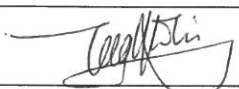
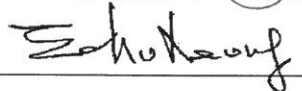


China Harbour Engineering Company Limited

Contract No. HY/2010/02

**Hong Kong – Zhuhai – Macao Bridge
Hong Kong Boundary Crossing
Facilities –
Reclamation Works****Quarterly EM&A Report for
December 2013- February 2014**

[06/2014]

	Name	Signature
Prepared & Checked:	Y T Tang	
Reviewed, Approved and Certified:	Echo Leong (ETL)	

Version: Rev. 0 Date: 26 June 2014

Disclaimer

This report is prepared for China Harbour Engineering Company Limited and is given for its sole benefit in relation to and pursuant to Contract No. HY/2010/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities-Reclamation Works and may not be disclosed to, quoted to or relied upon by any person other than China Harbour Engineering Company Limited without our prior written consent. No person (other than China Harbour Engineering Company Limited) into whose possession a copy of this report comes may rely on this report without our express written consent and China Harbour Engineering Company Limited may not rely on it for any purpose other than as described above.

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Ref.: HYDHZMBEEM00_0_2035L.14

26 June 2014

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

By Fax (3698 5999) and By Post

Attention: Mr. Roger Marechal

Dear Mr. Marechal,

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

**Contract No. HY/2010/02
Hong Kong – Zhuhai – Macao Bridge
Hong Kong Boundary Crossing Facilities – Reclamation Work
Quarterly Environmental Monitoring & Audit Report for Dec 2013 to Feb 2014**

Reference is made to the Environmental Team's submission of the Quarterly Environmental Monitoring & Audit Report for December 2013 to February 2014 (letter ref. 60249820/C/RMKY14062603 dated 26 June 2014) copied to us by E-mail on 21 May 2014. Please be advised that we have no further comment at this stage.

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

1. Multi-parameter analytical approach for dolphin monitoring as per commitment by the ET in their R-t-C to ENPO-E0026 since 24 Dec 2013.

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 December 2013 and 28 February 2014. As informed by the Contractor, major activities in the reporting quarter were:-

Marine-based Works

- Cellular structure installation
- Connecting arc cell installation
- Laying geo-textile
- Sand blanket laying
- Sand filling
- Maintenance of silt curtain & silt screen at sea water intake of HKIA
- Stone column installation
- Band drain installation
- Backfill cellular structure
- Geotechnical Instrumentation works
- Construction of temporary seawall
- Ground investigation
- Surcharge laying
- Precast Yard setup
- Seawall blocks for temporary construction
- Construction of temporary access from Portion D to Portion A
- Construction of temporary pier at Portion A
- Sand Drain
- Vibro-compaction on surcharge
- Rubble mound seawall construction

Land-based Works

- Maintenance works of Site Office at Works Area WA2
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Geo-textile fabrication at Works Area WA2
- Installed sand bag at Works Area WA2
- Silt curtain fabrication at Works Area WA4

- Maintenance of Temporary Marine Access at Works Area WA2

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

24-hour Total Suspended Particulates (TSP) monitoring	15 sessions
1-hour TSP monitoring	15 sessions
Noise monitoring	12 sessions
Impact water quality monitoring	39 sessions
Impact dolphin monitoring	6 surveys
Joint Environmental site inspection	13 sessions

Breaches of Action and Limit Levels for Air Quality

All 1-Hour TSP results were below the Action and Limit Level in the reporting quarter. Six (6) 24-hour TSP results recorded among AMS2, AMS3A and AMS7 exceeded the Action Level and two (2) 24-hour TSP results recorded at AMS3A exceeded the Limit Level at in the reporting quarter. Investigation results show that the exceedances were not related to Project.

Breaches of Action and Limit Levels for Noise

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

Breaches of Action and Limit Levels for Water Quality

Ten (10) Action Level Exceedances were recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter. Three (3) Limit Level Exceedances were recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter.

Investigation result shows that the Action Level Exceedance recorded at SR5 and Limit Level Exceedance recorded at IS10 on 18 Dec 13 were related to Project. Investigation result shows that other water quality exceedances were unlikely to be project-related.

Breaches of Action and Limit Levels for Impact Dolphin Monitoring

Two (2) Action Level exceedances were recorded for Chinese White Dolphin monitoring in the reporting quarter.

Triggering of Event and Action Plan for Impact Dolphin Monitoring

Event and Action Plan for Impact Dolphin Monitoring was triggered. For the detail of investigation, please refer to appendix L.

Implementation Status and Review of Environmental Mitigation Measures

Most recommended mitigation measures, as included in the EM&A programme, were implemented properly in the reporting quarter.

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

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

Complaint, Notification of Summons and Successful Prosecution

As informed by the Contractor on 5 Dec 13, there was one (1) noise complain related to a barge moving through the southern channel of HyD's construction site after 23:00 on 8.11.2013. Site daily for barges was requested from the Contractor. Referring to the site daily provided by the Contractor, there was no barge operated after 18:25 on 08 Nov 13. The complaint is therefore considered unlikely to be related to the construction works.

As informed by the Contractor on 12 Dec 13. A complaint involves the leakage of sand from barges causing water discoloration at sea near Tuen Mun Pierhead Garden and sand material without properly covered was blown to the inside of the residential area which caused disturbance to residence. With refer to available information provided and monitoring data recorded on 09 Dec 13, it cannot indicate that the water quality impact and air quality impact were caused by the vessel of this Contract and therefore the complaint could not be concluded as related to this Contract

As informed by the Contractor on 6 Jan 14. A complaint involves barges loaded with sand material without properly covered was blown to the inside of the residential area of Tuen Mun Pierhead Garden which caused disturbance to residence. With refer to available information provided, it cannot indicate that the water quality impact and air quality impact were caused by the vessel of this Contract and therefore the complaint could not be concluded as related to this Contract.

EPD referred a complaint from complainant who advised that blackish mud was found along the edge of the construction site of Hong Kong-Zhuhai-Macao Bridge Hong Kong Project near the airport in the morning of 18 January 2014. Therefore in accordance with the investigation results, the complaint is therefore considered as not related to contract HY/2010/02.

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

1 INTRODUCTION

1.1 Background

- 1.1.1 Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Work (here below, known as “the Project”) mainly comprises seawall construction and reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCLKL).
- 1.1.2 The environmental impact assessment (EIA) reports (Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities – EIA Report (Register No. AEIAR-145/2009) (HKBCFEIA) and Tuen Mun – Chek Lap Kok Link – EIA Report (Register No. AEIAR-146/2009) (TMCLKLEIA), and their environmental monitoring and audit (EM&A) Manuals (original EM&A Manuals), for the Project were approved by Environmental Protection Department (EPD) in October 2009.
- 1.1.3 EPD subsequently issued the Environmental Permit (EP) for HKBCF in November 2009 (EP-353/2009) and the Variation of Environmental Permit (VEP) in June 2010 (EP-353/2009/A), November 2010 (EP-353/2009/B), November 2011 (EP-353/2009/C), March 2012 (EP-353/2009/D), October 2012 (EP-353/2009/E), April 2013 (EP-353/2009/F) and August 2013 (EP-353/2009/G). Similarly, EPD issued the Environmental Permit (EP) for TMCLKL in November 2009 (EP-354/2009) and the Variation of Environmental Permit (VEP) in December 2010 (EP-354/2009/A) and January 2014 (EP-354/2009/B).
- 1.1.4 The Project is a designated project and is governed by the current permits for the Project, i.e. the amended EPs issued on 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 eighth quarterly 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 from 1 December 2013 and 28 February 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	2528 3031	2668 3970
IEC / ENPO (ENVIRON Hong Kong Limited)	Independent Environmental Checker	Raymond Dai	3465 2888	3548 6988
	Environmental Project Office Leader	Y.H. Hui	3465 2868	3465 2899
Contractor (China Harbour Engineering Company Limited)	General Manager (S&E)	Daniel Leung	3157 1086	2578 0413
	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 the reporting quarter are listed below:-

Marine-based Works

- Cellular structure installation
- Connecting arc cell installation
- Laying geo-textile
- Sand blanket laying
- Sand filling
- Maintenance of silt curtain & silt screen at sea water intake of HKIA
- Stone column installation
- Band drain installation
- Backfill cellular structure
- Geotechnical Instrumentation works
- Construction of temporary seawall
- Ground investigation
- Surcharge laying
- Precast Yard setup
- Seawall blocks for temporary construction
- Construction of temporary access from Portion D to Portion A
- Construction of temporary pier at Portion A
- Sand Drain
- Vibro-compaction on surcharge
- Rubble mound seawall construction

Land-based Works

- Maintenance works of Site Office at Works Area WA2
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Geo-textile fabrication at Works Area WA2
- Installed sand bag at Works Area WA2
- Silt curtain fabrication at Works Area WA4
- 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.

2 SUMMARY OF EM&A PROGRAMME REQUIREMENTS

2.1 Monitoring Parameters

- 2.1.1 The Project Specific EM&A Manual designated 4 air quality monitoring stations, 2 noise monitoring stations, 21 water monitoring stations (9 Impact Stations, 7 Sensitive Receiver Stations and 5 Control/Far Field Stations) to monitor environmental impacts on air quality, noise and water quality respectively. Pre-set and fixed transect line vessel based dolphin survey was required in two AFCD designated areas (Northeast and Northwest Lantau survey areas). The impact dolphin monitoring at each survey area should be conducted twice per month.
- 2.1.2 For impact air quality monitoring, monitoring locations AMS2 (Tung Chung Development Pier) and AMS7 (Hong Kong SkyCity Marriott Hotel) were set up at the proposed locations in accordance with Project Specific EM&A Manual. The conditional omission of Monitoring Station AMS6 was effective since 19 November 2012. For monitoring location AMS3 (Ho Yu College), as proposed in the Project Specific EM&A Manual, approval for carrying out impact monitoring could not be obtained from the principal of the school. Permission on setting up and carrying out impact monitoring works at nearby sensitive receivers, like Caribbean Coast and Coastal Skyline, was also sought. However, approvals for carrying out impact monitoring works within their premises were not obtained. Impact air quality monitoring was conducted at site boundary of the site office area in Works Area WA2 (AMS3A) respectively. Same baseline and Action Level for air quality, as derived from the baseline monitoring data recorded at Ho Yu College, was adopted for this alternative air quality location.
- 2.1.3 For impact noise monitoring, monitoring locations NMS2 (Seaview Crescent Tower 1) was set up at the proposed locations in accordance with Project Specific EM&A Manual. However, for monitoring location NMS3 (Ho Yu College), as proposed in the Project Specific EM&A Manual, approval for carrying out impact monitoring could not be obtained from the principal of the school. Permission on setting up and carrying out impact monitoring works at nearby sensitive receivers, like Caribbean Coast and Coastal Skyline, was also sought. However, approvals for carrying out impact monitoring works within their premises were not obtained. Impact noise monitoring was conducted at site boundary of the site office area in Works Area WA2 (NMS3A) respectively. Same baseline noise level, as derived from the baseline monitoring data recorded at Ho Yu College was adopted for this alternative noise monitoring location.
- 2.1.4 In accordance with the Project Specific EM&A Manual, twenty-one stations were designated for impact water quality monitoring. The nine Impact Stations (IS) were chosen on the basis of their proximity to the reclamation and thus the greatest potential for water quality impacts, the seven Sensitive Receiver Stations (SR) were chosen as they are close to the key sensitive receives and the five Control/ Far Field Stations (CS) were chosen to facilitate comparison of the water quality of the IS stations with less influence by the Project/ ambient water quality conditions.
- 2.1.5 Due to safety concern and topographical condition of the original locations of SR4 and SR10B, alternative impact water quality monitoring stations, naming as SR4(N) and SR10B(N), were adopted, which are situated in vicinity of the original impact water quality monitoring stations (SR4 and SR10B) and could be reachable. Same baseline and Action Level for water quality, as derived from the baseline monitoring data recorded, were adopted for these alternative impact water quality monitoring stations.
- 2.1.6 The monitoring locations used during the reporting quarter are depicted in Figures 2, 3 and 4 respectively.
- 2.1.7 The Project Specific EM&A Manual also required environmental site inspections for air quality, noise, water quality, chemical, waste management, marine ecology and landscape and visual impact.

2.2 Environmental Quality Performance (Action/Limit Levels)

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

2.3 Environmental Mitigation Measures

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

3 MONITORING RESULTS

3.1 Air Quality Monitoring

- 3.1.1 In accordance with the Project Specific EM&A Manual, impact 1-hour Total Suspended Particulates (TSP) monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days at the 4 monitoring stations (AMS2, AMS3A, AMS6 and AMS7).
- 3.1.2 The monitoring locations for impact air quality monitoring are depicted in Figure 2. However, for AMS6 (Dragonair/CNAC (Group) Building), permission on setting up and carrying out impact monitoring works was sought, however, access to the premise has not been granted yet on this report issuing date.
- 3.1.3 The weather was mostly sunny, with occasional cloudy and occasional rainy in the reporting quarter. The major dust source in the reporting quarter included construction activities from the Project, as well as nearby traffic emissions.
- 3.1.4 The number of monitoring events and exceedances recorded in each month of the reporting quarter are presented in Table 3.1 and Table 3.2 respectively.

