

**Central Reclamation, Phase III
Environmental Monitoring & Audit
Monthly Report No. 19
February 2005**

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| <i>Prepared by :</i> | Albert Chan, ACL - Environmental Consultant | | 14 Mar. 2005 |
| <i>Reviewed by :</i> | Susana Bezy, ACL – ET Leader | | 14 Mar. 2005 |
| <i>Authorised by :</i> | Jon Varndell, ACL – Project Mgr | | 14 Mar. 2005 |
| <i>Distribution</i> | | | |
| <i>Copy No</i> | <i>Issue to</i> | <i>Attention</i> | <i>Corr. Ref.</i> |
| 1 | CEDD | Mr H H Yeung | 3128/M45/200/OC6976/al |
| 2, 3 | EPD | Mr M W Ho | 3128/M45/200/OC6976/al |
| 4 | EPD (LCO) | Mr Samson Cheng | 3128/M45/200/OC6976/al |
| 5 | Leighton-China State-Van Oord JV | Mr Malcolm Plummer | 3128/M45/200/OC6976/al |
| 6 | CRIII Sites/PRE | Mr Douglas Miller | 3128/M45/200/OC6976/al |
| 7 | Independent Checker (Environment) | Mr Bill Douglas | 3128/M45/200/OC6976/al |
| 8 | Environmental Team Leader | Ms Susana Bezy | 3128/M45/200/OC6976/al |
| 9 | Office Copy | | |
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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 nineteenth 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 28 February 2005.

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 3, 17 and 24 February 2005.
- Noise monitoring was performed continuously for 24 hours.
- Water quality monitoring was undertaken on the following days:
 - 2 February 2005
 - 4 February 2005
 - 7 February 2005
 - 14 February 2005
 - 16 February 2005
 - 18 February 2005
 - 21 February 2005
 - 23 February 2005
 - 25 February 2005
 - 28 February 2005

Exceedance of Action and Limit Levels

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

No noise quality exceedances were recorded during February 2005.

Elevated SS levels were recorded on 2, 7, 23 and 28 February 2005. The exceedances recorded on 7 and 28 February were investigated and found to be attributable to silty discharges not related to the project works. However, the exceedances recorded on 2 and 23 February were found to be caused by the sand filling works at IRAE. All parties were immediately informed of the exceedances and the Contractor relocated the impervious silt curtains closer to the sand filling works in order to reduce SS dispersion. This is now the standard practice adopted by the Contractor to avoid further exceedances. Subsequent site inspections did not find any sediment plumes in the area.

One DO exceedance was recorded on 14 February 2005. An investigation found that the DO exceedance was not attributed to project works but to natural variations in ambient conditions.

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 3, 17 and 24 February 2005. A joint inspection was carried out with the IEC on 24 February 2005.

It is noted that the Contractor has commenced excavation to bored piling at the Eastern Seawall prior to obtaining a marine dumping permit. A meeting amongst the Contractor, EPD, ER, ET and CEDD has been scheduled in early March 2005 to discuss this work.

Key Works for the Coming Month

Future key works are as follows:

- Architectural works for Pier No. 7;
- Pile shaft excavation and obstruction removal at Public Pier West;
- Piling work, including pile head trimming and pile cap construction at Pier No. 8;
- Cooling water main construction at Lung Wui Road;
- Sand filling works at IRAE;
- Land piling works and superstructure construction works for the Central Terminal Building (CTB);
- Advanced dredging at FRAW;
- Seawall construction at IRAE;
- Temporary seawall construction at IRAE;
- Rock filling and rock mound trimming at IRAE;
- In-situ work for the pumping station and caissons installed at IRAE;
- Temporary works for piling at the Man Yiu Street Footbridge;
- Remedial works for existing Culvert F;
- Excavation to bored piling at Eastern Seawall;
- Ballast material filling to pre-cast units; and
- Maintenance and necessary repair works for seawater intake silt screens.

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 nineteenth monthly EM&A Report under the EIAO, which presents the results of EM&A work conducted during the period from 1 to 28 February 2005, inclusive.

