China Harbour Engineering Company Limited

Contract No. HY/2010/02

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

Monthly EM&A Report for October 2014

[11/2014]

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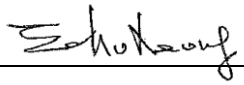
Reviewed, Approved and Certified:	Echo Leong (ETL)	

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Ref.: HYDHZMBEEM00_0_2446L.14 14 November 2014

Engineer's Representative By Fax (3698 5999) and By Post
Ove Arup & Partners
Chief Resident Engineer's Office
5 Ying Hei Road, Tung Chung, Lantau
Hong Kong

Attention: Mr. Roger Marechal

Dear Sirs,

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

Contract No. HY/2010/02 HZMB HKBCF – Reclamation Work
Monthly Environmental Monitoring & Audit Report for October 2014

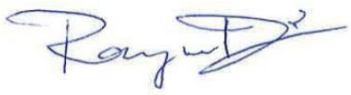
Reference is made to the Environmental Team's submission of the Monthly Environmental Monitoring & Audit Report for October 2014 (letter ref: 60249820/C/RMKY14111401 dated 14 November 2014) copied to us by E-mail on 14 November 2014.

We are pleased to inform you that we have no adverse comment on the captioned Monthly EM&A Report. We write to verify the captioned report in accordance with Condition 5.4 of EP-353/2009/G and Condition 4.4 of EP-354/2009/B (for TM-CLKL Southern Landfall Reclamation only).

ET is reminded to improve their work arrangement to avoid delay in reporting information to meet the submission timeframe as required in the EP.

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

c.c.	HyD	Mr. Matthew Fung	(By Fax: 3188 6614)
	HyD	Mr. Wai-ping Lee	(By Fax: 3188 6614)
	AECOM	Ms. Echo Leong	(By Fax: 2317 7609)
	CHEC	Mr. Lim Kim Chuan	(By Fax: 2578 0413)

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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 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 1 and 31 October 2014. As informed by the Contractor, major activities in the reporting period were:-

Marine-base

- Capping Beams structures
- Optimizing rubble mound seawalls
- Conforming sloping seawalls
- Laying geo-textile
- Rock filling
- Sand filling
- Public filling
- Band drain installation
- Surcharge remove & laying
- Geotechnical Instrumentation works
- Precast Yard for seawall blocks & culverts
- Maintenance of silt curtain & silt screen at sea water intake of HKIA

Land-base

- Maintenance works of Site Office at Works Area WA2
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Maintenance of Temporary Marine Access at Works Area WA2

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

24-hour Total Suspended Particulates (TSP) monitoring	5 sessions
1-hour TSP monitoring	5 sessions
Noise monitoring	4 sessions
Impact water quality monitoring	14 sessions
Impact dolphin monitoring	2 surveys
Joint Environmental site inspection	5 sessions

Breaches of Action and Limit Levels for Air Quality

One (1) 24-hour TSP result at AMS3B exceeded Action Level on 27 October 2014, after investigation, the exceedance was considered not related to this Contract. All 1-Hour TSP results were below the Action and Limit Level in the reporting month.

Breaches of Action and Limit Levels for Noise

For construction noise, no exceedance was recorded at all monitoring stations in the reporting period.

Breaches of Action and Limit Levels for Water Quality

A total of (18) eighteen exceedances were recorded in this reporting month: (1) One Limit Level Exceedance of Turbidity and (1) Limit Level Exceedance of Suspended Solids were recorded at IS17 during ebb tide on 10 October 2014; (1) One Action Level Exceedance of SS at SR10B(N) was recorded on10 October 2014 during flood tide; (1) One Action Level Exceedance of SS at IS8 was recorded on 3 October 2014 during flood tide; (1) One Action Level Exceedance of SS at IS(Mf)11 was recorded on 6 October 2014 during ebb tide; (2) Two Action Level Exceedances of SS at IS(Mf)11 and SR5 were recorded on 6 October 2014 during flood tide; (3) Three Action Level Exceedances of SS were recorded at IS10, SR4(N) and SR5 on 13 October 2014 during flood tide; (1) One Action Level Exceedance of SS was recorded at IS17 on 20 October 2014 during ebb tide; (1) action level exceedance and (1) limit level exceedance of SS were recorded at SR4(N) and IS8 respectively on 20 October 2014 during flood tide; (2) Two Action Level Exceedances of SS were recorded at SR10A and SR10B(N) on 22 October 2014 during flood tide; (2) Two Action Level Exceedances of SS were recorded at IS10 and SR4(N) during flood tide on 24 October 2014. (1) Action Level Exceedance was recorded at IS8 on 31 October 2014 during ebb tide.

After investigation, all impact water quality exceedances were considered not related to this Contract except the Limit Level Exceedance of Turbidity, Limit Level Exceedance of Suspended Solids recorded at IS17 during ebb tide on 10 October 2014 and Action Level Exceedance of Suspended Solids recorded at IS17 during flood tide on 20 October 2014, which were considered related to this Contract. Recommendation has been given and rectification has been carried on by the Contractor on 28 October 2014.

Impact Dolphin Monitoring

A total of six sightings were made, four “on effort” and two “opportunistic”. Three sightings were made on the 13 October 2014 in NWL and three sightings were made on 20 October 2014 also in NWL. A total of twenty-two individuals were sighted from the two impact dolphin surveys in the reporting period. Sighting details are summarised and plotted in Appendix K and Figure 5c, respectively.

Behaviour: Of the six sightings, two groups were feeding, one group was travelling and three groups was engaged in multiple activities, two of which comprised feeding and surface active behaviours and one of which comprised feeding and travelling behaviours. The locations of sighting with different behaviour are mapped in Figure 5d.

Two calves were recorded in October 2014. The mother of one was HZMB 026. The location of sighting with calf is mapped in Figure 5e.

Complaint, Notification of Summons and Successful Prosecution

Two environmental complaints have been received in October 2014.

As informed by the Contractor yesterday, 14 October 2014, a follow up air quality complaint has been received by this Contract (same case to environmental complaint reported in the last reporting month). The complainant complained that about 20-30 sand barges always moor at the sea area opposite to tower 4 of Melody Garden and Richland Garden. This problem has affected the air quality. After investigation, there is no adequate information to conclude the observed impact is related to this Contract.

With reference to RSS’s letter ref.: 211036/(HY2010/02)/M05/432/B07605 dated on 30 September 2014 pertaining the performance on barges operations at the sea area off the Tuen Mun Ferry Pier. A complaint concerning leakage of sand filling material from vessels at sea area off Tuen Mun Ferry Pier was first received by EPD from Tuen Mun District Council (TM DC) on 19 September 2014 and it was subsequently referred by

EPD to the Highways Department to handle on 23 September 2014 through EPD's memo ref.: EP/RW/0000362128.Referring to EPD's Memo, it is also noted that some local residents at Tuen Mun expressed their concern that the stockpile of dusty sand material on the barges should be covered with impervious sheeting to avoid causing fugitive dust emissions of sand and dust. Subsequently, TM DC followed up their complaint with Highways Department on 17 October 2014. The follow up complaint concerning water quality impact at sea area off Tuen Mun area was referred to the project team to response on 17 October 2014. After investigation, there is no adequate information to conclude the observed impact is related to this Contract.

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

Reporting Change

There was no reporting change required in the reporting period.

Future Key Issues

Key issues to be considered in the coming month included:-

- Site runoff should be properly collected and treated prior to discharge;
- Minimize loss of sediment from filling works;
- Regular review and maintenance of silt curtain systems, drainage systems and desilting facilities;
- Exposed surfaces/soil stockpiles should be properly treated to avoid generation of silty surface run-off during rainstorm;
- Regular review and maintenance of wheel washing facilities provided at all site entrances/exits;
- Conduct regular inspection of various working machineries and vessels within works areas to avoid any dark smoke emission;
- Suppress dust generated from work processes with use of bagged cements, earth movements, excavation activities, exposed surfaces/soil stockpiles and haul road traffic;
- Quieter powered mechanical equipment should be used;
- Provision of proper and effective noise control measures for operating equipment and machinery on-site, such as erection of movable noise barriers or enclosure for noisy plants;
- Closely check and replace the sound insulation materials regularly;
- Better scheduling of construction works to minimize noise nuisance;
- Properly store and label oil drums and chemical containers placed on site;
- Proper chemicals, chemical wastes and wastes management;
- Maintenance works should be carried out within roofed, paved and confined areas;
- Collection and segregation of construction waste and general refuse on land and in the sea should be carried out properly and regularly; and
- Proper protection and regular inspection of existing trees, transplanted/retained trees.
- Control night-time lighting and glare by hooding all lights.
- Regular review and provide maintenance to dust control measures such as sprinkler system.

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 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 6 August 2013 (EP-353/2009/G) and 28 January 2014 (EP-354/2009/B) (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

1.2.1 This is the thirty-second monthly EM&A 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 in October 2014.

1.3 Project Organization

1.3.1 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	3698 5700	2698 5999
IEC / **ENPO** (ENVIRON Hong Kong Limited)	Independent Environmental Checker	Raymond Dai	3465 2888	3465 2899
	Environmental Project Office Leader	Y. H. Hui	3465 2868	3465 2899
Contractor (China Harbour Engineering Company Limited)	Environmental Officer	Richard Ng	36932253	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 this reporting period are listed below:-

Marine-based Works

- Cellular structure installation
- Optimizing rubble mound seawalls
- Conforming sloping seawalls
- Laying geo-textile
- Sand blanket laying
- Sand filling
- Rock filling
- Maintenance of silt curtain & silt screen at sea water intake of HKIA
- Band drain installation
- Backfill cellular structure
- Geotechnical Instrumentation works
- Surcharge laying
- Capping Beams structures
- Construction of temporary jetties for surcharge laying
- Temporary Watermain construction
- Flat barge of unloading public fill for surcharge laying
- Precast Yard Setup

Land-based Works

- Maintenance works of Site Office at Works Area WA2
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Maintenance of Temporary Marine Access at Works Area WA2

1.4.3 The 3-month rolling construction programme of the Project is shown in Appendix B.

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

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

1.5 Summary of EM&A Programme Requirements

1.5.1 The EM&A programme required environmental monitoring for air quality, noise, water quality, marine ecology and environmental site inspections for air quality, noise, water quality, waste management, marine ecology, and landscape and visual impact. The EM&A requirements for each parameter described in the following sections include:-

- All monitoring parameters;
- Monitoring schedules for the reporting month and forthcoming month;
- Action and Limit levels for all environmental parameters;
- Event / Action Plan;
- Environmental mitigation measures, as recommended in the Project EIA reports; and
- Environmental requirement in contract documents.

2 AIR QUALITY MONITORING

2.1 Monitoring Requirements

2.1.1 In accordance with the Project Specific EM&A Manual, baseline 1-hour and 24-hour Total Suspended Particulates (TSP) levels at 4 air quality monitoring stations were established. Impact 1-hour 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. The Action and Limit level of the air quality monitoring is provided in Appendix D.

2.2 Monitoring Equipment

2.2.1 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at each designated monitoring station. The HVS meets all the requirements of the Project Specific EM&A Manual. Portable direct reading dust meters were used to carry out the 1-hour TSP monitoring. Brand and model of the equipment is given in Table 2.1.

Table 2.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
Portable direct reading dust meter (1-hour TSP)	Sibata Digital Dust Monitor (Model No. LD-3 and LD-3B)
High Volume Sampler (24-hour TSP)	Tisch Environmental Mass Flow Controlled Total Suspended Particulate (TSP) High Volume Air Sampler (Model No. TE-5170)

2.3 Monitoring Locations

2.3.1 Monitoring locations AMS2 and AMS7 were set up at the proposed locations in accordance with Project Specific EM&A Manual. 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. 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 (AMS3B) 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.

2.3.2 It was observed that a tree near AMS3B may affect the wind flow around the HVS located at AMS3B. With no further comment received from IEC, the HVS at AMS3B has been relocated on 8 September 2014 to slightly more than 2 meters separation from it, measured horizontally. 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.

2.3.3 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 is effective since 19 November 2012.

2.3.4 Figure 2 shows the locations of monitoring stations. Table 2.2 describes the details of the monitoring stations.

Table 2.2 Locations of Impact Air Quality Monitoring Stations

Monitoring Station	Location	Description
AMS2	Tung Chung Development Pier	Rooftop of the premise
AMS3B	Site Boundary of Site Office Area at Works Area WA2	On ground at the area boundary
AMS6*	Dragonair/CNAC (Group) Building	On ground at boundary of the premise
AMS7	Hong Kong SkyCity Marriott Hotel	On ground at boundary of the premise

#Remarks: Reference is made to EPD conditional approval of the omission of air monitoring station (AMS 6) for the project. The omission will be effective on 19 November 2012.

2.4 Monitoring Parameters, Frequency and Duration

2.4.1 Table 2.3 summarizes the monitoring parameters, frequency and duration of impact TSP monitoring.

Table 2.3 Air Quality Monitoring Parameters, Frequency and Duration

Parameter	Frequency and Duration
1-hour TSP	Three times every 6 days while the highest dust impact was expected
24-hour TSP	Once every 6 days

2.5 Monitoring Methodology

2.5.1 24-hour TSP Monitoring

(a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS.

(i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
(ii) No two samplers should be placed less than 2 meters apart.
(iii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
(iv) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
(v) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
(vi) No furnace or incinerator flues nearby.
(vii) Airflow around the sampler was unrestricted.
(viii) Permission was obtained to set up the samplers and access to the monitoring stations.
(ix) A secured supply of electricity was obtained to operate the samplers.
(x) The sampler was located more than 20 meters from any dripline.
(xi) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
(xii) Flow control accuracy was kept within ±2.5% deviation over 24-hour sampling period.

(b) Preparation of Filter Papers

(i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
(ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±5%. A convenient working RH was 40%.

(iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.

(c) Field Monitoring

(i) The power supply was checked to ensure the HVS works properly.
(ii) The filter holder and the area surrounding the filter were cleaned.
(iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
(iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
(v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
(vi) Then the shelter lid was closed and was secured with the aluminum strip.
(vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
(viii) A new flow rate record sheet was set into the flow recorder.
(ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.1 m^3/min, and complied with the range specified in the updated EM&A Manual (i.e. 0.6-1.7 m^3/min).
(x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
(xi) The initial elapsed time was recorded.
(xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
(xiii) The final elapsed time was recorded.
(xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
(xv) It was then placed in a clean plastic envelope and sealed.
(xvi) All monitoring information was recorded on a standard data sheet.
(xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.

(d) Maintenance and Calibration

(i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
(ii) 5-point calibration of the HVS was conducted using TE-5025A Calibration Kit prior to the commencement of baseline monitoring. Bi-monthly 5-point calibration of the HVS will be carried out during impact monitoring.
(iii) Calibration certificate of the HVSs are provided in Appendix E.

2.5.2 1-hour TSP Monitoring

(a) Measuring Procedures

The measuring procedures of the 1-hour dust meter were in accordance with the Manufacturer's Instruction Manual as follows:-

(i) Turn the power on.
(ii) Close the air collecting opening cover.
(iii) Push the "TIME SETTING" switch to [BG].
(iv) Push "START/STOP" switch to perform background measurement for 6 seconds.
(v) Turn the knob at SENSI ADJ position to insert the light scattering plate.
(vi) Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
(vii) Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
(viii) Pull out the knob and return it to MEASURE position.
(ix) Push the "TIME SETTING" switch the time set in the display to 3 hours.
(x) Lower down the air collection opening cover.
(xi) Push "START/STOP" switch to start measurement.

(b) Maintenance and Calibration

(i) The 1-hour TSP meter was calibrated at 1-year intervals against a continuous particulate TEOM Monitor, Series 1400ab. Calibration certificates of the Laser Dust Monitors are provided in Appendix E.

(ii) 1-hour validation checking of the TSP meter against HVS is carried out on half-year basis at the air quality monitoring locations.

2.6 Monitoring Schedule for the Reporting Month

2.6.1 The schedule for air quality monitoring in October 2014 is provided in Appendix F.

2.7 Results and Observations

2.7.1 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in Table 2.4 and 2.5 respectively. Detailed impact air quality monitoring results are presented in Appendix G.

Table 2.4 Summary of 1-hour TSP Monitoring Results in the Reporting Period

	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AMS2	82	75 - 90	374	500
AMS3B	82	75 - 91	368	500
AMS7	82	73 - 92	370	500

Table 2.5 Summary of 24-hour TSP Monitoring Results in the Reporting Period

	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AMS2	83	67 – 106	176	260
AMS3B	114	67 – 220	167	260
AMS7	84	60 – 124	183	260

2.7.2 One (1) 24-hour TSP result at AMS3B exceeded Action Level on 27 October 2014, after investigation, the exceedance was considered not related to this Contract. All 1-Hour TSP results were below the Action and Limit Level in the reporting month.

2.7.3 For the 24-hour TSP action level exceedance on 27 October 2014 at AMS3B:

2.7.3.1 According to information provided by the Contractor, no land-based construction was being undertaken at Works Area WA2 during the monitoring period.

2.7.3.2 Site inspection has been conducted on 7 November 2014 to review works activities of adjacent construction site(s) for identifying the possible source(s), construction site was observed and the source of impact may be contributed by adjacent construction site which do not belongs to this contract. Please see below photo record for reference.

