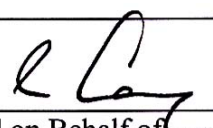


**Proposed Extension of Public Golf Course
at Kau Sai Chau Island, Sai Kung**

**Monthly Environmental Monitoring & Audit (EM&A) Report
for April 2006**

(Report No. 382210/004)

Report Authorized For
Issue By:



For and on Behalf of
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May 2006

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Your ref : 40040032/CERT/05_06.doc
Our ref :

**Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung
(Independent Environmental Checker)**

CHECK CERTIFICATE

1. We certify that professional skill and care have been used in the checking of the Environmental Team's (ET) No.4 Monthly EM&A Report for April 2006 for the construction of Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung.
2. We certify that the ET's EM&A programme for the reporting period has been satisfactorily executed and the No.4 Monthly EM&A report for April 2006 has been verified.
3. We would comment that our evaluation of the ET's EM&A is based on a random audit process which cannot be guaranteed to have all non-conformities identified.

Signed



Independent Environmental Checker

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Date 3 May 2006

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Executive Summary

This is the fourth monthly Environmental Monitoring and Audit (EM&A) report prepared by Black & Veatch, the designated Environmental Team (ET), for the Project “Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung”. The construction works of golf course was commenced on 16th January 2006. This report presents the results of the EM&A works conducted in the month of April 2006 (25th March 2006 to 24th April 2006).

Summary of construction works undertaken during this report period

Vegetation clearance at Holes 1, 2, 3, 8, 9 & 18 were completed. For Hole 17, approximate 30% of vegetation was cleared. Haul roads located at centre and northern part of the project was completed to link up Holes between 1-10, 17&18. Major cut & fill work was carried at Holes 1, 2, 3, 8, 9, 17 & 18 during the reporting month.

The temporary barging point was completed at early April 2006. The floating pontoon was located at the EP location. Site formation for the concrete batching plant was completed and the construction of concrete batching plant was on-going. No concrete production was recorded during the monitoring month. Site office was started to construct near the mid-April 2006 near the existing maintenance building. No chemical storage area was available on site.

For the desalination plant, no dredging work for the desalination plant intake and outfall pipelines was carried out. Only land formation work for the desalination plant was carried out.

Stream buffer zone was demarcated at Stream A and partially at Stream B (tributary mainly). Construction of temporary bridge no. 9 was completed at the end of March 2006 within the Stream A buffer zone area. The intrusion of buffer zone area was mainly the abutment area for the temporary bridge no. 9. Temporary bridge no. 5, across the existing freshwater marsh near to existing Hole N15, was started to construct at the end of this reporting month.

Environmental Monitoring and Audit Progress

A summary of monitoring activities in this reporting period is shown as follows:

24-hour Total Suspended Particulates (TSP) monitoring at GCA B1	5 times
Water quality monitoring (marine + freshwater)	10 times
Terrestrial Ecology	1 time
Marine Ecology	1 time
Landscaping & Visual	2 times

Air Quality

5 sets of 24-hour TSP monitoring were carried out on 30th, 4th, 11th, 18th & 22nd April 2006 at Bungalow A (GCA B1) at Kau Sai Chau during this reporting month. One exceedance (TSP = 235 µg/m³) of action level of 24-TSP was recorded at GCA B1 on 4th April 2006.

Water Quality

10 sets of water quality monitoring were carried out on 27th, 29th and 31st March 2006 and 4th, 6th, 8th, 10th, 12th, 19th and 24th April 2006 at 9 marine and 7 freshwater monitoring locations. Monitoring was performed on schedule. The extra set of water quality sampling was carried out due to the amber, red and black rain storm event occurred on 24th April 2006.

For marine water, (i) three limit level exceedances of turbidity and (ii) five limit level exceedances of SS were recorded at KLW, M_Marsh, TTC, M_BP and KS on 24th April 2006 due to the heavy rainstorm.

During the reporting month, (i) three action and nine limit level exceedances of turbidity and SS were recorded at Stream A, (ii) one action and seven limit level exceedances of turbidity and SS were recorded at Streams B and C and (iii) three action and five limit levels exceedances of turbidity and SS were recorded at the downstream of freshwater inland marsh.

Ecology

Terrestrial ecology was conducted on 21st and 26th April 2006. The demarcation of the stream buffer zone had been established for Stream A and Stream B, and a temporary access bridge had been constructed as a crossing for Stream A. Stream C buffer zone demarcation establishment will be finished by the Contractor before the works fronts reach Stream C. In general, except the temporary bridge crossing point at Stream A, the streams and the riparian vegetation were in natural conditions similar to the condition during the Baseline Survey.

Marine ecology was conducted on 27th & 28th April 2006 at Site B2, Site C and Control Site. A seawall had constructed at Site B2 as the landing point of the temporary barging point. The monitoring regime At Site B2 was adjusted. The total numbers of tagged corals at Site B2 were increased from 20 to 50. Minor sedimentation coverage ranged from 3 to 5% was observed at Site B2 but the percentage was smaller than the action level standard (i.e. 15%), and thus did not trigger response plan. Site C and the Control Site still remained similar conditions as during the Baseline Survey. No mortality, sedimentation or bleaching was found on the tagged corals in these two sites.

Landscaping & Visual

Landscape and visual monitoring and site audits were carried on 4th and 20th April 2006. Vegetation clearance work, site formation and erection of site office were being carried out at present. Some of the trees had been already transplanted to final location. Stockpiles of cleared vegetation were found stored on site and require removal.

Environmental Site Auditing

Four weekly joint environmental site audits were carried out on 29th March, 4th, 11th and 21st April 2006 with the Contractor's representative. A monthly joint environmental site audit was carried out on 21st April 2006 by the Contractor's Representative ET's representative and Independent Environmental Checker (IC(E)).

Environmental Non-conformance

Air Quality

One exceedance (TSP = 235 µg/m³) of action level of 24-TSP was recorded at GCA B1 on 4th April 2006. The exceedance was considered project-related. Follow up action on review of the dust suppression mitigation measure is required.

Freshwater and Marine Water

For marine water, all eight exceedances of SS and turbidity were recorded at KLW, M_Marsh, TTC, M_BP and KS on 24th April 2006 due to the heavy rainstorm event. For the exceedances at KLW and KS, they were considered not attributed to the works. No further action was required. The exceedances were mainly due to natural variation of marine water after heavy rainstorm event.

Major silty runoff was observed on 24th April 2006 during the site investigation after the heavy rainstorm event from Stream A, haul road near temporary barging point and existing freshwater inland marsh. Six exceedances (three exceedances of SS and three exceedances of turbidity) were recorded at M_Marsh, TTC and M_BP. All six exceedances were, considered project-related.

The exceedances recorded at Stream A were mainly attributed to from runoff from filling area of Hole 17 and temporary bridge no. 9 and heavy rainstorm event on 24th April 2006. As no construction work adjacent to the Streams B & C, those exceedances were considered natural variation of the streams and considered not project-related. The exceedances recorded at freshwater inland marsh were mainly attributed to the runoff from Holes 1 & 18 to the existing freshwater inland marsh and considered project-related.

All notifications of exceedances have been forwarded to the relevant parties and the subsequent exceedance incident report prepared by the ET was reviewed by the IEC before issuing to relevant parties.

For those considered project-related freshwater and marine water exceedances, the Contractor was required to urgently review the temporary drainage management plan and implement necessary improvement to prevent runoff from the construction site to the marine and stream courses. The Contractor was also requested to rectify the situation as soon as possible. The water quality monitoring results revealed that the temporary drainage installed on site was insufficient.

No environmental complaint was received in this reporting period. No environmental summon was received in this reporting period.

Implementation Status of Environmental Mitigation Measures

The Contractor was reminded the following issues and take actions if necessary

- Watering the haul road especially in conjunction to the existing golf course and during excavation work areas regularly;
- Provide dust suppression mitigation measures especially potential dust generation activities such as rock breaking;
- Minimize the water quality impact when undertaking excavation works. Temporary drainage system and contingency plan should be proposed to the Engineer's Representative (ER) for approval and ET for comment. It is important to provide sufficient temporary drainage at critical areas to confine, collect and provide proper treatment before discharge to marine water and stream courses to ensure the water quality is comply with WPCO requirement;
- Minimize the exposed areas by controlling the vegetation clearance area. Vegetation should be kept in-situ as much as possible until works require at the construction areas;
- Minimize the cut-and-fill areas;
- Removal of the vegetation stockpiles;
- Strengthen the preventive/interim measures for the silty runoff along the boundary of the exposed areas especially at low lying areas. More frequency maintenance on the silt fence is necessary;
- Modification at major haul road to prevent the silty runoff is necessary; and
- Providing wheel washing facilities.

Future Key Issues

Key issues to be considered in the coming month include:

- Implementation of sufficient temporary drainage system on site;
- Dust generation from activities on-site : cut-and-fill at mainly Holes 1-9 & 17-18, concrete batching plant operation, temporary haul road construction;
- Construction of site office and storage areas near the existing maintenance building;
- Construction of temporary bridge no. 5 near Holes 5 & 6;
- Land formation works for the desalination plant near to the existing pier;
- Silty runoff due to vegetation clearance and exposed excavated areas from construction site to marine and stream courses;
- Storage of chemicals/fuel and chemical waste/waste oil on site; and
- Sewage and general refuse generated from workers.

Potential environmental impacts arising from the construction activities in the coming month are expected to be mainly associated with dust, site runoff and waste management.

1. Introduction

1.1 Background of the Project

1.1.1 Black & Veatch (hereinafter called the "ET") was appointed by Hong Kong Jockey Club (hereinafter called the "Project Proponent") to undertake Environmental Monitoring and Audit (EM&A) for "Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung" (hereinafter called the "Project"). Under the requirements of Section 4 of Environmental Permit EP-224/2005, EM&A programme as set out in the EM&A Manual is required to be implemented. In accordance with the EM&A Manual, environmental monitoring of air quality, water quality, terrestrial and marine ecology, landscape and visual, archaeology (watching brief) and land contamination are required for the Project.

1.1.2 This report summarises the environmental monitoring and audit works for the Project in April 2006 (from 25th March to 24th April 2006).

1.2 Purpose of the Report

1.2.1 This is the fourth EM&A report which summarizes the impact monitoring results and audit findings for the EM&A programme during the reporting period from **25th March to 24th April 2006**.

1.3 Structure of the Report

1.3.1 The structure of the report is shown in Table 1.1.

Table 1.1 Structure of the Report

Section		Description
1	Introduction	Details the scope and structure of the report
2	Project Information	Summarizes background and scope of the project, site description, project organization and contact details, construction programme, the construction works undertaken and the status of environmental permits/licenses during the reporting period.
3	Environmental Monitoring Requirement	Summarizes the monitoring parameters, programmes, methodology, frequency, location, action and limit levels, event action plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.
4	Implementation Status on Environmental Mitigation Measures	Summarizes the implementation of environmental protection measures during the reporting period.
5	Monitoring Results	Summarizes the monitoring results obtained in the reporting period.
6	Environmental Site Auditing	Summarizes the audit findings of the weekly site inspections undertaken within the reporting period.
7	Environmental Non-conformance	Summarizes any monitoring exceedance, environmental complaints and environmental summons within the reporting period.
8	Future Key Issues	Summarizes the impact forecast and monitoring schedule for the next three month (25 Apr – 24 Jul 2006).
9	Recommendations and Conclusions	Lists out any recommendations and provides an overall conclusion of the results and findings of the EM&A programme for the reporting period.

