

**Public Golf Course at Kau Sai Chau Island, Sai Kung**  
**Operation Phase**  
**Environmental Monitoring & Audit (EM&A) Report**  
**for April 2008**

**(Report No. 382812/0201/002)**

Report Authorized For  
Issue By:



For and on Behalf of  
Black & Veatch Hong Kong Limited

**Black & Veatch Hong Kong Limited**  
Room 1201-09, Millennium City 5,  
418 Kwun Tong Road,  
Kowloon, Hong Kong




**The Jockey Club Kau Sai Chau**  
**Public Golf Course Limited**  
One Sports Road  
Happy Valley  
Hong Kong

**May 2008**

## Table of Content

### Executive Summary

1. Introduction
  - 1.1 *Background of the Project*
  - 1.2 *Purpose of the Report*
  - 1.3 *Structure of the Report*
2. Project Information
  - 2.1 *Background*
  - 2.2 *Site Description*
  - 2.3 *Summary of EM&A Requirements*
3. Environmental Monitoring Requirements
  - 3.1 *Water Quality*
  - 3.2 *Marine Ecology*
  - 3.3 *Landscape and Visual*
  - 3.4 *Soil Nutrient*
4. Monitoring Results
  - 4.1 *Water Quality*
  - 4.2 *Marine Ecology*
  - 4.3 *Landscape & Visual*
  - 4.4 *Soil Nutrient*
5. Conclusions

	<b>Name</b>	<b>Signature</b>	<b>Date</b>
Prepared	<b>Esther Tong</b>		May 2008
Checked	<b>Manuel Chua</b>		May 2008
Reviewed	<b>PK Lee</b>		May 2008

**List of Figure**

- 1.1 Master Layout Plan of the Proposed Third Golf Course
- 3.1 Proposed Water Quality Monitoring Locations (Operation phase)
- 3.2 Locations of Coral and Seagrass Monitoring (Sites D2, D3 and C)

**List of Table**

- Table 1.1 Structure of the Report 1
- Table 2.1 Summary of Impact EM&A Requirements during Operation Phase
- Table 3.1 Derived Summaries of Action and Limit Levels for Freshwater Water Quality
- Table 3.2 Action and Limit Levels for Water Quality Monitoring
- Table 3.3 Derived Summaries of Action and Limit Levels for Marine Water Quality
- Table 3.4 Water Quality Monitoring Parameter, Frequency and Locations
- Table 3.5 Water Quality Monitoring Locations during Operation Phase
- Table 3.9 Analytical Methods to be applied to Water Quality Samples
- Table 4.1-1 Marine Water Exceedance Summary (April 2008)
- Table 4.1-2 Marine water Exceedance Summary April 2008)
- Table 4.1-3 Pesticides Monitoring Results (April 2008)

**List of Annex**

- Annex A Monitoring Programme for the reporting month
- Annex B Event Action Plan
- Annex C Monitoring results
- Annex D Calibration Certificates
- Annex E Fertilizer and pesticides applications

<b>DOCUMENT CONTROL</b>		Public Golf Course at Kau Sai Chau, Sai Kung - Operation Phase			No. 382812/0201/002
<b>AMENDMENT RECORD</b>					Prepared by: Esther Tong
Monthly EM&A Monitoring Report - April 2008		Client: <b>Hong Kong Jockey Club</b>			Initials: ET
					Date: May 2008
<b>Pages:</b>	<b>Date:</b>	<b>Issue No.</b>	<b>Description:</b>		<b>Initials:</b>
All	May 08	1	Monthly EM&A Report for submission to EPD		ET

## **Executive Summary**

This is the second Operation Phase Monthly Environmental Monitoring and Audit (EM&A) Report prepared by Black & Veatch for the Project “Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung”. This report presents the results of the EM&A works conducted in the month of April 2008 (25<sup>th</sup> March to 24<sup>th</sup> April 2008).

### ***Water Quality***

2 sets of water quality monitoring were carried out on 1<sup>st</sup> and 15<sup>th</sup> April 2008 at 8 marine and 6 freshwater monitoring locations. No water sample is taken at M\_RO2 (marine station), the monitoring will only be carried out when desalination plant is in operation. For F\_Filter (fresh water station), no filter effluent was discharging during sampling and, thus no water sample was taken. Heavy rainstorm was hoisted on 19<sup>th</sup> April 2008 during this reporting month. Water sample was taken on 20<sup>th</sup> April 2008. Due to heavy rainstorm, sufficient water was collected from the ADS filter (F\_Filter).

Exceedances found at marine stations are considered non-project related while exceedances found at fresh water monitoring stations are considered project related during the reporting month. Exceedances are mainly due to the runoff from the unstable newly vegetated turf or hydroseeding areas to streams.

### ***Marine Ecology***

The coral monitoring will commence once rock-filled pier at the temporary barging point removal is completed.

### ***Landscaping & Visual***

The Contractor is finalizing the landscaping works, the landscape and visual site audit will be conducted once planting on the golf course are completed.

### ***Soil Nutrient***

Nutrient analysis at East Course was carried out in March 2008. The nutrient status is presented in this reporting month.

## 1. Introduction

### 1.1 Background of the Project

1.1.1 Black & Veatch (hereinafter called the “ET”) was appointed by The Jockey Club Kau Sai Chau Public Golf Course Limited (hereinafter called the "Project Proponent") to undertake Operation Phase of 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/A, 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 on water quality, marine ecology, landscape and visual and land contamination during operation phase are required for the Project.

1.1.2 This report summarises the environmental monitoring and audit works for the Project in **April 2008**.

### 1.2 Purpose of the Report

1.2.1 This is the **second** EM&A report which summarizes the impact monitoring results and audit findings for the EM&A programme during the reporting period from **25<sup>th</sup> March to 24<sup>th</sup> April 2008**.

### 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**

<b>Section</b>		<b>Description</b>
<b>1</b>	Introduction	Details the scope and structure of the report
<b>2</b>	Project Information	Summarizes background and scope of the project and site description
<b>3</b>	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.
<b>4</b>	Monitoring Results	Summarizes the monitoring results obtained in the reporting period.
<b>5</b>	Environmental Non-conformance	Summarizes any monitoring exceedance, environmental complaints and environmental summons within the reporting period.
<b>6</b>	Conclusions	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. Application for Variation of an Environmental Permit by the Project Proponent was submitted on 2 August 2006 (Application No. VEP-222/2006) and the EP was superseded by EP-224/2005/A.

### **2.2 Site Description**

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

### **2.3 Summary of EM&A Requirements**

2.3.1 The EM&A programme requires environmental monitoring for water quality, marine ecology, landscape and visual and land contamination during operation phase. 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.

2.3.2 A summary of impact EM&A requirements is presented in Table 2.1.

**Table 2.1 Summary of Impact EM&A Requirements during Operation Phase**

<b>Impacts</b>	<b>Parameters/descriptions</b>	<b>Locations</b>	<b>Frequencies</b>
<b>Water Quality</b>	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity, SS, NO <sub>3</sub> -N, NO <sub>2</sub> -N, NH <sub>3</sub> -N, TP, Chl-a and selected pesticides.	9 marine and 6 freshwater locations	2-year of monitoring period for the operation phase. Monitoring should be carried out on bi-weekly basis for the first 12 months, after when the frequency will be reviewed by EPD. Additional monitoring parameters at Lake 1D are required (TKN, Ortho-P and Conductivity)
	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity, SS, NO <sub>3</sub> -N, NO <sub>2</sub> -N, NH <sub>3</sub> -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.
<b>Marine Ecology</b>	Natural corals	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.
<b>Landscape and Visual</b>	Audits to ensure effective implementation of mitigation measures	Golf course area and at visual sensitive receivers	Auditing inspections and reporting shall be undertaken once every two months for the first year of the operation phase.
<b>Soil Nutrient</b>	Nutrient Status of the Soil	Golf course	Twice annually



### 3. Environmental Monitoring Requirements

#### 3.1 Water Quality

##### Monitoring Requirement

3.1.1 Water quality monitoring was conducted in accordance with the EM&A Manual. Tables 3.1 to 3.3 show the established Action/Limit Levels for the water environmental monitoring parameters.

**Table 3.1 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<sub>3</sub>-N, NO<sub>2</sub>-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

**Table 3.2 Action and Limit Levels for Water Quality Monitoring  
(applicable to irrigation lake 1D and existing reservoir)**

Parameter (mg/L unless stated)	Action and Limit Levels
pH	6.0 - 9.0 <sup>(1)</sup>
Turbidity (NTU)	-
Dissolved Oxygen	>4 <sup>(1)</sup>
Chlorophyll a (mg/m <sup>3</sup> )	<5 <sup>(1)</sup>
Nitrate N	0.20 <sup>(1)</sup>
Nitrite N	0.20 <sup>(1)</sup>
Ammoniacal N	0.50 <sup>(1)</sup>
Total Kjeldahl N	1.2 <sup>(2)</sup>
Total Phosphate	0.1 <sup>(1)</sup>
Ortho Phosphate	0.05 <sup>(1)</sup>
Conductivity (µS/cm)	<1000 <sup>(1)</sup>

Note: (1) These values are based on professional judgment and knowledge

(2) Based on 90<sup>th</sup> percentile of operational phase monitoring data (1996 to June 1998)

**Table 3.3 Derived Summaries of Action and Limit Levels for Marine Water Quality**

Parameters	Location	Action	Location	Limit
<b>DO (Surface &amp; Middle)</b>	FCZ	6.0 mg/L	FCZ	5.3 mg/L
	All except FCZ	4.9 mg/L	All except FCZ	4.6 mg/L
<b>DO (Bottom)</b>	All	3.7 mg/L	All	3.4 mg/L
<b>pH (depth-averaged)</b>		N/A	All	6.5 - 8.5
<b>SS (Depth-averaged)☆</b>	FCZ	4.5 mg/L	FCZ	5.6 mg/L
	All except FCZ	6.1 mg/L	All except FCZ	10.6 mg/L
<b>SS (Depth-averaged) Dredging for submarine pipelines⊕</b>	M_RO1	6.1 mg/L	M_RO1	10.6 mg/L
<b>Turbidity (Tby) (depth-averaged) ☆</b>	FCZ	2.9 NTU☼	FCZ	3.9 NTU☼
	All except FCZ	3.3 NTU☼	All except FCZ	6.2 NTU☼
<b>Ammonia Nitrogen (depth-averaged)</b>	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
<b>Nitrate Nitrogen (depth-averaged)</b>	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
<b>Nitrite Nitrogen (depth-averaged)</b>	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
<b>TIN (depth-averaged)</b>	FCZ	0.12 mg/L	FCZ	0.14 mg/L
	All except FCZ	0.16 mg/L	All except FCZ	0.18 mg/L
<b>Total Phosphorus (depth-averaged)</b>	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<sub>2</sub>-N) at non-FCZ stations, the trigger level has made reference to the existing golf course guideline values. The guideline value of NO<sub>2</sub>-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<sub>2</sub>-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

### Monitoring Parameters, Frequency and Programme

3.1.2 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.

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

3.1.4 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, salinity and conductivity (Lake 1D only).

3.1.5 Additional marine and freshwater water quality monitoring parameters for the impact monitoring during construction include nitrate nitrogen (NO<sub>3</sub>-N), nitrite nitrogen (NO<sub>2</sub>-N), ammonia nitrogen (NH<sub>3</sub>-N), total phosphate (TP) and selected pesticides. For Lake 1D, Total Kjeldahl Nitrogen (TKN) and Orthophosphate (Ortho P) are required.

3.1.6 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 3.1.5.

### *Monitoring Frequency*

3.1.7 The monitoring parameters and frequency are summarized in Table 3.4. The monitoring programme for the reporting period is shown in **Annex A**.

**Table 3.4 Water Quality Monitoring Parameter, Frequency and Locations**

Parameters	Frequency	Location
Dissolved Oxygen (mg/L)	Bi-weekly for the first operation year, subjected to review for the second operation year	<b>Marine Water</b> Fish culture zone stations: TTC, KLW, KS  Control stations: M_A, M_B  Impact stations: M_BP, M_RO1, M_Marsh, M_Coral (M_RO2 - only when RO in operation)
Temperature (°C)		
Turbidity (NTU)		
pH		
Salinity (ppt)		
Suspended Solids (mg/L)		
Conductivity (uS/cm)*		
	<b>Marine water :</b> 2 times per day – 1 for mid-flood and 1 for mid-ebb  <b>Freshwater :</b> once per day	<b>Freshwater Water</b> Stream A (F_DA) Stream B (F_DB) Stream C (F_DC) Inland Marsh (F_Inland_M) Outlet of ADS Filter (F_Filter) Lake 1D (F_lake 1D)

Remarks: \*Lake 1D only

Monitoring Locations

3.1.8 The water quality monitoring locations for marine and freshwater (**Figure 3.1**) are summarized in Table 3.5.

**Table 3.5 Water Quality Monitoring Locations during Operation Phase**

Identification Number	Location	Approx. Water Depth	No. of Depth
<b>Marine Water (9 stations)</b>			
TTC	Tai Tau Chau Fish Culture Zone	9.5 m	3
KLW	Kai Lung Wan Fish Culture Zone	13 m	3
KS	Kau Sai Fish Culture Zone	11 m	3
M_BP	Temporary barging point	9.6 m	3
M_RO1	Desalination plant south of the existing pier	5 m	2
M_RO2	Desalination plant south of the existing pier	13 m	3
M_Marsh	Discharge point at the existing marsh	7.7 m	3
M_Coral	Marine water of Port Shelter	10.2m	3
M_A	Water Control Station of Port Shelter	7.5 m	3
M_B	Water Control Station of Port Shelter	16.5 m	3
<b>Fresh Water (7 stations)</b>			
F_DA	downstream of stream A	Mid-depth	1
F_DB	downstream of stream B	Mid-depth	1

Identification Number	Location	Approx. Water Depth	No. of Depth
F_DC	downstream of stream C	Mid-depth	1
F_Inland M	Downstream of the existing marsh (Inland)	Mid-depth	1
F_lake 1D	Irrigation Lake 1D	Mid-depth	1
F_Filter	Filter effluent point at Holes 5 / 6	Mid-depth	1

### Monitoring Equipment

#### *Dissolved Oxygen and Temperature Measuring Equipment*

3.1.9 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<sup>-1</sup> and 0 - 200% saturation; and
- a temperature of 0 - 45 degrees Celsius.

3.1.10 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).

3.1.11 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*

3.1.12 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*

3.1.13 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*

3.1.14 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*

- 3.1.15 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*

- 3.1.16 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*

- 3.1.17 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*

- 3.1.18 A portable, battery-operated flow meter should be used for the determination of water depth at each designated monitoring location and record in m<sup>3</sup>/s. A hand held or meter fixed to the underside of the survey boat may be used.

*Sample Containers and Storage*

- 3.1.19 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*

- 3.1.20 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

- 3.1.21 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.
- 3.1.22 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.
- 3.1.23 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*

- 3.1.24 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*

- 3.1.25 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**

<b>Determinant</b>	<b>Standard Method</b>	<b>Reporting Limit</b>
Suspended Solids	APHA 2540 D	2 mg/L
Nitrate Nitrogen	APHA 4500-NO <sub>3</sub> <sup>-</sup>	0.01 mg/L
Nitrite Nitrogen	APHA 4500-NO <sub>2</sub> <sup>-</sup>	0.01 mg/L
Ammonia Nitrogen	APHA 4500-NH <sub>3</sub> (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*

- 3.1.26 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

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

## **3.2 Marine Ecology**

### Introduction

- 3.2.1 The marine ecological monitoring surveys are conducted in accordance with the EM&A manual.
- 3.2.2 As stipulated in the EM&A Manual, the ecological monitoring surveys for marine ecology included coral monitoring at both the eastern and western coasts of Kau Sai Chau Island (Site C and Control Site). It is not required to monitor Site D2 due to no commencement of dredging work for the desalination plant during the construction phase. The purpose of the monitoring survey was to check the conditions of the tagged corals and the impact sites.

### Monitoring Frequency and Schedule

- 3.2.3 At each of the Site C and a Control Site near the AFCD's Coral Buoy at Sharp Island (**Figure 3.2**), 20 natural coral colonies are already selected and tagged during construction phase. If the tagged coral is found die or not suitable for sequent operation phase monitoring during the first month survey, new coral will be selected, tagged and replaced for the damage one. The species of corals had 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 decussata*, *Platygyra acuta*, *Platygyra carnosus*, *Plesiastrea versipora*, *Psammocora superficialis*, and *Turbinaria peltata*.
- 3.2.4 The coral monitoring will be conducted monthly for the first three months of the operation phase, and if no exceedance was recorded, the monitoring schedule will be changed to semi-annually (i.e. one dry season and one in wet season) during the rest of the operation phase. Monitoring survey will consist of checking tagged corals at both impact sites and control site. Percentages of survival, sedimentation and bleaching for each tagged corals will be recorded. The monitoring programme for the reporting period is shown in **Annex A**.

### Event and Action Plans

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

## **3.3 Landscape and Visual**

- 3.3.1 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, regular site inspections on trees health will be conducted. Auditing inspections and reporting are undertaken once every two months during the first year of the operation phase. The monitoring programme for the reporting period is shown in **Annex A**.

## **3.4 Soil Nutrient**

- 3.4.1 Routine soil testing for nutrients at East Course will be conducted semi-annually to ensure that nutrient applications to the golf course are having the desired effect. Adjustments, if necessary, are made to the applications program approved by Golf Course Superintendent to amend any soil imbalances or deficiencies in nutrients. The details of the fertilizers and pesticides application will also be recorded.



#### 4. Monitoring Results

4.1.1 Monitoring data are provided in **Annex C**.

##### 4.1 Water Quality

4.1.2 Marine and freshwater water quality monitoring were conducted at the 9 and 6 designated monitoring stations respectively.

4.1.3 Application of the discharge licence of the desalination plant is in progress. The monitoring M\_RO2 is not necessary until the desalination plant fully is operational.

4.1.4 Monitoring of marine and freshwater locations was conducted on 2 occasions in April 2008 (1<sup>st</sup> and 15<sup>th</sup> April 2008). The QA/QC results for laboratory testing in the reporting month are acceptable and summarised in **Annex D**. Rainstorm signal was hoisted on 19 April 2008 during this reporting month while the water sample was taken on 20 April 2008.

4.1.5 As there is no water discharge from the Holes 5 / 6 through the drainage system during sampling (except on 20 April 2008 after the rainstorm event), no water sample for F\_Filter was collected during the reporting month. Summary of fertilizer and pesticides applications are summarized in **Annex E**.

4.1.6 Chemical applications were applied during the reporting month. They are approved pesticides listed in the turfgrass management plan in the final EIA report. Water samples were required to send to overseas laboratory for analysis and testing.

##### Marine water

4.1.7 The marine water exceedances are summarised in **Table 4.1-1**.

4.1.8 The ammonia nitrogen concentrations measured at the control station (M\_A and M\_B) were ranging from 0.04 mg/L to 0.06 mg/L. The exceedance measured at M\_Marsh, TTC, M\_Coral and KS were also within the similar range (0.04 mg/L to 0.06 mg/L). Therefore, the ammonia nitrogen exceedances are considered non-project related.

4.1.9 For SS, exceedances were recorded at TTC and KS (ranging from 4.7 to 5.8 mg/L). The increase of SS at TTC and KS has the same order magnitude than SS measured at control stations. The SS exceedances are considered non-project related.

4.1.10 For chlorophyll a exceedance (2 µg/L) which was similar to M\_A (1.9 µg/L) and M\_B (2 µg/L). The chlorophyll a exceedance is considered non-project related.

**Table 4.1-1 Marine Water Exceedance Summary (April 2008)**

Monitoring Location	Exceedance Level	Date	Parameters	Project-related
M Marsh	Limit Level	1 Apr 2008	NH3-N	No
TTC	Action Level	15 Apr 2008	SS	No
TTC	Limit Level	1 Apr 2008	NH3-N	No
TTC	Limit Level	15 Apr 2008	NH3-N	No
TTC	Limit Level	20 Apr 2008	NH3-N	No
M Coral	Limit Level	1 Apr 2008	NH3-N	No
KS	Limit Level	1 Apr 2008	NH3-N	No
KS	Limit Level	15 Apr 2008	SS, NH3-N	No

Monitoring Location	Exceedance Level	Date	Parameters	Project-related
KS	Action Level	20 Apr 2008	SS, Chl a	No
KS	Limit Level	20 Apr 2008	NH3-N, NO3-N, TIN	No

Fresh water

4.1.11 The fresh water exceedances are summarised in **Table 4.1-2**.

**Table 4.1-2 Marine water Exceedance Summary (April 2008)**

Monitoring Location	Exceedance Level	Date	Parameters	Project-related
F_DA	Limit Level	1 Apr 2008	Tur, SS, NH3-N, NO3-N, NO2-N, TIN and Chl a	Yes
	Limit Level	15 Apr 2008	Tur, SS, NO3-N, TIN, Chl a	Yes
	Limit Level	20 Apr 2008	Tur, SS, NH3-N, Chl a	Yes
F_DB	Limit Level	1 Apr 2008	Tur, NO3-N, TIN, Chl a	Yes
	Action Level	15 Apr 2008	SS	Yes
	Limit Level	15 Apr 2008	Tur, NO3-N, TIN	Yes
	Limit Level	20 Apr 2008	Tur, SS, NO3-N, TIN, Chl a	Yes
F_DC	Limit Level	1 Apr 2008	pH, NO3-N, TIN, Chl a	Yes
	Limit Level	15 Apr 2008	pH	Yes
	Limit Level	20 Apr 2008	pH, Tur, SS, NO3-N, TIN, Chl a	Yes
F_Inland M	Action Level	1 Apr 2008	SS	Yes
	Limit Level	1 Apr 2008	NO3-N, NO2-N, TIN	Yes
	Limit Level	15 Apr 2008	NO3-N, TIN	Yes
	Action Level	20 Apr 2008	SS	Yes
	Limit Level	20 Apr 2008	NO3-N, TIN, Chl a	Yes

4.1.12 April 2008 is the first month of wet season. The constructed East Course is started to operate for approximate 2 months. According to the site observation, many of the hydroseeding and turf areas are not fully grown and immature.

