AECOM

China Harbour Engineering Company Limited

Contract No. HY/2010/02

Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works

Annual Review Report for March 2012- February 2013

[06/2014]

	Name	Signature
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Engineer's Representative
Ove Arup & Partners
Chief Resident Engineer's Office
5 Ying Hei Road, Tung Chung, Lantau
Hong Kong

By Fax (3698 5999) and By Post

Attention: Mr. Roger Marechal

Dear Mr. Marechal,

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/2010/02
Hong Kong – Zhuhai – Macao Bridge
Hong Kong Boundary Crossing Facilities – Reclamation Work
Annual Environmental Monitoring & Audit Report for March 2012 to Feb 2013

Reference is made to the Environmental Team's submission of the Annual Environmental Monitoring & Audit Report for March 2012 to February 2013 (letter ref. 60249820/C/RMKY14062001 dated 20 June 2014) copied to us by E-mail on 20 June 2014. Please be advised that we have no further comment at this stage.

We would, however, like to draw your attention that the ET shall supplement the Annual EM&A Report with respect to the following observations:

1. Detailed review, analysis and evaluation of dolphin monitoring data covering annual period as per section 12.9.1.1 (vi) of the EM&A Manual for TM-CLKL with level of details not less than the same part in your submitted quarterly EM&A report and AFCD's annual marine mammal monitoring reports applicable to the dolphin monitoring.

2. Data/evidence about distribution and activity of fishing trawlers correlated to dolphin habitat use and behavioural activities to support your review on the environmental acceptability of the project with reference to specific impact hypotheses and the predicted scenario as per section 12.9.1.1 (xv) of the EM&A Manual for TM-CLKL.

Thank you very much for your kind attention and please do not hesitate to contact the undersigned should you have any queries.

Yours sincerely,

Raymond Dai
Independent Environmental Checker

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TABLE OF CONTENTS

List of Tables

Figures

List of Appendices

EXECUTIVE SUMMARY

Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Work (here below, known as "the Project") mainly comprises seawall construction and reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCLKL). It is a designated project and is governed by the current permits for the Project, i.e. the amended Environmental Permits (EPs) issued on 06 August 2013 (EP-353/2009/G) and 28 January 2014 (EP-354/2009/B) (for TMCLKL Southern Landfall Reclamation only).

Ove Arup & Partners Hong Kong Limited (Arup) was appointed by Highways Department (HyD) as the consultants for the design and construction assignment for the Project's reclamation works (i.e. the Engineer for the Project).

China Harbour Engineering Company Limited (CHEC) was awarded by HyD as the Contractor to undertake the construction work of the Project.

ENVIRON Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Project.

AECOM Asia Co. Ltd. (AECOM) was appointed by CHEC to undertake the role of Environmental Team for the Project for carrying out the environmental monitoring and audit (EM&A) works.

The construction phase of the Project under the EPs was commenced on 12 March 2012 and will be tentatively completed by early Year 2016. The EM&A programme, including air quality, noise, water quality and dolphin monitoring and environmental site inspections, was commenced on 12 March 2012.

This report documents the findings of EM&A works conducted in the period between 12 March 2012 and 28 February 2013. As informed by the Contractor, major activities in the reporting quarter were:-

Marine-based Works

- Cone penetration test;
- Geotextile laying and fabrication;
- Stone column installation trial;
- Silt curtain fabrication and deployment; and
- Stone column installation
- Maintenance of Silt curtain
- Silt curtain deployment and repairing
- Sand blanket trial
- Stone blankets laying.
- Band drain installation trial
- Construction of cellular structure
- Backfill cellular structure

Land-based Works

- Site office erection and construction at Works Area WA2;
- Public Works Regional Laboratory erection and construction at Works Area WA3;
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Constructing site access at Works Area WA2 to Ying Hei Road, Tung Chung;
- Drainage works at Works Area WA2 and WA3;
- Geotextile fabrication at Works Area WA2 and WA4; and
- Stone column installation barges setup and their maintenance works at Works Area WA4.
- Silt curtain fabrication at Works Area WA2 and WA4;
- Hoarding erection at Work Areas Portion D and Works Area WA2
- Sign board erection at Works Area WA2

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

24-hour Total Suspended Particulates (TSP) monitoring	61 sessions
1-hour TSP monitoring	61 sessions
Noise monitoring	51 sessions
Impact water quality monitoring	149 sessions
Impact dolphin monitoring	24 surveys
Joint Environmental site inspection	51 sessions

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring in the reporting quarter. However, one (1) Action Level exceedance and four (4) Limit Level exceedance was recorded for 24-hour TSP results in the reporting period. Investigation results show that the exceedances were not due to the Project works. The Contractor was recommended to continue implementing existing dust mitigation measures

Breaches of Action and Limit Levels for Noise

One (1) Limit Level exceedance of impact noise monitoring was recorded in the reporting period. Investigation into the possible causes of each exceedance was undertaken and reported in the respective monthly EM&A reports. Investigation results show that the exceedance was not due to the Project works. The Contractor was recommended to continue implementing existing noise mitigation measures.

Breaches of Action and Limit Levels for Water Quality

Thirty (30) Action Level exceedances and (2) Limit Level exceedances were recorded at measured suspended solids (SS) values (in mg/L), three (3) Action Level exceedances were recorded at measured turbidity (in NTU) and one (1) Action Level exceedance was recorded at measured DO (Bottom) (mg/L) during the reporting period. Investigation result show that the exceedances were not due to the Project works. Investigation results show that the exceedances were not due to the Project works. Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains.

Triggering of Event and Action Plan for Impact Dolphin Monitoring

No triggering of Event and Action Plan for impact dolphin monitoring was noted in the reporting period.

Implementation Status and Review of Environmental Mitigation Measures

Most of the recommended mitigation measures, as included in the EM&A programme, were implemented properly in the reporting period. Reference is made to ET's proposal of the omission of air monitoring station (AMS 6) dated on 1 November 2012 and EPD's letter dated on 19 November 2012 regarding the conditional approval of the proposed omission of air monitoring station (AMS 6) for Contract No. HY/2010/02. The aforesaid omission of Monitoring Station AMS6 was effective since 19 November 2012.

The recommended environmental mitigation measures effectively minimize the potential environmental impacts from the Project. The EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.

Complaint, Notification of Summons and Successful Prosecution

Four (4) environmental complaints were received in the reporting period.

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

1 INTRODUCTION

1.1 Background

1.1.1 Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Work (here below, known as "the Project") mainly comprises seawall construction and reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCLKL).

1.1.2 The environmental impact assessment (EIA) reports (Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities – EIA Report (Register No. AEIAR-145/2009) (HKBCFEIA) and Tuen Mun – Chek Lap Kok Link – EIA Report (Register No. AEIAR-146/2009) (TMCLKLEIA), and their environmental monitoring and audit (EM&A) Manuals (original EM&A Manuals), for the Project were approved by Environmental Protection Department (EPD) in October 2009.

1.1.3 EPD subsequently issued the Environmental Permit (EP) for HKBCF in November 2009 (EP-353/2009) and the Variation of Environmental Permit (VEP) in June 2010 (EP-353/2009/A), November 2010 (EP-353/2009/B), November 2011 (EP-353/2009/C), March 2012 (EP-353/2009/D), October 2012 (EP-353/2009/E), April 2013 (EP-353/2009/F) and August 2013 (EP-353/2009/G). Similarly, EPD issued the Environmental Permit (EP) for TMCLKL in November 2009 (EP-354/2009) and the Variation of Environmental Permit (VEP) in December 2010 (EP-354/2009/A) and January 2014 (EP-354/2009/B).

1.1.4 The Project is a designated project and is governed by the current permits for the Project, i.e. the amended EPs issued on 24 April 2013 (EP-353/2009/F) and 8 December 2011 (EP-354/2009/A) (for TMCLKL Southern Landfall Reclamation only).

1.1.5 A Project Specific EM&A Manual, which included all project-relation contents from the original EM&A Manuals for the Project, was issued in May 2012.

1.1.6 Ove Arup & Partners Hong Kong Limited (Arup) was appointed by Highways Department (HyD) as the consultants for the design and construction assignment for the Project's reclamation works (i.e. the Engineer for the Project).

1.1.7 China Harbour Engineering Company Limited (CHEC) was awarded by HyD as the Contractor to undertake the construction work of the Project.

1.1.8 ENVIRON Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Project.

1.1.9 AECOM Asia Co. Ltd. (AECOM) was appointed by CHEC to undertake the role of Environmental Team for the Project for carrying out the EM&A works.

1.1.10 The construction phase of the Project under the EPs was commenced on 12 March 2012 and will be tentatively completed by early Year 2016.

1.1.11 According to the Project Specific EM&A Manual, there is a need of an EM&A programme including air quality, noise, water quality and dolphin monitoring and environmental site inspections. The EM&A programme of the Project commenced on 12 March 2012.

1.2 Scope of Report

1.3.1 This is the first Annual EM&A Review Report under the Contract No. HY/2010/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works. This report presents a

summary of the environmental monitoring and audit works, list of activities and mitigation measures proposed by the ET for the Project from 12 March 2012 and 28 February 2013.

1.3 Project Organization

1.4.1 The project organization structure is shown in Appendix A. The key personnel contact names and numbers are summarized in Table 1.1.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
Engineer's Representative (ER) (Ove Arup & Partners Hong Kong Limited)	Chief Resident Engineer	Roger Marechal	2528 3031	2668 3970
IEC / ENPO (ENVIRON Hong Kong Limited)	Independent Environmental Checker	Raymond Dai	3743 0788	3548 6988
	Environmental Project Office Leader	Y.H. Hui	3743 0788	3548 6988
Contractor (China Harbour Engineering Company Limited)	General Manager (S&E)	Daniel Leung	3157 1086	2578 0413
	Environmental Officer	C. M. Wong	3157 1086	2578 0413
	24-hour Hotline	Alan C.C. Yeung	9448 0325	--
ET (AECOM Asia Company Limited)	ET Leader	Echo Leong	3922 9280	2317 7609

1.4 Summary of Construction Works

1.4.1 The construction phase of the Project under the EP commenced on 12 March 2012.

1.4.2 As informed by the Contractor, details of the major works carried out in the reporting period are listed below:-

Marine-based Works

- Cone penetration test;
- Geotextile laying and fabrication;
- Stone column installation trial;
- Silt curtain fabrication and deployment; and
- Stone column installation
- Maintenance of Silt curtain
- Silt curtain deployment and repairing
- Sand blanket trial
- Stone blankets laying.
- Band drain installation trial
- Stone column installation
- Construction of cellular structure
- Backfill cellular structure

Land-based Works

- Site office erection and construction at Works Area WA2;
- Public Works Regional Laboratory erection and construction at Works Area WA3;
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Constructing site access at Works Area WA2 to Ying Hei Road, Tung Chung;
- Drainage works at Works Area WA2 and WA3;
- Geotextile fabrication at Works Area WA2 and WA4; and
- Stone column installation barges setup and their maintenance works at Works Area WA4.
- Silt curtain fabrication at Works Area WA2 and WA4;
- Hoarding erection at Work Areas Portion D and Works Area WA2
- Sign board erection at Works Area WA2

The construction programme of the Project is shown in Appendix B.

The general layout plan of the Project site showing the detailed works areas is shown in Figure 1.

The environmental mitigation measures implementation schedule are presented in Appendix C.

2 SUMMARY OF EM&A PROGRAMME REQUIREMENTS

2.1 Monitoring Parameters

2.1.1 The Project Specific EM&A Manual designated 4 air quality monitoring stations, 2 noise monitoring stations, 21 water monitoring stations (9 Impact Stations, 7 Sensitive Receiver Stations and 5 Control/Far Field Stations) to monitor environmental impacts on air quality, noise and water quality respectively. Pre-set and fixed transect line vessel based dolphin survey was required in two AFCD designated areas (Northeast and Northwest Lantau survey areas). The impact dolphin monitoring at each survey area should be conducted twice per month.

2.1.2 For impact air quality monitoring, monitoring locations AMS2 (Tung Chung Development Pier) and AMS7 (Hong Kong SkyCity Marriott Hotel) were set up at the proposed locations in accordance with Project Specific EM&A Manual. The conditional omission of Monitoring Station AMS6 was effective since 19 November 2012. For monitoring location AMS3 (Ho Yu College), as proposed in the Project Specific EM&A Manual, approval for carrying out impact monitoring could not be obtained from the principal of the school. Permission on setting up and carrying out impact monitoring works at nearby sensitive receivers, like Caribbean Coast and Coastal Skyline, was also sought. However, approvals for carrying out impact monitoring works within their premises were not obtained. Impact air quality monitoring was conducted at site boundary of the site office area in Works Area WA2 (AMS3A) respectively. Same baseline and Action Level for air quality, as derived from the baseline monitoring data recorded at Ho Yu College, was adopted for this alternative air quality location.

2.1.3 For impact noise monitoring, monitoring locations NMS2 (Seaview Crescent Tower 1) was set up at the proposed locations in accordance with Project Specific EM&A Manual. However, for monitoring location NMS3 (Ho Yu College), as proposed in the Project Specific EM&A Manual, approval for carrying out impact monitoring could not be obtained from the principal of the school. Permission on setting up and carrying out impact monitoring works at nearby sensitive receivers, like Caribbean Coast and Coastal Skyline, was also sought. However, approvals for carrying out impact monitoring works within their premises were not obtained. Impact noise monitoring was conducted at site boundary of the site office area in Works Area WA2 (NMS3A) respectively. Same baseline noise level, as derived from the baseline monitoring data recorded at Ho Yu College was adopted for this alternative noise monitoring location.

2.1.4 In accordance with the Project Specific EM&A Manual, twenty-one stations were designated for impact water quality monitoring. The nine Impact Stations (IS) were chosen on the basis of their proximity to the reclamation and thus the greatest potential for water quality impacts, the seven Sensitive Receiver Stations (SR) were chosen as they are close to the key sensitive receives and the five Control/ Far Field Stations (CS) were chosen to facilitate comparison of the water quality of the IS stations with less influence by the Project/ ambient water quality conditions.

2.1.5 Due to safety concern and topographical condition of the original locations of SR4 and SR10B, alternative impact water quality monitoring stations, naming as SR4(N) and SR10B(N), were adopted, which are situated in vicinity of the original impact water quality monitoring stations (SR4 and SR10B) and could be reachable. Same baseline and Action Level for water quality, as derived from the baseline monitoring data recorded, were adopted for these alternative impact water quality monitoring stations.

2.1.6 The monitoring locations used during the reporting period are depicted in Figures 2, 3 and 4 respectively.

2.1.7 The Project Specific EM&A Manual also required environmental site inspections for air quality, noise, water quality, chemical, waste management, marine ecology and landscape and visual impact.

2.2 Environmental Quality Performance (Action/Limit Levels)

2.2.1 The environmental quality performance limits (i.e. Action and/or Limit Levels) of air and water quality monitoring were derived from the baseline air and water quality monitoring results at the respective monitoring stations, while the environmental quality performance limits of noise monitoring were defined in the EM&A Manual.

2.2.2 The environmental quality performance limits of air quality, noise and water monitoring are given in Appendix D.

2.3 Environmental Mitigation Measures

2.2.3 Relevant environmental mitigation measures were stipulated in the Particular Specification and EPs (EP-353/2009/G and EP-354/2009/B) (for TMCLKL Southern Landfall Reclamation only) for the Contractor to adopt. A list of environmental mitigation measures and their implementation statuses are given in Appendix C.

3 MONITORING RESULTS

3.1 Air Quality Monitoring

3.1.1 Introduction

3.1.1.1. In accordance with the Project Specific EM&A Manual, impact 1-hour Total Suspended Particulates (TSP) monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days at the 4 monitoring stations (AMS2, AMS3A, AMS6 and AMS7).

3.1.1.2. The monitoring locations for impact air quality monitoring are depicted in Figure 2. However, for AMS6 (Dragonair/CNAC (Group) Building), permission on setting up and carrying out impact monitoring works was sought, however, access to the premise has not been granted yet on this report issuing date. Conditional omission of the AMS6 was approved by EPD in November 13.

3.1.1.3. The weather was mostly sunny, with occasional cloudy and occasional rainy in the reporting period. The major dust source in the reporting period included construction activities from the Project, as well as nearby traffic emissions.

3.1.1.4. The number of monitoring events and exceedances recorded in each month of the reporting period are presented in Table 3.1 and Table 3.2 respectively.

3.1.1.5. The baseline and impact air quality monitoring data are provided in the baseline monitoring report and monthly EM&A reports respectively. The graphical plots of the impact air quality monitoring results are provided in Appendix E. No specific trend of the monitoring results or existence of persistent pollution source was noted.

Table 3.1 Summary of Number of Monitoring Events for 1-hr & 24-hr TSP Concentration

Monitoring Parameter	Location	No. of monitoring events
		Mar 12 – Feb 13
1-hr TSP	AMS2	183
	AMS3A	183
	AMS7	183
24-hr TSP	AMS2	61
	AMS3A	61
	AMS7	61

Table 3.2 Summary of Number of Exceedances for 1-hr & 24-hr TSP Monitoring

Monitoring Parameter	Location	Level of Exceedance	Level of Exceedance
			Mar 12 – Feb 13
1-hr TSP	AMS2	Action	0
		Limit	0
	AMS3A	Action	0
		Limit	0
	AMS7	Action	0
		Limit	0
	Total		***0***
24-hr TSP	AMS2	Action	0
		Limit	0
	AMS3A	Action	**1**
		Limit	***4***
	AMS7	Action	0
		Limit	0
	Total		***5***

3.1.2 Environmental Mitigation Measures

3.1.2.1 Relevant Air mitigation measures, as recommended in the EIA Report were stipulated in the EM&A Manual for the Contractor to adopt. The implementation status of air quality mitigation measures is depicted in Appendix C.

3.1.3 Summary of Actions Taken in the event of Non-Compliance

3.1.3.1 Other than the mitigation measures implemented as mentioned in Appendix C, in the event of non-compliance, actions were taken in accordance with the Event-Action Plan in the EM&A Manual. The Contractor was notified immediately. Investigation was carried out within three working days of identification of non-compliance such as identifying the air pollution sources, checking the implementation status of the mitigation measures, etc., and measurement was repeated to confirm the investigation findings. Further investigation was carried out to identify the source of pollution when deemed necessary. In summary, no direct evidence between the exceedance at AMS3A and the Hong Kong Boundary Crossing Facilities - reclamation works could be established for all non-compliances and therefore no action was required to be taken.

3.1.4 Review of Reasons for and the implications of Non-Compliance

3.1.4.1 A total of 1 Action level and 4 Limit Level exceedances were recorded during the 24-hr TSP impact monitoring period. No exceedance of 1-hour TSP exceedance level was recorded at all monitoring station during the 1-hr TSP impact monitoring period. Investigation into the possible causes of each exceedance was undertaken and reported in the respective monthly EM&A reports.

3.1.5 Environmental Acceptability of the Project

3.1.5.1 Trend of 1-hour and 24-hour TSP

3.1.5.1.1 Other than a few isolated events, the 24-hour TSP monitoring results were well below the Action and Limit levels. The trend of TSP at AMS2, AMS3A and AMS7 were comparable to the baseline range and showed no noticeable deterioration of air quality during the impact monitoring period.

3.1.5.2 Correlation between exceedances with possible dust generating activities

3.1.5.2.1 Possible dust generating activities of the Project did not cause any noticeable deterioration in air quality at Hong Kong Boundary Crossing Facilities – Reclamation Works. With proper implementation of air quality mitigation measures, the monitoring results showed no adverse air quality impact.

3.1.5.3 Comparison of EM&A results with EIA predictions

Table 3.3 Maximum Predicted TSP concentrations under the "Mitigated" scenario

ASR	Location	Predicted Daily Concentrations*		Average Impact 1-hour TSP Levels, μg/m^3	Average Impact 24-hour TSP Levels, μg/m^3
		1-hour	24-hour		
AMS7	Hong Kong SkyCity Marriott Hotel	344	92	78	67.9

*Extracted from Table 5-8 of the EIA report

3.1.5.3.1 At 1-hour and 24-hour TSP monitoring station at AMS7, the average 24-hour TSP levels recorded in the EM&A programme were in similar magnitude as the Daily dust level predicted in the EIA.

3.1.6 Practicality and Effectiveness of the EIA process and the EM&A programme

3.1.6.1 Monitoring and auditing of air quality was recommended for the construction phase of the Project in the EIA to ensure no exceedance of the TSP standard at the sensitive receiver.

3.1.6.2 The air quality monitoring methodology was effective in monitoring the air quality impacts of the Project. Baseline monitoring of 1-hour and 24-hour TSP helped to determine the ambient TSP levels at the sensitive receiver prior to commencement of construction works. During periods when there were possible dust generating construction activities, impact monitoring of 24-hour TSP helped to determine whether the Project caused unacceptable air quality impacts on the sensitive receiver. As the scope of the Project mainly includes reclamation works during the reporting period and dust generation from the construction activities such as wind erosion and sand filling is the key concern during the construction phase. The monitoring of TSP was therefore considered to be cost effective for the Project.

3.1.6.3 All recommended mitigation measures were applicable to the Project. As discussed above, the Project did not cause unacceptable air quality impacts. However, as the nature of the Project is reclamation works of approximately 130 hectares of land in size, some mitigation measures in practice were generally focused on dust generating activities only. Nevertheless, the mitigation measures implemented were effective and efficient in controlling air quality impacts.

3.1.6.4 Monitoring and audit of 24-hour TSP levels had ensured that any deterioration in air quality was readily detected and timely actions taken to rectify any non-compliance. Assessment and analysis of 24-hour TSP results collected throughout the baseline and impact monitoring periods also demonstrated the environmental acceptability of the Project. Weekly site inspections had ensured that the EIA recommended air quality mitigation measures were effectively implemented. The EM&A program is considered to be cost effective.

3.1.7 Conclusion

3.1.7.1 Air quality monitoring for the Project was conducted during the baseline and impact monitoring periods. Key construction activities including geotextile laying, stone column installation, stone blanket laying, construction of cellular structure and backfill cellular structure. The trend of 1-Hour TSP and 24-hour TSP was comparable to the baseline range and showed no noticeable deterioration of air quality during the monitoring period. Although exceedances were recorded, they were isolated and short-term events. There is no evidence of long-term deteriorating trend.

3.1.7.2 The average 24-hour TSP levels recorded at AMS7 in EM&A programme were in similar magnitude with the Daily dust level predicted in the EIA. No TSP level was predicted by the Project EIA at AMS2 and AMS3A and therefore, no comparison of EM&A data with EIA predictions could be made. Air quality mitigation measures implemented were effective in controlling air quality impacts.

3.2 Noise Monitoring

3.2.1 Introduction

3.2.1.1 Impact noise monitoring was conducted at the 2 monitoring stations (NMS2 and NMS3A) for at least once per week during 07:00 – 19:00 in the reporting period.

3.2.1.2 The monitoring locations used during the reporting period are depicted in Figure 2.

3.2.1.3 Major noise sources during the noise monitoring included construction activities of the Project and nearby traffic noise.

3.2.1.4 The number of impact noise monitoring events and exceedances are summarized in Table 3.3 and Table 3.4 respectively.

Table 3.4 Summary of Number of Monitoring Events for Impact Noise

Monitoring Parameter	Location	No. of monitoring events
		Mar 12 - Feb 13
Noise	NMS2	51
	NMS3A	51

Table 3.5 Summary of Number of Monitoring Exceedances for Impact Noise

Monitoring Parameter	Location	Level of Exceedance	No. of Exceedance(s)
Noise	NMS2	Action	0
		Limit	0
	NMS3A	Action	1
		Limit	0
	Total		**1**

3.2.1.5 The graphical plots of the trends of the monitoring results are provided in Appendix F. No specific trend of the monitoring results or existence of persistent pollution source was noted.

3.2.2 Environmental Mitigation Measures

3.2.2.1. Relevant noise mitigation measures, as recommended in the EIA Report were stipulated in the EM&A Manual for the Contractor to adopt. The implementation status of noise mitigation measures is depicted in Appendix C. Construction Noise Permits were applied and complied with when construction works were carried out during restricted hours.

3.2.3 Non-compliance (exceedances) of the Environmental Quality Performance Limits (Action and Limit Levels)

3.2.3.1 Summary of Non-compliance (Exceedances)

3.2.3.1.1 Table 3.5 summarised the number exceedance recorded at each monitoring station throughout the impact monitoring period. There was one (1) limit level exceedance recorded at NMS3A. Investigation into the possible causes of each exceedance was undertaken and reported in the respective monthly EM&A reports, the investigations results confirmed that the limit level exceedance was not related to project.

3.2.3.2 Summary of Actions Taken in the event of Non-Compliance

3.2.3.2.1 Investigation was carried out within three working days of identification of non-compliance. Assessments showed that all exceedances were not due to the works and therefore no action was required to be taken and these were verified by the IEC.

3.2.3.3 Review of Reasons for and the implications of Non-Compliance

3.2.3.3.1 There was one (1) limit level exceedance recorded at NMS3A. Investigation into the possible causes of each exceedance was undertaken and reported in the respective monthly EM&A reports.

3.2.3.3.2 In summary, the average impact noise levels recorded in the reporting quarter were generally within the range of the predicted construction noise levels in the Project EIA.

3.2.4 Environmental Acceptability of the Project

3.2.4.1 Trend of Measured Noise Level (Leq)

3.2.4.1.1 Other than an isolated event, the noise monitoring results for all monitoring stations were below the Limit levels. The trend showed no noticeable noise impact from the Project during the impact monitoring period.

3.2.4.2 Correlation between exceedances with possible noise generating activities

3.2.4.2.1 Exceedances were rarely recorded for all monitoring stations. However, exceedance was recorded at monitoring station NMS3A.

3.2.4.2.2 For exceedance recorded at NMS3A, it exceeded the limit level. trench excavation (near access road) and general site clearance were the major land-based construction activity being undertaken at Works Area WA2 during the monitoring period. Stone blanket laying at Portion B and Portion E1 was the major marine-based construction activities being undertaken during the monitoring period. Field observations indicated that construction activities, like sheet piling, percussive piling and excavation, were carrying out in other private developments (which are located at eastern and southern side of the Works Area WA2) during the course of monitoring, which are close to the monitoring station NMS3A and contribute to the measured noise level. Therefore, noise generating activities of the Project did not cause any noticeable noise impact at the sensitive receivers. The impact noise levels recorded were generally similar to the predicted construction noise levels in the Project EIA.

3.2.5 Comparison of EM&A results with EIA predictions

3.2.5.1 The EIA predicted that noise emitted by the use of Powered Mechanical Equipment (PME) on site would be the major source of noise impact during construction. The Construction Noise Impact at Noise Sensitive Receivers are summarised in Table 3.6 (extracted from Table 6-9 of the EIA Report).

Table 3.6 Construction Noise Impact at Noise Sensitive Receivers

NSR	Location	Predicted Noise Levels, dB(A)	
		Total Noise Impacts, dB(A)	Criterion, dB(A)
NMS2	Seaview Crescent Tower 1	74	75

3.2.5.2 During the construction period of the Project, one (1) noise complaints were received in the impact monitoring period. The measured impact noise levels of the Project for each monitoring station are summarised in Table 3.7 for comparison with EIA.

Table 3.7 Summary of Construction Noise Monitoring Results in the Reporting Period

NSR	Location	Average, dB(A), $L_{eq,30\ mins}$	Range, dB(A), $L_{eq,30\ mins}$	Limit Level, dB(A), $L_{eq,30\ mins}$
NMS2	Seaview Crescent Tower 1	66	61 - 74^	75
NMS3A	Site Boundary of Site Office Area at Works Area WA2	65	57 - 75*	70

^ The sound level meter was set on a tripod at a height of 1.2 m above the ground for free-field measurements at NMS2. A correction of +3 dB(A) was made to the free field measurements.

* Façade measurements were made at NMS3A on or before 5 September 2012. Free field measurements were made on all monitoring after 5 September 2012 due to removal of site office located at NMS3A. A correction of +3 dB(A) was be made to all free field measurements.

3.2.5.3 The average impact noise levels recorded in EM&A during impact monitoring were mostly within the range of the predicted construction noise levels in the EIA Report. ET's assessment had shown that exceedances recorded were not due to the works of Reclamation Works and this had been verified by the IEC.

3.2.6 Practicality and Effectiveness of the EIA process and the EM&A programme

3.2.6.1 Monitoring and auditing of noise was recommended for the construction phase of the Project in the EIA process to ensure compliance with the appropriate criterion at the receivers.

3.2.6.2 The noise monitoring methodology was effective in monitoring the noise impacts of the Project. Baseline noise monitoring determined the ambient noise levels at the sensitive receivers prior to commencement of construction works. During periods when possible noise generating construction activities were on-going, impact noise monitoring would determine whether the Project caused adverse noise impacts on the sensitive receivers. The monitoring methodology which focus on $L_{eq30\ minute}$ therefore considered to be cost effective for the Project.

3.2.6.3 Noise mitigation measures recommended in the EIA Report were stipulated in the EM&A Manual for the Contractor to implement during the construction phase of the Project. The list of noise mitigation measures is depicted in Appendix C. All recommended mitigation measures were applicable to the Project. As discussed above, the Project did not cause adverse noise impacts to the receivers. Therefore, the mitigation measures implemented were effective and efficient in controlling noise impacts.

3.2.6.4 Monitoring and audit of noise levels ensured that any noise impact to the receivers would readily be detected and timely actions could be taken to rectify any non-compliance. Assessment and analysis of noise results collected throughout the baseline and impact monitoring periods also demonstrated the environmental acceptability of the Project. Weekly site inspections ensured that the EIA recommended noise mitigation measures were effectively implemented. The EM&A program is considered to be cost effective.

3.2.7 Conclusion

3.2.6.5 The trend of L_{eq} was comparable to the baseline range and showed no noticeable noise impact during the impact monitoring period. Although exceedance was recorded, there was no evidence of long-term increasing trend. The average impact noise levels recorded in EM&A programme were mostly lower than the construction noise levels predicted in the EIA.

3.3 Water Quality Monitoring

3.3.1 Introduction

3.3.1.1 Impact water quality monitoring was conducted 3 times per week during mid-ebb and mid-flood tides at 21 water monitoring stations (9 Impact Stations, 7 Sensitive Receiver Stations and 5 Control/Far Field Stations).

3.3.1.2 The monitoring locations used during the reporting period are depicted in Figure 3.

3.3.1.3 Number of impact water quality monitoring events and exceedances recorded in the reporting period at each impact station are summarized in Table 3.8 and Table 3.9 respectively.

Table 3.8 Summary of Number of Monitoring Events for Impact Water Quality

Monitoring Parameter	Tide	No. of monitoring events
		Mar 12 - Feb 13
Water Quality	Mid-Ebb	147*
	Mid-Flood	148*

*Due to adverse weather condition during the impact water quality monitoring periods, three (3) water quality monitoring sessions scheduled on mid flood tide of 05, 20 Apr 12 and 23 Jul 12 and four (4) water quality monitoring sessions scheduled on mid ebb tide of 20 Apr 12, 18 May 12, and 23, 27 July 12 were cancelled.

Table 3.9 Summary of Water Quality Exceedances in Mar 12-Feb 13

Station	Exceedance Level	DO (S&M)		DO (Bottom)		Turbidity		SS		Total	
		Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood
IS5	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)6	Action	0	0	0	0	0	**1 (23 Apr 12)**	**3 (28 Nov 12; 5 and 10 Dec 12)**	**4 (23 Apr 12; 26 Nov 12; 5 and 14 Dec, 12)**	**3**	**5**
	Limit	0	0	0	0	0	0	0	0	0	0
IS7	Action	0	0	0	0	0	**1 (23 Apr 12)**	**3 (26, 28 Nov 12; 10 Dec, 12)**	**3 (23 Apr 12; 18 Jun 12; 16 Nov 12)**	**3**	**4**
	Limit	0	0	0	0	0	0	0	0	0	0
IS8	Action	0	0	0	0	0	0	0	**1 (16 Nov 12)**	0	**1**
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)9	Action	0	0	0	0	0	0	1 **(26 Nov 12)**		1	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS10	Action	0	0	0	0	0	0	0	**2 (9 Apr 12; 2 Jan13)**	0	**2**
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)11	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0

Station	Exceedance Level	DO (S&M)		DO (Bottom)		Turbidity		SS		Total	
		Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood
IS(Mf)16	Action	0	0	0	0	0	0	**1 (30 Nov 12)**	**2 (3 Dec 12; 4 Jan13)**	**1**	**2**
	Limit	0	0	0	0	0	0	0	0	0	0
IS17	Action	0	0	**1 (21 May 12)**	0	0	0	0	0	**1**	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR3	Action	0	0	0	0	0	0	0	**1 (10 Dec 12)**	0	**1**
	Limit	0	0	0	0	0	0	0	0	0	0
SR4 (N)	Action	0	0	0	0	0	0	0	**2 (16 Nov 12; 3 Dec 12)**	0	**2**
	Limit	0	0	0	0	0	0	0	0	0	0
SR5[1]	Action	0	0	0	0	0	**1 (29 Oct 12)**	0	**4 (5 and 10 Dec 12; 11 and Jan 13)**	**1**	**4**
	Limit	0	0	0	0	0	0	0	**1 (29 Oct 12)**	0	**1**
SR6	Action	0	0	0	0	0	0	**1 (4 Jun 12)**	**2 (2 and 14 Jan 13)**	**1**	**2**
	Limit	0	0	0	0	0	0	0	0	0	0
SR7	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	**1 (12 Mar 12)**	0	0	**1**
SR10A	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR10B (N)	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
Total	**Action**	0	0	**1**	0	0	**3**	**9**	**21**	**34**	
	Limit	0	0	0	0	0	0	**1**	**1**	**2**	

Note: S: Surface;
M: Mid-depth;
[1]: Due to safety concern and presence of Airport Approach Restricted Areas, alternative impact water quality monitoring station SR5(N) was adopted, which is in vicinity of SR5 and could be reachable, for the period from 12 to 28 March 2012.

3.3.1.4 Please refer to the monthly EM&A report (March 2012 to February 2013) accordingly for the details of the captioned exceedances.

3.3.1.5 The graphical plots of the trends of the monitoring results are provided in Appendix G. No specific trend of the monitoring results or existence of persistent pollution source was noted.

3.3.2 Environmental Mitigation Measures

3.1.2.1 Relevant water quality mitigation measures, as recommended in the EIA Report were stipulated in the EM&A Manual for the Contractor to adopt. The implementation status of water quality mitigation measure is depicted in Appendix C.

3.3.3 Non-compliance (exceedances) of the Environmental Quality Performance Limits (Action and Limit Levels)

3.3.4.1 Summary of Non-compliance (Exceedances)

3.3.4.1.1 Table 3.9 summarised the number of dissolved oxygen, turbidity and suspended solids exceedances recorded at each sensitive receiver station throughout the impact monitoring period. A total of 36 exceedances were recorded during the entire construction period with 34 Action level exceedances and 2 Limit level exceedances.

3.3.4 Review of Reasons for and the implications of Non-Compliance

3.3.4.1 Thirty (30) Action Level exceedances and (2) Limit Level exceedances were recorded at measured suspended solids (SS) values (in mg/L), three (3) Action Level exceedances was recorded at measured turbidity (in NTU) and one (1) Action Level exceedance was recorded at measured DO (Bottom) (mg/L) during the reporting period. Investigation result show that the exceedances were not due to the Project works.

3.3.4.2 After review of the investigation results on the incidnetfor water quality exceedances (for detail of investigations please refer to section 4 of monthly EM&A report (Mar 12 to Feb 13), ambient conditions were considered to have effects on the water quality monitoring results. Exceedances were considered to be due to a combination of the following potential causes: 1. Non-Project related vessel activities such as trawling of fishing vessels near the monitoring station 2. Rough sea condition caused by adverse weather and relatively strong current experienced during the monitoring period and 3. During the time when exceedances of DO were recorded at monitoring stations, relatively low DO values were also recorded at corresponding upstream Control Stations during ebb tide or flood tides indicating these exceedances of DO were unlikely to be contributed by Project works.. This indicated these exceedances of DO were unlikely to be contributed by Project works. 4. Local effects in the vicinity of the monitoring station where exceedance was recorded.

3.3.5 Environmental Acceptability of the Project

3.3.5.1 Trend of water quality

Dissolved Oxygen

3.3.5.1.1 The dissolved oxygen levels recorded in the impact monitoring period showed a seasonal trend in which lower DO levels were recorded during the wet season and higher DO levels were recorded during the dry season. One reason for this seasonal trend may have been the increase in water temperature during the wet season leading to decreases in the solubility of oxygen in water and vice versa during the dry season. The trend of dissolved oxygen levels was presented in Appendix G. Other than an isolated action level exceedance, the trend of dissolved oxygen levels at each monitoring stations in Appendix F did not show any noticeable deterioration of dissolved oxygen levels.

Turbidity

3.3.5.1.2 The turbidity levels trend showed fairly distributed at all monitoring station during the reporting period. No obvious trend of turbidity levels of each monitoring station was shown. The trend of turbidity levels of each monitoring station was shown in Appendix G. Moreover, the trend did not show any noticeable deterioration of turbidity.

Suspended Solids

3.3.5.1.3 The trend of suspended solid levels of each impact monitoring station was shown similar with the control stations of each tide, i.e , slightly fluctuated between the period from September to December 2012. The trend of suspended solid levels of each monitoring station was shown in Appendix G. Moreover, the trend did not show any noticeable deterioration of Suspended Solids.

3.3.6 Correlation between exceedances with possible marine construction activities

3.3.6.1 With proper implementation of water quality mitigation measures, marine construction activities of the Project were not observed to cause any unacceptable water quality impacts to the sensitive receiver stations.

Table 3.10 Summary of number of water quality exceedances per monitoring month

Month	Sand Filling Rate m^3/month	Depth averaged DO	Depth averaged Turbidity	Depth averaged SS	Total
Mar-12	0	0	1	0	1
Apr-12	0	0	2	3	5
May-12	0	1	0	0	1
Jun-12	0	0	0	2	2
Jul-12	0	0	0	0	0
Aug-12	28,053	0	0	0	0
Sep-12	12,769	0	0	0	0
Oct-12	28,882	0	1	1	2
Nov-12	2,276	0	0	9	9
Dec-12	0	0	0	10	10
Jan-13	0	0	0	6	6
Feb-13	2,608	0	0	0	0

3.3.6.2 As shown in Table 3.10, there was no apparent correlation between the dredging and filling rates and the number of water quality exceedances recorded per monitoring day.

3.3.6.3 For dissolved oxygen, the numbers of dissolved oxygen exceedances show no noticeable deterioration of dissolved oxygen or correlation between filling rate and dissolve oxygen exceedance.

3.3.6.4 For turbidity, the numbers of turbidity exceedances show no noticeable deterioration of turbidity or correlation between filling rate and turbidity exceedance.

3.3.6.5 For turbidity, the numbers of turbidity exceedances show no noticeable deterioration of suspended solid or correlation between filling rate and suspended exceedance.

3.3.6.6 The trend did not show any correlation between water quality impact and the filling rates during the impact monitoring period.

3.3.6.7 With proper implementation of water quality mitigation measures and additional mitigation measures, marine construction activities of the Project were not observed to cause any unacceptable water quality impacts to the sensitive receiver stations.

3.3.7 Comparison of EM&A results with EIA predictions

3.3.7.1 Results from the sensitive receiver stations were compared with the EIA predictions for the sensitive receivers in the following manner:

- WSR 27 - San Tau Beach SSSI with SR3
- WSR 22c- Tai Ho Wan Inlet (outside) with SR4(N)
- WSR 25 - Cooling water intake at HK International Airport with SR5

Dissolved oxygen (DO)

3.3.7.2 According to Section 9.10.7.4 of the EIA Report, the dissolved oxygen depletion from the loss of sediment to suspension during the construction of the reclamation for HKBCF was calculated to be 0.4 mg/L at WSR25. Since, as stated in the Table 9.6a of the EIA report the DO of the NW Western water is generally high and overage ranges between 5.7 – 6.8 mg/L and depletion will not be detrimental to the ecological systems of the area. The average Depth averaged DO record at SR5 is 6.5 mg/L in October 2012 when the filling rate/month is the highest during the reporting period and therefore no significant dissolved oxygen depletion from was noted during impact monitoring.

3.3.7.3 The baseline dissolved oxygen levels and the level of depletion during impact monitoring at each sensitive receiver are summarised in Tables 5.7.

Table 3.11 Comparison of depth averaged dissolved oxygen levels (Surface & Mid-depth, Bottom depth) during baseline and impact monitoring period (mgL^{-1})

Sensitive Receiver in Baseline	Associated Location during Impact Monitoring	Monitoring Depth	Baseline mean		Impact mean (October 2012)		Depletion during Impact Monitoring	
			Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
SR3	SR3*	Surface & mid	6.8	6.7	7.0	7.3	-0.2	-0.6
		Bottom	-	6.2	-	-	-	-
SR4^	SR4(N)**	Surface & mid	6.1	6.3	6.9	7.0	-0.8	-0.7
		Bottom	6.0	6.2	6.9	6.9	-0.9	-0.7
SR5	SR5**	Surface & mid	6.4	6.3	6.2	6.6	0.2	-0.3
		Bottom	6.1	6.1	6.0	6.4	0.1	-0.3
SR6	SR6**	Surface & mid	6.6	6.5	6.3	6.2	0.3	0.3
		Bottom	6.2	6.1	6.2	6.0	0	0.1
SR7	SR7**	Surface & mid	6.3	6.0	6.2	6.4	0.1	-0.4

		Bottom	6.1	5.9	6.1	6.2	0	-0.3
SR10A	SR10A	Surface & mid	6.0	6.0	6.0	6.1	0	-0.1
		Bottom	5.7	5.8	6.0	6.0	-0.3	-0.2
SR10B^	SR10B(N)**	Surface & mid	6.1	6.0	5.9	6.0	0.2	0
		Bottom	6.2	5.8	6.0	5.9	0.2	-0.1

^Due to safety issue, the water quality monitoring location of SR4 has been changed to SR4(N) during impact monitoring.
*Only mid-depth station of DO were monitored at SR3 in mid-ebb during baseline monitoring, in both mid-ebb and mid-flood during impact monitoring as the water depth less than 3m.
** The mid-depth station of DO was omitted at SR4(N) during impact monitoring as the water depth is less than 6m.

3.3.7.4 Comparing baseline averaged dissolved oxygen levels with EM&A results; no significant depletion was found at all sensitive receiver locations. There was no adverse effect on dissolved oxygen concentrations as a result of the filling works of the Project as the depleted dissolved oxygen concentrations did not breach the Water Quality Objectives nor did they exceed the AL levels adopted for the Project.

Suspended solids (SS)

3.3.7.5 The EIA determined the acceptability of elevations in suspended sediment concentrations based on the Water Quality Objectives. The Water Quality Objectives for suspended sediments for the North Western Water Control Zones were defined as being an allowable elevation of 30% above the background. The ambient and tolerance values for suspended sediment concentrations in the vicinity of sensitive receivers adopted in Table 9.11 of the EIA Report are presented in Table 3.12.

Table 3.12 Ambient and Tolerance Values for Suspended Sediment Concentrations (mgL^{-1}) in the Vicinity of Sensitive Receivers adopted in the EIA

Sensitive Receiver in EIA Report	Associated EPD Station	Ambient value (90th Percentile)		Tolerance value (30% Tolerance)	
		Dry Season	Wet Season	Dry Season	Wet Season
WSR 27	NM5,6,8	8.3	5.6	2.5	1.7
WSR 22c	NM1,2,3	5.5	3.7	1.7	1.1
WSR 25	NM1,2,3	5.5	3.7	1.7	1.1

3.3.7.6 The use of single layer silt curtain system has been modelled in the 2012 mitigated scenario. The predicted suspended sediment concentrations under the 2012 mitigated scenario of the Project as shown in Table 9.21 in the EIA Report are summarised in Table 3.13.

Table 3.13 Calculated Elevations in Suspended Sediment Concentrations at Sensitive Receivers (mgL^{-1}) under the 2012 mitigated scenario from the EIA

Sensitive Receiver in EIA Report	Associated Location during Impact Monitoring	Calculated Elevations	
		Dry Season	Wet Season
WSR 27	SR3	0.0	0.0
WSR 22c	SR4(N)	0.1	0.0
WSR 25	SR5	3.0	2.7

3.3.7.7 For suspended solids, as the baseline monitoring was conducted in a November 2012 which is the transitional season or just the start of dry season while no data were recorded in the wet season, direct comparison with the EIA predictions could not be made. The comparison of EM&A results with baseline results in the following paragraphs was based on the criteria of acceptability of 30 percent elevations above the background as defined in the Water Quality Objectives which was also used in scenario predictions in the EIA.

3.3.7.8 Baseline water quality monitoring for the Project was conducted during the transitional season. The mean baseline suspended solids level at each sensitive receiver and 30 percent of the baseline mean are presented in Table 3.14.

Table 3.14 Baseline suspended solids levels and 30% of baseline mean (mgL^{-1})

Associated Location in Baseline Report	Baseline mean		30% of baseline mean	
	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
SR3	14.0	16.3	4.2	4.9
SR4	11.3	12.2	3.4	3.7
SR5	10.6	11.9	3.2	3.6
SR6	11.9	11.9	3.6	3.6
SR7	11.4	10.4	3.4	3.1
SR10A	10.2	10.2	3.1	3.1
SR10B	11.5	11.1	3.5	3.3

3.3.7.9 The average elevations in suspended solids concentrations of the same month which baseline monitoring was conducted (October 2012) were compared with the baseline levels are provided in Table 3.15.

Table 3.15 Average suspended solids levels at sensitive receivers (mgL^{-1}) in October 2012

Sensitive Receiver in Baseline	Associated Location during Impact Monitoring	Impact SS Mean (in October 2012)			
		Mid-ebb	Elevation	Mid-flood	Elevation
SR3	SR3	8.8	-5.1	12.0	-4.3
SR4	SR4(N)*	8.8	-2.4	12.0	-0.2
SR5	SR5	12.0	1.5	13.4	1.4
SR6	SR6	7.2	-4.7	8.6	-3.3
SR7	SR5	9.3	-2.1	10.8	0.4
SR10A	SR10A	7.4	-2.8	9.4	-0.8
SR10B	SR10B(N)*	8.5	-3.0	13.6	2.5

*Due to safety issue, the water quality monitoring location of SR4 & SR10b have been changed to SR4(N) & SR10B(N) respectively during impact monitoring.

3.3.7.10 With the highest filling rate in October 2012, the elevations in suspended solids levels were below 30 percent of the baseline suspended solids levels at all stations. Regional influences would have effects on the deterioration in water quality than activities at the work site. A combination of the following potential causes: 1. Non-Project related vessel activities such as trawling of fishing vessels near the monitoring station 2. Rough sea condition caused by adverse weather and relatively strong current experienced during the monitoring period and 3. During the time when exceedances of DO were recorded at monitoring stations, relatively low DO values were also recorded at corresponding upstream Control Stations during ebb tide or flood tides indicating these exceedances of DO were unlikely to be contributed by Project works.. This indicated these exceedances of DO were unlikely to be contributed by Project works. 4. Local effects in the vicinity of the monitoring station where exceedance was recorded.

3.3.8 Practicality and Effectiveness of the EIA process and the EM&A programme

3.3.9.1. Monitoring and audit of water quality was recommended for the construction phase of the Project in the EIA process to ensure any deterioration in water quality would be readily detected and timely action could be taken to rectify the situation.

3.3.9.2. Baseline water quality monitoring determined the ambient water quality in the region prior to commencement of construction works. Impact water quality monitoring helped to determine whether the Project would cause unacceptable water quality impacts on the sensitive receivers. Post-project water quality monitoring upon completion of all marine construction activities helped to demonstrate the return of ambient conditions that existed prior to commencement of the construction works.

3.3.9.3. Water quality mitigation measures were recommended in the EIA and a list of water quality mitigation measures were stipulated in the EM&A Manual for the Contractor to implement during the construction phase of the Project. The list of water quality mitigation measures is depicted in Appendix C. All recommended mitigation measures were applicable to the Project. Precautionary measures including installation of silt curtains were also implemented to prevent migration of suspended solids towards the sensitive receivers. Monitoring results showed that water quality at sensitive receivers was affected by regional water quality influenced by tidal and climatic conditions, local impacts from the vicinity of the receivers. As discussed above, the Project was not observed to cause unacceptable water quality impacts to the sensitive receivers. Therefore, the mitigation measures implemented were effective and efficient in controlling water quality impacts.

3.3.9.4. Monitoring and audit of water quality ensured that any water quality impacts to the receivers would be readily detected and timely actions could be taken to rectify any non-compliance. Assessment and analysis of water quality results collected throughout the baseline, impact and post-project monitoring

periods also demonstrated the environmental acceptability of the Project. Weekly site inspections ensured that the EIA recommended and additional water quality mitigation measures were effectively implemented.

3.3.9 Conclusion

3.3.9.1 Water quality monitoring for the Project was conducted during the baseline and impact monitoring periods. For dissolved oxygen, turbidity and suspended solids levels, a total of 36 exceedances were recorded. Assessment indicated that there was no correlation between the filling rates and the number of water quality exceedances recorded. Exceedances were considered to be due to a combination of factors including 1. Non-Project related vessel activities such as trawling of fishing vessels near the monitoring station 2. Rough sea condition caused by adverse weather and relatively strong current experienced during the monitoring period and 3. During the time when exceedances of DO were recorded at monitoring stations, relatively low DO values were also recorded at corresponding upstream Control Stations during ebb tide or flood tides indicating these exceedances of DO were unlikely to be contributed by Project works.. This indicated these exceedances of DO were unlikely to be contributed by Project works. 4. Local effects in the vicinity of the monitoring station where exceedance was recorded which might have been contributed to the local impacts in the vicinity of the receivers.

3.3.9.2 The DO and SS levels recorded at SR3, SR4 (N) and SR5 were in similar magnitude as predicted in the Project EIA. No comparison could be made from SR6 to SR10B(N) as predictions were not made in the Project EIA. For turbidity, as no prediction was made in the Project EIA, no comparison could be made. With the implementation of water quality mitigation measures recommended in the EIA and additional water quality mitigation measures implemented during the EM&A programme, marine construction activities of the Project did not cause any unacceptable water quality impacts to the sensitive receivers.

3.4 Dolphin Monitoring

3.4.1 Introduction

3.4.1.1 In accordance with the requirements specified in Section 9.3 of the EM&A Manuel, monthly vessel-based surveys were conducted to monitor impacts on the Indo-Pacific humpback or Chinese white dolphin (*Sousa chinensis*). The surveys were conducted in the areas known as NEL and NWL and travelled the transect lines depicted in Figure 4.

3.4.1.2 Due to the presence of deployed silt curtain systems at the site boundaries of the Project, line 10 was shortened from 6.4km to 3.6km in length. Therefore, the total transect length for NEL and NWL combined is reduced to approximately 111km as of June 2012.

3.4.1.3 Surveys were conducted twice per month, using combined line transect and photo-identification techniques. The research team comprised qualified and experienced researchers and Marine Mammal Observers (MMO).

3.4.1.4 The mitigation measures for dolphins are included in the Environmental Permit for this project are included in Appendix C.

3.4.2 Environmental Mitigation Measures

3.4.2.1 Relevant mitigation measures for dolphins, as recommended in the EIA Report were stipulated in the EM&A Manual for the Contractor to adopt. The implementation status of mitigation measures for dolphins is depicted in Appendix C.

3.4.3 Monitoring Summary

3.4.3.1 Vessel-based surveys have been conducted monthly from March 2012 to February 2013, i.e., during the first year of the construction phase. A total of 49 survey days were completed between March 2012-February 2013.

3.4.3.2 During any one month, it is a requirement to survey both NEL and NWL twice. During March, April and May 2012, inclement weather conditions resulted in a short fall survey track being completed under favourable conditions, as such supplementary surveys were conducted between June and August 2012. A total of 2627.5km were completed whereas 2601.4km were conducted under favourable conditions (defined as Beaufort Sea State 3 or better and with visibility of >1km) between March 2012-February 2013.

3.4.3.3 Between March 2012-February 2013, a total of 203 dolphin sightings were recorded, 145[1] as on effort and 58 as opportunistic[2], The detailed effort and sighting breakdown is shown in Table 1 and Table 2 of Appendix H. The location of all sightings is shown in Figure 1 of Appendix H.

3.4.3.4 A total of 94 dolphins (one deceased adult was included in the photo-ID catalogue) were added to the photo-identification catalogue established specifically for the HZMB Project (Table 3 of Appendix H). Not all dolphins photographed are identifiable as only individuals with unambiguous marks, cuts and/or pigmentation or with uniquely shaped fins can be included in the photo-identification catalogue. Of the identifiable dolphins recorded, the most often sighted dolphins (HZMB052 and HZMB011) were seen on eight separate days, however, just over half the individuals recorded, 47 in total, were seen only once between March 2012 and February 2013 (Table 3 of Appendix H).

1 The total number of includes 1 on effort sighting made of a recovered dead dolphin. This dolphin sighting is not used in the calculation of density, distribution, encounter rate, behavior analyses.

2 The vessel is classified as “on effort” when it is traveling the transect lines and sightings made while on the transect line are recorded as “on effort”. When traveling between transect lines or when off the transect line for photo-identification, the vessel is classified as “off effort” although the survey team will still observe the area and will record any additional sightings made. These sightings will be recorded as “opportunistic” sightings.

3.4.3.6 Two deceased dolphins have been recovered during impact surveys; a neonate in July 2012 and an adult in September 2012. The adult was included in the photo-ID catalogue. Both carcasses were necropsied by AFCD/Ocean Park Corporation who hold detailed information on causes of death. Site reports concluded that neither incident was related to the Project.

3.4.4 Environmental Acceptability of the Project

Table 3.16 Comparison of low, moderate and high habitat utilisation in NEL and NWL between years 2011-12 and 2012-13

	Advanced	2012-13	Advanced	2012-13
Frequency of Use	NWL		NEL	
	DPSE			
<20	69	58	71	72
20-60	16	30	22	11
> 60	17	11	4	16
	SPSE			
<5	52	40	65	65
5-15	27	46	31	13
>15	22	14	9	22

Distribution, Habitat Use and Behaviour of Marine Mammals

3.4.4.1 The EM&A Manuel stipulated that surveys be conducted in such a way as to be comparable to the baseline survey for this project (September -November 2011) and to the long term annual monitoring conducted by AFCD. As such, analyses of density per survey effort (DPSE) and sightings per survey effort (SPSE) were calculated in accordance with the methodology detailed in AFCD reports (e.g., AFCD 2012[3]). The survey areas are divided into 1km x 1km squares and the relative number of sightings and densities are calculated for each block. NEL has 55 blocks and NWL has 90 blocks (only blocks of more than 0.75km^2 are included)

3.4.4.2 For the period March 2012-February 2013, DPSE was calculated in six categories, ranging from low use to high use. NEL and NWL have 16% and 11% of each respective area classified as high use (> 60 DPSE); 11% (NEL) and 30% (NWL) as moderate use (20.1-60 DPSE); and 72% (NEL) and 58% (NWL) as low use (< 20 DPSE) (Figure 2 of Appendix H).

3.4.4.3 For the period March 2012-February 2013, SPSE was calculated in six categories, ranging from low use to high use. NEL and NWL have 22% and 14% of each respective area classified as high use (> 15 SPSE); 13% (NEL) and 46% (NWL) as moderate use (5.1-15 SPSE); and 65% (NEL) and 40% (NWL) as low use (< 5 SPSE) (Figure 3 of Appendix H).

3.4.4.4 For the period February 2011 – January 2012, DPSE was calculated in six categories, ranging from low use to high use. NEL and NWL have 4% and 17% of each respective area classified as high use (> 60 DPSE); 22% (NEL) and 16% (NWL) as moderate use (20.1-60 DPSE); and 71% (NEL) and 69% (NWL) as low use (< 20 DPSE) (provided by ENPO, Figure 4 of Appendix H). These figures were compared to impact monitoring data for March 2012-February 2013 (Table 3.16 of Appendix H). For DPSE in NWL, there was a decrease in low use grid cells, an increase in moderate use cells and a decrease in high use cells. As the geographical location of the cells remained similar between years, however, (see Figures 2 and 4 of Appendix H) this is an indication that preferred habitat has not changed over the NWL area rather that the habitat utilisation is more dispersed. In NEL, where low use cells have stayed at the same proportion and geographical location, the number of moderate use cells has halved and high use cells has increased dramatically. This indicates that dolphin groups occurred at a higher density in their preferred geographical area. Thus, when comparing the

[3] Agriculture, Fisheries and Conservation Department (AFCD) 2012. *Annual Marine Mammal Monitoring Programme April 2011-March 2012.)* The Agriculture, Fisheries and Conservation Department, Government of the Hong Kong SAR.

year prior to Project commencement and the first year of HKBCF construction, a higher density of dolphins occurred in the area immediately adjacent to the Project site. This would indicate that the HKBCF did not cause any negative impacts, e.g., disturbance from habitat, during the first year of operation.

3.4.4.5 For the period February 2011 – January 2012, SPSE was calculated in six categories, ranging from low use to high use. NEL and NWL have 9% and 22% of each respective area classified as high use (> 15 SPSE); 31% (NEL) and 27% (NWL) as moderate use (5.1-15 SPSE); and 65% (NEL) and 52% (NWL) as low use (< 5 SPSE) during the year February 2011-January 2013 (Figure 5 of Appendix H). These figures were compared to impact monitoring data for March 2012-February 2013 (Table 3.16 of Appendix H). For SPSE in NWL, there has been an increase in moderate use gird cells but a reduction in low use and a slight reduction in high use cells. This correlates with that observed for DPSE, unsurprisingly as they are derived from interrelated data (see Figures 3 and 4 of Appendix H). This is also true for SPSE and DSPE in NEL, indicating that use has remained consistent across the NEL habitat use during the first year of impact monitoring year when compared to the year preceding construction activities at HKBCF.

3.4.4.6 Encounter rates per area per quarter for the year March 2012 to February 2013 were calculated. Variability in encounter rate is indicated by the SE which, with the exception of the first quarter of the year (March – May 2012) that had no encounters, shows that there is an overlap of variation in both areas for each quarter thus making it difficult to discern any differences in encounter rate that may be present (Figure 5 of Appendix H).

3.4.4.7 Sightings of dolphins were divided into quarterly periods and an increase then decrease in the number of sightings is depicted as the year progresses through each quarter, i.e., lowest use in March – May 2012, high use in June – November 2012 and, again, lower use in December 2012-February 2013 (Figure 6 of Appendix H).

3.4.4.8 Sightings of mothers and calves were made throughout the year (Figure 7 of Appendix H). Although it is often difficult to identify calves, using high resolution images and the identity of mothers, it has been possible to identify a minimum 14 individual calves (Figure 8 of Appendix H). One dead calf was recovered during impact surveys in July (see 3.4.3.5).

3.4.4.9 Mother and calves were often associated with large groups (5 or more individual dolphins) except during the quarter December 2012 and February 2013 (Figure 9 of Appendix H).

3.4.4.10 Four distinctive behavioural categories were defined; “associated with fishing trawler”, “feeding”, “travelling” and “surface active”. Three other categories were also defined; “multiple” (more than one behavior was observed at one time), “other” and “unknown”. Dolphins were most often engaged in foraging activities (both feeding and associated with fishing trawlers) in both NEL and NWL (Figure 10 and Figure 11 of Appendix H).

3.4.4.11 During surveys conducted in 2011-12, behavioural information was only recorded for approximately 20% of all sightings made. Although it is difficult to compare these limited data quantitatively with the data from 2012-13, plotting of behaviours by year (Figure 12 of Appendix H) highlights the consistency of the Lung Kwu Chau area of NWL as an important feeding area.

3.4.4.12 Abundance estimates were calculated for every month in 2012-13 using the programme Distance. Due to the variable spatial and temporal survey conduct during the year proceeding the first year of impact monitoring (advanced plus baseline surveys), only the baseline period was used in abundance calculations as the survey coverage was relatively consistent. Surface abundance estimates (abundance is not corrected for availability) show that there is monthly variation in habitat use during 2012-13 with no definitive trend. The month of lowest abundance is April at 12.9 dolphins (95% CI = 6-29) and the highest is November 202.6 dolphins (95% CI = 147-286). The baseline period (Sept-Nov 2011) had an abundance of 113 dolphins (95% CI = 53-193). Apart from the months of lowest abundance (March and April 2012: it is noted that these months had less survey effort than following months) there is considerable overlap between nearly all abundance estimates and associated confidence intervals. These type of data alone rarely allow any clear perspective of significant

differences between any baseline and impact period due to the inherent monthly and seasonal variation in habitat use as well as the small, sparsely dispersed nature of the population. Further, NEL and NWL incorporate only a small proportion of the dolphins known distribution and abundance estimates are only relevant to the surveyed areas. What these data do show is that the abundances estimated for the impact monitoring period fall within the bounds of the baseline abundance estimate, with the exception of March and April 2012 when fewer dolphins occurred in both NEL and NWL (Figure 13 of Appendix H)

3.4.4.13 Feeding activities comprise approximately 50% of all observed behavior. This has remained consistent throughout the year. Between March 2012 – February 2013, dolphins were often recorded following fishing trawlers, often for hours. It is noted that the Hong Kong trawl ban commenced on 31 December 2012 and that dolphins have been sighted across the western maritime border following active fishing trawlers. This is not part of the impact monitoring designated area, however, it is known that dolphins freely travel across this area and dolphins which "normally" reside in Hong Kong may be spending more than usual amounts of time in adjacent waters feeding behind trawlers. "Surface active" behavior was seen throughout the year but decreased between September 2012 and February 2013 (Figure 10 of Appendix H).

3.4.4.14 As stated in the reports compiled for each quarter, the variation in distribution, habitat use, groups size, behavior, mother and calf occurrence and encounter rates varied throughout the year but no particular difference was noted from data recorded historically (in AFCD annual monitoring reports) or the baseline data with perhaps the exception of limited on effort sightings during March-May 2012. Nonetheless, very few and no sightings have also been recorded in AFCD data sets for this period. The breakdown in individual distribution, use and behavioural categories therefore do not show any changes which can be defined as significant. This is largely due to the variation in these traits as demonstrated in AFCD reports and typical of small cetacean populations in general.

Correlation between Marine Mammal Presence and Construction Activities

3.4.4.15 Construction activities at HKBCF have steadily increased since March 2012. Based on the pattern of habitat use, using both DSPE and SPSE, there has been consistent high use of those areas directly adjacent to HKBCF. This would indicate that the level of disturbance caused by HKBCF is either insufficient to cause disturbance or that the area serves as either critical habitat or supports a vital activity therefore, a degree of disturbance is tolerated.

3.4.4.16 It was recognised that HKBCF is located in an area of importance to the dolphin population of Hong Kong. As such, it was required in the EM&A Manuel that a suitable analytical technique be proposed and implemented so that significant changes attributable to construction activities could be detected with a degree of certainty and in a timely manner. Single parameter analyses are unable to detect impact as the influence of additional and co-correlated factors are not accounted for. As such, a multi-parameter model was proposed and reviewed by management authorities. This analysis is currently underway and shall be reported in full in a separate report immediately on its completion.

3.4.4.17 Successful foraging is a vital activity for marine mammals and in Hong Kong, feeding often occurs in association with active fishing trawlers. As such, the distribution and activity of fishing trawlers is directly correlated to dolphin habitat use and behavioural activities. In January 2013, all commercial trawling ceased in Hong Kong waters. As such, patterns of association which were significant in the first year of impact monitoring (March 2012-February 2013) will no longer exist in subsequent quarters and years of monitoring and dolphin distribution and behavior may be fundamentally changed. This has occurred in other areas where fishing activities have changed (Ansmann et al. 2012[4]) There are no predictions in the EIA as to what these changes may be and subsequent reporting should consider any effect the trawler ban may have on dolphins and separate it from potential impacts from construction activities.

3.4.4.18 The silt curtain and Project related working vessels within the NEL area do not take up a significant proportion of the dolphins habitat nor does the footprint of HKBCF itself incorporate any high density habitat for dolphins (according to the EIA). As such, although the reclamation will result in habitat loss, it is a small proportion of habitat that was historically not often used by dolphins.

[4] Ansmann, I., Parra, G.J., Chilvers, B. and Lanyon, J. (2012). Dolphins restructure social system after reduction of commercial fisheries. *Animal Behaviour*, 84(3), pp.575-581.

3.4.5 Verification of Impact Statements Stated in EIA and Supporting Documentation

3.4.5.1 The Statements made in the EIA and supporting documents are descriptive and do not provide a quantitative framework against which to compare data gathered through the first year of the impact monitoring for the purposes of verifying impact on CWD. Further, some statements made pertain only to the operational phase of HZMB (that is, when all in water construction works are completed) and not the explicit impacts of the many different construction activities which are required to construct HZMB. In the interests of thoroughness, any impact statements made in key documents relevant to HKBCF are extracted here and commented on with regards to the data gathered from the first year of construction activities at HKBCF.

3.4.5.2 The EIA report for HZMB[5] makes several statements with regards to impact on cetaceans during the **construction phase** in sections pertaining to water quality and bioaccumulation:

3.4.5.2.1 Construction Phase: In section 10.6.4.25 of the EIA report, it is stated that, "*Project has low potential to cause increased sewage discharge, therefore this potential impact is **insignificant**. The potential water quality impacts due to site runoff, sewage from workforce and wastewater from various construction activities, and accidental spillage would be controlled through the implementation of suitable mitigation measures, including temporary drainage system, chemical toilets, etc"*

3.4.5.2.2 This Project has consistently maintained water quality objectives as described in the EM&A Manual except where noted in Section 7.1.5. These exceptions, however, were subsequently found to be unrelated to Project works.

3.4.5.3 In Section 10.6.4.37 of the EIA report, it is stated that, "Thus insignificant bioaccumulation impacts from the construction of HKBCF and HKLR are predicted for CWD (except perhaps with the exception of silver – as per 10.6.4.32)"

3.4.5.3.1 It is noted that for both of the above impact predictions to be investigated more thoroughly, long term trends in pathogens and toxin loads in CWD should be analysed. This has recently been completed for the Pearl River Delta (PRD) population of CWD and it is noted that both bioaccumulation and biomagnification are significantly higher than populations elsewhere (Gui *et a*l 20146). In light of this new information, the statements made in the EIA may need to be re-assessed and the allowable limits for water quality parameters revised.

3.4.5.4 In Section 10.7.2.8 of the EIA report, it is stated that, "164 ha of sea area (138 ha reclamation and 26 ha works area) will be lost during construction due to HKBCF reclamation near the northeast Airport Island. Although the sea area is only utilised by limited number of individual CWD, it is of moderate ecological value due to the close proximity with dolphin hotspot. Moderate impact is anticipated and mitigation measures are required. As the habitat loss due to construction would largely be carried forward to the operational phase and become permanent habitat loss, mitigation measures for operational phase (see Section 10.7.4) will mitigate this impact as well)"

3.4.5.4.1 At HKBCF, moderate impact is anticipated but the degree or type of impact is not quantified in any numerical, spatial or temporal scale. After only one year of construction activities at HKBCF there is no clear pattern of any sudden or trending change in density, mortality, behaviour or school size associated with construction activities (see monthly surface abundance estimates and comparison with baseline study). Indeed, in NEL there is an increase in the percentage of high density usage cells. The impact of "permanent habitat loss" as a result of the HKBCF reclamation Section 10.7.4. of the EIA), is stated to be fully mitigated by the establishment of a Marine Protected Area after the construction phase of the Project is completed. This predication cannot be assessed until the HZMB operational phase starts and the Marine Park Area is established.

[5] Ove Arup & Partners Hong Kong Ltd 2009 HZMB – HKBCF & HKLR EIA Report. 24037-REP-125-01 Pages 83-5, 97, 115
[6] Gui, D., Yu, R., He, X., Tu, Q., Chen, L. and Wu, Y. Bioaccumulation and biomagnid=fication of persistent organic pollutants in Indo-Pacific humpback dolphins (*Sousa chinensis*) from the Pearl River Estuary, China. *Chemosphere* 114:106-113

3.4.5.4.2 The Ecological Baseline Survey[7] defines an Impact Index which is used to predict impact for each area through which the HZMB structure passes. HKBCF is located in the area defined as the "Northeast Lantau Section (NELS) – from the eastern edge of the airport platform to its connection to the North Lantau Highway".

3.4.5.5 It is noted that this report states (Section 5.7.10) that, *"it is imperative that cumulative impacts along the whole alignment [of HZMB] are thoroughly assessed*".

3.4.5.5.1 A reference to cumulative impacts is made in Section 10.7.6 of the EIA. Section 10.7.6.3 is relevant to HKBCF. This refers only to the cumulative impact of the permanent loss of CWD habitat and no other impacts of either the construction or operational phase of the HZMB project. Nonetheless, the conclusion of this section states that the setting up of a marine park "effectively mitigates" CWD habitat loss. As such, this prediction cannot be verified until such a time as a marine park is established.

3.4.5.5.2 As a rigorous cumulative assessment has not yet been conducted, there is little quantitative information against which impact survey observations can be made. Further, there are no predictions which deal specifically with the activities at HKBCF and no predictions of direct, temporary or residual impacts on CWD. As such, it is anticipated that impacts to the CWD population which have not been defined in the original EIA. will occur as construction activities progress at HKBCF

3.4.6 Practicality and Effectiveness of the EM&A Programme

3.4.6.1 Monitoring and auditing of marine mammals was recommended for the construction phase of HKBCF to evaluate impact on marine mammals.

3.4.6.2 Combined line transect and photo-identification methodologies have been used as part of the AFCD long term monitoring programme for over 15 years. As such, a long term data set can be used to establish trends in population distribution and abundance over the long term.

3.4.6.3 The AFCD annual monitoring report for the period 2011-2012 stated that a significant decline had been detected in population abundance in the NEL area over the last decade. Only long term inter annual abundance estimates can be used to detect such changes. This decline was noted prior to construction had begun at HKBCF.

3.4.6.4 Significant declines in abundance cannot be detected in the short term, i.e., month by month, by using the combined line transect and photo-identification methodologies described in the EM&A Manuel. For a project of this scale in an area of importance to the Hong Kong dolphin population, the EM&A Manuel required that new analyses be proposed to detect any potential impacts in a timely manner. The proposed method which correlates a suite of biological, physical and environmental variables is able to detect short term significant change and is used by management authorities elsewhere for marine mammal monitoring during construction activities.

3.4.7 Conclusion

3.4.6.1 Between March 2012 and February 2013, dolphins have not been deterred from the area immediately adjacent to HKBCF although variation in seasonal and annual differences make it problematic to quantify statistical significance. Nonetheless, dolphins have occurred in this area consistently throughout the first year of impact monitoring.

3.4.6.2 Marine mammal monitoring was conducted between March 2012 and February 2013 in accordance with EM&A Manuel methodologies. These methodologies have been invaluable in the past in determining both broad scale and long term patterns of distribution, abundance, association, habitat use and behavioral activities. There is historically much variation in these parameters and all observations to date have fallen within patterns and trends documented previously.

[7] Agreement No. MW 01/2003. Hong Kong- Zhuhai- Macao Bridge: Hong Kong Section and the North Lantau Highway Connection: Ecological Baseline Survey. Final 9 Month Ecological Baseline Survey Report the (p 42 – 43)

3.4.6.3 The surface abundance estimates calculated to date indicate that the density of dolphins using Hong Kong waters coincides with that estimated for baseline estimates and confidence intervals. A more qualitative approach to detecting fine scale and short term changes associated with HKBCF should use a multi-parameter analyses approach. Currently, survey and environmental data from other sources have been requested to complete these analyses so that any impacts can be discerned with a degree of certainty and in a timely manner so that current mitigation measures can be evaluated and strengthened if required.

4 ENVIRONMENTAL SITE INSPECTION AND AUDIT

4.1.1 Site Inpsection

4.1.1.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. In the reporting period, 51 site inspections were carried out. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

4.1.1.2 Particular observations during the site inspections are described below:

4.1.2 Air Quality

4.1.2.1 The Contractor was reminded to provide vehicle washing facility at Works Area WA3.

4.1.2.2 The Contractor was reminded to implement dust suppression measures, especially on water spraying on haul road, at Works Area WA3.

4.1.2.3 Bags of cement were found debagged at open area. The Contractor was reminded that de-bagging, batching and mixing process of cement should be carried out in an area sheltered on top and the 3 sides.

4.1.2.4 Soil stockpiles placed at Work Area WA4 were covered with tarpaulin sheet incompletely. The Contractor was reminded to cover up the soil stockpiles completely with tarpaulin sheet if no works was carrying out temporarily.

4.1.2.5 The Contractor was reminded to check the operating plants on barge regularly and carry out maintenance /repair (if necessary), to avoid any dark smoke emission.

4.1.3 Noise

4.1.3.1. Noise Emission Labels (NELs) were found missing from the air compressors employed on barge FTP19 at Portion A. The Contractor was reminded to affix the NELs to the air compressor employed.

4.1.3.2. Air compressors on barge Sun Moon Kee were observed without valid noise emission label. The contractor was reminded to fit air compressors with valid noise emission label prior to operation. (Reminder

4.1.4 Water Quality

4.1.4.1 The Contractor was recommended to review the drainage system regularly and provide wastewater treatment facilities, especially for silty surface run-off during rainfall, if necessary, at Works Area WA3. Although concrete u-channels and sand bag bundings were provided at part of the site boundaries and provision of temporary drainage system was undergoing, The Contractor was recommended to provide sand bag bundings at the site boundaries temporarily prior to completion of u-channels.

4.1.4.2 Rubbish and accumulated rainwater was found inside the u-channel at Works Area WA4. The Contractor should clear up the rubbish and accumulated rainwater, especially after rainstorm.

4.1.4.3 Broken sand bags were observed at site boundary at Works Area WA4. The Contractor should remove and replace the broken sand bags.

4.1.4.4 Although it was rainy during the inspection, the Contractor was reminded to enhance the pumping system provided at U-channels at Work Area WA4 in order to avoid accumulation of run-off inside the channels.

4.1.4.5 Parts of the curtains were found distorted. Distorted silt curtains were noted at boundaries of the works areas, at Portion C2a and Portion A and parts of the silt curtain system at Portion B, D and E2. The Contractor was informed to rectify the situation swiftly.

4.1.4.6 Debris and wastes were found inside the drainage channel at Works Area WA4. The Contractor was reminded to clear the debris and wastes regularly and maintain the drainage channels properly.

4.1.4.7 Silt curtain installed for stone column installation works on barge FTB18 was found damaged. The Contractor was reminded to keep monitor and well maintain of the silt curtain more frequently to ensure the silt curtain are fully functional. The damaged silt curtain found on barge FTB18 was fixed in the reporting period. (Closed)

4.1.4.8 Defects noticed at parts of the perimeter silt curtain at portions E1, C2a. C2c were observed and under maintenance. The Contractor was reminded to swiftly rectify the perimeter silt curtain in particular the portions where defects were observed to ensure the sediment plume generated by construction activities could be prevented from discharging to areas outside the site boundary. The adverse situation was rectified by the Contactor in March 2013. (Closed)

4.1.4.9 It was noticed that a localised silt curtain was readily adjacent to Barge AP4 but was not deployed to enclose the active stone column installation at Portion A. The Contractor rectified the situation by enclosing the active stone column installation with localised silt curtain in the reporting period. (Closed)

4.1.4.10 Silty plume was noted around the stone column installation areas of FTP19 at Portion C2c. The Contractor was advised to check the condition of the silt curtain systems installed regularly and review the arrangement of localized primary silt curtains to minimize any leakage from works. (Under follow-up status)

4.1.4.11 Distortion of part of silt curtain system at site boundaries at Portion D, B, C2a and silt curtain system installed around the stone column installation area of FTB19 at Portion C2c were rectified. (Closure of item from previous reporting month)

4.1.4.12 Silty plume was noted around the stone column installation areas of FTB16 at Portion D and around the silt curtain system when the stone column installation was carried out by FTB23 when site inspection was conducted on FTB 19. The Contractor was advised to check the silt curtain systems installed regularly and review the arrangement of localized primary silt curtains to minimize any leakage from works. Also the Contractor was reminded to fix the primary silt curtain prior to stone column installation works. Such conditions were rectified within the reporting period and the contractor was reminded to keep checking the silt curtains systems regularly. (Closure of item in reporting period)

4.1.5 Chemical and Waste Management

4.1.5.1 Floating wastes were observed within the silt curtain confined areas of the stone blanket installation works area in Portion A of the Site. The Contractor was reminded to clear the floating wastes within works areas regularly.

4.1.5.2 Oil drums were found stored improperly at FTP19 in Portion E1. The Contractor was reminded to provide drip trays to oil drum stored on site to retain any leaked oil if there is such case.

4.1.5.3 Accumulation of oily water and materials were observed inside the drip trays employed on barge FTP19 at Portion A. The Contractor was reminded to clear the materials and oily water. The oily mixture should be treated and disposed of as chemical waste.

4.1.5.4 It is noted that few trucks of construction wastes were not transferred to designated disposal ground. The Contractor was reminded to provide measures to ensure construction wastes were sorted, transferred and disposed of properly. Toolbox talks and trainings should be provided to workers and dump truck drivers on waste management issues.

4.1.5.5 Battery packs were found improperly placed on the barge Ever Shine 18 at Portion C2c, the Contractor was reminded to provide drip trays to the battery packs used on site to retain any leaked chemical, if there is such case.

4.1.5.6 Chemical container was found improperly stored on the barge FTP23 at Portion A and on barge FTB 16 at Portion D. The Contractor was reminded to properly store chemical container in works area with provision of drip tray.

4.1.5.7 Oil drums were found improperly stored on barge San Hang Bo 601 at Portion C2a, San Hang Bo 208 (at Portion E2), San Hang Bo 402 (at Portion B) and FTB 17 (at Portion C2a) and Works Area WA4., and used oil drums on barge San Hang Bo 208 at Portion C2a were found improperly treated. Oil drums were also found improperly stored on barge Ever Shine 668 at Portion C2a and FTB 20 at Portion A. Drip trays should be provided to oil drums stored within works areas to retain any leaked oil if there is such case. On the other hand, used oil drums should be properly cleaned and labeled.

4.1.5.8 Oil drums, chemical containers and batteries were found improperly stored on barge San Hang Bo 401 at Portion C2a. Drip trays should be provided to oil drums, chemical containers and batteries stored within works areas to retain any leaked chemicals/oil if there is such case.

4.1.5.9 Moreover, oil stains were noted on the barge San Hang Bo 208 (where power pack where vibratory clamp placed), on the barge Ever Shine 668 at Portion C2a (where power pack and vibratory clamp placed) and on the barge deck of barge FTB 17 at Portion C2a. Also, similar case was noted near the wire bundle at the barge FTB19. Proper measures like drip trays/tarpaulin sheets should be provided to retain any leaked oil and oil stains should be cleared and disposed of as chemical wastes.

4.1.5.10 Power packs, generators and vibratory clamp were found improperly stored on barge San Hang Bo 208 (at Portion E2) and 402 (at Portion B). The Contractor should provide proper measures, like drip trays and tarpaulin sheet coverage, to retain any leaked oil from the plants. Oil stains on barge decks should be cleared and the absorbents should be treated as chemical wastes.

4.1.5.11 Waste skip placed at Works Area WA4 was full and stockpile of C&D wastes was also noted. The Contractor was reminded to sort the C&D wastes properly and dispose of the C&D wastes timely.

4.1.5.12 General refuse was stockpiled on barge San Hang Bo 208, 601 at Portion C2a and on barge FTB 16 at Portion D. The Contractor was reminded to remove the general refuse in a timely manner, designate areas and provide proper containers to store general refuse generated in works areas. The Contractor was reminded to clear and sort the general refuse within works areas regularly and properly.

4.1.5.13 Oily mixtures accumulated in the bunding area and drip tray were observed at barge Ever Shine 668 at Portion A, barge San Hang Bo 401 at Portion C2a, barge FTB20 at Portion D, inside the drip trays provided at ring-type sheetpile installation frame (type B) at Portion B and the bunded areas and bin on barge FTP19 at Portion C2c. The Contractor was reminded to clear the oily mixture within works area regularly and disposal of as chemical waste. Regular review should be conducted for working barges to ensure sufficient measures and spill control kits were provided on working barges to avoid any spreading of leaked oil/chemicals. Tarpaulin sheet coverage was recommended to minimize the chance of water accumulation inside drip trays during rainstorm. Regular checking of the drip tray conditions should be carried out.

4.1.5.14 As a reminder, the Contractor should maintain patrol boats with Spill Kits, for control of any spills and collection of any floating waste, within marine works area.

4.1.5.15 It was noted that provision of drip tray to the power pack at barge San Hang Bo 209 at Portion E2 was undergoing, the Contractor was reminded to complete the drip tray construction work swiftly in order to retain any leaked oil if there is such case.

4.1.5.16 Open holes was found in the bunding for storage oil drums and power pack at Barge San Hang Bo 208 and between barge surface and the bunding on barge Sang Hang Qi 7. The Contractor was reminded to seal the open holes to retain any oil leakage. Open holes found in the bunding for

storage oil drums and power pack at Barge Sang Hang Bo 208 and barge Sang Hang Qi 7 were sealed to prevent any leakage of oil. Also, an opening at the bottom of a drip tray was observed on FTB 19. The Contractor was reminded to seal the opening at the bottom of the drip tray. The opening at the bottom of a drip tray was sealed in the reporting period. (Closure of item in the reporting period)

4.1.5.17 Oily water accumulated in drip trays were cleared on Barge FTB 20 and Barge Kiu Chi and disposed of as chemical waste in the reporting period. (Closed)

4.1.5.18 General refuses accumulated on Barge Kiu Chi were disposed of properly in the reporting period. (Closed)

4.1.5.19 Oil leakage was noted from a plant on FTB16 at Portion D. Oily mixture was accumulated inside the bunded area, at FTB19 at Portion C2a and accumulated inside the power pack on Barge San Hang Bo 305, too. The Contractor was recommend to repair the plant and clear the mixture and treat them as chemical wastes. Such conditions were rectified within the reporting period. (Closed)

4.1.5.20 Oil stains were found on barge and near power pack at barge San Hang Qi 7, near two roll of wire on barge Sang Hang Qi 7, near oil drum on barge Sun Moon Kee, on barge near powerpack on barge Sang Hang Bo 210 and on Barge San Hang Bo 401. The contractor was reminded to clean the oil stain and the absorbents should be treated as chemical wastes. The Contractor was reminded to provide mitigation measure such as drip tray or tarpaulin sheet to retain any oil leakage. The Contractor provided mitigation measure such as tarpaulin sheet to retain any oil leakage and bunding was provided to retain leaked oil from the power pack on Barge San Hang Qi 7. (Closed)

4.1.5.21 Empty oil drums were found improperly stored on barge Sun Moon Kee. The contractor was reminded to provide mitigation measures such as providing drip trays to waste oil drums or to place the waste oil drum to a proper storage area for temporary storage. Empty oil drums on barge Sun Moon Kee were removed. Also, oil drums were stored inside the drip trays to retain any oil leakage at Works Area WA4. (Closed)

4.1.5.22 Oil drums were found improperly stored on barge San Hang Qi 7, barge Sun Moon Kee, FTB19 at Portion C2a and Sang Hang Bo 205. Drip trays should be provided to oil drums stored within works areas to retain any leaked oil. Oil drums were stored inside the bunding on barge within the reporting period. (Closure of item in the reporting period) A drum of waste oil was found improperly stored on barge Sun Moon Kee. The Contractor was reminded to place the waste oil drum to designated chemical waste storage area for temporarily storage. The chemical waste container should also be labelled. A proper lid should be provided to the opened drum. Such condition was rectified within the reporting period. (Closed)

4.1.5.23 Drip tray was provided to the power pack on barge San Hang Bo 402 at Portion B. Measure was provided to vibratory clamp on barge San Hang Bo 208 and oil stains on barge deck were cleared. The Contractor was reminded that measures like drip trays and tarpaulin sheet coverage should be provided to plants to retain any leakage. Oil stains on barge deck should be cleared and absorbents should be treated as chemical wastes. (Closed)

4.1.5.24 Power pack without drip trap was observed. The contractor was reminded to provide proper measure such as drip tray to power pack to retain leaked oil. Power pack was found improperly stored on Barge San Hang Bo 401. The Contractor was reminded that proper measures like drip trays/tarpaulin sheets should be provided to retain any leaked oil from power pack on the barge. Power pack improperly stored on Barge San Hang Bo 401 was removed within the reporting period. (Closed).

4.1.5.25 Drip tray was provided to the power pack on barge San Hang Bo 402 at Portion B. Measure was provided to vibratory clamp on barge San Hang Bo 208 and oil stains on barge deck were cleared. The Contractor was reminded that measures like drip trays and tarpaulin sheet coverage should be provided to plants to retain any leakage. Oil stains on barge deck should be cleared and absorbents should be treated as chemical wastes. (Closed).

4.1.5.26 The contractor was reminded to disposal the oil absorbent materials of as chemical wastes and provide a proper chemical waste storage area on Barge San Hang Bo 208. (Reminder)

4.1.5.27 General refuse collection bin on FTB16 at Portion D was found placed inside the bunded area for oil drums storage. The Contractor was recommended to relocate the general refuse collection area. Such condition was rectified within the reporting period. (Closed)

4.1.5.28 The containers placed for containing the dripping water from air-conditioner were found full of water and debris at Barge SHA HANG QI 6. Immediate actions of clearing up the containers were taken by the Contractor. The Contractor was reminded to keep the barge clean and tidy. (Closed)

4.1.5.29 Oil drum was found improperly stored at FTB24, FTB18, FTB16, FTB19, SHB208, Sun Moon Kee. The Contractor rectified the situation by removing the oil drums from the area without bunding and/or relocating the oil drum inside the bunded area to prevent oil leakage (Closed).

4.1.5.30 Oil drums were provided with bundnig n barge Sang Hang Qi 7and the Contractor properly labelled the oil drum on barge Sang Hang Qi 7 and barge Sang Hang Bo 205 to enclose the oil drums stored within works areas to retain any leaked oil within the reporting period (Closed).

4.1.5.31 Oil drums were found without proper labelling at barge Ever Shine. The Contractor was advised to label all oil drums properly and oil drums were provided with proper labelling at barge Ever Shine within the reporting period (Closed).

4.1.5.32 Bucket of waste water was found near at a location without bunding/drip tray on Sang Han Bo 209. The Contractor immediately rectified the situation by relocated the bucket of waste water inside the bunded area to prevent potential waste water runoff into nearby water system. The Contractor was reminded to place buckets of waste water inside bunded area on barge (reminder).

4.1.5.33 The oil stain found near the power pack on barge Sang Hang Qi 7 and Sang Hang Bo 210, underneath a pack of cable and on the floor of barge Fai Yue 3228 and near a vibration clamp on barge Fai Yue 3228 were cleared and the absorbents were treated as chemical wastes. Mitigation measure such as tarpaulin sheet was placed underneath a pack of cable and on the floor of barge Fai Yue 3228 to retain any potential oil leakage. (Closed).

4.1.5.34 The Contractor provided mitigation measure such as tarpaulin sheet and bunding to retain potential leaked oil near the machine on barge Sun Moon Kee to power pack on Sang Hang Bo 205 to retain leaked oil respectively within the reporting period (Closed).

4.1.5.35 Gap was observed between barge surface and the bunding on barge Sun Moon Kee. The Contractor was reminded to seal the gap to prevent oil leakage. Gaps between barge surface and the bunding on barge Sun Moon Kee were sealed within the reporting period (Closed).

4.1.5.36 Uncovered open holes in the bundings and drip trays were found on barge FTB18 and on barge Sun Moon Kee. Oil leakage was found on barge Sun Moon Kee leaked through a bunding. The leaked oil was immediately cleared by the Contractor using absorbents and the Contractor was reminded to dispose the absorbents as chemical waste. The Contractor was reminded to seal/cover the open holes properly to prevent oil leakage. Open holes in the bundings and drip trays found on barge FTB18 were covered in the reporting period (Closed)

4.1.5.37 Incident of oil spillage was observed on barge FTB 20. The spilled oil was immediately cleared by the Contractor using spill kit and the Contractor was reminded to dispose the absorbents as chemical waste. The Contractor was reminded to maintain proper oil spill cleanup procedure for oil spillage (Reminder).

4.1.5.38 Oil was found accumulated inside the drip tray on barge FTB20. The Contractor rectified the situation by clearing the waste oil inside the drip tray, the Contractor is reminded to dispose the waste oil as chemical waste. (Reminder)

4.1.5.39 Water was observed dripping from the pipe connected to the air conditioner. The Contractor provided mitigation measures by placing a bucket to collect water that dripped from the air conditioner. (Closed)

4.1.5.40 Stagnant water accumulated inside the car tire on barge Sang Han Bo 205 and inside the drip tray on barge Sang Han Bo 210 were observed. The Contractor was reminded to clear the water or open a hole on the tire on Sang Han Bo 205 to prevent mosquito breeding and to clear the water accumulated inside the drip tray on barge Sang Han Bo 210 respectively. Stagnant water accumulated inside the wheel tire on barge Sang Han Bo 205 and inside the drip tray on barge Sang Han Bo 210 were removed in the reporting period. (Closed)

4.1.5.41 Garbages accumulated on barge Kiu Chi was observed and food waste was observed left outside of the bin on barge SHB 402. The Contractor was remineded to clear up the garbages/food waste frequently to keep site clean and tidy. Garbages accumulated on barge Kiu Chi was cleared in the reporting period. (Closed)

4.1.5.42 Although the content of the stockpile on barge Fu Tat was dampened, however, the Contractor was reminded to dampen the stockpile frequently to suppress fugitive dust generated. (Reminder)

4.1.6 Landscape and Visual Impact

4.1.6.1 No adverse observation was identified in the reporting period.

4.1.7 Others

4.1.7.1 No adverse observation was identified in the reporting period.

4.1.7.2 The Contractor has rectified most of the observations as identified during environmental site inspection in the reporting period. Rectifications of remaining identified items are undergoing by the Contractor. Follow-up inspections on the status on provision of mitigation measures will be conducted to ensure all identified items are mitigated properly.

5 ADVICE ON THE SOLID AND LIQUID WASTE MANAGEMENT STATUS

5.1 Summary of Solid and Liquid Waste Management

5.1.1 The Contractor registered as a chemical waste producer for this project. Sufficient numbers of receptacles were available for general refuse collection and sorting.

5.1.2 As advised by the Contractor, 779,097.5 m^3 of imported fill were imported for the Project use in the reporting period. 7,618kg of chemical waste were generated and disposed of in the reporting period. 825.5 m^3 of general refuse were generated and disposed of in the reporting period. Summary of waste flow table is detailed in Appendix I.