2. Project Information

2.1 Background

2.1.1 The Project comprises the following major components:

- Construction of a third 18-hole public golf course on the east side of the island, south of the existing golfing area;
- A new irrigation lake to collect surface runoff from new 18-hole golf course. Water stored at the new irrigation lake can also be diverted to existing reservoir for tertiary treatment and recycling;
- A new desalination plant adjacent to the existing pier to serve as an additional irrigation water supply for the new golf course during dry season; and
- Expansion of existing administration and maintenance buildings.

2.1.2 The potential environmental impacts of the Project have been studied in the Environmental Impact Assessment (EIA) report (EIAO Register No. AEIAR- 091/2005). The EIA was approved on 14 November 2005 under the EIAO. An Environmental Permit (EP-224/2005) was granted on 28 November 2005.

2.2 Site Description

2.2.1 A layout plan of the Project is provided in **Figure 1.1**.

2.3 Project Organization

2.3.1 Project organization and lines of communication are shown in **Figure 1.2**.

2.4 Construction Programme

2.4.1 The tentative construction programme for the Project is presented in **Annex A**. The construction works were commenced on 16 January 2006 and are scheduled to be completed by end of July 2007.

2.5 Status of Environmental Submission

2.5.1 A summary of the reporting requirement for compliance with EP conditions of the Project is listed in Table 2.1.

Table 2.1 Summary of Compliance with EP Conditions

EP-224/2005	Environmental Permit Submission	Status	Remarks
2.3	Management organization of the main construction companies and/or any form of joint ventures associated with the construction of the Project.	Submitted	At least one week before the commencement of construction of the Project.
2.4	Contamination Assessment Plan (CAP) submission. If land contamination is confirmed by the site investigation, submission of a Remediation Assessment	Submitted	The site investigation was carried out on 14 th and 15 th February 2006. The CAR was submitted on 23 rd March 2006. Based on the results, all hotspots are not contaminated. Therefore, RAP is not

EP-224/2005	Environmental Permit Submission	Status	Remarks
	Plan (RAP) including a Contamination Assessment Report (CAR) is required.		required.
3.6	Detailed methodology for Coral Transplantation submission to the Director for approval.	In progress	At least one month before commencement of the Coral Transplantation.
4.1	EM&A Manual (revised)	Submitted	At least two weeks before commencement of construction of the Project.
4.3	Baseline Monitoring Report	Submitted	At least two weeks before commencement of construction of the Project
4.5	Monthly EM&A Report	Submitted	within 10 working days after the end of the reporting month
5.1	Set up a dedicated web site and notify the Director in writing the Internet address.	Completed	Within 6 weeks after the commencement of construction of the Project (http://www.kscgolf.com/ema/index.asp)

2.6 Summary of EM&A Requirements

2.6.1 The EM&A programme requires environmental monitoring for air quality, water quality, terrestrial and marine ecology, landscape and visual, archaeology (watching brief) and land contamination. The EM&A requirements for each parameter are described in subsequent sections, including:

- All monitoring parameters;
- Action and Limit Levels for all environmental parameters;
- Event and Action Plans; and
- Environmental mitigation measures, as recommended in the project EIA final report.

2.6.2 A summary of impact EM&A requirements is presented in Table 2.2.

Table 2.2 Summary of Impact EM&A Requirements

Impacts	Parameters/descriptions	Locations	Frequencies	Duration
Air Quality	24-Hour TSP	1 Location	Once every 6 days	During Construction
	1-Hour TSP	1 Location	Three times in every 6 days	During Construction (As required when complaint received)
Water Quality	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity and SS	9 marine and 7 freshwater locations	<u>First 3 months</u> 3 times a week, mid-ebb and mid-flood tides. If there is no exceedance occurs for the first 3 months, reduce to once per week.	During Construction
	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity, SS, NO3-N, NO2-N, NH3-N, TP and selected pesticides.	9 marine and 7 freshwater locations	Once per week. If there is no exceedance occurs, monitoring frequency is subjected to change and shall be agreed with EPD.	During Construction: turf establishment period (permanent low flow drainage is not completed)
	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity, SS, NO3-N, NO2-N, NH3-N, TP, Chl-a and selected pesticides.	9 marine and 6 freshwater locations	A 2-year of monitoring period for the operation phase is proposed. Monitoring should be carried out on bi-weekly basis for the first 12 months, after when the frequency will be reviewed by EPD.	During Operation
	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity, SS, NO3-N, NO2-N, NH3-N, TP, Chl-a and selected pesticides	8 marine locations	Additional water quality monitoring shall be carried out after heavy rain storm or when there is an overflow event from the reservoir, irrigation buffer lake or detention ponds/tanks.	During Construction and Operation
Terrestrial Ecology	Monitoring aquatic fauna	Streams B, C & D	Once a month	During Construction
	Environmental Site Inspection mainly on intact of buffer zones	Streams A, B and C	Once a week	During Construction

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Impacts	Parameters/descriptions	Locations	Frequencies	Duration
Marine Ecology	Transplanted corals	Site D2	Quarterly for one year after transplantation	During construction
	Natural corals	Site C, Site B2, Site D2, and the Control Site.	<p>For Site D2 and the Control Site: Weekly at the first two weeks of dredging works for the desalination plant pipelines. If no exceedance was recorded, the monitoring schedule would be changed to biweekly till the pipeline construction works are finished.</p> <p>For Site C, B2 and the Control Site: Monthly for the first three months of the construction phase. If no exceedance was recorded, the monitoring schedule would be changed to quarterly during the rest of the construction phase.</p>	During Construction
		Site C, Site D2 and the Control Site.	First three months would be monthly conducted during the first two years of the operation phase. If no exceedance was recorded, the monitoring schedule would be changed to semi-annually, i.e. once in dry season and once in wet season.	During Operation
	Seagrass bed	Site D3, and at Site D2 if seagrasses were found during the baseline monitoring.	Weekly during the first two weeks of dredging works, and then biweekly till the pipeline construction works are finished.	During Construction
		Site D3, and at Site D2 if seagrasses were found during the baseline monitoring.	<p>During the first two years of the operation phase.</p> <p>The monitoring schedule during the first three months would be monthly. After that, the monitoring schedule would be changed to semi-annually, i.e. once in dry season and once in wet season.</p>	During Operation
Landscape and Visual	Audits to ensure effective implementation of mitigation measures	Project area and at visual sensitive receivers	Auditing inspections and reporting shall be undertaken once every two weeks of the construction phase and once every two months of the operation phase.	During Construction and Operation
Archaeology (Watching Brief)	Monitor archaeological potential sites at major cut areas	Hole 2, Hole 11, Hole 12, Hole 14, Hole 15 and Hole 16.	The archaeologist should keep the AMO informed of the progress of watching brief. The archaeologist should submit progress reports every 3 months during the programme of the watching brief.	During Construction
Land Contamination	Total Sulphur and Total Lead	Locations 2, 3, 6, 7 & 8	One month before commencement of work at the identified 5 hotspots	During Construction
General Site Conditions	Environmental Site Inspection	Works areas and areas affected by works	Periodically (weekly basis)	During Construction

3. Environmental Monitoring Requirements

3.1 Air Quality

Monitoring Requirement

- 3.1.1 24-hour TSP monitoring was carried out at GCA B1 to monitor the construction dust impact level in this reporting period.
- 3.1.2 The established Action/Limit Levels (AL levels) for the 1-hour and 24-hour TSP monitoring works are summarized in Table 3.1 and Table 3.2.

Table 3.1 Action and Limit Levels for 1-hour TSP

Location	Description	Action Level	Limit Level
GCA B1	Bungalow A adjacent to Kau Sai Chau Public Golf Course Administration Building	277.2 $\mu\text{g m}^{-3}$	500 $\mu\text{g m}^{-3}$

Note: The action levels for GCA B1 are developed based on baseline monitoring result.

Table 3.2 Action and Limit Levels for 24-hour TSP

Location	Description	Action Level	Limit Level
GCA B1	Bungalow A adjacent to Kau Sai Chau Public Golf Course Administration Building	187.4 $\mu\text{g m}^{-3}$	260 $\mu\text{g m}^{-3}$

Note: The action levels for GCA B1 are developed based on baseline monitoring result.

Monitoring Parameters, Frequency and Programme

- 3.1.3 The monitoring parameters and frequency are summarized in Table 3.3. The monitoring programme for the reporting period is shown in **Annex B**.

Table 3.3 TSP Monitoring Parameter and Frequency

Parameter	Frequency
24-hour TSP	Once every 6 days
1-hour TSP	3 times every 6 days (as required in case of complaints)

Monitoring Locations

- 3.1.4 In accordance with the EM&A Manual, one monitoring station (GCA B1) was selected and shown in **Figure 3.1**.

Monitoring Equipment

- 3.1.5 24-hour and 1-hour TSP (in case of complaints received) were performed using High Volume Samplers (HVS) and measured in-situ respectively. 24-hour TSP level of samples will be collected using filters and High Volume Sampler and the collected samples will be determined by a local HOKLAS accredited laboratory upon receipt of the samples and 1-hour TSP level will be performed in-situ.

- 3.1.6 High volume samplers (HVS - Model GS-2310 Accu-vol) complete with the appropriate sampling inlets were installed for 24-hour TSP sampling. The HVS is composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50 Appendix B). A portable dust meter was used for the 1-hour TSP monitoring. Table 3.4 summarises the equipment used.

Table 3.4 Air Quality Monitoring Equipment

Equipment	Model
HVS Sampler	GS 2310 Accu-vol system
Calibrator	GMW 25
1-hour TSP Dust Meter	Laser Dust Monitor – Model LD-1 (L)

Monitoring Methodology and Calibration Details

24-hour TSP Monitoring

(i) Field Monitoring, Operation & Analytical Procedures

- 3.1.7 Operating/analytical procedures for the operation of HVS are as follows. The sampler was placed on a horizontal platform with appropriate supporting structure such that:
- the filter was at least 1.3 meters above ground;
 - no two samplers should be placed less than 2 metres apart;
 - the distance between the sampler and an obstacle, such as buildings, would be at least twice the height that the obstacle protrudes above the sampler;
 - a minimum of 2 metres separation from walls, parapets and penthouses would be required for the rooftop samplers;
 - a minimum of 2 metres separation from any supporting structure, measured horizontally would be required;
 - airflow around the sampler would be unrestricted;
 - no furnaces or incineration flues would be operating near the sampler;
 - the sampler would be more than 20 metres from the dripline; and
 - any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.
- 3.1.8 Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 1.1 m³/min. and 1.4 m³/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.
- 3.1.9 For TSP sampling, fibreglass filters (G810) were used [Note: these filters have a collection efficiency of > 99% for particles of 0.3 mm diameter].
- 3.1.10 The power supply was checked to ensure the sampler worked properly.
- 3.1.11 On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air monitoring station.
- 3.1.12 The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.

- 3.1.13 The filter was aligned on the screen so that the gasket formed an air-tight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.
- 3.1.14 The shelter lid was closed and secured with the aluminum strip.
- 3.1.15 The timer was then programmed. Information was recorded on the record sheeting, which included the starting time, the weather condition, and the filter number (the initial weight of the filter paper can be found out by using the filter number).
- 3.1.16 After sampling, the filter was transferred from the filter holder of the HVS to a sealable plastic bag and sent to the laboratory for weighing. The elapsed time was also recorded.
- 3.1.17 Before weighing, all filters were conditioned for 24 hours before weighing under temperature of $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and the relative humidity (RH) $< 50\% \pm 5\%$, preferably 40%. The HOKLAS laboratory (ALS Technichem (HK) Pty Ltd) has comprehensive quality assurance and quality control programmes.