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

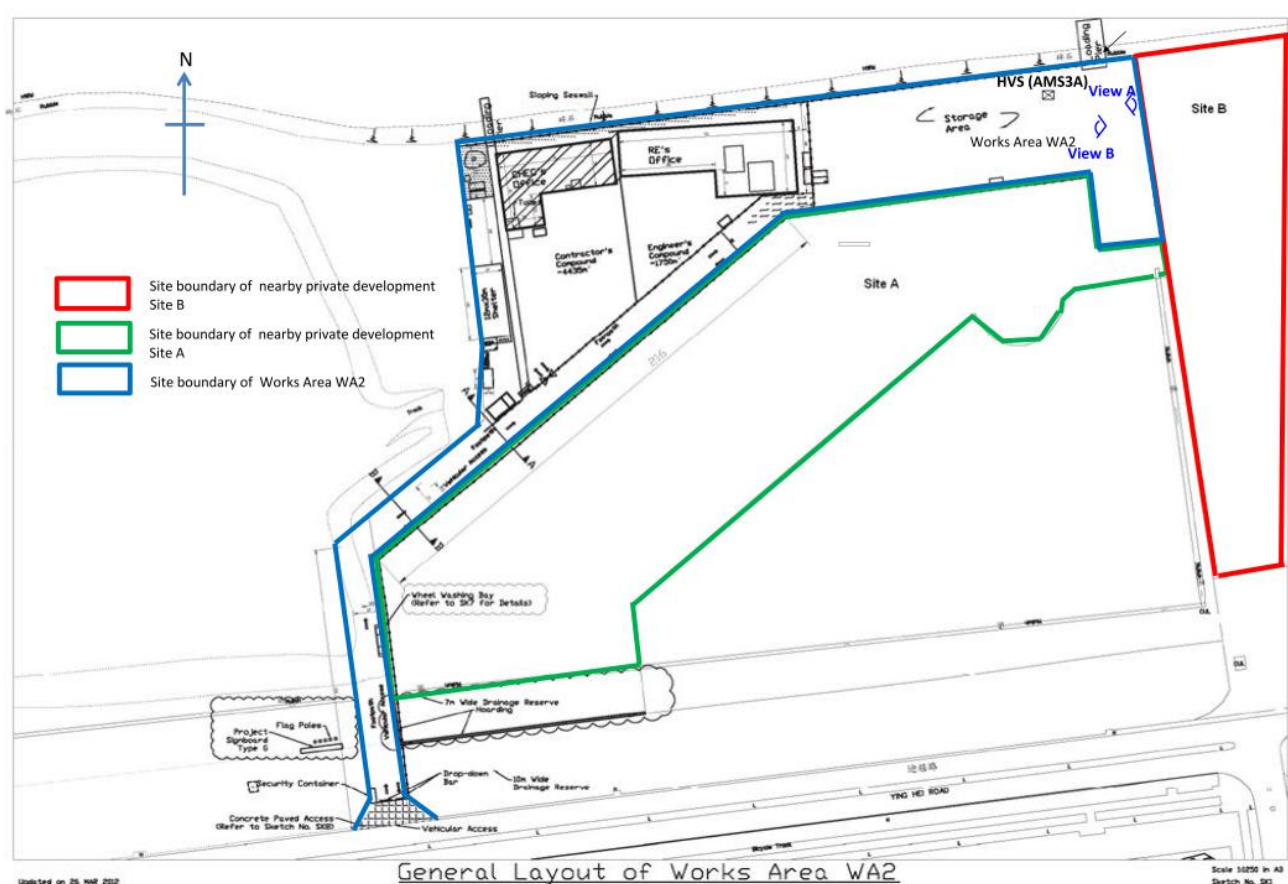
Monitoring Parameter	Location	No. of monitoring events		
		December 13	January 14	February 14
1-hr TSP	AMS2	15	15	15
	AMS3A	15	15	15
	AMS7	15	15	15
24-hr TSP	AMS2	5	5	5
	AMS3A	5	5	5
	AMS7	5	5	5

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

Monitoring Parameter	Location	Level of Exceedance	Level of Exceedance		
			December 13	January 14	February 14
1-hr TSP	AMS2	Action	0	0	0
		Limit	0	0	0
	AMS3A	Action	0	0	0
		Limit	0	0	0
	AMS7	Action	0	0	0
		Limit	0	0	0
		Total	0	0	0
24-hr TSP	AMS2	Action	0	0	0
		Limit	0	0	0
	AMS3A	Action	1	2	0
		Limit	0	2	0
	AMS7	Action	1	2	0
		Limit	0	0	0
		Total	2	6	0

- 3.1.5 All 1-Hour TSP results were below the Action and Limit Level in the reporting quarter. Six (6) 24-hour TSP results recorded among AMS2, AMS3A and AMS7 exceeded the Action Level and two (2) 24-hour TSP results recorded at AMS3A exceeded the Limit Level at in the reporting quarter. Investigation results show that the exceedances were not related to Project.

- 3.1.6 For the 24Hr TSP Action Level exceedance recorded at AMS3A, a result of $212\mu\text{g}/\text{m}^3$ was recorded on 11 Dec 13 (24-hr TSP).
- 3.1.6.1 According to information provided by the Contractor, land-based construction activity such as installation of sand bags, delivery of band drain material and stitching of Type 2 geotextile were being undertaken at Works Area WA2 during the monitoring period.
- 3.1.6.2 Functional checking on HVS at AMS3A was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3A. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.
- 3.1.6.3 Photo records shows vehicle parking activities were observed inside an area at construction sites of nearby private development project which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA2. (Please also see photo and layout map attached for reference of site conditions (View A.))
- 3.1.6.4 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 10 and 11 Dec 13 (as attached) east winds was prevailing during the monitoring period. Traffic activities at construction sites of nearby private development project which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA 2 may contribute to the measured dust levels at the monitoring station AMS3A.



Conditions of the construction sites near Works Area WA2:

View A: (Parking lot observed at nearby construction site which do not belongs to this Contract):



View B (Hard paved surface observed at Works Area WA2)



- 3.1.6.5 The 1-hr TSP values recorded at AMS3A on 11 Dec 13, which are within the monitoring period of the 24-hr TSP, were 84 $\mu\text{g}/\text{m}^3$, 88 $\mu\text{g}/\text{m}^3$ and 86 $\mu\text{g}/\text{m}^3$ respectively. All measured values are well below the Action and Limit Levels.
- 3.1.6.6 The measured 24-hr TSP values recorded at AMS2 and AMS7 (which are closer to the marine-based works areas) on the same monitoring date were 155 $\mu\text{g}/\text{m}^3$ and 165 $\mu\text{g}/\text{m}^3$ respectively, which are below the Action and Limit Levels.
- 3.1.6.7 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 attached layout map and photo record (View B))
 2. Vehicle washing facility was provided at vehicle exit points,
 3. Measures for preventing fugitive dust emission are provided, e.g. canvas/tarpaulin covers.
- 3.1.6.8 The dust exceedance was therefore considered not to be due to the Project works.
- 3.1.6.9 The Contractor was recommended to continue implementing existing dust mitigation measures.

- 3.1.7 For the 24Hr TSP Action Level exceedance recorded at AMS7, a result of $186\mu\text{g}/\text{m}^3$ was recorded on 27 Dec 13 (24-hr TSP).
- 3.1.7.1 According to information provided by the Contractor during the monitoring period. Marine-based construction activity such as band drain, stone column installation and cellular structure installation was being undertaken at C2a, portion D and portion A.
- 3.1.7.2 Stone column was being installed at the seabed therefore it is considered that stone column installation at Portion D and Portion A is unlikely to contribute to the recorded 24hr-TSP exceedance.
- 3.1.7.3 Both band drain and cellular structure installation conducted at C2a, portion D and portion A are unlikely to contribute to the recorded 24hr-TSP exceedance due to no significant fugitive dust was expected to be generated in the process.
- 3.1.7.4 Excavators and generators were operated by ultra low sulphur diesel (ULSD) to minimize the possibility of air pollution have been implemented at throughout the construction site.
- 3.1.7.5 Photo record below shows that the Contractor implemented dust control measures on works area of Portion A:



- 3.1.7.6 Functional checking on HVS at AMS7 was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS7. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.
- 3.1.7.7 The 1-hr TSP values recorded at AMS7 on 27 Dec 13, which are within the monitoring days of the 24-hr TSP, were $89\mu\text{g}/\text{m}^3$, $89\mu\text{g}/\text{m}^3$ and $88\mu\text{g}/\text{m}^3$ respectively. All measured values are well below the Action and Limit Levels.
- 3.1.7.8 The measured 24-hr TSP values recorded at AMS2 and AMS3A on the same monitoring date were $93\mu\text{g}/\text{m}^3$ and $160\mu\text{g}/\text{m}^3$ respectively, which are below the Action and Limit Levels.
- 3.1.7.9 On the other hand, according to observation made at the monitoring station AMS7, there was no non-project potential cause/activity at the surrounding of monitoring station AMS7 which might potentially contribute to the dust action level exceedance.
- 3.1.7.10 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 27 and 28 Dec 13 (as attached) southwest winds was prevailing during the monitoring period. Construction works carried out by this Contract is unlikely to cause dust exceedance at AMS7 under South-southwest prevailing wind direction. The dust exceedance was therefore considered not to be due to the Project works.
- 3.1.7.11 The Contractor was recommended to continue implementing existing dust mitigation measures and the Contractor was reminded ensure to undertake watering at least 8 times per day on all exposed soil within the Project site and associated work areas throughout the construction phase.

- 3.1.8 For the 24Hr TSP Limit Level exceedance recorded at AMS3A, a result of $502\mu\text{g}/\text{m}^3$ was recorded on 07 Jan 14 (24-hr TSP).
- 3.1.8.1 According to information provided by the Contractor, land-based construction activity such as stitching and transloading of Type 2 geotextile were being undertaken at Works Area WA2 during the monitoring period.
- 3.1.8.2 Functional checking on HVS at AMS3A was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3A. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.
- 3.1.8.3 Photo records shows fugitive dust were generated by vehicle activities observed inside an area at construction sites of nearby private development project which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA2. (Please also see photo and layout map attached for reference of site conditions (View A.))

View A (fugitive dust were observed at the parking lot of the nearby construction site which do not belongs to this Contract)



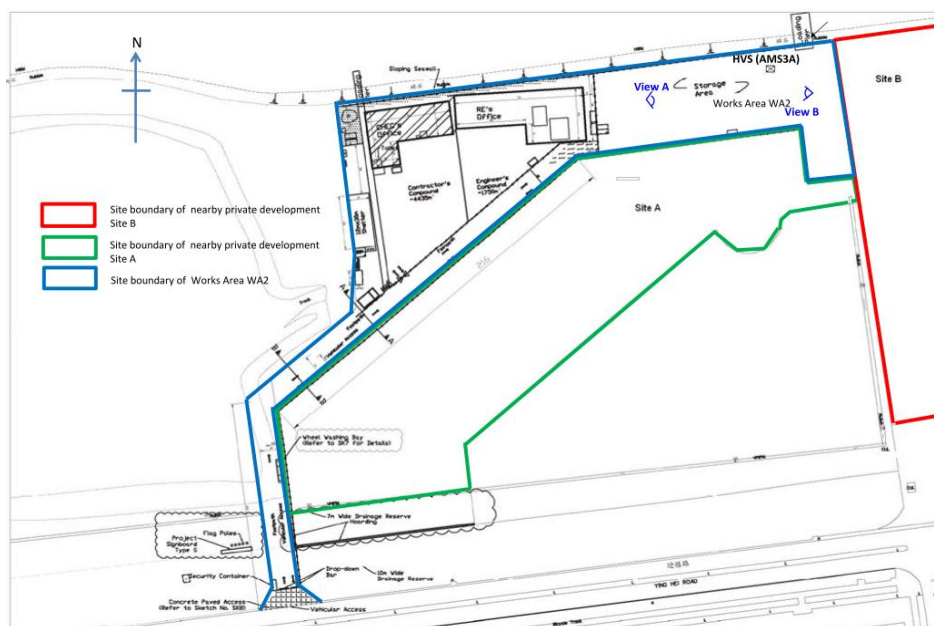
- 3.1.8.4 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 06 and 07 Jan 14 (as attached) Southeast wind was prevailing during the monitoring period. Traffic activities at construction sites of nearby private development project which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA 2 may contribute to the measured dust levels at the monitoring station AMS3A.
- 3.1.8.5 The 1-hr TSP values recorded at AMS3A on 7 Jan 14, which are within the monitoring period of the 24-hr TSP, were $84\mu\text{g}/\text{m}^3$, $83\mu\text{g}/\text{m}^3$ and $83\mu\text{g}/\text{m}^3$ respectively. All measured values are well below the Action and Limit Levels.
- 3.1.8.6 The measured 24-hr TSP values recorded at AMS7 (which are closer to the marine-based works areas) on the same monitoring date was $133\mu\text{g}/\text{m}^3$, which are below the Action and Limit Levels.
- 3.1.8.7 The measured 24-hr TSP values recorded at AMS3A on next monitoring date were $154\mu\text{g}/\text{m}^3$, which was below the Action and Limit Level.

- 3.1.8.8 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 attached layout map and photo record (View B))
 2. Vehicle washing facility was provided at vehicle exit points,
 3. Measures for preventing fugitive dust emission are provided, e.g. canvas/tarpaulin covers.
- 3.1.8.9 The Contractor was recommended to continue implementing existing dust mitigation measures.

View B (Hard paved surface observed at Works Area WA2)