5.1.3 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system, dispose of C&D materials and wastes at designated ground and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

5.1.4 The Contractor is reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

6 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

6.1 Implementation Status of Environmental Mitigation Measures

6.1.1 Insufficient dolphin survey efforts due to inclement weather conditions in March and April 2012 and inability of setting up and carrying out impact air quality monitoring at AMS6 (Dragonair/CNAC (Group) Building) were noted in the reporting period. Supplementary dolphin surveys have been conducted during June and July 2012 to ensure that adequate survey efforts will be maintained. (March – May 12)

6.1.2 Two (2) Non-Compliance dated on 31 Oct 2012 and 6 Nov 2012 was noted during the reporting period.

6.1.3 For the Non-Compliance dated on 31 Oct 2012, as informed by the Contractor on 30 November 2012, a noise complaint was received by EPD on the 18 Oct 2012 and on one of the two complaint follow up inspection conducted by EPD on 19 and 31 October 2012, operation of a powered mechanical equipment after 19:00 without valid CNP was observed on 31 Oct 12 at WA4. One worker was carrying out emergency maintenance for machinery with generator after 19:00, while no construction noise permit was in force, which is suspected that the Noise Control Ordinance (Cap.400) was violated. A "Pink Form" (inspection record) was subsequently issued by EPD on the 14 November 2012 regarding the suspected violation of Noise Control Ordinance (Cap.400).

6.1.3.1 The Contractor was recommended to implement the following noise mitigation measures in case any construction activities involving the use of Powered Mechanical Equipment (PME) is conducted in the concerned area:

a) Work involves Powered Mechanical Equipment (PME) should be stopped before 7 pm
b) Review the need to increase the frequency of Construction Noise and Suppression training, provide extra training if deemed necessary.
c) Install notice sign on site to notice workers that Powered Mechanical Equipment (PME) and Prescribed Construction Work (PCW) (e.g. 1. Erection or dismantling of formwork or scaffolding. 2. Loading, unloading or handling of rubble, wooden boards, steel bars, wood or scaffolding material and 3. Hammering) are not allowed from 7pm to 7am on the next day or anytime on public holidays, including Sundays.
d) The noise mitigation measures should be maintained and the effectiveness of noise mitigation measures deployed within works area should be enforced and reviewed onsite regularly in order to provide sufficient noise screening effect properly.

6.1.3.2 A follow-up site inspection was conducted on 3 January 2013 by ET and with representative from the Contractor. During the inspection, follow up actions taken by the Contractor to improve the situation was observed. No Powered Mechanical Equipment (PME) was in operation and it was observed that notice signs were installed on site by the Contractor to notice workers that work involves Powered Mechanical Equipment (PME) is prohibited from 19:00 to 07:00 on all days and whole day on public holiday.

6.1.3.3 Prior to any confirmation of any possible summon and prosecution. ET will continue to monitor the mitigation actions carried out by the Contractor and provide appropriate assistance and advice whenever necessary.

6.1.4 For the Non-Compliance dated 6 Nov 2012 there was an incident of trial filling of sand blanket by conveyor without full enclosure observed and reported. The condition was rectified and the wind board was installed on 8 Nov 2012.

6.1.4.1 Defects were noticed at parts of the perimeter silt curtain at portions E1, C2a. C2c and those defective parts are yet to be rectified. Although maintenance works were noted during site inspections and on the records provided by the Contractor. However, there is still parts of the silt curtain were found defective in the reporting period therefore the Contractor was reminded again to swiftly complete the rectification works of the perimeter silt curtain in particular the portions where defects were observed to ensure the sediment plume generated by construction activities could be prevented from discharging to areas outside the site boundary. Meanwhile, ET followed up the situation and closely monitored the progress of the maintenance work and reported the progress accordingly during the reporting period.

6.1.4.2 In response to the site audit findings, the Contractors carried out corrective actions.

6.1.4.1 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in Appendix C. Most of the recommended mitigation measures, as included in the EM&A programme, were implemented properly in the reporting period, except inability of setting up and carrying out impact air quality monitoring at AMS6 (Dragonair/CNAC (Group) Building) were noted. Liaison with relevant parties for permission on access to the premise for setting up and carrying out impact air quality monitoring works at AMS6 was continued until 19 November 2012. Reference is made to ET's proposal of the omission of air monitoring station (AMS 6) dated on 1st November 2012 and EPD's letter dated on 19th November 2012 regarding the conditional approval of the proposed omission of air monitoring station (AMS 6) for Contract No. HY/2010/02. The aforesaid omission of Monitoring Station AMS6 will be effective since 19th November 2012. Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively. .

6.1.4.3 Training of marine travel route for marine vessels operator was given to relevant staff and relevant records were kept properly.

6.1.4.4 Regarding the implementation of dolphin monitoring and protection measures (i.e. implementation of Dolphin Watching Plan, Dolphin Exclusion Zone and Silt Curtain integrity Check), regular checking were conducted by the experienced MMOs within the works area to ensure no dolphin was trapped by the enclosed silt curtain systems. Any dolphin spotted within the enclosed silt curtain systems was reported and recorded. Relevant procedures were followed and measures were well implemented. Silt curtain systems were also inspected timely in accordance to the submitted plan. All inspection records were kept properly.

6.1.4.5 Acoustic decoupling measures on noisy plants on construction vessels were checked regularly and these measures were well implemented.

6.1.4.6 As informed by the Contractor, insufficient mitigation measures were noted during a joint site inspection with the representative of the Contractor and the Resident Engineer in the after from 14:30 to 16:00 of 28 Jan 2013.

6.1.4.7 It was noticed that part of the demarcation for Zone F was missing; being contrary to the other condition 3.d.16 of the above CNP. In addition , Some generators and air compressors on barge FTB-16 in Zone S4 were not completely screened by the acoustic baffles and parts of those powered mechanical equipment (PME) were visible from Hong Kong SkyCity Marriott Hotel (noise sensitive receiver); being contrary to other condition of the CNP. It is understood that the set up of acoustic baffles for FTB-20 in Zone S5 was identical to FTB-16 in Zone S4. Therefore the Contractor was advised to inspect and rectify (if necessary) the acoustic baffles so as to comply with other condition 3.d.13 of the CNP.

6.1.4.8 The Contractor was reminded to carry out necessary actions to rectify the above deficiencies and the Contractor was reminded not to operate those PME during restricted hours without compliance with the CNP conditions.

6.1.4.9 As informed by the Contractor on 9 February 2013, the deficiencies were rectified. 7 nos. of demarcation (were no more visible) for Zone F have been re-deployed.

6.1.4.10 Extra noise barriers were installed onto barge FTB-16 in Zone S4 and FTB-20 in S5. generators and air compressors on barge FTB-16 in Zone S4 and FTB-20 in S5 were completely screened by the acoustic baffles and parts of those powered mechanical equipment (PME) were no more visible from Hong Kong SkyCity Marriott Hotel (noise sensitive receiver).

6.1.4.11 The Contractor was reminded to strictly comply with the condition of the CNP.

7 SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

7.1 Summary of Exceedances of the Environmental Quality Performance Limit

7.1.1. No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring in the reporting quarter. However, one Action Level exceedance and four (4) Limit Level exceedance was recorded for 24-hour TSP results in the reporting period. Investigation results show that the exceedances were not due to the Project works. The Contractor was recommended to continue implementing existing dust mitigation measures

7.1.2. One (1) Limit Level exceedance of impact noise monitoring was recorded in the reporting period. Investigation into the possible causes of each exceedance was undertaken and reported in the respective monthly EM&A reports. Investigation results show that the exceedance was not due to the Project works. The Contractor was recommended to continue implementing existing noise mitigation measures.

7.1.3. The Contractor was recommended to continue implementing existing noise mitigation measures.

7.1.4. Thirty (30) Action Level exceedances and (2) Limit Level exceedances were recorded at measured suspended solids (SS) values (in mg/L), three (3) Action Level exceedances was recorded at measured turbidity (in NTU) and one (1) Action Level exceedance was recorded at measured DO (Bottom) (mg/L) during the reporting period. Investigation result show that the exceedances were not due to the Project works. Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains.

7.1.5. Cumulative statistics on exceedances is provided in Appendix J.

8 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

8.1 Summary of Environmental Compliants, Notification of Summons and Successful Prosecutions

8.1.1 The Environmental Complaint Handling Procedure is annexed in Figure 5.

8.1.2 As informed by the Contractor on the 28 Dec 2012, a night time noise at Works Area WA4 related complain (after 7 pm) was received by EPD on 18 Oct 2012. After investigation, the Contractor was reminded to implement necessary mitigation measures.

8.1.3 A complaint was referred by EPD on 24 Oct 12 regarding the blackish water (suspected oil spillage) observed outside the construction site near the Hong Kong International Airport and the new development pier in Tung Chung. Photos were taken by the complainant on 19, 22 and 24 October 2012. The investigation results show that the complaint was non-project related. However the Contractor was reminded to continue to implement necessary mitigation measures.

8.1.4 EPD referred a complaint from a complainant on 18 Jan 2013 who advised that turbid water and concrete/cement was arising from the Hong Kong-Zhuhai-Macao Bridge Hong Kong Projects to marine water. The source of turbid water and concrete/cement was not specified by the complainant. After investigation, it could not be concluded whether the complaint was considered as project related or not. However the Contractor was reminded to continue to implement necessary mitigation measures.

8.1.5 One (1) complaint was referred to the HyD by the Islands District Council (IDC) on the 6 February 2013 regarding a resident from Phase 1 Caribbean Coast who complained the nuisance brought by construction along Ying Hei Road, Tung Chung. Complaint investigation was conducted by the HyD and written reply were subsequently given to IDC by HyD on 4 March 13. The investigation results show that the complaint was non-project related. Nevertheless, the Contractor was reminded by HyD to continue to keep the site and its nearby area clean and tidy.

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

8.1.7 Statistics on complaints, notifications of summons and successful prosecutions are summarized in Appendix J.

9 REVIEW OF THE VALIDITY OF THE EIA PREDICTION

9.1 Only five (5) 24-hour TSP monitoring exceedances were recorded in the reporting period and it was considered not related to the Project works. All the rest of air quality monitoring results in the reporting period were below the Action Levels established in the baseline air quality monitoring carried out in November 2011. The result was in line with the Environmental Impact Assessment (EIA) prediction that dust generation would be controlled and would not exceed the acceptable criteria, with proper implementation of the recommended dust mitigation measures.

9.2 Only one (1) construction noise monitoring exceedance was recorded in the reporting period. This is generally in line with the EIA and ERR prediction that with the implementation of noise mitigation measures, the construction noise from the Project works will meet the stipulated criterion at the residential NSRs and at a majority of the education institutions as predicted by the EIA.

9.3 36 water quality monitoring exceedances were recorded in the reporting period and it was considered not related to the Project works. All the rest of water quality monitoring results in the reporting period were below the Action Levels established in the baseline water quality monitoring carried out in November 2011. The result was in line with the Environmental Impact Assessment (EIA) prediction that water quality impact would be controlled and would not exceed the acceptable criteria, with proper implementation of the recommended water quality mitigation measures.

10 REVIEW OF ENVIRONMENTAL IMPLEMENTATION STATUS

10.1 The impact air quality, noise and water quality monitoring programme ensured that any environmental impact to the receivers would be readily detected and timely actions could be taken to rectify any non-compliance. The environmental monitoring results indicated that the construction activities in general were in compliance with the relevant environmental requirements and were environmentally acceptable. The weekly site inspection ensured that all the environmental mitigation measures recommended in the EIA were effectively implemented. Despite the minor deficiencies found during site audits, the Contractor had taken appropriate actions to rectify deficiencies within reasonable timeframe. Therefore, the effectiveness and efficiency of the mitigation measures were considered high in most of the time.

10.2 For all the parameters under monitoring as mentioned in Section 3, the measured levels were in line with the EIA predictions generally. This indicates that the mitigation measures were effectively implemented.

11 REVIEW OF EM&A PROGRAMME

11.1 The environmental monitoring methodology was considered well established as the monitoring results were found in line with the EIA predictions.

11.2 As effective follow up actions were promptly taken once exceedances were recorded, no further exceedance occurred for each case. The EM&A programme was considered successfully and adequately conducted during the course of the reporting period.

12 COMMENTS, RECOMMENDATIONS AND CONCLUSIONS

12.1 Comments on mitigation measures

12.1.1 According to the environmental site inspections performed in the reporting period, the following recommendations were provided:

12.2 Air Quality Impact

- All working plants and vessels on site should be regularly inspected and properly maintained to avoid dark smoke emission.
- All vehicles should be washed to remove any dusty materials before leaving the site.
- Haul roads should be sufficiently dampened to minimize fugitive dust generation.
- Wheel washing facilities should be properly maintained and reviewed to ensure properly functioning.
- Temporary exposed slopes and open stockpiles should be properly covered.
- Enclosure should be erected for cement debagging, batching and mixing operations.
- Water spraying should be provided to suppress fugitive dust for any dusty construction activity.

12.3 Construction Noise Impact

- Quieter powered mechanical equipment should be used as far as possible.
- Noisy operations should be oriented to a direction away from sensitive receivers as far as possible.
- Proper and effective noise control measures for operating equipment and machinery on-site should be provided, such as erection of movable noise barriers or enclosure for noisy plants. Closely check and replace the sound insulation materials regularly
- Vessels and equipment operating should be checked regularly and properly maintained.
- Noise Emission Label (NEL) shall be affixed to the air compressor and hand-held breaker operating within works area.
- Better scheduling of construction works to minimize noise nuisance.

12.4 Water Quality Impact

- Regular review and maintenance of silt curtain systems, drainage systems and desilting facilities in order to make sure they are functioning effectively.
- Construction of seawall should be completed as early as possible.
- Regular inspect and review the loading process from barges to avoid splashing of material.
- Silt, debris and leaves accumulated at public drains, wheel washing bays and perimeter u-channels and desilting facilities should be cleaned up regularly.
- Silty effluent should be treated/ desilted before discharged. Untreated effluent should be prevented from entering public drain channel.
- Proper drainage channels/bunds should be provided at the site boundaries to collect/intercept the surface run-off from works areas.
- Exposed slopes and stockpiles should be covered up properly during rainstorm.

12.5 Chemical and Waste Management

- All types of wastes, both on land and floating in the sea, should be collected and sorted properly and disposed of timely and properly. They should be properly stored in designated areas within works areas temporarily.
- All chemical containers and oil drums should be properly stored and labelled.
- All plants and vehicles on site should be properly maintained to prevent oil leakage.
- All kinds of maintenance works should be carried out within roofed, paved and confined areas.
- All drain holes of the drip trays utilized within works areas should be properly plugged to avoid any oil and chemical waste leakage.
- Oil stains on soil surface and empty chemical containers should be cleared and disposed of as chemical waste.
- Regular review should be conducted for working barges and patrol boats to ensure sufficient measures and spill control kits were provided on working barges and patrol boats to avoid any spreading of leaked oil/chemicals.

12.6 Landscape and Visual Impact

- All existing, retained/transplanted trees at the works areas should be properly fenced off and regularly inspected.

12.7 Recommendations on EM&A Programme

12.7.1. The impact monitoring programme for air quality, noise, water quality and dolphin ensured that any deterioration in environmental condition was readily detected and timely actions taken to rectify any non-compliance. Assessment and analysis of monitoring results collected demonstrated the environmental impacts of the Project. With implementation of recommended effective environmental mitigation measures, the Project's environmental impacts were considered as environmentally acceptable. The weekly environmental site inspections ensured that all the environmental mitigation measures recommended were effectively implemented.

12.7.2. The recommended environmental mitigation measures, as included in the EM&A programme, effectively minimize the potential environmental impacts from the Project. Also, the EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

12.8 Conclusions

12.8.1 The construction phase and EM&A programme of the Project commenced on 12 March 2012.

12.8.2 For air quality monitoring, no Action/Limit Level exceedance of 1-hour TSP results was recorded in the reporting period. However, one (1) Action Level and Four (4) Limit Level exceedances of 24-hour TSP results were recorded at monitoring location AMS3A in the reporting period. Investigation results show that both the Action and Limit Level exceedance of 24-hour TSP results were not project-related. Possible dust generating activities of the Project did not cause any noticeable deterioration in air quality at the area. The average 24-hour TSP level recorded at AMS7 in EM&A programme was lower than the daily dust level predicted in the EIA.

12.8.3 There was (1) one limit level exceedance recorded at NMS3A. Noise generating activities of the Project did not cause any noticeable noise impact at the sensitive receivers. The impact noise levels recorded were generally similar to the predicted construction noise levels in the Project EIA.

12.8.4 Thirty (30) Action Level exceedances and (2) Limit Level exceedances were recorded at measured suspended solids (SS) values (in mg/L), three (3) Action Level exceedances was recorded at measured turbidity (in NTU) and one (1) Action Level exceedance was recorded at measured DO (Bottom) (mg/L) during the reporting period. Investigation result show that the exceedances were not due to the Project works. After review of investigation results of water quality exceedances (for detail of investigations please refer to section 4 of monthly EM&A report (Mar 12 to Feb 13), ambient conditions were considered to have effects on the water quality monitoring results. Exceedances were considered to be due to a combination of the following potential causes: 1. Non-Project related vessel activities such as trawling of fishing vessels near the monitoring station 2. Rough sea condition caused by adverse weather and relatively strong current experienced during the monitoring period and 3. During the time when exceedances of DO were recorded at monitoring stations, relatively low DO values were also recorded at corresponding upstream Control Stations during ebb tide or flood tides indicating these exceedances of DO were unlikely to be contributed by Project works.. This indicated these exceedances of DO were unlikely to be contributed by Project works. 4. Local effects in the vicinity of the monitoring station where exceedance was recorded. Furthermore, no correlation between the filling rates and the number of water quality exceedances recorded per monitoring day was found. With proper implementation of water quality mitigation measures, marine construction activities of the Project did not cause any unacceptable water quality impacts to the receivers.

12.8.5 No triggering of Event and Action Plan for impact dolphin monitoring was noted in the reporting period.

12.8.6 Environmental site inspection was carried out forty eight times in the reporting period. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

12.8.7 Four (4) environmental complaints were received in the reporting period.

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

12.8.9 As discussed in the above sections, the Project did not cause unacceptable environmental impacts or disturbance to air quality, noise, water quality in the vicinity near the reclamation works.

12.8.10 Apart from the above mentioned monitoring, most of the recommended mitigation measures, as included in the EM&A programme, were implemented properly in the reporting period, except inability of setting up and carrying out impact air quality monitoring at AMS6 (Dragonair/CNAC (Group) Building) were noted. Liaison with relevant parties for permission on access to the premise for setting up and carrying out impact air quality monitoring works at AMS6 was continued until 19 November 2012. Reference is made to ET's proposal of the omission of air monitoring station (AMS 6) dated on 1 November 2012 and EPD's letter dated on 19 November 2012 regarding the conditional approval of the proposed omission of air monitoring station (AMS 6) for Contract No. HY/2010/02. The aforesaid omission of Monitoring Station AMS6 will be effective since 19 November 2012.

12.8.11 The recommended environmental mitigation measures effectively minimize the potential environmental impacts from the Project. The EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

12.8.12 Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.

812000 E 813000 E 814000 E 815000 E 816000 E 817000 E 818000 E 819000 E 820000 E 821000 E 822000 E 823000 E

825000 N 824000 N 823000 N 822000 N 821000 N 820000 N 819000 N 818000 N 817000 N 816000 N 815000 N

N

THE SITE

PROPOSED HONG KONG BOUNDARY CROSSING FACILITIES

HONG KONG INTERNATIONAL AIRPORT

SIU HO WAN WIND PROFILER

SIU HO WAN ANEMOMETER STATION

WORKS AREA WA4

WORKS AREA WA3

WORKS AREA WA2

TUNG CHUNG

THE BROTHERS

TO KAU WAN

SIU HO WAN

PENG CHAU

HONG KONG INTERNATIONAL AIRPORT

HKBCF

HONG KONG DISNEYLAND

TUNG CHUNG

KEY PLAN

NOTES

1. ALL COORDINATES ARE RELATED TO HONG KONG 1980 GRID.
2. ALL LEVELS ARE IN METRES ABOVE HONG KONG PRINCIPAL DATUM (mPD).
3. REFER TO DRG NO. 211036/SL/1002 FOR THE DEFINITION OF SETTING OUT LINE (SOL) FOR THE HONG KONG BOUNDARY CROSSING FACILITIES (HKBCF) RECLAMATION SITE.
4. REFER TO DRG NO. 211036/SL/1004 FOR DETAILS OF SITE BOUNDARY.
5. FOR EXTENT OF SORTING FACILITIES AT FILL BANK AT TSEUNG KWAN O AREA 137 REFER TO DRG NO. 211036/SL/1015.

LEGEND

SITE BOUNDARY

SETTING OUT LINE (SOL)

WORKS AREA BOUNDARY

Rev	Description	By	Date
-	FOR CONSTRUCTION	HYJL	11/11

Consultant

ARUP 奧雅納工程顧問 Ove Arup & Partners Hong Kong Limited

Supported By :
- Ecosystems Ltd.
- EDA Marine Ltd.
- Geotechnical Consulting Group (Asia) Ltd.
- Hong Kong Cetacean Research Project
- InteliBuild Technyx Asia Limited
- Tony Gee and Partners LLP

Contract No. and Title:

Contract No. HY/2010/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities
- Reclamation Works

Drawing title

KEY PLAN

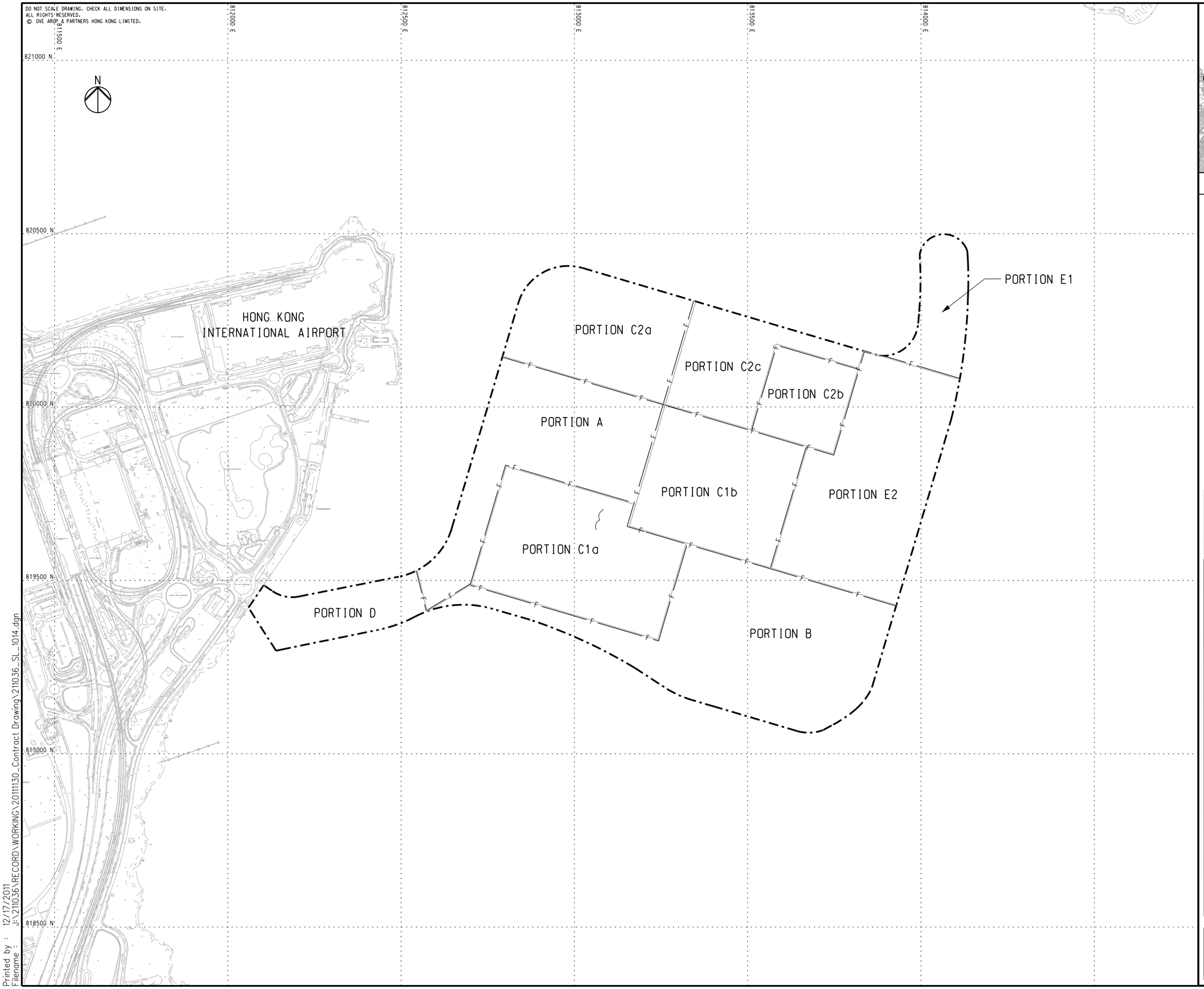
Drawing no. 211036/SL/1001 Rev. -

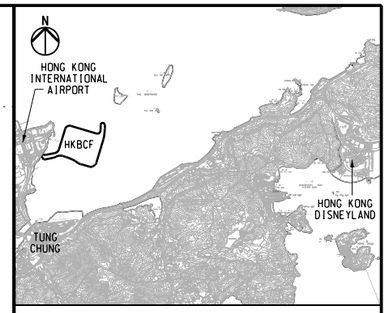
Drawn	Date	Checked	Approved
RL	11/09	KKY	DML

Scale 1:20000 @A1 1:40000 @A3 Status WORKING

路政署 HIGHWAYS DEPARTMENT
港珠澳大橋香港工程管理處 Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

Printed by : 12/17/2011
Filename : J:\211036\RECORD\WORKING\20111130_Contract Drawing\211036_SL_1001.dgn





KEY PLAN

NOTES

1. FOR LEGENDS AND NOTES FOR CHAIN LINK FENCE AND GATE REFER TO DRG NO. 211036/SL/1013.
2. THE ERECTION OF CHAIN LINK FENCE AND GATES SHALL BE COMPLETED BY THE HANDOVER DATE OF EACH PORTION OF SITE, OR AS INSTRUCTED BY THE ENGINEER.
3. FOR SETTING OUT COORDINATES OF DIFFERENT PORTIONS OF SITE REFER TO DRG NO. 211036/SL/1003.
4. ACCESS POINTS BETWEEN PORTIONS SHALL BE PROVIDED BY THE CONTRACTOR. AND THE LOCATIONS SHALL BE AGREED WITH THE ENGINEER ON SITE.
5. FOR HOARDING AND FENCE AT FILL BANK AT TSEUNG KWAN O AREA 137 REFER TO DRG NO. 211036/SL/1015.

LEGEND

- SETTING OUT LINE (SOL)
- WORKS AREA BOUNDARY
- PORTIONS BOUNDARY LINE

Rev	Description	By	Date
-	FOR CONSTRUCTION	HYJL	11/11

Consultant

ARUP 奧雅納工程顧問 Ove Arup & Partners Hong Kong Limited

Supported By :
- Ecosystems Ltd.
- EDA Marine Ltd.
- Geotechnical Consulting Group (Asia) Ltd.
- Hong Kong Cetacean Research Project
- InteliBuild Technyx Asia Limited
- Tony Gee and Partners LLP

Contract No. and Title:
Contract No. HY/2010/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities
- Reclamation Works

Drawing title
WORKS AREA LAYOUT
AND HORADING PLAN
(SHEET 2 OF 3)

Drawing no.	Rev.
211036/SL/1014	-

Drawn	Date	Checked	Approved
RL	06/10	KKY	DML

Scale 1:5000 @A1 1:10000 @A3
Status WORKING

路政署 HIGHWAYS DEPARTMENT
港珠澳大橋香港工程管理處
Hong Kong - Zhuhai - Macao Bridge
Hong Kong Project Management Office

Printed by : 12/17/2011
Filename : J:\211036\RECORD\WORKING\20111130_Contract Drawing\211036_SL_1014.dgn

ISO A3 297mm x 420mm

Checked:

Project Management Initials:

809000 E
810000 E
811000 E
812000 E
813000 E
814000 E
815000 E

820000 N
819000 N
818000 N
817000 N
816000 N

PROPOSED HONG KONG BOUNDARY CROSSING FACILITIES

AMS7

AMS6

AMS3A
NMS3A

AMS2
NMS2

CHEK LAP KOK

HONG KONG INTERNATIONAL AIRPORT

SCENIC HILL

Pak Sha Tsui

TUNG CHUNG

LEGEND

AMS1 AIR MONITORING STATIONS

NMS1 NOISE MONITORING STATIONS

WIND STATION

AECOM

Figure 2

IMPACT AIR QUALITY AND NOISE
MONITORING STATIONS AND WIND STATION

HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

Project No.: 60249820 Date: MAY 2012

Plot File by: Lammd 03/05/2012
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Plot File by: LAMMCL
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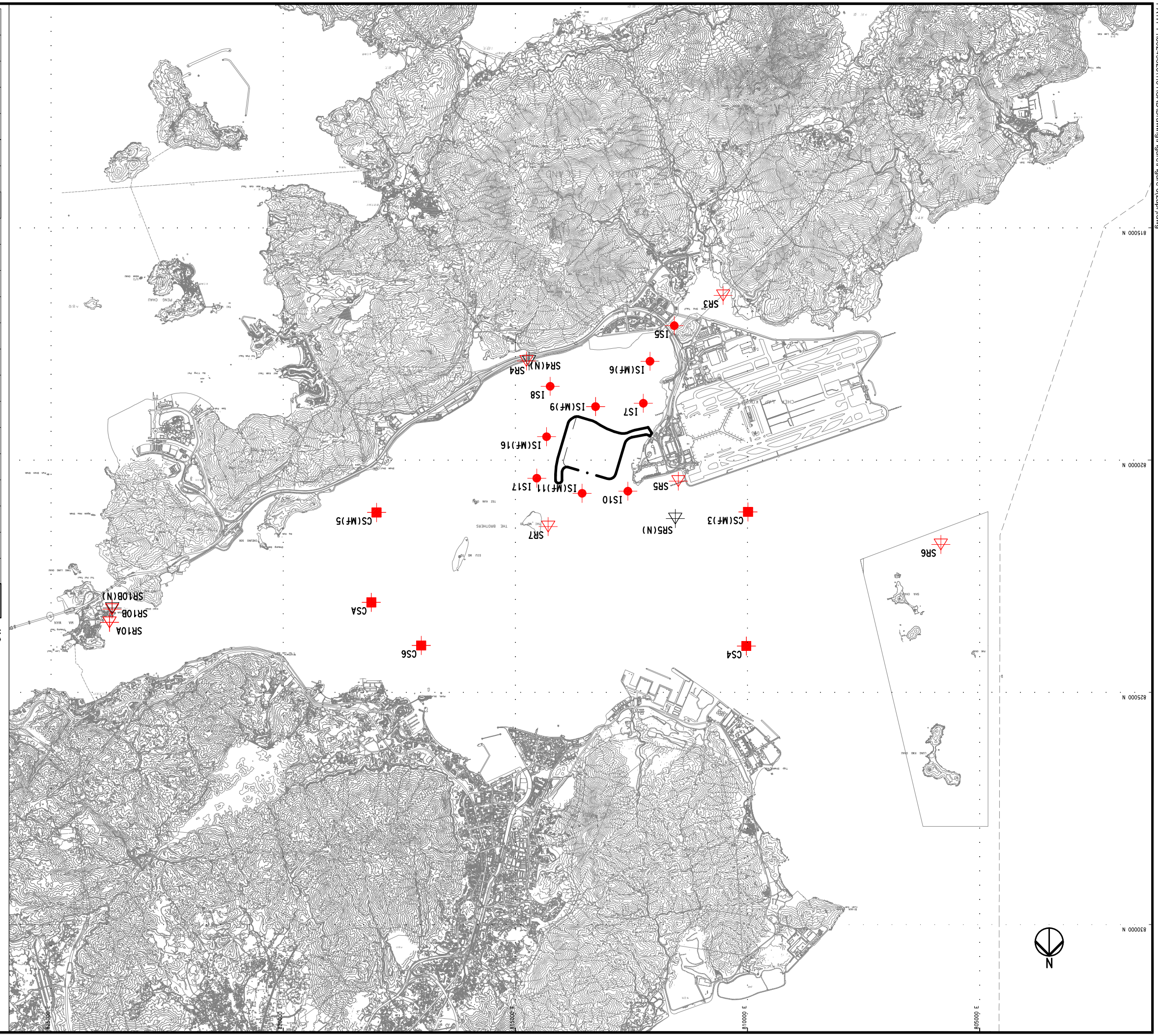
13/04/2012

Project Management Initials:

Checked:

ISO A3 297mm x 420mm



MONITORING STATIONS	CO-ORDINATES	
	EASTING	NORTHING
IS5	811579	817106
IS(MF)6	812101	817873
IS7	812244	818777
IS8	814251	818412
IS(MF)9	813273	818850
IS10	812577	820670
IS(MF)11	813562	820716
IS(MF)16	814328	819497
IS17	814539	820391
SR3	810525	816456
SR4(N)	814705	817859
SR5	811489	820455
SR5(N)	811555	821258
SR6	805837	821818
SR7	814293	821431
SR10A	823741	823495
SR10B(N)	823683	823187
CS(MF)3	809989	821117
CS(MF)5	817990	821129
CS4	810025	824004
CS6	817028	823992
CSA	818103	823064

SETTING OUT SCHEDULE

LEGEND

IS — IMPACT STATIONS

CS — CONTROL / FAR FIELD STATIONS

SR — SENSITIVE RECEIVERS STATIONS

SR — SENSITIVE RECEIVERS STATIONS (RELOCATED)

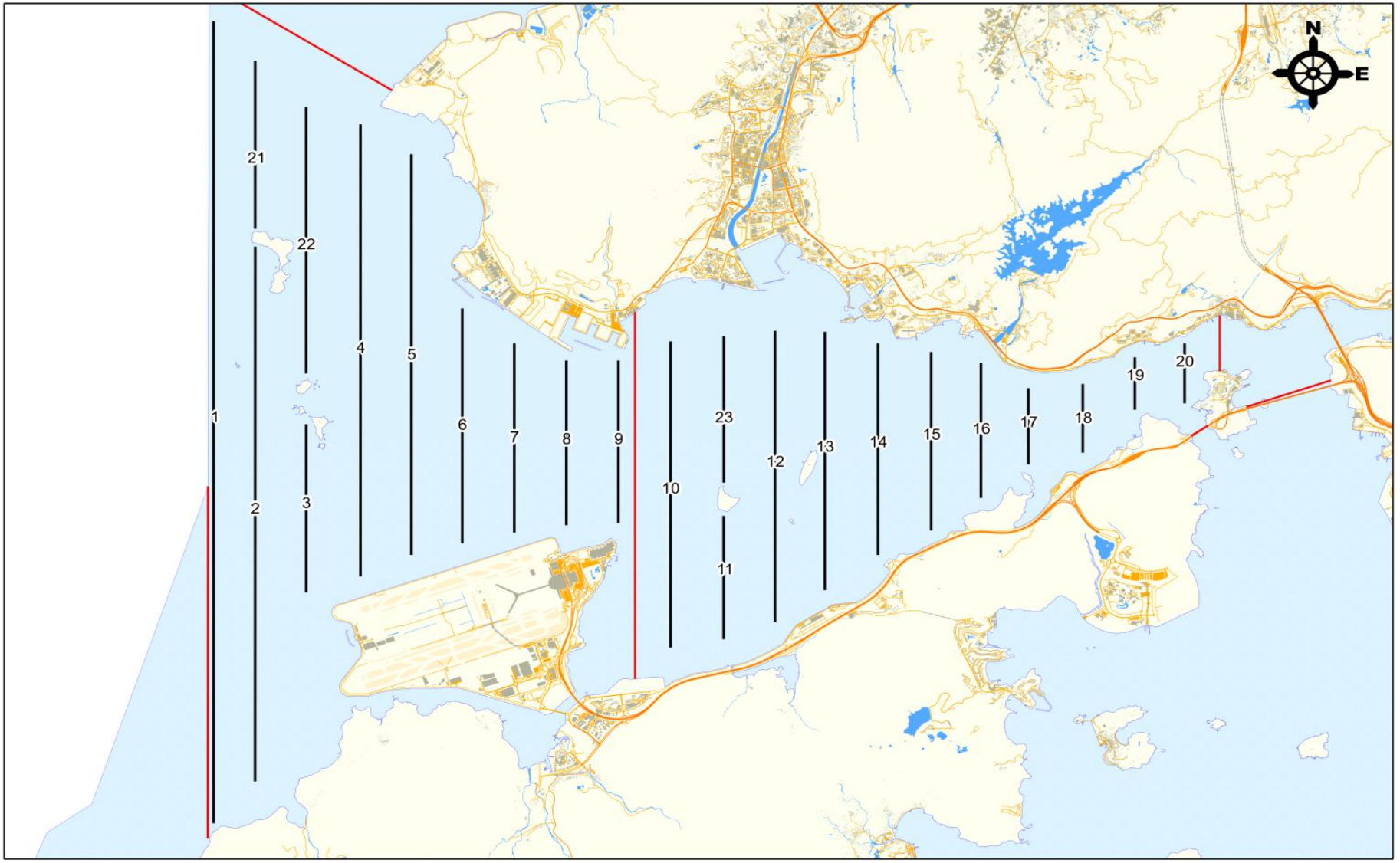
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

Project No.: 60249820 Date: APR 2012

IMPACT WATER QUALITY MONITORING STATIONS

AECOM

Figure 3



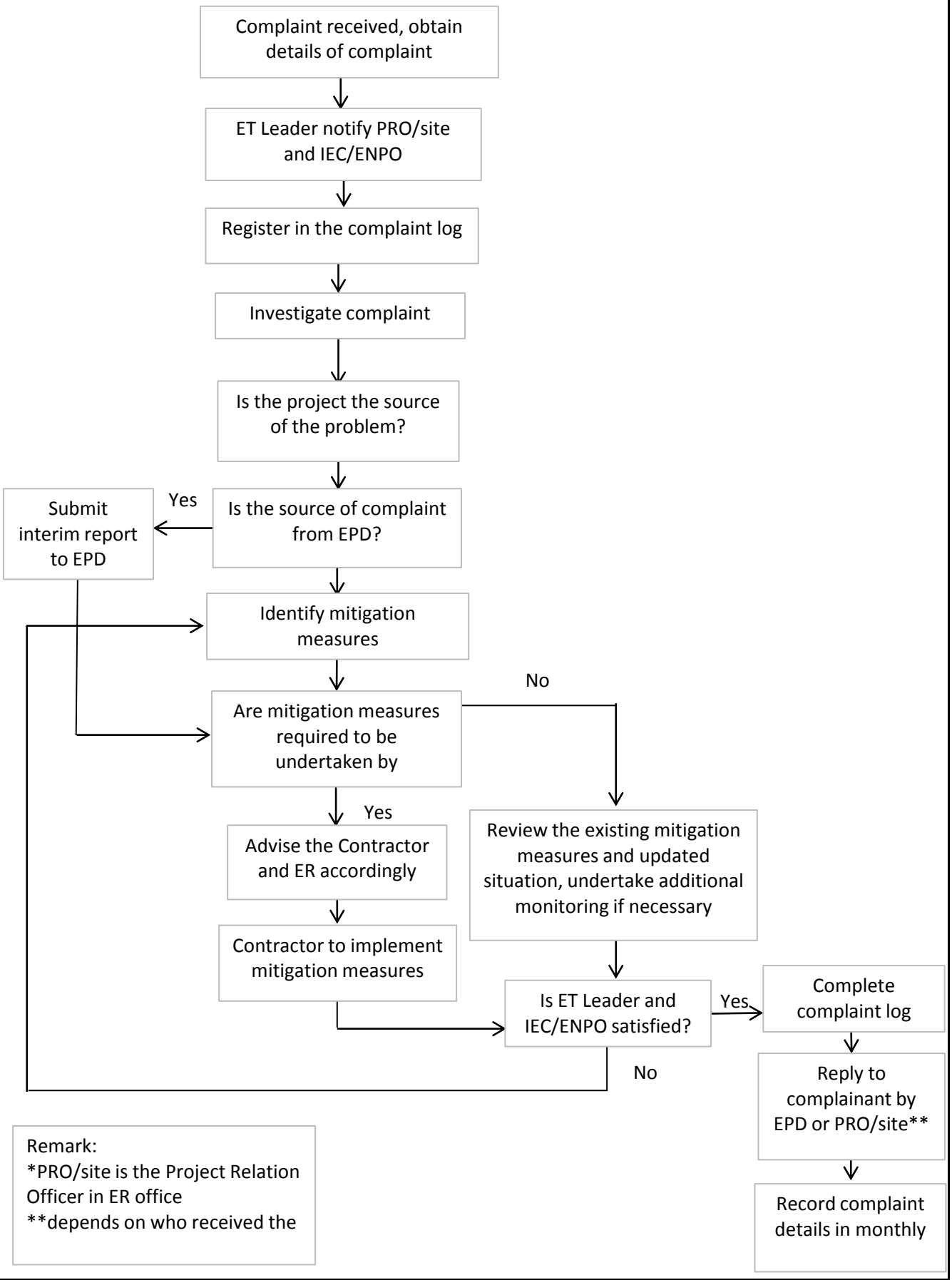
***Remark: Transect 10 is now 3.6km in length due to the HKBCF construction site. The total transect length for both NEL and NWL combined is 111km.**

HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 Date: January 13

Impact Dolphin Monitoring
Line Transect Layout Map

AECOM

Figure 4



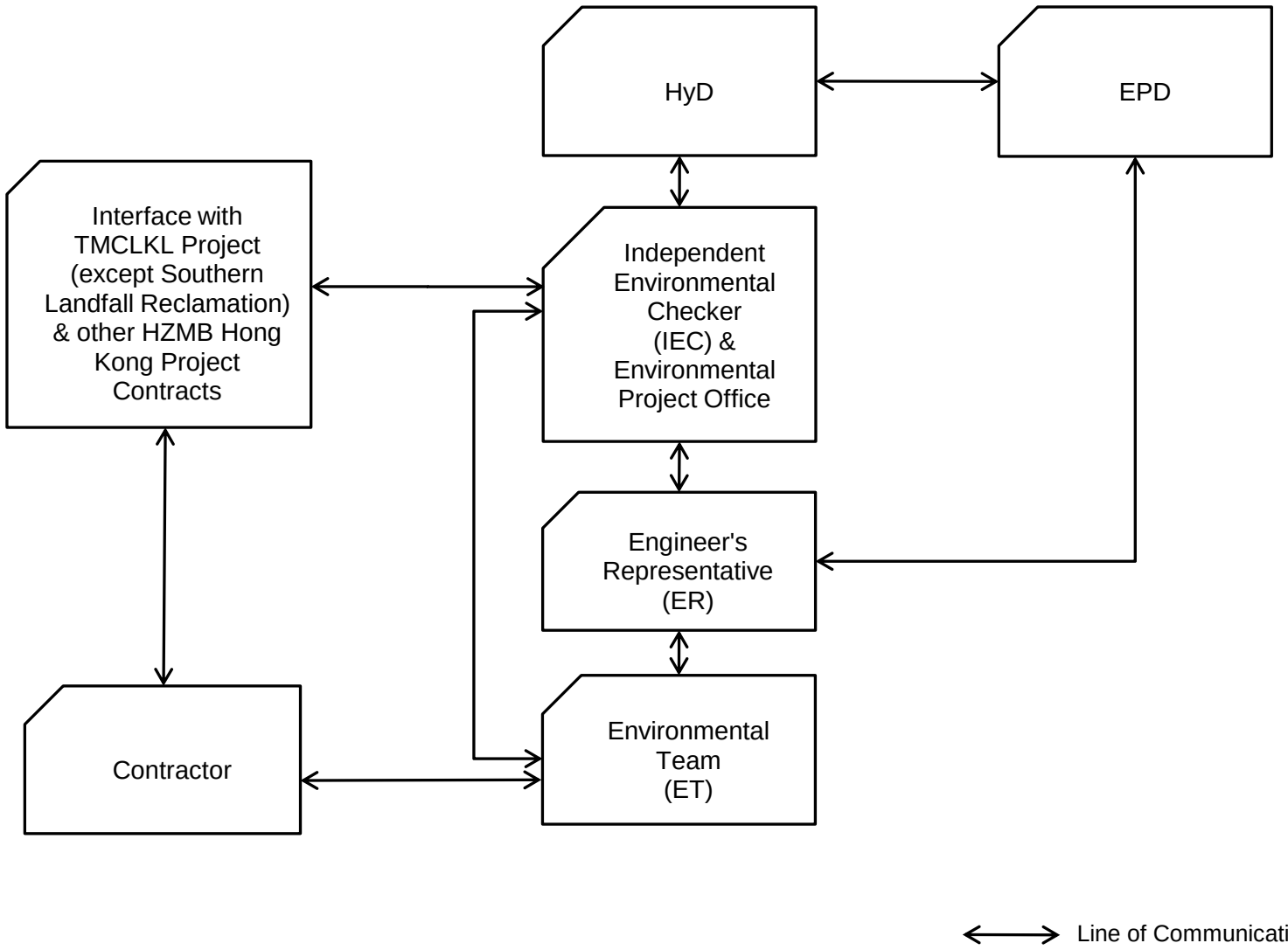
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

AECOM

Environmental Complaint Handling Procedure

Project No.: 60249820 **Date: July 2012**

Figure 5



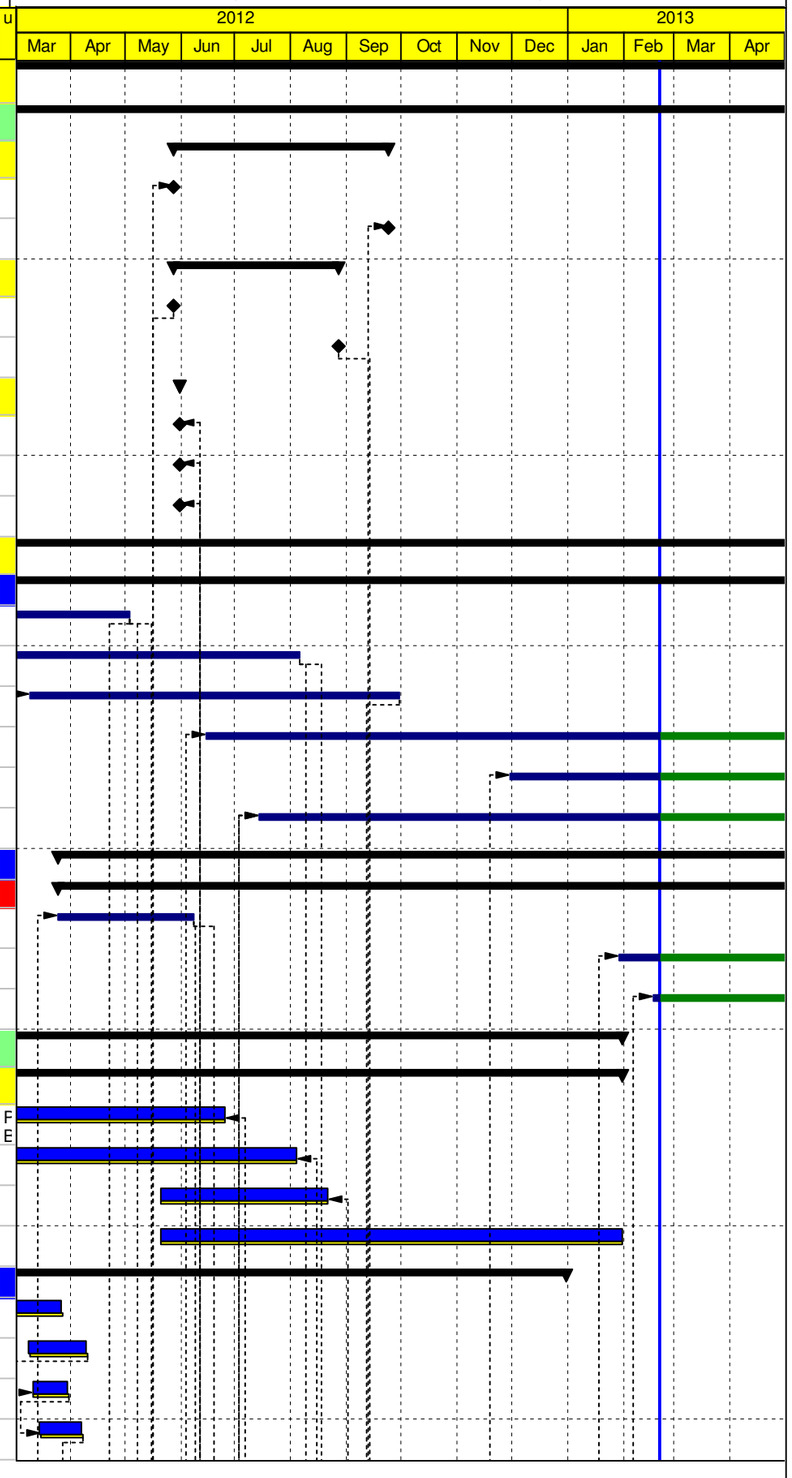
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
--RECLAMATION WORKS
Project No.: 60249820 Date: March 2013

Project Organisation for Environmental Works

AECOM

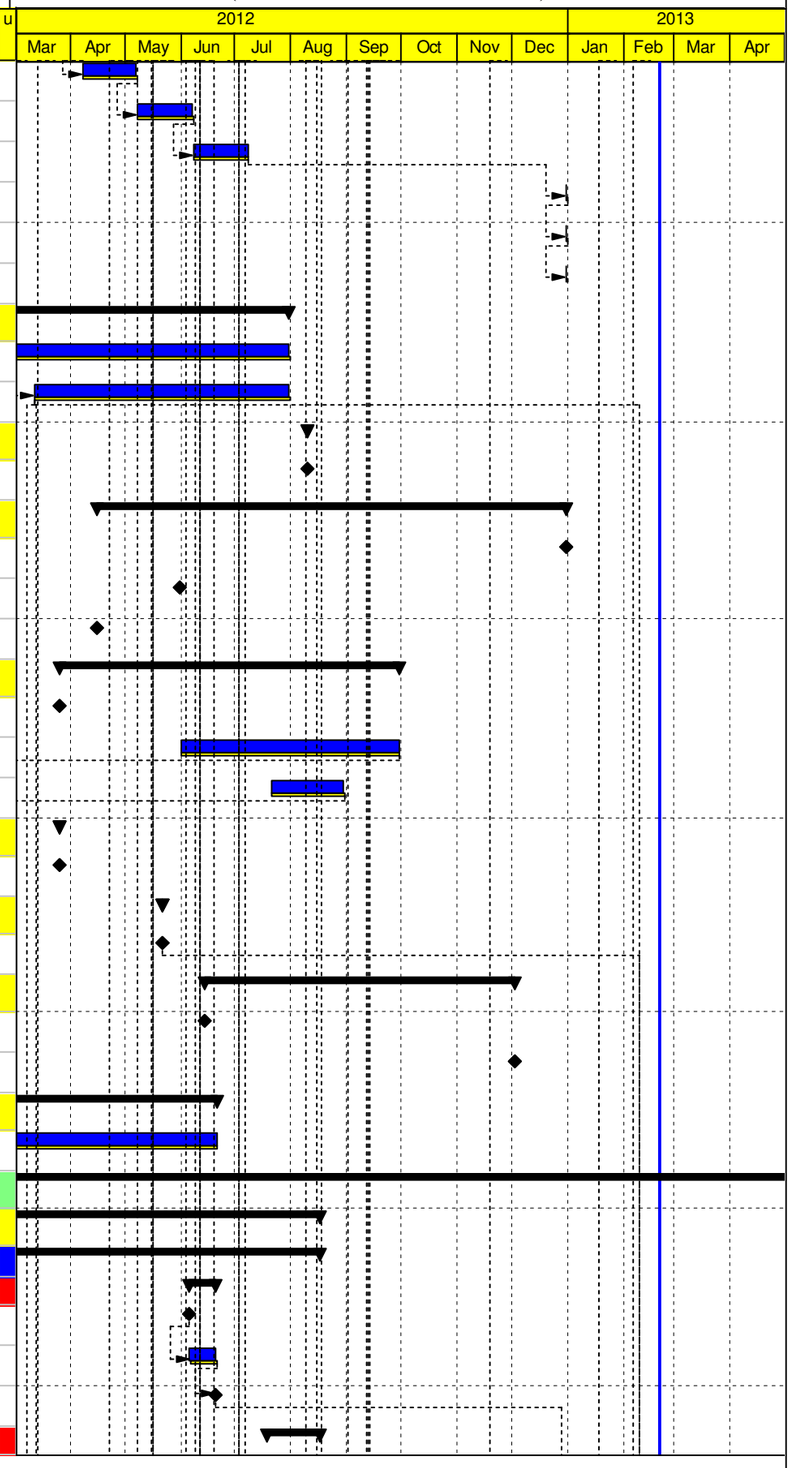
Appendix A

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Total Float	u
15th Monthly Progress Report status as of 21 Feb 2013		1918	1469	30-Nov-11 A	28-Feb-17	0	
Contract Key Dates		829	334	06-Jan-12 A	20-Jan-14	-46	
Key Dates for achievement of Stages and completion of Sections		120	0	27-May-12 A	24-Sep-12 A		
G1020	KD-1a, Achievement of Stage 1a (180days , 27May2012)	0	0		27-May-12 A		
G1030	KD-1b, Achievement of Stage 1b (300days, 24Sep2012)	0	0		24-Sep-12 A		
Possession of Site		91	0	28-May-12 A	27-Aug-12 A		
G1250	Works Area TKO-WA (Zone B1&B2)	0	0	28-May-12 A			
G1260	Works Area TKO-WA (Zone C)	0	0	27-Aug-12 A			
Vacation of Site		0	0	31-May-12 A	31-May-12 A		
G1310	Works Area WA3 (Other Zone)	0	0		31-May-12 A		
G1330	Works Area WA4 (Zone B)	0	0		31-May-12 A		
G1340	Works Area WA4 (Zone C)	0	0		31-May-12 A		
Summary Programme		829	334	06-Jan-12 A	20-Jan-14	-46	
Sewawall Construction		829	334	06-Jan-12 A	20-Jan-14	-46	
G1380	CONE PENETRATION TEST	134	0	06-Jan-12 A	04-May-12 A		
G1400	GEOTEXTILE LAYING	181	0	20-Feb-12 A	06-Aug-12 A		
G1410	STONE BLANKETS	179	0	10-Mar-12 A	30-Sep-12 A		
G1420	STONE COLUMNS INSIDE CELLS	240	327	15-Jun-12 A	13-Jan-14	-39	
G1430	STONE COLUMNS OUTSIDE CELLS	0	334	30-Nov-12 A	20-Jan-14	-69	
G1440	CELLULAR MAIN CELLS (EXCEPT MARINE ACCESS)	479	192	14-Jul-12 A	31-Aug-13	-267	
Reclamation Construction		635	328	25-Mar-12 A	14-Jan-14	-40	
Reclamation Below +5.5mPD		635	328	25-Mar-12 A	14-Jan-14	-40	
G1470	CONE PENETRATION TEST	102	0	25-Mar-12 A	08-Jun-12 A		
G1480	GEOTEXTILE FOR SAND BLANKET	232	204	30-Jan-13 A	12-Sep-13	68	
G1490	SAND BLANKET	343	328	18-Feb-13 A	14-Jan-14	-40	
Preliminary & General		416	0	02-Jan-12 A	31-Jan-13 A		
Procurement/Supply of Major Material		383	0	15-Jan-12 A	31-Jan-13 A		
P1400	Order of Sheet Pile material for Cellular Structure for Portion B	103	0	18-Feb-12 A	25-Jun-12 A		F E
P1420	Order of Sheet Pile material for Cellular Structure for Portion C	126	0	01-Mar-12 A	03-Aug-12 A		
P1870	Order of Sheet Pile material for Cellular Structure for Portion E	78	0	21-May-12 A	21-Aug-12 A		
P1890	*Order for Both Temporary and Permanent Corrosion Control Systems	212	0	21-May-12 A	31-Jan-13 A		
Straight Web Sheets Piles		352	0	15-Jan-12 A	31-Dec-12 A		
SPM-0020	Manufacture & Arrival of Straight Web Sheet Piles 2nd	73	0	15-Jan-12 A	27-Mar-12 A		
SPM-0050	Manufacture & Arrival of Straight Web Sheet Piles 5th	33	0	09-Mar-12 A	10-Apr-12 A		
SPM-0060	Manufacture & Arrival of Straight Web Sheet Piles 6th	20	0	11-Mar-12 A	30-Mar-12 A		
SPM-0070	Manufacture & Arrival of Straight Web Sheet Piles 7th	24	0	15-Mar-12 A	07-Apr-12 A		



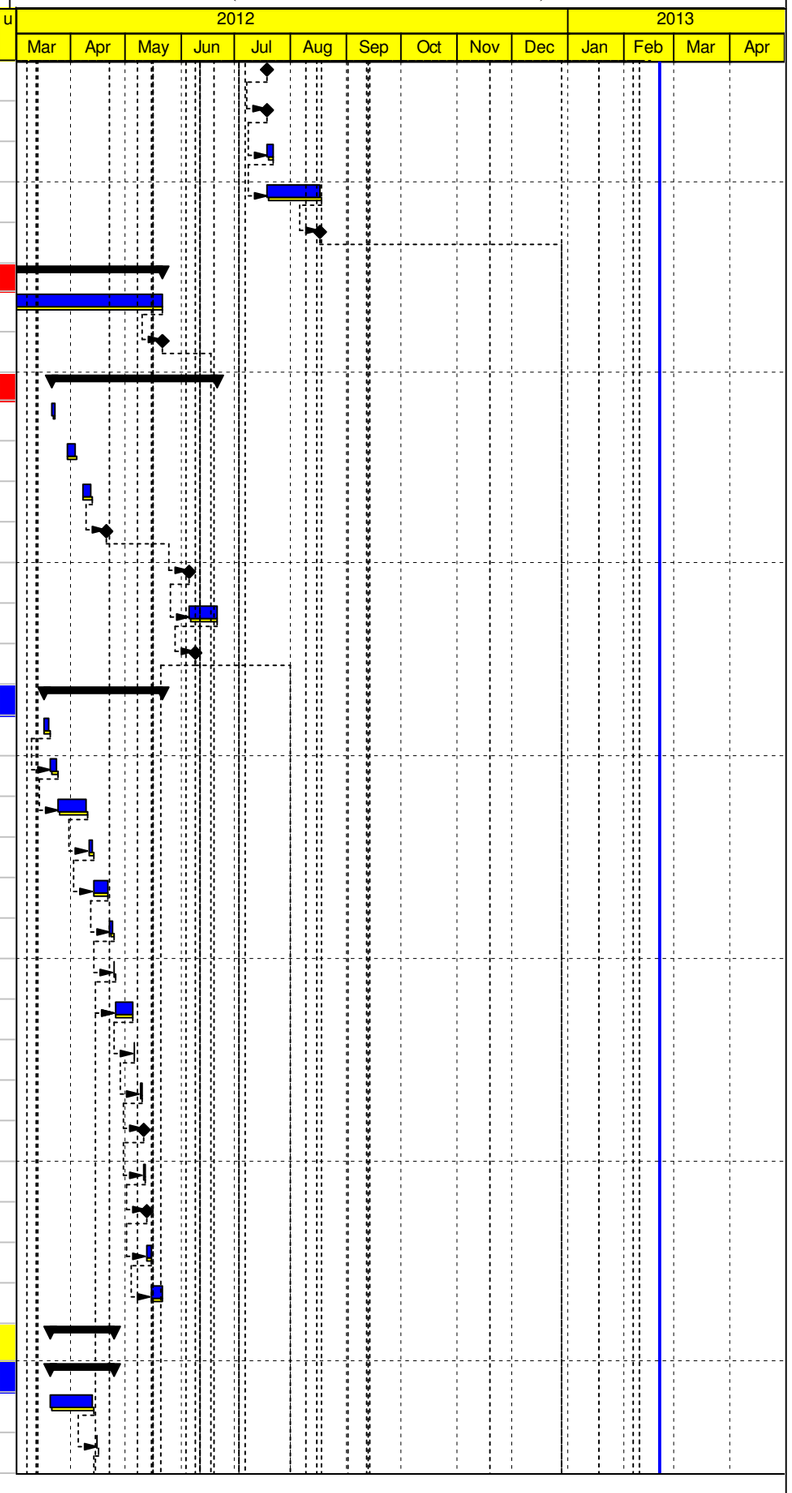
Remaining Level of Effort
Actual Level of Effort
Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Total Float
SPM-0080	Manufacture & Arrival of Straight Web Sheet Piles 8th	30	0	08-Apr-12 A	07-May-12 A	
SPM-0090	Manufacture & Arrival of Straight Web Sheet Piles 9th	31	0	08-May-12 A	07-Jun-12 A	
SPM-0100	Manufacture & Arrival of Straight Web Sheet Piles 10th	31	0	08-Jun-12 A	08-Jul-12 A	
SPM-0110	Manufacture & Arrival of Straight Web Sheet Piles 11th Delete	1	0	31-Dec-12 A	31-Dec-12 A	
SPM-0120	Manufacture & Arrival of Straight Web Sheet Piles 12th Delete	1	0	31-Dec-12 A	31-Dec-12 A	
SPM-0130	Manufacture & Arrival of Straight Web Sheet Piles 13th Delete	1	0	31-Dec-12 A	31-Dec-12 A	
Preconstruction Works		148	0	01-Feb-12 A	31-Jul-12 A	
P1360	Site Establishment, hoardings erections etc.	148	0	01-Feb-12 A	31-Jul-12 A	
P1370	Install Perimeter Silt Curtain	114	0	12-Mar-12 A	31-Jul-12 A	
Contract Submission		0	0	10-Aug-12 A	10-Aug-12 A	
C1220	Submission of Temporary Drainage Management Plan	0	0		10-Aug-12 A	
Site Establishment		213	0	16-Apr-12 A	31-Dec-12 A	
SE1140	Installation of 2 nos. Project Signboards (with HZMB Logo)	0	0		31-Dec-12 A	
SE1190	Contractor's Office Design and Construction at WA2	0	0		31-May-12 A	
SE1210	Public Complaints & Enquiries CUM Information Centre with Operative	0	0		16-Apr-12 A	
Environmental Submission		153	0	26-Mar-12 A	30-Sep-12 A	
E1020	Action Reporting Procedures by ETL to the Contractor for Agreement and to the Engineer for Approval, Verified by IEC	0	0		26-Mar-12 A	
E1060	All Submissions to EP No. EP-354/2009/A & EP-353/2009/B Permit Holder by HyD, Tuen Mun - CLK Link & HKBCF (Part C)	102	0	01-Jun-12 A	30-Sep-12 A	
E1070	All Submissions to EP No. EP-134/2002/I Permit Holder by CEDD, Fill bank at TKO Area 137 (Part C)	35	0	21-Jul-12 A	30-Aug-12 A	
Marine Works		0	0	26-Mar-12 A	26-Mar-12 A	
MW1030	Obtain Approval from the Engineer for Importation of Sand Fill from the PRC Mainland	0	0	26-Mar-12 A		
Geotechnical Works		0	0	22-May-12 A	22-May-12 A	
GW1030	Submission of Instrumentation Specialist	0	0	22-May-12 A		
Corrosion Control		0	0	14-Jun-12 A	03-Dec-12 A	
CC1010	Submission of Shop Drawings	0	0	14-Jun-12 A		
CC1030	Submission of Test Report by Manufacturer	0	0	03-Dec-12 A		
Plant Delivery & Mobilization		161	0	02-Jan-12 A	20-Jun-12 A	
PD00140	Preparation & Delivery of Plant for Cellular Structures	161	0	02-Jan-12 A	20-Jun-12 A	
Work Zone, as defined in PS Clause 1.03(6)		1052	669	04-Feb-12 A	21-Dec-14	-171
Events		194	0	06-Feb-12 A	17-Aug-12 A	
Interface with Others		194	0	06-Feb-12 A	17-Aug-12 A	
Marker Buoys at Chainage 4500 - 4900		15	0	06-Jun-12 A	20-Jun-12 A	
IF01040	Consent for resume site boundary by MD	0	0		06-Jun-12 A	
IF01050	Realignment of the silt curtain to resume site boundary	14	0	06-Jun-12 A	20-Jun-12 A	
IF01060	Resume the stone columns works at CH4500 to CH4900	0	0	20-Jun-12 A		
120M Accessway at Chainage 4900 - 5600		30	0	19-Jul-12 A	17-Aug-12 A	



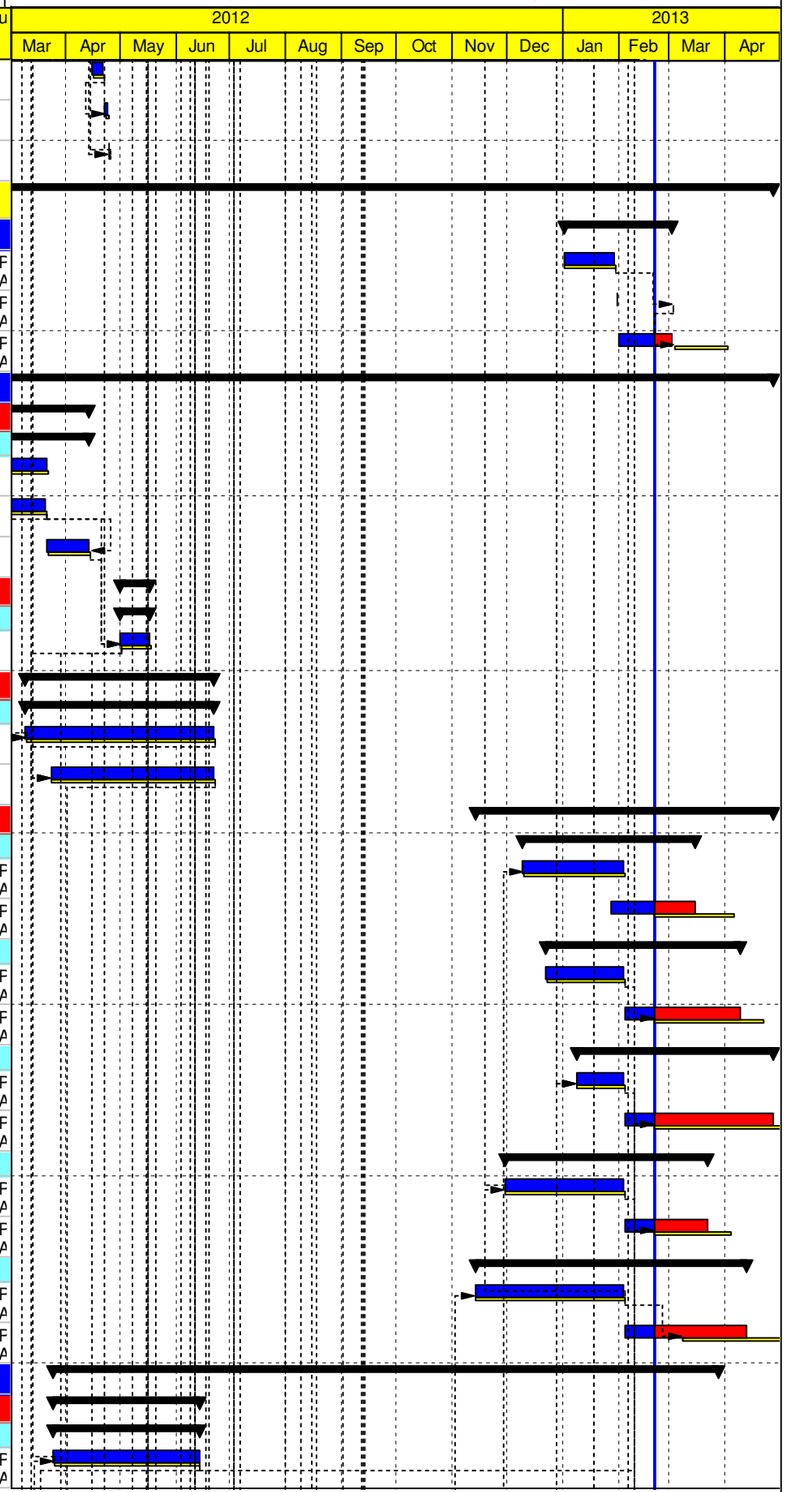
Remaining Level of Effort
Actual Level of Effort
Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Total Float
IF02010	Consent for resume site boundary by MD	0	0		19-Jul-12 A	
IF02020	Possession of 120M barge accessway inAirport SkyPier Basin	0	0	19-Jul-12 A		
IF02030	Realignment of the marker buoy	3	0	19-Jul-12 A	21-Jul-12 A	
IF02040	Realignment of the silt curtain	28	0	19-Jul-12 A	17-Aug-12 A	
IF02050	Resume the stone columns works at Portion A	0	0	17-Aug-12 A		
Abandoned Submarine Cables		106	0	06-Feb-12 A	22-May-12 A	
IF03020	Confirmation of Abandon of submarine cables by NWT & Hutchison	85	0	06-Feb-12 A	21-May-12 A	
IF03050	Resume the stone columns works	0	0	22-May-12 A		
Portion D		91	0	22-Mar-12 A	20-Jun-12 A	
A1570-010	Occupation by others in Portion D from 22/3 - 23/3/2012	2	0	22-Mar-12 A	23-Mar-12 A	
A1570-020	Occupation by others in Portion D from 30/3 - 4/4/2012	6	0	30-Mar-12 A	04-Apr-12 A	
A1570-030	Occupation by others in Portion D from 8/4 - 12/4/2012	5	0	08-Apr-12 A	12-Apr-12 A	
A1570-040	Suspend the installation of silt curtain	0	0	21-Apr-12 A		
A1570-050	Possession of site of Pier in Portion D to resume site boundary	0	0		06-Jun-12 A	
A1570-060	Silt curtain laying	14	0	06-Jun-12 A	20-Jun-12 A	
A1570-070	Resume the stone blankets at west side in Portion D	0	0	09-Jun-12 A		
Daily Record		66	0	17-Mar-12 A	21-May-12 A	
DR01-00050	Laying Silt Curtain for trial stone column	3	0	17-Mar-12 A	20-Mar-12 A	
DR01-00060	Trial stone columns 4nrs	4	0	21-Mar-12 A	24-Mar-12 A	
DR01-00070	Modify the stone column vibro-probe shoe	15	0	25-Mar-12 A	10-Apr-12 A	
DR01-00080	Trial stone columns 8 nos	3	0	11-Apr-12 A	13-Apr-12 A	
DR01-00090	Review of trial stone column report	8	0	14-Apr-12 A	22-Apr-12 A	
DR01-00100	Addition trial stone columns 3nrs	2	0	23-Apr-12 A	24-Apr-12 A	
DR01-00110	Approval of trial stone column by the Engineer	1	0	25-Apr-12 A	25-Apr-12 A	
DR01-00120	Resume installation of Stage 1 silt curtain and laying geotextile & stone blanket	10	0	26-Apr-12 A	05-May-12 A	
DR01-00130	1st Batch stone aggregate arrival - Test fail	1	0	06-May-12 A	06-May-12 A	
DR01-00140	2nd Batch stone aggregate arrival - Visual Approval	1	0	10-May-12 A	10-May-12 A	
DR01-00150	Start Permanent Stone Column works	0	0	11-May-12 A		
DR01-00160	Stone Column Works 2nrs	2	0	11-May-12 A	12-May-12 A	
DR01-00170	Causing stone column works due to the 2nd batch fail	0	0	13-May-12 A		
DR01-00180	Arrival of 3rd batch stone column	3	0	13-May-12 A	15-May-12 A	
DR01-00190	Wait for test result	6	0	16-May-12 A	21-May-12 A	
Trial Construction		36	0	21-Mar-12 A	25-Apr-12 A	
Trial installation of Stone Columns		36	0	21-Mar-12 A	25-Apr-12 A	
T0050	Install trial stone columns 12nrs	17	0	21-Mar-12 A	13-Apr-12 A	
T0060	The report of trial stone columns submit to the Engineer	1	0	16-Apr-12 A	16-Apr-12 A	



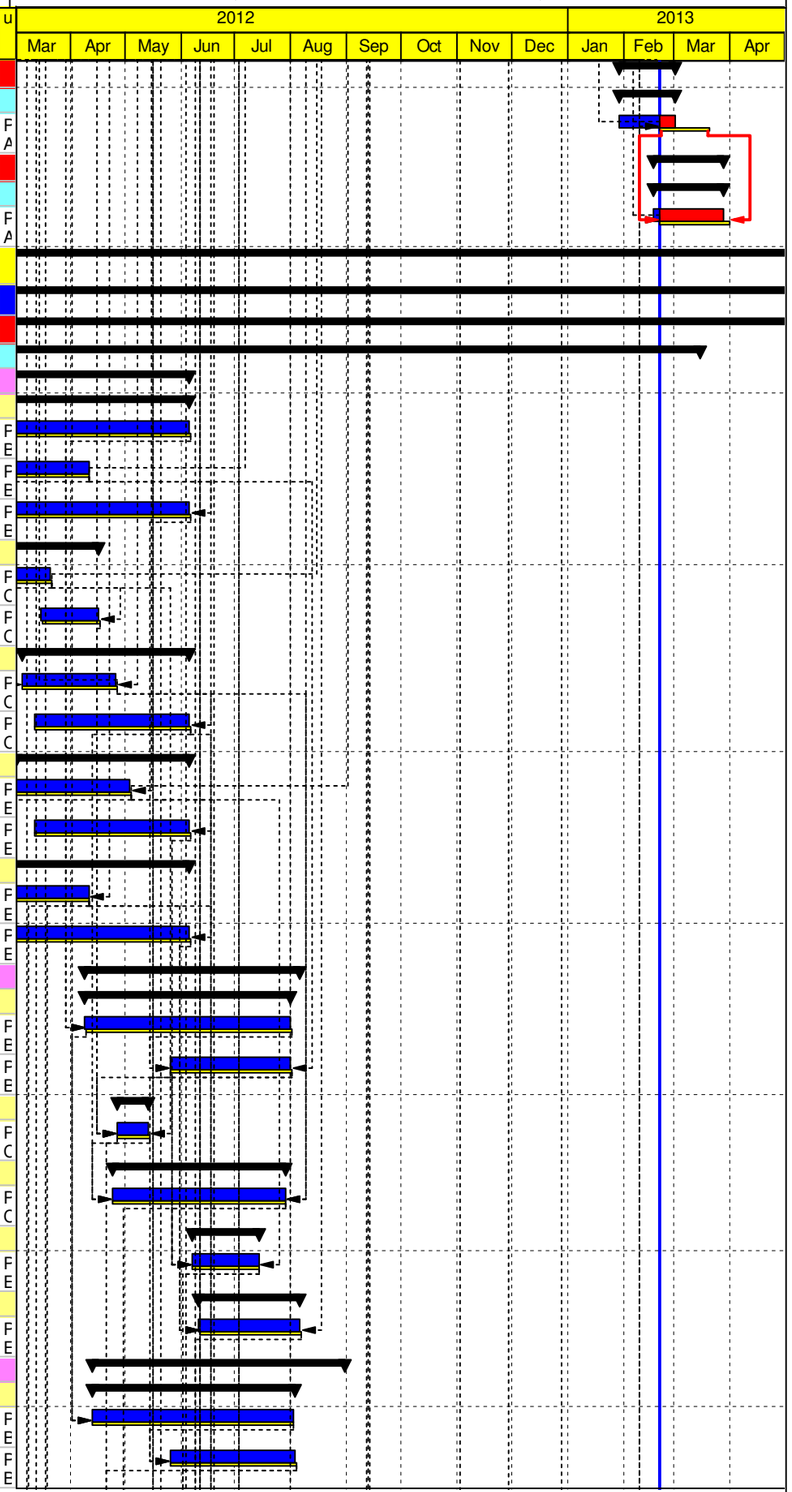
Remaining Level of Effort
Actual Level of Effort
Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Total Float	u
T0062	comments from the Engineer	7	0	16-Apr-12 A	22-Apr-12 A		
T0064	Additonal trial stone column	2	0	23-Apr-12 A	24-Apr-12 A		
T0070	The trial stone columns approved by the Engineer	1	0	25-Apr-12 A	25-Apr-12 A		
Portion A		462	66	04-Feb-12 A	27-Apr-13	-187	
Variation of Environmental Permit - Sand Blanket laying in all portions		91	10	02-Jan-13 A	02-Mar-13	-406	
VEP-10010	VEP Preparation	25	0	02-Jan-13 A	30-Jan-13 A		FA
VEP-10020	VEP Discussion with EPD	1	0	31-Jan-13 A	31-Jan-13 A		FA
VEP-10030	VEP Approval by EPD	30	10	01-Feb-13 A	02-Mar-13	-406	FA
Ground Treatment		462	66	04-Feb-12 A	27-Apr-13	-187	
CPT		57	0	04-Feb-12 A	14-Apr-12 A		
Seawall Portion Aat C119 - C134 & Portion C2a C115 - C118		57	0	04-Feb-12 A	14-Apr-12 A		
CPTSA0-015	The Level confirm by the Engineer	39	0	07-Feb-12 A	22-Mar-12 A		
CPTSA0-020	CPT Portion A from C124 to C115	40	0	04-Feb-12 A	21-Mar-12 A		
CPTSA0-025	The Level confirm by the Engineer	17	0	22-Mar-12 A	14-Apr-12 A		
Geotextile		15	0	01-May-12 A	18-May-12 A		
Seawall Portion Aat C119 - C134 & Portion C2a C115 - C118		15	0	01-May-12 A	18-May-12 A		
GESA0-020	Geotextile Portion A from C125 to C115	15	0	01-May-12 A	18-May-12 A		
Stone Blanket		84	0	10-Mar-12 A	22-Jun-12 A		
Seawall Portion Aat C119 - C134 & Portion C2a C115 - C118		84	0	10-Mar-12 A	22-Jun-12 A		
STBA0-010	Stone Blankets Portion A from C134 to C126	84	0	10-Mar-12 A	22-Jun-12 A		
STBA0-020	Stone Blankets Portion A from C125 to C115	72	0	24-Mar-12 A	22-Jun-12 A		
Stone Columns C118 - C134 6,399Nos.		162	61	14-Nov-12 A	27-Apr-13	-171	
Portion AC118 - C121 4Cells 1,460Nos.		106	21	10-Dec-12 A	15-Mar-13	-180	
SC0A-1000	Stone Columns PA C118 - C121 4cells 250nrs/1460nrs completed upto 4Feb2013	53	0	10-Dec-12 A	04-Feb-13 A		FA
SC0A-1010	Removal of C120 for stone columns	41	21	28-Jan-13 A	15-Mar-13	-180	FA
Portion AC122 - C124 3Cells 1,075Nos.		109	44	23-Dec-12 A	09-Apr-13	-166	
SC0A-2000	Stone Columns PA C122 - C124 3cells 238nrs/1075nrs completed upto 4Feb2013	41	0	23-Dec-12 A	04-Feb-13 A		FA
SC0A-2010	Stone Columns PA C122 - C124 3cells 837nrs/1075nrs (15nrs/day) FTB-AP3	56	44	05-Feb-13 A	09-Apr-13	-166	FA
Portion AC125 - C128 4Cells 1,516Nos.		110	61	09-Jan-13 A	27-Apr-13	-171	
SC0A-3000	Stone Columns PA C125 - C128 4cells 433nrs/1516nrs completed upto 4Feb2013	25	0	09-Jan-13 A	04-Feb-13 A		FA
SC0A-3010	Stone Columns PA C125 - C128 4cells 1,083nrs/1516nrs (15nrs/day) FTB19	73	61	05-Feb-13 A	27-Apr-13	-171	FA
Portion AC129 - C131 3Cells 1,181Nos		114	28	30-Nov-12 A	22-Mar-13	-151	
SC0A-4000	Stone Columns PA C129 - C131 584nrs/1181nrs completed upto 4Feb2013	62	0	30-Nov-12 A	04-Feb-13 A		FA
SC0A-4010	Stone Columns PA C129 - C131 597nrs/1181nrs (15nrs/day) FTB20	40	28	05-Feb-13 A	22-Mar-13	-151	FA
Portion AC132 - C134 3Cells 1,167Nos		162	47	14-Nov-12 A	12-Apr-13	-170	
SC0A-5000	Stone Columns PA C132 - C134 3cells 288nrs/1167nrs completed upto 4Feb2013	77	0	14-Nov-12 A	04-Feb-13 A		FA
SC0A-5010	Stone Columns PA C132 - C134 3cells 879nrs/1167nrs (15nrs/day) FTB-AP4	59	47	05-Feb-13 A	12-Apr-13	-170	FA
Reclamation		371	36	25-Mar-12 A	28-Mar-13	-432	
Portion A CPT		75	0	25-Mar-12 A	14-Jun-12 A		
Land Portion A		75	0	25-Mar-12 A	14-Jun-12 A		
CPTRA0-010	CPT for Portion A	75	0	25-Mar-12 A	14-Jun-12 A		FA



Remaining Level of Effort
Actual Level of Effort
Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Total Float	u
Portion A Geotextile		26	8	30-Jan-13 A	01-Mar-13	-381	
Land Portion A		26	8	30-Jan-13 A	01-Mar-13	-381	
GERA0-010	Geotextile 285,000m2 for sand blanket PA Main Area C118 to C126 10,000m2/day	26	8	30-Jan-13 A	01-Mar-13	-381	FA
Portion A Sand Blanket		36	33	18-Feb-13 A	28-Mar-13	-399	
Land Portion A		36	33	18-Feb-13 A	28-Mar-13	-399	
SABRA0-010	Sand Blankets 357,500m3 PA Main Area C120 to C126 10,000m3/day	36	33	18-Feb-13 A	28-Mar-13	-399	FA
Portion B, C & E		1043	669	13-Feb-12 A	21-Dec-14	-171	
Portion B, C & E		1043	669	13-Feb-12 A	21-Dec-14	-171	
Seawall		583	218	13-Feb-12 A	26-Sep-13	51	
Ground Treatment		425	23	13-Feb-12 A	15-Mar-13	-197	
CPT		93	0	13-Feb-12 A	06-Jun-12 A		
Seawall Portion B at C001 - C050		93	0	13-Feb-12 A	06-Jun-12 A		
CPTSB0-015	The Level confirm by the Engineer	86	0	21-Feb-12 A	06-Jun-12 A		FE
CPTSB0-020	CPT Portion B from C026 to C050	47	0	13-Feb-12 A	11-Apr-12 A		FE
CPTSB0-025	The Level confirm by the Engineer	86	0	21-Feb-12 A	06-Jun-12 A		FE
Seawall Portion C2a at C101 - C114		42	0	24-Feb-12 A	17-Apr-12 A		
CPTSC2a-01(	CPT Portion C2a from C114 to C101	23	0	24-Feb-12 A	21-Mar-12 A		FC
CPTSC2a-01!	The Level confirm by the Engineer	24	0	16-Mar-12 A	17-Apr-12 A		FC
Seawall Portion C2c at C091 - C100		75	0	05-Mar-12 A	06-Jun-12 A		
CPTSC2c-01(	CPT Portion C2c from C100 to C091	42	0	05-Mar-12 A	26-Apr-12 A		FC
CPTSC2c-01!	The Level confirm by the Engineer	69	0	12-Mar-12 A	06-Jun-12 A		FC
Seawall Portion E2 at C051 - C068		77	0	02-Mar-12 A	06-Jun-12 A		
CPTSE2-010	CPT Portion E2 from C051 to C068	49	0	02-Mar-12 A	04-May-12 A		FE
CPTSE2-015	The Level confirm by the Engineer	69	0	12-Mar-12 A	06-Jun-12 A		FE
Seawall Portion E1 at C069 - C090		90	0	16-Feb-12 A	06-Jun-12 A		
CPTSE1-010	CPT Portion E1 from C069 to C090	44	0	16-Feb-12 A	11-Apr-12 A		FE
CPTSE1-015	The Level confirm by the Engineer	81	0	27-Feb-12 A	06-Jun-12 A		FE
Geotextile		112	0	09-Apr-12 A	06-Aug-12 A		
Seawall Portion B at C001 - C050		107	0	09-Apr-12 A	01-Aug-12 A		
GESB0-010	Geotextile Portion B from C001 to C025	107	0	09-Apr-12 A	01-Aug-12 A		FE
GESB0-020	Geotextile Portion B from C026 to C050	63	0	26-May-12 A	01-Aug-12 A		FE
Seawall Portion C2a at C101 - C114		17	0	27-Apr-12 A	14-May-12 A		
GESC2a-010	Geotextile Portion C2a from C114 to C101	17	0	27-Apr-12 A	14-May-12 A		FC
Seawall Portion C2c at C091 - C100		90	0	24-Apr-12 A	29-Jul-12 A		
GESC2c-010	Geotextile Portion C2c from C100 to C091	90	0	24-Apr-12 A	29-Jul-12 A		FC
Seawall Portion E2 at C051 - C068		36	0	07-Jun-12 A	14-Jul-12 A		
GESE2-010	Geotextile Portion E2 from C051 to C068	36	0	07-Jun-12 A	14-Jul-12 A		FE
Seawall Portion E1 at C069 - C090		53	0	11-Jun-12 A	06-Aug-12 A		
GESE1-010	Geotextile Portion E1 from C069 to C090	53	0	11-Jun-12 A	06-Aug-12 A		FE
Stone Blankets		131	0	13-Apr-12 A	31-Aug-12 A		
Seawall Portion B at C001 - C050		105	0	13-Apr-12 A	03-Aug-12 A		
STBB0-010	Stone Blankets Portion B from C001 to C025	104	0	13-Apr-12 A	02-Aug-12 A		FE
STBB0-020	Stone Blankets Portion B from C026 to C050	65	0	26-May-12 A	03-Aug-12 A		FE



Remaining Level of Effort
Actual Level of Effort
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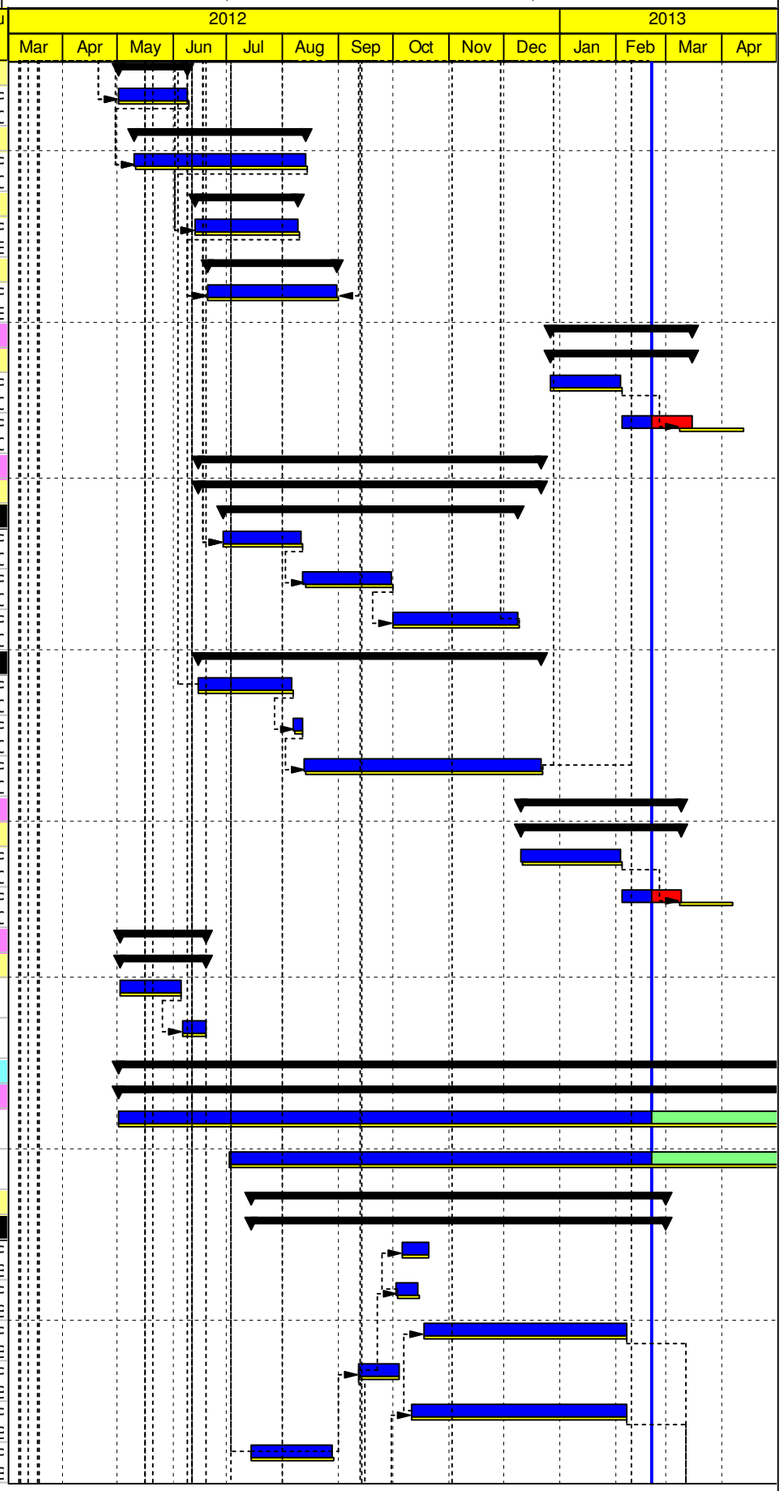
Milestone
Summary

