

**Central Reclamation, Phase III  
Environmental Monitoring & Audit  
Monthly Report No. 14  
September 2004**

<i>Client</i>	<b>Civil Engineering and Development Department Hong Kong Island and Islands Development Office</b>		
<i>Project</i>	<b>Supplementary Agreement No. 3 to Agreement No. CE 15/94 Central Reclamation, Phase III Design and Construction for the Minimum Option</b>		
<i>Report No.</i>	<b>3128-REP-187-00</b>	<i>Copy No.</i>	
<i>Date of Issue</i>	<b>8 October 2004</b>	<i>File Ref.</i>	<b>L:\S-proj\CR3\CR3.NEW\3128\ Reports\0187.doc</b>
<i>Report Title</i>	<b>Central Reclamation, Phase III Environmental Monitoring &amp; Audit Monthly Report No. 14 - September 2004</b>		
	<i>Name</i>	<i>Sign</i>	<i>Date</i>
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ACL	Atkins China Limited
CEDD	Civil Engineering and Development Department
CRIII	Central Reclamation Phase III
EIA	Environmental Impact Assessment
EIAO	Environmental Impact Assessment Ordinance
EM&A	Environmental Monitoring and Audit
EPD	Environmental Protection Department
ER	Engineer's Representatives
ET	Environmental Team
IEC	Independent Environmental Checker
LCSD	Leisure and Cultural Services Department
LCSVO-JV	Leighton China State Van Oord Joint Venture
TDD	Territory Development Department
TSP	Total Suspended Particulates
WMP	Waste Management Plan

## **Executive Summary**

The Central Reclamation Phase III (CRIII) Works, Contract No. HK 12/02, was awarded to Leighton China State Van Oord Joint Venture (LCSVO-JV) by the Territory Development Department (now called the Civil Engineering and Development Department (CEDD) after the merger of the Civil Engineering Department and the Territory Development Department on 1 July 2004), Hong Kong Islands and Islands Development Office. The works under the Contract HK 12/02 commenced on 28 February 2003. Contract HK 16/03 for the CRIII Hinterland Drainage Improvement Works was awarded to Wang Kee Construction Co. Ltd. and works for this contract commenced on 17 December 2003.

Atkins China Limited (ACL) has been appointed by CEDD to implement the Environmental Monitoring and Audit (EM&A) programme that was identified in the EIA Report for the CRIII Project and is providing Environmental Team (ET) services during the duration of the construction works.

This is the fourteenth Monthly EM&A Report under the EIAO for the works specified in Section 1.3 of the CRIII EIA Report. This report summarises the monitoring results and audit findings of the EM&A programme during the reporting period from 1 to 30 September 2004.

### ***Environmental Monitoring and Audit Progress***

The monthly EM&A programme was undertaken in accordance with the EM&A Manual. A summary of the monitoring activities performed in this reporting month is listed below:

- Environmental site inspections were undertaken on 2, 9, 16 and 23 September 2004.
- Noise monitoring was performed continuously for 24 hours.
- Water quality monitoring was undertaken on the following days:
  - 1 September 2004
  - 3 September 2004
  - 6 September 2004
  - 8 September 2004
  - 10 September 2004
  - 13 September 2004
  - 15 September 2004
  - 17 September 2004
  - 20 September 2004
  - 22 September 2004
  - 24 September 2004
  - 27 September 2004
  - 29 September 2004

### ***Exceedance of Action and Limit Levels***

There was no environmental air quality monitoring required during the reporting period.

Continuous noise monitoring was carried out during the reporting period and no noise quality exceedances were recorded during the reporting month.

From the analysis of water quality monitoring results collected during the reporting period, exceedances of the Action and Limit Levels were found on several occasions. Although DO levels below the Action Level were observed at seawater intake and marine-based stations, investigations found that they were due to natural variation or changes in ambient conditions and not caused by the project marine works. It was noted that when the DO Action and/or Limit Levels were exceeded at the marine-based stations the control stations recorded similarly low DO levels.

Elevated concentrations of SS were recorded on 6, 15, 17, 20, 24, 29 and 29 September 2004. Investigations into these exceedances found that they were generally attributed to ambient conditions and/or influences not related to project works. The results did not show any significant gradient effects between stations located near the works and stations located farther away from the works. Further, additional SS monitoring at the Queensway Government Offices (QGO) outfall and Culvert J noted high SS levels at these locations. As such, elevated SS levels in the surrounding area may have been significantly influenced by these discharges.

### ***Complaint Log***

No environmental complaints were received during the reporting period.

### ***Notifications of Summons and Prosecutions***

There were no notifications of summons or prosecutions received with regard to the environment during this reporting period.