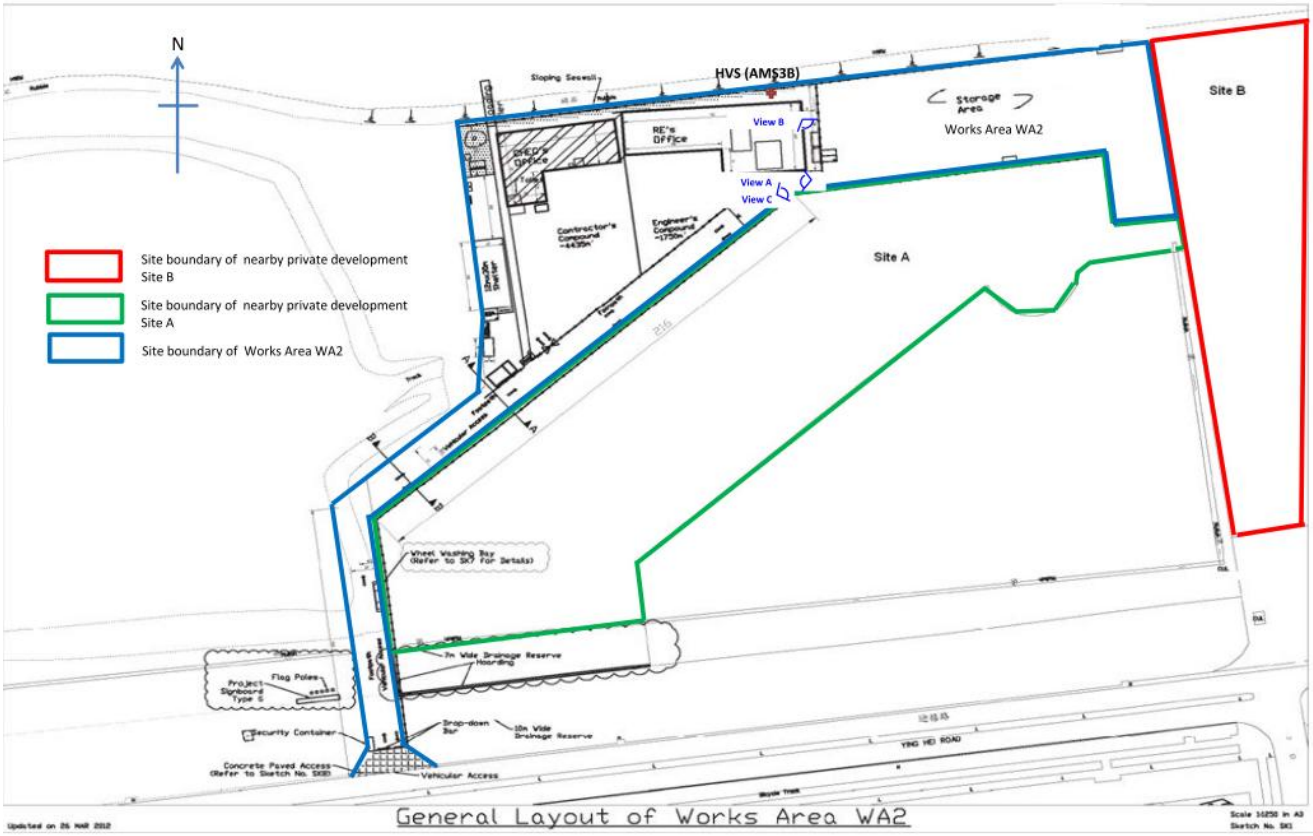
2.7.3.3 Functional checking on HVS at AMS3B was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3B, initial flow, final flow and average rate are 1.34m3/min. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.

2.7.3.4 The 1-hr TSP values recorded at AMS3B on 27 October 14, which are within the monitoring period of the 1-hr TSP, were 75μg/m^3, 76μg/m^3 and 76μg/m^3 respectively. All measured values are well below the Action and Limit Levels.

2.7.3.5 The measured 24-hr TSP values recorded at AMS2 and AMS7 (which are closer to the marine-based works areas) on 27 October 2014 date were 76μg/m^3 and 92μg/m^3, which are below the Action and Limit Levels.

2.7.3.6 The measured 24-hr TSP values recorded at AMS3B on next monitoring date, 1 November 2014 was 76μg/m3, which did not exceed the Action or Limit Level.

2.7.3.7 Below layout map shows the location of HVS at AMS3B:



2.7.3.8 The following dust mitigation measures have been implemented at Works Area WA2:

1 Works Area WA2's surface was hard-paved, compacted or hydro-seeded (Please refer to above layout map and photo records below (View A))

- Photo record taken on 7 November 2014 during ad hoc site inspection: View B on layout map

- Photo record taken on 7 November 2014 during ad hoc site inspection: View C on layout map

2 Vehicle washing facility was provided at vehicle exit points,
3 Measures for preventing fugitive dust emission are provided, e.g. canvas/tarpaulin covers.

2.7.3.9 After investigation, the dust exceedance was considered not to be due to works of this Contract.

2.7.4 The event action plan is annexed in Appendix L.

2.7.5 Meteorological information collected from the wind station during the monitoring periods on the monitoring dates, as shown in Figure 2, including wind speed and wind direction, is annexed in Appendix H.

3 NOISE MONITORING

3.1 Monitoring Requirements

3.1.1 In accordance with the Project Specific EM&A Manual, impact noise monitoring was conducted for at least once per week during the construction phase of the Project. The Action and Limit level of the noise monitoring is provided in Appendix D.

3.2 Monitoring Equipment

3.2.1 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in Table 3.1.

Table 3.1 Noise Monitoring Equipment

Equipment	Brand and Model
Integrated Sound Level Meter	Rion NL-31 & B&K2238
Acoustic Calibrator	Rion NC-74 & B&K 4231

3.3 Monitoring Locations

3.3.1 Monitoring locations NMS2 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 (NMS3B) respectively. Same baseline noise level (as derived from the baseline monitoring data recorded at Ho Yu College) and Limit Level were adopted for this alternative noise monitoring location.

3.3.2 Figure 2 shows the locations of the monitoring stations. Table 3.2 describes the details of the monitoring stations.

Table 3.2 Locations of Impact Noise Monitoring Stations

Monitoring Station	Location	Description
NMS2	Seaview Crescent Tower 1	Free-field on the rooftop of the premise
NMS3B	Site Boundary of Site Office Area at Works Area WA2	Free-field on ground at the area boundary.

3.4 Monitoring Parameters, Frequency and Duration

3.4.1 Table 3.3 summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Parameter	Frequency and Duration
30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays (Monday to Saturday). L_{eq}, L_{10} and L_{90} would be recorded.	At least once per week

3.5 Monitoring Methodology

3.5.1 Monitoring Procedure

(a) 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) shall be made to the free field measurements.

(b) All measurement at NMS3B were free field measurements in the reporting month at NMS3B. A correction of +3 dB(A) shall be made to the free field measurements.

(c) The battery condition was checked to ensure the correct functioning of the meter.

(d) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:-

(i) frequency weighting: A
(ii) time weighting: Fast
(iii) time measurement: $L_{eq(30\text{-minutes})}$ during non-restricted hours i.e. 07:00 – 1900 on normal weekdays.

(e) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.

(f) During the monitoring period, the L_{eq}, L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.

(g) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.

(h) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

3.5.2 Maintenance and Calibration

(a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.

(b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.

(c) Calibration certificates of the sound level meters and acoustic calibrators are provided in Appendix E.

3.6 Monitoring Schedule for the Reporting Month

3.6.1 The schedule for construction noise monitoring in October 2014 is provided in Appendix F.

3.7 Monitoring Results

3.7.1 The monitoring results for construction noise are summarized in Table 3.4 and the monitoring data is provided in Appendix I.

Table 3.4 Summary of Construction Noise Monitoring Results in the Reporting Period

	Average, dB(A), $L_{eq\ (30\ mins)}$	Range, dB(A), $L_{eq\ (30\ mins)}$	Limit Level, dB(A), $L_{eq\ (30\ mins)}$
NMS2	67	66 – 68*	75
NMS3B	67	63 – 68*	70/65^

*+3dB(A) Façade correction included
^ Daytime noise Limit Level of 70 dB(A) applies to education institutions, while 65dB(A) applies during school examination period.

3.7.2 No Action or Limit Level Exceedance of construction noise was recorded in the reporting month.

3.7.3 Major noise sources during the noise monitoring included construction activities of the Project, construction activities by other contracts and nearby traffic noise.

3.7.4 The event action plan is annexed in Appendix L.

4 WATER QUALITY MONITORING

4.1 Monitoring Requirements

4.1.1 Impact water quality monitoring was carried out to ensure that any deterioration of water quality was detected, and that timely action was taken to rectify the situation. For impact water quality monitoring, measurements were taken in accordance with the Project Specific EM&A Manual. Appendix D shows the established Action/Limit Levels for the environmental monitoring works.

4.2 Monitoring Equipment

4.2.1 Table 4.1 summarises the equipment used in the impact water quality monitoring programme.

Table 4.1 Water Quality Monitoring Equipment

Equipment	Brand and Model
Dissolved Oxygen (DO) and Temperature Meter, Salinity Meter and Turbidimeter	YSI Model 6820
pH Meter	YSI Model 6820 or Thermo Orion 230A+
Positioning Equipment	JRC DGPS 224 Model JLR-4341 with J-NAV 500 Model NWZ4551
Water Depth Detector	Eagle Cuda-168 and Lowrance x-4
Water Sampler	Kahlsio Water Sampler (Vertical) 2.2 L with messenger

4.3 Monitoring Parameters, Frequency and Duration

4.3.1 Table 4.2 summarises the monitoring parameters, frequency and monitoring depths of impact water quality monitoring as required in the Project Specific EM&A Manual.

Table 4.2 Impact Water Quality Monitoring Parameters and Frequency

Monitoring Stations	Parameter, unit	Frequency	No. of depth
Impact Stations: IS5, IS(Mf)6, IS7, IS8, IS(Mf)9, IS10, IS(Mf)11, IS(Mf)16, IS17 *Control/Far Field Stations:* CS(Mf)3, CS(Mf)5, CS4, CS6, CSA *Sensitive Receiver Stations:* SR3-SR7, SR10A&SR10B	• Depth, m • Temperature, ^{o}C • Salinity, ppt • Dissolved Oxygen (DO), mg/L • DO Saturation, % • Turbidity, NTU • pH • Suspended Solids (SS), mg/L	Three times per week during mid-ebb and mid-flood tides (within ± 1.75 hour of the predicted time)	3 (1 m below water surface, mid-depth and 1 m above sea bed, except where the water depth is less than 6 m, in which case the mid-depth station may be omitted. Should the water depth be less than 3 m, only the mid-depth station will be monitored).

4.4 Monitoring Locations

4.4.1 In accordance with the Project Specific EM&A Manual, twenty-one stations (9 Impact Stations, 7 Sensitive Receiver Stations and 5 Control/Far Field 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.

4.4.2 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.

4.4.3 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.

4.4.4 The locations of these monitoring stations are summarized in Table 4.3 and depicted in Figure 3.

Table 4.3 Impact Water Quality Monitoring Stations

Station	Description	East	North
IS5	Impact Station (Close to HKBCF construction site)	811579	817106
IS(Mf)6	Impact Station (Close to HKBCF construction site)	812101	817873
IS7	Impact Station (Close to HKBCF construction site)	812244	818777
IS8	Impact Station (Close to HKBCF construction site)	814251	818412
IS(Mf)9	Impact Station (Close to HKBCF construction site)	813273	818850
IS10	Impact Station (Close to HKBCF construction site)	812577	820670
IS(Mf)11	Impact Station (Close to HKBCF construction site)	813562	820716
IS(Mf)16	Impact Station (Close to HKBCF construction site)	814328	819497
IS17	Impact Station (Close to HKBCF construction site)	814539	820391
SR3	Sensitive receivers (San Tau SSSI)	810525	816456
SR4(N)	Sensitive receivers (Tai Ho)	814705	817859
SR5	Sensitive receivers (Artificial Reef in NE Airport)	811489	820455
SR6	Sensitive receivers (Sha Chau and Lung Kwu Chau Marine Park)	805837	821818
SR7	Sensitive receivers (Tai Mo Do)	814293	821431
SR10A	Sensitive receivers (Ma Wan FCZ)1	823741	823495
SR10B(N)	Sensitive receivers (Ma Wan FCZ)2	823683	823187
CS(Mf)3	Control Station	809989	821117
CS(Mf)5	Control Station	817990	821129
CS4	Control Station	810025	824004
CS6	Control Station	817028	823992
CSA	Control Station	818103	823064

4.5 Monitoring Methodology

4.5.1 Instrumentation

(a) The in-situ water quality parameters, viz. dissolved oxygen, temperature, salinity, turbidity and pH, were measured by multi-parameter meters (i.e. Model YSI 6820 CE-C-M-Y) and pH meter (i.e. Thermo Orion 230A+) respectively.

4.5.2 Operating/Analytical Procedures

(a) Digital Differential Global Positioning Systems (DGPS) were used to ensure that the correct location was selected prior to sample collection.

(b) Portable, battery-operated echo sounders were used for the determination of water depth at each designated monitoring station.

(c) All in-situ measurements were taken at 3 water depths, 1 m below water surface, mid-depth and 1 m above sea bed, except where the water depth was less than 6 m, in which case the mid-depth station was omitted. Should the water depth be less than 3 m, only the mid-depth station was monitored.

(d) At each measurement/sampling depth, two consecutive in-situ monitoring (DO concentration and saturation, temperature, turbidity, pH, salinity) and water sample for SS. The probes were retrieved out of the water after the first measurement and then re-deployed for the second measurement. Where the difference in the value between the first and second readings of DO or turbidity parameters was more than 25% of the value of the first reading, the reading was discarded and further readings were taken.

(e) Duplicate samples from each independent sampling event were collected for SS measurement. Water samples were collected using the water samplers and the samples were stored in high-density polythene bottles. Water samples collected were well-mixed in the water sampler prior to pre-rinsing and transferring to sample bottles. Sample bottles were pre-rinsed with the same water samples. The sample bottles were then be packed in cool-boxes (cooled at $4^{o}C$ without being frozen), and delivered to ALS Technichem (HK) Pty Ltd. for the analysis of suspended solids concentrations. The laboratory determination work would be started within 24 hours after collection of the water samples. ALS Technichem (HK) Pty Ltd. is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes. For QA/QC procedures, one duplicate samples of every batch of 20 samples was analyzed.

(f) The analysis method and reporting and detection limit for SS is shown in Table 4.4.

Table 4.4 Laboratory Analysis for Suspended Solids

Parameters	Instrumentation	Analytical Method	Reporting Limit	Detection Limit
Suspended Solid (SS)	Weighting	APHA 2540-D	0.5mg/L	0.5mg/L

(g) Other relevant data were recorded, including monitoring location / position, time, water depth, tidal stages, weather conditions and any special phenomena or work underway at the construction site in the field log sheet for information.

4.5.3 Maintenance and Calibration

(a) All in situ monitoring instruments would be calibrated and calibrated by ALS Technichem (HK) Pty Ltd. before use and at 3-monthly intervals throughout all stages of the water quality monitoring programme. Calibration details are provided in Appendix E.

(b) The dissolved oxygen probe of YSI 6820 was calibrated by wet bulb method. Before the calibration routine, the sensor for dissolved oxygen was thermally equilibrated in water-saturated air. Calibration cup is served as a calibration chamber and it was loosened from airtight condition before it is used for the calibration. Calibration at ALS Technichem (HK) Pty Ltd. was carried out once every three months in a water sample with a known concentration of dissolved oxygen. The sensor was immersed in the water and after thermal equilibration, the known mg/L value was keyed in and the calibration was carried out automatically.

(c) The turbidity probe of YSI 6820 is calibrated two times a month. A zero check in distilled water was performed with the turbidity probe of YSI 6820 once per monitoring day. The probe will be calibrated with a solution of known NTU at ALS Technichem (HK) Pty Ltd. once every three months.

4.6 Monitoring Schedule for the Reporting Month

4.6.1 The schedule for impact water quality monitoring in October 2014 is provided in Appendix F.

4.7 Results and Observations

4.7.1 Impact water quality monitoring results and graphical presentations are provided in Appendix J.

4.7.2 A total of (18) eighteen exceedances were recorded in this reporting month: (1) One Limit Level Exceedance of Turbidity and (1) Limit Level Exceedance of Suspended Solids were recorded at IS17 during ebb tide on 10 October 2014; (1) One Action Level Exceedance of SS at SR10B(N) was recorded on10 October 2014 during flood tide; (1) One Action Level Exceedance of SS at IS8 was recorded on 3 October 2014 during flood tide; (1) One Action Level Exceedance of SS at IS(Mf)11 was recorded on 6 October 2014 during ebb tide; (2) Two Action Level Exceedances of SS at IS(Mf)11 and SR5 were recorded on 6 October 2014 during flood tide; (3) Three Action Level Exceedances of SS were recorded at IS10, SR4(N) and SR5 on 13 October 2014 during flood tide; (1) One Action Level Exceedance of SS was recorded at IS17 on 20 October 2014 during ebb tide; (1) action level exceedance and (1) limit level exceedance of SS were recorded at SR4(N) and IS8 respectively on 20 October 2014 during flood tide; (2) Two Action Level Exceedances of SS were recorded at SR10A and SR10B(N) on 22 October 2014 during flood tide; (2) Two Action Level Exceedances of SS were recorded at IS10 and SR4(N) during flood tide on 24 October 2014. (1) Action Level Exceedance was recorded at IS8 on 31 October 2014 during ebb tide.

