

China Harbour Engineering Company (Group)

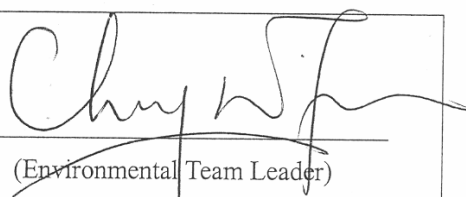
Contract No. CV/2002/09

**Tai O Development
Sheltered Boat Anchorage**

**Environmental Monitoring and Audit
Quarterly Report (July 2003 – September 2003)**

(Version 1.0)

Certified By



(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

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EXECUTIVE SUMMARY

1. This is the second Environmental Monitoring and Audit (EM&A) Quarterly Summary Report prepared by Cinotech Consultants Limited (the Environmental Team, ET) for the project “Tai O Development – Sheltered Boat Anchorage” (the Project). This summary report presents EM&A works performed in the period between July 2003 and September 2003.
2. The construction activities undertaken in the reporting quarter were:
 - Dredging works;
 - Ground investigation (land and marine);
 - Site investigation;
 - Mangrove fencing work;
 - Diving inspection;
 - Intertidal Archaeological Survey;
 - Rock filling at loading jetty

Environmental Monitoring Works

3. Environmental monitoring for the Project was performed regularly as stipulated in the EM&A Manual and the results were checked and reviewed. Site audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
4. Summary of the non-compliance of the reporting period is tabulated Table I.

Table I Summary Table for Non-compliance Recorded in the Reporting Month

Media / Nature	No of Exceedances		Action Taken	Results of action taken	Remarks
	Action Level	Limit Level			
Noise	0	1	N.A.	N.A.	The exceedance was not due to the Project works.
Water Quality					
DO	41	452	N.A.	N.A.	The exceedances were not due to the Project works.
Turbidity	13	97			
SS	11	97			

Construction Noise

5. All construction noise monitoring was conducted as scheduled in the reporting period.
6. As the Contractor has granted the Construction Noise permit on restricted hours including 1900 – 2300 on weekdays and General Holidays including Sundays (CNP nos. GW-UW0185-03 and GW-UW0285-03), noise monitoring works on restricted hour were conducted.
7. No noise limit level exceedance was recorded, except the restricted hour monitoring event at N11 on 31 August 2003 for restricted hour monitoring. According to the field observation, the dominated noise sources were road and marine traffic, idling vehicle and people/tourist in the Bus Terminal. The exceedance was considered not due to the Project.

Water Quality

8. Water quality monitoring was conducted as scheduled in the reporting period, except the monitoring events on 25th August during Mid-ebb tide and 3rd September 2003 during both Mid-ebb and Mid-flood tides. The aforementioned monitoring events were cancelled due to inclement weather.
9. A total of 13 Action Level and 97 Limit Level exceedances for turbidity were record. For suspended solids (SS), a total of 11 Action Level and 97 Limit Level exceedances were recorded in the reporting period.
10. A total of 41 Action Level and 452 Limit Level exceedances for DO were reported in the reporting quarter. However, no direct evidence showed that the exceedances were due to the Project works and the exceedances were all considered to be invalid.

Environmental Complaint and Prosecution

11. No environmental prosecution or complaint was received during the reporting quarter.

Environmental Licensing and Permitting

12. License/Permits granted to the Project include the Environmental Permit (EP), Waste Disposal (Chemical Waste) License, Marine Dumping Permits and Construction Noise Permits (CNP).

Future Key Issues

13. Dredging works and site investigation works will be the major construction activities for the coming quarter. The anticipated environmental impact will be mainly on noise and water quality due to dredging works.

1. INTRODUCTION

- 1.1 Tai O was formerly one of the largest fishing villages in Hong Kong and was a historical case for fishing boats in the western approaches of Lantau Island and the Pearl River estuary. However, the importance of the fishing industry in Tai O has declined in recent decades, which has resulted in a degradation of its population base.
- 1.2 The formation of the Tai O sheltered boat anchorage is fully supported by the Islands Provisional District Board members and is widely seen as a means of reviving the town's local fishing industry and contributing to the revitalization of Tai O.
- 1.3 Previous consultancies undertaken on behalf of the Civil Engineering Department (CED) to determine the feasibility of construction a sheltered boat anchorage (Agreement No. CE 41/98) Environmental and Drainage Impact Assessment for the Tai O Sheltered Boat Anchorage Study. The original development scheme comprised an 8 ha anchorage for 220 vessels and about 1 ha reclamation for boat maintenance facilities, parking area, bus terminus and a loading/unloading bay.
- 1.4 The original development scheme has been gazetted under the Foreshore & Sea-bed (Reclamations) Ordinance in December 2000. Following public consultation and interdepartmental discussion, the scope of the scheme was revised in the adoption of the current development scheme with a reduced area of boat anchorage, shortened breakwater and reduced area of reclamation.
- 1.5 The project now comprises construction of a 4 ha sheltered boat anchorage for small boats/fishing vessels and a breakwater of about 350 m length, formation of about 0.22 ha of land for a future bus terminus, construction of a 0.23 ha promenade, site formation and associated engineering works for a mangrove planting area and restoration of the existing historic seawall.
- 1.6 An Environmental Permit No. EP-144/2002 was issued on 11 Sep 2002 for this project (EP) to the Civil Engineering Department as Permit Holder. An updated Environmental Monitoring and Audit Manual (the EM&A Manual) was prepared to fulfill requirement stipulated in Condition 2.3 of the EP.
- 1.7 The works of the Project is constructed under CED's construction Contract No. CV/2002/09 "Tai O Development – Sheltered Boat Anchorage". The site layout of the Project is shown in Figure 1.1. The Project works were commenced on 14th April 2003.
- 1.8 Cinotech Consultants Limited was commissioned by the China Harbour Engineering Company (Group) (the Contractor) to undertake the Environmental Team (ET) Services for the Project. This is the second quarterly EM&A report summarizes the EM&A works for the Project in the period between July 2003 and September 2003.