(ii) Maintenance

- 3.1.18 Proper maintenance would be provided for the HVS as described below:
- 3.1.19 The HVS motors and their accessories have been properly maintained. Appropriate maintenance such as routine motor brushes replacement (time interval for replacement is about 500 hours) and electrical wiring checking have been conducted to ensure that the equipment and necessary power supply were in good working condition.
- 3.1.20 Initial calibration of HVS was conducted upon installation of equipment. The subsequent calibration would be provided at 2-month intervals using GMW-25 Calibration Kit.

1-hour TSP Monitoring

(i) Measuring Procedures

- 3.1.21 The measuring procedures of the 1-hour dust meter have been in accordance with the Manufacturer's Instruction Manual as follows:
- Set POWER to "ON", push BATTERY button, make sure that the meter's indicator is in the range with a red line and allow the instrument to stand for about 3 minutes (Then, the air sampling inlet has been capped).
 - Push the knob at MEASURE position.
 - Push "O-ADJ" button. (Then meter's indication is 0).
 - Push the knob at SENSI ADJ position and set the meter's indication to S value described on the Test Report using the trimmer for SENSI ADJ.
 - Pull out the knob and return it to MEASURE position.
 - Push "START" button.
 - All measurement procedures in section 2.3 of the approved EM&A Manual are followed during the reporting period.

(ii) Maintenance

- 3.1.22 The 1-hour TSP meter would be checked at 3 month intervals and calibrated at 1-year intervals throughout all stages of the air quality baseline monitoring.

Event and Action Plans

3.1.23 The Event and Action Plan (EAP) for air quality monitoring is presented in **Annex C**.

3.2 Water Quality

Monitoring Requirement

3.2.1 Water quality monitoring was conducted in accordance with the EM&A Manual. Tables 3.5 & 3.6 show the established Action/Limit Levels for the water environmental monitoring parameters.

Table 3.5 Derived Summaries of Action and Limit Levels for Marine Water Quality

Parameters	Location	Action	Location	Limit
DO (Surface & Middle)	FCZ	6.0 mg/L	FCZ	5.3 mg/L
	All except FCZ	4.9 mg/L	All except FCZ	4.6 mg/L
DO (Bottom)	All	3.7 mg/L	All	3.4 mg/L
pH (depth-averaged)		N/A	All	6.5 - 8.5
SS (Depth-averaged)☆	FCZ	4.5 mg/L	FCZ	5.6 mg/L
	All except FCZ	6.1 mg/L	All except FCZ	10.6 mg/L
SS (Depth-averaged) Dredging for submarine pipelines⊕	M_RO1	6.1 mg/L	M_RO1	10.6 mg/L
Turbidity (Tby) (depth-averaged) ☆	FCZ	2.9 NTU☼	FCZ	3.9 NTU☼
	All except FCZ	3.3 NTU☼	All except FCZ	6.2 NTU☼
Ammonia Nitrogen (depth-averaged)	FCZ	0.02 mg/L	FCZ	0.03 mg/L
	All except FCZ	0.05 mg/L Δ	All except FCZ	0.05 mg/L Δ
Nitrate Nitrogen (depth-averaged)	FCZ	0.08 mg/L	FCZ	0.09 mg/L
	All except FCZ	0.09mg/L Δ	All except FCZ	0.09 mg/L Δ
Nitrite Nitrogen (depth-averaged)	FCZ	0.02 mg/L θ	FCZ	0.02 mg/L θ
	All except FCZ	0.02 mg/L	All except FCZ	0.04 mg/L
TIN (depth-averaged)	FCZ	0.12 mg/L	FCZ	0.14 mg/L
	All except FCZ	0.16 mg/L	All except FCZ	0.18 mg/L
Total Phosphorus (depth-averaged)	All	0.09 mg/L Δ	All	0.09 mg/L Δ

Remarks:

☆ : Action and limit levels are subjected to review especially for wet season throughout the construction phase of the project.

⊕ : Action and limit levels are subjected to review before the dredging works.

☼ : All are based on EM&A baseline monitoring data due to marked difference between EPD turbidity data and those from the baseline survey.

Δ : For nutrient monitoring (except NO₂-N) at non-FCZ stations, the trigger level has made reference to the existing golf course guideline values. The guideline value of NO₂-N is below the current detection limit of 0.01mg/L and thus not used.

θ : The same action and limit level of 0.02 mg/L is determined from the EM&A baseline data as 78% of the NO₂-N data are ≤ 0.01 mg/L and all remaining 22% equal to 0.02 mg/L.

FCZ including fish culture zones of Kai Lung Wan, Tai Tau Chau and Kau Sai

All except FCZ including remaining impact monitoring station of M_RO1, M_Marsh, M_BP and M_Coral.

Control monitoring locations: M_A & M_B

Table 3.6 Derived Summaries of Action and Limit Levels for Freshwater Water Quality

Parameters	Location	Action	Location	Limit
DO (mid-depth)		6.3 mg/L	All	4 mg/L ξ
pH (mid-depth)		N/A	All	6.0 - 9.0
SS (mid-depth) ☆	All	3.8 mg/L or 120% of upstream control station's SS at the same tide of the same day	All	8 mg/L or 130% of upstream control station's SS at the same tide of the same day
Turbidity (Tby) (mid-depth) ☆	All	3.1 NTU or 120% of upstream control station's Tby at the same tide of the same day	All	4 NTU or 130% of upstream control station's Tby at the same tide of the same day
Ammonia Nitrogen (mid-depth)		N/A	All	0.01 mg/L
Nitrate Nitrogen (mid-depth)	All	0.10 mg/L	All	0.11 mg/L
Nitrite Nitrogen (mid-depth)		N/A	All	0.01 mg/L
TIN (mid-depth)	All	0.12 mg/L	All	0.13 mg/L
Total Phosphorus (mid-depth)		N/A	All	0.02 mg/L

Remarks:

☆ : Action and limit levels are subjected to review especially for wet season.

Freshwater monitoring locations: F_UA, F_DA, F_UB, F_DB, F_UC, F_DC and F_Inland Marsh

As most of the freshwater samples were reported of NH₃-N, NO₂-N levels below the detection limit of 0.01 mg/L, limit level is set at 0.01 mg/L. Similarly for TP, a limit level of 0.02 mg/L (the detection limit of TP) is imposed.

ξ : Water Quality Objectives of the Port Shelter

Monitoring Parameters, Frequency and Programme

3.2.2 For marine water quality, measurements shall be taken at both mid-flood and mid-ebb tides and at three water depths (1 m below water surface, mid-depth and 1 m above sea bed, except where the water depth is less than 6 m, in which case the mid-depth station may be omitted). Should the water depth be less than 3 m, only the mid-depth station will be monitored.

3.2.3 For the stream course, measurements shall be taken at mid-water depth.

3.2.4 The water quality parameters which need to be monitored are as follows:

- Marine water quality - dissolved oxygen (DO), temperature, turbidity, suspended solids (SS), pH and salinity
 - Freshwater water quality - dissolved oxygen (DO), temperature, turbidity, suspended solids (SS), pH and salinity
- 3.2.5 Additional marine and freshwater water quality monitoring parameters for the impact monitoring during construction include nitrate nitrogen (NO₃-N), nitrite nitrogen (NO₂-N), ammonia nitrogen (NH₃-N), total phosphate (TP) and selected pesticides.
- 3.2.6 The ET Leader shall propose the additional monitoring parameters for approval by IC(E), Engineer, EPD and AFCD, and shall submit such information for approval at least 2 weeks before the turf establishment period.
- 3.2.7 Additional water quality monitoring at Tai Tau Chau FCZ (TTC), Kai Lung Wan FCZ (KLW), Kau Sai FCZ (KS), downstream of the existing marsh (M_Marsh), marine water of Port Shelter (M_Coral), existing reservoir (F_Inland M) and Control stations (M_A and M_B) shall be carried out after heavy rain storm or when there is an overflow event from the reservoir, irrigation buffer lake or detention ponds/tanks. The heavy rain storm shall be defined when there is an amber/red/black rainstorm warning signal issued by the Hong Kong Observatory. The water sample shall be taken within 24 hours after the black/red/amber rainstorm warning signal is cancelled. Please refer to revised EM&A manual for the sampling condition requirement after a heavy rain storm event occurs. The monitoring parameters shall include dissolved oxygen, temperature, turbidity, suspended solids, pH and salinity. Additional parameters shall be the same as stated in paragraphs 3.2.5-3.2.6.

Monitoring Frequency

- 3.2.8 The monitoring parameters and frequency are summarized in Table 3.7. The monitoring programme for the reporting period is shown in **Annex B**.

Table 3.7 Water Quality Monitoring Parameter, Frequency and Locations

Parameters	Frequency	Location
Dissolved Oxygen (mg/L)	3 days per week	<u>Marine Water</u> Fish culture zone stations: TTC, KLW, KS
Temperature (°C)		Control stations: M_A, M_B
Turbidity (NTU)		Impact stations: M_BP, M_RO1, M_Marsh, M_Coral
pH		
Salinity (ppt)		<u>Freshwater Water</u> Stream A (F_UA, F_DA) Stream B (F_UB, F_DB) Stream C (F_UC, F_DC) Inland Marsh (F_Inland_M)
Suspended Solids (mg/L)		

Monitoring Locations

3.2.9 The water quality monitoring locations for marine and freshwater (**Figure 3.2**) are summarized in Table 3.8.

Table 3.8 Water Quality Monitoring Locations during Construction Phase

Identification Number	Location	Co-ordinates		Approx. Water Depth	No. of Depth
<i>Marine Water (9 stations)</i>		latitude	longitude		
TTC	Tai Tau Chau Fish Culture Zone	22° 22' 03.7"	114° 19' 19.6"	9.5 m	3
KLW	Kai Lung Wan Fish Culture Zone	22° 22' 10.6"	114° 18' 01.4"	13 m	3
KS	Kau Sai Fish Culture Zone	22° 20' 26.5"	114° 18' 59.9"	11 m	3
M_BP	Temporary barging point	22° 21' 50.6"	114° 19' 16.7"	9.6 m	3
M_RO1	Desalination plant south of the existing pier	22° 21' 51.8"	114° 18' 17.7"	5 m	2
M_Marsh	Discharge point at the existing marsh	22° 22' 19.8"	114° 19' 05.4"	7.7 m	3
M_Coral	Marine water of Port Shelter	22° 21' 21.3"	114° 19' 42.7"	10.2m	3
M_A	Water Control Station of Port Shelter	22° 22' 51.3"	114° 18' 34.5"	7.5 m	3
M_B	Water Control Station of Port Shelter	22° 20' 26.4"	114° 20' 11.8"	16.5 m	3
<i>Fresh Water (7 stations)</i>					
F_UA	Upstream and downstream of stream A	22° 21' 32.3"	114° 19' 06.5"	-	1
F_DA		22° 21' 33.5"	114° 19' 06.8"		1
F_UB	Upstream and downstream of stream B	22° 21' 23.9"	114° 19' 16.1"	-	1
F_DB		22° 21' 27.2"	114° 19' 16.0"		1
F_UC	Upstream and downstream of stream C	22° 21' 14.8"	114° 19' 26.4"	-	1
F_DC		22° 21' 03.5"	114° 19' 32.0"		1
F_Inland M	Downstream of the existing marsh (Inland)	22° 22' 17.9"	114° 18' 59.1"	-	1

Monitoring Equipment

3.2.10 The equipment listed below shall be supplied by the ET and approved by the IC(E) and the Engineer for water quality monitoring.