### ***Site Inspection and Audit***

Environmental site inspections for the CRIII project works area were undertaken on 2, 9, 16 and 23 September 2004. No environmental non-conformance and deficiencies were observed during the site inspections.

### ***Future Key Issues***

Future Key Issues are as follows:

- Placing of underlayer and armour rock at IRAW
- Surcharge material works at IRAW and IRAE;
- Remaining dredging works at IRAE;
- Substructure works for the CTB;
- Superstructure works at Pier No. 7; and
- Cooling watermain work.

## **1. INTRODUCTION**

### **1.1 Basic Project Information**

The Territory Development Department (now called the Civil Engineering and Development Department (CEDD) after the merger of the Civil Engineering Department and the Territory Development Department on 1 July 2004) of Hong Kong Special Administrative Region (HKSAR) is constructing the Central Reclamation Phase III Project (CRIII).

The Main Works Contract HK 12/02 for CRIII commenced on 28th February 2003. Leighton-China State-Van Oord Joint Venture (LCSVO-JV) was awarded the Contract No. HK 12/02 for the construction of the CRIII Engineering Works. Contract HK 16/03 for the CRIII Hinterland Drainage Improvement Works was awarded to Wang Kee Construction Co. Ltd. and works for this contract commenced on 17 December 2003.

Atkins China Limited (ACL) has been commissioned by TDD (now called CEDD) to undertake the environmental monitoring and audit work for the project in accordance with the Environmental Permit (EP No. EP-122/2002) issued to TDD on 7 March 2002. The CRIII Project Organisation is shown in **Annex A**.

This is the fourteenth monthly EM&A Report under the EIAO, which presents the results of EM&A work conducted during the period from 1 to 30 September 2004, inclusive.

## 2. ENVIRONMENTAL STATUS

### 2.1 Works Undertaken

The works undertaken during the reporting month include marine piling, placing of armour rock and levelling stone works, dredging, surcharge material works, landside cooling water mains works, substructure works for the Central Terminal Building (CTB) and maintenance and necessary repair work for seawater intake silt screens.

### 2.2 Environmental Permits

A summary of the status of all environmental permits, license, and/or notification to EPD for this project during the reporting period are presented in **Table 2.1**.

**Table 2.1 - Summary of the Environmental License / Permit Status**

Item	Item Description	Date of Application	Permit Status
	<i>LCSVO-JV submitted an Application for Renewal of Construction Noise Permit GW-TS0134-04 for the use of Powered Mechanical Equipment for the purpose of carrying out construction works other than percussive piling during restricted hours (Ref. H2189/9762/MP/DC/ST/ec)</i>	<i>27 September 2004</i>	–
1	<i>LCSVO-JV submitted the Estimated Dumping Quantity for an Application for a Permit to Dump Material (Category M &amp; H Sediment) at Sea Under the Dumping at Sea Ordinance (Ref. H2189/U2c/9674/MP/EY/ST/ec)</i>	<i>21 September 2004</i>	–
2	<i>LCSVO-JV submitted a Test Report for Treated Effluent for Wastewater Discharge Licence No. EP880/W10/XX0195 (Ref. H2189/U2c/9428/MP/DC/ST/ec)</i>	<i>10 September 2004</i>	–
3	<i>LCSVO-JV submitted an Application for a Permit to Dump Material (Category M &amp; H Dredged Sediment) at Sea Under the Dumping at Sea Ordinance (Ref. H2189/U2c/9403/MP/EY/ST/ec)</i>	<i>9 September 2004</i>	–
4	<i>LCSVO-JV submitted an Application for Renewal of Construction Noise Permit GW-TS0117-04 (Ref. H2189/U2c/9391/MP/EY/ST/ec)</i>	<i>6 September 2004</i>	–

### 2.3 Environmental Document Submission

A summary of the status of the submissions provided during the reporting month is presented in **Table 2.2**.

**Table 2.2 - Summary of the Contractor's Environmental Related Document Submissions to the Engineer's Representatives (ER)**

Item	Document Title	Version	Date of Submission to ER
1	<i>New Construction Noise Permit (GW-RS0422-04)</i>	-	<i>28 September 2004</i>
2	<i>Disposal of Chemical Waste (Trip Ticket issued)</i>	-	<i>11 September 2004</i>

A summary of the Environmental Certification Sheet submissions to EPD during the reporting month is presented in **Table 2.3**.

