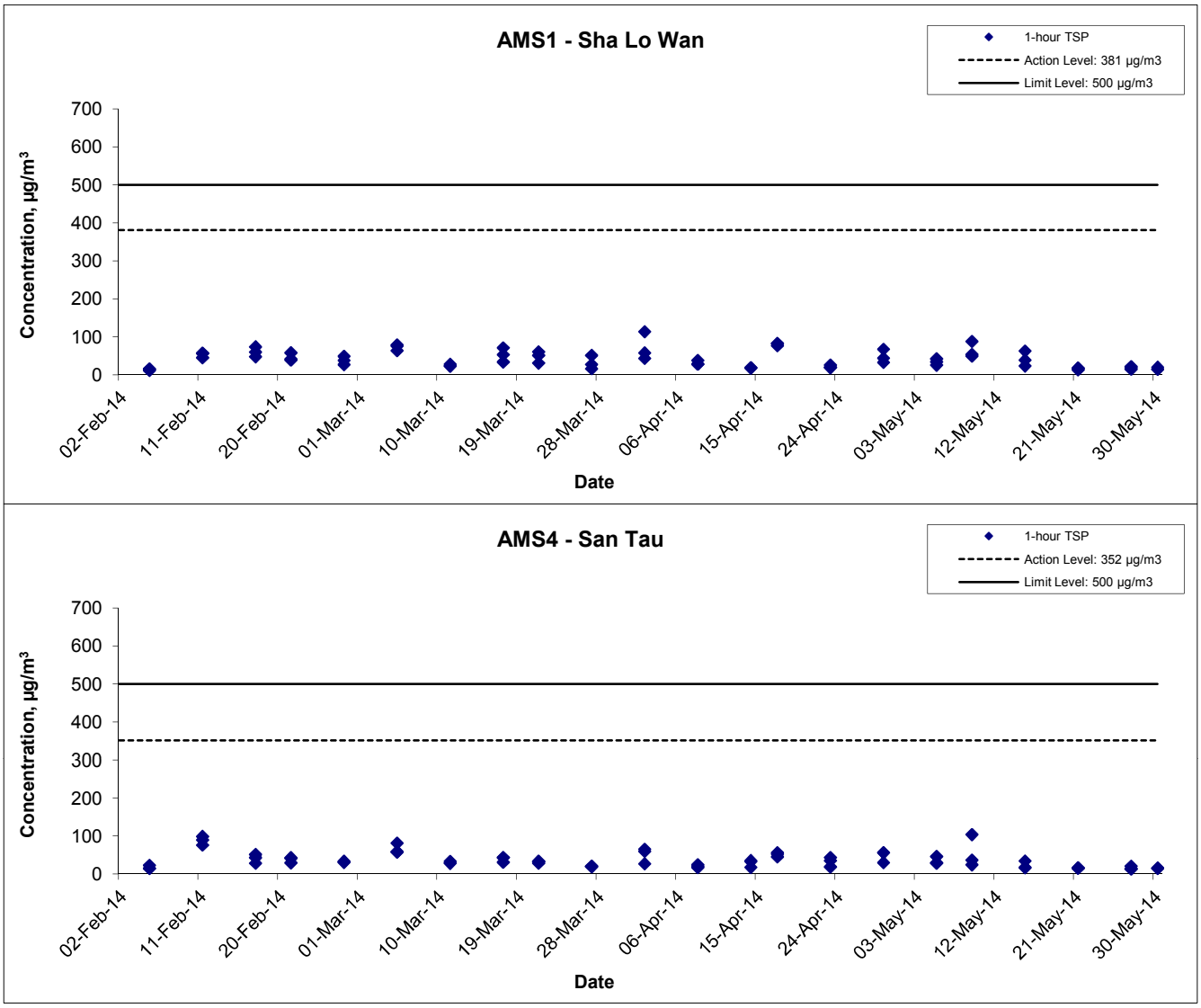
APPENDIX B
GRAPHICAL PRESENTATION OF 1-HOUR TSP MONITORING RESULTS

1-hour TSP Concentration Levels



Title: Graphical Presentation of 1-hour TSP Monitoring Results	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill	Scale: N.T.S Date: May 14	Project No.: MA12014 Appendix: B

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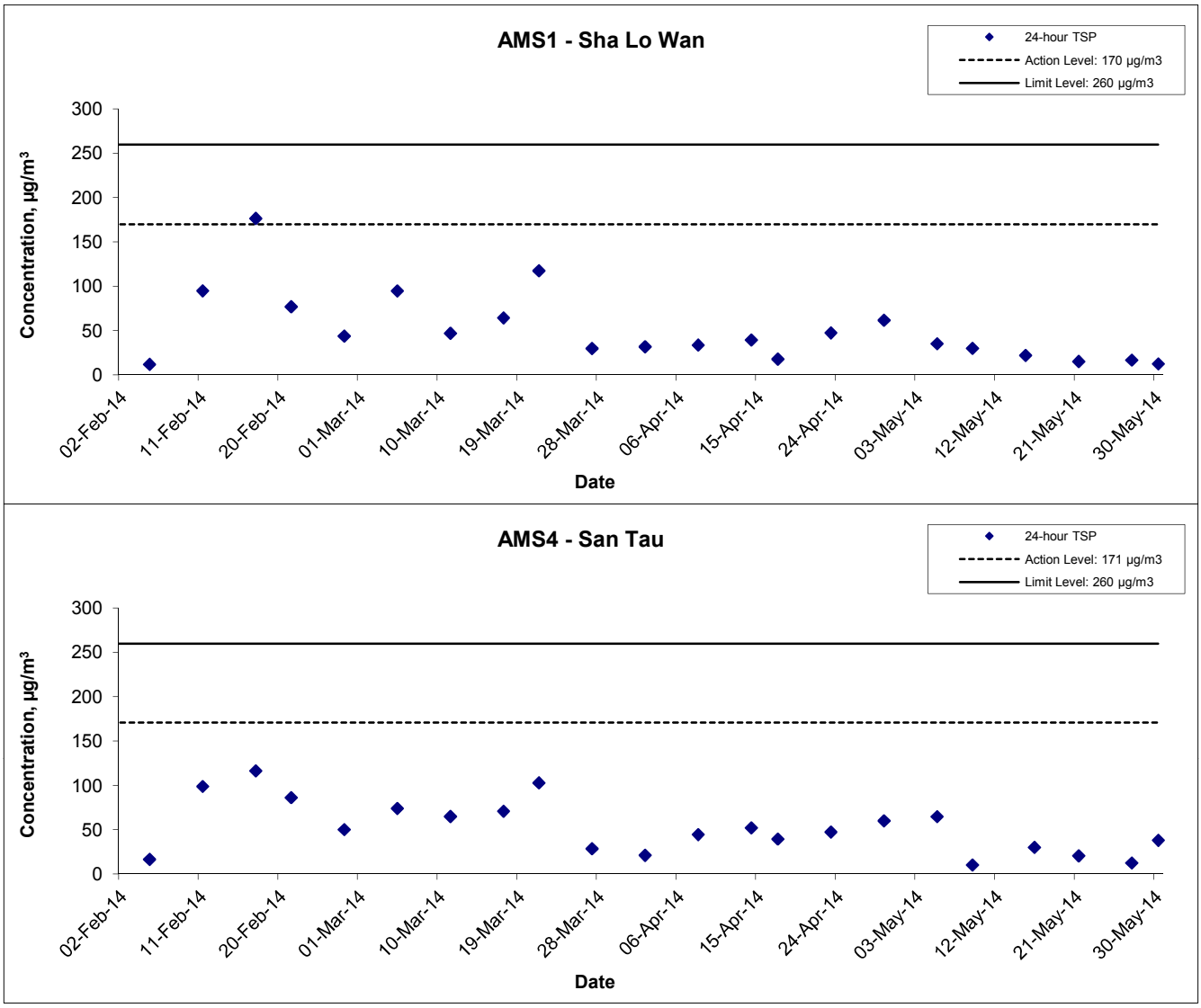
APPENDIX C
GRAPHICAL PRESENTATION OF 24-HOUR TSP MONITORING RESULTS

24-hour TSP Concentration Levels

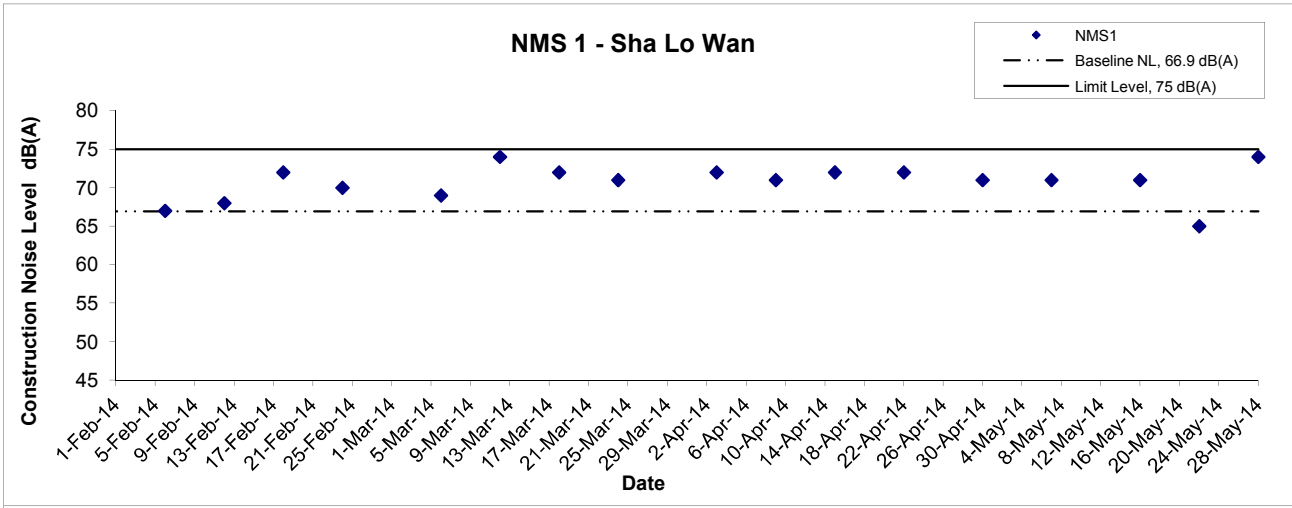


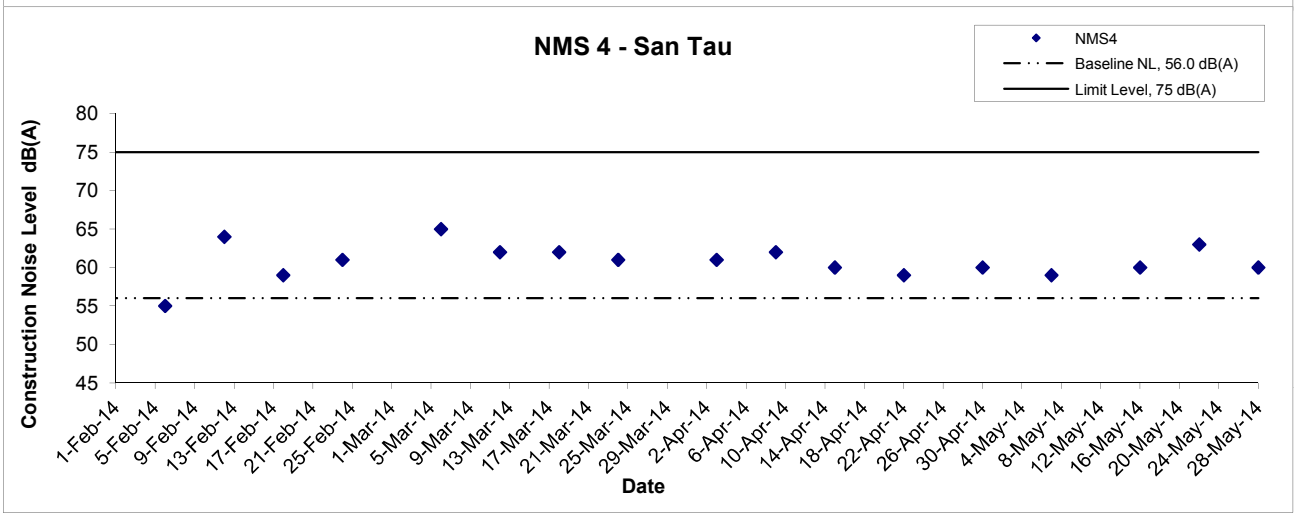
Title: Graphical Presentation of 24-hour TSP Monitoring Results	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill	Scale: N.T.S Date: May 14	Project No.: MA12014 Appendix: C

CINOTECH

APPENDIX D
GRAPHICAL PRESENTATION OF NOISE MONITORING RESULTS

Noise Levels

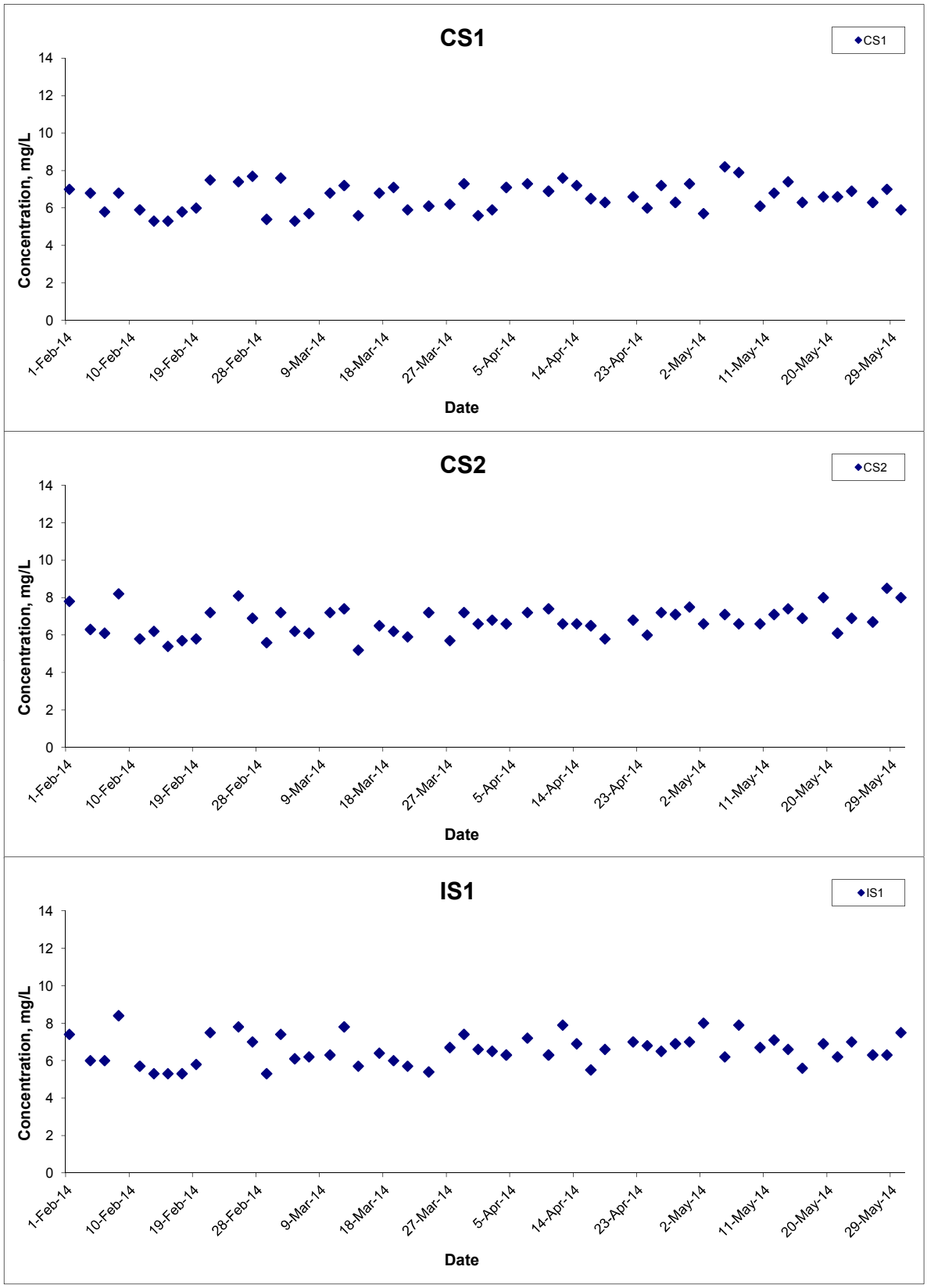




Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
		Date: May 14	Appendix: D	

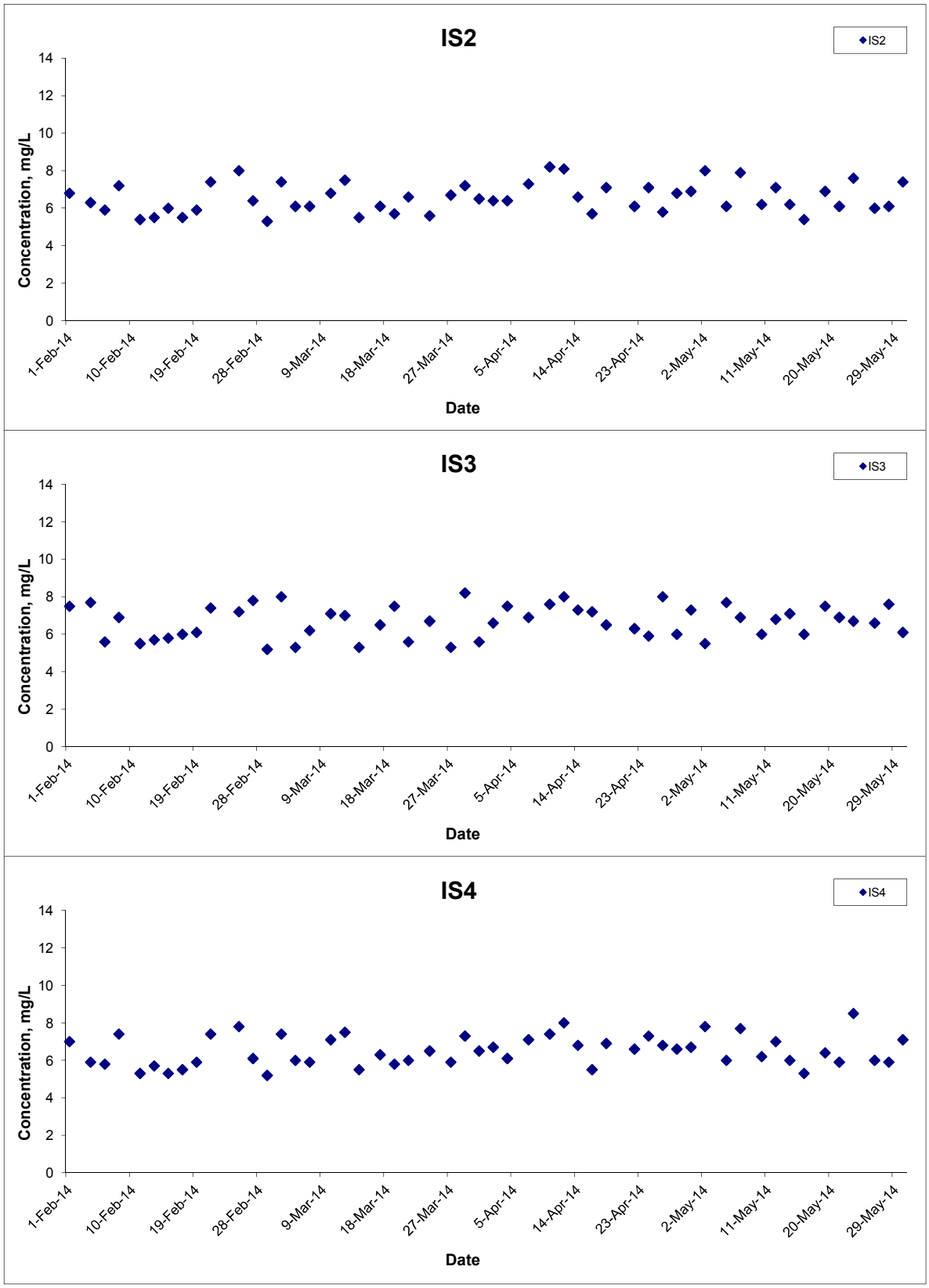
APPENDIX E
GRAPHICAL PRESENTATION OF WATER QUALITY MONITORING RESULTS

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



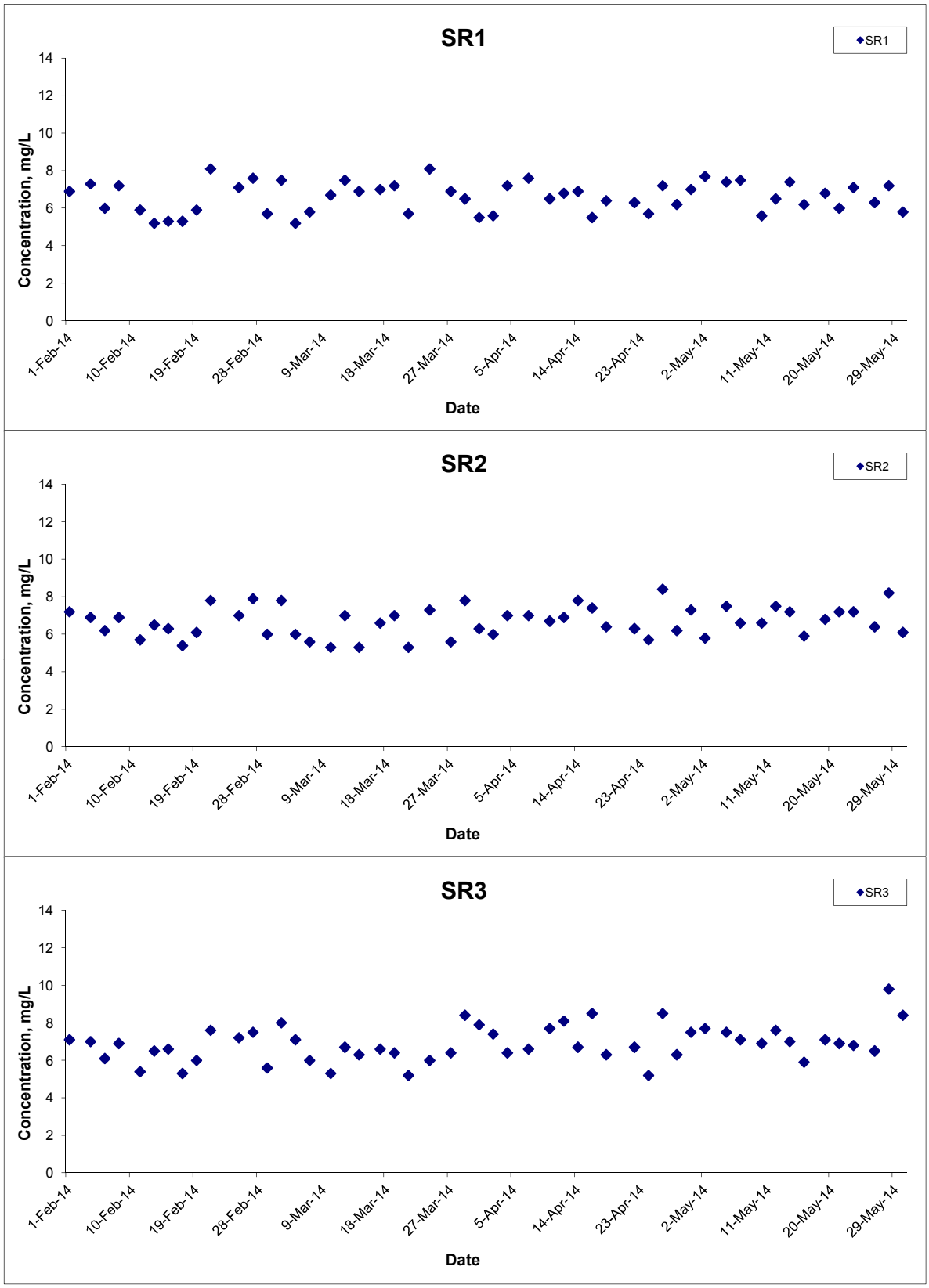
Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
		Date: May 14	Appendix: E	

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: May 14	Appendix: E	

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



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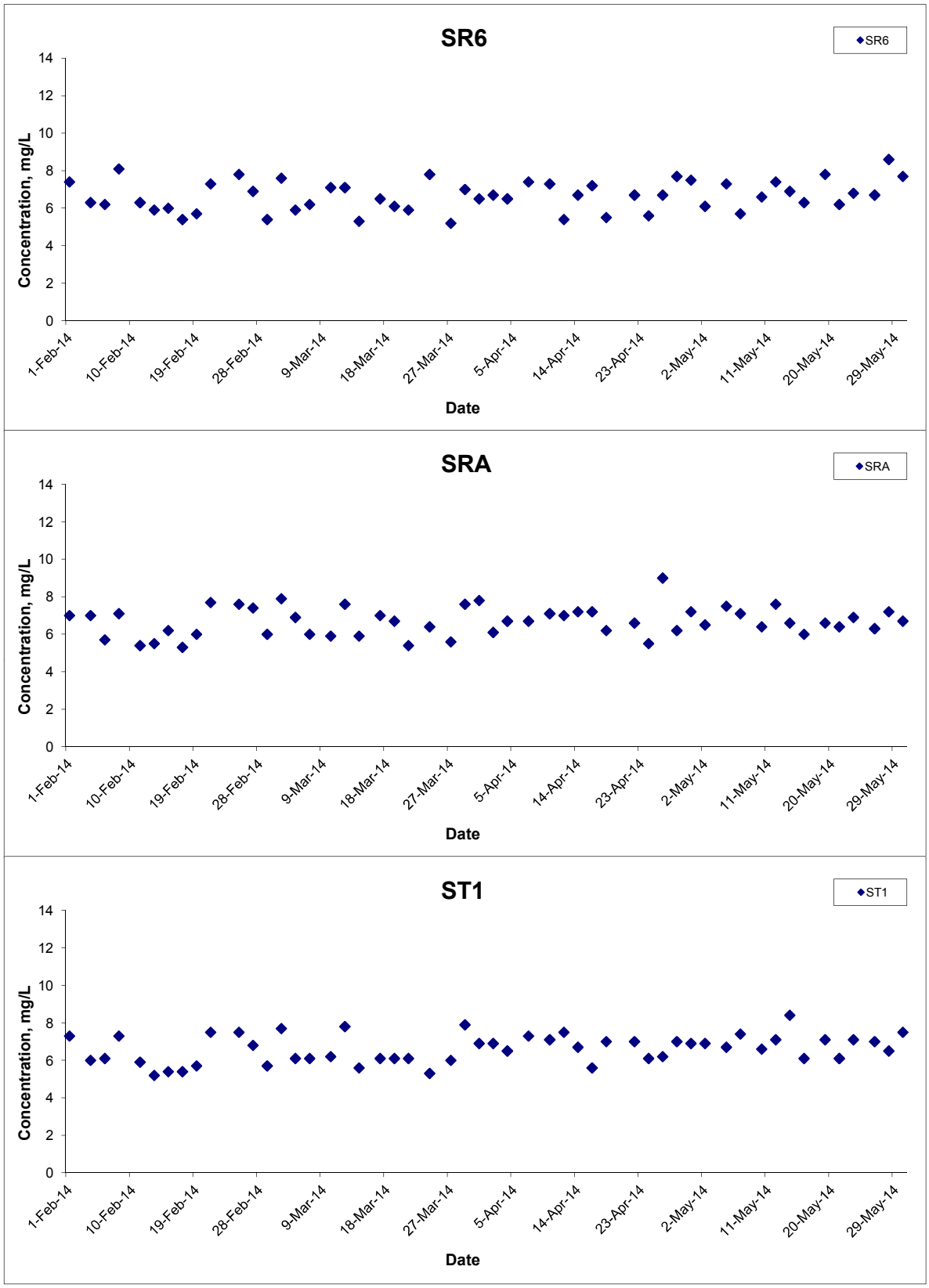
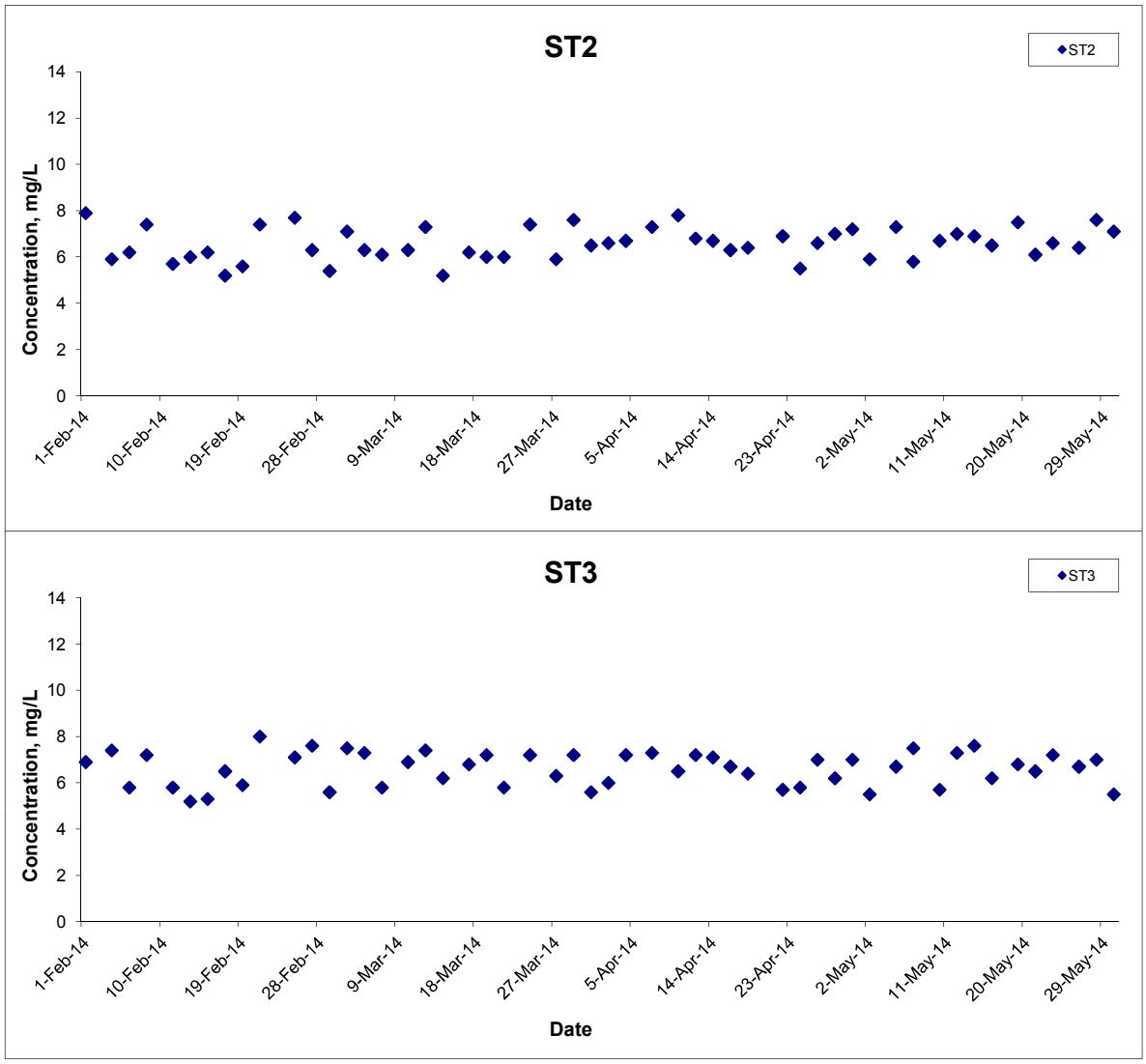
		Date: May 14	Appendix: E	

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



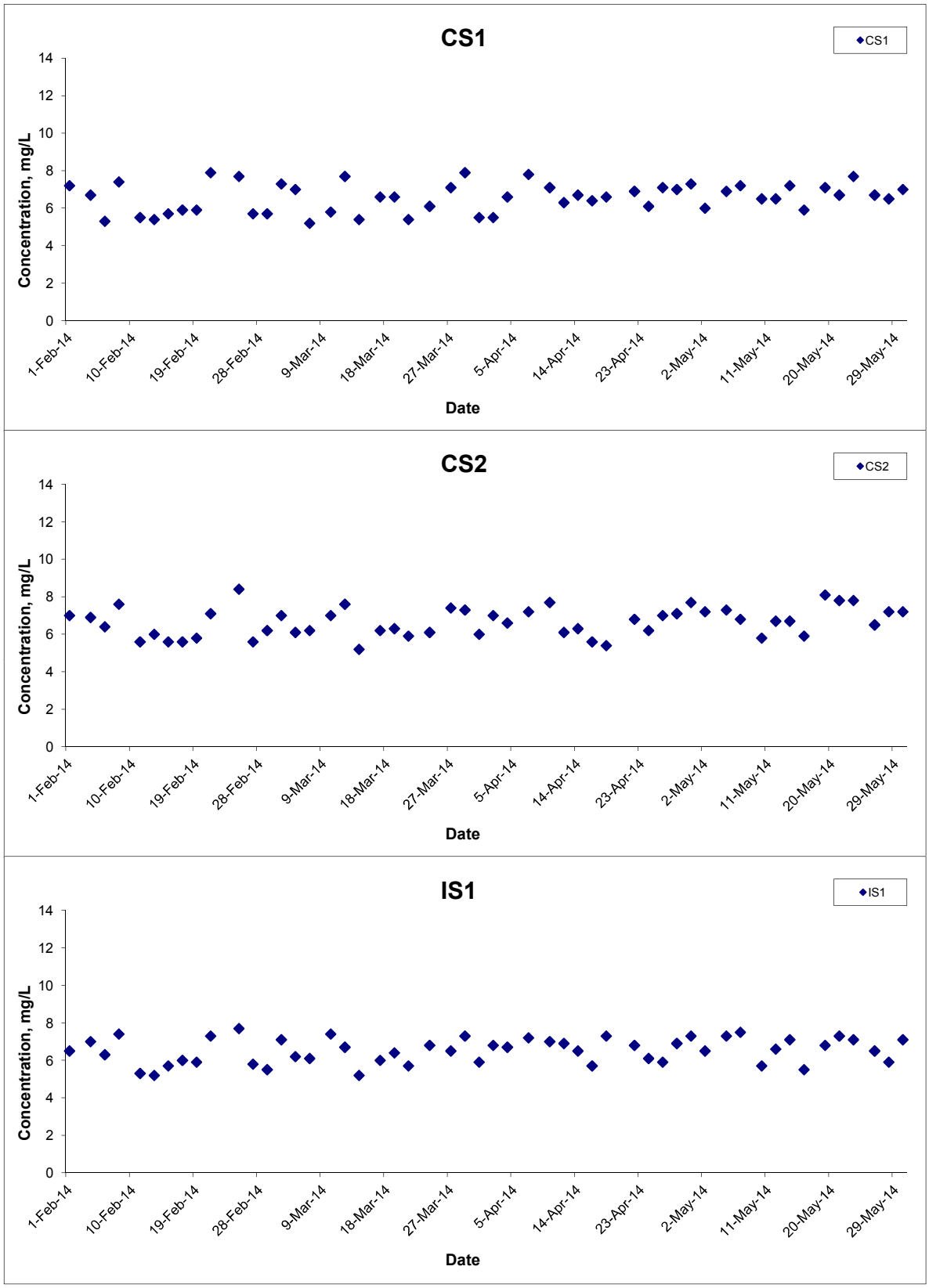
Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
		Date: May 14	Appendix: E	