Dissolved Oxygen and Temperature Measuring Equipment

3.2.11 The instrument shall be a portable and weatherproof DO measuring instrument complete with cable and sensor, and use a DC power source. The equipment shall be capable of measuring:

- dissolved oxygen levels in the range of 0 - 20 mg L⁻¹ and 0 - 200% saturation; and
- a temperature of 0 - 45 degrees Celsius.

3.2.12 It shall have a membrane electrode with automatic temperature compensation complete with a cable. Sufficient stocks of spare electrodes and cables shall be available for replacement where

necessary. (For example, YSI model 59 meter, YSI 5739 probe, YSI 5795A submersible stirrer with reel and cable or an approved similar instrument).

- 3.2.13 Should salinity compensation not be built-in in the DO equipment, in-situ salinity shall be measured to calibrate the DO equipment prior to each DO measurement.

Turbidity Measurement Instrument

- 3.2.14 Turbidity shall be measured in situ by the nephelometric method. The instrument shall be portable and weatherproof turbidity measuring instrument using a DC power source complete with cable, sensor and comprehensive operation manuals. It shall have a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU (for example, Hach model 2100P or an approved similar instrument). The cable shall not be less than 25m in length. The meter shall be calibrated in order to establish the relationship between NTU units and the levels of suspended solids.

Suspended Solids

- 3.2.15 A water sample at least 2.5L in capacity with messenger and using a 10m line should be collected. Samples should be submitted to HOKLAS accredited laboratory as soon as possible for gravimetric analysis for suspended.

Sampler

- 3.2.16 A water sampler is required. It shall comprise a transparent PVC cylinder, with a capacity of not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler shall have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth (for example, Kahlsico Water Sampler or an approved similar instrument).

Water Depth Detector

- 3.2.17 A portable, battery-operated echo sounder shall be used for the determination of water depth at each designated monitoring station. This unit can either be hand held or affixed to the bottom of the work boat, if the same vessel is to be used throughout the monitoring programme.

Salinity

- 3.2.18 A portable salinometer capable of measuring salinity in the range of 0 - 40 parts per thousand (ppt) shall be provided for measuring salinity of the water at each monitoring location.

pH

- 3.2.19 The instrument shall consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It shall be readable to 0.1pH in a range of 0 to 14. Standard buffer solutions of at least pH 7 and pH 10 shall be used for calibration of the instrument before and after use. Details of the method shall comply with APHA, 19th ed. 4500-HTB.

Flow Rate Meter

- 3.2.20 A portable, battery-operated flow meter should be used for the determination of water depth at each designated monitoring location and record in m³/s. A hand held or meter fixed to the underside of the survey boat may be used.

Sample Containers and Storage

- 3.2.21 Water samples for laboratory analysis shall be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen) and delivered to the laboratory and analysed as soon as possible after collection. Sufficient volume of samples shall be collected to achieve the required detection limit.

Monitoring Position Equipment

- 3.2.22 A hand-held or boat-fixed type digital Differential Global Positioning System (DGPS) with way point bearing indication or other equipment instrument of similar accuracy, shall be provided and used during marine water monitoring to ensure the monitoring vessel is at the correct location before taking measurements.

Monitoring Methodology and Calibration Details

- 3.2.23 Dissolved oxygen (DO), temperature, turbidity, pH and salinity were measured in situ at the designated water quality monitoring stations. General observation, weather conditions, with the sampling time, date and location were marked on the field record sheet.
- 3.2.24 Water samples were taken from each monitoring station for laboratory analysis. The sample identification number, sampling location, date, time, project name and analyses were required.
- 3.2.25 The samples were placed in a cooler with ice (to 4°C without being frozen) and kept away from sunlight. Samples were submitted to a Hong Kong Laboratory Accreditation Scheme (HOKLAS) or other international accredited laboratory for analysis within 24 hours of sampling.

Calibration of In-Situ Instruments

- 3.2.26 All in situ monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use and subsequently re-calibrated at three monthly intervals throughout all stages of the water quality monitoring programme. Responses of sensors and electrodes were checked with certified standard solutions before each use. Wet bulb calibration for a DO meter were carried out before measurement at each monitoring location.

Laboratory Analysis

- 3.2.27 All laboratory work were carried out by ALS Technichem Pty Ltd (HOKLAS accredited laboratory). Water samples were collected at the monitoring and control stations for carrying out the laboratory determinations. The determination work will start within 24 hours after collection of the water samples. The analysis shall follow the standard methods according to APHA Standard Methods for the Examination of Water and Wastewater, 19th Edition, or an equivalent method approved by EPD.

Table 3.9 Analytical Methods to be applied to Water Quality Samples

Determinant	Standard Method	Reporting Limit
Suspended Solids	APHA 2540 D	2 mg/L
Nitrate Nitrogen	APHA 4500-NO ₃ ⁻	0.01 mg/L
Nitrite Nitrogen	APHA 4500-NO ₂ ⁻	0.01 mg/L
Ammonia Nitrogen	APHA 4500-NH ₃ (D)	0.01 mg/L
Total phosphorus	ASTM D515-88B	0.02 mg/L*
Chlorophyll a	APHA 10200 H2 &3	0.5 µg/L

Remarks: *After review baseline data, the detection limit report will be revised to 0.02 mg/L.

QA/QC Procedure

- 3.2.28 ALS Technichem Pty Ltd. has comprehensive quality assurance and quality control programmes. For QA/QC procedures of parameters, one duplicate sample was analysed for every batch of 20 samples as required by HOKLAS.

Event and Action Plans

- 3.2.29 The Event and Action Plan (EAP) for water quality monitoring is presented in **Annex C**.

3.3 Ecology

Introduction

- 3.3.1 The marine and terrestrial ecological monitoring surveys for the ecological EM&A were conducted in accordance with the EM&A manual.
- 3.3.2 As stipulated in the EM&A Manual, the ecological monitoring surveys for terrestrial ecology would be conducted monthly during the construction phase. Monitoring survey would consist of aquatic fauna survey. While the majority of the Project Area would be subject to site formation, natural streams would be partially or fully preserved and protected by buffer zones, and therefore would constitute the primary target of the terrestrial ecological monitoring. Special attention should thus be paid to ecologically sensitive streams to ensure minimum damage to existing vegetation and streams. The purpose of the monitoring survey was to check the conditions of the stream habitat and the associated aquatic fauna communities.
- 3.3.3 While the ecological monitoring surveys for marine ecology included coral monitoring at both the eastern and western coasts of Kau Sai Chau Island. The coral monitoring at the western coast would be conducted concurrently with the dredging works which has yet to conduct, and therefore had not been commenced. The coral monitoring at the eastern Kau Sai Chau would be monthly during the construction phase. Monitoring survey would consist of checking tagged corals at both impact sites and control site. The purpose of the monitoring survey was to check the conditions of the tagged corals and the impact sites.

Ecological Mitigation Measures and Implementations

- 3.3.4 Ecological mitigation measures to be implemented during the construction phase include the following:
- Establishment of buffer zones for the natural stream courses during both construction phase.
 - Provision of temporary bypass channels or pipes during construction phase for stream courses subject to pipe culverting.
 - Protection of water quality of the natural stream courses and temporary bypass channels or pipes.
 - Transplantation of coral colonies within the dredging area for the desalination plant prior to the dredging works.
 - Avoidance of corals when the anchoring points are deployed, and to shift the floating temporary barging point to the location with least corals within the mapping area.
 - Regular site audit of ecological mitigation measures and good site practice.

Monitoring Frequency and Schedule

Terrestrial Ecology

- 3.3.5 As reported in the EIA Report, there were four perennial natural streams (Streams A-D) within the Assessment Area for the EIA Study. Streams A, B & C were located within the Project Area, while Stream D was outside the Project Areas and acted as the main stream draining the western part of the Assessment Area. Buffer Zone would be established for the three streams within the Project Area along their partial length (Stream A) or full length (Streams B & C) (**Figure 3.3**). Moreover, Streams B, C & D would be monitored for aquatic fauna monthly during the construction phase. Monitoring on the implementation of the mitigation measures for stream protection, the effectiveness of stream buffer zones, and the aquatic fauna in streams would be conducted during the entire construction phase.
- 3.3.6 The objectives of the monitoring survey are to check the status of *Caridina trifasciata* and *Nanhaipotamon hongkongensis*. The surveys covered natural stream courses within the assessment area (Streams A to D), and aquatic fauna were studied by various sampling methods depending upon site conditions. Methods included direct observation, active searching, and sample collection using hand-nets. Hand nets were used to collect swimming organisms such as shrimps and fish. Where necessary boulders on the stream beds were overturned to locate aquatic organisms such as crabs. Aquatic species encountered was recorded, with special attention to rare or protected species.

Marine Ecology

- 3.3.7 As required in the EM&A Manual, prior to the commencement of all construction works, a baseline survey of natural corals were conducted in December 2005. At each of the Site C, Site B2, Site D2 and a Control Site near the AFCD's Coral Buoy at Sharp Island (**Figure 3.4**), 20 natural coral colonies in good conditions (i.e. generally intact and no sign of bleaching) and significant sizes (over 20 cm in diameter) were selected and tagged. Each of the tagged coral colonies was identified to species level and their conditions, in terms of percentages of survival, sedimentation and bleaching, were recorded. Each coral was attached with a plastic label with assigned number and then photographed. The species and the size of each tagged corals were also recorded. The species of corals to have been tagged included the following 15 species: *Cyphastrea serailia*, *Favia speciosa*, *Favites abdita*, *Favites pentagona*, *Goniastrea aspera*, *Goniopora columna*, *Hydnophora exesa*, *Leptastrea pruinosa*, *Lithophyllon undulatum*, *Pavona decussate*, *Platygyra acuta*, *Platygyra carnosus*, *Plesiastrea versipora*, *Psammocora superficialis*, and *Turbinaria peltata*. All tagged corals were in good conditions, without significant sign of bleaching or being covered by sediments. The seagrass beds in Site D3 were also surveyed for their extent, coverage percentage and health conditions. The results of the baseline survey were presented in the Baseline Report.
- 3.3.8 The coral monitoring regime at Site B2 was adjusted at the present survey due to the damages on tagged corals reported in the last monitoring report (March 2006). The tagged corals B-11 to B-20, which were distributed in linear formation parallel to the seawall and within the area covered by the temporary barging point, would be retained for monitoring purpose, while another 40 additional corals would be tagged, 20 on each side of the temporary barging point. The total number of tagged corals at Site B2 was thus increased from 20 to 50, and included corals within and outside the sea area covered by the temporary barging point. The indicative locations of the 50 tagged corals were shown in **Figure 3.4b**.
- 3.3.9 The reporting month (April 2006) was the Month Four of the construction programme. As the dredging works for the desalination plant had not been commenced, the impact sites to be monitored in this monitoring survey were Site B2 and Site C (impact sites on the eastern Kau

Sai Chau Island for the new golf course) only, while Site D2 and Site D3 (impact sites on the western Kau Sai Chau Island for desalination plant) were not required in this survey. The coral transplantation, which should be conducted prior to the commencement of dredging works, had not been performed. The monitoring on transplanted corals on the bedrock at Site D2 (see **Figure 3.5**) therefore was not needed in this survey.

- 3.3.10 The schedule for the impact sites on the eastern Kau Sai Chau Island during construction would be monthly in the first three months of the construction programme, and if no exceedance was recorded then quarterly till the end of the construction. As coral damage incident was reported in Month Three of the construction programme, AFCD requested the monthly monitoring should be extended to cover another three months (April, May and June 2006). The present survey was the fourth monitoring survey (the fourth monthly survey). The survival and health conditions of the coral colonies were recorded.
- 3.3.11 During the weekly site inspection, ET also monitored and audited the implementation of the recommended mitigation measures for terrestrial and marine ecology. Monitoring locations for ecology are shown in **Figures 3.3 – 3.5**. The monitoring programme for the reporting period is shown in **Annex B**.