**Table 2.3 - Summary of Environmental Certification Sheet Submissions to the Environmental Protection Department (EPD)**

No	Certification Subject	Letter Ref.	Date of Submission to EPD	Approved Status
1	<i>Certification of Monthly Environmental Report No. 13 - August 2004</i>	<i>3128/HK12/02 M45/200/OC6415/SB/AC/al</i>	<i>10 September 2004</i>	-

#### 2.4 Environmental Meetings

An environmental meeting was held on 3 September 2004 between the Contractor, CEDD, EPD and the ET to discuss the exceedances reported in August 2004.

During the discussion, the ET summarised the investigations and actions that were undertaken after the notification of exceedances. Following the meeting, the Contractor submitted a list of upcoming marine works and additional mitigation measures for these works. These measures include large scale floating silt curtains for sand filling works and additional silt curtains to be placed around existing seawater intake silt screens.

#### 2.5 Environmental Monitoring Locations

The environmental monitoring locations are provided in **Annex C**.

### 3. EM&A REQUIREMENTS

#### 3.1 Summary of Impact EM&A Requirements

The EM&A programme requires environmental monitoring for air quality, noise, water quality, waste management and landscape and visual aspects as specified in the CRIII Project EIA. The EM&A requirements for each issue area are described in subsequent sections including:

- All required monitoring parameters;
- Action and Limit Levels; and
- Event-Action Plans.

A summary of impact EM&A requirements is presented in **Table 3.1**.

**Table 3.1 - Summary of Impact EM&A Requirements**

Parameters	Descriptions	Locations	Frequencies	Duration
TSP	24-Hour TSP	2 Locations	Once every 6 days	During dust generating construction works
	1-Hour TSP	2 Locations	Three times in every 6 days	During dust generating construction works
Noise	Leq (30 mins), L <sub>10</sub> , L <sub>90</sub> .	1 Location	Continuous measurements	Two weeks before Construction and During Construction
Water Quality	Dissolved Oxygen; Salinity; Temp; Suspended Solids; Turbidity.	14 Locations	3 times a week, Mid-ebb/flood tides	During Marine Works
Waste	On-Site Waste Audit	Active Work Sites	Periodically	During Construction
	On-Site Waste Inspection			
Landscape and Visual	Audits to ensure effective implementation of mitigation measures			During Construction
General Site Conditions	Environmental Site Inspection	Works areas and areas affected by works	Periodically	During Construction

### **3.2 Environmental Quality Performance Limits**

Environmental Quality Performance Limits for air, noise and water quality as provided in the Baseline Monitoring Report (Final) are shown in Annex D.

### **3.3 Event Action Plan**

The Event Action Plans for air, noise and water quality as provided in the Baseline Monitoring Report (Final) are shown in **Annex E**.

### **3.4 Implementation of Environmental Measures**

The Contractor is required to implement mitigation measures listed in the EIA Report, EM&A Manual and Further Environmental Permit. During routine site inspections, the Contractor's implementation of mitigation measures is reviewed. With regard to mitigation measures for water quality, the Contractor has installed frame type silt curtains for rock filling works to reduce SS dispersion. Further, the Contractor carried out daily visual inspection of the silt screens for seawater intakes. Floating debris in the project area was collected at least once everyday and in the water body near cooling water intakes debris was collected at least three times a day. Bi-weekly diving inspections for the silt screens were also carried out during the reporting month.

**4. MONITORING RESULTS**

**4.1 Impact Monitoring Schedule in September 2004**

Regular site inspections were carried out to assess whether the project's environmental protection and pollution control measures are in compliance with the contract specifications. Inspections were conducted on 2, 9, 16 and 23 September 2004.

Air quality monitoring has not commenced yet as no significant work areas or construction activities with the potential to impact air quality are within range of the closest air quality sensitive receivers (ASR).

Continuous 24-hour noise monitoring was conducted during this reporting period.

Impact water quality monitoring at all monitoring stations was undertaken during this reporting month. The water quality monitoring schedule for September 2004 is presented in **Table 4.1**.

**Table 4.1 - Water Quality Monitoring Programme (Seawater Intakes Stations)**

<b>Date of Sampling</b>	<b>Tidal State</b>	<b>Timing of Sampling</b>
1 September 2004	Mid Ebb	12:32 - 15:25
	Mid Flood	07:26 - 11:04
3 September 2004	Mid Ebb	13:20 - 16:17
	Mid Flood	07:38 - 11:10
6 September 2004	Mid Ebb	15:09 - 17:47
	Mid Flood	10:40 - 13:35
8 September 2004	Mid Ebb	07:46 - 10:54
	Mid Flood	15:10 - 17:55
10 September 2004	Mid Ebb	08:21 - 11:07
	Mid Flood	15:10 - 17:40
13 September 2004	Mid Ebb	10:32 - 13:22
	Mid Flood	15:18 - 18:00
15 September 2004	Mid Ebb	10:42 - 13:38
	Mid Flood	15:46 - 18:46
17 September 2004	Mid Ebb	13:06 - 15:05
	Mid Flood	07:42 - 10:35
20 September 2004	Mid Ebb	14:29 - 17:07
	Mid Flood	09:45 - 12:44
22 September 2004	Mid Ebb	07:38 - 10:44
	Mid Flood	15:17 - 17:59
24 September 2004	Mid Ebb	07:46 - 10:10
	Mid Flood	15:16 - 18:04
27 September 2004	Mid Ebb	10:35 - 13:40

