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

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

(Report No. 382210/010)

Report Authorized For Issue By:

For and on Behalf of
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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.10 Monthly EM&A Report for October 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.10 Monthly EM&A report for October 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 

_____
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Date 7 November 2006

Executive Summary

This is the tenth 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 October 2006 (25th September 2006 to 24th October 2006).

Summary of construction works undertaken during this report period

The full scale remediation work for the contaminated soil (originally located at Hole 18 – hotspot L3) at Hole 17 (one of the major fill area) was carried out on 4 October 2006. A Final Site Remediation Report (FSRR) will be prepared by the Contractor in the next reporting month.

A coral transplantation methodology will be submitted during the next reporting month for AFCD and EPD approval and comment. The coral transplantation (Site D2) near the existing KSC pier will commence once the methodology approved.

According to the EM&A manual, two graves (G5 and G20) are required to be preserved by record. Record for preservation of Grave 20 located at Hole 2 was completed during the reporting month. As the grave G5 can be kept in-situ with provision of buffer zone according to the latest golf course design, no preservation by record was required. Archaeology watching brief was started since early September 2006 and in progress at Holes 11, 12, 14, 15 and 16. Stream buffer zone was demarcated at Streams A, B1, B2 and C (one side facing to the haul road only).

All haul roads formation and vegetation clearance was mostly completed during the reporting month. For northern and central portions of the third golf course, most of the bulk earthworks were competed at Holes 1-9 and 17 during the reporting month. It will move to the next phases of the construction sequence which are mainly the drainage system installation, irrigation system installation, turfing and furnishing. For southern portions of the third golf course, major construction works were bulk earthworks and preparation of permanent bridges/pipe culvert construction. The expected turf establishment period will be started on December 2006 but it will totally depend on the availability and water quality of the water source from desalination plant, existing reservoir and water storage from rain water on site. There is no conclusive planting date yet. However, Holes 3, 5 & 8 will be the three targets golf holes for earliest turfing.

Closed low flow drainage system includes lake formation, gravity drains, rising main, underground water tanks and pumping stations. The permanent drainage system installation at Holes 5 & 7 was mostly completed. The drainage system will be installed once the land formation complete. Lake formation at 1D, Hole 4 and Hole 10 was in progress. The construction of gravity drain from Lake 1D to existing reservoir was in progress. Underground water tanks at Holes 2, 4, 10 and 11 were in progress.

The floating pontoon was located and operated at the designated location according to Environmental Permit (EP). Concrete batching plant has been in operation. For the desalination plant, no dredging work for the desalination plant intake and outfall pipelines was carried out but only land formation work.

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)	5 times
Terrestrial Ecology	1 time

Marine Ecology	0 time*
Landscaping & Visual	2 times

* For marine ecology, it will be carried out on quarterly basis and the next coral monitoring will be on December 2006.

Air Quality

5 sets of 24-hour TSP monitoring were carried out on 27th September, 3rd, 9th, 14th and 20th October 2006 at Bungalow A (GCA B1) at Kau Sai Chau during this reporting month. No exceedance of 24-TSP was recorded at GCA B1. A consistent high 24-hour TSP concentrations were recorded (very close to the action level) since mid-September 2006.

Water Quality

5 sets of water quality monitoring were carried out on 25th September, 3rd, 9th, 13th and 23rd October 2006 at 9 marine and 7 freshwater monitoring locations. No additional water sample was taken due to heavy rainstorms. Monitoring was performed on scheduled.

Terrestrial Ecology

Terrestrial ecology monitoring was conducted on 27th October 2006. The demarcation of the stream buffer zone had been established for Stream A and Stream B, the works fronts and haul roads had advanced beyond Stream B and reached near Stream C at the time of the monitoring survey. Stream C buffer zone demarcation establishment will be finished by the Contractor before the works fronts reach Stream C. The downstream section of Stream A channel had been was accidentally filled up by boulders, and Remedial work was not implemented by the Contractor to clear the rubbles and restore the downstream manually. In general, Streams B, C and D and the riparian vegetation were still in natural conditions similar to the condition during the Baseline Survey.

Marine Ecology

Marine ecology monitoring was not required in October 2006. The next marine monitoring will be conducted in December 2006.

Landscaping & Visual

Landscape and visual monitoring and site audits were carried out on 4th and 18th October 2006. The Contractor shall take measures to improve the condition of damaged trees. Damaged trees next to administration building were still unprotected after being damaged by the adjacent construction activities. Trees (T1000 and T1011) were transplanted in this month and in fair condition. The performance of the Contractor was considered unsatisfactory on this aspect since July 2006, they are (i) no rectification work has been carried out for all mal-pruning transplanted trees, (ii) no provision of any tree protection zones for all retain trees near administration building - construction materials were stockpiled and surrounded at the tree base area and (iii) the cause of the tree death T925 was outstanding.

