Highways Department

Contract No. HY/2007/04

Hong Kong – Shenzhen Western Corridor (Operational Phase)

Monthly EM&A Report No. 14 (for the month August 2008)

[09/2008]

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Date: 09 September 2008

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By Fax (2761 4864) & Post

Attention: Mr. K.M. Bok / Mr. William Chiang

Dear Sirs,

Re: Contract No. HY/2007/04
Hong Kong – Shenzhen Western Corridor (Operational Phase)
Monthly EM&A Report for Operational Phase – August 2008

Reference is made to ET's e-mail correspondences enclosed with a copy of the Operational Phase Monthly EM&A Report for August 2008 for the captioned project. We are pleased to inform that we have no further comment on the captioned Report.

We are pleased to inform you that the captioned Report, which had been certified by the Environmental Team Leader, is verified by IEC in compliance with Condition 1.9 of the Environmental Permit No.EP-162/2003/B and Condition 1.7 of the Environmental Permit No. EP-290/2007 of the Project.

Thank you very much for your kind attention and please do not hesitate to contact the undersigned or our Mr. Damien Ku if you have any queries.

Yours sincerely,

K.S. Lee
Independent Environmental Checker

c.c.	Mr. Alan Kwok	ENSR (ET Leader)	By Fax: 2891 0305
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EXECUTIVE SUMMARY

This is the fourteenth monthly Environmental Monitoring and Audit (EM&A) report prepared by ENSR Asia (HK) Ltd. (ENSR), the designated Environmental Team (ET), for the operational phase of the Project "Hong Kong-Shenzhen Western Corridor". Operation of the Project commenced on 1 July 2007. This report presents the results of EM&A works conducted between 1 and 31 August 2008.

Weekly site audits and monitoring of bridge lighting scheme and bird collisions were carried out in the reporting month. Environmental mitigation measures and environmental complaint handling procedures were also implemented.

Environmental Monitoring Works

Noise
No operational noise monitoring was carried out in the reporting month. The last operational noise monitoring was completed on 23 June 2008.

Water Quality
No road surface runoff monitoring was carried out in the reporting month. The last road surface runoff from carriageway monitoring was completed on 1 March 2008.

Ecology
The fourteenth monthly bridge lighting scheme and bird collisions monitoring was conducted on 15 August 2008. No bird mortality was recorded in this monitoring.

Sedimentation Rate Monitoring
No sedimentation rate monitoring was carried out in the reporting month. The last sedimentation rate monitoring was completed on 17 June 2008.

Environmental Licensing and Permitting
Permits granted to the Project include the Environmental Permits for the Project (EP-162/2003/B and EP-290/2007).

Environmental Site Audit
Weekly environmental site audits were carried out in the reporting month. No specific observation was identified.

Reporting Change

There was no reporting change in this month.

Environmental Complaints and Prosecution

No complaint related to environmental issues was made against the Project in the reporting period.

Future Key Issues

Key issues to be considered in the coming month include:

- Maintain sufficient cleaning works for the carriageway by vacuum air sweeper(s) to remove grits and pollutants; and
- Implement the Emergency Response Plan for Spillage of Chemicals.

1. INTRODUCTION

Background

1.1 ENSR Asia (HK) Ltd. (ENSR) (hereinafter called the "ET") was appointed by Highways Department (hereinafter called the "Client") to undertake Environmental Monitoring and Audit for "Hong Kong-Shenzhen Western Corridor" (hereinafter called the "Project") during operational phase. Under the requirements of Section 6 of Environmental Permit EP-162/2003/B and Section 3 of Environmental Permit EP-290/2007, EM&A programme as set out in the EM&A Manuals is required to be implemented. In accordance with the Environmental Permit and the EM&A Manuals, environmental monitoring of operational noise, water quality, ecology and sedimentation rate are required for the Project.

1.2 Operation for the Project commenced on 1 July 2007. This report summarises the environmental monitoring and audit works for the Project between 1 and 31 August 2008.

Project Organization

1.3 The structure of the environmental management team is shown in Figure 1.1. Contacts of key environmental staff of the Project are shown in Appendix A.