Date of Sampling	Tidal State	Timing of Sampling
	Mid Flood	15:21 - 18:05
29 September 2004	Mid Ebb	10:58 - 13:42
	Mid Flood	15:43 - 18:33

## 4.2 Monitoring Methodology

### 4.2.1 Air Quality Monitoring

Air quality monitoring will be performed in accordance with the methodology described in the EM&A Manual once construction activities requiring air quality monitoring commence. The locations of the monitoring stations at City Hall and PLA Headquarters are shown in **Annex C**.

### 4.2.2 Noise Quality Monitoring

Continuous 24-hour noise monitoring was performed in accordance with the methodology described in the EM&A Manual in the reporting period. The location of the noise monitoring station at City Hall is shown in **Annex C**.

### 4.2.3 Water Quality Monitoring

Water quality monitoring was performed in accordance with the methodology described in the EM&A Manual. Monitoring for the reporting month was conducted at all stations, which comprises of 6 marine-based stations and 8 seawater intake stations. The locations of the monitoring stations are shown in **Annex C**.

## 4.3 Monitoring Equipment

### 4.3.1 Air Quality

The equipment that is used for air quality monitoring is listed in **Table 4.2**.

**Table 4.2 - Equipment for Air Quality Monitoring**

Parameter Measured	Equipment
24-Hour Sampling	High Volume Sampler Model GS2310 by Anderson Instruments to be used for both monitoring stations.
1-Hour Sampling	MicroDust pro Aerosol Monitoring System to be used for both monitoring locations.

### 4.3.2 Noise Quality

The equipment used for continuous noise quality monitoring is listed in **Table 4.3**.

**Table 4.3 - Noise Monitoring Equipment**

Equipment	Model
Integrated Sound Level Meter (SLM)	B&K 2238

Calibrator	B&K 4231, Class 1
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#### 4.3.3 Water Quality

The equipment that was used for water quality monitoring is listed in **Table 4.4**.

**Table 4.4 - Equipment Used for Marine Water Quality Monitoring**

Parameter Measured	Equipment
Dissolved Oxygen and Temperature Measuring Equipment	<p>A Dissolved Oxygen meter YSI model 58 was used.</p> <ul style="list-style-type: none"> <li>• This instrument was portable and weatherproof and used a DC power source. The equipment was capable of measuring:</li> <li>• DO levels in the range of 0-20 mg/l and 0-200% saturation; and</li> <li>• Temperature of between 0 - 45 degree Celsius.</li> <li>• The equipment had a membrane electrode with an automatic temperature compensation complete with a cable. In addition, a Wirling Psychrometer was used as a reference thermometer during the sampling.</li> </ul>
Turbidity Measurement Instrument	A Turbidimeter, HACH model 2100P was used for determining turbidity levels. The instrument is portable and weatherproof and uses a DC power source. The instrument includes a photoelectric sensor capable of measuring turbidity between 0-1000 NTU.
PH	A MP125 pH Meter from Mettler Toledo was used to measure pH.
Salinity / Conductivity Meter	A Salinity / Conductivity meter YSI model 63 and model 30 was used for determining salinity concentrations.
Sample Containers and Storage	Water samples for SS analysis were stored in high density polythene bottles with no preservative added, packed in ice and delivered to the laboratory, and analysed as soon as possible after collection.

#### 4.3.4 Equipment Calibration

The calibration frequencies of the monitoring equipment are provided in **Table 4.5**.

**Table 4.5 - Equipment Calibration Frequencies**

Equipment	Calibration Frequency	Latest Calibration Date
Dissolved Oxygen Meter	Every 6 months	25 July 2004
Turbidimeter	Every 3 months for secondary standards; meter is calibrated prior to each measurement to the secondary standards	30 June 2004
pH Meter	Prior to each sampling day	–
Pyschrometer	Every 6 months	19 March 2004
Integrated SLM	Every year	20 August 2004

## **4.4 Impact Monitoring Results**

### **4.4.1 Air Quality & Noise Monitoring Results**

No air quality monitoring work was undertaken during the reporting period as no significantly dusty construction activities with the potential to impact air quality are within range of the closest air quality sensitive receivers.