2. ENVIRONMENTAL STATUS

2.1 Works Undertaken

The works undertaken during the reporting month include obstruction clearing for marine piles, piling work and preparation work for pipe cap construction at Pier 8, sand filling works and rock profile trimming at IRAE, deep compaction works at IRAW, in-situ work for pumping stations, seawall block installations, landside cooling watermain works, superstructure and land piling works for the Central Terminal Building (CTB), temporary drainage diversion and land piling for the Man Yiu Street footbridge, Eastern Seawall construction works, temporary intake pipes installation and maintenance and necessary repair work for seawater intake silt screens. It was noted that no works were carried out between 8 and 14 February 2005 due to the Chinese New Year holiday. Additionally, it is noted that the Contractor has commenced excavation to bored piling for the Eastern Seawall prior to obtain a marine dumping permit.

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 |
|------|---|---------------------|---------------|
| 1 | <i>Application for a Permit to Dump Material (Category L Sediment) at Sea Under the Dumping at Sea Ordinance – Supplementary Information (Ref. H2189/U2c/12330/MP/EY/ST/ec)</i> | 25 February 2005 | – |
| 2 | <i>Application for a Permit to Dump Material (Category H & M Sediment) at Sea Under the Dumping at Sea Ordinance – Supplementary Information (Ref. H2189/U2c/12329/MP/EY/ST/ec)</i> | 25 February 2005 | – |
| 3 | <i>Terminate Employment of Hopper Barge (HB 1040S) for Dumping Operation Under the Dumping at Sea Ordinance (Ref. H2189/U2c/12338/MP/EY/ST/ec).</i> | 25 February 2005 | – |
| 4 | <i>Application for Renewal of Construction Noise Permit (GW-RS0491-04) for Man Yiu Street & Culvert F) (Ref. H2189/U2c/12253/MP/DC/CKA/ST/ec).</i> | 22 February 2005 | – |
| 5 | <i>Application for Construction Noise Permit for Night-time works for Pier 8 & Public Pier West (Ref. H2189/U2c/12252/MP/DC/JA/ST/ec)</i> | 22 February 2005 | – |
| 6 | <i>Application for Construction Noise Permit for Site at Lung Wui Road and Junction of Performing Arts Avenue & Fenwick Pier (Ref. H2189/U2c/12282/MP/DC/KTY/ST/ec).</i> | 22 February 2005 | – |
| 7 | <i>Application for Construction Noise Permit for IRAE & Caissons at IRAE (Ref. H2189/U2c/12179/MP/EY/DS/ST/ec).</i> | 18 February 2005 | – |
| 8 | <i>Application for a Permit to Dump Material (Category M & H Dredged Sediment) at Sea Under the Dumping at Sea Ordinance (Ref. H2189/U2c/12211/MP/EY/ST/cm).</i> | 18 February 2005 | – |
| 9 | <i>New Construction Noise Permits GW-RS0069-05 & PP-RS0005-05 (Ref. H2189/C1/12165/MP/DC/ST/atm).</i> | 15 February 2005 | – |
| 10 | <i>New Dumping Permits (EP/MD/05-0113 & EP/MD/05-114) (Ref. H2189/C1/12150/MP/EY/ST/atm).</i> | 14 February 2005 | – |
| 11 | <i>New Construction Noise Permit GW-RS0043-05) (Ref. H2189/C1/12109/MP/DC/ST/atm).</i> | 7 February 2005 | – |
| 12 | <i>Application for a Permit to Dump Material (Uncontaminated Sediment) at Sea Under the Dumping at Sea Ordinance (Ref. H2189/U2c/12096/MP/EY/JA/ST/ec).</i> | 5 February 2005 | – |
| 13 | <i>Application for Renewal of Construction Noise Permit (GW-RS-0031-05) (Ref. H2189/U2c/12004/MP/EY/DS/ST/ec).</i> | 2 February 2005 | – |
| 14 | <i>Application for Construction Noise Permit for Unloading, Transporting and Storage of Pre-cast Caisson Units (IRAE Package 2) (Ref. H2189/U2c/11972/MP/EY/ST/ec)</i> | 1 February 2005 | – |

2.3 Environmental Document Submission

A summary of the status of the submissions provided during the reporting month is presented in

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

Table 2.2.