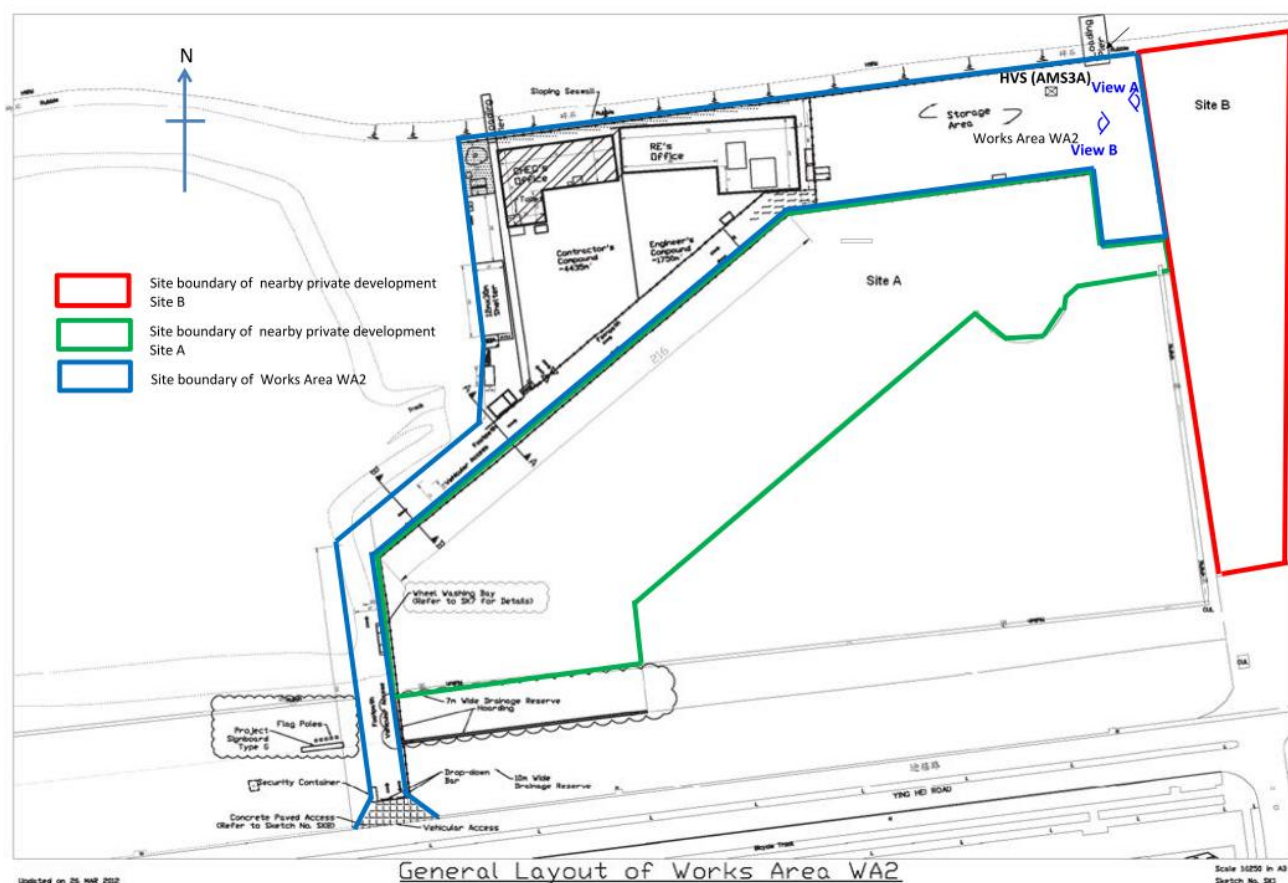


The following figure is the General Layout of Works Area WA2

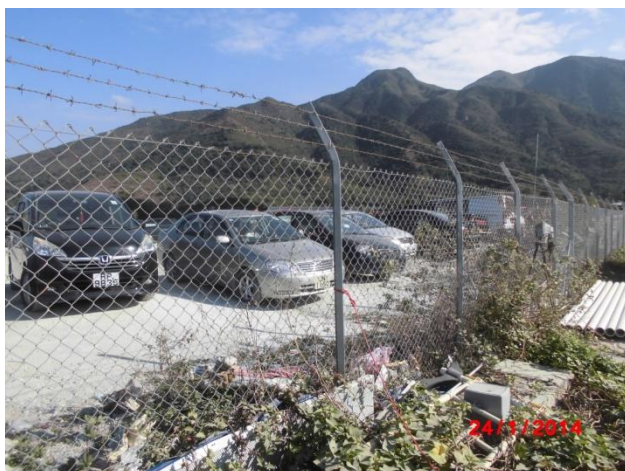


- 3.1.9 For the 24Hr TSP Action Level exceedance recorded at AMS2, a result of $185\mu\text{g}/\text{m}^3$ was recorded on 08 Jan 14 (24-hr TSP).
- 3.1.9.1 According to information provided by the Contractor during the monitoring period. Marine-based construction activity such as band drain, stone column installation and cellular structure installation was being undertaken at C2a, C2c, C1a, C1b, D, E1, E2, A and B.
- 3.1.9.2 Stone column was being installed at the seabed therefore it is considered that stone column installation at Portion E1, E2 and Portion B is unlikely to contribute to the recorded 24hr-TSP exceedance.
- 3.1.9.3 Both band drain or cellular structure installation conducted at C2a, C2b, C2c, C1a, C1b, E1, E2, A and B are unlikely to contribute to the recorded 24hr-TSP exceedance due to no significant fugitive dust was expected to be generated in the process.
- 3.1.9.4 Checking record of Jan 14 shows that plant engine is operated by ULSD.
- 3.1.9.5 With reference to the weekly joint site inspection records of 2, 9, 16, 22 and 29 of Jan 14, no dark smoke of was observed and this indicates that plant engines are properly maintained.
- 3.1.9.6 Excavators and generators were operated by ultra low sulphur diesel (ULSD) to minimize the possibility of air pollution have been implemented at throughout the construction site.
- 3.1.9.7 Functional checking on HVS at AMS2 was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS2. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.
- 3.1.9.8 The 1-hr TSP values recorded at AMS2 on 7 Jan 14, were $84\mu\text{g}/\text{m}^3$, $83\mu\text{g}/\text{m}^3$ and $85\mu\text{g}/\text{m}^3$ respectively. All measured values are well below the Action and Limit Levels.
- 3.1.9.9 The measured 24-hr TSP values recorded at AMS7 (which is located closer to active works than AMS2) on 7 Jan 14 was $133\mu\text{g}/\text{m}^3$, which was below the Action and Limit Levels.
- 3.1.9.10 On the other hand, according to observation made at the monitoring station AMS2, there was no non-project potential cause/activity at the surrounding of monitoring station AMS2 which might potentially contribute to the dust action level exceedance.
- 3.1.9.11 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 7 and 8 Jan 14 (as attached), East-southeast winds were prevailing during the monitoring period. Construction works carried out by this Contract are unlikely to cause dust exceedance at AMS2 under the abovementioned prevailing wind directions.
- 3.1.9.12 The dust exceedance was therefore considered not to be due to the Project works.
- 3.1.9.13 The Contractor was recommended to continue implementing existing dust mitigation measures and the Contractor was reminded ensure to undertake watering at least 8 times per day on all exposed soil within the Project site and associated work areas throughout the construction phase.

- 3.1.10 For the 24Hr TSP Action Level exceedance recorded at AMS3A, a result of $175\mu\text{g}/\text{m}^3$ was recorded on 18 Jan 14 (24-hr TSP).
- 3.1.10.1 According to information provided by the Contractor, land-based construction activities such as transloading land based equipment, accessories and installed sand bags were being undertaken at Works Area WA2 during the monitoring period.
- 3.1.10.2 Functional checking on HVS at AMS3A was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3A. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.
- 3.1.10.3 Photo records shows vehicle parking activities were observed inside an area at construction sites of nearby private development project which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA2. (Please also see photo and layout map attached for reference of site conditions (View A.))



View A (parking lot observed at nearby construction site which do not belongs to this Contract)



- 3.1.10.4 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 17 and 18 Jan 14 (as attached) South-southeast winds was prevailing during the monitoring period. Traffic activities at construction sites of nearby private development project which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA 2 may contribute to the measured dust levels at the monitoring station AMS3A.
- 3.1.10.5 The 1-hr TSP values recorded at AMS3A on 18 Jan 14, which are within the monitoring period of the 24-hr TSP, were $84\mu\text{g}/\text{m}^3$, $83\mu\text{g}/\text{m}^3$ and $85\mu\text{g}/\text{m}^3$ respectively. All measured values are well below the Action and Limit Levels.
- 3.1.10.6 The measured 24-hr TSP values recorded at AMS2 (which are closer to the marine-based works areas) on the same monitoring date were $124\mu\text{g}/\text{m}^3$, which were below the Action and Limit Levels.
- 3.1.10.7 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 attached layout map and photo record (View B))
 2. Vehicle washing facility was provided at vehicle exit points,
 3. Measures for preventing fugitive dust emission are provided, e.g. canvas/tarpaulin covers.

View B (Hard paved surface observed at Works Area WA2)

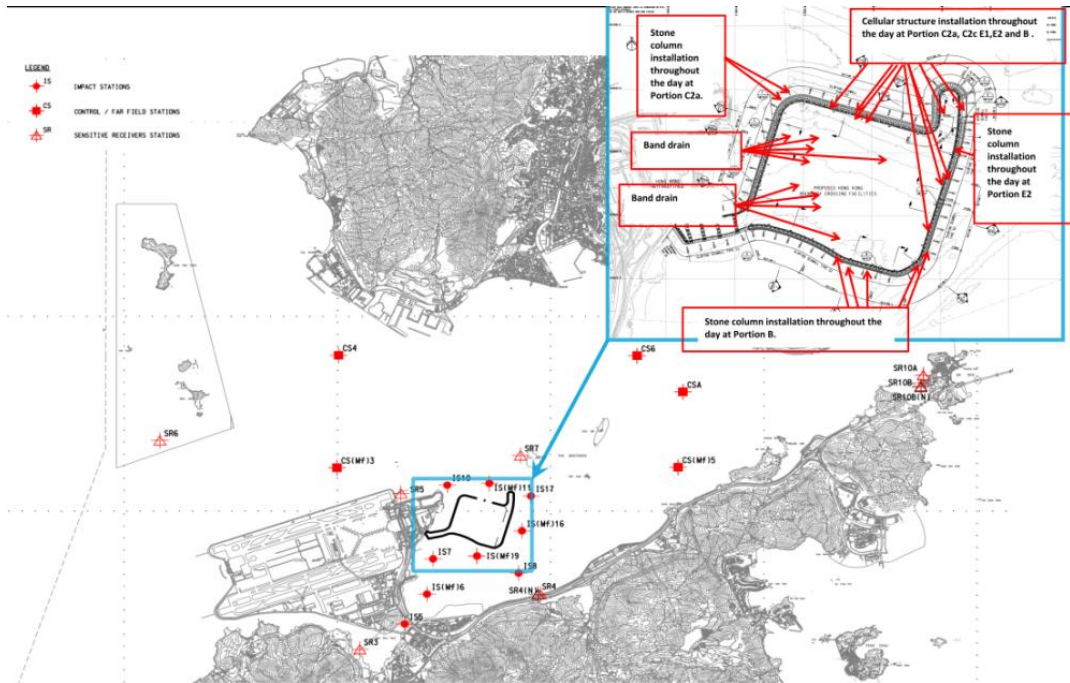


- 3.1.10.8 The dust exceedance was therefore considered not to be related to the Project works.

3.1.11 For the 24Hr TSP Action Level exceedance recorded at AMS7, a result of $207\mu\text{g}/\text{m}^3$ was recorded on 18 Jan 14 (24-hr TSP).

3.1.11.1 According to information provided by the Contractor during the monitoring period. Marine-based construction activity such as band drain, stone column installation and cellular structure installation was being undertaken at all area except Portion D.

3.1.11.2 Stone column was being installed at the seabed therefore it is considered that stone column installation at Portion C2a, Portion E2 and Portion B are unlikely to contribute to the recorded 24hr-TSP exceedance. For active works carried out on 18 Jan 14, please refer to the below layout map.



3.1.11.3 Both band drain or cellular structure installation which was conducted during the monitoring period are considered unlikely to contribute to the recorded 24hr-TSP exceedance due to no significant fugitive dust was expected to be generated in the process.

3.1.11.4 Excavators and generators were operated by ultra low sulphur diesel (ULSD) to minimize the possibility of air pollution have been implemented at throughout the construction site.

3.1.11.5 Checking record of Jan 14 shows that plant engine was operated by ULSD.

3.1.11.6 With reference to the weekly joint site inspection records of 2, 9, 16, 22 and 29 of Jan 14, no dark smoke of was observed and this indicates that plant engines are properly maintained.

3.1.11.7 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 23 and 24 Jan 14, South-southeast winds was prevailing during the monitoring period. However, photo record attached shows that dust control measures was implemented by the Contractor.

Photo record showed that the Contractor implemented dust control measures on pelican barge loaded with rock/sand. The Contractor was reminded to continue to provide dust control measures on pelican barge loaded with rock/sand.



Photo record showed that the Contractor implemented dust control measures such as wind-board installed on pelican barge. The Contractor was reminded to continue to provide such dust control measure.



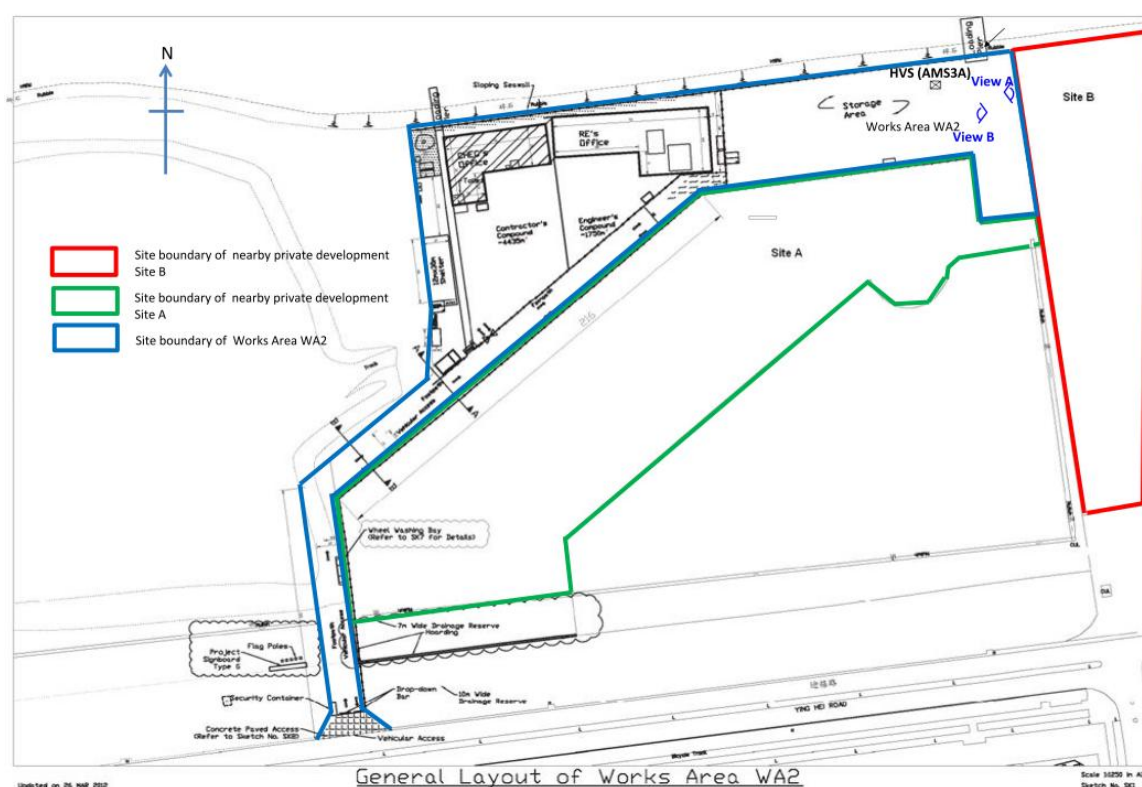
- 3.1.11.8 Functional checking on HVS at AMS7 was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3A. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.
- 3.1.11.9 The 1-hr TSP values recorded at AMS7 on 18 Jan 14, which are within the monitoring days of the 24-hr TSP, were $84\mu\text{g}/\text{m}^3$, $83\mu\text{g}/\text{m}^3$ and $83\mu\text{g}/\text{m}^3$ respectively. All measured values are well below the Action and Limit Levels.
- 3.1.11.10 The measured 24-hr TSP values recorded at AMS2 and AMS3A on the same monitoring date were $93\mu\text{g}/\text{m}^3$ and $160\mu\text{g}/\text{m}^3$ respectively, which are below the Action and Limit Levels.
- 3.1.11.11 On the other hand, according to observation made at the monitoring station AMS7, there was no non-project potential cause/activity at the surrounding of monitoring station AMS7 which might potentially contribute to the dust action level exceedance.

Photo shows the conditions of the surrounding near the monitoring station AMS7:

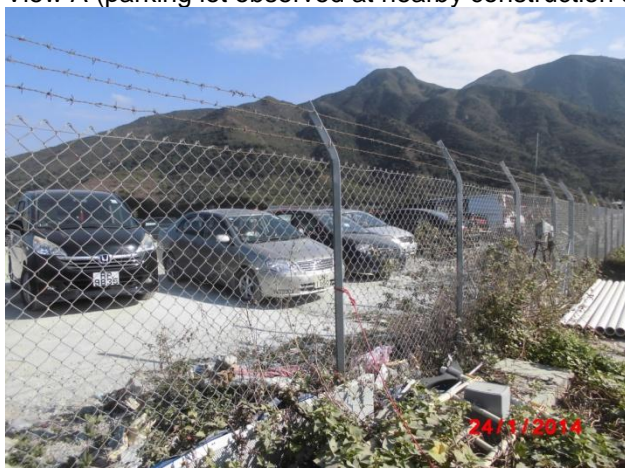


3.1.11.12 The dust exceedance was therefore considered not to be due to the Project works.

- 3.1.12 For the 24Hr TSP limit Level exceedance recorded at AMS3A, a result of $374\mu\text{g}/\text{m}^3$ was recorded on 24 Jan 14 (24-hr TSP).
- 3.1.12.1 According to information provided by the Contractor, land-based construction activities such as transloading band drain material, sand bags and tidy up and clearance of site area were being undertaken at Works Area WA2 during the monitoring period.
- 3.1.12.2 Functional checking on HVS at AMS3A was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3A. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.
- 3.1.12.3 Photo records shows vehicle parking activities were observed inside an area at construction sites of nearby private development project which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA2. (Please also see photo and layout map attached for reference of site conditions (View A.))



View A (parking lot observed at nearby construction site which do not belongs to this Contract)



- 3.1.12.4 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 23 and 24 Jan 14 (as attached) Southeast winds was prevailing during the monitoring period. Traffic activities at construction sites of nearby private development project which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA 2 may contribute to the measured dust levels at the monitoring station AMS3A.
- 3.1.12.5 The 1-hr TSP values recorded at AMS3A on 24 Jan 14, which are within the monitoring period of the 24-hr TSP, were $84\mu\text{g}/\text{m}^3$, $82\mu\text{g}/\text{m}^3$ and $81\mu\text{g}/\text{m}^3$ respectively. All measured values are well below the Action and Limit Levels.
- 3.1.12.6 The measured 24-hr TSP values recorded at AMS2 and AMS7 (which are closer to the marine-based works areas) on the same monitoring date were $66\mu\text{g}/\text{m}^3$ and $109\mu\text{g}/\text{m}^3$, which are below the Action and Limit Levels.
- 3.1.12.7 The measured 24-hr TSP value recorded at AMS3A on next monitoring date was $183\mu\text{g}/\text{m}^3$, which exceeded the Action Level (The dust exceedance was considered not to be due to the Project works after investigation).
- 3.1.12.8 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 attached layout map and photo record (View B))
 2. Vehicle washing facility was provided at vehicle exit points,
 3. Measures for preventing fugitive dust emission are provided, e.g. canvas/tarpaulin covers.