1.4 A layout plan of the Project is provided in Figure 1.2.

Summary of the EM&A Requirements

1.5 The EM&A programme requires environmental monitoring for operational noise, water quality, ecology and sedimentation rate. The EM&A requirements for each item are described in subsequent sections, including:

- Monitoring parameters;
- Environmental mitigation measures, as recommended in the project EIA final report;
- Environmental requirements in the contract documents.

1.6 Site audits findings are described in Section 6.

1.7 Advice on the implementation status of environmental protection and pollution control/mitigation measures are summarised in Section 6 of the Report.

2. OPERATIONAL NOISE MONITORING

Monitoring Requirements

2.1 Noise monitoring is required to monitor the operational noise level at the nearby sensitive receivers during peak traffic hour.

2.2 The measured noise level will be compared to the predicted traffic noise levels in the EIA under full provision of the mitigation measures.

Monitoring Parameters, Frequency and Duration

2.3 The traffic noise level should be measured twice within the first year of the road opening. Measurements should be made in terms of the A-weighted L_{10} over three 30-mins periods during the peak traffic hour. Other parameters L_{90} and L_{eq} would be included for reference purpose.

Monitoring Locations

2.4 Noise monitoring was required to be carried out at NSRs SWC-AN1 and SWC-AN2. The monitoring locations are summarized in Table 2.2.

Table 2.2 The Noise Monitoring Locations

Monitoring Station	Location	Monitoring Type	Description
SWC-AN1	Village House at Ngau Hom Shek	Façade	G/F
SWC-AN2	Village House at Ngau Hom Shek	Façade	G/F

Results and Observations

2.5 Operational noise monitoring was completed on 23 June 2008. No monitoring was carried out in the reporting month.

3. WATER QUALITY

Monitoring Requirements

3.1 The monitoring is to determine the characteristics of bridge runoff in particular the first flush from the HK-SWC bridge during rain-storm events and to review the frequency of road cleaning.

3.2 The original method on road surface runoff monitoring involves installation of equipments onto the bridge deck or the parapets on both sides of the expressway. After reviewing by relevant government departments, including the Hong Kong Police Force and Fire Services Department, the installation of equipment was considered causing disturbance to other road users including the fire services and police vehicles during emergency operation and considered relatively unsafe for the ET staff working on the expressway.

3.3 An alternative proposal on the monitoring method using a water tanker to simulate an artificial rainfall by spraying water onto the catchment area of the monitoring gully during bridge closure at night was prepared. The alternative proposal was approved by EPD. A procedural guide was also prepared. The guide was vetted by the IEC and the Engineer and was reviewed by EPD.

Monitoring Parameters, Frequency and Duration

3.4 Two periods of monitoring during the first 3 months and after 6 months of the opening of the HK-SWC Bridge would be required. The monitoring should include in total 12 sampling / rainstorm events (12 sets of data) and cover the dry season period. A total of 6 sets of sampling data should be collected during the first 3 months after the opening of the HK-SWC bridge. The other 6 sets of sampling data should be collected in month 7 to month 9 after opening of the HK-SWC Bridge. The minimum interval between two sampling events shall not be less than 4 days.

3.5 The commencement of the road surface runoff monitoring programme was postponed to September 2007 due to the requirement in obtaining consent and relevant permits and licenses from relevant government departments for working on the bridge deck. The monitoring of road surface runoff from carriageway was completed on 1 March 2008.

3.6 All samples were cooled to 4°C without being frozen and delivered to a HOKLAS laboratory within 24 hours for analysis for the following pollutants in highway runoff:

- Total suspended solids
- Total organic carbon
- Chemical oxygen demand
- Nitrate and nitrite
- Total Kjeldahl Nitrogen
- Total phosphorus
- Copper
- Lead
- Zinc

Monitoring Locations

3.7 Water samples were collected from six different road gullies, three on each side of the carriageways. The exact monitoring locations were recorded in terms of nearby lighting pole / highways chainage.

Results and Observations

3.8 The monitoring of road surface runoff from carriageway was completed on 1 March 2008. No monitoring was carried out in the reporting month.