| Item | Document Title | Version | Date of Submission to ER |
|------|--|---------|--------------------------|
| 1 | <i>New Construction Noise Permits GW-RS0069 & PP-RS0005-05) (Ref. H2189/C1/12165/MP/DC/ST/atm).</i> | - | 15 February 2005 |
| 2 | <i>New Marine Dumping Permits (EP/MD/05-0113 & EP/MD/05-114) (Ref. H2189/C1/12150/MP/EY/ST/atm).</i> | - | 14 February 2005 |
| 3 | <i>New Construction Noise Permit GW-RS0043-05 (Ref. H2189/C1/12109/MP/DC/ST/atm).</i> | - | 7 February 2005 |
| 5 | <i>New Construction Noise Permit GW-RS0044-05 (Ref. H2189/C1/12065/MP/ST/atm).</i> | - | 4 February 2005 |

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. 18 - January 2005</i> | <i>3128/M45/200/OC6893/AC/al</i> | 14 February 2005 | - |
| 2 | <i>Certification of Quarterly EM&A Report No. 6 for November 2004 through January 2005</i> | <i>3128/HK12/02/M45/200/OC6893/AC/al</i> | 14 February 2005 | - |
| 3 | <i>Variation of FEP Condition 3.2(a) – Advanced Dredging in FRAW for Caisson Storage</i> | <i>3128/HK12/02/M45/200/OC6889/SB/al</i> | 14 February 2005 | - |

2.4 Environmental Meetings

No environmental meetings were held during the reporting month.

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 ₁₀ , L ₉₀ | 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 floating type impervious silt curtains for sand filling works at IRAE 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 February 2005

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 3, 17 and 24 February 2005.

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. No construction works were conducted between 8 and 14 February 2005 due to the Chinese New Year holiday. As such, no monitoring was conducted during this period. Further, site access to the City Hall monitoring station was restricted during 17 and 18 February 2005 due to special events at City Hall.

Impact water quality monitoring at all monitoring stations was undertaken during this reporting month. The water quality monitoring schedule for February 2005 is presented in **Table 4.1**.

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

| Date of Sampling | Tidal State | Timing of Sampling |
|------------------|-------------|--------------------|
| 2 February 2005 | Mid Ebb | 15:13 - 18:30 |
| | Mid Flood | 10:40 - 13:50 |
| 4 February 2005 | Mid Ebb | 07:28 - 10:47 |
| | Mid Flood | 12:12 - 14:57 |
| 7 February 2005 | Mid Ebb | 09:58 - 12:43 |
| | Mid Flood | 14:37 - 17:05 |
| 14 February 2005 | Mid Ebb | 14:33 - 18:05 |
| | Mid Flood | 08:52 - 13:20 |
| 16 February 2005 | Mid Ebb | 16:58 - 20:30 |
| | Mid Flood | 10:40 - 14:05 |
| 18 February 2005 | Mid Ebb | 15:34 - 19:00 |
| | Mid Flood | 08:32 - 12:24 |
| 21 February 2005 | Mid Ebb | 09:29 - 13:03 |
| | Mid Flood | 14:24 - 17:10 |
| 23 February 2005 | Mid Ebb | 10:28 - 13:48 |
| | Mid Flood | 15:28 - 18:03 |
| 25 February 2005 | Mid Ebb | 12:16 - 14:59 |
| | Mid Flood | 07:37 - 10:45 |
| 28 February 2005 | Mid Ebb | 13:28 - 16:15 |
| | Mid Flood | 07:41 - 11:15 |

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 |

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"> This instrument was portable and weatherproof and used a DC power source. The equipment was capable of measuring: DO levels in the range of 0-20 mg/l and 0-200% saturation; and Temperature of between 0 - 45 degree Celsius. 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. |
| Turbidity Measurement Instrument | <p>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.</p> |
| PH | <p>A MP125 pH Meter from Mettler Toledo was used to measure pH.</p> |
| Salinity / Conductivity Meter | <p>A Salinity / Conductivity meter YSI model 63 and model 30 was used for determining salinity concentrations.</p> |
| Sample Containers and Storage | <p>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.</p> |