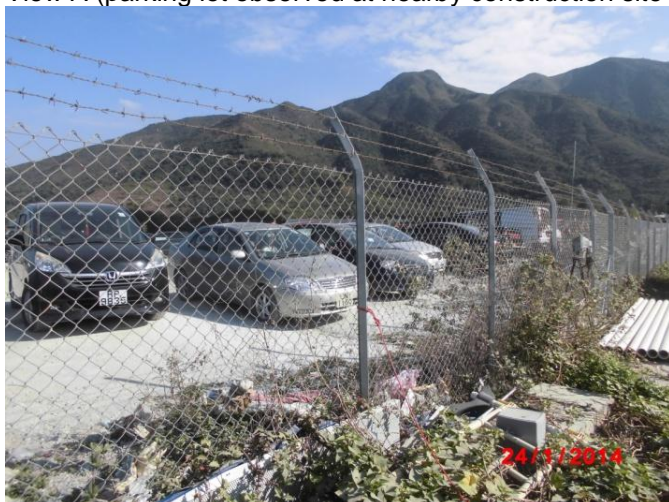
View B (Hard paved surface observed at Works Area WA2)



- 3.1.12.9 The dust exceedance was therefore considered not to be due to the Project works.

- 3.1.13 For the 24Hr TSP Action Level exceedance recorded at AMS3A, a result of $183\mu\text{g}/\text{m}^3$ was recorded on 28 Jan 14 (24-hr TSP). And the 24hr-TSP results received on 4 Feb 14.
- 3.1.13.1 According to information provided by the Contractor, land-based construction activity such removing batch/rolls of materials off site area was being undertaken at Works Area WA2 during the monitoring period.
- 3.1.13.2 Functional checking on HVS at AMS3A was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3A. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.
- 3.1.13.3 Photo records shows vehicle parking activities were observed inside an area at construction sites of nearby private development project which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA2. (Please also see photo and layout map attached for reference of site conditions (View A.))

View A (parking lot observed at nearby construction site which do not belongs to this Contract)



- 3.1.13.4 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 28 and 29 Jan 14 (as attached) South-southeast winds was prevailing during the monitoring period. Traffic activities at construction sites of nearby private development project which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA 2 may contribute to the measured dust levels at the monitoring station AMS3A.
- 3.1.13.5 The 1-hr TSP values recorded at AMS3A on 29 Jan 14, which are within the monitoring period of the 1-hr TSP, were $83\mu\text{g}/\text{m}^3$, $84\mu\text{g}/\text{m}^3$ and $82\mu\text{g}/\text{m}^3$ respectively. All measured values are well below the Action and Limit Levels.
- 3.1.13.6 The measured 24-hr TSP values recorded at AMS2 and AMS7 (which are closer to the marine-based works areas) on the same monitoring date were $106\mu\text{g}/\text{m}^3$ and $129\mu\text{g}/\text{m}^3$, which are below the Action and Limit Levels.
- 3.1.13.7 The measured 24-hr TSP values recorded at AMS3A on next monitoring date were $79\mu\text{g}/\text{m}^3$, which did not exceed the Action or Limit Level.
- 3.1.13.8 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 attached layout map and photo record (View B))
 2. Vehicle washing facility was provided at vehicle exit points,
 3. Measures for preventing fugitive dust emission are provided, e.g. canvas/tarpaulin covers.

View B (Hard paved surface observed at Works Area WA2)



- 3.1.13.9 The dust exceedance was therefore considered not to be due to the Project works.
- 3.1.14 The graphical plots of the trends of the monitoring results are provided in Appendix E. No specific trend of the monitoring results or existence of persistent pollution source was noted.
- 3.1.15 The event action plan is annexed in Appendix L.

3.2 Noise Monitoring

- 3.2.1 Impact noise monitoring was conducted at the 2 monitoring stations (NMS2 and NMS3A) for at least once per week during 07:00 – 19:00 in the reporting quarter.
- 3.2.2 The monitoring locations used during the reporting quarter are depicted in Figure 2.
- 3.2.3 No Action or Limit Level Exceedance of construction noise was recorded in the reporting quarter.
- 3.2.4 Major noise sources during the noise monitoring included construction activities of the Project and nearby traffic noise.
- 3.2.5 The number of impact noise monitoring events and exceedances are summarized in Table 3.3 and Table 3.4 respectively

Table 3.3 Summary of Number of Monitoring Events for Impact Noise

Monitoring Parameter	Location	No. of monitoring events		
		December 13	January 14	February 14
	NMS2	4	4	4
	NMS3A	4	4	4

Table 3.4 Summary of Number of Monitoring Exceedances for Impact Noise

Monitoring Parameter	Location	Level of Exceedance	Level of Exceedance		
			December 13	January 14	February 14
	NMS2	Action	0	0	0
		Limit	0	0	0
	NMS3A	Action	0	0	0
		Limit	0	0	0
		Total	0	0	0

- 3.2.6 The graphical plots of the trends of the monitoring results are provided in Appendix F. No specific trend of the monitoring results or existence of persistent pollution source was noted.
- 3.2.7 The event action plan is annexed in Appendix L.

3.3 Water Quality Monitoring

3.3.1 The monitoring locations used during the reporting quarter are depicted in Figure 3.

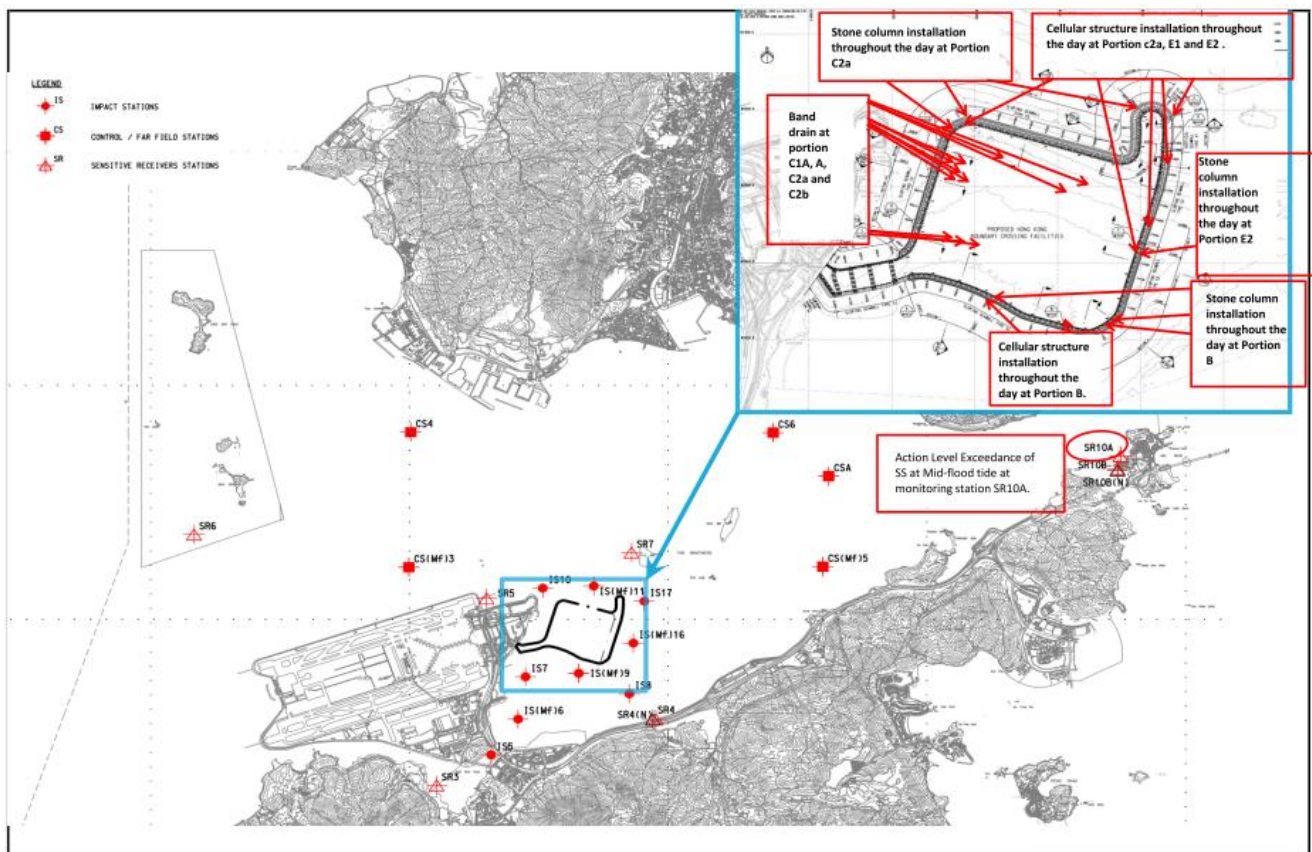
3.3.2 Ten (10) Action Level Exceedances were recorded at measured suspended solids (SS) values (in mg/L) in the reporting Quarter. Three (3) Limit Level exceedances were recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter.

Table 3.5 Summary of Water Quality Exceedances in Dec 13- Feb 14

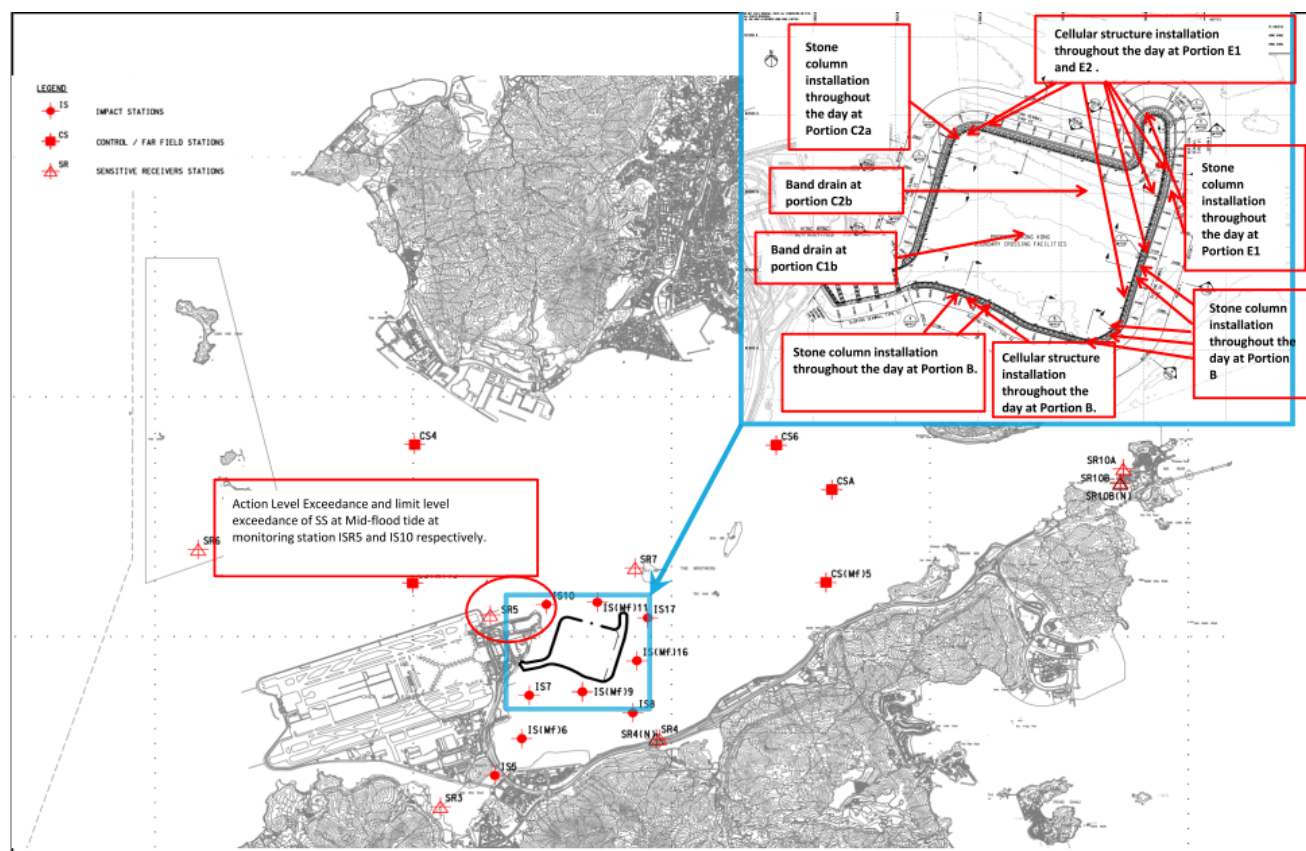
Station	Exceedance Level	DO (S&M)		DO (Bottom)		Turbidity		SS		Total	
		Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood
IS5	Action	0	0	0	0	0	0	0	(1) 10 Jan14	0	1
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)6	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS7	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS8	Action	0	0	0	0	0	0	0	(1) 6 Jan14	0	1
	Limit	0	0	0	0	0	0	0	(1) 20 Dec13	0	1
IS(Mf)9	Action	0	0	0	0	0	0	0	(1) 18 Dec13, (2) 6, 15 Jan14	0	3
	Limit	0	0	0	0	0	0	0	(1) 17 Jan14	0	1
IS10	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	(1) 18 Dec13	0	1
IS(Mf)11	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)16	Action	0	0	0	0	0	0	0	(1) 21 Feb14	0	1
	Limit	0	0	0	0	0	0	0	0	0	0
IS17	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR3	Action	0	0	0	0	0	0	0	(1) 10 Jan14	0	1
	Limit	0	0	0	0	0	0	0	0	0	0
SR4(N)	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR5	Action	0	0	0	0	0	0	0	(1) 18 Dec 13	0	1
	Limit	0	0	0	0	0	0	0	0	0	0
SR6	Action	0	0	0	0	0	0	0	(1) 3 Jan14	0	1
	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) 6 Dec13	0	1
	Limit	0	0	0	0	0	0	0	0	0	0
SR10B (N)	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
Total	Action	0	0	0	0	0	0	0	10	10	
	Limit	0	0	0	0	0	0	0	3	3	

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

- 3.3.3 One (1) Action Level exceedance at measured Suspended Solids (mg/L) was recorded on 06 Dec 2013 at monitoring station SR10A at Mid-flood tide. For Action Level exceedances at measured Suspended Solids (mg/L), 28.2 mg/L was recorded at Monitoring Station SR10A.
- 3.3.3.1 For locations and type of active works carried out on 6 Dec 13, please refer to the above layout map.
- 3.3.3.2 IS(Mf)11 and IS10 are located downstream and closer to the active works than monitoring station SR10A 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 SR10A.
- 3.3.3.3 The monitoring location of monitoring station SR10A are considered upstream and remote to the active works of this project during flood tide. Therefore it was unlikely that the exceedance recorded at SR10A during flood tide was due to active construction activities of this project.
- 3.3.3.4 The depth averaged SS (in mg/L) and depth averaged turbidity (in NTU) at CS(Mf)5 is 12mg/L and 18.7NTU respectively which is below the action and limit levels. This indicates that water quality at area closer to active works was not adversely affected.
- 3.3.3.5 The exceedance was likely due to local effects in the vicinity of SR10A.
- 3.3.3.6 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.
- 3.3.3.7 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except on Sunday and public holiday.