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Total Float	u
Seawall Portion C2a at C101 - C114		36	0	02-May-12 A	09-Jun-12 A		
STBC2a-010	Stone Blankets Portion C2a from C114 to C101	36	0	02-May-12 A	09-Jun-12 A		FC
Seawall Portion C2c at C091 - C100		89	0	11-May-12 A	14-Aug-12 A		
STBC2c-010	Stone Blankets Portion C2c from C100 to C091	89	0	11-May-12 A	14-Aug-12 A		FC
Seawall Portion E2 at C051 - C068		54	0	13-Jun-12 A	09-Aug-12 A		
STBE2-010	Stone Blankets Portion E2 from C051 to C068	54	0	13-Jun-12 A	09-Aug-12 A		FE
Seawall Portion E1 at C069 - C090		68	0	20-Jun-12 A	31-Aug-12 A		
STBE1-010	Stone Blankets Portion E1 from C069 to C090	68	0	20-Jun-12 A	31-Aug-12 A		FE
Stone Columns for Sloping Seawall by Marine Plant		96	21	27-Dec-12 A	15-Mar-13	-180	
Portion C2a C113 - C117 5Cells 2,164Nos FTB17		96	21	27-Dec-12 A	15-Mar-13	-180	
SC0A-1030	Stone Columns PC2a C113 - C117 5cells 492nrs/2164nrs Completed upto 4Feb2013	37	0	27-Dec-12 A	04-Feb-13 A		FC
SC0A-1040	Stone Columns PC2a C113 - C117 5cells 495nrs/2164nrs (15nrs/day) FTB17 before 28Feb2013	33	21	05-Feb-13 A	15-Mar-13	-180	FC
Stone Columns whole area in each cellular structure by Marine Plant		177	0	15-Jun-12 A	22-Dec-12 A		
Seawall Portion C2c at C092 - C102 11cells 3,095nrs		177	0	15-Jun-12 A	22-Dec-12 A		
FTB17 532nrs		152	0	29-Jun-12 A	09-Dec-12 A		
V3-SCIC-01(	Stone Columns inside cells & 2rows 84nrs FTB17	41	0	29-Jun-12 A	11-Aug-12 A		FC
V3-SCIC-03(	Mobilization of vibro probes FTB17 stone column barge	46	0	12-Aug-12 A	30-Sep-12 A		FC
V3-SCIC-04(	Stone Columns inside cells & 2rows 448nrs (15nrs/day) FTB17	65	0	01-Oct-12 A	09-Dec-12 A		FC
FTB19 2,563nrs		177	0	15-Jun-12 A	22-Dec-12 A		
V3-SCIC-11(	Stone Columns inside cells & 2rows 272nrs FTB19	49	0	15-Jun-12 A	06-Aug-12 A		FC
V3-SCIC-13(	Mobilization of vibro probes FTB19 stone column barge	5	0	07-Aug-12 A	12-Aug-12 A		FC
V3-SCIC-14(	Stone Columns inside cells & 2rows 2291nrs (15nrs/day) FTB19	123	0	13-Aug-12 A	22-Dec-12 A		FC
Stone Columns Inside cellular structures by Marine Plant		106	16	11-Dec-12 A	09-Mar-13	-248	
Seawall Portion C2a at C103 - C112 10cells 990nrs		106	16	11-Dec-12 A	09-Mar-13	-248	
SCIC-010	Stone Columns inside cells & 2rows 2cells 578nrs/990nrs FTB18 upto 20Jan2013	52	0	11-Dec-12 A	04-Feb-13 A		FC
SCIC-020	Stone Columns insdie cells & 2rows 2cells 412nrs/990nrs (15nrs/day) FTB18	28	16	05-Feb-13 A	09-Mar-13	-248	FC
Stone Columns Inside cells by Land Plant		41	0	03-May-12 A	19-Jun-12 A		
Seawall Portion B at K024 - C051 28cells 3,080nrs		41	0	03-May-12 A	19-Jun-12 A		
V3-SCIB0-00(	Preparation of Supplementary Agreement for changing the small diameter of cellular walls	29	0	03-May-12 A	05-Jun-12 A		
V3-SCIB0-00(	Confirmation of Supplementary Agreement for changing the small diameter of cellular walls	12	0	06-Jun-12 A	19-Jun-12 A		
Cellular Structures		504	218	02-May-12 A	26-Sep-13	51	
Cellular Main Cells 89cells		504	218	02-May-12 A	26-Sep-13	51	
CS10000	Production of Y Junction for Cellular Walls Construction	504	218	02-May-12 A	26-Sep-13	51	
CS10010	Pre-fabrication of 1/4 sheetpile walls	443	218	02-Jul-12 A	26-Sep-13	5	
Full Guide Frames Method 89cells		230	8	14-Jul-12 A	28-Feb-13	-430	
Portion B K024 to K051 28cells		230	8	14-Jul-12 A	28-Feb-13	-430	
CS028-000	Portion B Cellular Structure K028	14	0	06-Oct-12 A	21-Oct-12 A		FE
CS031-000	Portion B Cellular Structure K031	12	0	03-Oct-12 A	15-Oct-12 A		FE
CS033-000	Portion B Cellular Structure K033 type_C 3476m3	105	0	18-Oct-12 A	07-Feb-13 A		FE
CS034-000	Portion B Cellular Structure K034	22	0	12-Sep-12 A	04-Oct-12 A		FE
CS037-000	Portion B Cellular Structure K037 type_C 3476m3	112	0	11-Oct-12 A	07-Feb-13 A		FE
CS038-000	Portion B Cellular Structure K038	42	0	14-Jul-12 A	28-Aug-12 A		FE



Remaining Level of Effort
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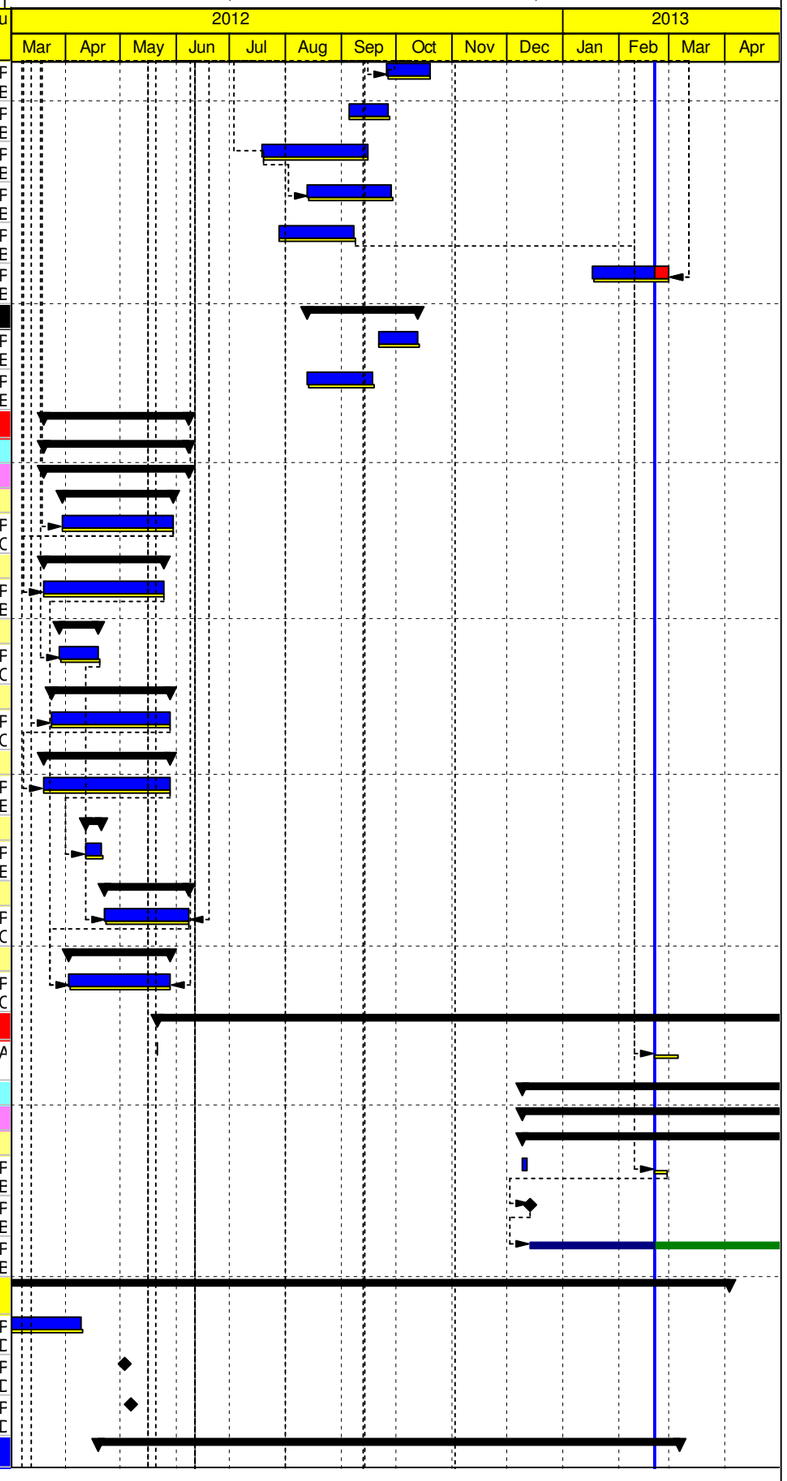
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Total Float	u
CS039-000	Portion B Cellular Structure K039	23	0	26-Sep-12 A	19-Oct-12 A		FE
CS041-000	Portion B Cellular Structure K041	21	0	05-Sep-12 A	27-Sep-12 A		FE
CS045-000	Portion B Cellular Structure K045	55	0	19-Jul-12 A	15-Sep-12 A		FE
CS046-000	Portion B Cellular Structure K046	44	0	13-Aug-12 A	28-Sep-12 A		FE
CS049-000	Portion B Cellular Structure K049	40	0	28-Jul-12 A	08-Sep-12 A		FE
CSB00-010	Portion B Modification of guide frame for Cellular structures	36	7	18-Jan-13 A	28-Feb-13	-399	FE
Portion E2 K052 to C067 16cells		58	0	13-Aug-12 A	13-Oct-12 A		
CS055-000	Portion E2 Cellular Structure K055	21	0	21-Sep-12 A	13-Oct-12 A		FE
CS056-000	Portion E2 Cellular Structure K056	35	0	13-Aug-12 A	18-Sep-12 A		FE
Reclamation		75	0	20-Mar-12 A	08-Jun-12 A		
Ground Treatment		75	0	20-Mar-12 A	08-Jun-12 A		
CPT		75	0	20-Mar-12 A	08-Jun-12 A		
Land Portion C1a		58	0	30-Mar-12 A	30-May-12 A		
CPTRC1a-01	CPT for Portion C1a	58	0	30-Mar-12 A	30-May-12 A		FC
Land Portion B		62	0	20-Mar-12 A	25-May-12 A		
CPTRB0-010	CPT for Portion B	62	0	20-Mar-12 A	25-May-12 A		FE
Land Portion C2a		21	0	29-Mar-12 A	19-Apr-12 A		
CPTRC2a-01	CPT for Portion C2a	21	0	29-Mar-12 A	19-Apr-12 A		FC
Land Portion C1b		60	0	24-Mar-12 A	28-May-12 A		
CPTRC1b-01	CPT for Portion C1b	60	0	24-Mar-12 A	28-May-12 A		FC
Land Portion E2		65	0	20-Mar-12 A	28-May-12 A		
CPTRE2-010	CPT for Portion E2	65	0	20-Mar-12 A	28-May-12 A		FE
Land Portion E1		10	0	12-Apr-12 A	21-Apr-12 A		
CPTRE1-010	CPT for Portion E1	10	0	12-Apr-12 A	21-Apr-12 A		FE
Land Portion C2b		44	0	23-Apr-12 A	08-Jun-12 A		
CPTRC2b-01	CPT for Portion C2b	44	0	23-Apr-12 A	08-Jun-12 A		FC
Land Portion C2c		52	0	03-Apr-12 A	28-May-12 A		
CPTRC2c-01	CPT for Portion C2c	52	0	03-Apr-12 A	28-May-12 A		FC
Geotechnical Instrumentation Works		669	669	22-May-12 A	21-Dec-14	-171	
A2550	Submission and Approval of Instrumentation Method Statement	11	0	22-May-12 A	22-May-12 A		A
Geotechnical Instrumentation Works for Seawalls		669	669	10-Dec-12 A	21-Dec-14	-171	
Cluster Type SB 2nrs Inclinometer Cluster inside cells		669	669	10-Dec-12 A	21-Dec-14	-171	
SB-1 K049 Portion B		669	669	10-Dec-12 A	21-Dec-14	-171	
CTSB1-010	Installation of SB-1 K049 Portion B	6	0	10-Dec-12 A	12-Dec-12 A		FE
CTSB1-020	Commencement of Monitoring of SB-1 K049 Portion B	0	0	14-Dec-12 A			FE
CTSB1-030	Monitoring of SB-1 K049 Portion B by Weekly until removal of surcharge	662	669	14-Dec-12 A	21-Dec-14	-171	FE
Portion D		449	42	08-Feb-12 A	03-Apr-13	22	
A1565-1	The Level confirm by the Engineer Package 1	63	0	08-Feb-12 A	10-Apr-12 A		FC
A1585-2	The Level confirm by the Engineer Package 2	0	0		04-May-12 A		FC
A1595-3	The Level confirm by the Engineer Package 3	0	0		07-May-12 A		FC
Submission		321	14	19-Apr-12 A	06-Mar-13	50	



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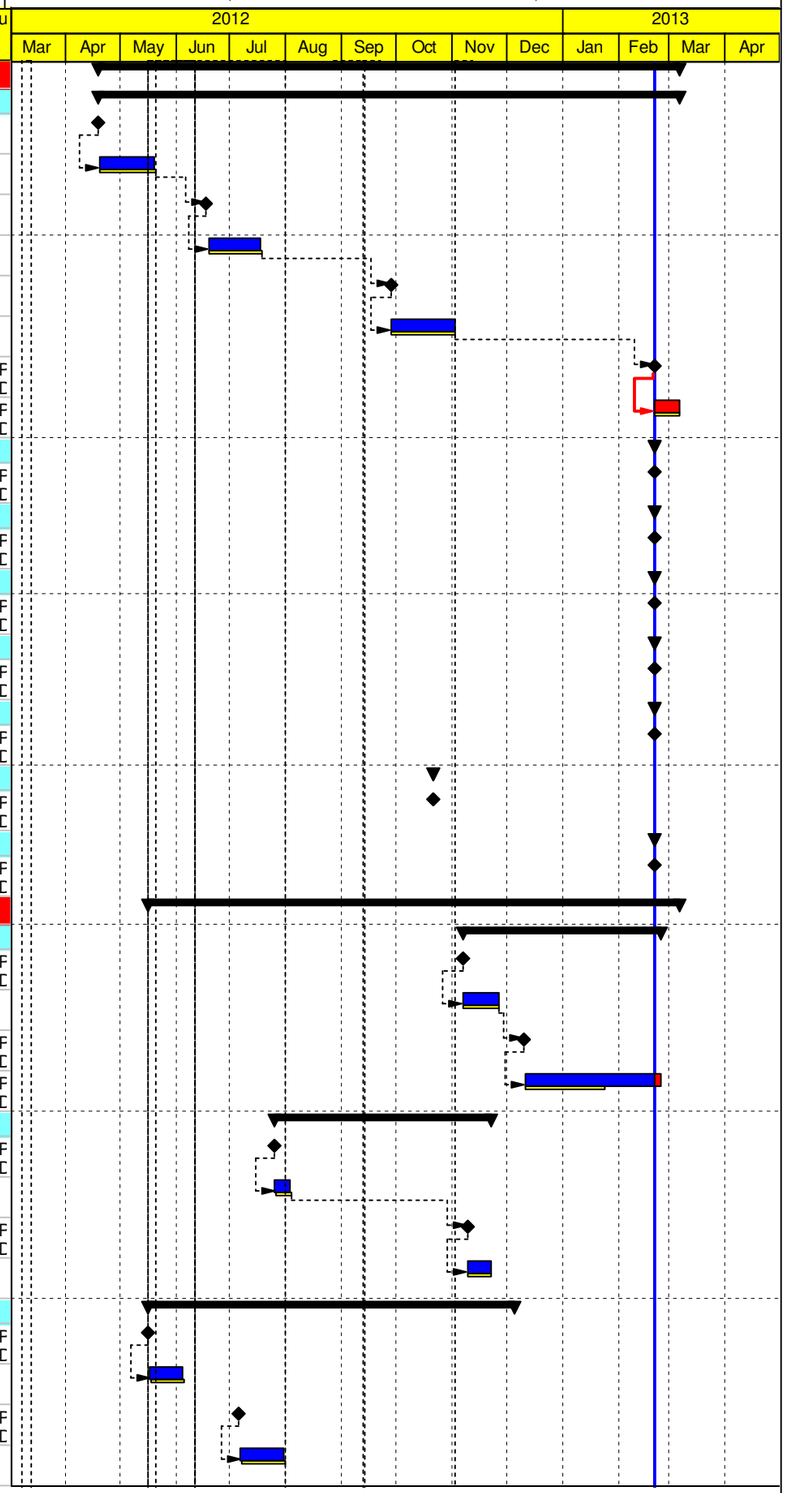
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Total Float	u
Design Submission		321	14	19-Apr-12 A	06-Mar-13	11	
Settlement Assessment for Reclamation Areas at Portion D		321	14	19-Apr-12 A	06-Mar-13	-259	
PD-DGN-13010	Settlement Assessment for Reclamation Area at Portion D submission	0	0		19-Apr-12 A		
PD-DGN-13020	Settlement Assessment for Reclamation Area at Portion D comments	31	0	20-Apr-12 A	20-May-12 A		
PD-DGN-13030	Settlement Assessment for Reclamation Area at Portion D submission	0	0		18-Jun-12 A		
PD-DGN-13040	Settlement Assessment for Reclamation Area at Portion D comments	30	0	19-Jun-12 A	18-Jul-12 A		
PD-DGN-13050	Settlement Assessment for Reclamation Area at Portion D submission	0	0		28-Sep-12 A		
PD-DGN-13060	Settlement Assessment for Reclamation Area at Portion D comments	36	0	28-Sep-12 A	02-Nov-12 A		
PD-DGN-13070	Settlement Assessment for Reclamation Area at Portion D submission	0	0		21-Feb-13*	-259	F
PD-DGN-13080	Settlement Assessment for Reclamation Area at Portion D comments	14	14	21-Feb-13	06-Mar-13	-259	F
Settlement Assessment for Reclamation with land-based Drain		0	0	21-Feb-13	21-Feb-13	-211	
PD-DGN-01010	Settlement Assessment for Reclamation with Land based band drain	0	0		21-Feb-13*	-211	F
Stability Analysis and Settlement Assessment for Vertical Seawall w No Dredging		0	0	21-Feb-13	21-Feb-13	-308	
PD-DGN-02010	Stability Analysis and settlement assessment for vertical seawall with no dredging	0	0		21-Feb-13*	-308	F
Stability Analysis and Settlement Assessment for Sloping Seawall w No Dredging		0	0	21-Feb-13	21-Feb-13	-308	
PD-DGN-03010	Stability Analysis and Settlement Assessment for Sloping seawall with no dredging	0	0		21-Feb-13*	-308	F
Settlement Assessment for Culverts C1 - C4 w No Dredging		0	0	21-Feb-13	21-Feb-13	25	
PD-DGN-04010	Settlement assessment for box culverts C1 - C4 with no dredging	0	0		21-Feb-13*	25	F
Structural Analysis for Culverts C1 - C4 w Precast Method		0	0	21-Feb-13	21-Feb-13	25	
PD-DGN-05010	Structural analysis for Box Culverts C1 - C4 with Precast Method	0	0		21-Feb-13*	25	F
Drainage Impact Assessment & Temporary Diversion (stg1 - for reclamation and surcharge period)		0	0	21-Oct-12 A	21-Oct-12 A		
PD-DGN-06010	Drainage Impact Assessment and Temporary Diversion (stage 1 - for reclamation and Surcharge Period)	0	0		21-Oct-12 A		F
Detailed Drawings for Temporary and Permanent Seawalls, Reclamation & Surcharge		0	0	21-Feb-13	21-Feb-13	-308	
PD-DGN-12010	Detailed Drawings for Temporary and Permanent Seawalls, Reclamation and surcharge	0	0		21-Feb-13*	-308	F
Method Statement Submission		293	14	17-May-12 A	06-Mar-13	50	
Seawall		79	4	07-Nov-12 A	24-Feb-13	-312	
PD-MTD-01010	MTD for Temporary Seawall Cosntruction - Preparation & Submission 1st	0	0		07-Nov-12 A		F
PD-MTD-01020	MTD for Temporary Seawall Construction - Comments	20	0	07-Nov-12 A	26-Nov-12 A		
PD-MTD-01030	MTD for Temporary Seawall Cosntruction - Preparation & Submission 2nd	0	0		10-Dec-12 A		F
PD-MTD-01040	MTD for Temporary Seawall Construction - Approval	45	4	11-Dec-12 A	24-Feb-13	-312	F
Reclamation		120	0	25-Jul-12 A	22-Nov-12 A		
PD-MTD-02010	MTD for reclamation - Preparation & Submission 1st	0	0		25-Jul-12 A		F
PD-MTD-02020	MTD for reclamation - Comments	9	0	26-Jul-12 A	03-Aug-12 A		
PD-MTD-02030	MTD for reclamation - Preparation & Submission 2nd	0	0		09-Nov-12 A		F
PD-MTD-02040	MTD for reclamation - Approval	14	0	09-Nov-12 A	22-Nov-12 A		
Vertical Drain by land plant		202	0	17-May-12 A	05-Dec-12 A		
PD-MTD-03010	MTD for Vertical Drain by land plant - Preparation & submission 1st	0	0		17-May-12 A		F
PD-MTD-03020	MTD for Vertical Drain by Land plant - Comments	19	0	18-May-12 A	05-Jun-12 A		
PD-MTD-03030	MTD for Vertical Drain by land plant - Preparation & submission 2nd	0	0		06-Jul-12 A		F
PD-MTD-03040	MTD for Vertical Drain by Land plant - Comments	25	0	07-Jul-12 A	31-Jul-12 A		



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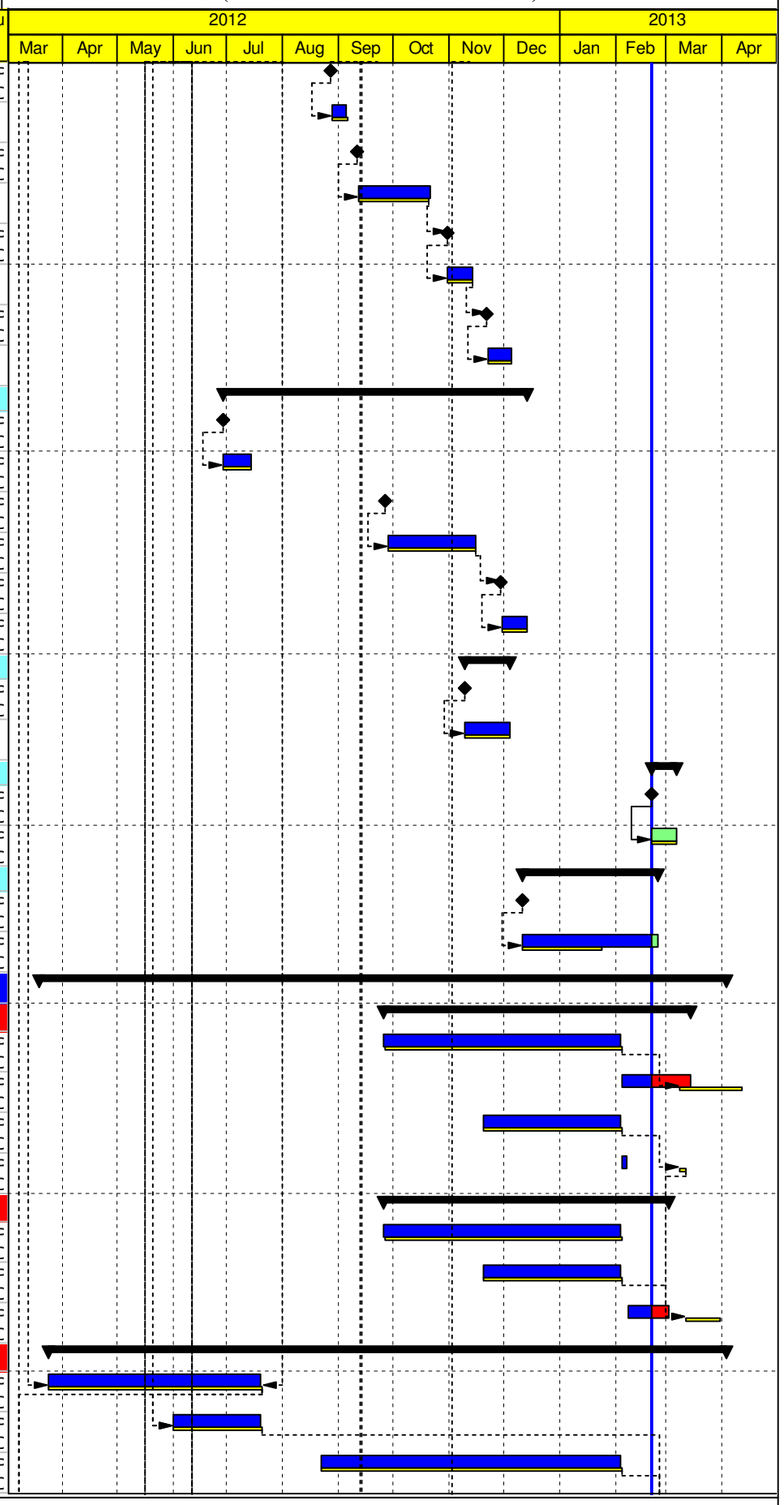
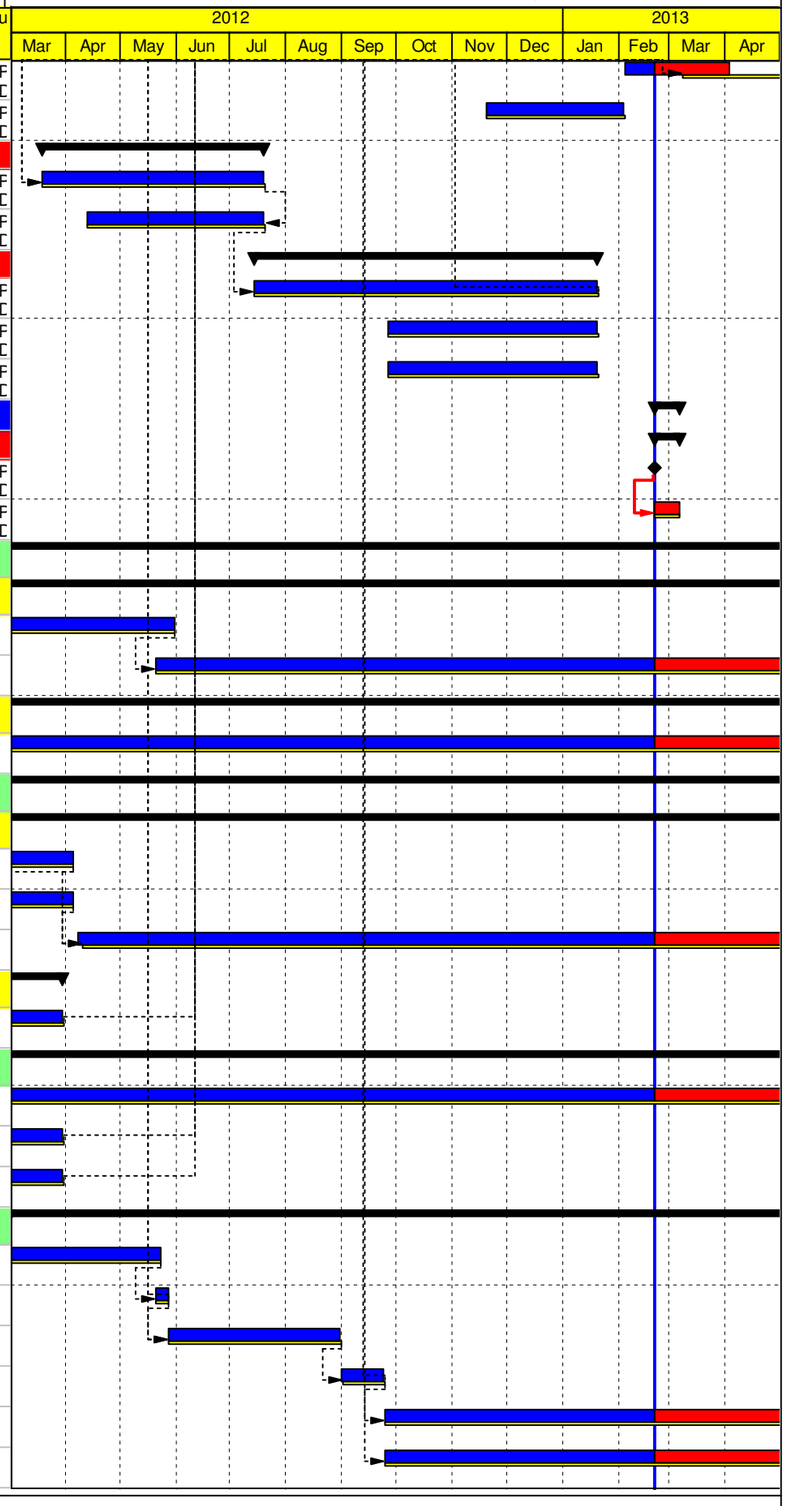
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Total Float	u
PD-MTD-03050	MTD for Vertical Drain by land plant - Preparation & submission 3rd	0	0		27-Aug-12 A		F C
PD-MTD-03060	MTD for Vertical Drain by Land plant - Comments	9	0	28-Aug-12 A	05-Sep-12 A		
PD-MTD-03070	MTD for Vertical Drain by land plant - Preparation & submission 4th	0	0		11-Sep-12 A		F C
PD-MTD-03080	MTD for Vertical Drain by Land plant - Comments	39	0	12-Sep-12 A	21-Oct-12 A		
PD-MTD-03090	MTD for Vertical Drain by land plant - Preparation & submission 5th	0	0		30-Oct-12 A		F C
PD-MTD-03100	MTD for Vertical Drain by Land plant - Comments	14	0	31-Oct-12 A	13-Nov-12 A		
PD-MTD-03110	MTD for Vertical Drain by land plant - Preparation & submission 6th	0	0		21-Nov-12 A		F C
PD-MTD-03120	MTD for Vertical Drain by Land plant - Approval	14	0	22-Nov-12 A	05-Dec-12 A		
Stone Columns by land plant		168	0	28-Jun-12 A	13-Dec-12 A		
PD-MTD-04010	MTD for Stone Columns by Land Plant - Preparation & submission 1st	0	0		28-Jun-12 A		F C
PD-MTD-04020	MTD for Stone Columns by Land Plant - Comments	16	0	29-Jun-12 A	14-Jul-12 A		F C
PD-MTD-04030	MTD for Stone Columns by Land Plant - Preparation & submission 2nd	0	0		27-Sep-12 A		F C
PD-MTD-04040	MTD for Stone Columns by Land Plant - Comments	49	0	28-Sep-12 A	15-Nov-12 A		F C
PD-MTD-04050	MTD for Stone Columns by Land Plant - Preparation & submission 3rd	0	0		29-Nov-12 A		F C
PD-MTD-04060	MTD for Stone Columns by Land Plant - Comments	14	0	30-Nov-12 A	13-Dec-12 A		F C
Construction & Sequence of Culvert C1 - C4		26	0	09-Nov-12 A	04-Dec-12 A		
PD-MTD-05010	MTD for construction of culvert C1 - C4 - Preparation & Submission	0	0		09-Nov-12 A		F C
PD-MTD-05020	MTD for construction of culvert C1 - C4 - Approval	26	0	09-Nov-12 A	04-Dec-12 A		
Extension Culvert EC1		14	14	21-Feb-13	06-Mar-13	50	
PD-MTD-06010	MTD for culvert EC1 - Preparation & Submission	0	0	21-Feb-13*		50	F C
PD-MTD-06020	MTD for culvert EC1- Approval	14	14	21-Feb-13	06-Mar-13	50	F C
Float & Sink installation of Culvert C1 - C4		45	4	11-Dec-12 A	24-Feb-13	56	
PD-MTD-07010	MTD for Float & Sink of culvert C1 - C4 - Preparation & Submission	0	0		11-Dec-12 A		F C
PD-MTD-07020	MTD for Float & Sink of culvert C1 - C4 - Approval	45	4	11-Dec-12 A	24-Feb-13	56	F C
Stone Columns by Marine Plant		409	42	19-Mar-12 A	03-Apr-13	-435	
Stone Columns in Zone A 2,154nrs		181	20	26-Sep-12 A	14-Mar-13	-393	
A1624	PD Zone A Lower Stone Columns 690nrs/1166nrs completed upto 4Feb2013	123	0	26-Sep-12 A	04-Feb-13 A		F C
A1634	PD Zone A Lower Stone Columns 476nrs/1166nrs (15nrs/day) AP1	32	20	05-Feb-13 A	14-Mar-13	-393	F C
A1644	PD Zone A Upper Stone Columns 952nrs/988nrs Completed upto 4Feb2013	72	0	20-Nov-12 A	04-Feb-13 A		F C
A1654	PD Zone A Upper Stone Columns 36nrs/988nrs (15nrs/day) AP2	3	0	05-Feb-13 A	07-Feb-13 A		F C
Stone Columns in Zone B 2,906nrs		170	9	26-Sep-12 A	02-Mar-13	-374	
A1664	PD Zone B Lower Stone Columns 927nrs/1161nrs completed upto 4Feb2013	123	0	26-Sep-12 A	04-Feb-13 A		F C
A1684	PD Zone B Upper Stone Columns 1481nrs/1745nrs Completed upto 4Feb2013 AP2	72	0	20-Nov-12 A	04-Feb-13 A		F C
A1694	PD Zone B Upper Stone Columns 264nrs/1745nrs (15nrs/day) AP2	18	9	08-Feb-13 A	02-Mar-13	-374	F C
Stone Columns in Zone C 2,456nrs		404	42	24-Mar-12 A	03-Apr-13	-435	
A1570	D - Lay Geotextile at West Portion	110	0	24-Mar-12 A	20-Jul-12 A		F C
A1575	D - Lay Stone Blanket Westion Portion	46	0	01-Jun-12 A	20-Jul-12 A		F C
A1580-20	PD Zone C Lower Stone Columns 1,078nrs/1,850nrs completed upto 4Feb2013	155	0	22-Aug-12 A	04-Feb-13 A		F C



Remaining Level of Effort
Actual Level of Effort
Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Total Float	u
A1580-30	PD Zone C Lower Stone Columns 772nrs/1,850nrs (15nrs/day) FTB16	51	39	05-Feb-13 A	03-Apr-13	-402	F C
A1580-40	PD Zone C Upper Stone Columns 280nrs/606nrs completed upto 4Feb2013	72	0	20-Nov-12 A	04-Feb-13 A		F C
Stone Columns East 3,296nrs		115	0	19-Mar-12 A	20-Jul-12 A		
A1602	D - Lay Geotextile at East Portion	115	0	19-Mar-12 A	20-Jul-12 A		F C
A1603	D - Lay Stone Blanket at East Portion	92	0	13-Apr-12 A	20-Jul-12 A		F C
Stone Columns at Box Culverts		177	0	14-Jul-12 A	20-Jan-13 A		
A1604-30	PD C1 Culvert Stone Columns 99nrs/217nrs completed upto 4Feb2013	177	0	14-Jul-12 A	20-Jan-13 A		F C
A1604-40	PD C3 Culvert Stone Columns 55nrs/175nrs completed upto 4Feb2013	109	0	26-Sep-12 A	20-Jan-13 A		F C
A1604-60	PD C4 Culvert Stone Columns 61nrs/147nrs completed upto 4Feb2013	109	0	26-Sep-12 A	20-Jan-13 A		F C
Site Instruction		14	14	21-Feb-13	06-Mar-13	-445	
Removal of rockfill at existing seawall		14	14	21-Feb-13	06-Mar-13	-445	
SI1-B00010	PD - Instruction of removal of rockfill by the Engineer	0	0	21-Feb-13*		-445	F C
SI1-B00020	PD - Method statement of removal rock mound at existing seawall preparation	14	14	21-Feb-13	06-Mar-13	-445	F C
Works Area WA2 (Tung Chung)		1570	1207	30-Nov-11 A	28-Feb-17	0	
Zone A		1518	1207	06-Feb-12 A	28-Feb-17	0	
A1430	Establishment of Engineer's Accommodation	94	0	06-Feb-12 A	31-May-12 A		
A1880	Maintenance of Engineer's Accommodation	1434	1207	21-May-12 A	28-Feb-17	0	
Zone B		615	252	30-Nov-11 A	20-Dec-13	0	
A3090	Maintenance of Site	615	252	30-Nov-11 A	20-Dec-13	0	
Works Area WA3 (Siu Ho Wan STW)		1570	1207	30-Nov-11 A	28-Feb-17	0	
Zone A		1570	1207	30-Nov-11 A	28-Feb-17	0	
WA3-1000	Site Clearance & Hoarding	103	0	30-Nov-11 A	05-Apr-12 A		
WA3-1010	Establishment of Accomodation for Public Works Regional Laboratory	38	0	21-Feb-12 A	05-Apr-12 A		
WA3-1020	Maintenance of Accomodation for Public Works REgion Laboratory	1467	1207	08-Apr-12 A	28-Feb-17	0	
Others		99	0	30-Nov-11 A	30-Mar-12 A		
A3100	Maintenance of Site	99	0	30-Nov-11 A	30-Mar-12 A		
Works Area WA4 (To Kau Wan)		548	252	23-Feb-12 A	20-Dec-13	0	
A1910	Maintenance of Site Zone A	548	252	23-Feb-12 A	20-Dec-13	0	
A2060	Maintenance of Site Zone B	32	0	23-Feb-12 A	30-Mar-12 A		
A2070	Maintenance of Site Zone C	32	0	23-Feb-12 A	30-Mar-12 A		
Works Area TKO Fill Bank		1736	1379	01-Mar-12 A	30-Nov-16	0	
WA-TKO-1000	Establishment of Public Fill Sorting Facilities Zone A	84	0	01-Mar-12 A	23-May-12 A		
WA-TKO-1010	Testing and commission of Sorting Facilities First Stage	7	0	21-May-12 A	27-May-12 A		
WA-TKO-1020	Establishment of Public Fill Sorting Facilities Zone B	81	0	28-May-12 A	31-Aug-12 A		
WA-TKO-1030	Testing and commission of Sorting Facilities for Zone B	20	0	01-Sep-12 A	24-Sep-12 A		
WA-TKO-1040	Operate and Maintain Public Fill Sorting Facilities in Zone A, B1 & B2	1254	1134	25-Sep-12 A	30-Nov-16	0	
WA-TKO-1050	Maintainance of Site in Zone C	570	450	25-Sep-12 A	22-Aug-14	0	



Remaining Level of Effort
Actual Level of Effort
Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Appendix C - Implementation Schedule of Environmental Mitigation Measures

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
Air Quality				
S5.5.6.1 of HKBCFEIA	A1	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	All construction sites	V
S5.5.6.2 of HKBCFEIA and S4.8.1 of TKCLKLEIA	A2	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. • 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; • When there are open excavation and reinstatement works, hoarding of not less	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		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		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		on the top and the 3 sides; • 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; • All unpaved roads/exposed area shall be watered which results in dust suppression by forming moist cohesive films among the discrete grains of road surface material. • No burning of debris or other materials on the works areas is allowed; • Water spray shall be used during the handling of fill material at the site and at active cuts, excavation and fill sites where dust is likely to be created; • Open dropping heights for excavated materials shall be controlled to a maximum height of 2m to minimise the fugitive dust arising from unloading; • During transportation by truck, materials shall not be loaded to a level higher than the side and tail boards, and shall be dampened or covered before transport. Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards; • 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		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		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.		
S5.5.6.3 of HKBCFEIA and S4.8.1 of TKCLKLEIA	A3	The Contractor should undertake proper watering on all exposed spoil and associated work areas (with at least 8 times per day) throughout the construction phase.	All construction sites	V
S5.5.6.4 of HKBCFEIA and S4.11 of TKCLKLEIA	A4	Implement regular dust monitoring under EM&A programme during the construction stage.	Selected representative dust monitoring station	V
S5.5.7.1 of HKBCFEIA	A5	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 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;	All construction sites	N/A

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• 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.		
S5.5.2.7 of HKBCFEIA	A6	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.	All construction sites	N/A (Construction in process)
Construction Noise (Air borne)				
S6.4.10 of HKBCFEIA	N1	Use of good site practices to limit noise emissions by considering the following: • only well-maintained plant should be operated on-site and plant should be	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		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.		
S6.4.11 of HKBCFEIA	N2	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.	All construction sites	V
S6.4.12 of HKBCFEIA	N3	Install movable noise barriers (typically density @14kg/m^2), acoustic mat or full enclosure close to noisy plants including air compressor, generators, saw.	For plant items listed in Appendix 6D of the EIA report at all construction sites	N/A
S6.4.13 of HKBCFEIA	N4	Select “Quiet plants” which comply with the BS 5228 Part 1 or TM standards.	For plant items listed in Appendix 6D of the	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
			EIA report at all construction sites	
S6.4.14 of HKBCFEIA	N5	Sequencing operation of construction plants where practicable.	All construction sites where practicable	V
S5.1 of TMCLKLEIA	N6	Implement a noise monitoring under EM&A programme.	Selected representative noise monitoring station	V
Waste Management (Construction Waste)				
S12.6 of TMCLKLEIA	WM1	The Contractor shall identify a coordinator for the management of waste.	All construction sites	V
S12.6 of TMCLKLEIA	WM2	The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	All construction sites	V
S12.6 of TMCLKLEIA	WM3	EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken.	All construction sites	V
S8.3.8 of HKBCFEIA and S12.6 of TMCLKLEIA	WM4	*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;	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• 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 the disposal of C&D materials are properly documented and verified; • 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; and • The surplus surcharge should be transferred to a fill bank.		
S8.3.9-S8.3.11 of HKBCFEIA and S12.6 of	WM5	*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	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
TMCLKLEIA		hoardings should not be used, as in other projects. Metal hoarding and falsework 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 areas of the sites should be considered for such segregation and storage.		
S8.2.12-S8.3.15 of HKBCFEIA and S12.6 of TMCLKLEIA	WM6	*Chemical Waste* • 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	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		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 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 of HKBCFEIA and S12.6 of TMCLKLEIA	WM7	*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.	All construction sites	V
S8.3.17 of HKBCFEIA and S12.6 of TMCLKLEIA	WM8	*General Refuse* • The site and surroundings shall be kept tidy and litter free. 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	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		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, 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. • Sufficient dustbins shall be provided for storage of waste as required under the Public Cleansing and Prevention of Nuisances By-laws. In addition, general refuse shall be cleared daily and shall be disposed of to the nearest licensed landfill or refuse transfer station. • All waste containers shall be in a secure area on hardstanding.		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
Water Quality (Construction Phase)				
	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 backfilling, as well as protection measures. Details of the measures are provided below: • Reclamation filling for the Project shall not proceed until at least 200m of leading seawall at the reclamation area formed above +2.2mPD, unless otherwise agreement was obtained from EPD, except for the 300m gaps for marine access. All underwater filling works shall be carried out behind seawalls to avoid dispersion of suspended solids outside the Project limit; • Except for the filling of the cellular structures, not more than 15% public fill shall be used for reclamation filling below +2.5mPD during construction of the seawall; • After the seawall is completed except for the 300m marine access as indicated in the EPs, not more than 30% public fill shall be used for reclamation filling below +2.5mPD, unless otherwise agreement from EPD was obtained; • Upon completion of 200m leading seawall, no more than a total of 60 filling barge trips per day shall be made with a cumulative maximum daily filling rate of 60,000	During filling	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		m3 for HKBCF and TMCLKL southern landfall reclamation during the filling operation; and • Upon completion of the whole section of seawall except for the 300m marine access as indicated in the EPs, no more than a total of 190 filling barge trips per day shall be made with a cumulative maximum daily filling rate of 190,000 m3 for the remaining filling operations for HKBCF and TMCLKL southern landfall reclamation. • Floating type perimeter silt curtains shall be around the HKBCF site before the commencement of marine works. Staggered layers of silt curtain shall be provided to prevent sediment loss at navigation accesses. The length of each staggered layers shall be at least 200m; • Single layer silt curtain to be applied around the North-east airport water intake; • The silt-curtains should be maintained in good condition to ensure the sediment plume generated from filling be confined effectively within the site boundary; • The filling works shall be scheduled to spread the works evenly over a working day; • Cellular structure shall be used for seawall construction; • A layer of geotextile shall be placed on top of the seabed before any filling activities take place inside the cellular structures to form the seawall; • The conveyor belts shall be fitted with windboards and conveyor release points shall be covered with curtain to prevent any spillage of filling materials onto the		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		surrounding waters; and • An additional layer of silt curtain shall be installed near the active stone column installation points. A layer of geotextile with stone blanket on top shall be placed on the seabed prior to stone column installation works. • 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		
S9.11.1.3 of HKBCFEIA and S6.10 of TMCLKLEIA	W2	<u>Land Works</u> 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	All land-based construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		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 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		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		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; • 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 offsite 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		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		discharge to the storm water system..		
S9.14 of HKBCFEIA and S6.10 of TMCLKLEIA	W3	Implement a water quality monitoring programme	At identified monitoring location	V
S6.10 of TMCLKLEIA	W4	All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice.	All construction site areas	V
Ecology (Construction Phase)				
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E1	• Install silt curtain during the construction • Limit works fronts • Construct seawall prior to reclamation filling where practicable • Good site practices • Strict enforcement of no marine dumping • Site runoff control • Spill response plan	Seawall, reclamation area	V
S10.7 of HKBCFEIA	E2	• 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.	Land-based works areas	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E3	• Good site practices, including strictly following the permitted works hours, using quieter machines where practicable, and avoiding excessive lightings during night time.	Land-based works areas	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E4	• Dolphin Exclusion Zone • Dolphin watching plan	Marine works	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E5	• Decouple compressors and other equipment on working vessels • Proposal on design and implementation of acoustic decoupling measures applied during reclamation works • Avoidance of percussive piling	Marine works	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E6	• Control vessel speed • Skipper training • Predefined and regular routes for working vessels; avoid Brothers Islands	Marine traffic	V
S10.10 of HKBCFEIA and S8.14 of TMCLKLEIA	E7	• Vessel based dolphin monitoring	Northeast and Northwest Lantau	V
Fisheries				

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
S11.7 of HKBCFEIA	F1	• Reduce re-suspension of sediments • Limit works fronts • Good site practices • Strict enforcement of no marine dumping • Spill response plan	Seawall, reclamation area	V
S11.7 of HKBCFEIA	F2	• Install silt-grease trap in the drainage system collecting surface runoff	Reclamation area	V
Landscape & Visual (Construction Phase)				
S14.3.3. 3 of HKBCFEIA and S10.9 of TMCLKLEIA	LV1	*Mitigate Landscape Impacts* G1/CM4 Grass-hydroseed or sheeting bare soil surface and stock pile areas. 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 new coastline.	All construction site areas	N/A
S10.9 of TMCLKLEIA	LV2	*Mitigate Landscape Impacts* CM7 Ensure no run-off into water body adjacent to the Project Area.	All construction site areas	V
S14.3.3. 3 of HKBCFEIA	LV4	*Mitigate Visual Impacts* V1 Minimize time for construction activities during construction period.	All construction site areas	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
S10.9 of TMCLKLEIA	LV5	*Mitigate Visual Impacts* CM6 Control night-time lighting and glare by hooding all lights.	All construction site areas	V
EM&A				
S15.2.2 of HKBCFEIA	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	All construction site areas	V
S15.5 - S15.6 of HKBCFEIA	EM2	• An Environmental Team needs to be employed as per the EM&A Manual. • Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. • 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.	All construction site areas	V

Legend: V = implemented; x = not implemented; N/A = not applicable

Appendix D - Summary of Action and Limit Levels

Table 1 – Action and Limit Levels for 1-hour TSP

Location	Action Level	Limit Level
AMS2	374 $\mu g/m^3$	500 $\mu g/m^3$
AMS3A*	368 $\mu g/m^3$	500 $\mu g/m^3$
AMS6	360 $\mu g/m^3$	500 $\mu g/m^3$
AMS7	370 $\mu g/m^3$	500 $\mu g/m^3$

Remarks: * Action Level set out at AMS3 Ho Yu College is adopted.

Table 2 – Action and Limit Levels for 24-hour TSP

Location	Action Level	Limit Level
AMS2	176 $\mu g/m^3$	260 $\mu g/m^3$
AMS3A*	167 $\mu g/m^3$	260 $\mu g/m^3$
AMS6	173 $\mu g/m^3$	260 $\mu g/m^3$
AMS7	183 $\mu g/m^3$	260 $\mu g/m^3$

Remarks: * Action Level set out at AMS3 Ho Yu College is adopted.

Table 3 – Action and Limit Levels for Construction Noise (0700-1900 hrs of normal weekdays)

Location	Action Level	Limit Level
NMS2	When one documented complaint, related to 0700 – 1900 hours on normal weekdays, is received from any one of the sensitive receivers	75 dB(A)
NMS3A		*65 / 70 dB(A)

*Daytime noise Limit Level of 70 dB(A) applies to education institutions, while 65dB(A) applies during school examination period.

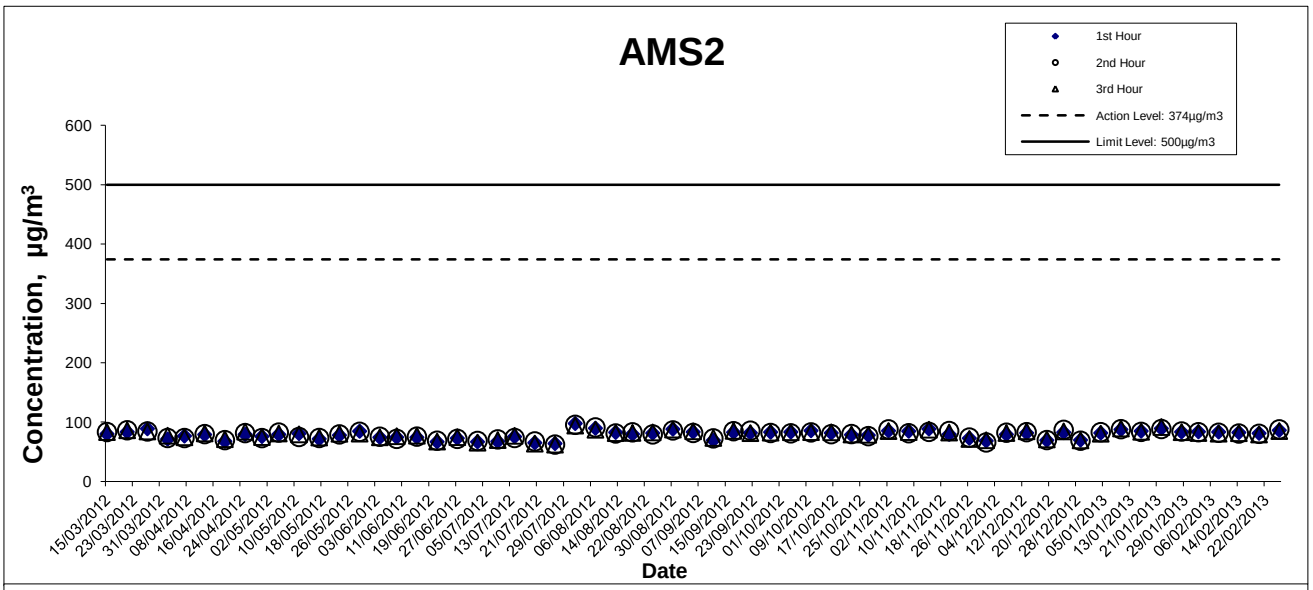
Table 4 – Action and Limit Levels for Water Quality

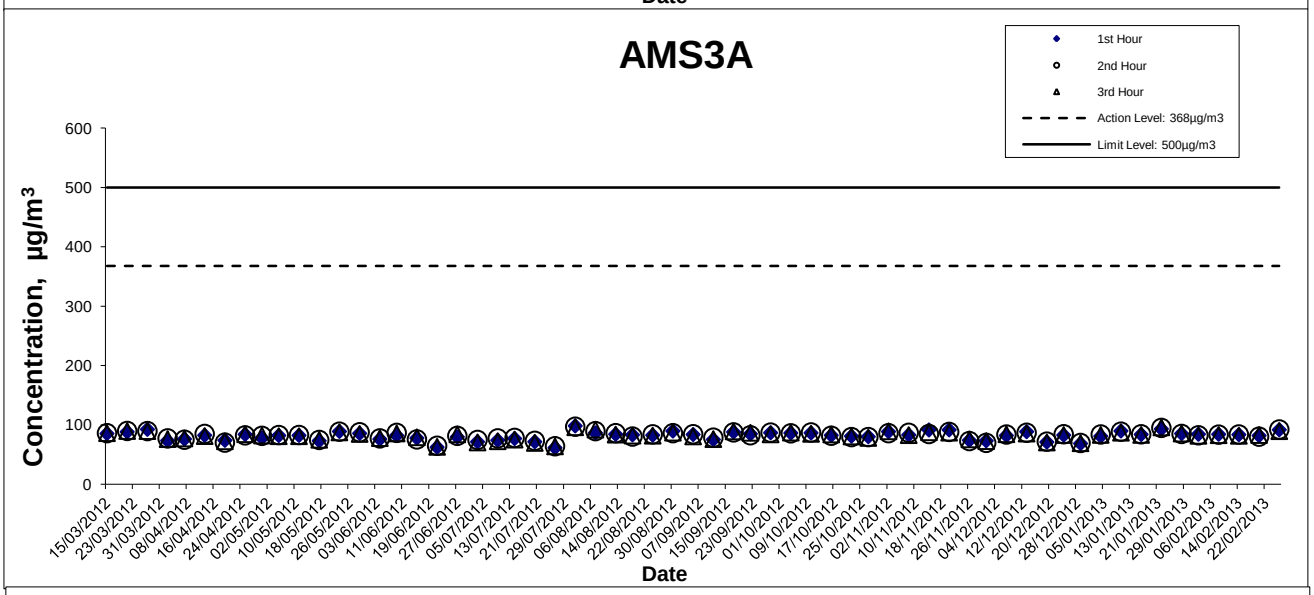
Parameters	**Action**	**Limit**
DO in mg L^{-1} (Surface, Middle & Bottom)	Surface and Middle 5.0 Bottom 4.7	Surface and Middle 4 .2 (except 5 mg/L for FCZ) Bottom 3.6
SS in mg L^{-1} (depth-averaged)	23.5 or 120% of upstream control station's SS at the same tide of the same day *23.5 and 120% of upstream control station's SS at the same tide of the same day	34.4 or 130% of upstream control station's SS at the same tide of the same day and 10mg/L for WSD Seawater intakes *34.4 and 130% of upstream control station's SS at the same tide of the same day and 10mg/L for WSD Seawater intakes
Turbidity in NTU (depth-averaged)	27.5 or 120% of upstream control station's turbidity at the same tide of the same day *27.5 and 120% of upstream control station's turbidity at the same tide of the same day	47.0 or 130% of upstream control station's turbidity at the same tide of the same day *47.0 and130% of upstream control station's turbidity at the same tide of the same day

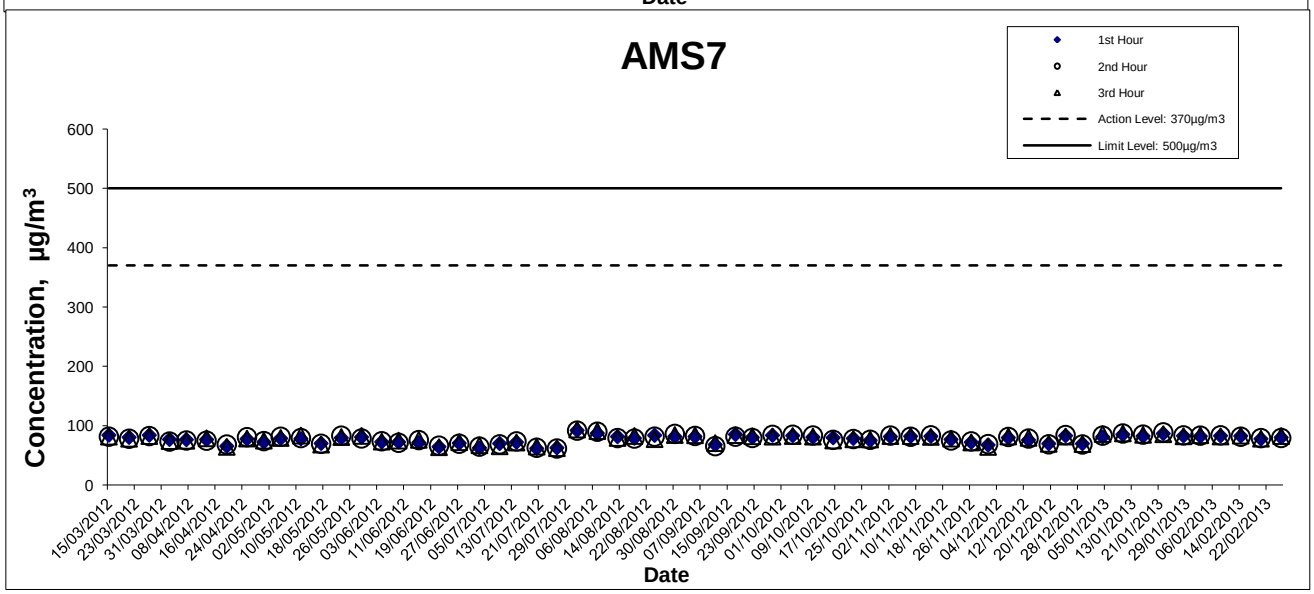
* Remarks: Reference is made to EPD approval of adjustment of water quality assessment criteria. The adjustment was effective since 18 February 2013

Notes:

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 limits occurs when monitoring result is lower than the limits.
3. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.







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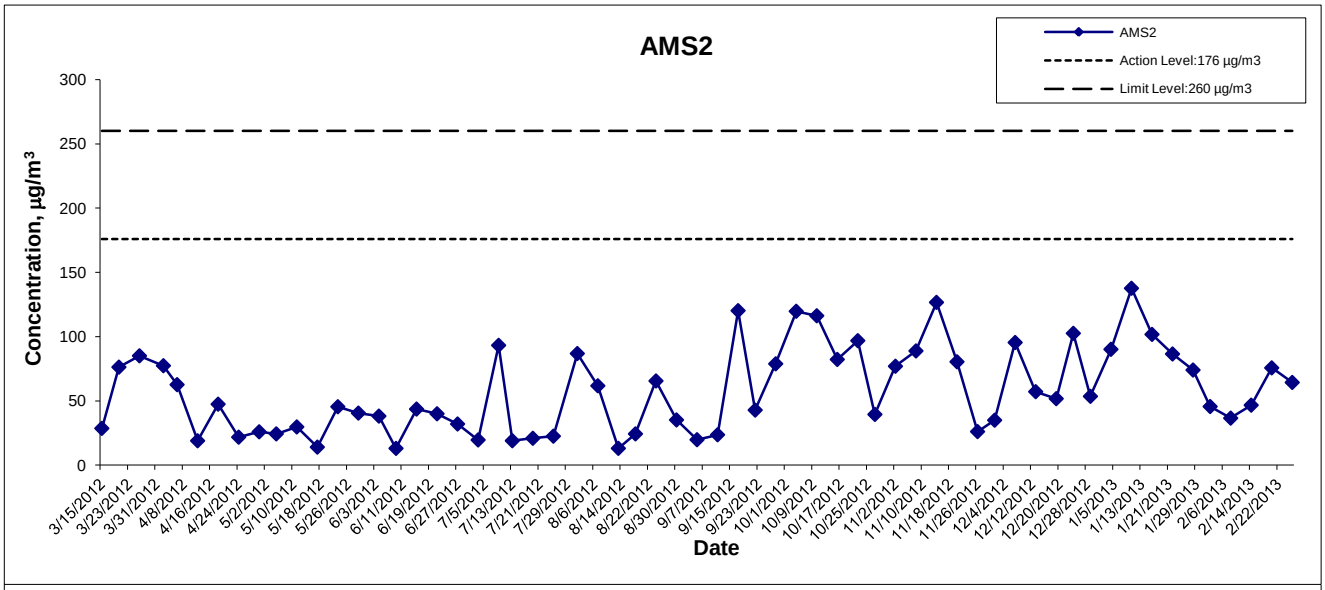
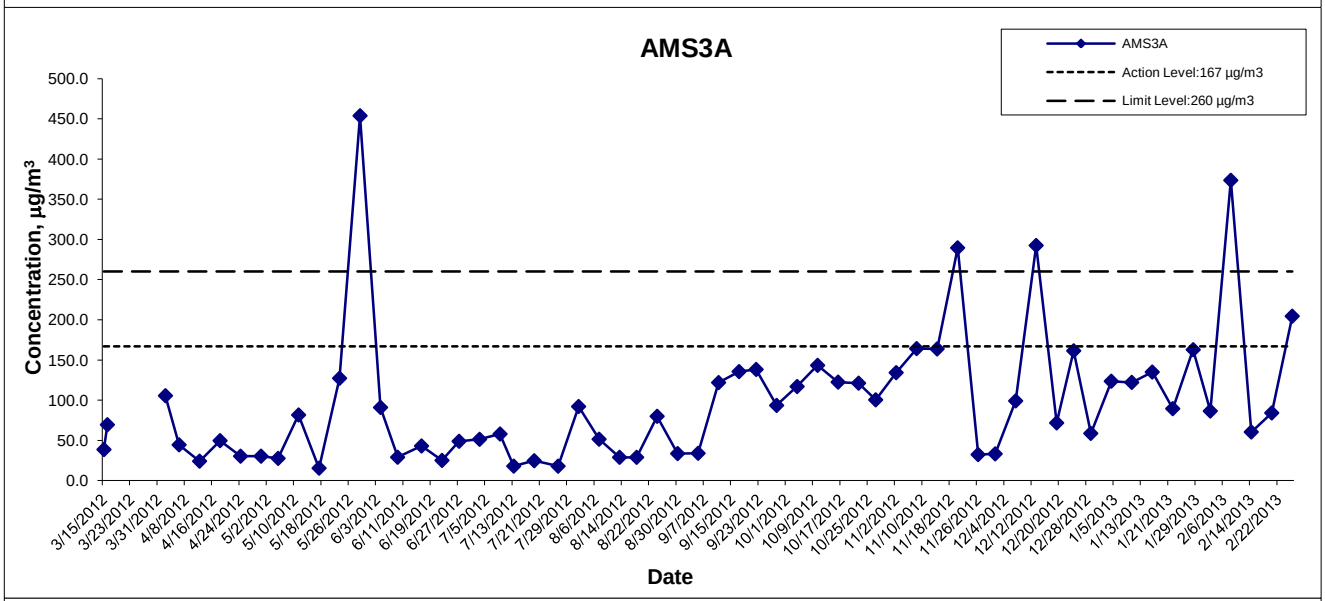
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

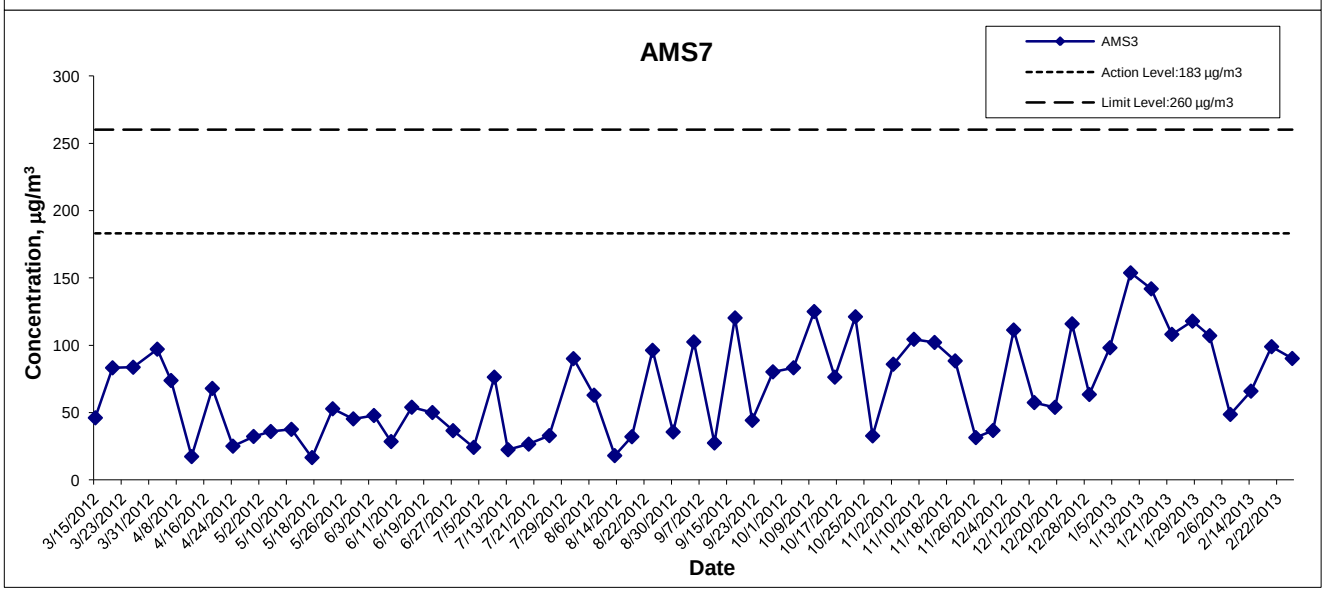
Graphical Presentation of Impact 1-hour TSP Monitoring Results

Project No.: 60249820 **Date: Apr 2013**

Appendix E







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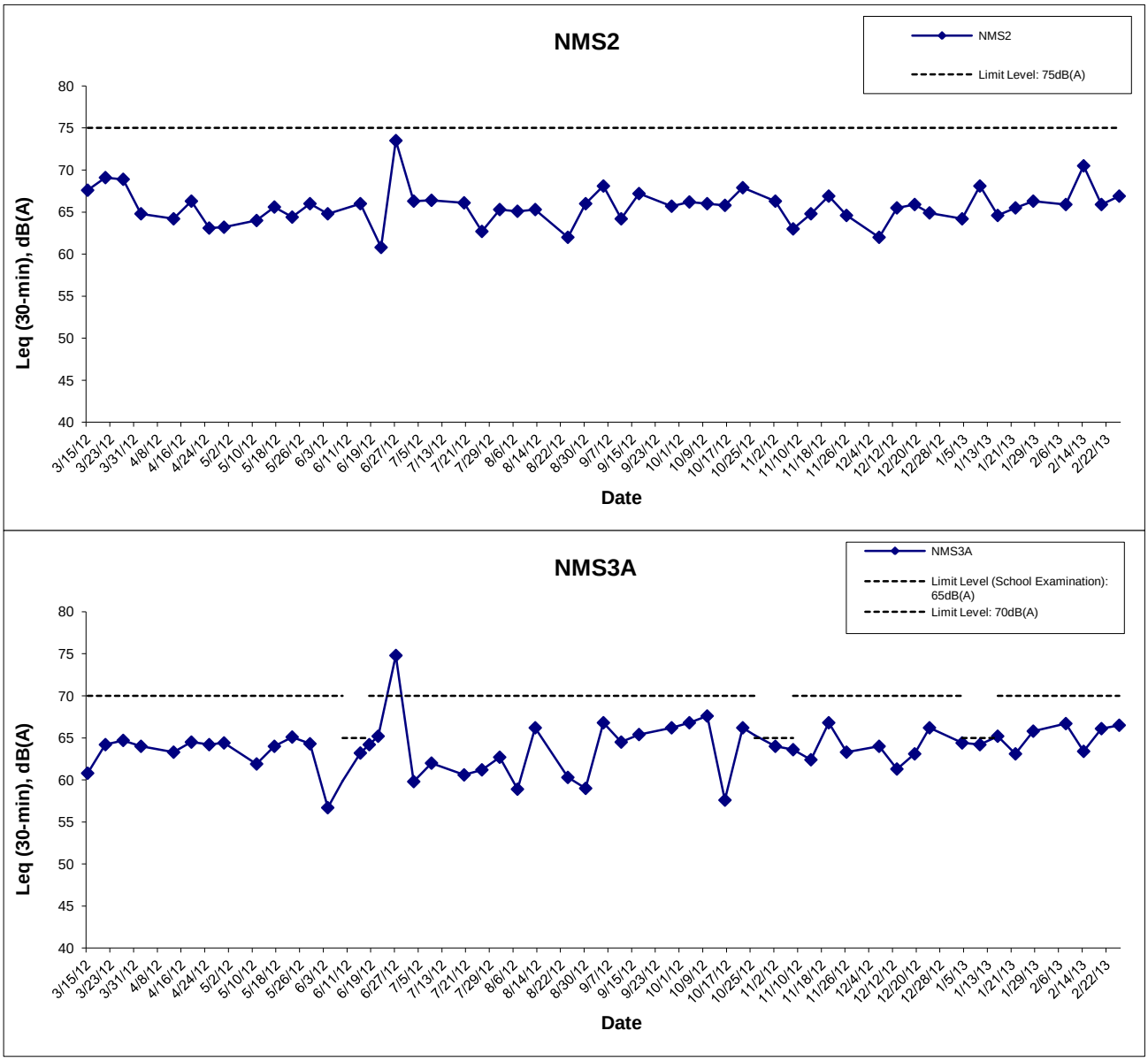
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

AECOM

Graphical Presentation of Impact 24-hour TSP Monitoring Results

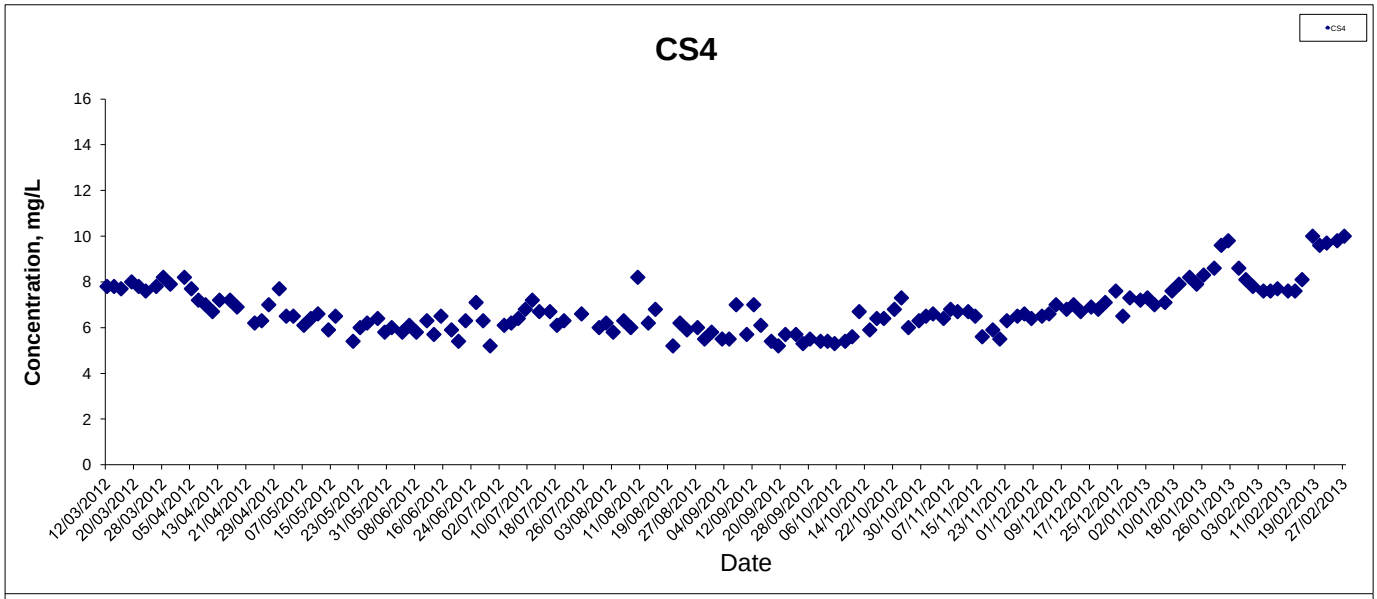
Project No.: 60249820 **Date: Apr 2013**

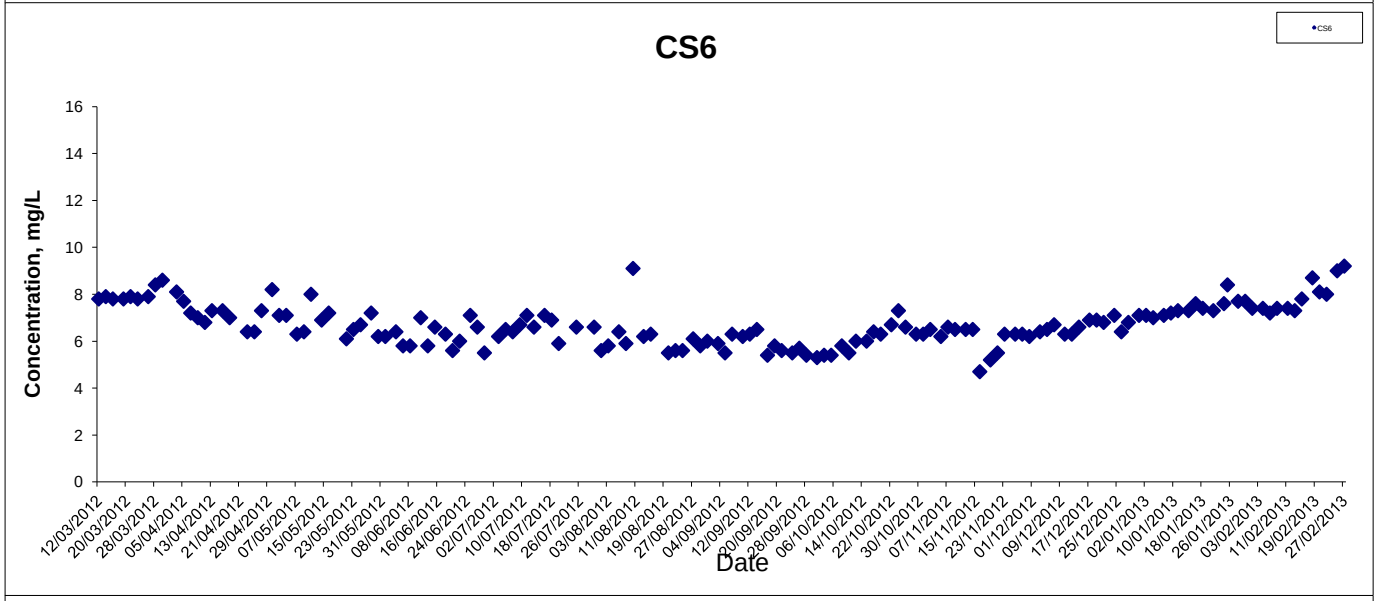
Appendix E

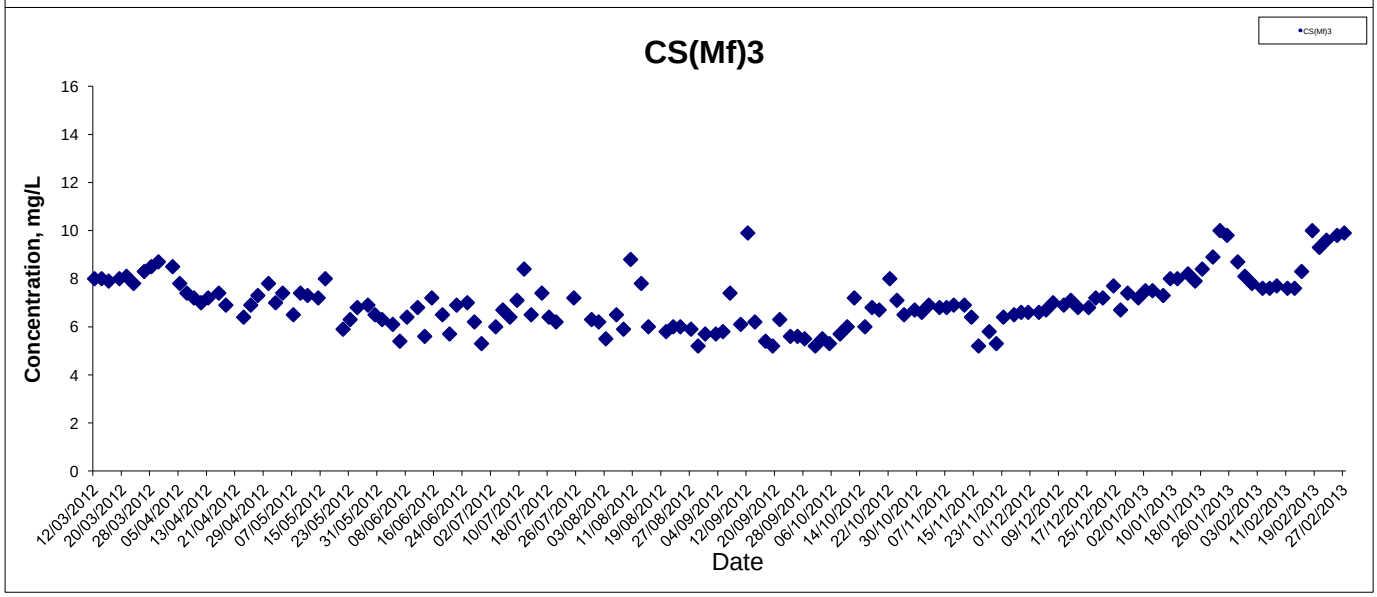


Remarks: Effective from July 2012, the Limit Level at NMS3A was revised to 70dB(A).