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 Date: May 14	Project No.: MA12014 Appendix: E	CINOTECH

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



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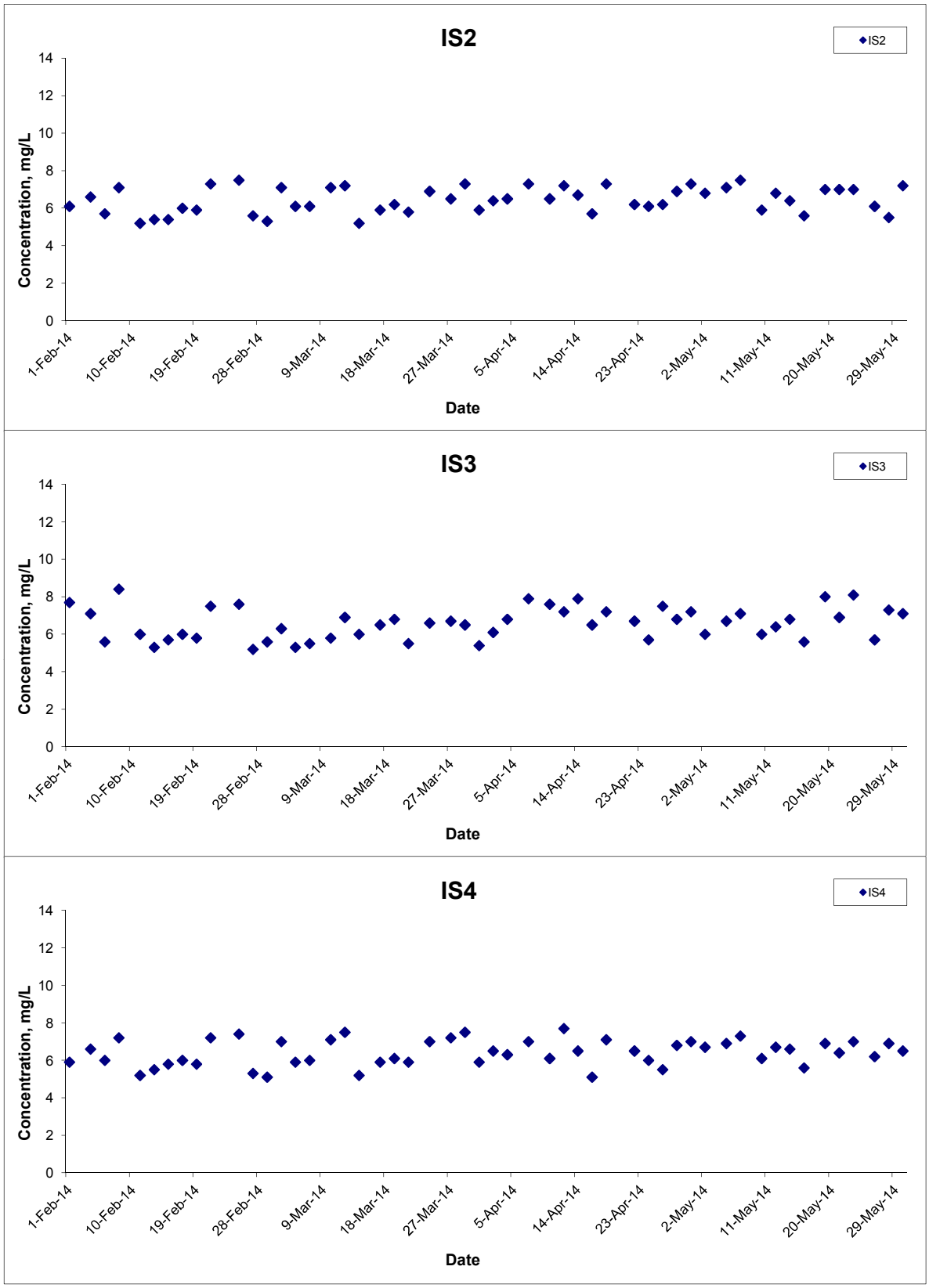
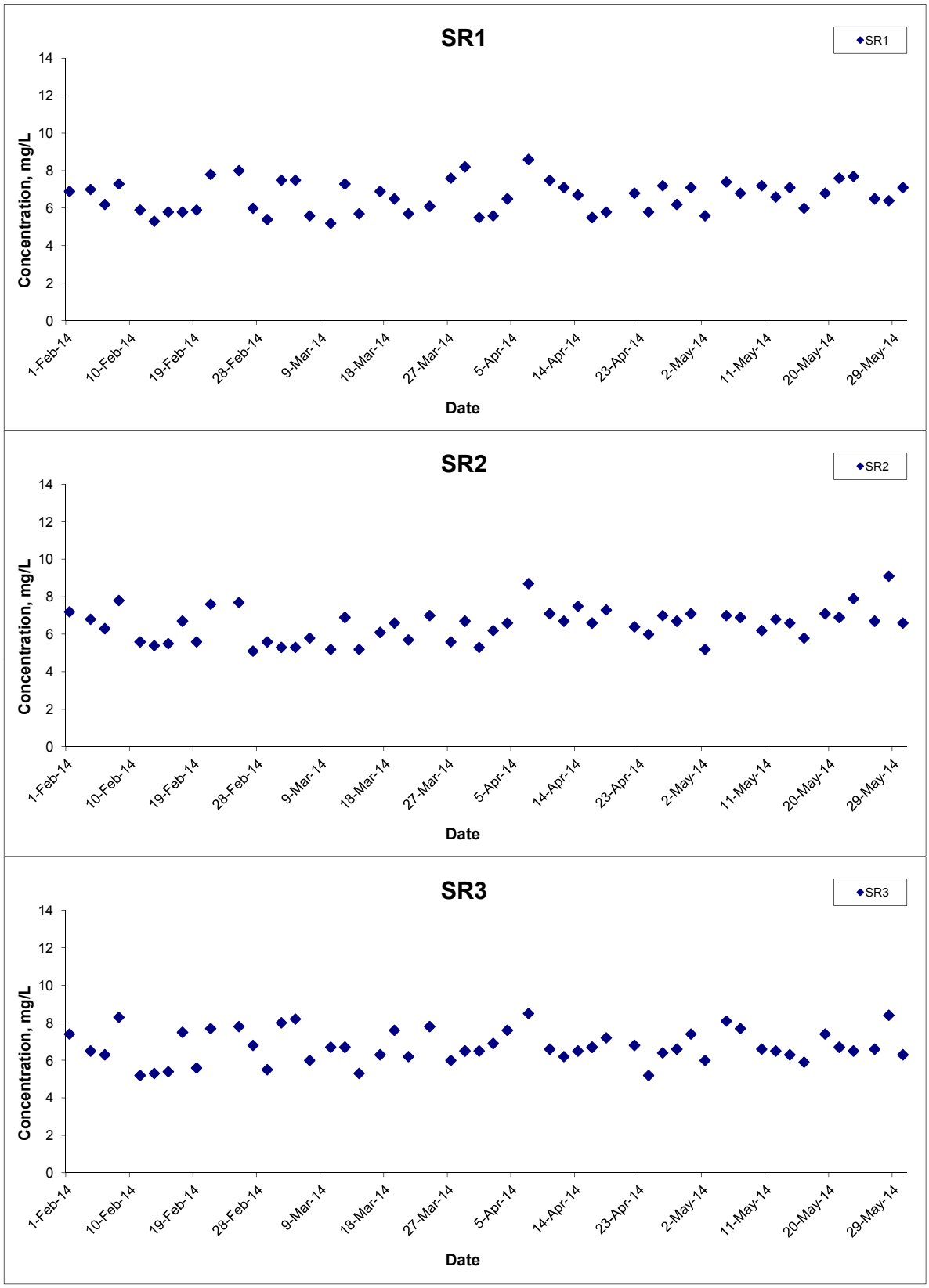
		Date: May 14	Appendix: E	

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: May 14	Appendix: E	

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



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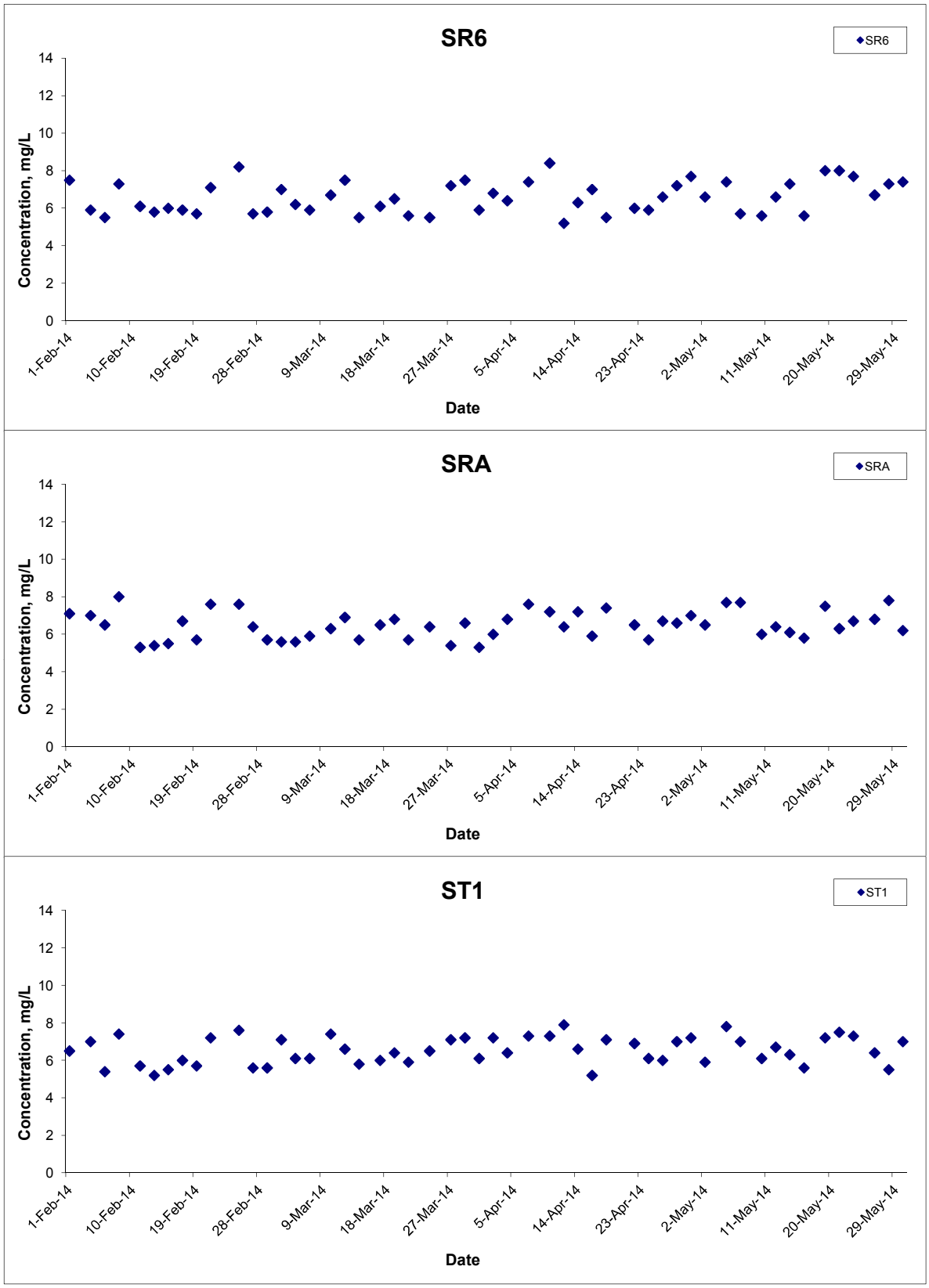

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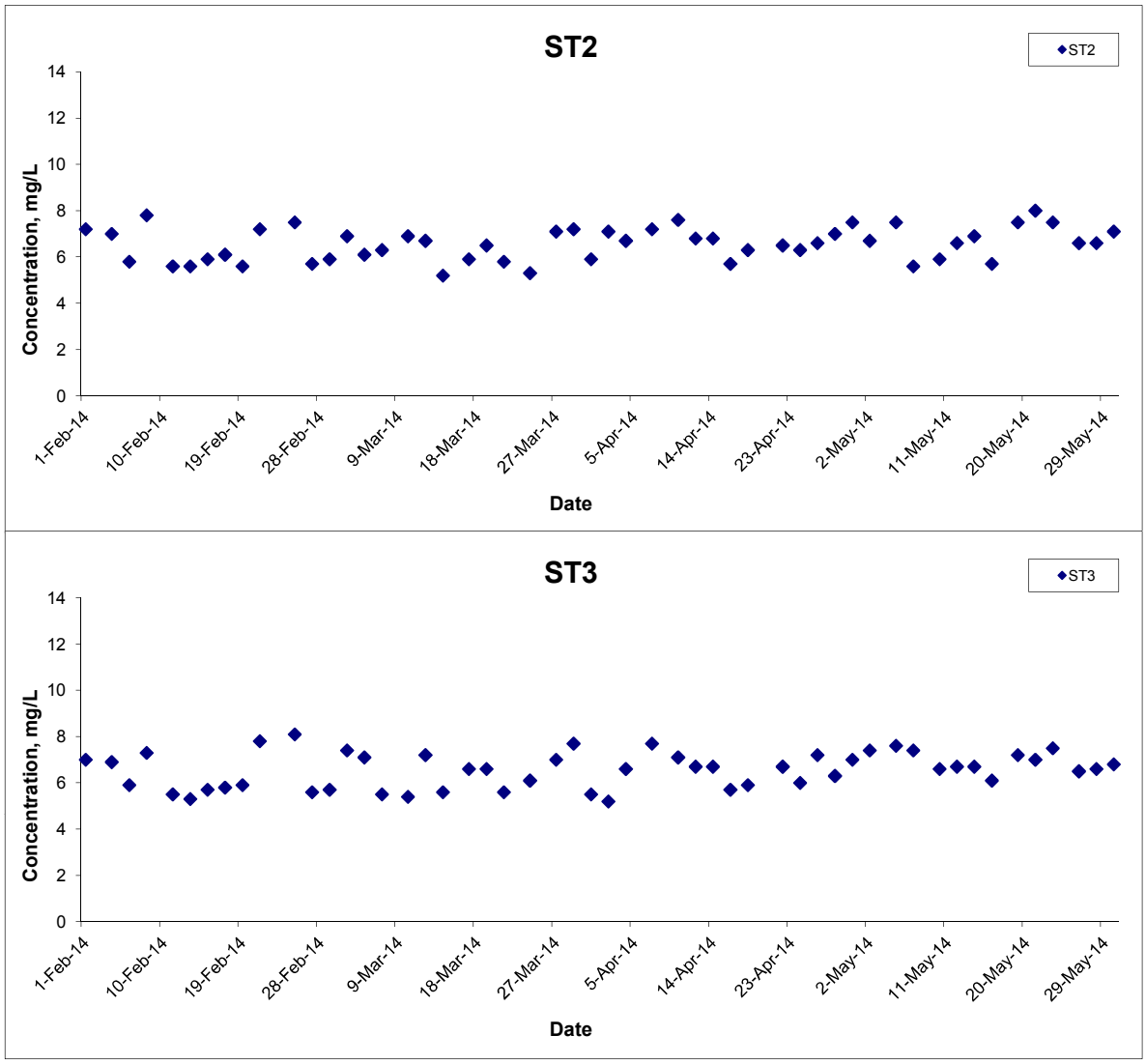

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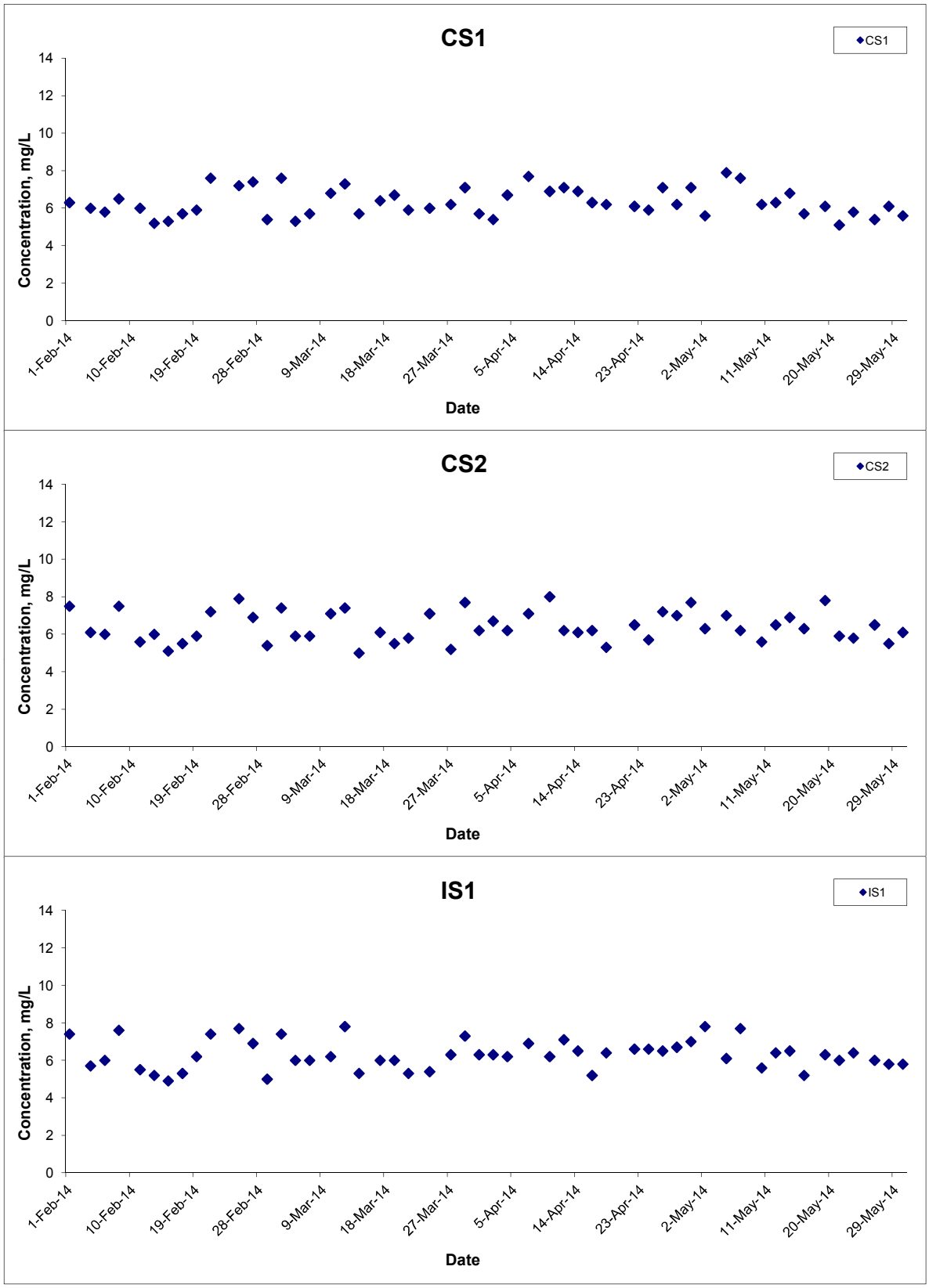
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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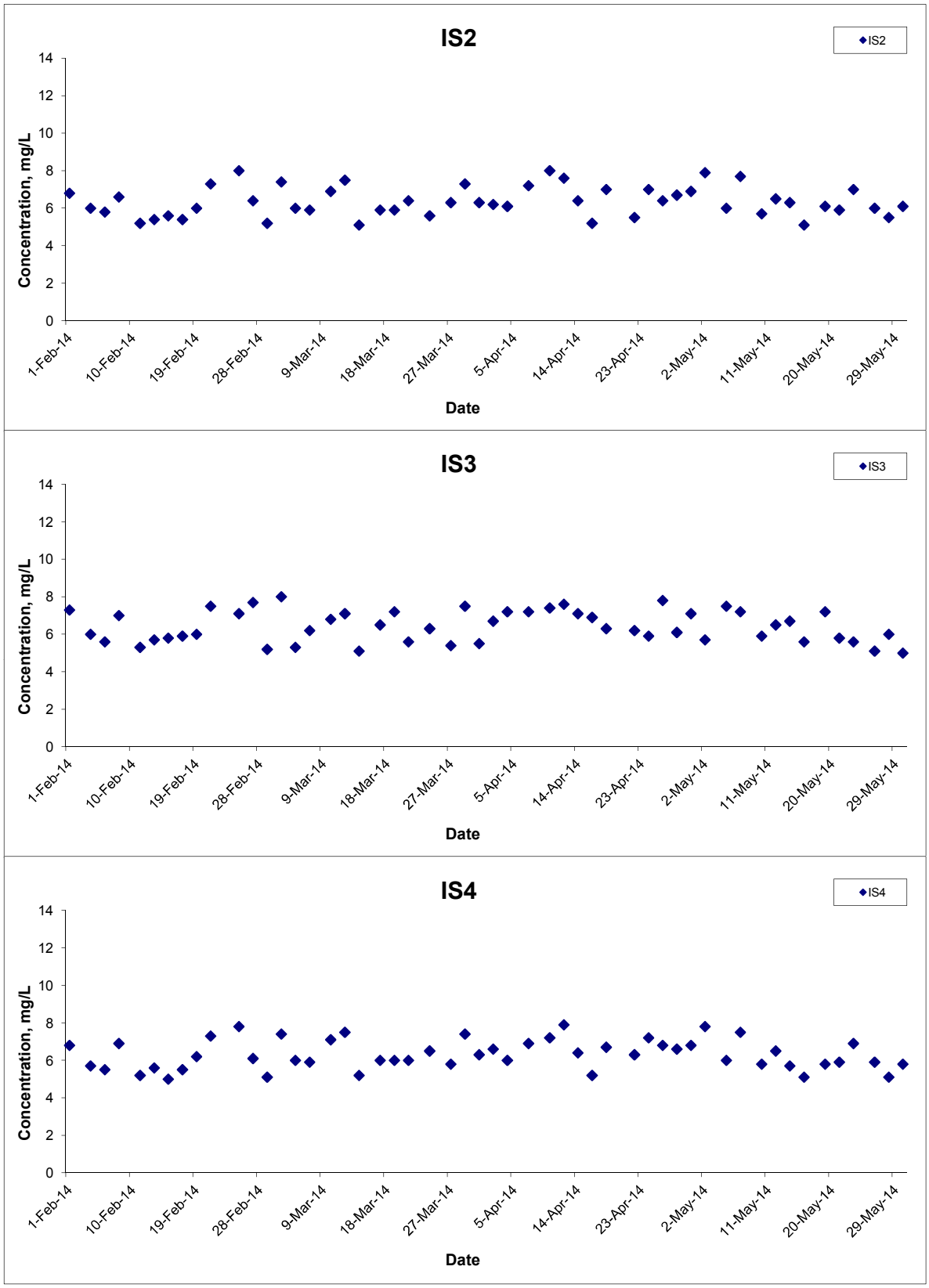
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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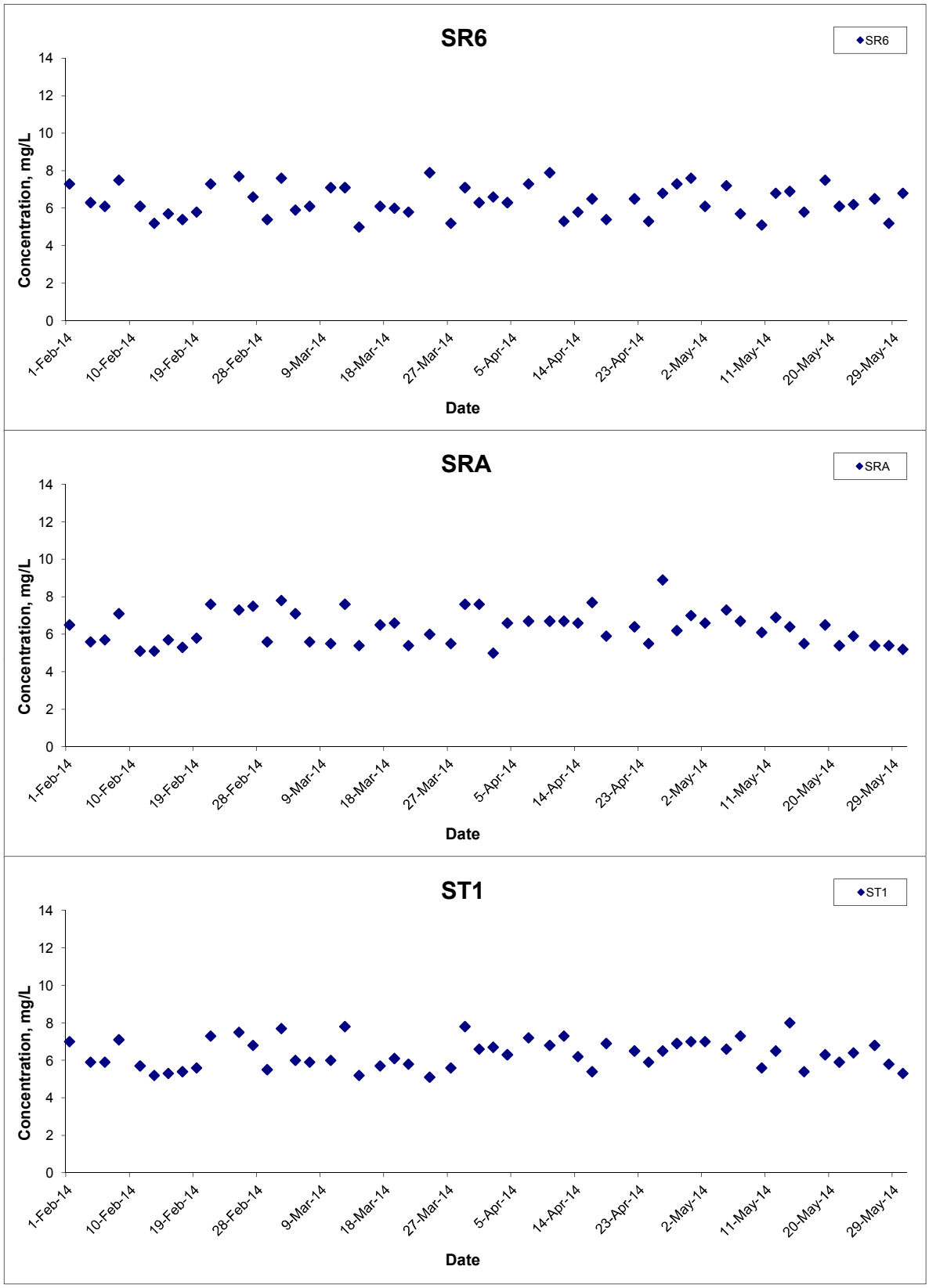
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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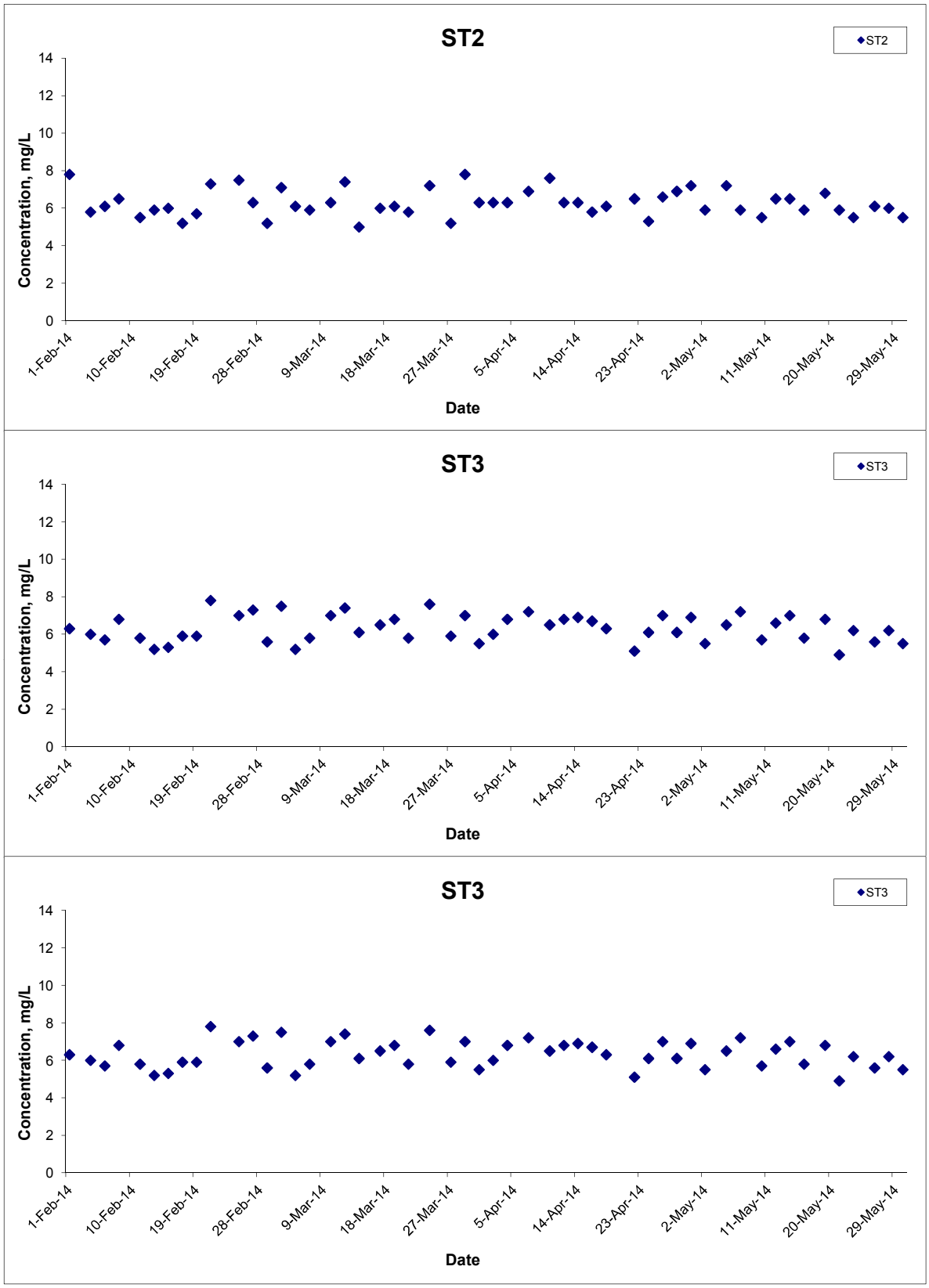

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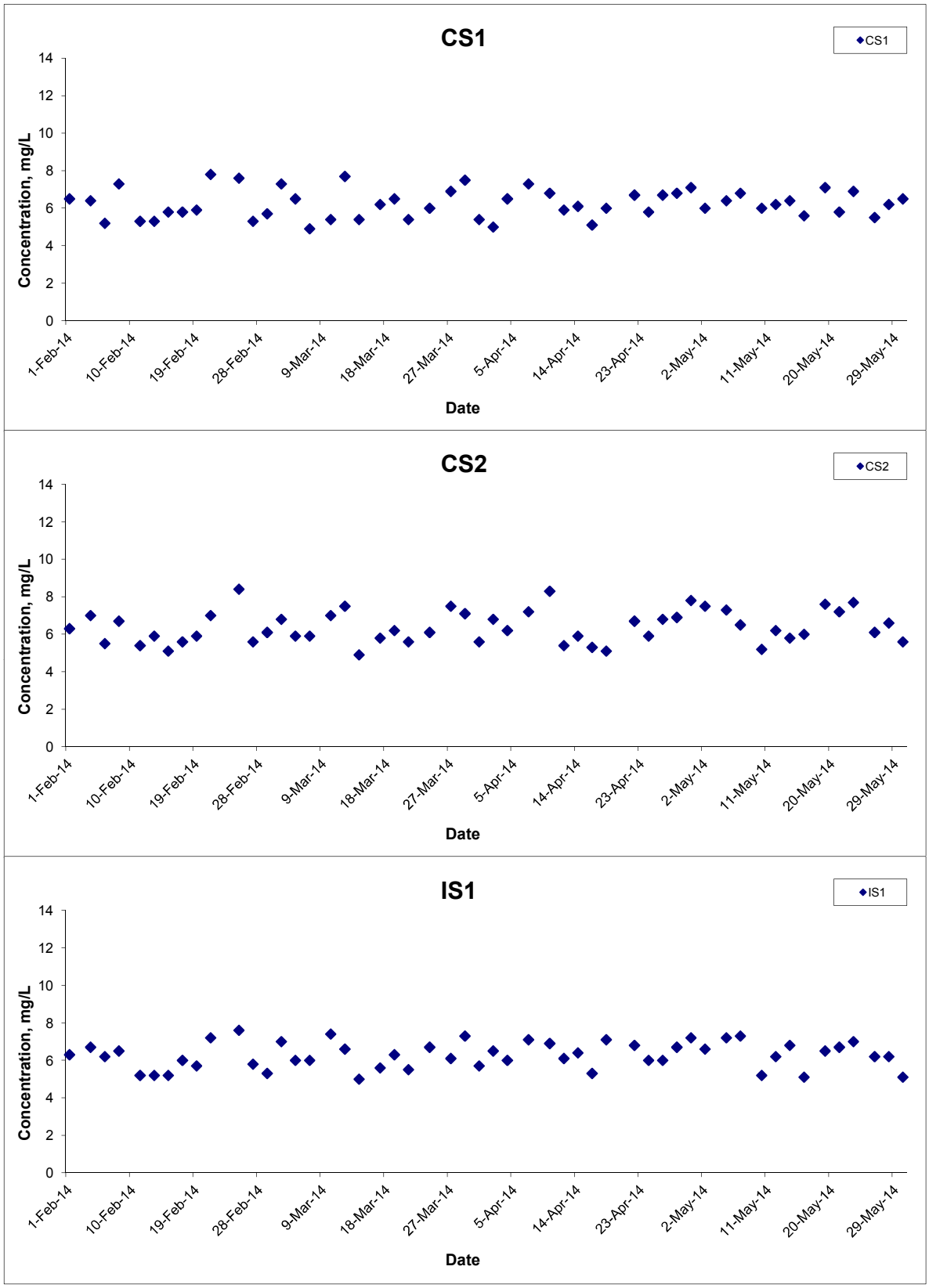