- 3.3.4 One (1) action level exceedances at measured Suspended Solids (mg/L) was recorded on 18 Dec 2013 at monitoring station SR5 at Mid-flood tide and one (1) limit level exceedance at measured Suspended Solids (mg/L) was recorded on 18 Dec 2013 at monitoring station IS10 at Mid-flood tide. For Action Level exceedance at measured Suspended Solids (mg/L), 33.2mg/L were recorded at Monitoring Station SR5. For limit level exceedance at measured Suspended Solids (mg/L), 34.9 mg/L was recorded at Monitoring Station IS10.



- 3.3.4.1 For locations and type of active works carried out on 18 Dec 13, please refer to the above layout map.
- 3.3.4.2 Exceedances recorded at SR5 and IS10 are likely due to marine based construction activities of the Project because:
- 3.3.4.3 With refer to monitoring record, appearance of water was not clear at IS10 and SR5 when compared with the appearance of water at IS(Mf)11 and IS17 during monitoring during Mid-flood tide on 18 Dec 13. This indicates the source of exceedance may not due to works activities at portion E1 and E2 which is directly upstream of IS(Mf)11 and IS17. The relatively turbid water observed at IS10 and SR5 may due to activities at Portion C2a during flood tide.
- 3.3.4.4 As informed by the Contractor, active works like stone column and cellular structure installation were carried out at Portion C2a, E1, E2 and B on 18 and 20 Dec 13. With review of the information provided by the Contractor, active works like stone column and cellular structure installation were both carried out at Portion C2a, E1, E2 and B on 16, 18 and 20 Dec 13 at almost the same location but no exceedance was recorded at monitoring station SR5, IS10 and IS(Mf)9 on 16 and 20 Dec 13 during mid flood tide. This indicates stone column and cellular structure installation were unlikely to cause the exceedance at monitoring station SR5, IS10 and IS(Mf)9 on 18 Dec 13.
- 3.3.4.5 With refer to the silt curtain condition on 18 Dec 13, defects of the perimeter silt curtain was observed at northwest of the construction site.

3.3.4.6 As such, the exceedances recorded at IS10 and SR5 were considered as project related.

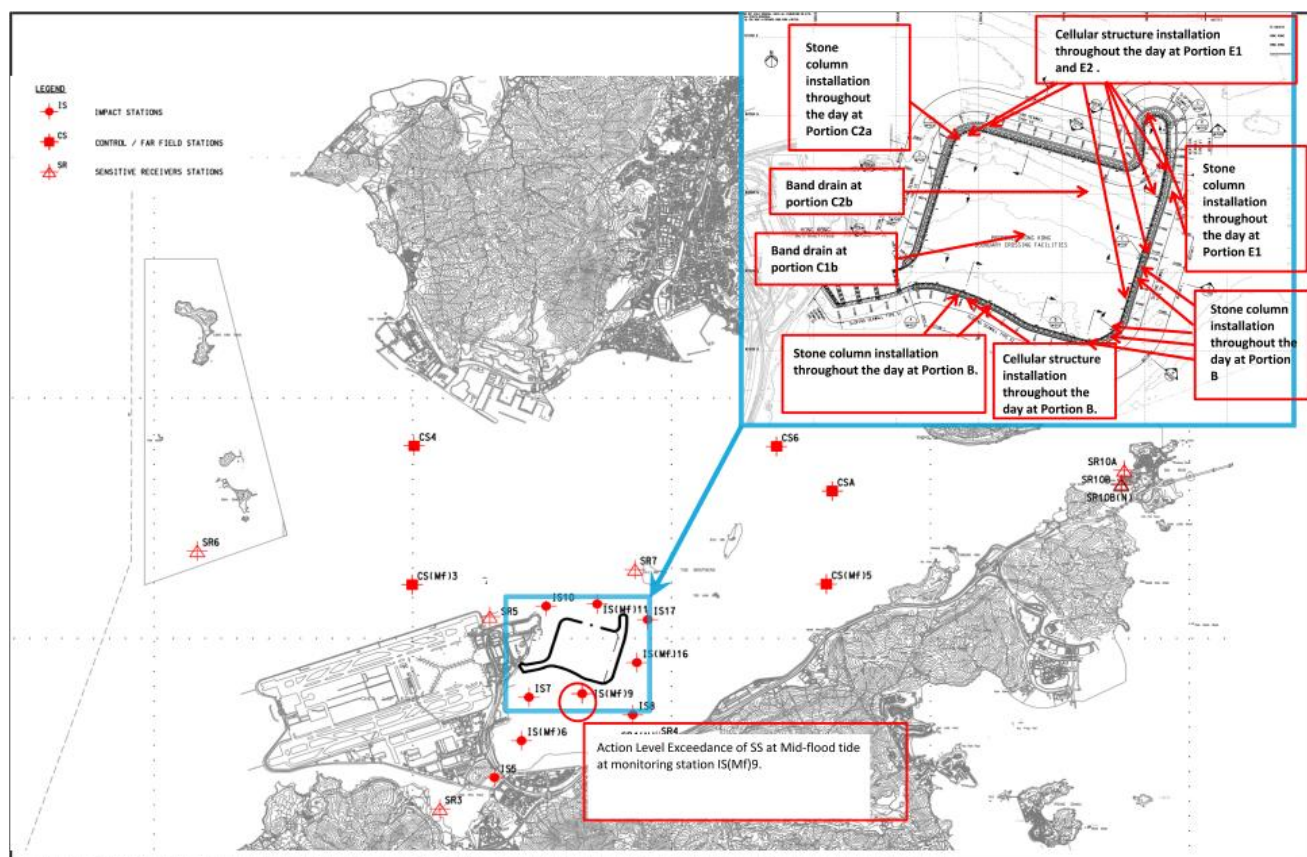
3.3.4.7 For action required under the action plan, please refer to Appendix L - Event Action Plan

3.3.4.8 Action taken under the action plan

- 1 Water sample was taken on site and was delivered to the laboratory and the SS was not measured in-situ, as a result it is not applicable to "Repeat in situ measurement to confirm findings"
- 2 With refer to the joint site inspection audit conducted on 19 Dec 13, sources of impact is likely due to the turbine activities and/or movement of vessel at shallow water (at near the entrance at southwestern of the Construction site and/or when vessel's propeller was turn on at shallow water). 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 perimeter silt curtain at certain sections.
- 3 IEC, contractor, ER and EPD were informed on 3 January 13 through notification of exceedance via email;
- 4 Monitoring data was reviewed, plant, equipment and Contractor's working methods was checked during joint site inspection audit conducted on 19 Dec 13;
- 5 The Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.
- 6 As informed by the Contractor maintenance work for the defects of the northwest part of the perimeter silt curtain was conducted on 4 January 13.
- 7 Monitoring results show no recurrence of exceedance of SS at IS10 and SR5 on 20, 23 and 25 of Dec 2013.

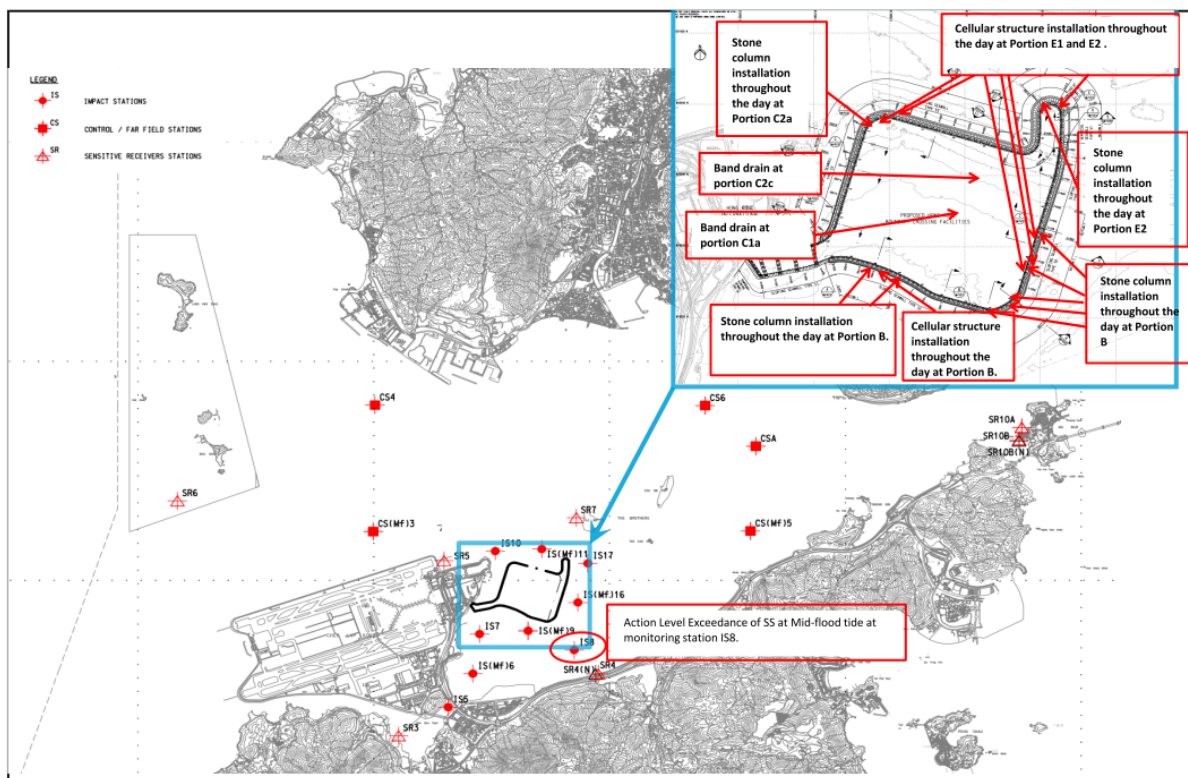
3.3.4.9 The exceedances note at IS10 and SR5 on 18 Dec 13 were considered as project related. Although the silt curtain integrity checking record on 4 January 13 shows that the disconnected silt curtain observed on 18 Dec 13 at northwest of HKBCF were rectified, the effectiveness of such rectification will be closely monitored through impact water quality monitoring and inspected through regular site inspection audit. The Contractor was further reminded to ensure provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.

- 3.3.5 One (1) action level exceedances at measured Suspended Solids (mg/L) was recorded on 18 Dec 2013 at monitoring station IS(Mf)9 at Mid-flood tide. For the Action Level exceedances at measured Suspended Solids (mg/L), 23.9 mg/L was recorded at Monitoring Station IS(Mf)9.



- 3.3.5.1 For locations and type of active works carried out on 18 Dec 13, please refer to the above layout map.
- 3.3.5.2 Exceedance recorded at IS(Mf)9 is unlikely due to marine based construction activities of the Project because:
- 3.3.5.3 With refer to the silt curtain condition on 18 Dec 13, no defects of the perimeter silt curtain was observed at south and southeast of the construction site.
- 3.3.5.4 The Depth averaged turbidity (in NTU) and depth averaged SS (in mg/L) of nearby monitoring station, such as IS7, IS8 and IS(Mf)16 were below the action and limit level, indicating the water quality at area nearby IS(Mf)9 was not adverse affected.
- 3.3.5.5 With referred to monitoring record, no turbid water or silt plume was observed when monitoring was conducted IS(Mf)9. (Please refer to the attached photo record for reference of sea condition)
- 3.3.5.6 As such, the exceedance recorded at IS(Mf)9 is considered to be non-project related.
- 3.3.5.7 The Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.
- 3.3.5.8 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except on Sunday and public holiday.

- 3.3.6 One (1) Limit Level exceedance at measured Suspended Solids (mg/L) was recorded on 20 Dec 2013 at monitoring station IS8 at Mid-flood tide. For limit exceedance at measured Suspended Solids (mg/L), 44.1 mg/L was recorded at Monitoring Station IS8.

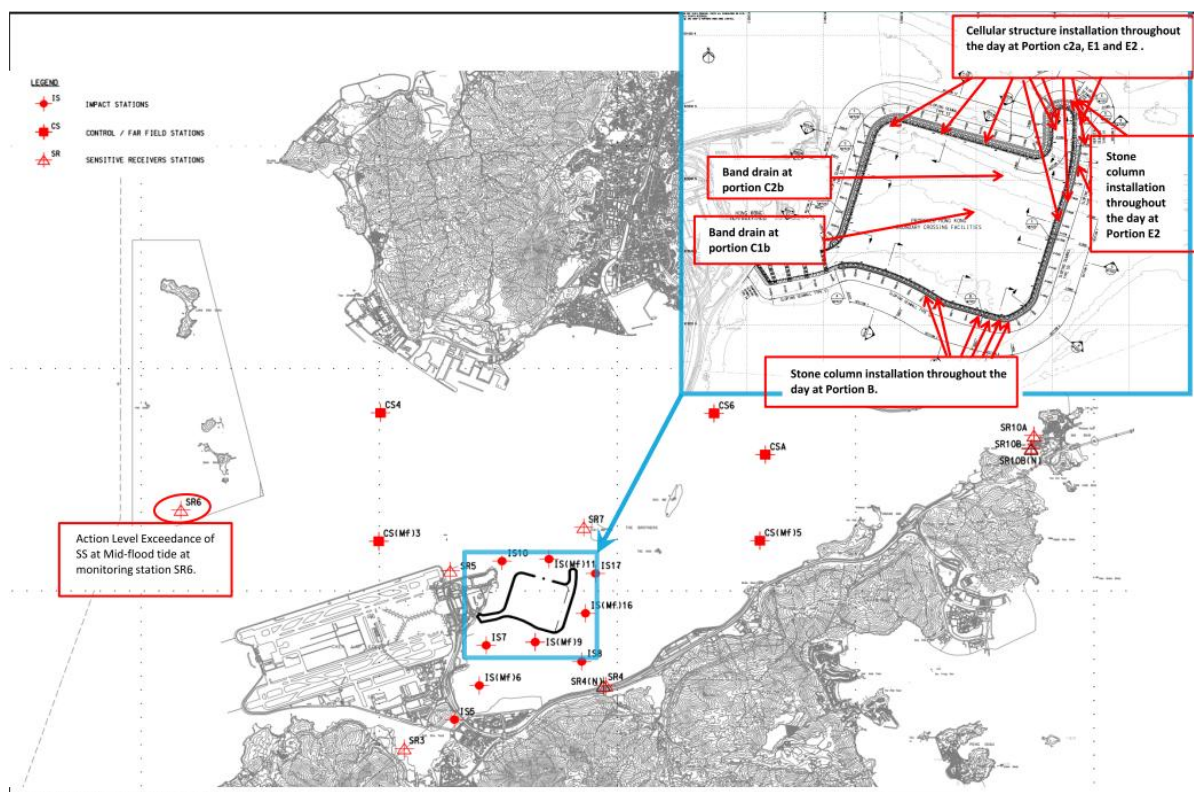


- 3.3.6.1 For locations and type of active works carried out on 20 Dec 13, please refer to the above layout map.
- 3.3.6.2 IS(Mf)9 and IS(Mf)16 are located closer to the active works than monitoring station IS8. Depth Average Suspended Solids (SS) values (in mg/L) recorded during the flood tide on the 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 were not adversely affected.
- 3.3.6.3 The monitoring location of monitoring station IS8 are considered located upstream to the active works of this project during flood tide. Therefore it was unlikely that the exceedances recorded at IS8 was due to active construction activities of this project.
- 3.3.6.4 When impact water quality monitoring was carried out during mid flood tide at monitoring location IS8 on 20 Dec 13, no defects of the perimeter silt curtain was observed and no silty plume were observed to flow from the inside to the outside of the site boundary. (For reference, please see attached photo):



- 3.3.6.5 Turbidity level (NTU) result recorded on 20 Dec 13 at IS8 during flood tide is 22.3 NTU which is below the Action and Limit Level, this indicates turbidity level was not adversely affected.
- 3.3.6.6 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.
- 3.3.6.7 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except on Sunday and public holiday.
- 3.3.6.8 The exceedance was likely due to local effects in the vicinity of IS8.