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







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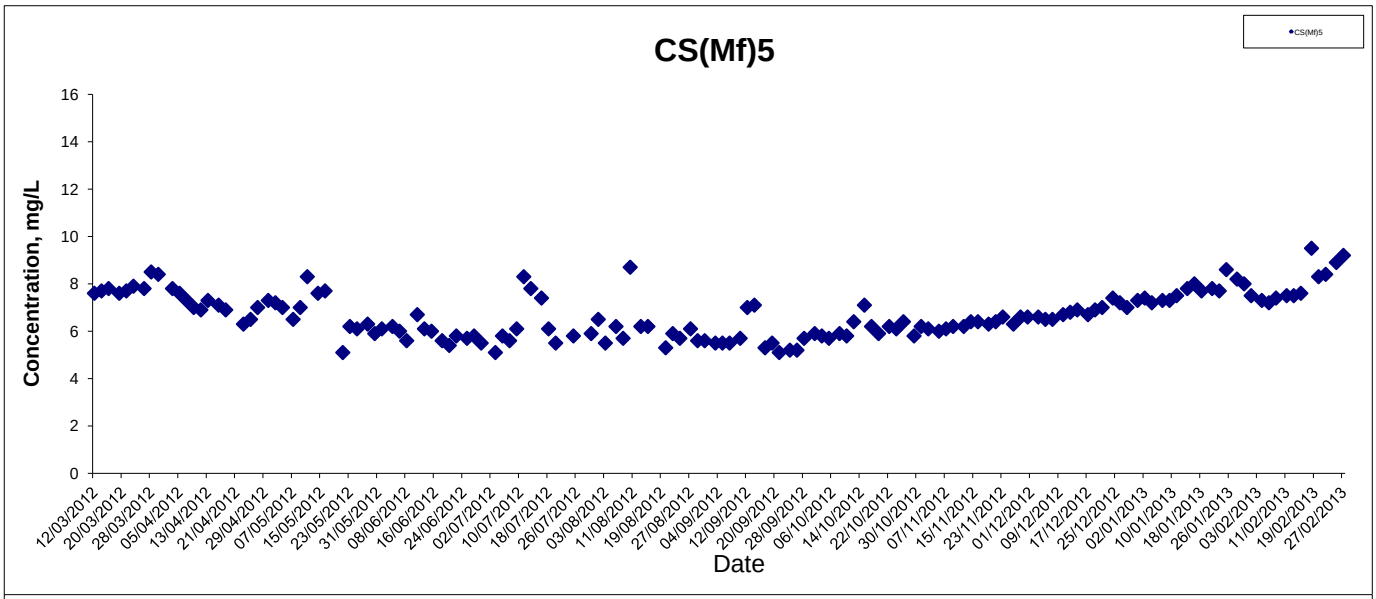
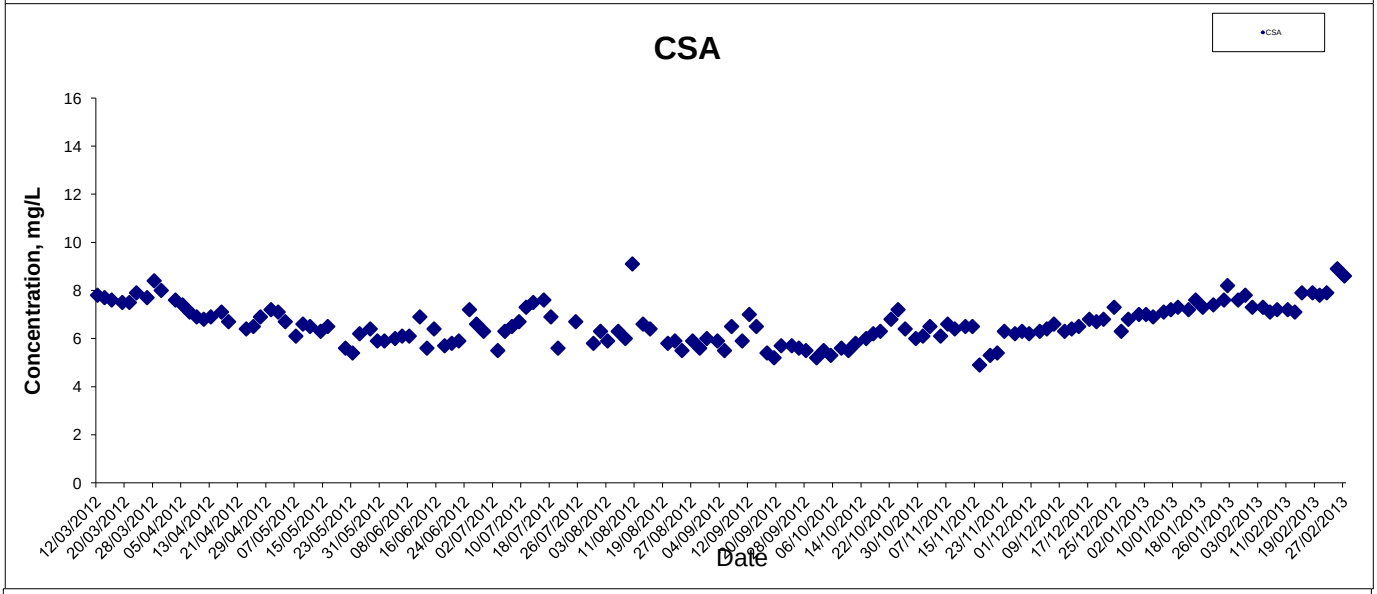
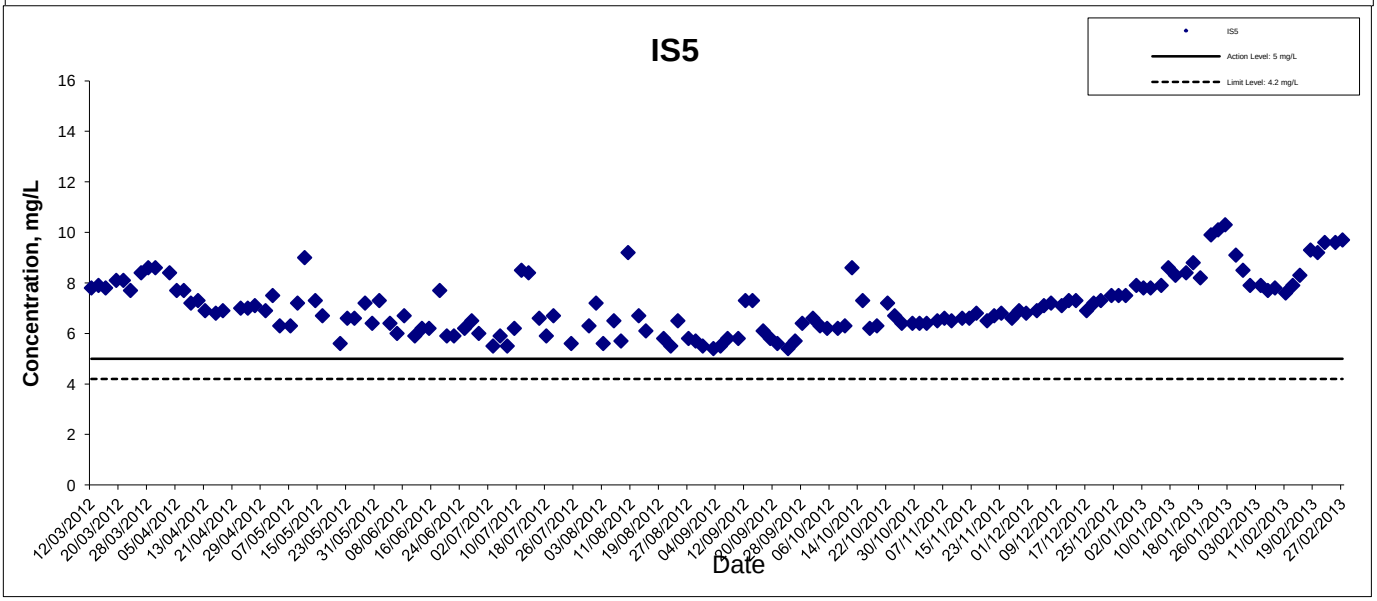
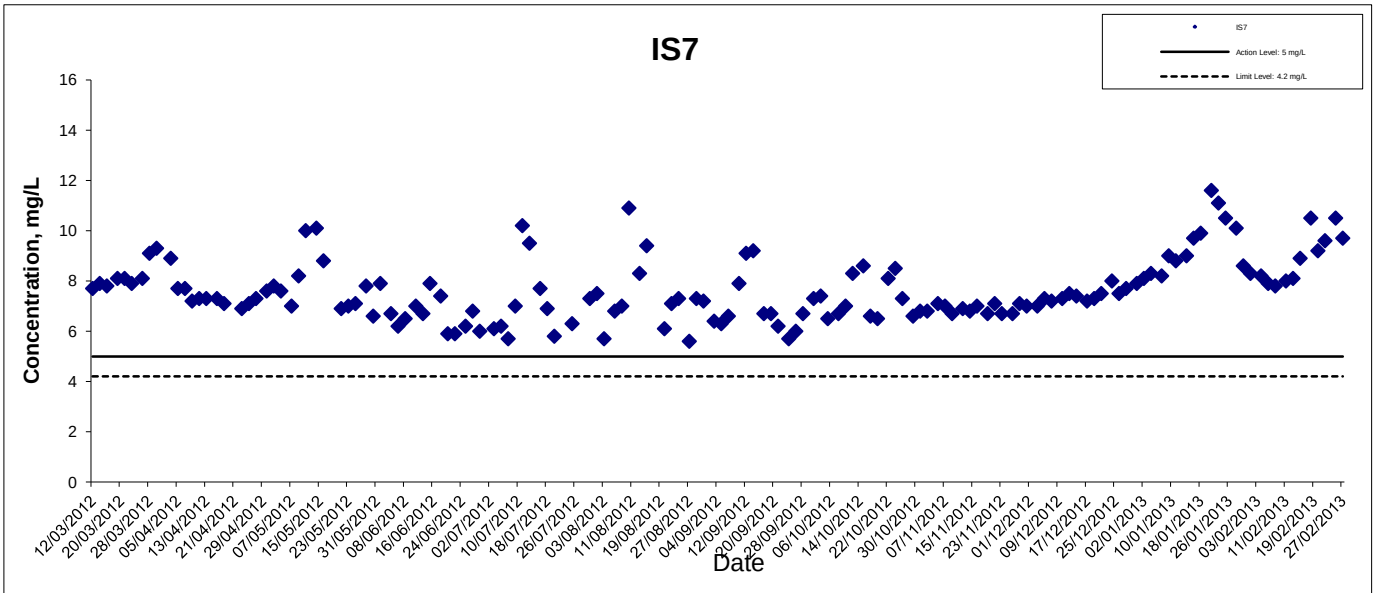
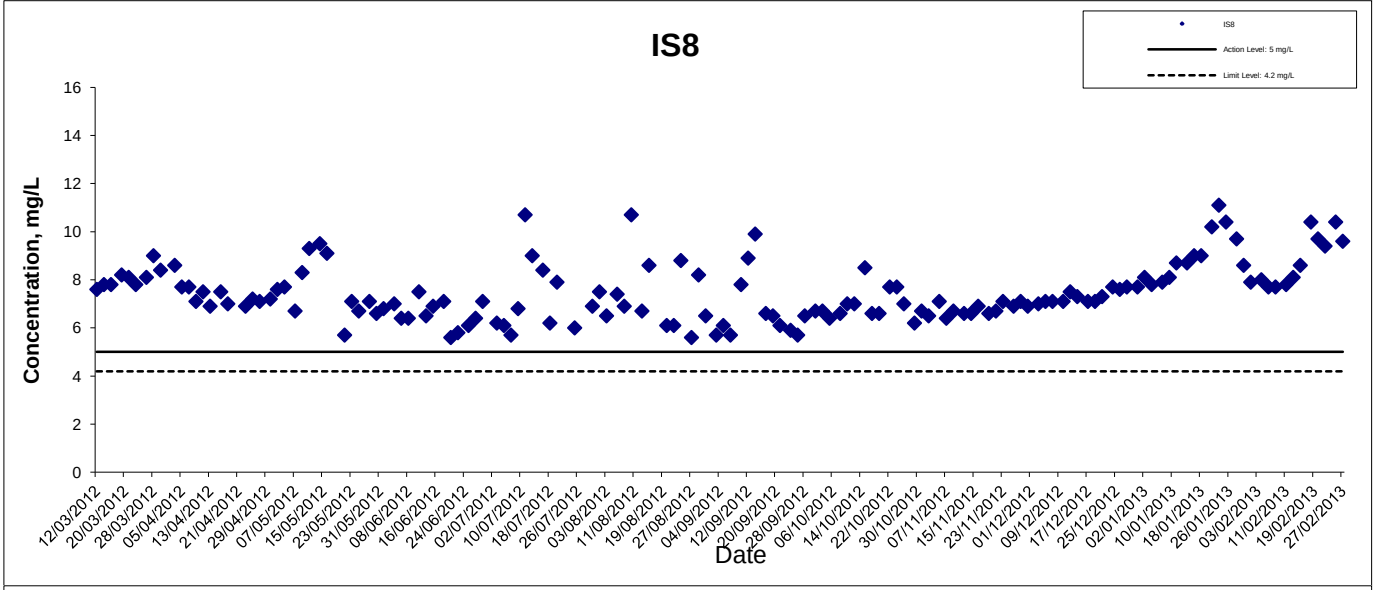


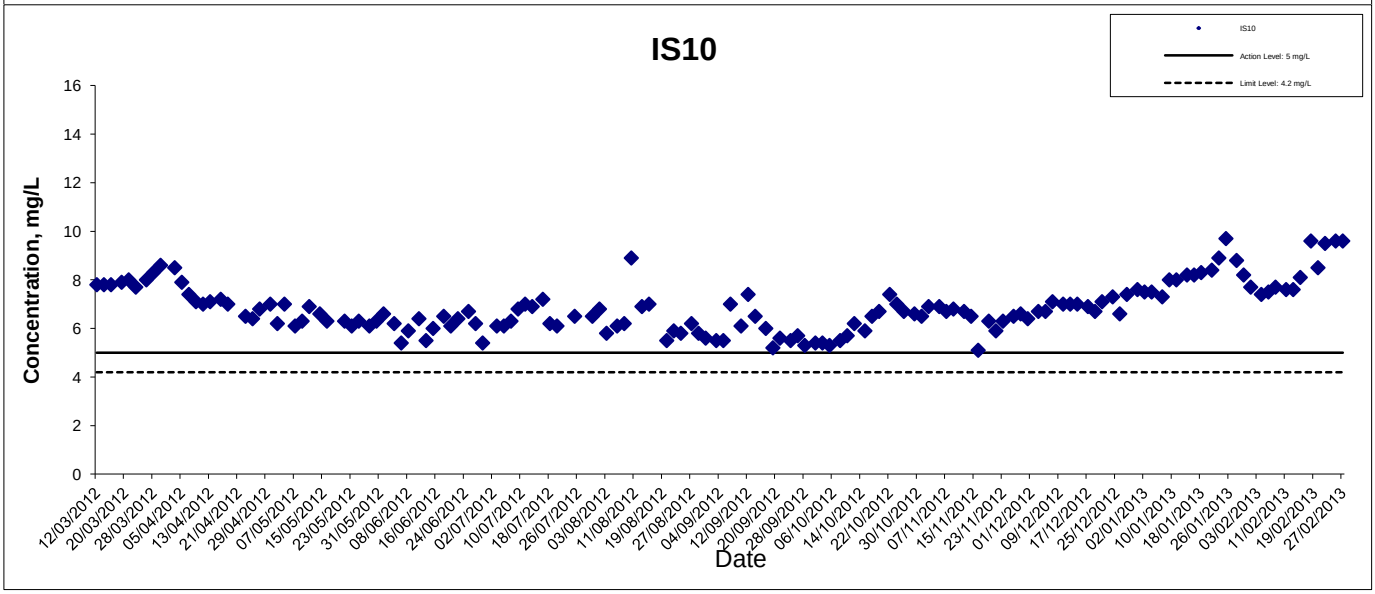




Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide







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HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

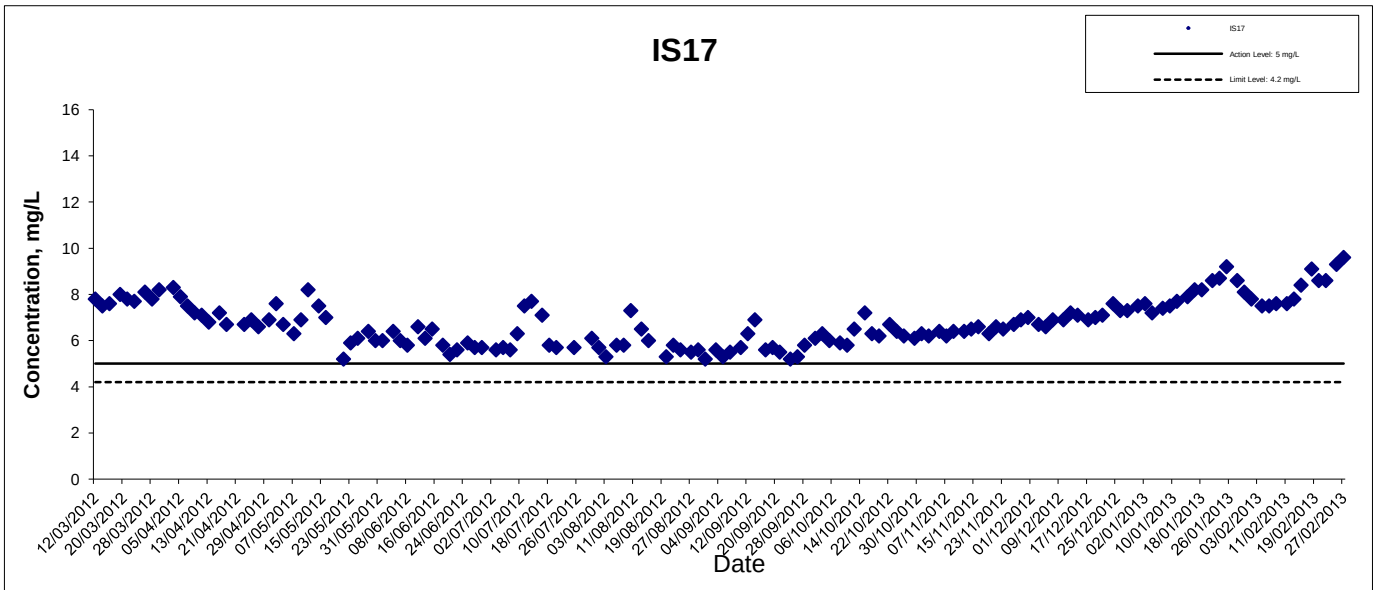
AECOM

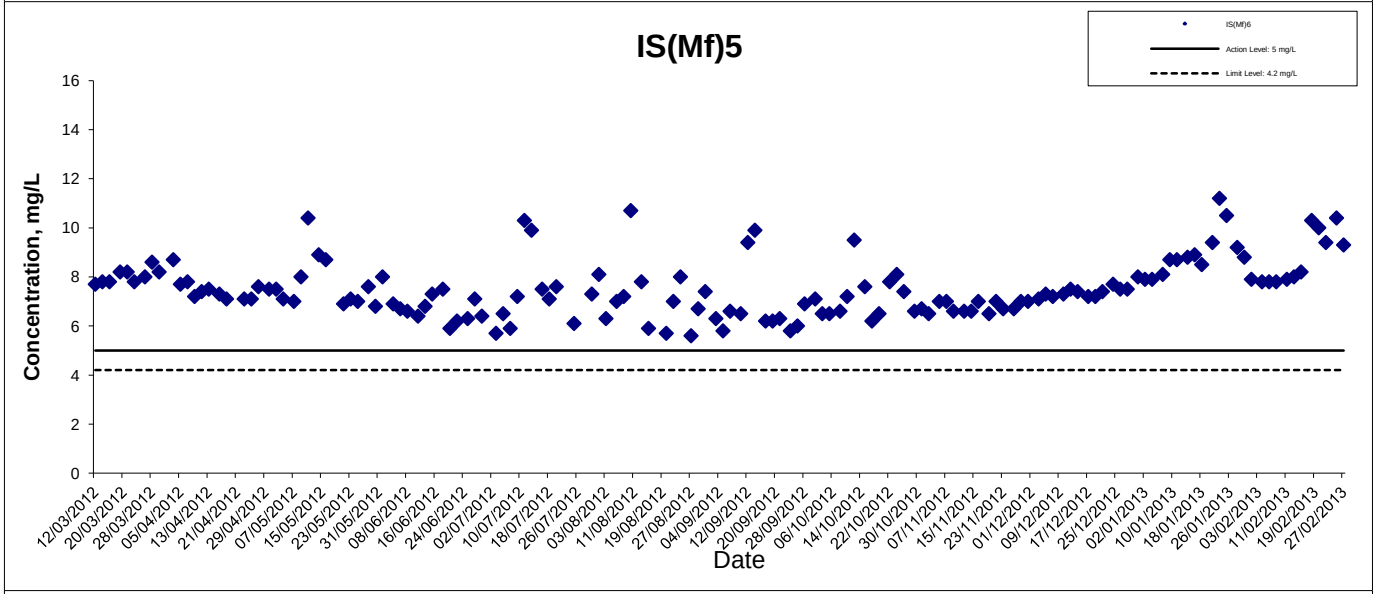
Graphical Presentation of Impact Water Quality Monitoring Results

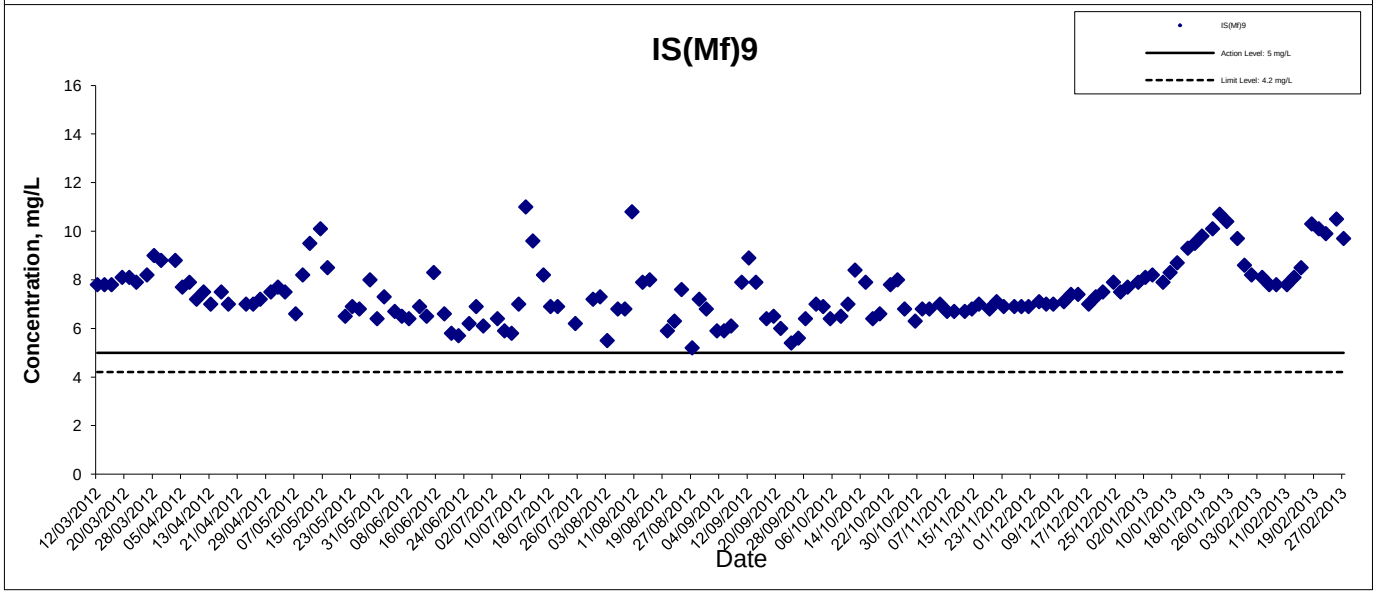
Project No.: 60249820 **Date: Apr 2013**

Appendix G

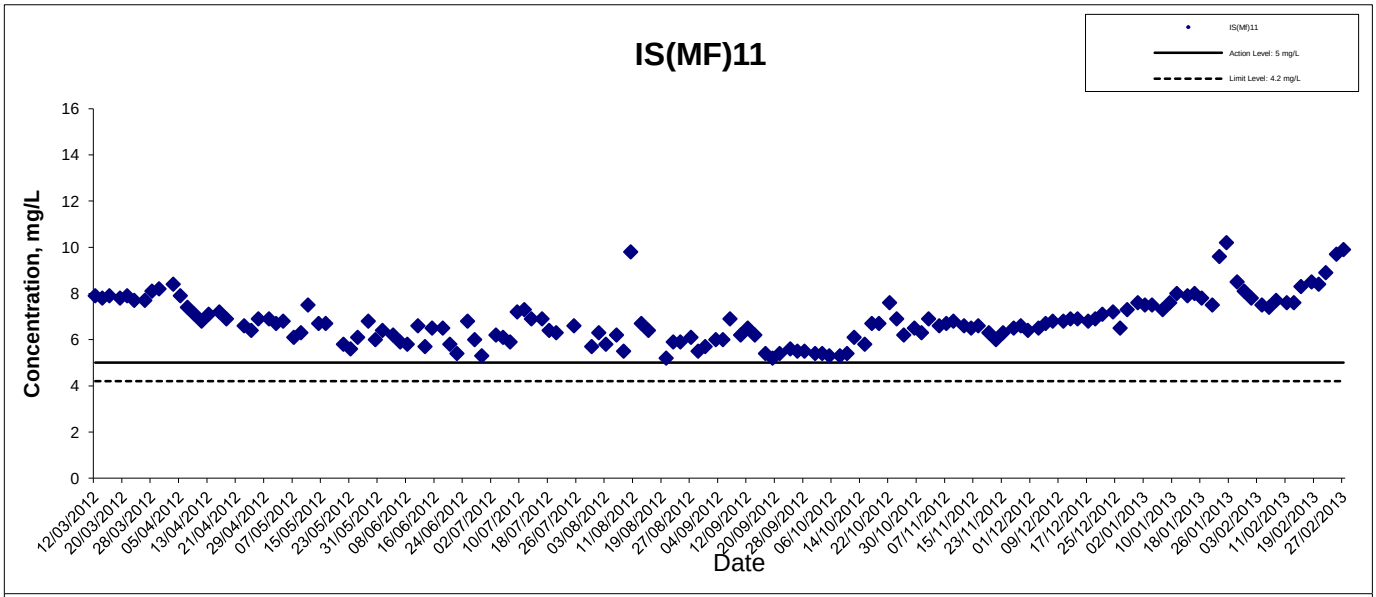
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

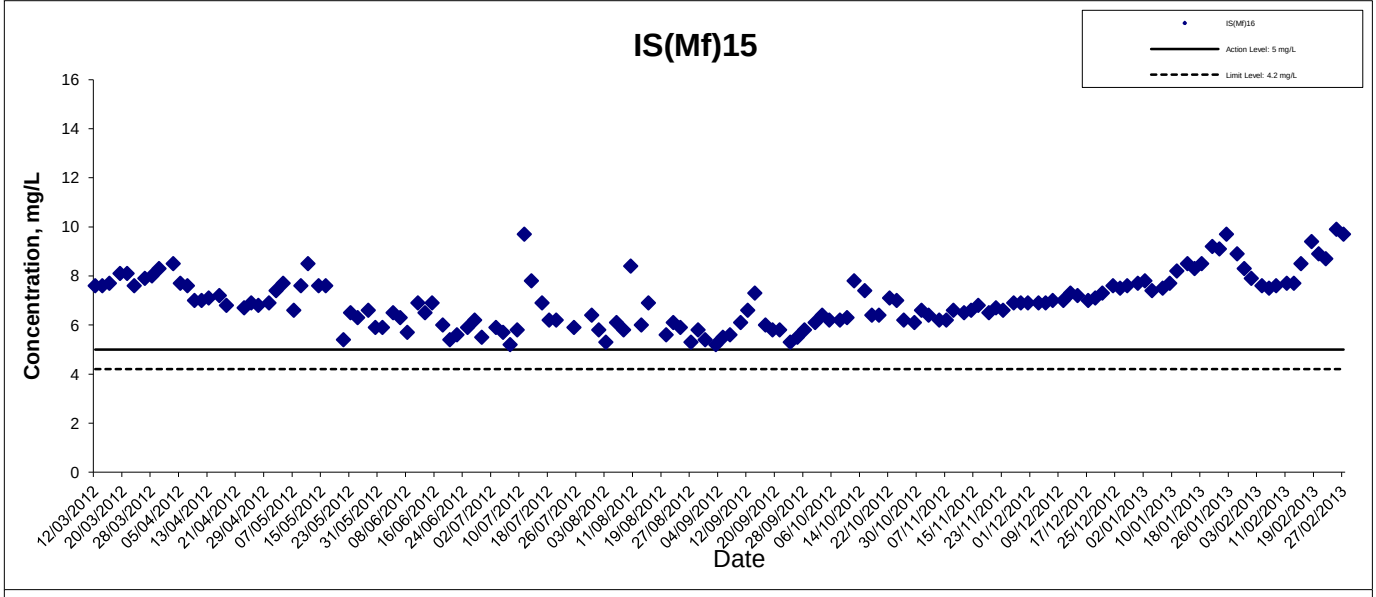


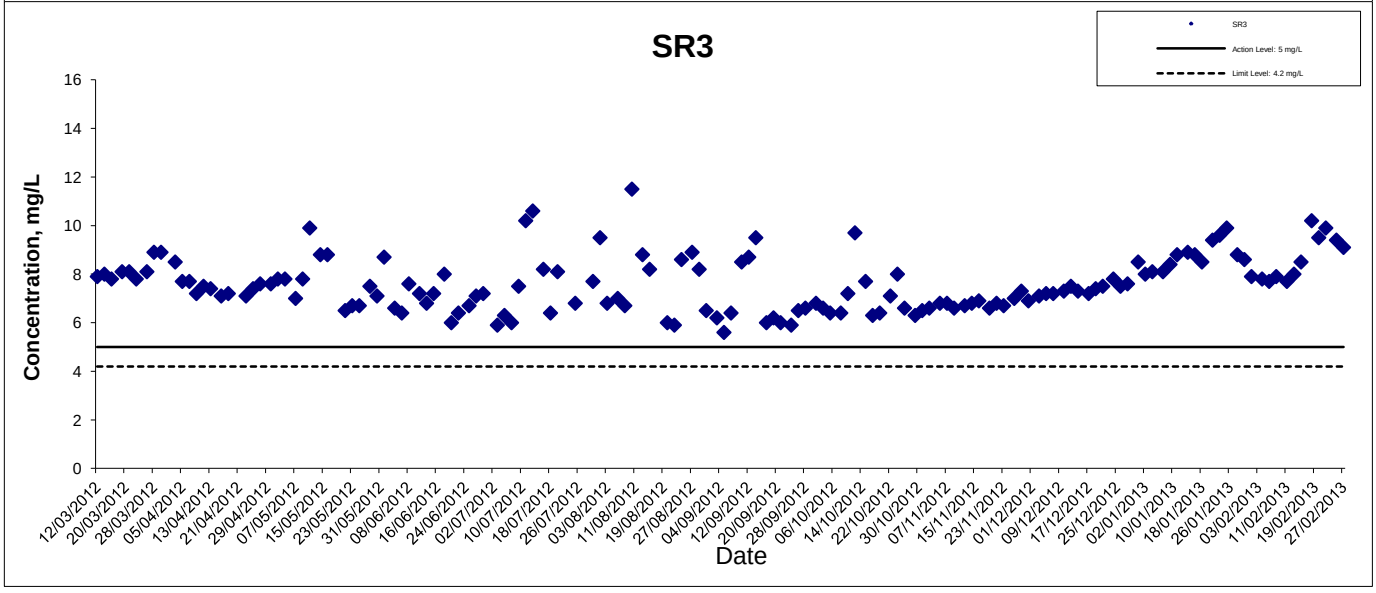




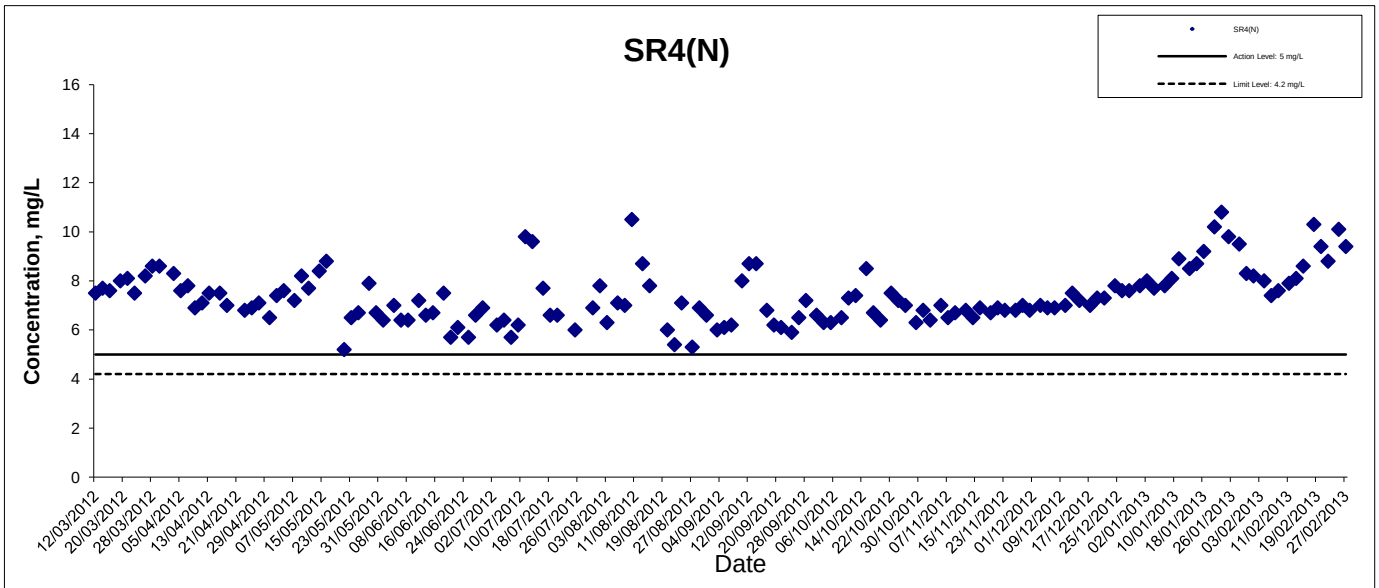
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

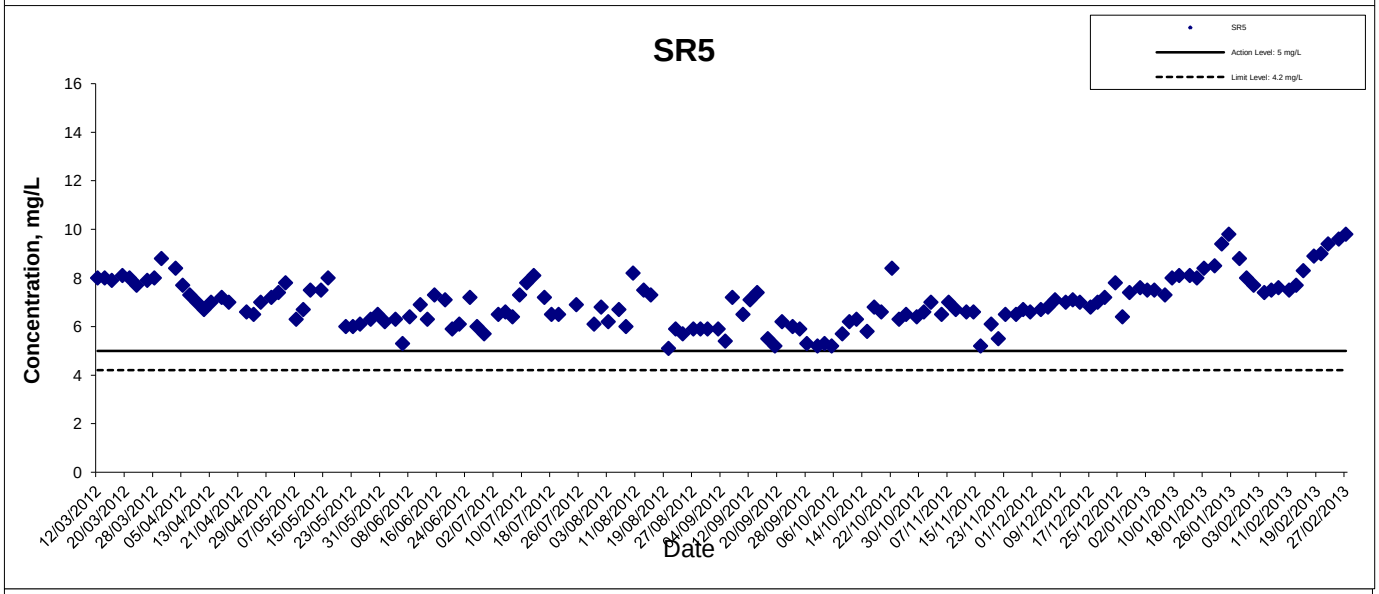


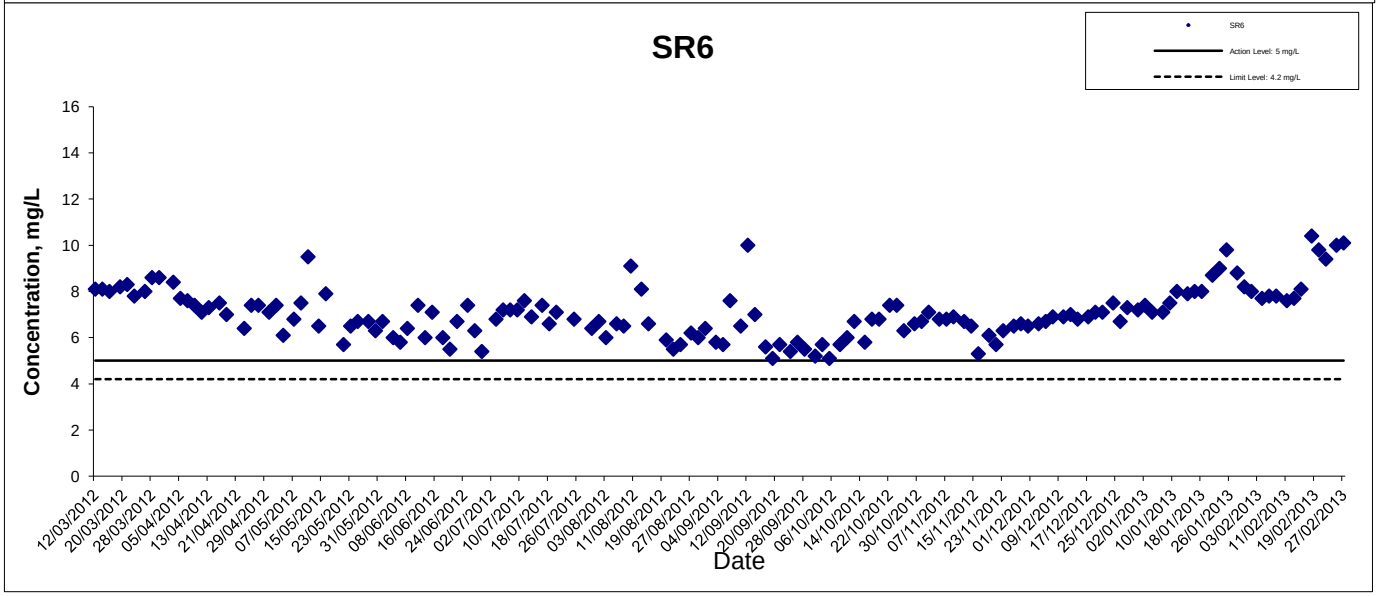




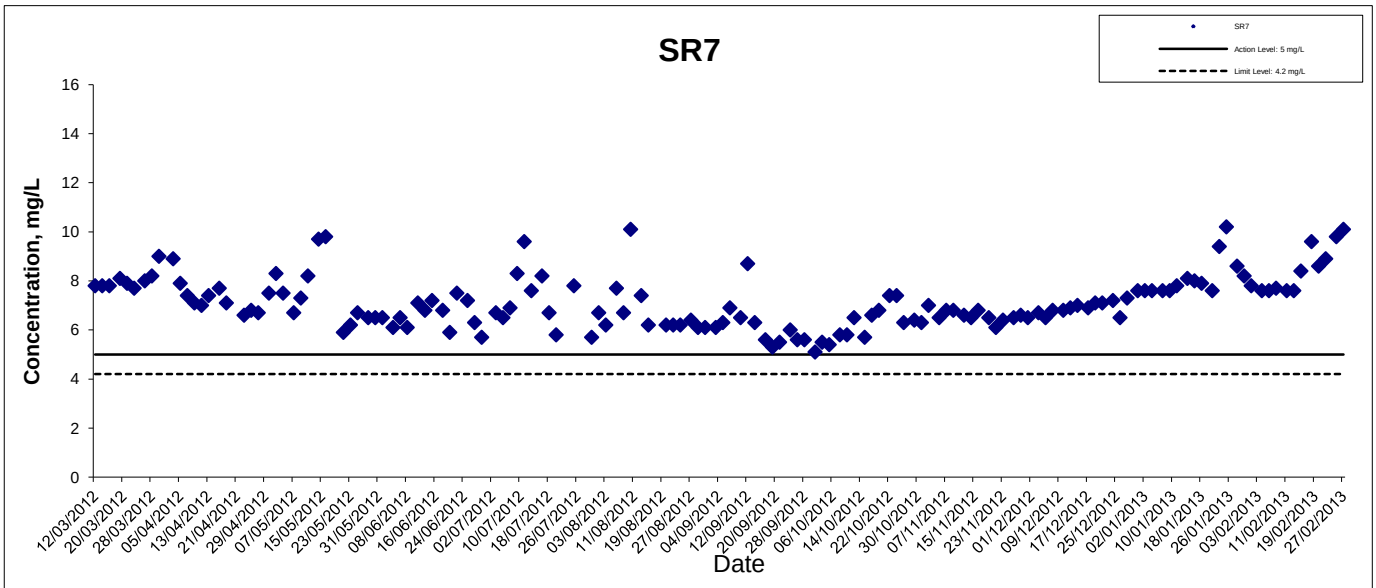
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

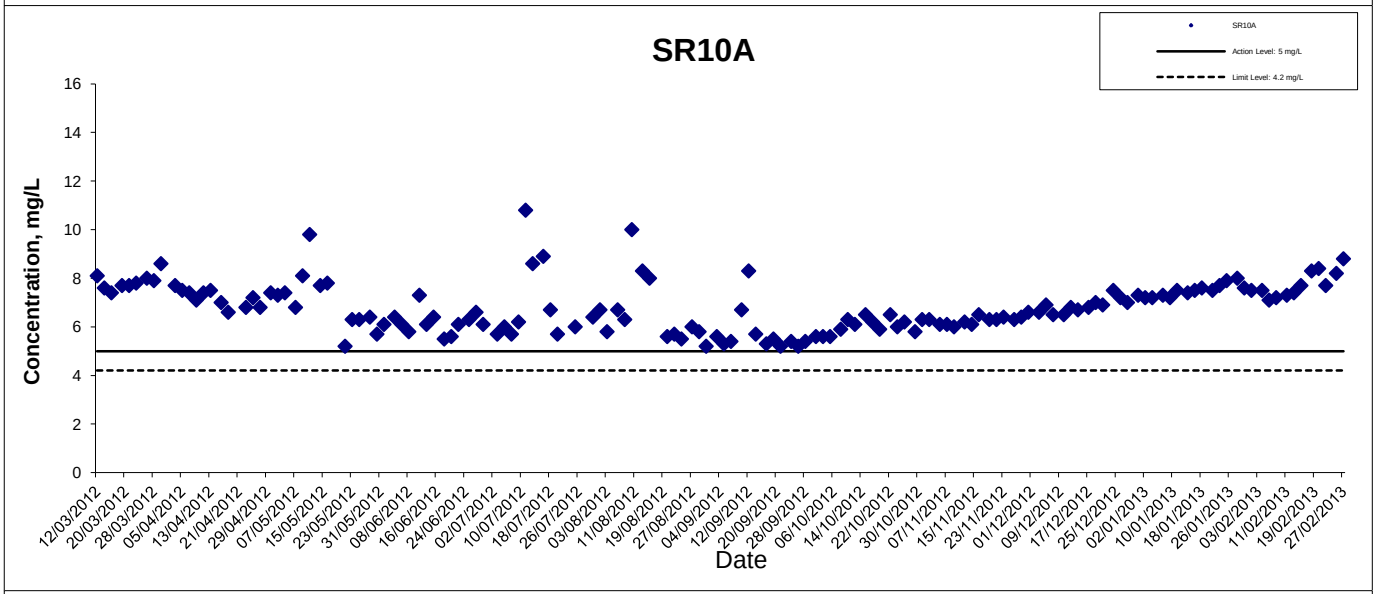


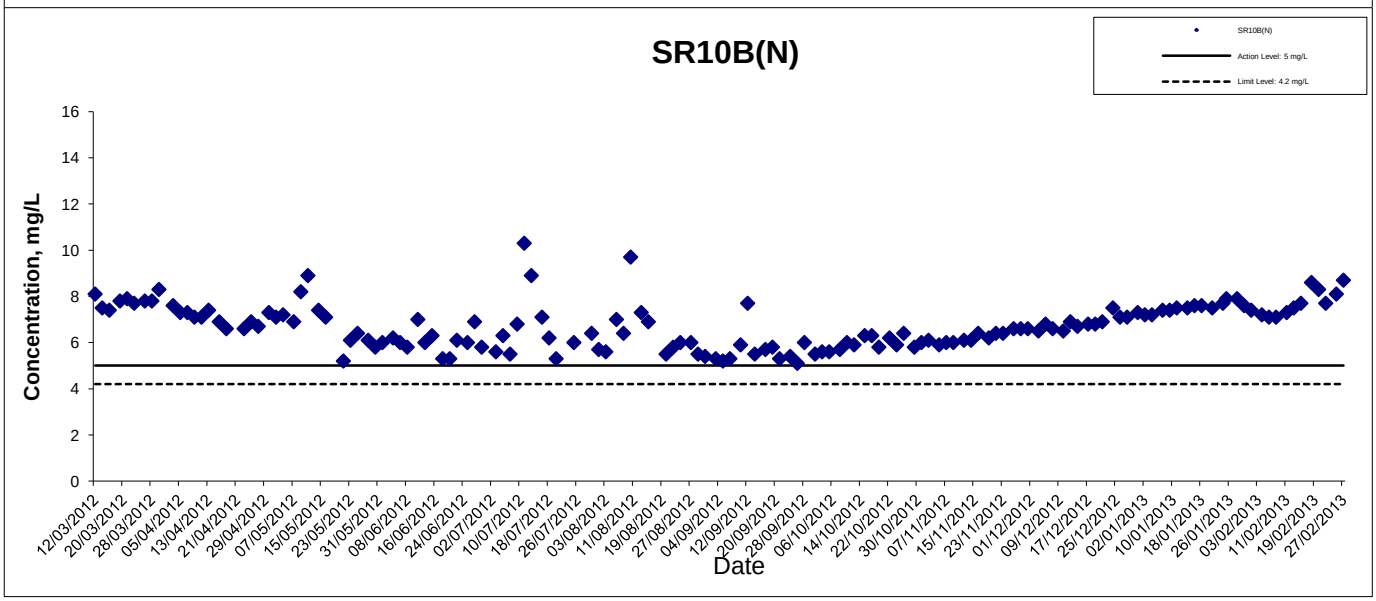




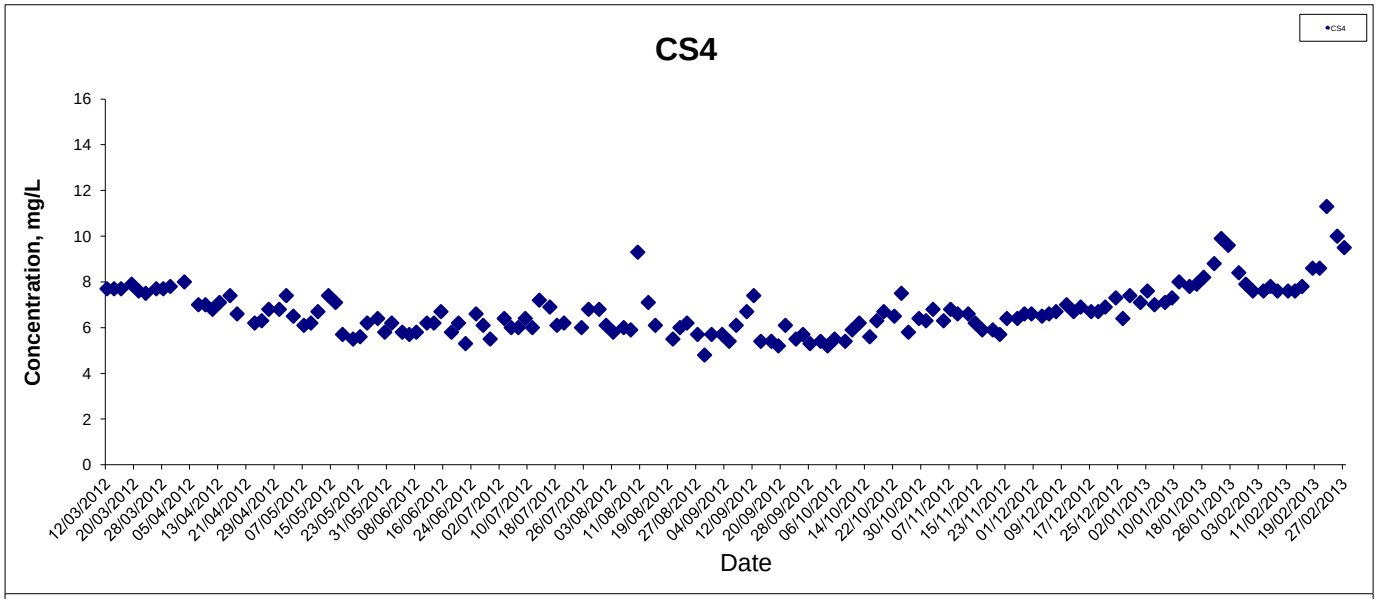
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

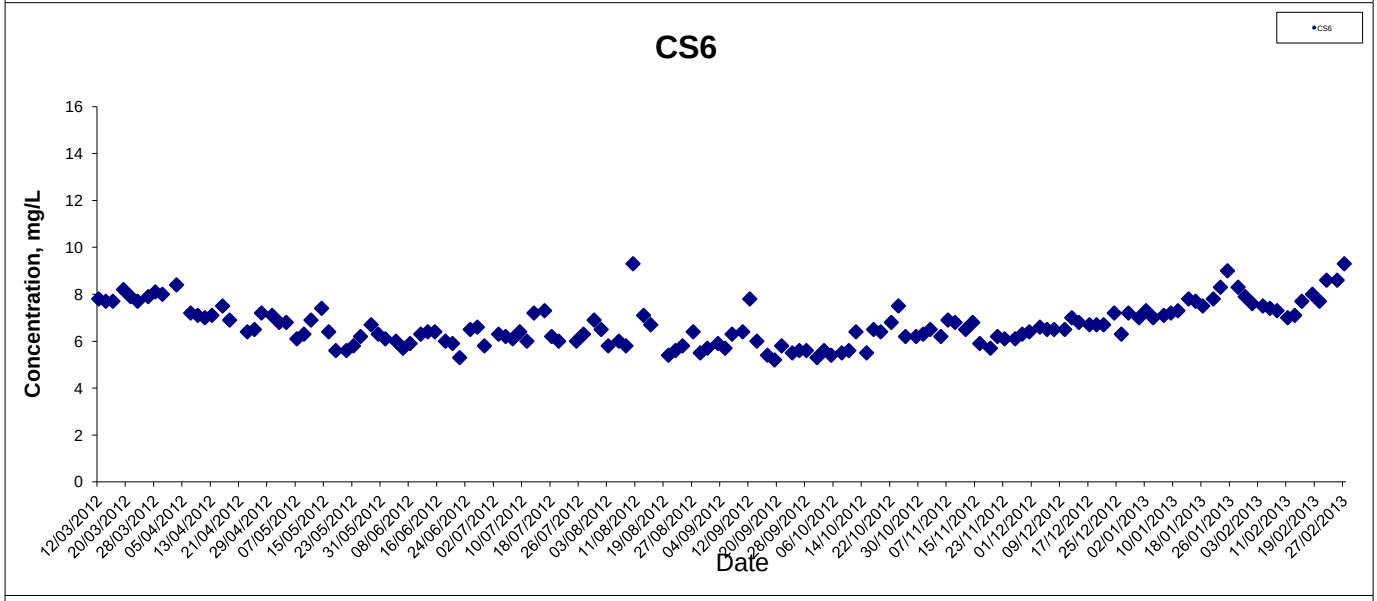


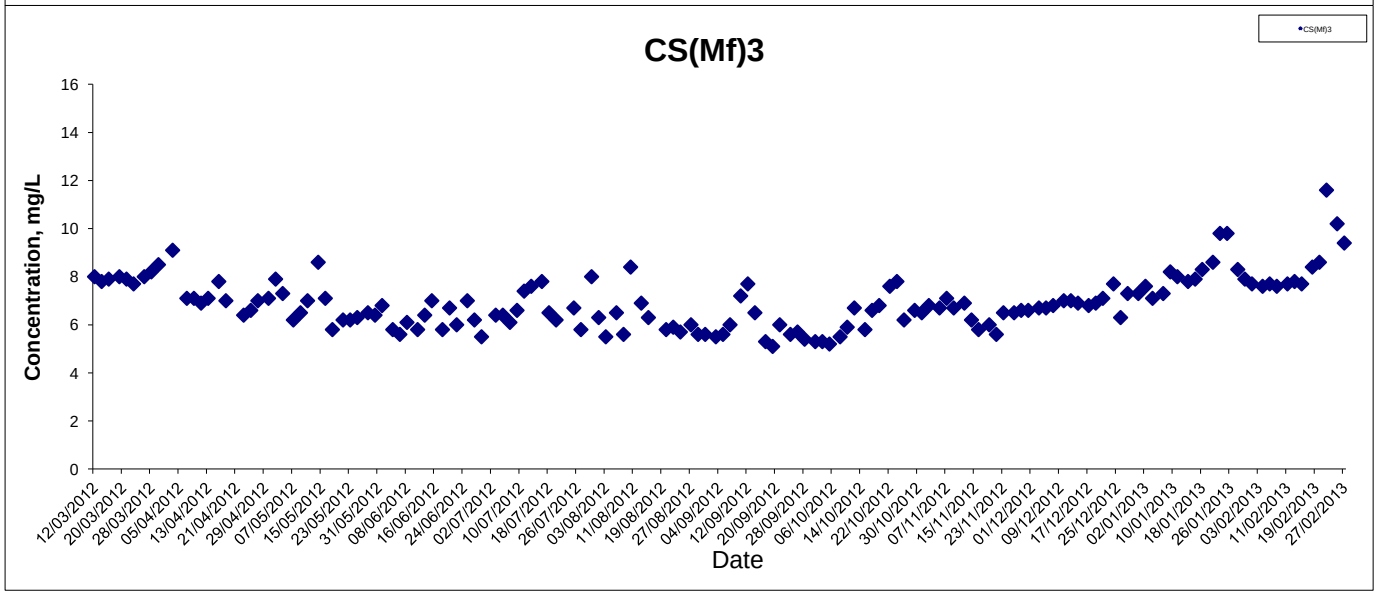




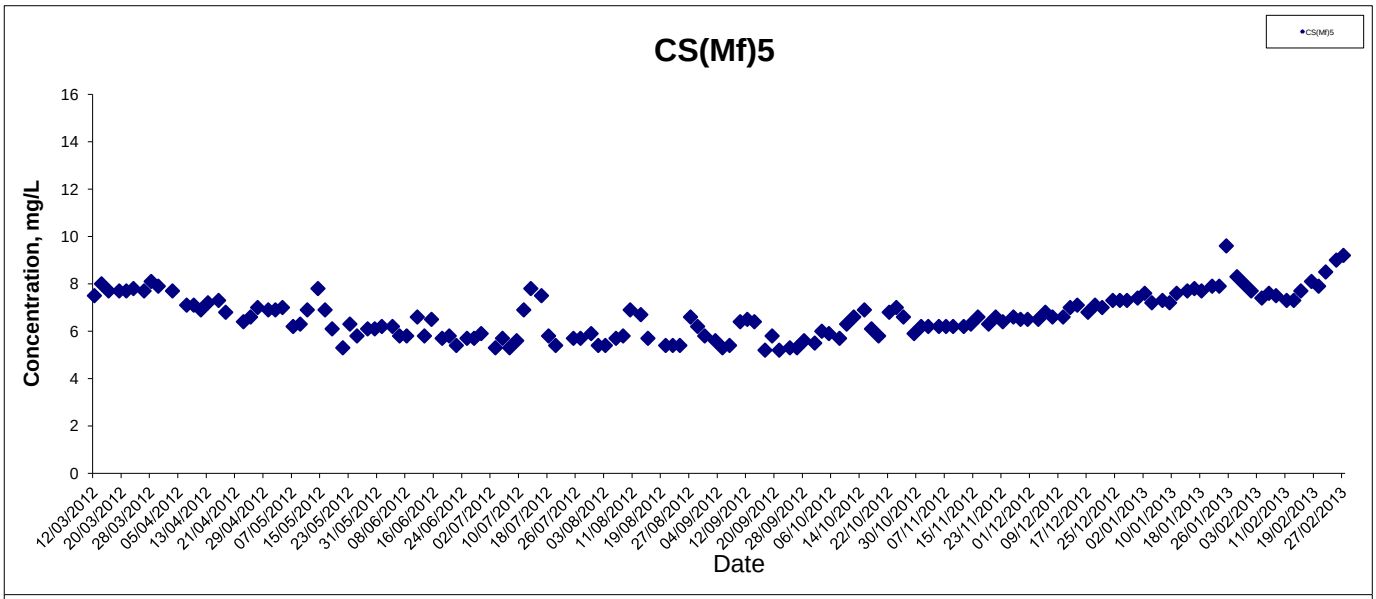
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

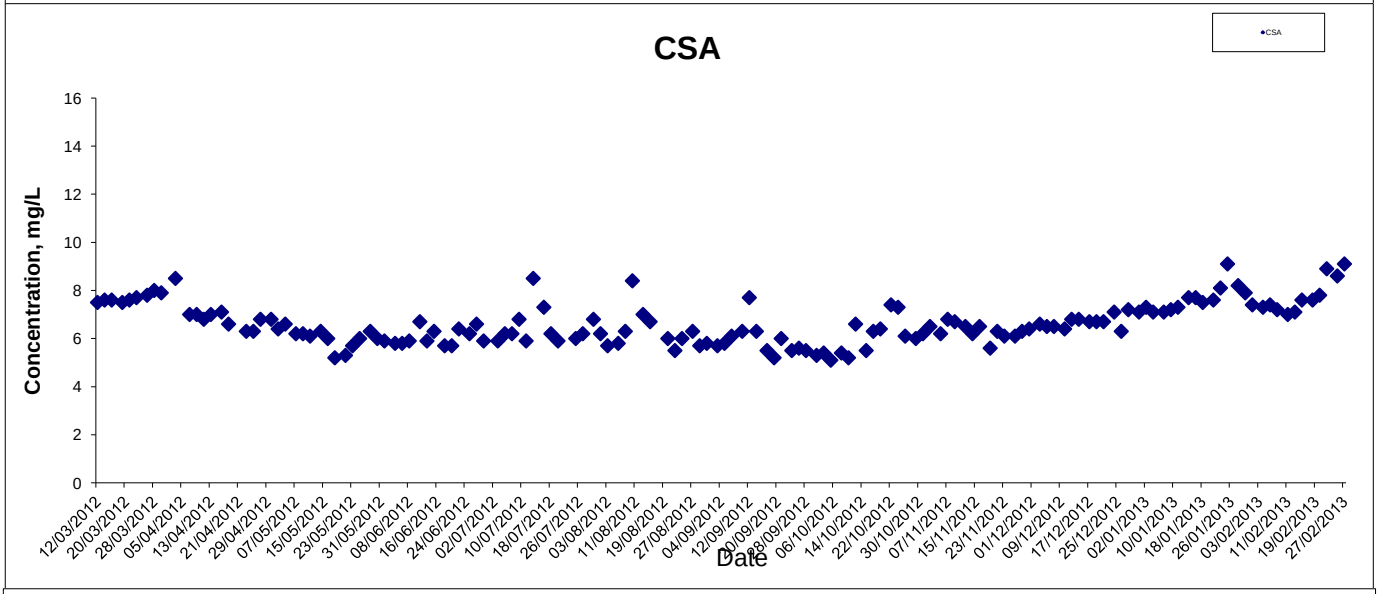


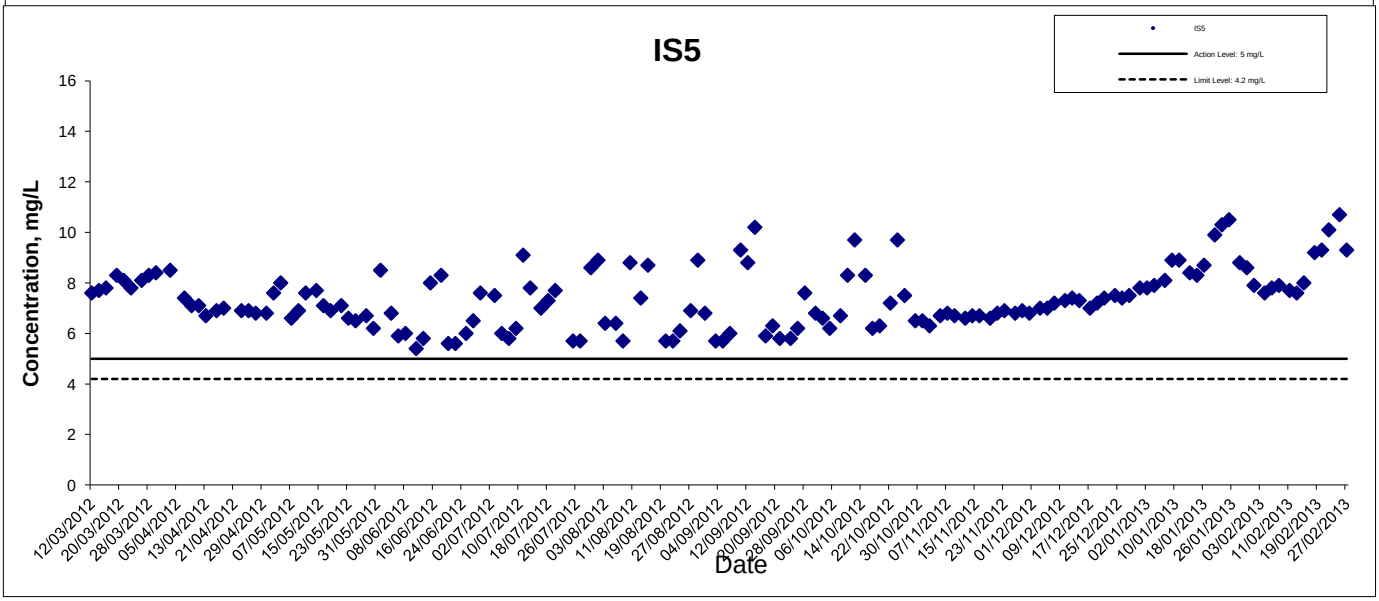




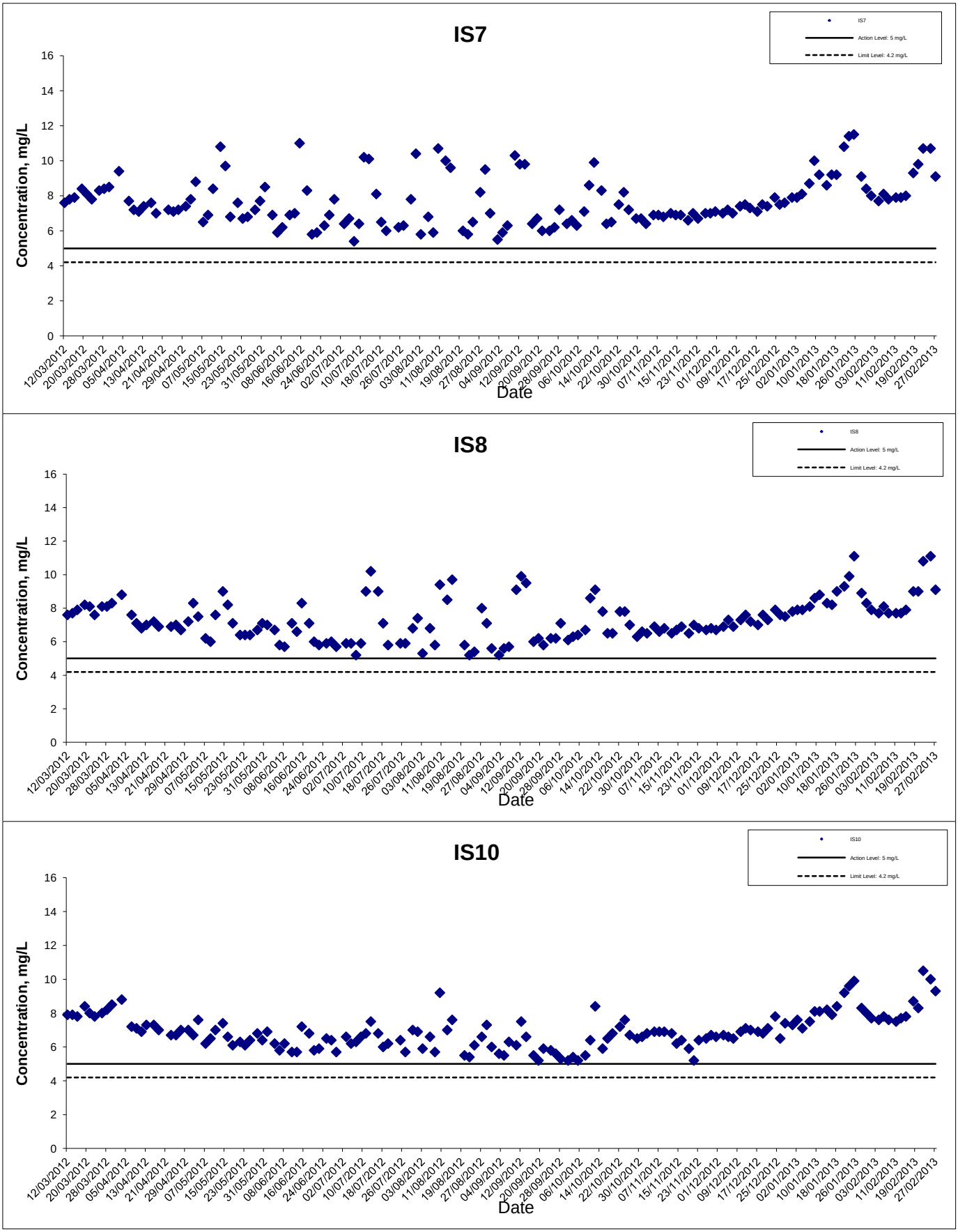
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



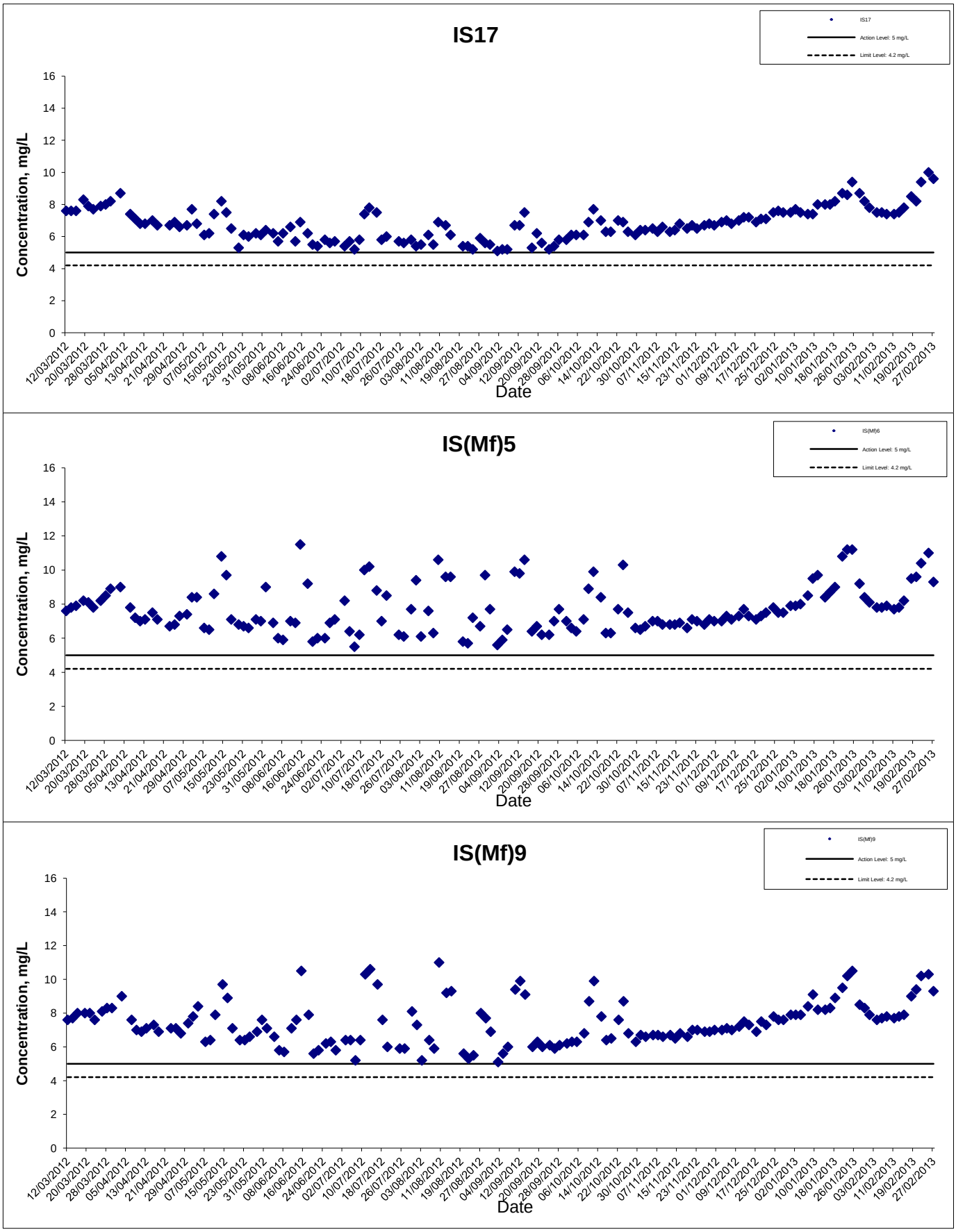




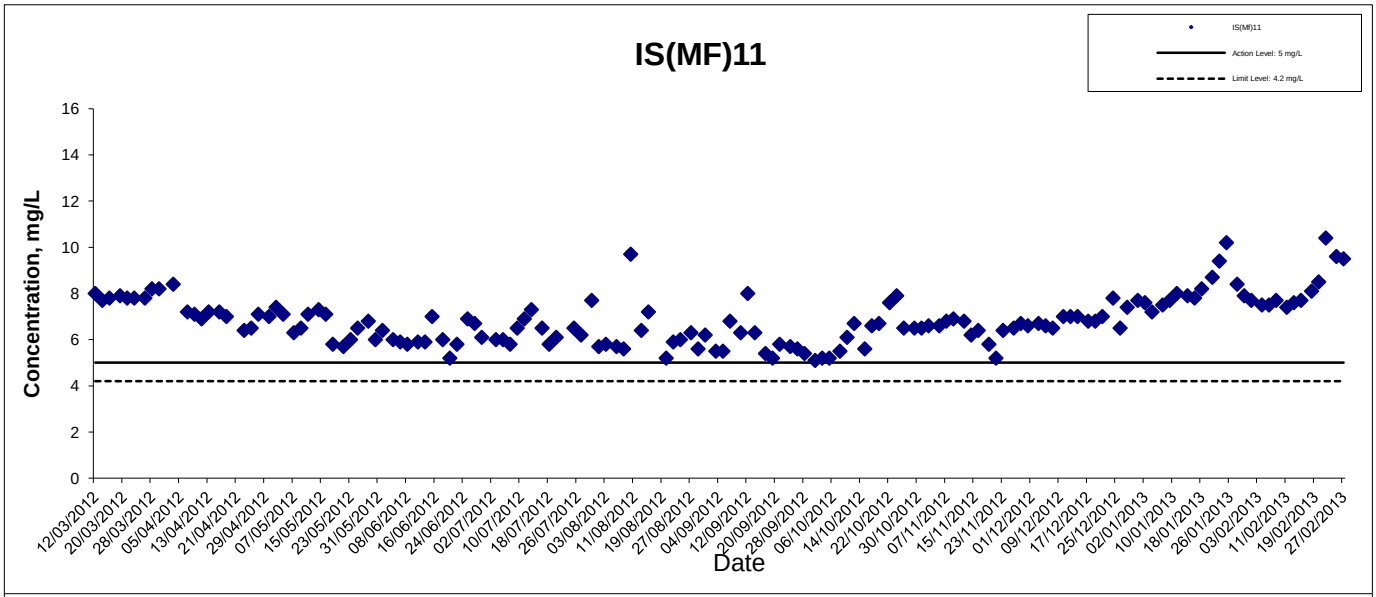
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

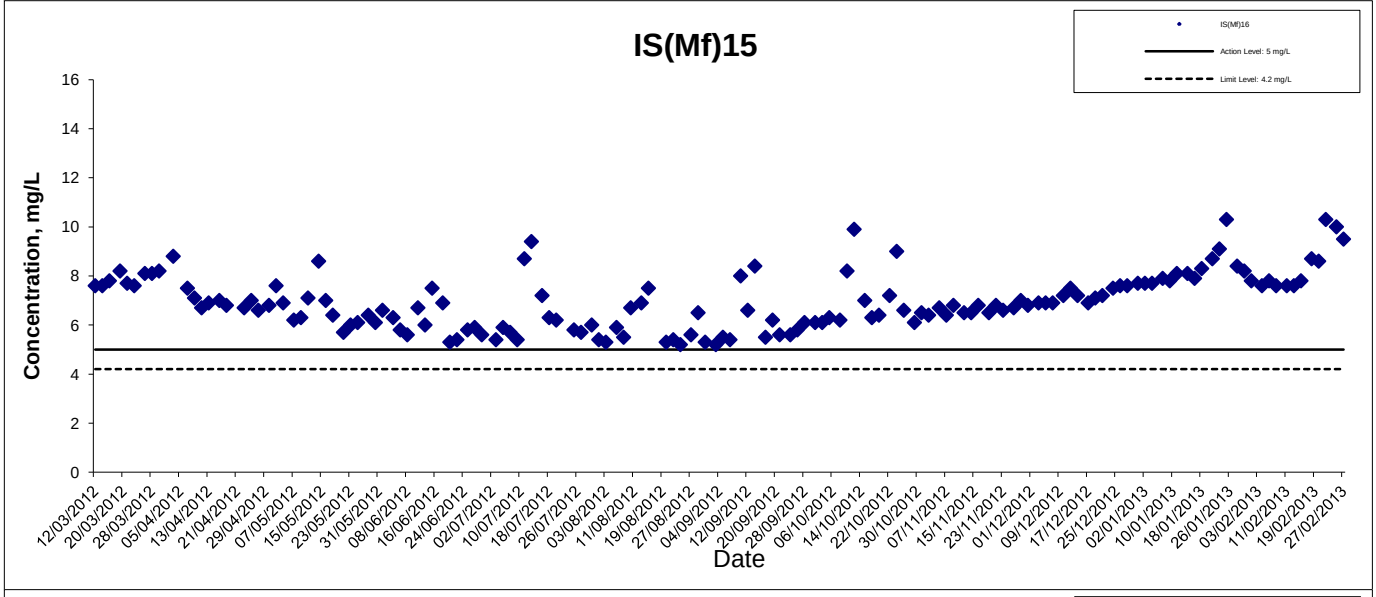


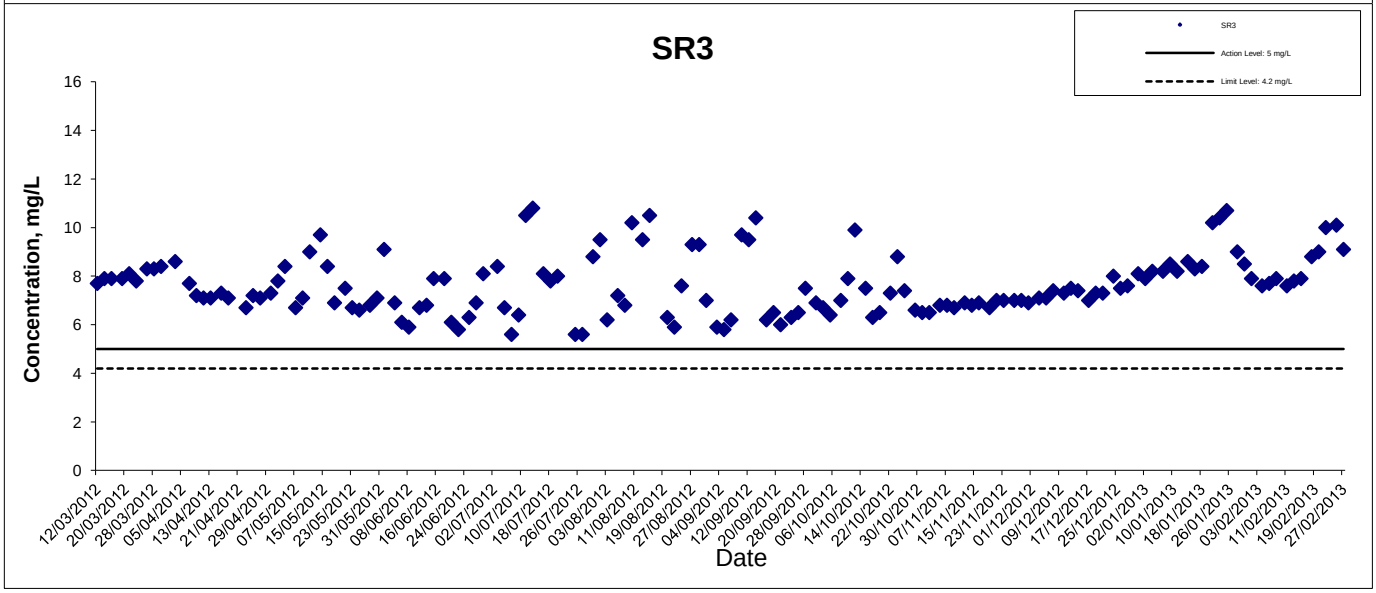
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



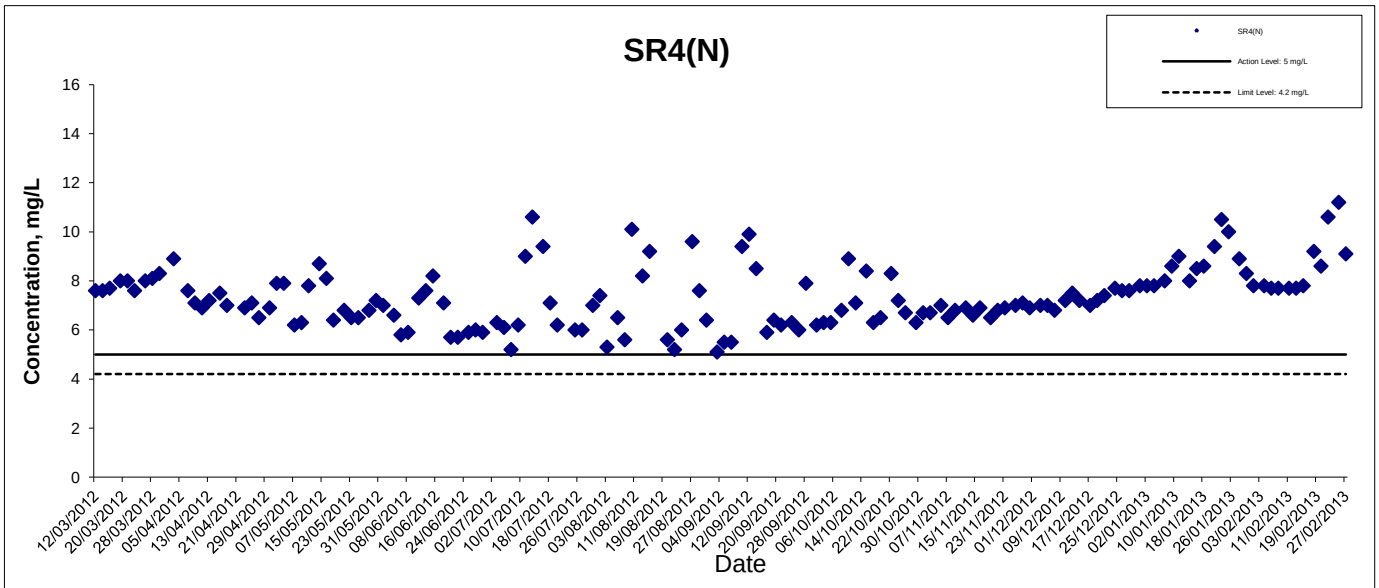
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

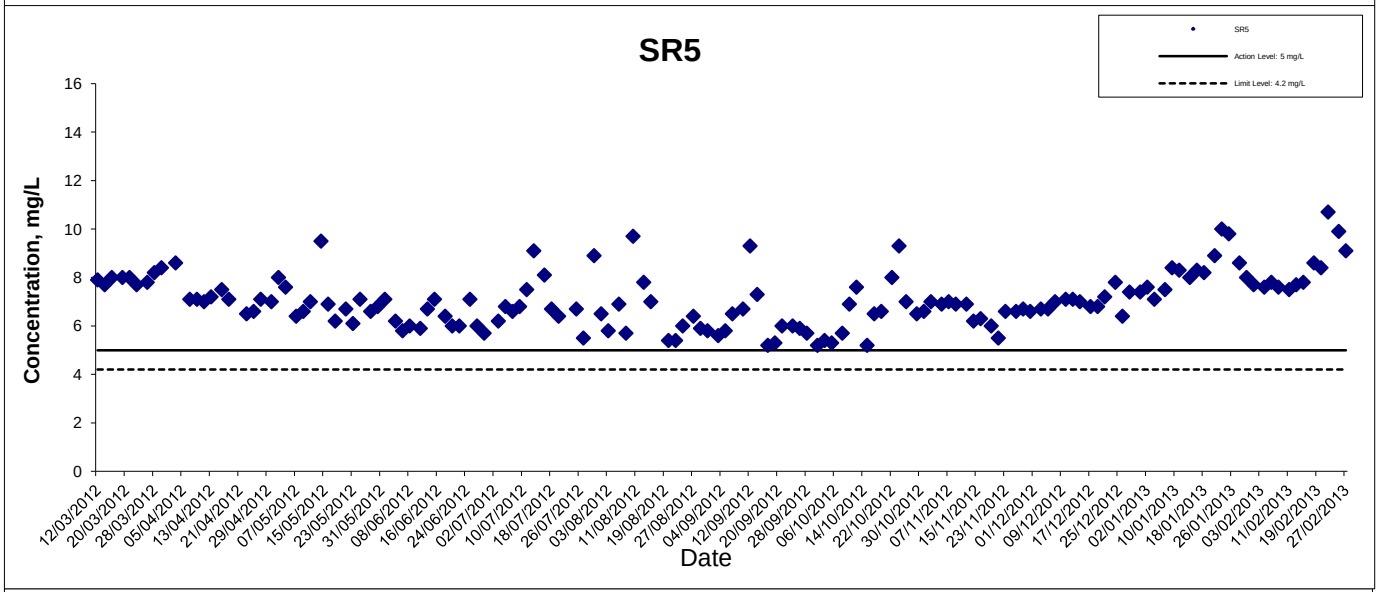


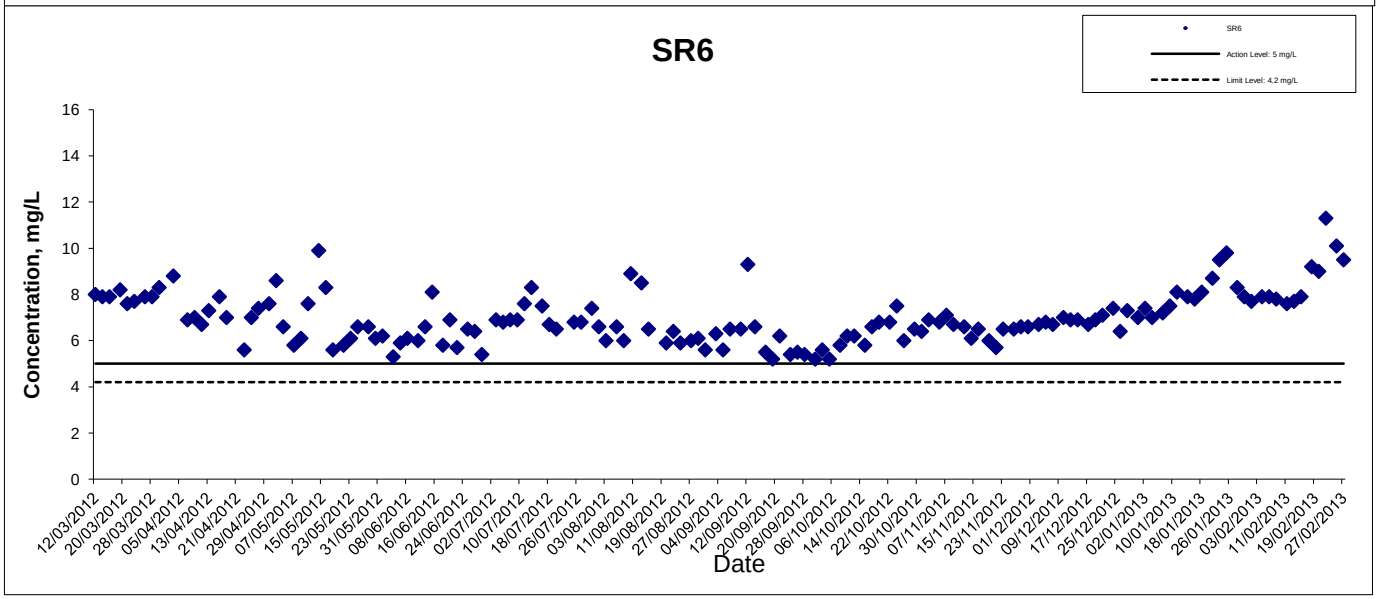




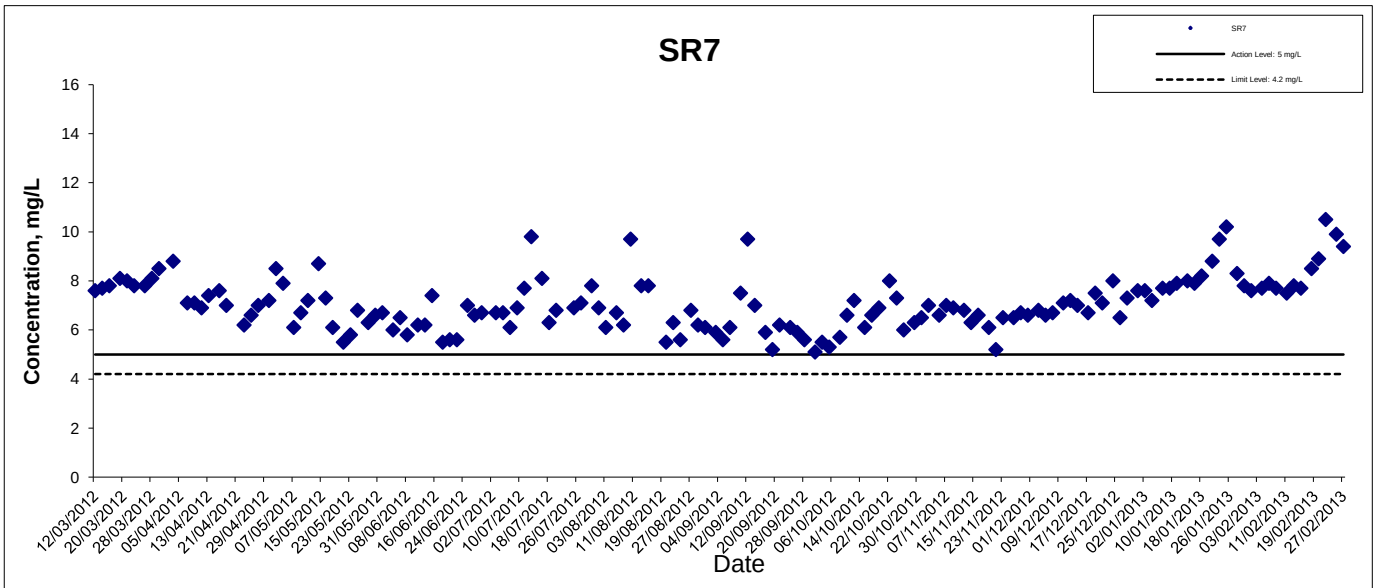
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

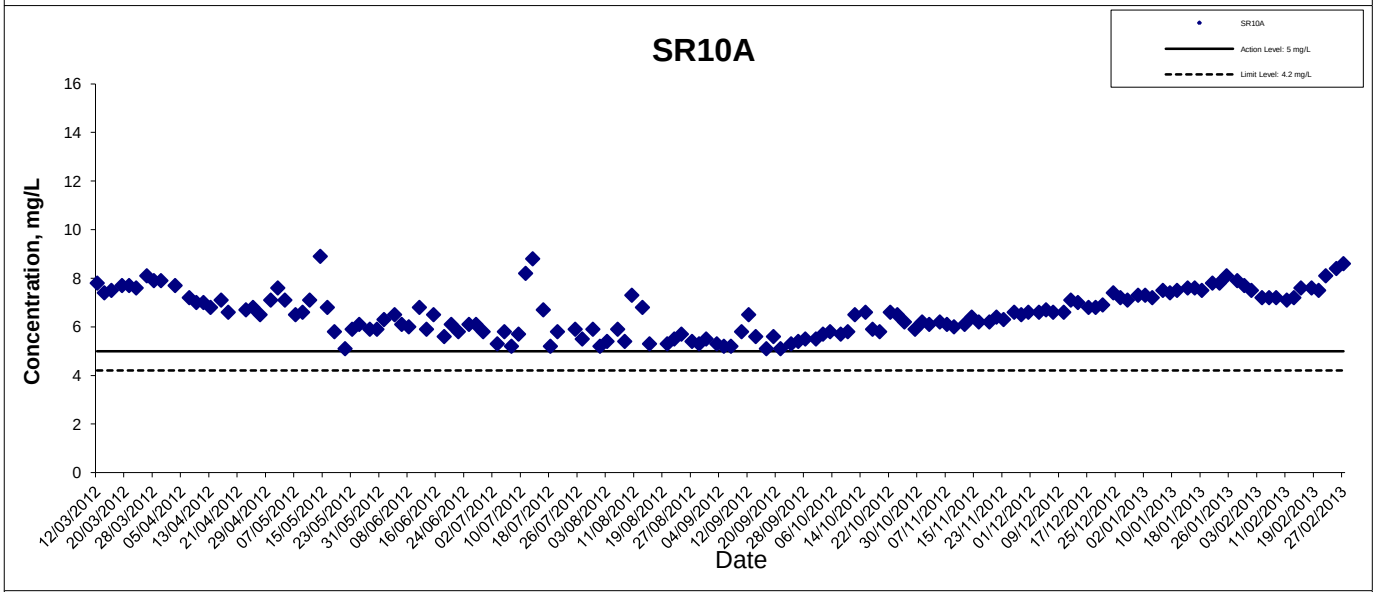


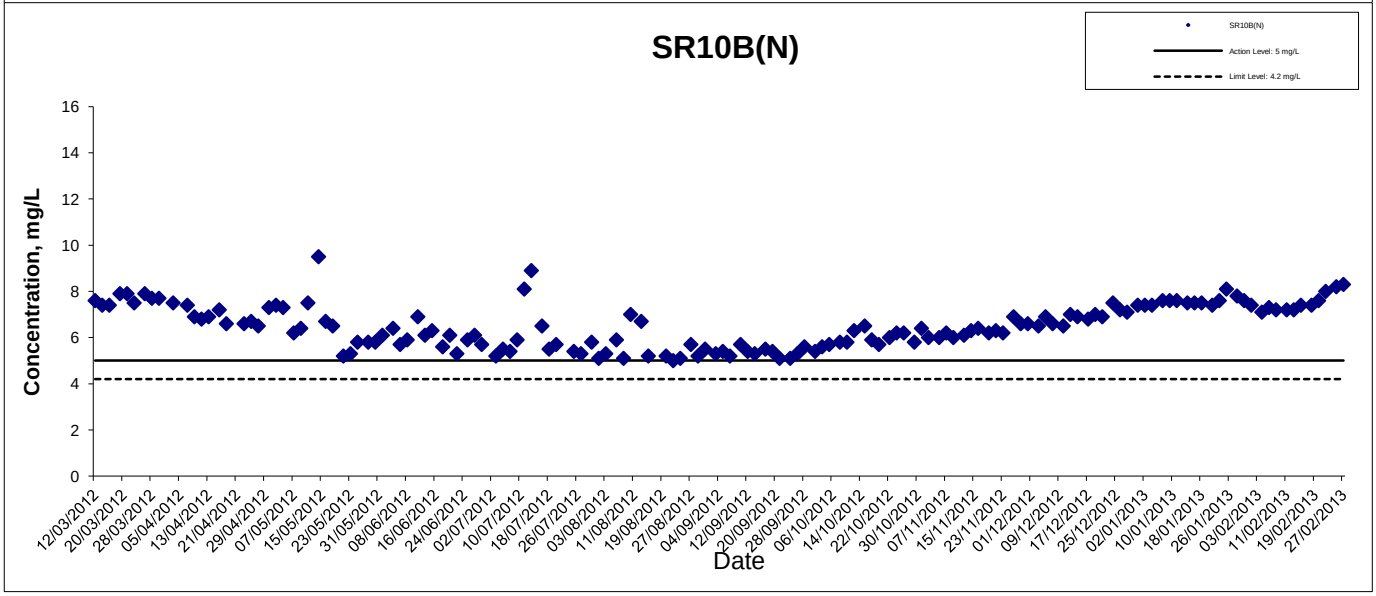




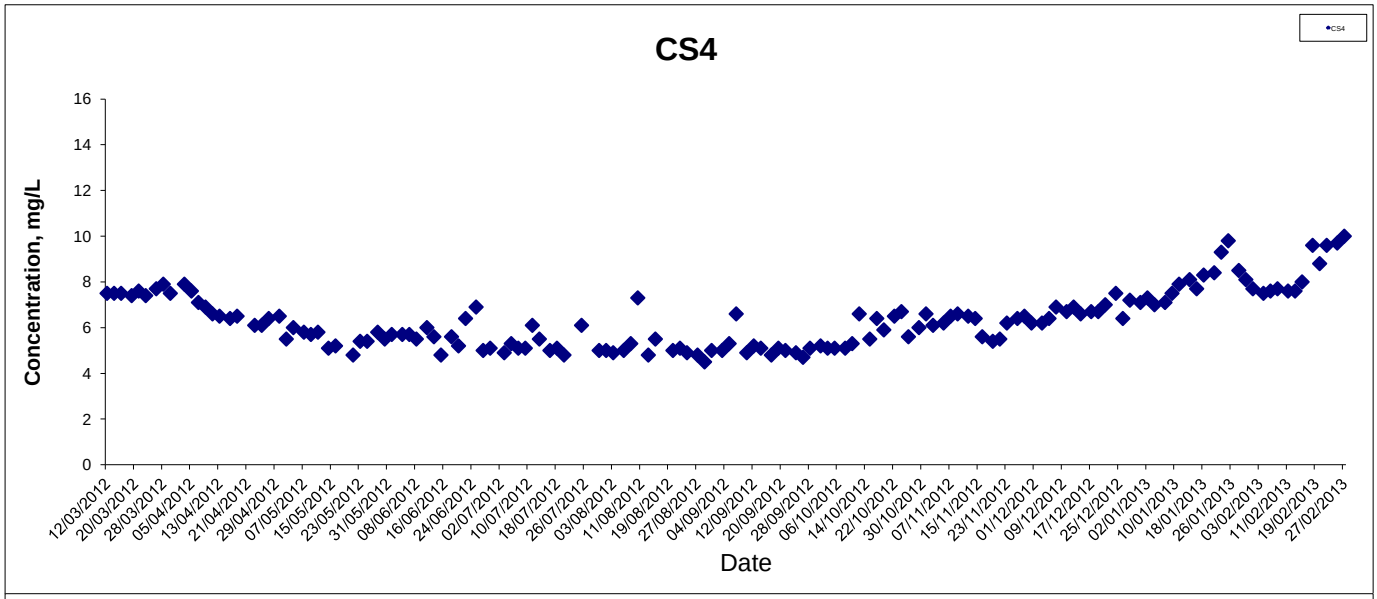
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

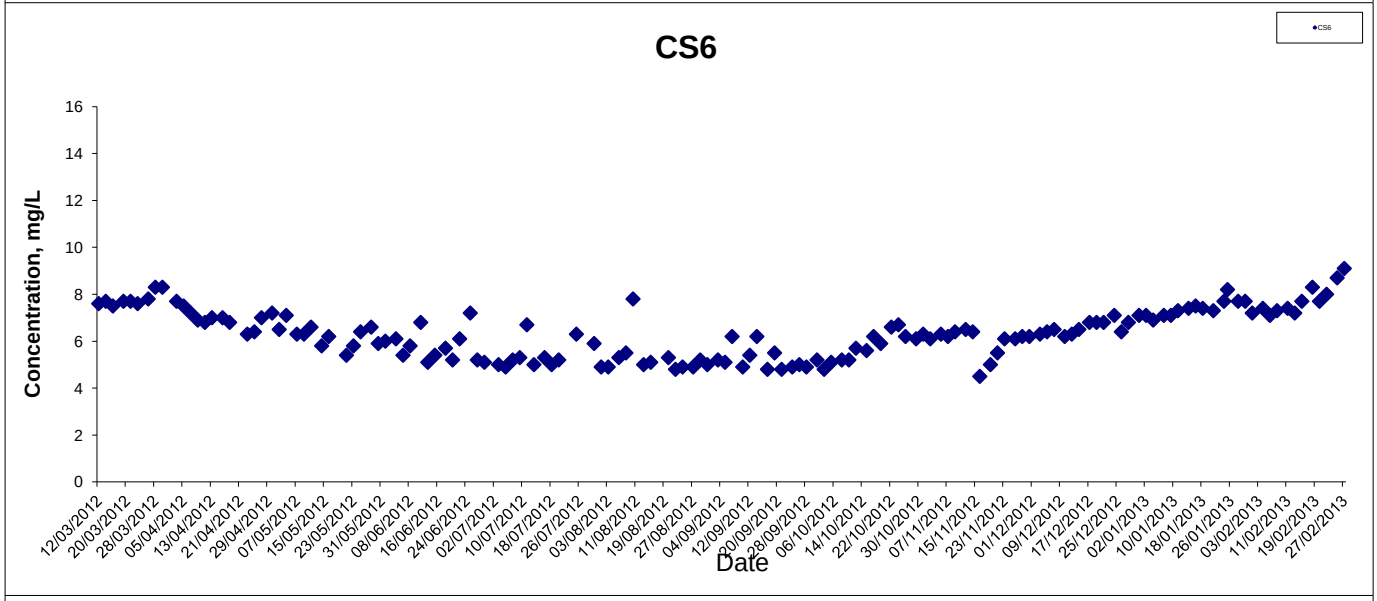


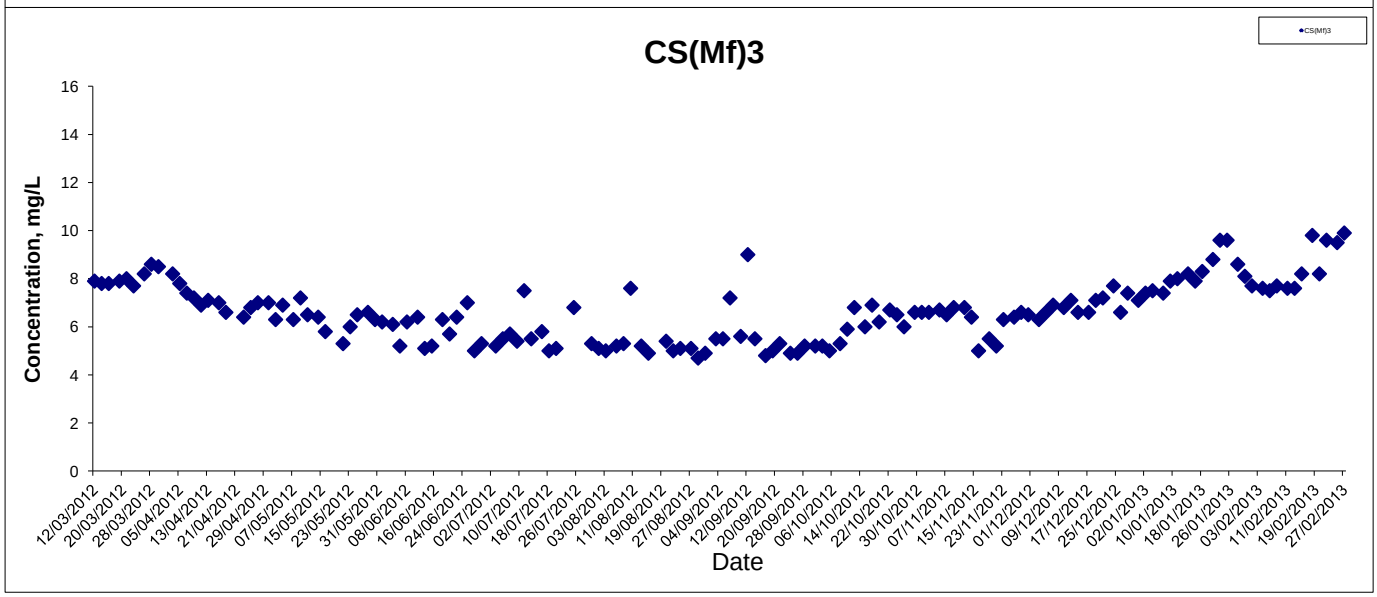




Dissolved Oxygen (Bottom) at Mid-Ebb Tide







HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

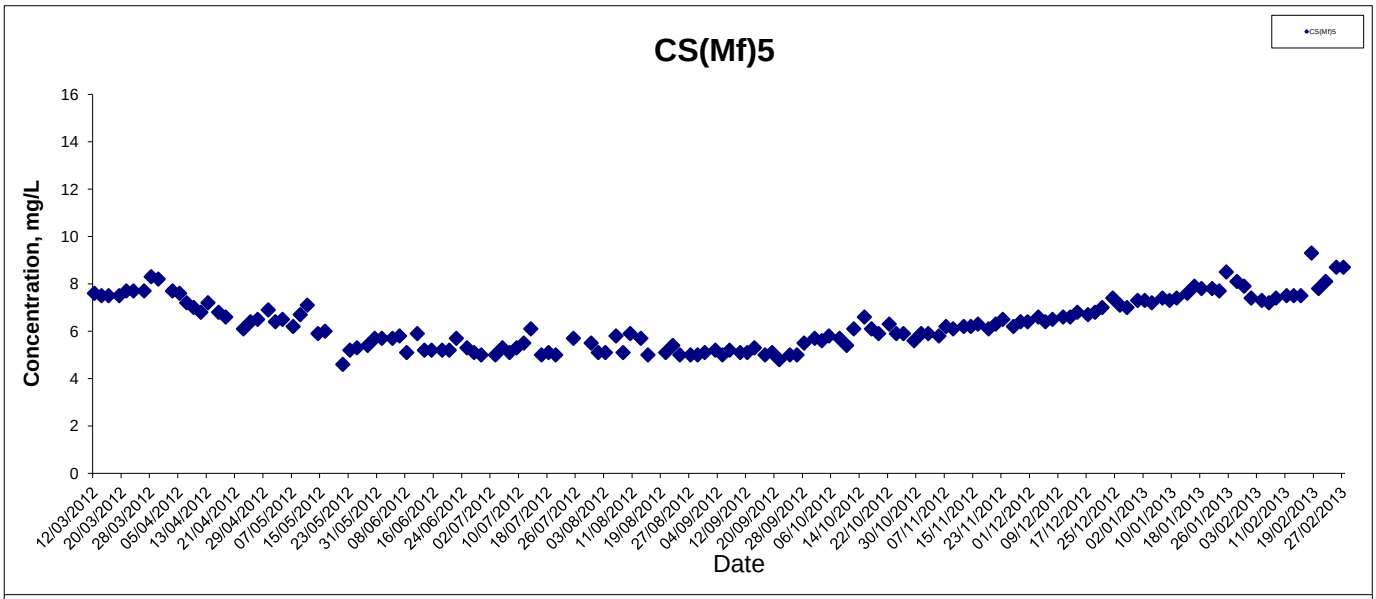
AECOM

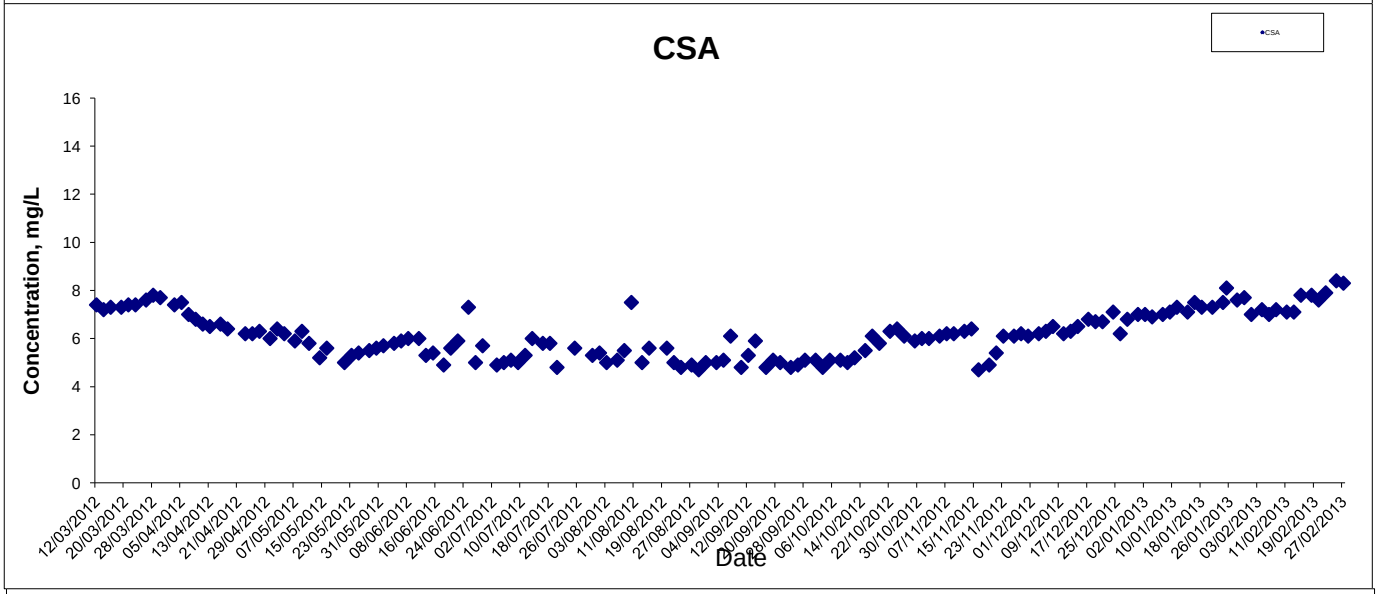
Graphical Presentation of Impact Water Quality Monitoring Results

