



Highways Department

Contract No. HY/2007/13

Environmental Team for Deep Bay Link (Operational Phase)

**Monthly EM&A Report No. 12
(for the month of May 2009)**

06/2009

| | Name | Signature |
|----------------------|----------|---|
| Prepared & Checked: | Edith Ng |  |
| Reviewed & Approved: | Y T Tang |  |

| | | |
|--|---|--------------------|
| Version: | 0 | Date: 17 June 2009 |
| <p>The information contained in this report is, to the best of our knowledge, correct at the time of printing. The interpretation and recommendations in the report are based on our experience, using reasonable professional skill and judgment, and based upon the information that was available to us. These interpretations and recommendations are not necessarily relevant to any aspect outside the restricted requirements of our brief. This report has been prepared for the sole and specific use of our client and Maunsell Consultants Asia Ltd. accepts no responsibility for its use by others.</p> <p>This report is copyright and may not be reproduced in whole or in part without prior written permission.</p> | | |

Maunsell Consultants Asia Ltd.

8/F, Grand Central Plaza, Tower 2, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong
Tel: (852) 2605 6262 Fax: (852) 2891 0305 www.maunsell.aecom.com



CH2MHILL

西圖香港有限公司

CH2M HILL Hong Kong Limited

Room 238, 2/F, Shui On Centre

6-8 Harbour Road

Wanchai, Hong Kong

Tel (852) 2507-2203

Fax (852) 2507-2293

Our Ref.: HYDDBLWCEM00/2/11298

Date: 11 August 2009

Highways Department
Major Works Project Management Office
6th Floor, Ho Man Tin Government Offices,
88 Chung Hau Street, Homantin, Kwoloon

By Fax (2761 4864) & Post

Attention: Mr. Robert Chan / Mr. Stephen Chan

Dear Sirs,

**Re: Contract No. HY/2007/13
Deep Bay Link (Operational Phase)
Monthly EM&A Report for Operational Phase – May 2009**

Reference is made to ET's e-mail correspondence of the Operational Phase Monthly EM&A Report (May 2009) 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-163/2003/G of the Project.

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

Yours sincerely,

K.S. Lee
Independent Environmental Checker

c.c. Mr. Y T Tang
Mr. Eric Chan

MCAL (ETL)
Arup (HY2002/21)

By Fax: 2891 0305
By Fax: 2268 3955

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EXECUTIVE SUMMARY

This is the twelfth monthly Environmental Monitoring and Audit (EM&A) report prepared by Maunsell Consultants Asia Ltd., the designated Environmental Team (ET), for the operational phase of the Project "Deep Bay Link". Operation of Deep Bay Link commenced on 1 July 2007 and the operational phase EM&A programme started on 1 October 2007. This report presents the results of EM&A works conducted between 1 and 31 May 2009.

Monitoring on operation noise and amphibian were carried out in the reporting month. Monitoring of road surface runoff from carriageway were not carried out in the reporting month. Environmental mitigation measures and environmental complaint handling procedures were implemented.

Environmental Monitoring Works

Noise

The first operation noise monitoring had been completed in October 2008. A supplementary operation noise monitoring was carried out in the reporting month.

Water Quality

All road surface runoff from carriageway monitoring had been completed in January 2008. No such monitoring was carried out in the reporting month.

Ecology

Amphibian monitoring at Pond 15 was carried out in the reporting month.

Environmental Licensing and Permitting

Permit granted to the Project includes the Environmental Permit for the Project (EP-163/2003/G).

Reporting Change

There was no reporting change in this month.

Environmental Complaints and Prosecution

No complaint, summon or prosecution related to environmental issues was received or 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;
- Properly maintain the noise barriers during operation of the Project; and
- Implementation of the Emergency Response Plan for Spillage of Chemicals.

1. INTRODUCTION

Background

- 1.1 Maunsell Consultants Asia Ltd. (MCAL) (hereinafter called the "ET") was appointed by Highways Department (hereinafter called the "Client") to undertake Environmental Monitoring and Audit for "Deep Bay Link" (hereinafter called the "Project") during operational phase. Under the requirements of Section 6 of Environmental Permit EP-163/2003/G, EM&A programme as set out in the EM&A Manual is required to be implemented. In accordance with the Environmental Permit and the EM&A Manual, environmental monitoring of operational noise, water quality and ecology are required for the Project.
- 1.2 Operation of Deep Bay Link commenced on 1 July 2007 and the operational phase EM&A programme commenced on 1 October 2007. This report summarises the environmental monitoring and audit works for the Project between 1 and 31 May 2009.

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 and ecology. 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 specified in EM&A manual and in the contract documents.
- 1.6 Status of Environmental License, advice on the implementation status of environmental protection and pollution control/mitigation measures are summarised in Section 5 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 measurements were conducted at ten monitoring locations according to the approved Traffic Noise Monitoring Plan (rev. 2). Table 2.1 describes these monitoring stations.