- 3.3.7 One (1) Action Level exceedance at measured Suspended Solids (mg/L) was recorded on 03 Jan 2014 at monitoring station SR6 at Mid-flood tide. For Action Level exceedances at measured Suspended Solids (mg/L), 23.9 mg/L was recorded at Monitoring Station SR6.



- 3.3.7.1 For locations and type of active works carried out on 03 Jan 14, please refer to the above layout map.
- 3.3.7.2 When impact water quality monitoring was carried out during mid flood tide at monitoring location IS10, SR5 and SR6 on 3 Jan 14, no silty plume were observed to flow from the inside to the outside of the northwestern part of the perimeter silt curtain.
- 3.3.7.3 IS10, SR5 (located outside northwest part of the perimeter silt curtain) and IS(Mf)11 (located outside north part of the perimeter silt curtain) which are closer to the active works than monitoring station SR6. Depth Averaged Suspended Solids (SS) values (in mg/L) recorded during the flood tide on the same day at IS10, SR5 and IS(Mf)11 were below the Action and Limit Level which shows that the water quality closer to active works was not adversely affected.

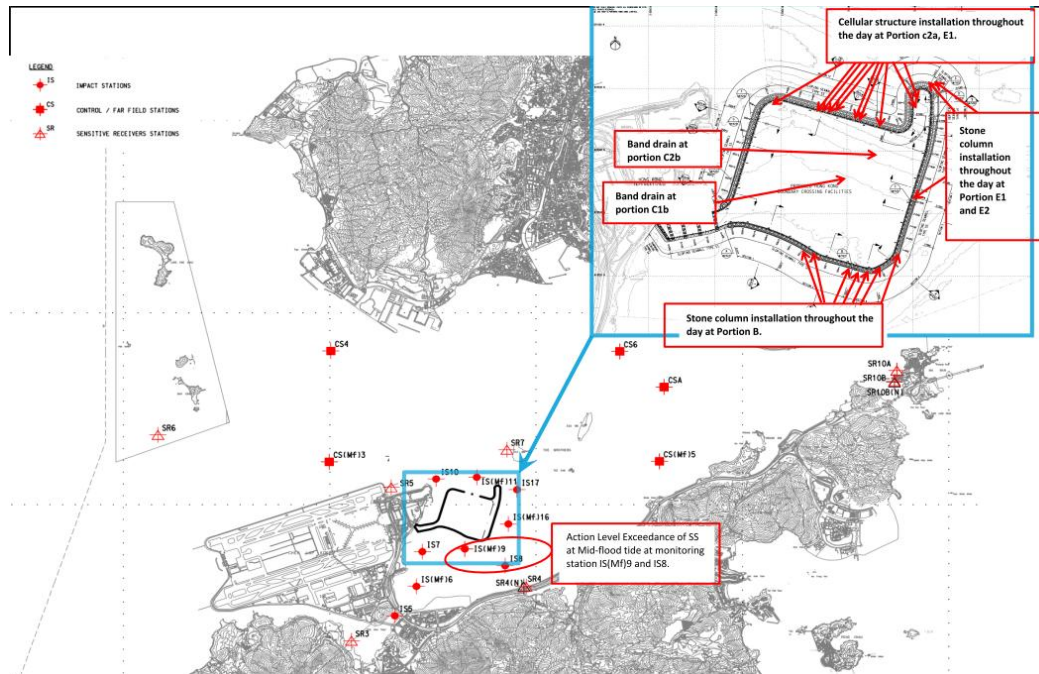


3.3.7.4 Turbidity level (NTU) results recorded on 03 Jan 14 at SR6, SR5, IS10 and IS(Mf)11 during flood tide are 20.8 NTU, 18.6 NTU, 17.8 NTU and 17.3 NTU which are below the Action and Limit Level, this indicates turbidity level of the area nearby was not adversely affected.

3.3.7.5 The exceedance was likely due to local effects in the vicinity of SR6.

3.3.8 Two (2) action level exceedances at measured Suspended Solids (mg/L) were recorded on 06 Jan 2014 at monitoring station IS(Mf)9 and at monitoring station IS8 at Mid-flood tide. For Action Level exceedance at measured Suspended Solids (mg/L), 24.4mg/L were recorded at Monitoring Station IS(Mf)9 and 25.4mg/L were recorded at Monitoring Station IS8.

3.3.8.1 For works activities carried out on 06 Jan 14, please refer to the attached layout map.



3.3.8.2 The Depth averaged turbidity (in NTU) and depth averaged SS (in mg/L) of nearby monitoring station, such as IS7 and IS(Mf)16 were below the action and limit level, indicating the water quality at area nearby IS(Mf)9 and IS8 was not adversely affected.

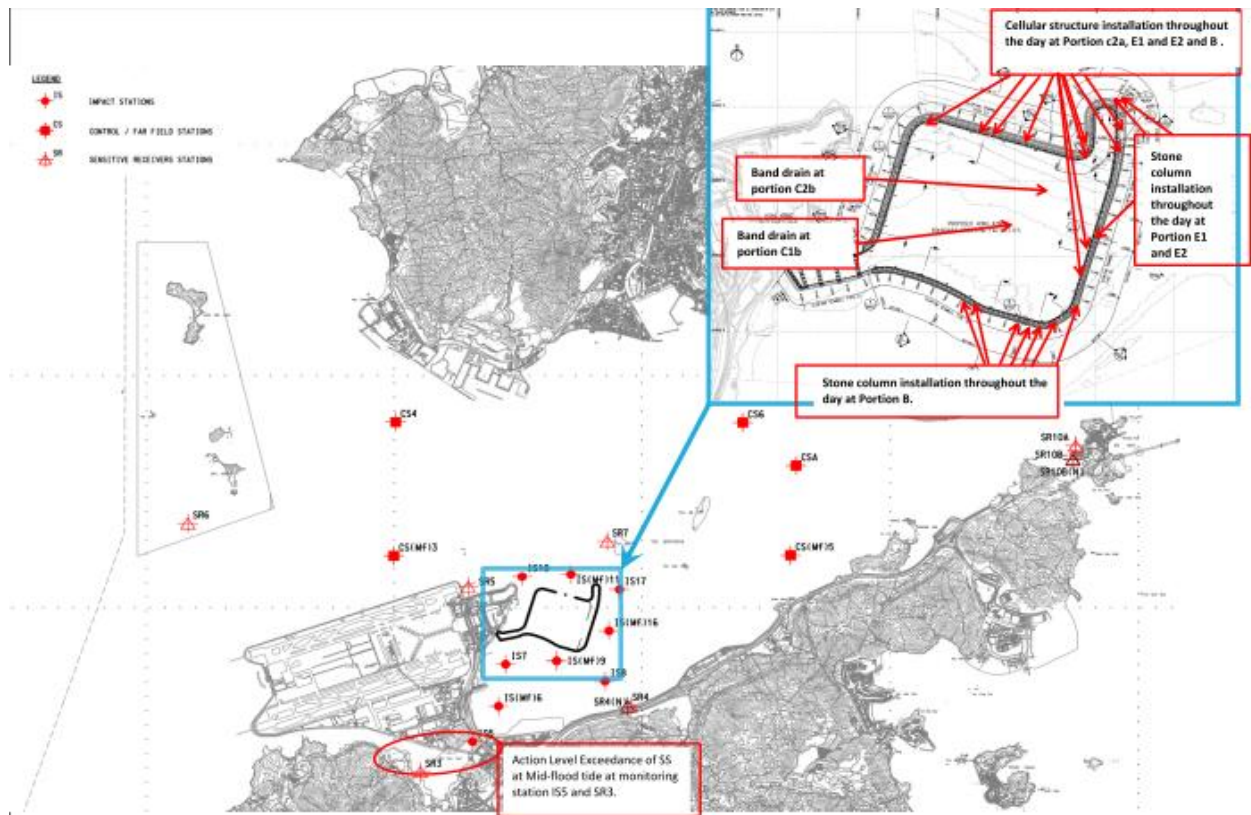
3.3.8.3 The turbidity level (in NTU) at IS(Mf)9, IS8, IS7 and IS(Mf)16 were below the action and limit level and no silt plume was observed when monitoring was conducted IS(Mf)9 and IS8, this indicates that the turbidity level (in NTU) at IS(Mf)9, IS8, IS7 and IS(Mf)16 were not adversely affected.



- 3.3.8.4 Also, with refer to the silt curtain condition on 06 Jan 14, no defects of the perimeter silt curtain was observed at south and southeast of the construction site.
- 3.3.8.5 The exceedances were likely due to local effects in the vicinity of IS(Mf)9 and IS8.
- 3.3.8.6 As such, the exceedances recorded at IS(Mf)9 and IS8 are considered non-project related.
- 3.3.8.7 The Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.
- 3.3.8.8 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except on Sunday and public holiday.

3.3.9 Two (2) action level exceedances at measured Suspended Solids (mg/L) were recorded on 10 Jan 2014 at monitoring station IS5 and at monitoring station SR3 at Mid-flood tide. For Action Level exceedances at measured Suspended Solids (mg/L), 25.1 mg/L was recorded at Monitoring Station IS5 and 24.8 mg/L was recorded at Monitoring Station SR3.

3.3.9.1 For site activities carried out on 10 Jan 14, please refer to the below layout map.



3.3.9.2 Suspended solids values recorded at Impact Station IS(Mf) 6, IS(Mf)9 and IS7 located downstream and closer to active work than SR3 and IS5 were below the Action and Limit Level during the same tide on the same day. As such, active works is unlikely to cause exceedance to IS5 and SR3.

3.3.9.3 Same type of works was carried out at the same locations on 8, 10 and 13 Jan 14 but Suspended Solids values recorded at SR3 and IS5 on 8 and 13 Jan 14 are all below the Action and Limit Level during the same tide on the these days. As such, active works conducted on 10 Jan 14 are unlikely to cause exceedance to IS5 and SR3.

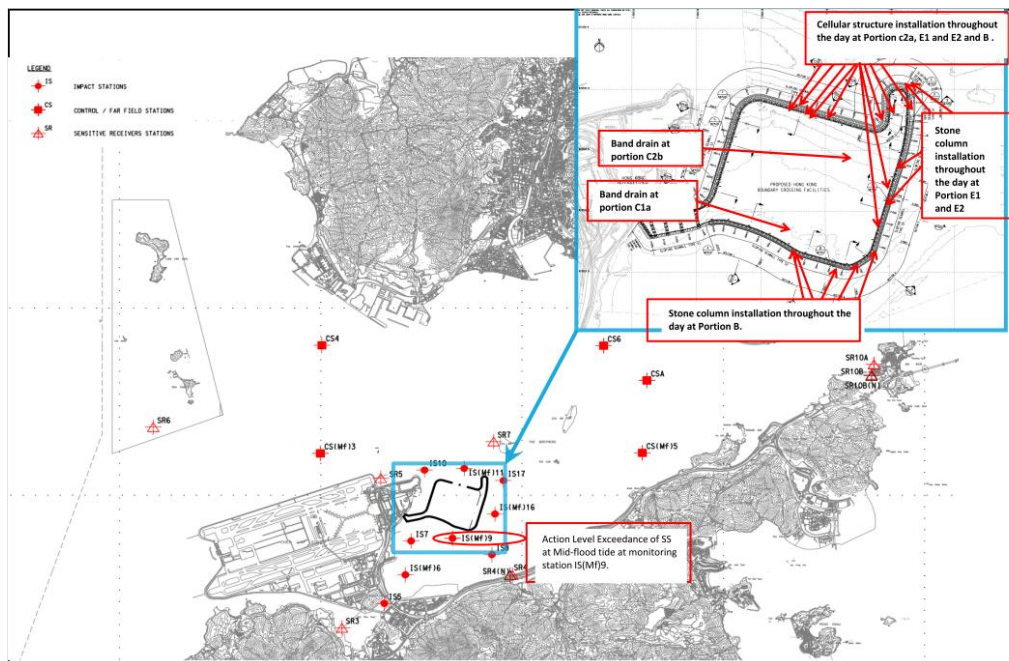
3.3.9.4 Turbidity level recorded at IS7, IS(Mf)6 and IS(Mf)9 were below the action and limit level. This indicated that area closer to active works was not adversely affected.

3.3.9.5 The exceedances were likely due to local effects in the vicinity of IS5 and SR3.

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

3.3.9.7 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except on Sunday and public holiday.

- 3.3.10 One (1) Action Level exceedance at measured Suspended Solids (mg/L) was recorded on 15 Jan 2014 at monitoring station IS(Mf)9 at Mid-flood tide. For the Action Exceedance at measured Suspended Solids (mg/L), 26.6 mg/L was recorded at Monitoring Station IS(Mf)9.



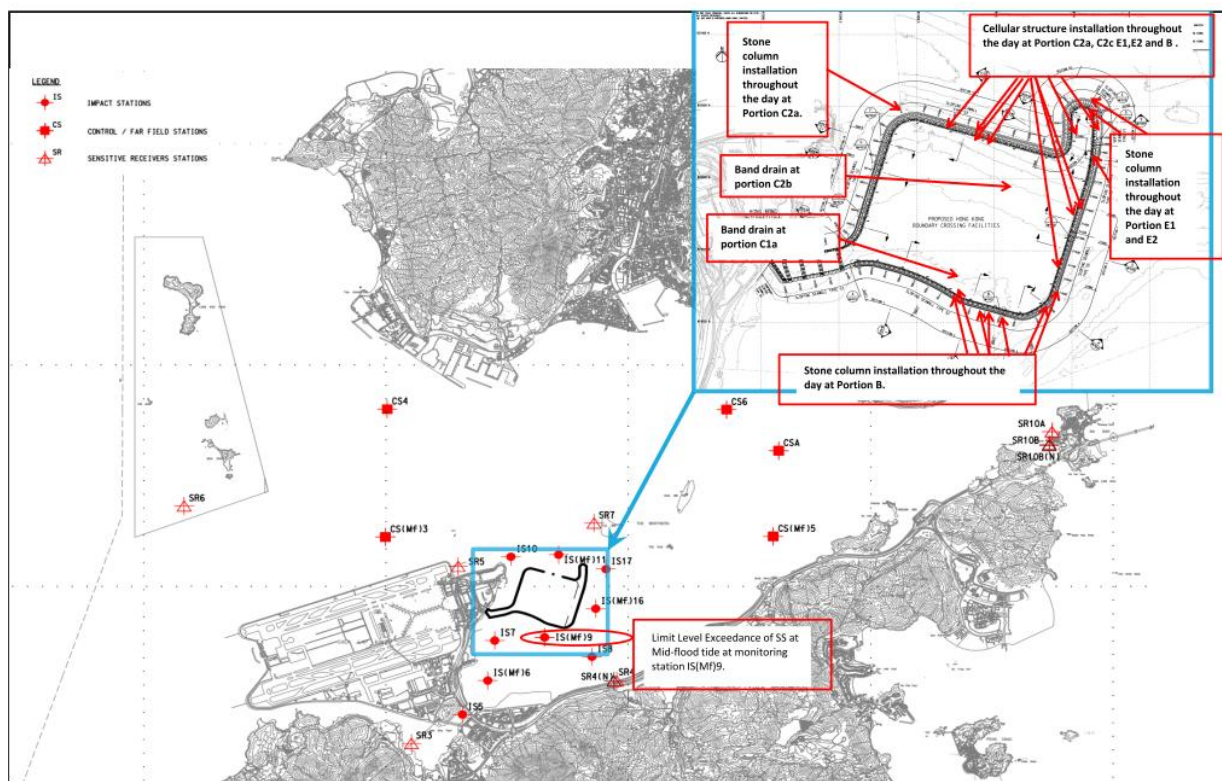
- 3.3.10.1 The Depth averaged turbidity (in NTU) and depth averaged SS (in mg/L) of nearby monitoring station, such as IS8, IS7 and IS(Mf)16 were below the action and limit level, indicating the water quality at area nearby IS(Mf)9 was not adversely affected.