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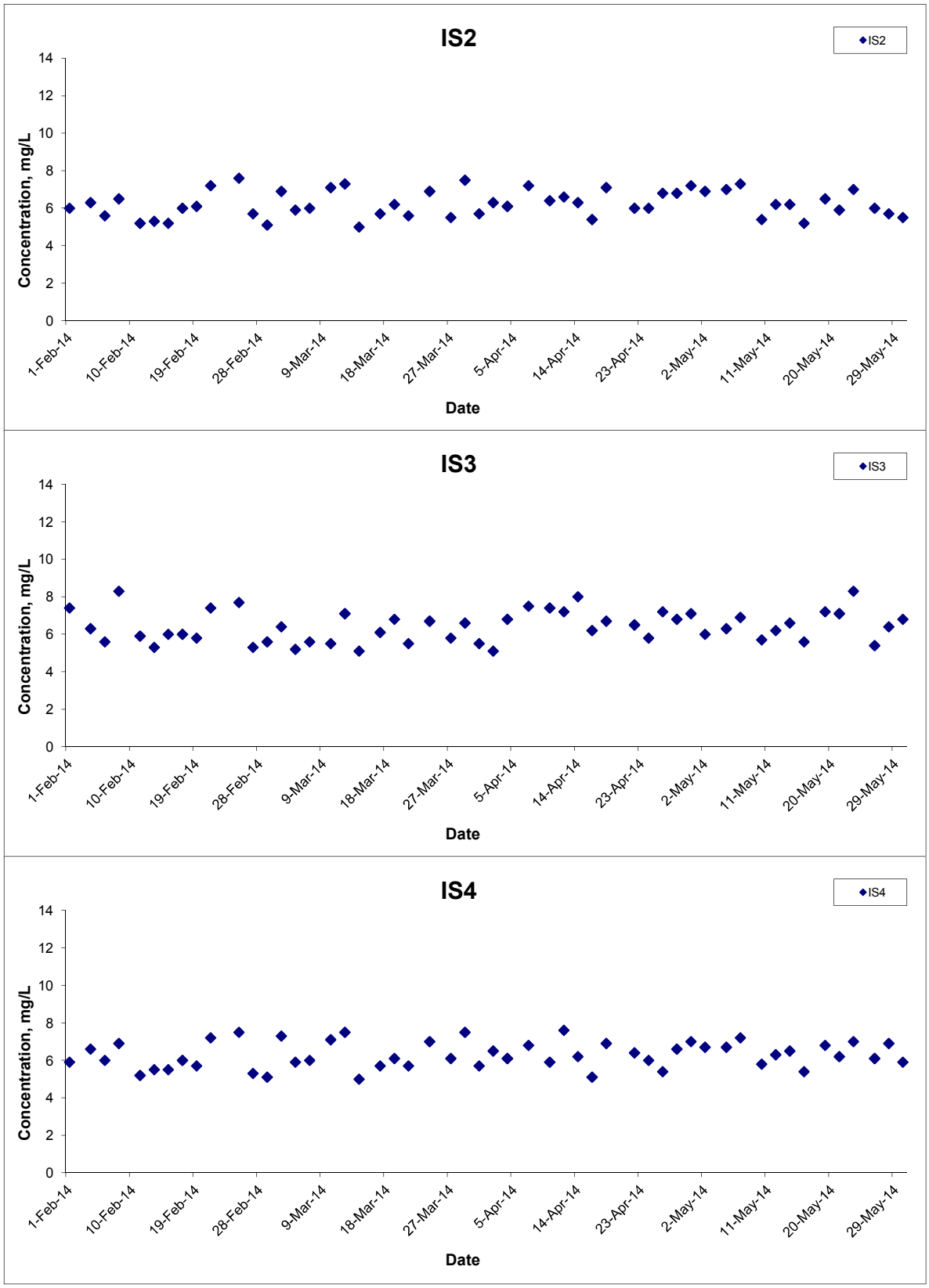

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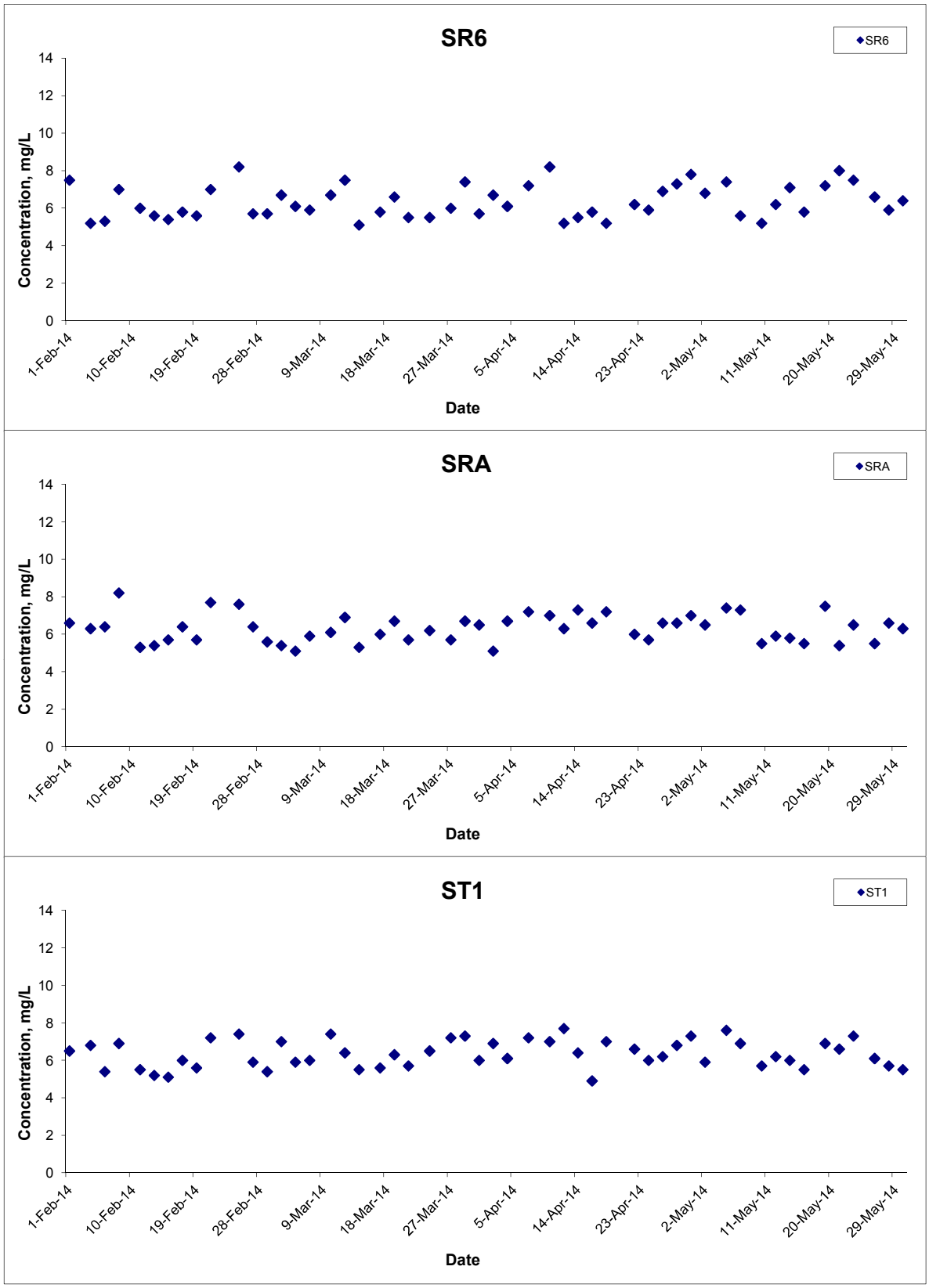

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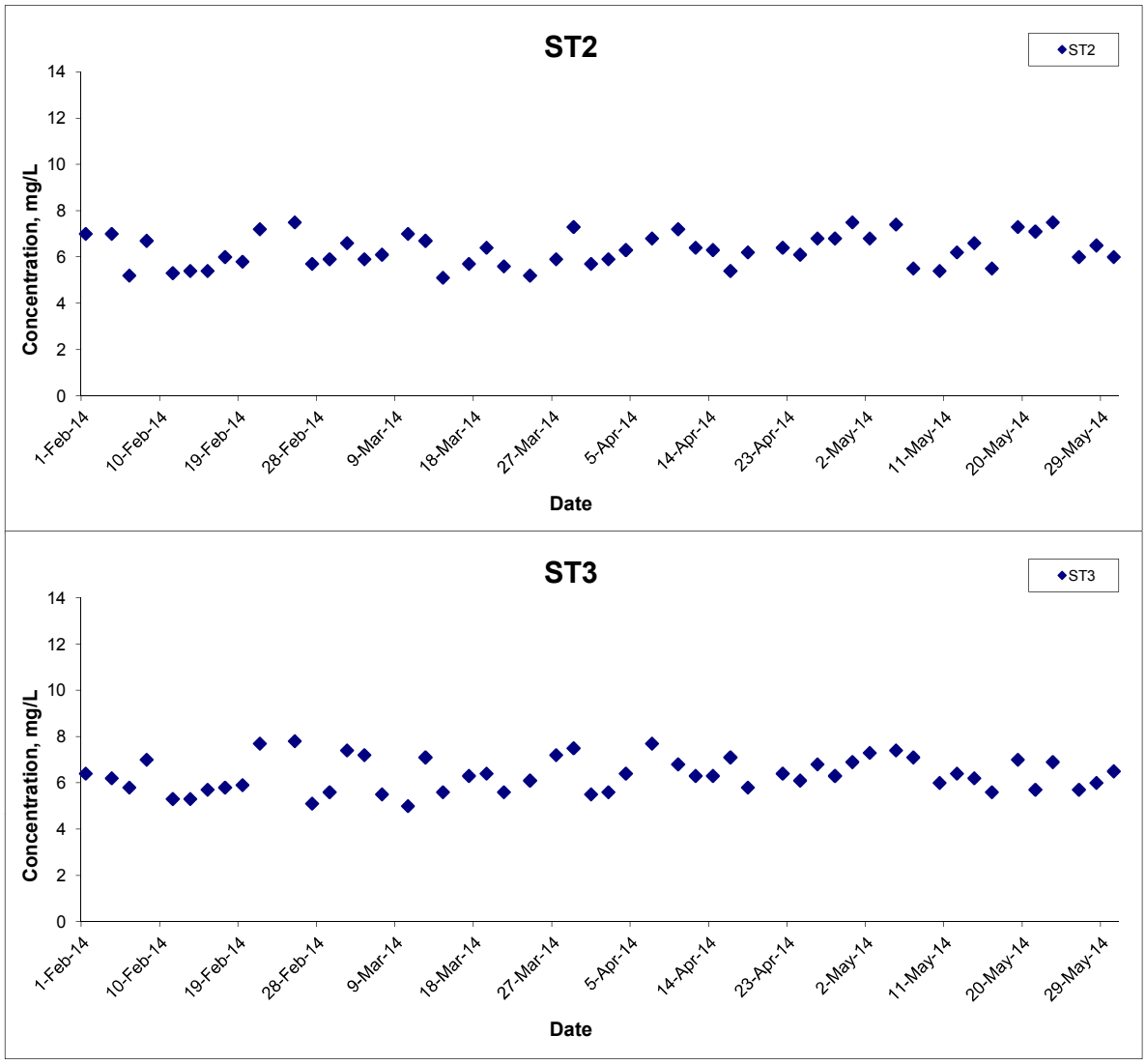

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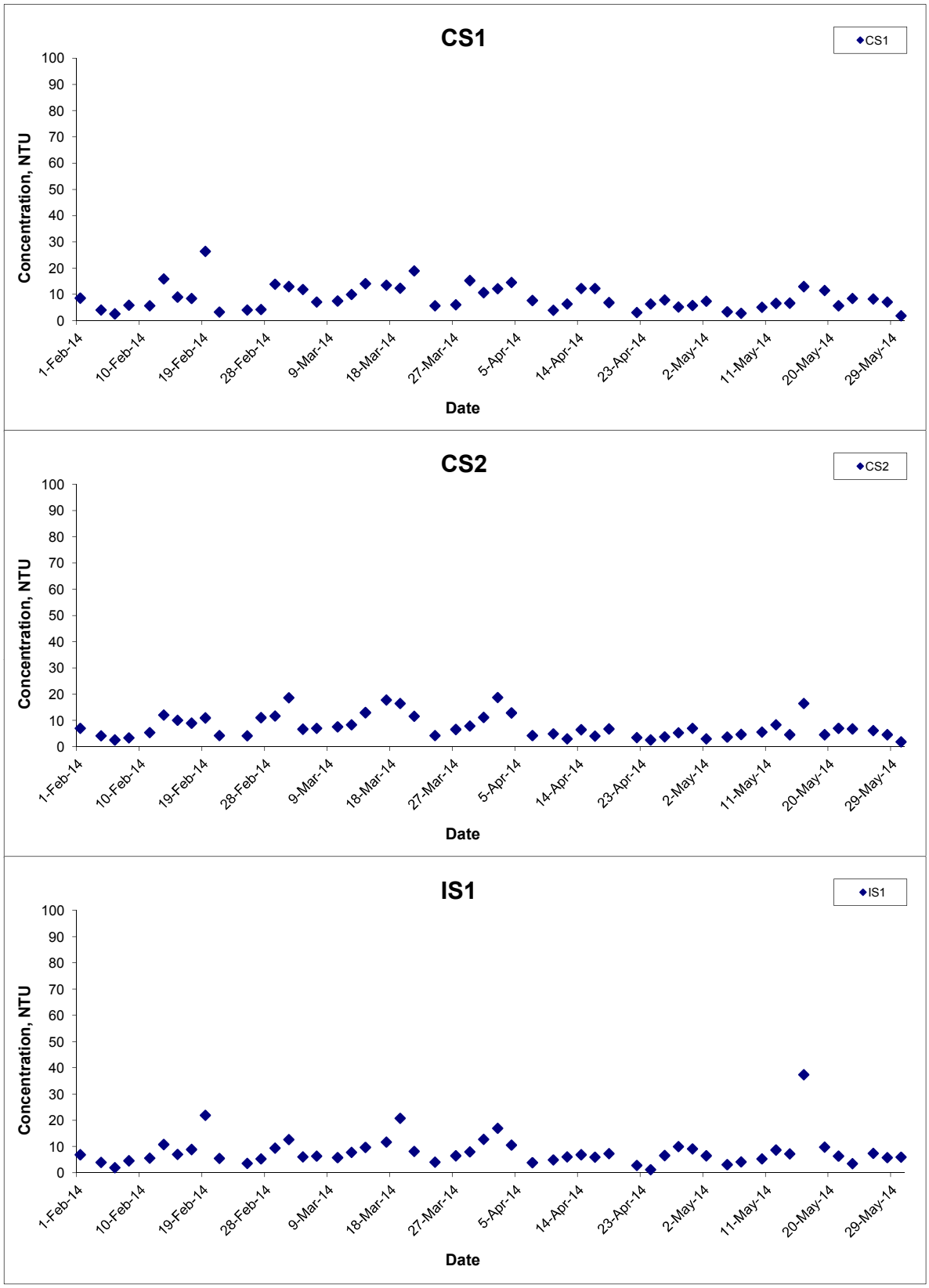
Turbidity (Depth-averaged) at Mid-Ebb Tide



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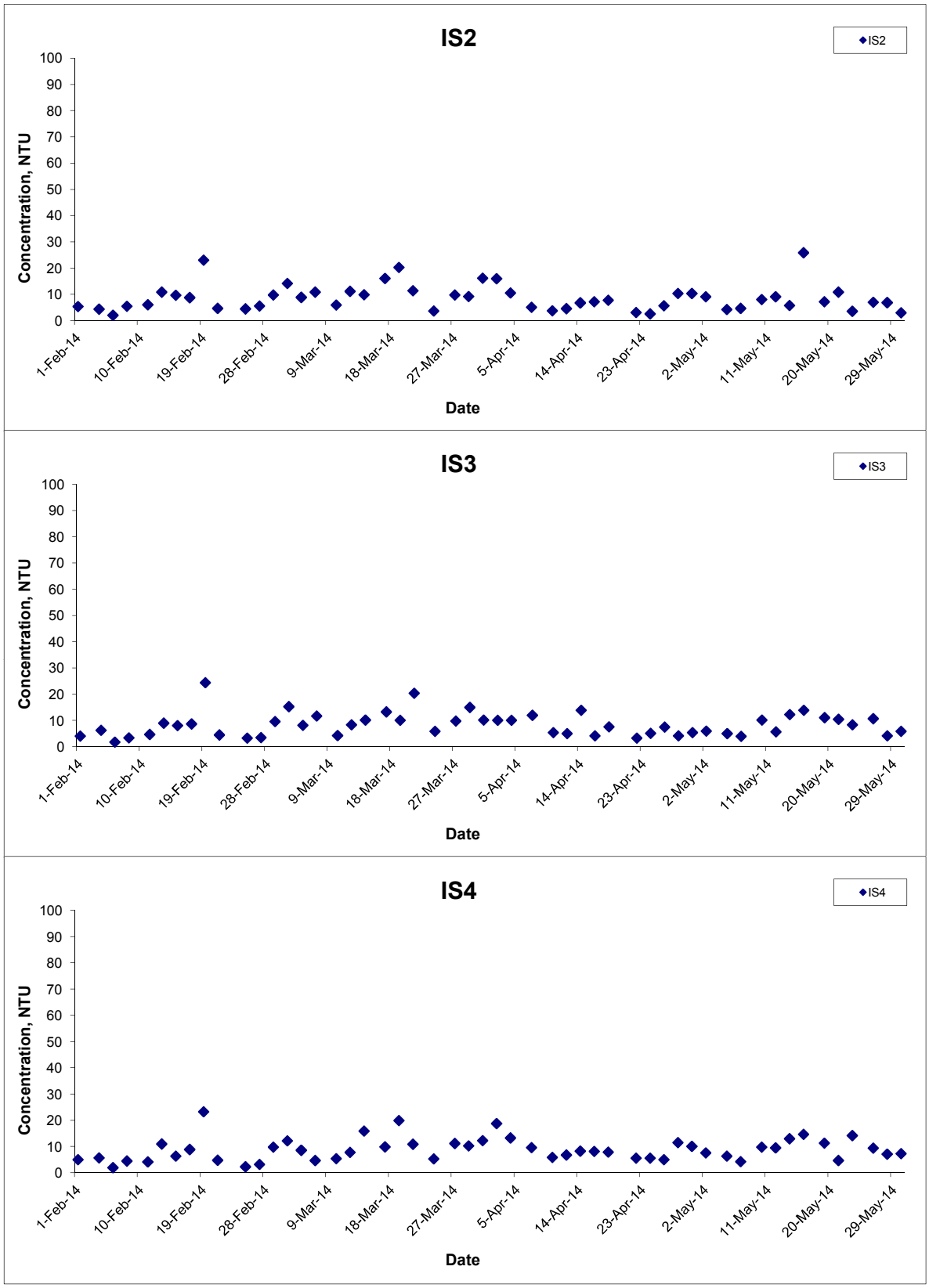

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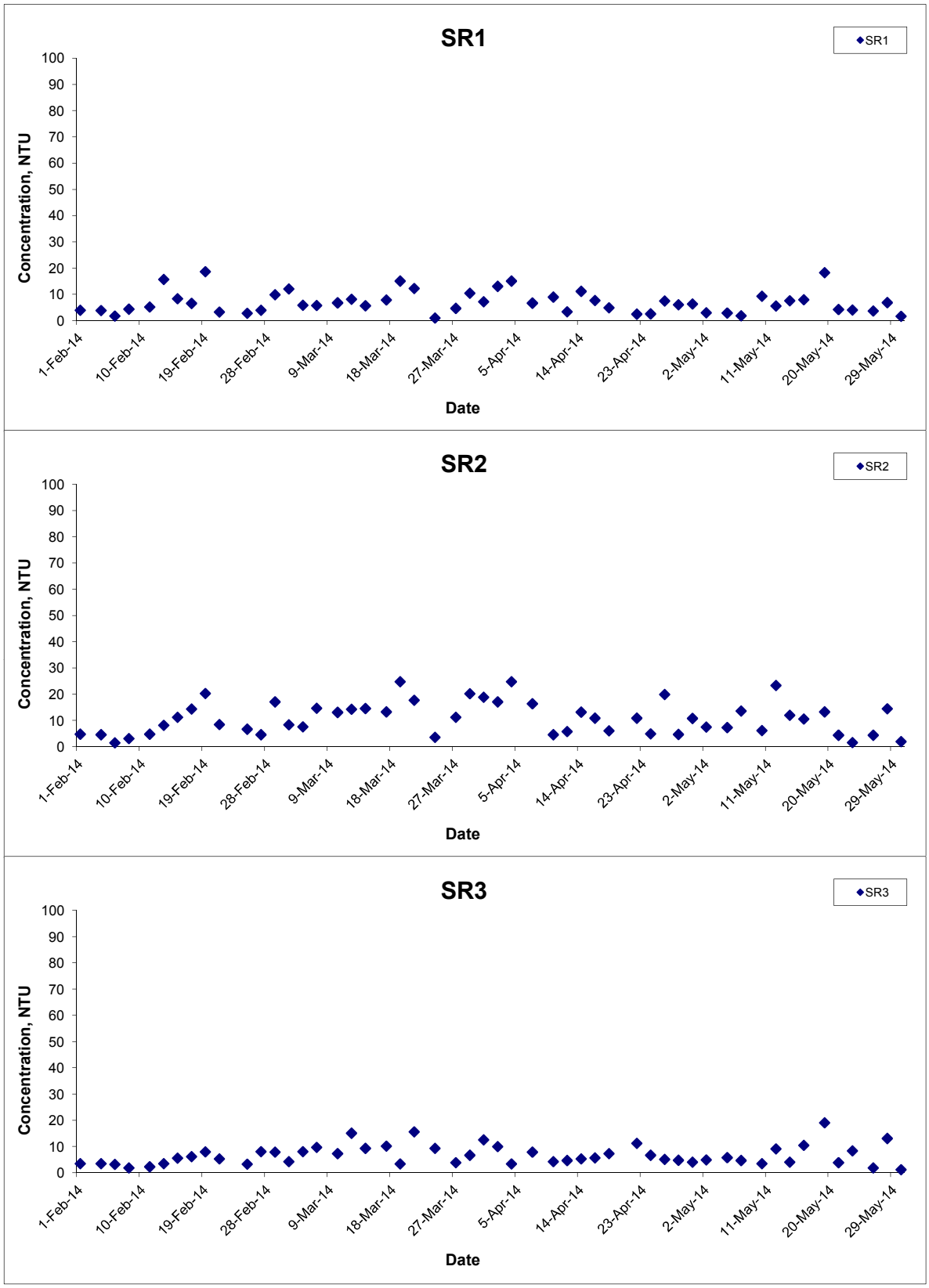
Turbidity (Depth-averaged) at Mid-Ebb Tide



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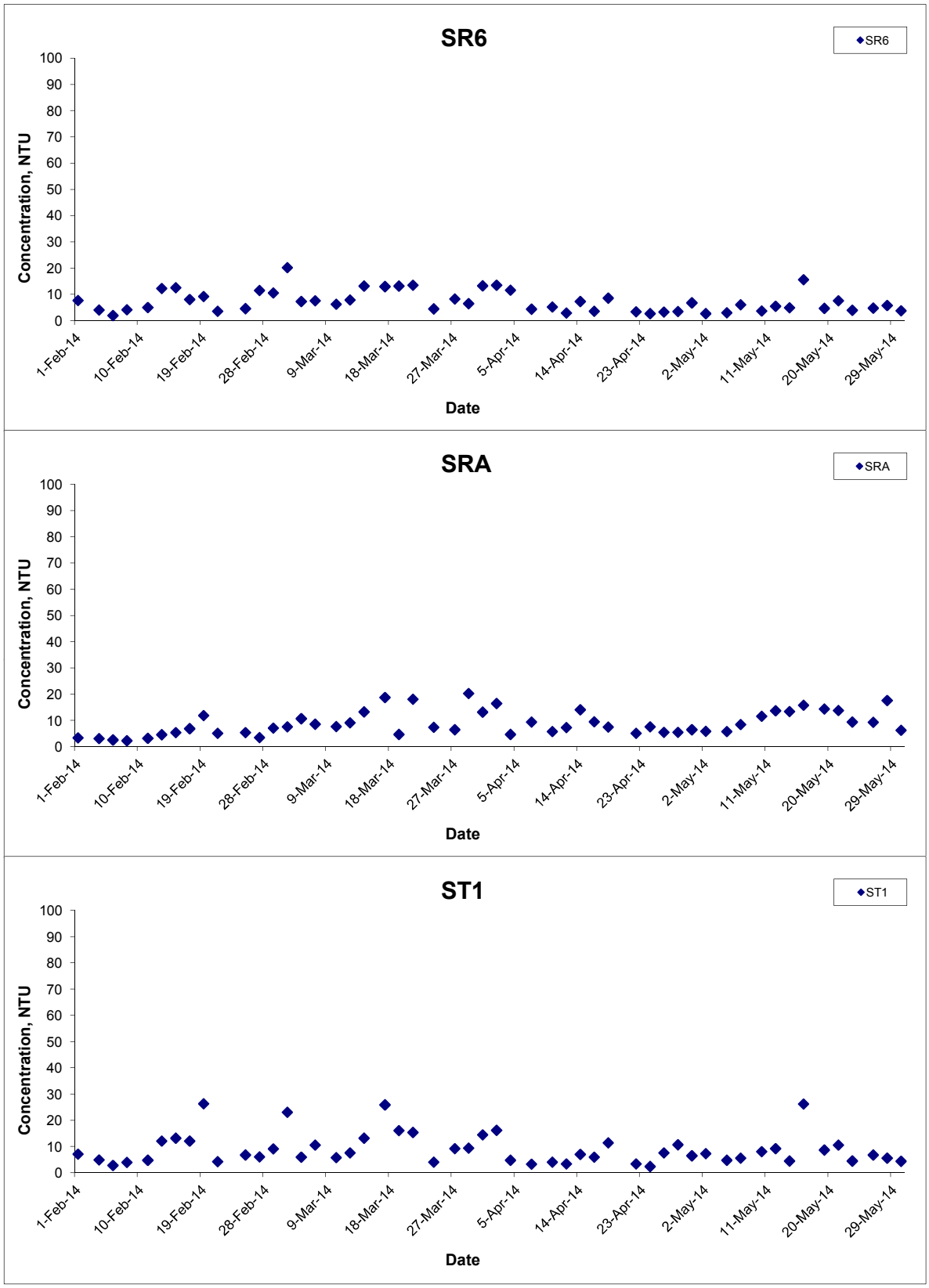

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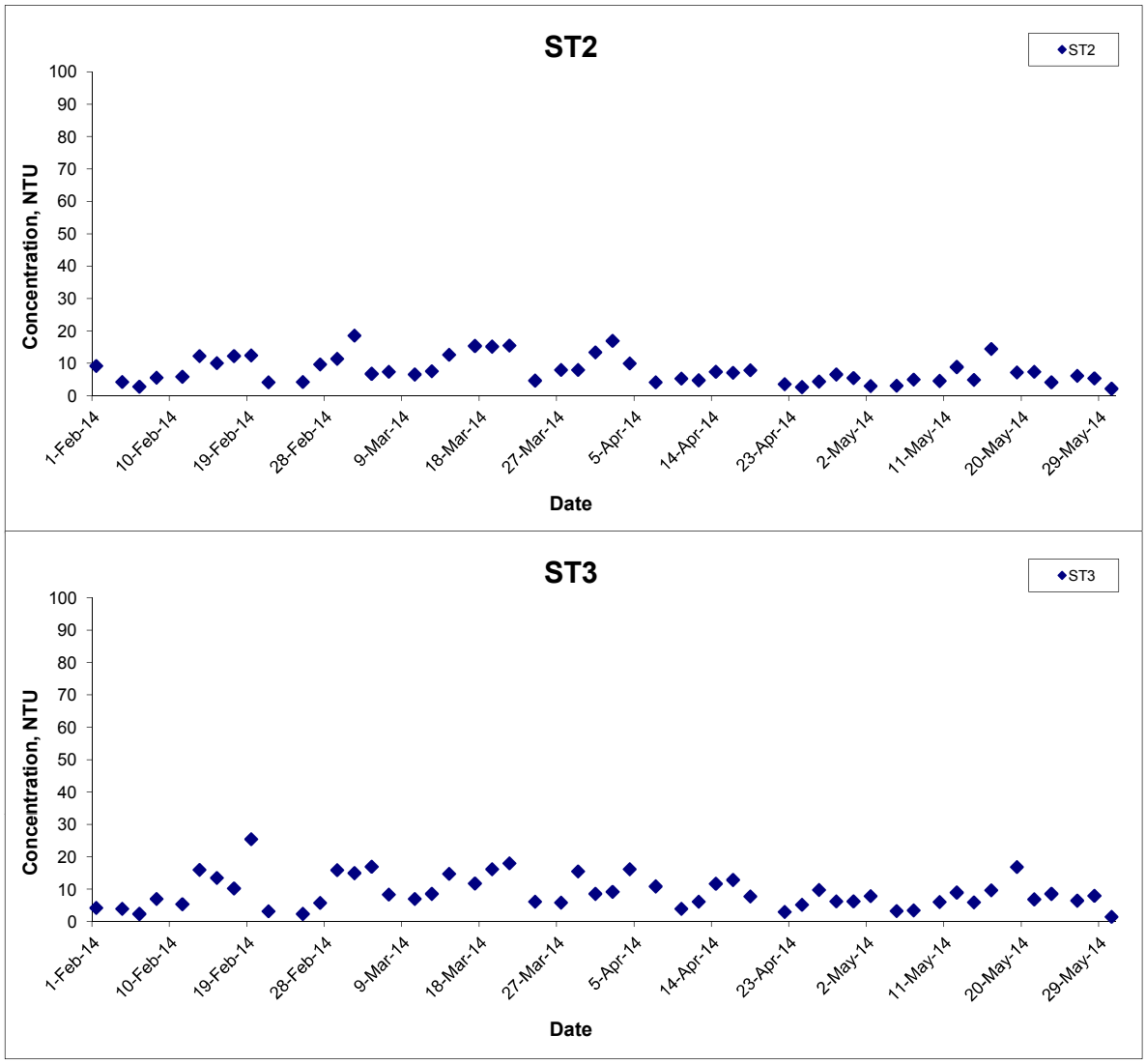

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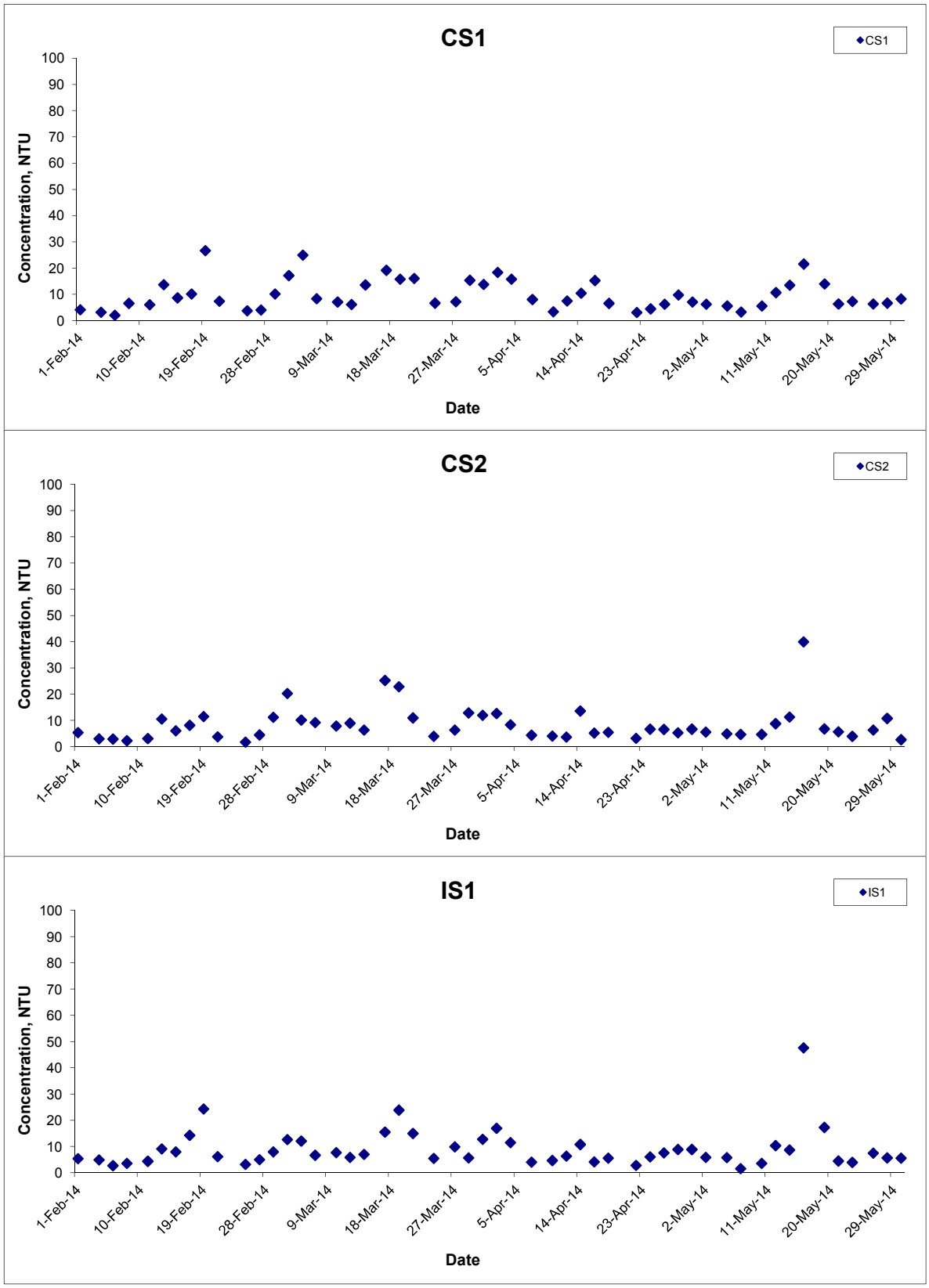
Turbidity (Depth-averaged) at Mid-Flood Tide