Table 2.1 Noise Monitoring Locations (Sensitive Receivers)

| Monitoring Station | Location |
|--------------------|---|
| OP1 | 2/F, Village house north to Tsing Chuen Wai |
| OP2 | G/F, Village House near Tsing Chuen Wai |
| OP3 | 11/F, Block 1, Botania Villa |
| OP4 | G/F, Village House at Ngau Hom Shek |
| OP5A | G/F, Village House at San Sang San Tsuen |
| OP6 | G/F, Poultry Farm with residential house |
| OP7A | 19/F, Block 1, The Sherwood |
| E1 | 2/F, Home of Elderly near To Yuen Wai |
| E1A | 2/F, Village House at To Yuen Wai |
| E2A | 1/F, Village House near Tan Kwai Tsuen |

Results and Observations

- 2.5 The first operational noise monitoring had been completed on 8 October 2008.
- 2.6 However, for monitoring stations of Village House at Ngau Hom Shek (OP4) and Village House at To Yuen Wai (E1A), as the measured noise levels were interfered by insects and background noise, a supplementary operational noise monitoring was carried out at these two locations in May 2009, in the consent of HyD.
- 2.7 Supplementary operational noise monitoring was carried out in 19 May 2009 at Village House of To Yuen Wai (E1A) in lieu of the monitoring conducted in October 2008. For monitoring station OP4, insect disturbance was still significant upon arrival of the location for noise measurement on 6 and 14 May 2009. Considering that it is not meaningful to conduct noise measurement with interference by insects, the supplementary noise measurement at this monitoring station was aborted.
- 2.8 Since the operational noise monitoring report was still under preparation during the submission of this monthly EM&A report, the results, observations and discussions will be reported in the next monthly EM&A Report.

3. WATER QUALITY

Monitoring Requirements

- 3.1 The monitoring is to determine the characteristics of bridge runoff in particular the first flush from the Deep Bay Link bridge during rain-storm events and to review the frequency of road cleaning.
- 3.2 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.
- 3.3 The proposed criteria, action level and actions required as stipulated in the EM&A Manual are included in Appendix B.

Monitoring Parameters, Frequency and Duration

- 3.4 The monitoring should include in total 12 sampling / rainstorm events (12 sets of data). A total of 6 sets of sampling data should be collected during the first 3 months after the opening of the Deep Bay Link (1st monitoring period). The other 6 sets of sampling data should be collected in month 4 to month 6 after opening of the Deep Bay Link (2nd monitoring period). The minimum interval between two sampling events shall not be less than 4 days.
- 3.5 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
 - Nitrite
 - Total Kjeldahl Nitrogen
 - Total phosphorus
 - Copper
 - Lead
 - Zinc
- 3.6 The road surface runoff from carriageway monitoring period was completed in January 2008.

Monitoring Locations

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

Results and Observations

- 3.9 The 12 road surface runoff from carriageway monitoring had been completed. In the reporting month, no monitoring of road surface runoff from carriageway monitoring was carried out.

4. ECOLOGY

Monitoring Requirements

- 4.1 As required under Clause 3.3 of the Environmental Permit, the approved Habitat Creation and Management Plan and Section 7.2 of the EM&A Manual, 1 year maintenance / establishment programme at the Wetland Compensation Area (Pond 15) and 2 years monitoring of habitat conditions at Pond 15 during operational phase were required.

Monitoring Parameters, Frequency and Duration

- 4.2 Maintenance for the Pond 15 complex is required to be carried out for 1 year (12 months) after the completion of construction of the pond. Maintenance works at Pond 15 include the removal of colonizing *Mikania micrantha* and *Urochloa mutica*, replanting bamboos and aquatic vegetation (at the end of 12-month) and the removal of refuse.
- 4.3 Ecological monitoring is also required to be carried out for 2 years after the completion of construction of the pond. Monitoring of water level and water quality (Dissolved Oxygen and 5-day Biological Oxygen Demand) should be carried out quarterly. Monitoring of flora, pelagic fauna and benthic species are required to be carried out twice a year (covering both dry and wet seasons), while monitoring of avifauna and amphibian are required to be carried out 4 times a year (covering all 4 seasons) and once a year (between April and May) respectively. The trigger and action levels set by the EM&A Manual for Deep Bay Link Pond 15 Complex (Section 7.3 in HY/2002/23) are provided in Appendix B.
- 4.4 The construction of Pond 15 complex completed in October 2007 and was handed over to MCAL on 1 November 2007. The maintenance work and monitoring programme commenced on 1 November 2007.
- 4.5 While the ecological monitoring programme continued in the reporting month, maintenance of Pond 15 complex was not carried out in the reporting month, since the 1-year maintenance programme during the early establishment period of Pond 15 complex had been completed in October 2008, and had been handed over to Agriculture, Fisheries and Conservation Department (AFCD) in November 2008.

Hydrology

Monitoring Locations

- 4.6 The Pond 15 Complex comprises four ponds, including Pond 15X, 15ABD, 15Y and 15C1. Water level at the centre of each pond is monitored.
- 4.7 For water quality, all water samples are collected at mid-depth at all ponds.

