



PROJECT No.: TCS/00408/08

**DSD CONTRACT NO. DC/2007/17  
DRAINAGE IMPROVEMENT WORKS IN CHEUNG PO,  
MA ON KONG, YUEN KONG SAN TSUEN AND TIN SAM  
TSUEN OF YUEN LONG DISTRICT AND SEWERAGE AT  
TSENG TAU CHUNG TSUEN, TUEN MUN**

**MONTHLY EM&A REPORT FOR KT14A  
(NOVEMBER 2008)**

PREPARED FOR  
**CHINA ROAD & BRIDGE CORPORATION**

Quality Index

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## Executive Summary

ES01 This is the second monthly EM&A report for KT14A, covering the construction period from 26 October to 25 November 2008.

### Breaches of AL levels

ES02 Monitoring results of the Reporting Period demonstrated no exceedances of environmental quality criteria of air quality and construction noise.

ES03 For water quality however, a total of thirteen (13) exceedances of environmental quality criteria (A/L/Levels), namely six (6) DO exceedances, one (1) Turbidity exceedances, five (5) SS exceedances and one (1) Zn exceedances, were recorded during the Reporting Period, as summarized below:

location	Exceedance	DO	Turbidity	pH	SS	NH <sub>4</sub> <sup>+</sup> N	Zn	Total
W8B	Action Level	6	0	0	0	0	0	6
	Limit Level	0	1	0	5	0	1	7

ES04 The DO, Turbidity, SS and Zn exceedances are considered not related to the works under the Project, but due to inappropriately set A/L levels, in addition to the changes of the ambient water quality conditions. In fact, higher levels of the parameters can be found in the baseline monitoring data.

### Environmental Complaint, Notifications of Summons and Prosecutions

ES05 No documented complaints, notifications of summons and successful prosecutions were received during the Reporting Period. No adverse environmental impacts were observed during the weekly site inspection and environmental audit of the Reporting Period, indicating the implemented mitigation measures for air quality, construction noise and ecology were effective. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

### Reporting Changes

ES06 No reporting changes were made during the Reporting Period.

### Future Key Issues

ES07 As dry season has approached, construction dust will become a key environmental issue. Construction dust suppression measures should be fully implemented. The implemented construction dust mitigation measures should also be maintained and improved, as necessary, during dusty works including vehicle movement on dry and windy days.

ES08 On the other hand, water quality mitigation measures to avoid ingress of turbidity and other water quality pollutants via site surface water runoff into the river within KT14A should be properly maintained or improved, as appropriate.

ES09 In addition, special attention should also be paid to construction noise and other environmental issues identified in the EM&A Manual. Mitigation measures recommended in the EIA and summarized in Mitigation Measure Implementation Schedule should be fully implemented.

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## 1 ENVIRONMENTAL STATUS

This is the second monthly EM&A report for KT14A, covering the construction period from 26 October to 25 November 2008 (hereinafter 'the Reporting Period').

### 1.1 PROJECT AREA AND CONSTRUCTION PROGRAMME

Drawing showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations is enclosed in Appendix A, while CRBC's construction program is enclosed in Appendix B.

### 1.2 WORKS UNDERTAKEN DURING THE REPORTING PERIOD

Works undertaken during the Reporting Period with fine tuning of construction activities showing the inter-relationship with environmental protection/mitigation measures for the month are summarized as follows:

- (a) Preparation Works includes:
  - Underground utility investigation
  - Site clearance
  - Structural condition survey
  - Tree Survey / Tree protection
  - Hoarding erection
- (b) Sheet Piling work at CH 0 – CH 56
- (c) Channel Excavation
- (d) Environmental Monitoring at all the channels

### 1.3 ENVIRONMENTAL MANAGEMENT ORGANIZATION

Management structure and key personnel contact names and telephone numbers of the environmental management organization, where DSD is the Project Proponent; CRBC is the main Contractor of the Project; EPD and AFCD are the supervisory departments for environmental protection of the Project; BVHKL is the Engineer's Representative of DSD (hereinafter 'the ER'); ARUP is the Independent Environmental Checker (hereinafter 'the IEC') and Action-United Environmental Services and Consulting (hereinafter 'AUES') is the environmental team (hereinafter 'the ET'), are presented in Appendix C.