Noise quality monitoring work was undertaken during the reporting period. The noise monitoring results are provided in **Annex F**. Graphical representation of the noise monitoring data is provided in **Annex G**.

### **4.4.2 Water Quality Monitoring Results**

Water quality monitoring was undertaken at all water quality monitoring locations during the reporting period. The water quality monitoring results from this reporting period are presented in **Annex H**. Graphical representation of the water quality data is provided in **Annex I**. Summaries of the results are provided in **Tables 4.5 to 4.9**.

### **Marine-Based Stations**

Monitoring stations M8 and M10 were selected as the marine-based impact stations as they are located outside the predicted influence of the dredging and reclamation works. The detection of water quality degradation at these two stations may indicate that project marine works are adversely affecting water quality in Victoria Harbour. Stations M7 and M9 are within the expected influence of the reclamation activities and are located along the works area boundary (or extent of the predicted sediment plume). As such, M7 and M9 are used as indicator stations to note any significant elevations in SS, turbidity or reductions in DO that may affect the marine-based impact monitoring stations.

**Table 4.5** is a summary of the marine-based stations monitoring results during mid-ebb tide.

**Table 4.5 - Summary of Mid-Ebb Results for Marine-Based Stations**

Station		Parameter				
		DO (S&M) mg/L	DO (B) mg/L	DO % Sat. (DA)	Turbidity (DA) NTU	SS (DA) mg/L
C1	min	3.9	3.2	54	4.7	5
	max	5.2	4.5	72	10.8	11
	avg	4.4	3.9	63	7.4	8
	sd	0.3	0.4	6	1.7	2
C2	min	3.7	3.1	55	4.4	5
	max	5.0	4.2	71	10.3	13
	avg	4.4	3.8	62	6.8	8
	sd	0.4	0.4	5	1.8	2
M7	min	3.5	3.3	52	4.8	6
	max	4.9	4.5	72	10.1	10
	avg	4.3	3.9	61	7.5	8
	sd	0.4	0.4	6	1.6	2
M8	min	3.6	3.3	52	4.7	5
	max	4.9	4.7	73	10.4	12
	avg	4.3	4.0	62	7.1	8
	sd	0.4	0.3	6	1.8	2
M9	min	3.8	3.5	55	4.2	5
	max	4.9	4.4	71	11.0	11
	avg	4.3	4.0	62	7.6	8
	sd	0.3	0.3	5	2.0	2
M10	min	3.9	3.4	56	4.7	6
	max	5.5	4.5	75	10.6	11
	avg	4.5	3.9	63	7.5	8
	sd	0.4	0.3	6	1.7	2

As **Table 4.5** shows, DO levels at marine-based impact stations (M8 & M10) in the surface to middle layer during mid-ebb survey ranged between 3.6 and 5.5 mg/L with an average value of 4.4 mg/L and DO measurements in the bottom layer ranged from 3.3 to 4.7 mg/L with an average level of 4.0 mg/L. Similar DO levels were recorded at the control stations at which DO levels in the surface to middle layer during mid-ebb survey ranged from 3.7 to 5.2 mg/L with an average value of around 4.4 mg/L; DO measurements in the bottom layer ranged between 3.1 and 4.5 mg/L with an average level of 3.8 mg/L.

SS levels during mid-ebb tide ranged from 5 to 12 mg/L with an average value of 8 mg/L at the marine-based impact stations (M8 & M10), which is comparable to results from the control stations in which SS content ranged from 5 to 13 mg/L with an average of 8 mg/L. Generally, the results showed no clear gradient effect (high SS and low DO levels from near-field stations M7 and M9 to far-field stations M8 and M10), which indicates that marine works are not adversely affecting marine water quality outside the work site boundary in Victoria Harbour. Marine water quality at impact monitoring stations was found to be similar to that at the control

stations also indicating that project marine works were generally not adversely affecting water quality in Victoria Harbour.