4. ECOLOGY

Monitoring Requirements

4.1 As required under Clause 6.9, 6.7 and 6.10 of the Environmental Permit EP-162/2003/B, Clause 3.4 of the Environmental Permit EP-290/2007 and Section 6.3.2 – 6.3.4 of the EM&A Manual, operational disturbance on intertidal bird communities, bridge lighting scheme and bird collisions, and replanted mangroves have to be monitored bi-monthly (for 2 years), monthly (for 3 years) and quarterly (for 2 years) respectively.

4.2 The trigger and action levels for bird density for the monitoring on intertidal bird communities are provided in Appendix B.

Operational Disturbance on Intertidal Bird Communities

Monitoring Equipment

4.3 Equipment used for monitoring included a 20-60x telescope, 10x42 binoculars, and a hand-held GPS.

Monitoring Locations

4.4 Two monitoring locations were selected: Ngau Hom Shek (NHS) and Sheung Pak Nai (SPN). The NHS site locates adjacent to the Hong Kong - Shenzhen Western Corridor (HK-SWC), and provides information for potential operational phase disturbance. The SPN site was used as a control site during the monitoring process in construction phase. In this Project, the SPN site was also used as a control site to maintain consistency. It is located approximately 950m to the southwest of NHS.

Results and observation

4.5 There was no monitoring of intertidal bird communities in the reporting month.

4.6 The next monitoring is tentatively scheduled on 11 September 2008.

Bridge Lighting Scheme and Bird Collisions

Monitoring Equipment

4.7 A camera and a pair of binoculars were required during the monitoring process.

Monitoring Locations

4.8 The monitoring of bird collision took place along the Hong Kong-Shenzhen Western Corridor (HK-SWC), which is approximately 5.5km long and 40m wide.

Monitoring Methodology

4.9 A survey was conducted to assess the impacts of different lighting schemes on bird mortality as caused by collision with the bridge and associated structures. In order to monitor the bird's mortality, a survey was carried out along the HK-SWC at both sides of the carriageway covering both the Hong Kong and Shenzhen sections. Attention was paid to the road surface while attempts were made to spot dead birds. Sea surface was also scanned for any floating dead birds.

4.10 The four lighting schemes are listed as follows:

- ***Scheme 1*** – Monday to Thursday and Sunday, 19.30-22.00. Architectural lighting for the tower.
- ***Scheme 2*** – Friday, Saturday and general festival, 19.30-22.00. Architectural lighting for the tower

and side faces of the deck.

- ***Scheme 3*** – Special festival and events, 19.30-22.00. Architectural lighting for the tower, stay cables and the side faces of the deck.
- ***Scheme 4*** – During inclement weather, turn off the architectural lighting.

Results and observation

4.11 The survey was conducted on 15 August 2008 at 7.30pm. Lighting Scheme 2 was being monitored. The temperature was 32 ^{o}C and humidity was 65%.

4.12 No dead bird was found on the bridge nor floating on water surface during the survey. There was no significant evidence to suggest adverse impacts from the HK-SWC on bird collision.

Replanted Mangroves

Monitoring Locations

4.13 The monitoring of the survival and growth of the compensatory mangrove plantation took place right below the HK-SWC on the mudflat near the shore at NHS. The total area of the plantation was 2010.9m^2. It was composed of 7,736 *Kandelia obovata* droppers.

Results and observation

4.14 There was no monitoring of replanted mangrove carried out in the reporting month.

4.15 The next monitoring is tentatively scheduled for October 2008.

5. SEDIMENTATION RATE MONITORING

Monitoring Requirements

5.1 As required under Clause 6.2 of the Environmental Permit EP-162/2003/B, monitoring on the sedimentation rate in Deep Bay would be required on a monthly basis.

Monitoring Parameters, Frequency and Duration

5.2 The monitoring work took place every month starting from the construction phase and up to one year after the project has commenced the operation. Additional work may be needed subject to the weather condition.

Monitoring Locations

5.3 Monitoring was carried out at 7 monitoring stations as specified in the approved Sedimentation Rate Monitoring Plan at Tsim Bei Tsui, Mai Po mudflat and those between HK-SWC and Tsim Bei Tsui. These include two locations at Tsim Bei Tsui (Stations P1 & P2), three locations at the Mai Po Mudflat (Stations P3 to P5) and two locations near Sha Kiu Tsuen (Stations P6 & P7).