### 1.4 LICENSING STATUS

#### 1.4.1 Air Pollution Control (Construction Dust) Regulation

Pursuant to the **Air Pollution Control (Construction Dust) Regulation**, CRBC has notified EPD, via submission of Form NA dated 14 February 2008, of the scope and nature of the works to be carried out under the Project, including construction activities such as stockpiling, loading and unloading, transfer of dusty material, use of vehicles and debris handling, etc. CRBC will continuously review the status of the environmental licenses and apply the required licenses/permits prior to the commencement of construction work.

#### 1.4.2 Noise Control Ordinance

No **Construction Noise Permit** (hereinafter 'CNP') is required for the Project pursuant to the **Noise Control Ordinance** (hereinafter 'NCO') and the associated applicable subsidiary regulations of **Noise Control (General) Regulation**, **Noise Control (Hand-held Percussive Breaker) Regulation** and **Noise Control (Air Compressor) Regulation**, as the use of powered mechanical equipment, or conducting construction work in during restricted hours, i.e. 1900 to 0700 hours on normal weekdays and any time on general holidays including Sundays is not anticipated during the whole construction period. CRBC will continuously review the status of the environmental licenses under the NCO and apply the required licenses/permits prior to the commencement of construction work.

#### 1.4.3 Waste Disposal (Charges for Disposal of Construction Waste) Regulation

CRBC has applied for a Billing Account (Construction Work Contract with Value of \$1million or Above), under the **Waste Disposal (Charges for Disposal of Construction Waste) Regulation**. The account number 7006524 has been assigned on 9 Jan 2008.

#### 1.4.4 Water Pollution Control Ordinance

CRBC has applied for a discharge license under Section 20 of the **Water Pollution Control Ordinance**, and the license No. 1U461/1 has been issued.

#### 1.4.5 Waste Disposal (Chemical Waste) (General) Regulation

CRBC has registered as a Chemical Waste Producer with EPD under the Waste Disposal (Chemical Waste) (General) Regulation and the Waste Producer Number assigned is WPN: 5611-531-C3124-28 dated 2 May 08.

### 1.5 ENVIRONMENTAL PROTECTION AND POLLUTION CONTROL MITIGATION MEASURES

CRBC has committed to implement environmental protection and pollution control and mitigation measures as recommended in the PP, EP and the EM&A Manual. The updated Environmental Mitigation Measures Schedule is attached in **Appendix I**, summarized in the Mitigation Measures Implementation Schedules in the EM&A Manual. The implemented mitigation measures include:

- (a) Watering of exposed dry and dusty surface, including stock piles of dusty materials;
- (b) Covering of the loose soil to minimize water quality impacts;
- (c) Hard pavement of haul road leading to public roads;
- (d) Wheel washing facility at to avoid construction dust impacts on the public roads; and
- (e) Construction of noise barriers.
- (f) During construction works nearly the seasonal wetland, mitigation measures of Ecology will be followed in accordance with EM&A Manual Annex A ECO.1 and ECO.3;

## 2 MONITORING METHODOLOGY

### 2.1 MONITORING PARAMETERS

According to the EM&A requirements set out in the EIA, Environmental Permits No. EP231/2005A (hereinafter 'the EP') and the associated EM&A Manual, monitoring parameters are summarized as follows.

Table 2-1 Summary of Monitoring Parameters

Environmental Aspect	Monitoring Parameters	
Air Quality	(a) 1-Hour Total Suspended Particulate (hereinafter '1-Hr TSP'); and (b) 24-Hour Total Suspended Particulate (hereinafter '24-Hr TSP').	
Construction Noise	(a) A-weighted equivalent continuous sound pressure level (30min) (hereinafter 'Leq(30min)') during the normal working hours; and (b) A-weighted equivalent continuous sound pressure level (5min) (hereinafter 'Leq(5min)') for construction work during the restricted hours.	
Water Quality	(a) In Situ Measurement	temperature, Dissolved Oxygen (hereinafter 'DO'), pH & Turbidity
	(b) Laboratory Analysis	Suspended Solids (hereinafter 'SS'), Ammonia Nitrogen (hereinafter 'NH <sub>3</sub> -N') and Zinc (hereinafter 'Zn')

### 2.2 MONITORING LOCATIONS

Details of the monitoring locations are summarized in **Table 2-2** and shown in **Appendix A**. For ease of reference, '(a)' is denoted for the relocated location ID to differentiate from the original 'EM&A Manual' location.