4.1.13 Relatively high SS and Turbidity concentrations were recorded at downstream A on 1<sup>st</sup>, 15<sup>th</sup> and 20<sup>th</sup> April 2008. Site inspections indicated that the source of silty runoff came from the newly planting area located at Hole 17. For Streams B and C, high SS and Turbidity concentrations were recorded only on 20 April 2008 after the rainstorm events. The increase of SS and Turbidity was mainly due to the stream bed was disrupted by the rain leading to SS and Turbidity elevation. For NO3-N (ranging from 0.22 mg/L to 1.29 mg/L) and Chlorophyll a (0.9 µg/L to 2.0 µg/L), measured values at downstream of Streams A, B and C and Fresh Water Inland Marsh are within limited range. Therefore, water quality variations are considered due to natural variation. It is considered that the increase SS, Turbidity, NO3-N, NO2-N, TIN and chlorophyll a are project related.

4.1.14 pH value measured at downstream C was 6.0. After reviewing the water quality at Stream C during construction phase and post-monitoring, the low pH is considered vary naturally.

4.1.15 The lake 1D is designed for temporary storage to collect the runoff from East Course through the closed low flow drainage system. The water will be recycled and reused as one of the irrigation water sources for the East Course. NO2-N, ortho-phosphate and chlorophyll a exceedances were recorded. As there is no overflow / discharge from the Lake 1D to marine or fresh water bodies, no further action has to be taken.

4.1.16 The monitoring of pesticides are summarised in **Table 4.1-3**.

**Table 4.1-3 Pesticides Monitoring Results (April 2008)**

<b>Date</b>	<b>Monitoring Station</b>	<b>Parameters</b>	<b>Monitoring Result</b>
1 <sup>st</sup> Apr 08	F_Inland_Marsh, M_Marsh, TTC, M_BP, M_Coral, KS, F_DB, F_DC, F_DA	Oxadiazon	Undetectable
15 <sup>th</sup> Apr 08	F_Inland_Marsh, M_Marsh, TTC, M_BP, M_Coral, KS, F_DB, F_DC, F_DA	Chlorothalonil	Undetectable
15 <sup>th</sup> Apr 08	TTC, M_BP, M_Coral, KS, F_DC	Oxadiazon	Undetectable

## **4.2 Marine Ecology**

4.2.1 As the removal of the temporary barging point is still in progress, the operation phase monitoring will commence when removal is completed.

## **4.3 Landscape & Visual**

4.3.1 The landscape work is not yet completed by the Contractor. The operation phase monitoring will commence when the Final Landscape Plan is available from the Contractor.

## **4.4 Soil Nutrient**

4.4.1 Soil samples were taken at East Course in March 2007 (18 holes –green, tee and fairway). The soil test analysis is presented in the this monthly report for record.

## **5. Conclusions**

- 5.1.1 The Environmental Monitoring and Audit (EM&A) Report presents the operational EM&A works undertaken during the period from 25<sup>th</sup> March to 24<sup>th</sup> April 2008 in accordance with EM&A Manual and the requirement under EP-224-2005/A.
- 5.1.2 Exceedances on marine stations are recorded and considered non-project related. The exceedances are mainly due to the natural variation.
- 5.1.3 Exceedances on fresh water stations are recorded and considered project related. The exceedances are mainly due to the newly planted turf and hydroseeding areas.
- 5.1.4 Application of discharge licence of the desalination plant is in progress. Marine water monitoring location at M\_RO2 is not required.
- 5.1.5 Removal of rock-filled pier at the temporary barging point is in progress. Coral monitoring will commence once removal complete.
- 5.1.6 The landscape work is not yet completed by the Contractor. The operation phase monitoring will commence when the Final Landscape Plan is available from the Contractor.
- 5.1.7 No environmental complaint / summon was received during the reporting month.

# **Annex A**

## **Monitoring Programme for the reporting month**

Public Golf Course at Kau Sai Chau Island, Sai Kung  
Operation Phase - Monthly EM&A Report

---

<b>April 2008</b>						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 WQ	2	3	4	5
6	7	8	9	10	11	12
13	14	15 WQ	16	17	18	19
20 WQ	21	22	23	24	25	26
27	28	29	30			

WQ: Water Quality Monitoring

# **Annex B**

## **Event Action Plan**

### **Event and Action Plan for Water Quality**

Should monitoring results of the water quality parameters at any designated monitoring station exceed the water quality criteria related to turf management, action the proposed actions to be taken shall be as follows:

- inform Golf Course Manager immediately and stop chemical application;
- notify EPD and AFCD;
- review the application and re-evaluate suitability and availability of alternatives to chemical controls, etc.;
- agree remedial measures with Golf Course Manager and inform EPD and AFCD;
- implement the agreed remedial measures immediately; and
- increase monitoring frequency and/or locations to demonstrate effectiveness of the remedial measures.



**Action and Limit level and Event Action Plan for natural corals monitoring**

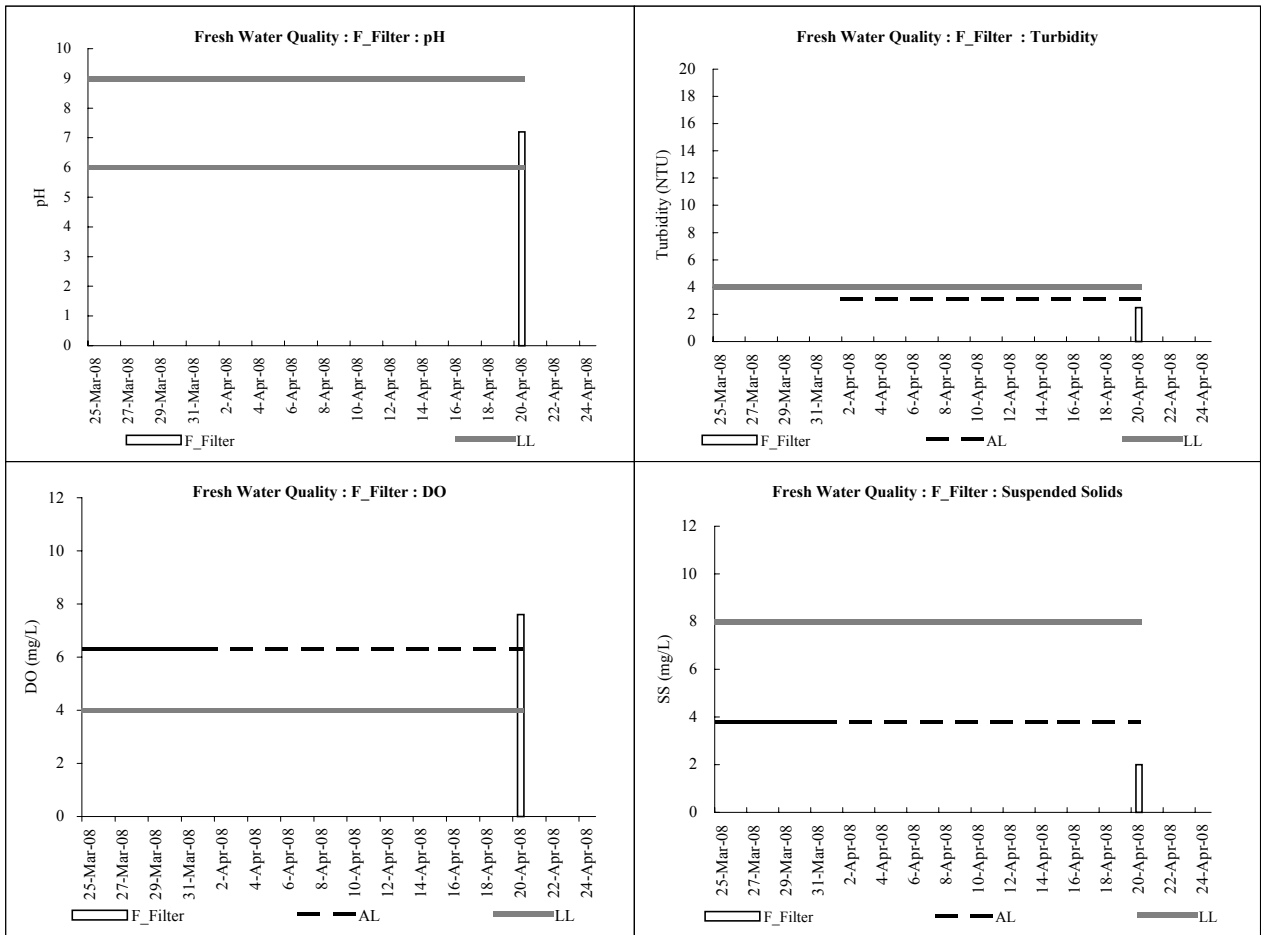
<b>Parameters</b>	<b>Action Level</b>	<b>Limit Level</b>
Sedimentation	a 15% increase in the percentage of sedimentation on the hard corals occurs at more than 20% of the tagged coral colonies at one or more monitoring sites	a 25% increase in the percentage of sedimentation on the hard corals occurs at more than 20% of the tagged coral colonies at one or more monitoring sites
Bleaching	a 15% increase in the percentage of bleaching of hard corals occurs at more than 20% of the tagged coral colonies at one or more monitoring sites	a 25% increase in the percentage of bleaching of hard corals occurs at more than 20% of the tagged coral colonies at one or more monitoring sites
Mortality	a 15% increase in the percentage of partial mortality of corals occurs at more than 20% of the tagged coral colonies at one or more monitoring sites	a 25% increase in the percentage of partial mortality of corals occurs at more than 20% of the tagged coral colonies at one or more monitoring sites

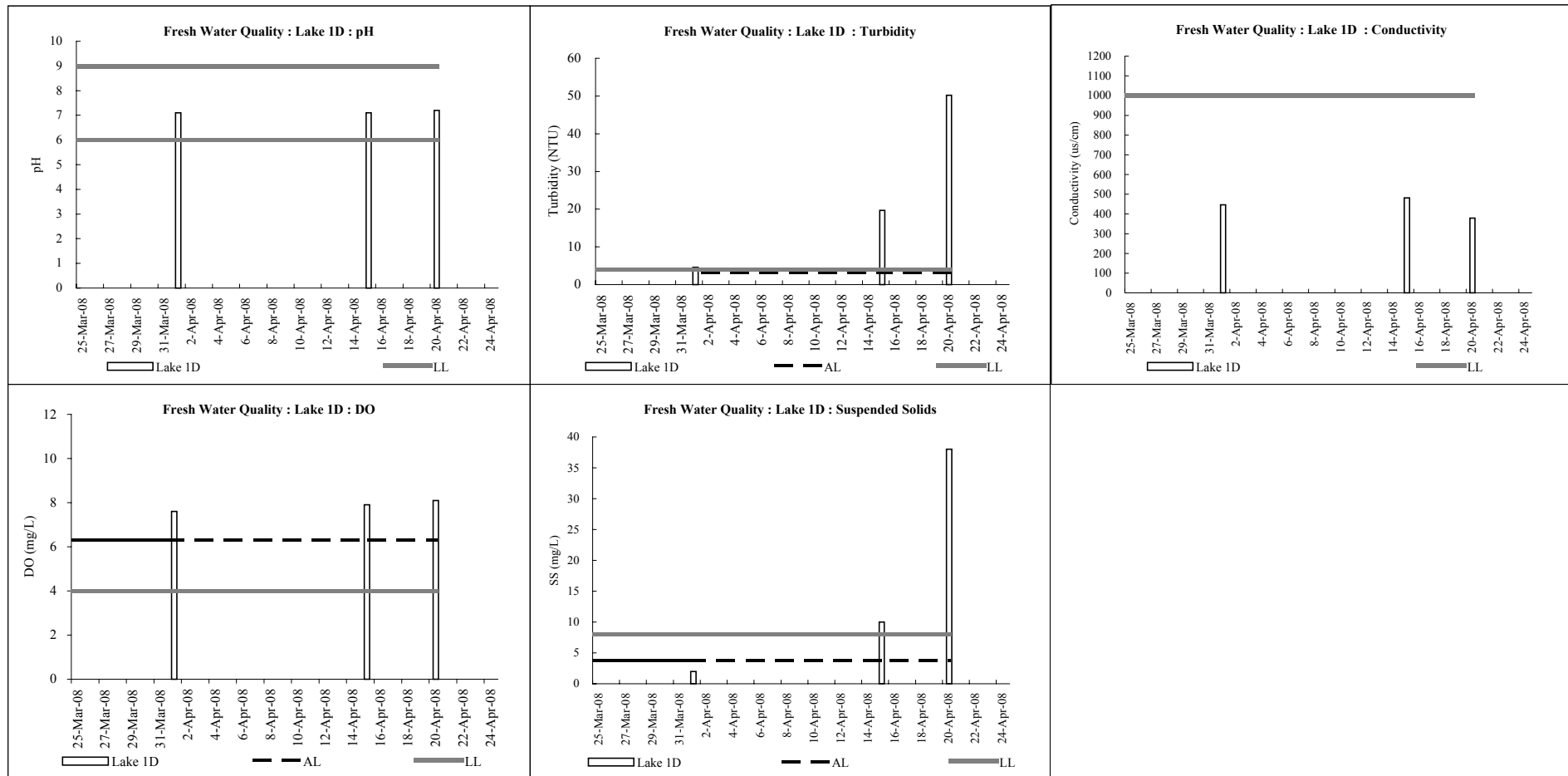
<b>Action</b>	<b>Action Level</b>	<b>Limit Level</b>
Operation phase	If the Action Level is exceeded the ET Leader should inform Golf Course Operator, EPD, and AFCD. The data from the water quality monitoring should also be reviewed. If the water quality monitoring shows no attributable effects of the installation works, then the Action Level is not triggered. If the water quality data indicate exceedances (salinity and/or pesticides) the ET Leader should discuss with the Golf Course Operator the most appropriate method of reducing salinity (e.g. reduce the daily operation time of the desalination plant), and/or control chemicals from runoff (e.g. reduce the frequency and quantity of chemical applied, check the intactness and effectiveness of the closed drainage system and stream buffer zone). This mitigated method should then be enacted on the next working day.	If the Limit Level is exceeded the ET Leader should inform all parties Golf Course Operator, EPD, and AFCD immediately. Should the Limit Level be exceeded, the Golf Course Operator should stop the operation of the desalination plant and/or the application of chemicals immediately and work out the solution according to the requirements of EPD and AFCD. The operation of the desalination plant and/or the application of chemicals would be suspended until an effective solution is identified.