2. PROJECT CHARACTERISTICS

Project Organization and Contacts of Key Management

- 2.1 An organization structure and the line of communication were set up for the Project between the Project Proponent, Engineer Representative (ER), Independent Environmental Checker (IEC), the Contractor and Environmental Team (ET). The organization chart and contact details are shown in Appendix A and Figure 1.2.

Construction Programme and Synopsis of Work

- 2.2 The construction programme is presented in Appendix B. The site activities during the reporting period are summarized in Table 2.1.

Table 2.1 Summary of Works Undertaken in the Reporting Months

Item	Work Activity	Month		
		Jul 03	Aug 03	Sep 03
1.	Dredging works	✓	✓	✓
2.	Ground investigation (land and marine)	✓	✓	-
3.	Site investigation	✓	✓	✓
4.	Mangrove fencing work	✓	✓	✓
5.	Diving inspection	✓	✓	-
6.	Intertidal Archaeological Survey	✓	✓	-
7.	Rock filling at loading jetty	-	-	-

3. ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

Monitoring Parameters and Monitoring Locations

- 3.1 The EM&A Manual designate locations for the ET to monitor environmental impacts in terms of noise and water quality due to the Project. The Project area and monitoring locations are depicted in Figures 2.1 and 3.1. Appendix C gives details of monitoring requirements.

Monitoring Methodology and Calibration Details

- 3.2 Monitoring works/equipments were conducted/calibrated regularly in accordance with the EM&A Manual. Copies of calibration certificates are attached in the appendices of the Monthly Reports.

Environmental Quality Performance Limits (Action and Limit Levels)

- 3.3 The environmental quality performance limits, i.e. Action and Limit Levels were derived from the baseline monitoring results. Should the measured environmental quality parameters exceed the Action/Limit Levels, the respective action plans would be implemented. The Action/Limit Levels for each environmental parameter are given in Appendix D.

Environmental Mitigation Measures

- 3.4 Relevant mitigation measures as recommended in the project EIA report have been stipulated in the EM&A Manual for the Contractor to implement. A list of mitigation measures is given in Appendix G.

4. MONITORING RESULTS

Weather Conditions

- 4.1 The weather during monitoring sessions was mainly sunny or rainy. The weather conditions for each individual monitoring session were presented in the field record sheets.

Noise

- 4.2 All construction noise monitoring was conducted as scheduled in the reporting period.
- 4.3 As the Contractor has granted the Construction Noise permit on restricted hours including 1900 – 2300 on weekdays and General Holidays including Sundays (CNP nos. GW-UW0185-03 and GW-UW0285-03), noise monitoring works on restricted hour were conducted.
- 4.4 No noise limit level exceedance was recorded, except the restricted hour monitoring event at N11 on 31 August 2003 for restricted hour monitoring. According to the field observation, the dominated noise sources were road and marine traffic, idling vehicle and people/tourist in the Bus Terminal. The exceedance was suspected not due to the Project.

Water Quality

- 4.5 Water quality monitoring was conducted as scheduled in the reporting period, except the monitoring events on 25th August during Mid-ebb tide and 3rd September 2003 during both Mid-ebb and Mid-flood tides. The aforementioned monitoring events were cancelled due to inclement whether.

Turbidity and SS

- 4.6 A total of 13 Action Level and 97 Limit Level exceedances for turbidity were record. For suspended solids (SS), a total of 11 Action Level and 97 Limit Level exceedances were recorded in the reporting period.
- 4.7 The turbidity and SS level exceedances were considered not directly related to the Project due to the followings reasons:
- Exceedance of SS and Turbidity levels were recorded at W1, W2, W3 and W4 whereas those of stations A1, A2 and W5 were closer to the project site. This can be explained by the fact that the SS and turbidity were brought about from the Pearl River Delta region rather than the project itself.
 - The monitoring location at W4 (Control Point) is sheltered by the hinterland and hence the low levels of turbidity and SS at W4 cannot reflect the influence of tidal effect on turbidity and SS to the impact stations W1 – W3 at mid-flood tide
 - Limit level exceedances for turbidity and SS were recorded at impact monitoring stations whereas low levels of turbidity and SS were recorded at the control station (W1 at mid-ebb tide and W4 at mid-flood tide) at the corresponding tide.
 - The turbidity level measured at W1, W2 and W3 were well below the baseline level.