- 3.3.10.2 Since the turbidity level (in NTU) at IS(Mf)9, IS8, IS7 and IS(Mf)16 were below the action and limit level and no silt plume was observed when monitoring was conducted IS(Mf)9, this indicates that the turbidity level (in NTU) at IS(Mf)9, IS8, IS7 and IS(Mf)16 were not adversely affected. Please refer to the photo record attached for sea condition recorded on 15 Jan 14 at southeast vessel entrance of the perimeter silt curtain (near monitoring station IS(Mf)9).



- 3.3.10.3 Also, with refer to the silt curtain condition on 15 Jan 14, no defects of the perimeter silt curtain was observed at south and southeast of the construction site.
- 3.3.10.4 The exceedance was likely due to local effects in the vicinity of IS(Mf)9.
- 3.3.10.5 As such, the action level exceedance recorded at IS(Mf)9 is considered non-project related.
- 3.3.10.6 The Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.
- 3.3.10.7 The Contractor was reminded that, with reference to EM&A manual Clause 9.1.1, the vessel access opening of the perimeter silt curtain would be formed by two piece of silt-curtain with overlapping length of 150m minimum and a separation distance of about 50m.

- 3.3.11 One (1) Limit Level exceedance at measured Suspended Solids (mg/L) was recorded on 17 Jan 2014 at monitoring station IS(Mf)9 at Mid-flood tide. For action exceedance at measured Suspended Solids (mg/L), 36.8 mg/L was recorded at Monitoring Station IS(Mf)9.



- 3.3.11.1 The Depth averaged turbidity (in NTU) and depth averaged SS (in mg/L) of nearby monitoring station, such as IS8, IS7 and IS(Mf)16 were below the action and limit level, indicating the water quality at area nearby IS(Mf)9 was not adverse affected.
- 3.3.11.2 Since the turbidity level (in NTU) at IS(Mf)9, IS8, IS7 and IS(Mf)16 were below the action and limit level and no silt plume was observed when monitoring was conducted at IS(Mf)9. Please refer to the photo record below for sea condition near IS(Mf)9 on 17 Jan 14.



- 3.3.11.3 Also, with refer to the silt curtain condition on 17 Jan 14, no defects of the perimeter silt curtain was observed at south and southeast of the construction site.
- 3.3.11.4 The exceedance was likely due to local effects in the vicinity of IS(Mf)9.
- 3.3.11.5 As such, the limit level exceedance recorded at IS(Mf)9 is considered non-project related.
- 3.3.11.6 The Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.
- 3.3.11.7 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except on Sunday and public holiday.

LEGEND:

- IS IMPACT STATIONS
- CS CONTROL / FAR FIELD STATIONS
- SR SENSITIVE RECEIVERS STATIONS

Portion B:

- Stone column installation throughout the day at Portion B.
- Band drain at Portion E2.
- Band drain at Portion B.

Portion C2a:

- Cellular structure installation throughout the day at Portion C2a, C2c E1, E2 and B.
- Stone column installation throughout the day at Portion E1 and E2.

Action Level Exceedance of SS at Mid-flood tide at monitoring station IS(MF)16.

3.3.12.2 Same type of works was carried out at the same location on 19, 21 and 24 Feb 14 but Suspended Solids values recorded at IS(Mf)16 on 19 and 24 Feb 14 were all below the Action and Limit Level during the same tide on the same day.

3.3.12.4 Suspended Solids values recorded at Impact Station nearest to monitoring station IS(Mf)16 such as IS17 and IS(Mf)9 were all below the Action and Limit Level during the same tide on the same day. This indicates that the SS level near IS(Mf)16 was not adversely affected.

3.3.12.6 Mitigation measures such as localised silt curtain for stone column installation was implemented on 21 Feb 14.

3.3.12.7 With refer to the daily silt curtain integrity checking record of 21 Feb 14, no defects was observed along the part of the perimeter silt curtain located east of HKBCF-reclamation site which is next to IS(Mf)16. For the condition of the perimeter silt curtain condition near monitoring station IS(Mf)16, please refer to the photo record below:



- 3.3.12.8 The exceedance was likely due to local effects in the vicinity of IS(Mf)16.
- 3.3.12.9 The exceedance is considered as non-project related.
- 3.3.12.10 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.
- 3.3.12.11 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except on Sunday and public holiday.
- 3.3.13 The graphical plots of the trends of the monitoring results are provided in Appendix G. No specific trend of the monitoring results or existence of persistent pollution source was noted.

3.4 Dolphin Monitoring

- 3.4.1 In accordance with the Project Specific EM&A Manual, pre-set and fixed transect line vessel based dolphin survey was required in two AFCD designated areas (Northeast Lantau (NEL) and Northwest Lantau (NWL) survey areas). The impact dolphin monitoring at each survey area should be conducted twice per month.
- 3.4.2 The impact dolphin monitoring conducted is vessel-based and combines line-transect and photo-ID methodology, which have adopted similar survey methodologies as that adopted during baseline monitoring to facilitate comparisons between datasets.
- 3.4.3 The layout map of impact dolphin monitoring have been provided by AFCD and is shown in Figure 4.
- 3.4.4 The effort summary and sighting details during the reporting quarter are shown in the Appendix H. A summary of key findings of the dolphin surveys completed during the reporting quarter is shown below:

Table 3.6 Summary of Key Dolphin Survey Findings in Dec 2013- Feb 2014

Number of Impact Surveys Completed [^]	6
Survey Distance Travelled under Favourable On- Effort Condition	626.8km
Number of Sightings	26 sightings (21 sightings are "on effort" (which are all under favourable condition), 5 "sightings are opportunistic")
Number of dolphin individual sighted	107 individuals (the best estimated group size)
Dolphin Encounter Rate [#]	NEL: 0.5 NWL: 4.8
Dolphin Group Size	Average of NEL: 1 Average of NWL: 4.2 Varied from 1-13 individuals
Most Often frequent dolphin sighting area	Sha Chau and Lung Kwu Chau Marine Park, the western limit of NWL and one area to the north of the Hong Kong International Airport platform.

Remarks:

[^] Completion of line transect survey of NEL and NWL survey area once was counted as one complete survey.

[#] Dolphin Encounter Rate = (Sum of 1st, 2nd, 3rd month's total sighting/ Sum of 1st, 2nd, 3rd month's total effort)*100km (encounter rates are calculated using on effort sightings made under favourable conditions only.)

- 3.4.5 Two (2) Action Level exceedances were recorded in the reporting quarter. The investigation results showed that there is no evidence that exceedances are related to Project works are annexed in Appendix L. Actions were taken according to the Event and Action Plan for impact dolphin monitoring. Please refer to Appendix L for details of action taken.

Table 3.7 Summary of STG and ANI encounter rates in Dec 2013- Feb 2014

	NEL	NWL	Level Exceeded
STG*	0.5	4.5	Action
ANI**	0.5	20.7	Action

*Quarterly Average Encounter Rate of Number of Dolphin Sightings (STG) presents averaged encounter rates of the three monitored months in terms of groups per 100km per survey event.

STG Encounter rate = (Average of (total number sighting/total effort) of 1st and 2nd completed survey# of 1st month+ Average of (total number sighting/total effort) of 1st and 2nd completed survey# of 2nd month + Average of (total number sighting/total effort) of 1st and 2nd completed survey# of 3rd month)/3*100km

**Quarterly Average Encounter Rate of Total Number of Dolphins (ANI) presents averaged encounter rates of the three monitored months in terms of individuals per 100km per survey event.

ANI Encounter rate = (Average of (total number of Individual/total effort) of 1st and 2nd completed survey# of 1st month+ Average of (total number of Individual/total effort) of 1st and 2nd completed survey# of 2nd month + Average of (total number of Individual/total effort) of 1st and 2nd completed survey# of 3rd month +)/3*100km

- 3.4.6 Details of the comparison and analysis methodology and their findings and discussions are annexed in Appendix H.

3.5 Environmental Site Inspection and Audit

3.5.1 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 quarter, 13 site inspections were carried out. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

3.5.2 Particular observations during the site inspections are described below:

Air Quality

3.5.3 Dark smoke was observed generating from an excavator at works area of Portion A. The Contractor should provided maintenance to the machineries used on-site. (Closed)

3.5.4 Fugitive dust was observed when moisten rock material is being transferred by a barge installed with conveyor belt. The Contractor was reminded to enhanced dust control measures to prevent generation of fugitive dust. (Reminder)

3.5.5 Dry sand surface was observed on works area of Portion A. The Contractor was reminded to provide sufficient dust control measures. The Contractor provided dust control measures. The Contractor was reminded to continued to provide dust control measures on works area of Portion A. (Reminder)

3.5.6 An idle air compressor was observed without drip tray on steel cell. The Contractor was reminded to provide mitigation measures such as drip tray to air compressor prior to operation. An idle air compressor was observed without drip tray on steel cell. The Contractor should provide mitigation measures such as drip tray to air compressor prior to operation. (Closed)

3.5.7 Dark smoke was observed generating from an excavator and a loader at works area of Portion A. The machine was turned off. The Contractor is reminded to provide maintenance to the machineries used on-site so that emission of dark smoke could be effectively prevented. (Reminder)

Noise

3.5.8 Noise decoupling measure was observed to be missing from the generators on Hong Fai and SHB205 and on barge SHB210. Noise decoupling measures should be provided to the concerned generators. (Closed)

3.5.9 Insufficient acoustically decoupling measure of generator and water pumps was observed on barge FTB19, two generators on SHB 210 and 2 generators on FTB 21. The Contractor was advised to provide sufficient acoustic decoupling measure(s) such as acoustic mat to noisy equipments. The Contractor was reminded that insufficient/inadequate mitigation measures must be swiftly rectified. (Closed)

Chinese White Dolphin

3.5.10 No adverse observation was identified in the reporting month.

Water Quality

3.5.11 Turbid water was observed at the southwestern silt curtain entrance area. Refer to the photo taken and site observations, sources of impact likely due to the turbine activities and/or movement of vessel at shallow water (at near the entrance at southwestern of the Construction site and/or when vessel's propeller was turn on at shallow water). 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 perimeter silt curtain at certain sections and/or insufficient overlapping at entrance/exit of the perimeter silt curtain. (Closed)

- 3.5.12 The Contractor was advised to regularly evaluate the integrity of the perimeter silt curtain by reviewing the results obtained from daily checking or/and monthly diver inspections specified by the Silt Curtain Deployment Plan. The Contractor was advised to provide sufficient mitigation measures and swiftly carry out maintenance once defects of the perimeter silt curtain are found during the above mentioned daily checking and/or monthly diver inspection. (Closed)
- 3.5.13 Oil drums, chemical containers and generator were observed without the provision of drip trays at Portion, on barge 天駿 3, on barge SHB205, on temporary rock bund and on Portion A. The Contractor provided drip trays to oil drums, chemical container and generator to retain leakage, if any. (Closed)
- 3.5.14 An oil drum was observed to be not properly plugged at works area of Portion A. The Contractor provided measures to seal the opening of oil drums to avoid leakage. (Closed)
- 3.5.15 Containers of chemical to be used and chemical waste were misplaced together in Hong Fai. The Contractor should store the chemical and chemical waste separately. (Closed)
- 3.5.16 Movable lighting machineries were observed to be placed on bare ground of Portion D, on SHB205 and at works area at Portion A without the provision of drip trays. It was observed that drip trays were provided to movable lighting machineries at temporary rock bund and at works area at portion A and on SHB205. The contractor was advised to continue to provide drip tray or equivalent measures to retain potential oil leakage to movable lighting machineries. (Closed)
- 3.5.17 Trays of oil drums were found to be placed near to the shore. The Contractor should secure the oil drums with drip tray away from the shore to ensure no washing off of oil occurs. (Closed)
- 3.5.18 Oil stain was observed on barge FTB19 and SHB205. The Contractor was advised to clear the oil stain using absorbent material. (Closed)
- 3.5.19 Waste water was observed accumulated inside drip trays on FTB21 and the Contractor was reminded to clear the waste water regularly to prevent runoff or accidental spillage (Reminder)
- 3.5.20 Defect was observed within a bunding and waste oil water mixture was observed on the barge surface. The Contractor was reminded to rectify the defects observed and cleared the oil waste using chemical absorbent material and dispose the chemical absorbent material as chemical waste. (Closed)
- 3.5.21 Oil stain was observed on temporary rock bund. The Contractor was advised to clear the oil stain using absorbent material. (Closed)
- 3.5.22 During site inspection audit, sandfilling seem to be conducted at one end of the temporary rock bund. The Contractor was reminded to conduct sandfilling behind at least 200m leading temporary rock bund/seawall. (Reminder)
- 3.5.23 Disconnected silt curtain was observed at the western side of the silt curtain. The Contractor was advised to provide sufficient mitigation measures and swiftly carry out maintenance once defects of the perimeter silt curtain are found during the daily checking and/or monthly diver inspection. (Closed)
- 3.5.24 Localised silt curtain was not observed when stone column installation. The Contractor was reminded to provide mitigation measures such as localized silt curtain to active stone column installation points. (Closed)
- 3.5.25 Gap was observed between the bunding and the barge surface. The Contractor was reminded to properly seal the gap between the bunding and barge surface to prevent potential oil leakage. (Closed)
- 3.5.26 Oil stain was observed on temporary rock bund, The Contractor was reminded to clear the oil stain on temporary rock bund. (Closed)

Chemical and Waste Management

- 3.5.27 Rubbish bin was observed without being covered; the Contractor was reminded to properly store general waste and covers all rubbish bins. The Contractor properly store general waste and covers all rubbish bins. (Closed).
- 3.5.28 General refuse was scattered on sea water and along the shore near Portion D. The Contractor was reminded to clear the refuse in timely manner and keep site clean and tidy. The Contractor cleared the refuse in timely manner and keeps site clean and tidy. (Closed)
- 3.5.29 Movable lighting machineries were observed to be placed on bare ground of Portion D without the provision of drip trays. Drip trays were observed to be provided to movable lighting machineries at temporary rock bund and at works area at portion A. The contractor was advised to continue to provide drip tray or equivalent measures to retain potential oil leakage to movable lighting machineries. An ineffective leakage preventive measure for movable lighting machineries at Portion D was pending for Contractor's rectification. (Closed)
- 3.5.30 Defect was observed within a bunding and waste oil water mixture was observed on the barge surface. The Contractor was reminded to rectify the defects observed and cleared the oil waste using chemical absorbent material and dispose the chemical absorbent material as chemical waste. (Closed)
- 3.5.31 Litter and general refuse was observed on sea and land at works area of Portion D and at the edge of the works area of Portion A and in the water within and adjacent to the works site between steel cell# 37 and steel cell# 38. The Contractor was reminded to regularly clear the litter and general refuse at this area. The Contractor was cleared the litter and general refuse at these areas. (Closed)
- 3.5.32 Construction waste such as band drain was observed along the northern edge of works area at Portion A and on edge of temporary rock bund. The Contractor was advice to properly store and dispose construction waste such as band drain. (Closed)
- 3.5.33 Construction waste such as band drain was observed along the northern edge of works area at Portion A and on edge of temporary rock bund. The Contractor was advice to properly store and disposes construction waste such as band drain. (Closed)
- 3.5.34 Bags of general refuses were observed stored on barge surface. The Contractor was reminded to regularly collect and dispose the general refuse regular. (Reminder)

Landscape and Visual Impact

- 3.5.35 No relevant works was carried out in the reporting Quarter.