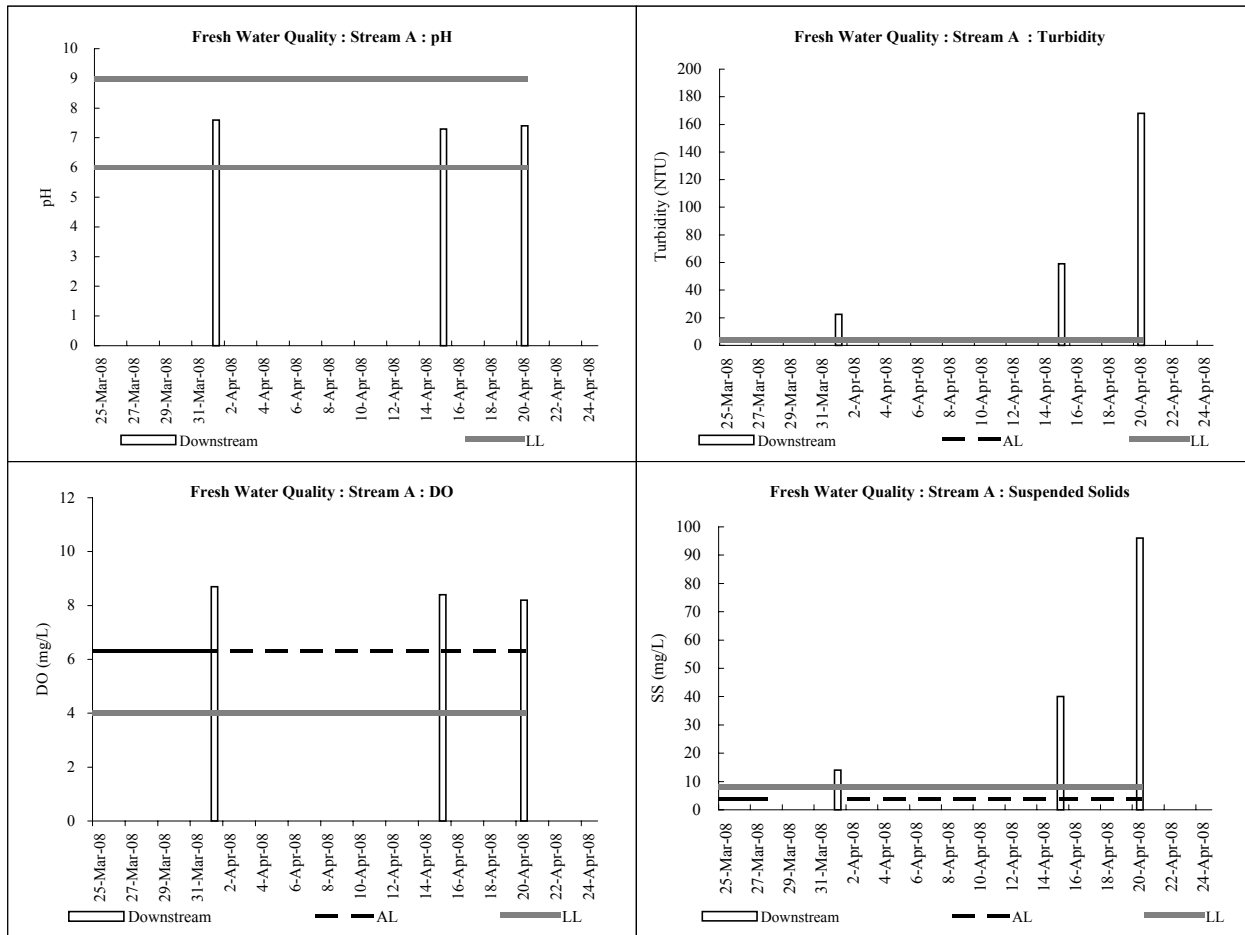
# **Annex C**

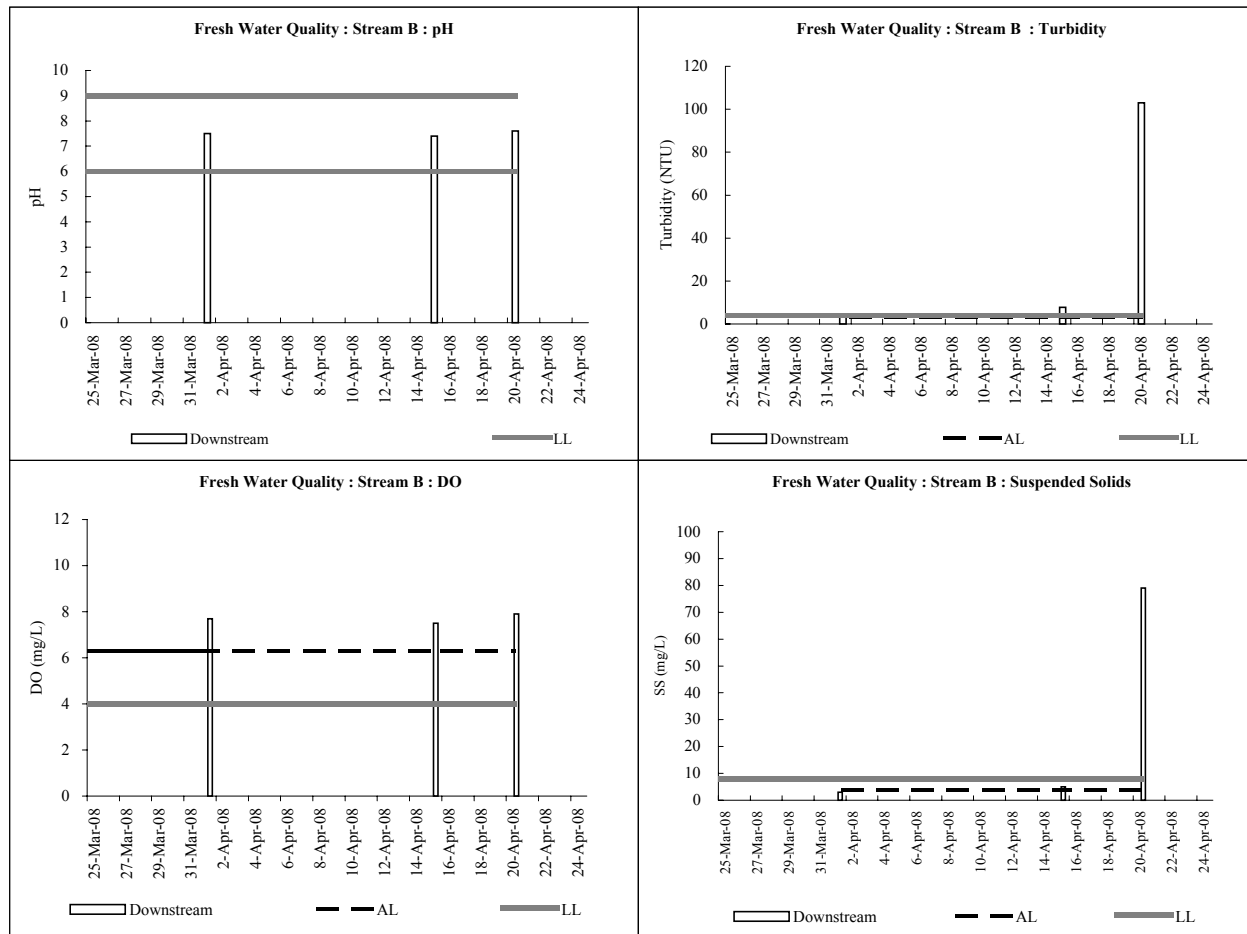
## **Monitoring results**

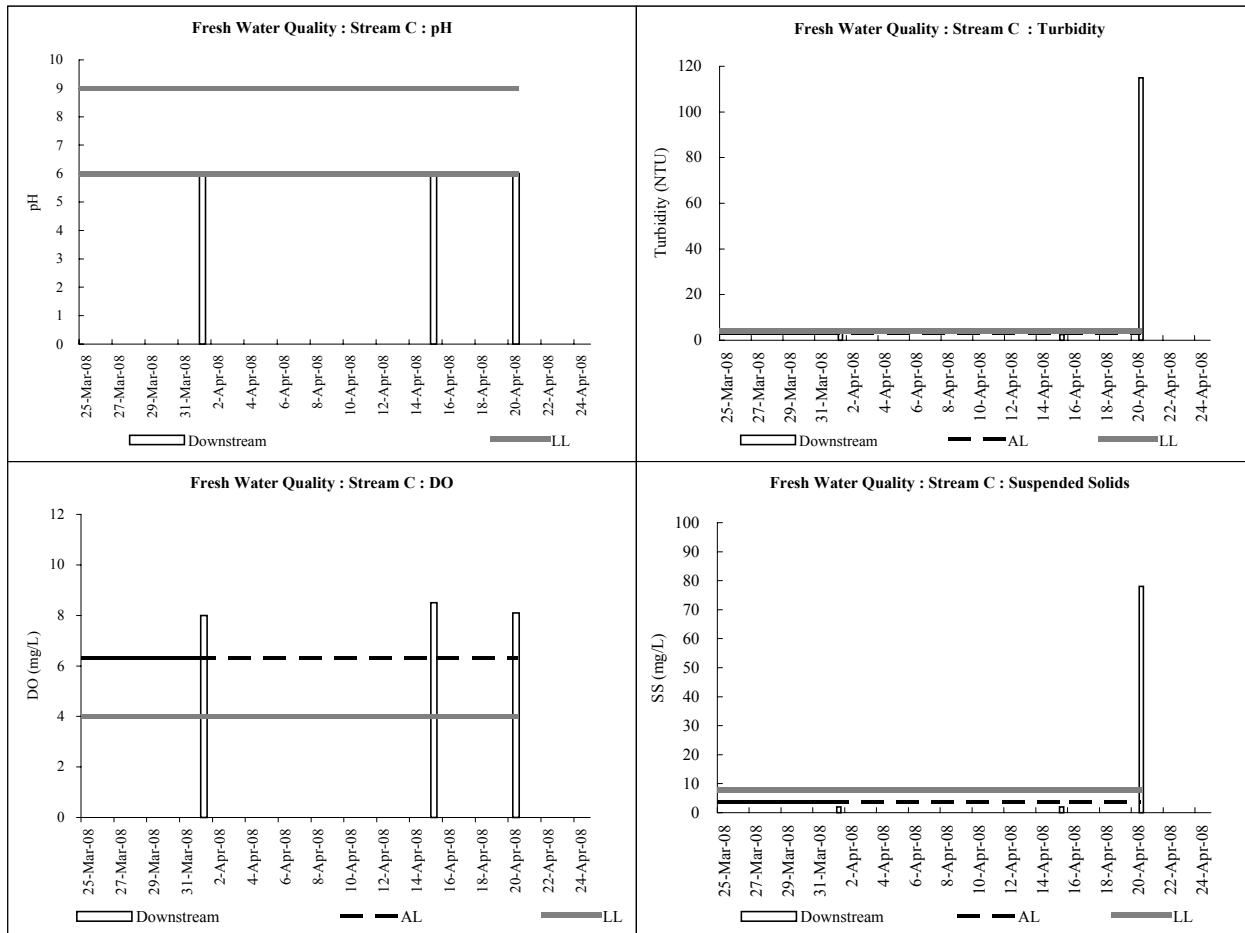
# Water Quality



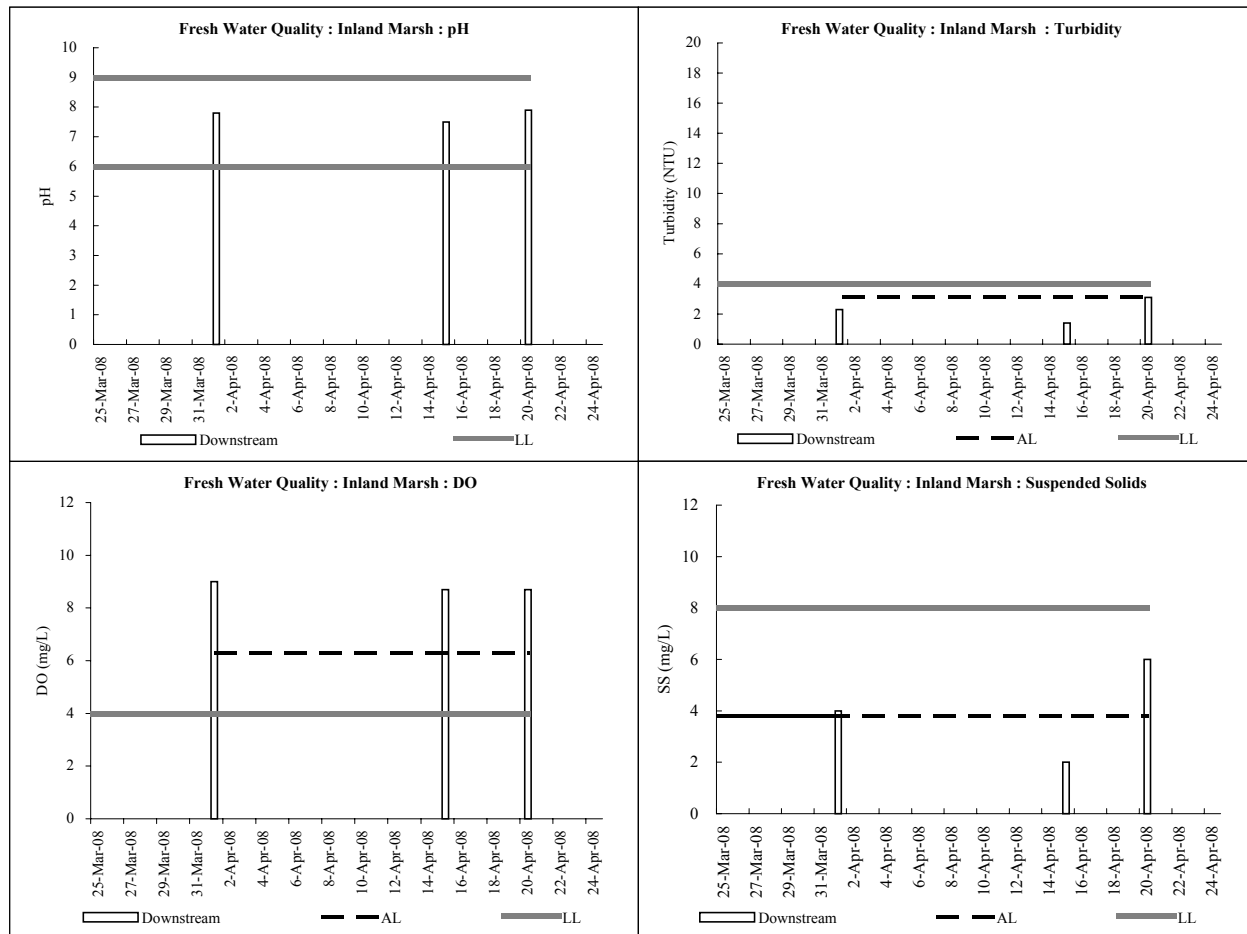


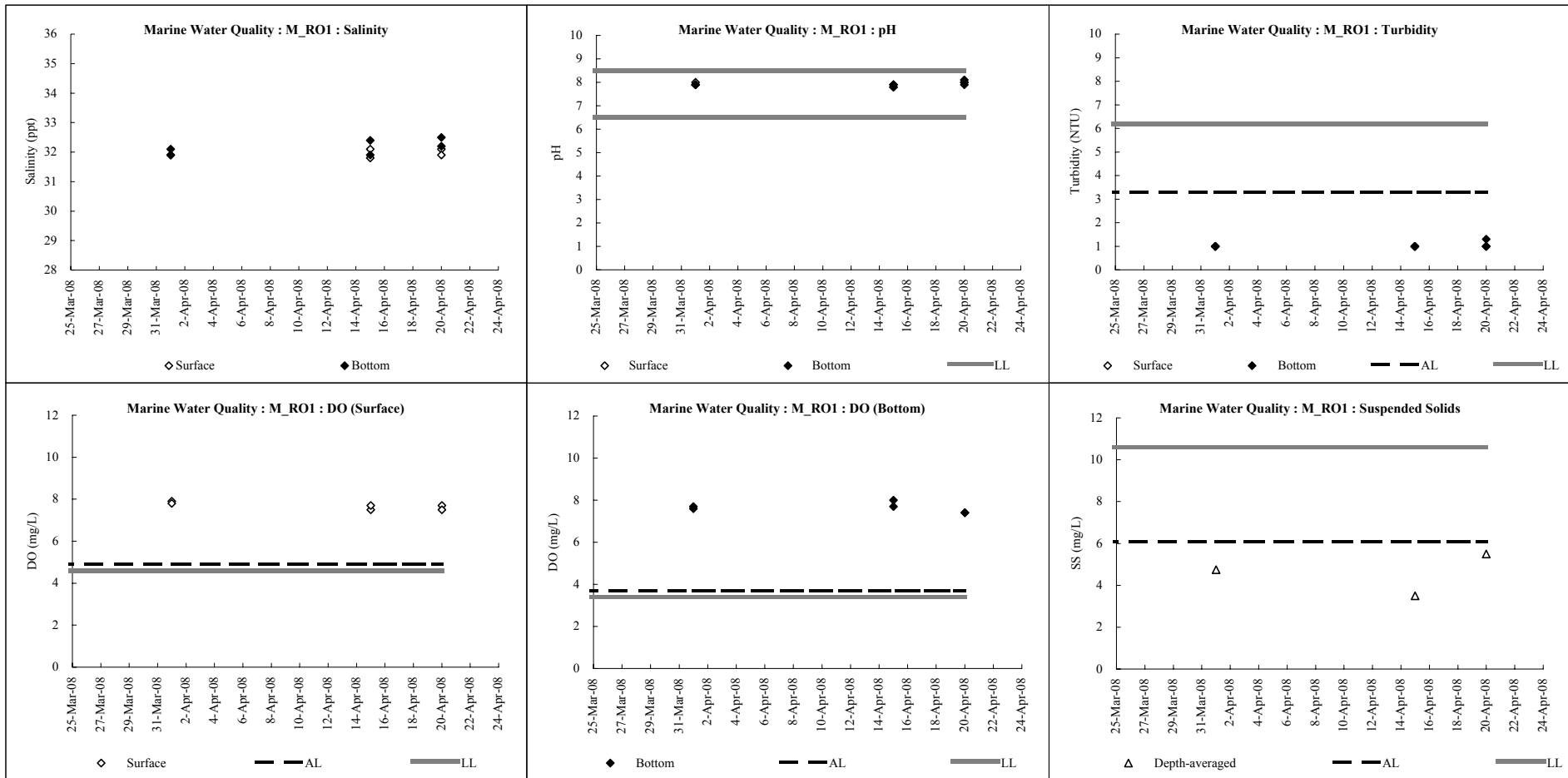


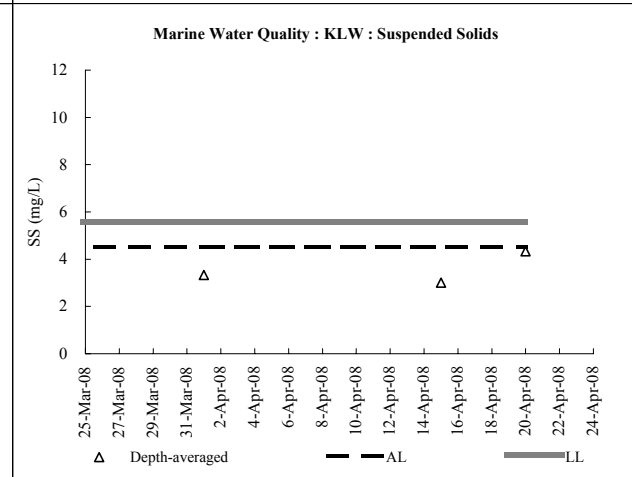
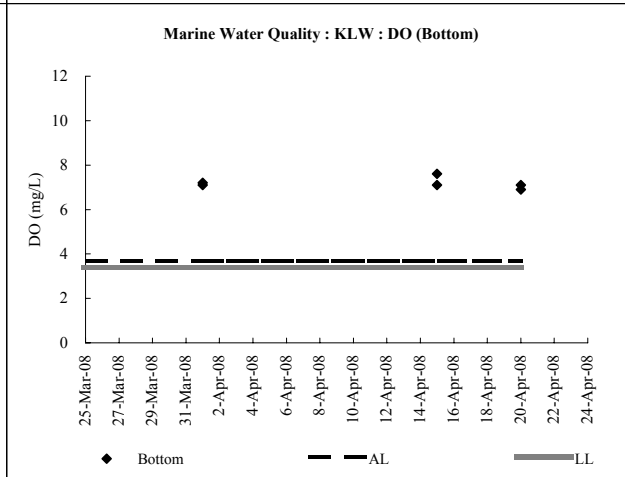
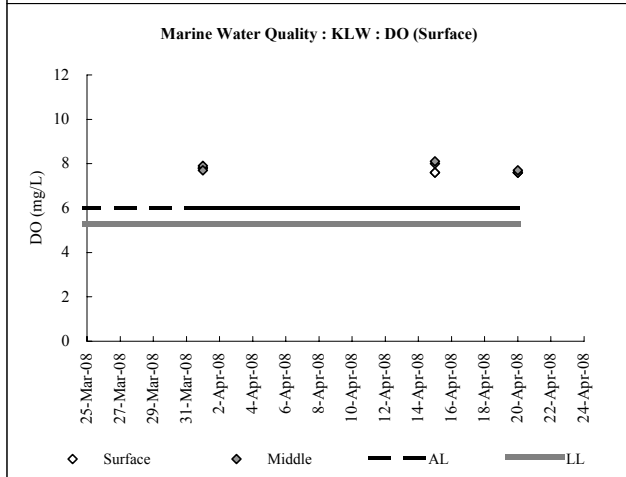
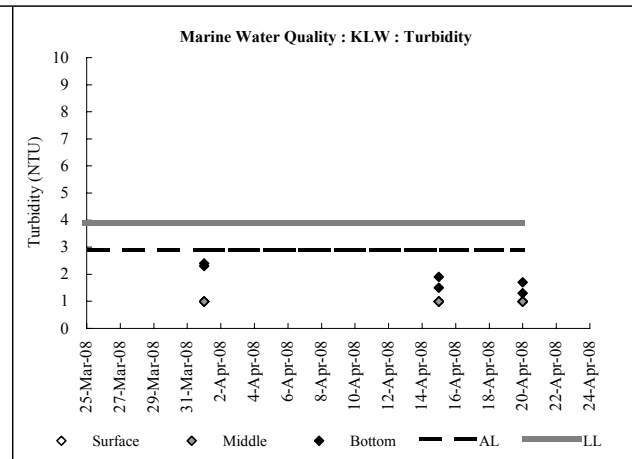
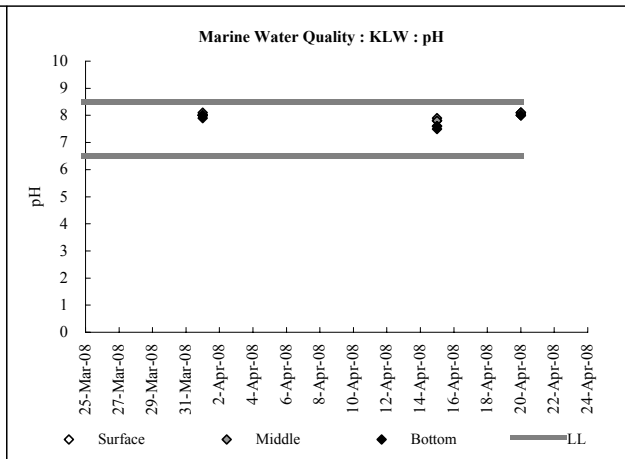
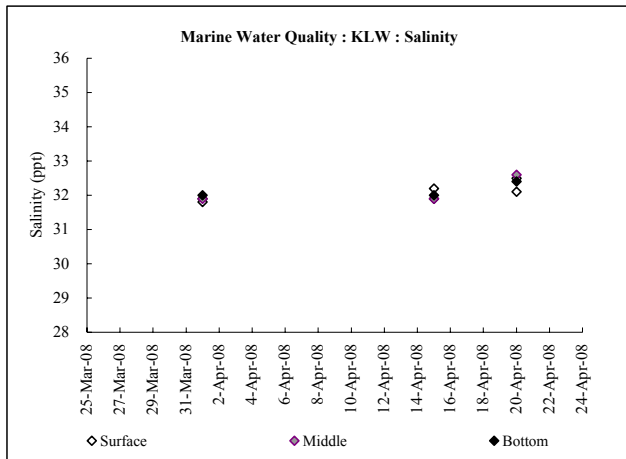