Table 2-2 Summary of Monitoring Locations

Env. Aspect	Monitoring Location ID	Identified Address / Co-ordinates
Air	A8(a)	Entrance of Strong Sing Garden
Noise	N8	Ground floor of Strong Sing Garden H502
Water	W8A	E825274 / N831712
	W8B	E825143 / N831786

## 2.3 MONITORING FREQUENCY, DURATION AND SCHEDULE

### 2.3.1 Monitoring Frequency and Duration

Impact environmental monitoring is conducted upon commencement of the construction activities and throughout the whole construction period to detect and minimize any adverse environmental impacts generated from the construction activities of the Project. The monitoring frequency and duration for air quality, construction noise, water quality, ecology and other parameters are summarized below.

#### Air Quality

Frequency: Once every 6 days for 24-Hr TSP and three times every 6 days for 1-Hr TSP, when the highest construction dust impacts are anticipated.

Duration: Throughout the construction period

#### Construction Noise

Frequency: Measurement of Leq 30min: Once a week during 0700-1900 on normal weekdays for Leq30min

If the construction work is undertaken at restrict hour, the frequency of noise monitoring will be conducted in accordance with the requirements under the related Construction Noise Permit issued by EPD as follows:

- 3 consecutive Leq5min at restrict hour from 1700 – 2300;
- 3 consecutive Leq5min for restrict hour from 2300 – 0700 next day;
- 3 consecutive Leq5min for Sunday or public holiday from 0700 – 1900;

Duration: Throughout the construction period

#### Water Quality

Frequency: Three times a week with at least 36 hour intervals between any two consecutive monitoring events

Depths: As the water columns in the stream water within KT14A is generally less than 3 m, measurement is performed at the mid-depths of the monitoring locations. In case the water columns are deeper than 6 m, measurement shall be carried out at three water depths, namely, 1 m below water surface, mid-depth, and 1 m above river bed. If the water depths are between 3 to 6 m, the mid-depth measurement is omitted.

Duration: Throughout the construction period.

### 2.3.2 Environmental Monitoring Schedule

The monitoring schedules for the Reporting Period and forthcoming month are presented in **Appendix D**.

## 2.4 MONITORING EQUIPMENT AND PROCEDURE

The monitoring equipment and procedures for air quality, construction noise, stream water quality and ecology are summarized below. Calibration certificates of the equipment and the related laboratories are presented in **Appendix E**.

### 2.4.1 Weather Conditions during the Reporting Period

All meteorological information is sourced from the Hong Kong Observatory (Lau Fau Shan Station). The meteorological data include wind direction, wind speed, humidity, rainfall, air pressure and temperature etc., that in general are required for evaluating the environmental impact arising from the construction activities. The meteorological data are presented in **Appendix D**.

2.4.2 Air Quality

**Monitoring Equipment**

A list of air quality monitoring equipment is shown below.

Table 2-4-1 Air Quality Monitoring Equipment

Equipment	Model
<b>24-Hr TSP</b>	
High Volume Air Sampler (herein after 'HVS')	Grasby Anderson GMWS 2310 HVS
Calibration Kit	TISCH Model TE-5028A
<b>1-Hr TSP</b>	
Portable Dust Meter	TSI DustTrak Model 8520 / Sibata LD-3 Laser Dust Meter

**Monitoring Procedure**

**1-Hr TSP**

The 1-Hr TSP measurement follows manufacturer's Operation and Service Manual, using a 1-Hr TSP monitor brand named TSI Dust Track Aerosol Monitor Model 8520 or Sibata LD-3 Laser Dust Meter, which is a portable, battery-operated laser photometer to record the real time 1-hr TSP based on 90° light scattering. The 1-hr TSP monitor consists of the following:

- i. A pump to draw sample aerosol through the optic chamber where TSP is measured;
- ii. A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
- iii. A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

The 1-Hr TSP meter to be used will be within the valid period, calibrated by the manufacturer prior to purchasing. Zero response of the instrument will be checked before and after each monitoring event.