Environmental Site Auditing

Four weekly joint environmental site audits were carried out on 27th September, 4th, 10th, 17th and 24th October 2006, with the Engineer and Contractor's representatives. A monthly joint environmental site audit was carried out on 24th October 2006 by the Contractor's Representative, ET's representative and Independent Environmental Checker (IC(E)).

Environmental Non-conformance

Air Quality

No exceedance of 24-TSP was recorded at GCA B1.

Marine Water Quality

One exceedances of turbidity and nine exceedances of suspended solids (SS) on 25th September, 9th, 19th and 23rd October 2006 were recorded at KLW, TTC, M_Marsh and M_BP. All exceedances were considered not project-related and the increase of the turbidity and SS values were mainly due to the natural variation of marine water (magnitude of the increase of turbidity and SS were similar to the control monitoring stations at M_A and M_B).

Freshwater Quality

Eighteen exceedances of turbidity and ten exceedances of suspended were recorded at F_DA, F_DB, F_DC and F_Inland Marsh. The exceedances recorded at freshwater inland marsh were mainly attributed to runoff from silty water discharged from the wheel washing facility near to the Contractor's site office. The exceedances recorded at Streams A and B were considered not project-related. While exceedances recorded at Stream C and fresh water inland marsh were considered project-related.

The exceedances at Stream B were mainly due to the natural variation and therefore they were considered not project-related. No silty runoff from construction of temporary crossing at Streams B1 and B2 were observed during sampling.

Exceedances were recorded at both upstream and downstream of Stream C during previous and this reporting month. As the upstream monitoring location (F_UC) of Stream C is located within the construction work area, it represents and becomes an impact monitoring station instead of control station. All exceedances were considered project-related.

All notifications of exceedances and the subsequent exceedance incident reports have been forwarded to the relevant parties.

For those considered project-related exceedances at freshwater and marine water, the Contractor was required to critically review the temporary drainage management plan and implement necessary improvement to prevent runoff from the construction site to the marine water 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 and should be improved especially at those concern areas.

No environmental complaint and environmental summons were received in this reporting month.

Implementation Status of Environmental Mitigation Measures

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

Air Quality

- Increase frequency of watering at main haul roads and rock breaking areas;
- Pave major haul roads with gravels/concrete to minimize the dust emission due to the heavy traffic;
- Cover the all soil/sand/aggregates stockpiles with tarpaulin or other measures to reduce the dust emission; and
- Install hoarding at the main exit/entrance of the construction site;

Waste Management

- Properly dispose of the vegetation stockpiles, general refuse and construction waste off-site;
- Provide chemical storage areas and construction waste sorting area; and
- Provide sufficient mobile toilets at remote site areas;

Ecology

- Remove of rubbles at downstream of Stream A manually;

Water Quality

- Enhance the wheel washing facility at the main exit/entrance of the construction site;
- Minimize the water quality impact when undertaking cut-and-fill works. It is important to provide sufficient temporary drainage at critical areas to confine, collect and provide proper treatment before discharging to marine water and stream courses to ensure that the water quality is complied with WPCO requirements;
- Provide sufficient treatment facilities especially at water sensitive areas before water discharges from construction site;
- Maintain the integrity of silt curtains and remove of settled silt within the silt curtain which have been installed outside the fresh water inland marsh, near Hole 2, near Hole 4 and Stream A;
- Strengthen the preventive/interim measures for avoiding silty runoff from the exposed areas to the low lying areas. More frequent maintenance of the silt fence is necessary; and
- Provide temporary drainage at the temporary bridges;

Landscape & Visual

- Protect the retain trees with sufficient watering mainly located at the administration building;
- Provide tree protection zone for all retain tree at the administration building; and
- Provide incident report for the death of the tree T925;

Future Key Issues

General issues to be considered in the coming month include:

- Potential dust generation from activities on-site : bulk earthworks at Holes 10 to 16, concrete batching plant operation and soil/sand/aggregates stockpiles;
- Archaeology watching brief at Holes 11, 12, 14, 15 & 16;
- Provide sufficient temporary drainage and mitigation measures for construction temporary/permanent crossings at Streams A, B1, B2 and C;
- Implement sufficient and improve the temporary drainage system on site to prevent silty runoff discharging to marine and stream courses;
- Implement sufficient temporary drainage system before carrying out any newly exposed area;
- Carry out land formation works for the desalination plant near to the existing pier;
- Dispose of construction wastes, vegetation and general refuse off-site; and
- Hydroseed the bare/rock slopes according to the golf course design.

Key issues at particular areas:

- Submit the Temporary Drainage Master Plan (TDMP) for the turf establishment period prepared by the Contractor at least one month before implementation for ER and Jockey Club's approval;
- Awaiting the approval for coral transplantation methodology and complete coral transplantation before the desalination pipelines installation (dredging works); and
- Implement filter systems (nutrients and pesticides removal) at Holes 5 and 6;

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 October 2006 (from 25th September to 24th October 2006).