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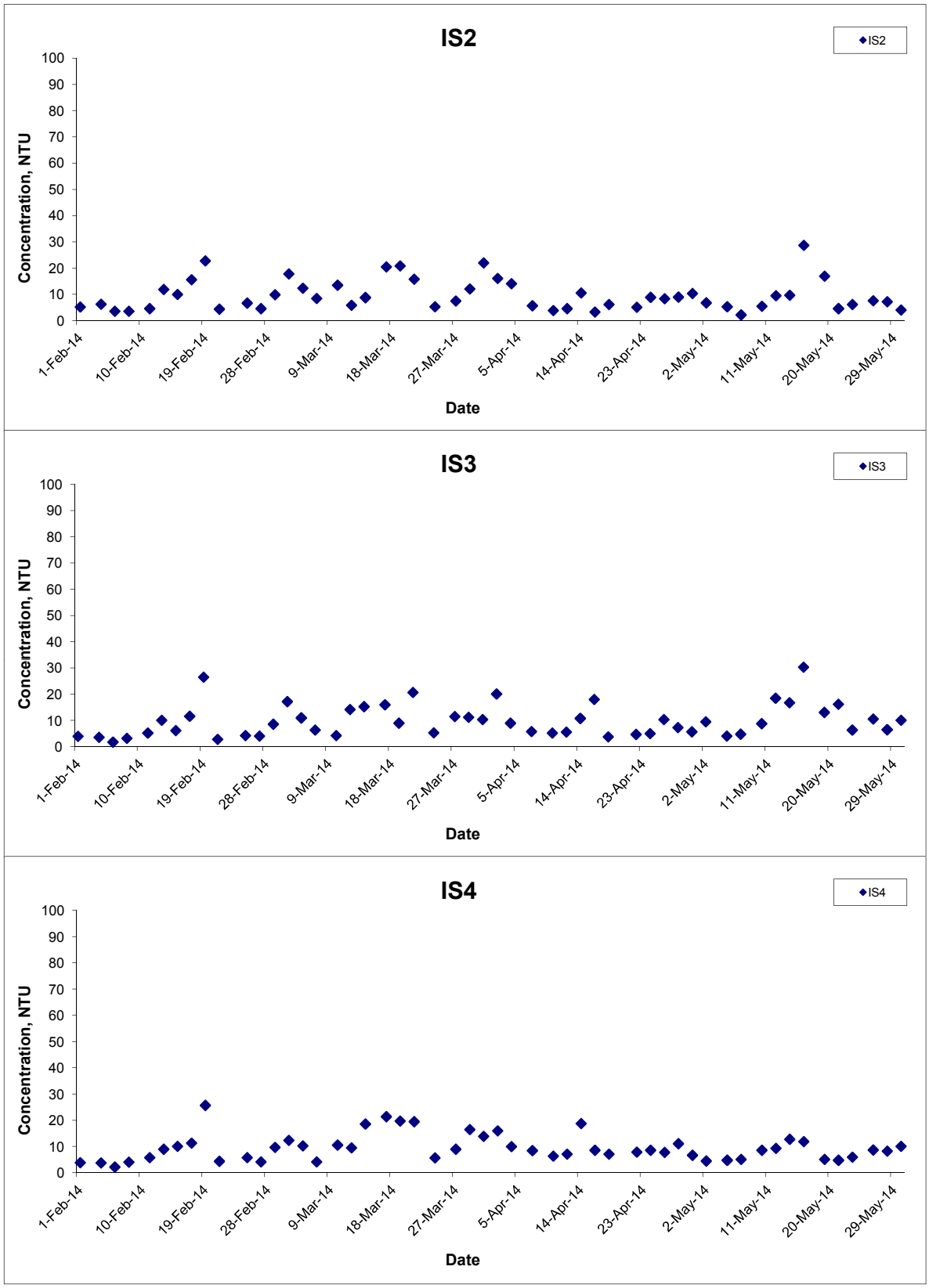
Turbidity (Depth-averaged) at Mid-Flood Tide



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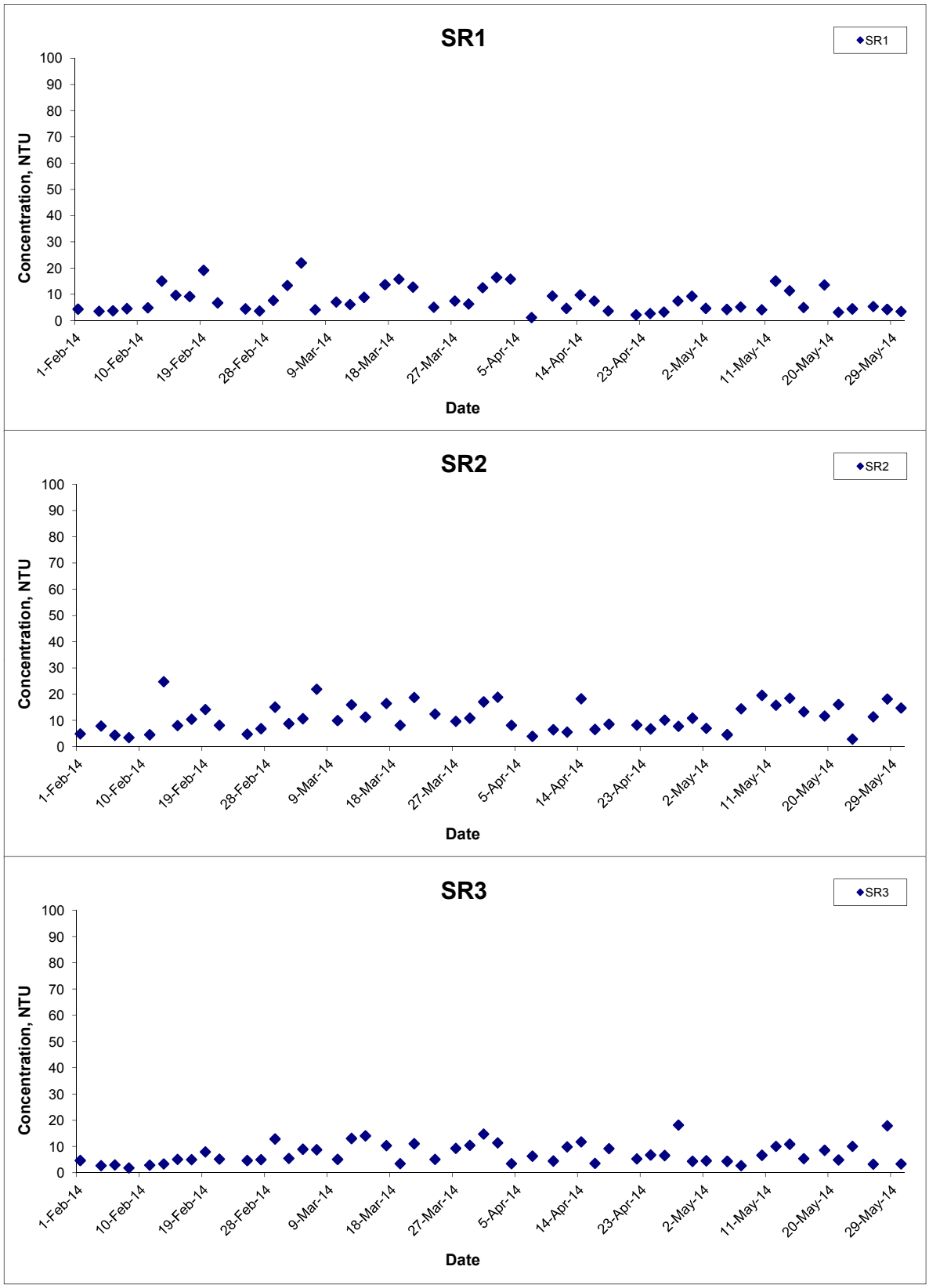
Turbidity (Depth-averaged) at Mid-Flood Tide



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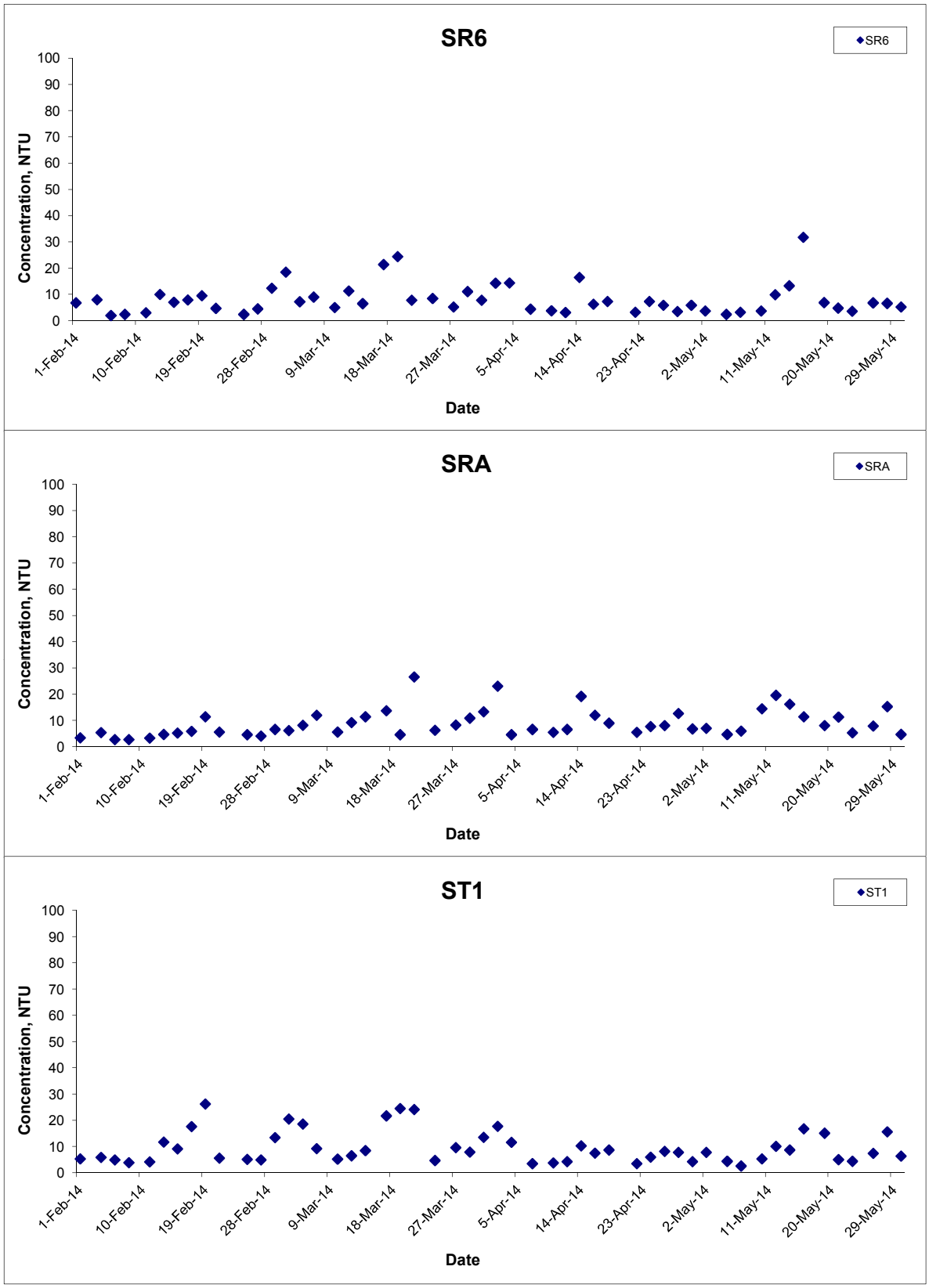

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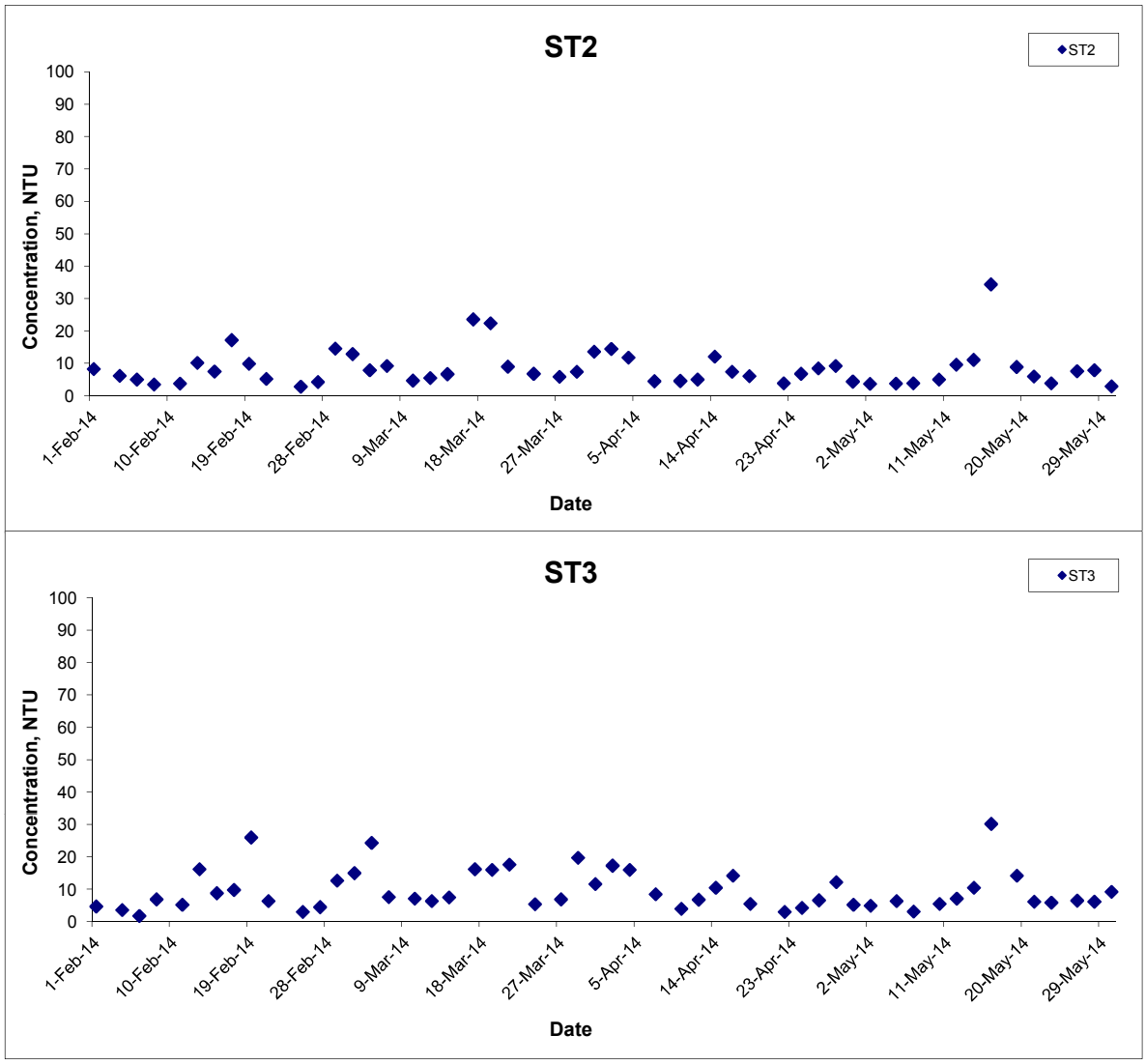

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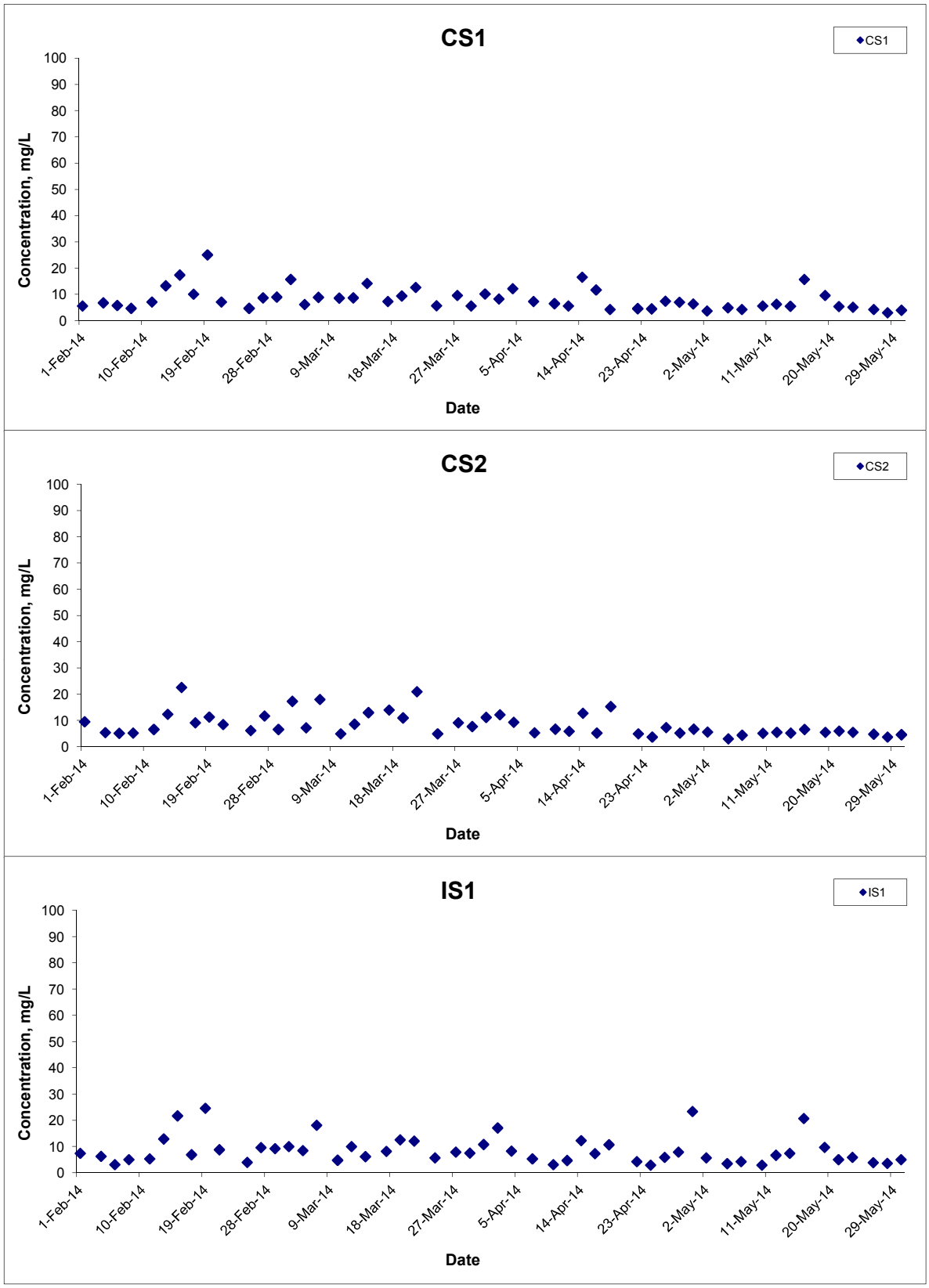
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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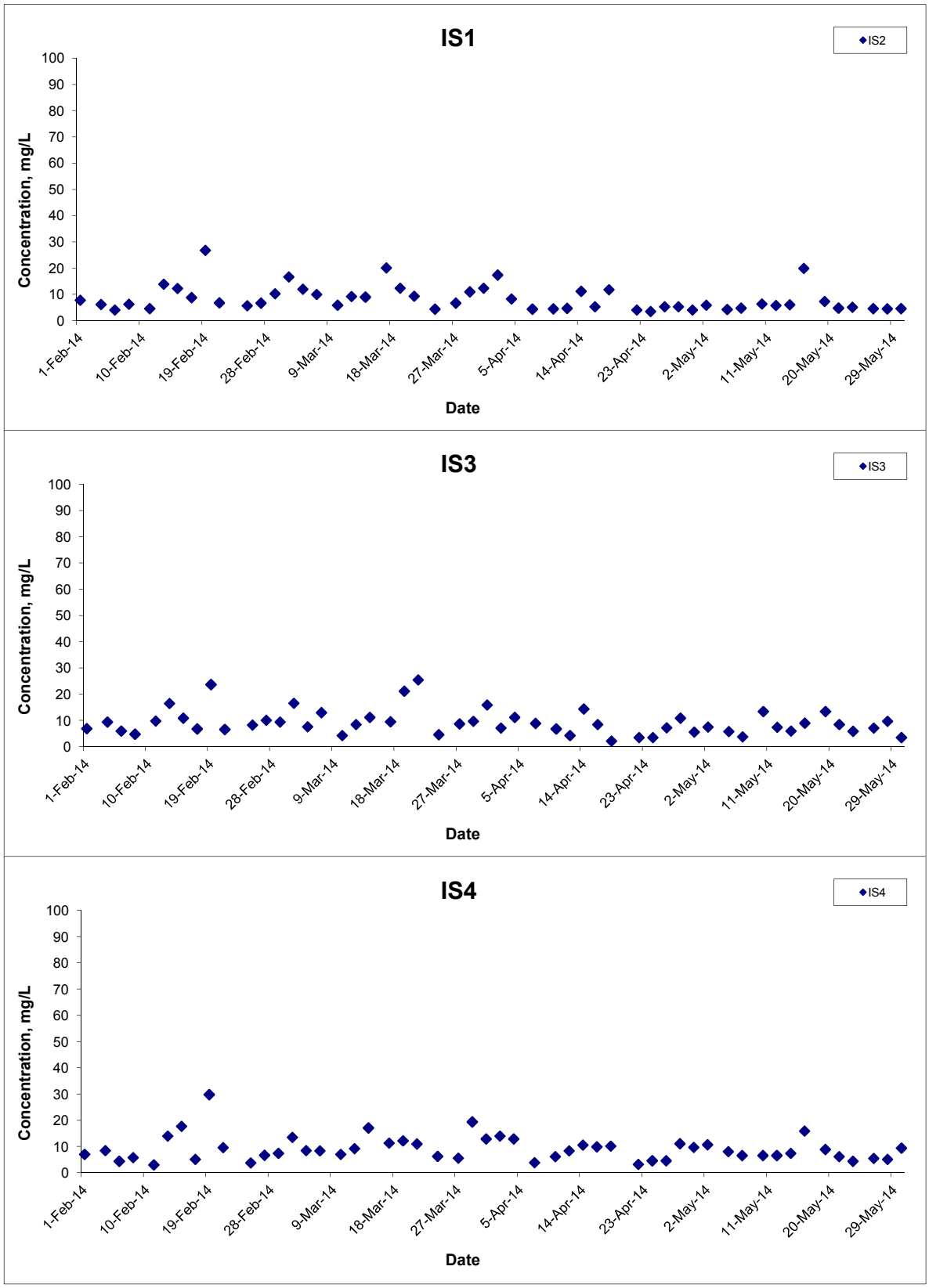

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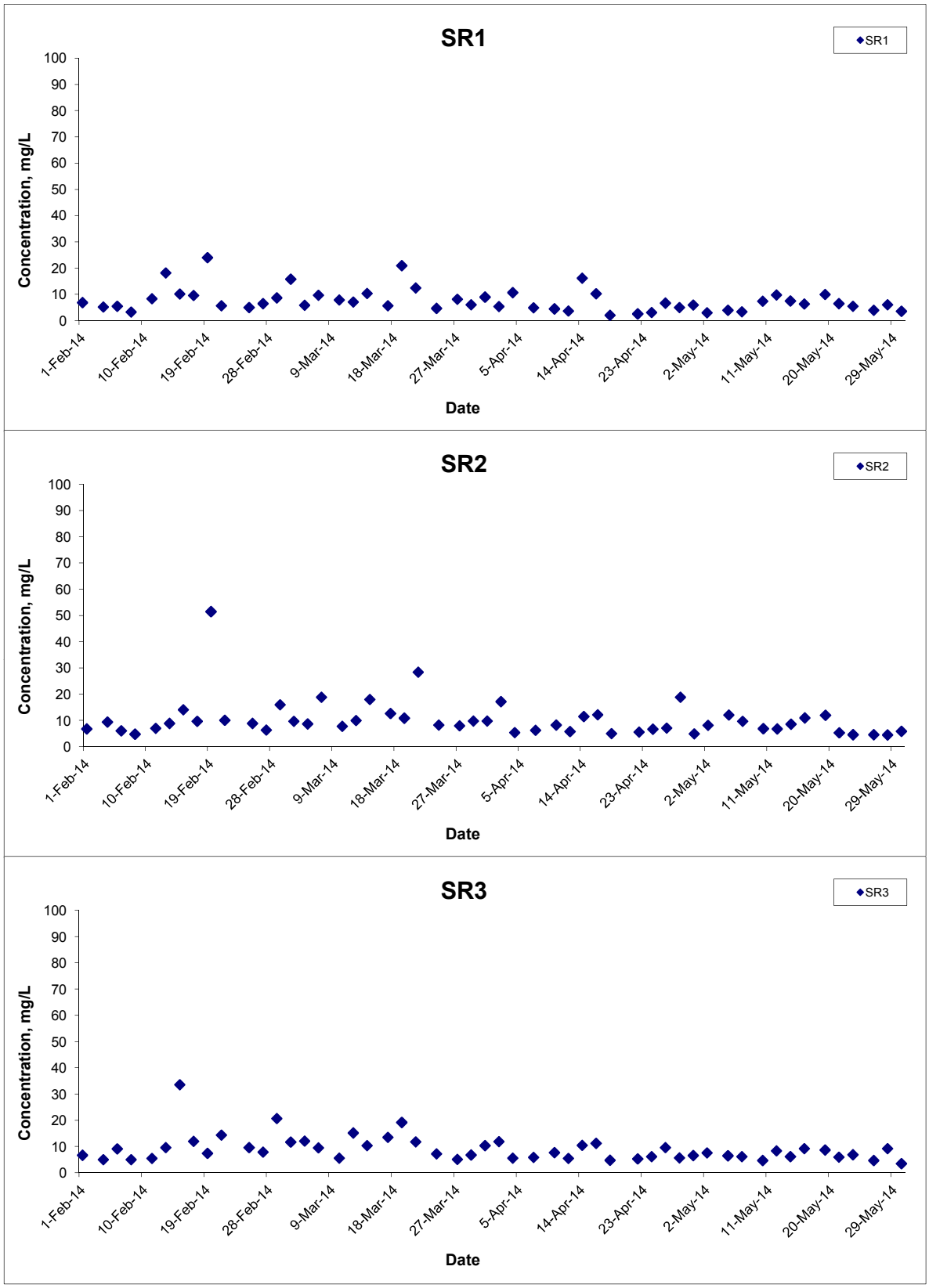

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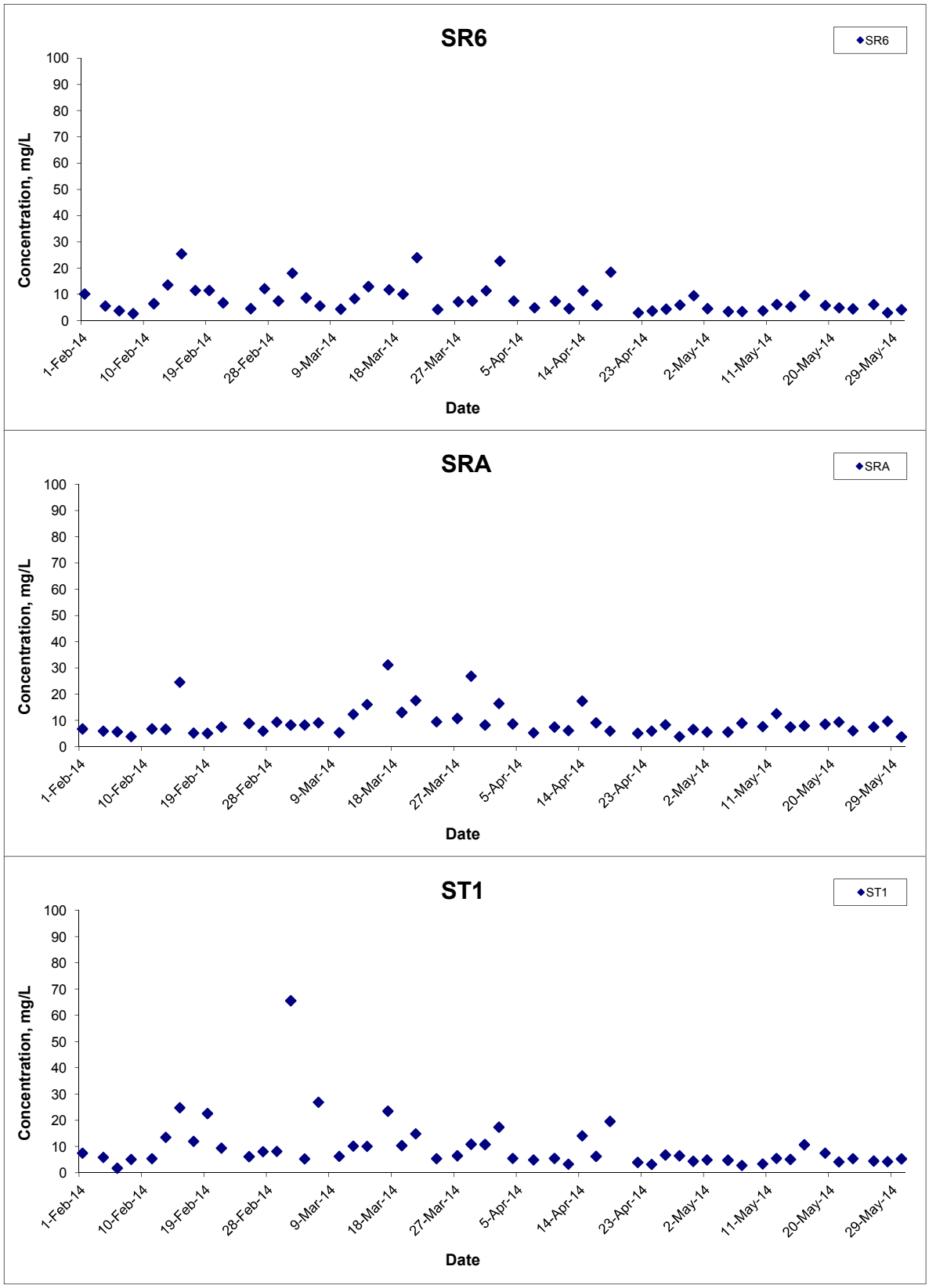

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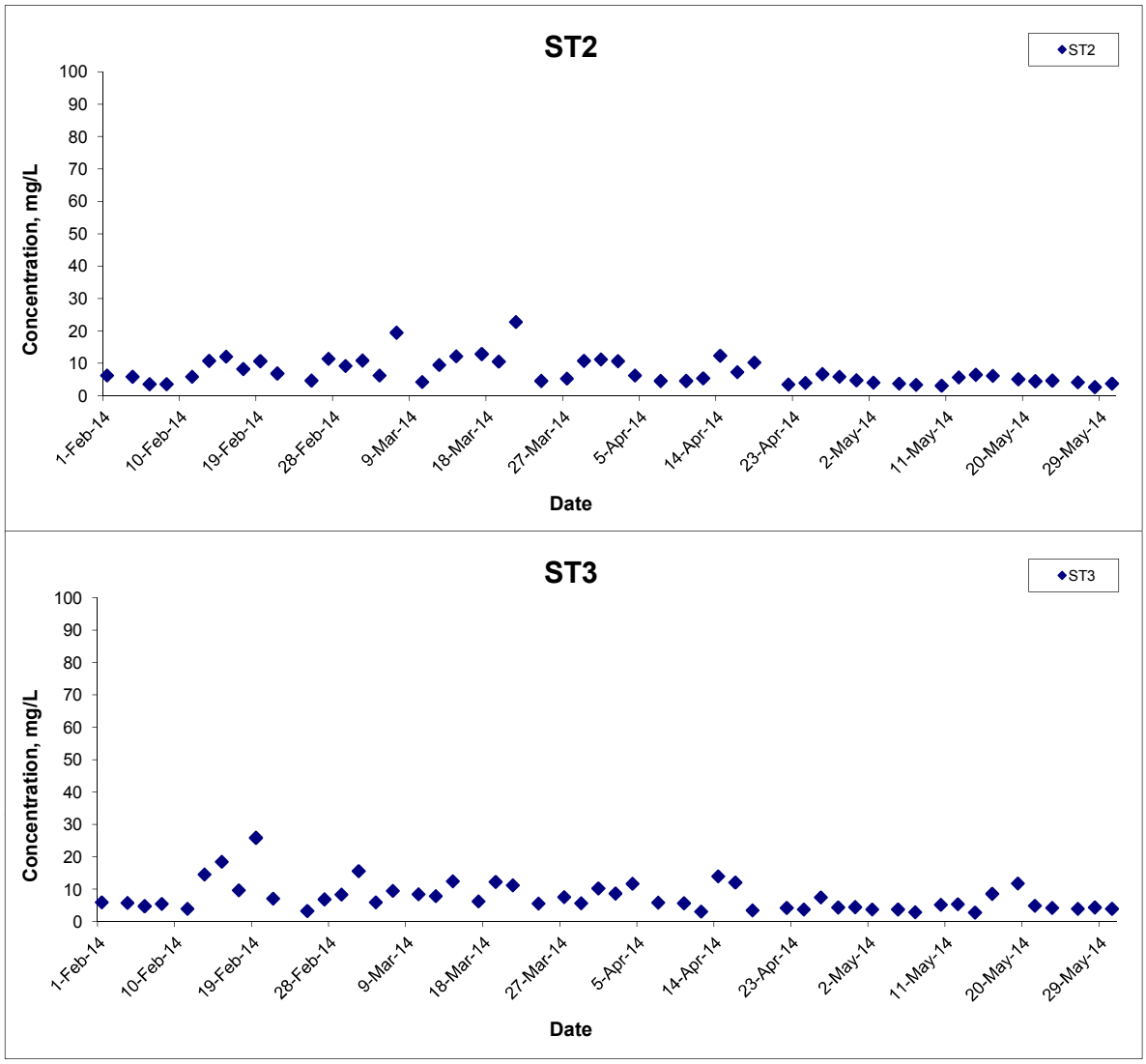