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 | 28 January 2005 |
| Turbidimeter | Every 3 months for secondary standards; meter is calibrated prior to each measurement to the secondary standards | 26 January 2005 |
| pH Meter | Prior to each sampling day | – |
| Pyschrometer | Every 6 months | 19 February 2005 |
| 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 | 5.6 | 5.7 | 69 | 1.7 | 3 |
| | max | 7.5 | 7.3 | 93 | 4.5 | 6 |
| | avg | 6.7 | 6.7 | 83 | 3.2 | 4 |
| | sd | 0.6 | 0.5 | 7 | 0.9 | 1 |
| C2 | min | 5.6 | 5.5 | 69 | 2.0 | 3 |
| | max | 7.6 | 7.8 | 95 | 3.9 | 5 |
| | avg | 6.8 | 6.7 | 83 | 3.2 | 4 |
| | sd | 0.7 | 0.8 | 9 | 0.7 | 1 |
| M7 | min | 5.5 | 5.6 | 67 | 1.9 | 3 |
| | max | 7.6 | 7.3 | 91 | 4.5 | 6 |
| | avg | 6.4 | 6.5 | 79 | 3.1 | 4 |
| | sd | 0.7 | 0.6 | 8 | 0.9 | 1 |
| M8 | min | 5.5 | 5.5 | 67 | 2.1 | 3 |
| | max | 7.8 | 7.6 | 95 | 4.4 | 6 |
| | avg | 6.7 | 6.7 | 82 | 3.4 | 4 |
| | sd | 0.7 | 0.7 | 9 | 0.8 | 1 |

| Station | | Parameter | | | | |
|---------|-----|---------------|-------------|----------------|--------------------|--------------|
| | | DO (S&M) mg/L | DO (B) mg/L | DO % Sat. (DA) | Turbidity (DA) NTU | SS (DA) mg/L |
| M9 | min | 5.6 | 5.4 | 68 | 1.7 | 3 |
| | max | 7.6 | 7.7 | 93 | 5.4 | 5 |
| | avg | 6.5 | 6.6 | 81 | 3.4 | 4 |
| | sd | 0.5 | 0.6 | 7 | 1.2 | 1 |
| M10 | min | 5.6 | 5.5 | 68 | 1.9 | 3 |
| | max | 7.6 | 7.3 | 91 | 4.8 | 6 |
| | avg | 6.7 | 6.6 | 82 | 3.1 | 4 |
| | sd | 0.6 | 0.6 | 7 | 0.9 | 1 |

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 5.5 and 7.8 mg/L with an average value of 6.7 mg/L and DO measurements in the bottom layer ranged from 5.5 to 7.6 mg/L with an average level of 6.7 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 5.6 to 7.6 mg/L with an average value of around 6.8 mg/L; DO measurements in the bottom layer ranged between 5.5 and 7.8 mg/L with an average level of 6.7 mg/L.

SS levels during mid-ebb tide ranged from 3 to 6 mg/L with an average value of 4 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 3 to 6 mg/L with an average of 4 mg/L. Generally, the results showed no clear gradient effect, 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 | 5.7 | 5.7 | 70 | 1.9 | 3 |
| | max | 7.6 | 7.3 | 94 | 5.8 | 5 |
| | avg | 6.7 | 6.6 | 83 | 3.4 | 4 |
| | sd | 0.5 | 0.5 | 6 | 1.2 | 1 |
| C2 | min | 5.7 | 5.6 | 69 | 2.0 | 3 |
| | max | 7.5 | 7.7 | 95 | 4.9 | 6 |
| | avg | 6.8 | 6.6 | 83 | 3.0 | 4 |
| | sd | 0.5 | 0.6 | 7 | 0.9 | 1 |
| M7 | min | 5.5 | 5.5 | 67 | 2.7 | 3 |
| | max | 7.0 | 7.1 | 87 | 7.0 | 7 |
| | avg | 6.3 | 6.4 | 79 | 4.0 | 5 |
| | sd | 0.5 | 0.5 | 6 | 1.4 | 1 |

| Station | | Parameter | | | | |
|---------|-----|---------------|-------------|----------------|--------------------|--------------|
| | | DO (S&M) mg/L | DO (B) mg/L | DO % Sat. (DA) | Turbidity (DA) NTU | SS (DA) mg/L |
| M8 | min | 5.5 | 5.6 | 68 | 2.1 | 3 |
| | max | 7.4 | 7.5 | 93 | 4.6 | 5 |
| | avg | 6.7 | 6.8 | 83 | 3.2 | 4 |
| | sd | 0.6 | 0.6 | 8 | 0.8 | 1 |
| M9 | min | 5.4 | 5.4 | 67 | 2.4 | 3 |
| | max | 7.1 | 7.2 | 88 | 6.2 | 5 |
| | avg | 6.4 | 6.5 | 80 | 3.7 | 4 |
| | sd | 0.5 | 0.5 | 6 | 1.3 | 1 |
| M10 | min | 5.5 | 5.6 | 68 | 2.0 | 3 |
| | max | 7.3 | 7.2 | 91 | 4.9 | 5 |
| | avg | 6.6 | 6.6 | 82 | 3.3 | 4 |
| | sd | 0.6 | 0.5 | 7 | 0.9 | 1 |