1.2 Purpose of the Report

1.2.1 This is the tenth EM&A report which summarizes the impact monitoring results and audit findings for the EM&A programme during the reporting period from **25th September** to **24th October 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 Oct – 24 Jan 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 the 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 the 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	Full scale remediation work was carried out in the reporting month. The Final Site Remediation Report (FSRR) will be prepared by the Contractor and submitted to EPD for record.

EP-224/2005	Environmental Permit Submission	Status	Remarks
	Plan (RAP) including a Contamination Assessment Report (CAR) is 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)
3.4	Variation of Environmental Permit for the construction of the temporary crossings at Stream B during wet season.	Completed	Variation of Environmental Permit was approved on 18th August 2006. The revised registered EP was EP-224/2005/A.

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	**First 3 months** 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

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.	**<u>For Site D2 and the Control Site:</u>** 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. **<u>For Site C, B2 and the Control Site:</u>** 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.	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.	During the first two years of the operation phase. 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.	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 μg m^{-3}	500 μg 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		Action Level	Limit Level
GCA B1	**Bungalow A** adjacent to Kau Sai Chau Public Golf Course Administration Building	187.4 μg m^{-3}	260 μg 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 were collected using filters and High Volume Sampler and the collected samples were 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 were placed less than 2 metres apart;
- the distance between the sampler and an obstacle, such as buildings, were at least twice the height that the obstacle protrudes above the sampler;
- a minimum of 2 metres separation from walls, parapets and penthouses were required for the rooftop samplers;
- a minimum of 2 metres separation from any supporting structure, measured horizontally was provided;
- airflow around the sampler was unrestricted;
- no furnaces or incineration flues were operating near the sampler;
- the sampler was more than 20 metres from the dripline; and
- any wire fence and gate to protect the sampler, did 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°C ±3°C and the relative humidity (RH) < 50% ±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 NO_2-N) at non-FCZ stations, the trigger level has made reference to the existing golf course guideline values. The guideline value of NO_2-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 NO_2-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 NH_3-N, NO_2-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 (NO_3-N), nitrite nitrogen (NO_2-N), ammonia nitrogen (NH_3-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** Marine water : 2 times per day – 1 for mid-flood and 1 for mid-ebb Freshwater : once per day	**Marine Water** Fish culture zone stations: TTC, KLW, KS Control stations: M_A, M_B Impact stations: M_BP, M_RO1, M_Marsh, M_Coral **Freshwater Water** Stream A (F_UA, F_DA) Stream B (F_UB, F_DB) Stream C (F_UC, F_DC) Inland Marsh (F_lnland_M)
Temperature (ºC)		
Turbidity (NTU)		
pH		
Salinity (ppt)		
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
Marine Water (9 stations)		**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
Fresh Water (7 stations)					
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 m^3/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 Sau Chau would be monthly for the first three months of the construction phase, and if no exceedance was recorded, the monitoring schedule would be changed to quarterly during the rest of the construction phase. As a coral damage incident was recorded in March 2006, the monthly monitoring was extended for another three months from April 2006 to June 2006. No exceedance was recorded during these three months, the monitoring schedule would be changed to quarterly after that till the end of 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 (preferably 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 during the baseline survey, without significant sign of bleaching or being covered by sediments, and therefore were all recommended as the monitored coral colonies (all 80 tagged corals, 20 from each site). The seagrass beds in Site D3 were also surveyed for their extent, coverage percentage and health conditions during the baseline survey. The results of the baseline survey has presented in the Baseline Monitoring Report. The original 20 tagged corals at Site B2 were re-organised in April 2006, with B-11 to B-20 retained, but 40 new tagged corals (B-21 to B-60) were established. The number of tagged corals at Site B2 was therefore increased from 20 nos. to 50 nos. The baseline conditions of these newly tagged corals (40 nos.) were presented in the monthly monitoring report of April 2006.

3.3.8 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.

3.3.9 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). As no exceedance was recorded during these three months, the monitoring schedule would be changed to quarterly after that till the end of the construction phase and will be resumed in September 2006.

3.3.10 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

3.3.11 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 Major construction works of the third golf course were site formation at Holes 11-16 and permanent drainage system installation.

4.1.2 The weather is approaching to dry season. The Contractor concentrates more on the dust suppression mitigation measures than the silty runoff impact to water sensitive receivers. However, Temporary Drainage Management Plan (TDMP) submission prepared by the Contractor for ER's approval is still required for the dry season and coming next wet season. In particular, TDMP for the turf establishment area is very critical because the expected earliest turf establishment will be in Dec 2006 but no formal submission of TDMP yet.