DO

- 4.8 A total of 41 Action Level and 452 Limit Level exceedances for DO were reported in the reporting quarter.
- 4.9 The DO level exceedances were considered not directly related to the Project due to the followings reasons:
- The DO levels at stations A1, A2 and W5, which were closer to the dredging area, were higher than those recorded at stations W1 to W4 for the same monitoring event.
 - DO levels may be affected by many other factors, e.g., salinity and water temperature. Graphical presentations of the variations of salinity and water temperature in the period between July 2003 and September 2003 are shown in Appendix F. Although the values of salinity at all stations were fluctuating during May 2003 and September 2003, an increasing trend was observed for the water temperature at all depths of all monitoring stations. In addition, the average water temperature at all monitoring stations during baseline monitoring period (i.e. 20.7°C) was significantly lower than in the reporting period (i.e. 28.5°C).
 - Therefore, one possible reason for the increase of DO exceedance when compared with previous months may be due to the seasonal effects. Weather was warmer in reporting quarter as compared with the baseline monitoring period. Therefore, the increase in water temperature may lead to the decrease in oxygen solubility in water and hence the DO levels.

5. AUDIT RESULTS

Implementation Status of Environmental Mitigation Measures

- 5.1 The implementation status of environmental mitigation measures (EMIS) is given in Appendix G.

Site Audit Summary

Water Quality

- 5.2 On 3rd September 2003, stagnant water was observed near Bus Terminal. The situation was improved during subsequent audit.

Chemical and Waste Management

- 5.3 On 2nd July 2003, oily water in the drip tray was discharged by the valve directly on the jack-up platform. The situation was rectified during subsequent audit.
- 5.4 On 9th July 2003, it was observed that drip tray of the generator near the bus terminal was accumulated of oily water. The situation was improved during subsequent audit.
- 5.5 Oily water accumulated in the drip tray of oil jack was observed during the site inspection on 16th July 2003. Provision of drip tray was observed during subsequent audit.
- 5.6 During the audits in August 2003, the Contractor was advised to provide better housekeeping for storing the oil tanks and general refuse in the site near Bus Terminal. The situation was improved during the audit on 10th September 2003.
- 5.7 On 10th September 2003, oil spillage was observed in the sea around the dredger. Improvement was observed during the follow-up audit.
- 5.8 On 25th September 2003, no drip tray was provided for a drilling machine and oil drums was observed. Overflow of oily water from the drilling works area near bus terminal was also noted. The Contractor was reminded to rectify the situations as soon as possible.

Air Quality, Noise and Permit / Licenses

- 5.9 No violation was observed during site inspections.

Status of Environmental Licensing and Permitting

- 5.10 Environmental licenses and permits including the Environmental Permit (EP), Waste Disposal (Chemical Waste) License, Marine Dumping Permit and Construction Noise Permits (CNP) were in place and valid during the reporting quarter. A summary status of licenses and permits is given in Appendix H.

Advice on Waste Management Status

- 5.11 The waste generated from the Project was mainly non-inert C&D and uncontaminated dredged sediment.

6. NON-COMPLIANCE (EXCEEDANCES) OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS (ACTION AND LIMIT LEVELS)

Summary of Exceedances

- 6.1 Environmental monitoring works were performed in the reporting month and all monitoring results were checked and reviewed. A summary of exceedances is attached in Appendix J.
- 6.2 No noise limit level exceedance was recorded, except the restricted hour monitoring event at N11 on 31 August 2003 for restricted hour monitoring. The exceedance was considered not due to the Project.
- 6.3 Water quality monitoring was conducted as scheduled in the reporting period, except the monitoring events on 25th August during Mid-ebb tide and 3rd September 2003 during both Mid-ebb and Mid-flood tides. The aforementioned monitoring events were cancelled due to inclement whether.
- 6.4 A total of 13 Action Level and 97 Limit Level exceedances for turbidity were record. For suspended solids (SS), a total of 11 Action Level and 97 Limit Level exceedances were recorded in the reporting period.
- 6.5 A total of 41 Action Level and 452 Limit Level exceedances for DO were reported in the reporting quarter. However, no direct evidence showed that the exceedances were due to the Project works and the exceedances were all considered to be invalid.
- 6.6 No environmental complaint and prosecution was received since the commencement of the Project.

Review of the Reasons for and the Implications of Non-compliance

- 6.7 There was no non-compliance from the site audits in the reporting quarter. The observations and recommendations made in each individual site audit session were attached in the Monthly Reports.

7. ENVIRONMENTAL COMPLAINTS

7.1 No environmental complaint was recorded since the Project commencement.

8. COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

8.1 Dredging and site investigation will be the major construction activities for the coming quarter. The anticipated environmental impact will be mainly on noise and water quality due to dredging works.