During mid-flood tide, DO levels at marine-based impact stations (M8 & M10) in the surface to middle layer ranged from 5.5 to 7.4 mg/L with an average level of 6.7 mg/L while DO values in the bottom layer ranged between 5.6 and 7.5 mg/L with an average of 6.7 mg/L. Similar DO concentrations were recorded at the control stations in the surface to middle layer during mid-flood survey ranged between 5.7 and 7.6 mg/L with an average value of 6.8 mg/L and DO results in the bottom layer ranged from 5.6 and 7.7 mg/L with an average of 6.6 mg/L.

SS content ranged between 3 and 5 mg/L (for stations M8 & M10) with an average of 4 mg/L during mid-flood tide and ranged from 3 to 6 mg/L with an average value of 4 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 | 5.4 | 68 | 3.4 | 4 |
| | max | 7.0 | 89 | 23.1 | 32 |
| | avg | 6.2 | 77 | 6.7 | 9 |
| | sd | 0.6 | 6 | 5.9 | 8 |

| Station | | Parameter | | | |
|---------|-----|-----------|-----------|---------------|---------|
| | | DO mg/L | DO % Sat. | Turbidity NTU | SS mg/L |
| M2 | min | 4.3 | 54 | 3.6 | 6 |
| | max | 6.9 | 84 | 7.5 | 10 |
| | avg | 5.9 | 72 | 5.1 | 8 |
| | sd | 0.7 | 8 | 1.0 | 1 |
| M3 | min | 4.4 | 56 | 3.2 | 4 |
| | max | 6.8 | 85 | 6.7 | 8 |
| | avg | 5.9 | 73 | 4.5 | 7 |
| | sd | 0.7 | 8 | 1.2 | 1 |
| M4 | min | 4.3 | 54 | 1.8 | 3 |
| | max | 6.7 | 82 | 6.5 | 9 |
| | avg | 5.9 | 73 | 3.6 | 5 |
| | sd | 0.7 | 8 | 1.7 | 2 |
| M5 | min | 4.6 | 59 | 2.7 | 4 |
| | max | 7.0 | 85 | 25.0 | 29 |
| | avg | 6.0 | 75 | 7.8 | 10 |
| | sd | 0.6 | 7 | 8.6 | 10 |
| M6 | min | 4.1 | 53 | 2.5 | 4 |
| | max | 6.7 | 83 | 14.0 | 16 |
| | avg | 5.9 | 72 | 5.2 | 7 |
| | sd | 0.7 | 8 | 3.8 | 4 |
| M11 | min | 4.9 | 62 | 2.6 | 3 |
| | max | 8.8 | 107 | 4.9 | 7 |
| | avg | 6.5 | 80 | 3.6 | 5 |
| | sd | 1.0 | 12 | 0.8 | 1 |
| M12 | min | 3.7 | 47 | 3.2 | 3 |
| | max | 7.3 | 86 | 5.8 | 12 |
| | avg | 6.1 | 74 | 4.4 | 7 |
| | sd | 1.0 | 11 | 1.0 | 3 |

Seawater intake results during mid-ebb tide, **Table 4.7**, show that DO levels ranged from 3.7 to 8.8 mg/L with an average of 6.0 mg/L. SS ranged between 3 and 32 mg/L with an average value of 7 mg/L. Elevated SS levels were recorded on 2 and 7 February during mid-ebb tide sampling.