4.1.3 Silt fence was implemented along the site boundary (major component of the temporary drainage system) for most of the newly exposed areas once after vegetation clearance was completed. However, maintenance frequency of the silt fence was unsatisfactory. Most of the formerly installed silt fence were collapsed and not installed properly and recorded during the site audit. The Contractor was reminded to rectify the situation to prevent silty runoff to the water sensitive areas. Potential heavy rain(s) could occur during the dry season.

4.1.4 The wheel washing facility provided on site was still not effective to mitigate the silty water discharge since the last two months, silty runoff was observed from this area to the freshwater inland marsh for all site audits. The sewage treatment plant was started to operate at the end of May 2006. Water discharge licence for this project was obtained in September 2006.

4.1.5 No dust suppression measure was provided for all rock breaking areas (Holes 6, 10, 11 and 14). Dust suppression measures for loading/unloading activities, rough shaping and haul road (truck traffic) were insufficient. According to the site observation and air quality results, it demonstrated that the provided mitigation measures on site were insufficient for dust suppression. Two to three water trucks were mainly watering at those haul roads near to the existing golf course. The water source was mainly pumped from the downstream of the fresh water inland marsh and downstream of Stream A which could dry up during the dry season. Alternative water source for dust suppression should be considered during the dry season. Water source from WSD has already successfully applied by the Contractor few months ago. The Contractor can also consider alternative water source such as underground water source or other dust mitigation measures.

4.1.6 Hydroseeding was observed at part of soil stockpile near Hole 17, soil stockpile at Hole 18 was covered by tarpaulin but no mitigation measure provided for all other soil/sand/aggregates stockpiles. Insufficient watering to the hydroseeded areas was observed which led to poor growth to minimize the dust generation and silty runoff properly.

4.1.7 Vegetation stockpile, general refuse and construction waste stockpiles were temporary stored on site since the start of the project without proper disposal. The Contractor agreed to dispose all waste off-site gradually starting from next reporting month. No chemical storage area was available on site since the start of this project. Insufficient mobile toilets were available on site at remote areas, only two units were located at the southern portion of construction site.

4.1.8 No dredging work has been carried out near to the existing pier for the desalination plant pipelines. 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 September to October 2006. All monitoring data are provided in **Annex E**. Monitoring of 24-hour TSP was conducted at GCA B1 on 27th September, 3rd, 9th, 14th and 20th October 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 No exceedance of 24-TSP was recorded at GCA B1 in the reporting month. However, a consistent high concentration of TSP trend was recorded (95%ile = 177 μg/m³ where the action level is 187 μg/m³) since mid-September 2006.

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 5 occasions in September to October 2006 (25th September, 3rd, 9th, 19th and 23rd October 2006). The QA/QC results for laboratory testing in the reporting month were acceptable. The QA/QC results are summarised in **Annex F**.

5.2.3 No heavy rainstorm signals were hoisted during the reporting month.

Marine water

- KLW : two action levels and one limit level exceedances of suspended solids;
- M_Marsh : two action levels exceedances of suspended solids; one action level exceedance of turbidity;
- TTC : two action levels and one limit level exceedances of suspended solids; and
- M_BP : one action level of suspended solids;

Table 5.2-1 Marine Water Exceedance Summary September - October 2006

Monitoring Station	Exceedance Level	Date	Parameters	Project-related
KLW	Action Level	25th Sept 2006	SS	No
	Limit Level	9th Oct 2006	SS	No
	Action Level	19th Oct 2006	SS	No
M_Marsh	Action Level	19th Oct 2006	Turbidity, SS	No
	Action Level	23rd Oct 2006	SS	No
TTC	Limit Level	25th Sept 2006	SS	No
	Action Level	9th Oct 2006	SS	No
	Limit Level	23rd Oct 2006	SS	No
M_BP	Action Level	23rd Oct 2006	SS	No

Remarks: Exceedances were mainly due to natural variation of marine water quality.

5.2.4 The marine water exceedances were summarised in **Table 5.2-1**. All exceedances at KLW, TTC, M_Marsh and M_BP were considered not project-related. The exceedances were mainly due to the natural variation of marine water. The magnitude of the increase of SS was similar to the control monitoring stations at M_A and M_B.

Freshwater

- F_DA : two action level exceedances of turbidity;
- F_DB : two action levels exceedances of SS;
- F_DC : Ten limit levels exceedances of turbidity; one limit level and two action level exceedances of suspended solids; and
- F_Inland M : six limit levels exceedances of turbidity; two action levels exceedances of suspended solids.