Table 4.5 Summary of Water Quality Exceedances

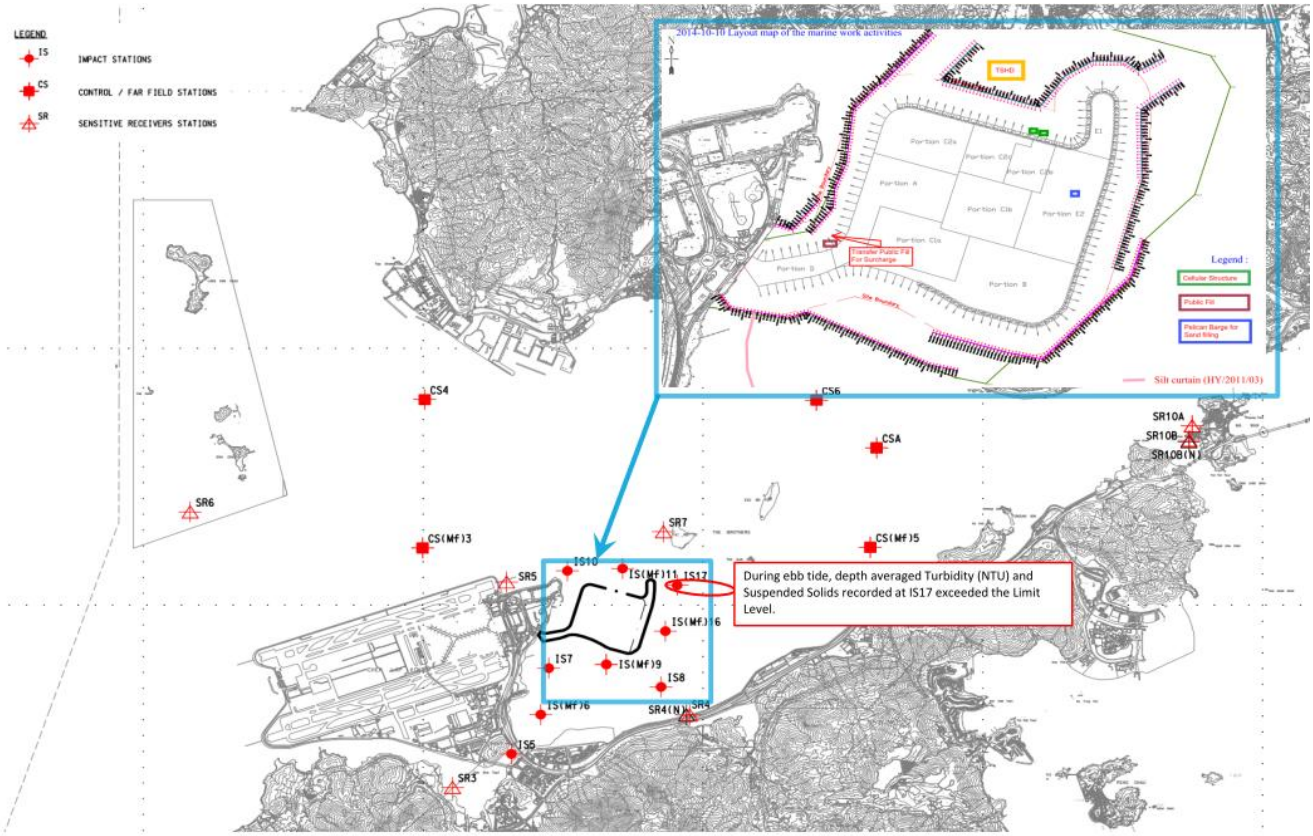
Station	Exceedance Level	DO (S&M)		DO (Bottom)		Turbidity		SS		Total	
		Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood
IS5	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)6	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS7	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS8	Action	0	0	0	0	0	0	**(1) 31 Oct 14**	**(1) 3 Oct 14**	**1**	**1**
	Limit	0	0	0	0	0	0	0	**(1) 20 Oct 14**	0	**1**
IS(Mf)9	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS10	Action	0	0	0	0	0	0	0	**(2) 13 and 24 Oct 14**	0	**2**
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)11	Action	0	0	0	0	0	0	**(1) 6 Oct 14**	**(1) 6 Oct 14**	**1**	**1**
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)16	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS17	Action	0	0	0	0	0	0	**(1) 20 Oct**	0	**1**	0
	Limit	0	0	0	0	**(1) 10 Oct 14**	0	**(1) 10 Oct**	0	**2**	0
SR3	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR4(N)	Action	0	0	0	0	0	0	0	**(3) 13, 20 and 24 Oct 14**	0	**3**
	Limit	0	0	0	0	0	0	0	0	0	0
SR5	Action	0	0	0	0	0	0	0	**(2) 6 and 13 Oct 14**	0	**2**
	Limit	0	0	0	0	0	0	0	0	0	0
SR6	Action	0	0	0	0	0	0	0	0	0	0
	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	0	0	0	0
SR10A	Action	0	0	0	0	0	0	0	**(1) 22 Oct 14**	0	**1**
	Limit	0	0	0	0	0	0	0	0	0	0
SR10B (N)	Action	0	0	0	0	0	0	0	**(2) 10 and 22 Oct 14**	0	**2**
	Limit	0	0	0	0	0	0	0	0	**0**	**0**
Total	**Action**	0	0	0	0	0	0	**3**	**12**	**15**	
	Limit	0	0	0	0	**1**	0	**1**	**1**	**3**	

Note: S: Surface; and
M: Mid-depth.

4.7.3 (1) One Limit Level Exceedance of Turbidity and (1) Limit Level Exceedance of Suspended Solids were recorded at IS17 during ebb tide on 10 October 2014. Exceedances recorded at IS17 are likely due to marine based construction activities of the Project because:

4.7.3.1 With refer to monitoring record, appearance of water was relatively more turbid at IS17 when compared with the appearance of water at IS(Mf)11, IS10 and IS(Mf)16 during monitoring at ebb tide on 10 Oct 14.

4.7.3.2 As informed by the Contractor, sand filling was carried out at Portion E2 on 8, 10 and 13 Oct 14 at almost the same location but no exceedance was recorded at monitoring station IS17 on 8 and 13 Oct 14 during mid ebb tide. This indicates filling works were unlikely to cause the exceedance in turbidity at monitoring station IS17.



4.7.3.3 The source of impact is likely due pelican barge's propeller movement at shallow water during ebb tide when the position of the barge was adjusted at portion E. In addition, with refer to the silt curtain condition on 10 Oct 14, defects of the perimeter silt curtain was observed at northwest of the construction site. The dispersion of turbid water from the inside of the perimeter silt curtain to the outside of the perimeter silt curtain is potentially due to defects of northwest part of the perimeter silt curtain.

4.7.3.4 Action taken under the event and action plan

1. in situ measurement was repeated to confirm findings of the exceedance of turbidity. Repeat in situ measurement is not applicable to suspended solid as SS was not measured in situ;
2. Source of impact refer to Section 4.7.3.3
3. IEC, Contractor, ER and EPD were noticed of the limit level exceedances via email;
4. Monitoring data was reviewed, plant, equipment and contractor's working methods were checked. Please refer to the layout map above.
5. The Contractor was reminded to ensure swift provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.

6. Mitigation measures such as perimeter silt curtain was implemented by the Contractor, however defects of the perimeter silt curtain was observed, the Contractor was reminded to ensure swift provision of maintenance to the silt curtains once defects were found. With refer to the maintenance record provided by the Contractor, maintenance work for the defects of the northwest part of the perimeter silt curtain was conducted on 28 October 2014.
7. Monitoring results show no recurrence of exceedance at IS17 during ebb tide on 13 Oct 2014.

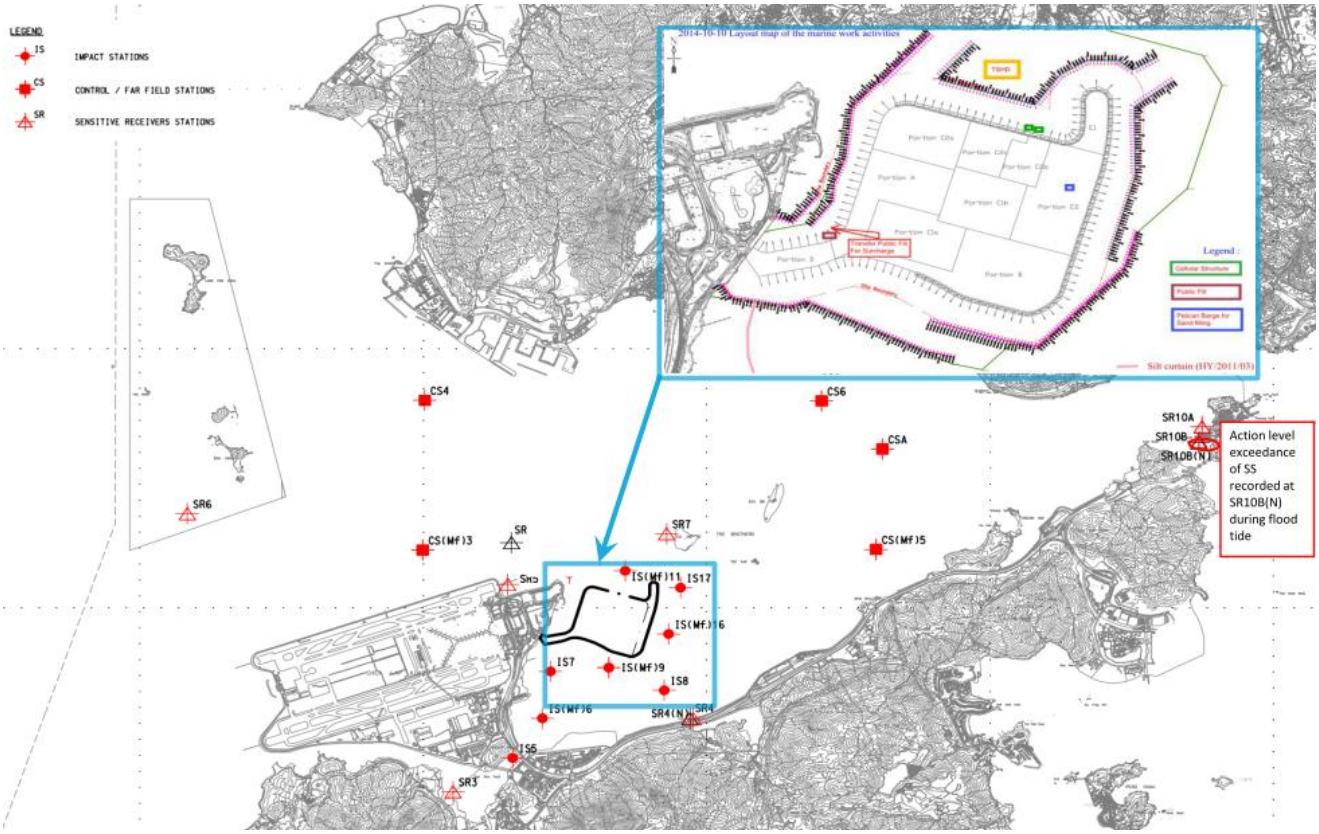
4.7.3.5 ET's conclusions and recommendations for mitigation: Exceedances recorded at IS17 are likely to be related to vessel movement at shallow water during ebb tide. The Contractor was further reminded to control the vessel traffic at this area and ensure swift provision of maintenance to the silt curtains once defect was found.

4.7.3.6 Contractor's actions to implement the mitigation: As informed by the Contractor, traffic control such as vessel speed limit was implemented and operation of sand filling vessel at shallow water during ebb tide was avoided. Monitoring results show no recurrence of exceedance at IS17 on 13 Oct 2014.

4.7.3.7 With refer to the maintenance record provided by the Contractor, maintenance work for the defects of the northwest part of the perimeter silt curtain was conducted on 28 October 2014.

4.7.4 (1) One Action Level Exceedance of SS at SR10B(N) was recorded on 10 October 2014 during flood tide and exceedance was not due to marine based construction works of the Project because:

4.7.4.1 IS(Mf)11 and IS10 are located downstream and closer to the active works than monitoring station SR10B(N) during flood tide. Depth Averaged Suspended Solids (SS) values (in mg/L) recorded during flood tide on the same day at IS(Mf)11 and IS10 were below the Action and Limit Level which indicates project work is unlikely to contribute to the action level exceedance recorded at SR10B(N).



4.7.4.2 The monitoring location of monitoring station SR10B(N) are considered upstream and remote to the active works of this project during flood tide. Therefore it was unlikely that the exceedance recorded at SR10B(N) during flood tide was due to active construction activities of this project.

4.7.4.3 The exceedance was likely due to local effects in the vicinity of SR10B(N).

Action taken under the action plan

1. Not applicable as SS was not measured in situ;
2. After considering the above mentioned investigation results, it appears that it was unlikely that the SS exceedance was attributed to active construction activities of this project;
3. IEC, contractor and ER were informed via email;
4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
5. Since it is considered that the SS exceedance is unlikely to be project related, as such, actions 5 - 7 under the EAP are not considered applicable.

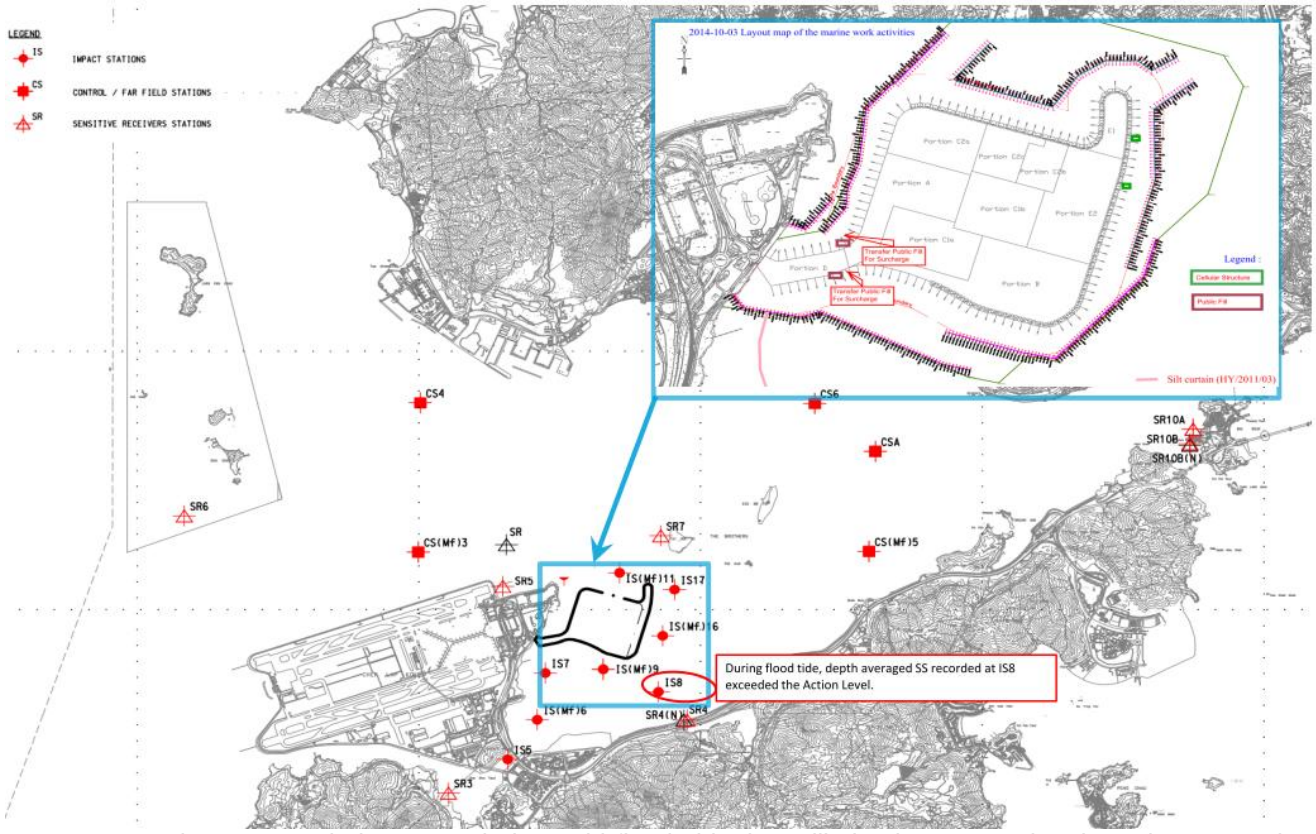
4.7.4.4 ET's conclusions and recommendations for mitigation: Exceedance was not due to marine based construction works of the Project. Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.

Contractor's actions to implement the mitigation

4.7.4.5 As informed by the Contractor, maintenance work of the silt curtain is on-going and carried out by the Contractor on a daily basis.

4.7.5 (1) One Action Level Exceedance of SS at IS8 was recorded on 3 October 2014 during flood tide;

4.7.5.1 Layout map for work activities carried out on 03 October 14 is showed below:



4.7.5.2 Exceedance recorded at IS8 during mid-flood tide is unlikely due to marine based construction activities of the Project because:

4.7.5.3 With reference to the information provided by the Contractor, only cellular structure installation was conducted at the northeast part of the HKBCF reclamation works during mid flood tide, but cellular structure installation is unlikely to cause silt plume and contribute to the elevation of SS at IS8 during flood tide.

4.7.5.4 IS(Mf)9 and IS(Mf)16 are located closer to the active works than monitoring station IS8. Depth Averaged Suspended Solids (SS) values (in mg/L) recorded during the flood tide on the same day at IS(Mf)9 and IS(Mf)16 were below the Action and Limit Level which shows that the water quality closer to active works was not adversely affected.

4.7.5.5 In accordance with the silt curtain integrity checking record of 3 October 2014, disconnection of the perimeter silt curtain was observed at the southeast part of HKBCF Reclamation Works, but with referred to monitoring record and photo record below, no sediment plume has been observed to flow from the inside of the perimeter silt curtain to the outside of the perimeter silt curtain and no discoloration of sea water has been observed. (Please refer to below photo). In accordance with the silt curtain integrity checking record, the observed disconnection was rectified on 6 October 2014

4.7.5.6 Photo record above shows the sea condition taken during flood tide at HKBCF Reclamation Works near IS8 on 3 October 2014.