**24-hr TSP**

The equipment used for 24-Hr TSP measurement is the high volume air sampling system (hereinafter 'HVS') brand named Thermo Andersen, Model GS2310 TSP. The HVS complies with US EPA Code of Federal Regulation, Appendix B to Part 50. The HVS consists of the following:

- (a) An anodized aluminum shelter;
- (b) A 8"x10" stainless steel filter holder;
- (c) A blower motor assembly;
- (d) A continuous flow/pressure recorder;
- (e) A motor speed-voltage control/elapsed time indicator;
- (f) A 6-day mechanical timer, and
- (g) A power supply of 220v/50 Hz

The HVS is operated and calibrated on a regular basis following the manufacturer's instruction using the NIST-certified standard calibrator brand named TISCH Calibration Kit Model TE-5025A. Regular HVS operation and maintenance as well as filter paper installation and collection is performed by the ET's competent technicians, whereas laboratory analyses are conducted in a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (herein after 'ALS'). The 24-hr TSP filters of the 24-Hour TSP will be kept in ALS for six months prior to disposal.

All relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper are recorded in details.



### 2.4.3 Construction Noise

#### **Monitoring Equipment**

A list of construction noise monitoring equipment is shown below.

Table 2-4-2 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	B&K Type 2236 & 2238
Calibrator	B&K Type 4231
Portable Wind Speed Indicator	Testo Anemometer

#### **Monitoring Procedure**

Sound level meters listed above comply with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications, as recommended in Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO).

All noise measurements will be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq(30 min) in six consecutive Leq(5 min) measurements will be used as the monitoring parameter for the time period between 0700-1900 hours on weekdays throughout the construction period. Leq(15min) in three consecutive Leq(5 min) measurements for other time periods (e.g. during restricted hours) will only be conducted for monitoring the construction noise during restricted hours as necessary.

The sound level meter is mounted on a tripod at a height of 1.2 m and placed at the assessment point and oriented such that the microphone is pointed to the site with the microphone facing perpendicular to the line of sight. The windshield is fitted for all measurements. Where a measurement is to be carried out at a building, the assessment point is normally at a position 1 m from the exterior of the building façade. Where a measurement is to be made for noise being received at a place other than a building, the assessment point is at a position 1.2 m above the ground in a free-field situation, i.e. at least 3.5 m away from reflective surfaces such as adjacent buildings or walls.

Immediately prior to and following each noise measurement the accuracy of the sound level meter is checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements will be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0dB. No noise measurement will be made in the present of significant fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed is checked with a portable wind speed meter capable of measuring the wind speed in m/s.

### 2.4.4 Water Quality

#### **Monitoring Equipment**

Monitoring Equipment for water quality is listed below.

Table 2-4-3 Water Quality Monitoring Equipment

Equipment	Model / Description
Water Depth Detector	Eagle Sonar
Water Sampler	Teflon bailer / bucket
Thermometer & DO meter	YSI 550A DO Meter
pH meter	Hanna HI 98128
Turbidimeter	Hach 2100p
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-litter plastic cool box

### **Monitoring Procedure**

#### **Water Depth**

As the water columns in the stream water within KT14A is generally less than 3 m, measurement is performed at the mid-depths of the monitoring locations. In case the water columns are deeper than 6 m, measurement shall be carried out at three water depths, namely, 1 m below water surface, mid-depth, and 1 m above river bed. If the water depths are between 3 to 6 m, the mid-depth measurement is omitted.

Water depths are determined prior to measurement and sampling, using a portable battery operated depth detector, brand named 'Eagle Sonar', if the depths exceed 1.5 meter. For the depths well below 1 meter, the depths of water columns are measured with a steel ruler with appropriate weight.