Others

- 3.5.36 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.

4 ADVICE ON THE SOLID AND LIQUID WASTE MANAGEMENT STATUS

4.1 Summary of Solid and Liquid Waste Management

- 4.1.1 The Contractor registered as a chemical waste producer for this project. Sufficient numbers of receptacles were available for general refuse collection and sorting.
- 4.1.2 As advised by the Contractor, 3,437,422.6 m³ of fill were imported for the Project use in the reporting period. 420 kg of paper/ cardboard packaging and 100 kg of metal were generated, 4 tonnes of chemical waste and 110.5 m³ of general refuse were generated and disposed of in the reporting period. Monthly summary of waste flow table is detailed in Appendix M.
- 4.1.3 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system, dispose of C&D materials and wastes at designated ground and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.
- 4.1.4 The Contractor is reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

5 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

5.1 Implementation Status of Environmental Mitigation Measures

- 5.1.1 In response to the site audit findings, the Contractors carried out corrective actions.
- 5.1.2 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in Appendix C. Most of the recommended mitigation measures are being upheld. Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.
- 5.1.3 Training of marine travel route for marine vessels operator was given to relevant staff and relevant records were kept properly.
- 5.1.4 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 checks were conducted by experienced MMOs within the works area to ensure that no dolphins were trapped by the silt curtain area. There were no dolphins spotted within the silt curtain during this quarter. The relevant procedures were followed and all measures were well implemented. The silt curtains were also inspected in accordance to the submitted plan.

6 SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

6.1 Summary of Exceedances of the Environmental Quality Performance Limit

- 6.1.1 All 1-Hour TSP results were below the Action and Limit Level in the reporting quarter. Six (6) 24-hour TSP results recorded among AMS2, AMS3A and AMS7 exceeded the Action Level and two (2) 24-hour TSP results recorded at AMS3A exceeded the Limit Level at in the reporting quarter. Investigation results show that the exceedances were not related to Project.
- 6.1.2 For construction noise, no exceedance was recorded at all monitoring stations in the reporting period.
- 6.1.3 Ten (10) Action Level Exceedances were recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter. Three (3) Limit Level Exceedances were recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter.
- 6.1.4 Investigation results shows that the Action Level Exceedance recorded at SR5 and Limit Level Exceedance recorded at IS10 on 18 Dec 13 were related to project. Investigation results show that other water quality exceedances unlikely to be non-project related.
- 6.1.5 Two (2) Action level exceedances of Chinese White Dolphin monitoring were recorded in the reporting quarter. Investigation results show that there is no evidence that exceedances are related to Project works. Event and Action Plan for Impact Dolphin Monitoring was triggered. For detail of investigation, please refer to appendix L.
- 6.1.6 Cumulative statistics on exceedances is provided in Appendix J.

7 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

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

- 7.1.1 The Environmental Complaint Handling Procedure is annexed in Figure 5.
- 7.1.2 As informed by the Contractor on 5 Dec 13, one (1) noises related complain of a barge moving through the southern channel of HyD's construction site after 23:00 on 8.11.2013. Site daily for barges was requested from the Contractor and as refer to the site daily provided by the Contractor, there was no barge operated after 18:25 on 08 Nov 13. The complaint is therefore considered not likely to be related to the construction works.
- 7.1.2.1 The Contractor was remind to continue to properly implement the existing noise mitigation measures i.e. to well maintain all plant and equipment in good condition to avoid noise generation and to turn off or throttled down idle equipment. The Contractor was reminded to inform related parties when environmental complain was received to ensure future timely reporting of any complaints/ enquiry.
- 7.1.3 As informed by the Contractor on 12 Dec 13. A complaint involves the leakage of sand from barges causing water discoloration at sea near Tuen Mun Pierhead Garden and sand material without properly covered was blown to the inside of the residential area which caused disturbance to residence.
- 7.1.3.1 Regarding the leakage from work barges causing water pollution near Tuen Mun Pierhead Garden , it is noted that all project related vessels (including sand barges) are designated with a regular marine travel route to the site, but the regular travel route plan of this project does not specify the travel route passing through the at area at sea near Tuen Mun Pierhead Garden and with refer to photo record, Contractor would water the sand material to keep the sand material wet to prevent generation of fugitive dust.
- 7.1.3.2 With refer to available information provided and monitoring data recorded on 09 Dec 13, it cannot indicate that the water quality impact and air quality impact were caused by the vessel of this Contract and therefore the complaint could not be concluded as related to this Contract.
- 7.1.3.3 The Contractor was advised to ensure the regular travel routes for all project related vessels (including sand barges) were being strictly followed and all vessels should have regular maintenance to ensure that all Sand Barge functioning well.
- 7.1.3.4 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.
- 7.1.3.5 Photo record shows that watering equipment is provided on pelican barge loaded with sand for watering of sand filling material to keep the sand material wet.



- 7.1.4 As informed by the Contractor on 6 Jan 14. A complaint involves barges loaded with sand material without properly covered was blown to the inside of the residential area of Tuen Mun Pierhead Garden which caused disturbance to residence. With refer to available information provided, it cannot indicate that the water quality impact and air quality impact were caused by the vessel of this Contract and therefore the complaint could not be concluded as related to this Contract.
- 7.1.6.1 Site visit was conducted on 9 Jan 14 and it was observed during the site investigation that watering equipment was provided on pelican barge loaded with sand for watering of sand filling material to keep the surface of sand material wet. This is consistent with HyD's reply to Oriental Daily Newspaper that the Contractor would water the sand material to keep the sand material wet to prevent generation of fugitive dust.
- 7.1.6.2 Photo record shows that watering equipment is provided on pelican barge loaded with sand for watering of sand filling material.



- 7.1.6.3 During the follow-up site visit conducted on 9 Jan 14, after interview with the skipper of the pelican barge, it was noted that pelican barge is designated with a regular marine travel route to the site, however the regular travel route plan of this project does not specify the travel route passing through the at area at sea near Tuen Mun Pierhead Garden.
- 7.1.6.4 Therefore it is considered the complaint is unlikely to be related to this project.

- 7.1.7 EPD referred a complaint from complainant who advised that blackish mud was found along the edge of the construction site of Hong Kong-Zhuhai-Macao Bridge Hong Kong Project near the airport in the morning of 18 January 2014
- 7.1.7.1 With refer to the site daily of 16, 17 and 18 Jan 14 provided by the Contractor (China Harbour Engineering Company Ltd), no excavation and dredging activities were conducted on site. This indicates that the blackish mud found along the edge of the construction site of this contract near the airport in the morning of 18 January 2014 was unlikely related to this project.
- 7.1.7.2 A follow up joint site inspection with the representatives of the Contractor, Residential Engineer and IEC/ENPO was conducted on 22 Jan 2014. Excavation and dredging activities were not observed within the site boundary of HKBCF during the joint site inspection audit.
- 7.1.7.3 Therefore in accordance with the abovementioned observations, the complaint is therefore considered as not related to contract HY/2010/02.
- 7.1.8 No notification of summons and successful prosecution was received in the reporting period.
- 7.1.9 No environmental notification of Summons and Successful Prosecutions was received in the reporting quarter.
- 7.1.10 Statistics on complaints, notifications of summons and successful prosecutions are summarized in Appendix J.

8 COMMENTS, RECOMMENDATIONS AND CONCLUSIONS

8.1 Comments on mitigation measures

8.1.6 According to the environmental site inspections performed in the reporting quarter, 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.

Construction Noise Impact

- Quieter powered mechanical equipment should be used as far as possible.
- Noisy operations should be oriented to a direction away from sensitive receivers as far as possible.
- Proper and effective noise control measures for operating equipment and machinery on-site should be provided, such as erection of movable noise barriers or enclosure for noisy plants. Closely check and replace the sound insulation materials regularly
- Vessels and equipment operating should be checked regularly and properly maintained.
- Noise Emission Label (NEL) shall be affixed to the air compressor and hand-held breaker operating within works area.
- Better scheduling of construction works to minimize noise nuisance.
- 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 and oil drums should be properly stored and labelled.
- All plants and vehicles on site should be properly maintained to prevent oil leakage.
- All kinds of maintenance works should be carried out within roofed, paved and confined areas.
- All drain holes of the drip trays utilized within works areas should be properly plugged to avoid any oil and chemical waste leakage.
- Oil stains on soil surface and empty chemical containers should be cleared and disposed of as chemical waste.
- Regular review should be conducted for working barges and patrol boats to ensure sufficient measures and spill control kits were provided on working barges and patrol boats to avoid any spreading of leaked oil/chemicals.

Landscape and Visual Impact

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

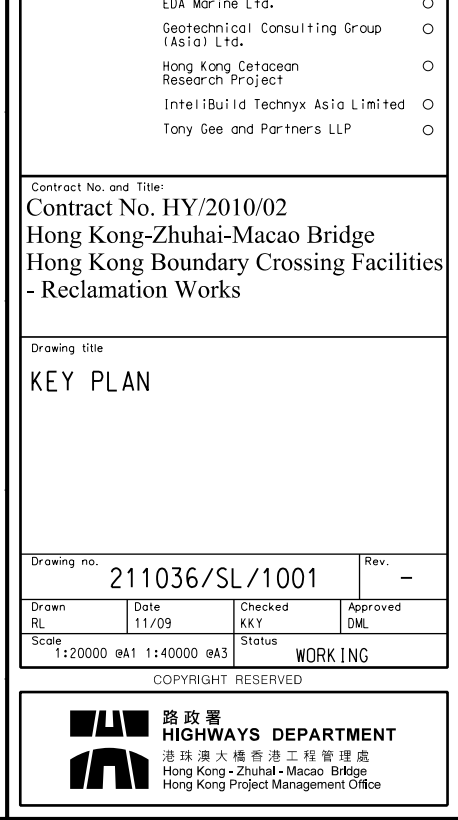
8.2 Recommendations on EM&A Programme

- 8.2.6 The impact monitoring programme for air quality, noise, water quality and dolphin ensured that any deterioration in environmental condition was readily detected and timely actions taken to rectify any non-compliance. Assessment and analysis of monitoring results collected demonstrated the environmental impacts of the Project. With implementation of recommended effective environmental mitigation measures, the Project's environmental impacts were considered as environmentally acceptable. The weekly environmental site inspections ensured that all the environmental mitigation measures recommended were effectively implemented.
- 8.2.7 The recommended environmental mitigation measures, as included in the EM&A programme, effectively minimize the potential environmental impacts from the Project. Also, the EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

8.3 Conclusions

- 8.3.1 The construction phase and EM&A programme of the Project commenced on 12 March 2012.
- 8.3.2 All 1-Hour TSP results were below the Action and Limit Level in the reporting quarter. Six (6) 24-hour TSP results recorded among AMS2, AMS3A and AMS7 exceeded the Action Level and two (2) 24-hour TSP results recorded at AMS3A exceeded the Limit Level at in the reporting quarter. Investigation results show that the exceedances were not related to Project.
- 8.3.3 For construction noise, no exceedance was recorded at all monitoring stations in the reporting period.
- 8.3.4 Ten (10) Action Level Exceedances were recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter. Three (3) Limit Level Exceedances were recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter.
- 8.3.5 Investigation results shows that the Action Level Exceedance of SS recorded at SR5 and Limit Level Exceedance recorded at IS10 on 18 Dec 13 were related to project. Investigation results show that other water quality exceedances unlikely to be non-project related.
- 8.3.6 Two (2) Action Level exceedances were recorded for Chinese White Dolphin monitoring in the reporting quarter. Investigation results show that there is no evidence that exceedances are related to Project works.
- 8.3.7 Environmental site inspection was carried out thirteen times in the reporting quarter. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.
- 8.3.8 As informed by the Contractor on 5 Dec13, one complaint was noted on 12 Nov regarding a barge moving through the southern channel. After investigation, the noise complaint was considered as non-project related.
- 8.3.9 As informed by the Contractor, complaint received from Penta-Ocean – Gitanes Joint Venture (CV/2012/03) mentioned that the formation works of the Contaminated Mud Pit CMP1 to the South of the Brothers (CMP1 of SB) which has been completed in mid-August 2013 and the pit has been commissioned for receiving contaminated marine mud from other projects starting from 16 August 2013. However, it was recently observed that some of the project vessels of HY/2010/02 (photos taken on 20 Nov 2013 are attached) had berthed within the said pit and those anchorages would likely cause disruption to the underlying contaminated mud and thus induce unfavourable contamination impact to the surrounding marine environment. In this regard, they reminded the contractor to avoid berthing of their vessels within the boundary of CMP1 of SB thereafter for the sake of environmental concern. After investigation, the complaint was considered as non-project related
- 8.3.10 As informed by the Contractor on 12 Dec 13. A complaint involves the leakage of sand from barges causing water discoloration at sea near Tuen Mun Pierhead Garden and sand material without properly covered was blown to the inside of the residential area which caused disturbance to residence. With refer to available information provided and monitoring data recorded on 09 Dec 13, it cannot indicate that the water quality impact and air quality impact were caused by the vessel of this Contract and therefore the complaint could not be concluded as related to this Contract.
- 8.3.11 As informed by the Contractor on 27 Dec 13. A complaint involves barges loaded with sand material without properly covered was blown to the inside of the residential area of Tuen Mun Pierhead Garden which caused disturbance to residence. With refer to available information provided, it cannot indicate that the water quality impact and air quality impact were caused by the vessel of this Contract and therefore the complaint could not be concluded as related to this Contract.
- 8.3.12 As informed by the Contractor on 6 Jan 14. A complaint involves barges loaded with sand material without properly covered was blown to the inside of the residential area of Tuen Mun Pierhead Garden which caused disturbance to residence. With refer to available information provided. It is considered the complaint is unlikely to be related to this project.

- 8.3.13 EPD referred a complaint from complainant who advised that blackish mud was found along the edge of the construction site of Hong Kong-Zhuhai-Macao Bridge Hong Kong Project near the airport in the morning of 18 January 2014. After receipt of the complaint, site daily was reviewed and follow-up investigation has been conducted and excavation and dredging activities were not observed within the site boundary of HKBCF during the joint site inspection audit. Therefore in accordance with the investigation results, the complaint is considered as not related to contract HY/2010/02.
- 8.3.14 No notification of summons and successful prosecution was received in the reporting period.
- 8.3.15 Apart from the above mentioned monitoring, most of the recommended mitigation measures, as included in the EM&A programme, were implemented properly in the reporting quarter.
- 8.3.16 The recommended environmental mitigation measures effectively minimize the potential environmental impacts from the Project. The EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.
- 8.3.17 Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.



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- EUA Marine Ltd.
Geotechnical Consulting Group
(Asia) Ltd.
Hong Kong Cetacean
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Tony Gee and Partners LLP

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Tony Gee and Partners

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Geotechnical Consulting Group (Asia) Ltd.

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Contract No. and Title:

Contract No. HY/2010/02

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Boundary Crossing Facilities - Reclamation Works

Drawing title

KEY PLAN

Drawing no.

211036/SL/1001

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Hong Kong Project Management Office



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KEY PLAN

NOTES

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

LEGEND

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

-	FOR CONSTRUCTION	HYJL	11/11
Rev	Description	By	Date

Consultant

ARUP 奧雅納工程顧問 ●

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

Drawing title

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

Drawing no.		211036/SL/1014	Rev.	-
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Scale 1:5000 @A1 1:10000 @A3		Status	WORKING	

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