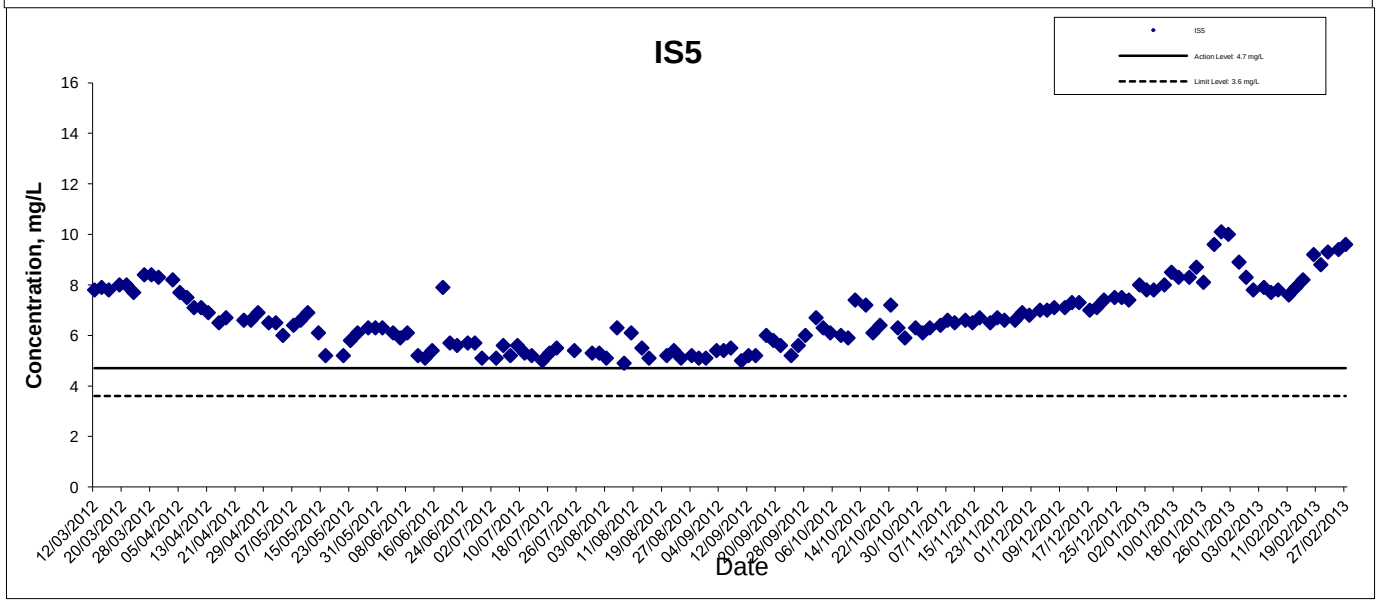
Project No.: 60249820 Date: Apr 2013

Appendix G

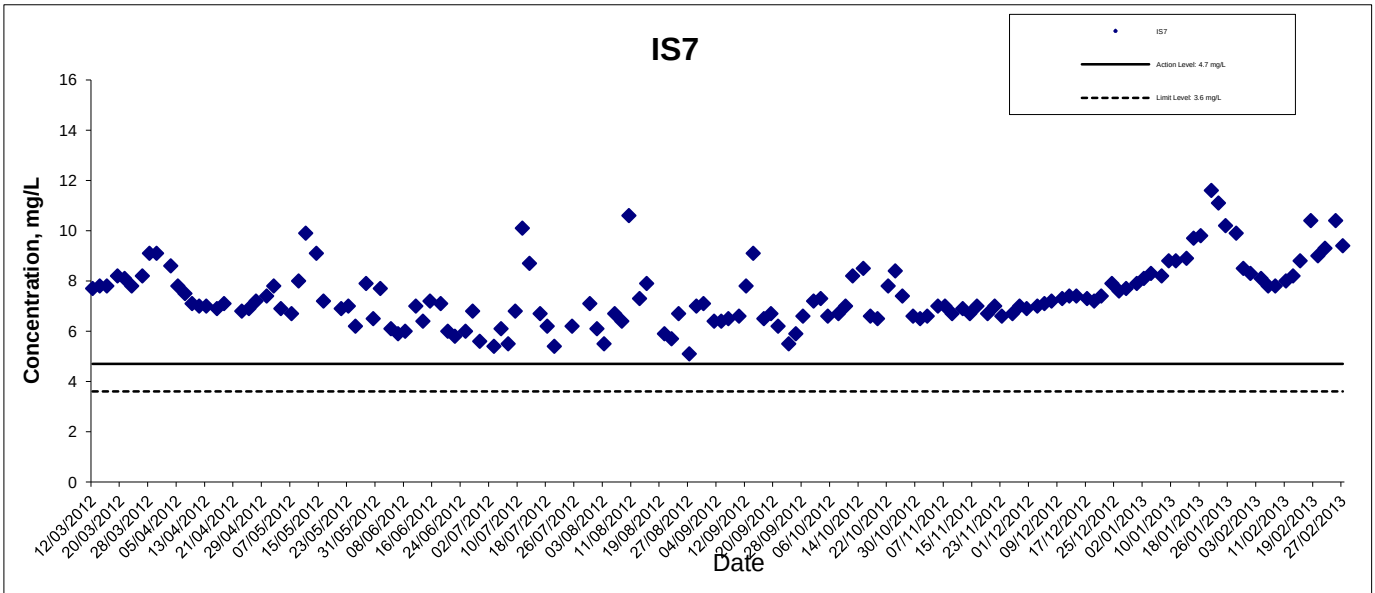
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

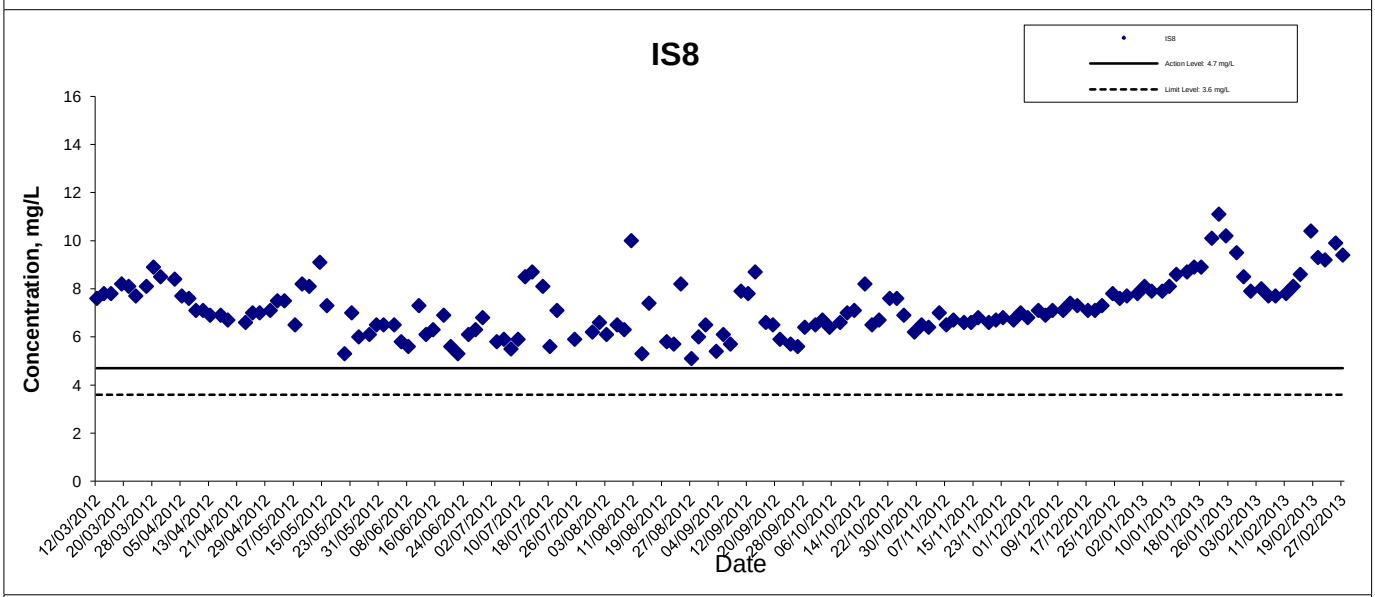


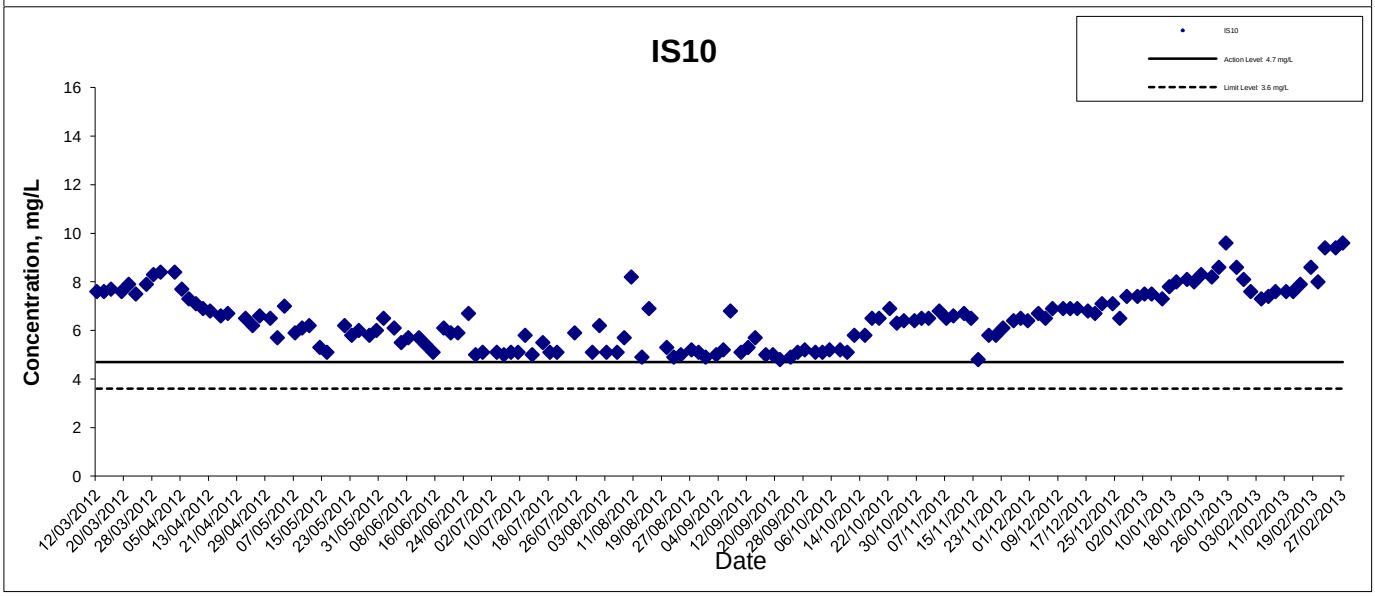




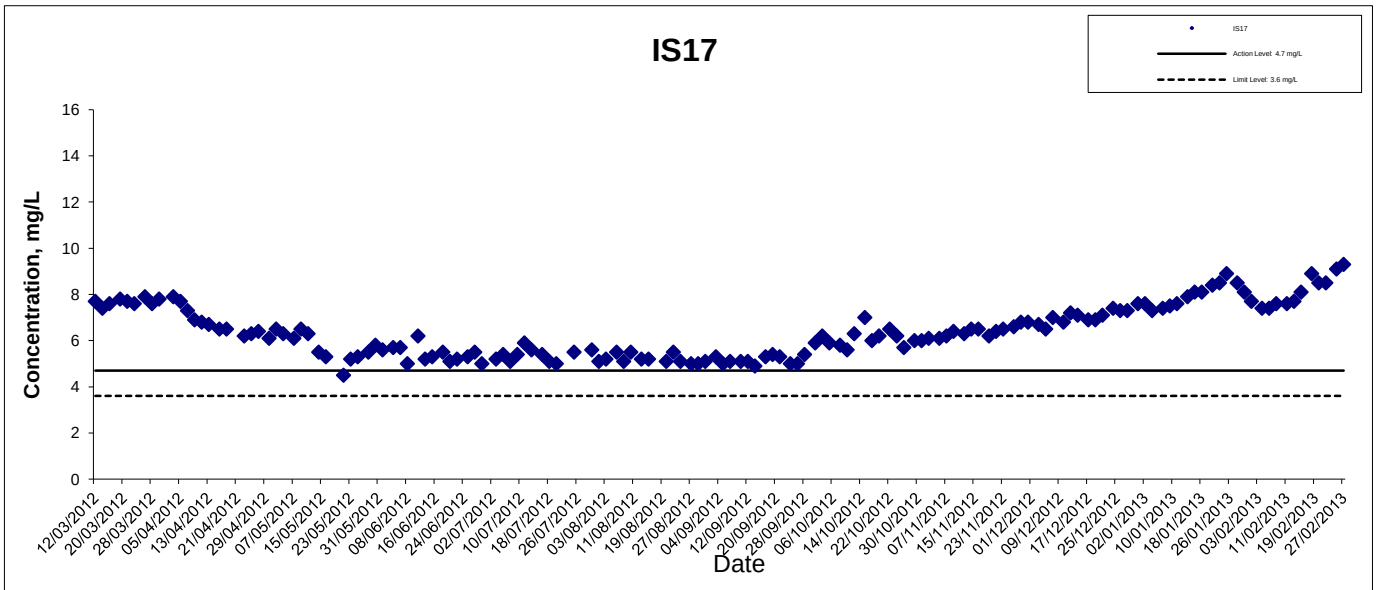
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

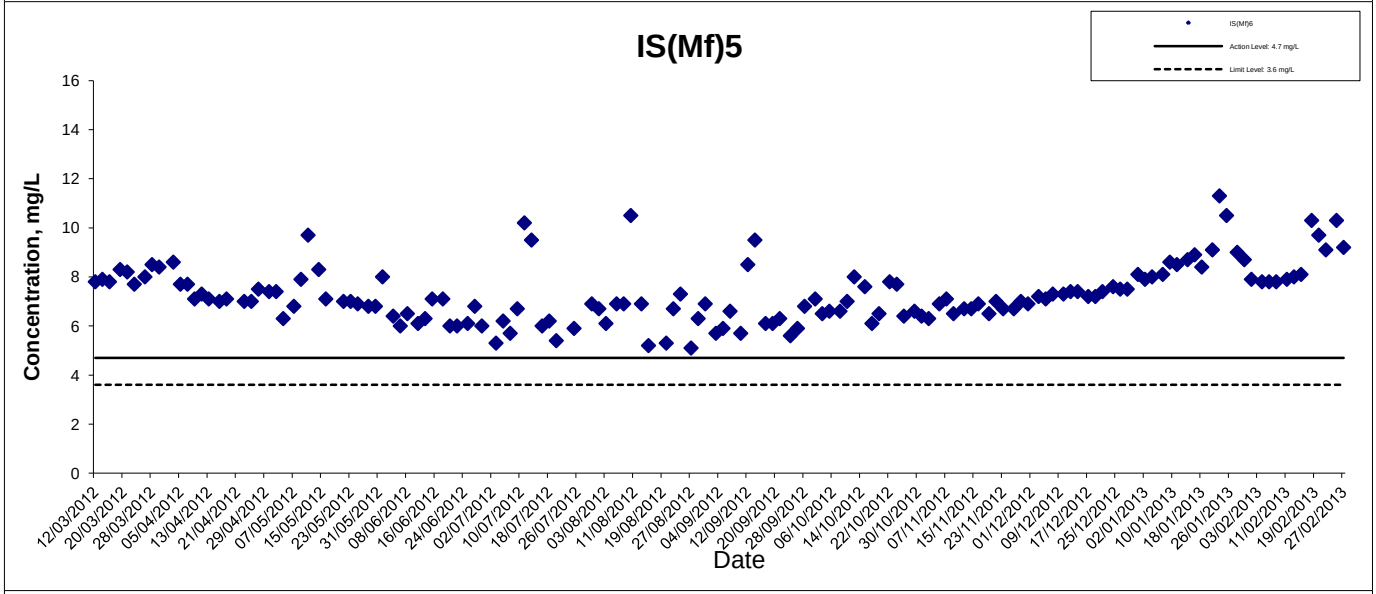


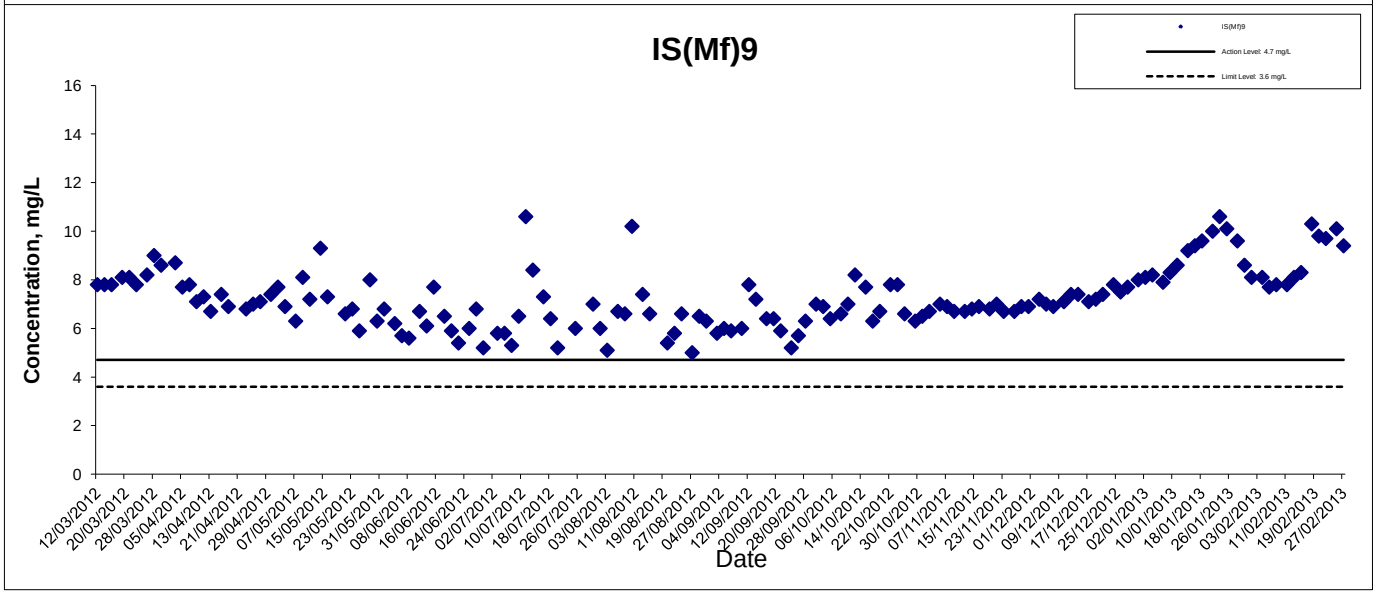




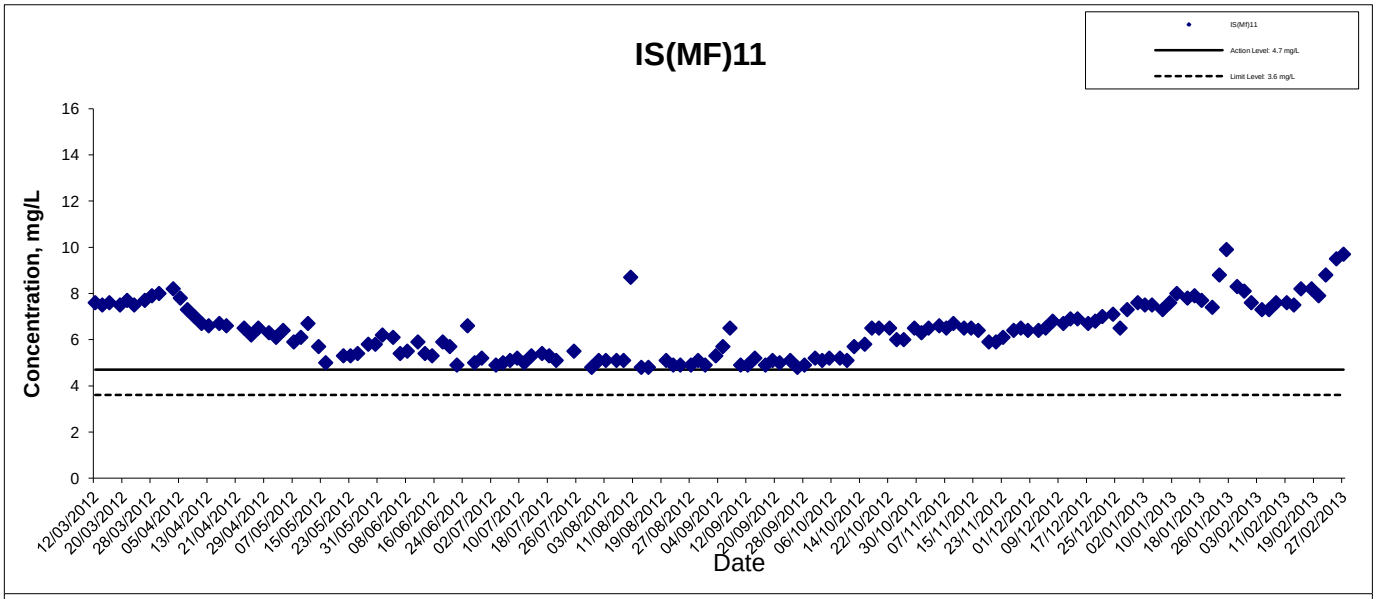
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

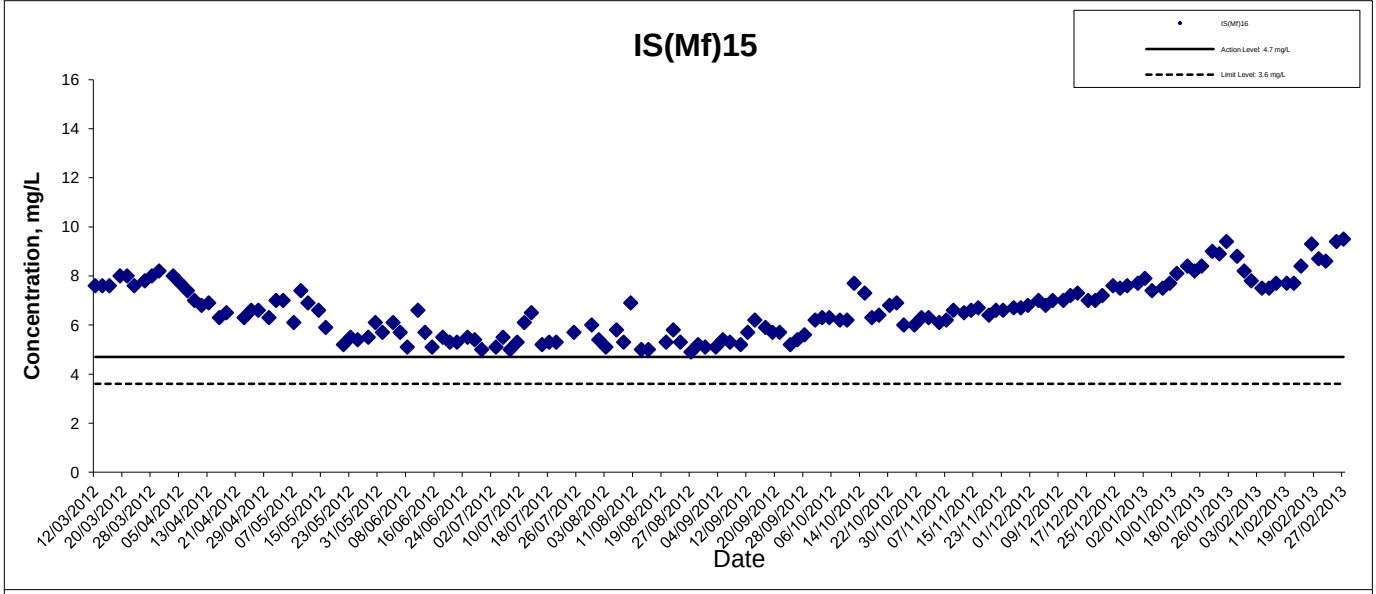


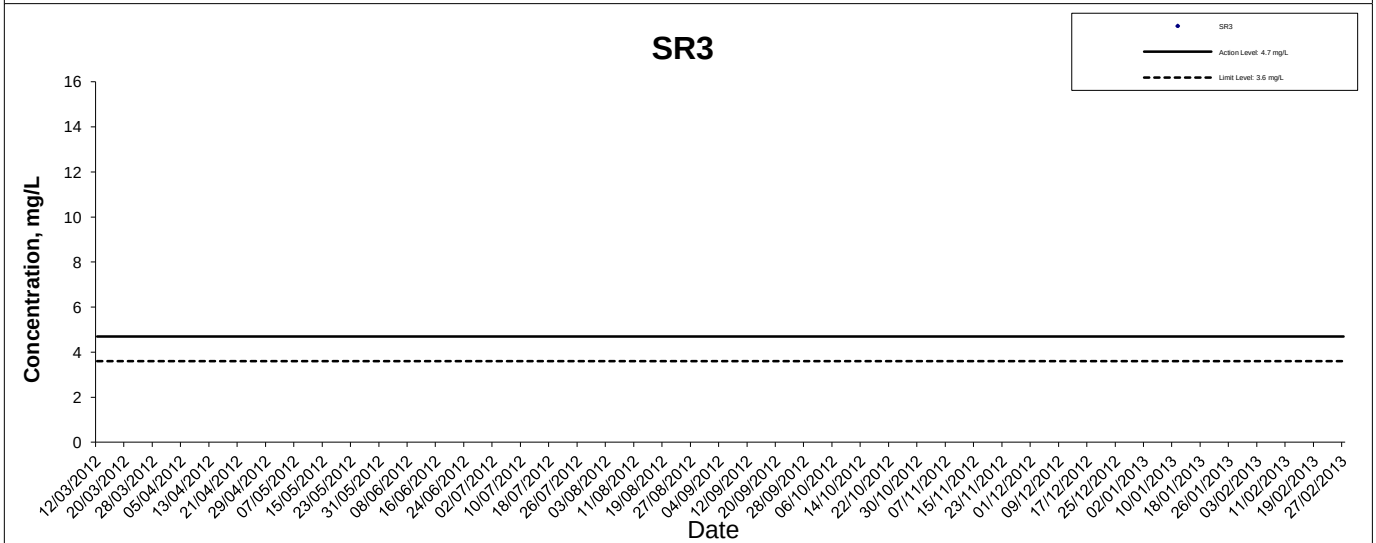




Dissolved Oxygen (Bottom) at Mid-Ebb Tide

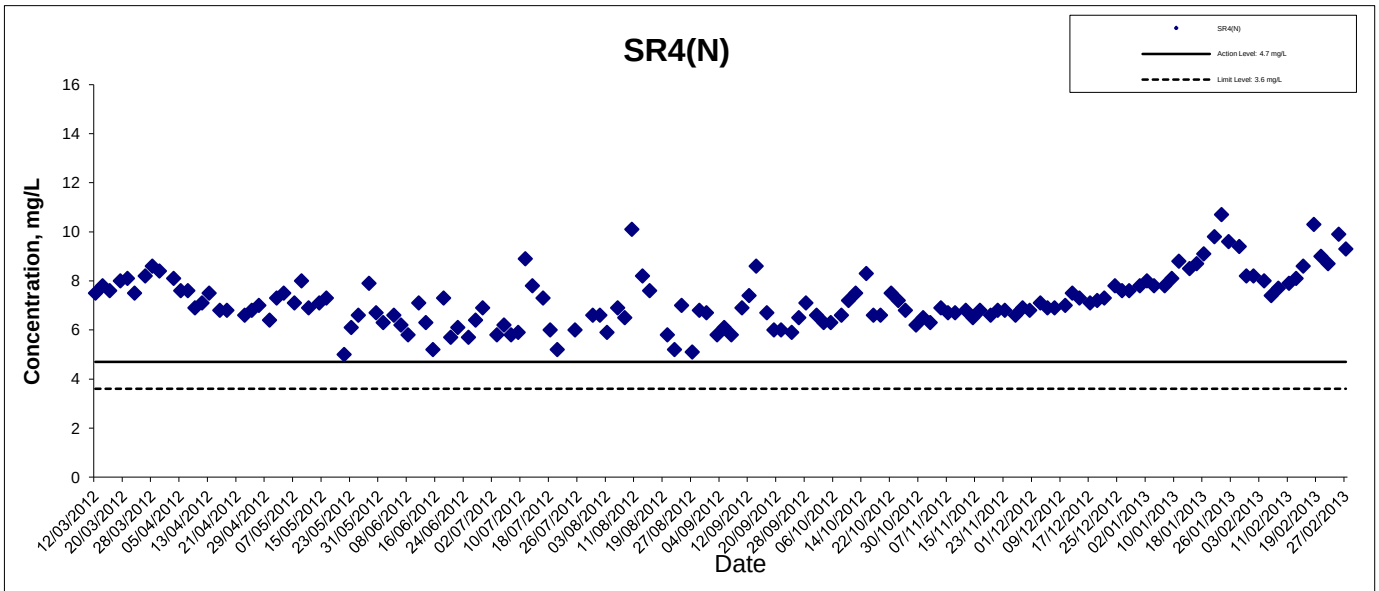


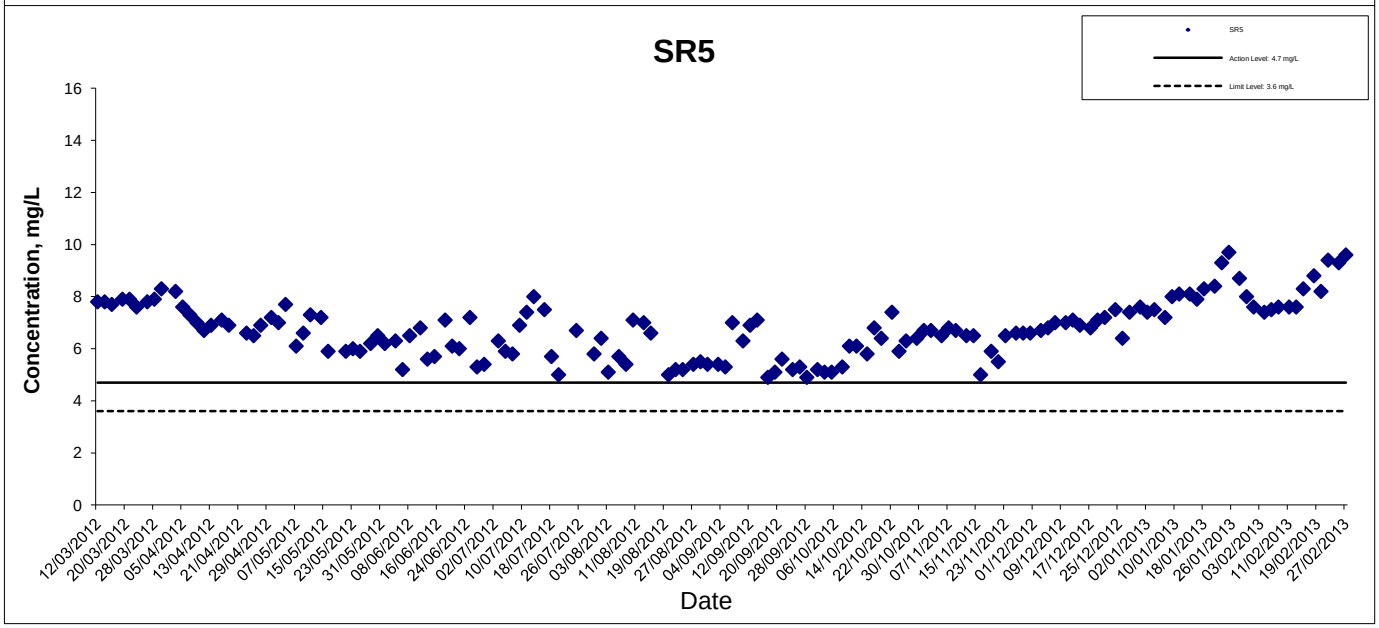


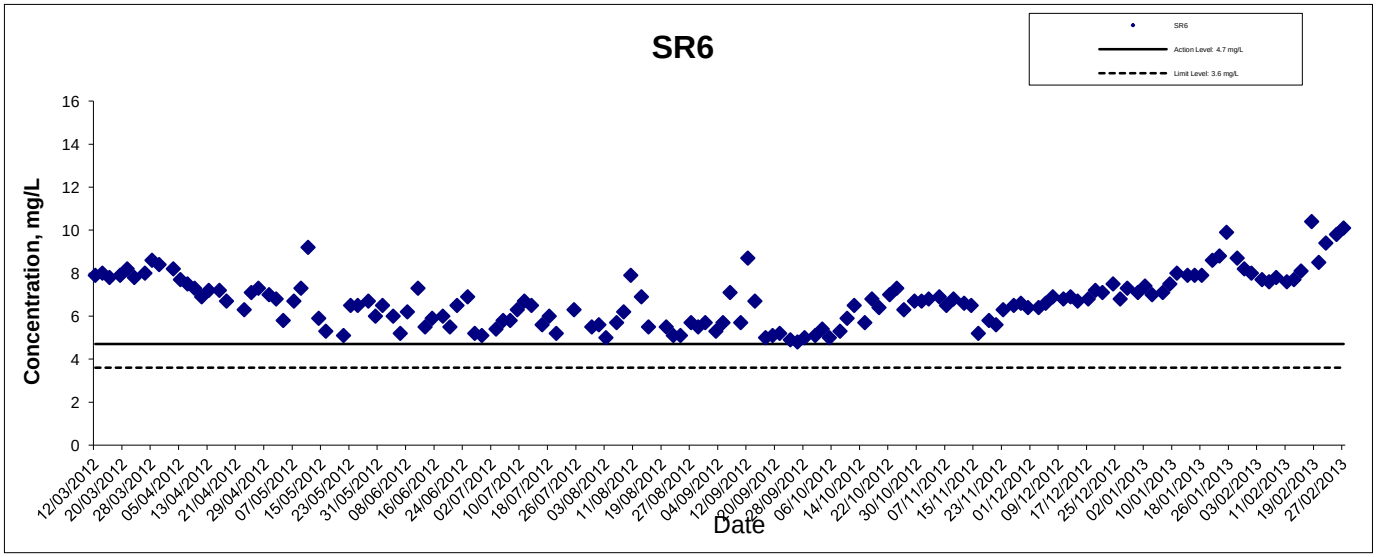


As the measured water depths were less than 3 m during all monitoring days, water samples are collected at mid-depth only .

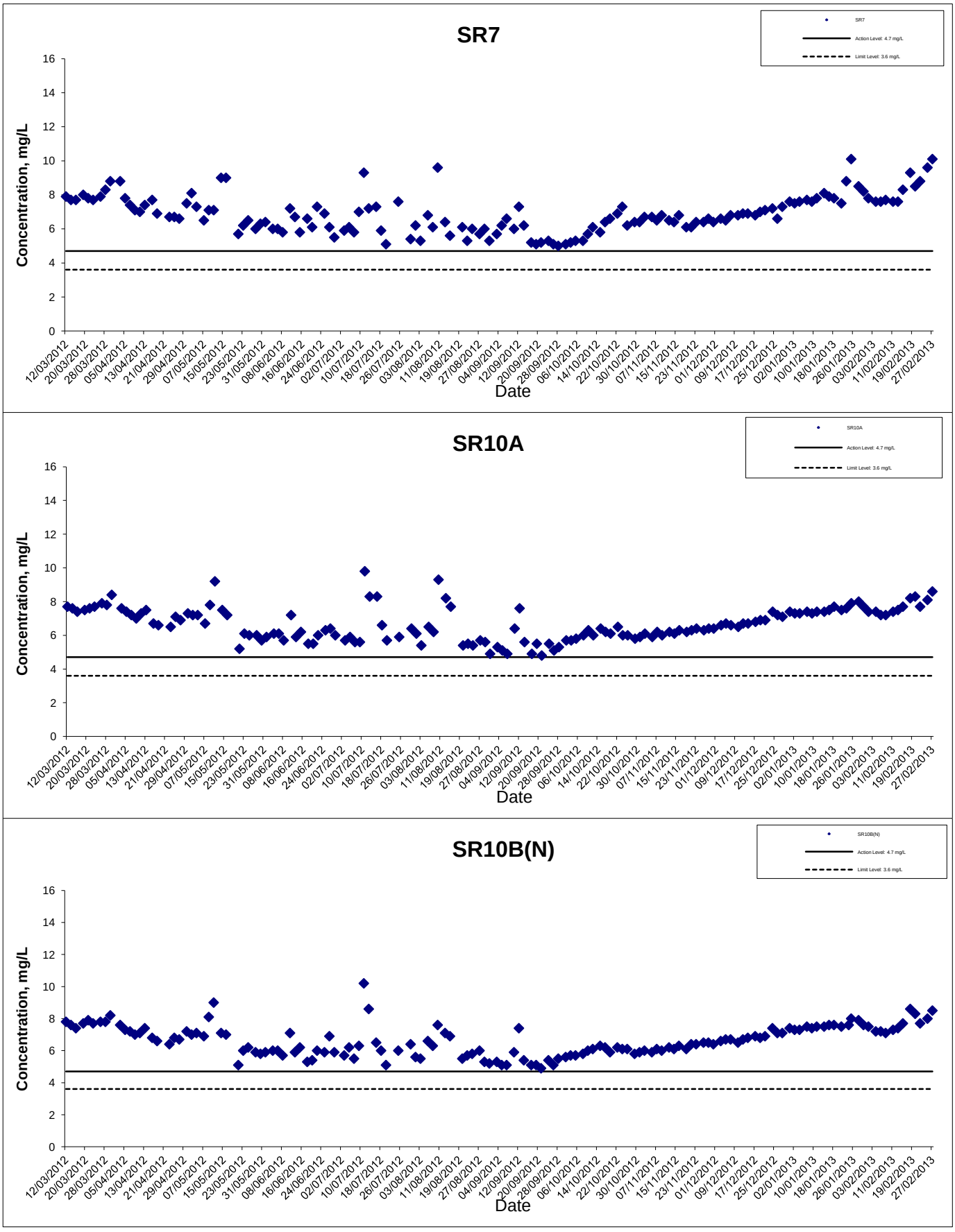
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



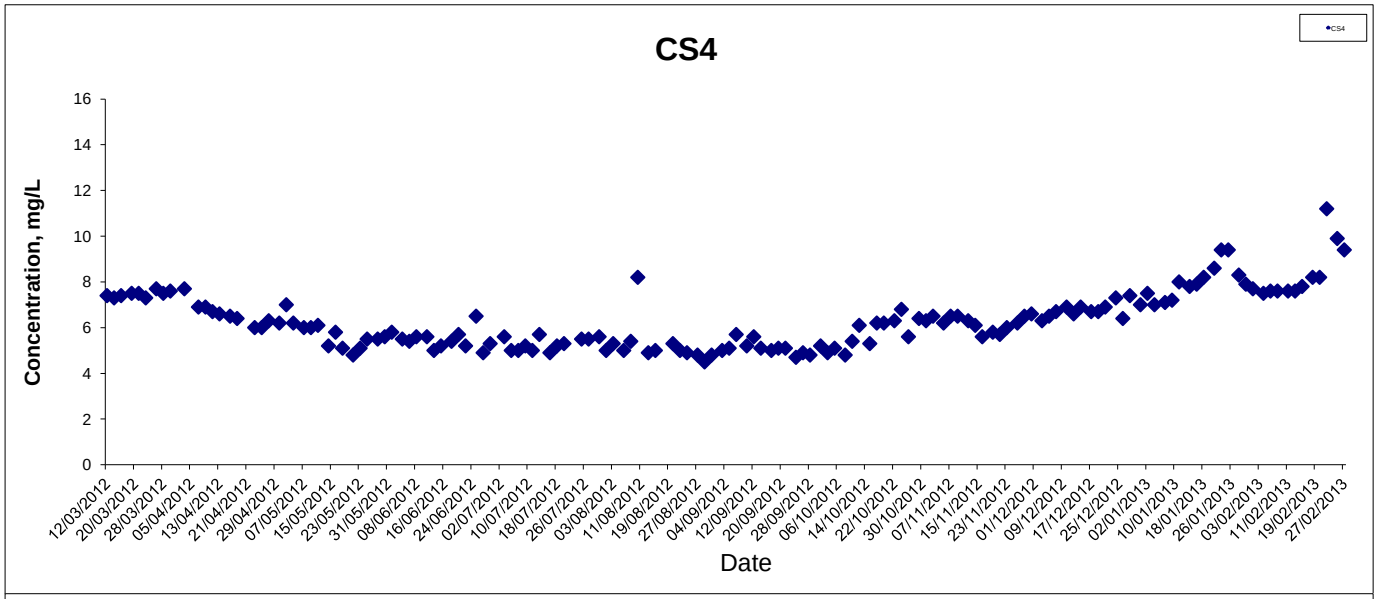


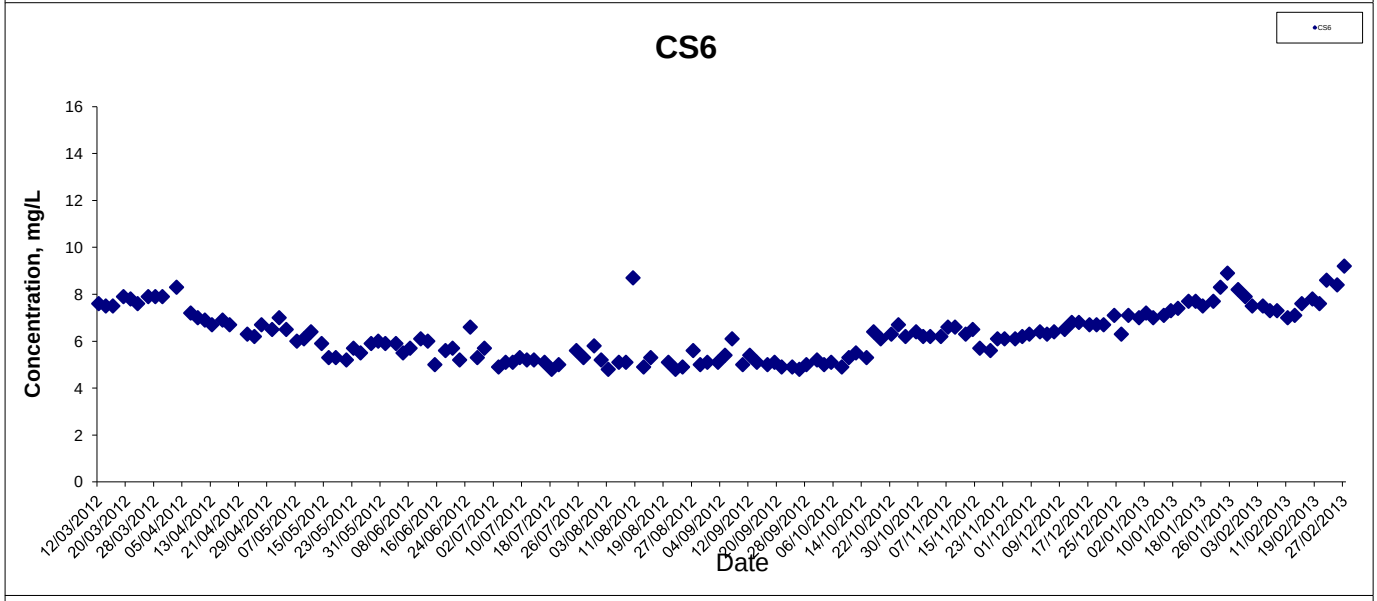


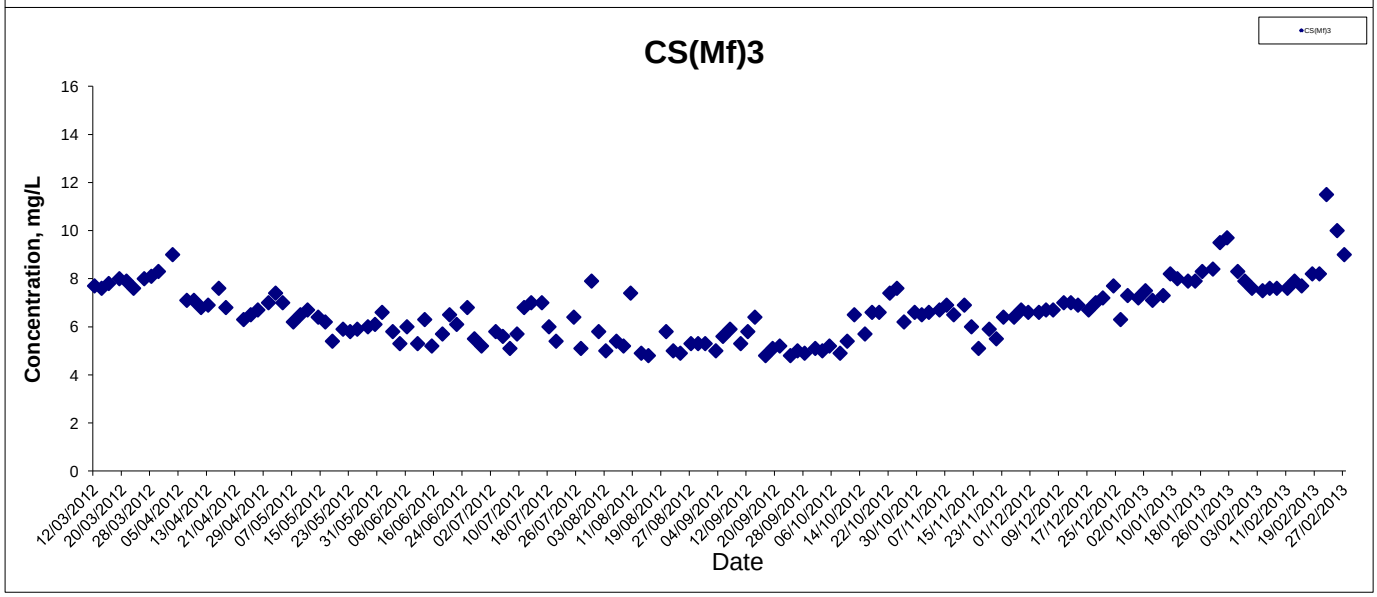
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



Dissolved Oxygen (Bottom) at Mid-Flood Tide





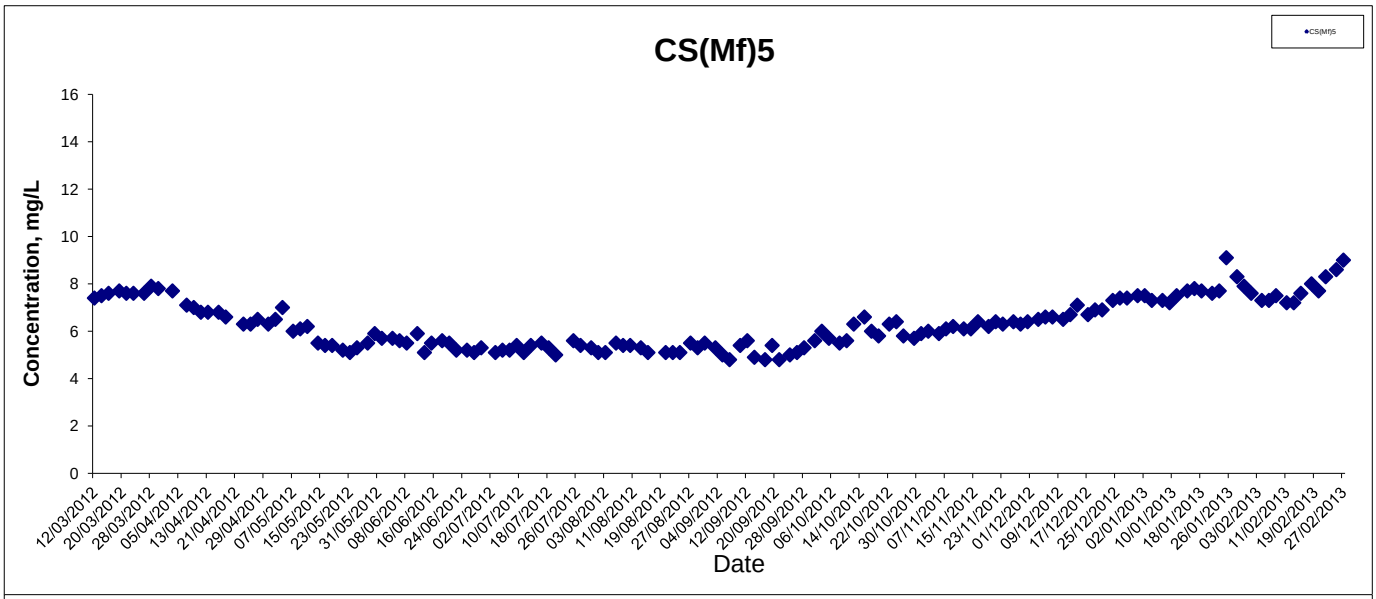


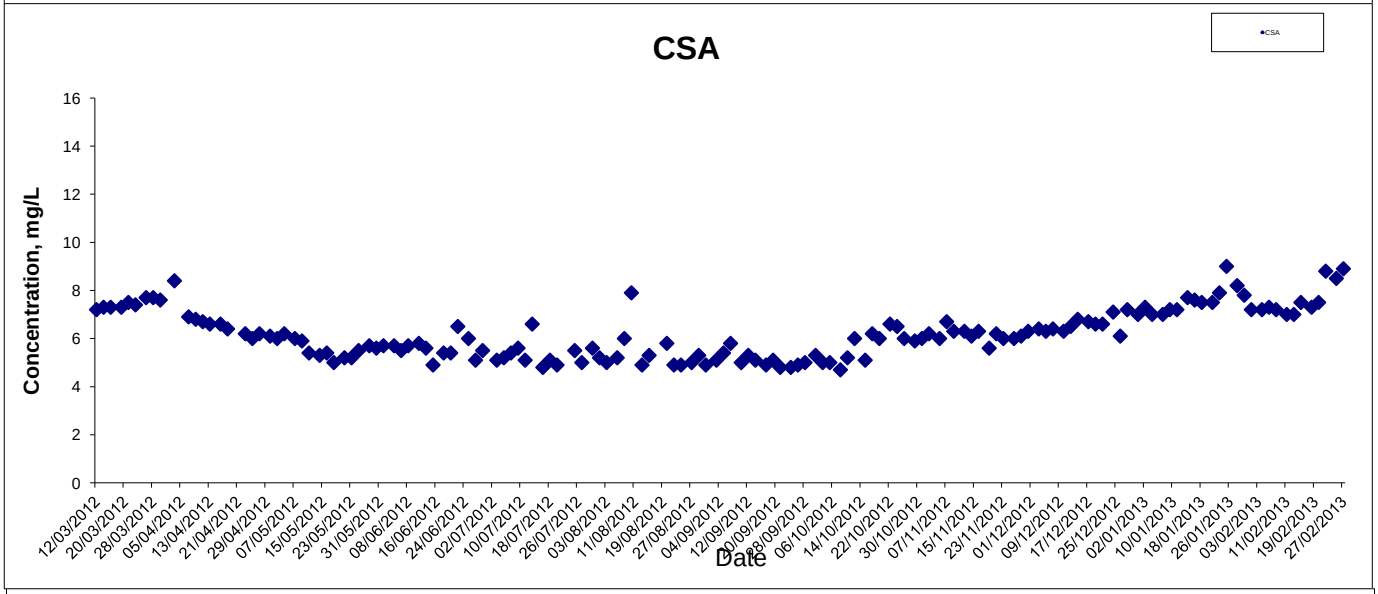
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

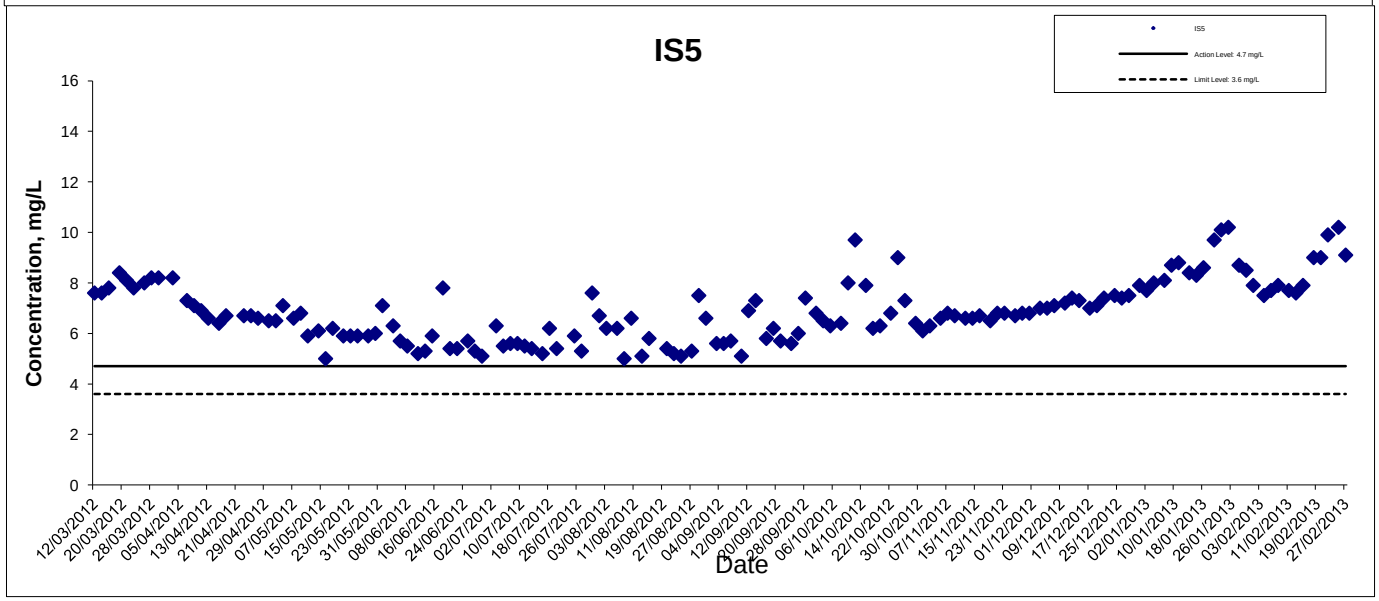
AECOM

Graphical Presentation of Impact Water Quality Monitoring Results

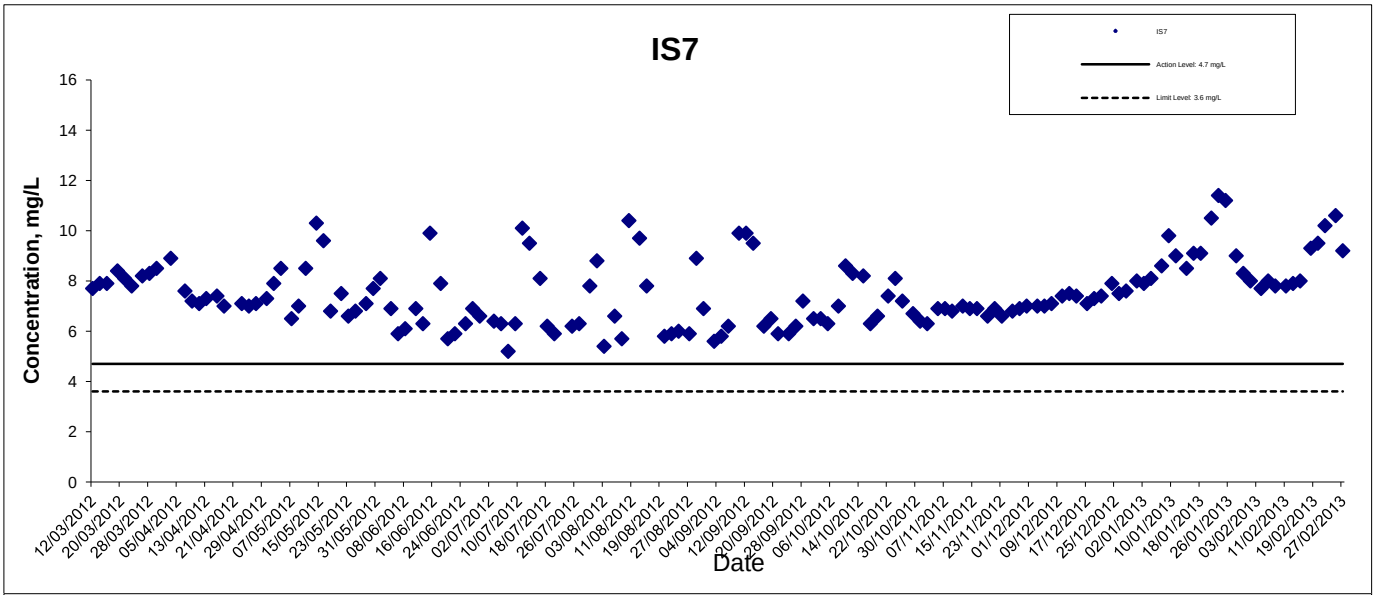
Dissolved Oxygen (Bottom) at Mid-Flood Tide

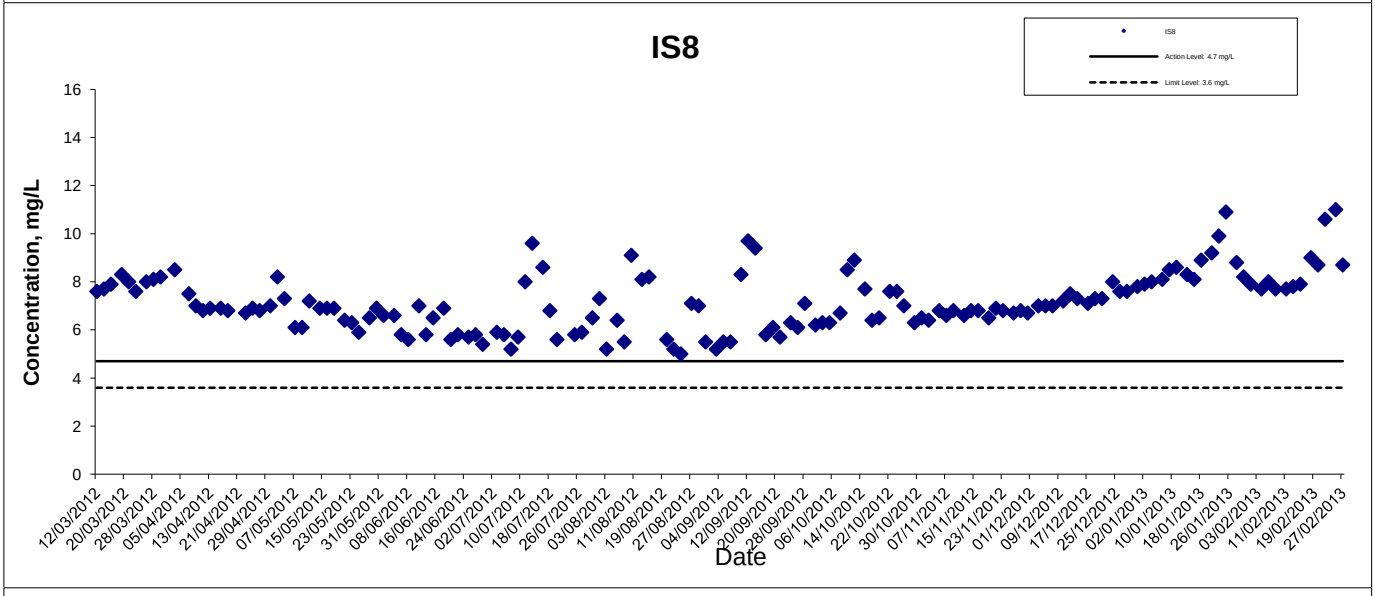


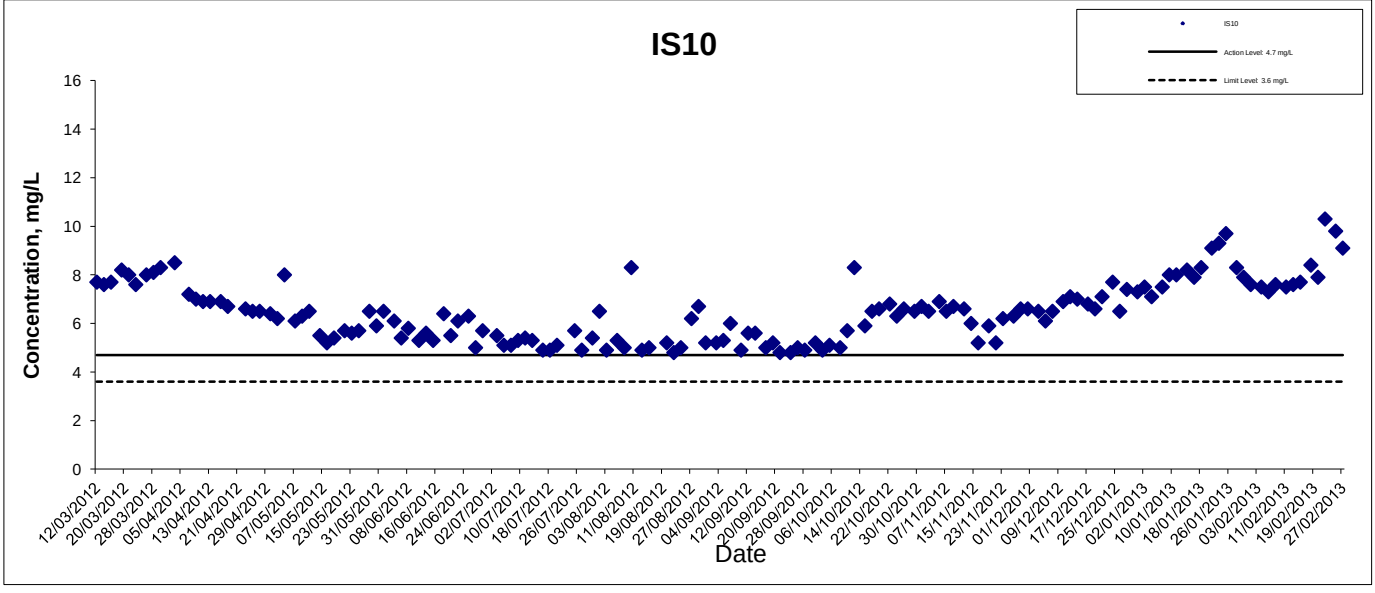




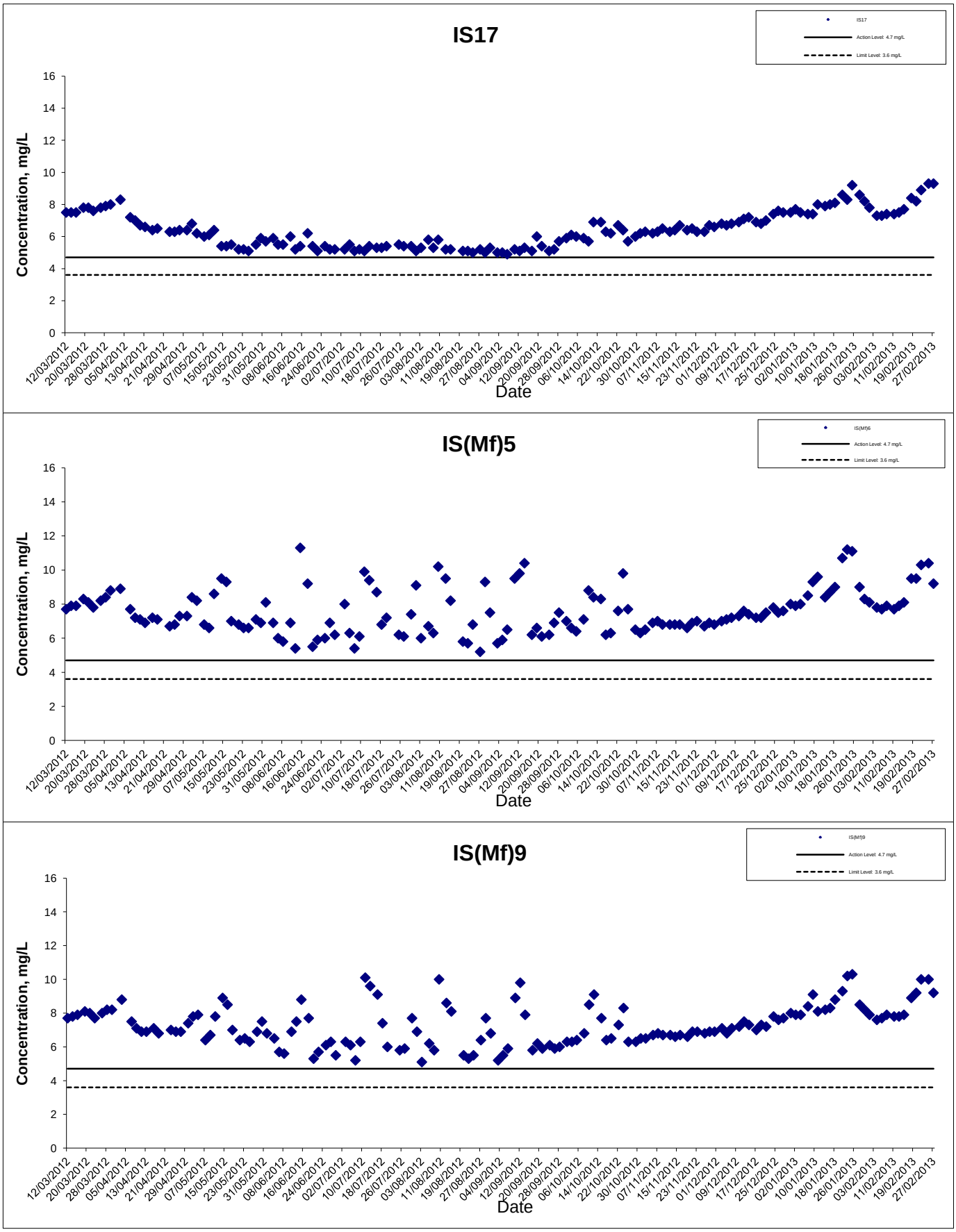
Dissolved Oxygen (Bottom) at Mid-Flood Tide



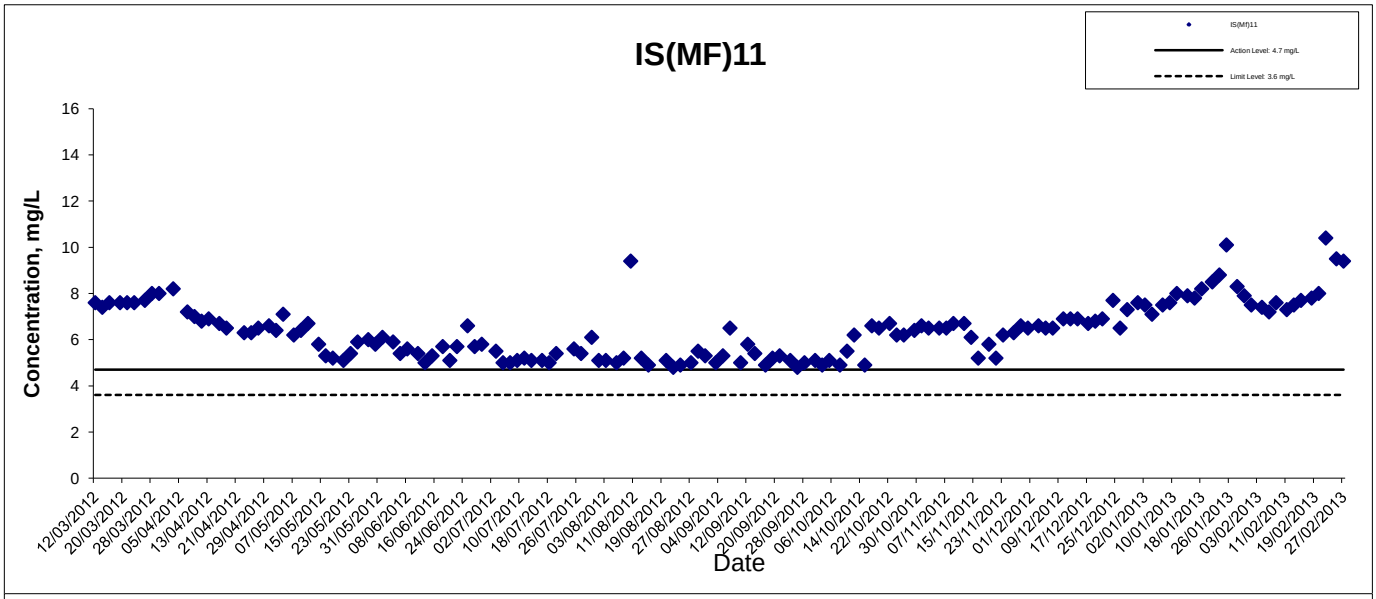


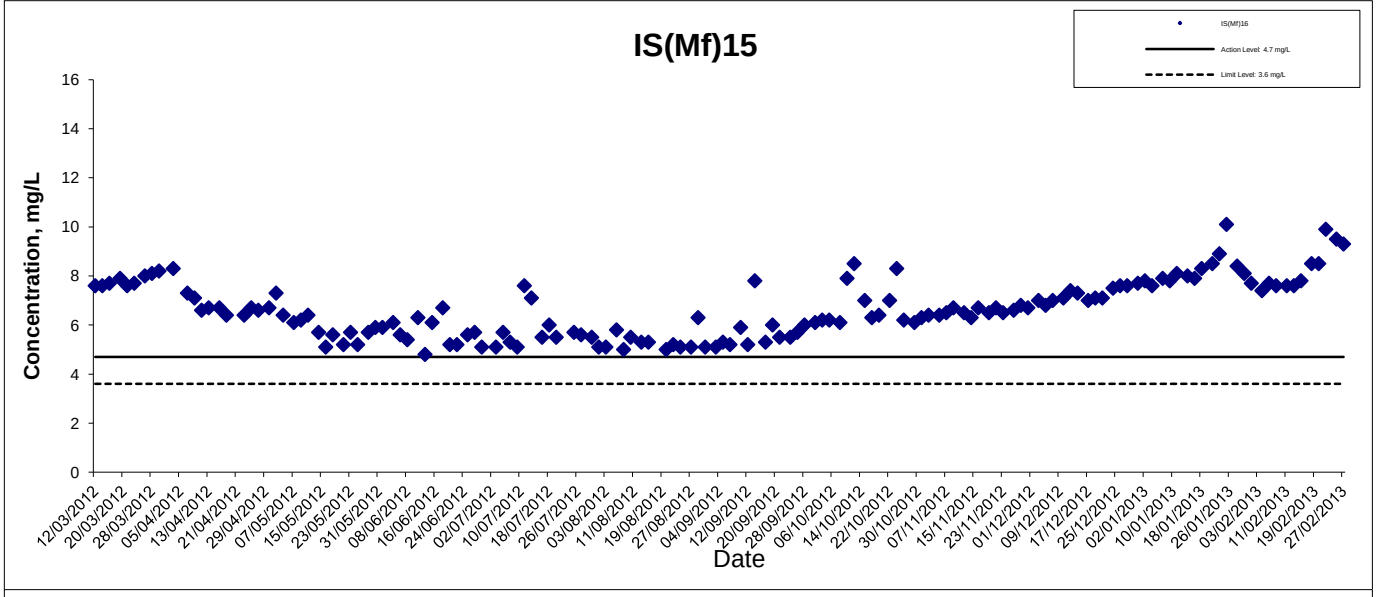


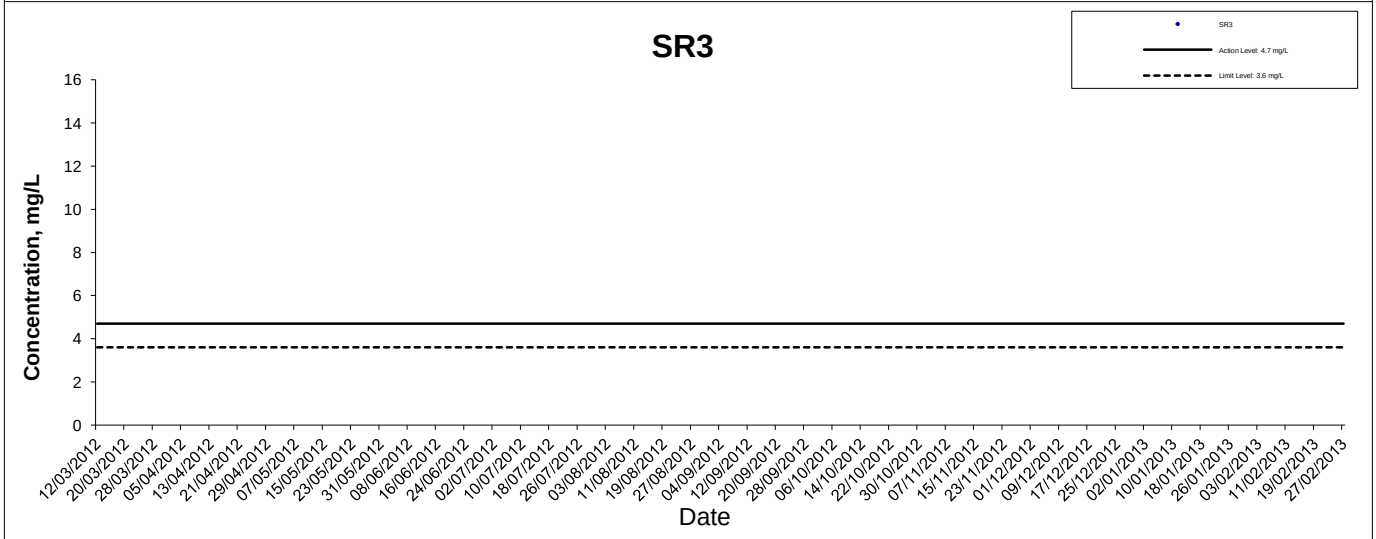
Dissolved Oxygen (Bottom) at Mid-Flood Tide



Dissolved Oxygen (Bottom) at Mid-Flood Tide

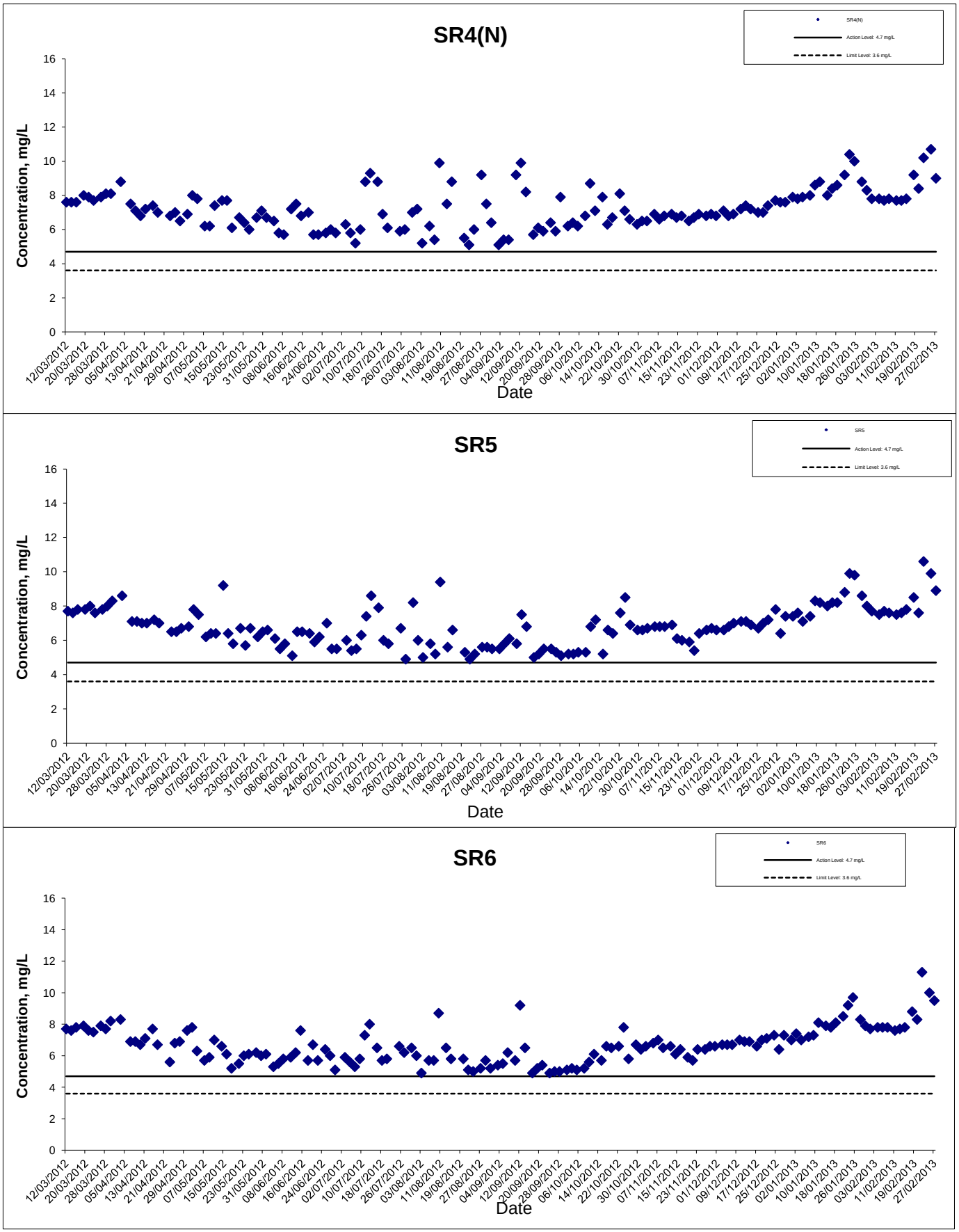




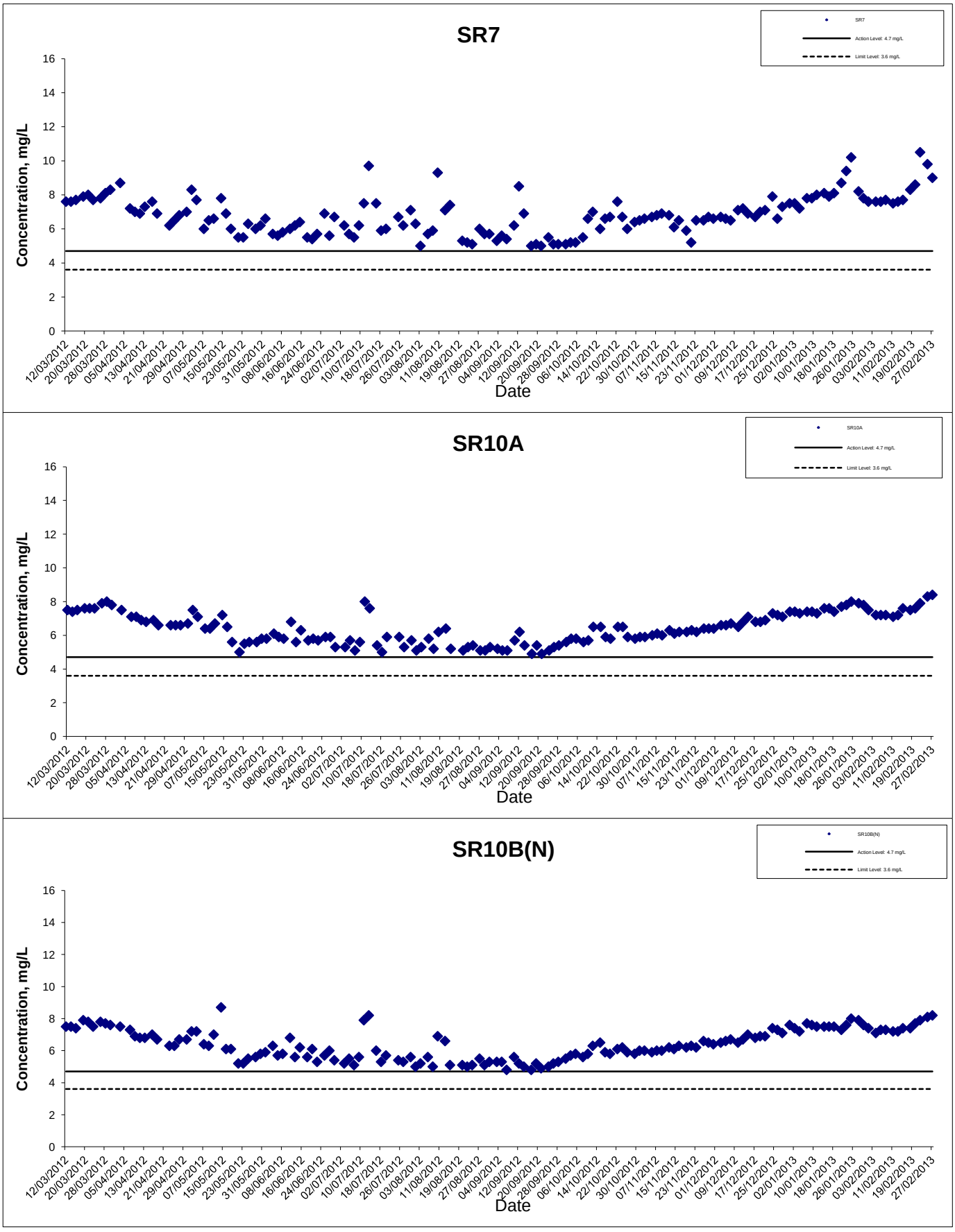


As the measured water depths were less than 3 m during all monitoring days, water samples are collected at mid-depth only .