Event and Action Plans

- 3.3.12 The Event and Action Plan (EAP) for ecology monitoring is presented in **Annex C**.

3.4 Landscape and Visual

- 3.4.1 The EIA concluded that the landscape and visual impacts associated with the construction of the third golf course are anticipated to be acceptable with mitigation. In order to ensure that the effective management and implementation of landscape mitigation measures developed and defined in the EIA, the ET conducted regular site inspections of the construction work sites.
- 3.4.2 Auditing inspections and reporting are undertaken once every two weeks of the construction phase. The effectiveness of the mitigation works has been audited in order to ensure impact reduction levels are achieved as described in the EIA report for this monitoring month. The monitoring programme for the reporting period is shown in **Annex B**.

3.5 Archaeology (Watching Brief)

Introduction

- 3.5.1 The archeological impact assessment conducted in the EIA concluded that some potential for archaeological material remains at the Wan Chai Archaeological Site and a watching brief is recommended during the construction phase.
- 3.5.2 A watching brief is a process whereby a qualified and licensed archaeologist monitors the excavation works during the construction phase in areas identified (and agreed with the Antiquities and Monuments Office (AMO)) to be of archaeological potential.
- 3.5.3 The archaeologist conducting the watching brief should obtain a licence prior to commencement of works as stipulated in Section 12 of the Antiquities and Monuments Ordinance (Cap. 53). The licence was granted on 22nd December 2005.

Monitoring Location

- 3.5.4 The monitoring locations include Hole 2, Hole 11, Hole 12, Hole 14, Hole 15 & Hole 16. The monitoring locations are present in **Figure 3.6**.

Monitoring Frequency

- 3.5.5 A total of 18 days of monitoring is considered as minimum, and additional arrangement for watching brief should be made in consultation with AMO in case significant archaeological findings are unearthed in the course of excavation work.

Progress Report

- 3.5.6 Archaeologist should submit progress reports every 3 months during the programme of the watching brief.
- 3.5.7 A summary table for categories of archaeological find and recommended action is presented in **Annex C**.

3.6 Land Contamination

Potential Areas Recommended for Further Investigation

- 3.6.1 Contamination Assessment Plan (CAP) shall be submitted to EPD for approval before site investigation. If land contamination is confirmed by the site investigation, submission of a Remediation Assessment Plan (RAP) including a Contamination Assessment Report (CAR) is required. Potential 5 land contamination hotspots are presented in **Figure 3.7**.

4. Implementation Status on Environmental Protection Requirements

- 4.1.1 The major works at construction site were (i) excavation at Holes 1, 2, 3, 8, 9, 17 & 18, (ii) construction of concrete batching plant at Hole 2, (iii) construction of site office near the maintenance building, (iv) land formation for desalination plant near existing KSC pier, (v) haul road for Holes 3 to 8 and (vi) construction of temporary bridge no. 5 between Holes 5 & 6 during this reporting month.
- 4.1.2 The construction of temporary barging point was completed on early April 2006 and floating pontoon was located at the designated location according to Environmental Permit.
- 4.1.3 The Contractor has provided interim/minimum preventive mitigation measures (silt fence mainly, rock bund covered with geotextile fabric at some low lying areas) to control silty runoff. Sedimentation basins with rock bunds were provided at Holes 1 & 18 low lying areas and modification at the discharge outlet (distribution channel was paved with small rocks and geotextile fabric underneath) near the existing maintenance building to freshwater inland marsh was observed. No cut-off drainage was observed implemented on site during the site audit.
- 4.1.4 For dust suppression, the Contractor was providing mainly at Holes 2 & 9 (with water sprayer) during rock breaking activities. Watering of haul road was observed during the site audit.
- 4.1.5 No dredging work has been carried out near to the existing pier for the desalination plant pipelines.
- 4.1.6 The construction of the site office and chemical storage area were on-going and located near to the existing maintenance building.
- 4.1.7 Silty runoff was observed during the construction of temporary bridge no. 9 across the Stream A. The Contractor was reminded to provide sufficient silty runoff mitigation measures at temporary bridges no. 9 and no. 5 with sufficient temporary drainage system to cater and prevent the runoff discharge to the stream course and freshwater inland marsh respectively.
- 4.1.8 Heavy rainstorm event occurred on early morning 24th April 2006 with the Amber, Red and Black rain storm warnings (from 1:15 am till 7:45 am). An ad-hoc site walk was conducted and observed numerous areas of major silty runoff concerns. The site conditions are summarized below:
- Silt fence has collapsed at various locations especially low lying areas leading to direct silty runoff to marine water and Stream A;
 - Silty runoff from the low areas of Holes 1 & 18 near the existing maintenance building leading to direct silty discharge to freshwater inland marsh and overflow from the weir to marine water;
 - Rocks and soils were washed to Stream A and temporary bridge no. 9 causing direct silty runoff; and
 - Silty runoff was observed at marine water from the haul road near temporary barging point.

- 4.1.9 The Contractor was reminded to implement proper temporary drainage measures and critically reviewed the temporary drainage measures. We recommended the Contractor shall urgently further discuss with the Engineer on the effectiveness and site-specific mitigation measures if necessary to prevent runoff to marine water and stream courses.
- 4.1.10 The Contractor was repeatedly reminded to ensure the revised programme should indicate minimize the exposed area in wet season, control vegetation clearance at sensitive areas and provide sufficient mitigation measures to minimize the potential silty runoff from the construction site.
- 4.1.11 According to the construction programme, turf establishment will start at the August 2006. The Contractor was reminded to provide temporary drainage system to collect and divert the runoff to the existing reservoir when the permanent drainage system is not completed yet. The Contractor was recommended that turf establishment should not be concentrated in a short period of time to reduce the potential nutrients and pesticides runoff to freshwater and marine water sensitive receivers.
- 4.1.12 Summary of implementation status is provided in **Annex D**.

5. Monitoring Results

5.1 Air Quality

- 5.1.1 Dust monitoring was conducted as scheduled in the reporting month. Monitoring of air quality was conducted on 5 occasions in March and April 2006. All monitoring data are provided in **Annex E**. Monitoring of 24-hour TSP was conducted at GCA B1 on 30th, 4th, 11th, 18th & 22nd April 2006. The QA/QC results for laboratory testing in the reporting month were acceptable. The QA/QC results are summarised in **Annex F**.
- 5.1.2 One exceedance (TSP = 235 µg/m³) of action level of 24-TSP was recorded at GCA B1 on 4th April 2006 in the reporting month. No 1-hour TSP measurement was required due to no complaint was received during this monitoring month.
- 5.1.3 ET reviewed the Air Pollutant Index (API) for all air quality monitoring stations in Hong Kong during the reporting month. There was a decreasing trend of API recorded from 30th March 2006 to 5th April 2006. The average API was ranging from 52-63 (medium to high) (**Annex E**). The 24-hr TSP monitoring results at GCA B1 on 30th Apr 2006 and 4th April 2006 were 36.9 µg/m³ and 235 µg/m³ respectively. During the monitoring period, the wind directions were dominated by East and Southeast which could cause a direct dust impact to the monitoring station at Bungalow A. In addition, the cut-and-fill area and exposed area was also increased during the reporting month. The exceedance was considered attributed to the works. The Contractor was reminded to provide sufficient dust suppression mitigation measures on site.

5.2 Water Quality

- 5.2.1 Marine and freshwater water quality monitoring were conducted at the 9 and 7 designated monitoring stations respectively. All monitoring data are provided in **Annex E**.
- 5.2.2 Monitoring of marine and freshwater locations was conducted on 10 occasions in March and April 2006 (27th, 29th and 31st March 2006 and 4th, 6th, 8th, 10th, 12th, 19th and 24th April 2006). The QA/QC results for laboratory testing in the reporting month were acceptable. The QA/QC results are summarised in **Annex F**.

Marine Water

- 5.2.3 For marine water, (i) three limit level exceedances of turbidity and (ii) five limit level exceedances of SS were recorded at K LW, M_Marsh, TTC, M_BP and KS on 24th April 2006 due to the heavy rainstorm. The marine water exceedances were summarised in **Table 5.2-1**.

Table 5.2-1 Marine Water Exceedance Summary March – April 2006

Monitoring Station	Exceedance Level	Date	Parameters	Project-related
K LW	Limit Level	24 th Apr 2006	SS	No
TTC	Limit Level	24 th Apr 2006	SS, Turbidity	Yes
KS	Limit Level	24 th Apr 2006	SS	No
M Marsh	Limit Level	24 th Apr 2006	SS, Turbidity	Yes
M BP	Limit Level	24 th Apr 2006	SS, Turbidity	Yes

Remarks: Exceedances were mainly due to the cause of heavy rainstorm event.

- 5.2.4 For the SS and turbidity exceedances at KLW and KS, they were considered not attributed to the works due to the following reasons: (a) no site runoff was observed from the land formation site of desalination plant during the site investigation on 24th April 2006, (b) similar order of magnitude of SS and turbidity increase were also recorded at control stations (M_A and M_B), (c) no construction work at southern part of Kau Sai Chau. Therefore, no further action was required. The exceedances at KLW and KS were mainly due to natural variation of marine water after heavy rainstorm event.
- 5.2.5 However, silty runoff was observed during the site investigation on 24th April 2006 after the heavy rainstorm event from Stream A, haul road near temporary barging point and existing freshwater inland marsh. Six SS and turbidity exceedances at M_Marsh, TTC and M_BP were considered project-related.

Freshwater

- 5.2.6 During the reporting month, (i) three action and nine limit level exceedances of DO, pH, turbidity and SS were recorded at Stream A, (ii) one action and seven limit level exceedances of turbidity and SS were recorded at Streams B and C and (iii) three action and five limit levels exceedances of DO, pH, turbidity and SS were recorded at the downstream of freshwater inland marsh. The freshwater water exceedances were summarised in **Table 5.2-2**.

Table 5.2-2 Freshwater Exceedance Summary March – April 2006

Monitoring Station	Exceedance Level	Date	Parameters	Project-related
F DA	Limit Level	27 th Mar 2006	SS, Turbidity	Yes*
	Action Level	29 th Mar 2006	Turbidity	Yes*
	Limit Level	29 th Mar 2006	SS	Yes*
	Action Level	31 st Mar 2006	Turbidity	Yes*
	Limit Level	31 st Mar 2006	SS	Yes*
	Limit Level	10 th Apr 2006	Turbidity	Yes*
	Limit Level	10 th Apr 2006	SS	Yes*
	Action Level	24 th Apr 2006	DO	Yes**
	Limit Level	24 th Apr 2006	pH	Yes**
	Limit Level	24 th Apr 2006	SS, Turbidity	Yes**
F DB	Limit Level	27 th Mar 2006	SS	No
	Action Level	4 th Apr 2006	Turbidity	No
	Limit Level	4 th Apr 2006	SS	No
	Limit Level	6 th Apr 2006	SS	No
	Limit Level	10 th Apr 2006	Turbidity	No
F DC	Limit Level	24 th Apr 2006	SS, Turbidity	No
	Limit Level	27 th Mar 2006	SS	No
F Inland Marsh	Action Level	10 th Apr 2006	SS	No
	Limit Level	10 th Apr 2006	Turbidity	No
	Action Level	12 th Apr 2006	SS	No
	Limit Level	12 th Apr 2006	Turbidity	No
	Limit Level	24 th Apr 2006	DO, pH	Yes**
	Limit Level	24 th Apr 2006	SS, Turbidity	Yes**

Remarks:

* - Exceedances were mainly due to the insufficient mitigation measures at temporary bridge no.9

** - Exceedances were mainly due to the cause of heavy rainstorm event

- 5.2.7 The exceedances recorded at Stream A were mainly attributed to (i) insufficient mitigation measure provided at the bridge abutment during the construction of temporary bridge no. 9 and (ii) silty runoff was observed from the filling area of Hole 17 to Stream A2 and deck of the temporary bridge no. 9 during the heavy rainstorm event on 24th April 2006. The temporary bridge was constructed by sheet piles and no temporary drainage was provided to collect and divert the runoff from the temporary bridge located within the Stream A buffer zone.
- 5.2.8 As no construction work adjacent to the Streams B & C, those exceedances were considered natural variation of the streams and considered not project-related.
- 5.2.9 The exceedances recorded at freshwater inland marsh were mainly attributed to the silty runoff from Holes 1 & 18 to the existing freshwater inland marsh and considered project-related.