4.7.5.7 Turbidity level recorded at IS8, IS(Mf)9 and IS(Mf)16 were below the action and limit level. This indicates the turbidity level at area near IS8 was not adversely affected.

4.7.5.8 The exceedance was likely due to local effects in the vicinity of IS8.

4.7.5.9 As such, the exceedance recorded at IS8 is unlikely to be project related.

4.7.5.10 Action taken under the event and action plan:

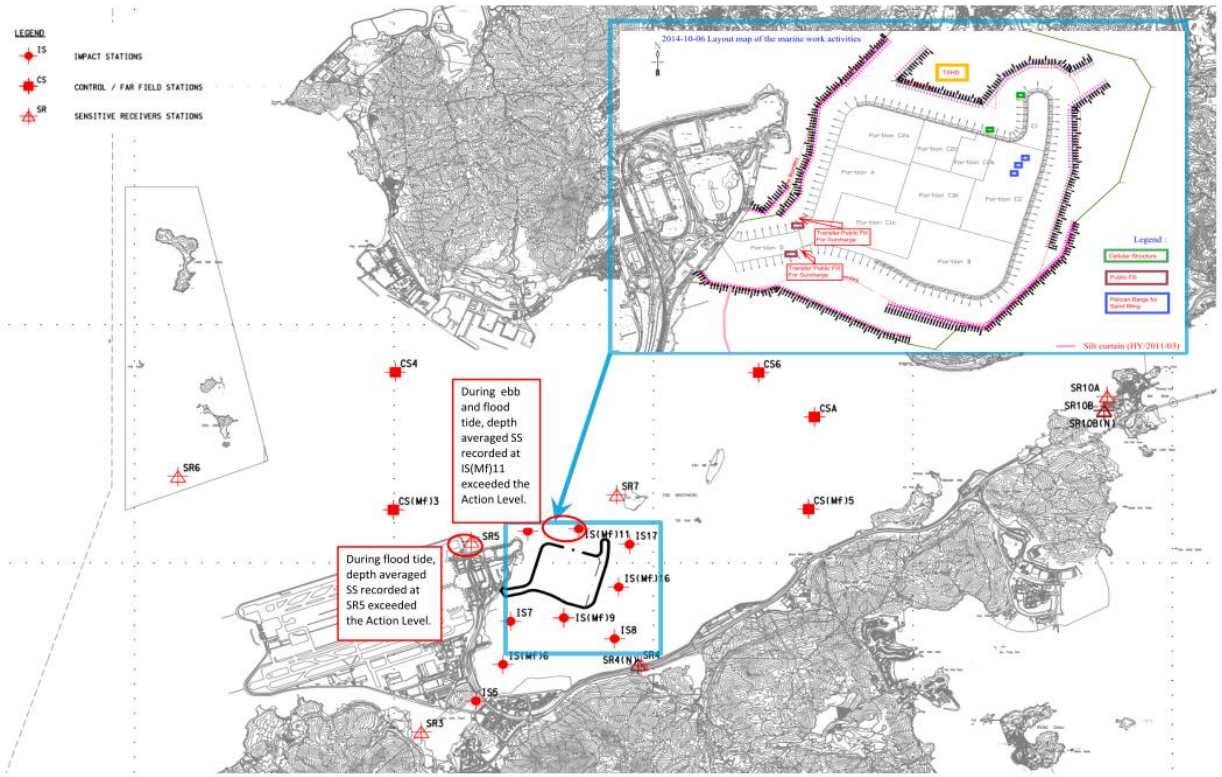
1. Not applicable as SS was not measured *in situ*;
2. After considering the above mentioned investigation results, it appears that it was unlikely that the SS exceedance was attributed to active construction activities of this project;
3. IEC, contractor and ER were informed via email;
4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
5-7. Since it is considered that the SS exceedance is unlikely to be project related, as such, actions 5 - 7 under the EAP are not considered applicable.

4.7.5.11 ET's conclusions and recommendations for mitigation: Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.

4.7.5.12 Contractor's actions to implement the mitigation: As informed by the Contractor, maintenance work of the silt curtain is on-going and carried out by the Contractor on a daily basis.

4.7.6 (1) One Action Level Exceedance of SS at IS(Mf)11 was recorded on 6 October 2014 during ebb tide; (2) Two Action Level Exceedances of SS at IS(Mf)11 and SR5 were recorded on 6 October 2014 during flood tide;

4.7.6.1 Layout map below shows active works conducted on 6-Oct-14. Works such as cellular structure installation was conducted at north part of the HKBCF Reclamation Works and sand filling was conducted at Portion E2 when monitoring was conducted.



4.7.6.2 Exceedance recorded at SR5 during mid-flood tide are unlikely due to marine based construction activities of the Project because:

4.7.6.3 With reference to the silt curtain checking record defects was observed at parts of the perimeter silt curtain which are close to the SR5.

4.7.6.4 With reference to the information provided by the Contractor, same types of work were carried out at almost the same locations on 3, 6 and 8 October 2014, impact water quality monitoring data recorded on 3 and 8 October 2014 at SR5 are all below the Action and Limit Level which indicates exceedance at SR5 was unlikely due to active works.

4.7.6.5 The location of monitoring station IS10 is located downstream and closer to active works than SR5 but no exceedance was recorded at IS10 during flood tide. This the acton level exceedance of SS at SR5 is unlikely attribute to active construction works.

4.7.6.6 Turbidity level recorded at SR5, IS10 and IS(Mf)11 recorded on 6 October 2014 were below the action and limit level. This indicates the turbidity level at area near SR5 was not adversely affected.

4.7.6.7 With refer to monitoring record, no silt plumes was observed when monitoring is conducted in SR5.

4.7.6.8 The exceedance was likely due to local effects in the vicinity of SR5.

4.7.6.9 Exceedances recorded at IS(Mf)11 during ebb and flood tide are unlikely due to marine based construction activities of the Project because:

4.7.6.10 With reference to the information provided by the Contractor, same types of work were carried out at almost the same locations on 3, 6 and 8 October 2014, impact water quality monitoring data recorded on 3 and 8 October 2014 at IS(Mf)11 are all below the Action and Limit Level which indicates exceedance were unlikely due to active works.

4.7.6.11 With reference to the silt curtain checking record defects was observed at parts of the perimeter silt curtain which are close to the IS(Mf)11. As informed by the Contractor, maintenance work of the silt curtain is on-going and carried out by the Contractor on a daily basis.

4.7.6.12 Turbidity level recorded at SR5, IS10, IS(Mf)11 and IS17 recorded on 6 October 2014 were below the action and limit level. This indicates the turbidity level at area near IS(Mf)11 was not adversely affected.

4.7.6.13 With refer to monitoring record, no dispersion of turbid water from the inside of the perimeter silt curtain to the outside of the perimeter silt curtain or silt plumes was observed when monitoring is conducted in IS(Mf)11.

4.7.6.14 The exceedances were likely due to local effects in the vicinity of IS(Mf)11.

4.7.6.15 After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.

4.7.6.16 Action taken under the event and action plan:

1. Not applicable as SS was not measured in situ;
2. After considering the above mentioned investigation results, it appears that it was unlikely that the SS exceedances were attributed to active construction activities of this project;
3. IEC, contractor and ER were informed via email;
4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
5-7. Since it is considered that the SS exceedances are unlikely to be project related, as such, actions 5 - 7 under the EAP are not considered applicable.

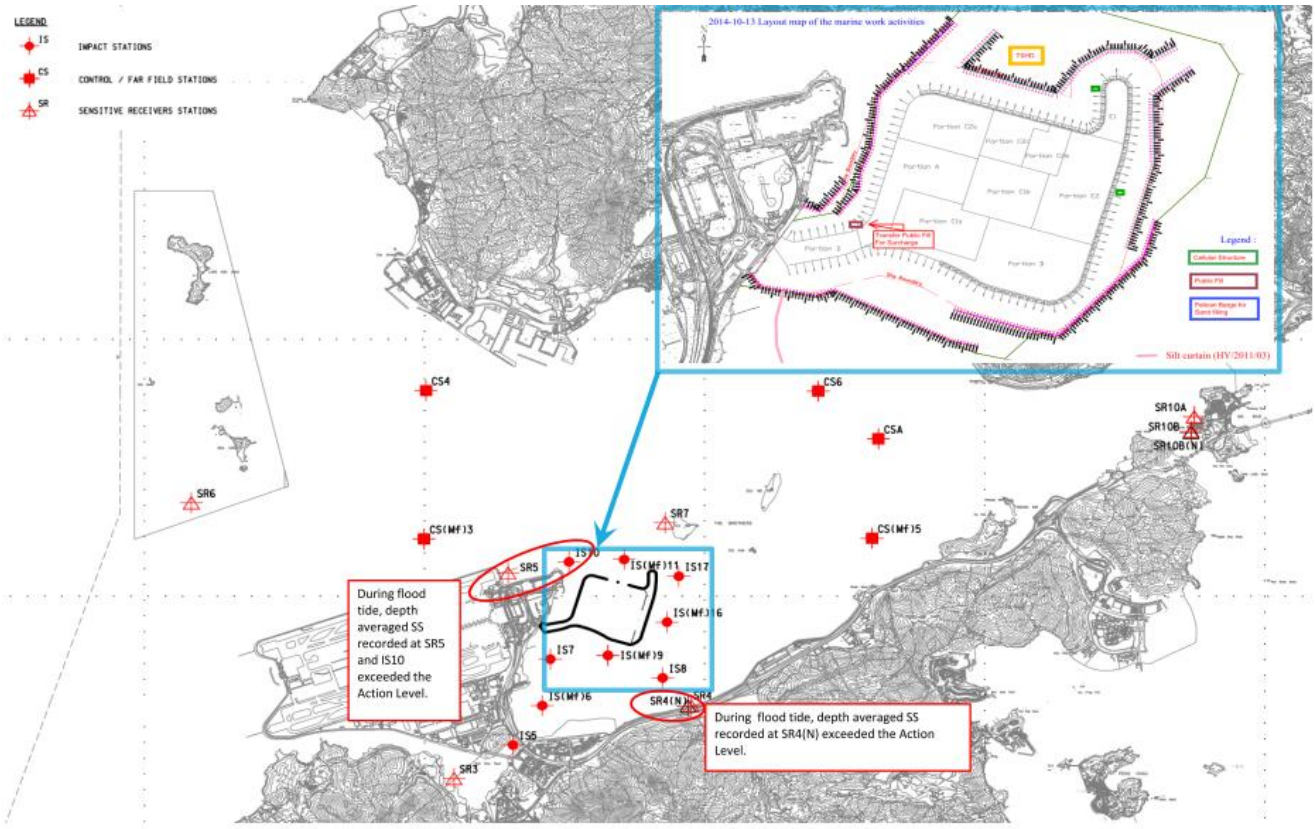
4.7.6.17 ET’s conclusions and recommendations for mitigation: Mitigation measures such as perimeter silt curtain was implemented by the Contractor, however defects of the perimeter silt curtain was observed, the Contractor was reminded to ensure swift provision of maintenance to the silt curtains once defects were found.

4.7.6.18 Contractor’s actions to implement the mitigation: With refer to the maintenance record provided by the Contractor, maintenance work for the defects of the northwest part of the perimeter silt curtain was conducted on 28 October 2014.

4.7.6.19 Photo shows sea condition at northwest part of HKBCF reclamation works on 6 Oct 2014 during ebb tide

4.7.7 (3) Three Action Level Exceedances of SS were recorded at IS10, SR4(N) and SR5 on 13 October 2014 during flood tide;

4.7.7.1 Layout map below shows active works conducted on 13-Oct-14. Works such as construction works for cellular structure were conducted at northeast part of the HKBCF Reclamation Works.



4.7.7.2 Exceedance recorded at IS10 and SR5 during mid-flood tide are unlikely due to marine based construction activities of the Project because:

4.7.7.3 With reference to the silt curtain checking record, defects was observed at parts of the perimeter silt curtain which are close to the IS10 and SR5.

4.7.7.4 With reference to the information provided by the Contractor, active construction works were carried out at locations closer to SR5 and IS10 on 10 October 2014. There were more active construction works carried out on 15 October 2014 during the same tide, impact water quality monitoring data recorded on 10 and 15 October 2014 at SR5 and IS10 are all below the Action and Limit Level which indicate exceedances at SR5 and IS10 were unlikely due to active construction works for cellular structure.

4.7.7.5 Relative more turbid water were observed at IS10 and SR5 during flood tide but no filling activities was observed in progress and no silt plume was observed to flow from the inside of the perimeter silt curtain to the outside of the perimeter silt curtain when monitoring was conducted at IS10 and SR5.

4.7.7.6 Also, turbidity level recorded at SR5, IS10 and IS(Mf)11 were below the action and limit level. This indicates the turbidity level at area near SR5 and IS10 was not adversely affected.

4.7.7.7 The exceedance was likely due to local effects in the vicinity of SR5 and IS10.

4.7.7.8 Exceedance recorded at SR4(N) during flood tide IS unlikely due to marine based construction activities of the Project because:

4.7.7.9 With reference to the silt curtain checking record defects was not observed at southeast part of the perimeter silt curtain which the closest to SR4(N).

4.7.7.10 The SS level recorded at IS(Mf)9, IS8 and IS(Mf)16 which located closer to active works were below the action and limit level which indicates exceedance at SR4(N) were unlikely due to active construction works for cellular structure.

4.7.7.11 Turbidity level recorded at SR4(N), IS(Mf)9, IS8 and IS(Mf)16 were below the action and limit level. This indicates the turbidity level at area near IS(Mf)11 was not adversely affected.

4.7.7.12 The exceedances were likely due to local effects in the vicinity of SR4(N).

4.7.7.13 After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.

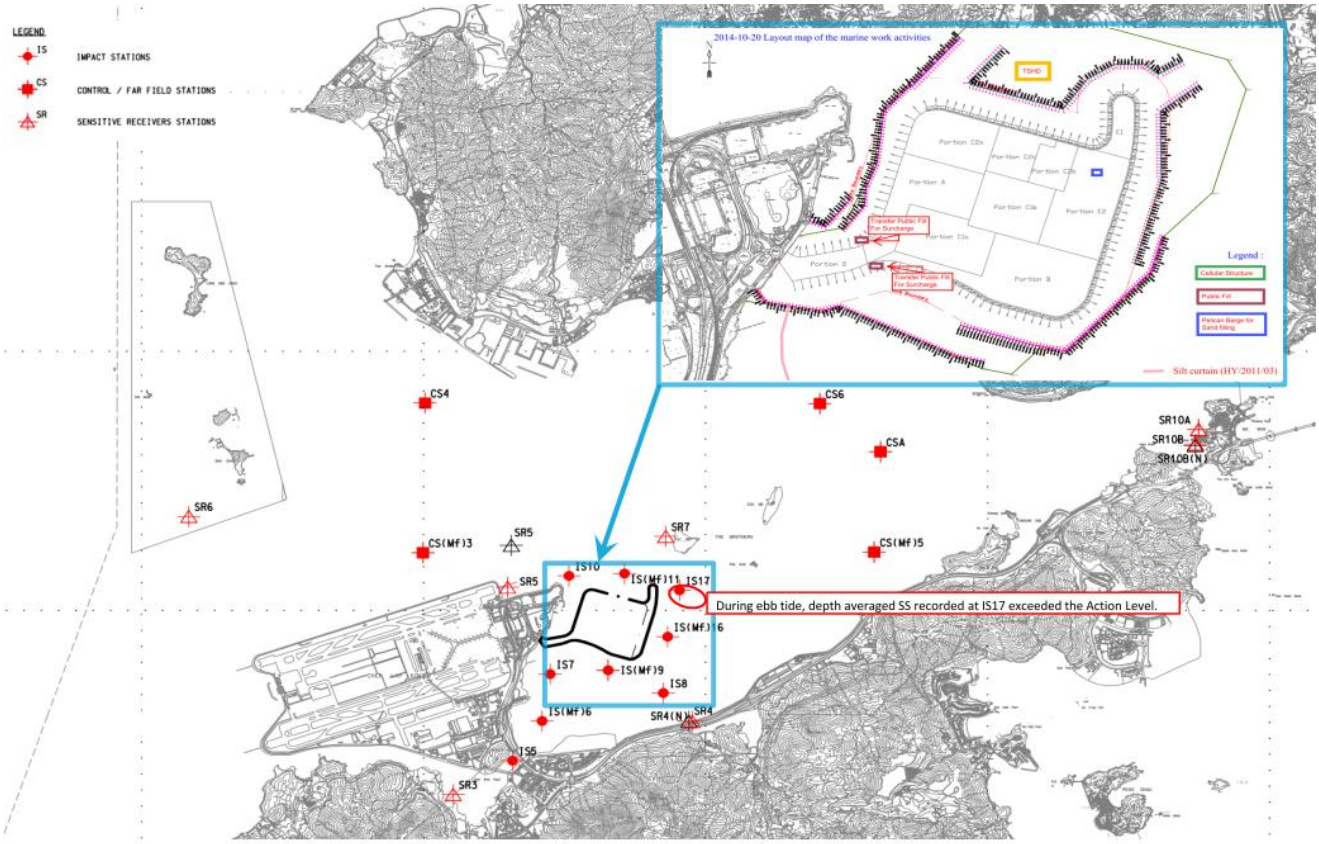
4.7.7.14 Action taken under the event and action plan:

1. Not applicable as SS was not measured in situ;
2. After considering the above mentioned investigation results, it appears that it was unlikely that the SS exceedances were attributed to active construction activities of this project;
3. IEC, contractor and ER were informed via email;
4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
5-7. Since it is considered that the SS exceedances are unlikely to be project related, as such, actions 5 - 7 under the EAP are not considered applicable.