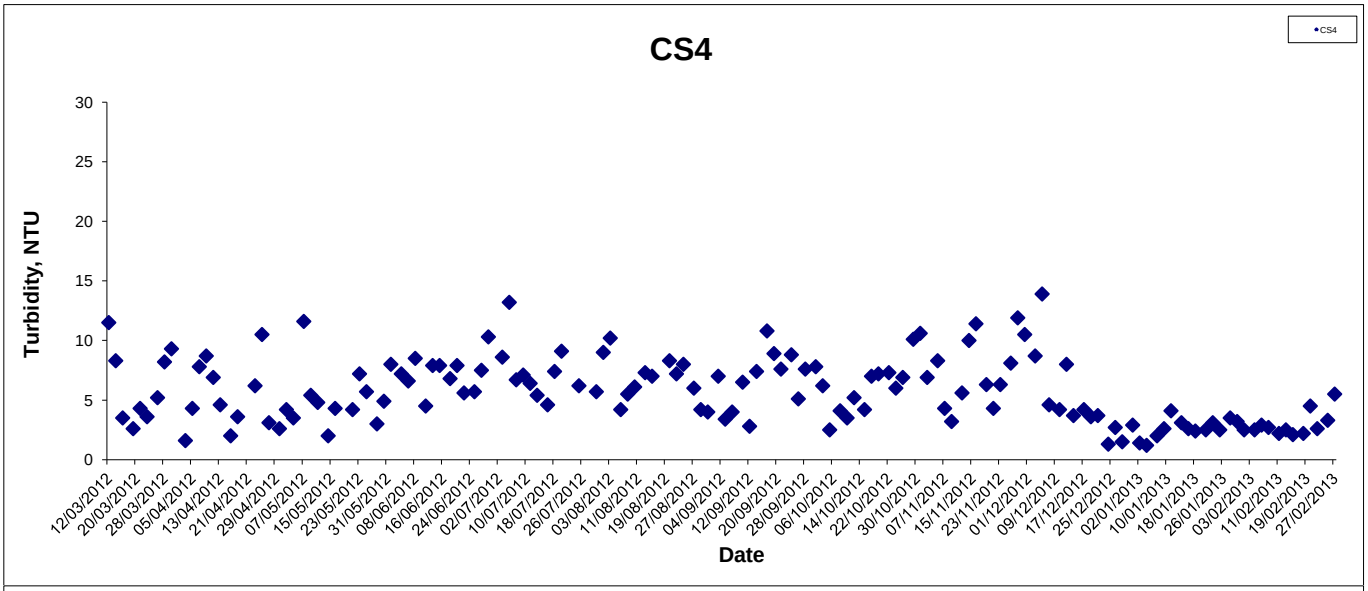
Dissolved Oxygen (Bottom) at Mid-Flood Tide

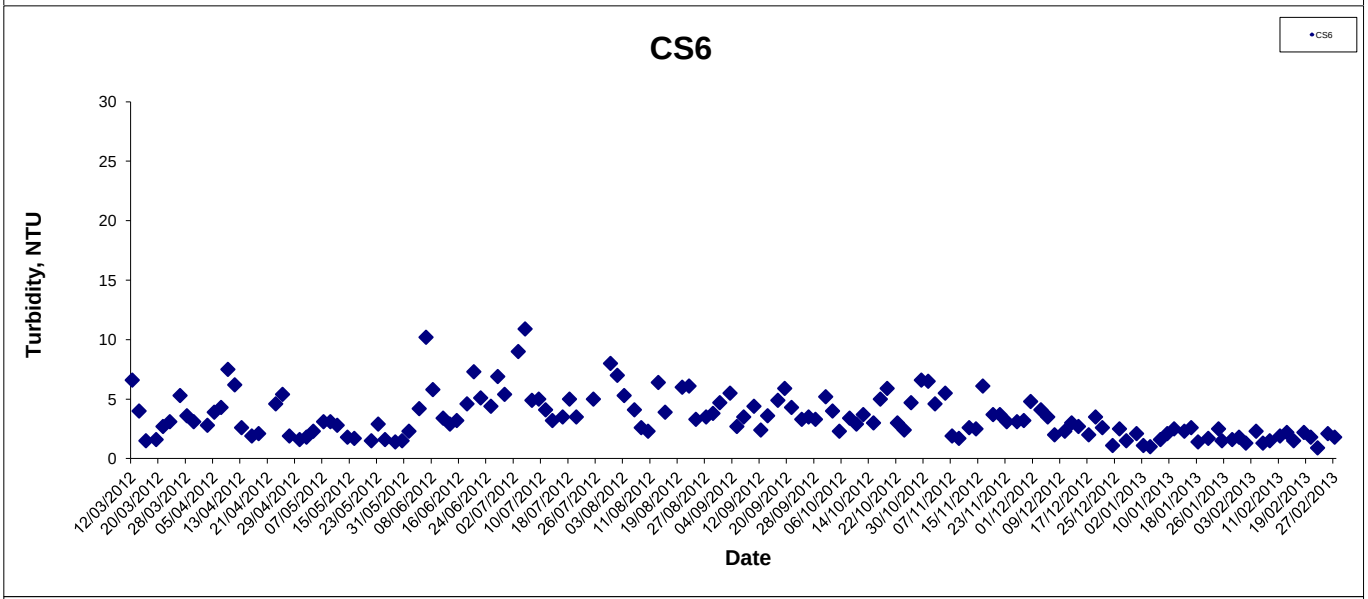


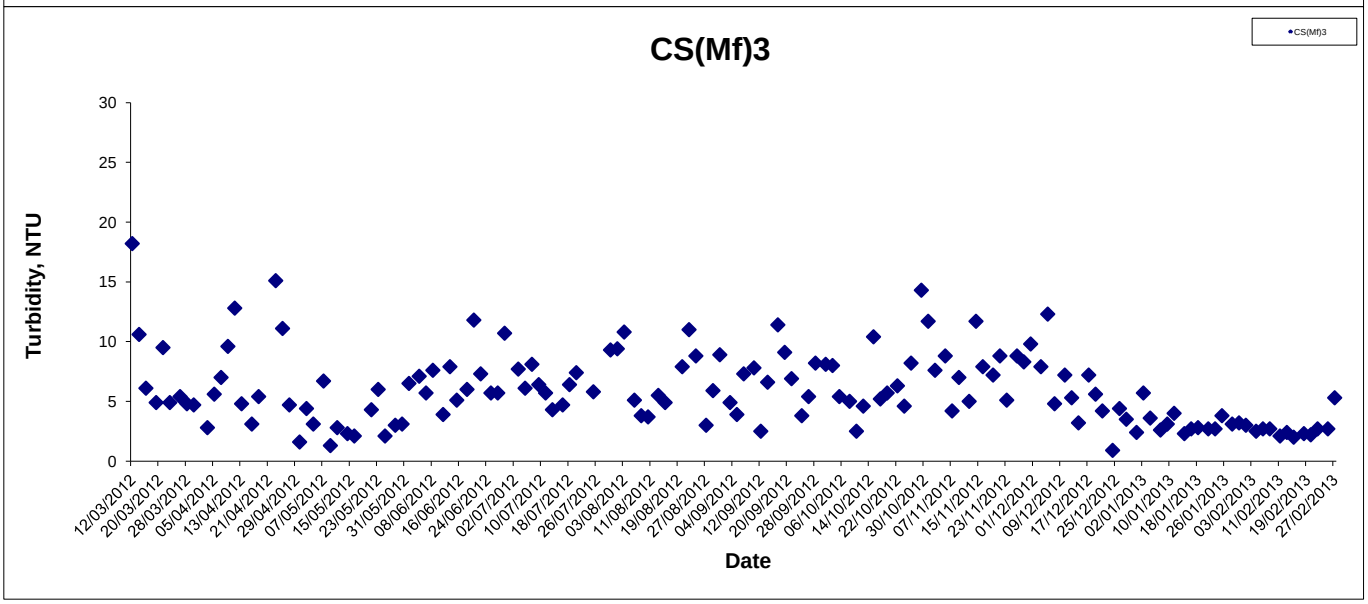
Dissolved Oxygen (Bottom) at Mid-Flood Tide



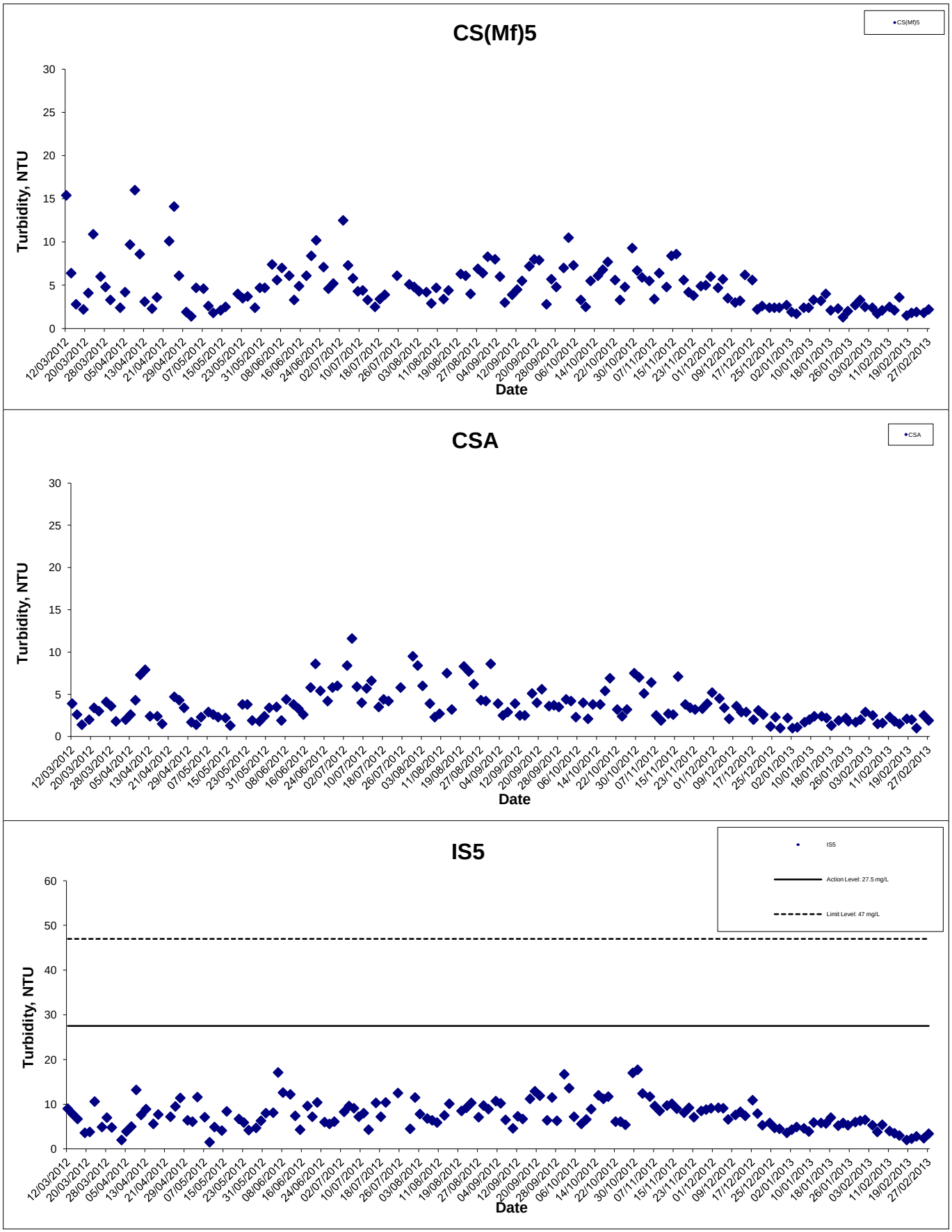
Turbidity at Mid-Ebb Tide







Turbidity at Mid-Ebb Tide

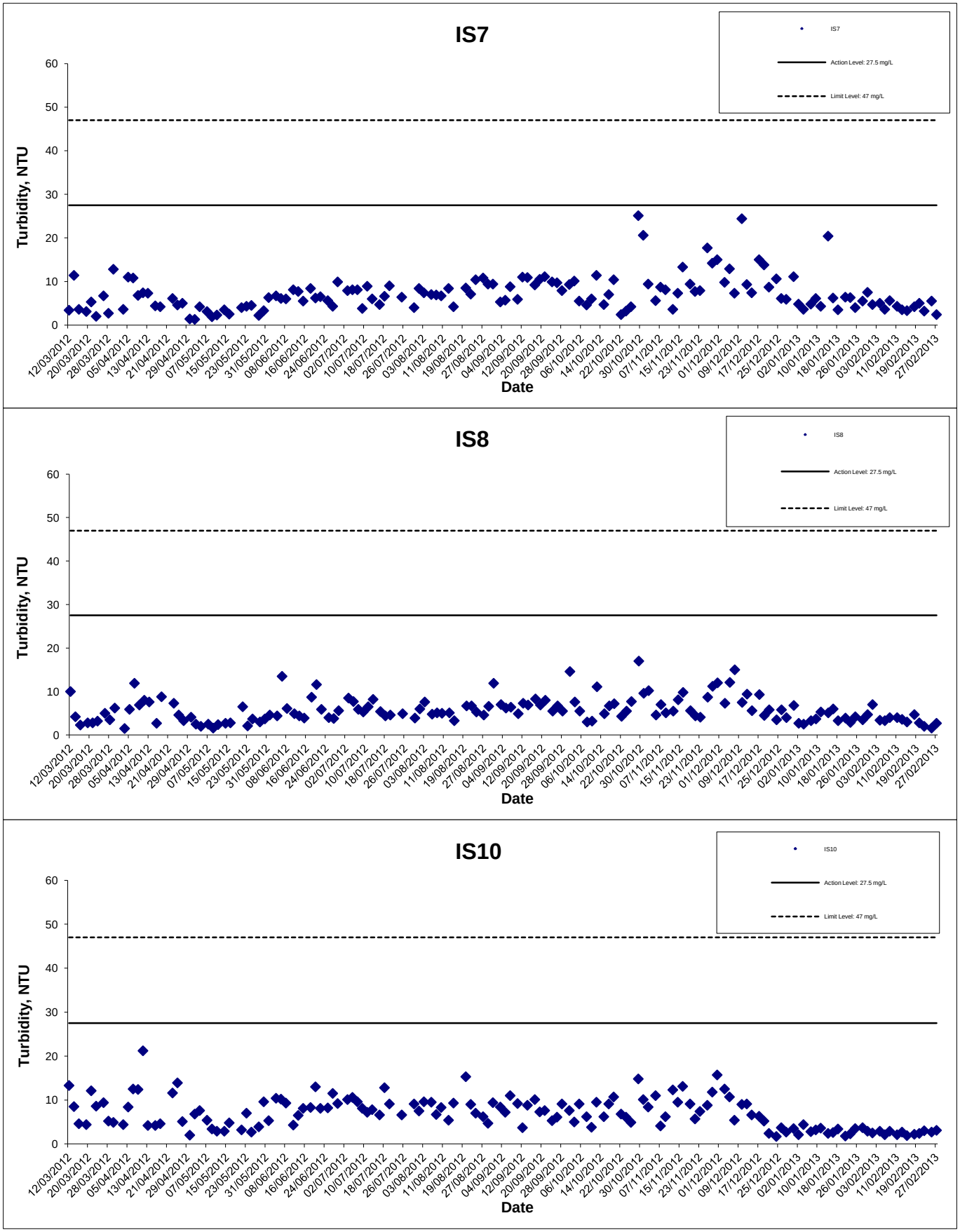


HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

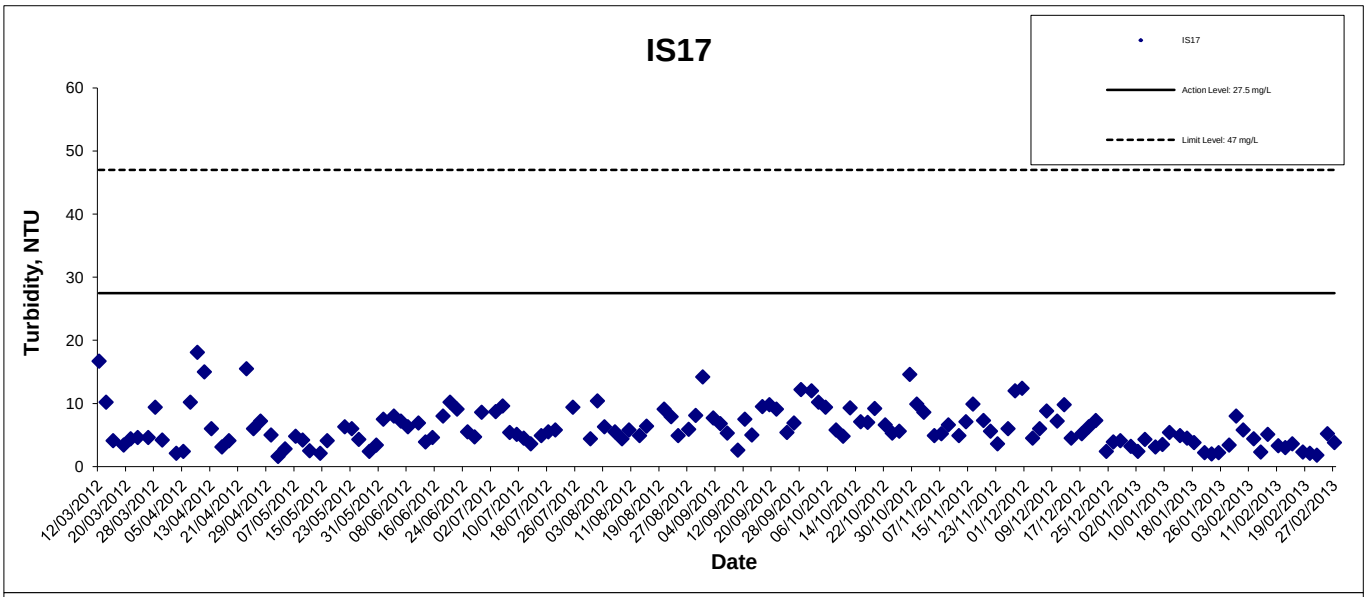
Graphical Presentation of Impact Water Quality Monitoring Results

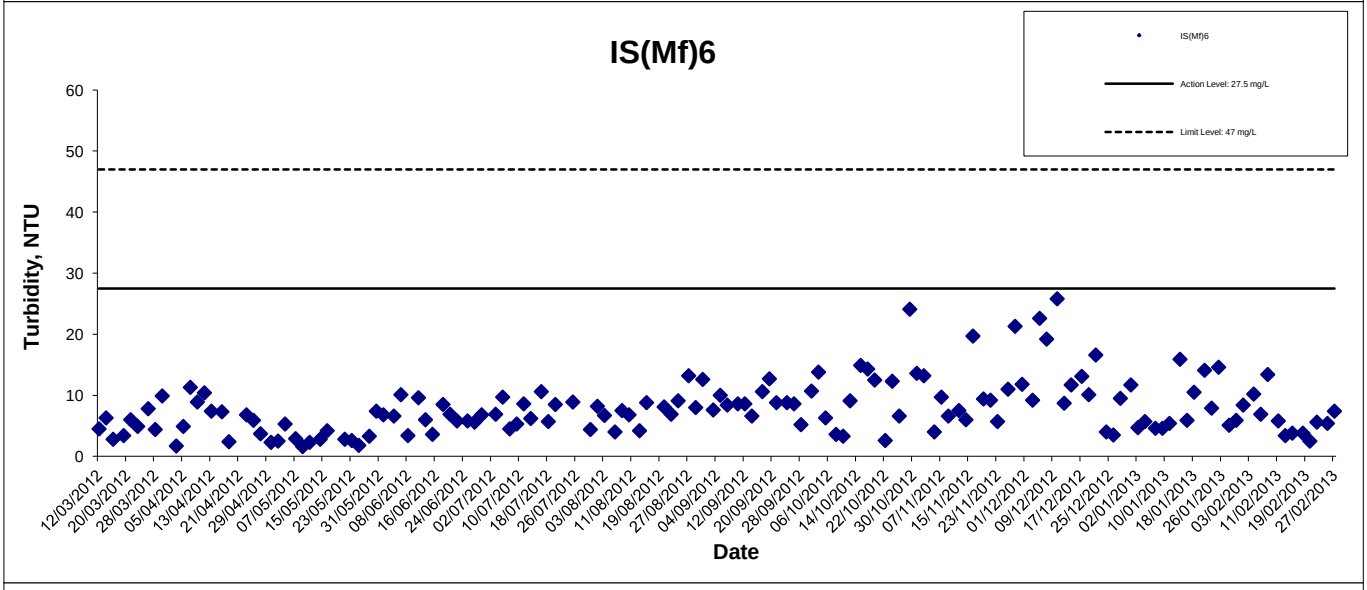
Project No.: 60249820 **Date: Apr 2013** **Appendix G**

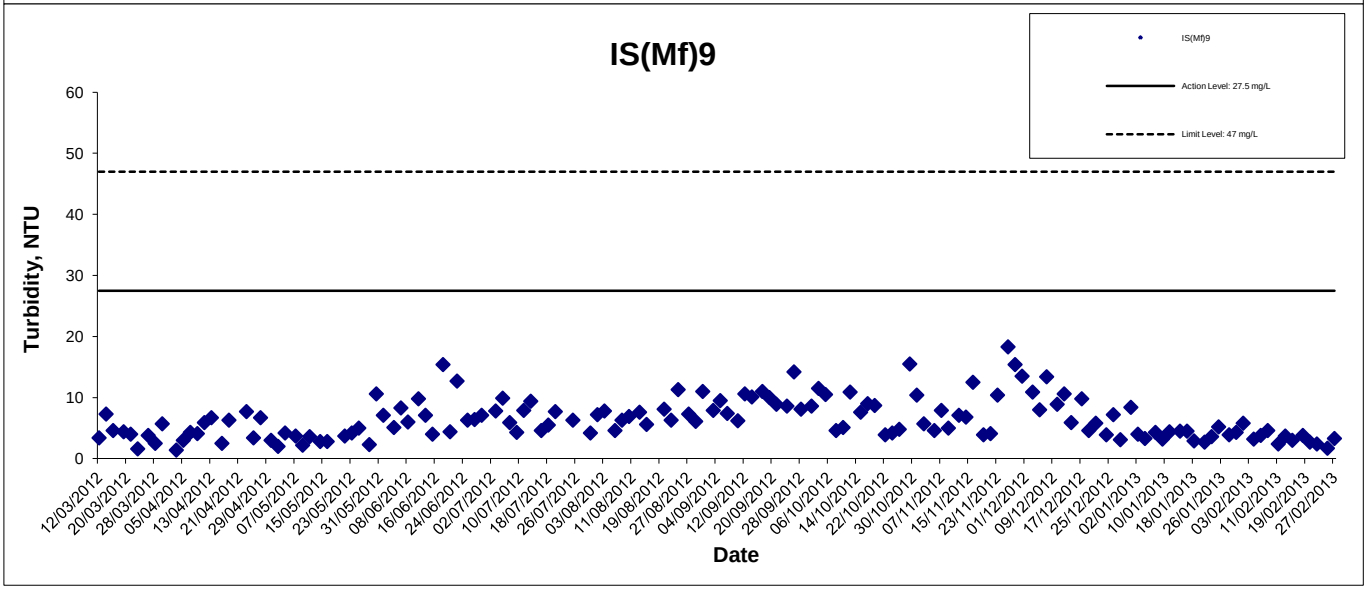
Turbidity at Mid-Ebb Tide



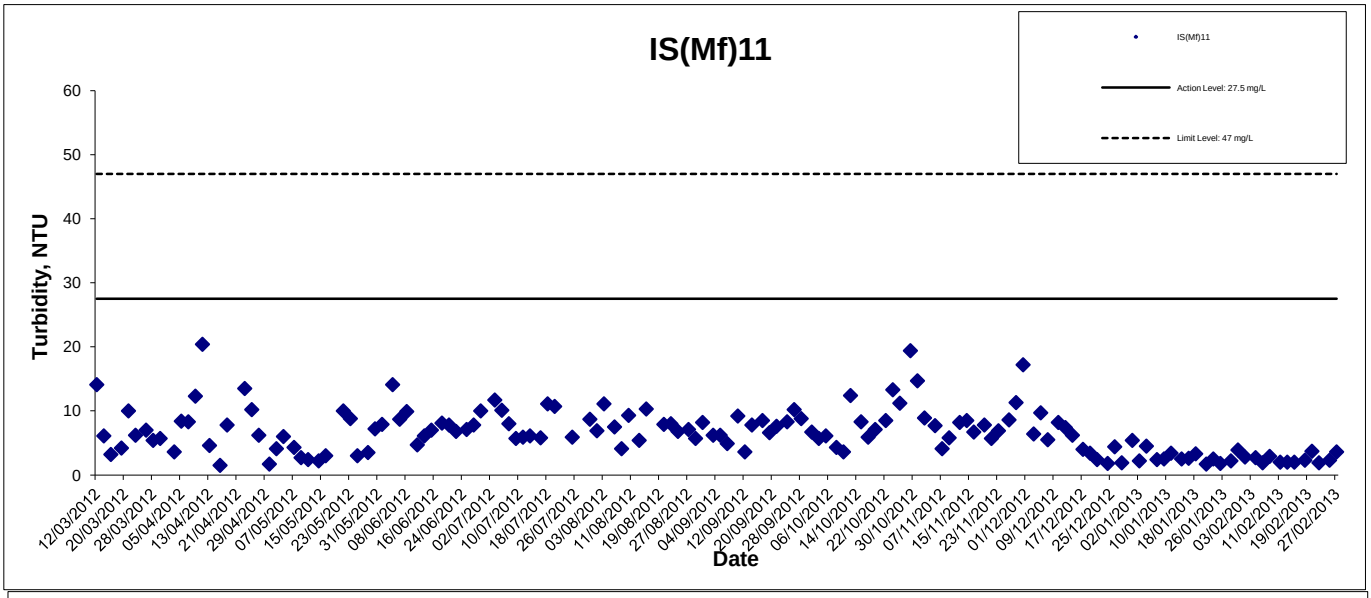
Turbidity at Mid-Ebb Tide

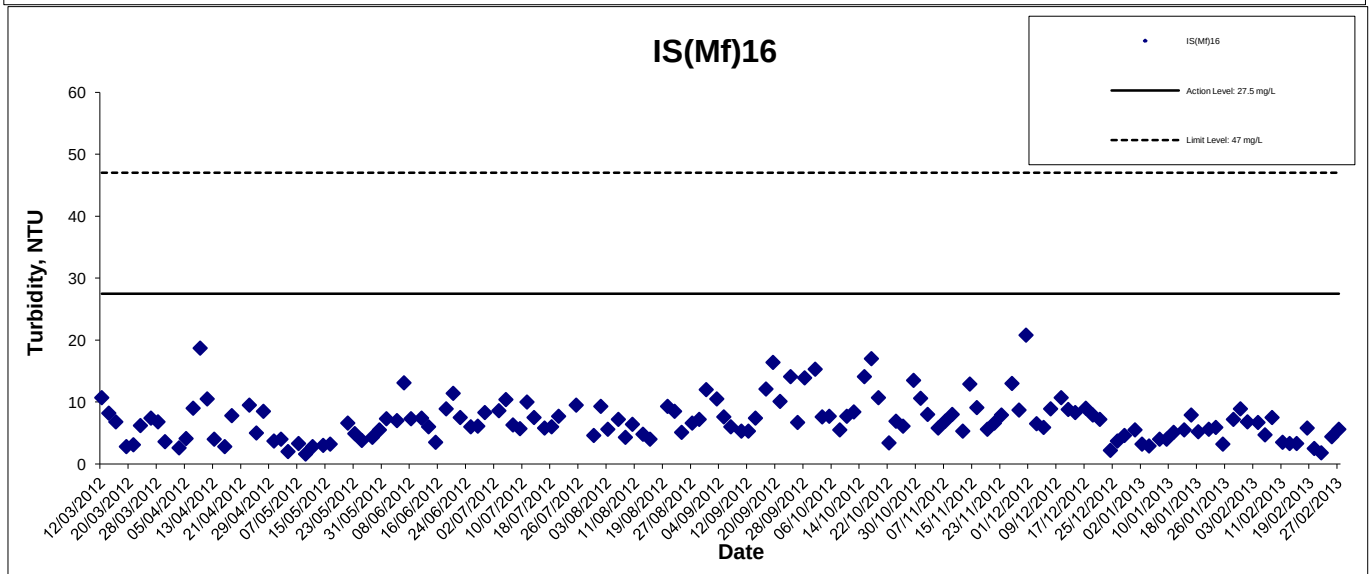


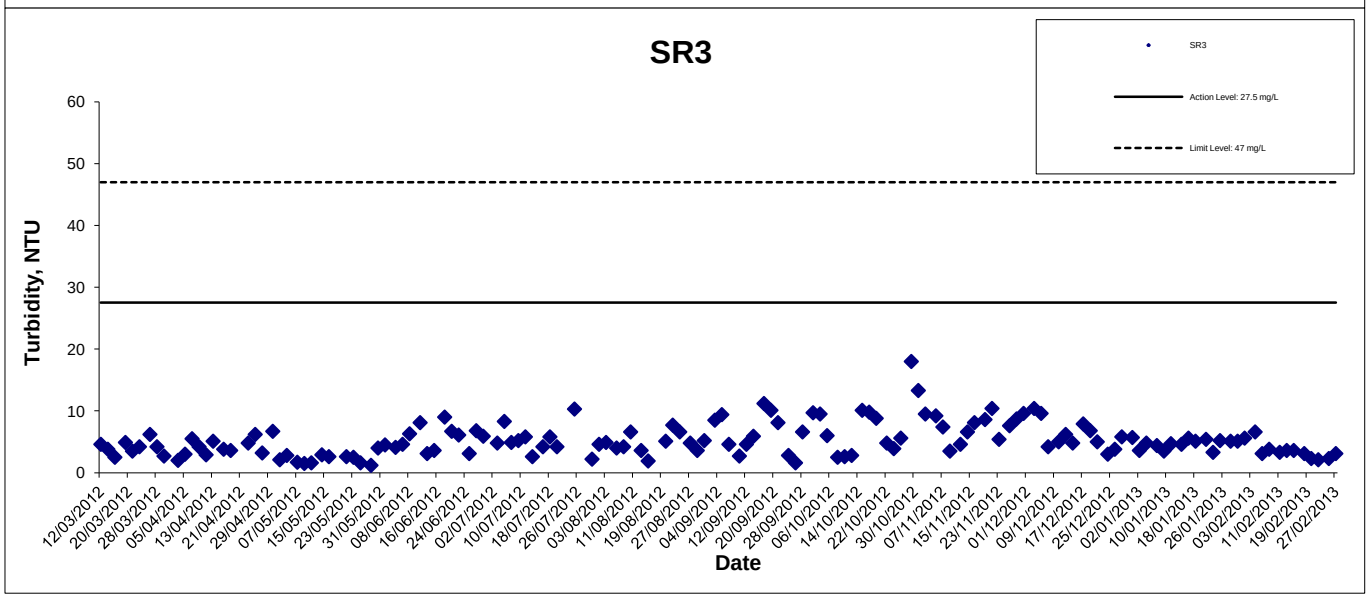




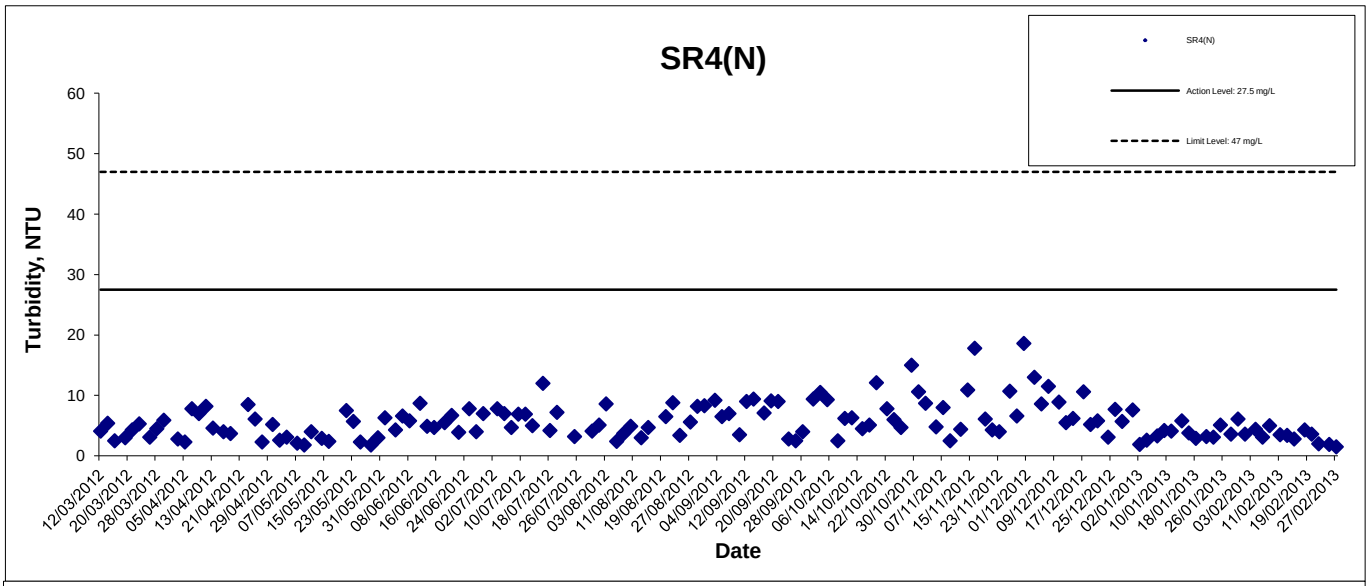
Turbidity at Mid-Ebb Tide

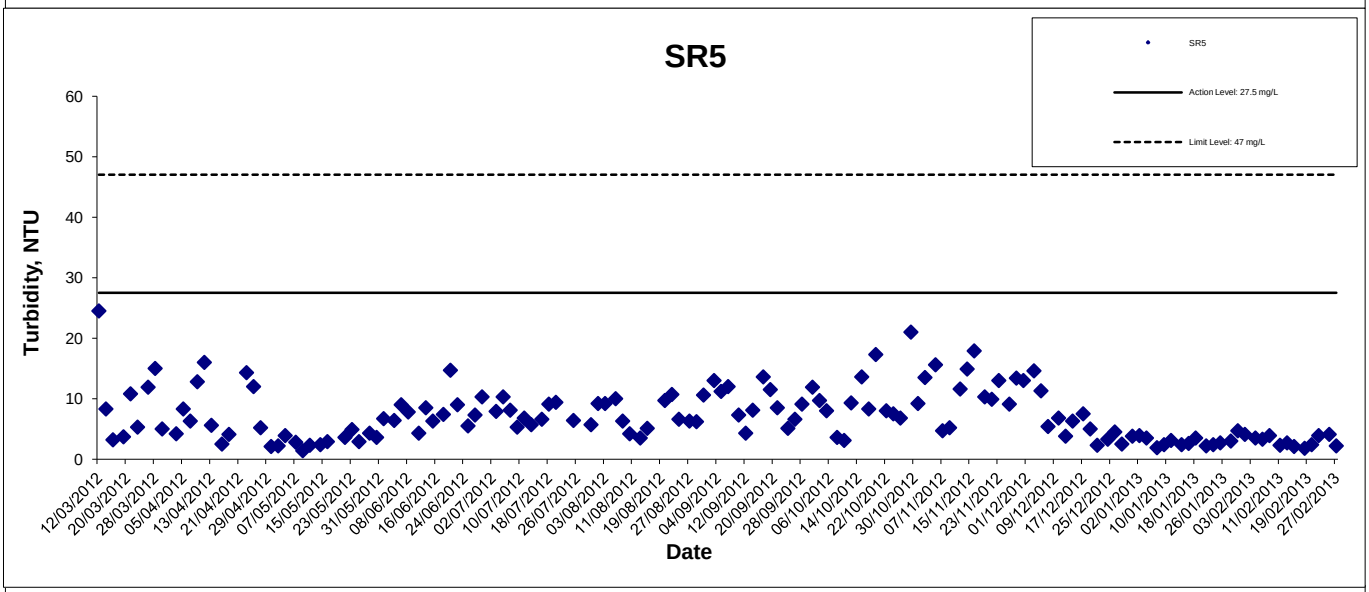


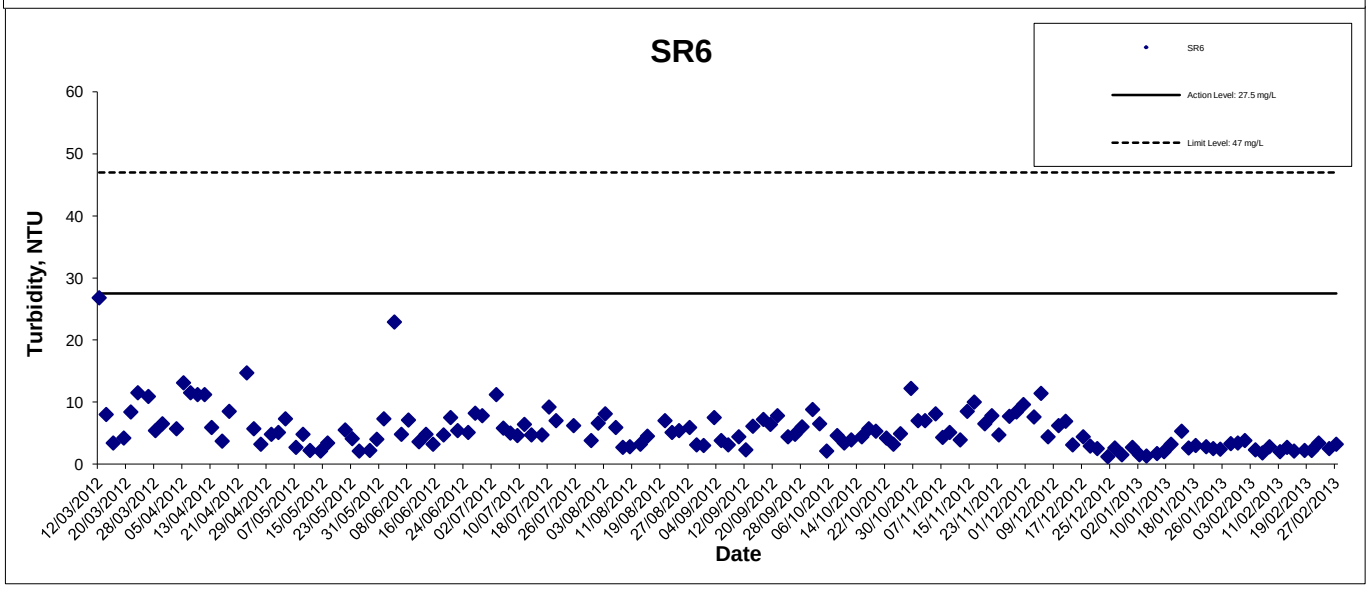




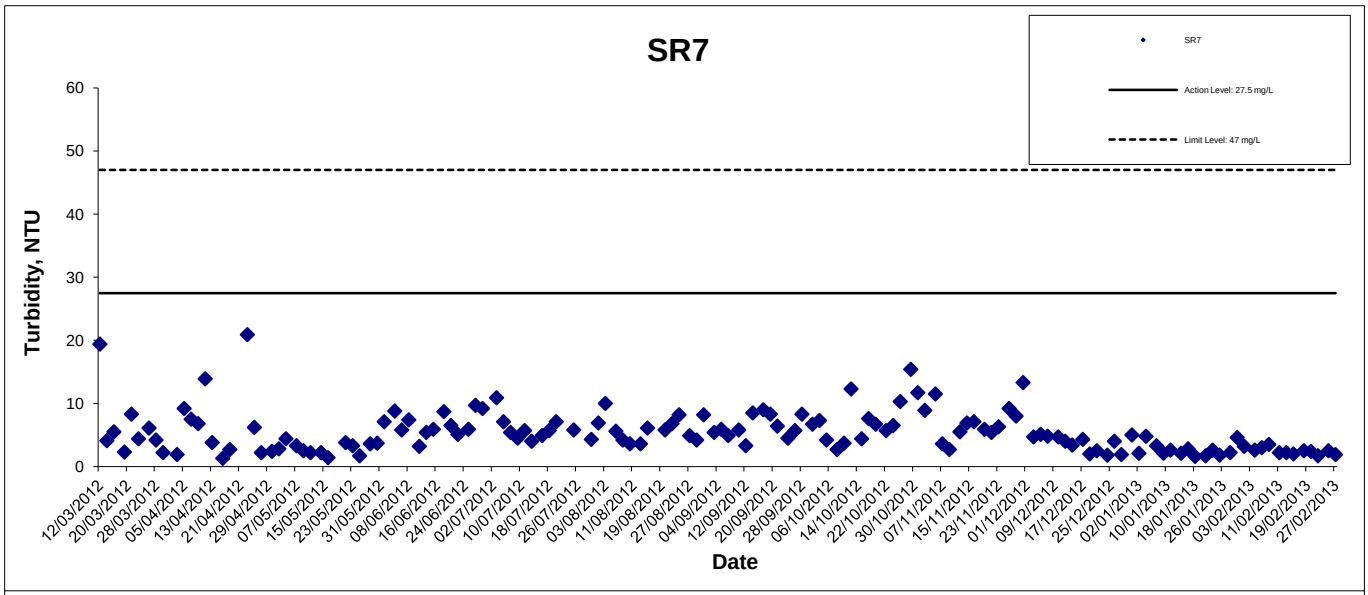
Turbidity at Mid-Ebb Tide

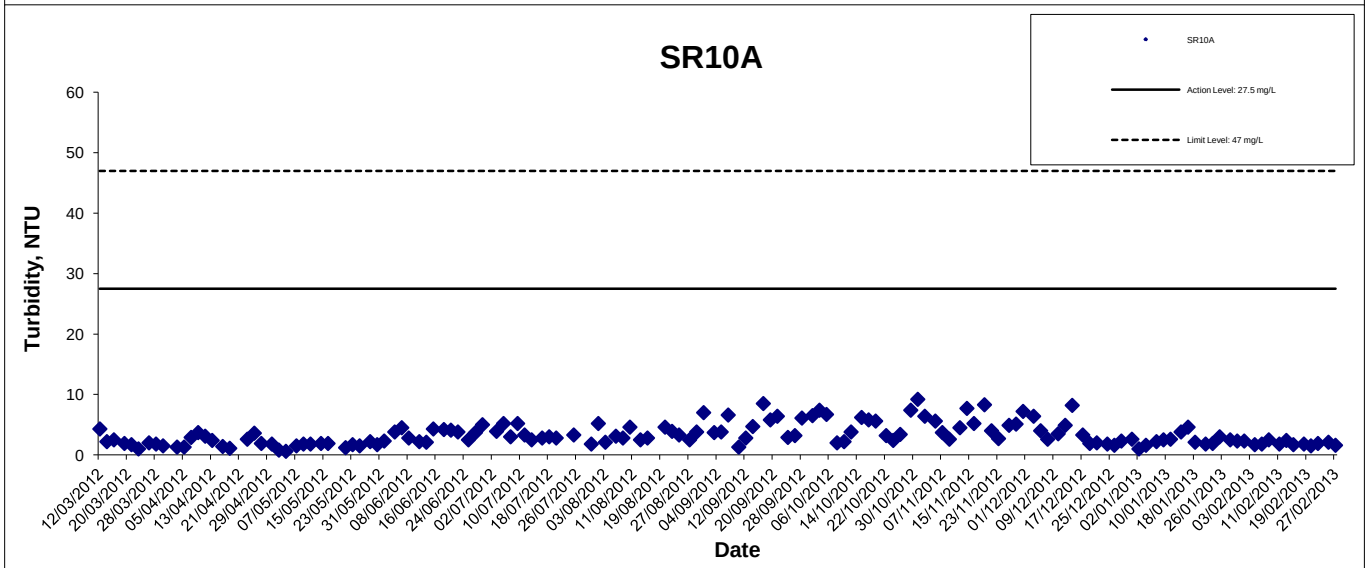


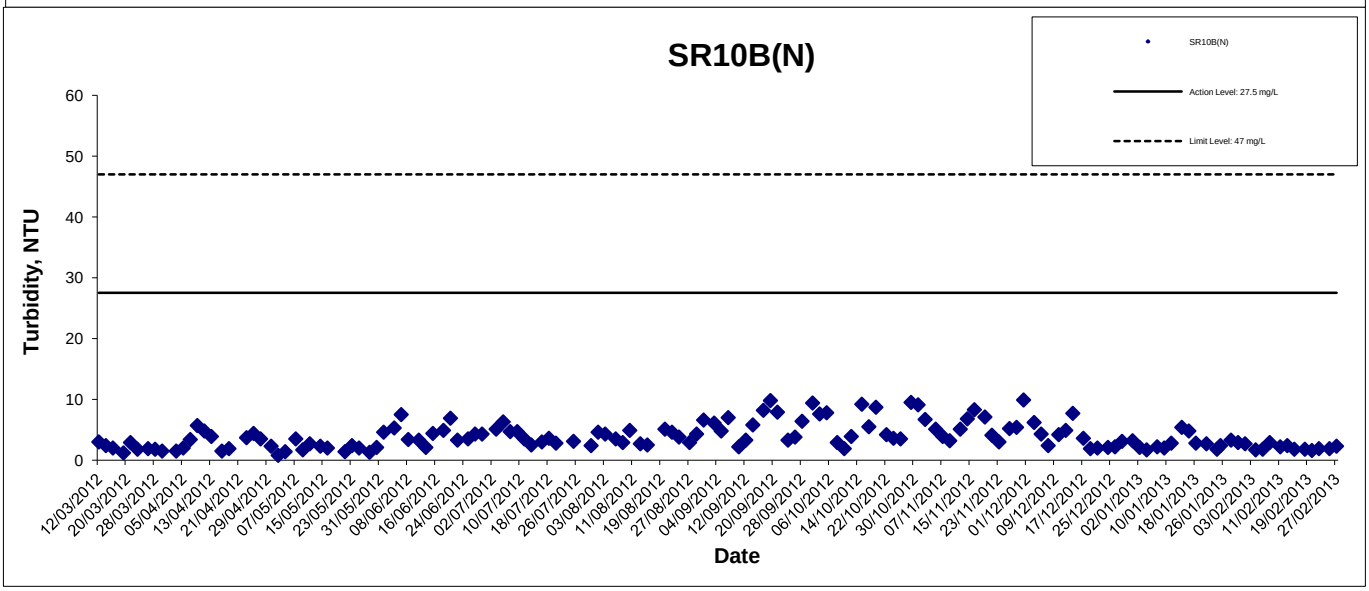




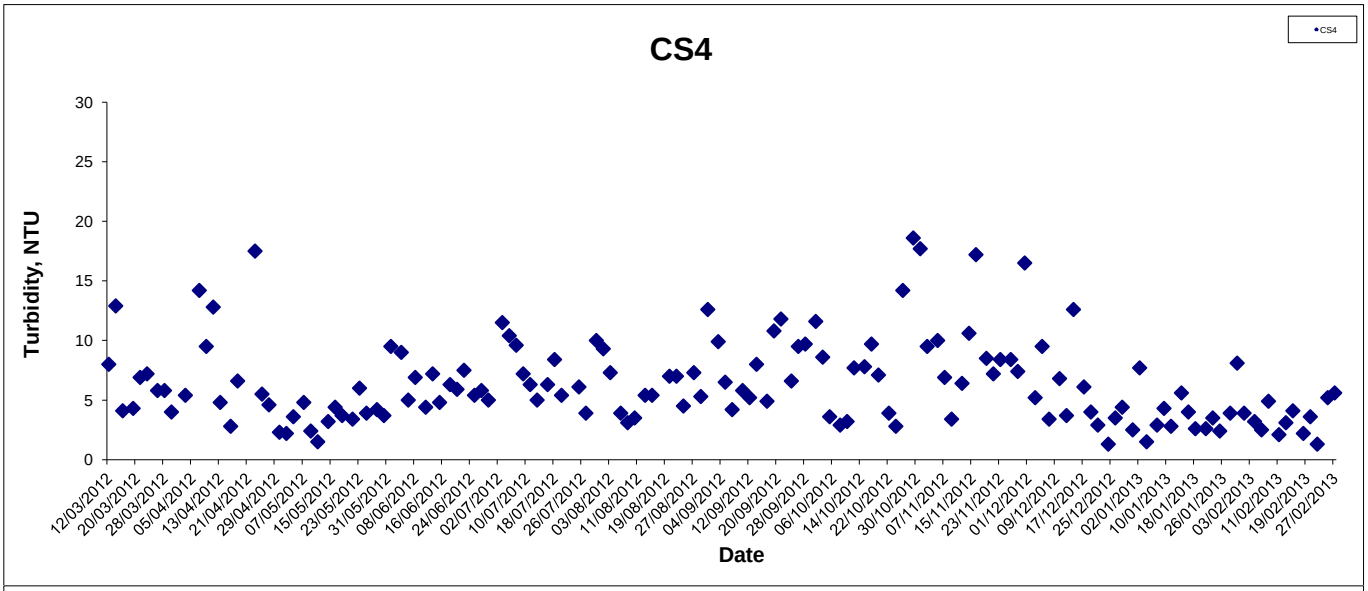
Turbidity at Mid-Ebb Tide

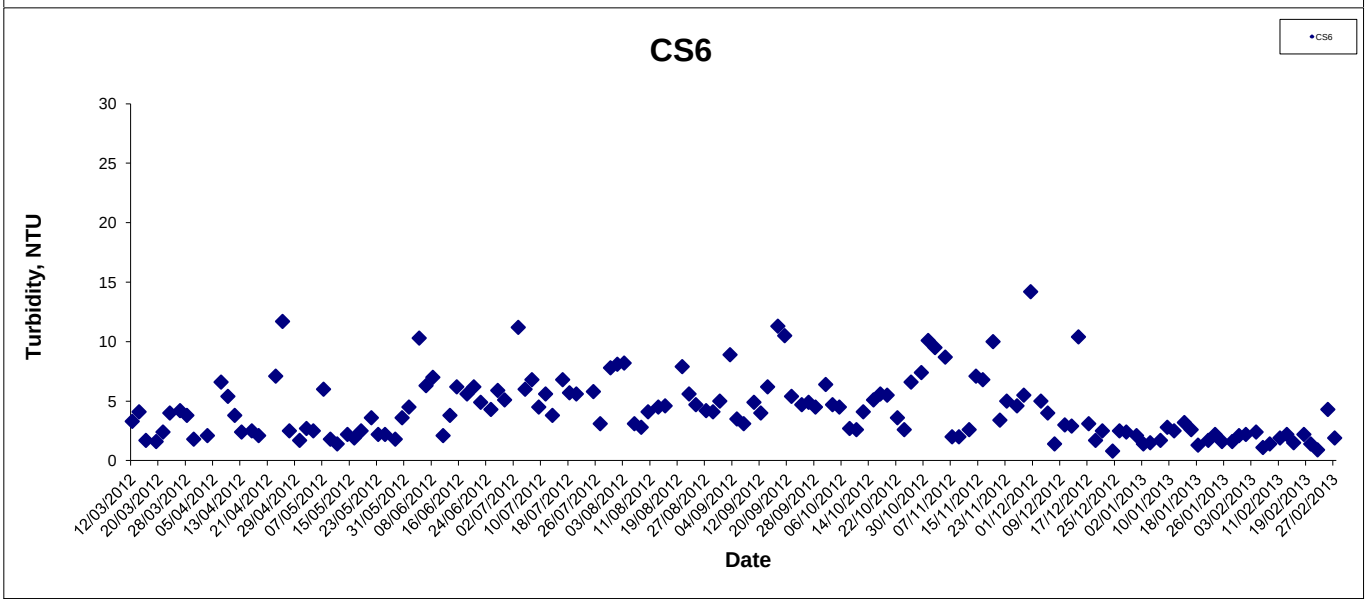


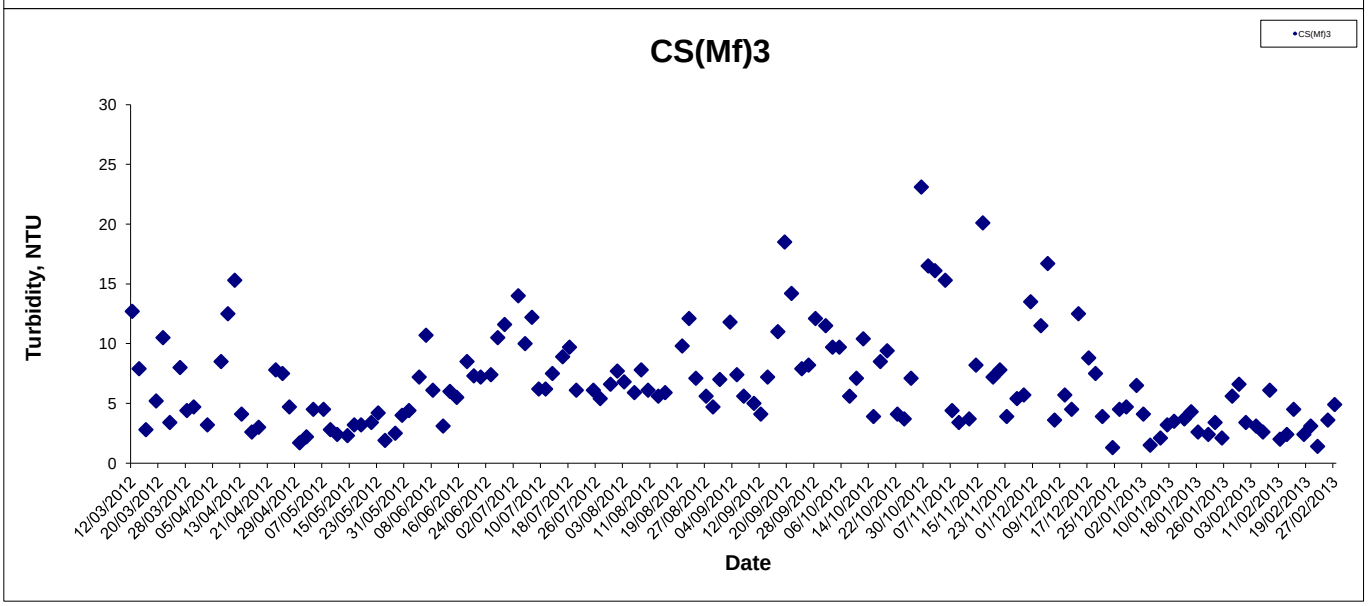




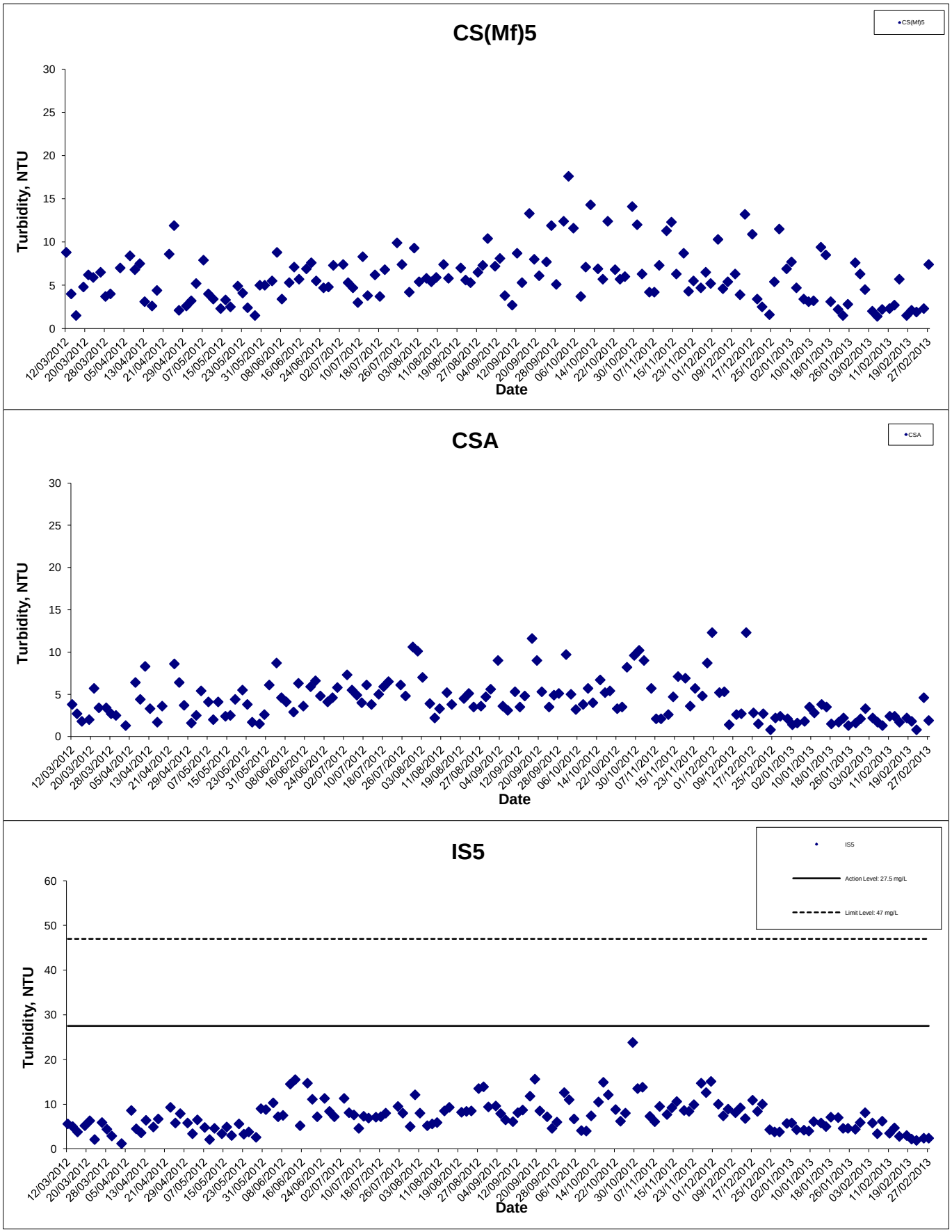
Turbidity at Mid-Flood Tide







Turbidity at Mid-Flood Tide



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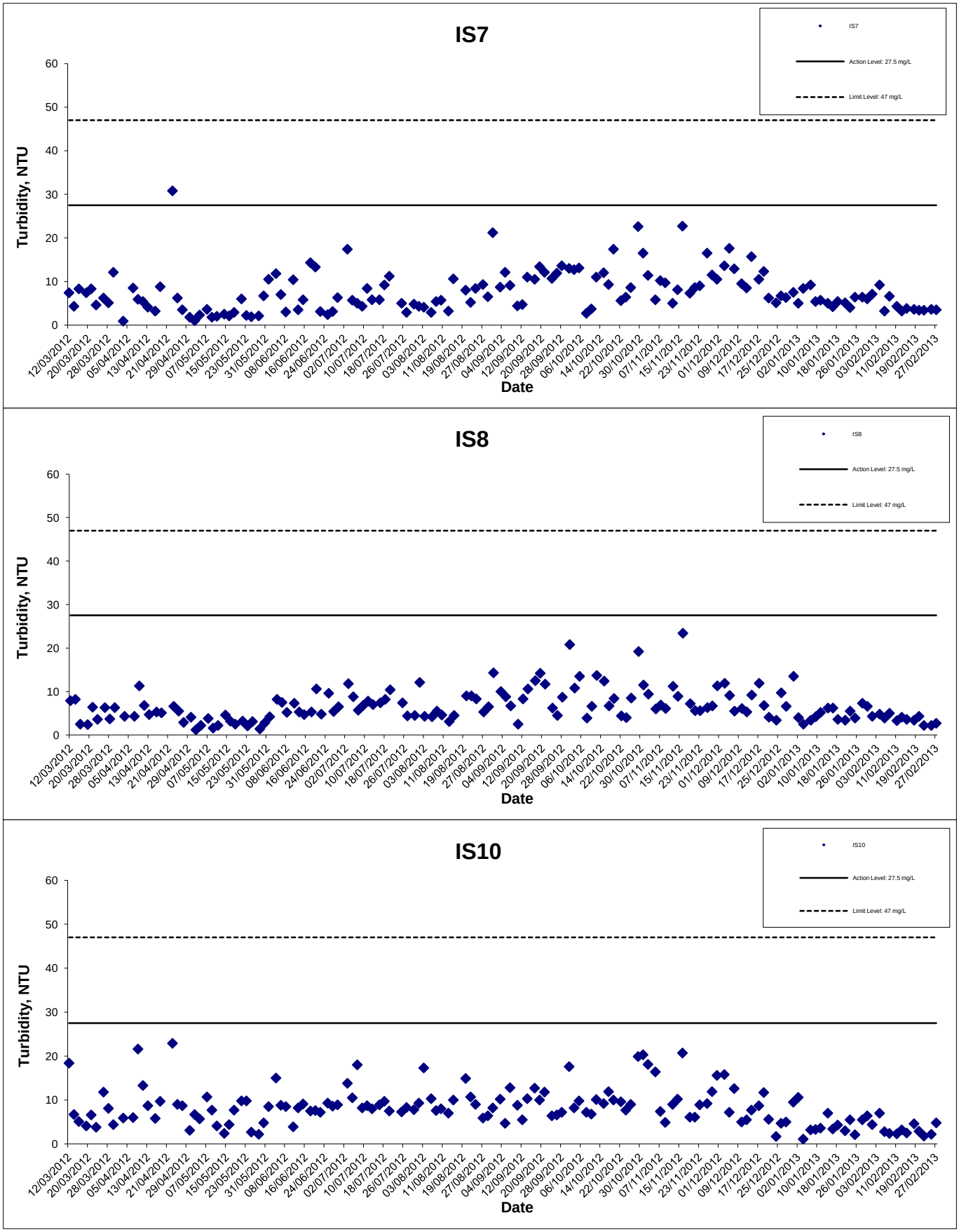

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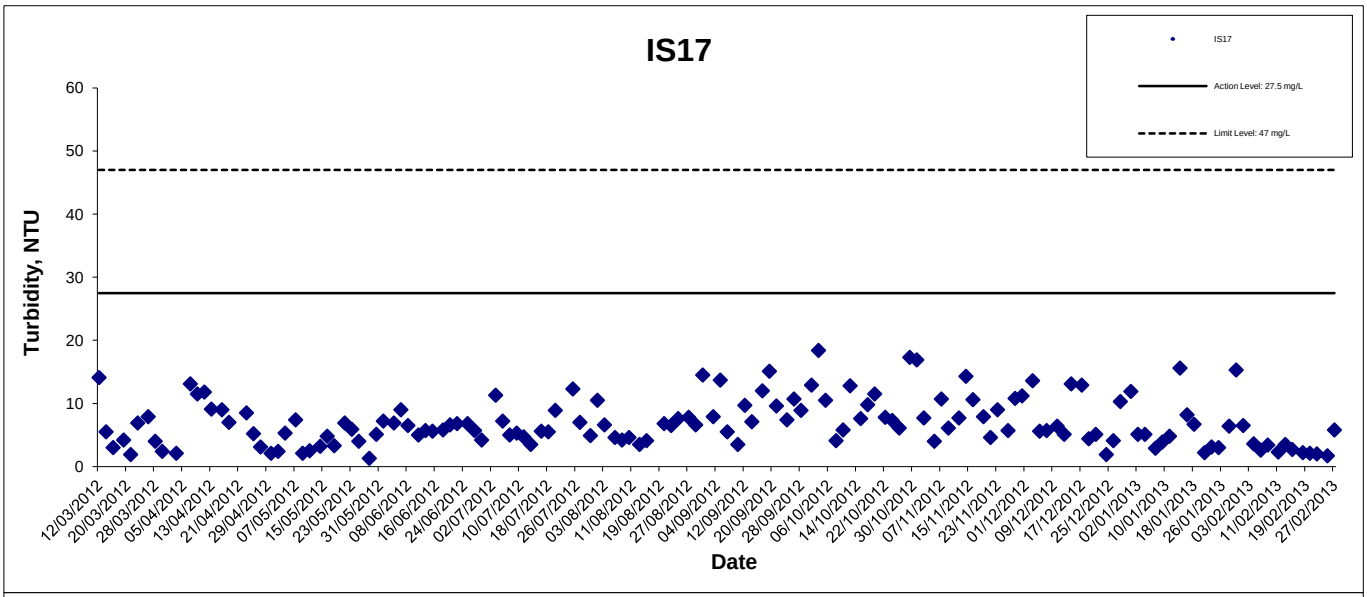

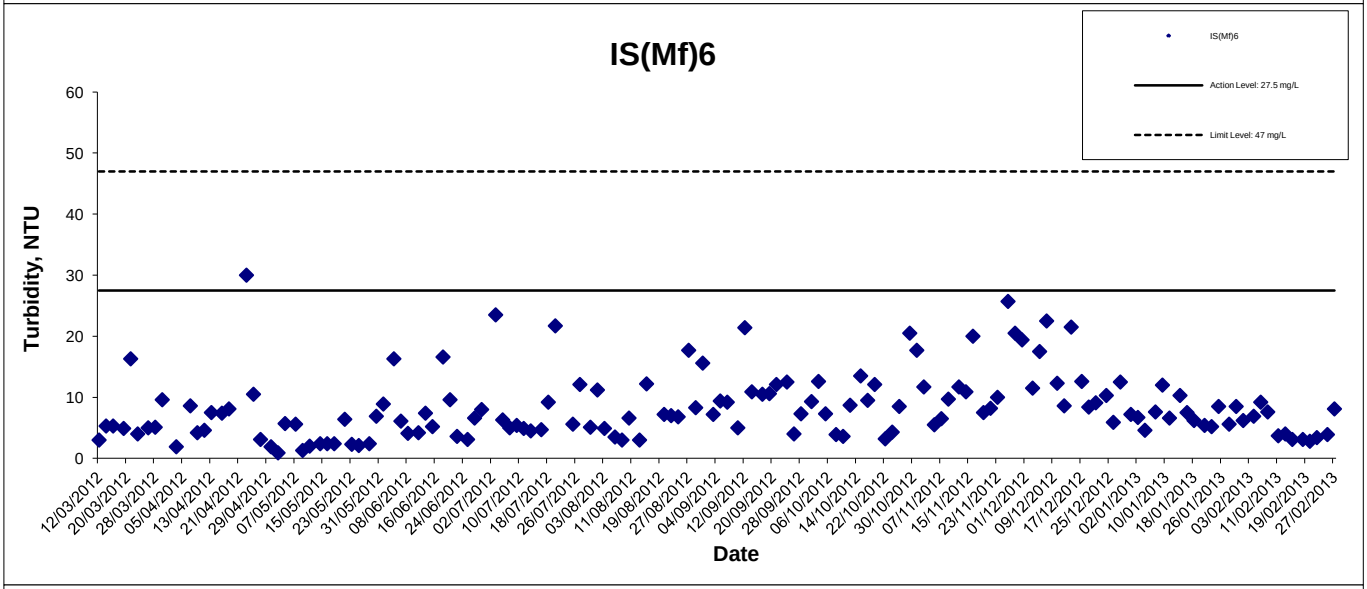

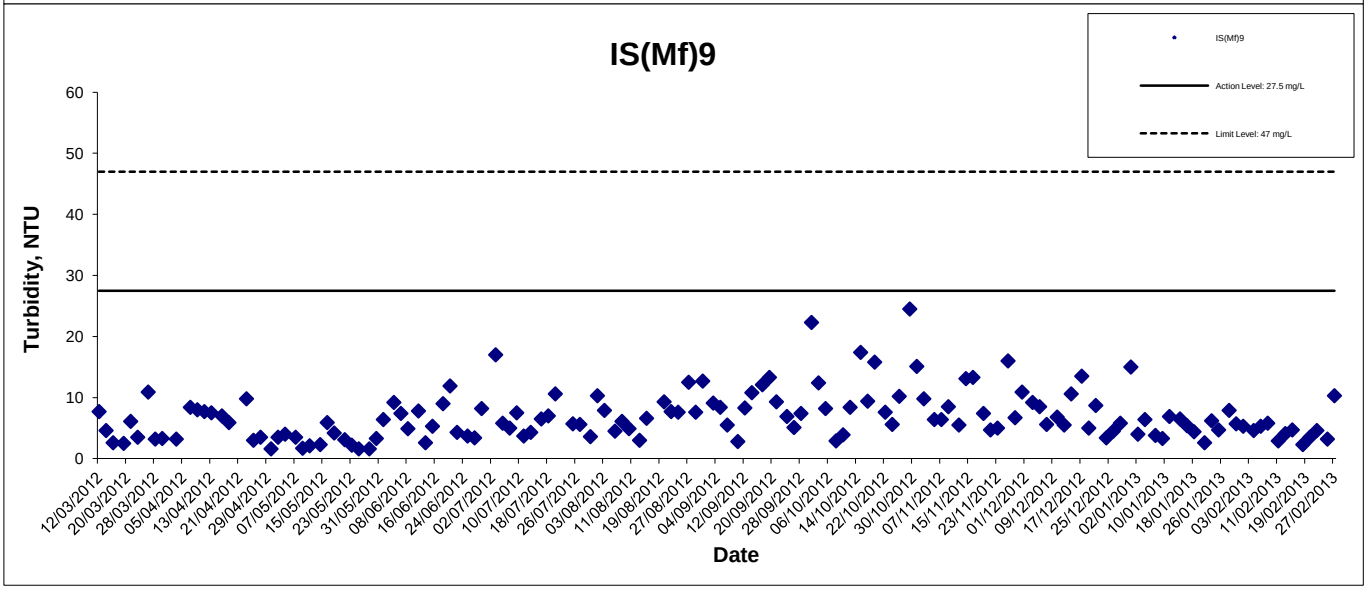

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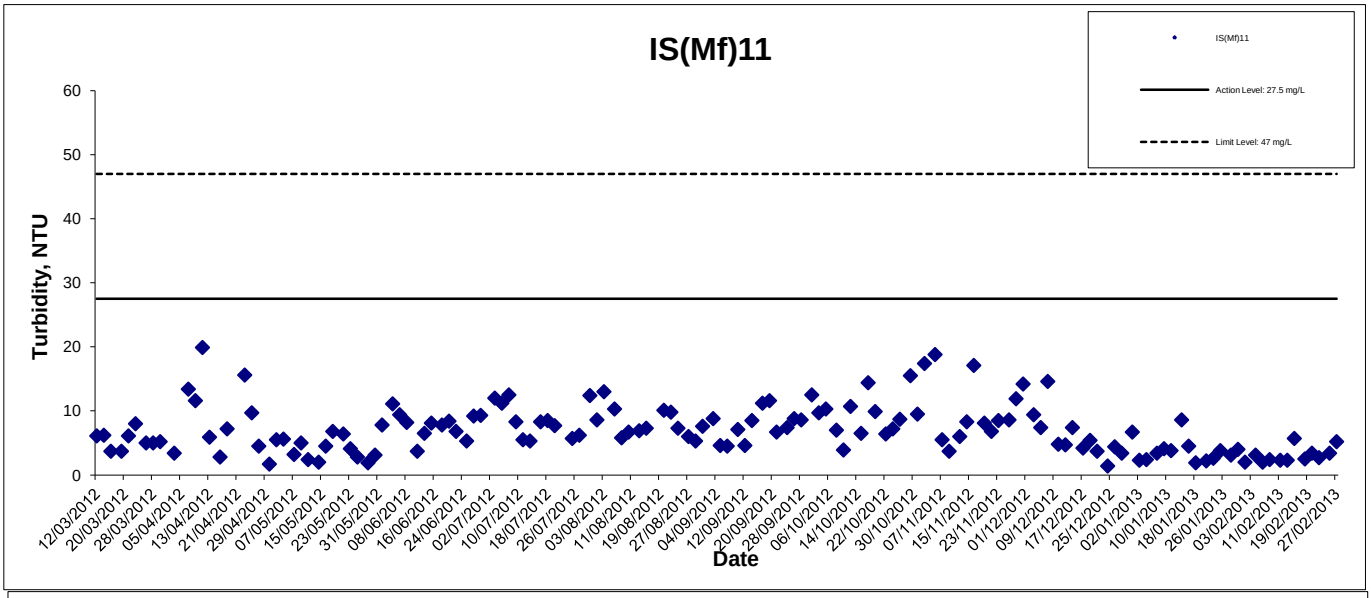

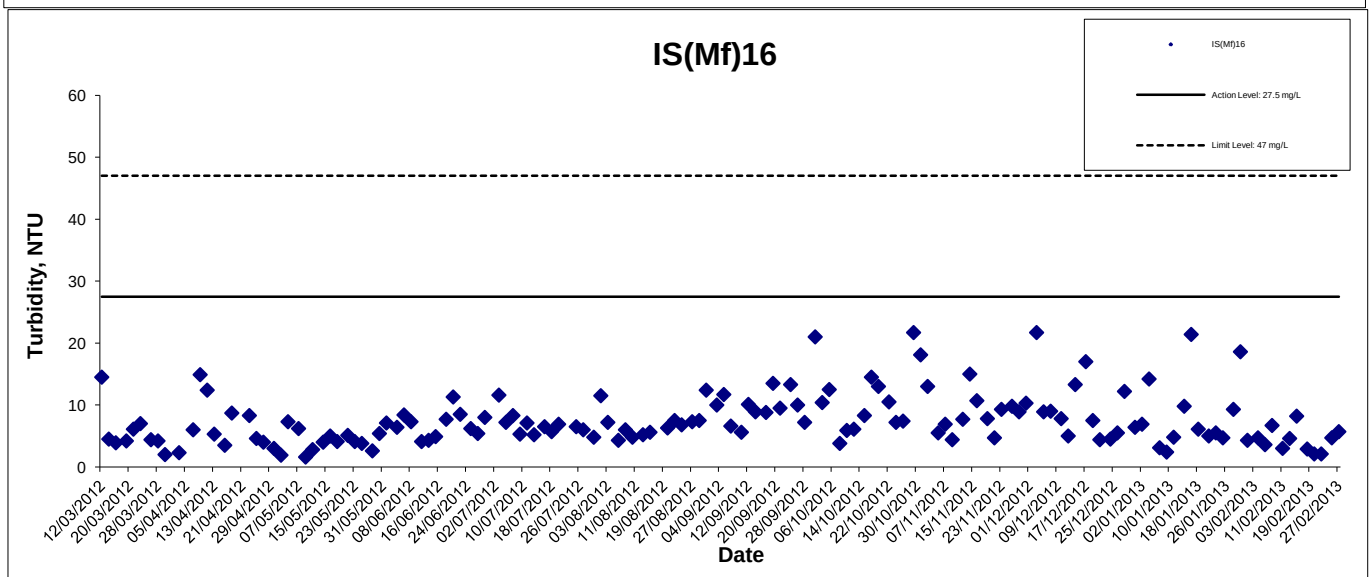

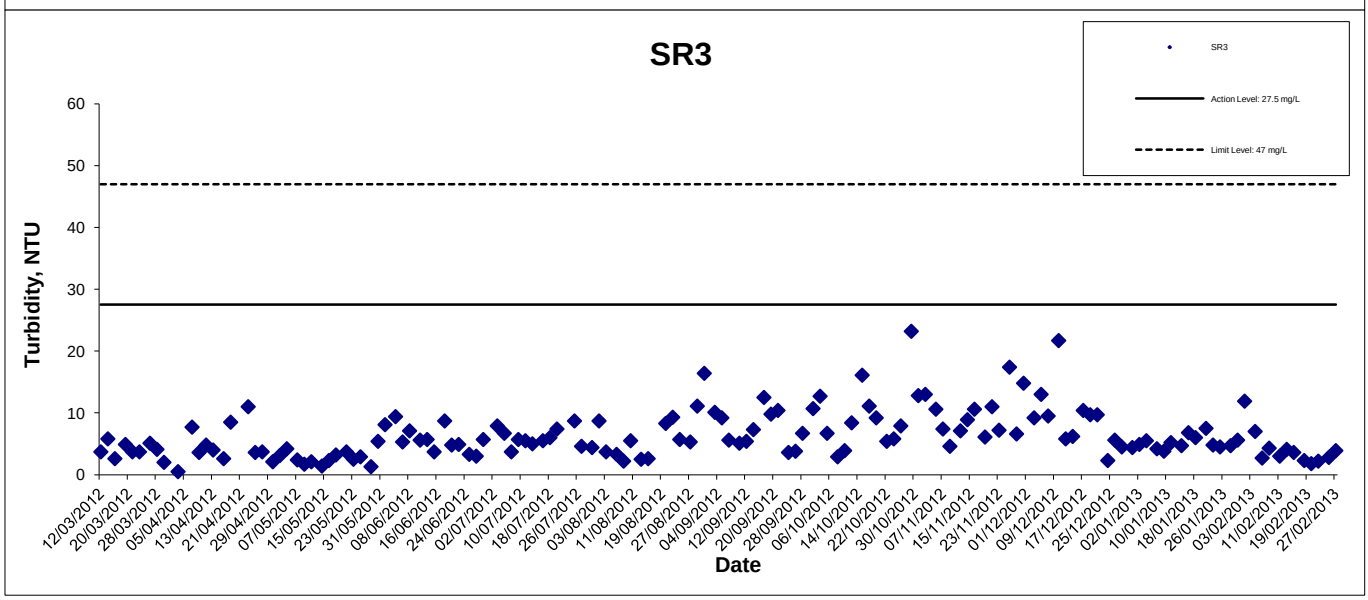

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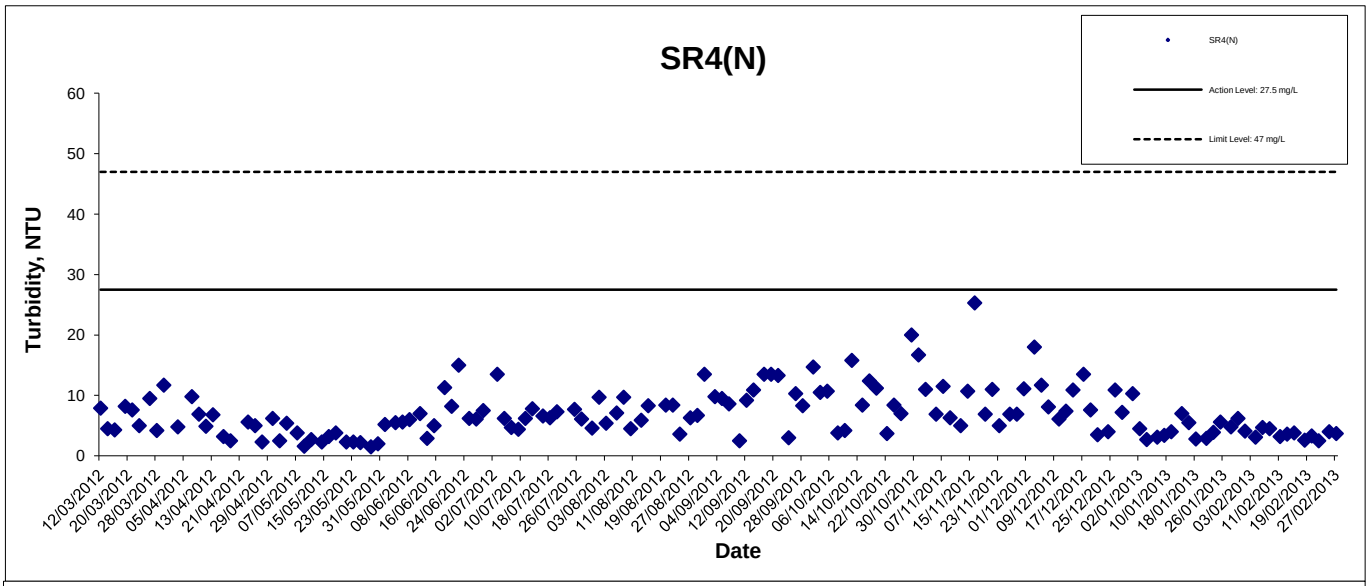

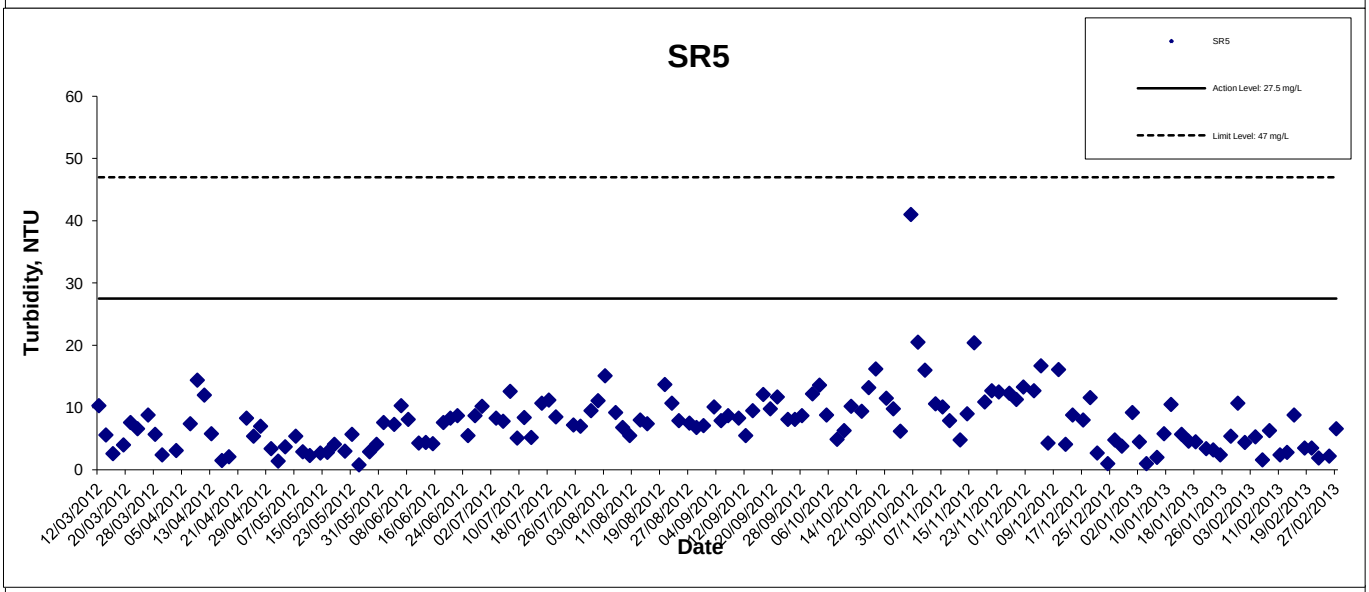

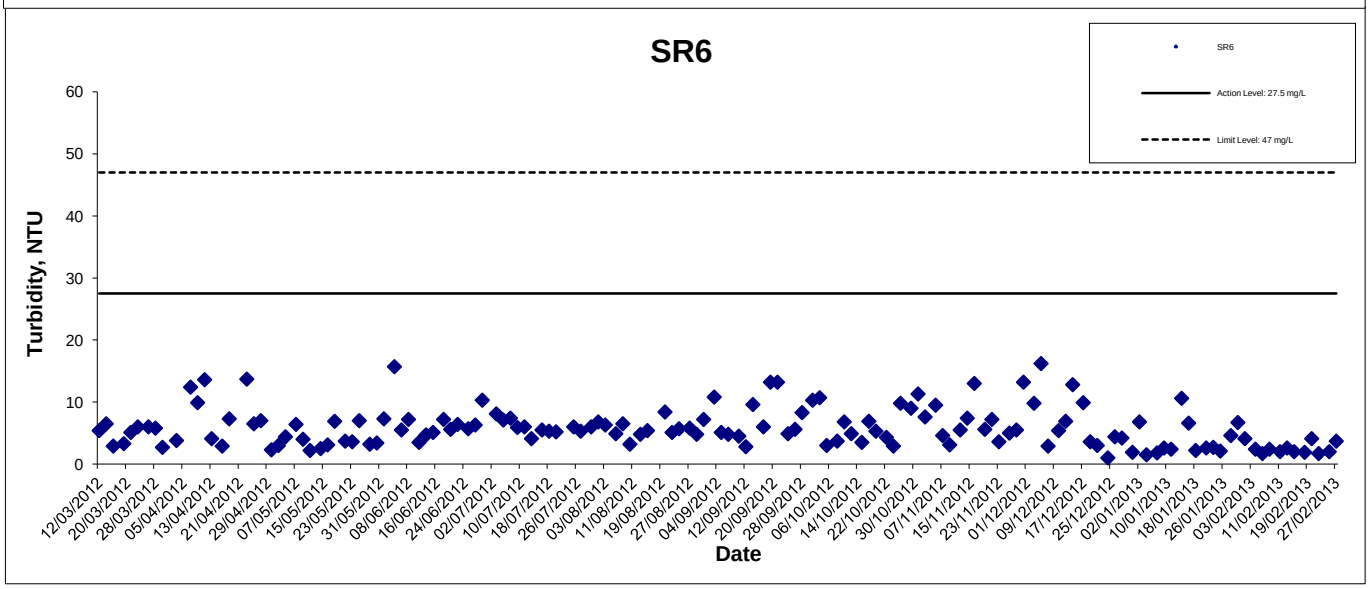

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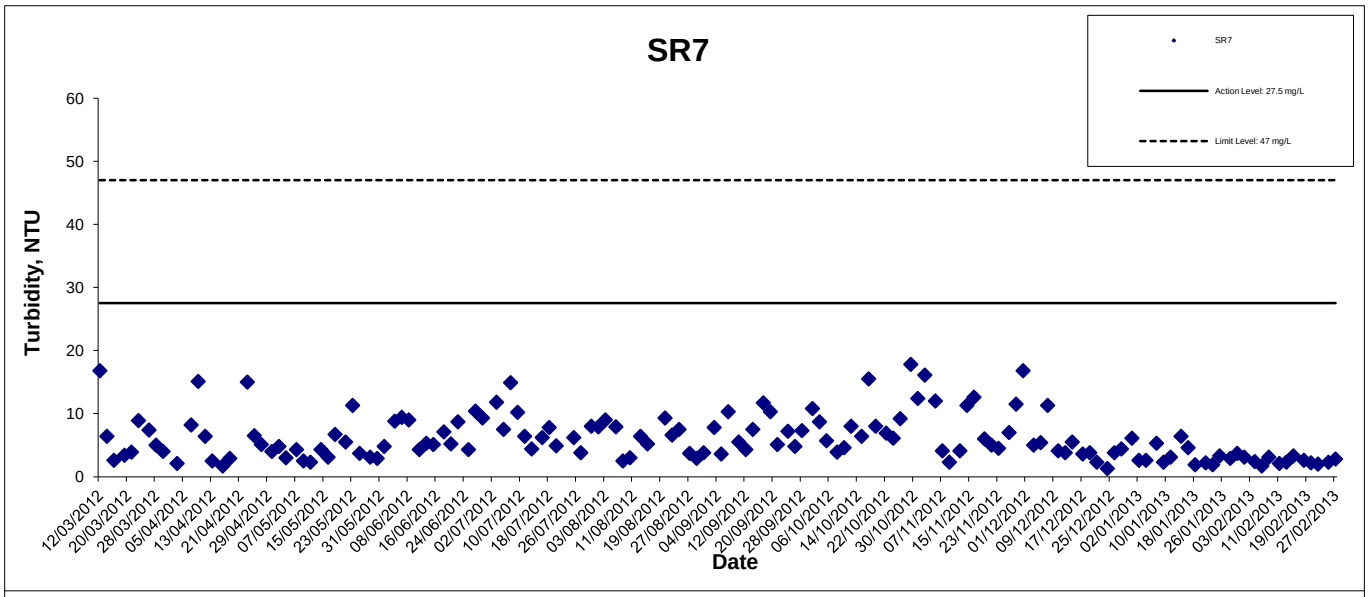
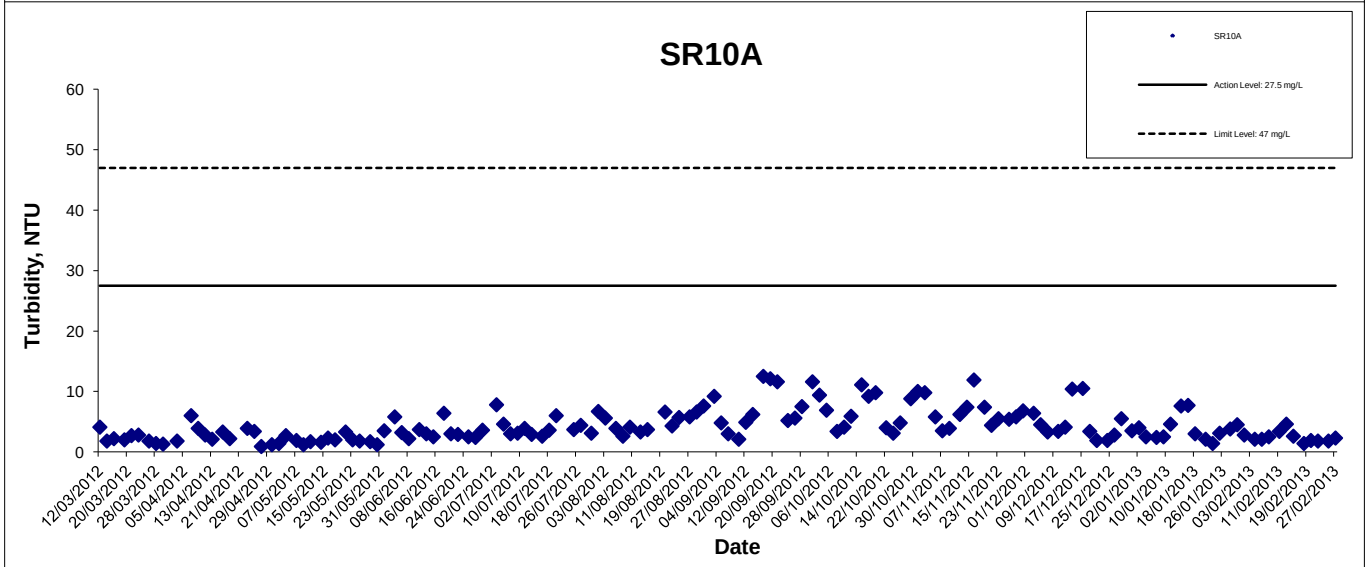
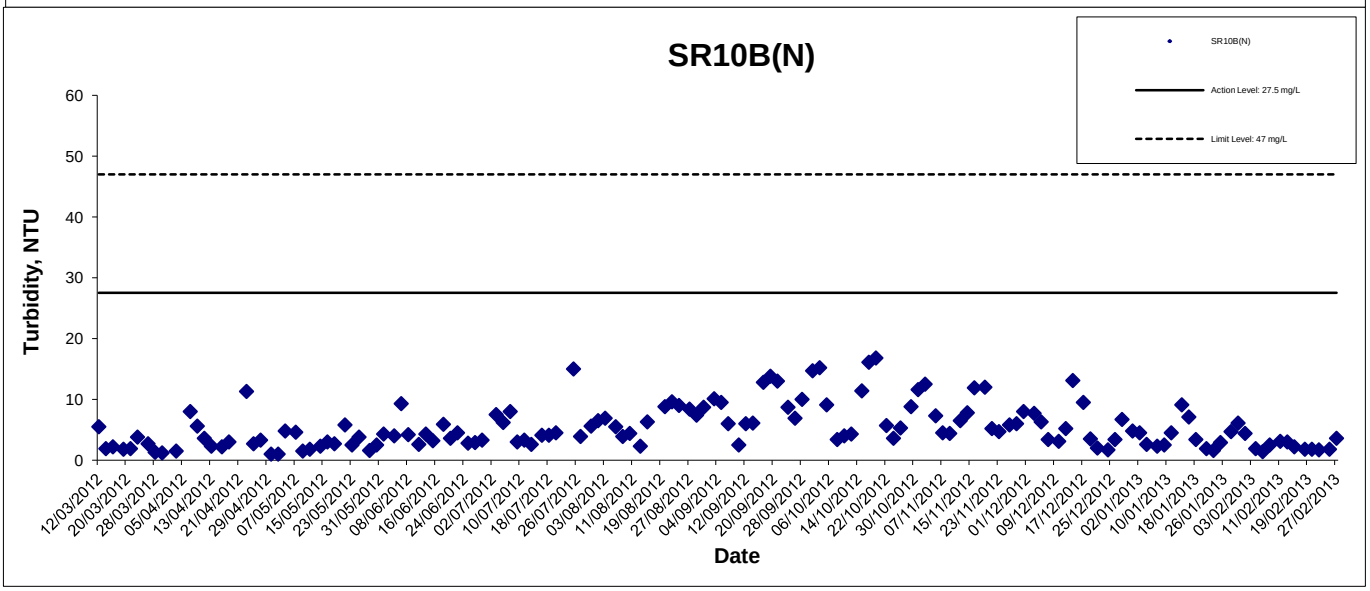
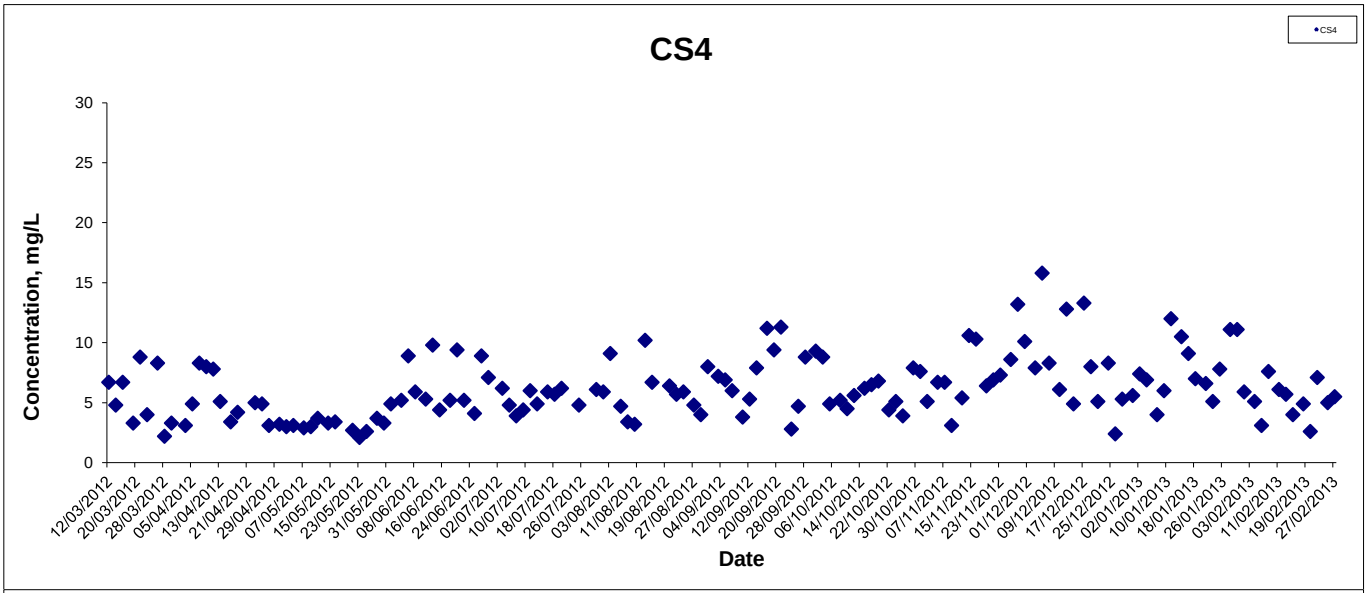
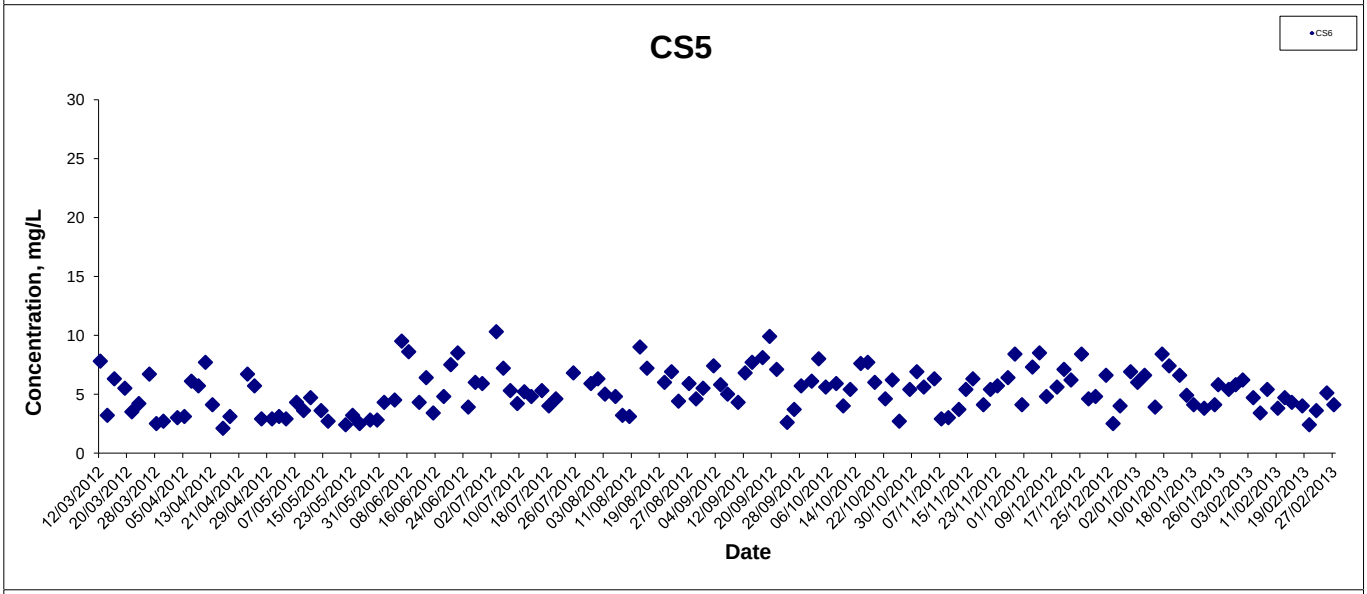