5.3 Ecology

- 5.3.1 Terrestrial and marine ecology monitoring photos are provided in **Annex E**.

Terrestrial Ecology

- 5.3.2 The Monitoring Survey for the reporting month was conducted on 21st & 26th April 2006. Site clearance works were advancing eastward and southward, and some earth works had been being conducted at the northern part of the new golf course site (areas closer to the existing golf course). There were also pathways beyond the works fronts to facilitate the land surveying works and the EM&A sampling on environmental parameters such as water quality and air quality by ET personnel.
- 5.3.3 Although the surveyed streams have not been previously affected by developments or pollution sources, they are relatively small. Water depth was less than 0.3m in most of the stream reaches even during wet season. Currently (still within dry season) these streams had very small surface flow or even had no surface flow for most of the length.
- 5.3.4 Stream A is located within the Project Area. Its main stream section (downstream to the confluence of two tributaries) would be protected by stream buffer zone (**Figure 3.3**). Stream A was heavily silted with sediments from eroded hillsides all year round, particularly at the main stream section. The stream had low flow.
- 5.3.5 Stream B is located within the Project Area. It had clear flow (with little sediment in the stream beds) of moderate volume during the wet season. This stream also has two main tributaries, B1 and B2. The full length of Stream B (two tributaries and the main stream) would all be protected by buffer zone (**Figure 3.3**). Stream B also contains a long estuarine section of muddy sandy substrate.
- 5.3.6 Stream C is located within the Project Area. This stream also has two main tributaries. It has had low but clear flow. In contrast to Stream B, Stream C drains to a sandy beach at Kau Chung Wan, and therefore lacks a clear estuarine zone. The full length of Stream C (two tributaries and the main stream) would all be protected by buffer zone (**Figure 3.3**).
- 5.3.7 Stream D is located outside the Project Area but within the Assessment Area and is the main stream draining the west side of the Assessment Area. It had clear water and moderate flow levels. Stream D is the only stream with deeper water depth among the four streams (water depth over 0.3 m in some of the stream reaches). As Stream D is outside the construction area, buffer zone would not be needed for this stream.

- 5.3.8 In general, the streams and the riparian vegetation were still in natural conditions. The only exception was the sections of stream banks right beneath the temporary access bridge at Stream A. Water levels in the 4 streams were still low, but higher than in previous monitoring surveys during dry season. For the two tributaries in Stream B, the flow in B2 tributary was similar but B1 tributary was still dry. The majority of Stream C had been found dry in previous monitoring surveys, but in the present survey surface flow was present in even upstream section. Stream D had shallow surface flow at the most upper reach. Photos of Streams A to D were shown in **Photo Plate 5.3-1 (Annex E)**.
- 5.3.9 The habitats and vegetation generally remained intact within a large portion of the project site (beyond the works fronts), within the stream buffer zone and outside the project area. No earthwork, human disturbance or fire disturbance was observed beyond the works fronts other than the historical erosion of hillsides and the access paths to the project site.
- 5.3.10 Aquatic fauna communities were checked during the monitoring survey. Atyid shrimp *Caridina trifasciata* were found in Stream B, Stream C & Stream D during the present monitoring survey (**Annex E - Photo Plate 5.3-2**). Although the rainfall in the early wet season had slightly increased the flow in the streams, abundance of this species was still low in all streams. It is anticipated that their abundance will increase more significantly later.
- 5.3.11 Another species of Atyid shrimp, *Caridina cantonensis*, which is common and widespread in Hong Kong was found in all four streams (Stream A to D), even in Stream A which had been affected by sediment. Other aquatic fauna and flora encountered during the monitoring included Freshwater snail *Brotia hainanensis*, which is usually found in streams with good water quality, found at B2 tributary of Stream B, and Long-armed Palemonid shrimp *Macrobrachia hainanensis* in rock pools in Stream A, and a juvenile Chiromantes haematocheir near Stream A (**Annex E - Photo Plate 5.3-2**).
- 5.3.12 The demarcation of the stream buffer zone had been fully established at Stream A main stream and Tributary B2 of Stream B at the time of the monitoring survey. Except at the temporary access bridge at Stream A, riparian vegetation within the buffer zone was not disturbed by construction works. As the construction works fronts had not exceeded Stream A, it is anticipated that the establishment of stream buffer zone demarcation will be finished before the works fronts reach Tributary B1 and Stream C.

Marine Ecology

- 5.3.13 The present Marine Ecological Monitoring Survey was conducted on 27th & 28th April 2006. The weather conditions were cloudy but calm, the underwater visibility was fine (approximately 5m). Less much macro algae were found at all three monitored sites on the surfaces of boulder or corals than in the last (February 2006) monitoring. At each site to be monitored for corals, the 20 colonies of natural corals selected during the Baseline Survey were recovered and checked for conditions.
- 5.3.14 Site B2 was the location for the temporary barging point. Site formation works were conducted at the nearby abandoned pier and the intertidal zone of the barging point location, and a seawall formed by rectangular concrete blocks was constructed along the seaward side of the intertidal zone. This area was used as the landing point of the temporary barging point. The temporary barging point had been installed at the location specified in the EP when the present monitoring survey was conducted.
- 5.3.15 The conditions of the tagged corals B-11 to B-20 during the present survey were compared with the conditions during the Baseline Survey (**Annex E - Photo Plates 5.3-3 to 5.3-4**). Among these 10 tagged corals, some of them had sedimentation coverage on the surface ranging from 3

- to 5% (i.e. B-12, B-13, and B-14, see **Table 5-3-1** below). As the sedimentation percentages were smaller than 15%, this observation did not trigger the action level response plan for corals.
- 5.3.16 40 additional natural corals were selected and tagged with plastic labels with codes ranging from B-21 to B-60. The distribution of these selected corals covered the areas to the south and to the north of the floating barging point boundary (see **Figure 3.4b**). The selected corals included *Favites abdita*, *Favia speciosa*, *Cyphastrea serailia*, *Platygyra acuta*, *Platygyra carnosus*, *Goniopora columna*, *Turbinaria peltata*, *Leptastrea pruinosa*, *Goniastrea aspera*, and *Psammocora superficialis*. Sizes of these tagged corals ranged from 13 cm to 39 cm. The selected species include various growth forms (massive - *Favia speciosa*, *Goniastrea aspera*, *Platygyra acuta* & *Cyphastrea serailia*; encrusting – *Leptastrea pruinosa*, *Goniastrea aspera* & *Cyphastrea serailia*; laminar - *Turbinaria peltata*) and species previously recorded in the site during the EIA study.
- 5.3.17 All selected corals were not covered by sediment (0% coverage of sediment) and had no sign of bleaching (0% bleaching) (**Table 5-3-2** below). Some corals had been observed with polyp recently died (B31, B-31, B-58 & B-60), but the percentages were minor (3-5% mortality) and would not affect the monitoring purpose. Photographs of each tagged coral were taken. These data and photos would be used as the baseline conditions of these tagged corals and would be compared with the data and photos from the coming construction phase monitoring surveys,
- 5.3.18 Site C was on the south-eastern coast of Kau Sai Chau Island and had a high coral coverage among the sites investigated during the EIA Study. The sizes of coral colonies at Site C were also larger than those at other sites. Site C was away from the boundary of the new golf course and would not be subject to direct impacts during construction. The site and its vicinity still remained similar conditions as during the Baseline Survey. All 20 tagged corals were recovered. No mortality, sedimentation or bleaching was found on any of the tagged corals (see **Table 5.3-3**). The corals remained similar conditions as during the Baseline Survey (**Annex E - Photo Plates 5.3-9 to 5.3-12**).
- 5.3.19 The Control Site is the buoy of coral marker established by AFCD in Sharp Island. Similar with Site C, both the coral coverage percentage and the sizes of coral colonies were high at this site and would not be impacted by the Project. The site and its vicinity still remained similar conditions as during the Baseline Survey. All 20 tagged corals were recovered. No mortality, sedimentation or bleaching was found on any of the tagged corals (see **Table 5.3-4**). The corals remained similar conditions as during the Baseline Survey (**Annex E - Photo Plates 5.3-13 to 5.3-16**).
- 5.3.20 **Photo Plates 5.3-3 to 5.3-16** showed the photos of each tagged corals. The assigned numbers, species, mortality percentage, sedimentation coverage percentage and bleaching percentage of the tagged corals during baseline survey and the present survey were presented in **Tables 5.3-1 to 5.3-4** below. Minor sedimentation was observed on some of the tagged corals at Site B2, but the percentages were smaller than the action level standard.

Table 5.3-1 Conditions of tagged corals at Site B2

Code of tagged corals	Species*	Baseline Survey (December 2005)			Month Four (April 2006)		
		Mortality (%)	Sedimentation (%)	Bleaching (%)	Mortality (%)	Sedimentation (%)	Bleaching (%)
B-11	<i>Turbinaria peltata</i>	0	0	0	0	0	0
B-12	<i>Plesiastrea versipora</i>	0	0	0	0	3	0
B-13	<i>Plesiastrea versipora</i>	0	0	0	0	5	0
B-14	<i>Goniastrea aspera</i>	0	0	0	0	5	0
B-15	<i>Lithophyllon undulatum</i>	0	0	0	0	0	0
B-16	<i>Favia speciosa</i>	0	0	0	0	0	0
B-17	<i>Favia speciosa</i>	0	0	0	0	0	0
B-18	<i>Turbinaria peltata</i>	0	0	0	0	0	0
B-19	<i>Favia speciosa</i>	0	0	0	0	0	0
B-20	<i>Favia speciosa</i>	0	0	0	0	0	0

* show sign of damage

Table 5.3-2 Baseline conditions of additional corals tagged in April 2006 at Site B2

Code of tagged corals	Species	Size (cm)	Mortality (%)	Sedimentation (%)	Bleaching (%)
B-21	<i>Favia speciosa</i>	32	0	0	0
B-22	<i>Cyphastrea serailia</i>	29	0	0	0
B-23	<i>Favia speciosa</i>	15	0	0	0
B-24	<i>Favia speciosa</i>	18	0	0	0
B-25	<i>Favites abdita</i>	17	0	0	0
B-26	<i>Cyphastrea serailia</i>	18	0	0	0
B-27	<i>Favia speciosa</i>	15	0	0	0
B-28	<i>Goniopora columna</i>	34	0	0	0
B-29	<i>Cyphastrea serailia</i>	21	0	0	0
B-30	<i>Favia speciosa</i>	17	0	0	0
B-31	<i>Platygyra acuta</i>	25	5	0	0
B-32	<i>Favia speciosa</i>	17	3	0	0
B-33	<i>Turbinaria peltata</i>	23	0	0	0
B-34	<i>Cyphastrea serailia</i>	29	0	0	0
B-35	<i>Cyphastrea serailia</i>	18	0	0	0
B-36	<i>Platygyra acuta</i>	15	0	0	0
B-37	<i>Favia speciosa</i>	27	0	0	0
B-38	<i>Cyphastrea serailia</i>	16	0	0	0
B-39	<i>Cyphastrea serailia</i>	35	0	0	0
B-40	<i>Favia speciosa</i>	22	0	0	0
B-41	<i>Leptastrea pruinosa</i>	18	0	0	0
B-42	<i>Goniastrea aspera</i>	21	0	0	0
B-43	<i>Favia speciosa</i>	17	0	0	0
B-44	<i>Cyphastrea serailia</i>	27	0	0	0
B-45	<i>Platygyra acuta</i>	21	0	0	0
B-46	<i>Favia speciosa</i>	18	0	0	0
B-47	<i>Favites abdita</i>	32	0	0	0