Results and Observations

5.4 The sedimentation rate monitoring in Deep Bay was completed on 17 June 2008. No monitoring was carried out in the reporting month.

6. ENVIRONMENTAL AUDIT

Site Environmental Audit

6.1 Site audits were carried out on a weekly basis to monitor environmental issues on the site to confirm that all mitigation measures were implemented properly. The summary of site audit in the reporting period is attached in Appendix C.

Status of Environmental Licensing and Permitting

6.2 All permits/licences/notifications obtained as of the reporting period are summarised in Table 6.1

Table 6.1 Summary of Environmental Notification, Licensing and Permit Status

Permit No.	Valid Period		Description	Status
	From	To		
Environmental Permit				
EP-162/2003/B	19 Jan. 04	-	1. Construction and operation of a 3.2 km dual 3-lane carriageway elevated structure of the Shenzhen Western Corridor spanning across Deep Bay from Ngau Hom Shek to the section of the Shenzhen Western Corridor within the boundary within the Mainland. 2. Construction and operation of a 340 m dual 3-lane carriageway of the Deep Bay Link connecting to the Shenzhen Western Corridor at Ngau Hom Shek.	Valid

Permit No.	Valid Period		Description	Status
	From	To		
EP-290/2007	20 Nov. 07	-	1. Operation of a 2.0km dual 3-lane carriageway elevated structure of the Shenzhen Bay Bridge spanning across Deep Bay from Shenzhen Bay Bridge – Hong Kong Section to Shenzhen Bay Port, Hong Kong Port Area at Dongjiaotou.	Valid

Implementation Status of Environmental Mitigation Measures

6.3 The ET conducted site inspections on 1, 8, 15, 20 and 27 August 2008.

6.4 No specific finding was identified in the reporting month.

Environmental Mitigation Implementation Schedule (EMIS)

6.5 According to the Environmental Permit (EP-162/2003/B), the mitigation measures detailed in the permits are required to be implemented. An updated summary of the EMIS is presented in Appendix D.

Summary of Exceedances of Environmental Quality Performance Limit

6.6 No exceedance was recorded in the reporting month.

6.7 The Event and Action Plans for feeding shorebirds are presented in Appendix B.

Implementation Status of Environmental Complaint Handling Procedures

6.8 Appendix E presents the environmental complaint flow diagram of the Project.

6.9 No complaint, summons or prosecution related to environmental issues was received or made against the Project in the reporting period.

7. FUTURE KEY ISSUES

Key Issues for the Coming Month

7.1 Key issues to be considered in the coming month include:

- Maintain sufficient cleaning works for the carriageway by vacuum air sweeper(s) to remove grits and pollutants; and
- Implementation of the Emergency Response Plan for Spillage of Chemicals.

Environmental Monitoring Programme for the Next Month

7.2 Tentative environmental monitoring and audit schedule for the next reporting month is shown in Appendix F.

8. CONCLUSIONS AND RECOMMENDATIONS

Conclusion

8.1 Environmental impact monitoring was performed between 1 and 31 August 2008. All monitoring results in the reporting period were checked and reviewed.

8.2 No operational noise monitoring was carried out in the reporting month since the monitoring had been completed.

8.3 No road surface runoff from carriageway monitoring was carried out in the reporting month since the monitoring had been completed.

8.4 No bird mortality was recorded during this month's bridge lighting scheme and bird collisions survey.

8.5 No sedimentation rate monitoring was carried out in the reporting month since the monitoring had been completed.

8.6 No specific observation was identified during the site audits in the reporting month.

8.7 No complaint, notification of summons or prosecution related to environmental issues was made against the Project in the reporting period.

Recommendations

8.8 According to the environmental audits performed, the following recommendations were made:

Water Quality Impact

- Maintain sufficient cleaning works for the carriageway by vacuum air sweeper(s) to remove grits and pollutants.
- Implement the Emergency Response Plan for Spillage of Chemicals.