4.7.7.15 ET's conclusions and recommendations for mitigation: Mitigation measures such as perimeter silt curtain was implemented by the Contractor, however defects of the perimeter silt curtain was observed, the Contractor was reminded to ensure swift provision of maintenance to the silt curtains once defects were found.

4.7.7.16 Contractor's actions to implement the mitigation: With refer to the maintenance record provided by the Contractor, maintenance work for the defects of the northwest part of the perimeter silt curtain was conducted on 28 October 2014.

4.7.8 (1) One Action Level Exceedance of SS was recorded at IS17 on 20 October 2014 during ebb tide, layout map below shows active works conducted on 20-Oct-14 during ebb tide:



4.7.8.1 Exceedance recorded at IS17 is likely due to marine based construction activities of the Project because:

4.7.8.2 With refer to monitoring record, appearance of water was relatively more turbid at IS17 when compared with the appearance of water at IS(Mf)11, IS10 and IS(Mf)16 during monitoring at ebb tide on 20-Oct-14.

4.7.8.3 With refer to the layout map above; sand filling was carried out at Portion E2 on 20-Oct-14 during ebb tide.

4.7.8.4 The source of impact is likely due pelican barge's propeller movement at shallow water during ebb tide when the position of the barge was adjusted at Portion E. In addition, with refer to the silt curtain condition on 20-Oct-14, defects of the perimeter silt curtain was observed at Northeastern of the construction site. The turbid water observed at IS17 is likely due to the dispersion of turbid water from the inside of the perimeter silt curtain to the outside of the perimeter silt curtain through the defective part of the perimeter silt curtain.

4.7.8.5 Action taken under the event and action plan

1. Repeat in situ measurement is not applicable to suspended solid as SS was not measured in situ;
2. Source of impact refer to bullet point section 4.7.8.4
3. IEC, Contractor, ER and EPD were noticed of the limit level exceedances via email;
4. Monitoring data was reviewed, plant, equipment and contractor's working methods were checked. Please refer to the layout map above.
5. The Contractor was reminded to ensure swift provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.
6. Mitigation measures such as perimeter silt curtain was implemented by the Contractor, however defects of the perimeter silt curtain was observed, the Contractor was reminded to ensure swift provision of maintenance to the silt curtains once defects were found. With refer to the maintenance

record provided by the Contractor, maintenance work for the defects of the Northeastern part of the perimeter silt curtain was conducted on 28-Oct-14.

7. Monitoring results show no recurrence of exceedance at IS17 during ebb tide on 22 Oct 2014.

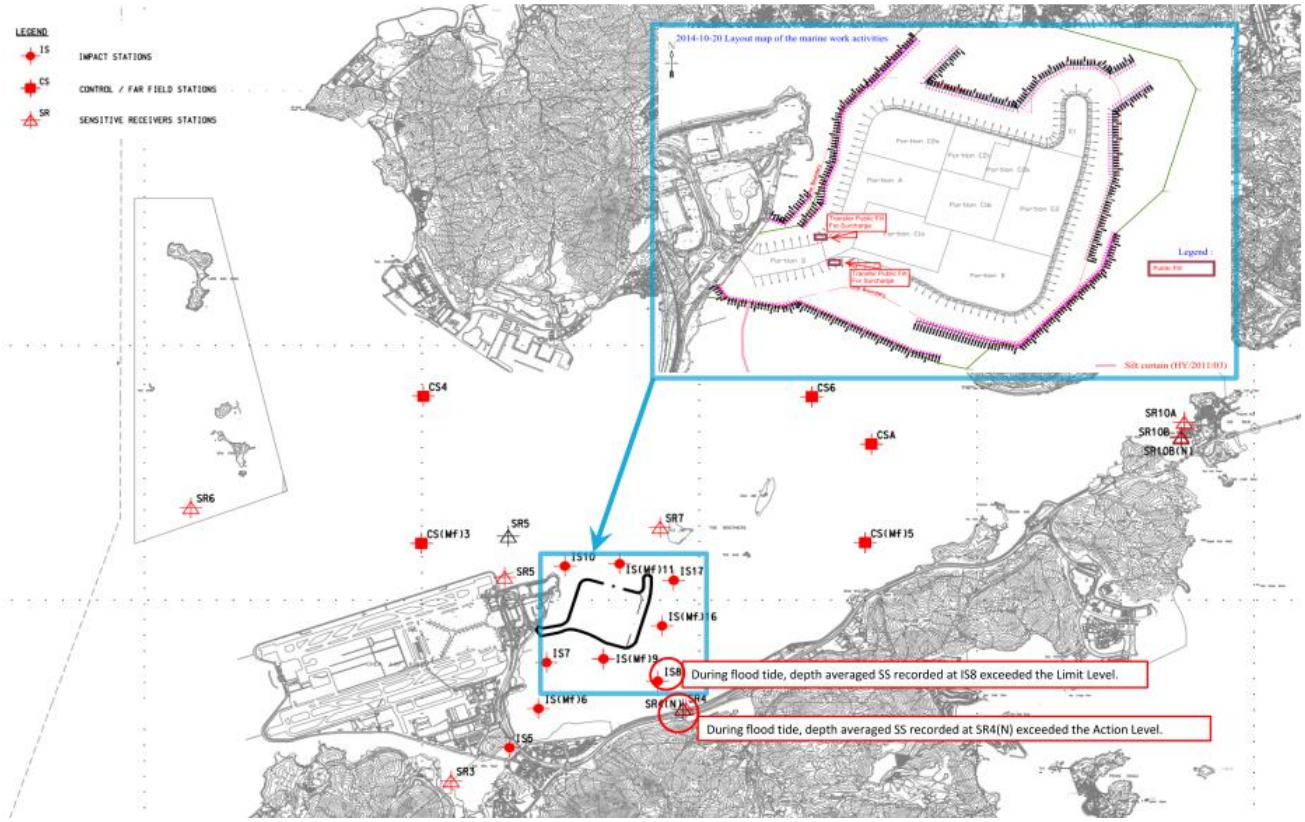
4.7.8.6 ET's conclusions and recommendations for mitigation: Exceedances recorded at IS17 are likely to be related to vessel movement at shallow water during ebb tide. The Contractor was further reminded to control the vessel traffic at this area and ensure swift provision of maintenance to the silt curtains once defect was found.

4.7.8.7 Contractor's actions to implement the mitigation: As informed by the Contractor, traffic control such as vessel speed limit was implemented and operation of sand filling vessel at shallow water during ebb tide was avoided. Monitoring results show no recurrence of exceedance at IS17 on 22-Oct-14.

4.7.8.8 With refer to the maintenance record provided by the Contractor, maintenance work for the defects of the Northeastern part of the perimeter silt curtain was conducted on 28-Oct-14.

4.7.9 (1) One action level exceedance and (1) limit level exceedance of SS were recorded at SR4(N) and IS8 respectively on 20 October 2014 during flood tide;

4.7.9.1 Layout map below shows active works conducted on 20-Oct-14 during flood tide.



4.7.9.2 With reference to the information provided by the Contractor, only public fill was transferred at Portion D for surcharge on 20 October 2014 during flood tide and no active marine construction activity from this Contract was conducted near IS8, as such, it is unlikely to cause silt plume and contribute to the elevation of SS at IS8 during flood tide.

4.7.9.3 IS(Mf)9 is located closer to the construction site than monitoring station IS8. Depth Averaged Suspended Solids (SS) values (in mg/L) recorded during the flood tide on the same day at IS(Mf)9 was below the Action and Limit Level which shows that the water quality closer to construction site was not adversely affected.

4.7.9.4 In accordance with the silt curtain integrity checking record of 20 October 2014, no defect of the perimeter silt curtain was observed at the southeast part of HKBCF Reclamation Works. In addition, with referred to monitoring record , no sediment plume has been observed to flow from the inside of the perimeter silt curtain to the outside of the perimeter silt curtain and no discoloration of sea water has been observed at IS8.

4.7.9.5 Turbidity level recorded at IS8, IS(Mf)9 and IS(Mf)16 were below the action and limit level. This indicates the turbidity level at area near IS8 was not adversely affected.

4.7.9.6 The exceedance was likely due to local effects in the vicinity of IS8.

4.7.9.7 As such, the exceedance recorded at IS8 is unlikely to be project related.

4.7.9.8 Exceedance recorded at SR4(N) during flood tide is unlikely due to marine based construction activities of the Project because:

4.7.9.9 With reference to the information provided by the Contractor, only public fill was transferred at Portion D for surcharge on 20 October 2014 during flood tide and no active marine construction activity from this Contract was conducted near SR4(N), as such, it is unlikely to cause silt plume and contribute to the elevation of SS at SR4(N) during flood tide.

4.7.9.10 With reference to the silt curtain checking record defects was not observed at southeast part of the perimeter silt curtain which the closest to SR4(N) on 20 October 2014.

4.7.9.11 The SS level recorded at IS(Mf)9, IS8 and IS(Mf)16 which located closer to active works were below the action and limit level on 20 October 2014 which indicates exceedance at SR4(N) was unlikely due to active construction works for cellular structure .

4.7.9.12 Turbidity level recorded at SR4(N), IS(Mf)9, IS8 and IS(Mf)16 on 20 October 2014 were below the action and limit level. This indicates the turbidity level at area near IS(Mf)11 was not adversely affected.

4.7.9.13 The exceedance was likely due to local effects in the vicinity of SR4(N).

4.7.9.14 Action taken under the event and action plan:

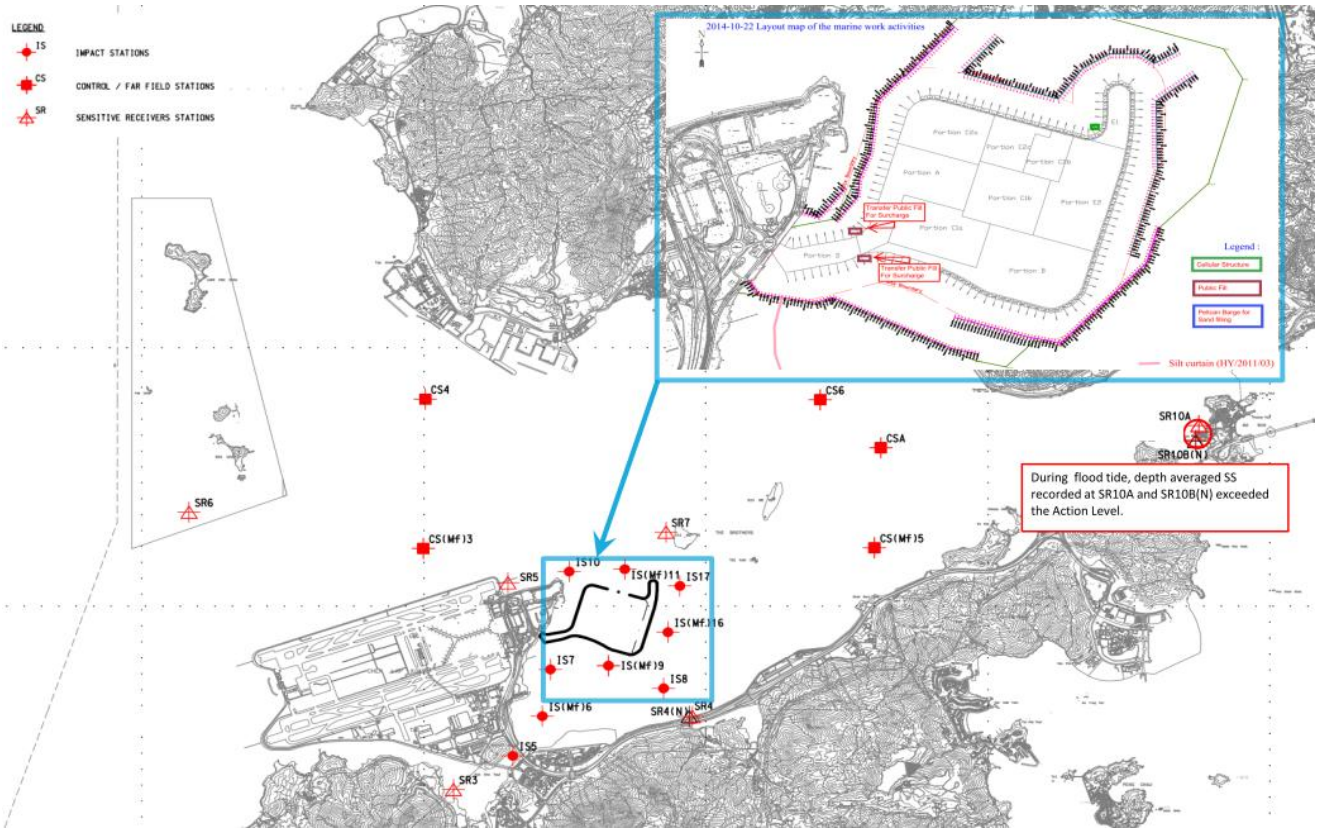
1. Not applicable as SS was not measured in situ;
2. After considering the above mentioned investigation results, it appears that it was unlikely that the SS exceedances were attributed to active construction activities of this project;
3. IEC, contractor and ER were informed via email;
4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
5-7. Since it is considered that the SS exceedances are unlikely to be project related, as such, actions 5 - 7 under the EAP are not considered applicable.

4.7.9.15 Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains and to carry out maintenance work once

4.7.9.16 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis.

4.7.10 (2) Two Action Level Exceedances of SS were recorded at SR10A and SR10B(N) on 22 October 2014 during flood tide;

4.7.10.1 For marine works, works involve cellular structure was conducted at portion E1 during flood tide on 22 October 2014. Also refer to layout map below:



4.7.10.2 Exceedances were not due to marine based construction works of the Project because:

4.7.10.3 IS(Mf)11 and IS10 are located downstream and closer to the active works than monitoring station SR10B(N) and SR10A during flood tide on 22 October 2014. Depth Averaged Suspended Solids (SS) values (in mg/L) recorded during flood tide on the same day at IS(Mf)11 and IS10 were below the Action and Limit Level which indicates project work is unlikely to contribute to the action level exceedance recorded at SR10B(N) and SR10A.

4.7.10.4 The monitoring location of monitoring station SR10B(N) and SR10A are considered upstream and remote to the active works of this project during flood tide. Therefore it was unlikely that the exceedances recorded at SR10B(N) and SR10A during flood tide were due to active construction activities of this project on 22 October 2014.

4.7.10.5 The exceedances are likely due to local effects in the vicinity of SR10B(N) and SR10A.

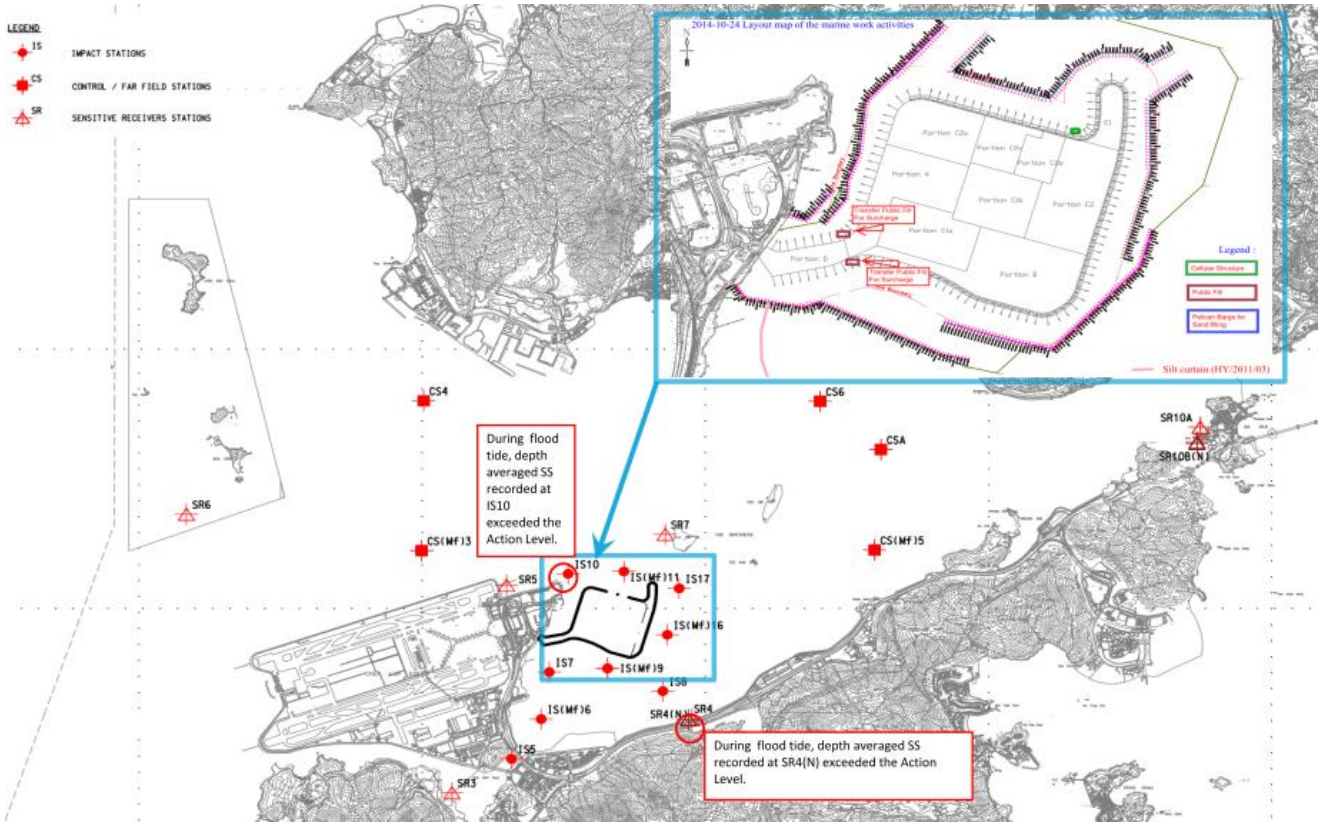
4.7.10.6 Action taken under the event and action plan:

1. Not applicable as SS was not measured in situ;
2. After considering the above mentioned investigation results, it appears that it was unlikely that the SS exceedances were attributed to active construction activities of this project;
3. IEC, contractor and ER were informed via email;
4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
5-7. Since it is considered that the SS exceedances are unlikely to be project related, as such, actions 5 - 7 under the EAP are not considered applicable.