Code of tagged corals	Species	Size (cm)	Mortality (%)	Sedimentation (%)	Bleaching (%)
B-48	<i>Cyphastrea serailia</i>	38	0	0	0
B-49	<i>Goniopora columna</i>	39	0	0	0
B-50	<i>Favia speciosa</i>	18	0	0	0
B-51	<i>Psammocora superficialis</i>	37	0	0	0
B-52	<i>Favia speciosa</i>	22	0	0	0
B-53	<i>Favia speciosa</i>	19	0	0	0
B-54	<i>Favia speciosa</i>	14	0	0	0
B-55	<i>Goniastrea aspera</i>	29	0	0	0
B-56	<i>Platygyra carnosus</i>	35	0	0	0
B-57	<i>Goniastrea aspera</i>	28	0	0	0
B-58	<i>Favia speciosa</i>	35	5	0	0
B-59	<i>Favia speciosa</i>	14	0	0	0
B-60	<i>Favia speciosa</i>	13	5	0	0

Table 5.3-3 Conditions of tagged corals at Site C

Code of tagged corals	Species	Baseline Survey (December 2005)			Month Four (April 2006)		
		Mortality (%)	Sedimentation (%)	Bleaching (%)	Mortality (%)	Sedimentation (%)	Bleaching (%)
C-01	<i>Platygyra carnosus</i>	0	0	0	0	0	0
C-02	<i>Platygyra carnosus</i>	0	0	0	0	0	0
C-03	<i>Favia speciosa</i>	0	0	0	0	0	0
C-04	<i>Favites abdita</i>	0	0	0	0	0	0
C-05	<i>Turbinaria peltata</i>	0	0	0	0	0	0
C-06	<i>Favia speciosa</i>	0	0	0	0	0	0
C-07	<i>Platygyra acuta</i>	0	0	0	0	0	0
C-08	<i>Platygyra acuta</i>	0	0	0	0	0	0
C-09	<i>Favia speciosa</i>	0	0	0	0	0	0
C-10	<i>Platygyra acuta</i>	0	0	0	0	0	0
C-11	<i>Favia speciosa</i>	0	0	0	0	0	0
C-12	<i>Platygyra acuta</i>	0	0	0	0	0	0
C-13	<i>Platygyra carnosus</i>	0	0	0	0	0	0
C-14	<i>Favia speciosa</i>	0	0	0	0	0	0
C-15	<i>Goniopora columna</i>	0	0	0	0	0	0
C-16	<i>Platygyra carnosus</i>	0	0	0	0	0	0
C-17	<i>Goniopora columna</i>	0	0	0	0	0	0
C-18	<i>Platygyra carnosus</i>	0	0	0	0	0	0
C-19	<i>Favites pentagona</i>	0	0	0	0	0	0
C-20	<i>Favia speciosa</i>	0	0	0	0	0	0

Table 5.3-4 Conditions of tagged corals at Control Site

Code of tagged corals	Species	Baseline Survey (December 2005)			Month Four (April 2006)		
		Mortality (%)	Sedimentation (%)	Bleaching (%)	Mortality (%)	Sedimentation (%)	Bleaching (%)
X-01	<i>Platygyra carnosus</i>	0	0	0	0	0	0
X-02	<i>Platygyra carnosus</i>	0	0	0	0	0	0
X-03	<i>Platygyra carnosus</i>	0	0	0	0	0	0
X-04	<i>Pavona decussata</i>	0	0	0	0	0	0
X-05	<i>Hydnophora exesa</i>	0	0	0	0	0	0
X-06	<i>Platygyra carnosus</i>	0	0	0	0	0	0
X-07	<i>Platygyra carnosus</i>	0	0	0	0	0	0
X-08	<i>Favites abdita</i>	0	0	0	0	0	0
X-09	<i>Cyphastrea serailia</i>	0	0	0	0	0	0
X-10	<i>Cyphastrea serailia</i>	0	0	0	0	0	0
X-11	<i>Platygyra carnosus</i>	0	0	0	0	0	0
X-12	<i>Platygyra acuta</i>	0	0	0	0	0	0
X-13	<i>Platygyra acuta</i>	0	0	0	0	0	0
X-14	<i>Platygyra acuta</i>	0	0	0	0	0	0
X-15	<i>Platygyra acuta</i>	0	0	0	0	0	0
X-16	<i>Platygyra acuta</i>	0	0	0	0	0	0
X-17	<i>Favia speciosa</i>	0	0	0	0	0	0
X-18	<i>Platygyra acuta</i>	0	0	0	0	0	0
X-19	<i>Goniastrea aspera</i>	0	0	0	0	0	0
X-20	<i>Cyphastrea serailia</i>	0	0	0	0	0	0

5.4 Landscape and Visual

- 5.4.1 Landscape resource changes during the site clearance work comprises of the loss of scrubland. As the construction progress, more vegetation and shrubs will be cleared, which will be followed by planting works.

5.5 Archaeology (Watching Brief)

- 5.5.1 Excavation was carried out at Hole 2 during this monitoring month and watching brief monitoring was carried out. According to the latest construction programme, the Hole 2 will not be completed in May 2006. Approximate 40% of the Hole 2 area was being excavated and the watching brief at Hole 2 will have to further extend. The first progress report (January to March 2006) had been sent to AMO for comments on 31st March 2006. The progress report will be submitted to AMO on quarterly basis. For the excavation at watching brief concern areas (Holes 11, 12, 14, 15 & 16), the excavation programme could be further delay to next dry season. Under the EP requirement, construction works within the buffer zone area is restricted within the November to March. As no temporary bridge was being constructed at Streams B and C buffer zone area, no construction work at southern part of Kau Sai Chau is expected unless the successfully apply for the Variation of EP.

5.6 Land Contamination

- 5.6.1 The Contamination Assessment Plan (CAP) was approved by EPD 17th February 2006. Site investigation was carried out on 14th and 15th February 2006. Site audit was carried out with IEC on 14th February 2006 with the Contractor's representatives. The CAP was approved on 17th February 2006. Contamination Assessment Report (CAR) was submitted to EPD for approval on 23rd March 2006. Based on the results, all 5 hotspots are not contaminated by Lead and Sulfur. Therefore, Remediation Assessment Plan (RAP) is not required.

6. Environmental Site Auditing

6.1.1 A joint site inspection was conducted with EPD and Contractor's representatives on 13th April 2006. During the site inspection, EPD has verbally raised their following concerns:

- (i) A barge was berthing on the south side of the floating pontoon (tagged corals were underneath the barge) and intended to unload the sheet piles onto the floating pontoon rather than at far end of the floating pontoon (anchor points) during the site inspection. EPD commented that Environmental Permit Holder (Hong Kong Jockey Club) might be prosecuted due to the violation of the EP Clause 3.11 (Photos 1-2).
- (ii) Some sedimentation basins and rock bunds were provided at areas of Holes 1 and 18 near to the existing maintenance building mainly as part of the silty runoff mitigation measures. However, the cut off temporary storm water drain from the natural catchment to the construction site was not implemented as revealed during the site inspection. EPD expressed concern over the silty water runoff to the marine water and stream courses and commended that the silt fence may not be sufficient/effective to prevent the silty runoff. In addition, EPD commented on the integrity of the silt fence along the construction site boundary. EPD recommended that in addition to the silt fence, a secondary treatment (temporary drainage system outside the silt fence) to confine, collect and pre-treat the water runoff before discharge is required in order to prevent direct silty runoff to marine and stream courses.
- (iii) No sufficient dust suppression mitigation measure was provided during the rock breaking activities at Hole 2. EPD reminded the Contractor to provide sufficient dust suppression measure during the rock breaking activities as required under the APCO.
- (iv) Stockpiles located near Stream A were not covered. EPD reminded the Contractor to properly cover exposed stockpiles as soon as possible to prevent silty runoff to Stream A.
- (v) For temporary bridge no. 9 at Stream A, EPD commented that the implemented mitigation measure at the abutment areas was insufficient and required further improvement. EPD recommended the Contractor to provide impermeable materials to cover the haul roads / other means to the temporary bridge no. 9 to prevent silty runoff to the Stream A. EPD also recommended the Contractor to provide preventive measures and temporary drainage at the temporary bridge no. 9.
- (vi) EPD reminded the Contractor that no construction activities should be carried out at Stream buffer zones areas. Application of Variation of Environmental Permit (VEP) is required before any works are permitted at these sensitive areas.
- (vii) EPD reminded the Contractor to provide sufficient temporary drainage system at the concrete batching plant area to recycle and reuse the water within the site according to the Contractor's previous submission to EPD and no water discharge from the concrete batching plant is allowed.
- (viii) EPD recommended the Contractor to strengthen the preventative mitigation measures at the temporary barging point as follows:
 - (a) Provide facilities along the seawall block and both side of the ramp to prevent any object/material falling into the marine water.
 - (b) Provide good housekeeping (keep the pontoon clean) especially at the far end of the floating pontoon in order to minimize the risk of any object/material falling into the

marine water

- (c) The surface of the ramp should be paved/properly covered (few holes were observed at the ramp) to prevent any falling objects/materials from the ramp.
- (d) Keep the height of the stockpiles at the floating pontoon similar to / lower than the bund height at both sides.
- (e) Keep the floating pontoon and rock filling pier free of storage at all times.

6.1.2 The Contractor is reminded to urgently rectify and improve the mitigation measures at the construction site. The Contractor is also urgently requested to submit the incident report and remedial work on the improper berthing at the temporary floating pontoon.

6.1.3 The weekly site inspections were conducted by the ET with Contractor's representative and/or Jockey Club's representative on 29th March, 4th, 11th and 21st April 2006 and the monthly joined site inspection with IEC and the Contractor's representative undertaken on 21st April 2006. The following observations and recommendations were made.

Dust Mitigation Measures

6.1.4 Excavation work was carried out at Holes 1, 2, 3, 8, 9, 17, & 18. Haul road was constructed linking up Holes 1-9, 17 & 18. Sprinklers were provided when the rock breaking activities were carried out for dust suppression at Holes 2 & 9 only. A standby water tank was available on site. The Contractor was reminded to minimize the dust generated by the site vehicles moving along the haul road. For other excavation or earth moving areas, the Contractor was reminded to provide sufficient dust suppression measure.

6.1.5 The Contractor has been installed hoarding near to existing S3, S4 & S6.

6.1.6 Concrete batching plant was started to construct at early April 2006. It will require few weeks for testing and commissioning. No temporary drainage was observed on site to collect and reuse the water from the concrete batching plant during the site audit. The Contractor was reminded to provide the temporary drainage before the start of the operational phase of the concrete batching plant.