5.2.5 The freshwater water exceedances were summarised in **Table 5.2-2.**

Table 5.2-2 Freshwater Exceedance Summary September to October 2006

Monitoring Station	Exceedance Level	Date	Parameters	Project-related
F_DA	Action Level	25th Sept 2006	Turbidity	No
	Action Level	3rd Oct 2006	Turbidity	No
F_DB	Action Level	25th Sept 2006	SS	No
	Action Level	23rd Oct 2006	SS	No
F_UC	Limit Level	25th Sept 2006	Turbidity, SS	Yes
	Limit Level	3rd Oct 2006	Turbidity	Yes
	Limit Level	9th Oct 2006	Turbidity	Yes
	Limit Level	19th Oct 2006	Turbidity	Yes
	Limit Level	23rd Oct 2006	Turbidity	Yes
F_DC	Limit Level	25th Sept 2006	Turbidity	Yes
	Action Level	25th Sept 2006	SS	Yes
	Limit Level	3rd Oct 2006	Turbidity	Yes
	Limit Level	9th Oct 2006	Turbidity	Yes
	Action Level	9th Oct 2006	SS	Yes
	Limit Level	19th Oct 2006	Turbidity	Yes
	Limit Level	23rd Oct 2006	Turbidity	Yes
F_Inland Marsh	Limit Level	25th Sept 2006	Turbidity	Yes
	Limit Level	3rd Oct 2006	Turbidity	Yes
	Limit Level	9th Oct 2006	Turbidity	Yes
	Limit Level	19th Oct 2006	Turbidity	Yes
	Limit Level	23rd Oct 2006	Turbidity	Yes
	Action Level	3rd Oct 2006	SS	Yes
	Action Level	19th Oct 2006	SS	Yes

Remarks: For Streams A and B, exceedances were mainly due to natural variation. For Stream C, exceedances were mainly after the site and haul road formation. For F_Inland M, the exceedances were mainly due to continue discharge of silty water from construction site in all times.

5.2.6 Exceedances of suspended solids and turbidity were considered not the runoff from the temporary bridges to Streams B1 and B2 and considered not project-related. For the upstream monitoring location (F_UB), it is located downstream to the construction area near Hole 10 and the monitoring location cannot be relocated further upstream (temporary bridges located at Streams B1 and B2) as no water was observed and available for sampling.

5.2.7 For Stream C, exceedances were recorded at both upstream and downstream monitoring locations. For the upstream monitoring location (F_UC), it is located downstream to the construction area near Hole 16 and the monitoring location cannot be relocated further upstream as no water was observed and available for sampling. Therefore, the F_UC is considered the most upstream location of Stream C. Same as Stream B, it is considered that F_UC is also the impact monitoring location rather than control monitoring station.

5.2.8 The exceedances recorded at freshwater inland marsh were manly attributed to the silty runoff from Holes 1, 6, 7, 8 & 18 and wheel washing facility provided near the maintenance building 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 27th October 2006. Site clearance works were advancing toward Stream C, and earth works had been being conducted at the majority of the new golf course site, including areas inside the existing golf course. In the present monitoring survey, the main stream course of Stream A (the section downstream to the confluence of tributaries A1 and A2) was found still to be filled up by rubbles which was first report in June 2006 (see **Photo Plate 5.3-1**). The rubbles were reported to be washed down from the upper Tributary A2 which was under pipe culvert construction. Although the riparian vegetation was not affected by the rubbles, this section of stream channel was temporarily lost. Stream A was of the lowest ecological value among the four natural streams as it was heavily silted with sediments from eroded hillsides all year round. No stream fish and only very limited aquatic fauna were recorded in Stream A before. The impact from this temporary loss of stream channel would not be severe. But remedial works should be implemented to clear the rubbles and restore the channel as the condition of this stream is expected to improve after the construction of the golf course extension (in which the eroded hill slopes would be replaced by turf).

5.3.3 The demarcation of the stream buffer zone had been fully established at Stream A main stream and the two tributaries of Stream B and Stream C (partially) at the time of the monitoring survey. Except at the temporary access bridges crossing Stream A and Stream B, riparian vegetation within the buffer zone was not disturbed by construction works.

5.3.4 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.

5.3.5 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.

5.3.6 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.

5.3.7 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**)

5.3.8 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.

5.3.9 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 5.3-1**). As it was approaching the end of wet season, there was no significant rainfall recently. In spite of the advance of works fronts, no obvious increase of the sediment inside the streams, e.g. Stream C was found. It was observed that the water in Stream C was clear, without the turbulence recorded in September 06 survey. Atyid shrimp *Caridina trifasciata* was still recorded in Stream B, C & D in the present survey.

5.3.10 Water levels in the 4 streams were much higher than in previous monitoring surveys during dry season. For the two tributaries in Stream B, the flow in B2 tributary was similar and flow in B1 tributary was also observed at its lower reach. 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 surface flow even at the most upper reach. Photos of Streams A to D were shown in **Photo Plate 5.3-1 (Annex E)**.

5.3.11 The habitats and vegetation generally remained intact within a large potion of the project site (beyond the works fronts), within the major of 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.