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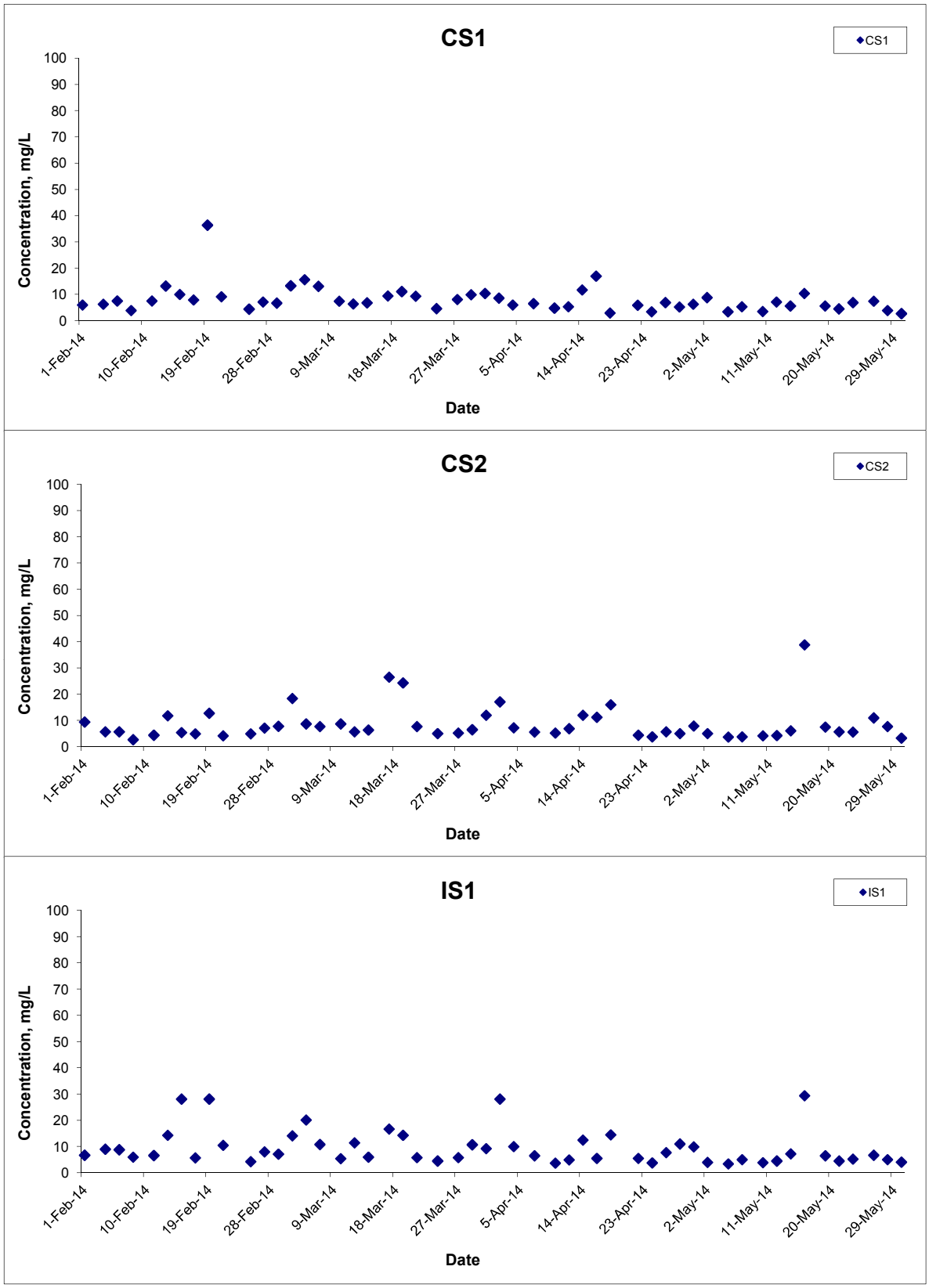
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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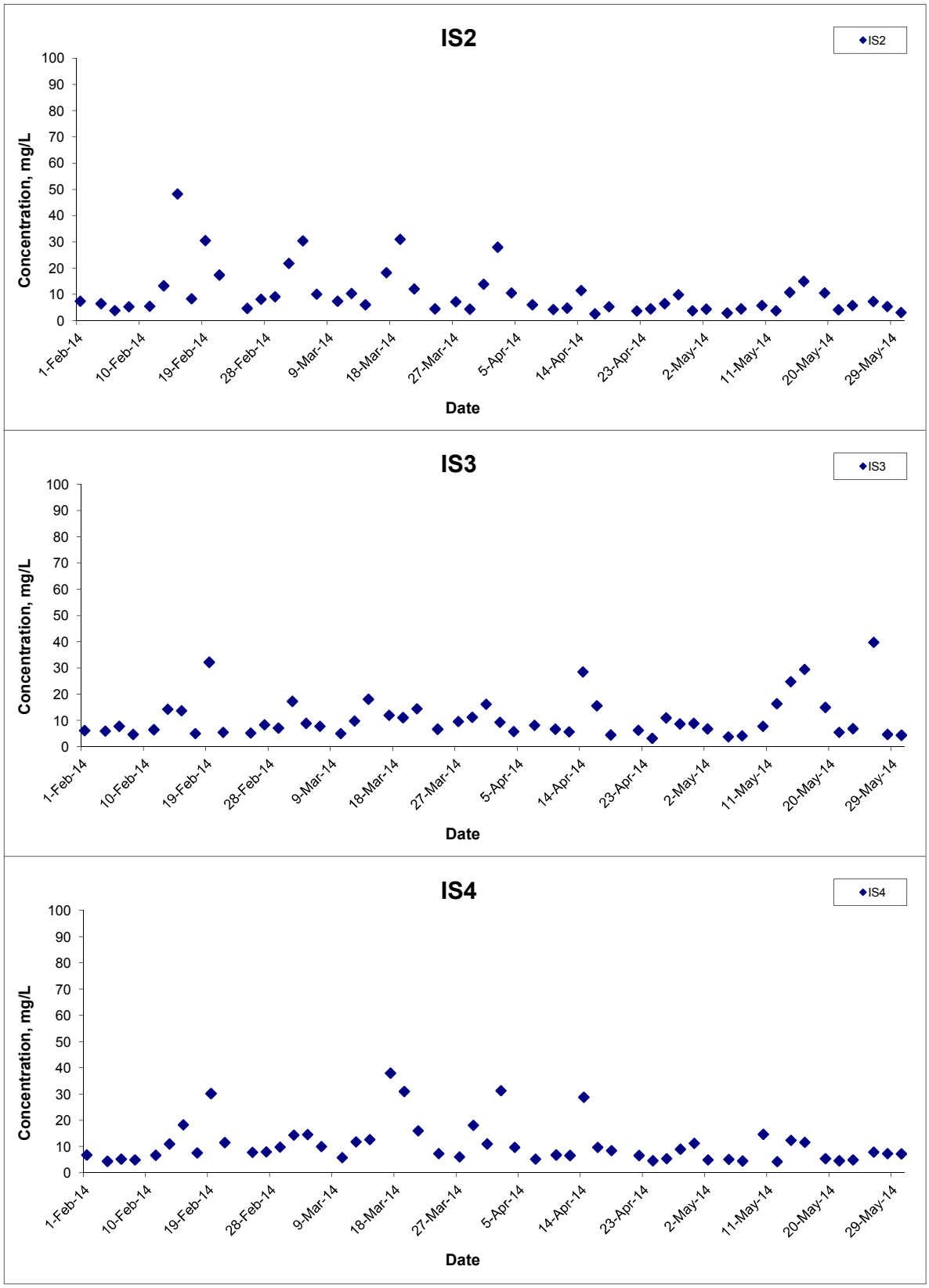

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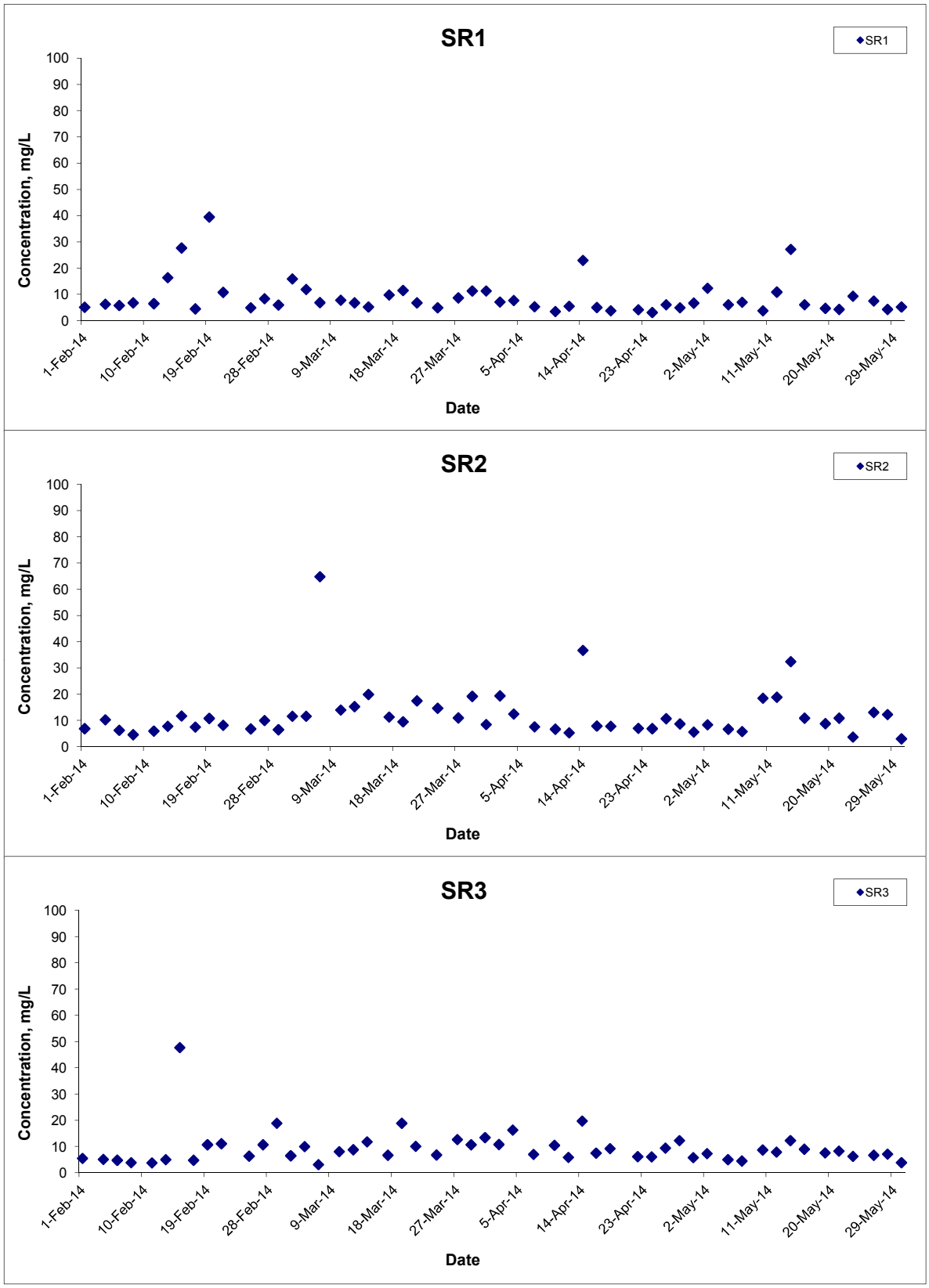

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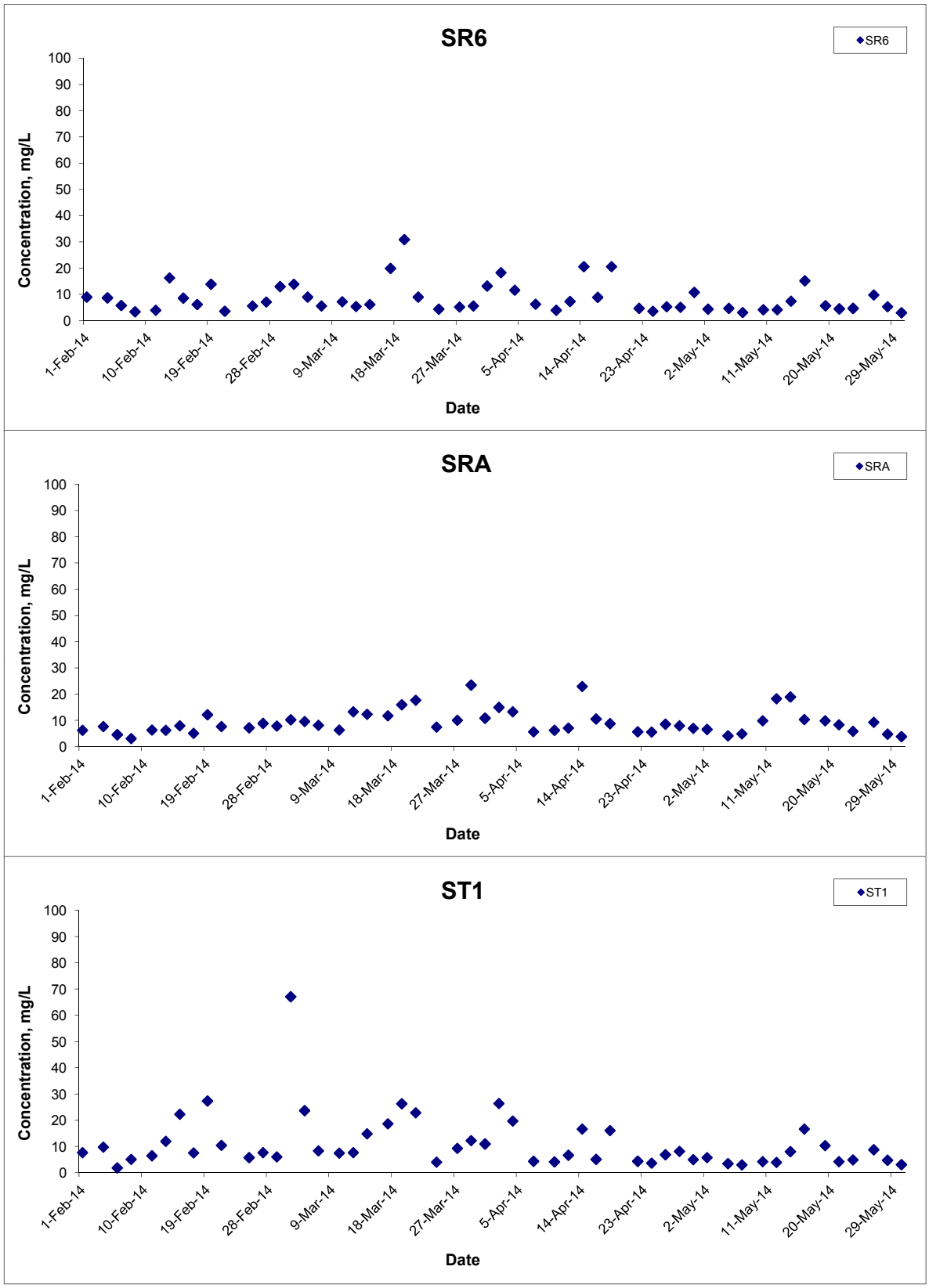

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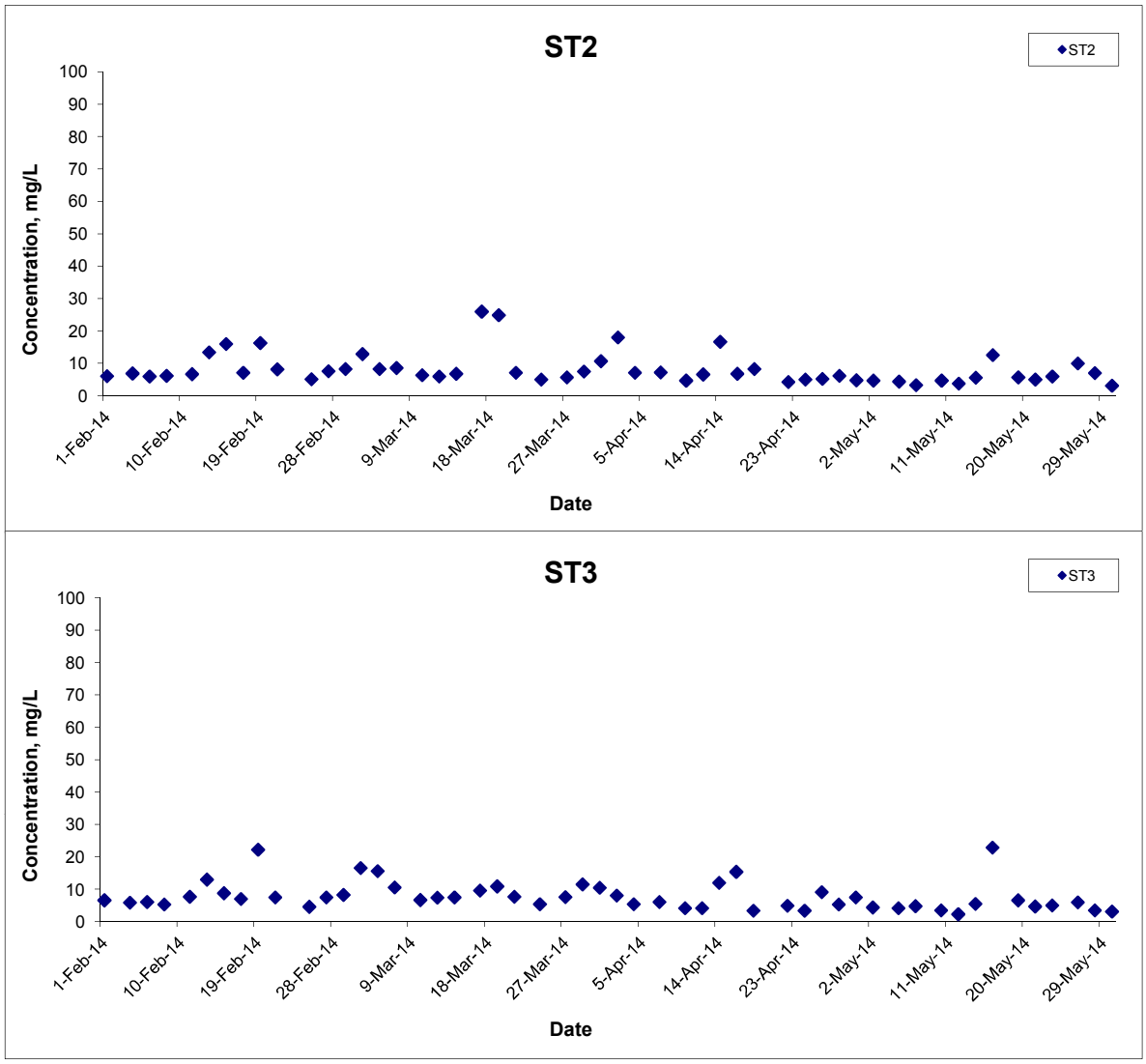

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APPENDIX F
DOLPHIN MONITORING REPORT
(LINE TRANSECT)

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

Quarterly Progress Report (March – May 2014)

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

5 July 2014

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 fifth 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 March to May 2014.

2. Monitoring Methodology

2.1. Vessel-based Line-transect Survey

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

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

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

2.1.2. The survey team used standard line-transect methods (Buckland et al. 2001) to conduct the systematic vessel surveys, and followed the same technique of data

collection that has been adopted over the last 17 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2013). For each monitoring vessel survey, a 15-m inboard vessel with an open upper deck (about 4.5 m above water surface) was used to make observations from the flying bridge area.

2.1.3. Two experienced observers (a data recorder and a primary observer) made up the on-effort survey team, and the survey vessel transited different transect lines at a constant speed of 13-15 km per hour. The data recorder searched with unaided eyes and filled out the datasheets, while the primary observer searched for dolphins and porpoises continuously through 7 x 50 *Fujinon* marine binoculars. Both observers searched the sea ahead of the vessel, between 270^{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. One to two professional digital cameras (*Canon* EOS 7D and/or 60D models), each equipped with long telephoto lenses (100-400 mm zoom), were available on board for researchers to take sharp, close-up photographs of dolphins as they surfaced. The images were shot at the highest available resolution and stored on Compact Flash memory cards for downloading onto a computer.

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

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

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

2.3. Data analysis

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

2.3.2. Encounter rate analysis – Encounter rates of Chinese white dolphins (number of on-effort sightings per 100 km of survey effort, and total number of dolphins sighted on-effort per 100 km of survey effort) were calculated in West Lantau (WL) survey area in relation to the amount of survey effort conducted during each month of monitoring survey. Dolphin encounter rates were calculated in two ways for comparisons with the HZMB baseline monitoring results as well as to AFCD long-term marine mammal monitoring results.

Firstly, for the comparison with the HZMB baseline monitoring results, the encounter rates were calculated using primary survey effort alone, and only data collected under Beaufort 3 or below condition would be used for encounter rate analysis. The average encounter rate of sightings (STG) and average encounter rate of dolphins (ANI) were deduced based on the encounter rates from six events during the present quarter (i.e. six sets of line-transect surveys in West Lantau), which was also compared with the one deduced from the six events during the baseline period (i.e. six sets of line-transect surveys in West Lantau).

Secondly, the encounter rates were calculated using both primary and secondary survey effort collected under Beaufort 3 or below condition as in AFCD long-term monitoring study. The encounter rate of sightings and dolphins were deduced by dividing the total number of on-effort sightings (STG) and total number of dolphins (ANI) by the amount of survey effort for the entire quarterly period (i.e. March – May 2014).

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 three-month impact phase monitoring period were obtained from the

dolphin sighting database and photo-identification catalogue. To deduce home ranges for individual dolphins using the fixed kernel methods, the program Animal Movement Analyst Extension, was loaded as an extension with ArcView© 3.1 along with another extension Spatial Analyst 2.0. Using the fixed kernel method, the program calculated kernel density estimates based on all sighting positions, and provided an active interface to display kernel density plots. The kernel estimator then calculated and displayed the overall ranging area at 95% UD level.

3. Monitoring Results

3.1. Summary of survey effort and dolphin sightings

3.1.1. During the period of March to May 2014, 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 192.12 km of survey effort was collected, with 82.2% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). The total survey effort conducted on primary lines was 127.56 km, while the effort on secondary lines was 64.56 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 March to May 2014, a total of 25 groups of 120 Chinese White Dolphins were sighted. All sightings were made during on-effort search. Seventeen on-effort sightings were made on primary lines, while another eight 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 March to May 2014 is shown in Figure 1. The dolphin groups were evenly distributed throughout the WL survey area, with higher concentrations between Kai Kung Shan and Fan Lau. The only areas where dolphins were rarely sighted included the northern end of the survey area (i.e. near and to the north of HKLR09 alignment; Figure 1).

3.2.2. Sighting distribution of dolphins in the present quarter was quite different from the one during the baseline period, with fewer dolphins being sighted in the

northern portion of the survey area between the bridge alignment and Kai Kung Shan in the present impact monitoring quarter (Figure 1).

3.2.3. Notably, only one sighting was made close to the HKLR09 alignment in WL survey area during the present quarter (Figure 1). In fact, when pooling the data from HKLR03 monitoring surveys in the same spring quarter of 2014, dolphins rarely occurred near the HKLR09 alignment in the present quarter as compared to the baseline monitoring period (Figure 2). There appeared to be a general shift in dolphin distribution further south of the WL survey area in the present quarter, and they rarely occurred at the juncture between NWL and WL survey areas (Figure 2).

3.2.4. As the dolphins may be affected by the intensive bored piling works along the HKLR09 alignment and avoided this area as indicated in individual range use (Section 3.9), this should be a growing concern, even though the overall encounter rate in WL in the present quarter was similar to the baseline monitoring period. Such shift in dolphin distribution and range use should be continuously monitored in the upcoming quarters of impact phase monitoring surveys.

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 March to May 2014 were also compared with the ones deduced from the baseline monitoring period (September – November 2011) (Table 3).

3.3.2. In WL survey area, the average dolphin encounter rates in the present three-month study period was slightly lower in ER(STG) but slightly higher in ER(ANI) than the ones recorded in the three-month baseline period respectively (Table 3), indicating the dolphin usage during this impact phase monitoring period in this survey area were more or less than same when compared to the baseline phase.

Table 2. Dolphin encounter rates (sightings per 100 km of survey effort) during the impact monitoring period (March to May 2014)

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 (March 12, 2014)	14.8	84.0
	Set 2 (March 26, 2014)	28.4	132.8
	Set 3 (April 15, 2014)	23.4	58.6
	Set 4 (April 23, 2014)	0.0	0.0
	Set 5 (May 7, 2014)	9.2	32.3
	Set 6 (May 20, 2014)	10.5	83.8

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (March to May 2014) and baseline monitoring period (September to 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)

	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)	
	March-May 2014	September-November 2011	March-May 2014	September-November 2011
West Lantau	14.40 ± 10.28	16.43 ± 7.70	65.23 ± 46.13	60.50 ± 38.47

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 (fifth quarter of the impact phase), the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.706 and 0.873 respectively. Therefore, no significant difference in dolphin encounter rate was detected between the baseline period and the present quarter.

3.3.4. Another comparison was made between the baseline period and the cumulative quarters in the impact phase (i.e. first five quarters of the impact phase), and the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.851 and 0.992 respectively. As a result, no significant difference was found in the dolphin encounter rates between the baseline period and the

cumulative quarters in the impact phase.

3.3.5. To facilitate the comparison with the AFCD long-term monitoring results, the encounter rates were also calculated for the present quarter (March to May 2014) using both primary and secondary survey effort. The encounter rates of sightings (STG) and dolphins (ANI) in WL were 15.2 sightings and 70.9 dolphins per 100 km of survey effort respectively.

3.4. Group size

3.4.1. Group size of Chinese White Dolphins ranged from 1-13 individuals per group in WL survey area between March and May 2014. 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.

Table 4. Comparison of average dolphin group sizes from impact monitoring period (March to May 2014) and baseline monitoring period (September-November 2011)

	Average Dolphin Group Size	
	March – May 2014	**September – November 2011**
West Lantau	4.80 ± 4.08 (n = 25)	3.63 ± 2.97 (n = 46)

3.4.2. The average dolphin group size in the WL region during March to May 2014 was higher than the ones recorded in the three-month baseline period (Table 4). About half of the dolphin groups were composed of 1-2 dolphins, but there were also 11 groups with more than 5 animals per group, and four groups with 10 animals or more per group. One of the larger groups was associated with an operating purse-seiner.

3.4.3. Distribution of dolphins with these 11 larger groups during March to May 2014 is shown in Figure 3. These groups were evenly distributed between Tai O Peninsula and Fan Lau, but were generally far away from the HKLR09 alignment. This was quite different from the baseline period, when some of the larger dolphin groups also occurred near Tai O Peninsula closer to the bridge alignment (Figure 3).

3.5. Habitat use

3.5.1. From March to May 2014, the most heavily utilized habitats by the dolphins mainly concentrated near Tai O Peninsula, Kai Kung Shan and Fan Lau (Figures 4a & 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 lower between the HKLR09 alignment and Tai O Peninsula during the present impact phase monitoring period (Figure 5), as in previous monitoring periods. This further indicated that the habitat use of dolphins in the vicinity of the bridge alignment may have been affected by the construction works, and their usage of WL waters was shifted southward as a result. Such shift in dolphin habitat use away from the bridge construction area should be continuously monitored in the upcoming quarters.

3.6. Mother-calf pairs

3.6.1. During the three-month impact phase monitoring period, two unspotted calves and seven unspotted juveniles (UJ) were sighted in WL survey area. These young calves comprised 7.5% of all animals sighted, which was slightly higher than the percentage recorded during the baseline monitoring period (6.6%).

3.6.2. The occurrence of these young calves were scattered between the bridge alignment and Peaked Hill, which was in stark contrast to the baseline period when calf occurrence was more concentrated near Tai O Peninsula (Figure 6).

3.7. Activities and associations with fishing boats

3.7.1. During the three-month impact monitoring period, only two dolphin sightings were associated with feeding activities near Fan Lau (Figure 7), comprising of 8% of the total number of dolphin sightings. This percentage was much lower than the percentage recorded during the baseline period (13.0%). Only one of the 25 sightings was associated with socializing activity near the artificial island in Chinese waters (Figure 7).

3.7.2. Although traveling activities were rarely observed during the baseline period and previous impact monitoring periods, three sightings of this type of activities were recorded during the present 3-mont period, which were located near Peaked Hill and Kai Kung Shan (Figure 7). One sighting of dolphins engaged in milling/resting was also recorded near Peaked Hill (Figure 7).

3.7.3. During the three-month period, only one dolphin group was associated with an operating purse-seiner.

3.8. Summary of photo-identification works

3.8.1. From March to May 2014, over 2,500 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.

3.8.2. In total, 55 individuals sighted 74 times altogether were identified (see summary table in Appendix III and photographs of identified individuals in Appendix IV). The majority of identified individuals were sighted only once or twice during the three-month period, but three individuals (CH108, WL62 and WL86) were sighted thrice.

3.8.3. Notably, six of these 55 individuals (NL33, NL182, NL295, WL04, WL05 and WL199) were also sighted in North Lantau waters during the HKLR03 monitoring surveys in the same three-month period.

3.8.4. During the three-month period, ten recognizable females, including CH105, NL33, NL98, NL264, NL304, WL28, WL86, WL98, WL118 and WL224, were sighted to be accompanied with their calf during their re-sightings. Notably, NL33, NL98 and NL264 spent most of their time in North Lantau waters in the past.

3.9. Individual range use

3.9.1. Ranging patterns of the 55 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 55 individuals, eight of them (NL33, NL98, NL182, NL264, NL288, NL295, WL04 and WL05) occurred primarily in North Lantau and ventured into West Lantau during the three-month period, while five other individuals (NL156, NL304, WL15, WL46 and WL179) split their time between North and West Lantau waters. The other 42 individuals centered their range use in West Lantau waters (Appendix V).

3.9.3. For those that regularly occurred in North Lantau waters, they have extended their range use from there to West Lantau waters, which could be a result of a range shift from North Lantau waters. Such range shifts should be continuously monitored in the upcoming quarters to determine whether these range shifts are consistent for North Lantau individuals.

3.9.4. On the other hand, for those that primarily used West Lantau waters as their home ranges, it was apparent that almost all of them utilized the southern part of their ranges, but rarely in the northern part of West Lantau, especially around the HKLR09 alignment where they frequently occurred in the past. It is possible that their range use in West Lantau waters have been affected by the HKLR09 construction activities, which have resulted in fine-scale range shift further south near Kai Kung Shan, Peaked Hill and Fan Lau instead of around Shum Wat and Tai O Peninsula. It will be crucial to examined whether such shift is temporary in nature or not, as a result of disturbance from the HKLR09-related works.

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. However, there is some apparent fine-scale change in dolphin occurrence in West Lantau survey area, with dolphins mostly utilizing the southern part of their ranges but not in the northern portion where HKLR09 construction activities occur.

4.2. Therefore, dolphin usage in WL region should be continuously monitored, to further examine whether it has been affected by the on-going construction activities in relation to the HZMB works.