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 | 5.5 | 70 | 3.0 | 5 |
| | max | 6.8 | 85 | 7.3 | 9 |
| | avg | 6.2 | 76 | 4.8 | 6 |
| | sd | 0.4 | 5 | 1.4 | 1 |

| Station | | Parameter | | | |
|---------|-----|-----------|-----------|---------------|---------|
| | | DO mg/L | DO % Sat. | Turbidity NTU | SS mg/L |
| M2 | min | 4.8 | 58 | 2.8 | 5 |
| | max | 6.6 | 82 | 10.5 | 10 |
| | avg | 5.7 | 71 | 5.4 | 8 |
| | sd | 0.6 | 7 | 2.1 | 2 |
| M3 | min | 4.9 | 58 | 3.2 | 5 |
| | max | 6.8 | 85 | 7.0 | 9 |
| | avg | 5.8 | 72 | 4.5 | 7 |
| | sd | 0.6 | 8 | 1.2 | 1 |
| M4 | min | 4.9 | 59 | 2.3 | 5 |
| | max | 7.1 | 88 | 31.2 | 36 |
| | avg | 5.9 | 73 | 7.2 | 10 |
| | sd | 0.7 | 8 | 8.9 | 10 |
| M5 | min | 5.0 | 60 | 2.6 | 4 |
| | max | 7.4 | 92 | 11.5 | 18 |
| | avg | 6.1 | 75 | 4.0 | 6 |
| | sd | 0.7 | 9 | 2.6 | 4 |
| M6 | min | 4.9 | 59 | 2.8 | 4 |
| | max | 7.0 | 86 | 12.0 | 14 |
| | avg | 6.0 | 74 | 4.3 | 6 |
| | sd | 0.8 | 10 | 2.7 | 3 |
| M11 | min | 5.7 | 70 | 2.3 | 4 |
| | max | 7.1 | 87 | 4.4 | 8 |
| | avg | 6.4 | 78 | 3.6 | 6 |
| | sd | 0.5 | 6 | 0.8 | 1 |
| M12 | min | 4.7 | 56 | 2.3 | 4 |
| | max | 7.2 | 89 | 5.3 | 9 |
| | avg | 6.1 | 76 | 3.6 | 6 |
| | sd | 0.7 | 9 | 0.9 | 2 |

During mid-flood survey, **Table 4.8** shows that DO levels at seawater intake stations ranged from 4.7 to 7.4 mg/L with an average of 6.0 mg/L. SS ranged from 4 to 36 mg/L with an average SS content of 7 mg/L. The above results show that water quality during mid-flood tide was also generally good. Elevated SS levels were found on 23 and 28 February 2005 during mid-flood tide sampling.

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 period.

5.1.3 Water Quality

Water quality was found to be generally good during the reporting month. However, elevated SS levels were recorded on 2, 7, 23 and 28 February 2005. The exceedances recorded on 7 and 28 February were investigated and found to be attributable to silty discharges not related to the project works. The silty discharge on 7 February was located adjacent to the HSBC seawater intake. The discharge on 28 February came from Outfall K and was likely caused by the flushing of storm drains during the rainy weather. Information about these discharges has been reported to EPD for their record and investigation.

The exceedances recorded on 2 and 23 February were found to be caused by the sand filling works at IRAE. All parties were immediately informed of the exceedances and the Contractor relocated the impervious silt curtains closer to the sand filling works in order to reduce SS dispersion. The Contractor also increased the frequency of maintenance for the seawater intake silt screens. Subsequent site inspections did not find any sediment plumes in the area.

One DO exceedance was recorded on 14 February 2005. An investigation found that the DO exceedance was attributed to natural variations in ambient conditions and not caused by project works.

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 summary of the findings from the site inspections conducted during the reporting month is provided in **Table 5.1**.

Table 5.1 - Summary of Environmental Site Inspections

| Date of Inspection | Observations | Action(s) |
|---------------------------|--|--|
| 3 February 2005 | An unmarked container was found at CR-12. | The Contractor was asked to attach a proper label to the container. |
| 17 February 2005 | A sedimentation tank at CR-10 was found to be overflowing. However, the water in the tank appears to be clean. | The Contractor was advised to switch off the sump pump whenever possible to prevent further overflows. |
| | No sediment plumes were observed. | No actions required. |
| 24 February 2005 | A waste oil drum was found at CR-12. | The Contractor was asked to properly store the waste oil container at the Chemical Waste Storage Area. |
| | Some mud was found on the road surface at the site entrance to Pier 7. | The Contractor was advised to clean the site entrance and the access road regularly. |