Marine Ecology

5.3.12 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.

5.3.13 According to the additional three months coral monitoring at Site B2, Site C and Control Site (Apr to June 06) due to the coral damage incident happened on 26th March 06, no exceedance was recorded on corals. AFCD have no objection to reduce the monitoring frequency from monthly to quarterly until the end of the construction phase. The first quarterly survey was conducted in September 2006. No survey was required in the reporting month (October 2006).

5.3.14 To avoid similar incident from occurring again and as an additional measure to protect the corals along the shore, diving inspection by coral specialist is suggested during the period of demolition of the temporary barging point.

5.3.15 The reporting month (October 2006) was the Month Ten of the construction programme. As the dredging works for the desalination plant had not been commenced, Site D2 and Site D3 (impact sites on the western Kau Sai Chau Island for desalination plant) were not required yet. 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 also not needed yet.

5.4 Archaeology (Watching Brief)

5.4.1 Excavation was carried out at Hole 2 during this monitoring month and watching brief monitoring was carried out. According to the latest construction programme, part of 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.

5.4.2 The Archaeological Watching Brief (AWB) will consist of 18 days of on-site monitoring of the construction work. An initial site visit was made on 20th January 2006 to inspect preliminary vegetation clearance at Hole 2. The second site visit was undertaken on 3rd February 2006. The first day of the monitoring was agreed on 14th February 2006 after the confirmation with the Contractor that the bulk excavation was being carried out at Hole 2.

5.4.3 Monitoring results were shown as follows:

Hole 2

5.4.4 Clearance of surface soil was monitored in Areas 1 and 2 (mainly the concrete batching plant and underground water tank location) which is around 60% of the actual bulk earthwork. All monitoring areas were investigated after vegetation clearance and no archaeological material was identified in the first quarterly report. A thirty minute video of the works was recorded. No works have been undertaken outside the Areas 1 and 2 up the reporting period (January to March 2006).

Holes 11, 12, 14, 15 & 16

5.4.5 For the excavation at watching brief concern areas (Holes 11, 12, 14, 15 & 16), the excavation programme was commended in early September 2006 after the completion of temporary bridges construction at Streams B1 and B2. Vegetation clearance was started in early September at Holes 11, 12 and 16 and almost complete at Holes 11 to 16 in this reporting month. Bulk earthwork at concerned watching brief area was concentrated Holes 11, 14 and 16. No archaeological material was identified in the second quarterly report (April to September 2006). Archaeological watching brief monitoring was in progress during this reporting month.

5.5 Land Contamination

5.5.1 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. The Contamination Assessment Report (CAR) and Remediation Action Plan (RAP) were approved on 18th August 2006.

5.5.2 Remedial work for the contaminated soil located at the Hotspot L3 (Hole 18) is required to be implemented properly according to the RAP. A confirmation pilot trial on the ratio of cement and contaminated soil was carried out during the reporting month. According to the Contractor's submitted methodology, the contaminated soil will be transferred from Hole 18 to Hole 17 for remediation. It is because that Hole 17 is the major fill area and the remediation soil to cement mixture can be used as general fill material. The full scale remediation work was carried in the reporting month on 4th October 2006. A Final Site Remediation Report (FSRR) will be prepared by the Contractor and submitted in the next reporting report.

6. Environmental Site Auditing

6.1.1 The weekly site inspections were conducted by the ET with Contractor's representative and/or Jockey Club's representative on 27th September, 4th, 10th, 17th and 24th October 2006, and the monthly joined site inspection with IEC and the Contractor's representative undertaken on 24th October 2006. The following observations and recommendations were made.

Dust Mitigation Measures

6.1.2 Major excavation work was carried at Holes 10, 11, 14 and 16 during the reporting month. Haul road was constructed linking up all 18 golf course except Hole 13. No dust suppression measure was provided during rock breaking activities carrying at Holes 6, 10, 11, 14 & 16. Dust generation from the haul road, during earth moving operation and excavation were observed at sunny and windy weather, insufficient dust mitigation measures was provided on site. According to the site observation, two to three water trucks were provided on site for haul road watering to minimize the dust generation from the haul road only.

6.1.3 There were five major large soil stockpiles on site near Holes 1, 9, 16 and 18. Only two of them were partially covered with tarpaulin / hydroseed. The Contractor was repeatedly urged to provide sufficient mitigation measures and watering the hydroseed areas.

6.1.4 The Contractor was reminded to minimize the dust generated by the site vehicles moving along the haul road by paving the heavy traffic haul road and haul road near to the existing golf course. The Contractor was repeatedly reminded to provide sufficient dust suppression measure at all other excavation / earth moving areas.

6.1.5 Concrete batching plant was operating during this reporting month. The estimated quantity of concrete produced was around 100m³/day. No major dust generation was observed from the concrete batching plant during operation.