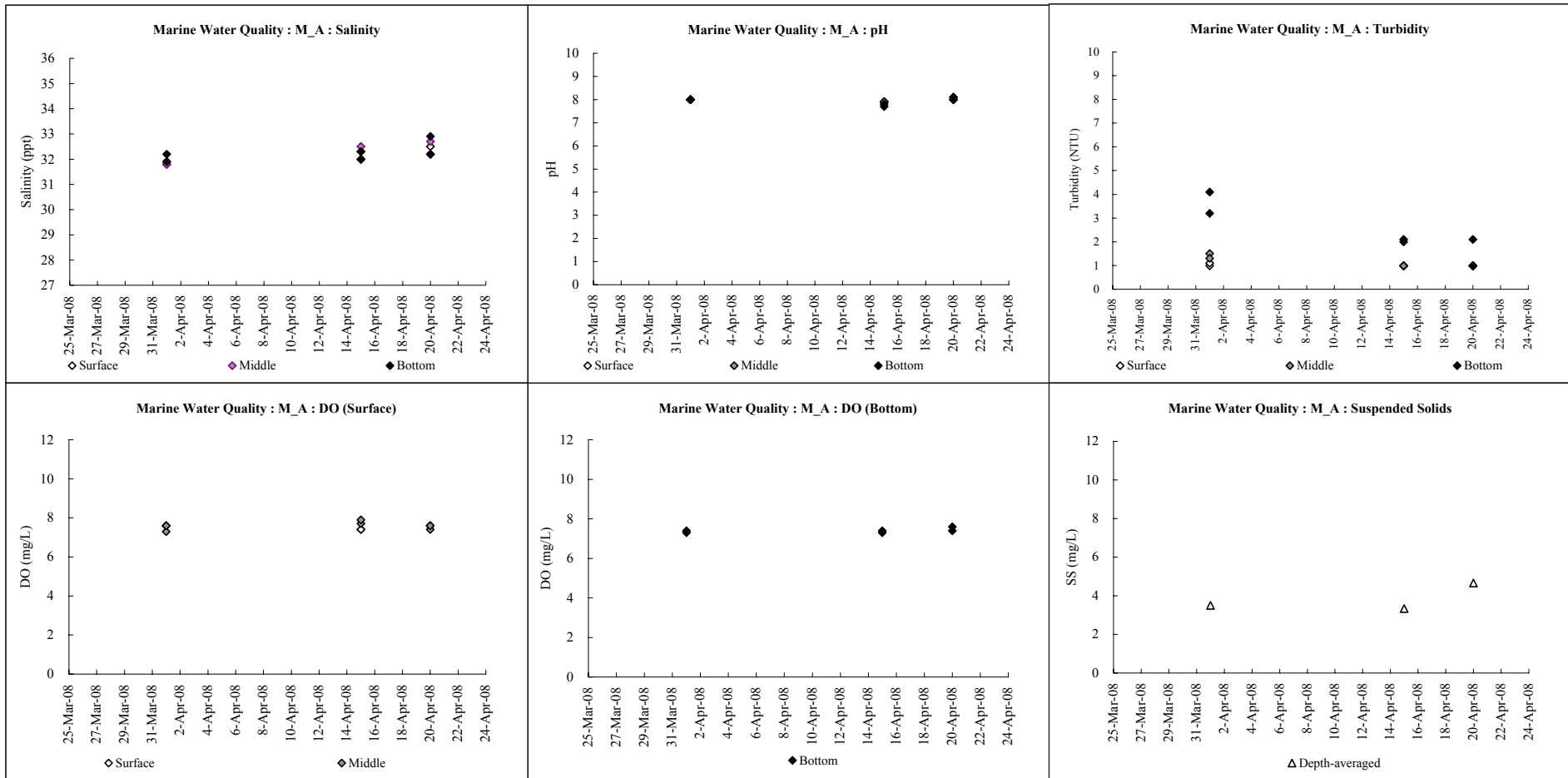


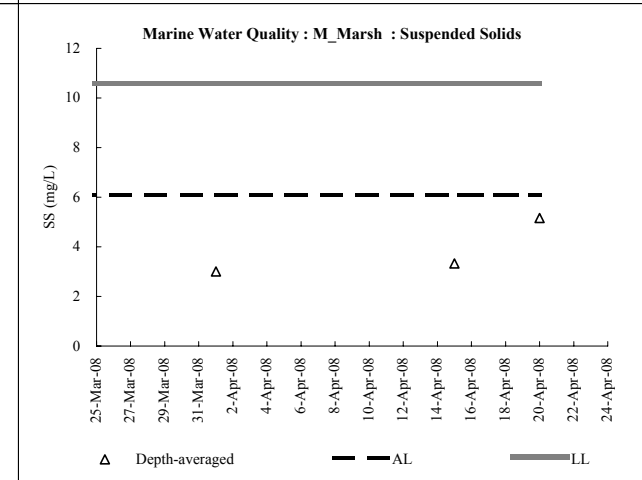
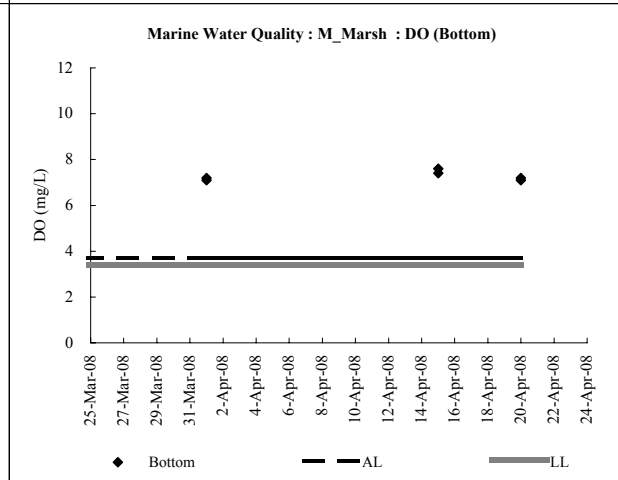
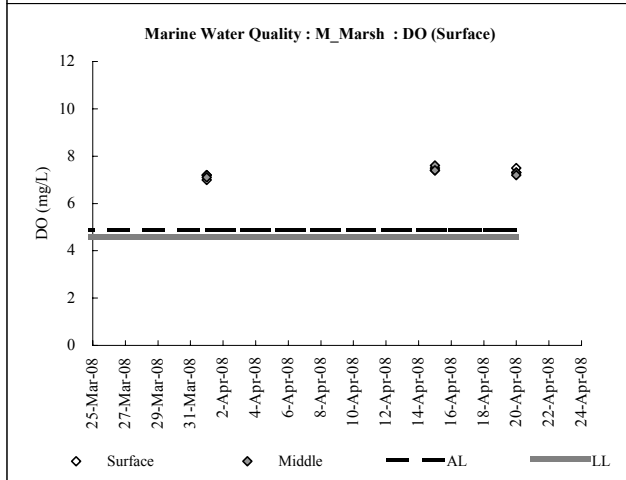
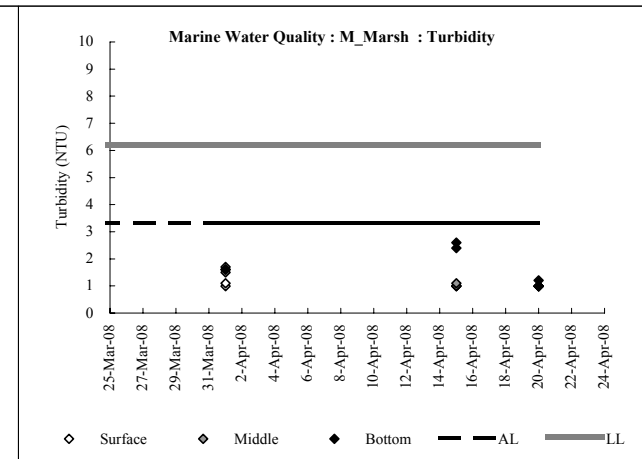
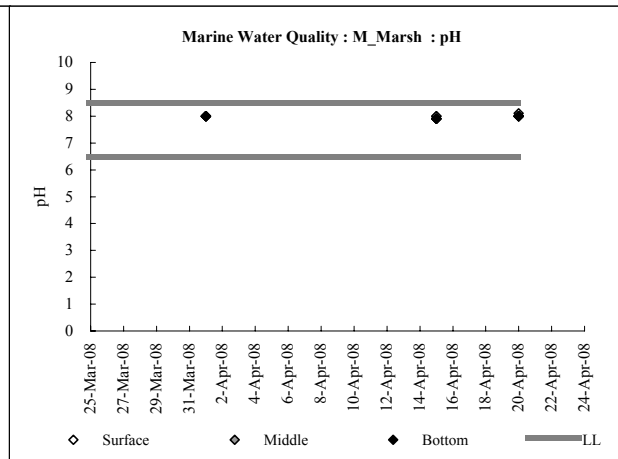
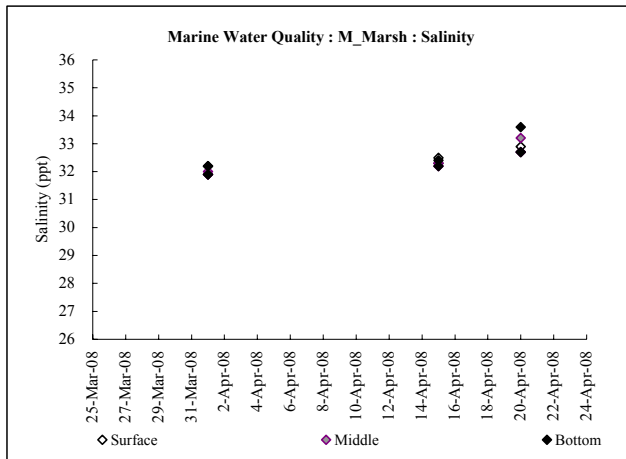