5. References

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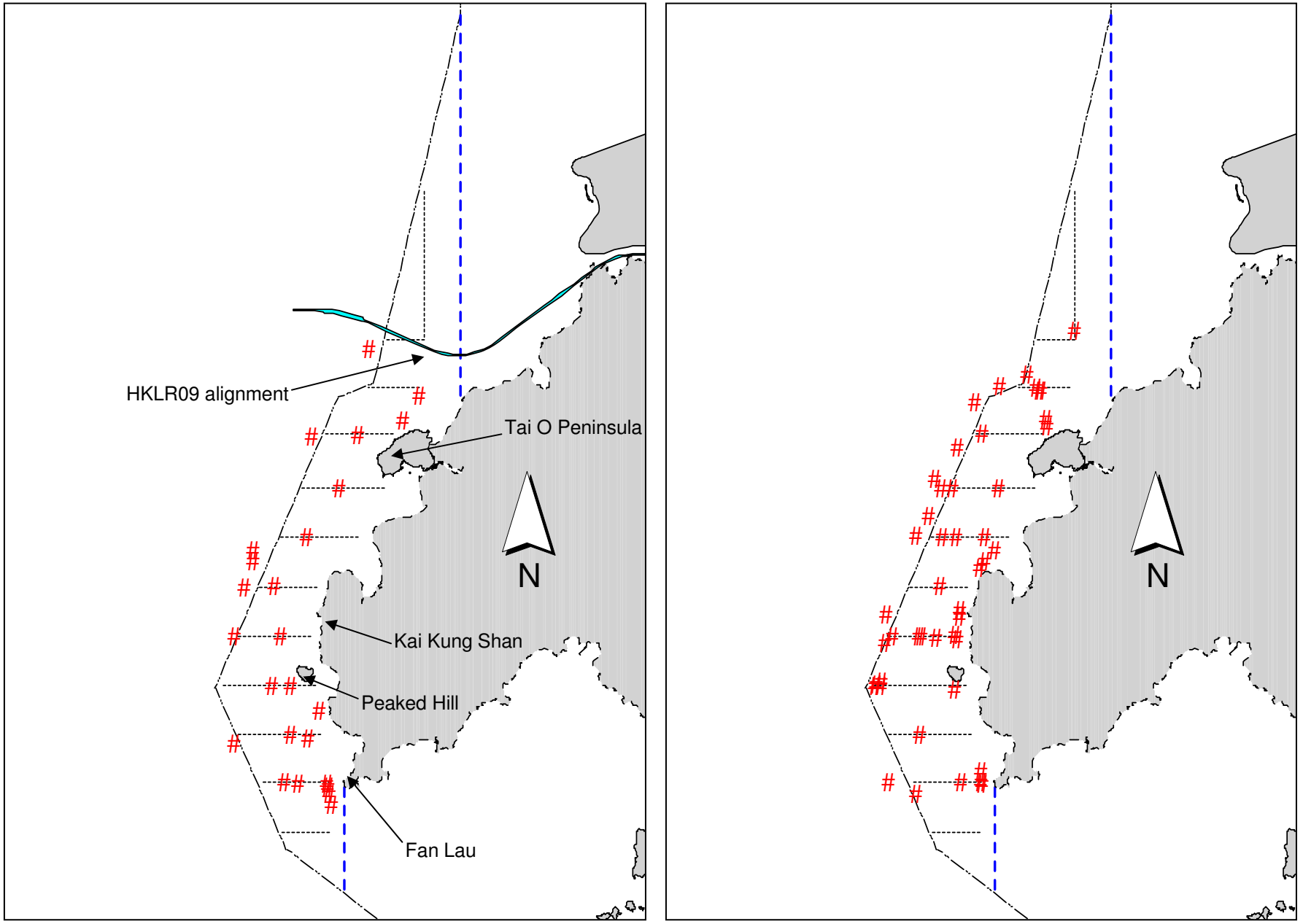


Figure 1. Distribution of Chinese white dolphin sightings in West Lantau during HKLR09 impact phase (left: March – May 2014) and baseline monitoring surveys (right: September – November 2011)

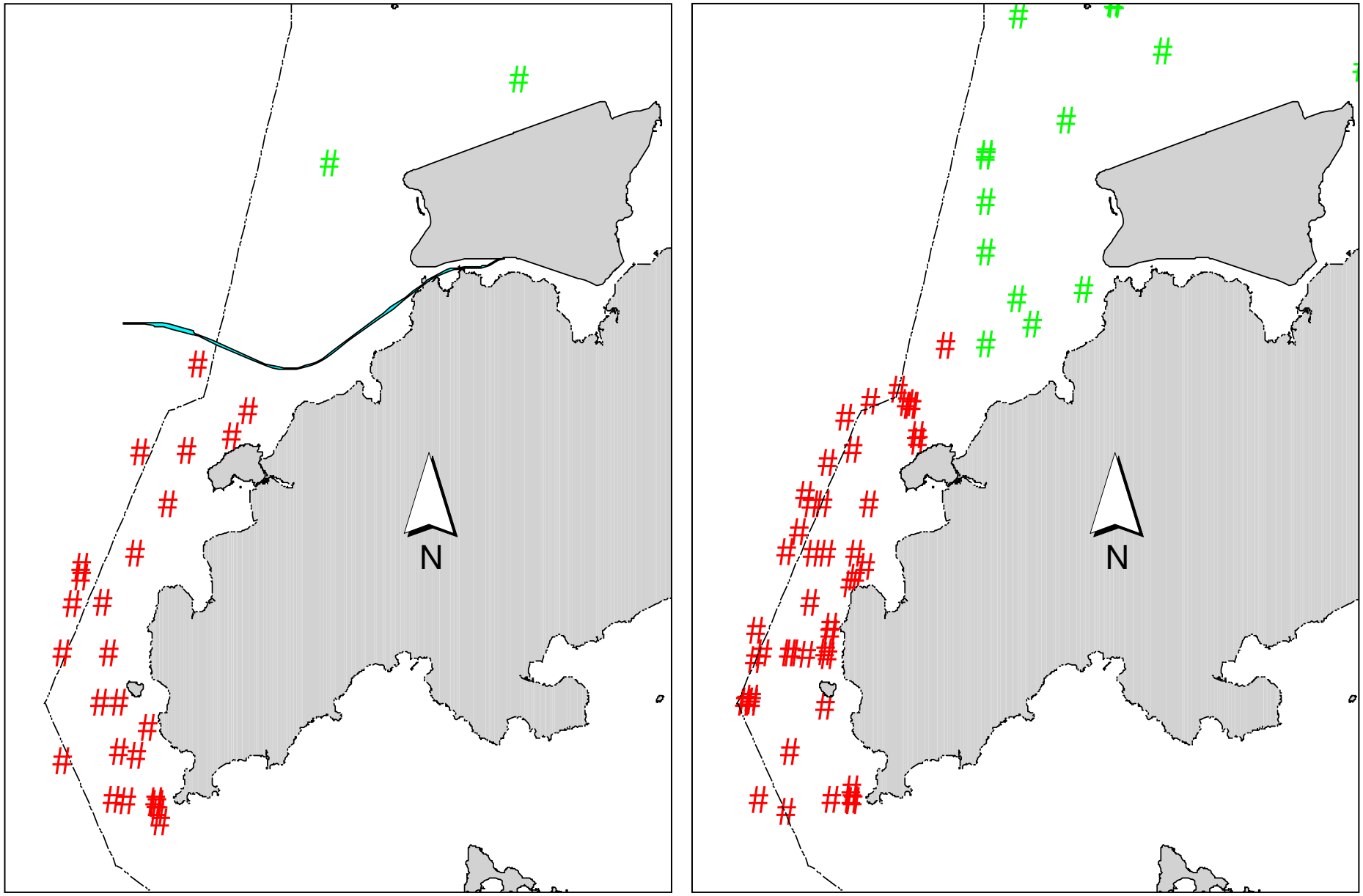


Figure 2. Distribution of Chinese white dolphin sightings from HKLR03 (in green) and HKLR09 surveys (in red) near the HKLR09 alignment during impact phase (left: March – May 2014) and baseline monitoring surveys (right: September – November 2011)

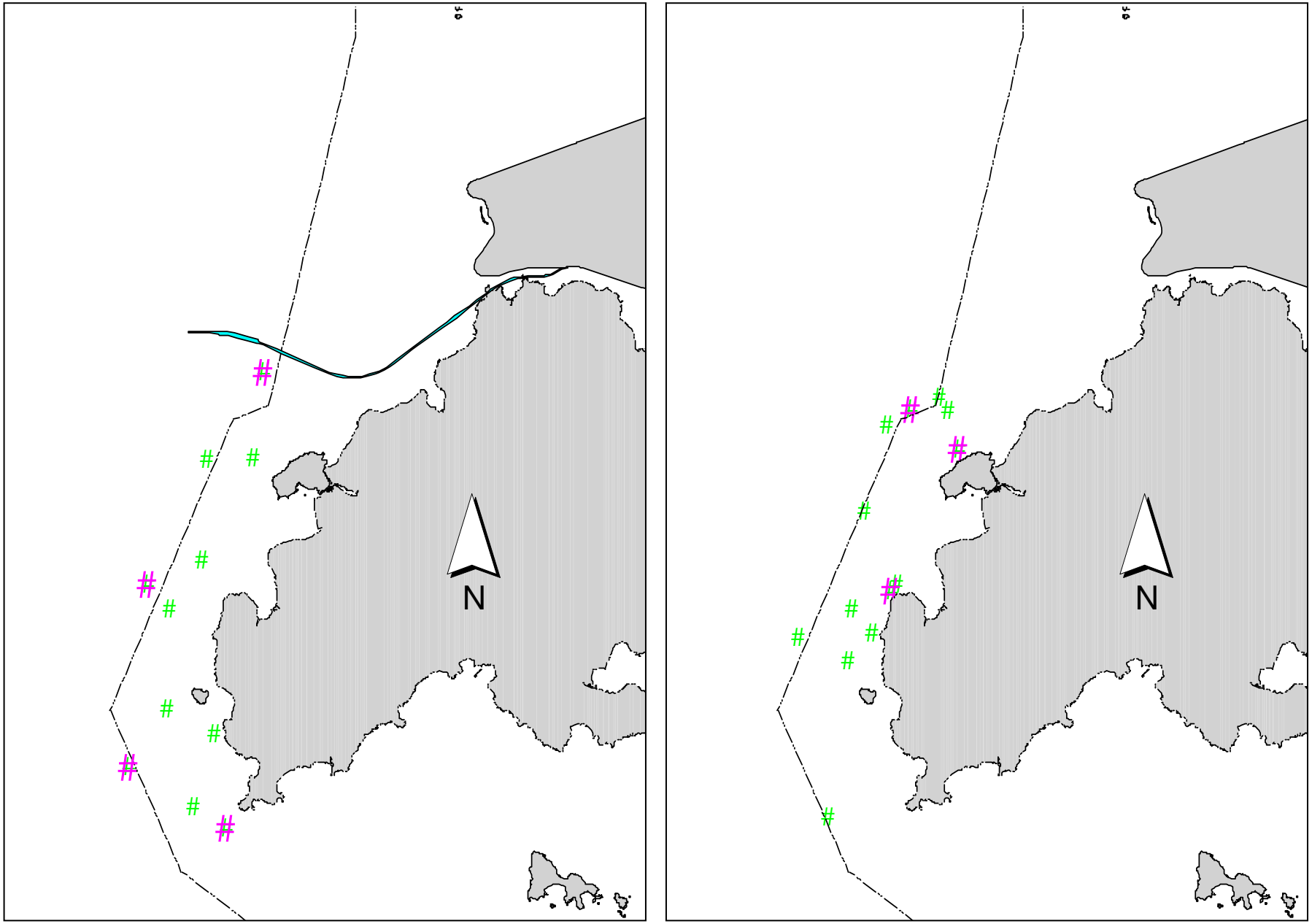


Figure 3. Distribution of Chinese white dolphins with larger group sizes during HKLR09 impact phase (left: March – May 2014) and baseline monitoring surveys (right: September – November 2011) (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

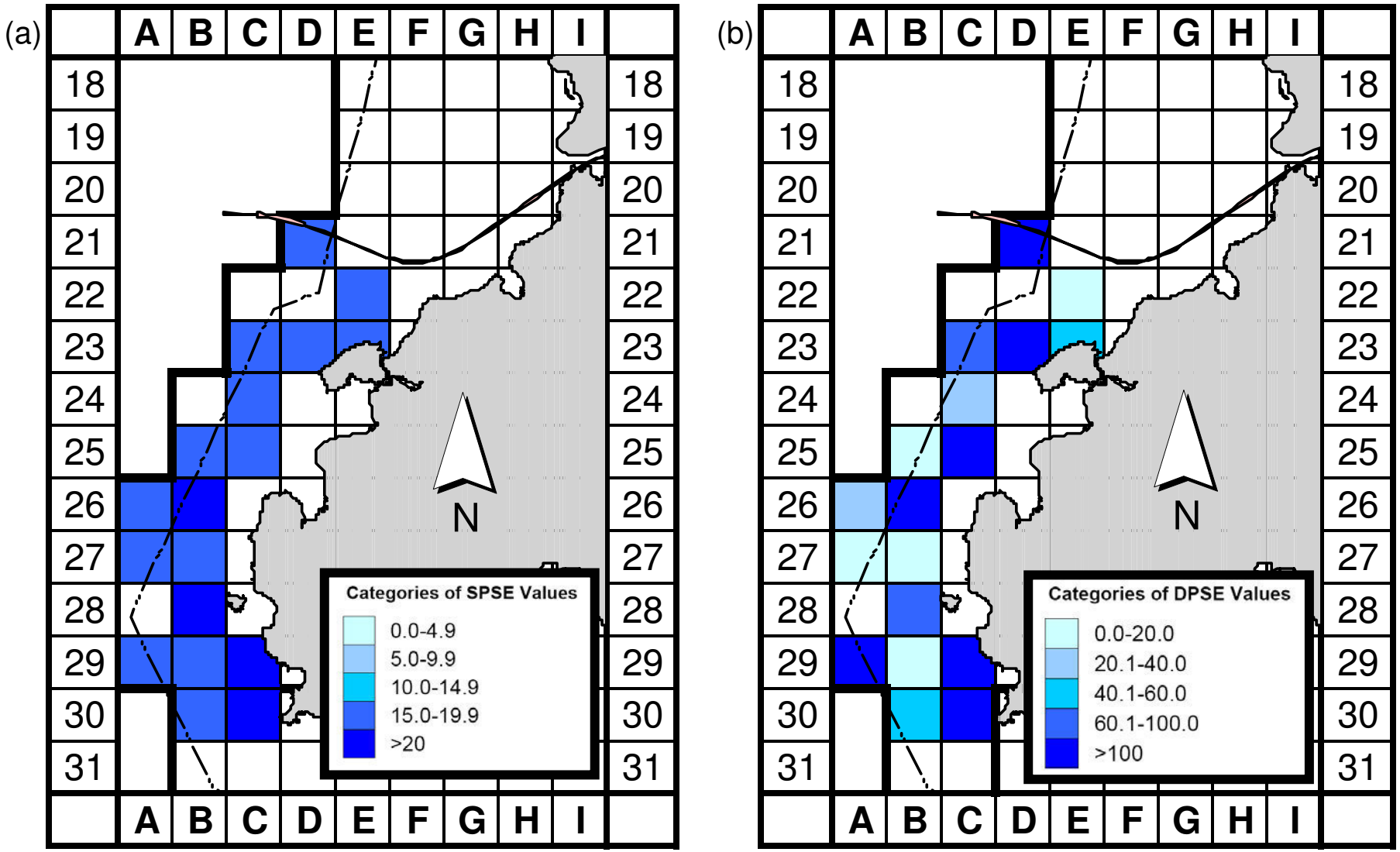


Figure 4a. Sighting density of Chinese white dolphins with corrected survey effort per km^2 in West Lantau survey area, using data collected during HKLR09 impact monitoring period (Mar-May 14) (SPSE = no. of on-effort sightings per 100 units of survey effort)

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 (Mar-May 14) (DPSE = no. of dolphins per 100 units of survey effort)

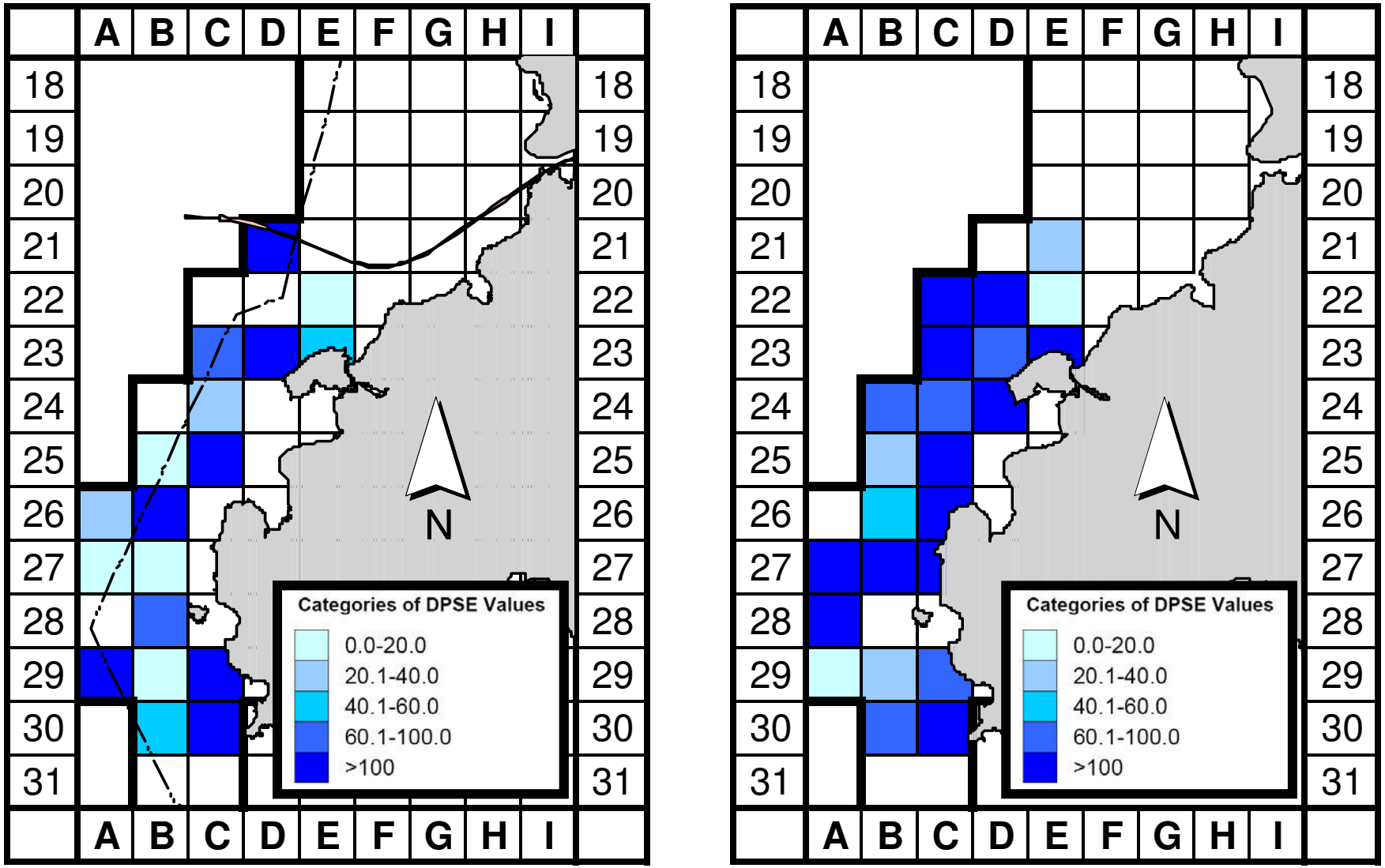


Figure 5. Comparison of density of Chinese white dolphins with corrected survey effort per km^2 in West Lantau survey area between the impact monitoring period (March-May 2014; left) and baseline monitoring period (September-November 2011; right)
(DPSE = no. of dolphins per 100 units of survey effort)

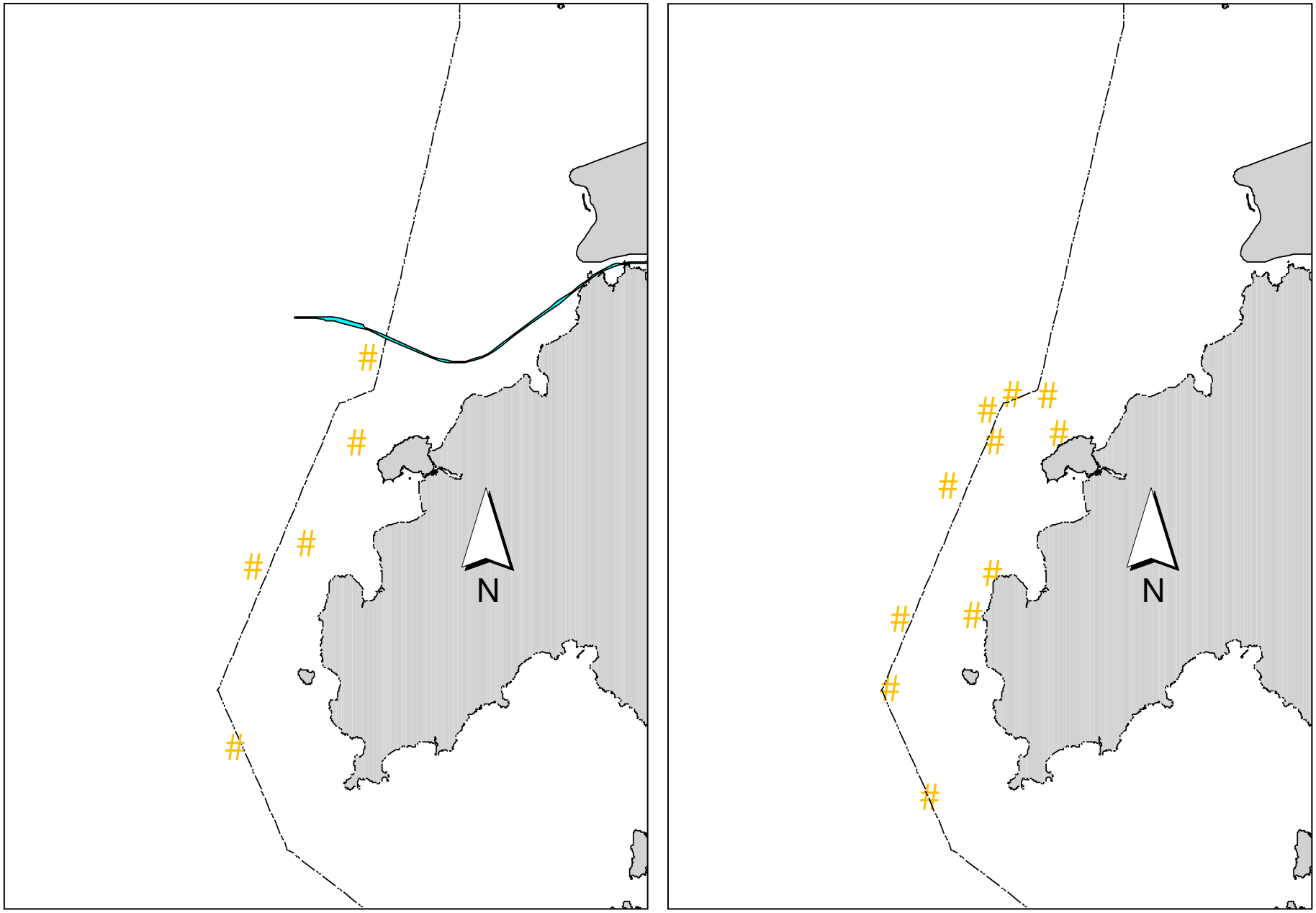


Figure 6. Distribution of young calves of Chinese white dolphins during HKLR09 impact phase (left: March – May 2014) and baseline monitoring surveys (right: September – November 2011)

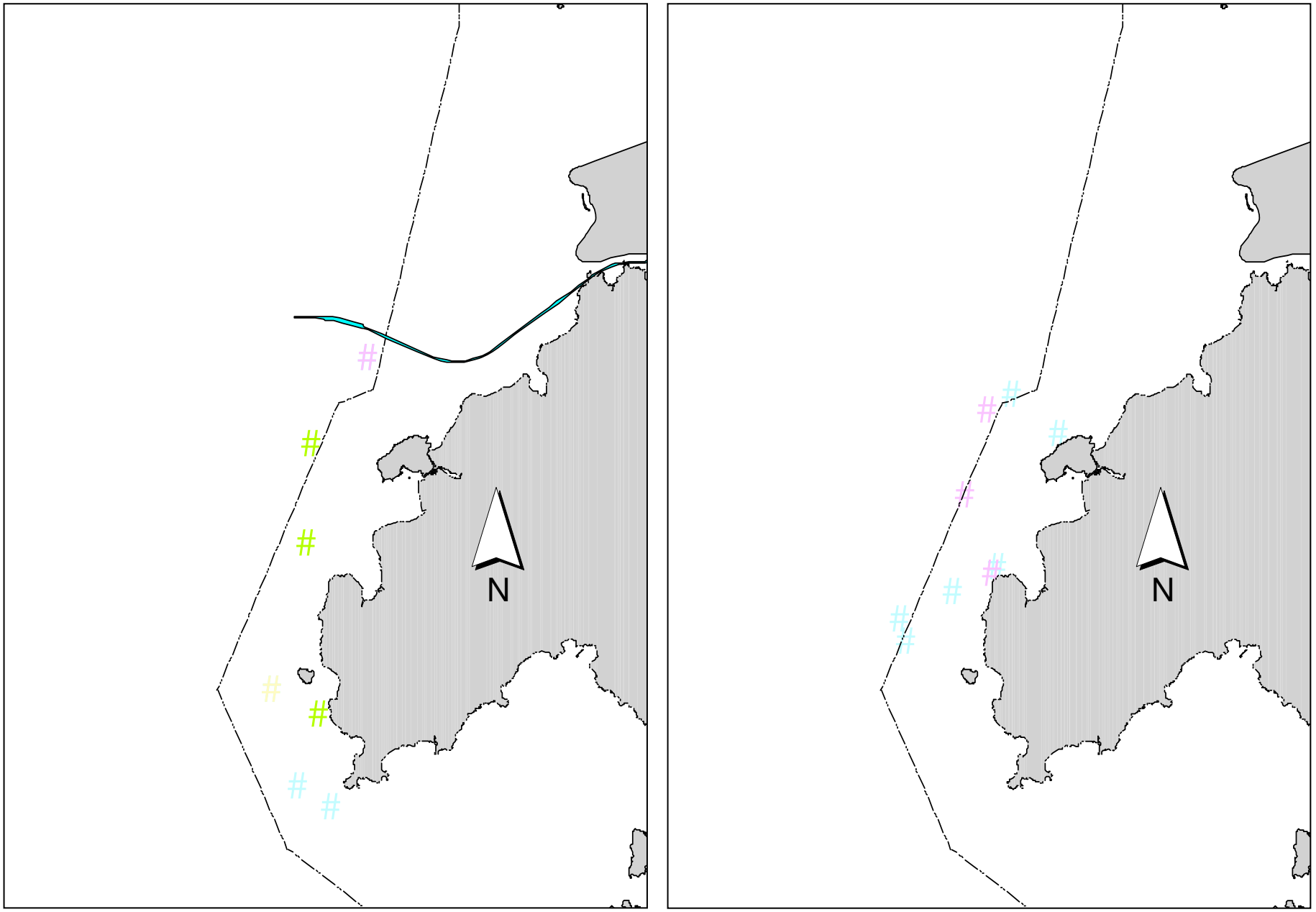


Figure 7. Distribution of dolphins engaged in feeding (in blue), socializing (in purple), traveling (in green) and milling (in yellow) activities during HKLR09 impact phase (left: March – May 2014) and baseline monitoring surveys (right: September – November 2011)

Appendix I. HKLR09 Survey Effort Database (March-May 2014)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
12-Mar-14	W LANTAU	2	7.04	SPRING	STANDARD31516	HKLR	P
12-Mar-14	W LANTAU	3	13.20	SPRING	STANDARD31516	HKLR	P
12-Mar-14	W LANTAU	4	0.85	SPRING	STANDARD31516	HKLR	P
12-Mar-14	W LANTAU	2	4.27	SPRING	STANDARD31516	HKLR	S
12-Mar-14	W LANTAU	3	6.60	SPRING	STANDARD31516	HKLR	S
26-Mar-14	W LANTAU	1	6.39	SPRING	STANDARD31516	HKLR	P
26-Mar-14	W LANTAU	2	14.70	SPRING	STANDARD31516	HKLR	P
26-Mar-14	W LANTAU	1	4.28	SPRING	STANDARD31516	HKLR	S
26-Mar-14	W LANTAU	2	6.13	SPRING	STANDARD31516	HKLR	S
15-Apr-14	W LANTAU	2	7.04	SPRING	STANDARD31516	HKLR	P
15-Apr-14	W LANTAU	3	10.03	SPRING	STANDARD31516	HKLR	P
15-Apr-14	W LANTAU	4	3.92	SPRING	STANDARD31516	HKLR	P
15-Apr-14	W LANTAU	2	4.31	SPRING	STANDARD31516	HKLR	S
15-Apr-14	W LANTAU	3	4.44	SPRING	STANDARD31516	HKLR	S
15-Apr-14	W LANTAU	4	1.97	SPRING	STANDARD31516	HKLR	S
23-Apr-14	W LANTAU	2	1.93	SPRING	STANDARD31516	HKLR	P
23-Apr-14	W LANTAU	3	13.66	SPRING	STANDARD31516	HKLR	P
23-Apr-14	W LANTAU	4	5.75	SPRING	STANDARD31516	HKLR	P
23-Apr-14	W LANTAU	2	1.97	SPRING	STANDARD31516	HKLR	S
23-Apr-14	W LANTAU	3	5.20	SPRING	STANDARD31516	HKLR	S
23-Apr-14	W LANTAU	4	4.29	SPRING	STANDARD31516	HKLR	S
7-May-14	W LANTAU	2	16.82	SPRING	STANDARD31516	HKLR	P
7-May-14	W LANTAU	3	4.86	SPRING	STANDARD31516	HKLR	P
7-May-14	W LANTAU	2	9.88	SPRING	STANDARD31516	HKLR	S
20-May-14	W LANTAU	3	9.55	SPRING	STANDARD31516	HKLR	P
20-May-14	W LANTAU	4	10.43	SPRING	STANDARD31516	HKLR	P
20-May-14	W LANTAU	5	1.39	SPRING	STANDARD31516	HKLR	P
20-May-14	W LANTAU	3	5.66	SPRING	STANDARD31516	HKLR	S
20-May-14	W LANTAU	4	4.07	SPRING	STANDARD31516	HKLR	S
20-May-14	W LANTAU	5	1.50	SPRING	STANDARD31516	HKLR	S

Appendix II. HKLR09 Chinese White Dolphin Sighting Database (March-May 2014)

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

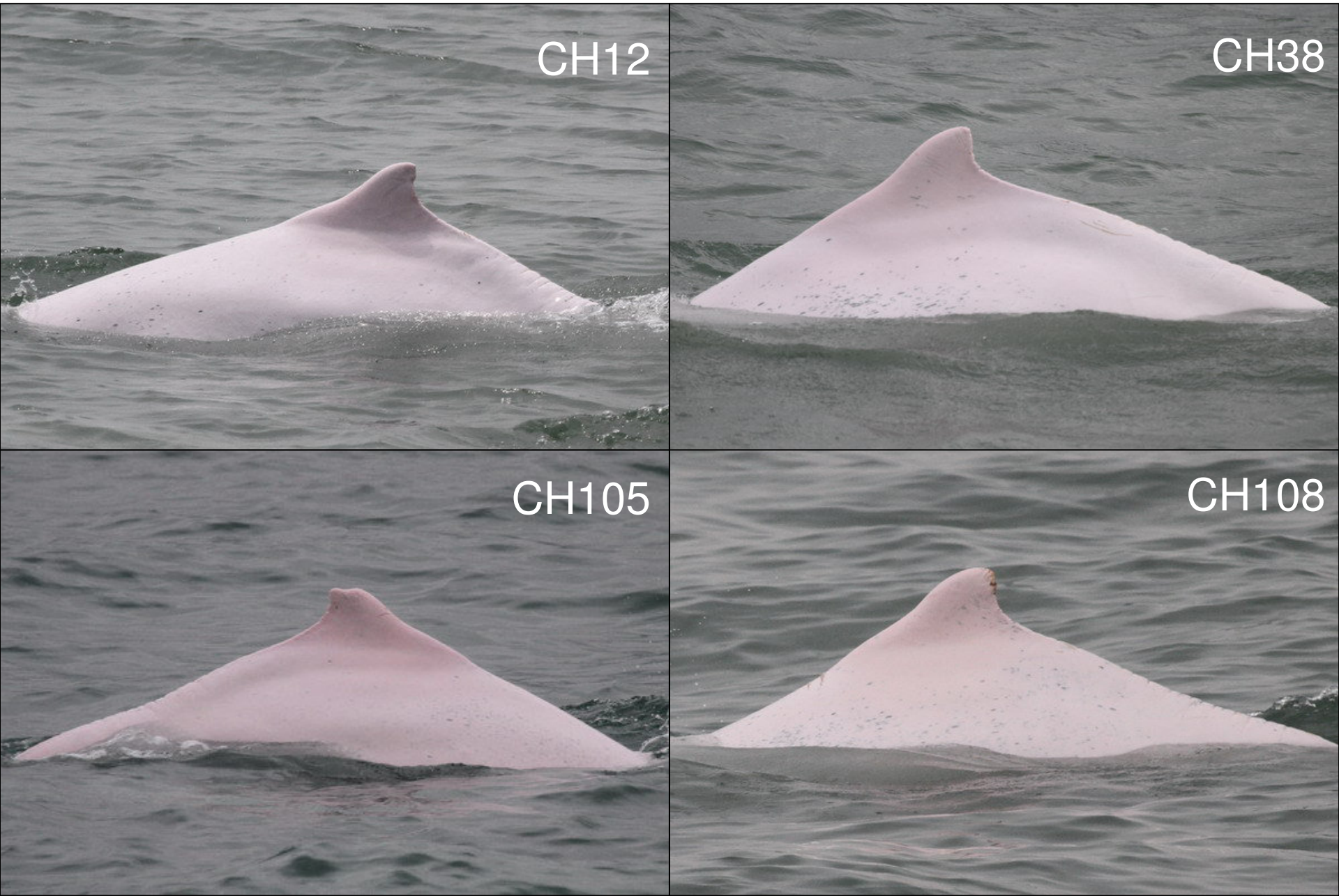
DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
12-Mar-14	1	1154	1	W LANTAU	2	276	ON	HKLR	814342	803670	SPRING	NONE	S
12-Mar-14	2	1201	3	W LANTAU	2	162	ON	HKLR	813833	803328	SPRING	NONE	S
12-Mar-14	3	1219	9	W LANTAU	2	65	ON	HKLR	813548	802349	SPRING	NONE	P
12-Mar-14	4	1311	7	W LANTAU	3	205	ON	HKLR	810462	800558	SPRING	NONE	P
12-Mar-14	5	1401	1	W LANTAU	3	41	ON	HKLR	807438	800912	SPRING	NONE	P
12-Mar-14	6	1419	1	W LANTAU	3	147	ON	HKLR	806395	801704	SPRING	NONE	S
26-Mar-14	1	1159	13	W LANTAU	2	495	ON	HKLR	806019	801785	SPRING	PURSE SEINE	P
26-Mar-14	2	1234	3	W LANTAU	2	68	ON	HKLR	806475	800765	SPRING	NONE	P
26-Mar-14	3	1252	2	W LANTAU	2	301	ON	HKLR	807382	801293	SPRING	NONE	P
26-Mar-14	4	1310	8	W LANTAU	2	284	ON	HKLR	807946	801511	SPRING	NONE	P
26-Mar-14	5	1325	1	W LANTAU	2	151	ON	HKLR	808435	800894	SPRING	NONE	P
26-Mar-14	6	1337	1	W LANTAU	2	54	ON	HKLR	809445	799690	SPRING	NONE	P
26-Mar-14	7	1402	1	W LANTAU	1	0	ON	HKLR	811205	800086	SPRING	NONE	S
15-Apr-14	1	1308	5	W LANTAU	3	100	ON	HKLR	813517	801369	SPRING	NONE	P
15-Apr-14	2	1336	2	W LANTAU	2	693	ON	HKLR	812463	801944	SPRING	NONE	P
15-Apr-14	3	1355	11	W LANTAU	3	140	ON	HKLR	810984	800085	SPRING	NONE	S
15-Apr-14	4	1412	2	W LANTAU	3	161	ON	HKLR	810452	799909	SPRING	NONE	P
15-Apr-14	5	1431	1	W LANTAU	3	70	ON	HKLR	809432	800700	SPRING	NONE	P
15-Apr-14	6	1515	8	W LANTAU	4	60	ON	HKLR	806463	801064	SPRING	NONE	P
15-Apr-14	7	1528	2	W LANTAU	3	63	ON	HKLR	806251	801734	SPRING	NONE	S
07-May-14	1	1041	13	W LANTAU	2	0	ON	HKLR	815297	802600	SPRING	NONE	S
07-May-14	2	1248	5	W LANTAU	2	160	ON	HKLR	808436	800502	SPRING	NONE	P
07-May-14	3	1324	10	W LANTAU	2	236	ON	HKLR	807264	799684	SPRING	NONE	S
07-May-14	4	1348	2	W LANTAU	2	131	ON	HKLR	806462	801693	SPRING	NONE	P
20-May-14	1	1135	8	W LANTAU	3	449	ON	HKLR	811457	801241	SPRING	NONE	P