6.1.6 Dust emission was observed during the unloading of aggregates from the barge to the trucks located at temporary barging point. The Contractor was reminded to keep the aggregates moist in any time during the material transfer.

Water Quality

Temporary Drainage Master Plan

6.1.7 The temporary drainage master plan (TDMP) for Holes 11-16 was submitted by the Contractor for ER to review during previous reporting month and approved in this reporting month. The Contractor is required to submit the TDMP for the (i) turf grass establishment period and (ii) next wet season. The pesticide is a prohibited substance which is not allowed to be discharged to any water bodies under the WPCO.

6.1.8 The TDMP indicates that there are many discharge points along the construction boundary to the marine water and streams. Same as the earlier submission, 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 treated before water discharge.

6.1.9 According to the site observation which is similar to the last few reporting months, cut-off drain was only implemented at Hole 17. The temporary drainage system implemented on site was

mainly surrounded with silt fence along the site boundary with few sedimentation basins before discharge. Most of the runoff was discharged by overland flow through silt fence to stream and marine water. The silt fence installed on site was not well-maintenance especially at formerly installed areas which may lead to silty runoff. The Contractor was repeatedly reminded to improve the effectiveness of the mitigation measures and provide sufficient temporary drainage system on site.

6.1.10 The Contractor was reminded to provide sufficient temporary drainage and cover/hydroseed/other means to prevent any silty runoff from the desalination plant especially the surrounding slope of the land formation area. No dredging of the intake and outfall pipelines was carried out during the reporting month.

6.1.11 The Contractor was reminded to provide adequate mitigation facilities on site and sufficient temporary drainage at temporary bridges no. 5, 9, 10 (two crossings) to ensure no polluted runoff discharge from the construction works to Stream A, Stream B and freshwater inland marsh. The permanent bridges / pipe culvert at Streams A, B and C will be commenced in the next reporting month. The permanent bridges should be constructed by precast unit and any discharge of polluted runoff to the stream is prohibited during construction.

6.1.12 The Contractor was repeatedly reminded to maintain the silt curtain and desilt the settled solids within the silt curtain in a routine basis and ensure the effectiveness of its intended use.

6.1.13 The Contractor agreed that the silty water from the wheel washing facility was diverted to the sedimentation basin near the Contractor's site office and treated with the wastewater treatment plant before discharge to fresh water inland marsh. According to the site observations, the temporary diversion for the silty water was demolished and the wastewater treatment plant was removed. Therefore, silty water was still directly discharged to the freshwater inland marsh. Only one wastewater treatment plant was located at Hole 10 for standby use.

6.1.14 No turf has been established during this reporting month. According to the construction programme, turf establishment will start in December 2006 at Holes 3, 5 & 8. The Contractor was reminded to provide temporary drainage system to collect and divert the runoff to the existing reservoir when the permanent closed low flow 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.

Ecology

6.1.15 Buffer zone at Streams A, B1, B2 and C (partially) had been established. The whole buffer zone aims to protect the streams and avoid any works/equipment intrusion into the buffer zone.

6.1.16 The main stream course of Stream A was found to be filled up by rubbles to the level of the weir at its downstream end since mid-June 2006, and its conditions remained similar in the present monitoring survey. Remedial works were not yet to be implemented to clear the rubbles and restore the channel manually.

6.1.17 Floating pontoon was berthed at EP location at the temporary barging point. No illegal berthing was observed during the site audit.

6.1.18 No dredging work was carried out at the desalination plant location. No monitoring and transplantation was carried at this area.

Waste / Chemical Management

6.1.19 Cleared vegetation was stockpile on site for a long time and no disposal was recorded. In addition, stockpile of construction waste was also observed located at Hole 2 at least four months. The Contractor was repeatedly reminded to dispose the vegetation stockpiles and construction waste off-site properly according to the waste management plan. The Contractor agreed to dispose the vegetation and construction waste in the next reporting month.

6.1.20 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 confirmed that the chemical waste generated was in small amount and would be disposed by their sub-contractor or store on site. The Contractor was reminded to provide chemical storage areas for chemical storage on site.

6.1.21 There were few general refuse disposal records only in the previous reporting month. The Contractor was requested to provide the waste generation and disposal record regularly for ER and ET to review and to ensure that all waste generated from the site is disposed properly and not through Jockey Club existing dumping system. According to the site observation, the general refuse was still accumulated within the construction area (at Hole 2) without proper disposal for more than few weeks.

Landscape and Visual

6.1.22 The landscape and visual monitoring and site audits were carried out on 4th and 18th October 2006. Damaged trees next to the administration building were still unprotected after being damaged by the adjacent construction activities.