Water Quality

Temporary Drainage Master Plan

6.1.7 A temporary drainage master plan (TDMP), which concentrates at Holes 1-9, 17-18 only, had been formally submitted on 29th March 2006 by the Contractor for ER to review during this monitoring month. ET initial comments are summarized below:

- (i) In some of construction areas, part of the runoff from the natural catchment will mix up with the construction site contaminated runoff before directly discharge to marine or stream courses.
- (ii) The TDMP indicates that there are many discharge points along the construction boundary to the marine water and streams. The basic temporary drainage principle submitted by CHEC is that the construction site contaminated runoff will pass through the silt fence / rock channel and then discharge/overflow to marine or stream courses. The construction site contaminated runoff will not be confined, collected and properly treat before water discharge.

Under the Water Pollution Control Ordinance (WPCO), the principle of discharges subject to Control is listed as the followings:

“Discharges of domestic sewage communal sewers and unpolluted water into stormwater drains, river courses and water bodies are not under control. However, the discharges from sewage treatment plants and septic tanks are subject to control”.

“All other effluents, whether discharged into communal sewers, stormwater drains, river courses or water bodies, are subject to control. These include effluents from all types of industrial, manufacturing, commercial, institutional and construction activities”.

“For a discharge subject to control, the discharger should apply for a licence from EPD and comply with its terms and conditions”.

- 6.1.8 ET recommends the runoff from the upper catchment (without construction work areas) should be cut off and divert away from the construction site as much as possible in order to minimize the mixing of contaminated water within the construction site area.
- 6.1.9 The water discharge from the construction site should be confined and pre-treat before discharge and the discharge water quality should comply with the WPCO.
- 6.1.10 The present submitted TDMP is only for the control of silty runoff. The Contractor is reminded to prepare the temporary drainage plan for approval and implement before turf grass establishment. This is a major concern because pesticide is a prohibited substance which is not allowed to be discharged to any water bodies under the WPCO.

Site Audit

- 6.1.11 Silt fences and rock bund covered with geotextile fabric were installed and strengthen some of at the relative some low areas (vulnerable to silty runoff) of the construction site boundary at Holes 1, 2, 9 and 17 as a preventative silty runoff measure. Sedimentation basins were provided at low lying areas at Holes 1 & 18. However, some installed silt fence areas along the site boundary were poorly maintained. The Contractor was reminded to maintain the integrity and function of the silt fences on regular basis to prevent the silty runoff from construction site.
- 6.1.12 The mitigation measure provided at the temporary bridge no. 9 had been enhancement but it was still cannot cater for polluted water directly discharge to Stream A during the rainstorm event on 24th April 2006. The Contractor was reminded to provide adequate facilities on site to ensure no polluted runoff discharge from the construction works to Stream A. A sufficient temporary drainage should also be provided to confine and divert away any polluted runoff from the temporary bridge away from the stream. Any discharge of polluted runoff to the stream is prohibited.
- 6.1.13 The Contractor was repeatedly reminded to provide adequate temporary drainage system at haul road between temporary barging point to Hole 2. Based on the site observation on 24th April 2006, sediment in the sump has been accumulated and blocked. Silty runoff was observed at the low lying area of the haul road and discharge into the adjacent inactive fish culture zone. The Contractor was recommended to frequently remove the accumulated sediment and maintain in a clean condition before and after rain.
- 6.1.14 Construction of temporary barging point was completed at early April 2006. The Contractor was reminded to provide the temporary drainage at the rock filling pier to prevent silty runoff to marine water.

- 6.1.15 Wheel washing facility was not available on site. The Contractor was suggested to provide at the following exit/entrance.
- (i) Adjacent to the existing maintenance building,
 - (ii) Desalination plant exit/entrance; and
 - (iii) Temporary barging point

Ecology

- 6.1.16 Only Stream buffer zone at Stream A has been established during this reporting month. The whole buffer zone aims to protect the streams and avoid any works/equipment intrusion into the buffer zone. No work has been carried out near Streams B and C. The Contractor was reminded to demarcate Streams B and C buffer zones before any construction work close to the buffer zone areas.
- 6.1.17 For the construction of floating pontoon, the Contractor was reminded to locate all anchoring points on the shore and/or at least 40m seaward to avoid coral communities near shore according to EP.

Waste / Chemical Management

- 6.1.18 Cleared vegetation was stockpile and located mainly in Holes 1 and 17 or along the site boundary (outside the silt fences) for wind/sun drying before proper disposal. The Contractor was reminded to remove the vegetation stockpiles and construction waste and dispose off-site properly according to the waste management plan.
- 6.1.19 No chemical storage area was available on site during the reporting month. Some oil tanks were required as the standby fuel. Drip trays were provided underneath the oil tanks to prevent leakage on the bare ground. The Contractor was reminded to provide chemical storage areas for chemical storage.
- 6.1.20 Site office was under construction near existing maintenance building. Mobile chemical toilets were provided on site. The number of workers could be increased up to 200 persons on site. The Contractor was reminded to provide sufficient sewage treatment facility and/or mobile chemical toilets on site to cater for the needs.

Landscape and Visual

- 6.1.21 The landscape and visual monitoring and site audits were carried out on 4th and 20th April 2006. During the site audit, site formation and vegetation clearance works were being carried out. Trees within the construction area were protected properly.
- 6.1.22 Eighteen trees (T903, T905, T906, T908, T909, T913, T966, T967, T970, T973, T981, T982, T1008, T1009, T1010, T1081, T1083, T1084) near the administrative building and two (T1230 and T1233) near the workshop have been transplanted to final location. However, this transplantation works were not carried out with a rootball preparation period of at least 1 month.
- 6.1.23 A two-storey high site office is being constructed near the administrative building during the second visit. The height of the office complies with the EIA requirements.
- 6.1.24 Stockpiles of cleared vegetation were still recorded on site.
- 6.1.25 Green hoardings were erected near the desalinization plant and next to administrative building to reduce visual impacts.

Status of Environmental Licensing and Permitting

6.1.26 Permits / licences submission and approval status are summarised in Table 6.1.

Table 6.1 Summary of Environmental Licensing and Permit Status

Permit/licence/notification form title	Submission date	Status	Registration No./ Remarks
Application for a construction noise permit for the use of powered mechanical equipment for the purpose of carrying out construction work other than percussive piling and/or the carrying out of prescribed construction work.	21 st Jan 2006	Approved on 16 th February 2006	GW-RE0012-06 (valid until 3 rd July 2006)
Application for a construction noise permit for the use of powered mechanical equipment for the purpose of carrying out construction work other than percussive piling and/or the carrying out of prescribed construction work.	13 th Mar 2006	Approved on 6 th April 2006	GW-RE0067-06 (valid until 22 nd August 2006)
Notification of the air pollution control (construction dust) regulation	21 st Jan 2006	Acknowledge receipt from EPD on 27 th February 2006	Ref. no.: 001006902
Registration as a chemical waste producer	10 th Jan 2006	Register on 7 th February 2006	WPN-5213-813-C1186-04
Application for a permit to dump material at sea under the Dumping at Sea Ordinance	10 th Jan 2006	Deferred by CHEC on 17 th March 2006 (CHEC/KSC3.9.1/0459)	No dredging work will be carried out between May to December 2006.
Application of exemption account for the construction waste charging scheme	12 th Jan 2006	Approved on 16 th January 2006	A/C no. 5005322 (valid until 2 nd August 2007)
Application for a licence for production pursuant to Section 14 of Air pollution Control Ordinance	2 nd Mar 2006	The total silo capacity for the cement works was 45 tonnes which is lower than 50 tonnes. It is not a specified process, application is not required.	EPD letter refer. no.: EP640/EA/SK/015
Application for a licence under Water Pollution Ordinance – Sewage treatment for toilets and pantry	14 th Mar 2006	Awaiting for approval (CHEC/KSC3/9.1/0414)	
Application for a licence under Water Pollution Ordinance – temporary drainage	16 th Mar 2006	Awaiting for approval (CHEC/KSC3/9.1/0460)	

7. Environmental Non-Conformance

7.1 Summary of Environmental Non-Compliance

Air Quality

- 7.1.1 One exceedance of action level of 24-TSP was recorded at GCA B1 on 4th April 2006 in the reporting month. The exceedance was considered attributed to the works. The Contractor was reminded to provide sufficient dust suppression mitigation measures on site.

Marine Water Quality

- 7.1.2 For marine water, two exceedances of SS recorded on 24th April 2006 at K LW and KS were considered not attributed to the works. However, three exceedances of SS and three exceedances of turbidity recorded at M_Marsh, TTC and M_BP were considered project-related due to the heavy rainstorm event on 24th April 2006.

Freshwater Quality

- 7.1.3 All exceedances (twenty in total of SS, turbidity, DO and pH), except Streams B and C (eight in total of SS and turbidity), were considered project-related and mainly due to the heavy rainstorm event on 24th April 2006.

Marine Ecology

- 7.1.4 Minor sedimentation was observed on some of the tagged corals at Site B2, but the percentages were smaller than the action level standard (i.e. 15%). The exceedance was considered project-related.

7.2 Summary of Environmental Complaint

- 7.2.1 No environmental complaint was received during the reporting month.

7.3 Summary of Environmental Summons

- 7.2.2 There was no notification of summons with respect to environmental issues registered in this month.

8. Future Key Issues

8.1 Key Issues for coming month

8.1.1 Works to be taken for the coming monitoring period are summarized as follows.

- Operation of temporary barging point
- Construction of temporary bridge no.5 between Holes 5 & 6
- Construction of site office
- Construction and operation of concrete batching plant
- Land formation for desalination plant
- Cut and fill at Golf Holes 1-9 & 17-18

8.2 Monitoring Schedule for the coming month

8.2.1 The tentative schedule of air, water, ecology and landscape & visual monitoring for the next three months is presented in **Annex F**. The environmental monitoring will be conducted at the same monitoring locations in this reporting month. The monitoring programme has been reviewed and was considered as adequate to cater the nature of works to be undertaken.

8.3 Construction programme for the next three month

8.3.1 The construction programme for the next three months is presented in **Annex G**.

9. Recommendations and Conclusions

- 9.1.1 The Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken during the period from 25th March 2006 to 24th April 2006 in accordance with EM&A Manual and the requirement under EP-224/2005.

Air Quality

- 9.1.2 One exceedance of the action level of 24-hour TSP was recorded at GCA B1.

Marine Water

- 9.1.3 Out of eight exceedances, six exceedances of limit level for suspended solids and turbidity were recorded at TTC, M_Marsh and M_BP and all of them were considered project-related.

Freshwater

- 9.1.4 Out of twenty eight exceedances (SS, turbidity, DO and pH), eight of them were considered not project-related (Streams B & C). Twenty of exceedances were considered project-related.

- 9.1.5 For terrestrial ecology, the streams (except Stream A – temporary bridge am) and the riparian vegetation were in natural conditions similar to the condition during the Baseline Survey.

- 9.1.6 Minor sedimentation was observed on some of the tagged corals at Site B2, but the percentages were smaller than the action level standard (i.e. 15%). The exceedance was considered project-related. For Site C and the Control Site still remained similar conditions as during the Baseline Survey. No mortality, sedimentation or bleaching was found on the tagged corals in these two sites.

- 9.1.7 The Contractor shall rectify the mal-pruning practice on the transplanted trees and was reminded to dispose the vegetation stockpiles properly.

- 9.1.8 One environmental non-compliance was recorded during the site investigation on 24th April 2006 due to the heavy rainstorm. No environmental complaint and environmental summons/prosecutions were received during the reporting period since the commencement of the Project.

- 9.1.9 The ET will keep track of the EM&A programme to ensure compliance of environmental requirements and the proper implementation of all necessary mitigation measures.