4.7.10.7 Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.

4.7.10.8 As informed by the Contractor, maintenance work of the silt curtain is on-going and carried out by the Contractor on a daily basis.

4.7.11 (2) Two Action Level Exceedances of SS were recorded at IS10 and SR4(N) during flood tide on 24 October 2014. Layout map below shows active works conducted on 24-Oct-14.



4.7.11.1 Exceedance recorded at IS10 during mid-flood tide is unlikely due to marine based construction activities of the Project because:

4.7.11.2 With reference to the silt curtain checking record, defects was observed at parts of the perimeter silt curtain which are close to the IS10.

4.7.11.3 With reference to the information provided by the Contractor, active construction works for cellular structure was carried out northeast part of the perimeter silt curtain. Almost the same active construction works was carried out on 22 and 27 October 2014 during the same tide, impact water quality monitoring data recorded on 22 and 27 October 2014 IS10 are all below the Action and Limit Level which indicate exceedance recorded at IS10 was unlikely due to active construction works for cellular structure.

4.7.11.4 No filling activities was observed in progress and no silt plume was observed to flow from the inside of the perimeter silt curtain to the outside of the perimeter silt curtain when monitoring was conducted at IS10.

4.7.11.5 Also, turbidity level recorded at SR5, IS10 and IS(Mf)11 recorded on 24 October 2014 were below the action and limit level. This indicates the turbidity level at area near IS10 was not adversely affected.

4.7.11.6 The exceedance was likely due to local effects in the vicinity of IS10.

4.7.11.7 Exceedance recorded at SR4(N) during flood tide IS unlikely due to marine based construction activities of the Project because:

4.7.11.8 With reference to the silt curtain checking record defects was not observed at southeast part of the perimeter silt curtain which the closest to SR4(N).

4.7.11.9 The SS level recorded at IS(Mf)9, IS8 and IS(Mf)16 which located closer to active works were below the action and limit level which indicates exceedance at SR4(N) were unlikely due to active construction works for cellular structure .

4.7.11.10 Turbidity level recorded at SR4(N), IS(Mf)9, IS8 and IS(Mf)16 recorded on 24 October 2014 were below the action and limit level. This indicates the turbidity level at area near IS(Mf)11 was not adversely affected.

4.7.11.11 The exceedances were likely due to local effects in the vicinity of SR4(N).

4.7.11.12 After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.

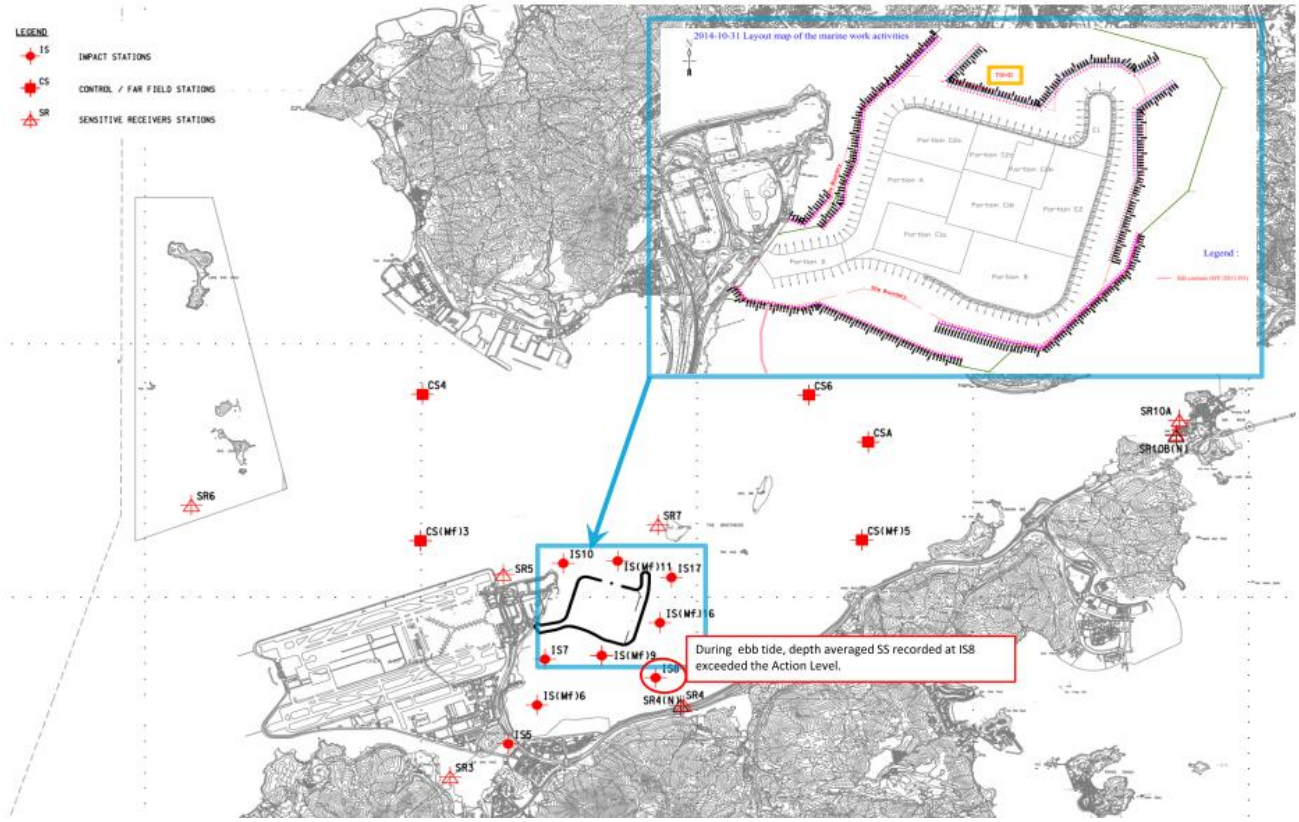
4.7.11.13 Action taken under the event and action plan:

1. Not applicable as SS was not measured in situ;
2. After considering the above mentioned investigation results, it appears that it was unlikely that the SS exceedances were attributed to active construction activities of this project;
3. IEC, contractor and ER were informed via email;
4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
5-7. Since it is considered that the SS exceedances are unlikely to be project related, as such, actions 5 - 7 under the EAP are not considered applicable.

4.7.11.14 ET's conclusions and recommendations for mitigation: Mitigation measures such as perimeter silt curtain was implemented by the Contractor, however defects of the perimeter silt curtain was observed, the Contractor was reminded to ensure swift provision of maintenance to the silt curtains once defects were found.

4.7.11.15 Contractor's actions to implement the mitigation: With refer to the maintenance record provided by the Contractor, maintenance work for the defects of the northwest part of the perimeter silt curtain was conducted on 28 October 2014.

4.7.12 For the action level exceedance of SS noted at IS8 during ebb tide on 31 October 2014. Layout map below shows active works conducted on 31-Oct-14 during ebb tide.



4.7.12.1 Exceedance recorded at IS8 during ebb tide is unlikely due to marine based construction activities of the Project because:

4.7.12.2 With reference to the information provided by the Contractor, no marine works was conducted during ebb tide, it is unlikely to cause silt plume and contribute to the elevation of SS at IS8 during ebb tide.

4.7.12.3 IS(Mf)9 is located closer to the construction site than monitoring station IS8. Depth Averaged Suspended Solids (SS) values (in mg/L) recorded during the ebb tide on 31 October 2014 at IS(Mf)9 was below the Action and Limit Level which shows that the water quality closer to construction site was not adversely affected.

4.7.12.4 In accordance with the silt curtain integrity checking record of 31 October 2014, no defect of the perimeter silt curtain was observed at the southeast part of HKBCF Reclamation Works. In addition, with referred to monitoring record , no sediment plume has been observed to flow from the inside of the perimeter silt curtain to the outside of the perimeter silt curtain and no discoloration of sea water has been observed at IS8.

4.7.12.5 Turbidity level recorded at IS8, IS(Mf)9 and IS(Mf)16 on 31 October were below the action and limit level. This indicates the turbidity level at area near IS8 was not adversely affected

4.7.12.6 The exceedance was likely due to local effects in the vicinity of IS8.

4.7.12.7 As such, the exceedance recorded at IS8 is unlikely to be project related.

4.7.12.8 Action taken under the event and action plan:

1. Not applicable as SS was not measured in situ;
2. After considering the above mentioned investigation results, it appears that it was unlikely that the SS exceedances were attributed to active construction activities of this project;

3. IEC, contractor and ER were informed via email;
4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
5-7. Since it is considered that the SS exceedance is unlikely to be project related, as such, actions 5 - 7 under the EAP are not considered applicable.

4.7.12.9 Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.

4.7.12.10 As informed by the Contractor, maintenance work of the silt curtain is on-going and carried out by the Contractor on a daily basis.

4.7.13 The event action plan is annexed in Appendix L.

5 DOLPHIN MONITORING

5.1 Monitoring Requirements

5.1.1 Vessel based surveys for the Chinese White Dolphin (CWD), *Sousa chinensis,* are to be conducted by a dedicated team comprising a qualified marine mammal ecologist and experienced marine mammal observers (MMOs). The purpose of the surveys are to evaluate the impact of the HKCBF reclamation and, if deemed detrimental, to take appropriate action as per the EM&A manual.

5.1.2 This 'Impact Monitoring' follows several months of 'Baseline Monitoring' so similar survey methodologies have been adopted to facilitate comparisons between datasets. Further, the data collected are compatible with, and are available for, incorporation into the data set managed by the Agriculture, Fisheries and Conservation Department (AFCD) as part of Hong Kong's long term Marine Mammal Monitoring Programme.

5.2 Monitoring Equipment

5.2.1 Table 5.1 summarises the equipment used for the impact dolphin monitoring.

Table 5.1 Dolphin Monitoring Equipment

Equipment	Model
Commercially licensed motor vessel	15m in length with a 4.5m viewing platform
Global Positioning System (GPS) x2	Integrated into T7000 Garmin GPS Map 76C
Computers (T7000 Tablet, Intel Atom)	Windows 7/MSO 13 Logger
Camera	Nikon D7100 300m 2.8D fixed focus Nikon D90 80-400mm zoom lens
Laser Rangefinder	Range Finder Bushnell 1000m
Marine Binocular x3	Nexus 7 x 50 marine binocular with compass and reticules Fujinon 7 x 50 marine binocular with compass and reticules

5.3 Monitoring Frequency and Conditions

5.3.1 Dolphin monitoring is conducted twice per month in each survey area.

5.3.2 Dolphin monitoring is conducted only when visibility is good (e.g., over 1km) and the sea condition is at a Beaufort Sea State of 4 or better.

5.3.3 When thunder storm, black rain or typhoon warnings are in force, all survey effort is stopped.

5.4 Monitoring Methodology and Location

5.4.1 The impact dolphin monitoring is vessel-based and combines line-transect and photo-ID methodology. The survey follows pre-set and fixed transect lines in the two areas defined by AFCD as:

5.4.2 Northeast Lantau survey area; and

5.4.3 Northwest Lantau survey area.

5.4.4 The co-ordinates for the transect lines and layout map have been provided by AFCD and are shown in Table 5.2 and Figure 4.

Table 5.2 Impact Dolphin Monitoring Line Transect Co-ordinates (Provided by AFCD)

	HK Grid System		Long Lat in WGS84	
ID	X	Y	Long	Lat
1	804671	814577	113.870308	22.269741
1	804671	831404	113.869975	22.421696
2	805475	815457	113.878087	22.277704
2	805477	826654	113.877896	22.378814
3	806464	819435	113.887615	22.313643
3	806464	822911	113.887550	22.345030
4	807518	819771	113.897833	22.316697
4	807518	829230	113.897663	22.402113
5	808504	820220	113.907397	22.320761
5	808504	828602	113.907252	22.396462
6	809490	820466	113.916965	22.323003
6	809490	825352	113.916884	22.367128
7	810499	820690	113.926752	22.325043
7	810499	824613	113.926688	22.360464
8	811508	820847	113.936539	22.326475
8	811508	824254	113.936486	22.357241
9	812516	820892	113.946329	22.326894
9	812516	824254	113.946279	22.357255
10*	813525	818270	113.956156	22.303225
10*	813525	824657	113.956065	22.360912
11	814556	818449	113.966160	22.304858
11	814556	820992	113.966125	22.327820
12	815542	818807	113.975726	22.308109
12	815542	824882	113.975647	22.362962
13	816506	819480	113.985072	22.314192
13	816506	824859	113.985005	22.362771
14	817537	820220	113.995070	22.320883
14	817537	824613	113.995018	22.360556
15	818568	820735	114.005071	22.325550
15	818568	824433	114.005030	22.358947
16	819532	821420	114.014420	22.331747
16	819532	824209	114.014390	22.356933
17	820451	822125	114.023333	22.338117
17	820451	823671	114.023317	22.352084
18	821504	822371	114.033556	22.340353
18	821504	823761	114.033544	22.352903
19	822513	823268	114.043340	22.348458
19	822513	824321	114.043331	22.357971
20	823477	823402	114.052695	22.349680
20	823477	824613	114.052686	22.360610
21	805476	827081	113.877878	22.382668
21	805476	830562	113.877811	22.414103
22	806464	824033	113.887520	22.355164
22	806464	829598	113.887416	22.405423
23	814559	821739	113.966142	22.334574
23	814559	824768	113.966101	22.361920

*****Remark: Due to the presence of deployed silt curtain systems at the site boundaries of the Project, some of the transect lines shown in Figure 5 could not be fully surveyed during the regular survey. Transect 10 is reduced from 6.4km to approximately 3.6km in length due to the HKBCF construction site. Therefore the total transect length for both NEL and NWL combined is reduced to approximately 111km.

5.5 Monitoring Procedures

5.5.1 The study area incorporates 23 transects which are to be surveyed twice per month. Each survey day lasts approximately 9 hours.

5.5.2 The survey vessel departs from Tung Chung Development Pier, Tsing Yi Public Pier or the nearest safe and convenient pier.

5.5.3 When the vessel reaches the start of a transect line, “on effort” survey begins. Areas between transect lines and traveling to and from the study area are defined as “off effort”.

5.5.4 The transect line is surveyed at a speed of 6-8 knots (11-14 km/hr). For the sake of safety, the speed was sometimes a bit slower to avoid collision with other vessels. During some periods, tide and current flow in the survey areas exceeds 7 knots which can affect survey speed. There are a minimum of four marine mammal observers (MMOs) present on each survey, rotating through four positions, observers (2), data recorder (1) and ‘rest’ (1). Rotations occur every 30 minutes or at the end of dolphin encounters. The data recorder records effort, weather and sightings data directly onto the programme Logger and is not part of the observer team. The observers search with naked eye and binoculars between 90° and 270° abeam (bow being 0°).

5.5.5 When a group of dolphins is sighted, position, bearing and distance data are recorded immediately onto the computer and, after a short observation, an estimate made of group size. These parameters are linked to the time-GPS-ships data which are automatically stored in the programme Logger throughout the survey period. In this manner, information on heading, position, speed, weather, effort and sightings are stored in a format suitable for use with DISTANCE software for subsequent line transect analyses.

5.5.6 Once the vessel leaves the transect line, it is deemed to be “off effort”. The dolphins are approached with the purpose of taking high resolution pictures for proper photo-identification of individual CWD. Attempts to photograph all dolphins in the group are made. Both the left and right hand sides of the dorsal fin area of each dolphin in the group are photographed, if possible. On finishing photographing, the vessel will return to the transect line at the point of departure and “on effort” survey is resumed.

5.5.7 Sightings which are made while on the transect line are referred to as "on effort sightings", while not on the actual transect line are referred to as an “opportunistic sightings” (e.g. another group of dolphins is sighted while travelling back to the transect line). Only “on effort sightings” can be used in analyses which require effort or rate quantification, e.g., encounter rate per 100km searched. This is also how “on effort sightings” are treated in the baseline report. “Opportunistic sightings” provide additional information on individual habitat use and population distribution and they are noted accordingly.

5.5.8 As time and GPS data are automatically logged throughout the survey and are linked to sightings data input, start and end times of encounters and deviation from the transect lines are recorded and can be subsequently reviewed.

5.6 Monitoring Schedule for the Reporting Month

5.6.1 The schedule for dolphin monitoring in October 2014 is provided in Appendix F.

5.6.2 Two surveys covering both study areas were completed.

5.7 Results and Observations

5.7.1 Dolphin surveys were conducted on 13, 14, 20 and 21 October 2014. A total of 220.1 km of transect line was conducted under favourable conditions. The total length travelled was also 220.1 km, please note that that some lines were shortened due to works and/or shipping traffic.

The effort summary and sightings data are shown in Tables 5.3 and 5.4, respectively. The survey efforts conducted in September 2014 are plotted in Figure 5a-b. For Table 5.3, only on-effort information is included. Transects conducted in all Beaufort Sea State are included. Compared to previous monthly reports, the whole number Beaufort Sea State scale is used so as to ease comparison with other dolphin monitoring reports.