Appendix III. Individual dolphins identified during HKLR09 monitoring surveys in March - May 2014

ID#	DATE	STG#	AREA
CH12	26/03/14	4	W LANTAU
CH38	12/03/14	4	W LANTAU
	15/04/14	3	W LANTAU
CH105	07/05/14	1	W LANTAU
	20/05/14	1	W LANTAU
CH108	12/03/14	3	W LANTAU
	26/03/14	3	W LANTAU
	15/04/14	3	W LANTAU
NL33	15/04/14	3	W LANTAU
NL98	07/05/14	1	W LANTAU
NL156	15/04/14	3	W LANTAU
NL182	20/05/14	1	W LANTAU
NL264	15/04/14	1	W LANTAU
NL288	15/04/14	1	W LANTAU
NL289	26/03/14	4	W LANTAU
NL295	15/04/14	1	W LANTAU
	15/04/14	3	W LANTAU
NL304	20/05/14	1	W LANTAU
SL05	15/04/14	6	W LANTAU
SL27	26/03/14	1	W LANTAU
SL35	26/03/14	1	W LANTAU
	26/03/14	4	W LANTAU
SL44	07/05/14	2	W LANTAU
SL51	12/03/14	3	W LANTAU
	12/03/14	4	W LANTAU
WL04	15/04/14	1	W LANTAU
WL05	15/04/14	1	W LANTAU
WL15	26/03/14	1	W LANTAU
WL25	26/03/14	4	W LANTAU
	15/04/14	4	W LANTAU
WL28	07/05/14	1	W LANTAU
	20/05/14	1	W LANTAU
WL46	15/04/14	3	W LANTAU
	07/05/14	1	W LANTAU
WL47	15/04/14	3	W LANTAU
WL50	12/03/14	3	W LANTAU

ID#	DATE	STG#	AREA
WL62	12/03/14	3	W LANTAU
	26/03/14	1	W LANTAU
	07/05/14	4	W LANTAU
WL69	07/05/14	3	W LANTAU
WL72	15/04/14	3	W LANTAU
WL74	07/05/14	2	W LANTAU
WL79	07/05/14	1	W LANTAU
WL86	12/03/14	2	W LANTAU
	12/03/14	3	W LANTAU
	26/03/14	1	W LANTAU
WL91	07/05/14	2	W LANTAU
WL93	26/03/14	1	W LANTAU
WL98	07/05/14	1	W LANTAU
WL109	26/03/14	4	W LANTAU
	15/04/14	3	W LANTAU
WL114	07/05/14	2	W LANTAU
WL118	07/05/14	3	W LANTAU
WL130	26/03/14	1	W LANTAU
	15/04/14	7	W LANTAU
WL131	26/03/14	4	W LANTAU
	15/04/14	6	W LANTAU
WL132	07/05/14	4	W LANTAU
WL137	12/03/14	4	W LANTAU
	15/04/14	3	W LANTAU
WL144	12/03/14	4	W LANTAU
WL152	26/03/14	4	W LANTAU
WL165	12/03/14	2	W LANTAU
	26/03/14	1	W LANTAU
WL173	15/04/14	6	W LANTAU
WL179	20/05/14	1	W LANTAU
WL193	07/05/14	1	W LANTAU
WL199	20/05/14	1	W LANTAU
WL208	07/05/14	3	W LANTAU
WL211	12/03/14	4	W LANTAU
WL219	20/05/14	1	W LANTAU
WL220	26/03/14	4	W LANTAU
WL221	26/03/14	1	W LANTAU
WL224	07/05/14	3	W LANTAU

Appendix IV. Fifty-Five individual dolphins that were identified during March to May 2014 under HKLR09 impact phase monitoring surveys



Appendix IV. (cont'd)

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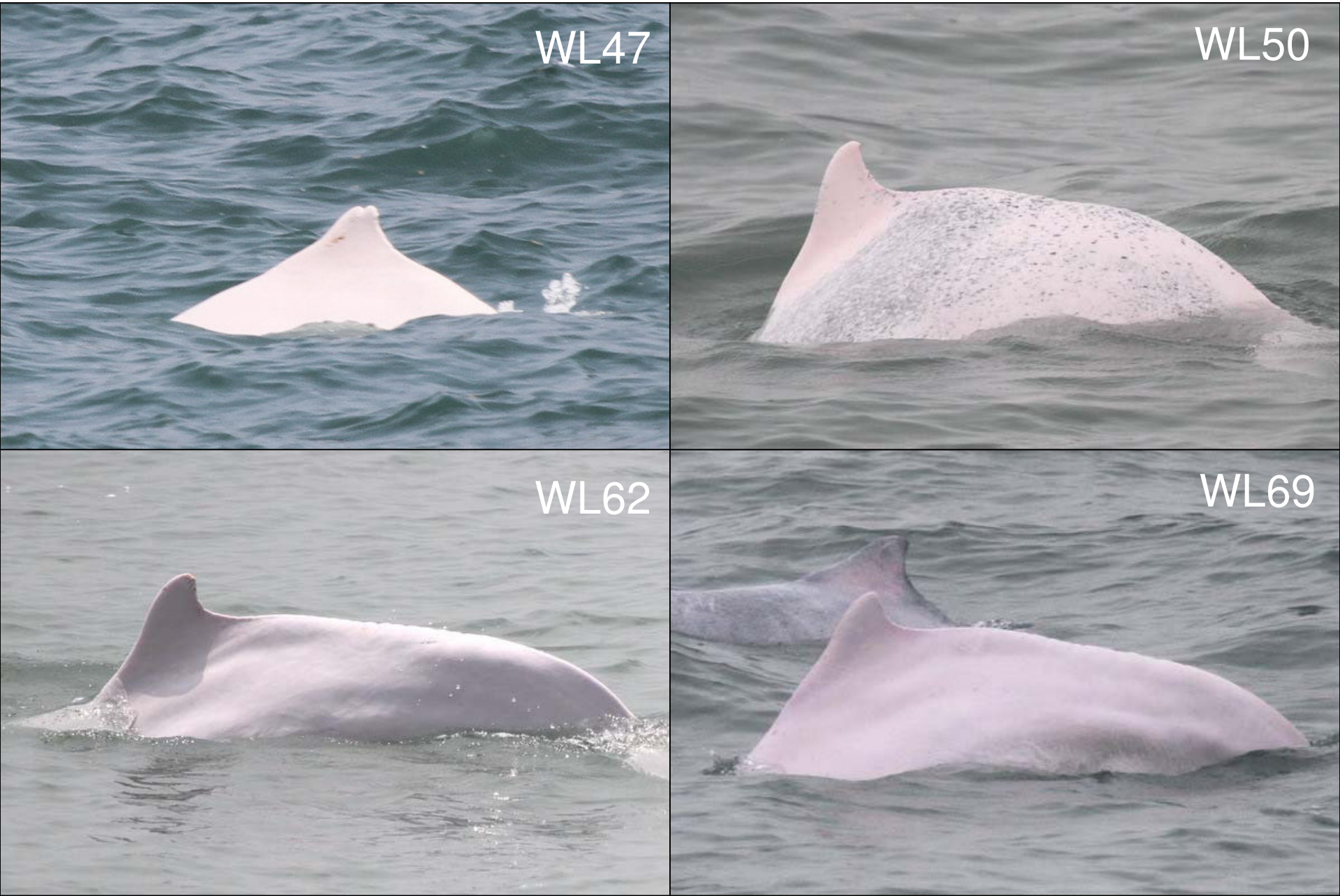
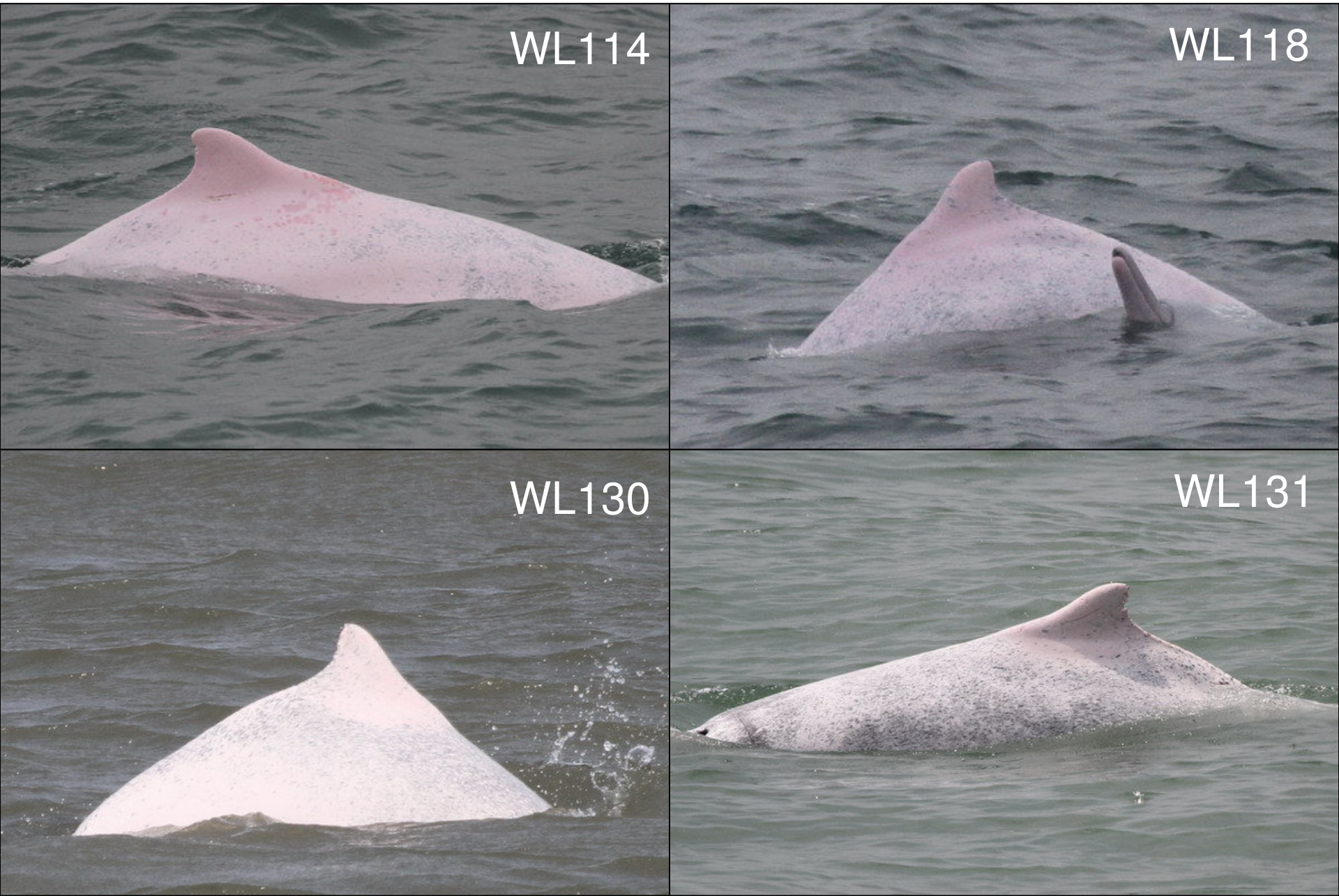
Appendix IV. (cont'd)



Appendix IV. (cont'd)

Appendix IV. (cont'd)

Appendix IV. (cont'd)



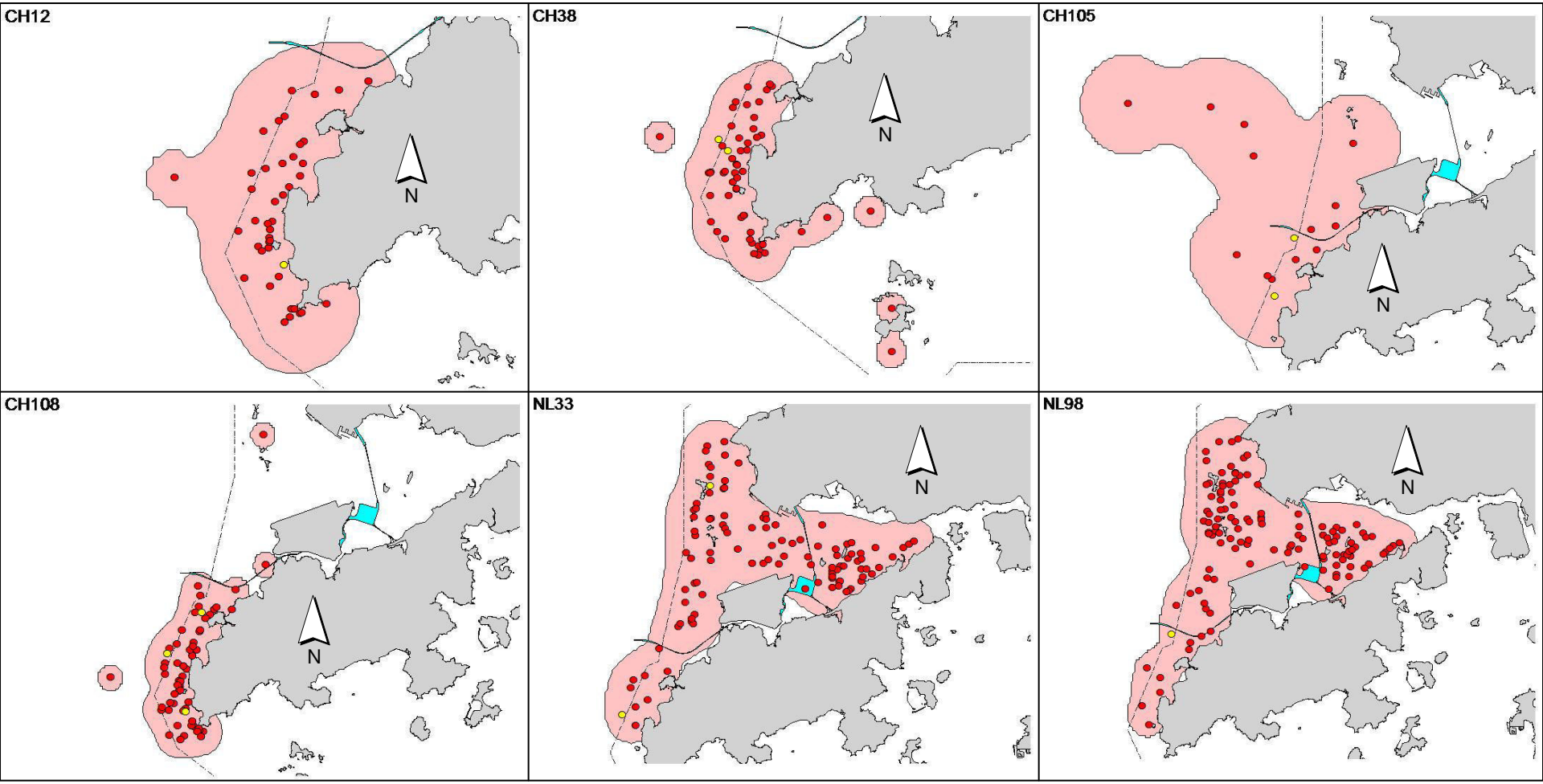
Appendix IV. (cont'd)

Appendix IV. (cont'd)

Appendix IV. (cont'd)

Appendix IV. (cont'd)

Appendix V. Ranging patterns (95% kernel ranges) of 55 individual dolphins that were sighted during HKLR09 impact phase monitoring period (note: yellow dots indicates sightings made in March-May 2014)



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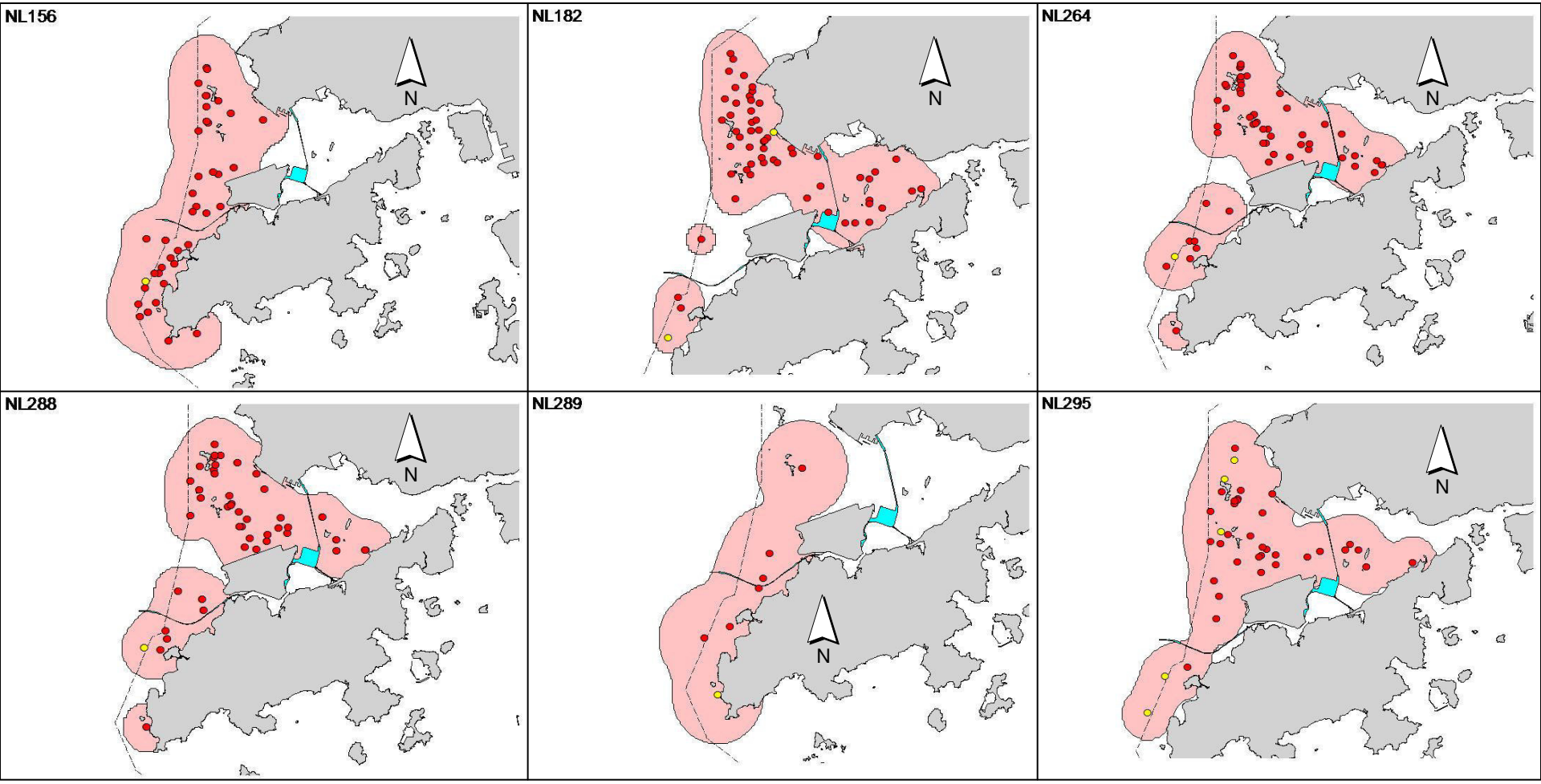

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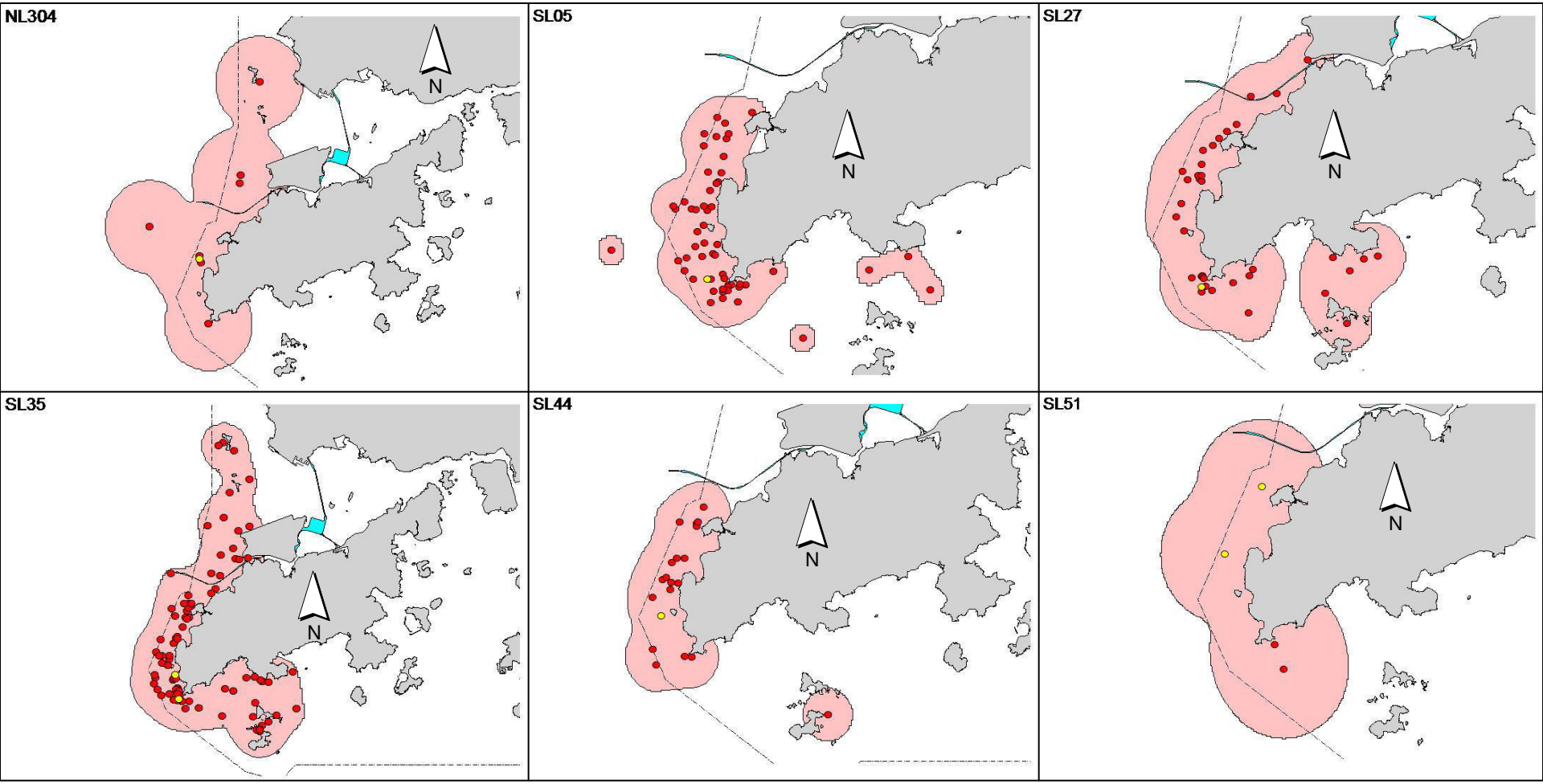
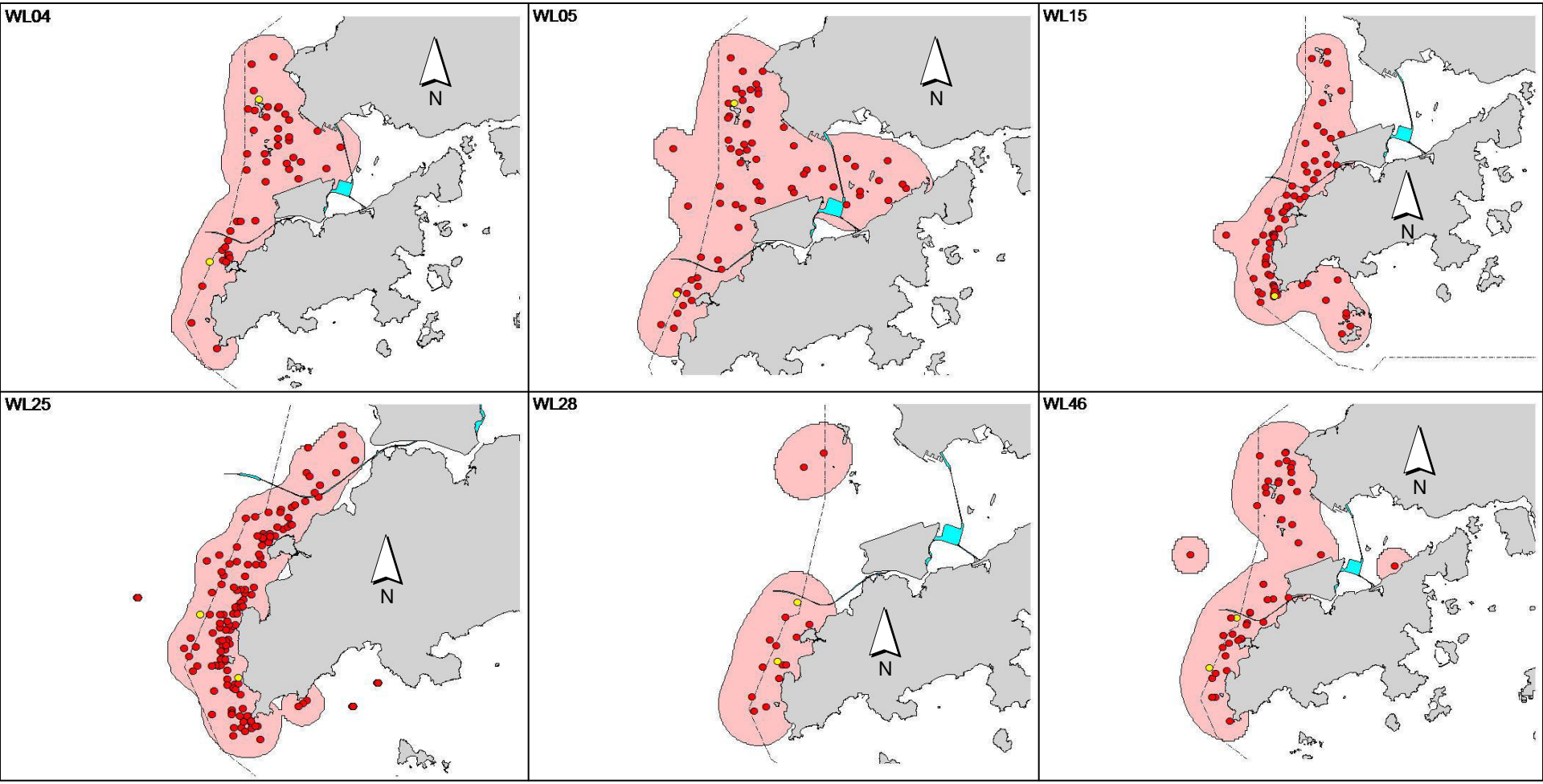
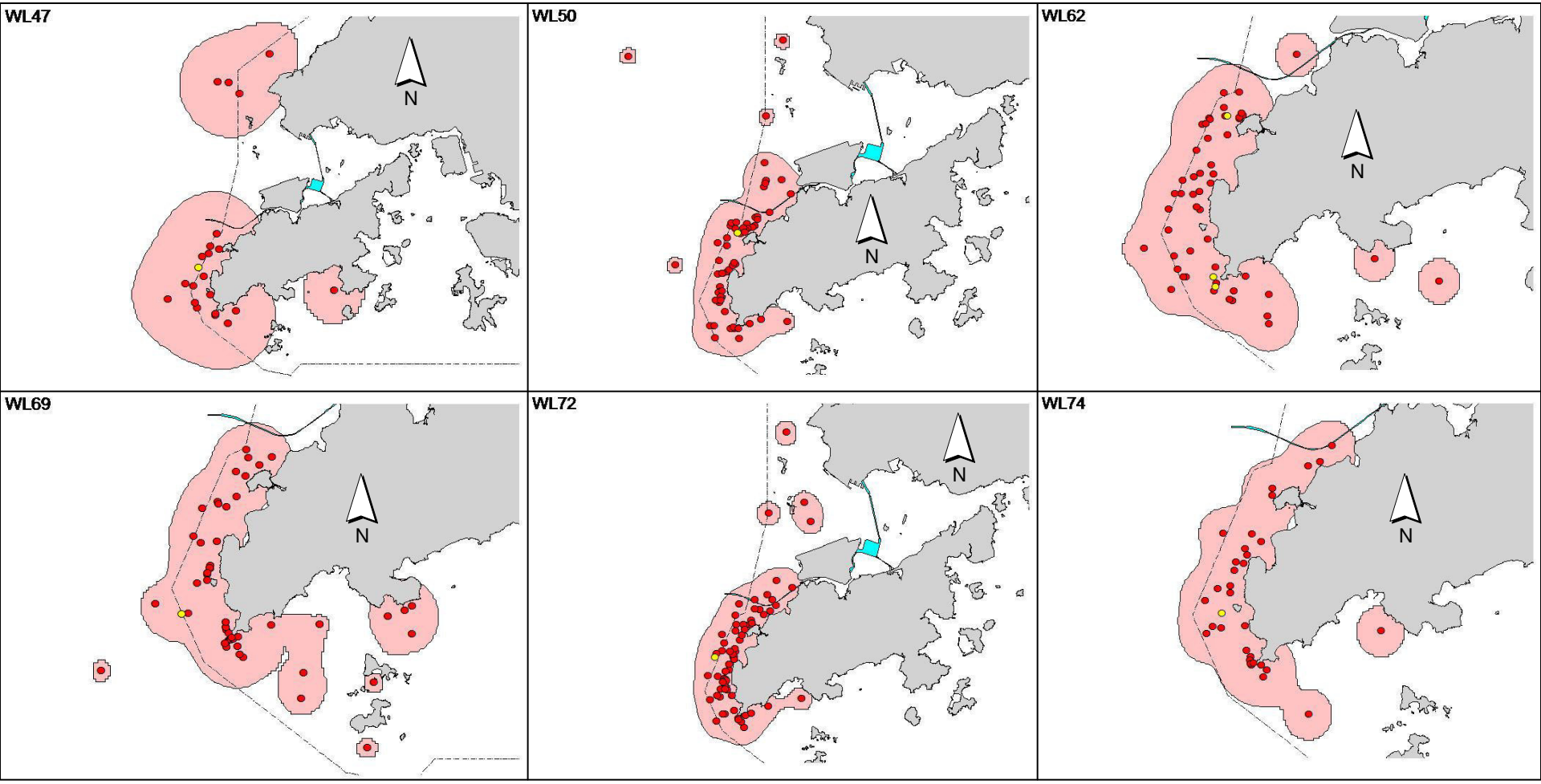


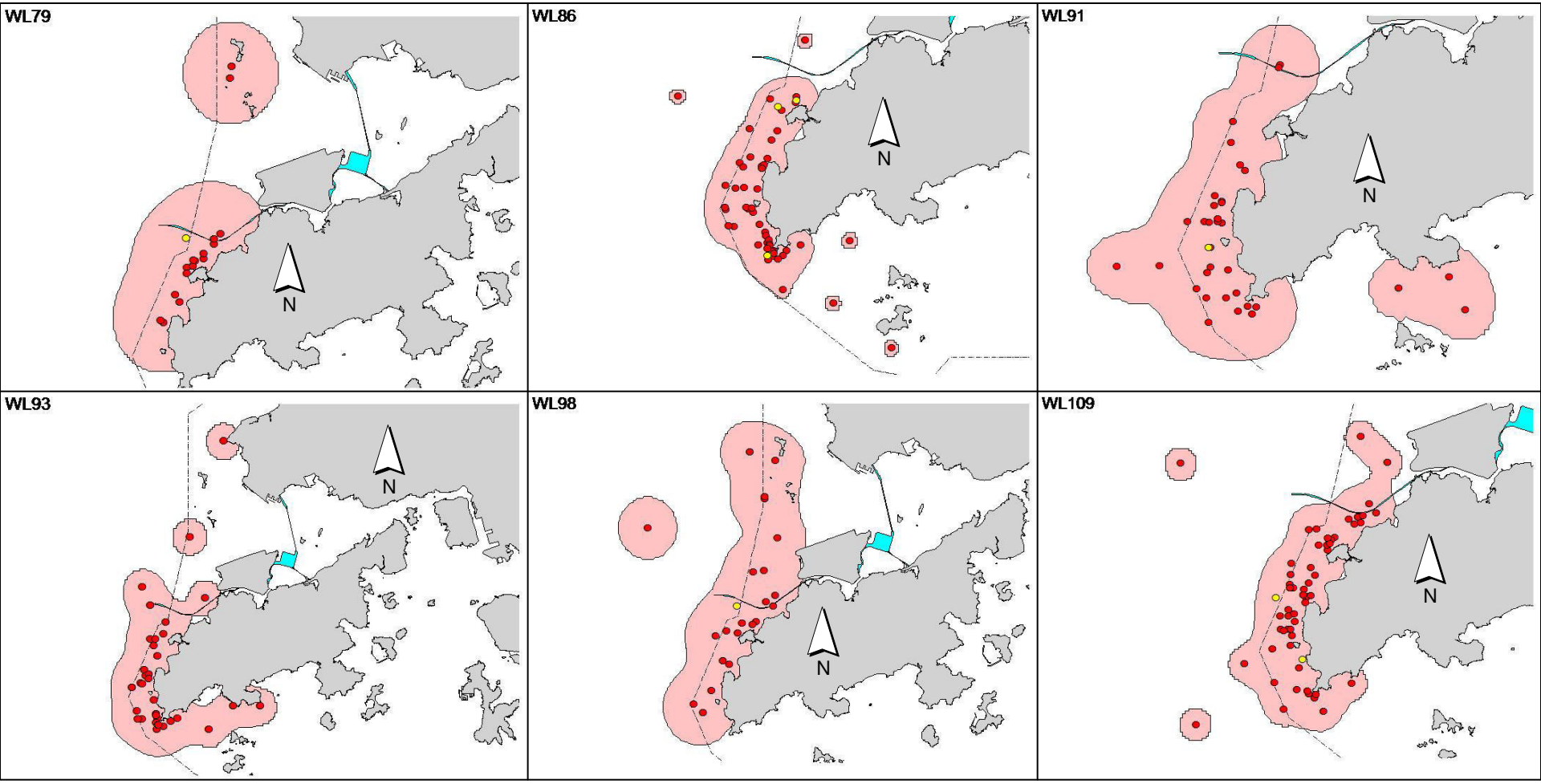
Appendix V. (cont'd)