Results and Observations

- 4.8 Water quality monitoring was not required during this monitoring month.

Fauna

Monitoring Locations

- 4.9 Amphibian monitoring was conducted along the path around each of the four ponds.
- 4.10 Bird, benthos and pelagic fauna monitoring was not required during the reporting month.

Monitoring Equipment

- 4.11 A torch and a vocal recorder were required during the survey.

Monitoring Methodology

- 4.12 Amphibian monitoring was conducted by walking around the ponds at night and recording encountered amphibians by active searching with torch and vocal identification. Species and categorical abundance of amphibians encountered were recorded.

Results and Observations

Amphibian

- 4.13 The survey was conducted on 18 May 2009, starting from 7:30 pm.
- 4.14 Only one individual of Brown Tree Frog *Polypedates megacephalus* was seen on the path of Pond 15ABD. Vocal calls from different species were also heard within the pond areas. These included Gunther's Frog *Rana guentheri* (in all the four ponds), Paddy Frog *Rana limnocharis* and Brown Tree Frog *Polypedates megacephalus* (in Pond 15Y and 15X), and Ornate Pigmy Frog *Microhyla ornata* (in Pond 15X). All the recorded species are considered to be widely distributed in Hong Kong and are not protected species.

Vegetation

Monitoring Locations

- 4.15 Monitoring of floral communities is conducted on a fixed belt transect on the bank of each of the ponds. Each transect begins on dry bank and ends in open water.

Results and Observations

- 4.16 Floral monitoring was not required during this month. The next monitoring is scheduled in June 2009.

Invasive Floral Species

- 4.17 The monitoring of invasive floral species within all pond areas and the bamboo planting sites was carried out during the weekly site visits. The climber, Mile-a-minute Weed (*Mikania micrantha*), was the species most frequently found on the body of bamboo plants. Any climbers found on the bamboo were removed immediately as much as possible during the visits.
- 4.18 As the ponds were handed over to Agriculture, Fisheries and Conservation Department (AFCD) in November 2008, subsequent invasive species removal / trimming is to be programmed by AFCD.

5. LICENCING AND IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

Status of Environmental Licensing and Permitting

5.1 All permits/licences/notifications obtained as of the reporting period are summarised in Table 5.1

Table 5.1 Summary of Environmental Notification, Licensing and Permit Status

| Permit No. | Valid Period | | Description | Status |
|-----------------------------|--------------|----|--|--------|
| | From | To | | |
| Environmental Permit | | | | |
| EP-163/2003/G | 27 Oct. 06 | - | 1. Construction and operation of a dual three-lane carriageway (Deep Bay Link) with bridge structures linking the Shenzhen Western Corridor at Ngau Hom Shek with the Yuen Long Highway at Lam Tei; 2. Construction and operation of an interchange between Deep Bay Link and Yuen Long Highway at Lam Tei. | Valid |

Implementation Status of Environmental Mitigation Measures

5.2 The mitigation measures had been implemented properly in the reporting month.

Environmental Mitigation Implementation Schedule (EMIS)

5.3 According to the Environmental Permit, the mitigation measures detailed in the permits are required to be implemented. An updated summary of the EMIS is presented in Appendix C.

Summary of Exceedances of Environmental Quality Performance Limit

5.4 No exceedance was recorded in the reporting month.

5.5 The Event and Action Plans for water quality are presented in Appendix B.

Implementation Status of Environmental Complaint Handling Procedures

5.6 Appendix D presents the environmental complaint flow diagram of the Project.

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

6. FUTURE KEY ISSUES

Key Issues for the Coming Month

6.1 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;
- Properly maintain the noise barriers during operation of the Project; and
- Implementation of the Emergency Response Plan for Spillage of Chemicals.

Environmental Monitoring Programme for the Next Month

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

7. CONCLUSIONS AND RECOMMENDATIONS

Conclusion

- 7.1 Environmental impact monitoring was performed between 1 and 31 May 2009. All monitoring results in the reporting period were checked and reviewed.
- 7.2 Supplementary operational noise monitoring was carried out for OP4 and E1A in the reporting month. However, the monitoring at OP4 was aborted due to significant insect disturbance upon arrival of the monitoring location. The results, observations and discussions will be reported in the next monthly EM&A Report.
- 7.3 The second monitoring period of the road surface runoff monitoring programme completed on 12 January 2008. No such monitoring was carried out in the reporting month.
- 7.4 Amphibian monitoring at Pond 15 was carried out in the reporting month. One individual of Brown Tree Frog *Polypedates megacephalus* was observed on the path of Pond 15ABD.
- 7.5 Maintenance of Pond 15 complex was not carried out in the reporting month as the maintenance programme had been completed and the ponds had been handed over to AFCD in November 2008. Subsequent invasive species removal / trimming is to be programmed by AFCD.
- 7.6 No complaint, notification of summons or prosecution related to environmental issues was made against the Project in the reporting period.

Recommendations

- 7.7 The following recommendations were made:

Water Impact

- 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.

Noise

- Properly maintain the noise barriers during operation of the Project.