Table 5.3 Impact Dolphin Monitoring Survey Effort Summary, Effort by Area and Beaufort Sea State

Survey	Date	Area	Beaufort	Effort (km)	Total Distance Travelled (km)
1	10/13/2014	NWL	1	13.1	**63**
	10/13/2014	NWL	2	33.3	
	10/13/2014	NWL	3	16.6	
	10/14/2014	NWL	2	3.1	**47.2**
	10/14/2014	NWL	3	6.9	
	10/14/2014	NEL	1	32.9	
	10/14/2014	NEL	2	4.3	
2	10/20/2014	NWL	1	14.7	**62.7**
	10/20/2014	NWL	2	47	
	10/20/2014	NWL	3	1	
	10/21/2014	NWL	1	9.9	**47.2**
	10/21/2014	NEL	1	37.3	
TOTAL in October 2014					**220.1**

*Remark: Surveys conduct under Beaufort Sea State 3 or below are considered as under favourable condition.

Table 5.4 Impact Dolphin Monitoring Survey Details October 2014

Date	Location	No. Sightings "on effort"	No. Sightings "opportunistic"
10/13/2014	NW L	2	1
	NEL	0	0
10/14/2014	NW L	0	0
	NEL	0	0
10/20/2014	NW L	2	1
	NEL	0	0
10/21/2014	NW L	0	0
	NEL	0	0
TOTAL in September 2014		**4**	**2**

Table 5.5 The Encounter Rate of Number of Dolphin Sightings & Total Number of Dolphins per Area^

Encounter Rate of Number of Dolphin Sightings (STG)*						
Date	**NEL Track (km)**	**NWL Track (km)**	**NEL Sightings**	**NWL Sightings**	**NEL Encounter Rate**	**NWL Encounter Rate**
13 & 14/10/2014	37.2	73.0	0	2	0.0	2.7
20 & 21/10/2014	37.3	72.6	0	2	0.0	2.8
Encounter Rate of Total Number of Dolphins (ANI)**						
Date	**NEL Track (km)**	**NWL Track (km)**	**NEL Dolphins**	**NWL Dolphins**	**NEL Encounter Rate**	**NWL Encounter Rate**
13 & 14/10/2014	37.2	73.0	0	10	0.0	13.7
20 & 21/10/2014	37.3	72.6	0	4	0.0	5.5

* Encounter Rate of Number of Dolphin Sightings (STG) presents encounter rates in terms of groups per 100km.
** Encounter Rate of Total Number of Dolphins (ANI) presents encounter rates in terms of individuals per 100km. And the encounter rate is not corrected for individuals, calculation may represent double counting.
^The table is made only for reference to the quarterly STG & ANI, which were adopted for the Event & Action Plan.

5.7.2 A total of six sightings were made, four “on effort” and two “opportunistic”. Three sightings were made on the 13 October 2014 in NWL and three sightings were made on 20 October 2014 also in NWL. A total of twenty-two individuals were sighted from the two impact dolphin surveys in the reporting period. Sighting details are summarised and plotted in Appendix K and Figure 5c, respectively.

5.7.3 Behaviour: Of the six sightings, two groups were feeding, one group was travelling and three groups was engaged in multiple activities, two of which comprised feeding and surface active behaviours and one of which comprised feeding and travelling behaviours. The locations of sighting with different behaviour are mapped in Figure 5d.

5.7.4 Two calves were recorded in October 2014. The mother of one was HZMB 026. The location of sighting with calf is mapped in Figure 5e.

5.7.5 Photo ID analyses for September 2014 is presented in Appendix K.

5.7.6 No resightings were made during September 2014. One new adult was identified and added to the catalogue (HZMB 124)

5.7.7 Noteworthy Observation[1]:

5.7.7.1 When impact monitoring was conducted at the southern parts of transect lines 1 & 2, the view of the area was partially blocked by the working vessels and fixed structures which do not belong to HKBCF Reclamation Works. The number of fixed structures has increased and the working vessels have moved when compared to last month’s observations. As the working vessels will move during the on-going works, it is considered that they will temporarily affect survey protocol, survey data collection, dolphin movement, dolphin habitat use and dolphin behaviour, whereas the fixed structures will continuously affect survey protocol, survey data collection, dolphin movement, dolphin habitat use and dolphin behaviour.

5.7.7.2 The HKBCF Project effected line 12. The view of the area was partially blocked by the working vessels and in water structures. As the working vessels will move as construction progresses, they will cause

[1] A noteworthy observation is to show that either the conduct of the surveys themselves is affected, i.e., the noted vessel or works impedes the progress or view of the survey platform. In addition, the vessel or construction works may be different or additional to that observed previously and further, are of such a nature that they are a likely to create an impact on the movement or behaviour of the subject of the impact survey, in this case, the dolphins.

temporary effects to survey protocol, survey data collection, dolphin movement, dolphin habitat use and dolphin behaviour, whereas the fixed structures will affect all survey protocols and dolphin ecology in the long term.

5.7.7.3 The northern end of line 9 and 10 was affected by works which do not belongs to the HKBCF Reclamation Works; in particular, the view of the area was partially blocked by the working vessels. The number area of the works site has increased in size and the working vessels have moved position when compared to observations made during last month's survey. As the working vessels will move during the on-going works, they will temporarily affect survey data collection, dolphin movement, dolphin habitat use and dolphin behaviour. The works here are creating a reclamation/sea wall site which is permanent and will thus continuously affect all survey protocols and dolphin ecology.

5.7.7.4 Anchored vessels affected southern end of line 18 on 14 October 2014 and northern part of line 22 on 22 October 2014 and line 23 on 14 & 21 October 2014. Vessels have rarely been noted as anchoring here some were only sighted on one survey day. It is therefore assumed that only a limited impact was made on survey data collection, dolphin movement, dolphin habitat use and dolphin behaviour on the days in question.

5.7.7.5 It was observed that lines 11 and 12 were affected by other project marine works activities which were not related to the HKBCF Reclamation Works.

5.7.7.6 Several new projects are ongoing at the southern ends of lines 1-7 and 12. These works partially blocked some of the survey view. No fixed structures were observed lines 1-7, however, line 12 works include fixed structures. As it is not known what activities these barges and platforms are conducting, the effect that these works may specifically have on dolphins is not known at this time.

5.7.7.7 The survey effort log notes the areas in which the visibility is limited or the survey is affected so that these can be accounted for in any subsequent analyses. Some of these obstructions will become permanent and some will be temporary as the HZMB is built and other projects progress. It is advised that the impact monitoring surveys should be completed as close to the predefined lines as possible (as per Figure 4 of this report).

5.7.7.8 The above noteworthy observations are largely a result of multiple and on-going infrastructure projects within the Lantau area. No amendment to EM&A protocols can negate the effects of these projects, e.g., it is a highly dynamic environment and viewing conditions may alter every survey (sometimes within surveys) and most of the survey area is affected, to some degree, by marine construction works. Instead, survey data analyses should incorporate any noteworthy observations which may affect either data collection or dolphin distribution and behavioural changes. The above mentioned activities recorded during boat survey will not affect implementation of the EM&A Programme provided appropriate data analyses are conducted. Given that viewing conditions will change frequently during the construction phase of HZMB, it is inappropriate at this time to implement any changes in EM&A procedures, however, a review of survey conditions will be made from time to time to assess if changes to procedures are required.

5.7.8 The event action plan is annexed in Appendix L.

6. ENVIRONMENTAL SITE INSPECTION AND AUDIT

6.1 Site Inspection

6.1.1 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 month, 5 site inspections were carried out on 3, 9, 16, 23 and 30 October 2014.

6.1.2 Particular observations during the site inspections are described below:

Air Quality

6.1.3 Fugitive dust was observed generated when truck pass through a road at Portion D. The Contractor is reminded to provide sufficient dust control measures to prevent generation of fugitive dust. The Contractor provided dust control measures to prevent generation of fugitive dust. (Closed)

6.1.4 Dust control measure was not observed at the ramp of Portion D. The Contractor was reminded to provide dust control measure such to ramp with exposed soil which the water car has no access. (Reminder)

Noise

6.1.5 No adverse observation was identified in the reporting month.

Water Quality

6.1.6 Oil drum was observed without drip tray. The Contractor was reminded to provide mitigation measures such as drip tray or bunding to oil drum. The Contractor provided mitigation measures such as drip tray to oil drum. (Closed)

6.1.7 Oil drum was observed without drip tray, the Contractor was reminded to provide drip tray to oil drums. The Contractor cleared the oil drum. (Closed)

6.1.8 It was observed that the frame of a drip tray was deformed; the Contractor was reminded to provide drip tray without defects. The Contractor provided drip tray without defects to oil drums. (Closed)

6.1.9 Public fill were observed on the edge of barge at Portion D. The Contractor was reminded to clear it to prevent potential runoff to the surrounding (Reminder)

6.1.10 Defects such as disconnection and insufficient overlapping of the perimeter silt curtain have been observed. The Contractor was advised to rectify the defects such as disconnection and insufficient overlapping of the perimeter silt curtain as soon as possible. The Contractor rectified the defects such as disconnection and insufficient overlapping of the perimeter silt curtain. (Closed)

6.1.11 Silty water was observed at both side of the northern part of the perimeter silt curtain. The Contractor was reminded to conduct necessary checking of the integrity of the silt curtain and swiftly carry out maintenance and repair once any defect is found. Photo record shows that the situation was not observed on 10 Oct 2014. (Closed)

6.1.12 Oil and water mixture was observed accumulated inside a drip tray. The Contractor was reminded to clear the mixture to prevent runoff. The Contractor cleared the mixture. (Closed)

6.1.13 Powered Mechanical Equipment (PME) was observed located close to sea. The Contractor was reminded to put the PME away from sea to prevent potential runoff. (Reminder)

Chemical and Waste Management

6.1.14 Stack of cardboard paper and wave barriers were observed when inspection was conducted at area between steel cell #91 – 94. The Contractor was reminded to stored general refuse within a temporary refuse collection facility, in appropriate containers prior to collection and disposal. (Reminder)

6.1.15 General refuse was observed at portion D, the Contractor was reminded to clear the general refuse regularly to keep the site clean and tidy. The Contractor cleared the generate refuse. (Closed)

Landscape and Visual Impact

6.1.16 No relevant adverse impact was observed in the reporting month.

Others

6.1.17 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.

6.2 Advice on the Solid and Liquid Waste Management Status

6.2.1 The Contractor had registered as a chemical waste producer for this Project. Receptacles were available for general refuse collection and sorting.

6.2.2 As advised by the Contractor, 1,750,755.2m3 of fill were imported for the Project use in the reporting period. 3kg of metal, 41kg of paper/cardboard packaging, 1,200kg chemical waste and 65m3 of general refuse were generated and disposed of in the reporting period. Monthly summary of waste flow table is detailed in Appendix M.

6.2.3 The Contractor is advised to properly maintain on site C&D materials and wastes storage, 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.

6.2.4 The Contractor is reminded that chemical waste 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, Labeling and Storage of Chemical Wastes.

6.3 Environmental Licenses and Permits

6.3.1 The environmental licenses and permits for the Project and valid in the reporting month is summarized in Table 6.1.

Table 6.1 Summary of Environmental Licensing and Permit Status

Statutory Reference	License/ Permit	License or Permit No.	Valid Period		License/ Permit Holder	Remarks
			From	To		
EIAO	Environmental Permit	EP-353/2009/G	06/08/2012	N/A	HyD	Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities
		EP-354/2009/B	28/01/2014	N/A		Tuen Mun – Chek Lap Kok Link (TMCLKL Southern Landfall Reclamation only)
APCO	NA notification	--	30/12/2011	--	CHEC	Works Area WA2 and WA3
APCO	NA notification	--	17/01/2012	--	CHEC	Works Area WA4
WDO	Chemical Waste Producer Registration	5213-951-C1186-21	30/3/2012	N/A	CHEC	Chemical waste produced in Contract HY/2010/02
WDO	Chemical Waste Producer Registration	5213-974-C3750-01	31/10/2012	--	CHEC	Registration as Chemical Waste Producer at To Kau Wan(WA4)
WDO	Chemical Waste Producer Registration	5213-839-C3750-02	13/09/2012	--	CHEC	Registration as Chemical Waste Producer at TKO 137(FB)
WDO	Billing Account for Disposal of Construction Waste	7014181	05/12/2011	N/A	CHEC	Waste disposal in Contract HY/2010/02
NCO	Construction Noise Permit	GW-RS0990-14	18/09/2014	24/12/2014	CHEC	Reclamation Works in Contract HY/2010/02
NCO	Construction Noise Permit	GW-RE0656-14	30/06/2014	22/12/2014	CHEC	Section of TKO Fill Bank under Contract HY/2010/02

6.4 Implementation Status of Environmental Mitigation Measures

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

6.4.2 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in Appendix C. Most of the necessary mitigation measures were implemented properly.

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

6.4.4 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.

6.4.5 Acoustic decoupling measures on noisy plants on construction vessels were checked regularly and the Contractor was reminded to ensure provision of ongoing maintenance to noisy plants and to carry out improvement work once insufficient acoustic decoupling measures were found.

6.4.6 Frequency of watering per day on exposed soil was checked; with reference to the record provided by the Contract, watering was conducted at least 8 times per day on reclaimed land. The frequency of watering is the mainly refer to water truck. Sprinklers are only served to strengthen dust control measure for busy traffic at the entrance of Portion D. As informed by the Contractor, during the mal-function period of sprinkler, water truck will enhance watering at such area. The Contractor was reminded to ensure provision of watering of at least 8 times per day on all exposed soil within the Project site and associated works areas throughout the construction phase.

6.4.7 EPD conducted inspection at HKBCF Reclamation Works at 11:36am on 23 October 2014, silt plume was observed spreading out from the Portion E1 of the construction site through the silt curtain when filling activities by derrick barge (振明28) was undergoing.

6.4.7.1 EPD subsequently issued a yellow form and requested Contractor to report them via ET Leader and IEC within 7 days after issuing the yellow form for the remedial actions and preventive actions taken to improve the situation.

6.4.7.2 Insufficient Mitigation Measures: Silt plume was found spreading out from Portion E1 of the construction site through the silt curtain on 23 October 2014.

6.4.7.3 Review of Contractor's investigation report and rectifications.

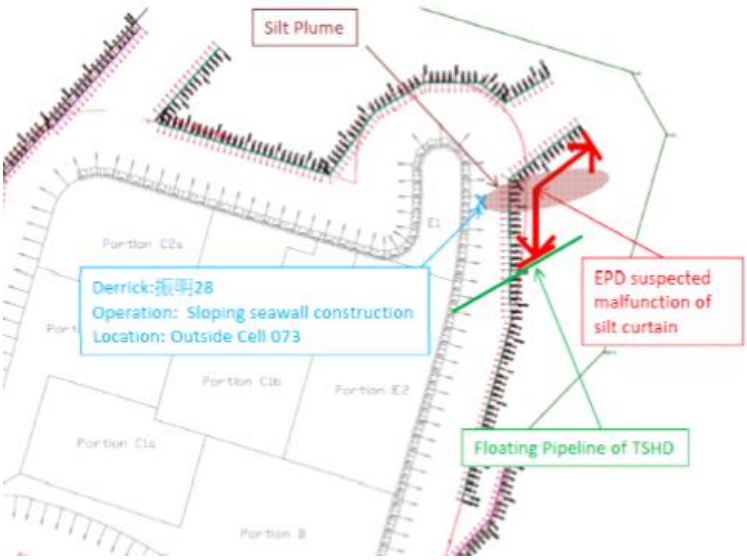
6.4.7.4 Investigation actions:

- Review of monitoring data obtained 20, 22, 24 and 27 October 2014.
- Investigation report provided by the Contractor on 29 October 2014 was reviewed:
- Diver checking and rectification record for integrity of silt curtain has been checked.
- Inspection condition of sea area near Portion E1 on 31 October 2014 around 1pm.

6.4.7.5 Investigation results:

- Suspended Solids (SS) level and turbidity level recorded at IS(Mf)11, IS17 and IS(Mf)16 and IS8 on 20, 22, 24 and 27 October 2014 were reviewed. (for IWQM data, refer to Appendix J)
- Review of Suspended Solids (SS) level and turbidity level recorded at IS(Mf)11, IS17 and IS(Mf)16 and IS8 on 20 October 2014:
- Limit Level Exceedance of SS at IS8 during flood tide and Action Level Exceedance of IS17 during ebb tide was noted on 20 October 2014. After investigation, the exceedance recorded at IS8 are unlikely to be project related. However, exceedance recorded at IS17 is likely due to marine based construction activities of the Project. For details of investigation, please refer to investigation details section 4.7.3 to 4.7.4.
- Review of Suspended Solids (SS) level and turbidity level recorded at IS(Mf)11, IS17, IS(Mf)16 and IS8 on 22, 24 and 27 October 2014:
- Turbidity level and Suspended Solids recorded on 22, 24 and 27 October 2014 at IS(Mf)11, IS17, IS(Mf)16 and IS8 were below the action and limit level. This indicates the turbidity level and suspended solid at sea area close to portion E1 was not adversely affected on 22, 24 and 27 October 2014.
- Figure 3.2 of the investigation report showed that the silt plume was no longer observed at 02:09pm on 23 October 2014 after derrick barge (振明 28) ceased the work at 11:40am.
- The Contractor arranged diver to check the integrity of the concerned silt curtain. Minor damaged found on the concerned silt curtain and rectification works had been carried out by the Contractor.

- Diver checking and rectification record for integrity of silt curtain has been checked and it shows that the part of the silt curtain which was suspected to be malfunction (showed by red arrow in the diagram below) has been rectified by the Contractor.