**Table 4.6** is a summary of monitoring results from marine-based stations during mid-flood tide.

**Table 4.6 - Summary of Mid-Flood Results for Marine-Based Stations**

Station		Parameter				
		DO (S&M) mg/L	DO (B) mg/L	DO % Sat. (DA)	Turbidity (DA) NTU	SS (DA) mg/L
C1	min	3.7	2.9	48	4.8	5
	max	5.7	4.4	77	12.7	14
	avg	4.5	3.9	63	8.4	9
	sd	0.5	0.4	8	2.5	3
C2	min	3.7	2.9	49	4.9	5
	max	7.1	4.7	93	9.2	13
	avg	4.5	3.8	63	7.3	8
	sd	0.9	0.5	11	1.5	3
M7	min	3.2	3.3	46	5.2	5
	max	5.1	4.6	68	10.0	16
	avg	4.1	3.8	59	7.7	8
	sd	0.5	0.4	7	1.6	3
M8	min	3.2	2.9	45	5.8	5
	max	7.3	4.8	94	9.4	13
	avg	4.4	4.0	64	7.8	8
	sd	1.0	0.5	12	1.4	3
M9	min	3.2	2.9	44	4.7	5
	max	7.0	4.8	92	11.4	14
	avg	4.3	3.8	61	8.0	9
	sd	0.9	0.5	11	2.2	3
M10	min	3.5	2.8	47	4.6	5
	max	6.4	4.8	85	13.0	14
	avg	4.5	4.0	64	8.3	8
	sd	0.7	0.5	9	2.7	3

During mid-flood tide, DO levels at marine-based impact stations (M8 & M10) in the surface to middle layer ranged from 3.2 to 7.3 mg/L with an average level of 4.5 mg/L while DO values in the bottom layer ranged between 2.8 and 4.8 mg/L with an average of 4.0 mg/L. Similar DO concentrations were recorded at the control stations in the surface to middle layer during mid-flood survey ranged between 3.7 and 7.1 mg/L with an average value of 4.5 mg/L and DO results in the bottom layer ranged from 2.9 and 4.7 mg/L with an average of 3.9 mg/L.

SS content ranged between 5 and 14 mg/L (for stations M8 & M10) with an average of 8 mg/L during mid-flood tide and ranged from 5 to 14 mg/L with an average value of 9 mg/L at the control stations. Again, the results showed no clear gradient effect and no significant difference between control stations and marine-based impact stations. Therefore, the marine-based station

results indicate that during the reporting month the dredging works were not adversely affecting water quality outside the work site boundary.

**Seawater Intake Stations**

**Table 4.7** is a summary of monitoring results from seawater intake stations during mid-ebb tide.

**Table 4.7 - Summary of Mid-Ebb Results for Seawater Intake Stations**

Station		Parameter			
		DO mg/L	DO % Sat.	Turbidity NTU	SS mg/L
M1	min	3.1	47	3.7	5
	max	5.0	76	13.0	12
	avg	3.9	59	8.1	8
	sd	0.5	8	2.7	2
M2	min	2.7	40	4.4	6
	max	4.5	67	12.3	18
	avg	3.5	53	9.0	11
	sd	0.5	8	2.5	4
M3	min	3.0	44	4.1	5
	max	4.6	69	12.6	11
	avg	3.7	54	7.5	8
	sd	0.5	7	2.3	2
M4	min	2.9	43	4.2	4
	max	4.3	65	12.1	15
	avg	3.6	54	7.6	8
	sd	0.4	6	2.4	3
M5	min	2.9	43	4.4	7
	max	5.1	77	13.9	16
	avg	3.8	56	9.0	11
	sd	0.6	10	2.6	3
M6	min	2.4	36	3.9	5
	max	5.2	78	14.9	15
	avg	3.6	53	8.2	9
	sd	2.4	36	3.9	5
M11	min	3.0	45	3.8	6
	max	5.0	76	12.0	12
	avg	4.0	60	7.8	8
	sd	0.6	9	2.4	2
M12	min	2.9	43	3.9	6
	max	5.0	76	10.9	15
	avg	3.7	55	7.5	10
	sd	0.6	9	2.5	3

Seawater intake results during mid-ebb tide, **Table 4.7**, show that DO levels ranged from 2.4 to 5.2 mg/L with an average of 3.7 mg/L. SS ranged between 4 and 18 mg/L with an average value of 9 mg/L. Low DO levels at the intake stations were recorded during the reporting month but investigations found that they were not due to project works. Elevated SS levels were found on 8, 15, 17, 20, 24, 27 and 29 September 2004. These levels were investigated and it was found that they were attributable to poor ambient conditions and/or influences not related to project works.

**Table 4.8** is a summary of monitoring results from seawater intake stations during mid-flood tide.

**Table 4.8 - Summary of Mid-Flood Results for Seawater Intake Stations**

Station		Parameter			
		DO mg/L	DO % Sat.	Turbidity NTU	SS mg/L
M1	min	3.1	47	5.1	6
	max	4.6	70	12.7	12
	avg	3.9	59	9.3	10
	sd	3.1	47	5.1	6
M2	min	3.0	45	5.4	8
	max	4.4	67	13.9	16
	avg	3.6	54	10.1	12
	sd	0.5	7	2.6	3
M3	min	2.7	41	4.9	9
	max	4.6	67	12.3	16
	avg	3.6	53	9.1	12
	sd	0.5	8	1.9	2