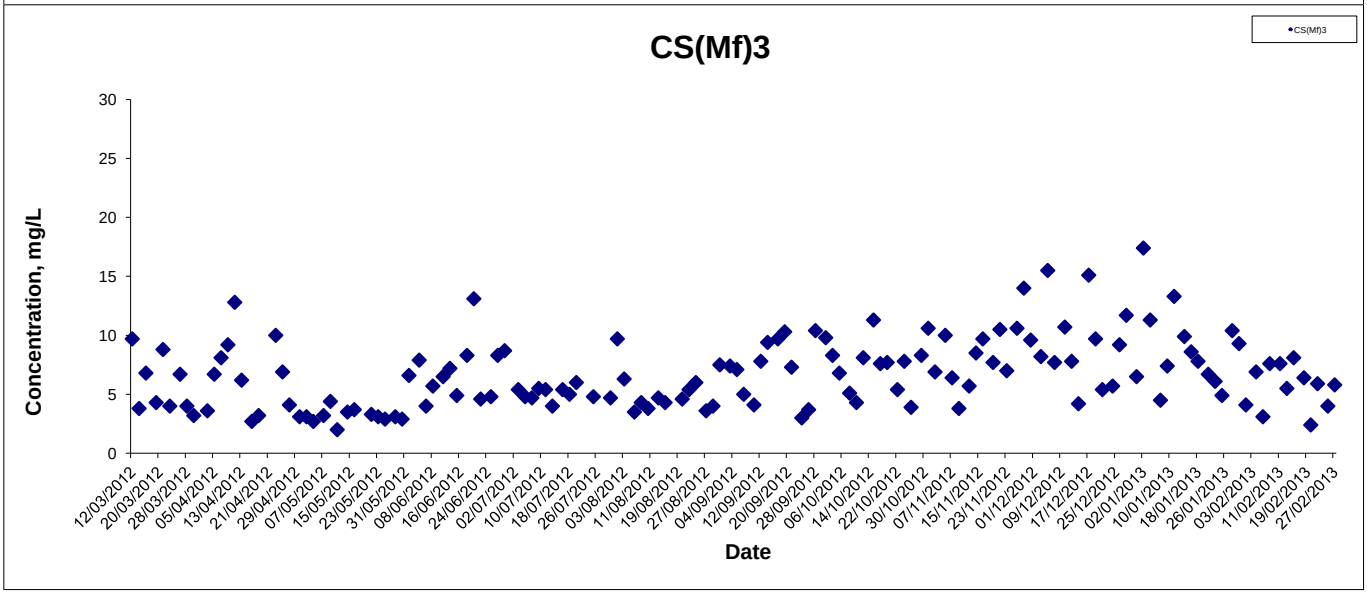




Suspended Solids at Mid-Ebb Tide







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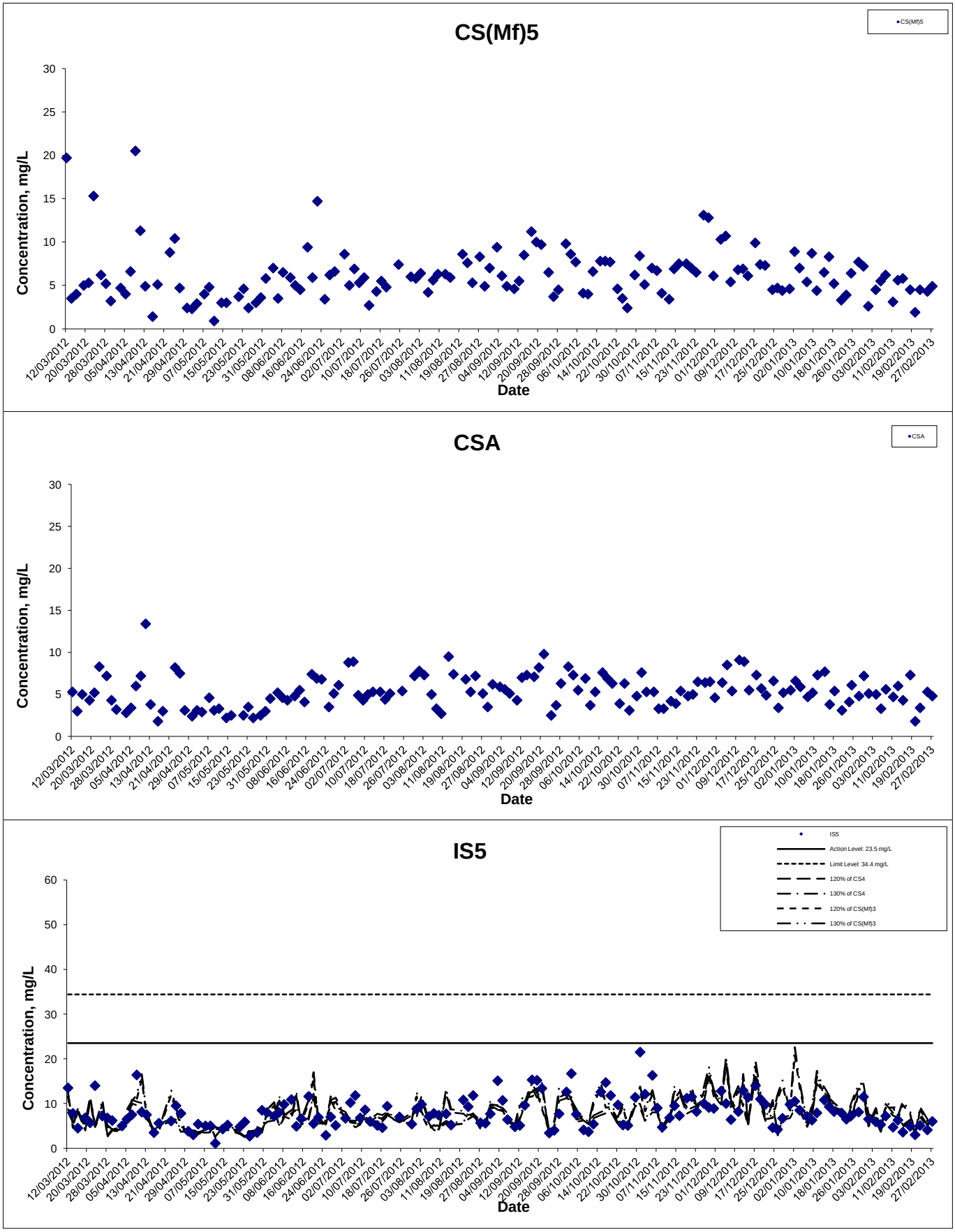
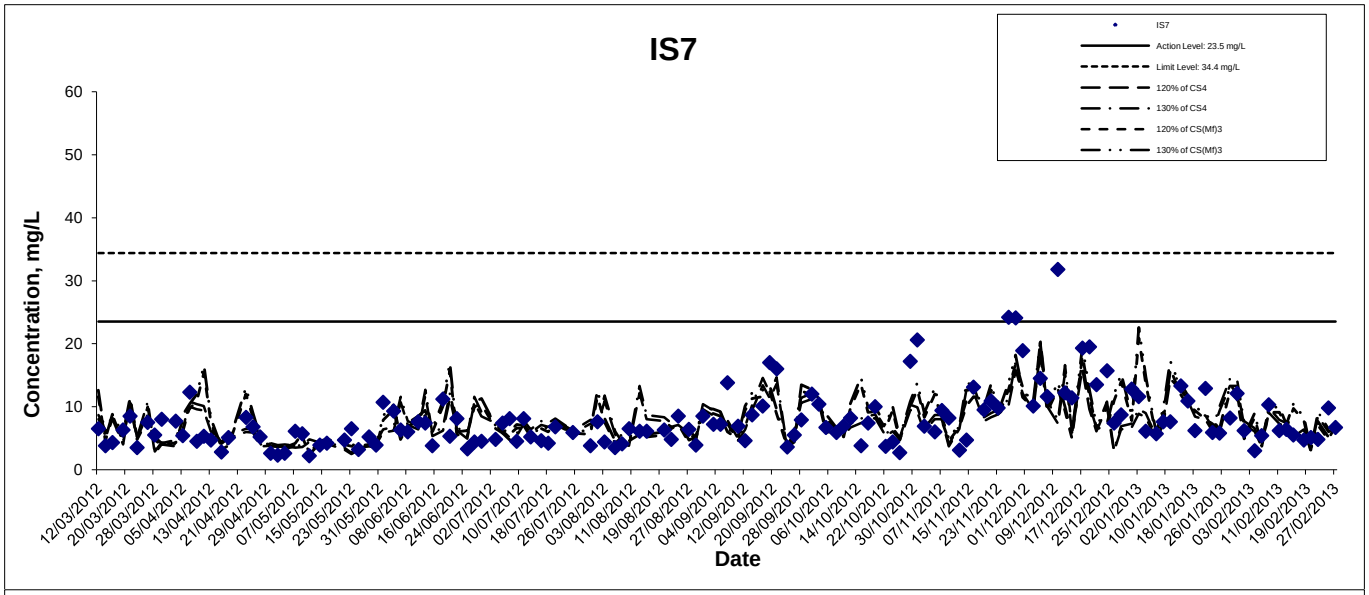


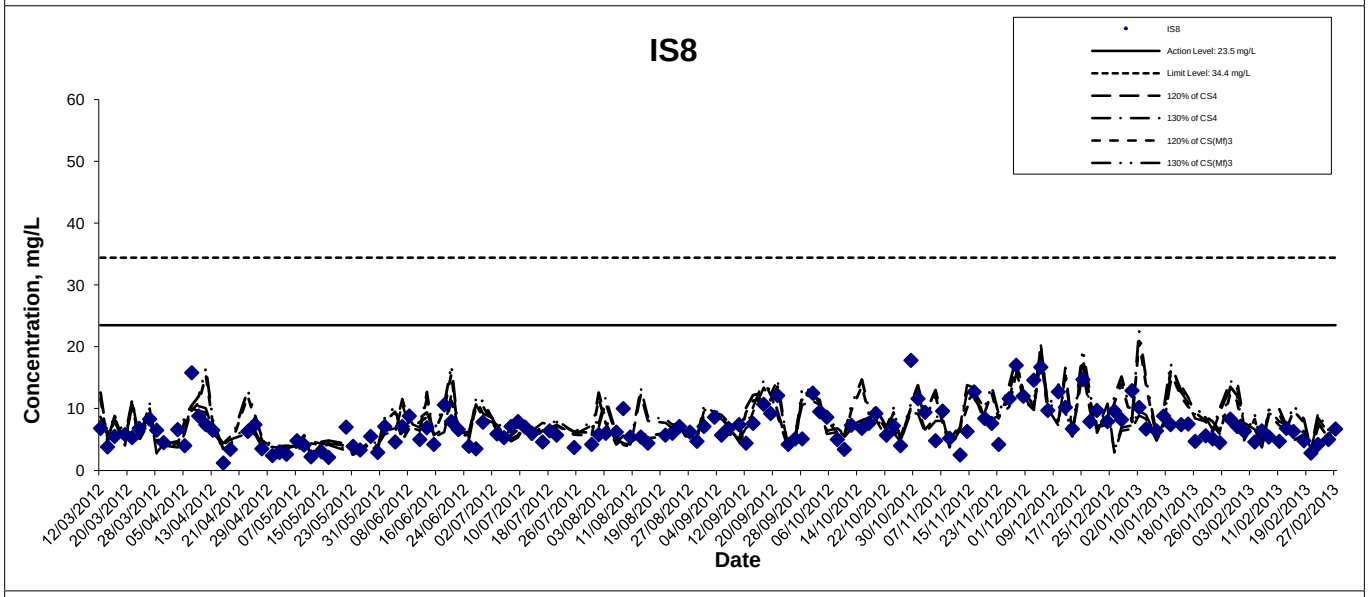
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

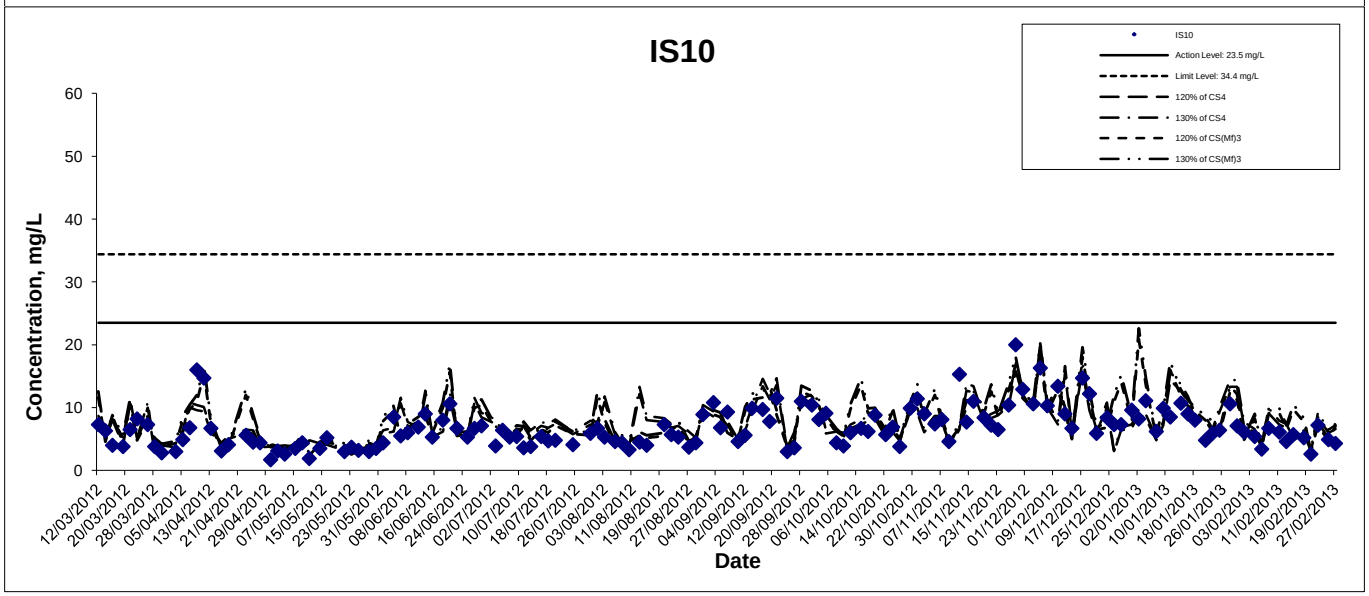
Graphical Presentation of Impact Water Quality Monitoring Results

Project No.: 60249820 **Date: Apr 2013** **Appendix G**

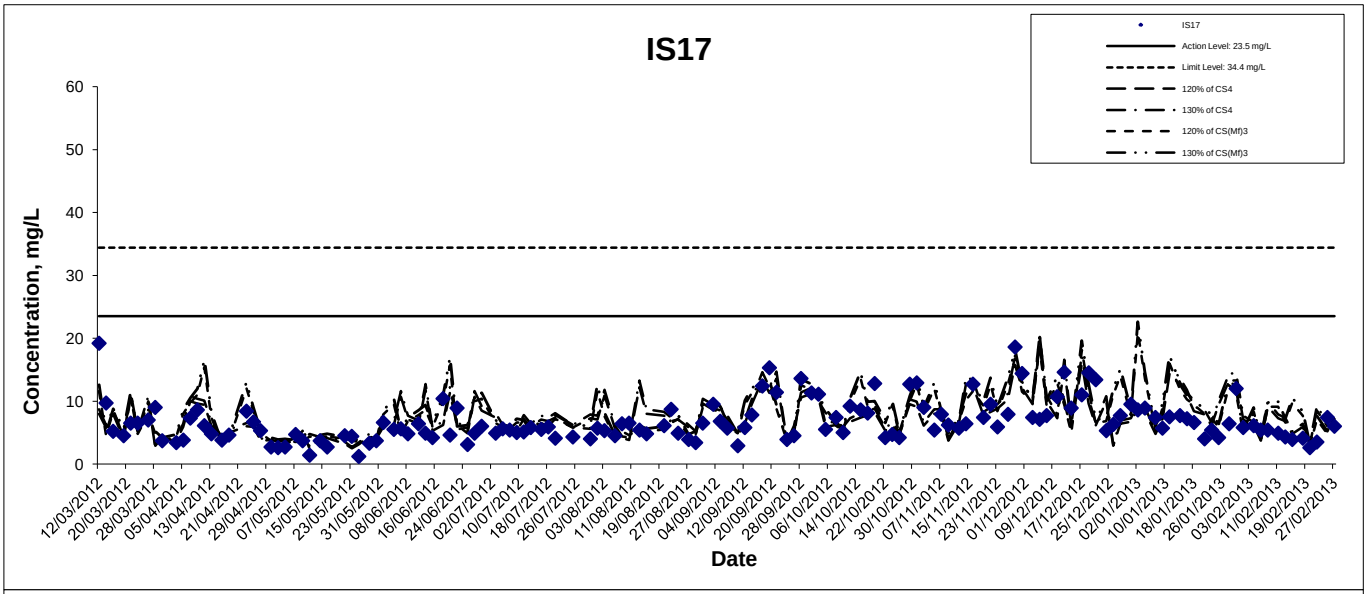
Suspended Solids at Mid-Ebb Tide

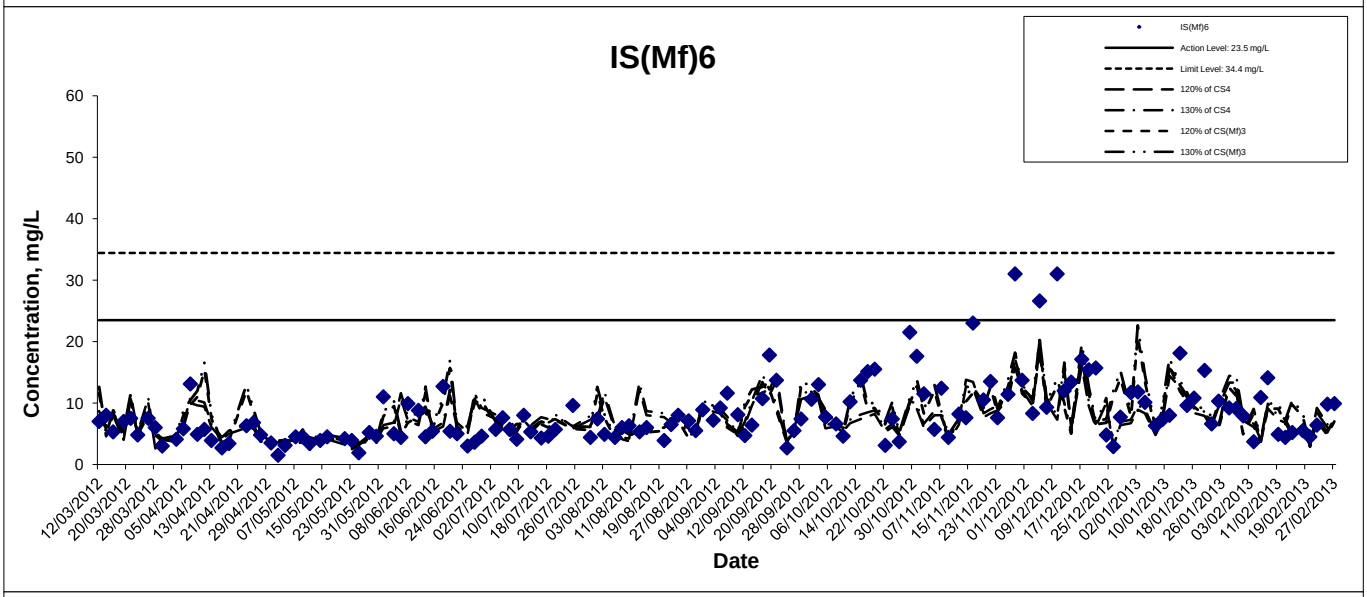


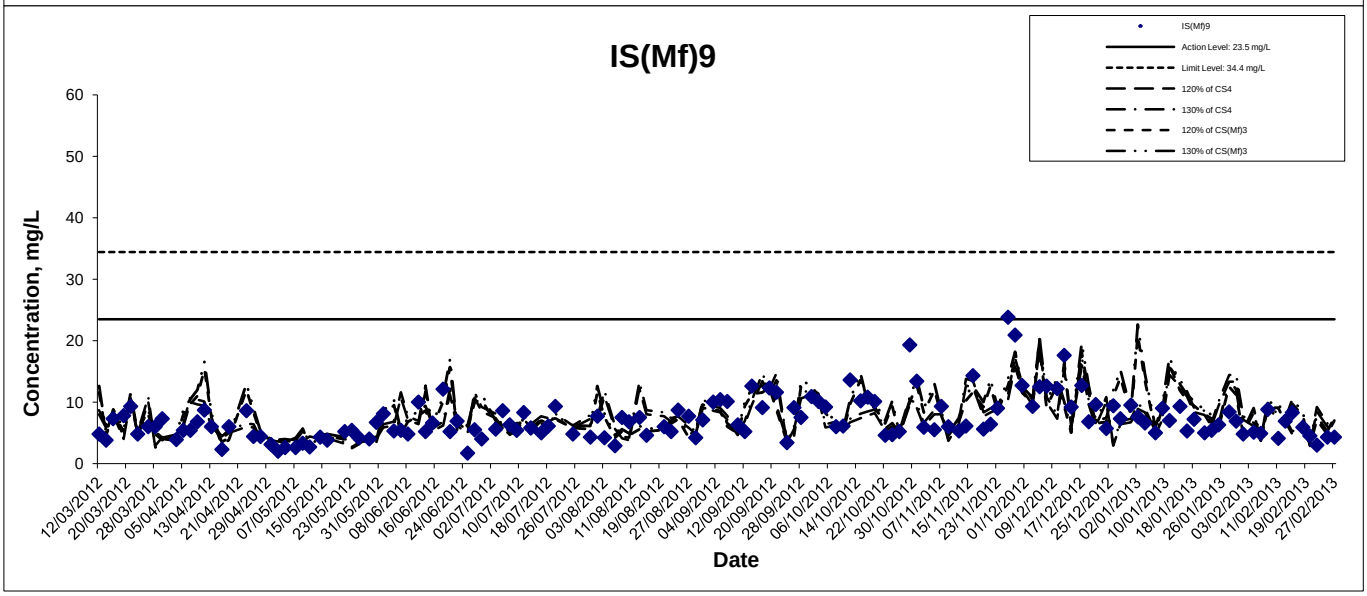




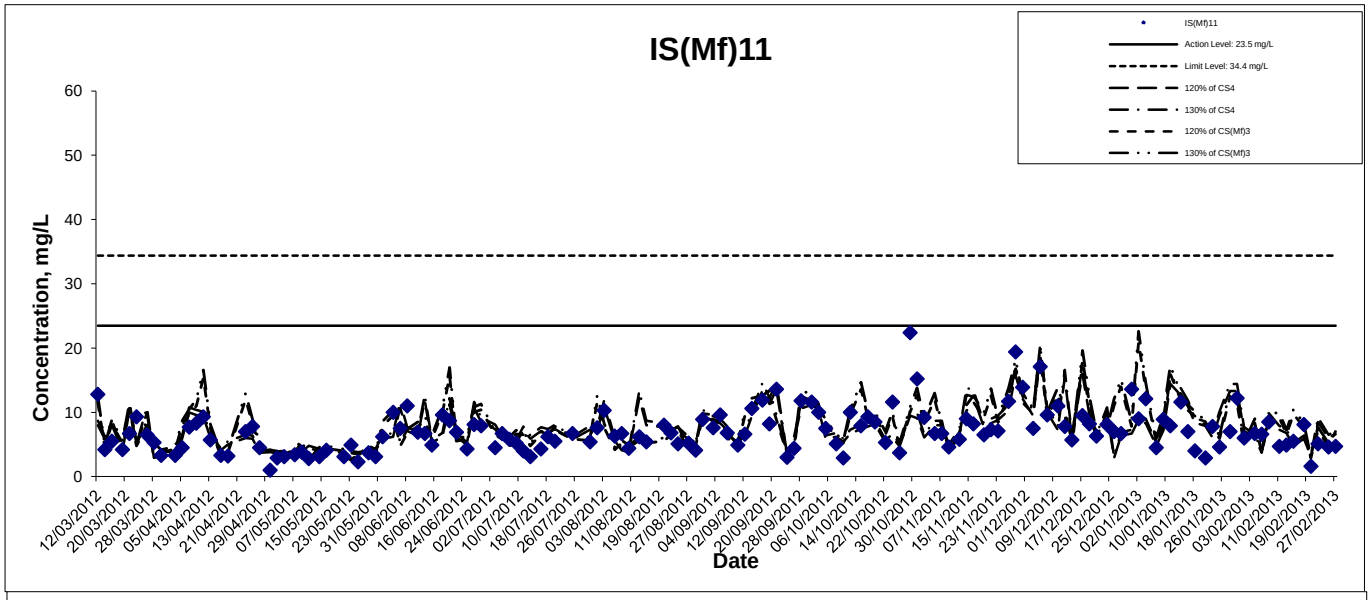
Suspended Solids at Mid-Ebb Tide

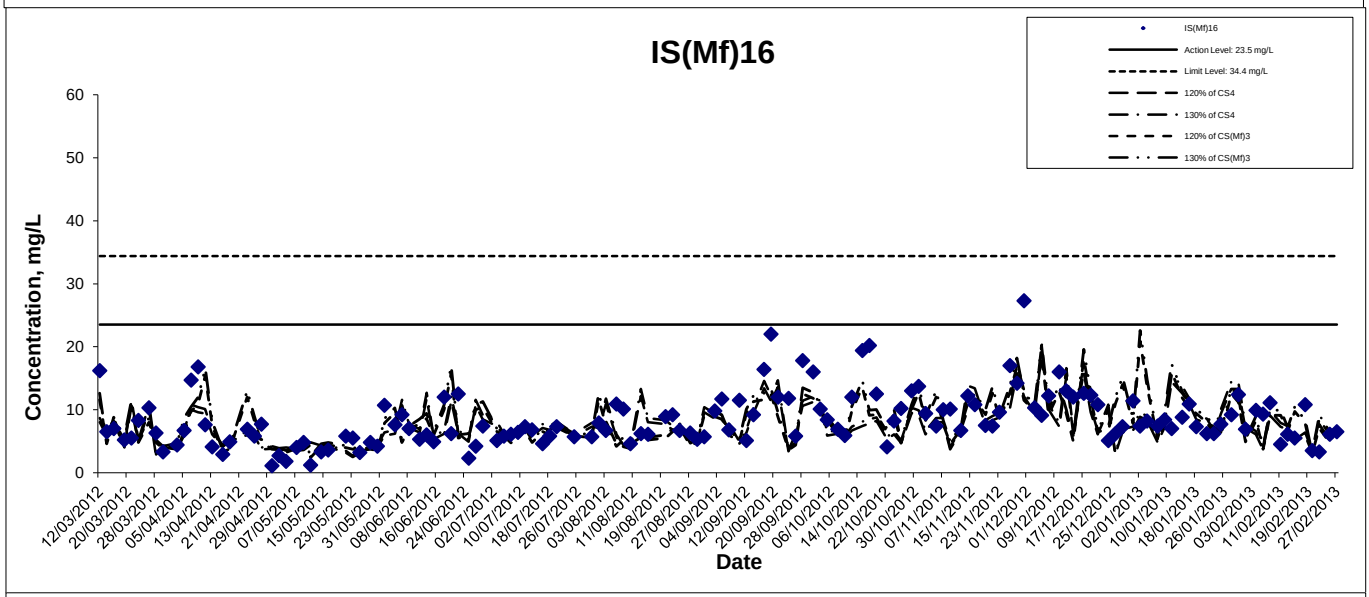


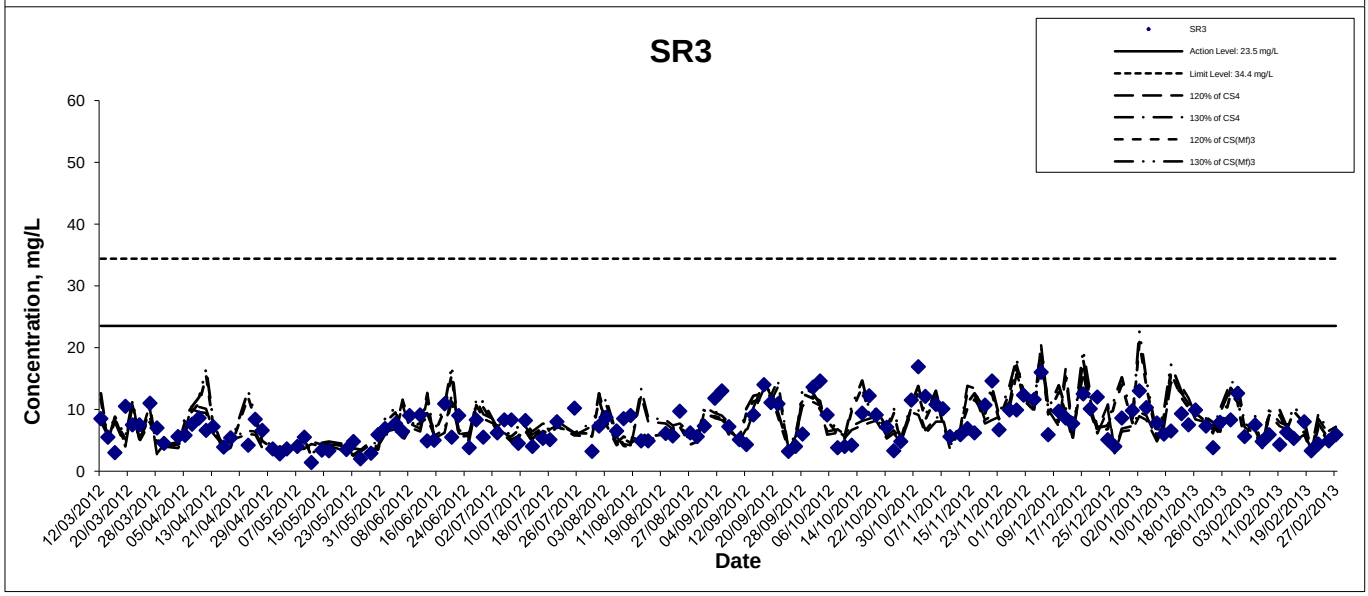




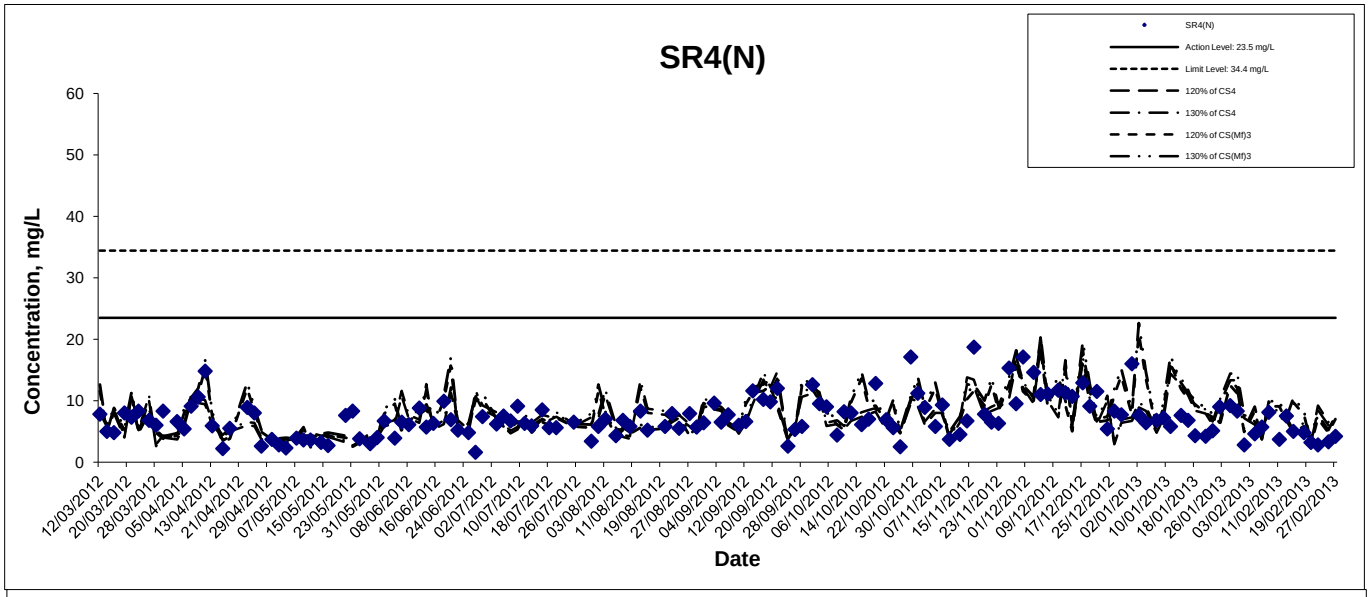
Suspended Solids at Mid-Ebb Tide

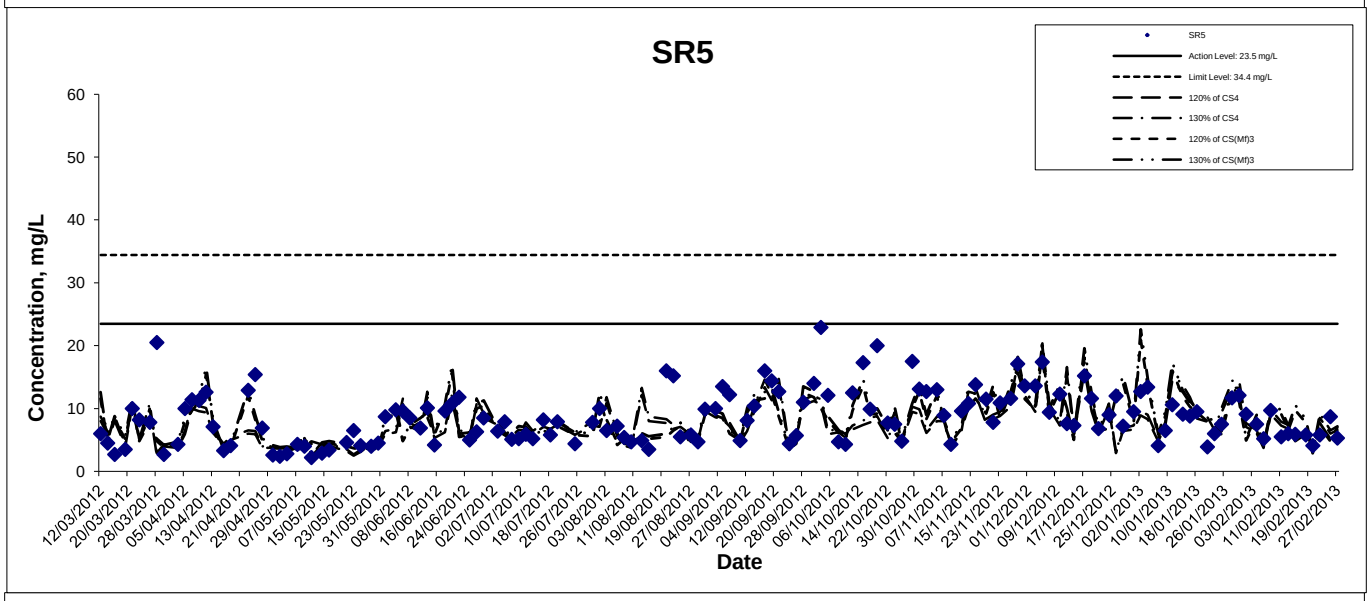


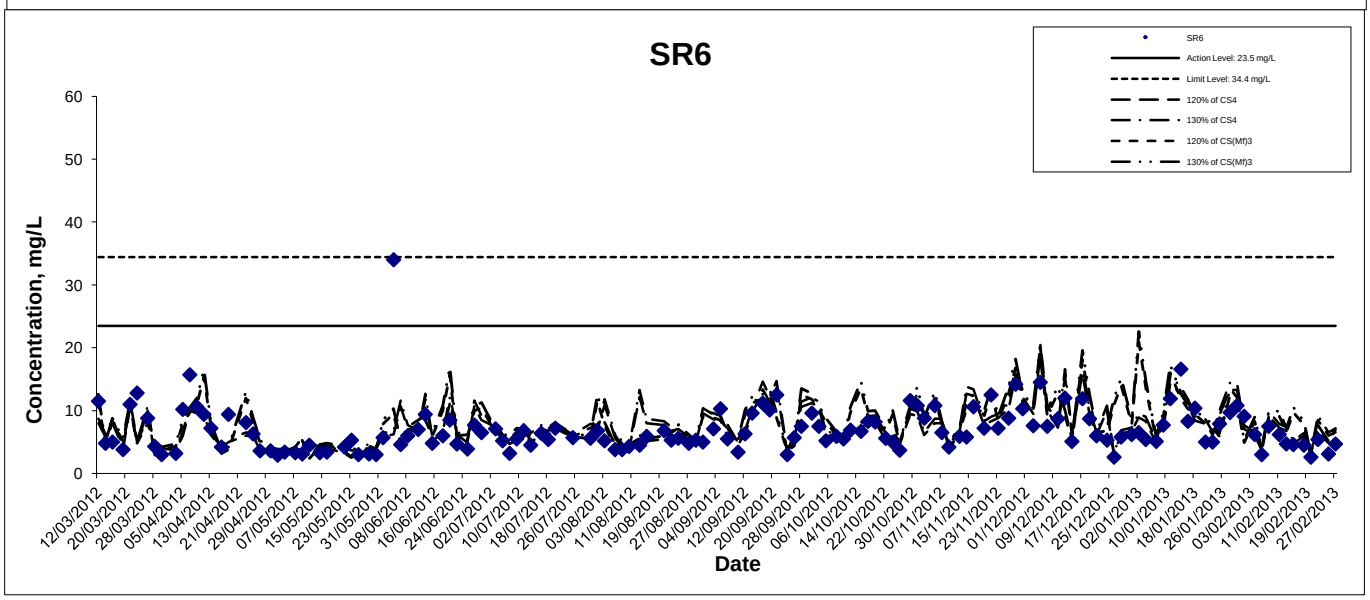




Suspended Solids at Mid-Ebb Tide







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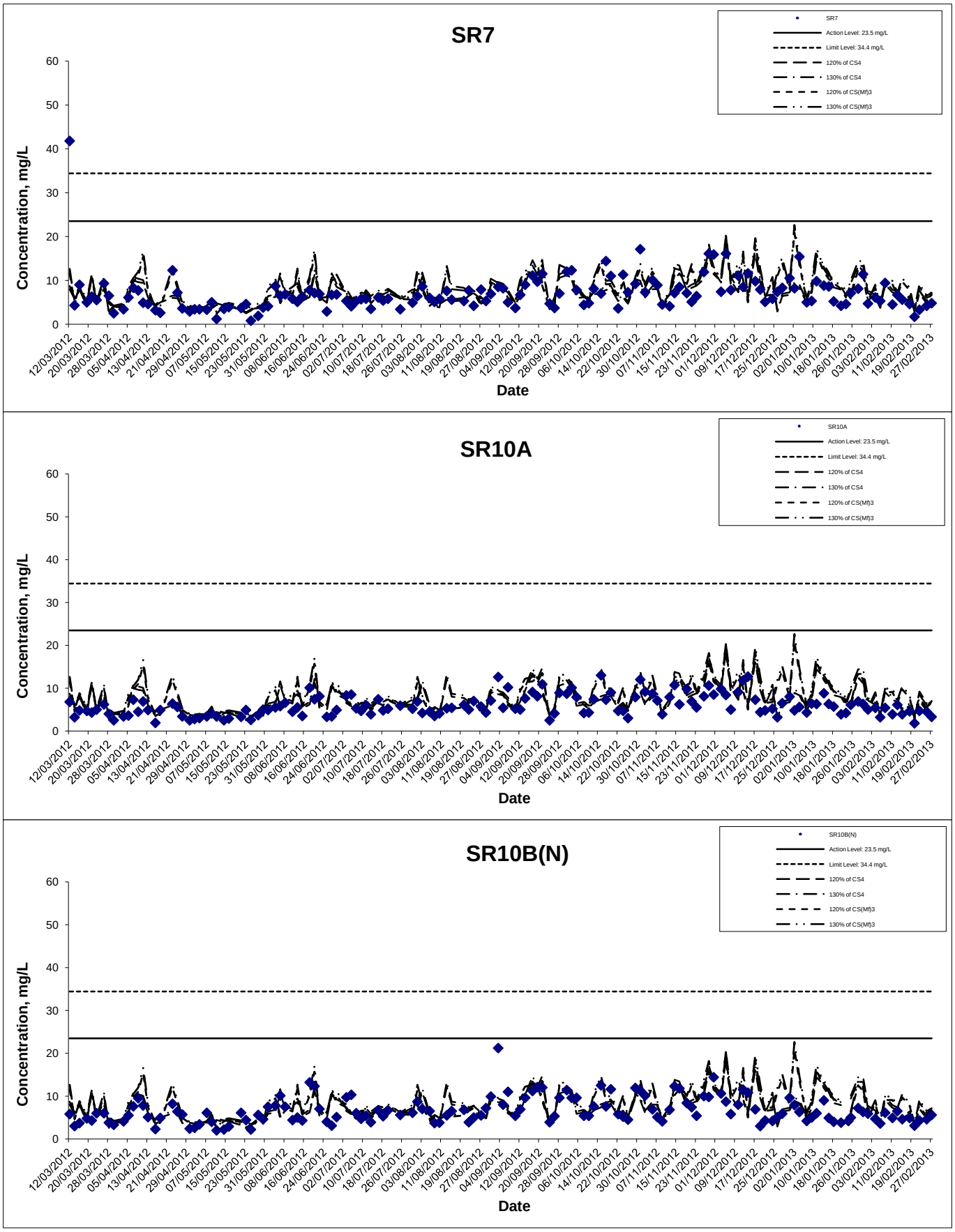

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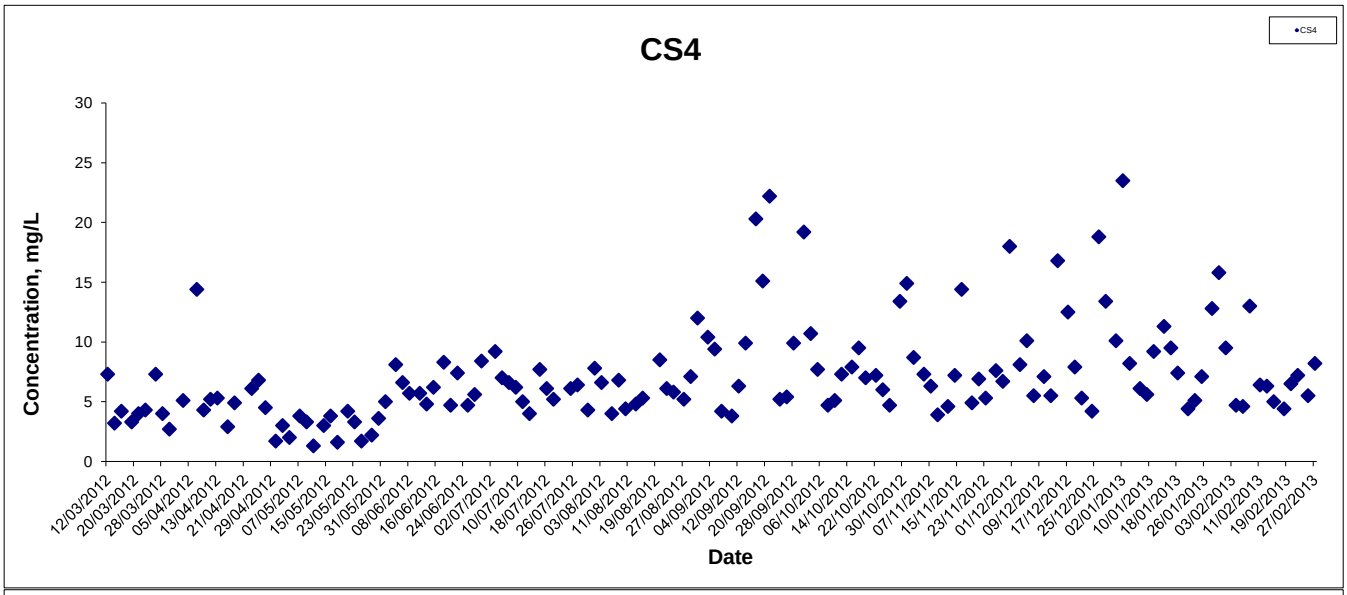

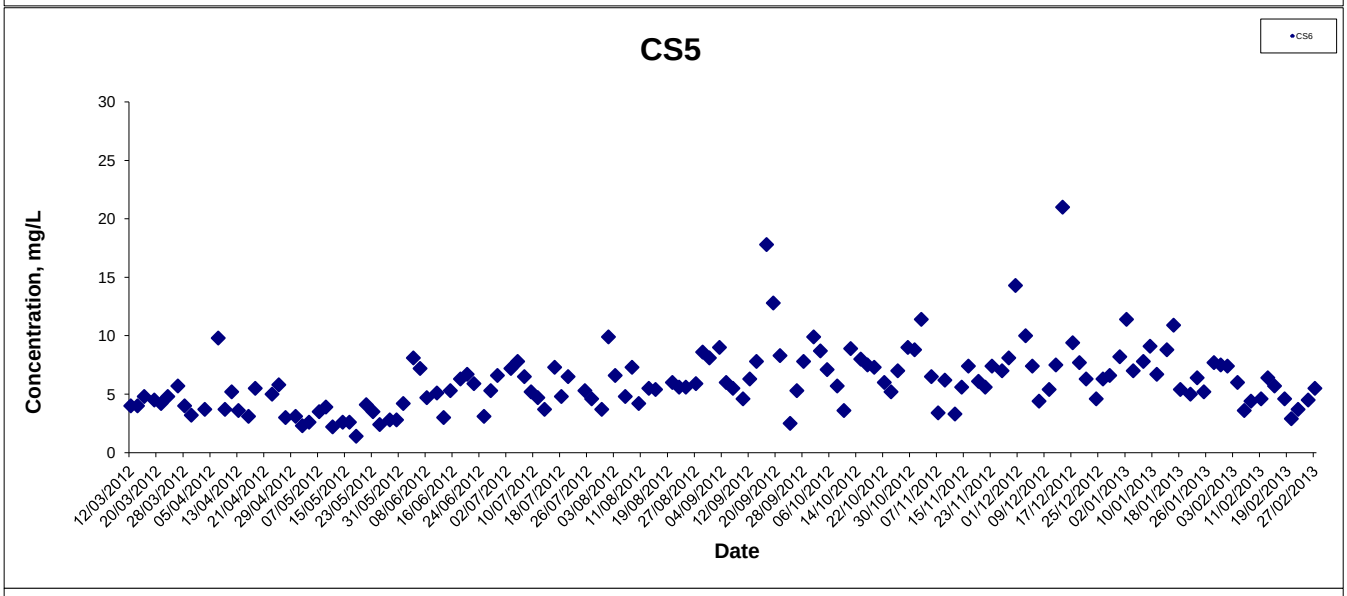

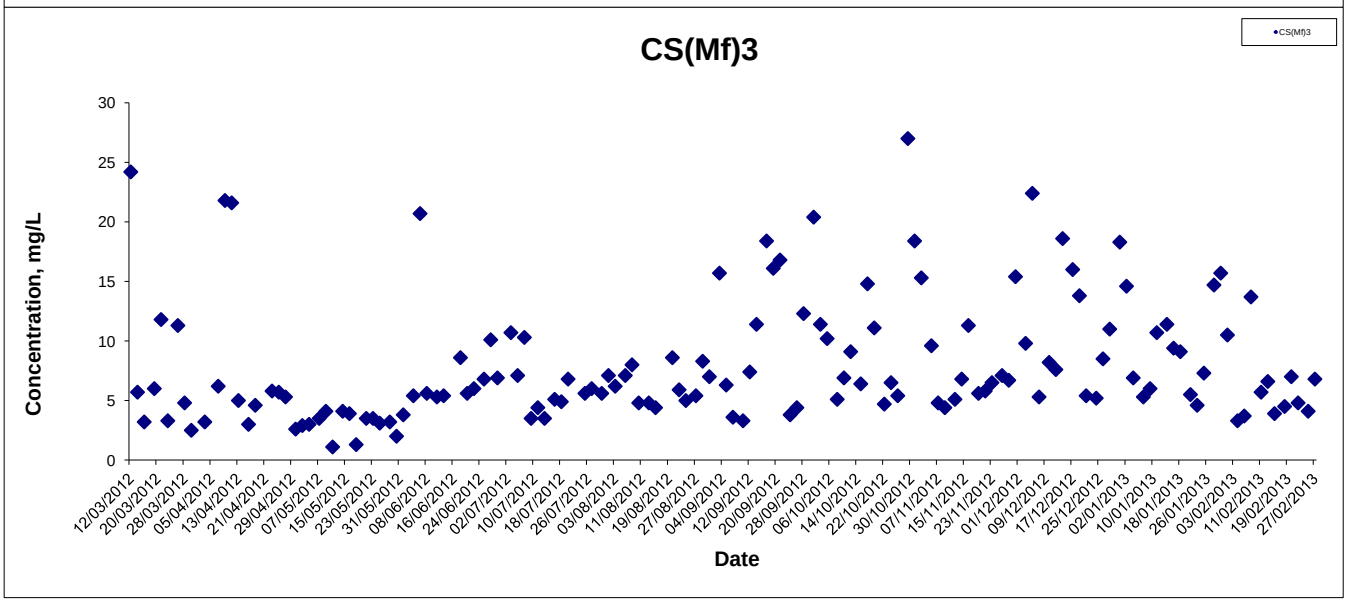

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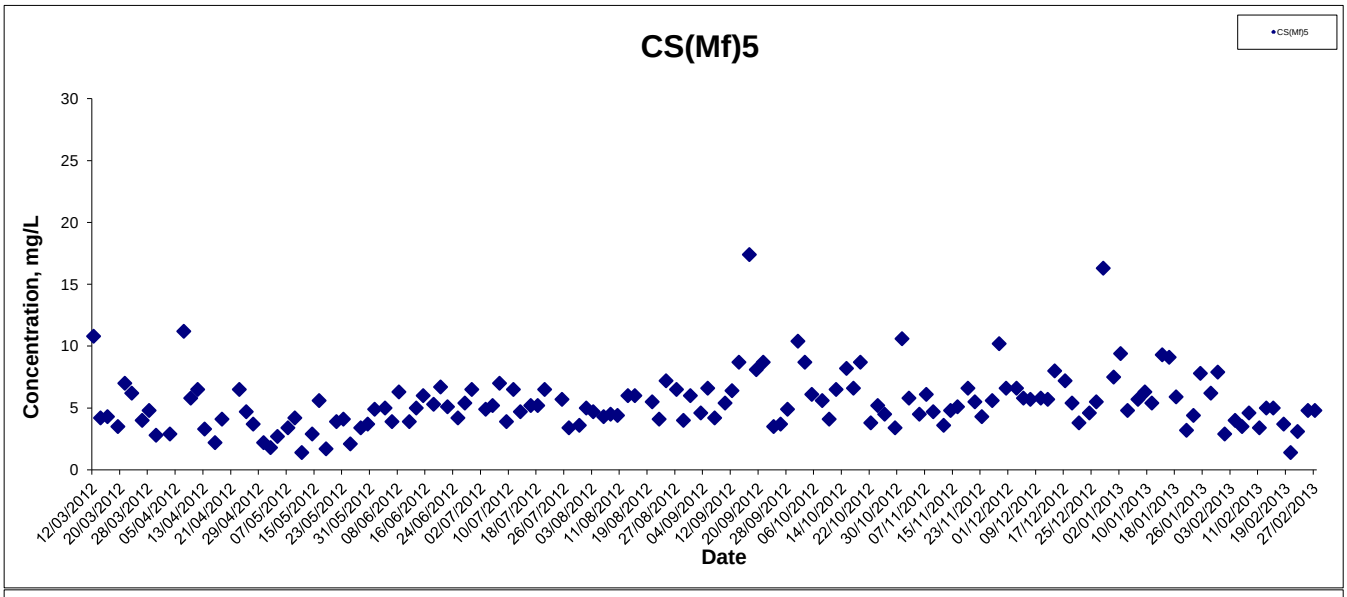

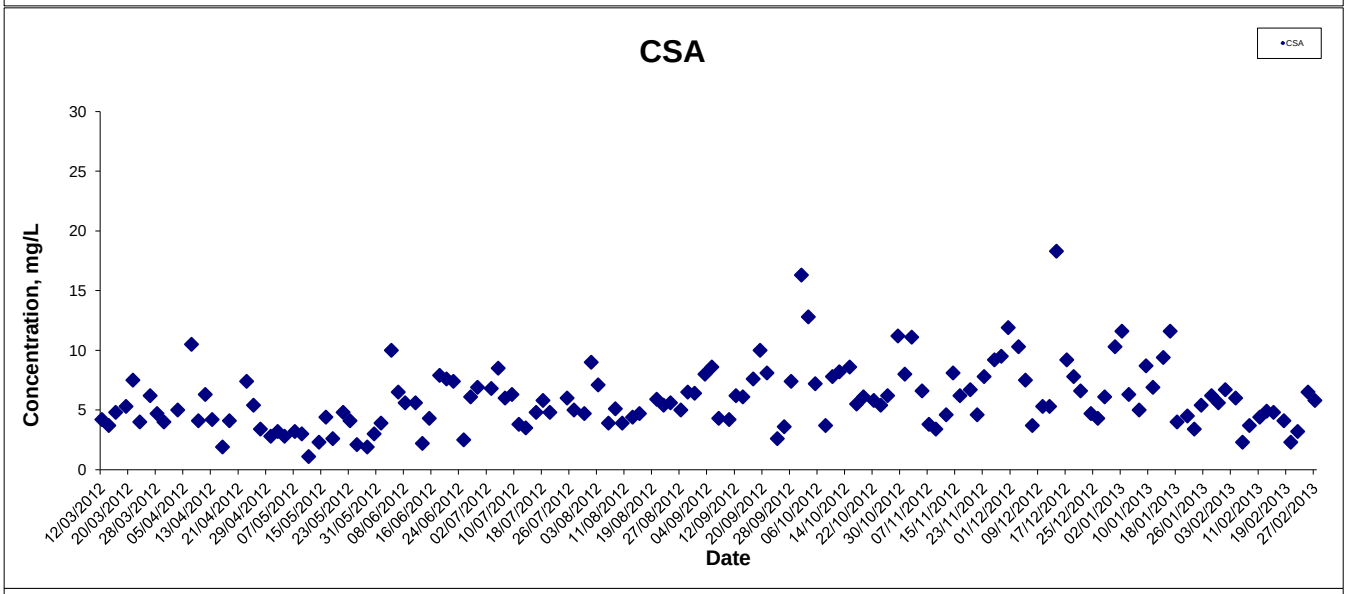

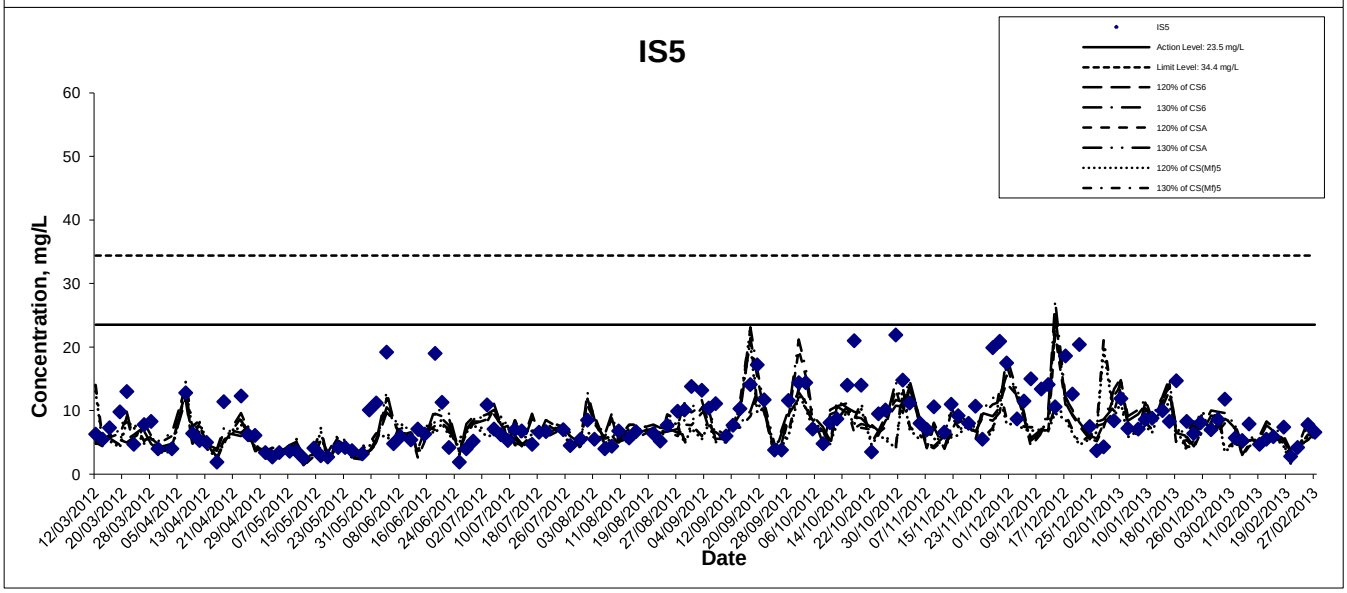

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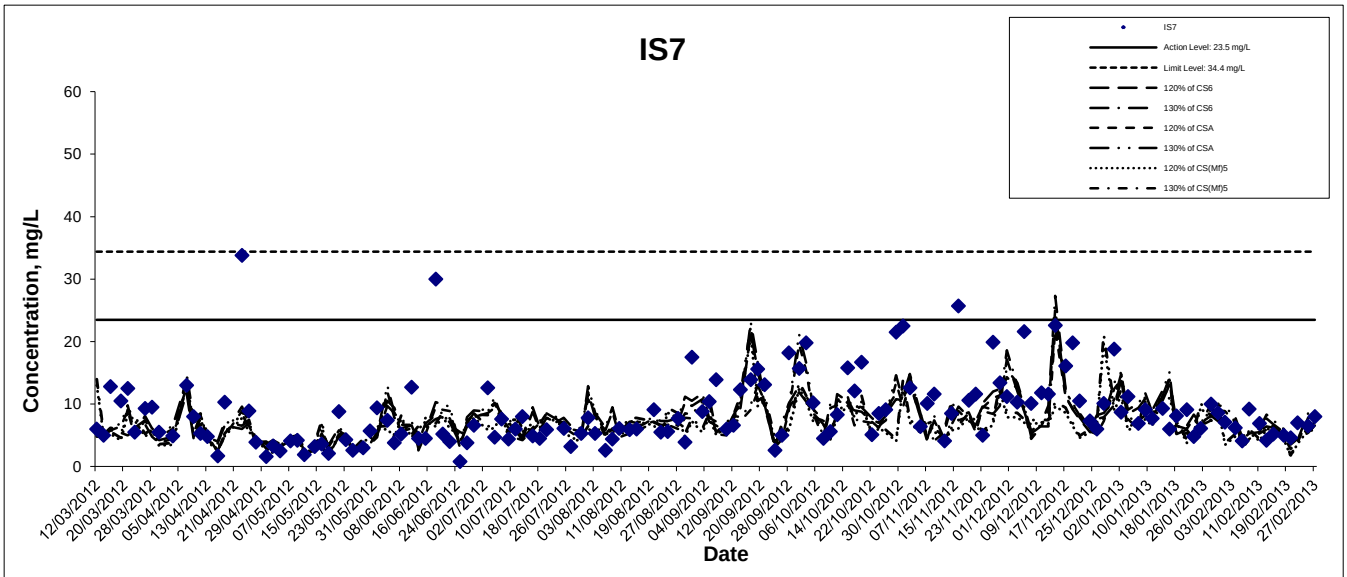

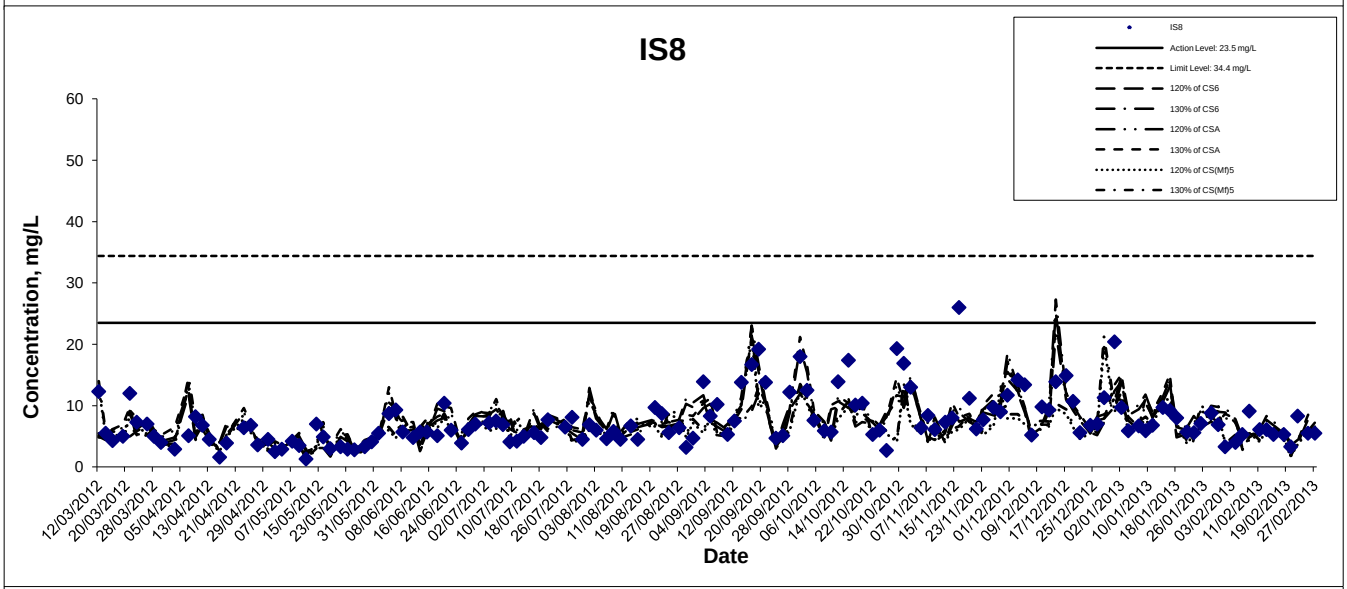

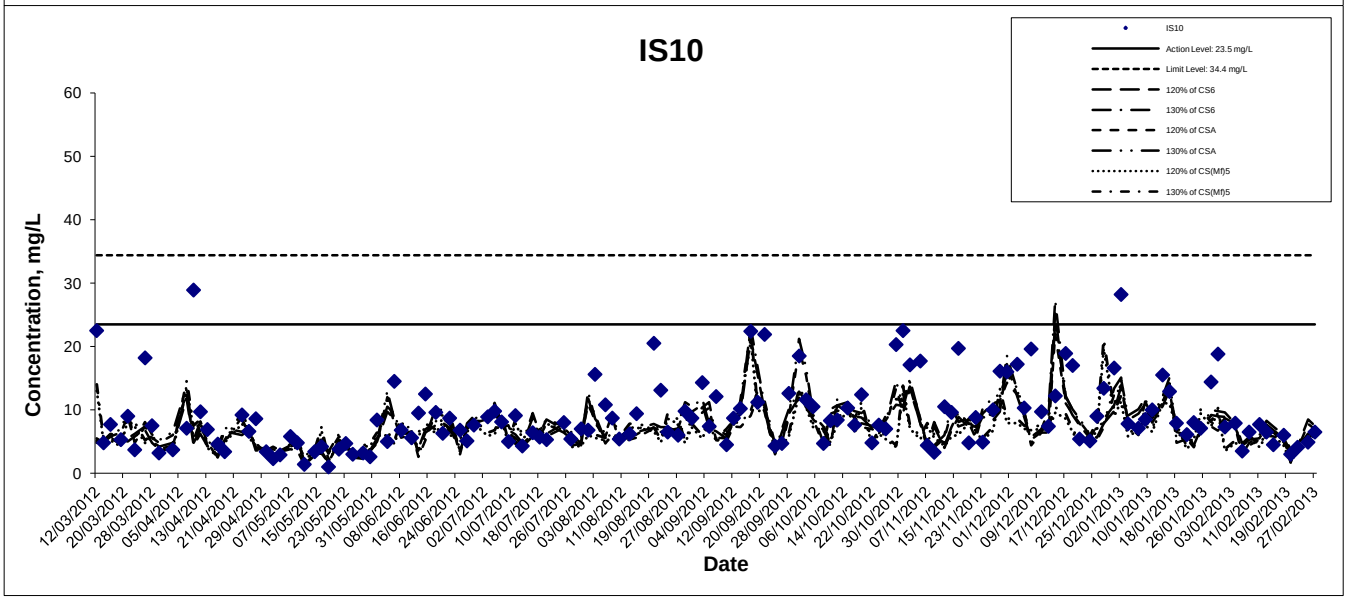

HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

AECOM

Graphical Presentation of Impact Water Quality Monitoring Results

Project No.: 60249820 **Date: Apr 2013**

Appendix G

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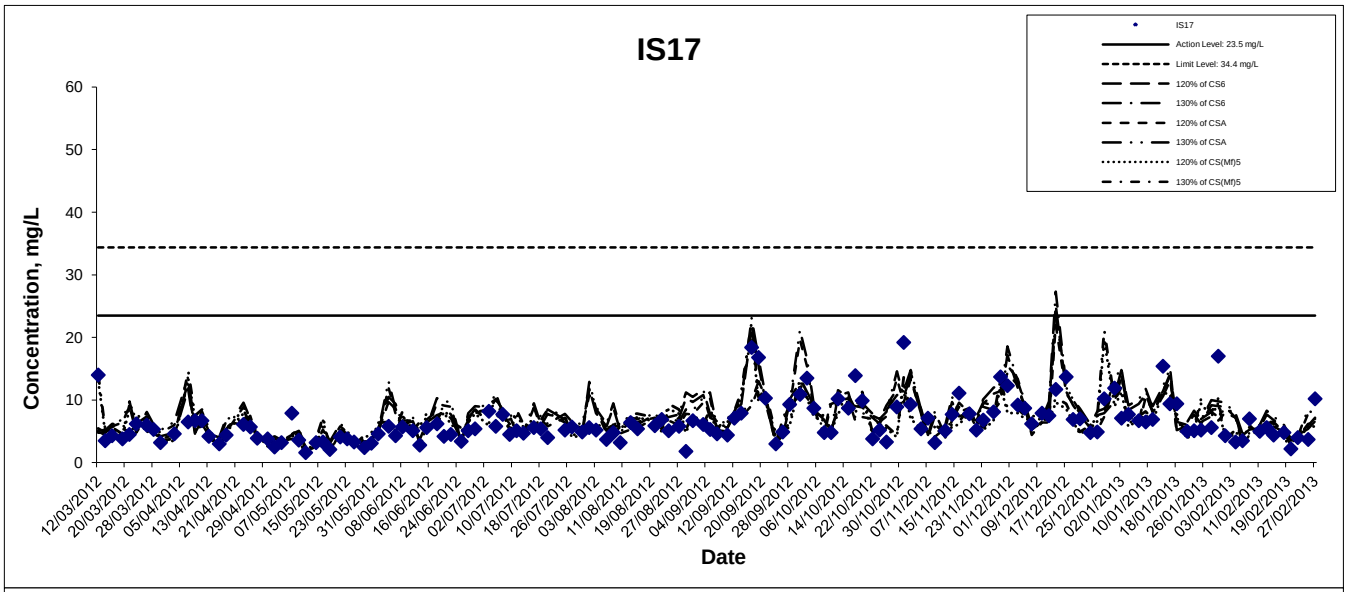

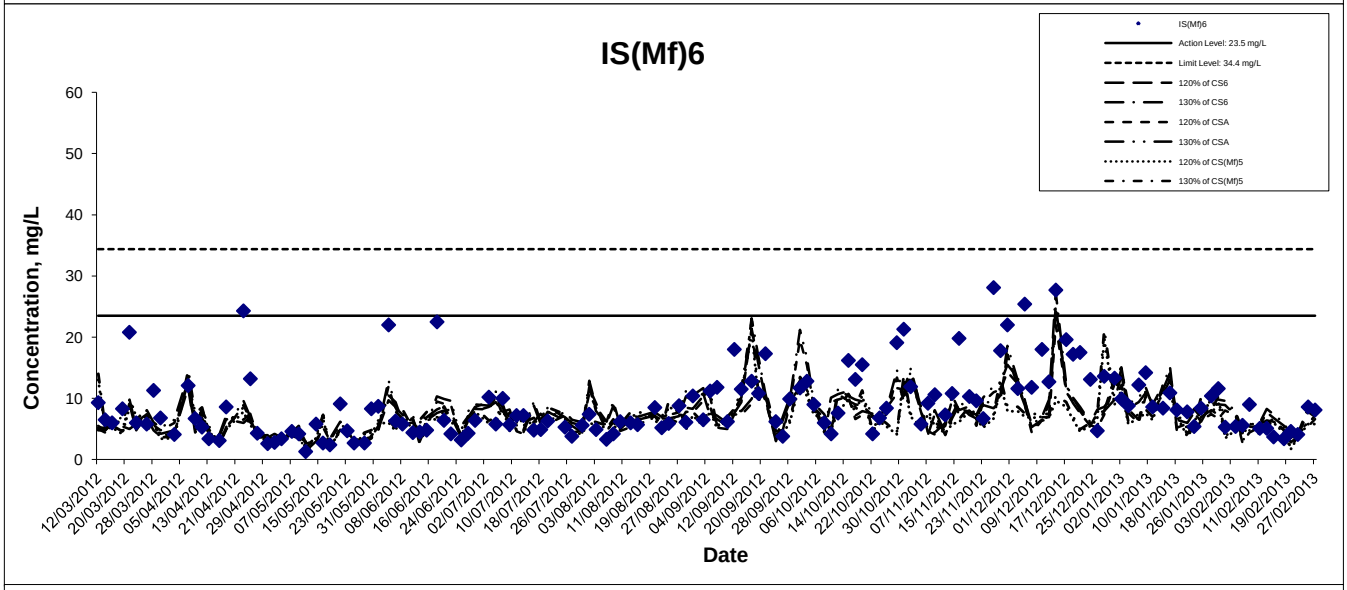

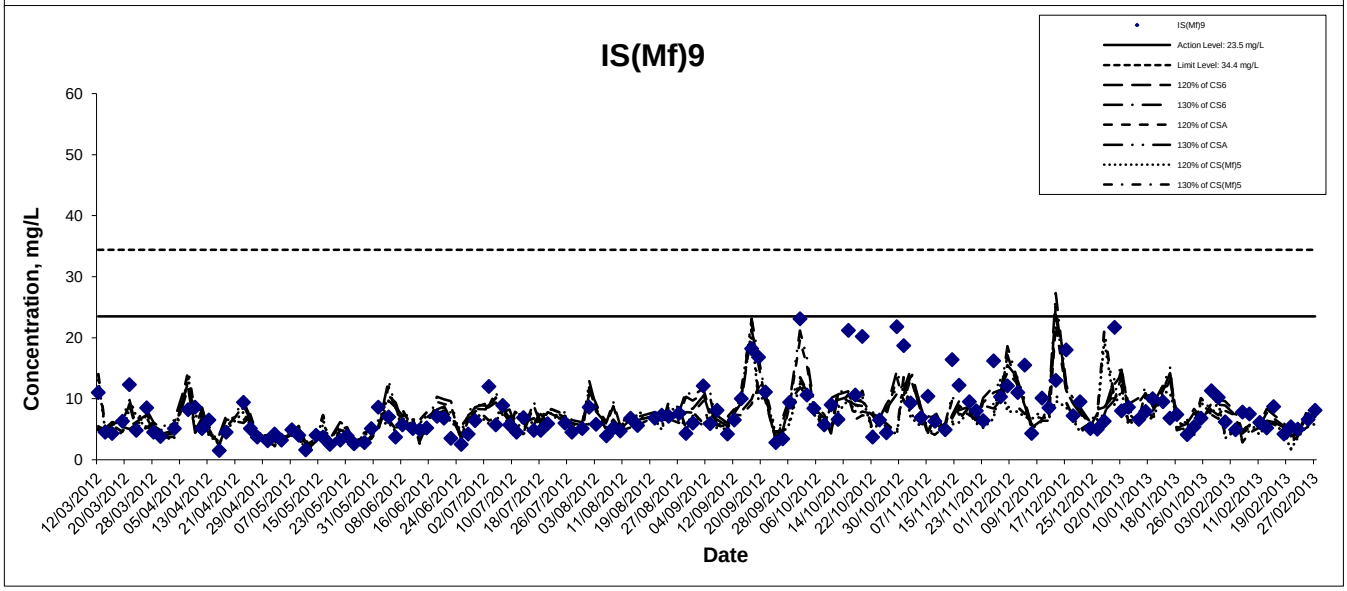

HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
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Project No.: 60249820 **Date: Apr 2013**

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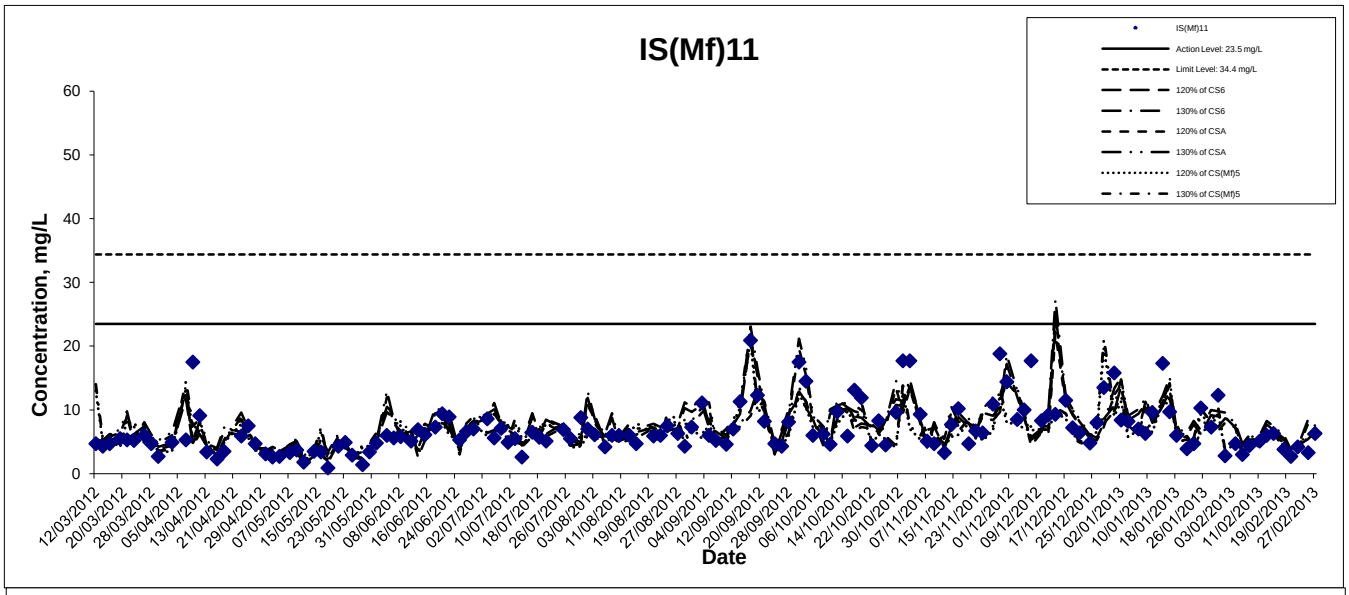

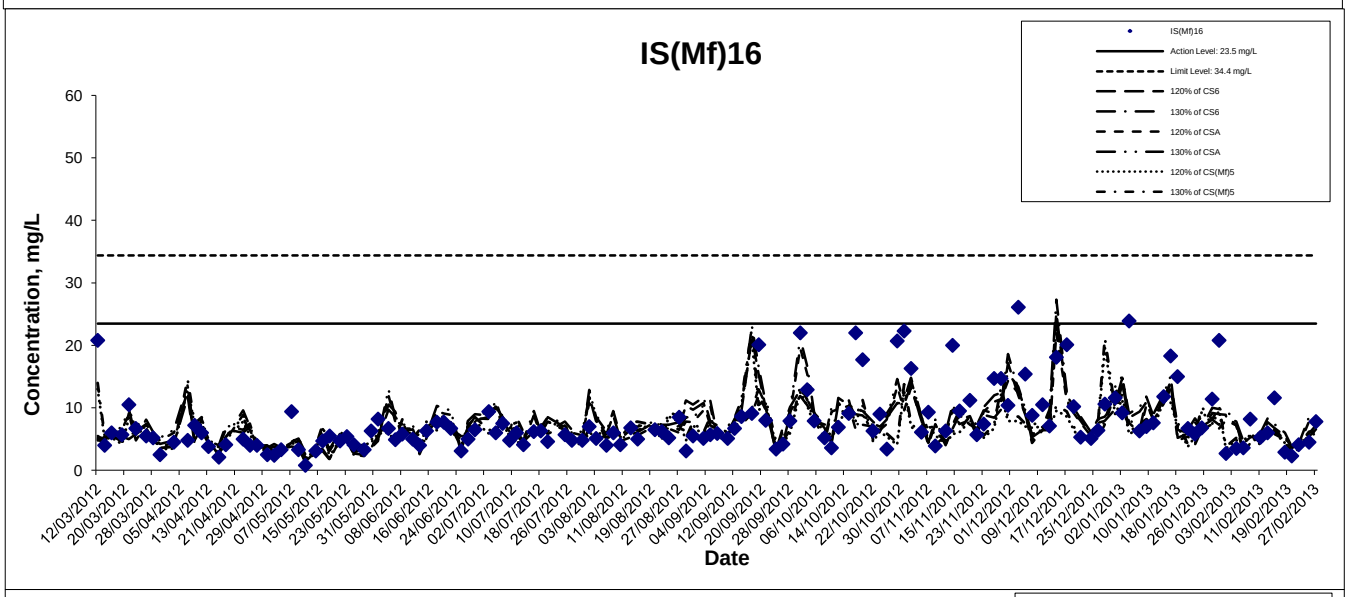

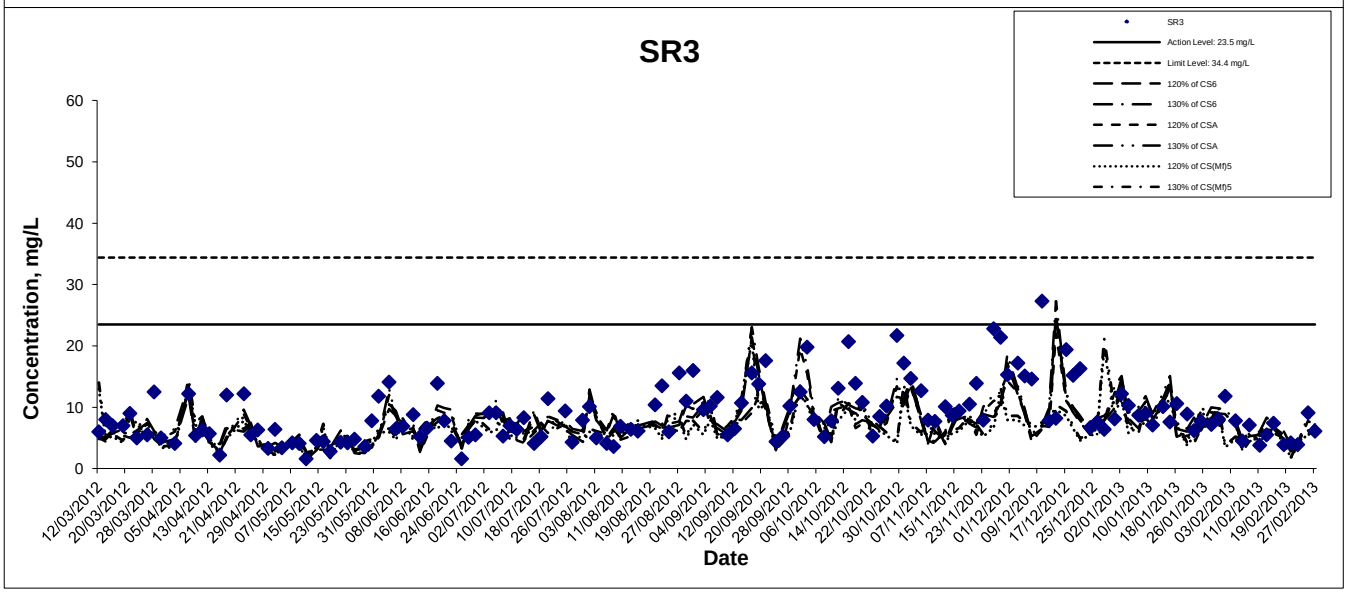

HONG KONG - ZHUHAI - MACAO BRIDGE

HONG KONG BOUNDARY CROSSING FACILITIES

- RECLAMATION WORKS

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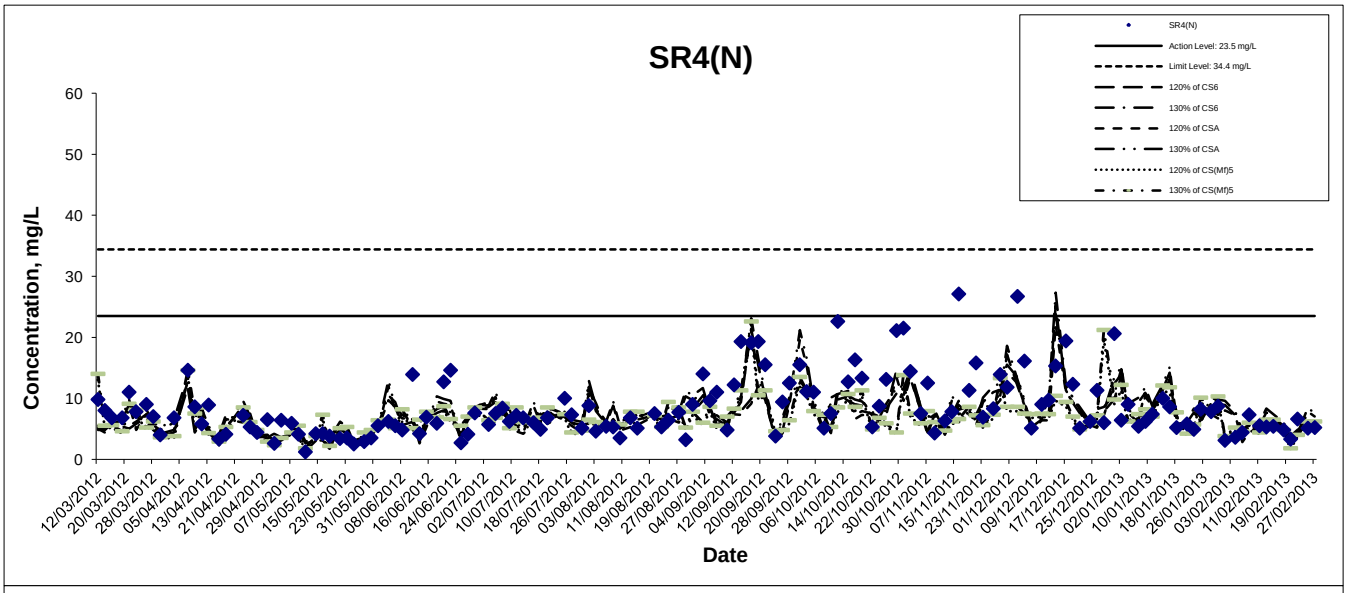

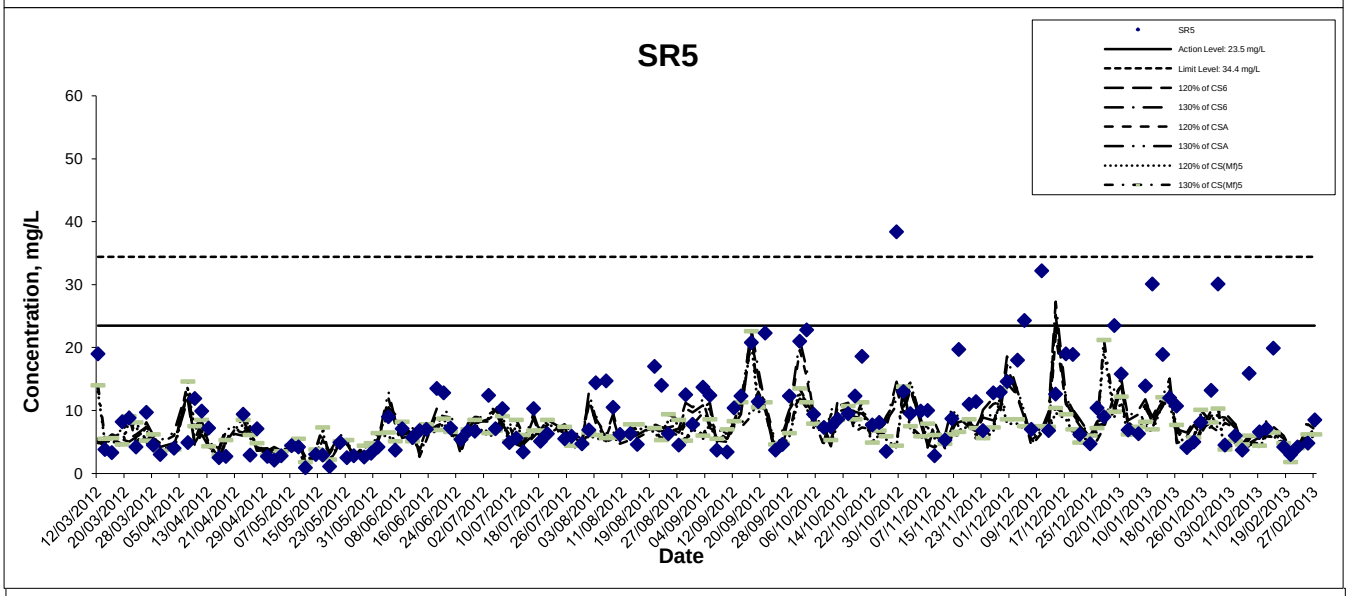

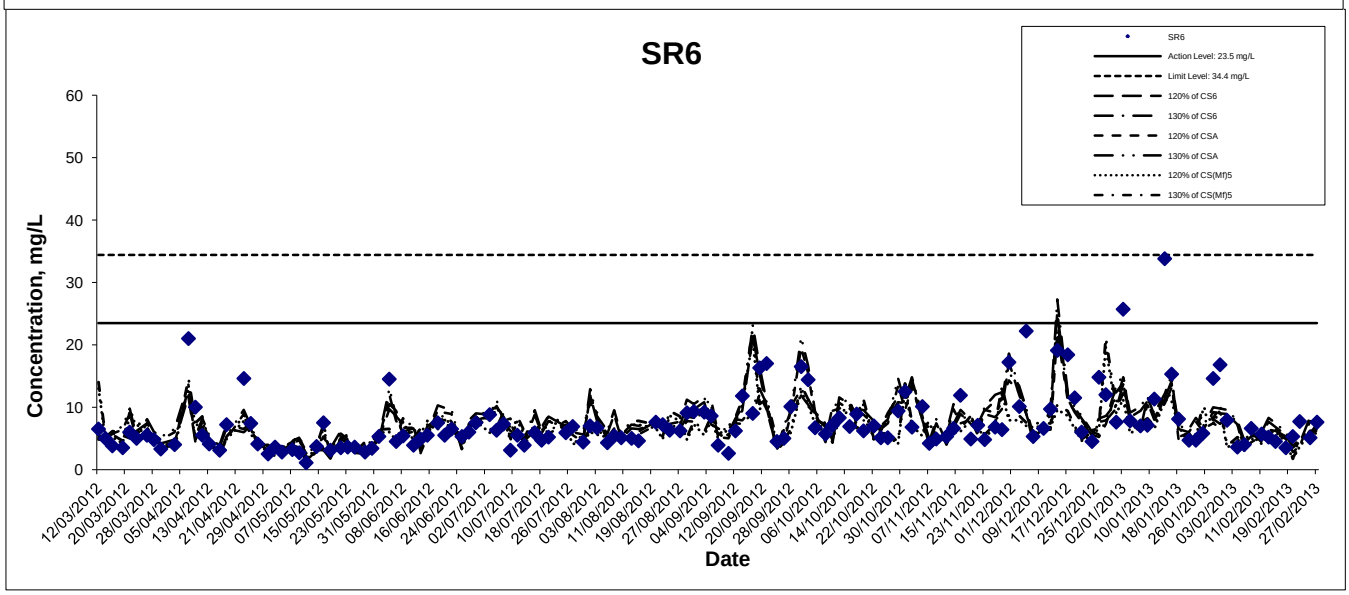

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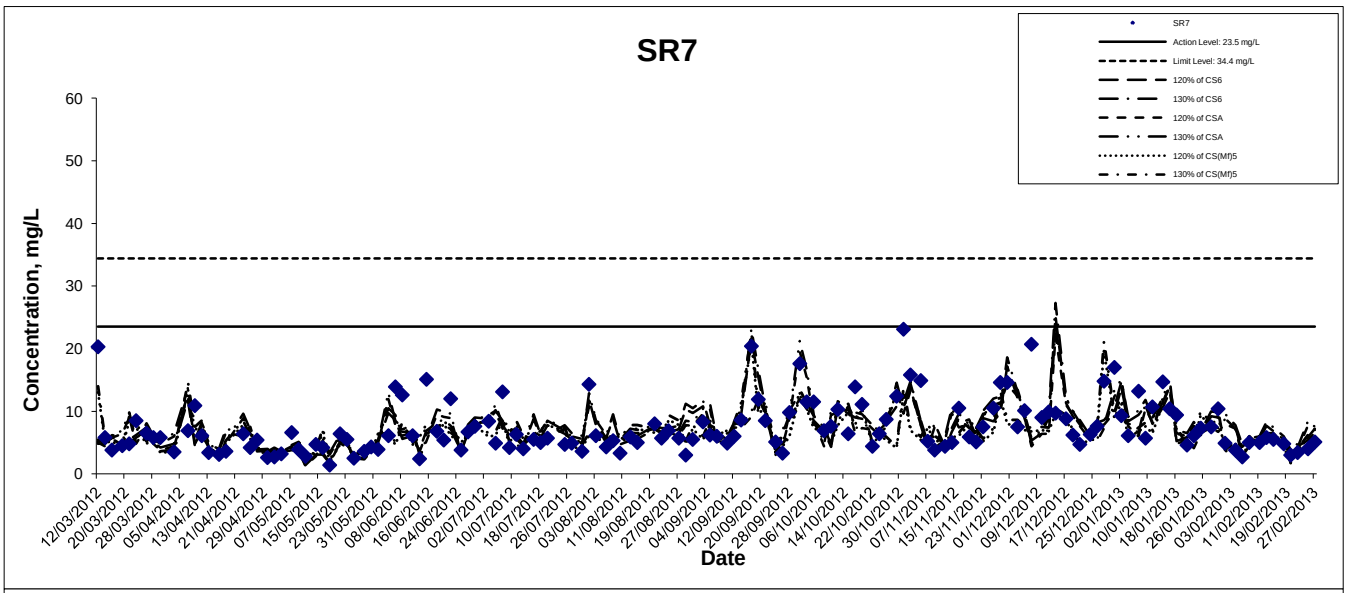