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 Works for the Coming Month

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

- Architectural works for Pier No. 7;
- Pile shaft excavation and obstruction removal at Public Pier West;
- Piling works including pile cap and beam construction at Pier 8;
- Sand filling at IRAE;
- Land piling works and substructure construction for the Central Terminal Building (CTB);
- Land piling work for the Man Yiu Street Footbridge;
- Seawall construction at IRAE;
- PLA temporary intake pipe construction;
- Cooling watermain work at Lung Wui Road;
- In-situ work to installed caissons and pumping stations at IRAE;
- Dredging and rock filling for temporary storage of caisson units at FRAW;
- Install filter layer to rock mound at IRAE;
- Remedial work for Culvert F;
- Rock excavation to bored piling at Eastern Seawall;
- Ballast material filling to caisson units and IRAE; and
- Maintenance and necessary repair works for 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 | |
|------------------|---------------|-------|
| 2 March 2005 | 09:42 | 16:13 |
| 4 March 2005 | 10:25 | 17:00 |
| 7 March 2005 | 10:32 | 15:08 |
| 9 March 2005 | 12:00 | 17:00 |
| 11 March 2005 | 08:30 | 13:30 |
| 14 March 2005 | 08:43 | 15:01 |
| 16 March 2005 | 09:26 | 16:30 |
| 18 March 2005 | 08:30 | 17:00 |
| 21 March 2005 | 09:52 | 17:00 |
| 23 March 2005 | 11:28 | 16:44 |
| 25 March 2005 | 12:00 | 17:00 |
| 28 March 2005 | 08:30 | 13:51 |
| 30 March 2005 | 08:30 | 15:01 |
| 1 April 2005 | 09:03 | 16:58 |
| 4 April 2005 | 09:20 | 13:43 |
| 6 April 2005 | 11:01 | 16:23 |
| 8 April 2005 | 12:00 | 17:00 |
| 11 April 2005 | 08:30 | 13:55 |
| 13 April 2005 | 08:30 | 15:08 |
| 15 April 2005 | 08:30 | 16:33 |
| 18 April 2005 | 08:30 | 17:00 |
| 20 April 2005 | 10:26 | 15:28 |
| 22 April 2005 | 11:18 | 17:00 |
| 25 April 2005 | 08:30 | 13:30 |
| 27 April 2005 | 08:30 | 13:59 |
| 29 April 2005 | 08:30 | 15:45 |
| 2 May 2005 | 08:30 | 17:00 |
| 4 May 2005 | 09:52 | 15:16 |
| 6 May 2005 | 11:10 | 17:00 |
| 9 May 2005 | 08:30 | 13:30 |
| 11 May 2005 | 08:30 | 14:06 |
| 13 May 2005 | 08:30 | 15:04 |
| 16 May 2005 | 08:30 | 17:00 |
| 18 May 2005 | 08:53 | 13:37 |
| 20 May 2005 | 10:09 | 16:06 |
| 23 May 2005 | 11:46 | 17:00 |

| Date of Sampling | Sampling Time | |
|------------------|---------------|-------|
| 25 May 2005 | 08:30 | 13:30 |
| 27 May 2005 | 08:30 | 14:56 |
| 30 May 2005 | 10:37 | 17:00 |

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

Generally, the ambient water quality was found to be in relatively good condition for February 2005. However, exceedances of the water quality criteria were recorded on a few occasions.

SS exceedances were recorded on 2, 7, 23 and 28 February 2005. The exceedances recorded on 7 and 28 February were investigated and found to be attributable to silty discharges not related to the project works. However, the exceedances recorded on 2 and 23 February were found to be caused by the sand filling works at IRAE. All parties were immediately informed of the exceedances and the Contractor relocated the impervious silt curtains closer to the sand filling works in order to reduce SS dispersion. Subsequent site inspections did not find any sediment plumes in the area.

One DO exceedance was recorded on 14 February 2005. An investigation found that the DO exceedance was not attributed to project works but to natural variations in ambient conditions.

Measures now have been undertaken by the Contractor to prevent exceedances of water quality Action & Limit Levels from occurring. These include the installation of floating type impervious silt curtains close to sand filling works at IRAE and increased maintenance of the seawater intake silt screens.

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.