Station		Parameter			
		DO mg/L	DO % Sat.	Turbidity NTU	SS mg/L
M4	min	3.0	45	5.3	7
	max	4.7	70	10.6	14
	avg	3.8	57	8.5	10
	sd	0.5	8	1.8	3
M5	min	2.8	43	4.3	6
	max	4.5	67	12.6	13
	avg	3.7	55	8.2	9
	sd	0.5	8	2.5	2
M6	min	2.7	40	4.8	5
	max	4.6	68	12.2	16
	avg	3.6	53	8.9	10
	sd	0.6	9	2.7	3
M11	min	2.9	44	4.9	6
	max	4.7	70	12.1	13
	avg	3.9	58	9.0	9
	sd	0.6	9	2.3	2
M12	min	3.0	45	4.5	6
	max	4.5	67	11.2	19
	avg	3.7	56	8.3	11
	sd	0.5	8	2.5	4

During mid-flood survey, **Table 4.8** shows that DO levels at seawater intake stations ranged from 2.7 to 4.7 mg/L with an average of 3.7 mg/L. SS ranged from 5 to 19 mg/L with an average SS content of 10 mg/L. The above results show that water quality during mid-flood tide was also generally good. Again, low DO levels were found but these were found to be not due to project works. The elevated SS levels found on 8, 15, 17, 20, 24, 27 and 29 September 2004 were investigated and were found that to be attributable to poor ambient conditions and/or influences not related to project works.

#### **4.4.3 Waste Management**

No waste management audit was scheduled within this reporting period. The arrangement of waste management audit is detailed in the Waste Management Plan.

#### **4.4.4 Landscape and Visual**

As the major construction activities undertaken during the reporting month were related to marine works, the landscape and visual impacts are considered to be minimal.

## **5. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE**

### **5.1 Environmental Exceedances**

The total number of exceedances for air, noise and water quality are presented in following sections.

#### **5.1.1 Air Quality**

No air quality monitoring work was undertaken during the reporting period.

#### **5.1.2 Noise Quality**

No noise quality exceedances were recorded during the reporting month.

#### **5.1.3 Water Quality**

During the reporting period, exceedances of the water quality criteria were generally found to be not caused by the project works. The ambient water quality throughout Hong Kong waters was found to be relatively poor, with low DO levels and relatively high SS concentrations being recorded at the control stations on a few occasions. Visual observations of the harbour during the reporting month noted that the water is generally murky and floating debris can be seen throughout Victoria Harbour, including areas well beyond the project site.

Elevated concentrations of SS were recorded on 6, 15, 17, 20, 24, 29 and 29 September 2004. These exceedances were investigated and were found to be attributable to poor ambient conditions and/or influences not related to project works. The investigations found no significant gradient effects between those stations close to the project works and those more remote to the works area. For example, station M12, which is located more than 1 km away from the works area, would record SS levels that are similar to those found at stations closer to the project works.

Additional SS monitoring was also conducted at Queensway Government Offices (QGO) outfall and Culvert J during the reporting month to observe the impacts from outfall discharges. For the exceedances recorded on 24, 27 and 29 September 2004, the additional SS monitoring results indicated that SS levels at the QGO outfall were relatively high. As such, elevated SS levels in the surrounding area (e.g. stations M5 and M6) may be significantly influenced by these discharges. Further, on 29 September, a high SS level was recorded at Culvert J indicating that water quality in the surrounding area (e.g. stations M3 and M4) may be significantly influenced by this discharge.

Although DO levels below the Action and Limit Levels were observed at seawater intake and marine-based stations, investigations found that they were due to natural variation or changes in ambient conditions and not caused by the project marine works. It was noted that when the DO Action and/or Limit Levels were exceeded at the marine-based stations the control stations recorded similarly low DO levels. Further, the results do not show any significant gradient effect between stations close to the marine works and stations more remote to the works area.

The Agriculture, Fisheries and Conservation Department (AFCD) observed red tide occurrences in Hong Kong waters (including Victoria Harbour) during early September. These occurrences have the potential to reduce DO levels in the surrounding waters.

#### **5.1.4 Waste Management**

No non-compliances with regard to waste management were recorded in the reporting month.

#### **5.1.5 Landscape and Visual**

No non-compliance with regard to landscape and visual aspects were recorded in the reporting month.

#### **5.1.6 Site Environmental Audit**

No environmental non-compliances were found during environmental site inspections conducted during the reporting period. A joint site inspection with the IEC was conducted on 23 September 2004, and the IEC's site inspection report is provided in **Annex K**.