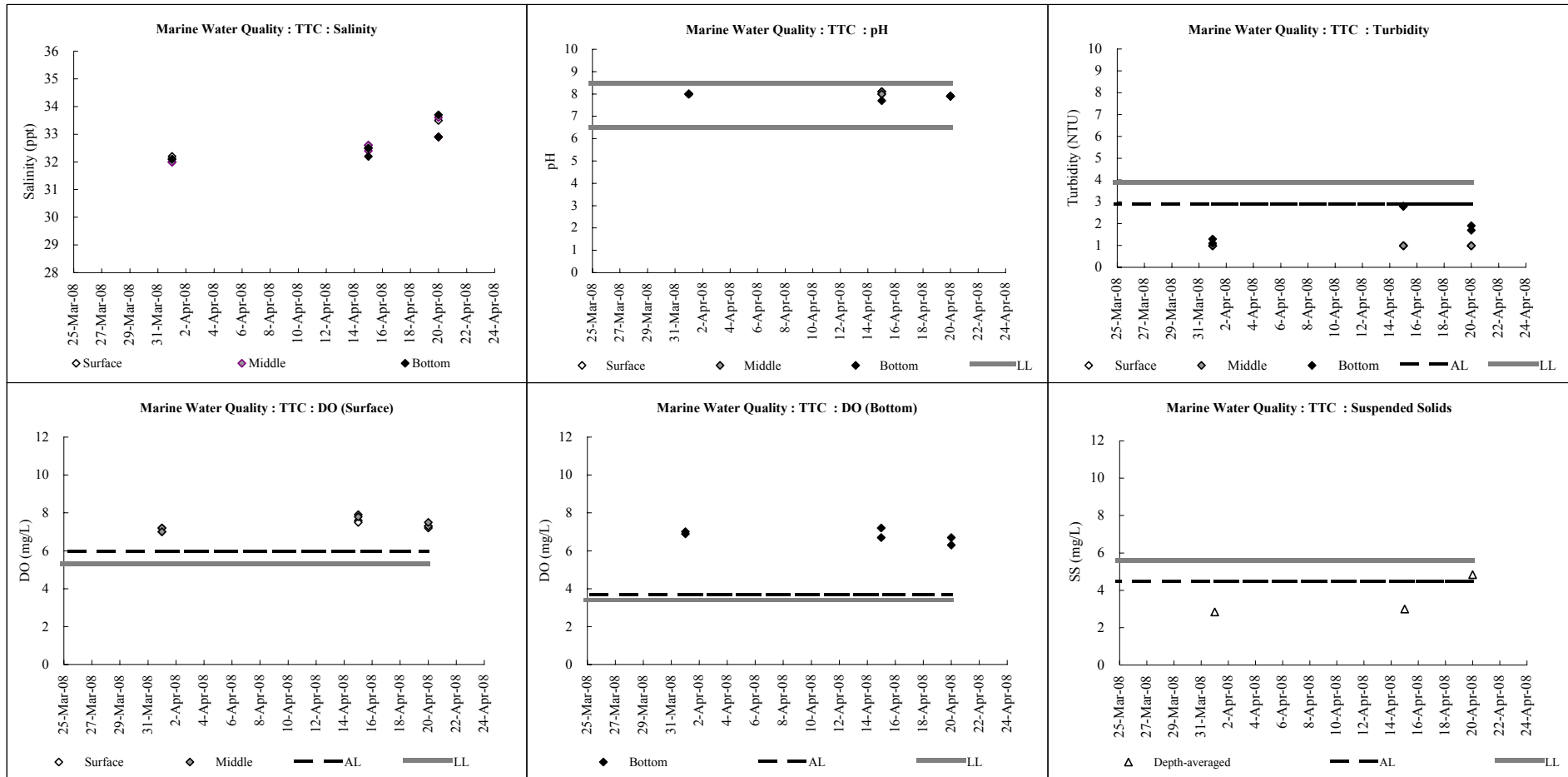


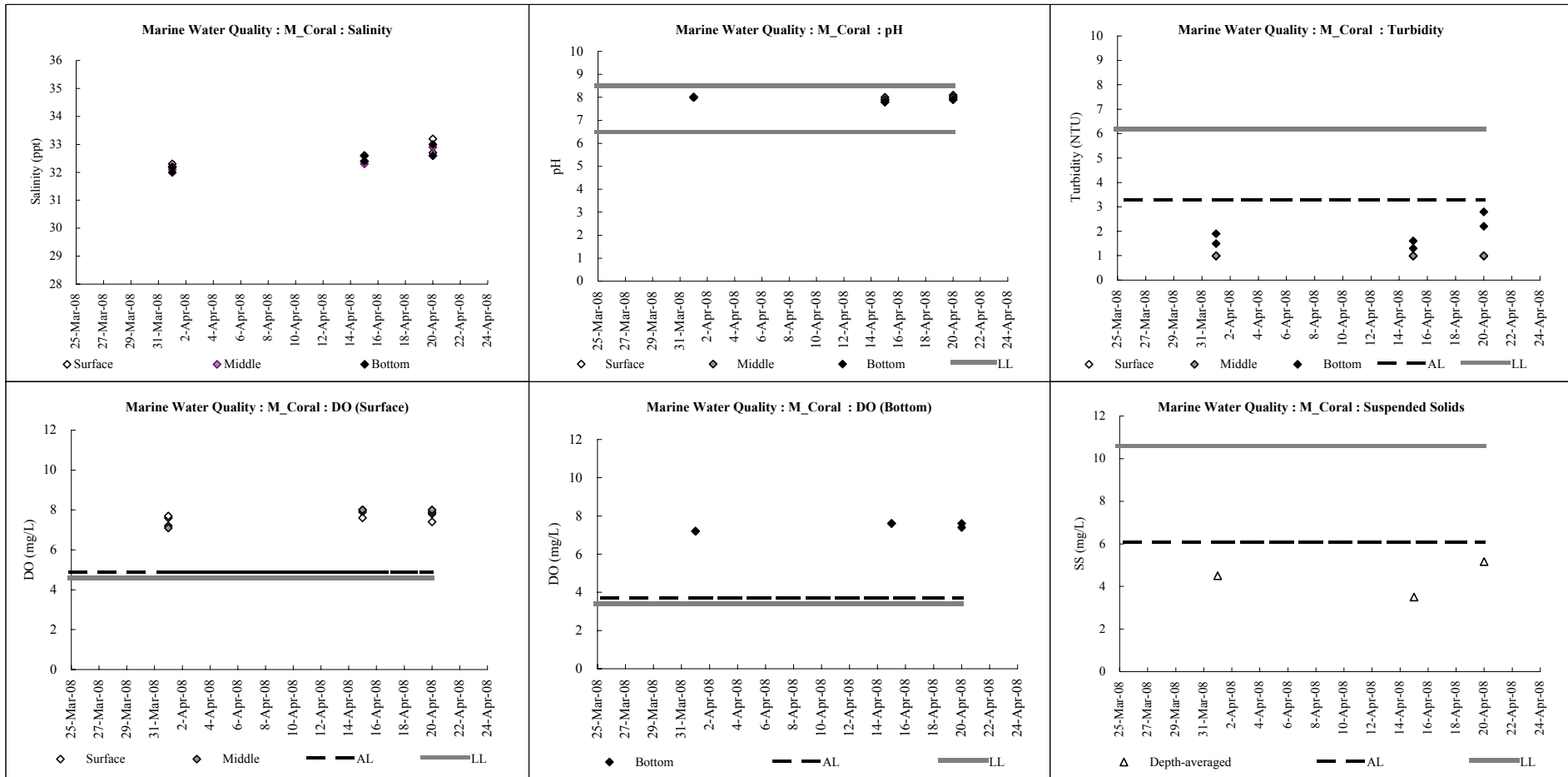


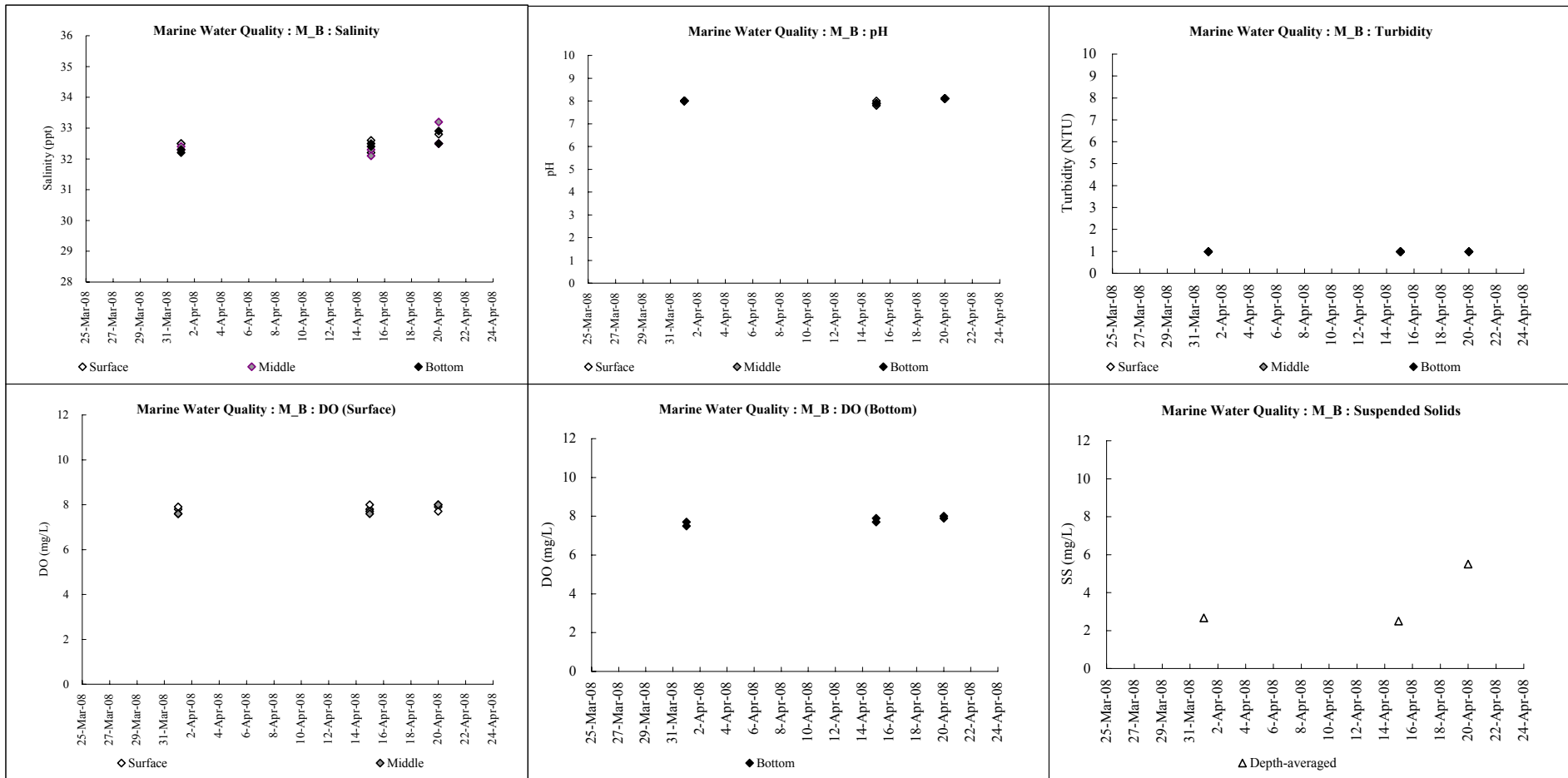




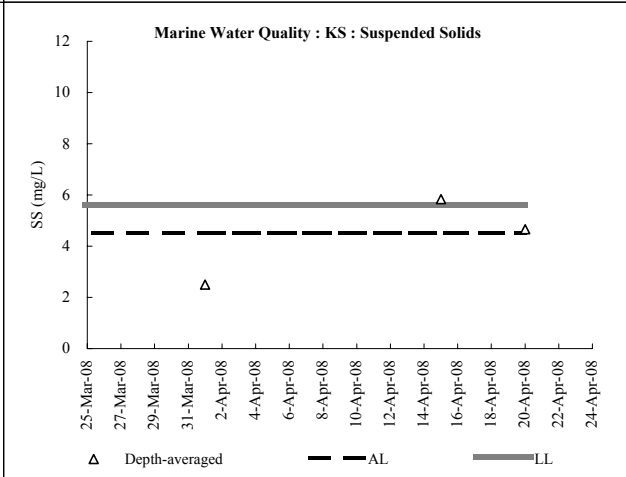
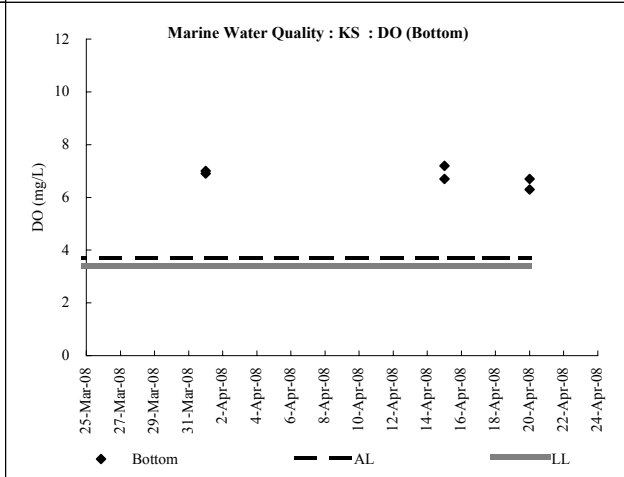
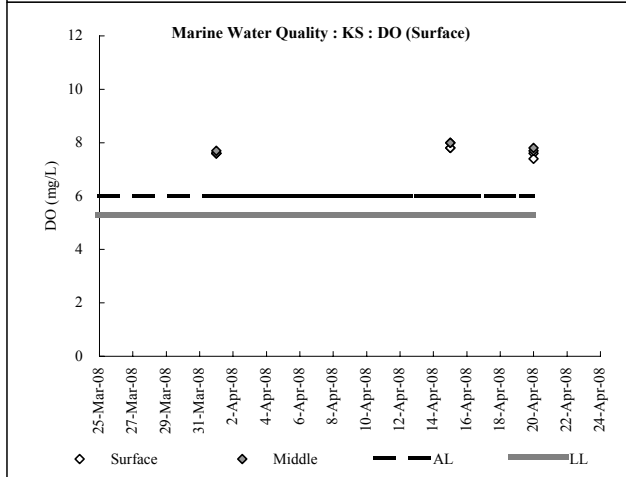
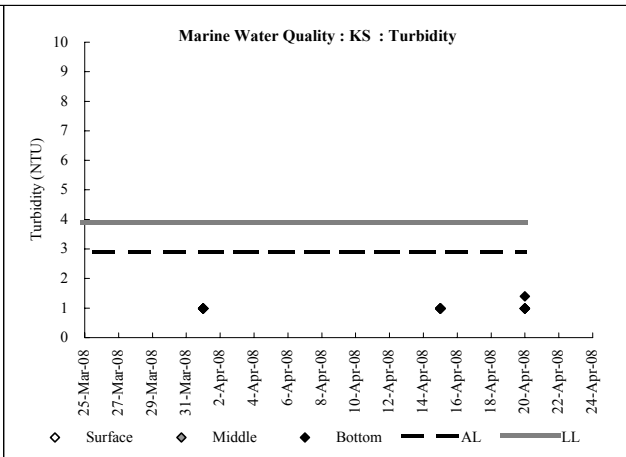
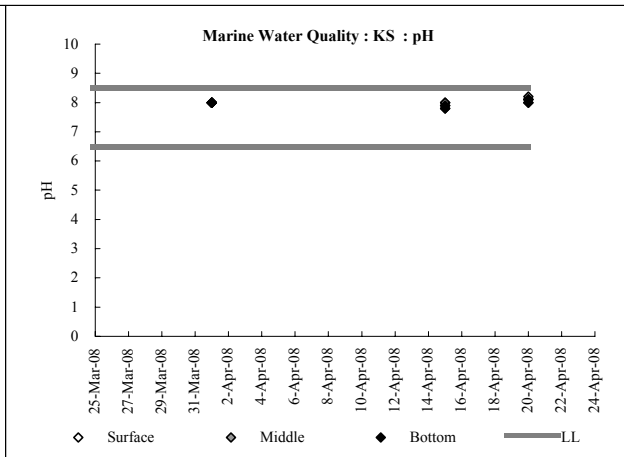
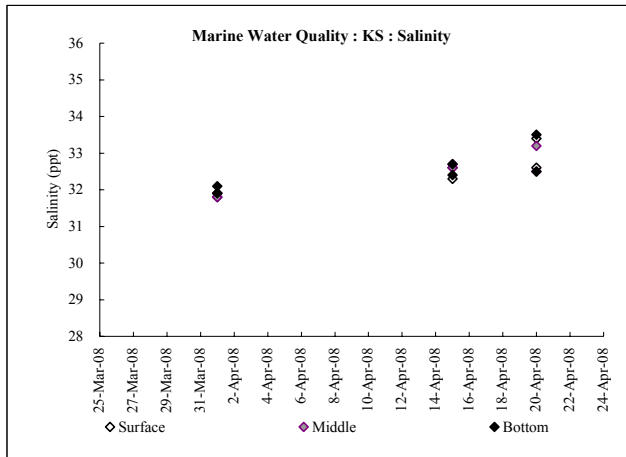