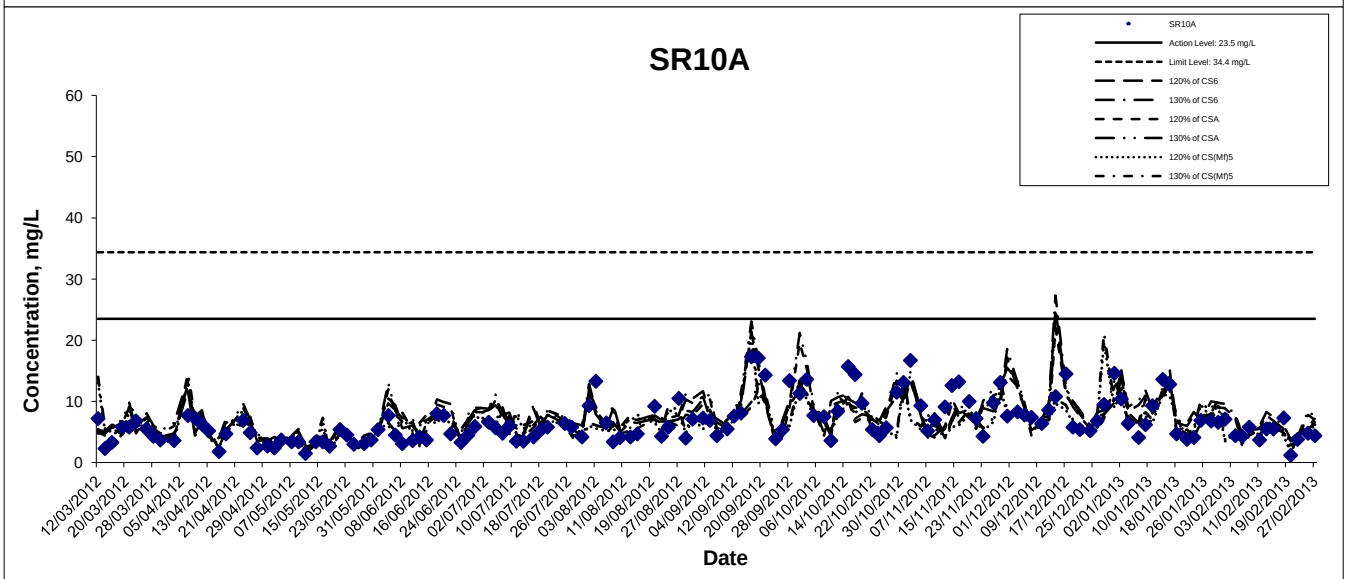

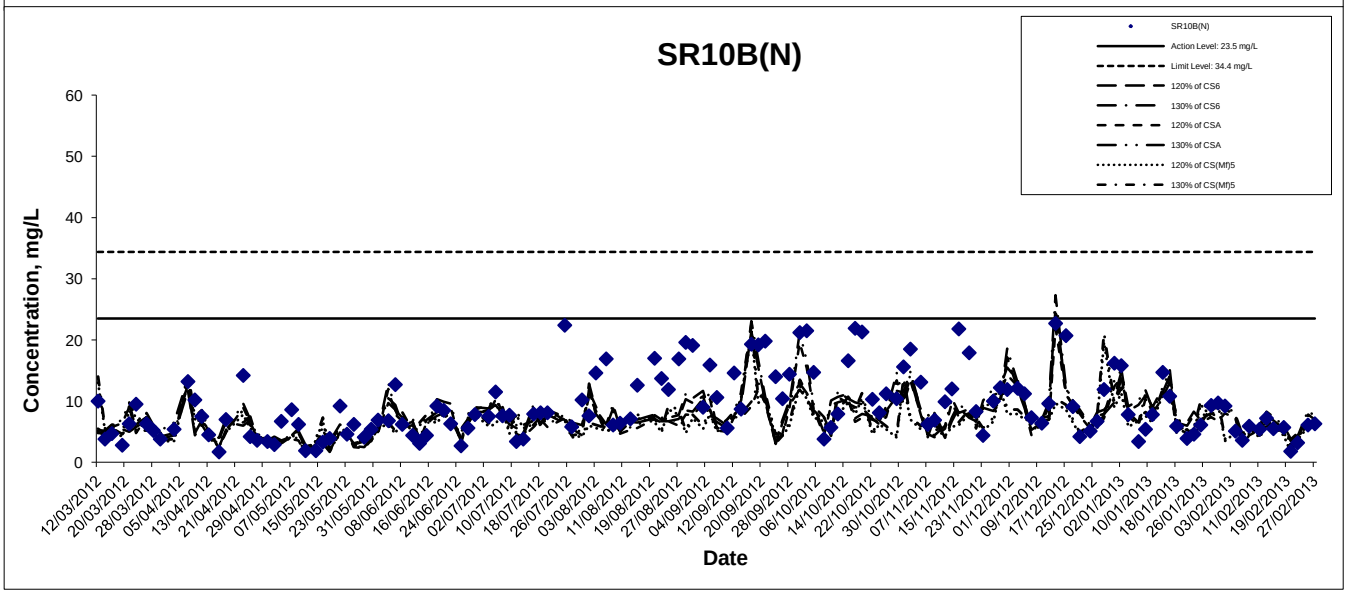

Appendix H Impact Dolphin Monitoring Survey Findings and Analysis

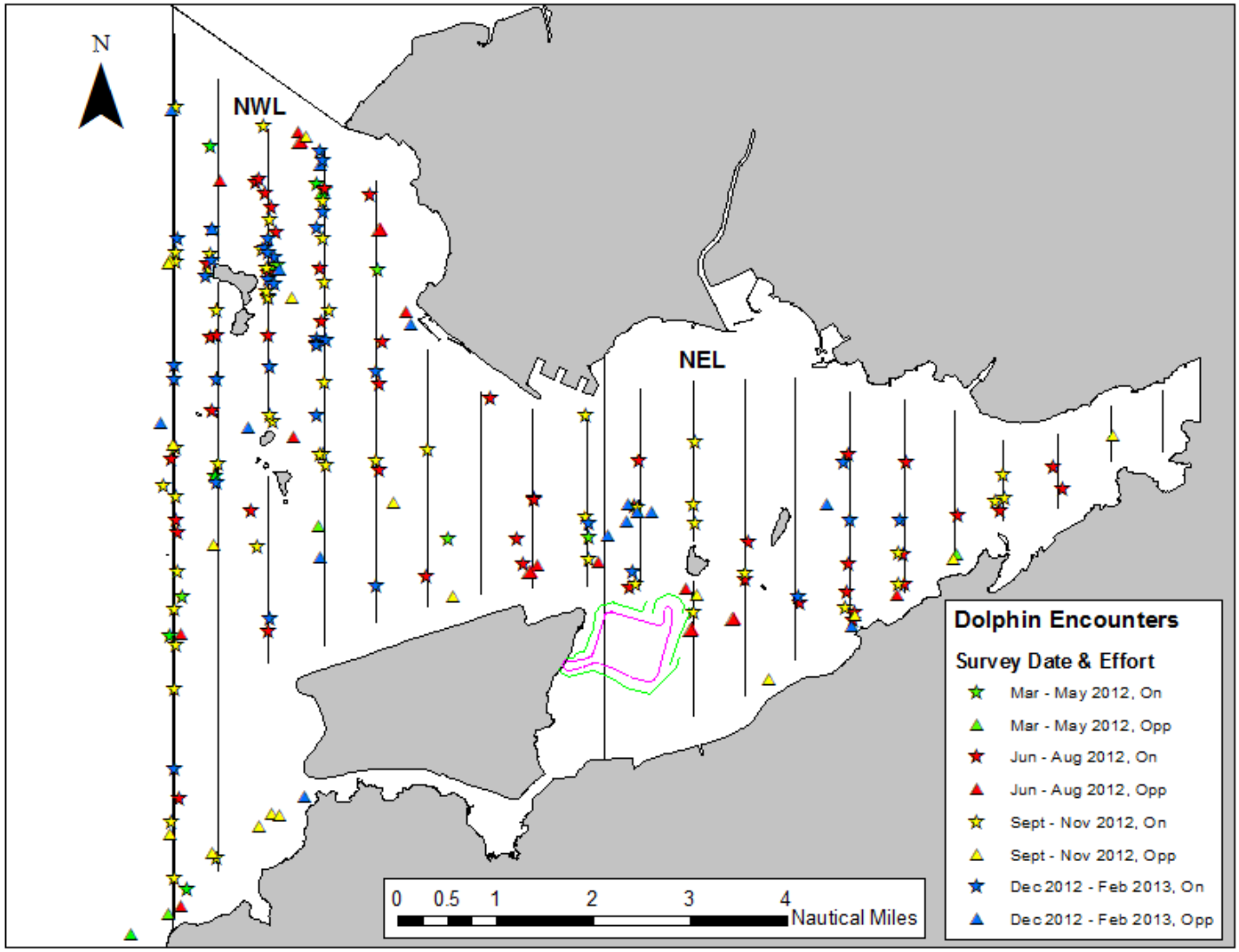

Figure 1 Dolphin Sightings Recorded During Monitoring Surveys, March 2012-February 2013

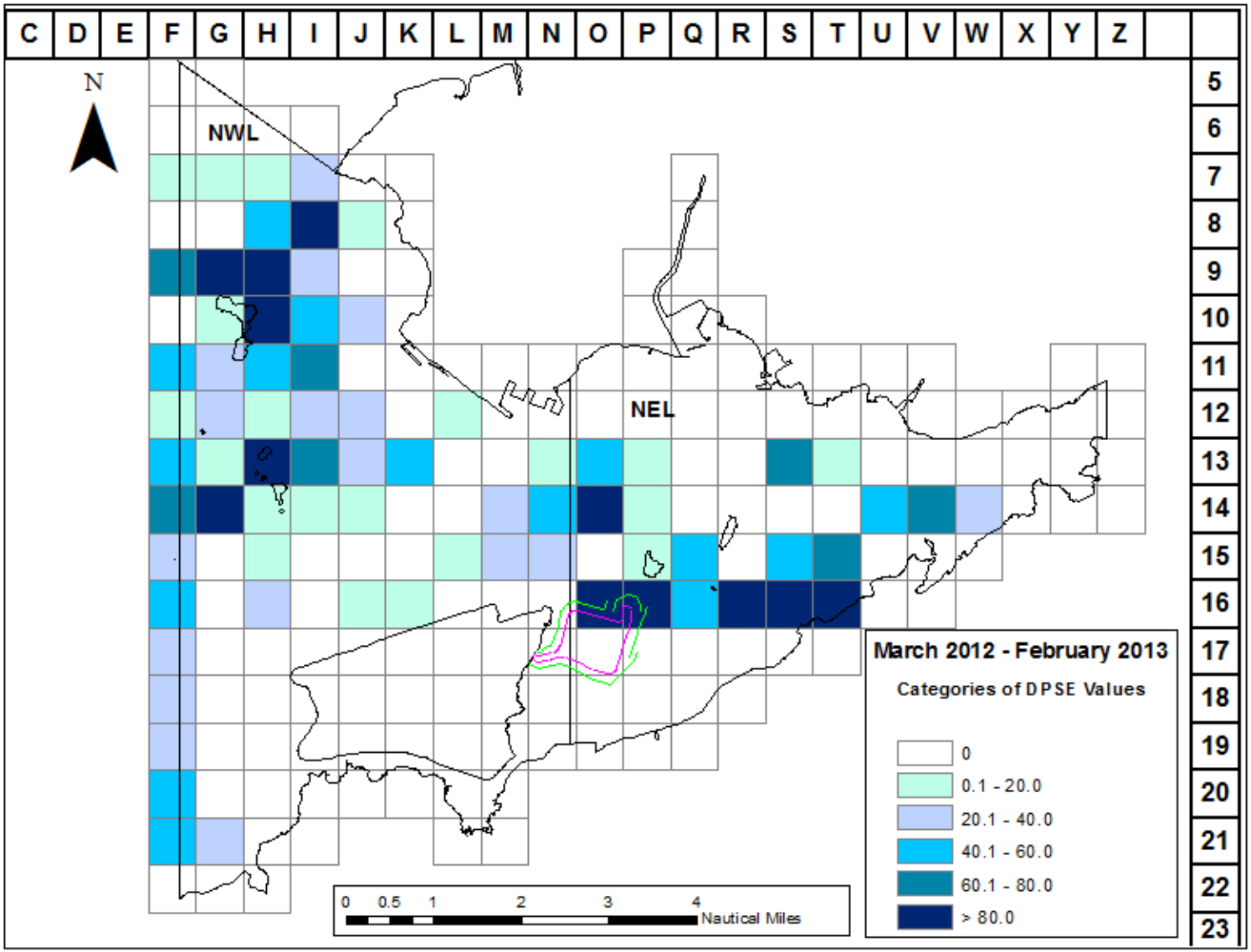

Figure 2 Dolphin density DPSE (number of dolphins per 100 units of survey effort) for March 2012- February 2013

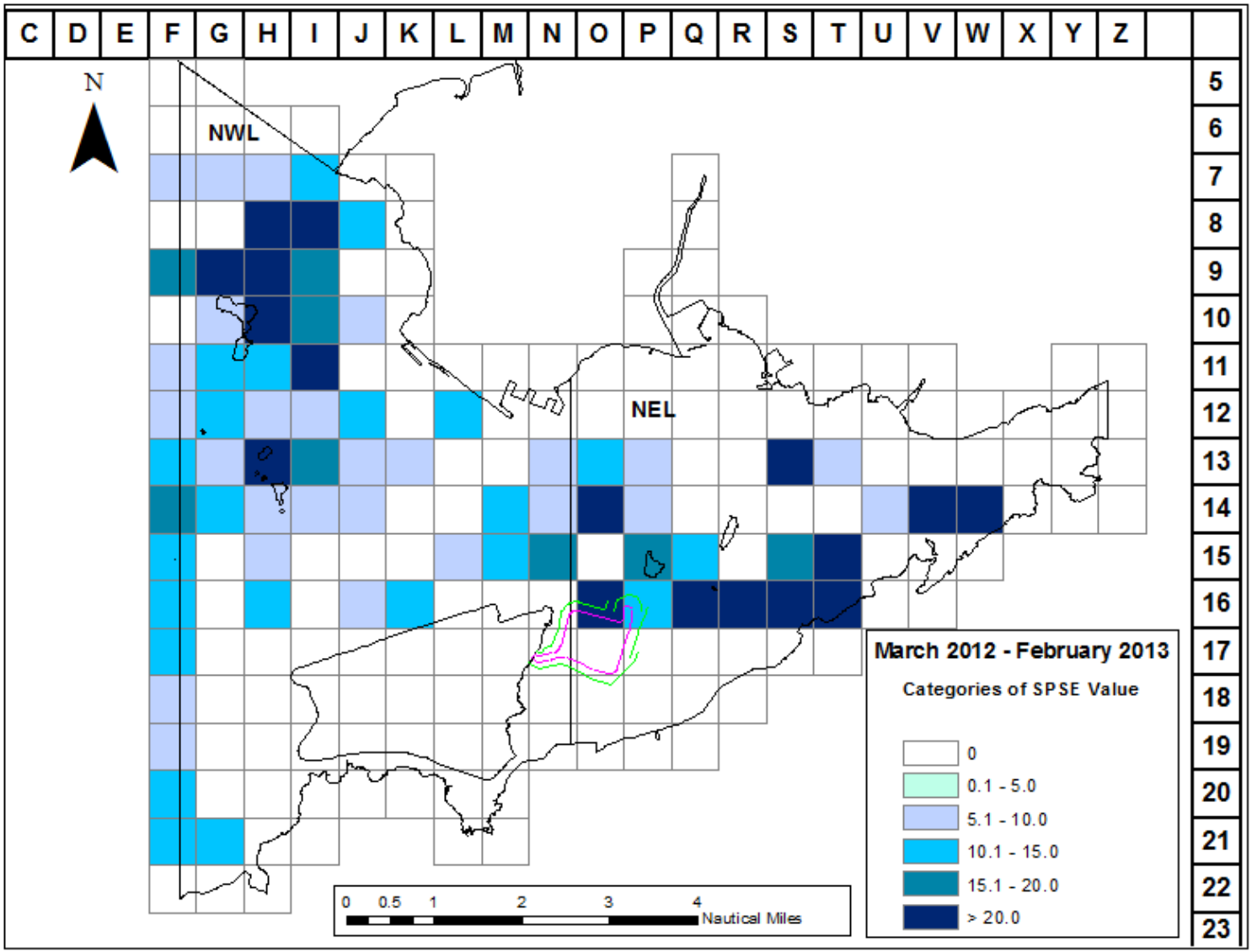

Figure 3 Sighting density SPSE (number of sightings per 100 units of survey effort) for March 2012- February 2013

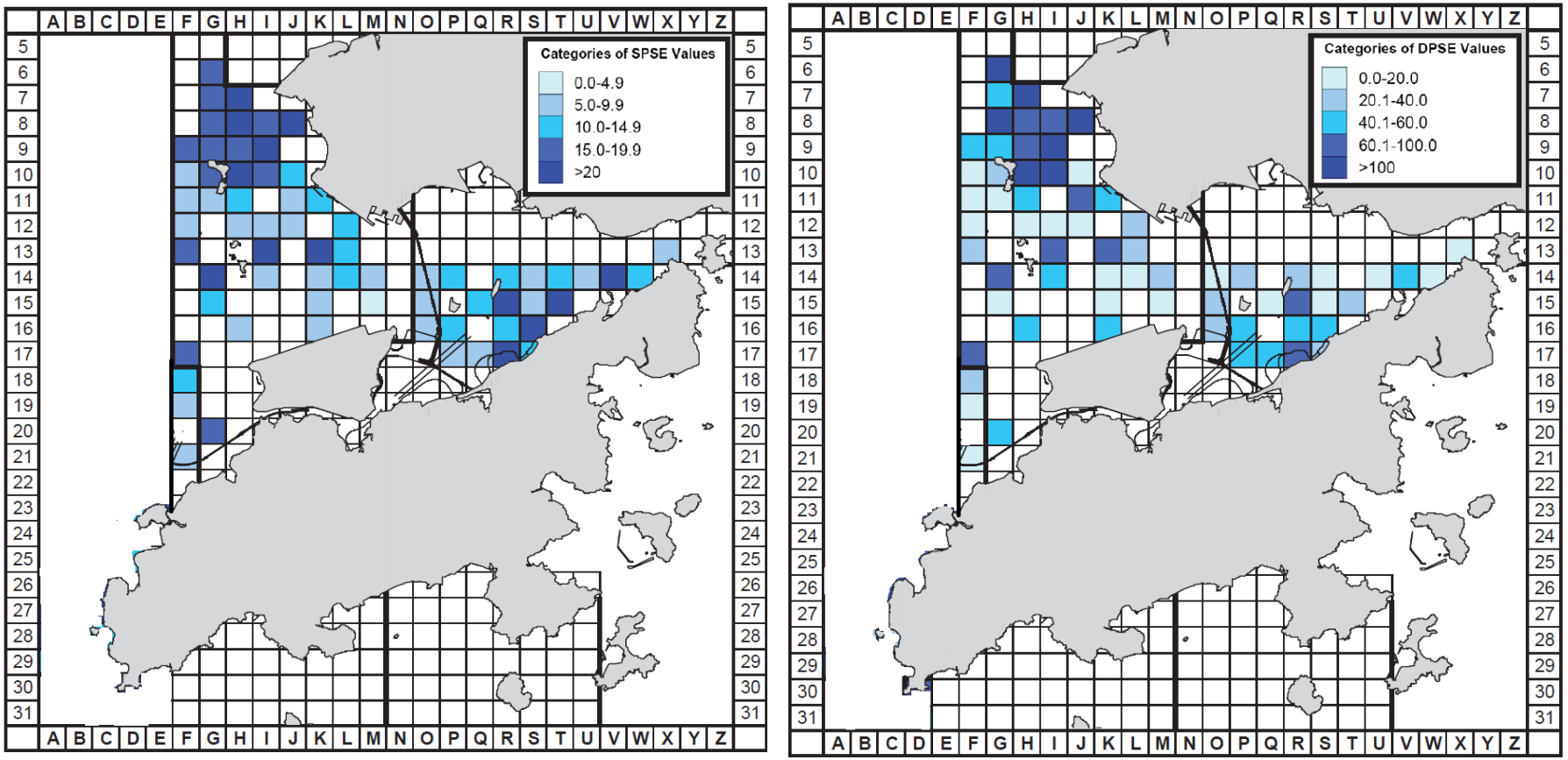

Figure 4 Yearly Dolphin Density Maps (number of dolphins/dolphin groups per 100 units of survey effort). Provided by ENPO from Advanced Monitoring Reporting Period February 2011- January 2012

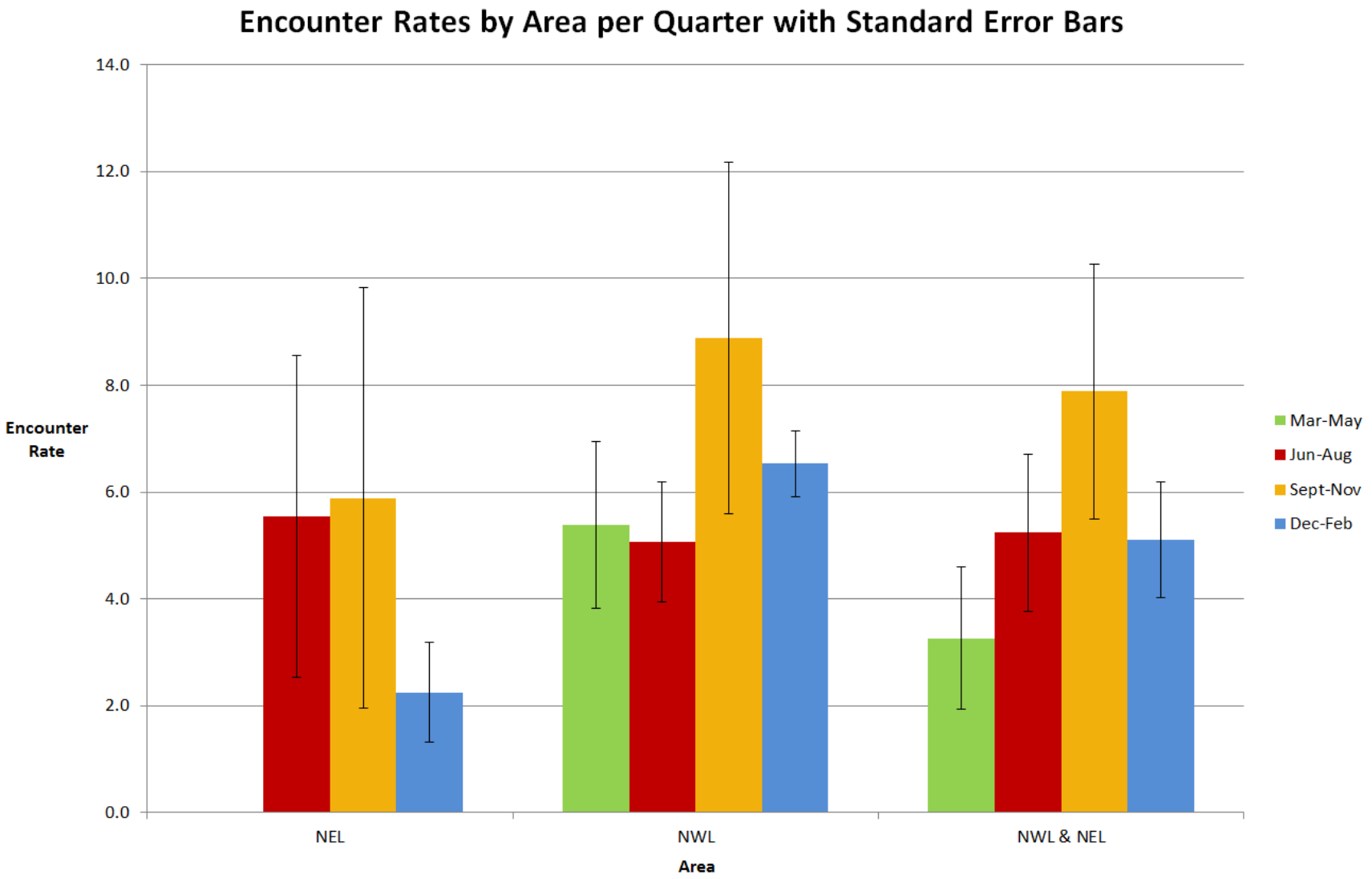

Figure 5 Encounter Rates for NEL, NWL and Combined per Quarter for the Year March 2012-February 2013

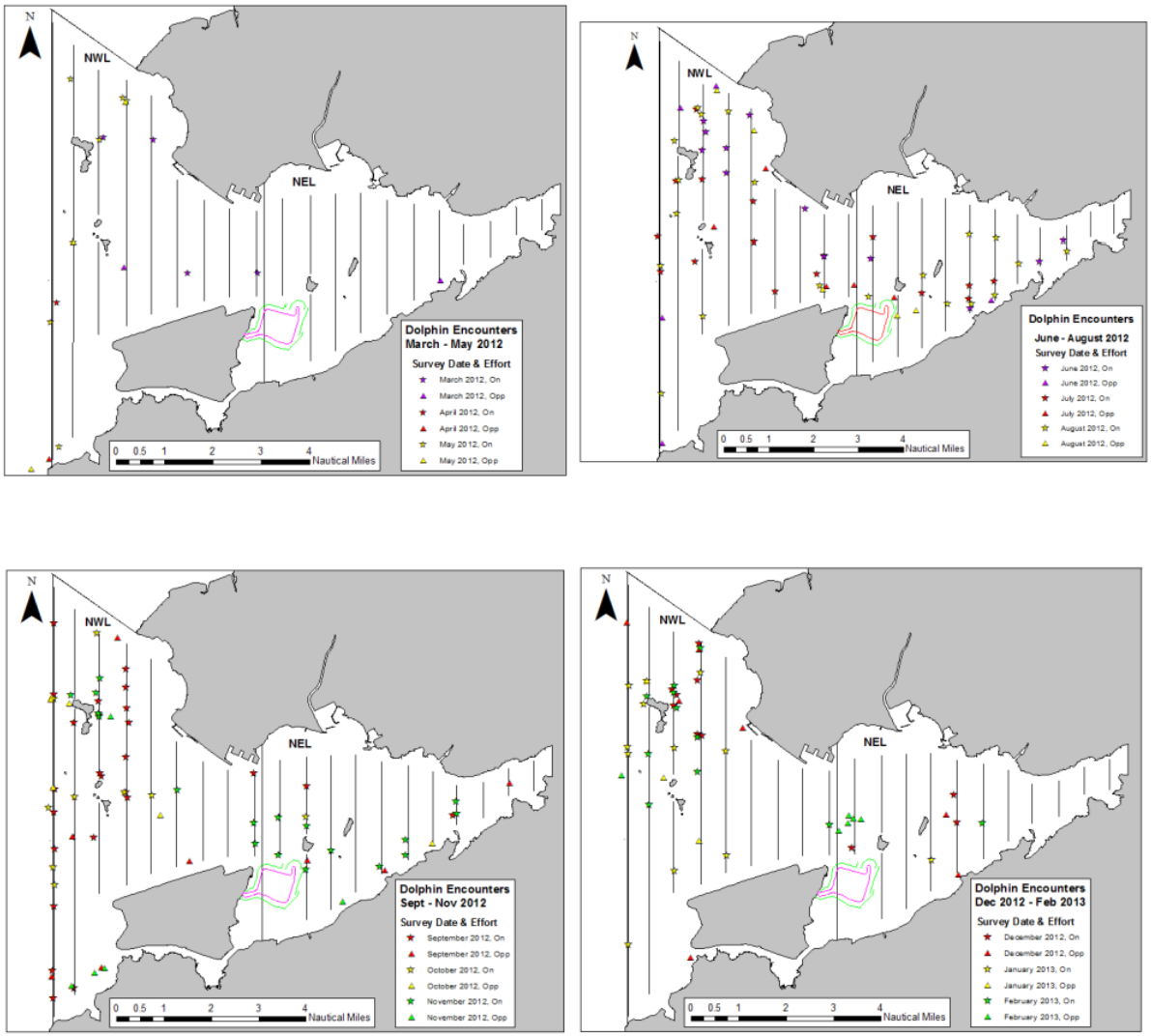

Figure 6 Dolphin Sightings Recorded per Quarter During Monitoring Surveys, March 2012-February 2013

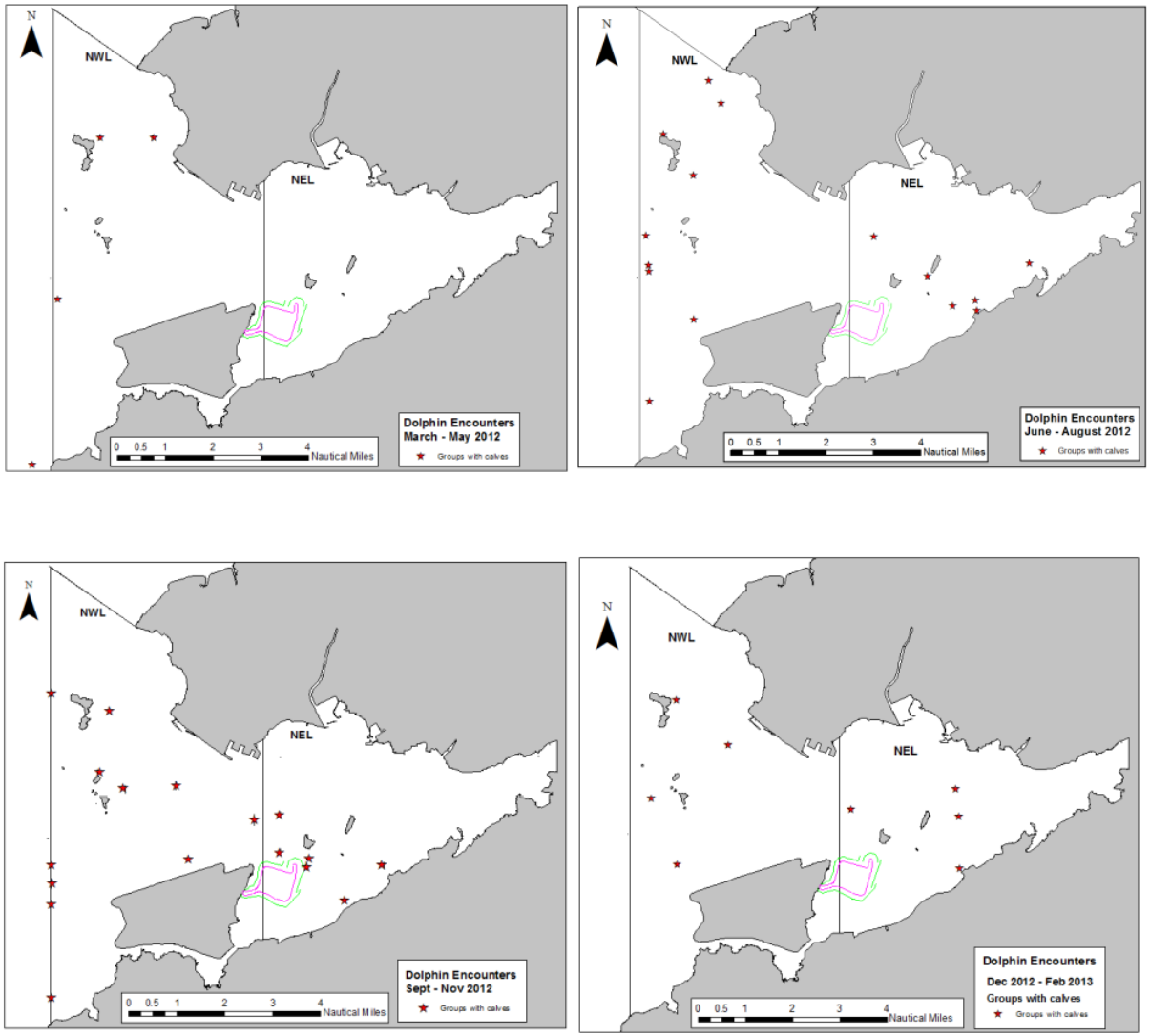

Figure 7 Mother and Calf Pairs Sighted per Quarter During Monitoring Surveys, March 2012-February 2013

2012-05-28_09-33-32_01 - cannot ID mother

2012-05-28_14-06-32_01 - cannot ID mother

2012-06-13_12-59-42 - calf of HZMB 014

2012-08-14_09-32-38_02 - calf of HZMB 021

2012-08-14_09-47-42 - cannot ID mother

2012-08-15_17-04-42

2012-09-03_08-51-50_01 - calf of HZMB 043

2012-11-05_13-26-06_01 - cannot ID mother

2013-01-28_12-23-20 - calf of HZMB 026

Figure 8 A minimum of 13 individual calves were photographed between March 2012 and February 2013.

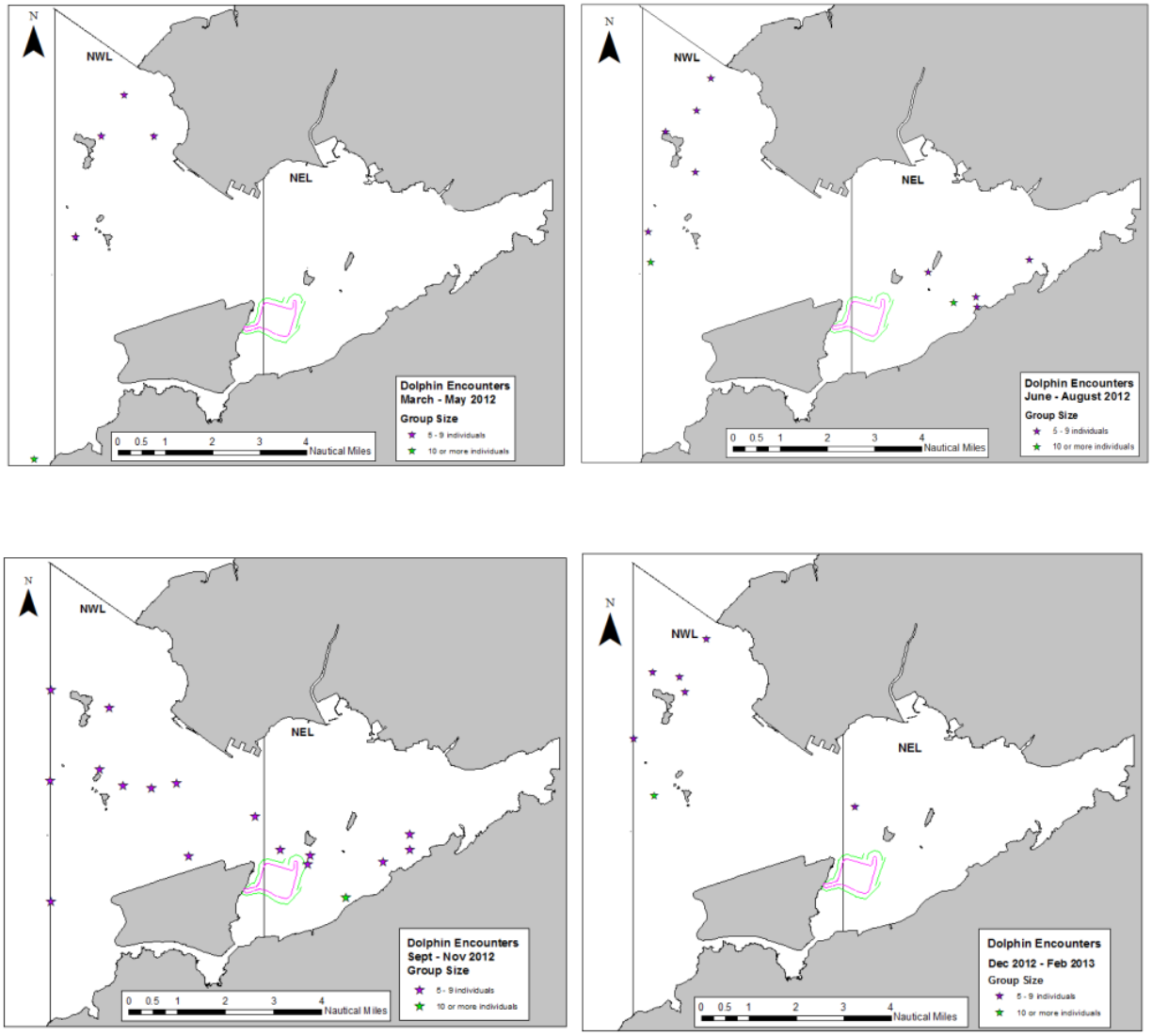

Figure 9 Dolphin Groups Sizes of More than Five Individuals per Quarter recorded between March 2012 and February 2013

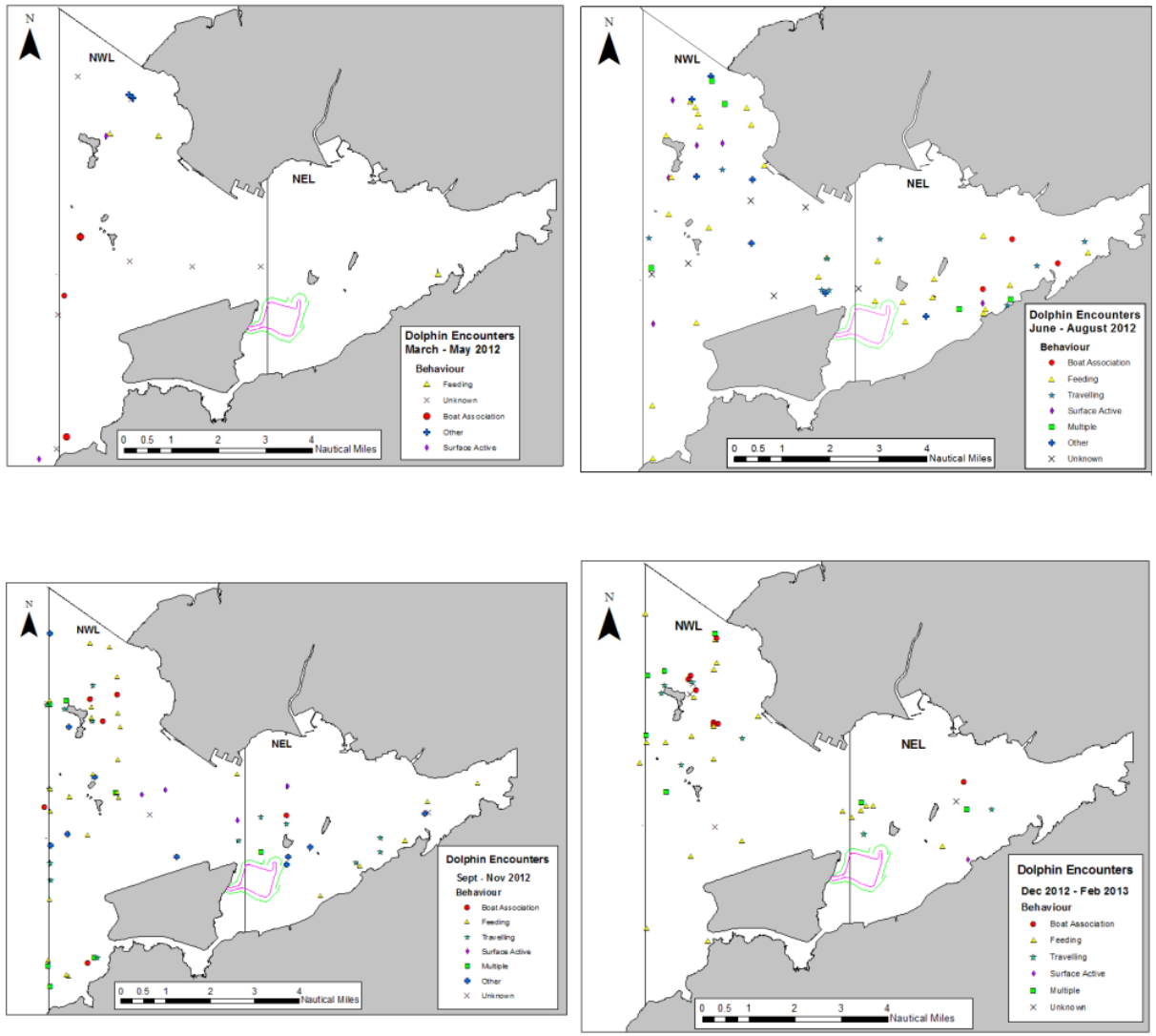

Figure 10 Dolphin Behavioural Activities per Quarter recorded between March 2012 and February 2013

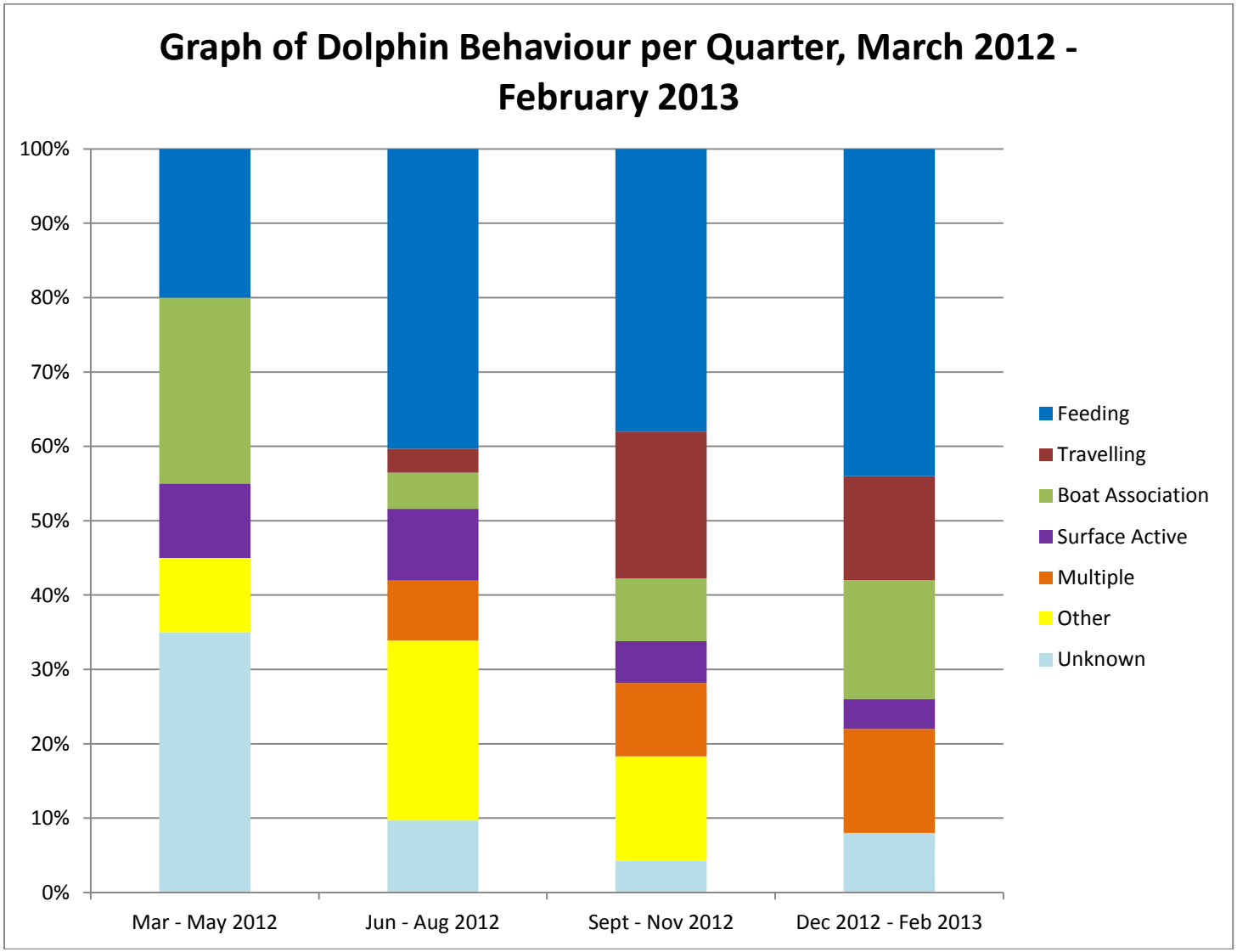

Figure 11 Dolphin Behavioural Activity per Quarter recorded between March 2012 and February 2013

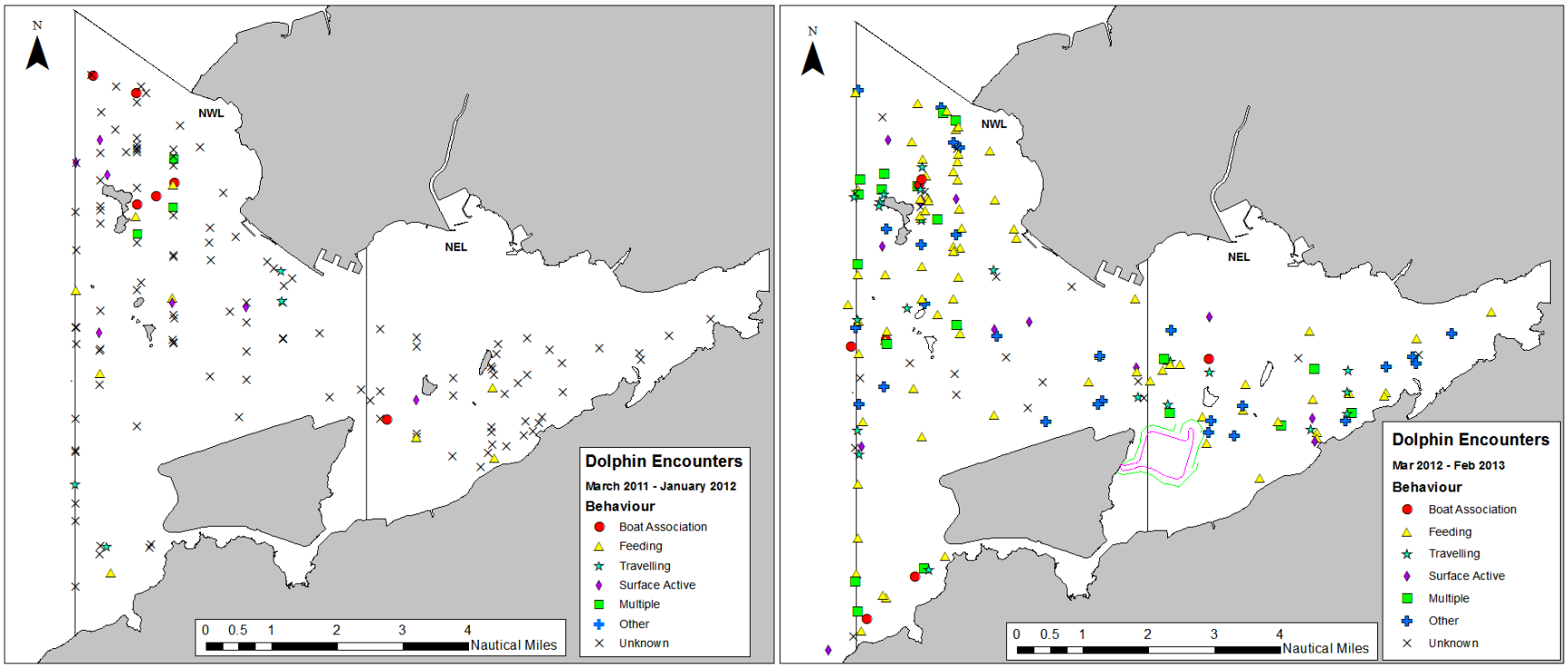

Figure 12. A Comparison of the location of behaviours in 2011-12 and 2012-13. The island in the northern part of NWL is highlighted as an important feeding area

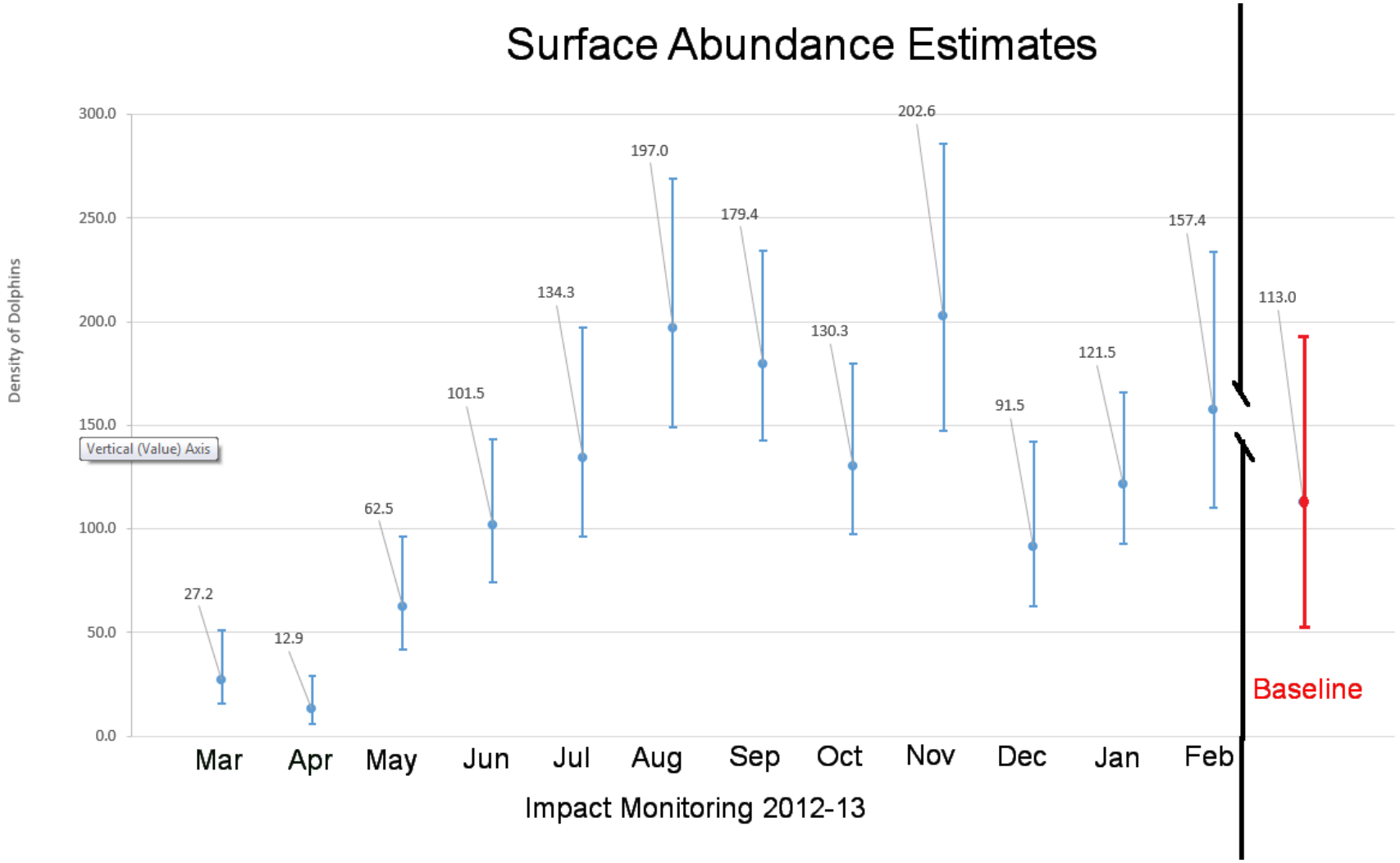

Figure 13. 2012-13 Monthly Surface Abundance Estimates (with 95% confidence intervals) and the Surface Abundance Estimate for the Baseline Period (Sep – Nov 2011) for Chinese white dolphin (*Souas chinensis*) in NEL and NWL waters, Hong Kong.

Table 1 Impact Monitoring Survey Schedule and Details (March 2012 – February 2013)

Date	Location of Survey	No. Sightings ON	No. Sightings Opp	Total km ON EFFORT (favourable conditions)
29-03-12	NW and NE Lantau	3	2	74.9
31-03-12	NW and NE Lantau	1	1	54.7
19-04-12	NW Lantau	1	1	25.7
23-04-12	NW and NE Lantau	0	0	53.4
01-05-12	NW and NE Lantau	2	0	72.7
10-05-12	NW and NE Lantau	0	0	46.2
28-05-12	NW Lantau	5	4	40.8
12-06-12	NW Lantau	0	1	52.9
13-06-12	NW and NE Lantau	2	0	50.3
14-06-12	NW Lantau	6	1	82.4
15-06-12	NW and NE Lantau	2	1	58.9
20-06-12	NW Lantau	3	2	81.9
25-06-12	NW and NE Lantau	0	0	35.1
10-07-12	NW Lantau	5	1	61.1
11-07-12	NW and NE Lantau	2	1	50.8
12-07-12	NW Lantau	4	1	62.2
16-07-12	NW and NE Lantau	4	1	46.3
17-07-12	NW and NE Lantau	0	1	84.2
20-07-12	NE Lantau	0	0	33.4
05-08-12	NW and NE Lantau	3	0	38.1
06-08-12	NW Lantau	7	1	68.9
14-08-12	NW Lantau	4	2	62.6
15-08-12	NW and NE Lantau	2	1	25.7
16-08-12	NE Lantau	3	1	21.4
03-09-12	NW Lantau	8(+1D)	2	37.9
04-09-12	NW and NE Lantau	9	0	49.4
05-09-12	NE Lantau	1	1	22.3
18-09-12	NW Lantau	4	4	74.4
19-09-12	NW and NE Lantau	2	1	39.6
11-10-12	NW and NE Lantau	1	0	39.8
12-10-12	NW Lantau	6	1	67.2
23-10-12	NW and NE Lantau	1	2	61.7
24-10-12	NW Lantau	1	3	54.2
01-11-12	NW Lantau	4	3	62.8
02-11-12	NW and NE Lantau	3	0	41.3
05-11-12	NW Lantau	3	1	71.0
06-11-12	NW and NE Lantau	8	1	38.2
04-12-12	NW and NE Lantau	1	1	79
06-12-12	NE Lantau	1	1	32.3

Date	Location of Survey	No. Sightings ON	No. Sightings Opp	Total km ON EFFORT (favourable conditions)
10-12-12	NW and NE Lantau	2	2	51.5
11-12-12	NW Lantau	7	3	51.3
08-01-13	NW Lantau	3	0	70.6
09-01-13	NW and NE Lantau	1	0	40.6
28-01-13	NW Lantau	8	3	63.4
29-01-13	NW and NE Lantau	0	0	47.6
14-02-13	NW and NE Lantau	5	0	76.6
15-02-13	NW Lantau	3	0	35.0
21-02-13	NW Lantau	3	4	71.8
22-02-13	NW and NE Lantau	0	2	37.3

Table 2 Impact Monitoring Survey Effort Summary (March 2012 – February 2013)

Date	Area	Beaufort	Effort (km)	Season	Vessel	Type
29-03-12	NWL	2	14.5	SPRING	HKDW	IMPACT
29-03-12	NWL	3	26.5	SPRING	HKDW	IMPACT
29-03-12	NEL	1	6.8	SPRING	HKDW	IMPACT
29-03-12	NEL	2	18.0	SPRING	HKDW	IMPACT
29-03-12	NEL	3	9.1	SPRING	HKDW	IMPACT
31-03-12	NWL	1	2.6	SPRING	HKDW	IMPACT
31-03-12	NWL	2	10.9	SPRING	HKDW	IMPACT
31-03-12	NEL	1	41.2	SPRING	HKDW	IMPACT
19-04-12	NWL	1	7.1	SPRING	HKDW	IMPACT
19-04-12	NWL	2	11.8	SPRING	HKDW	IMPACT
19-04-12	NWL	3	6.8	SPRING	HKDW	IMPACT
23-04-12	NWL	1	3.3	SPRING	HKDW	IMPACT
23-04-12	NWL	2	11.5	SPRING	HKDW	IMPACT
23-04-12	NWL	3	3.1	SPRING	HKDW	IMPACT
23-04-12	NEL	0	3.3	SPRING	HKDW	IMPACT
23-04-12	NEL	1	10.1	SPRING	HKDW	IMPACT
23-04-12	NEL	2	19.3	SPRING	HKDW	IMPACT
23-04-12	NEL	3	2.8	SPRING	HKDW	IMPACT
01-05-12	NWL	1	9.3	SPRING	HKDW	IMPACT
01-05-12	NWL	2	24.1	SPRING	HKDW	IMPACT
01-05-12	NWL	3	22.5	SPRING	HKDW	IMPACT
01-05-12	NEL	2	16.8	SPRING	HKDW	IMPACT
10-05-12	NWL	2	12.2	SPRING	HKDW	IMPACT
10-05-12	NWL	3	3.1	SPRING	HKDW	IMPACT
10-05-12	NEL	0	0.7	SPRING	HKDW	IMPACT
10-05-12	NEL	1	21.0	SPRING	HKDW	IMPACT
10-05-12	NEL	2	9.2	SPRING	HKDW	IMPACT
28-05-12	NWL	0	3.6	SPRING	HKDW	IMPACT
28-05-12	NWL	1	14.7	SPRING	HKDW	IMPACT
28-05-12	NWL	2	10.7	SPRING	HKDW	IMPACT
28-05-12	NWL	3	11.8	SPRING	HKDW	IMPACT
12-06-12	NWL	0	20.5	SUMMER	HKDW	IMPACT
12-06-12	NWL	1	22.4	SUMMER	HKDW	IMPACT
12-06-12	NWL	2	7.2	SUMMER	HKDW	IMPACT
12-06-12	NWL	3	2.8	SUMMER	HKDW	IMPACT
13-06-12	NWL	0	3.2	SUMMER	HKDW	IMPACT
13-06-12	NEL	0	29.4	SUMMER	HKDW	IMPACT
13-06-12	NEL	1	17.7	SUMMER	HKDW	IMPACT
14-06-12	NWL	0	13.7	SUMMER	HKDW	IMPACT
14-06-12	NWL	1	28.1	SUMMER	HKDW	IMPACT
14-06-12	NWL	2	40.6	SUMMER	HKDW	IMPACT
15-06-12	NWL	2	3.2	SUMMER	HKDW	IMPACT
15-06-12	NWL	3	0.2	SUMMER	HKDW	IMPACT
15-06-12	NEL	1	19.1	SUMMER	HKDW	IMPACT
15-06-12	NEL	2	28.6	SUMMER	HKDW	IMPACT
15-06-12	NEL	3	7.8	SUMMER	HKDW	IMPACT
20-06-12	NWL	1	71.8	SUMMER	HKDW	IMPACT
20-06-12	NWL	2	10.1	SUMMER	HKDW	IMPACT
25-06-12	NWL	2	2.3	SUMMER	HKDW	IMPACT
25-06-12	NWL	3	0.3	SUMMER	HKDW	IMPACT
25-06-12	NEL	2	28.5	SUMMER	HKDW	IMPACT
25-06-12	NEL	3	4.0	SUMMER	HKDW	IMPACT
10-07-12	NWL	1	14.3	SUMMER	HKDW	IMPACT
10-07-12	NWL	2	25.4	SUMMER	HKDW	IMPACT

Date	Area	Beaufort	Effort (km)	Season	Vessel	Type
10-07-12	NWL	3	21.4	SUMMER	HKDW	IMPACT
11-07-12	NWL	2	3.8	SUMMER	HKDW	IMPACT
11-07-12	NEL	1	14.4	SUMMER	HKDW	IMPACT
11-07-12	NEL	2	28.0	SUMMER	HKDW	IMPACT
11-07-12	NEL	3	4.6	SUMMER	HKDW	IMPACT
12-07-12	NWL	2	29.2	SUMMER	HKDW	IMPACT
12-07-12	NWL	3	33	SUMMER	HKDW	IMPACT
16-07-12	NWL	1	6.1	SUMMER	HKDW	IMPACT
16-07-12	NWL	2	2.8	SUMMER	HKDW	IMPACT
16-07-12	NEL	1	6.5	SUMMER	HKDW	IMPACT
16-07-12	NEL	2	28.8	SUMMER	HKDW	IMPACT
16-07-12	NEL	3	2.1	SUMMER	HKDW	IMPACT
17-07-12	NWL	1	32.3	SUMMER	HKDW	IMPACT
17-07-12	NWL	2	17.6	SUMMER	HKDW	IMPACT
17-07-12	NWL	3	34.3	SUMMER	HKDW	IMPACT
20-07-12	NEL	1	11.4	SUMMER	HKDW	IMPACT
20-07-12	NEL	2	19.6	SUMMER	HKDW	IMPACT
20-07-12	NEL	3	2.4	SUMMER	HKDW	IMPACT
05-08-12	NWL	2	3.4	SUMMER	HKDW	IMPACT
05-08-12	NEL	1	16.8	SUMMER	HKDW	IMPACT
05-08-12	NEL	2	11.6	SUMMER	HKDW	IMPACT
05-08-12	NEL	3	6.3	SUMMER	HKDW	IMPACT
06-08-12	NWL	1	33.6	SUMMER	HKDW	IMPACT
06-08-12	NWL	2	16.6	SUMMER	HKDW	IMPACT
06-08-12	NWL	3	18.7	SUMMER	HKDW	IMPACT
14-08-12	NWL	2	48.3	SUMMER	HKDW	IMPACT
14-08-12	NWL	3	14.3	SUMMER	HKDW	IMPACT
15-08-12	NWL	2	10.3	SUMMER	HKDW	IMPACT
15-08-12	NEL	1	8.3	SUMMER	HKDW	IMPACT
15-08-12	NEL	2	7.1	SUMMER	HKDW	IMPACT
16-08-12	NEL	1	3.4	SUMMER	HKDW	IMPACT
16-08-12	NEL	2	17.5	SUMMER	HKDW	IMPACT
16-08-12	NEL	3	0.5	SUMMER	HKDW	IMPACT
03-09-12	NWL	1	20.6	AUTUMN	HKDW	IMPACT
03-09-12	NWL	2	5.8	AUTUMN	HKDW	IMPACT
03-09-12	NWL	3	11.5	AUTUMN	HKDW	IMPACT
04-09-12	NWL	1	8.2	AUTUMN	HKDW	IMPACT
04-09-12	NWL	2	17.9	AUTUMN	HKDW	IMPACT
04-09-12	NWL	3	7.5	AUTUMN	HKDW	IMPACT
04-09-12	NWL	4	7.6	AUTUMN	HKDW	IMPACT
04-09-12	NEL	2	6.7	AUTUMN	HKDW	IMPACT
04-09-12	NEL	3	9.1	AUTUMN	HKDW	IMPACT
05-09-12	NEL	1	17.5	AUTUMN	HKDW	IMPACT
05-09-12	NEL	2	4.8	AUTUMN	HKDW	IMPACT
18-09-12	NWL	1	48.4	AUTUMN	HKDW	IMPACT
18-09-12	NWL	2	26	AUTUMN	HKDW	IMPACT
19-09-12	NWL	2	3.4	AUTUMN	HKDW	IMPACT
19-09-12	NEL	1	20.6	AUTUMN	HKDW	IMPACT
19-09-12	NEL	2	8.6	AUTUMN	HKDW	IMPACT
19-09-12	NEL	3	7	AUTUMN	HKDW	IMPACT
11-10-12	NWL	1	3.3	AUTUMN	HKDW	IMPACT
11-10-12	NEL	1	26.7	AUTUMN	HKDW	IMPACT
11-10-12	NEL	2	9.8	AUTUMN	HKDW	IMPACT
12-10-12	NWL	1	48.3	AUTUMN	HKDW	IMPACT
12-10-12	NWL	2	15.1	AUTUMN	HKDW	IMPACT

Date	Area	Beaufort	Effort (km)	Season	Vessel	Type
12-10-12	NWL	3	3.8	AUTUMN	HKDW	IMPACT
23-10-12	NWL	1	18.8	AUTUMN	HKDW	IMPACT
23-10-12	NWL	2	1.3	AUTUMN	HKDW	IMPACT
23-10-12	NWL	3	4	AUTUMN	HKDW	IMPACT
23-10-12	NEL	1	19	AUTUMN	HKDW	IMPACT
23-10-12	NEL	2	18.6	AUTUMN	HKDW	IMPACT
24-10-12	NWL	1	8	AUTUMN	HKDW	IMPACT
24-10-12	NWL	2	20.6	AUTUMN	HKDW	IMPACT
24-10-12	NWL	3	25.6	AUTUMN	HKDW	IMPACT
01-11-12	NWL	1	13.1	AUTUMN	HKDW	IMPACT
01-11-12	NWL	2	38.3	AUTUMN	HKDW	IMPACT
01-11-12	NWL	3	11.4	AUTUMN	HKDW	IMPACT
01-11-12	NWL	4	9.2	AUTUMN	HKDW	IMPACT
02-11-12	NWL	1	3.5	AUTUMN	HKDW	IMPACT
02-11-12	NEL	1	33.3	AUTUMN	HKDW	IMPACT
02-11-12	NEL	2	4.5	AUTUMN	HKDW	IMPACT
05-11-12	NWL	1	6.1	AUTUMN	HKDW	IMPACT
05-11-12	NWL	2	51.7	AUTUMN	HKDW	IMPACT
05-11-12	NWL	3	13.2	AUTUMN	HKDW	IMPACT
06-11-12	NWL	1	3.4	AUTUMN	HKDW	IMPACT
06-11-12	NEL	1	27.5	AUTUMN	HKDW	IMPACT
06-11-12	NEL	2	7.3	AUTUMN	HKDW	IMPACT
04-12-12	NWL	1	2.5	WINTER	HKDW	IMPACT
04-12-12	NWL	2	49	WINTER	HKDW	IMPACT
04-12-12	NWL	3	23.6	WINTER	HKDW	IMPACT
04-12-12	NEL	2	3.9	WINTER	HKDW	IMPACT
06-12-12	NEL	1	15.4	WINTER	HKDW	IMPACT
06-12-12	NEL	2	16.9	WINTER	HKDW	IMPACT
10-12-12	NWL	1	5	WINTER	HKDW	IMPACT
10-12-12	NWL	2	10.3	WINTER	HKDW	IMPACT
10-12-12	NEL	1	11.6	WINTER	HKDW	IMPACT
10-12-12	NEL	2	20.2	WINTER	HKDW	IMPACT
10-12-12	NEL	3	4.4	WINTER	HKDW	IMPACT
11-12-12	NWL	1	10.3	WINTER	HKDW	IMPACT
11-12-12	NWL	2	32.6	WINTER	HKDW	IMPACT
11-12-12	NWL	3	8.4	WINTER	HKDW	IMPACT
11-12-12	NWL	4	7.1	WINTER	HKDW	IMPACT
08-01-13	NWL	1	7.4	WINTER	HKDW	IMPACT
08-01-13	NWL	2	49.1	WINTER	HKDW	IMPACT
08-01-13	NWL	3	14.1	WINTER	HKDW	IMPACT
09-01-13	NWL	2	3.2	WINTER	HKDW	IMPACT
09-01-13	NEL	1	1.9	WINTER	HKDW	IMPACT
09-01-13	NEL	2	35.5	WINTER	HKDW	IMPACT
28-01-13	NWL	1	16.9	WINTER	HKDW	IMPACT
28-01-13	NWL	2	46.5	WINTER	HKDW	IMPACT
29-01-13	NWL	1	10.4	WINTER	HKDW	IMPACT
29-01-13	NEL	1	37.2	WINTER	HKDW	IMPACT
14-02-13	NEL	1	35.3	WINTER	HKDW	IMPACT
14-02-13	NEL	2	2.6	WINTER	HKDW	IMPACT
14-02-13	NWL	1	5.9	WINTER	HKDW	IMPACT
14-02-13	NWL	2	32.8	WINTER	HKDW	IMPACT
15-02-13	NWL	1	17.5	WINTER	HKDW	IMPACT
15-02-13	NWL	2	17.5	WINTER	HKDW	IMPACT
21-02-13	NWL	1	55.7	WINTER	HKDW	IMPACT
21-02-13	NWL	2	16.1	WINTER	HKDW	IMPACT

Date	Area	Beaufort	Effort (km)	Season	Vessel	Type
22-02-13	NWL	3	2.1	WINTER	HKDW	IMPACT
22-02-13	NEL	1	0.6	WINTER	HKDW	IMPACT
22-02-13	NEL	2	24.9	WINTER	HKDW	IMPACT
22-02-13	NEL	3	9.7	WINTER	HKDW	IMPACT
22-02-13	NEL	4	2.2	WINTER	HKDW	IMPACT

*Please note, the data presented in the First Quarterly Report for HKBCF erroneously recorded 12.9km in NEL which should have been assigned to NWL. This has been fixed for the yearly summary recorded in Table 2.

Table 3 Sightings of Individually Identified Chinese White Dolphin (*Sousa chinensis*) between March 2012 – February 2013 and baseline sightings

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 093		2013-02-21	587	NWL
HZMB 092		2013-02-21	589	NWL
		2013-02-15	581	NWL
HZMB 091		2013-02-15	579	NWL
HZMB 090		2013-02-15	579	NWL
HZMB 089		2013-02-15	579	NWL
HZMB 088		2013-02-15	579	NWL
HZMB 087		2013-02-15	579	NWL
HZMB 086	NL242	2013-02-15	579	NWL
		2011-10-10	2	NWL
HZMB 085		2013-02-15	579	NWL
HZMB 084		2013-02-14	575	NWL
HZMB 083	NL136	2013-02-15	579	NWL
		2013-01-28	568	NWL
		2012-01-28	564	NWL
HZMB 082		2013-02-21	587	NWL
		2013-02-15	579	NWL
		2013-01-28	563	NWL
HZMB 081		2013-01-28	559	NWL
		2013-01-28	557	NWL
HZMB 080		2013-01-28	556	NWL
HZMB 079		2013-01-28	556	NWL
HZMB 078		2013-02-15	579	NWL
		2013-01-08	552	NWL
HZMB 077		2012-12-11	541	NWL
HZMB 076		2012-12-11	541	NWL
HZMB 075		2012-12-06	525	NEL
HZMB 074		2013-02-21	594	NEL
		2012-12-10	529	NEL
		2012-12-06	525	NEL
HZMB 073		2013-02-21	594	NEL
		2012-12-10	529	NEL
		2012-12-06	525	NEL
HZMB 072		2012-10-24	476	NWL
HZMB 071		2012-10-24	475	NWL
		2012-10-12	466	NWL
		2012-08-15	393	NEL
HZMB 070		2012-10-24	476	NWL
HZMB 069		2012-10-24	476	NWL
HZMB 068		2012-10-24	476	NWL
HZMB 067		2012-10-24	475	NWL
HZMB 066	NL93	2013-01-28	559	NWL
		2012-12-11	537	NWL
		2012-10-24	475	NWL
		2012-10-12	466	NWL
		2012-08-15	393	NEL
HZMB 065		2012-10-12	466	NWL
HZMB 064		2013-01-28	561	NWL
		2012-10-24	475	NWL
		2012-10-12	466	NWL
HZMB 063		2012-10-12	466	NWL

Table 3. (cont'd) Sightings of Individually Identified Chinese White Dolphin (*Sousa chinensis*) between March 2012 – February 2013 and baseline sightings

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 061		2012-09-18	448	NWL
HZMB 060		2012-09-18	447	NWL
HZMB 059		2013-02-21	591	NWL
		2012-09-18	445	NWL
HZMB 057		2012-09-18	440	NWL
HZMB 056		2012-09-18	442	NWL
		2012-09-05	433	NEL
HZMB 055		2012-09-04	425	NWL
HZMB 054	CH34	2012-09-05	432	NEL
		2011-11-07	2	NWL
		2011-11-05	6	NWL
		2011-11-02	14	NWL
		2011-11-01	8	NEL
		2011-11-01	6	NEL
		2011-10-28	5	NWL
		2011-10-06	6	NWL
HZMB 053		2012-09-04	425	NWL
HZMB 052		2012-09-04	423	NWL
HZMB 051	NL213	2013-02-15	582	NWL
		2013-02-15	581	NWL
		2013-01-28	559	NWL
		2013-01-28	556	NWL
		2012-09-04	422	NWL
HZMB 050		2013-02-15	579	NWL
		2012-09-04	421	NWL
HZMB 049		2012-09-03	419	NWL
HZMB 048		2012-09-03	419	NWL
HZMB 047		2012-09-03	412	NWL
HZMB 046		2012-09-03	412	NWL
HZMB 045		2013-02-15	579	NWL
		2012-11-01	495	NWL
HZMB 044		2013-02-15	579	NWL
		2012-11-01	495	NWL
HZMB 043		2012-09-03	407	NWL
HZMB 042	NL260	2012-11-01	495	NWL
		2011-11-07	5	NWL
HZMB 041	NL24	2013-02-15	579	NWL
		2012-11-01	495	NWL
		2011-11-06	2	NEL
		2011-11-05	8	NWL
		2011-11-05	5	NWL
		2011-10-10	2	NWL
HZMB 040		2013-02-21	589	NWL
		2012-11-01	493	NWL
HZMB 038		2012-11-01	490	NWL
HZMB 037		2012-11-01	490	NWL
HZMB 036		2012-11-01	490	NWL
		2012-09-03	407	NWL
HZMB 035		2013-02-15	579	NWL
		2012-11-01	490	NWL

Table 3. (cont'd) Sightings of Individually Identified Chinese White Dolphin (*Sousa chinensis*) between March 2012 – February 2013 and baseline sightings

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 034		2012-11-01	493	NWL
HZMB 028		2012-08-06	373	NWL
HZMB 027		2013-02-15	579	NWL
		2013-01-28	568	NWL
		2013-01-28	564	NWL
		2012-06-14	299	NWL
HZMB 026		2013-01-28	561	NWL
		2012-06-13	295	NEL
HZMB 025		2013-02-22	596	NEL
		2013-02-21	591	NWL
		2012-12-06	525	NEL
		2012-10-11	457	NWL
		2012-06-13	295	NEL
HZMB 024		2012-06-13	295	NEL
HZMB 023		2013-02-21	589	NWL
		2013-02-15	579	NWL
		2012-07-10	330	NWL
HZMB 022		2013-02-21	589	NWL
		2013-02-15	579	NWL
		2012-07-10	330	NWL
HZMB 021	NL37	2012-07-10	330	NWL
		2011-09-16	4	NWL
HZMB 020		2012-07-10	330	NWL
HZMB 019		2012-07-10	330	NWL
HZMB 018		2013-02-21	594	NEL
		2012-12-10	529	NEL
		2012-07-10	330	NWL
HZMB 017		2012-07-10	330	NWL
HZMB 016		2012-12-11	539	NWL
		2012-09-18	446	NWL
		2012-09-04	421	NWL
		2012-07-10	330	NWL
HZMB 015		2012-07-10	330	NEL
HZMB 014	NL176	2012-08-06	373	NWL
		2012-06-13	295	NEL
		2011-11-06	4	NEL
		2011-11-01	8	NEL
		2011-11-01	6	NEL
HZMB 013		2012-05-28	281	NWL
HZMB 012		2012-05-28	281	NWL
HZMB 011	EL01	2013-02-22	597	NEL
		2013-02-21	592	NEL
		2013-02-14	572	NEL
		2012-11-06	517	NEL
		2012-09-19	452	NWL
		2012-03-31	261	NEL
		2011-11-02	14	NWL
		2011-11-01	9	NEL

Table 3. (cont'd) Sightings of Individually Identified Chinese White Dolphin (*Sousa chinensis*) between March 2012 – February 2013 and baseline sightings

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 009		2012-05-28	281	NWL
HZMB 008		2012-05-28	281	NWL
HZMB 007	NL246	2012-12-10	529	NEL
HZMB 006		2013-02-21	594	NEL
		2012-12-11	539	NWL
		2012-11-01	495	NWL
		2012-03-29	250	NWL
HZMB 005		2012-12-10	532	NWL
		2012-08-06	374	NWL
		2012-05-28	287	NWL
HZMB 004		2012-09-04	421	NWL
		2012-03-31	262	NWL
HZMB 003	NL179	2012-12-10	529	NEL
		2012-03-31	261	NWL
		2011-11-06	2	NEL
		2011-09-16	7	NWL
HZMB 002	WL111	2013-02-14	573	NWL
		2012-12-11	536	NWL
		2012-12-11	535	NWL
		2012-10-24	475	NWL
		2012-10-12	466	NWL
		2012-05-28	281	NWL
		2012-03-29	250	NWL
HZMB 001	WL46	2013-02-14	573	NWL
		2012-03-29	250	NWL
	CH98	2011-11-02	13	NWL
	NL11	2011-11-02	12	NWL
		2011-11-07	2	NWL
	NL12	2011-11-02	12	NWL
	NL33	2011-09-23	10	NWL
		2011-11-01	8	NEL
		2011-11-05	2	NWL
		2011-11-07	5	NWL
	NL37	2011-09-16	4	NWL
	NL46	2011-10-28	4	NWL
	NL48	2011-09-16	5	NWL
		2011-11-02	14	NWL
		2011-11-07	2	NWL
	NL75	2011-09-16	3	NWL
		2011-09-16	7	NWL
		2011-11-01	9	NEL
	NL80	2011-11-02	12	NWL
	NL93	2011-11-05	6	NWL
		2011-11-07	4	NWL
	NL98	2011-10-06	2	NEL
		2011-11-01	8	NEL
		2011-11-06	2	NEL
		2011-11-07	2	NWL
	NL120	2011-10-10	2	NWL
		2011-11-06	4	NEL

Table 3. (cont'd) Sightings of Individually Identified Chinese White Dolphin (*Sousa chinensis*) between March 2012 – February 2013 and baseline sightings

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
	NL123	2011-10-06	4	NWL
		2011-10-10	2	NWL
		2011-11-06	2	NEL
	NL214	2011-10-28	5	NWL
		2011-11-02	14	NWL
		2011-11-05	6	NWL
	NL220	2011-10-10	3	NEL
	NL224	2011-10-28	4	NWL
	NL226	2011-11-05	2	NWL
	NL230	2011-11-02	12	NWL
	NL233	2011-09-16	3	NWL
		2011-10-06	4	NWL
		2011-10-28	4	NWL
	NL241	2011-09-16	7	NWL
		2011-11-02	12	NWL
		2011-11-07	2	NWL
	NL244	2011-11-01	5	NWL
		2011-11-01	8	NEL
	NL246	2011-09-16	7	NWL
		2011-11-06	2	NEL
	NL256	2011-11-02	12	NWL
	NL258	2011-09-16	5	NWL
	NL259	2011-11-07	5	NWL
	NL261	2011-11-01	9	NEL
	NL264	2011-09-23	11	NWL
		2011-10-06	2	NEL
		2011-11-06	3	NEL
	NL269	2011-11-02	12	NWL
	NL272	2011-09-16	7	NWL
		2011-10-28	4	NWL
		2011-11-02	14	NWL
		2011-11-05	8	NWL
	NL278	2011-11-02	12	NWL
	NL279	2011-11-02	12	NWL
	SL42	2011-11-02	13	NWL
	SL43	2011-10-28	4	NWL
	WL04	2011-09-16	6	NWL
		2011-10-10	2	NWL
		2011-11-02	14	NWL
		2011-11-05	5	NWL
	WL05	2011-11-01	6	NEL
		2011-11-01	8	NEL
	WL11	2011-11-07	5	NWL
	WL25	2011-09-16	1	NWL
	WL88	2011-09-16	1	NWL
	WL111	2011-11-02	14	NWL
	WL116	2011-09-16	4	NWL
	WL124	2011-11-02	12	NWL
	WL156	2011-10-28	3	NWL
	WL162	2011-09-16	3	NWL

China Harbour Engineering Company Limited

Monthly Summary Waste Flow Table for December / 2012 (year)

Project : Hong Kong – Zhuhai – Macao Bridge, Hong Kong Boundary Crossing Facilities – Reclamation Works Contract No.: HY/2010/02

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete (see Note 1)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste (see Note 4)	Others, e.g. general refuse (see Note 3)
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m^3)
Mar	0	0	0	0	0	16.9360	0	0	0	0	0.58500
Apr	0	0	0	0	0	68.0870	0	0	0	0	0.00650
May	0	0	0	0	0	87.8779	0	0	0	0	0.01300
Jun	0	0	0	0	0	96.4000	0	0	0	0	0.01300
Sub-total	0	0	0	0	0	273.776	0	0	0	0	0.61750
Jul	0	0	0	0	0	97.1469	0	0	0	0	0.01300
Aug	0	0	0	0	0	79.6923	0	0	0	0	0.02600
Sep	0	0	0	0	0	31.5754	0	0	0	1.81800	0.02600
Oct	0	0	0	0	0	66.0257	0	0	0	1.00000	0.03250
Nov	0	0	0	0	0	44.9416	0	0	0	0.80000	0.03900
Dec	0	0	0	0	0	40.8694	0	0	0	2.40000	0.01950
Total	0	0	0	0	0	629.552	0	0	0	6.01800	0.77350

Notes:
(1) Broken concrete for recycling into aggregates.
(2) Plastics refer to plastic bottles/ containers, plastic sheets/ foam from packaging materials.
(3) Use the conversion factor : 1 full load of dumping truck being equivalent to 6.5m^3 by volume.
(4) Chemical waste refer to spent “battery” and “oil with water”.

China Harbour Engineering Company Limited

Monthly Summary Waste Flow Table for February / 2013 (year)

Project : Hong Kong – Zhuhai – Macao Bridge, Hong Kong Boundary Crossing Facilities – Reclamation Works Contract No.: HY/2010/02

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete (see Note 1)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste (see Note 4)	Others, e.g. general refuse (see Note 3)
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m^3)
Jan-13	0.0000	0.0000	0.0000	0.0000	0.0000	100.2272	0.0000	0.0000	0.0000	1.4000	0.0325
Feb-13	0.0000	0.0000	0.0000	0.0000	0.0000	49.3183	0.0000	0.0000	0.0000	0.2000	0.0195
Mar-13											
Apr-13											
May-13											
Jun-13											
Sub-total	0.0000	0.0000	0.0000	0.0000	0.0000	149.5455	0.0000	0.0000	0.0000	1.6000	0.0520
Jul-13											
Aug-13											
Sep-13											
Oct-13											
Nov-13											
Dec-13											
Total	0.0000	0.0000	0.0000	0.0000	0.0000	149.5455	0.0000	0.0000	0.0000	1.6000	0.0520

Notes: (1) Broken concrete for recycling into aggregates.

(2) Plastics refer to plastic bottles/ containers, plastic sheets/ foam from packaging materials.

(3) Use the conversion factor : 1 full load of dumping truck being equivalent to 6.5m3 by volume.

(4) Chemical waste refer to spent “battery” and “oil with water”.

Appendix J

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

Cumulative statistics on Exceedances

		Total no. recorded in this month	Total no. recorded since project commencement
1-Hour TSP	Action	-	-
	Limit	-	-
24-Hour TSP	Action	-	-
	Limit	-	-
Noise	Action	-	-
	Limit	-	-
Water Quality	Action	-	-
	Limit	-	-

Remarks: Exceedances which are not project-related are not presented in this table.

Cumulative statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecution

	Review Period	Subject	Status	Total no. received to date	Total no. received since project commencement
Environmental complaints	24 Oct 12 – 30 Oct 12	A complaint was referred by EPD on 24 Oct 12 regarding the blackish water (suspected oil spillage) observed outside the construction site near the Hong Kong International Airport and the new development pier in Tung Chung. Photos were taken by the complainant on 19, 22 and 24 October 2012. The investigation results show that the complaint	Closed	1	1

		was non-project related.			
	19 Oct 12 – 21 Jan 13	As informed by the Contractor on the 28 Dec 2012, a night time noise at Works Area WA4 related complain (after 7 pm) was received by EPD on 18 Oct 2012. After investigation, the Contractor was reminded to implement necessary mitigation measures.	Closed	1	2
	18 Jan 13 – 1 Feb 13	EPD referred a complaint from a complainant on 18 Jan 2013 who advised that turbid water and concrete/cement was arising from the Hong Kong-Zhuhai-Macao Bridge Hong Kong Projects to marine water. The source of turbid water and concrete/cement was not specified by the complainant. After investigation, it could not be concluded whether the complaint was considered as project related or not. However the Contractor was reminded to implement necessary mitigation measures.	Closed	1	3
	6 Feb13 – 4Mar 13	One (1) complaint was referred to the HyD by the Islands District Council	Closed	1	4

		(IDC) on the 6 February 2013 regarding a resident from Phase 1 Caribbean Coast who complained the nuisance brought by construction along Ying Hei Road, Tung Chung. Complaint investigation was conducted by the HyD and written reply were subsequently given to IDC by HyD on 4 March 13. The investigation results show that the complaint was non-project related.			
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

Appendix K – Event Action Plan

Event / Action Plan for Air Quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level				
Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 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.
Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER 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 ER; 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 ER 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. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit Level				
Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, 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 ER 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 ER 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.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Exceedance for two or more consecutive samples	1. Notify IEC, ER, 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 ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	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; 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.	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 ER until the exceedance is abated.

Event / Action Plan for Construction Noise

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level	1. Notify IEC and Contractor; 2. Identify source, investigate the causes of exceedance and propose remedial measures; 3. Report the results of investigation to the IEC, ER 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 ER 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. Inform IEC, ER, EPD and Contractor; 2. Identify source; 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; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER 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 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.	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 ER until the exceedance is abated.

Event / Action Plan for Water Quality

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action level being exceeded by one sampling day	1. Repeat *in situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor and ER; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Repeat measurement on next day of exceedance to confirm findings.	1. Check monitoring data submitted by ET and Contractor's working methods; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of non-compliance in writing; 2. Discuss with IEC on the proposed mitigation measures; 3. Make agreement on mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER; 5. Implement the agreed mitigation measures. 6. Amend working methods if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action level being exceeded by two or more consecutive sampling days	1. Repeat *in situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor and ER; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Action level; 8. Repeat measurement on next day of exceedance to confirm findings.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of non-compliance in writing; 2. Discuss with IEC on the proposed mitigation measures; 3. Make agreement on mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Assess the effectiveness of the implemented mitigation measures.	1. Inform the Engineer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER within 3 working days of notification; 5. Implement the agreed mitigation measures; 6. Amend working methods if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit level being exceeded by one sampling day	1. Repeat *in-situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Ensure mitigation measures are properly implemented; 5. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; 5. Implement the agreed mitigation measures; 6. Amend working methods if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit level being exceeded by two or more consecutive sampling days	1. Repeat *in-situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Make agreement on the mitigation measures to be implemented; 5. Ensure mitigation measures are properly implemented; 6. Assess the effectiveness of the implemented mitigation measures; 7. 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.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Take immediate action to avoid further exceedance; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; 6. Implement the agreed mitigation measures; 7. Resubmit proposals of mitigation measures if problem still not under control; 8. As directed by the Engineer, 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	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Dolphin numbers and behaviour patterns recorded in the impact and post-construction monitoring are significantly lower than or different from those recorded in the baseline monitoring	1. Repeat statistical data analysis to confirm findings; 2. Review historical data to ensure differences are as a result of natural variation or previously observed seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, ER and Contractor; 5. Check monitoring data; 6. Discuss additional dolphin monitoring and any other measures, with the IEC and Contractor.	1. Discuss monitoring with the ET and the Contractor; 2. Review proposals for additional monitoring and any other measures submitted by the Contractor and advise the ER accordingly.	1. Discuss with the IEC additional monitoring requirements and any other measures proposed by the ET; 2. Make agreement on the measures to be implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the ER; 3. Implement the agreed measures.