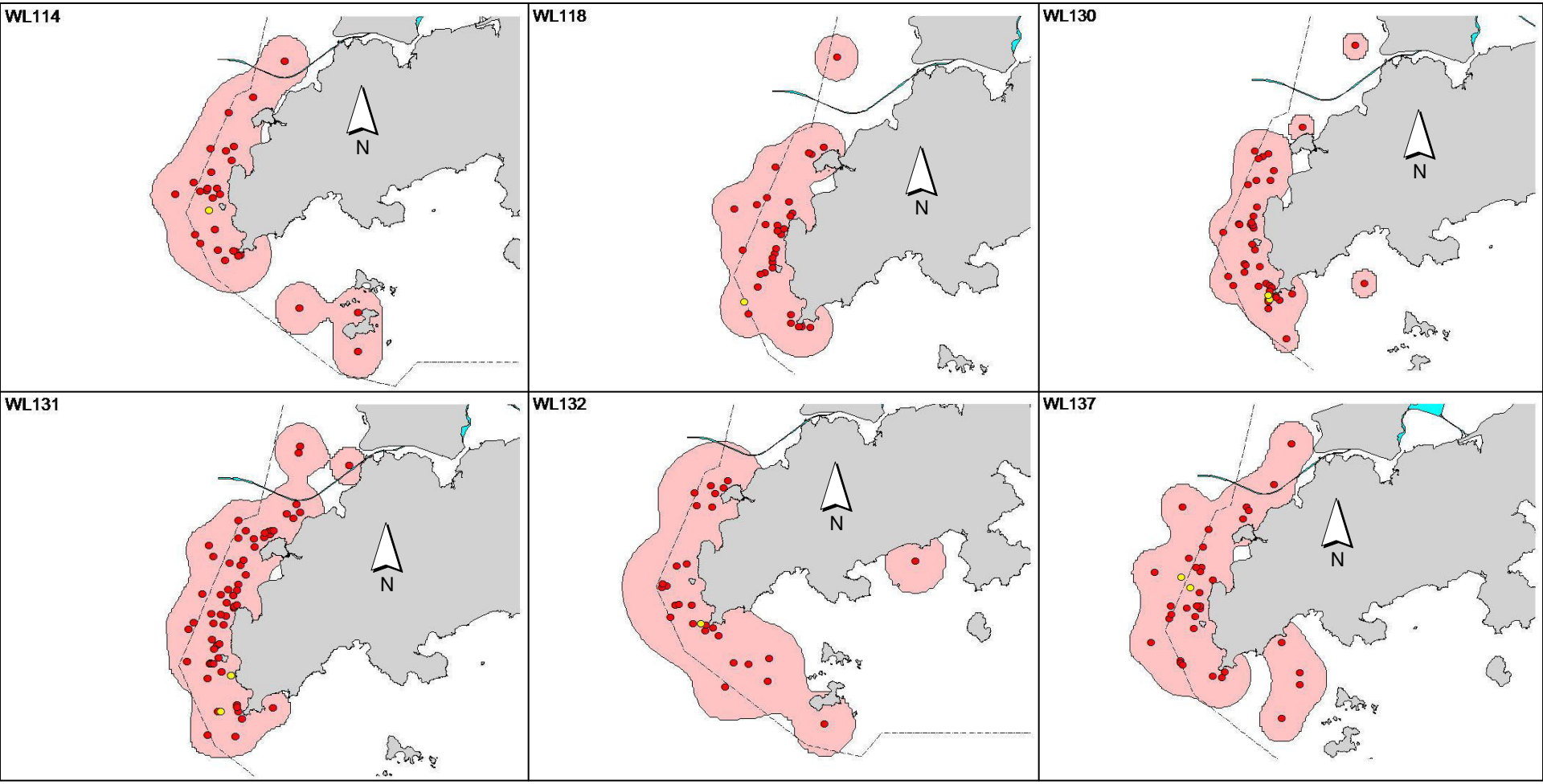
Appendix V. (cont'd)



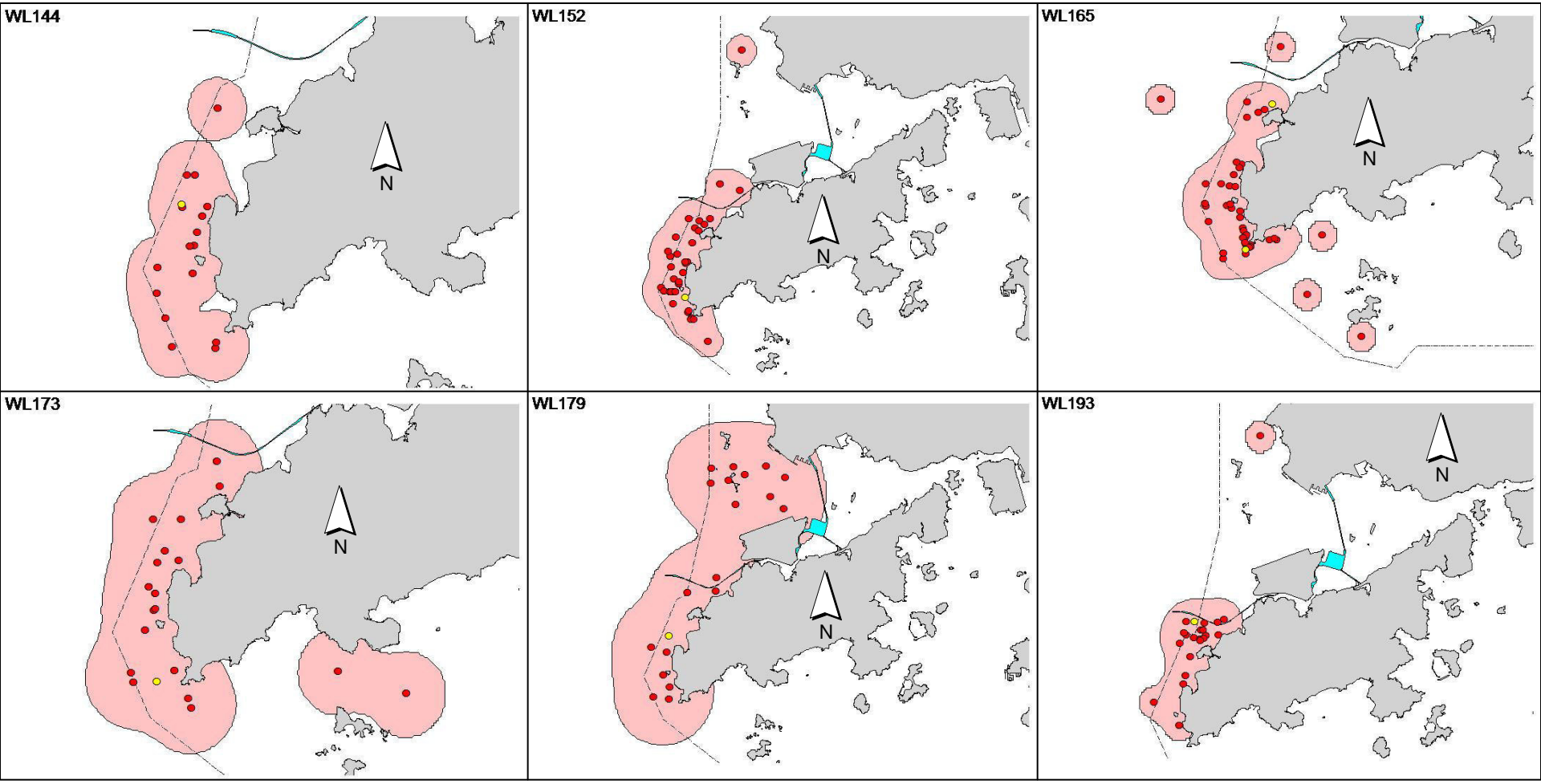
Appendix V. (cont'd)



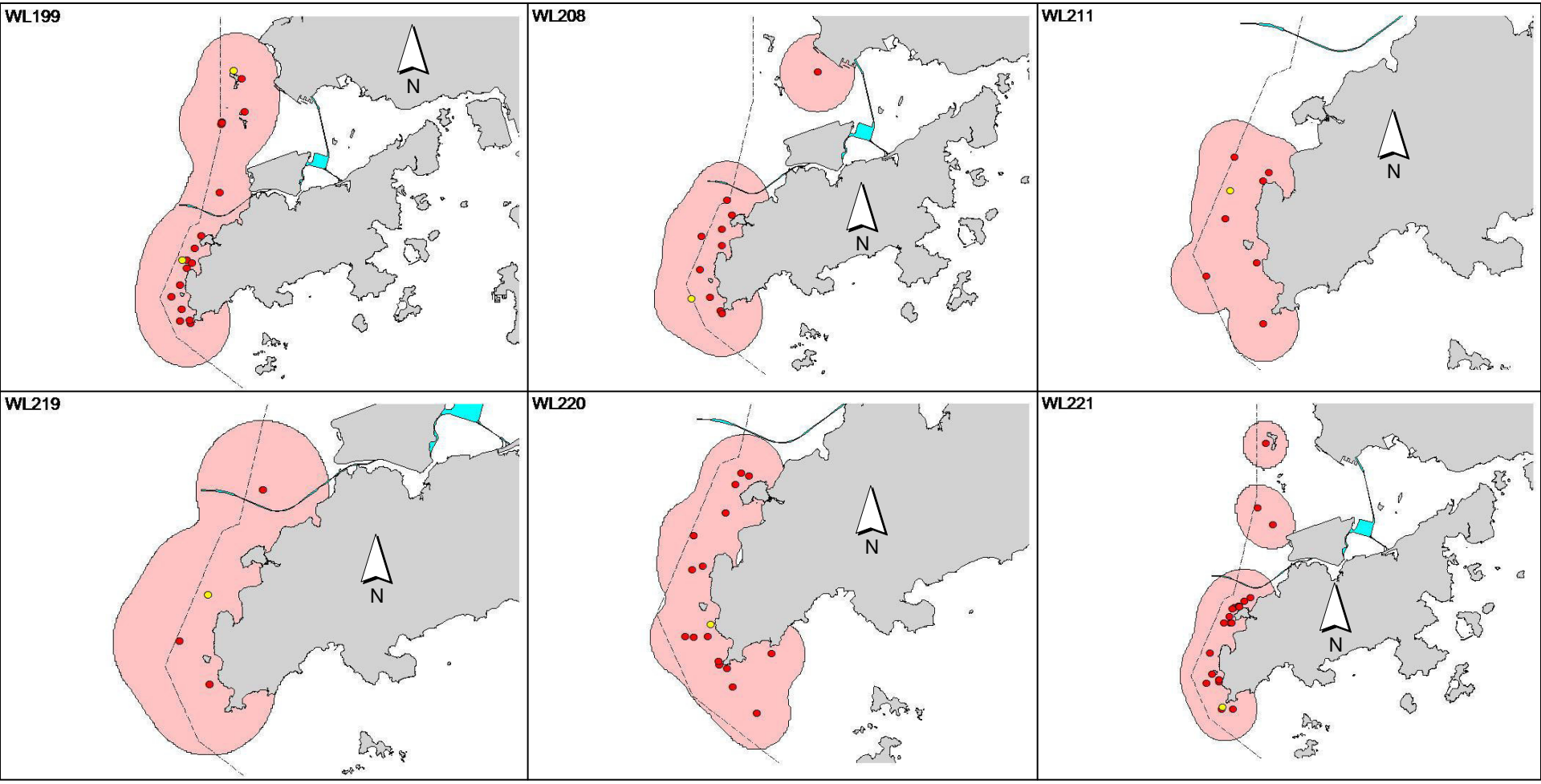
Appendix V. (cont'd)



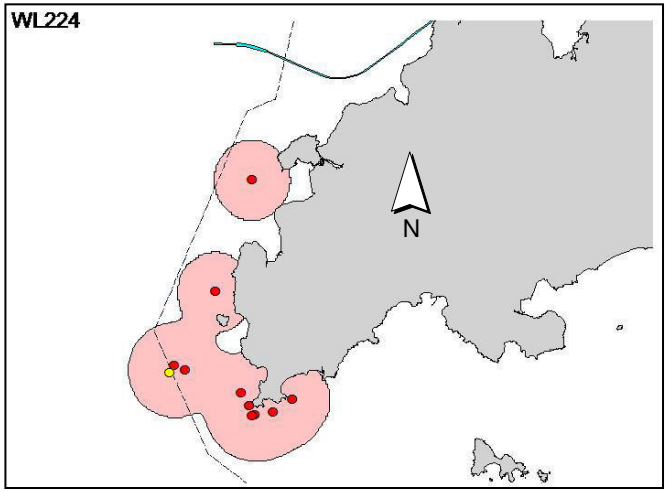
Appendix V. (cont'd)



Appendix V. (cont'd)



Appendix V. (cont'd)



APPENDIX 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 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.			

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 ^ 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 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.					^ N/A * ^ ^ ^
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

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

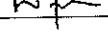
Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

2nspection Information

Checklist Reference Number	140305
Date	5 March 2014 (Wednesday)
Time	9:30-11:50

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.	B20
	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	
140305-R01	• To clear and avoid the oil leakage from the equipment to the unpaved area at WA7.	F8
140305-R02	• Clear the wastes at the drainage channel at WA7.	F6
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140228), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		5 March 2014
Checked by	Dr. Priscilla Choy		5 March 2014

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	140311
Date	11 March 2014 (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	
140311-R01	• Clear the waste materials and debris at the barge at P28.	B20
140311-R02	• Provide mitigation measures to avoid the leakage of muddy water to the sea at platform at P28.	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	
140311-R03	• To seal the hole of the drip tray at P75.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140305), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam	Ivy	11 March 2014
Checked by	Dr. Priscilla Choy		11 March 2014

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	140318
Date	18 March 2014 (Tuesday)
Time	9:30-11:55

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
140318-R04	• Properly deploy the silt curtain at P106 and P98.	B24,B25
	B. Ecology	
	No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	No environmental deficiency was identified during site inspection.	
	D. Noise	
	No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
140318-R01	• Clear the general refuse at construction sites near the containers and site entrance of Portion C.	F1iii, F4ii
140318-R02	• To plug the hole of drip tray at Portion C.	F9
140318-R05	• Provide drip tray for the oil container at P101.	F9
	F. Permits/Licences	
140318-R03	• To update the CNP which displays at the site entrance of Portion C	G1
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140311), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

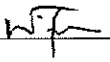
	Name	Signature	Date
Recorded by	Ivy Tam		18 March 2014
Checked by	Dr. Priscilla Choy		18 March 2014

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	140328
Date	28 March 2014 (Friday)
Time	13:30-15:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
140328-R03	• Properly store the construction material to avoid it getting to the sea at P48.	B20
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
140328-R01	• Provide noise emission labels for the breaker and air compressor at P39.	E8
	E. Waste / Chemical Management	
140328-R02	• Clear and avoid oil leakage from the pump for diesel oil at P39.	F8
140328-R04	• Provide drip tray for the oil containers at the barge of P48.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140318), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		28 March 2014
Checked by	Dr. Priscilla Choy		28 March 2014

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	140401
Date	1 April 2014 (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	
140401-R01	• Clear the stagnant water with oil which is nearly overflow at the drip tray at Portion C.	B8
140401-R04	• Clear the sand at the public road and provide sand bag bund at the water barrier for avoiding leakage of muddy water (Portion C).	B16
140401-R05	• Properly deploy the silt curtain at P106 and P107.	B25
140401-R06	• Clear the floating rubbish within the silt curtain at P101.	B21
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
140401-R04	• Clear the sand at the public road and provide sand bag bund at the water barrier for avoiding leakage of muddy water (Portion C).	D3
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
140401-R02	• To remove the oil containers away from the drainage channel at Portion C.	F3i
140401-R03	• Clear the oil spillage at near the site drain near site exit at Portion C.	F8
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140328), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		1 April 2014
Checked by	Dr. Priscilla Choy		1 April 2014

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	140408
Date	8 April 2014 (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	
140408-R04	• Properly deploy the silt curtain at P106.	B25
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
140408-R01	• Provide mitigation measures to avoid the oil leakage at near office container at Portion C.	F8
140408-R02	• Clear the accumulated waste at Portion C.	F1i
140408-R03	• Clear the soil at the U-channel at near P106.	F6
140408-R05	• To remove the construction materials at near the tree at P103.	F7
140408-R06	• To seal the hole of the drip tray at P98.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140401), Items 14040-R01, R02, R03, R04, R06 were improved/rectified by Contractor during the site inspection. Follow-up action is required for item 140401-R05 which is renamed as 140408-R04.	

	Name	Signature	Date
Recorded by	Ivy Tam		8 April 2014
Checked by	Dr. Priscilla Choy		8 April 2014

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	140415
Date	15 April 2014 (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	
140415-R02	• Pipe should be replaced or repaired to avoid leakage of muddy water. (P27)	B26
140415-R04	• The Contractor was reminded to treat the waste water before discharge. (P71)	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	
140415-R01	• Drip tray should be well-maintained to prevent leakage (P27)	F9
	F. Permits/Licences	
140415-R03	• Permits (EP, CNP) should be displayed on site conspicuously. (P27)	G1, G5
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140408), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

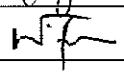
	Name	Signature	Date
Recorded by	Ivy Tam		15 April 2014
Checked by	Dr. Priscilla Choy		15 April 2014

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	140425
Date	25 April 2014 (Friday)
Time	13:30-15:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
140425-R02	• Clear the excess dusty materials at the boundary of platform at P49.	B20
	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	
140425-R01	• To review the size of the drip tray for the air compressor to avoid oil spillage at P49.	F8 & F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140415), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

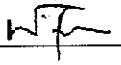
	Name	Signature	Date
Recorded by	Ivy Tam		25 April 2014
Checked by	Dr. Priscilla Choy		25 April 2014

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	140429
Date	29 April 2014 (Tuesday)
Time	9:30-12:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
140429-R01	• Clear the general refuse inside the casting at P20.	B21
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
140429-R03	• To check the generator which emitted heavy smoke at the barge at P20.	D19
140429-R06	• Clear the stockpile of concrete material at the boundary of platform at P39.	D7
	D. Noise	
140429-R02	• Provide acoustic decoupling measure for the generator at the barge at P20.	E7
140429-R05	• Provide noise emission labels for the hand-held breaker at P39.	E8
	E. Waste / Chemical Management	
140429-R04	• Clear the oil leakage at the barge at P20.	F8
	F. Permits/Licences	
140429-R07	• To display the CNP, if any at P39 and P48.	G7
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140425), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		29 April 2014
Checked by	Dr. Priscilla Choy		29 April 2014

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	140507
Date	7 May 2014 (Wednesday)
Time	9:30-11:55

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
140507-O01	• Silt curtain has observed damage and not deployed properly at near P106 and P107. The Contractor was reminded to replace the damage silt curtain as soon as possible.	B25
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
140507-R04	• Clear the soil at the public road at Portion C.	D3
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
140507-R02	• Clear the oil spillage at the site entrance of Portion C.	F8
140507-R03	• To remove the construction materials and provide fencing for protecting the trees at Portion A and C.	F4ii, F7
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140429), items 140429-R01, 02, 03, 04, 06, 07 were improved/rectified by contractor during the site inspection, while item 140429-R05 requires follow-up action.	

	Name	Signature	Date
Recorded by	Ivy Tam		7 May 2014
Checked by	Dr. Priscilla Choy		7 May 2014

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	140513
Date	13 May 2014 (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	
140513-R02	• Clear the deposited soil at the public road at near P107. (Portion C)	B9
140513-R05	• Properly deploy the silt curtain to ensure it function effectively at P106, P107, P98 and P101.	B25
140513-R06	• Clear the floating wastes within the silt curtain at P101.	B21
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
140513-R02	• Clear the deposited soil at the public road at near P107. (Portion C)	D3
	D. Noise	
140513-R07	• Provide noise emission labels for the hand-held breaker at P94.	E8
	E. Waste / Chemical Management	
140513-R01	• To seal the hole of drip tray and review the size of drip tray for placing the oil pump at near P108 (Portion C).	F9
140513-R03	• Clear the accumulated waste at the waste skip at near P107. (Portion C)	F1i.
140513-R04	• To remove the construction materials at near the tree and provide tree protection zone at P105 and P106.	F4ii.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140507), follow-up action is required for items 140507-O01, R03 and R04 which were renamed as 140513-R05, R04 and R02 respectively.	

	Name	Signature	Date
Recorded by	Ivy Tam		13 May 2014
Checked by	Dr. Priscilla Choy		13 May 2014

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	140520
Date	20 May 2014 (Tuesday)
Time	9:30-12:15

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
140520-R02	• To check the silt curtain and avoid the gap at the silt curtain at P68.	B25
140520-R03	• Clear the deposited waste materials at the platform at P73.	B20
	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	
140520-R01	• Clear the accumulated wastes at barge of P47.	F1i.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140513), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		20 May 2014
Checked by	Dr. Priscilla Choy		20 May 2014

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	140530
Date	30 May 2014 (Friday)
Time	13:30-15:40

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	
140530-O01	• Dust generation was observed from the trimming works at P45. The Contractor was reminded to provide sufficient dust mitigation measures properly.	D13, 14, 15
	D. Noise	
140530-R02	• To close the panel of air compressor at P45.	E9
140530-R03	• To check and provide noise emission label for the hand-held breakers at P45.	E8
	E. Waste / Chemical Management	
140530-R04	• Clear the waste materials at the platform at P72.	F1iii. & F4ii.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 140520), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

	Name	Signature	Date
Recorded by	Ivy Tam		30 May 2014
Checked by	Dr. Priscilla Choy		30 May 2014

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 2014 (Year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated[11]	Hard Rock and Large Broken Concrete[6]	Reused in the Contract[8,9]	Reused in other Projects[5,8,9]	Disposed as Public Fill[7]	Imported Fill[6,7,8,9]	Metals[12]	Paper/ cardboard packaging	Plastics[3]	Chemical Waste	Others, e.g. general refuse[8,9]
	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 m^3)
Jan	2.592	0.000	0.124	0.449	2.020	0.000	0.000	0.272	0.000	0.000	0.169
Feb	3.843	0.000	0.000	2.373	1.470	0.000	0.000	0.756	0.000	0.000	0.117
Mar	2.376	0.000	0.000	0.000	2.376	0.000	0.189	0.764	0.000	0.595	0.260
Apr	7.401	0.000	0.052	2.210	2.129	3.010	0.030	1.150	0.000	0.000	0.189
May	18.257	0.000	0.169	6.938	2.110	9.040	0.025	To Be Updated	0.000	0.000	0.221
Jun											
Sub-Total	34.469	0.000	0.345	11.970	10.105	12.050	0.244	2.942	0.000	0.595	0.956
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	34.469	0.000	0.345	11.970	10.105	12.050	0.244	2.942	0.000	0.595	0.956

Forecast of Total Quantities of C&D Materials to be Generated from the Contract [10]										
Total Quantity Generated[11]	Hard Rock and Large Broken Concrete[6]	Reused in the Contract[8,9]	Reused in other Projects[5,8,9]	Disposed as Public Fill[7]	Imported Fill[6,7,8,9]	Metals	Paper/ cardboard packaging	Plastics[3]	Chemical Waste	Others, e.g. general refuse[8,9]
(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 m^3)
24.000	121.054	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 September 2013.

(11) The volume of Total Quantity Generated means the volume of Hard Rock and Large Broken Concrete+Disposed as Public Fill+Imported Fill-Reused in the Contract-Reused in other Projects

(12) The density of metal is 7,850 kg/m^3.

APPENDIX K
SUMMARY OF EXCEEDANCE

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

Exceedance Report

(A) Exceedance Report for Air Quality

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

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

(C) Exceedance Report for Water Quality

Environmental Monitoring	Parameter	No. of Exceedance		No. of Exceedance related to the Construction Activities of this Contract	
		Action Level	Limit Level	Action Level	Limit Level
Water Quality	Dissolved Oxygen (DO) (Surface & Middle)	0	0	0	0
	Dissolved Oxygen (DO) (Bottom)	0	0	0	0
	Turbidity	6	1	0	0
	Suspended Solids (SS)	24	6	0	0

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

APPENDIX L
COMPLAINT LOG

Appendix L - Complaint Log

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

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 mats on ground for loading and unloading heavy or metal objects; and •To deploy professional personnel to supervise the works.	Closed
Com-2013-05-003	Near Tung Chung New Development Pier	18 May 2013	EPD received the public complaint on 18 May 2013. This complaint was a follow-up of a previous complaint received by EPD on 8 April 2013 (Com-2013-04-001).	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	Closed

			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.	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 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	Closed

				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. 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.	
Com-2013-11-001	Chek Lap Kok (CLK) South Road	16 November 2013	The complaint was received by project customer services on 16th November 2013 regarding the dust problem at Chek Lap Kok (CLK) South Road.	After receiving the complaint, ET conducted the site inspection on 19 and 29 November 2013 to check the appropriate environmental protection and pollution control measures which are properly implemented by the Contractor under HY/2011/09 (DCVJV). The observation are summarized as below:- • Dust generation works was conducted by the other Contractor at South East Quay • Proper watering of haul road to avoid dust generation during vehicle / plant equipment movement. • Vehicle washing facilities provided at every site exit at CLK South Road and South Perimeter Road. • No dark smoke was observed emitting from the plant equipments. Based on the information collected, the complaint of dust problem at Check Lap Kok South Road is considered not related to Contract No. HY/2011/09 as dust	Closed

				suppression measures has been properly implemented by the Contractor on site to prevent dust nuisance from the construction activities.	
Com-2014-01-001	Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09	3 January 2014	The complaint was received by EPD on 3rd January 2014. According to the EPD's letter, a resident in Tai O District was concerned for the noise nuisance occasionally arising from the hammering or hitting of metals from Contract No. HY/2011/09.	In response to the complaint, ET conducted an ad hoc night time site inspection at P0, P18 and P19 on 14 January 2014 between around 23:00 and 00:30 hours of 15 January 2014. In accordance with the site activities record and site inspections, the construction works conducted under Contract No. HY/2011/09 complied with the conditions in the CNP No. GW-RS1108-13. Nevertheless, the Contractor was advised to strictly follow the conditions of the permit because any deviation from the conditions may lead to cancellation of the permit, subsequent prosecution action and the Authority's refusal to issue further permit. In addition, the following environmental mitigation measures were recommended: • Review and adjust the lighting directions of the barge, under safety consideration, to avoid potential	Closed

				visual impacts to residents in vicinities; • To ensure the equipment are maintaining in good operation condition; and • To strengthen site supervision and provide training for the workers regularly to increase awareness of their environmental responsibilities to minimize the noise impact to the nearby residents and the specific mitigation measures.	
Com-2014-01-002	Hong Kong-Zhuhai-Macao Bridge	16 January 2014	The complaint was received by HyD's PR Team on 16 January 2014 that the complainant advised that the heavy exhaust fume affecting Tung Chung Crescent.	After receiving the complaint, ET conducted the site inspection on 21 January 2014 to check all the plant equipments which were operated for the construction works and air quality mitigation measures. Based on the information collected, the complaint of heavy exhausts affecting Tung Chung Crescent is considered not related to Contract No. HY/2011/09 due to the following reason(s):- 1) The work sites at Portion C and South East Quay at Portion A under Contract No. HY/2011/09 are approximately 800m from Tung Chung Crescent. Any unpleasant smell of exhaust fume would not be	Closed

				anticipated. 2) No heavy smoke was observed emitting from plants / equipment during the site inspection on 21 January 2014. 3) The vehicles and equipments were switched off while not in use. 4) All plant and equipment were well maintained and in good operating condition. 5) Air quality mitigation measures has been properly implemented by the Contractor on site to prevent dust nuisance from the construction activities.	
Com-2014-03-001	Oil Spillage at near Sha Lo Wan	5 March 2014	The complaint was received by EPD on 5 March 2014. The complainant suspected the oil leakage from the works area of Contract No. HY/2011/09 near Sha Lo Wan	Based on ET site inspection, no oil spillage from the works area under Contract No. HY/2011/09 at near Sha Lo Wan was observed. In addition, spill kits are ready on site in order to dealing with spillage cases promptly. Nevertheless, DCVJV was also recommended the mitigation measures as below: • Provide training for the workers regularly regarding the mitigation measures on waste / chemical management. • Provide sufficient chemical spillage kit (e.g. oil absorbent) to all vessels and	Closed

				working platform. • Regular check the condition of vessels and plant equipments to ensure no leakage of oil.	
Com-2014-03-002	Construction Noise in the vicinity of the waters outside Sha Lo Wan	11 March 2014	The complaint was received by EPD on 11 March 2014. According to the EPD's letter, the complainant was concerned for the mobile crane which operating in the vicinity of the waters outside Sha Lo Wan after 23:00.	In accordance with an ad hoc site inspection on 18 March 2014, no construction works were conducted during the restricted hours. The 1st investigation report has been submitted to EPD on 21 March 2014. The 2nd investigation report will be provided to report the investigation results after reviewing the site diary at the time of complaint. The Contractor was advised to strictly follow the conditions of the permit because any deviation from the conditions may lead to cancellation of the permit, subsequent prosecution action and the Authority's refusal to issue further permit. Nevertheless, the Contractor was reminded to take sufficient noise mitigation measures to minimize the environmental impact on the nearby community: · To space out noisy equipment and position it as far away as possible from the sensitive receivers; · To avoid concurrent uses of noisy equipment near the sensitive area; · To ensure the equipment are maintaining in good operation condition;	Under Investigation

				· To turned off any idle equipment on site; and · To enclose the noisy part of the machine by acoustic insulation material if feasible. · To arrange tailor-made training for the Production Team including the management and foremen to explain to them the conditions and requirements listed on the CNP. · To delegate one Engineer for ensuring that all construction activities and PMEs used are in full compliance with the CNP and legislative requirements.	
Com-2014-04-001	Construction marine works by the company Bauer Hong Kong in Tung Chung	14 April 2014	The complaint was received by Agriculture, Fisheries and Conservation Department (AFCD) on 14 April 2014, the complainant complained that the dead dolphin was found under a platform at construction marine works by the company Bauer Hong Kong in Tung Chung (Macau Bridge Piling Works)	In accordance with the photos showing a date of 27 November 2013 (08:00 – 08:25a.m.) which provided by the complainant, the dolphin was observed has been dead for some time and shows signs of decomposition. It was difficult to determine the cause of death of the deceased dolphin based on the photographs and the dead dolphin was found a few months ago. By examining the photos, it is found that the body was beside a barge, not under a working platform. In addition, the dead dolphin was found in the early morning in which the marine construction works have not been commenced. Therefore, from the above information the dead dolphin is	Closed

				considered to be washed to the work site. However, there is no significant increase of cetacean stranding were found in Hong Kong since the commencement of Contact No. HY/2011/09. In regard to the complaint, the following recommendations were made: ➢ In case stranded cetaceans are found, the AFCD shall be contacted immediately and provide the following information to facilitate AFCD's investigation: 1. Name and telephone number; 2. Date and time of discovery; 3. Location (as specific as possible); 4. Status of the stranded animal (i.e. alive, freshly dead, slightly decomposed, rotten, mummified); 5. Type and size of the stranded animal. ➢ To implement Dolphin Exclusion Zone during the installation of bored pile casing located in the waters to the west of Airport. ➢ To implement Dolphin Watching Plan after the bored piling casing is installed.	

Com-2014-05-001	At the shore of Sha Lo Wan	13 May 2014	The complaint was received by EPD on 13 May 2014. According to the EPD's email, the complainant was concerned about the sand material that was excavated on the shore of Sha Lo Wan for the construction of Hong Kong - Zhuhai - Macao Bridge (HZMB) Project on 11 May 2014.	After receiving the complaint from a Sha Lo Wan's village resident, the sub-contractor was instructed to stop the sand excavation and leave immediately. In addition, all sands excavated from the shore of Sha Lo Wan were returned back to the original area on 13 May 2014. Nevertheless, the Contractor was advised to arrange tailor-made training for Production Team including the management and foremen to explain to them the conditions and requirements listed on the Environmental Permit. In addition, indicative poles and flags are recommended to put within the site boundary to identify the extent of land areas in Sha Lo Wan / Sha Lo Wan (West) Archaeological site.	Closed
Com-2014-05-002	At the shore of Sha Lo Wan	27 May 2014	The complaint was received by EPD on 27 May 2014. According to the EPD's email, the complainant was concerned about the dumping rubbles along the shore area of Sha Lo Wan on 27 May 2014.	Under Investigation	
Com-2014-05-003	Pier 39 to 50	29 May 2014	ARUP received the complaint on 29 May 2013. The complainant advised that the workers disposed hundreds of kg of waste spoils	Under Investigation	

			(concrete and earth) into the sea every day in the existing locations of HZMB site area.	