- Subsequently, a rock placement trial was conducted by the Contractor on 28 October 2014. Silt plume was observed during the process but Figure 3.8 of the investigation report shows that spreading to the outside of the silt curtain was prevented by the silt curtain.
- Photo records taken on 31 October 2014 shows the sea condition at sea area near the northeast side of the HKBCF Reclamation Works and no silt plume was observed spreading out from Portion E1 of the construction site through the silt curtain:

6.4.7.6 As informed by the Contractor, rockfill materials would be placed more slowly by the derrick as well as the lowest dropping point to minimize the generation of silt plume. Daily site inspection in the area would be conducted so that any damaged parts of silt curtain can be observed and repaired promptly.

6.4.7.7 The Contractor was further reminded to ensure swift provision of maintenance to the perimeter silt curtains once defects of the perimeter silt curtain were observed and continue the preventive measures during rock filling and keep the site inspected at least daily to ensure compliance with respect to the recommendations in the EIA Report and EM&A Manual in particular on EIA Ref. Section 9.11.1.1

6.4.7.8 IWQM results on 29 and 31 October 2014 were review, no exceedance was recorded at IS17, IS(Mf)11 and IS(Mf)16 which indicates that no adverse water quality impact after the implementation of the preventive measures.

6.4.7.9 To prevent recurrence of the observed incident, inspection has been conducted by the Contractor on a daily basis to review if there is an impact to the water quality caused by rock filling activities using derrick barge and to promptly provide maintenance once any damaged parts of silt curtain is observed. The Contractor was further reminded to carry out swift rectification works to the situation once any adverse impact to the water quality is observed.

6.4.7.10 The Contractor was reminded that all water quality mitigation measures with respect to the recommendations in the EIA Report and EM&A Manual in particular on EIA Ref. Section 9.11.1.1 should be fully and properly implemented.

6.4.8 Review of Contractor's work and mitigation measures with respect to the recommendations in the EIA Ref. Section 9.11.1.6:

6.4.8.1 Actions taken:

- Review of monitoring results on 27 and 29 October 2014.
- Ad hoc site inspection was conducted on 31 October 2014

6.4.8.2 Investigation results:

- IWQM data obtained on 27 and 29 October 2014 were reviewed; no water quality monitoring exceedance was noted on 27 and 29 October 2014.
- Ad hoc site inspection was subsequently conducted on 31 October 2014 but no silt plume or turbid water was observed on 31 October 2014. Photo records taking on 31 October 2014 at around 01:00pm which shows the sea condition at sea area near Portion E1 of the HKBCF Reclamation Works:

6.4.8.3 The water quality will be closely monitored through IWQM works of this Contract, should any water quality exceedance is recorded, investigation will be conducted following the EAP for IWQM. Furthermore, joint site inspection will be conducted regularly to check whether the water quality at monitoring stations of HKBCF reclamation works is adversely affected.

6.4.8.4 The Contractor was reminded that all water quality mitigation measures with respect to the recommendations in the EIA Report and EM&A Manual in particular on EIA Ref. Section 9.11.1.6 should be fully and properly implemented.

6.5 Summary of Exceedances of the Environmental Quality Performance Limit

6.5.1 One (1) 24-hour TSP result at AMS3B exceeded Action Level on 27 October 2014, after investigation, the exceedance was considered not related to this Contract. All 1-Hour TSP results were below the Action and Limit Level in the reporting month.

6.5.2 For construction noise, no exceedance was recorded at all monitoring stations in the reporting period.

6.5.3 A total of (18) eighteen exceedances were recorded in this reporting month: (1) One Limit Level Exceedance of Turbidity and (1) Limit Level Exceedance of Suspended Solids were recorded at IS17 during ebb tide on 10 October 2014; (1) One Action Level Exceedance of SS at SR10B(N) was recorded on10 October 2014 during flood tide; (1) One Action Level Exceedance of SS at IS8 was recorded on 3 October 2014 during flood tide; (1) One Action Level Exceedance of SS at IS(Mf)11 was recorded on 6 October 2014 during ebb tide; (2) Two Action Level Exceedances of SS at IS(Mf)11 and SR5 were recorded on 6 October 2014 during flood tide; (3) Three Action Level Exceedances of SS were recorded at IS10, SR4(N) and SR5 on 13 October 2014 during flood tide; (1) One Action Level Exceedance of SS was recorded at IS17 on 20 October 2014 during ebb tide; (1) action level exceedance and (1) limit level exceedance of SS were recorded at SR4(N) and IS8 respectively on 20 October 2014 during flood tide; (2) Two Action Level Exceedances of SS were recorded at SR10A and SR10B(N) on 22 October 2014 during flood tide; (2) Two Action Level Exceedances of SS were recorded at IS10 and SR4(N) during flood tide on 24 October 2014. (1) One Action Level Exceedance was recorded at IS8 on 31 October 2014 during ebb tide.

6.5.4 After investigation, all impact water quality exceedances were considered not related to this Contract except the Limit Level Exceedance of Turbidity, Limit Level Exceedance of Suspended Solids recorded at IS17 during ebb tide on 10 October 2014 and Action Level Exceedance of Suspended Solids recorded at IS17 during flood tide on 20 October 2014, which were considered related to this Contract. Recommendation has been given and rectification has been carried on by the Contractor on 28 October 2014.

6.5.5 Cumulative statistics on exceedance is provided in Appendix N.

6.6 Summary of Complaints, Notification of Summons and Successful Prosecutions

6.6.1 The Environmental Complaint Handling Procedure is annexed in Figure 6.

6.6.2 Two environmental complaints have been received in October 2014.

6.6.3 As informed by the Contractor on 14 October 2014, a follow up air quality complaint has been received by this Contract (same case to environmental complaint EC-026). The complainant complained that about 20-30 sand barges always moor at the sea area opposite to tower 4 of Melody Garden and Richland Garden. This problem has affected the air quality.

6.6.3.1 Investigation Actions:

- 1hr TSP and 24hrs TSP monitoring data of complaint period 1- 15 October 2014 have been reviewed.
- Site inspections were conducted jointly with RSS, IEC and the Contractor on 16 October 2014 and jointly with RSS and the Contractor on 23 October 2014.

6.6.3.2 Investigation findings:

- There is no sufficient information provided by the complainant to make sure that the concerned barges are related to this project.
- Date of the observed impact was not specified by the complainant so the impact air quality monitoring (IAQM) results within the complaint period 1- 15 October 2014 for monitoring stations close to the concerned area – AQMS1, ASR1, ASR5, ASR6 and ASR10 have been reviewed and there was one action level exceedance of 24hr TSP on impact air quality monitoring result recorded at ASR1 but no information which shows that the action level exceedance at ASR1 is related to vessel of this Contract.

IAQM data AQMS1, ASR1, ASR5, ASR6 and ASR10 also available online from: http://www.hzmbenpo.com/php/list_air_year_All.php)

- As informed by the Contractor, the Contractor would continue to provide watering to stockpile of sand on sand delivery barges.
- Photo record below shows that sand barges were not covered but they are equipped with watering equipment and in order to prevent generation of fugitive dust, watering equipment was used to keep the sand filling material wet.

- In addition, site inspections were conducted jointly with RSS, IEC and the Contractor on 16 October 2014 and jointly with RSS and the Contractor on 23 October 2014, but no generation of fugitive dust was observed to be caused by barges loaded with filling material.
- Sand barges usually moor at around Sham Shui Kok anchorage area and the Contractor would continue to provide watering to stockpile of sand on sand delivery barges, therefore the potential impact to resident areas concerned by the complainant is low.
- The Contractor usually moor vessel at around Sham Shui Kok anchorage area (Except upon request by HK government and under this circumstances, then they will moor at Tuen Mun waters shortly for inspection.)

6.6.3.3 After investigation, there is no adequate information to conclude the observed impact is related to this Contract.

6.6.3.4 The Contractor was advised to ensure to continue the provision of fugitive dust mitigation measures to barges loaded with filling material such as watering to sand filling material on sand barges to keep the surface of stockpile of filling material wet.

6.6.4 With reference to RSS's letter ref.: 211036/(HY2010/02)/M05/432/B07605 dated on 30 September 2014 pertaining the performance on barges operations at the sea area off the Tuen Mun Ferry Pier. A complaint concerning leakage of sand filling material from vessels at sea area off Tuen Mun Ferry Pier was first received by EPD from Tuen Mun District Council (TM DC) on 19 September 2014 and it was subsequently referred by EPD to the Highways Department to handle on 23 September 2014 through EPD's memo ref.: EP/RW/0000362128. Referring to EPD's Memo, it is also noted that some local residents at Tuen Mun expressed their concern that the stockpile of dusty sand material on the barges should be covered with impervious sheeting to avoid causing fugitive dust emissions of sand and dust. Subsequently, TM DC followed up their complaint with Highways Department on 17 October 2014. The follow up complaint concerning water quality impact at sea area off Tuen Mun area was referred to the project team to response on 17 October 2014.

6.6.4.1 Investigation actions:

- Spot check of travel route record of sand delivery barges and review whether sand delivery barges of this Contract would moor/stay at sea area near Tuen Mun Ferry Pier
- Impact water quality monitoring (IWQM) results recorded in September and October 2014 which cover IWQM station(s) - IS14, IS15 and SR9 which are near to the concern area(s), have been reviewed.
- Regular site inspections were conducted jointly with RSS, IEC and the Contractor on 16 October 2014 and jointly with RSS and the Contractor on 23 October 2014.

6.6.4.2 Investigation findings:

- Spot check of travel route record also shows that that sand delivering vessels follow a designated marine travel route. However, only in particular cases, those vessels will moor near sea area off Butterfly beach for government department to carry out inspection. In general, the sand delivery barges were requested by the Contractor to moor as far away from residence as possible and continue to provide watering to stockpile of sand on sand delivery barges.
- Impact water quality monitoring (IWQM) results recorded in September and October 2014 which cover IWQM station(s) - IS14, IS15 and SR9 which are near to the concern area(s), have been reviewed. However no IWQM exceedance was noted in September and October 2014 at monitoring station IS14, IS15 and SR9 which are near to the concern area(s). (IWQM data of IS14, IS15 and SR9 available online at: http://www.hzmbenpo.com/php/list_water_year.php)
- In addition, site inspections were conducted jointly with RSS, IEC and the Contractor on 16 October 2014 and jointly with RSS and the Contractor on 23 October 2014, but no leakage of sand material or generation of fugitive dust was observed to be caused by barges loaded with sand material.
- In addition, sand delivery barges are equipped with watering equipment and in order to prevent generation of fugitive dust, watering equipment was used to keep the sand filling material wet.

- Nonetheless, as informed by the Contractor, the Contractor would study the feasibility of covering stockpile of sand on sand delivery barges.

6.6.4.3 After investigation, there is no adequate information to conclude the observed impact is related to this Contract. However, as informed by the Contractor, the Contractor would study the feasibility of covering stockpile of sand on sand delivery barges.

6.6.4.4 Nonetheless, the Contractor was advised to ensure that all vessels should have regular maintenance to ensure that all Sand Barge functioning well so that any leakage of filling material is prevented.

6.6.4.5 The Contractor was reminded, when vessel was not requested by government department for inspection at sea area off Tuen Mun Ferry Pier, the Contractor should avoid mooring their vessels at the concerned area as far as possible.

6.6.4.6 The Contractor was advised to ensure to continue the provision of fugitive dust mitigation measures to barges loaded with filling material such as watering to sand filling material on sand barges to keep the surface of stockpile of filling material wet.

6.6.4.7 In response to the concern raised on both air quality and water quality, effectiveness of relevant mitigation measures would be monitored through regular EM&A monitoring and site inspection of this project.

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

6.6.6 Statistics on complaints, notifications of summons and successful prosecutions are summarized in Appendix N.

7. FUTURE KEY ISSUES

7.1 Construction Programme for the Coming Months

7.1.1 As informed by the Contractor, the major works for the Project in November 2014 and December 2014 will be*:-

Marine-base

- Cellular structure installation
- Capping Beams structures
- Optimizing rubble mound seawalls
- Conforming sloping seawalls
- Laying geo-textile
- Rock filling
- Sand filling
- Public filling
- Band drain installation
- Surcharge laying
- Geotechnical Instrumentation works
- Precast Yard for seawall blocks & culverts
- Maintenance of silt curtain & silt screen at sea water intake of HKIA

Land-base

- Maintenance works of Site Office at Works Area WA2
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Maintenance of Temporary Marine Access at Works Area WA2

*Construction activities in November & December 2014 will be changed subject to works progress.

7.2 Key Issues for the Coming Month

7.2.1 Key issues to be considered in the coming months:-

- Site runoff should be properly collected and treated prior to discharge;
- Minimize loss of sediment from filling works;
- Regular review and maintenance of silt curtain systems, drainage systems and desilting facilities;
- Exposed surfaces/soil stockpiles should be properly treated to avoid generation of silty surface run-off during rainstorm;
- Regular review and maintenance of wheel washing facilities provided at all site entrances/exits;
- Conduct regular inspection of various working machineries and vessels within works areas to avoid any dark smoke emission;
- Suppress dust generated from work processes with use of bagged cements, earth movements, excavation activities, exposed surfaces/soil stockpiles and haul road traffic;
- Quieter powered mechanical equipment should be used;
- Provision of proper and effective noise control measures for operating equipment and machinery on-site, such as erection of movable noise barriers or enclosure for noisy plants;
- Closely check and replace the sound insulation materials regularly;
- Better scheduling of construction works to minimize noise nuisance;
- Properly store and label oil drums and chemical containers placed on site;
- Proper chemicals, chemical wastes and wastes management;
- Maintenance works should be carried out within roofed, paved and confined areas;
- Collection and segregation of construction waste and general refuse on land and in the sea should be carried out properly and regularly; and
- Proper protection and regular inspection of existing trees, transplanted/retained trees.
- Control night-time lighting and glare by hooding all lights.
- Regular review and provide maintenance to dust control measures such as sprinkler system.

7.3 Monitoring Schedule for the Coming Month

7.3.1 The tentative schedule for environmental monitoring in November 2014 is provided in Appendix F.

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

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

8.1.2 One (1) 24-hour TSP result at AMS3B exceeded Action Level on 27 October 2014, after investigation, the exceedance was considered not related to this Contract. All 1-Hour TSP results were below the Action and Limit Level in the reporting month.

8.1.3 For construction noise, no exceedance was recorded at all monitoring stations in the reporting period.

8.1.4 A total of (18) eighteen exceedances were recorded in this reporting month: (1) One Limit Level Exceedance of Turbidity and (1) Limit Level Exceedance of Suspended Solids were recorded at IS17 during ebb tide on 10 October 2014; (1) One Action Level Exceedance of SS at SR10B(N) was recorded on10 October 2014 during flood tide; (1) One Action Level Exceedance of SS at IS8 was recorded on 3 October 2014 during flood tide; (1) One Action Level Exceedance of SS at IS(Mf)11 was recorded on 6 October 2014 during ebb tide; (2) Two Action Level Exceedances of SS at IS(Mf)11 and SR5 were recorded on 6 October 2014 during flood tide; (3) Three Action Level Exceedances of SS were recorded at IS10, SR4(N) and SR5 on 13 October 2014 during flood tide; (1) One Action Level Exceedance of SS was recorded at IS17 on 20 October 2014 during ebb tide; (1) action level exceedance and (1) limit level exceedance of SS were recorded at SR4(N) and IS8 respectively on 20 October 2014 during flood tide; (2) Two Action Level Exceedances of SS were recorded at SR10A and SR10B(N) on 22 October 2014 during flood tide; (2) Two Action Level Exceedances of SS were recorded at IS10 and SR4(N) during flood tide on 24 October 2014. (1) action level exceedance was recorded at IS8 on 31 October 2014 during ebb tide.

8.1.5 After investigation, all impact water quality exceedances were considered not related to this Contract except the Limit Level Exceedance of Turbidity, Limit Level Exceedance of Suspended Solids recorded at IS17 during ebb tide on 10 October 2014 and Action Level Exceedance of Suspended Solids recorded at IS17 during flood tide on 20 October 2014, which were considered related to this Contract. Recommendation has been given and rectification has been carried on by the Contractor on 28 October 2014.

8.1.6 A total of six sightings were made, four “on effort” and two “opportunistic”. Three sightings were made on the 13 October 2014 in NWL and three sightings were made on 20 October 2014 also in NWL. A total of twenty-two individuals were sighted from the two impact dolphin surveys in the reporting period. Sighting details are summarised and plotted in Appendix K and Figure 5c, respectively.

8.1.7 Behaviour: Of the six sightings, two groups were feeding, one group was travelling and three groups was engaged in multiple activities, two of which comprised feeding and surface active behaviours and one of which comprised feeding and travelling behaviours. The locations of sighting with different behaviour are mapped in Figure 5d.

8.1.8 Two calves were recorded in October 2014. The mother of one was HZMB 026. The location of sighting with calf is mapped in Figure 5e.

8.1.9 Environmental site inspection was carried out 5 times in October 2014. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

8.1.10 Two environmental complaints have been received in October 2014. After investigation, there is no adequate information to conclude the observed impacts are related to this Contract.

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

8.2 Recommendations

8.2.1 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:

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.
- Regular review and provide maintenance to dust control measures such as sprinkler system.

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, enclosure for noisy plants or enhancement works to provide sufficient acoustic decoupling measure(s). 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.
- Acoustic decoupling measures should be properly implemented for all existing and incoming construction vessels with continuous and regularly checking to ensure effective implementation of acoustic decoupling measures.

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.

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, batteries and oil drums should be properly stored and labelled.
- All plants and vehicles on site should be properly maintained to prevent oil leakage. Proper measures, like drip trays and/or bundings, should be provided for retaining leaked oil/chemical from plants.
- 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, accumulated oil mixture 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.

Landscape and Visual Impact

- All existing, retained/transplanted trees at the works areas should be properly fenced off and regularly inspected.
- Control night-time lighting and glare by hooding all lights.