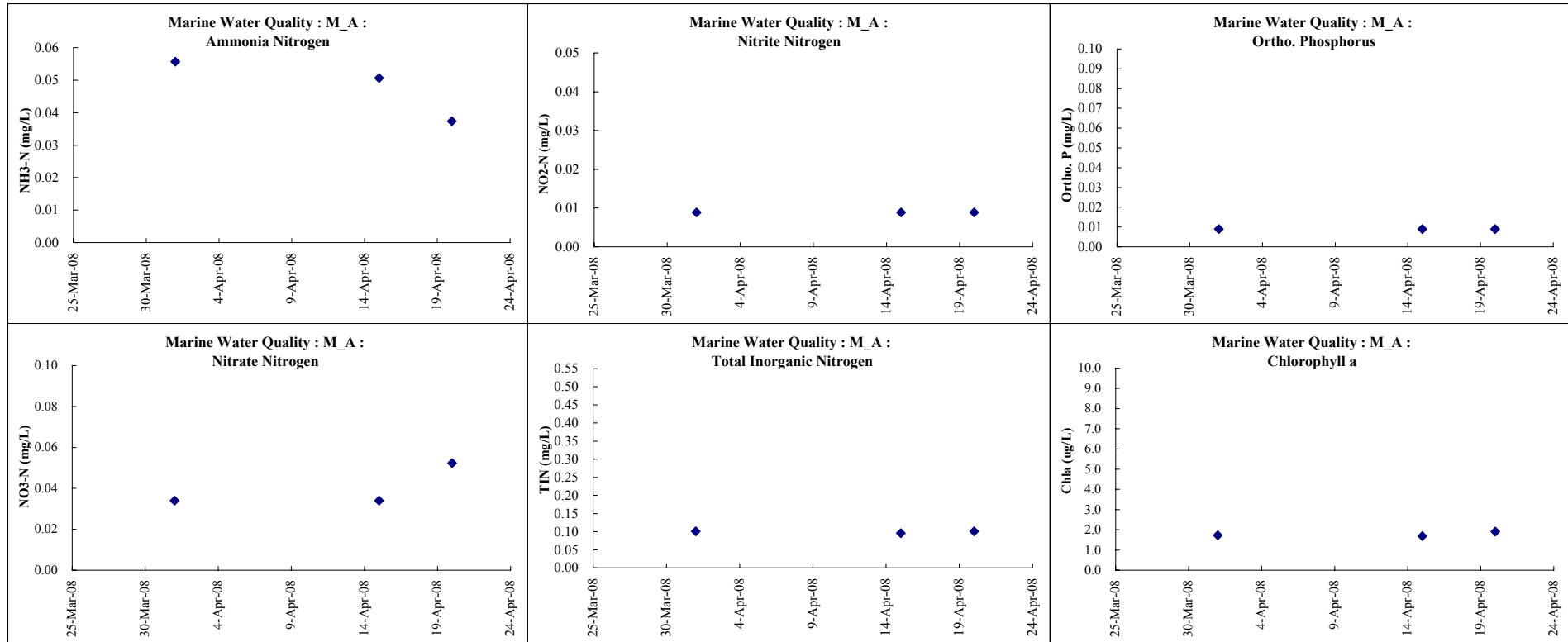


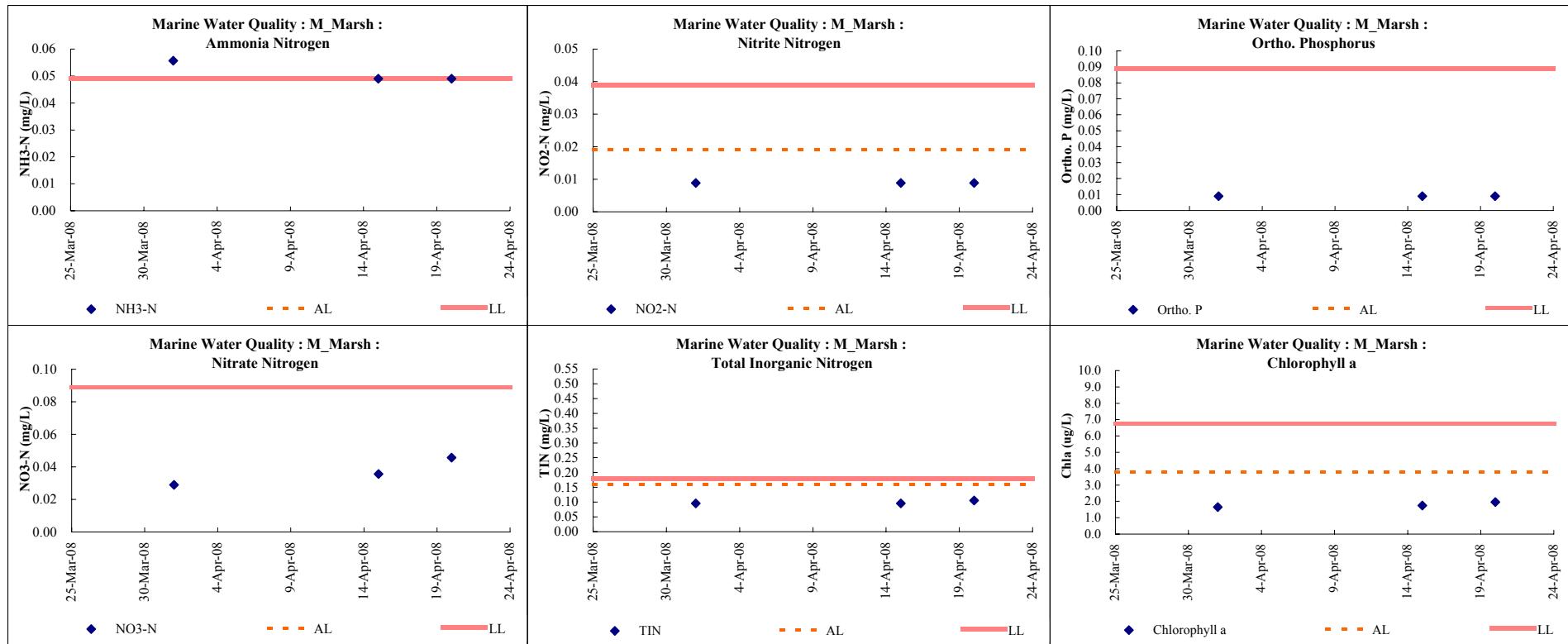


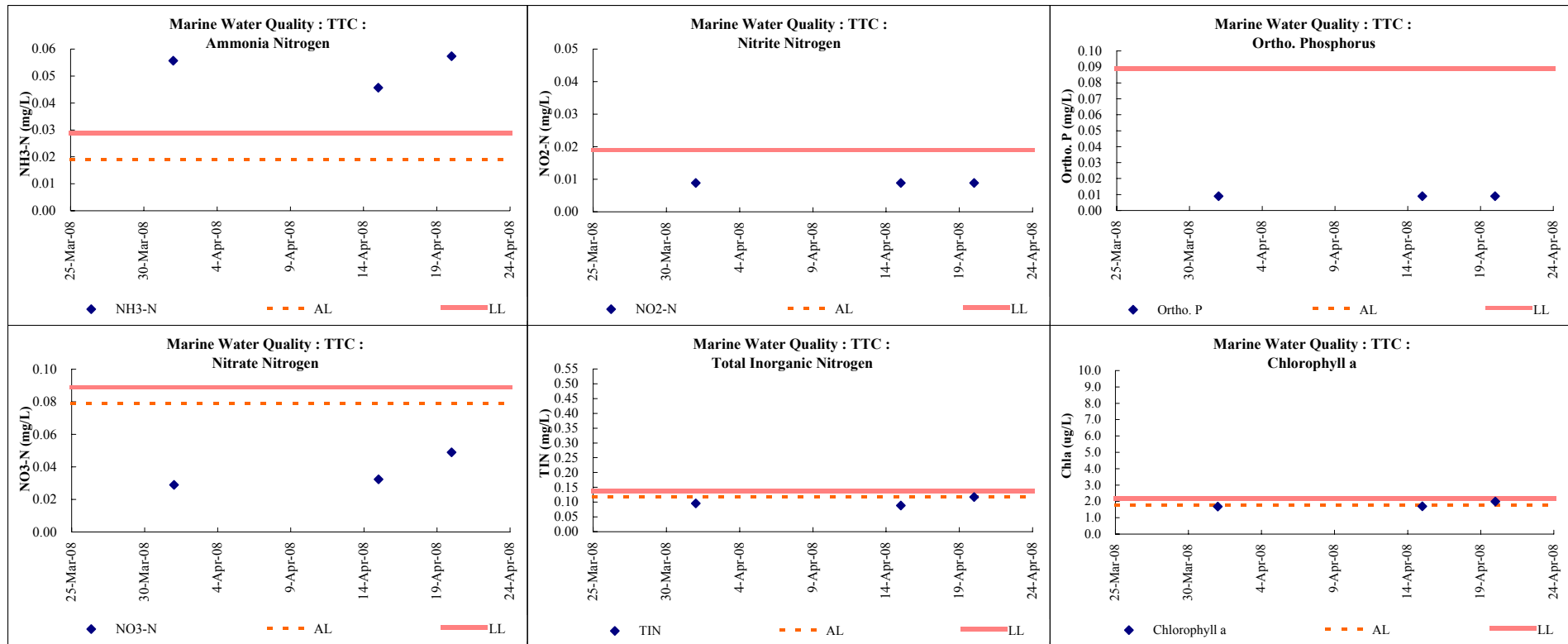


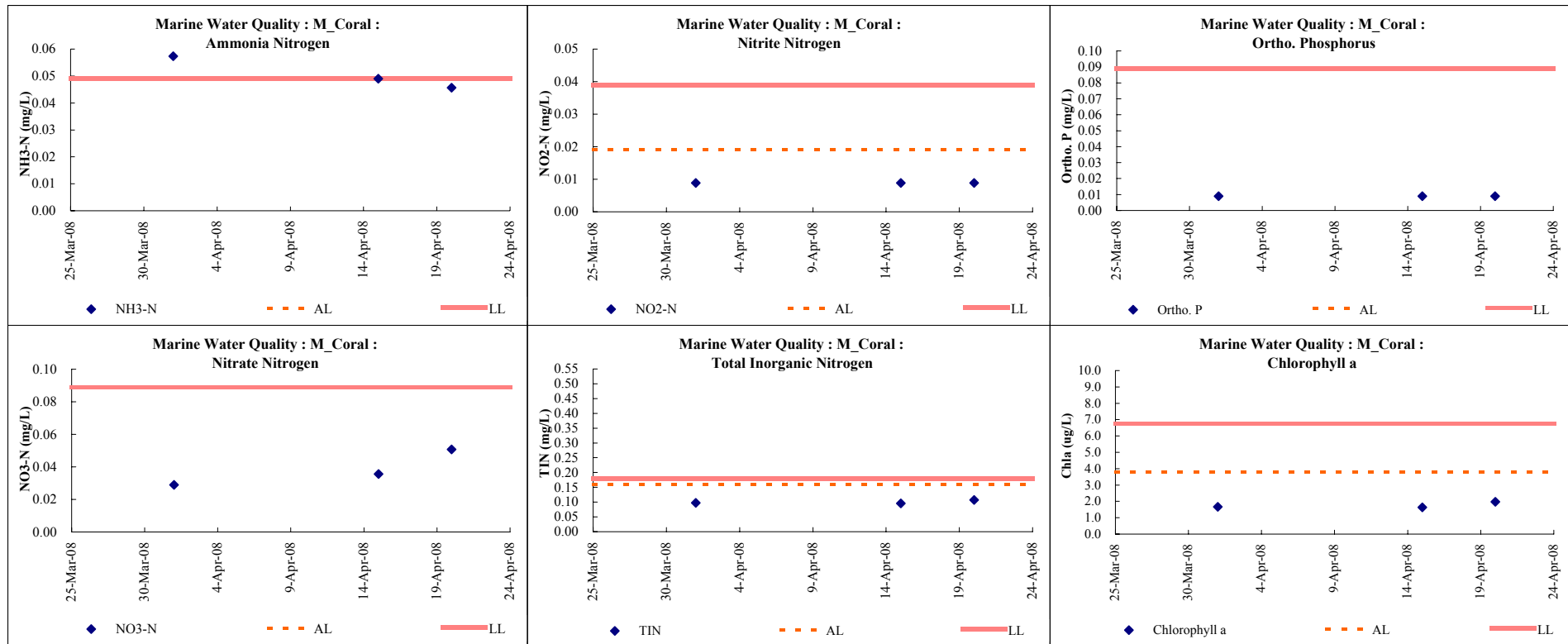


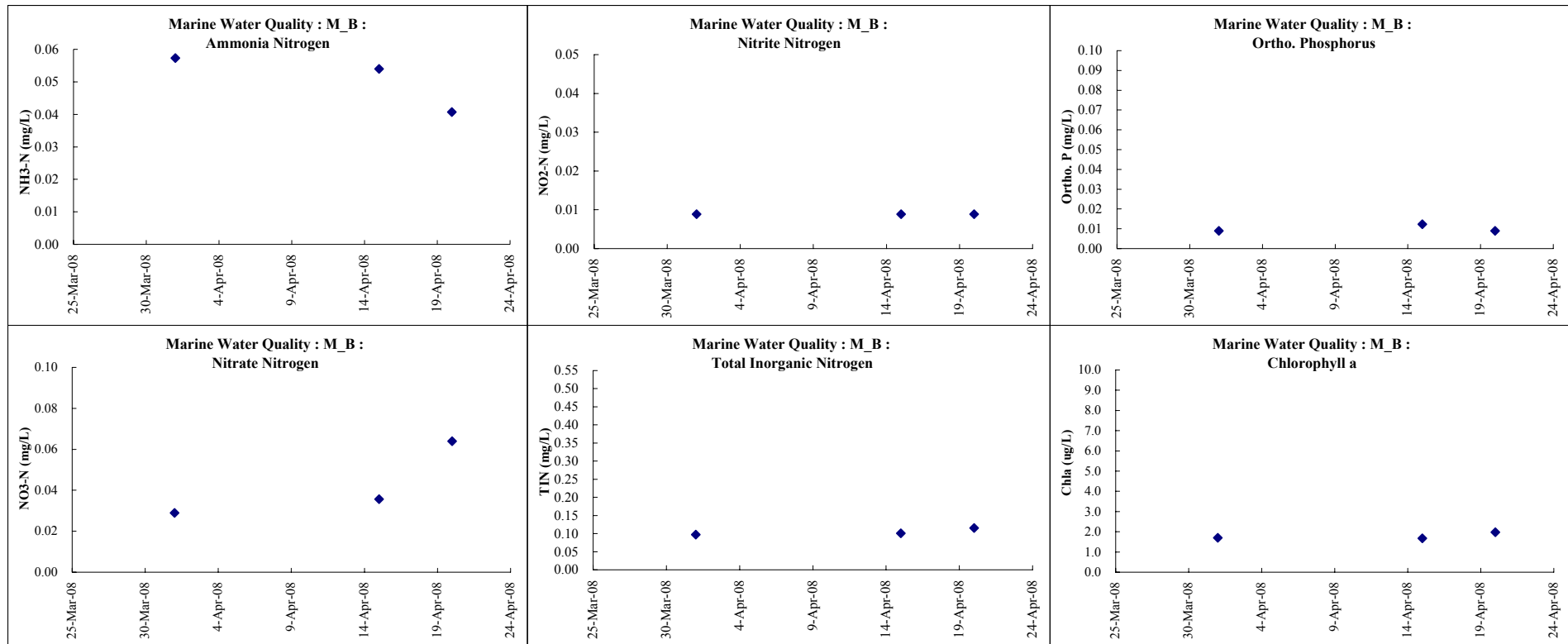


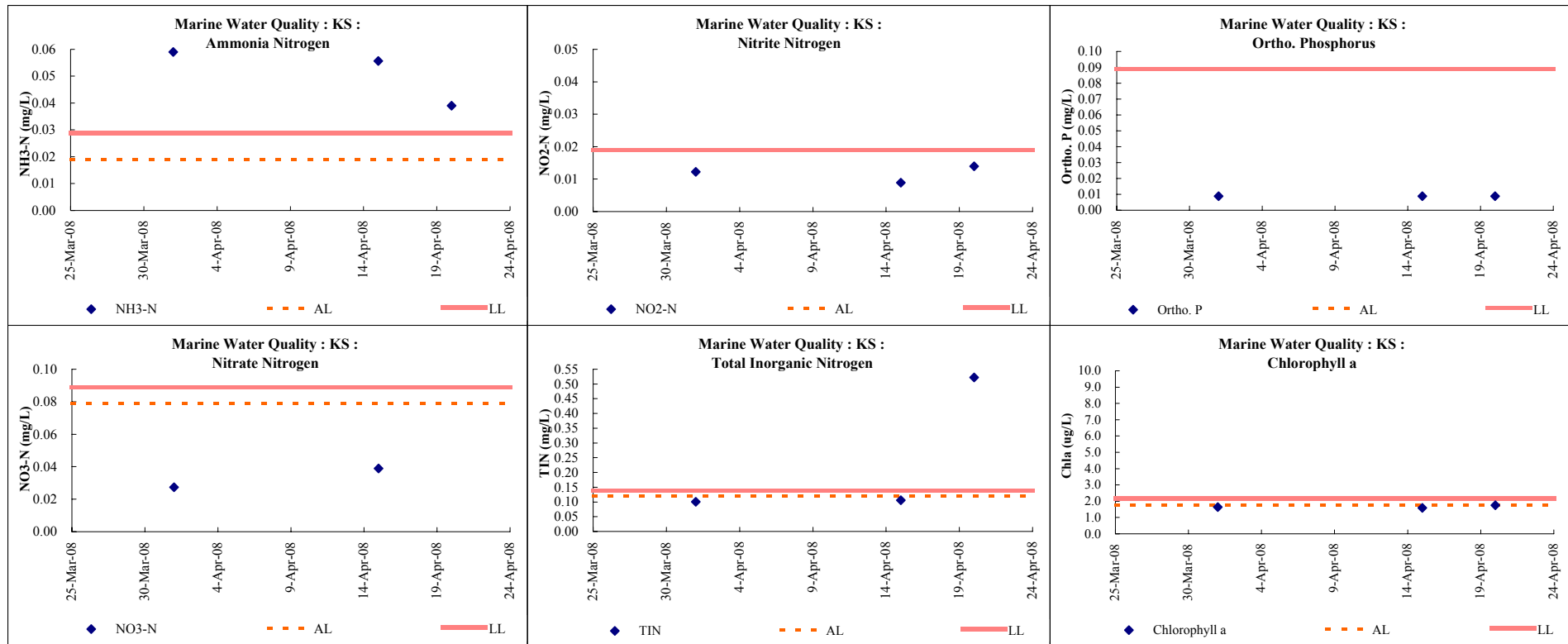


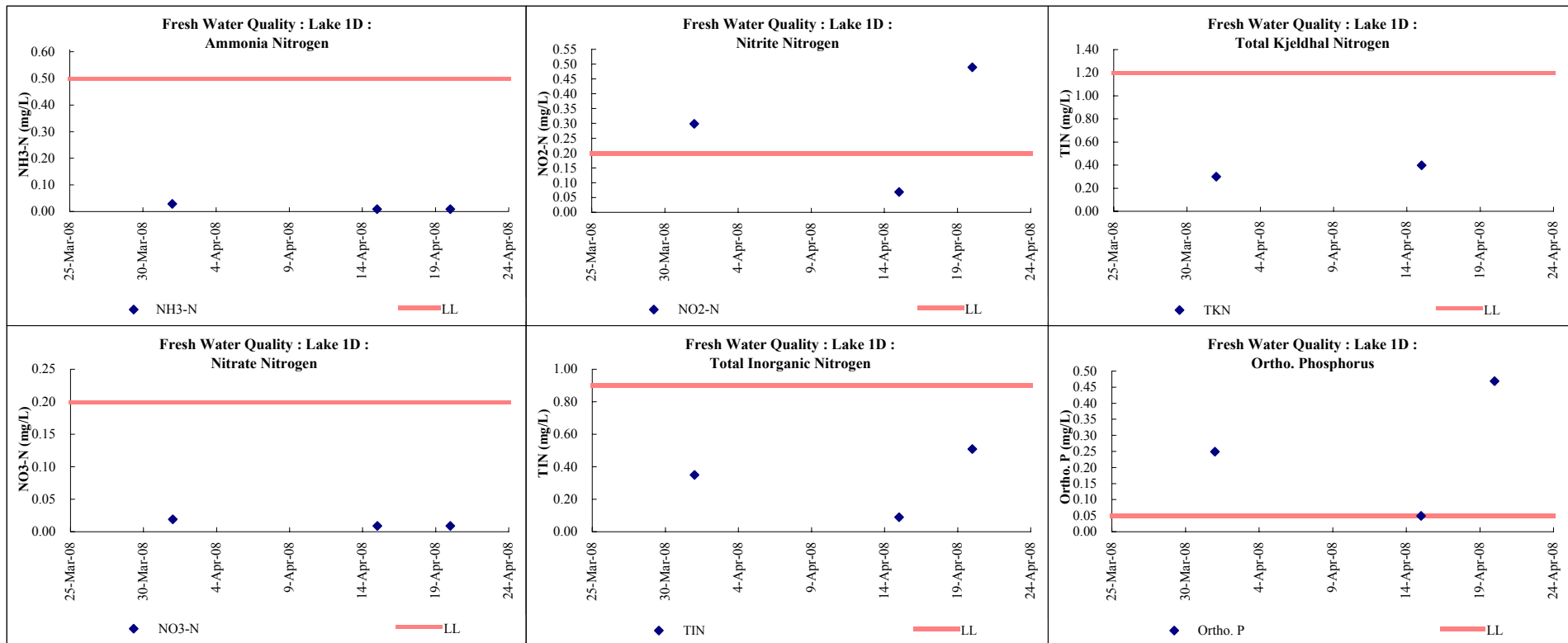




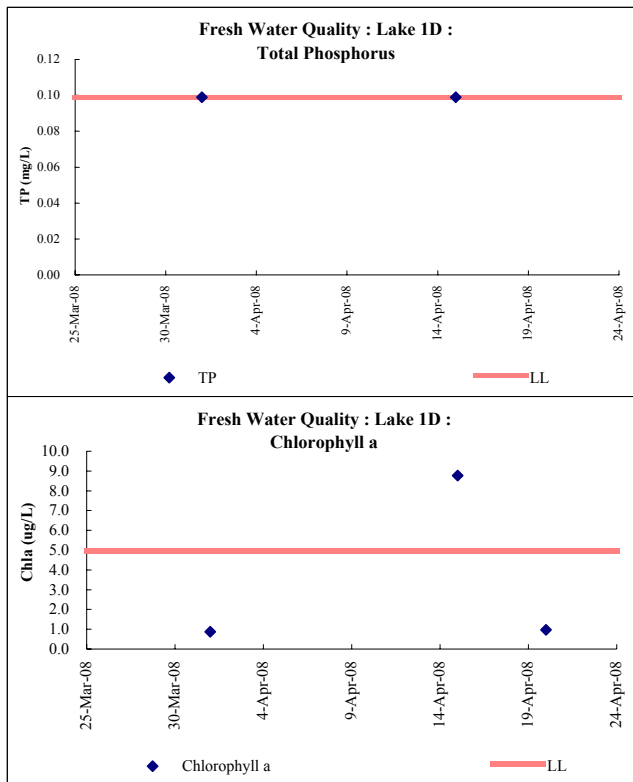


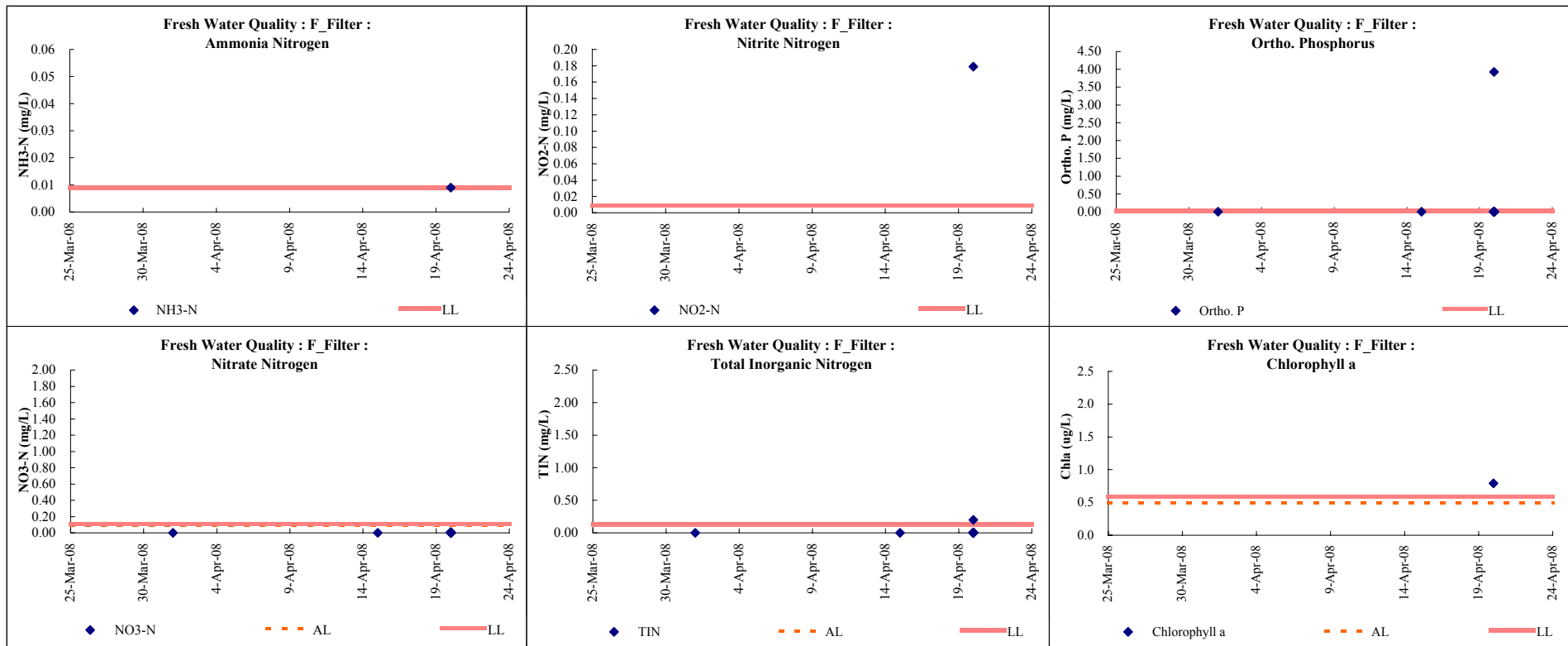


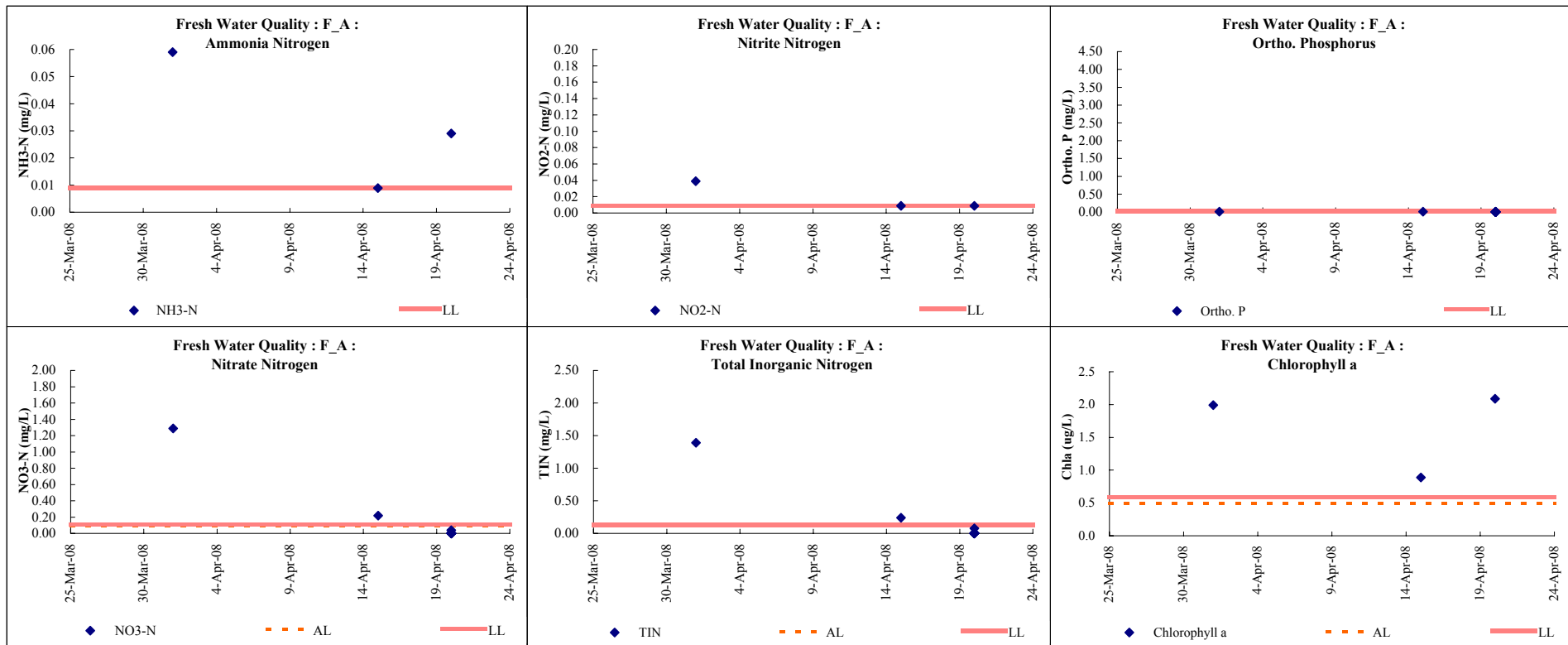


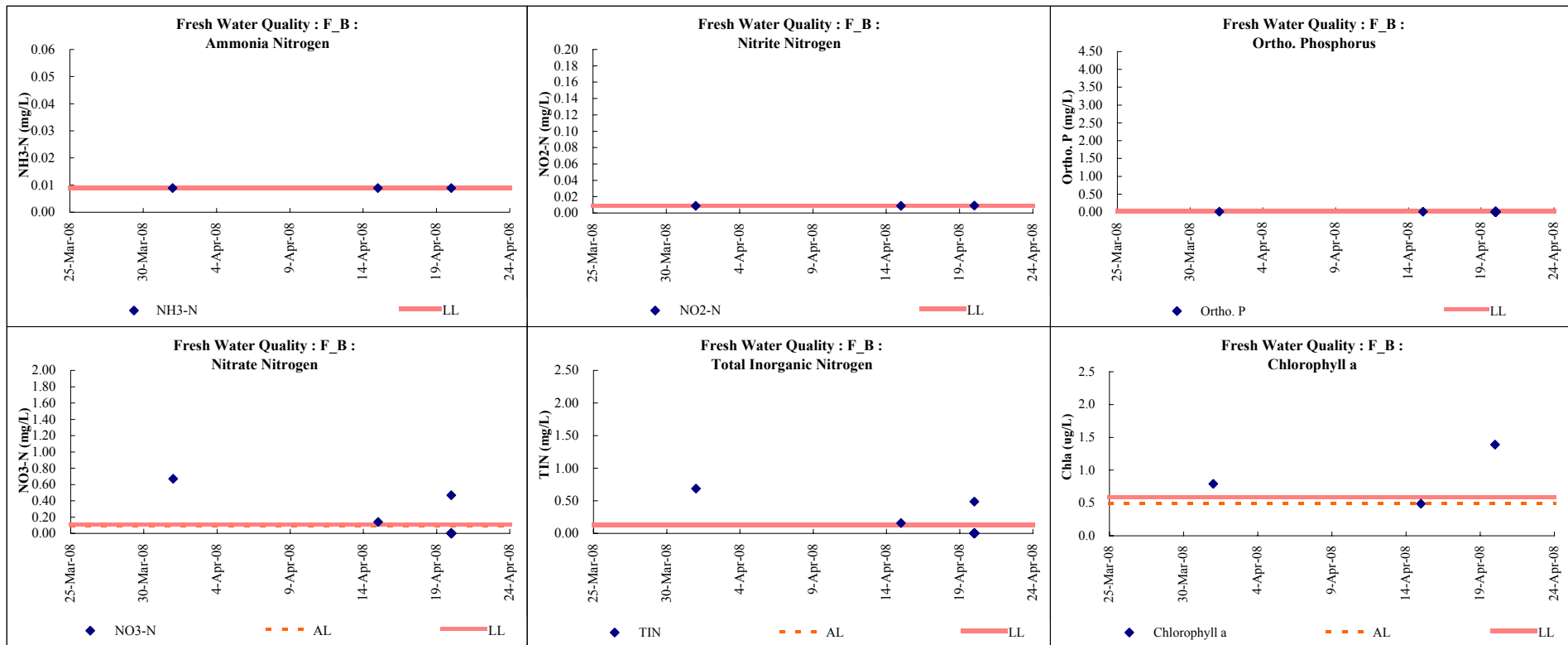


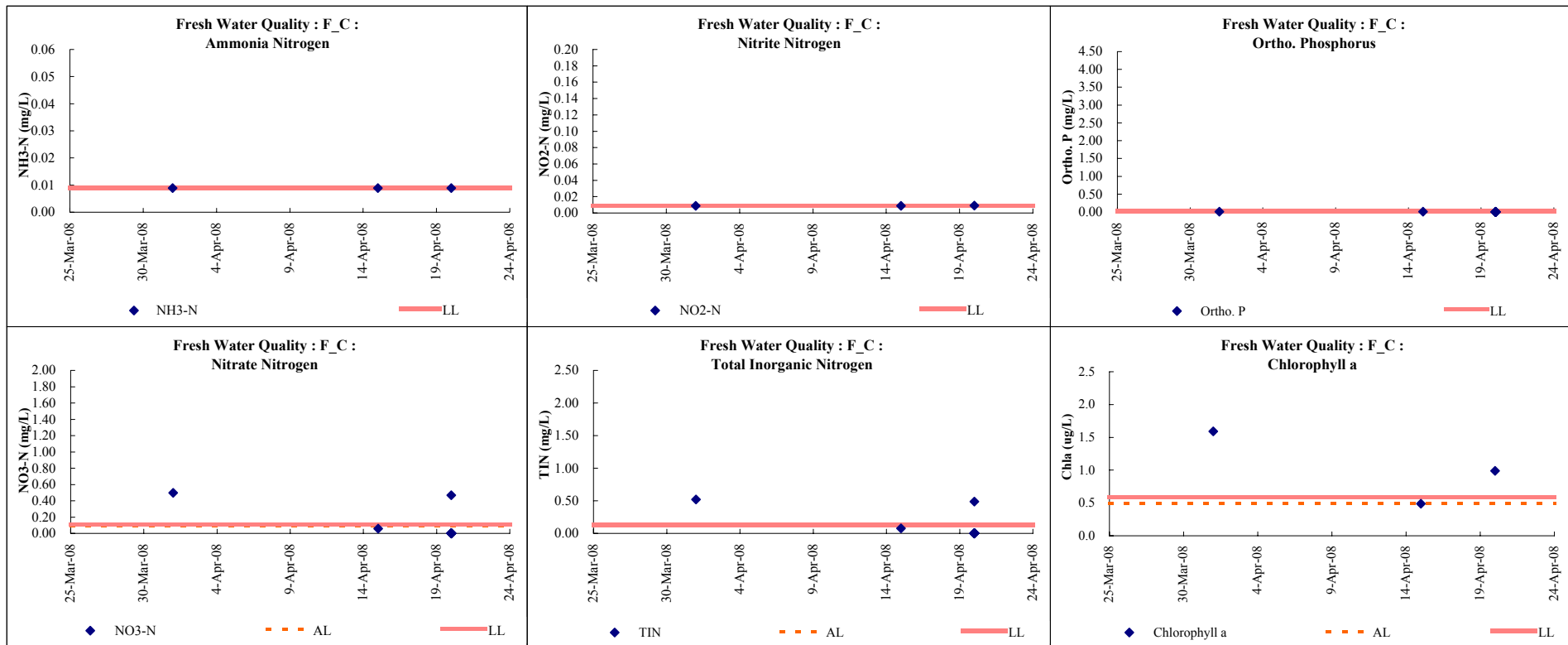


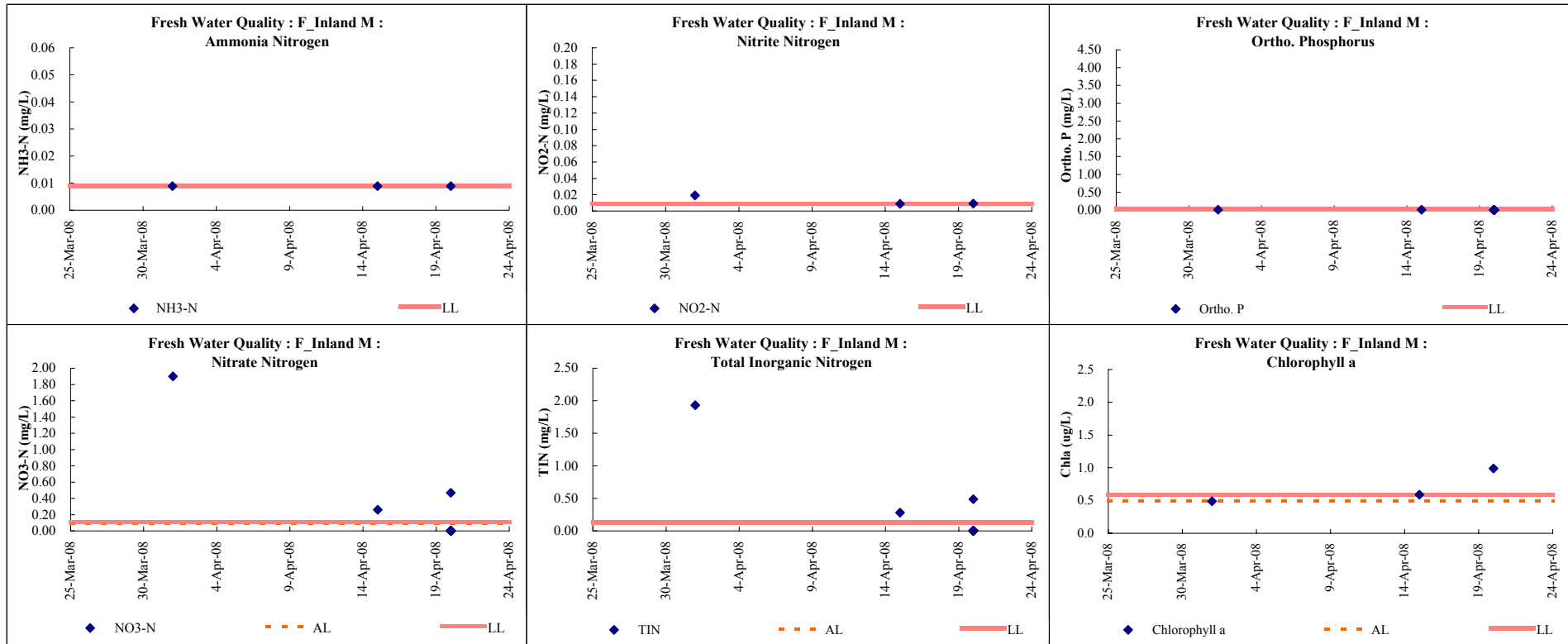












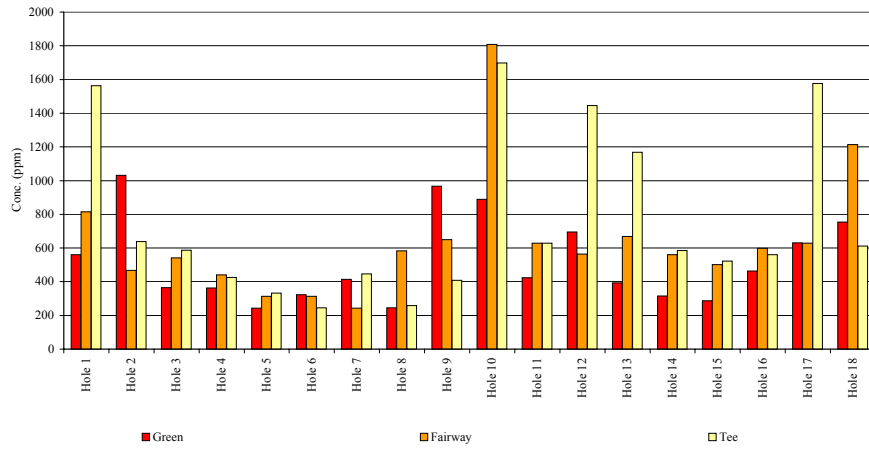
# Soil Nutrient

March 2008 - Soil Analysis

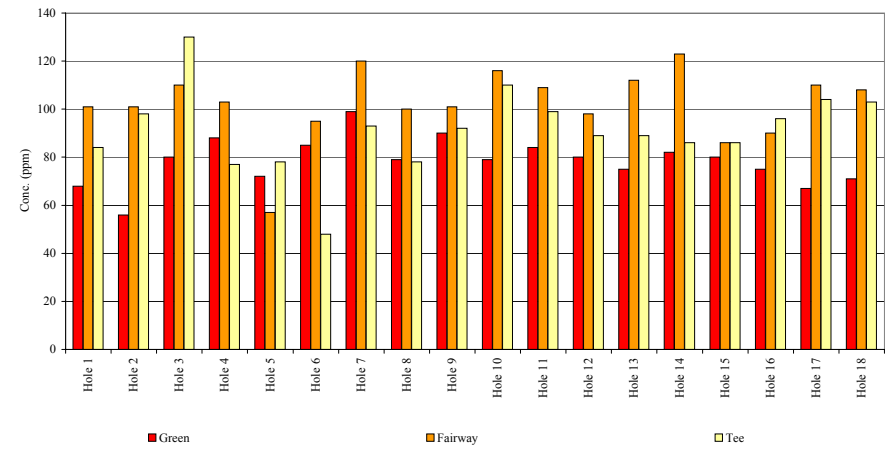
Parameter		Ca	Mg	K	P	S	B	Fe	Mn	Cu	Zn	Na	OM
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
Hole 1	Green	561	68	141	89	24	1	216	53	6.2	24	45	0.40%
	Fairway	814	101	113	19	9	0.7	280	61	0.9	3	49	0.60%
	Tee	1564	84	118	21	9	0.7	189	85	1.5	4	50	0.57%
Hole 2	Green	1032	56	71	146	14	1.1	242	48	25.3	88	50	0.43%
	Fairway	468	101	156	31	8	0.6	412	49	0.9	3	56	0.56%
	Tee	638	98	158	40	14	0.7	484	62	1	2	66	0.59%
Hole 3	Green	365	80	164	47	13	1	266	52	4.9	12	47	0.44%
	Fairway	542	110	220	37	21	0.6	301	58	1.1	3	61	0.72%
	Tee	587	130	258	95	12	0.8	414	63	1.2	4	64	0.65%
Hole 4	Green	362	88	224	46	15	1	318	57	3.1	12	52	0.46%
	Fairway	441	103	223	35	16	1	362	52	1.2	3	65	0.62%
	Tee	425	77	140	39	16	0.8	397	37	0.7	2	58	0.48%
Hole 5	Green	243	72	174	33	15	1.2	249	33	2.3	6	47	0.40%
	Fairway	314	57	151	30	18	1	221	29	1.3	3	51	0.49%
	Tee	332	78	114	35	14	0.9	337	48	0.8	2	53	0.61%
Hole 6	Green	322	85	188	40	17	1.3	300	50	1.4	4	48	0.47%
	Fairway	314	95	200	22	15	0.8	392	36	0.7	2	66	0.58%
	Tee	245	48	82	34	11	1	184	21	0.8	1	53	0.41%
Hole 7	Green	414	99	253	50	16	1	307	54	1.9	6	46	0.41%
	Fairway	244	120	231	27	13	0.7	358	50	0.8	2	64	0.64%
	Tee	447	93	202	54	12	0.7	381	47	0.9	3	63	0.61%
Hole 8	Green	245	79	213	43	17	1.1	277	36	2.3	6	50	0.47%
	Fairway	584	100	185	56	10	0.6	404	40	0.8	2	55	0.65%
	Tee	259	78	106	50	10	1.2	297	30	0.8	2	57	0.56%
Hole 9	Green	967	90	171	56	12	0.7	207	62	1.7	6	59	0.46%
	Fairway	650	101	84	14	9	0.9	403	59	0.9	3	67	0.49%
	Tee	408	92	208	17	31	0.7	531	53	0.7	2	54	0.60%
Hole 10	Green	888	79	165	41	11	0.7	200	59	1.2	4	59	0.47%
	Fairway	1808	116	137	25	9	0.7	136	91	1.1	5	63	0.57%
	Tee	1698	110	161	35	19	0.6	182	82	1.1	7	68	0.68%