6.1.23 Tree T1000 and T1011 were transplanted in this month and are in fair condition. All other transplanted trees were in fair condition. Mal-pruning of transplanted trees had not been rectified since July 2006. Construction material was still stockpiled within tree protection zones since July 2006. A statement on the cause of death of tree T925 recorded in the last report was still outstanding.

Status of Environmental Licensing and Permitting

6.1.24 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 pilling and/or the carrying out of prescribed construction work.	21st Jan 2006	Approved on 16th February 2006	GW-RE0012-06 (valid until 3rd July 2006), supersede by GW-RE0067-06.
Application for a construction noise permit for the use of powered mechanical equipment for the purpose of carrying out construction work other than percussive pilling and/or the carrying out of prescribed construction work.	6th Apr 2006	Approved on 9th Jun 06 (supersede the GW-RE0067-06)	GW-RE0157-06 (valid until 28th Nov 2006)
Notification of the air pollution control (construction dust) regulation	21st Jan 2006	Acknowledge receipt from EPD on 27th February 2006	Ref. no.: 001006902
Registration as a chemical waste producer	10th Jan 2006	Register on 7th February 2006	WPN-5213-813-C1186-04
Application for a permit to dump material at sea under the Dumping at Sea Ordinance	10th Jan 2006	Deferred by CHEC on 17th 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	12th Jan 2006	Approved on 16th January 2006	A/C no. 5005322 (valid until 2nd August 2007)
Application for a licence for production pursuant to Section 14 of Air pollution Control Ordinance	2nd 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 – Construction Site	18th Mar 2006	Approved on 12th Sept 2006 (CHEC/KSC3/9.1/0414)	EPD letter refer. No: EP640/W4/J1003

7. Environmental Non-Conformance

7.1 Summary of Environmental Non-Compliance

Air Quality

7.1.1 No non-compliance of 24-TSP was recorded at GCA B1 in the reporting month.

Marine Water Quality

7.1.2 One exceedances of turbidity and nine exceedances of suspended solids (SS) on 25th September, 9th, 19th and 23rd October 2006 were recorded at KLW, TTC, M_Marsh and M_BP. All exceedances were considered not project-related.

Freshwater Quality

7.1.3 Eighteen exceedances of turbidity and ten exceedances of suspended were recorded at F_DA, F_DB, F_DC and F_Inland Marsh. The exceedances recorded at freshwater inland marsh were mainly attributed to silty water discharged from the wheel washing facility near to the Contractor's site office. The exceedances recorded at Streams A and B were considered not project-related. Exceedances recorded at Streams C and freshwater inland marsh were considered project-related.

Terrestrial Ecology

7.1.4 No non-compliance was recorded during the site audit.

Marine Ecology

7.1.5 Coral monitoring survey was not required in this reporting month.

7.2 Summary of Environmental Complaint

7.2.1 No environmental complaint was received in this reporting month.

7.3 Summary of Environmental Summons

7.3.1 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 Major works to be taken for the coming monitoring period are summarized as follows.

- Operation of temporary barging point
- Operation of sewage treatment plant
- Operation of concrete batching plant
- Operation of wastewater treatment plant
- Land formation for desalination plant
- Drainage and irrigation systems installation at Golf Holes
- Haul road formation and bulk excavation at Hole 13
- Gravity drain construction from Lake 1D to reservoir
- Implementation of temporary drainage master plan
- Implementation of dust suppression mitigation measures
- Vegetation, general and construction wastes disposal off-site

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 September 2006 to 24th October 2006 in accordance with EM&A Manual and the requirement under EP-224-2005/A.

9.1.2 The Contractor was repeatedly reminded to improve and provide sufficient temporary drainage system on site to prevent silty runoff to marine and stream courses. In addition, the Contractor was reminded to provide sufficient dust suppression mitigation measures especially during rock breaking activity, earth movement (loading and unloading), at haul road (vehicle movement) and large soils stockpiles.

9.1.3 In the June 2006 monitoring survey of terrestrial ecology, the main stream course of Stream A was found to be filled up with rubbles to the level of the weir at its downstream end, and its conditions remained similar in the present monitoring survey. The Contractor was reminded to control the construction work quality and prevent same incident happened in future. Remedial works were not implemented to clear the rubbles and restore the channel by hand.

9.1.4 Same as the last reporting month, no rectification work was done by the Contractor. Regarding the retained trees, the Contractor shall take the following measures:

- Carry out surgery to damaged trees;
- Report the cause of death of tree T925;
- Maintain the tree protection zone required and remove all construction material / debris from the tree protection zone;
- Rectify the mal-pruning practice of the transplanted trees; and
- Carry out hydroseed works at temporary and permanent stockpiles/bare slopes when practical.

9.1.5 No environmental complaint and environmental summons/prosecutions was received during the reporting period.

9.1.6 The ET will keep track of the EM&A programme with respect to compliance of environmental requirements and the proper implementation of all necessary mitigation measures.