During the site inspection conducted on 2 September 2004, the silt curtain used for rock filling works at IRAW was found to be slightly damaged to one side. The Contractor was requested to repair the silt curtain before carrying out further rock filling works in the area. It was also noted that an external contractor was undertaking maintenance work for HSBC's seawater pumping station during the inspection.

The silt curtain used for the grab dredger was found damaged during the inspection carried out on 23 September 2004. The Contractor was asked to stop dredging works until the silt curtain has been repaired or replaced. During the inspection, the Contractor was also reminded that the wheels of dump trucks should be washed before the vehicles leave the site, particularly for the watermains works at CR-10.

### **5.2 Environmental Complaint and Prosecution**

No environmental complaints and no prosecution notices or summons were received during the reporting month.

### **5.3 Environmental Enquiries**

No environmental enquiries were received during the reporting month.

## 6. FORECAST AND SCHEDULE

### 6.1 Key Issues for the Coming Month

The key issues to be considered in the coming month include the following:

- Placing of underlayer and armour rock at IRAW
- Surcharge material works at IRAW and IRAE;
- Remaining dredging works at IRAE;
- Substructure works for the CTB;
- Superstructure works at Pier No. 7;
- Cooling watermain work; and
- Maintenance and necessary repairs to the seawater intake silt screens.

### 6.2 Monitoring Schedules for the Coming Months

Based on the Contractor's programme, the Environmental Monitoring Programme for the next three months is planned as follows:

#### ***TSP (24 hr and 1 hr monitoring)***

Upon commencement of significant dust generating activities within range of the closest air quality sensitive receiver, dependent upon the Contractor's programme.

#### ***Noise (Continuous Measurements)***

The noise monitoring programme throughout the entire construction period is 24-hour continuous.

#### ***Water Quality Monitoring***

The water quality monitoring schedule for the upcoming months is provided in the following table.

**Table 6.1 - Water Quality Monitoring Programme**

Date of Sampling	Sampling Time	
1 October 2004	08:30	13:53
4 October 2004	10:17	15:09
6 October 2004	08:30	17:00
8 October 2004	08:30	17:00
11 October 2004	10:24	17:00
13 October 2004	11:46	17:00
15 October 2004	08:30	14:00
18 October 2004	09:40	15:04
20 October 2004	08:00	17:00

Date of Sampling	Sampling Time	
22 October 2004	08:30	15:35
25 October 2004	10:17	17:00
27 October 2004	11:42	17:00
29 October 2004	08:30	14:00
1 November 2004	09:15	14:07
3 November 2004	07:00	15:23
5 November 2004	08:30	17:00
8 November 2004	08:48	16:01
10 November 2004	10:29	16:40
12 November 2004	11:57	17:00
15 November 2004	08:46	14:02
17 November 2004	11:05	15:33
19 November 2004	08:30	17:00
22 November 2004	08:56	15:42
24 November 2004	10:34	16:38
26 November 2004	11:52	17:00
29 November 2004	08:30	14:00
1 December 2004	09:00	14:37
3 December 2004	08:00	15:48
6 December 2004	08:30	14:21
8 December 2004	08:57	15:14
10 December 2004	10:47	16:14
13 December 2004	08:30	14:00
15 December 2004	09:51	14:45
17 December 2004	11:41	16:52
20 December 2004	08:30	14:04
22 December 2004	09:11	15:15
24 December 2004	10:52	16:08
27 December 2004	12:00	17:00
29 December 2004	09:00	14:00
31 December 2004	10:00	15:00

### 6.3 Construction Programme for the Next 3 Months

The construction programme for the next 3 months is provided in **Annex B** and will be updated by the Contractor.

The ET will follow the Contractor's proposed programme to ensure the compliance of environmental performance and proper implementation of all necessary mitigation measures.

## **7. CONCLUSION**

During the reporting period, exceedances of the water quality criteria were generally found to be not caused by the project works. The ambient water quality throughout Hong Kong waters was found to be relatively poor, with low DO levels and relatively high SS concentrations being recorded at the control stations on a few occasions. Visual observations of the harbour during the reporting month noted that the water is generally murky and floating debris can be seen throughout Victoria Harbour, including areas well beyond the project site.

Due to the poor ambient conditions, low DO levels have been recorded at seawater intake and marine-based stations. Investigations into the low DO levels found that they were not due to project works as control stations recorded similarly low levels.

Elevated SS levels were recorded on several occasions in September 2004. Investigations into these exceedances found that they were generally attributed to ambient conditions and/or influences not related to project works. The results did not show any significant gradient effects between stations located near the works and stations located farther away from the works.

The monitoring work for this reporting month has been independently verified by the Independent Environmental Checker (IEC) and has been found to be in compliance with the requirements of the EM&A programme.