Hole 11	Green	423	84	253	41	13	0.8	294	55	1.6	6	61	0.47%
	Fairway	628	109	163	24	11	0.8	332	66	1	3	61	0.64%
	Tee	628	99	208	45	14	0.7	381	57	1	3	54	0.63%
Hole 12	Green	696	80	196	44	15	0.7	238	58	1.5	4	55	0.47%
	Fairway	565	98	170	30	10	0.7	263	62	1	2	59	0.64%
	Tee	1446	89	145	57	9	0.5	164	75	0.9	7	50	0.63%
Hole 13	Green	393	75	225	38	26	1	311	50	1.3	4	57	0.45%
	Fairway	669	112	141	25	10	0.6	371	57	1	3	65	0.54%
	Tee	1169	89	132	41	7	0.6	234	69	0.8	4	42	0.61%
Hole 14	Green	316	82	294	37	21	1	331	56	1.4	4	50	0.51%
	Fairway	560	123	140	30	16	0.7	366	56	0.9	3	51	0.55%
	Tee	585	86	199	51	20	0.7	402	52	0.8	3	44	0.55%
Hole 15	Green	287	80	241	33	16	1	302	55	1.6	6	48	0.54%
	Fairway	502	86	196	20	12	0.7	372	47	0.9	3	52	0.64%
	Tee	523	86	189	55	9	0.8	469	42	0.9	3	57	0.65%
Hole 16	Green	464	75	238	58	23	1.2	305	53	1.2	4	46	0.50%
	Fairway	599	90	107	17	15	0.8	337	51	0.9	2	61	0.63%
	Tee	561	96	212	56	8	0.6	451	51	0.8	3	47	0.61%
Hole 17	Green	630	67	118	47	32	1.1	232	50	2	9	51	0.39%
	Fairway	628	110	150	27	10	1	332	59	1	2	59	0.60%
	Tee	1576	104	133	34	23	0.6	164	84	1.3	7	57	0.68%
Hole 18	Green	754	71	161	117	26	1.2	237	58	3.9	13	52	0.48%
	Fairway	1214	108	119	30	11	0.8	202	66	1	2	53	0.51%
	Tee	611	103	153	46	20	0.7	362	49	0.9	3	55	0.63%



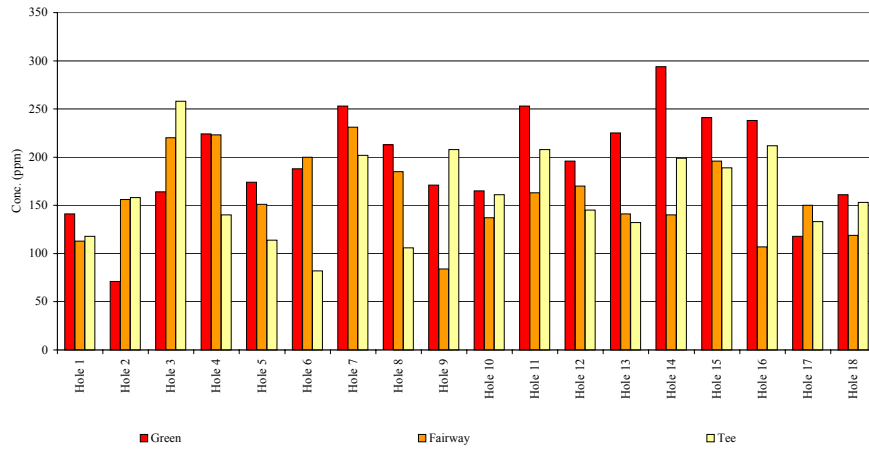
Calcium



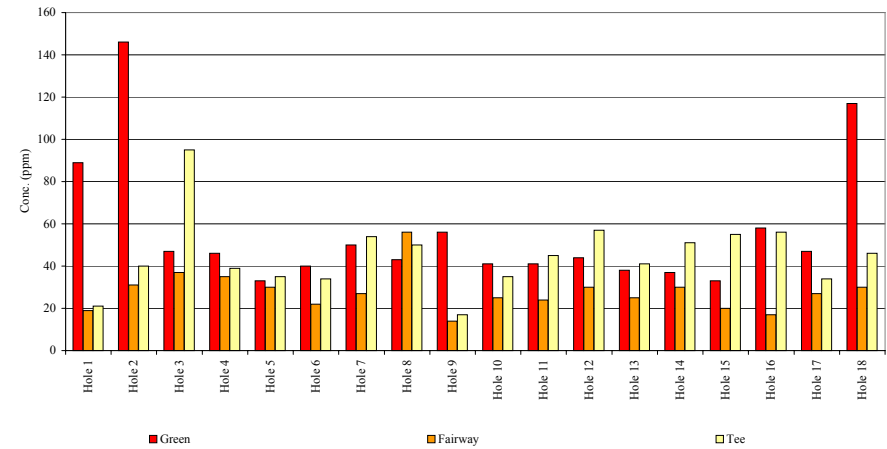
Magnesium



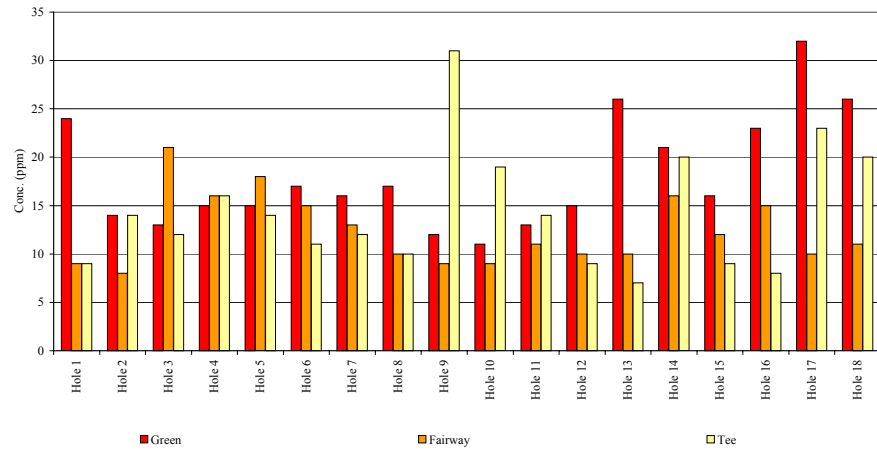
Potassium



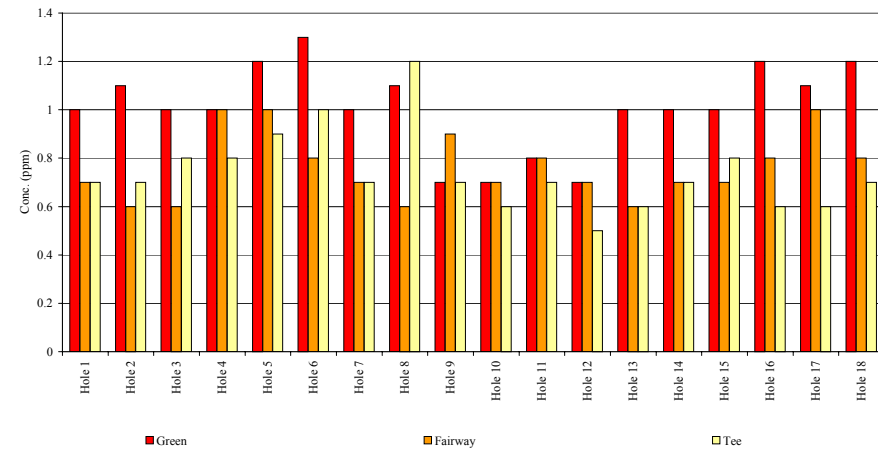
Phosphorus



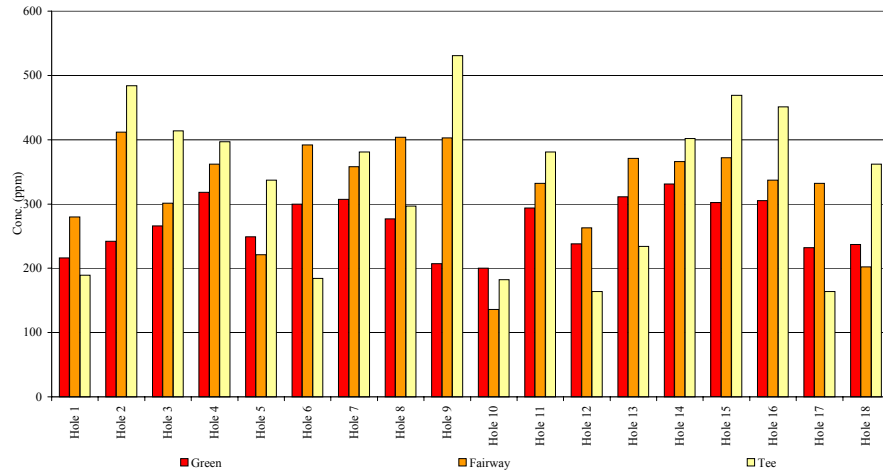
Sulfur



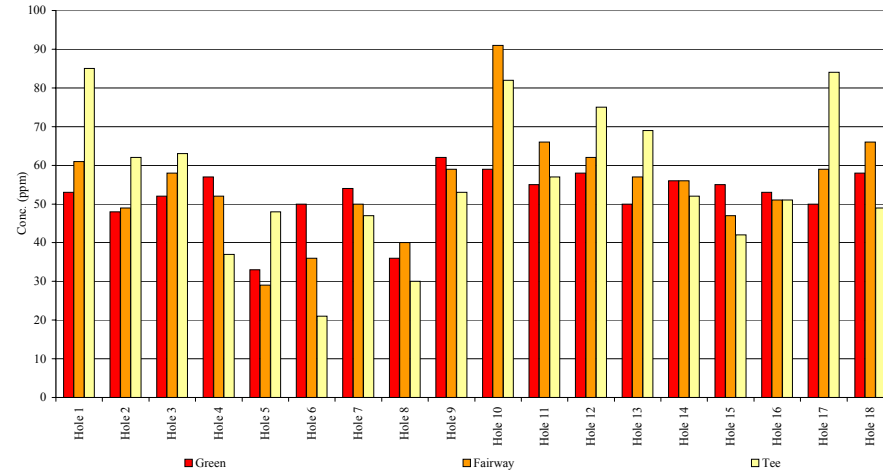
Boron

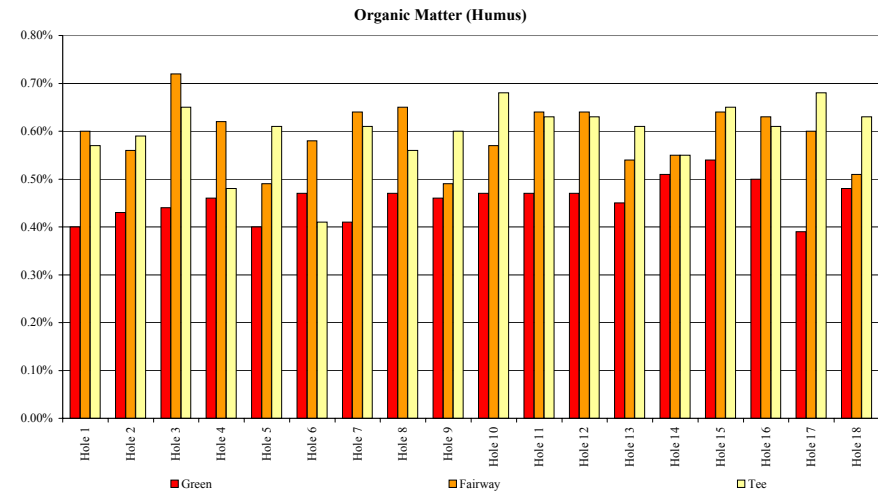
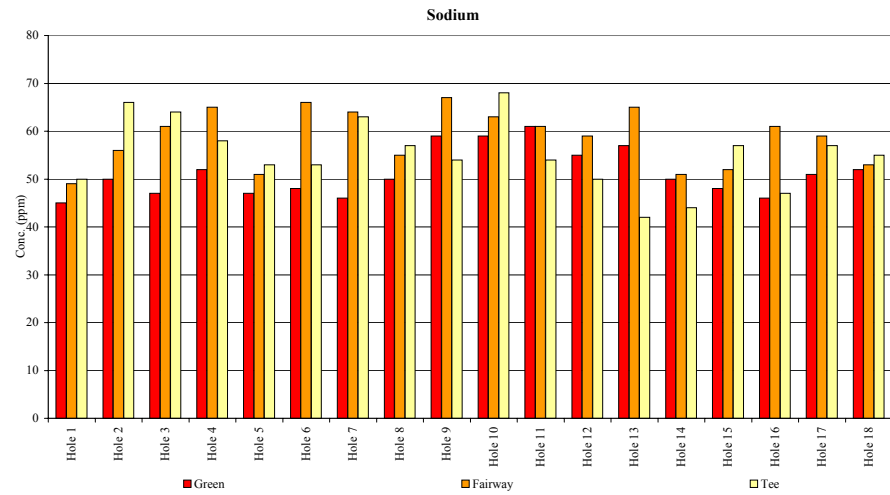
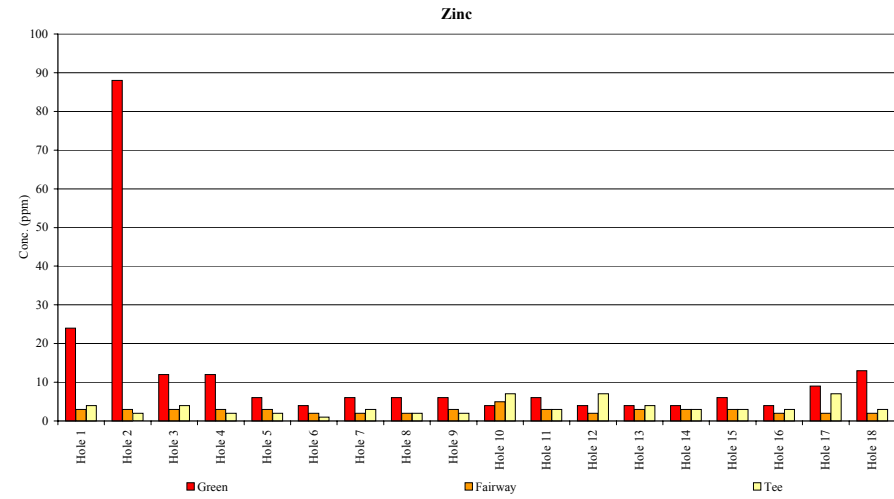
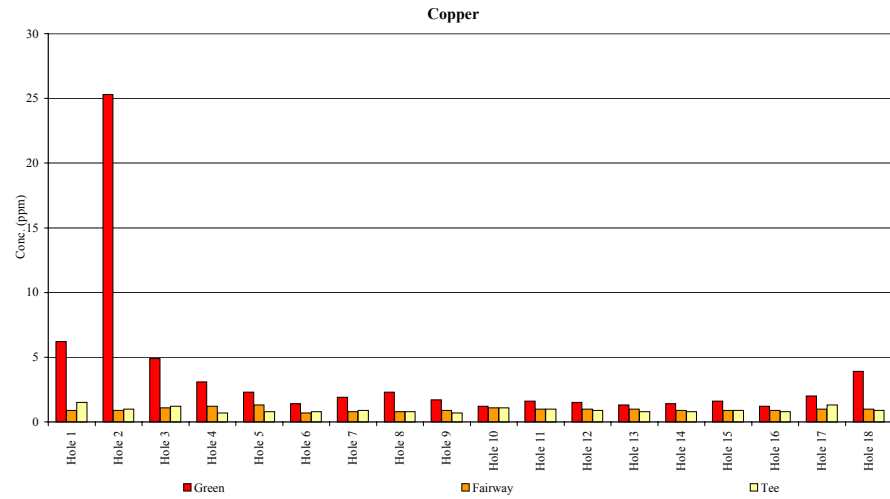


Iron



Manganese





# **Annex D**

## **Calibration Certificates**



## CERTIFICATE OF ANALYSIS

**CONTACT:** MR WONG SIU HO  
**CLIENT:** ENOVATIVE ENV TECHNOLOGY CO  
**ADDRESS:** RM 3704 SIK MAN HOUSE  
HOMANTIN ESTATE  
KOWLOON  
**ORDER No.:**  
**PROJECT:**

**Batch:** HK113521  
**Sub Batch:** 0  
**LABORATORY:** HONG KONG  
**DATE RECEIVED:** 25/04/2008  
**DATE OF ISSUE:** 30/04/2008  
**SAMPLE TYPE:** EQUIPMENT  
**No. of SAMPLES:** 1

### COMMENTS

The calibration procedure used for the analysis has been applied for the calibration of the above instrument.

### NOTES


This is the Final Report and supersedes any preliminary report with this batch number.  
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

### ISSUING LABORATORY: HONG KONG

#### Address

ALS Technichem (HK) Pty Ltd  
11/F  
Chung Shun Knitting Centre  
1-3 Wing Yip Street  
Kwai Chung  
HONG KONG

**Phone:** 852-2610 1044  
**Fax:** 852-2610 2021  
**Email:** hongkong@alsenviro.com

  
Ms Wong Wai Man, Alice  
Laboratory Manager - Hong Kong

#### Other ALS Environmental Laboratories

**AUSTRALIA**  
Brisbane  
Melbourne  
Sydney  
Newcastle

**AMERICAS**  
Vancouver  
Santiago  
Atofagasta  
Lima

ALS Technichem (HK) Pty Ltd  
Part of the ALS Laboratory Group

11/F, Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., H.K.

Phone: 852-2610 1044 Fax: 852-2610 2021 www.alsenviro.com

A Campbell Brothers Limited Company

*This report may not be reproduced except with prior written approval from ALS Technichem (HK) Pty Ltd.*

# CERTIFICATE OF ANALYSIS




Batch: HK113521  
Sub Batch : 0  
Date of Issue: 30/04/2008  
Client: ENOVATIVE ENV TECHNOLOGY CO  
Client Reference:

## Calibration of Turbidimeter

Item : YSI SONDE Environmental Monitoring System  
Model No. : 6920  
Serial No. : 000109DF  
Calibration Method : This meter was calibrated in accordance with standard method APHA (19th Ed.) 2130B  
Date of Calibration : 25 April, 2008

### Testing Results :

Expected Reading	Recording Reading
0.00 NTU	0.1 NTU
4.00 NTU	3.91 NTU
16.0 NTU	15.9 NTU
80.0 NTU	81.1 NTU
160 NTU	163 NTU
Allowing Deviation	±10%

  
Ms Wong Wai Man, Alice  
Laboratory Manager - Hong Kong

# CERTIFICATE OF ANALYSIS




Batch: HK113521  
Sub Batch : 0  
Date of Issue: 30/04/2008  
Client: ENOVATIVE ENV TECHNOLOGY CO  
Client Reference:

## Calibration of Conductivity System

Item : YSI SONDE Environmental Monitoring System  
Model No. : 6920  
Serial No. : 000109DF  
Calibration Method : This meter was calibrated in accordance with standard method APHA (19th Ed.) 2510B  
Date of Calibration : 25 April, 2008

### Testing Results :

Expected Reading	Recording Reading
1412 uS/cm	1399 uS/cm
6667 uS/cm	6674 uS/cm
58670 uS/cm	58433 uS/cm
Allowing Deviation	±10%

  
Ms Wong Wai Man, Alice  
Laboratory Manager - Hong Kong

# CERTIFICATE OF ANALYSIS



Batch: HK113521  
Sub Batch : 0  
Date of Issue: 30/04/2008  
Client: ENOVATIVE ENV TECHNOLOGY CO  
Client Reference:

## Calibration of Salinity System

Item : YSI SONDE Environmental Monitoring System  
Model No. : 6920  
Serial No. : 000109DF  
Calibration Method : This meter was calibrated in accordance with standard method APHA (19th Ed.) 2520 A and B  
Date of Calibration : 25 April, 2008

### Testing Results :

Expected Reading	Recording Reading
10.0 g/L	10.0 g/L
20.0 g/L	10.2 g/L
30.0 g/L	30.3 g/L
Allowing Deviation	±10%

  
Ms Wong Wai Man, Alice  
Laboratory Manager - Hong Kong



# CERTIFICATE OF ANALYSIS




Batch: HK113521  
Sub Batch : 0  
Date of Issue: 30/04/2008  
Client: ENOVATIVE ENV TECHNOLOGY CO  
Client Reference:

## Calibration of Thermometer

Item : YSI SONDE Environmental Monitoring System  
Model No. : 6920  
Serial No. : 000109DF  
Calibration Method : In-house Method  
Date of Calibration : 25 April, 2008

### Testing Results :

Reference Temperature (°C)	Recorded Temperature (°C)
3.5 °C 20.3 °C	3.5 °C 20.2 °C
Allowing Deviation	±2.0°C

  
Ms Wong Wai Man, Alice  
Laboratory Manager - Hong Kong

# CERTIFICATE OF ANALYSIS



Batch: HK113521  
Sub Batch : 0  
Date of Issue: 30/04/2008  
Client: ENOVATIVE ENV TECHNOLOGY CO  
Client Reference:

## Calibration of DO System

Item : YSI SONDE Environmental Monitoring System  
Model No. : 6920  
Serial No. : 000109DF  
Calibration Method : This meter was calibrated in accordance with standard method APHA (18th Ed.) 4500-0C & G  
Date of Calibration : 25 April, 2008

### Testing Results :

Expected Reading	Recording Reading
0.00 mg/L	0.10 mg/L
2.16 mg/L	2.10 mg/L
4.32 mg/L	4.43 mg/L
8.04 mg/L	8.00 mg/L
Allowing Deviation	±0.2 mg/L

  
\_\_\_\_\_  
Alice W M Wong  
Laboratory Manager - Hong Kong

# CERTIFICATE OF ANALYSIS




Batch: HK113521  
Sub Batch : 0  
Date of Issue: 30/04/2008  
Client: ENOVATIVE ENV TECHNOLOGY CO  
Client Reference:

## Calibration of pH System

Item : YSI SONDE Environmental Monitoring System  
Model No. : 6920  
Serial No. : 000109DF  
Calibration Method : This meter was calibrated in accordance with standard method APHA (19th Ed.) 4500 H:B  
Date of Calibration : 25 April, 2008

### Testing Results :

Expected Reading	Recording Reading
4.00	4.01
7.00	7.02
10.0	10.01
Allowing Deviation	±0.2 unit

  
Ms Wong Wai Man, Alice  
Laboratory Manager - Hong Kong



# **Annex E**

## **Fertilizer and Pesticides Application**

April 2008						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 F (2, PG2) WQ	2 C (1-18, PG2)	3 C (1-18, PG2)	4	5 F (1-18)
6	7 F (1, 2, 9, 17)	8 F (12, 13, 14, 15) C (3, 13, 14)	9 F (1, 2, 17, 18, PG2)	10	11	12
13	14 F (1-18)	15 WQ	16	17 F (1-18)	18	19
20 WQ	21	22 F (1-18, PG2)	23 F (1-18)	24 F (1-18)	25 F (1-18) C (1-18, PG2)	26 C (1-18, PG2)
27	28 F (1, 2, 17, 18, PG2)	29	30			


Remarks:


1. Dosage Application by JCKSC


F (follow with numbers) – fertilizers were applied at those holes of East Golf Course.


C (follow with numbers) – non-biological chemicals (eg. pesticides, fungicides, etc.) were applied at those holes of East Golf Course.

2. Weather Information (from Hong Kong Observatory)

 daily duration of sunshine > 4 hours and without raining

 daily duration of sunshine < 4 hours and without raining

 daily rainfall > 0.5 mm at Kau Sai Chau Island

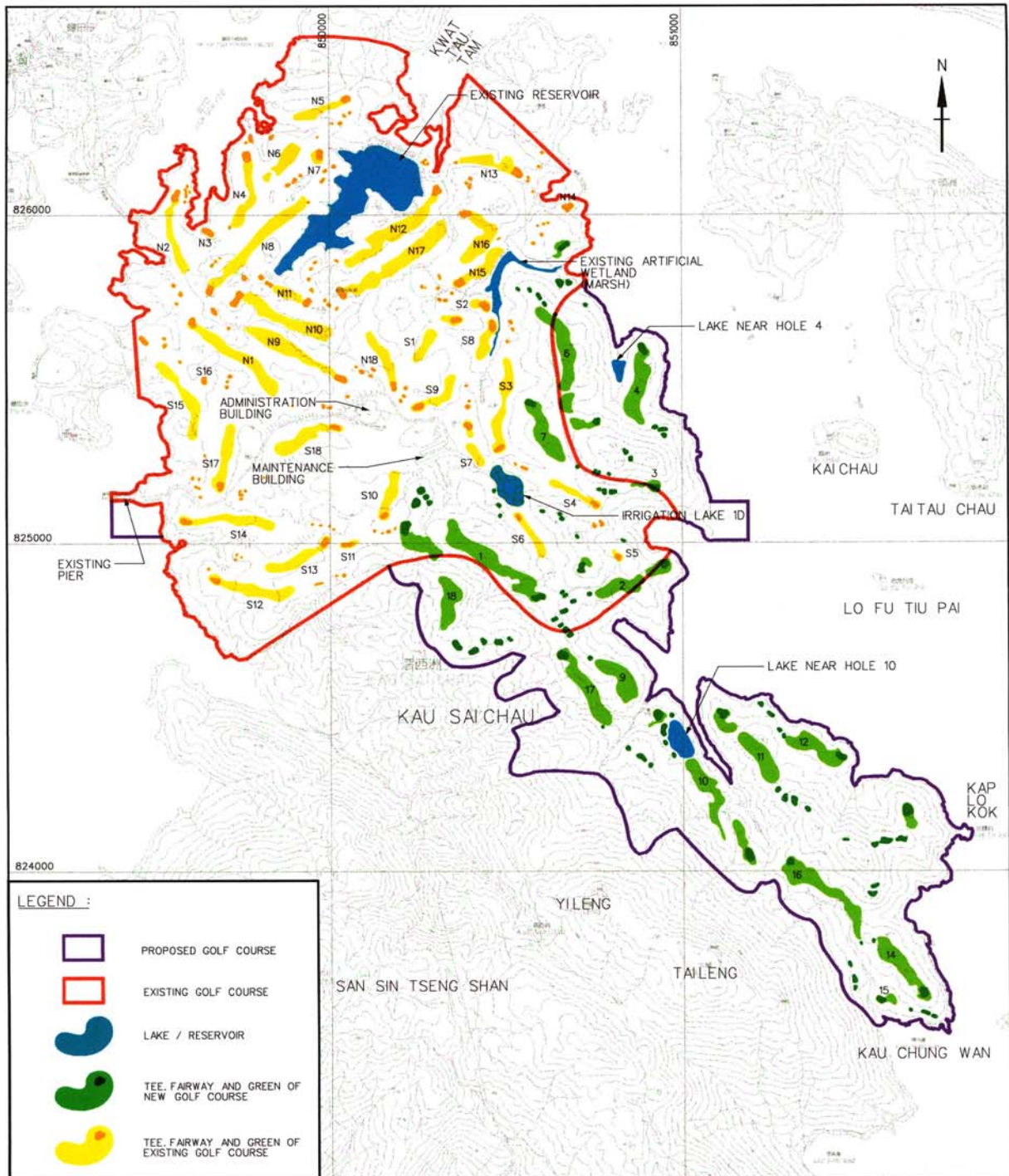
 daily rainfall > 30 mm at Kau Sai Chau Island

3. Environmental Monitoring

WQ – fresh and marine water quality monitoring were implemented.

# FIGURES





The Hong Kong Jockey Club

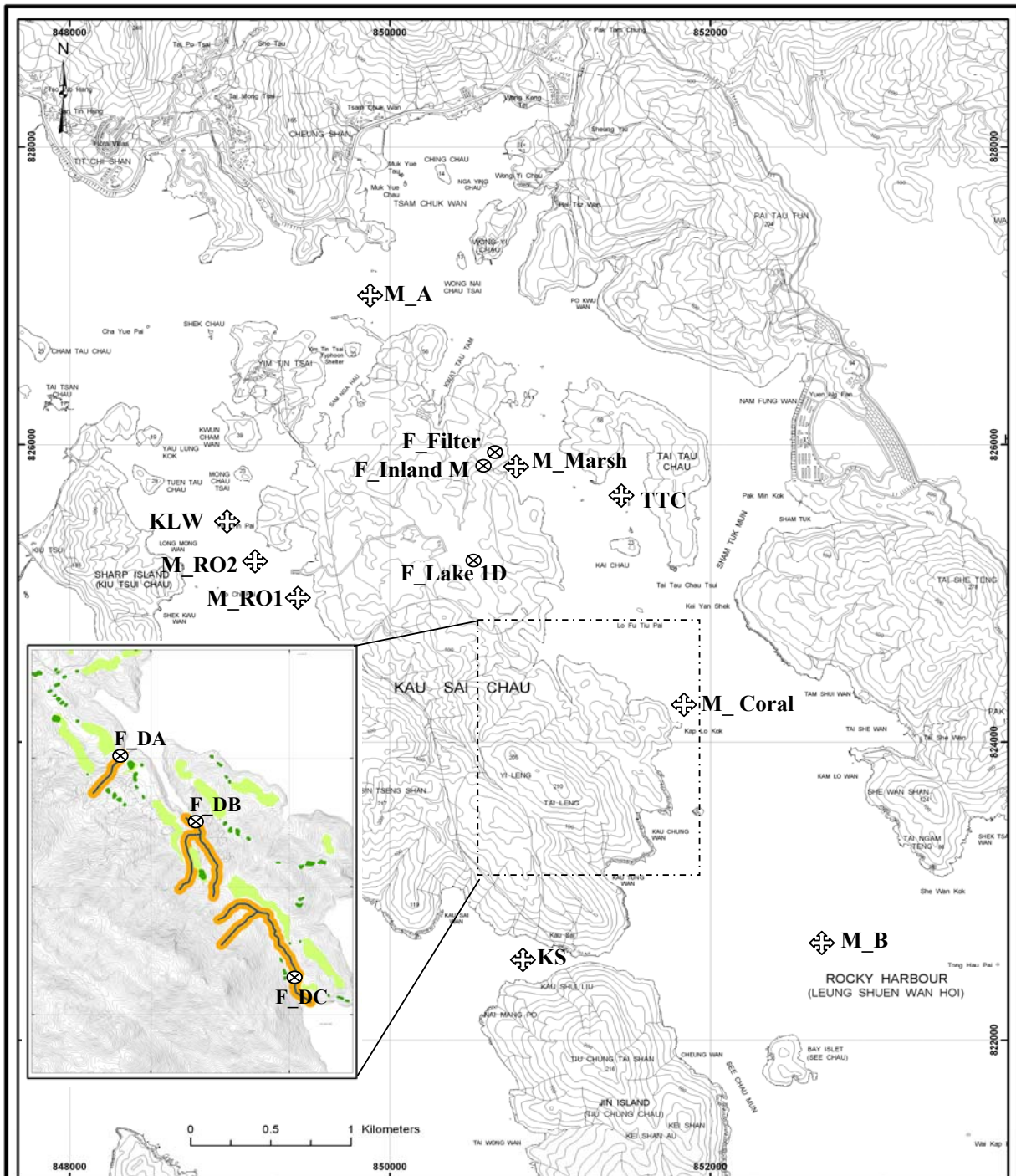
**BLACK & VEATCH HONG KONG LIMITED**  
 博威工程顧問有限公司

PROPOSED EXTENSION OF PUBLIC GOLF  
 Public Golf Course at Kau Sai Chau Island,  
 Sai Kung

Master Layer Plan

<b>Fig 1.1</b>	Revision
Reference	File Name
Prepared	Checked
Date	Scale
ET	PKL
Apr 08	1:15000 (A4)





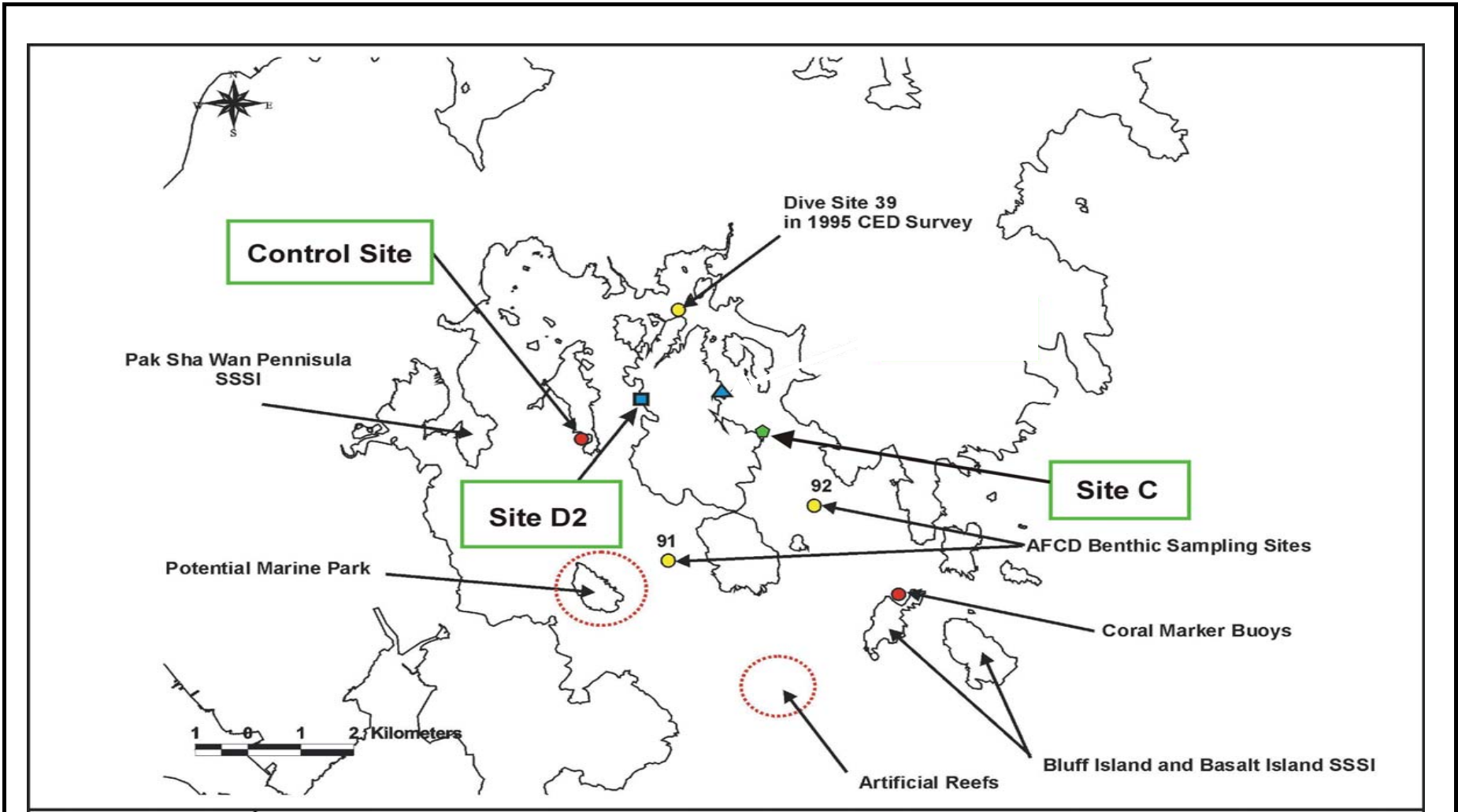

 香港賽馬會  
 The Hong Kong Jockey Club


 BLACK & VEATCH HONG KONG LIMITED  
 博威工程顧問有限公司

Public Golf Course at Kau Sai Chau Island, Sai Kung  
 Water Quality Monitoring Locations -  
 Operation Phase

Fig 3.1	
ET	PKL
Apr 08	

MXD: \\s:\p566\0\Project\032219\_022\location.mxd  
 Plot No: C:\P566\0\Project\032219\_022\location.pdf



香港賽馬會  
The Hong Kong Jockey Club



BLACK & VEATCH HONG KONG LIMITED  
博威工程顧問有限公司

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

Coral Survey Monitoring Location

Fig 3.2

Prepared	Checked
ET	PKL
Date	Apr-08