#### **Dissolved Oxygen (DO)**

A portable YSI 550A DO Meter will be used for in-situ DO measurement. The DO meter is capable of measuring DO in the range of 0 - 20 mg/L and 0 - 200 % saturation and checked against water saturated ambient air on each monitoring day prior to monitoring. Although the DO Meter automatically compensates ambient water temperature to a standard temperature of 20<sup>o</sup>C for ease of comparison of the data under the changing reality, the temperature readings of the DO Meter will be recorded in the field data sheets. Calibration of the equipment will be performed by ALS on quarterly basis.

#### **pH**

A portable Hanna pH Meter will be used for in-situ pH measurement. The pH meter is capable of measuring pH in the range of 0 – 14 and readable to 0.1. Standard buffer solutions of pH 7 and pH 10 are used for calibration of the instrument before and after measurement. Quarterly calibration of the equipment will be performed by ALS.

#### **Turbidity**

A portable Hach 2100p turbidity Meter will be used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU. Calibration of the equipment will be performed by ALS on quarterly basis.

#### **Suspended Solids (SS)**

SS will be determined by ALS upon receipt of the water samples using the HOKLAS accredited analytical method - ALS Method EA-025.

#### **Ammonia Nitrogen(NH<sub>3</sub>-N)**

NH<sub>3</sub>-N will be examined by ALS upon receipt of the water samples using the HOKLAS accredited analytical methods - ALS Method EK-055A.

#### **Zinc(Zn)**

Zn will be analyzed by ALS upon receipt of the water samples using the HOKLAS accredited analytical methods - ALS Method EG-020.

#### **Water Sampler**

Water samples will be collected using a plastic sampler to prevent metal contamination. As the water depths in the stream water within KT14A are generally less than 0.5 m, a plastic bucket with a rope of appropriate length is used for water sampling. The sampler is rinsed before collection with the sample to be taken. For water depths deeper than 0.5 meter, a cleaned plastic bailer bucket will be used for sample collection. 1000 mL water sample is collected from each depth for SS determination. The samples collected are stored in a cool box maintained at 4<sup>o</sup>C and delivered to ALS upon completion of the sampling by end of each sampling day.

#### **Sample Container**

Water samples are contained in screw-cap PE (Poly-Ethylene) bottles, which are provided and pretreated according to corresponding HOKLAS and ALS analytical requirements. Where appropriate, the sampling bottles are rinsed with the water to be contained. Water samples are then transferred from the water sampler to the sampling bottles to 95% bottle capacity to allow possible volume expansion during delivery and storage.

#### **Sample Storage**

A 'Willow' 33-litter plastic cool box packed with ice will be used to preserve the collected water samples prior to arrival at ALS. The water temperature of the cool box will be maintained at a temperature as close to 4<sup>o</sup>C as possible without being frozen. Samples collected will be delivered to the laboratory upon collection within the maximum storage time required under the HOKLAS and ALS analytical requirements.

#### 2.4.6 Waste Management

Waste Management is required for KT14A as stipulated in the EM&A Manual [382047/E/EMA/Issue 5]. During the monthly audit, ETL will pay attention to the issues relating to waste management, and check whether the Contractor has followed the relevant contract Specifications and the procedures specified under the law of HKSAR.

### 2.5 QUALITY ASSURANCE PROCEDURES AND DATA MANAGEMENT

#### 2.5.1 Documentation of the Environmental Monitoring

Field data including in-situ monitoring results, weather conditions and water sampling information and observation will be recorded in corresponding Field Data Sheets, which will be signed and dated by the respective environmental technician prior to submission to the ETL for validation and endorsement at the end of the monitoring day.

#### 2.5.2 Data Management and Analysis

All impact monitoring data will be processed by the AUES data recording and management system, which complies with in-house Quality (*ISO 9001:2000*) Management System. Monitoring results recorded in the monitoring equipment e.g. 1-Hr TSP Meters and Noise Meters will be downloaded directly from the equipment at the end of the monitoring period and input into a computerized database maintained by the ET. Laboratory results will be input directly into the computerized database and checked by personnel other than those who input the data.

#### 2.5.3 Quality Assurance Procedures

Appropriate and standard QA/QC measures will be adopted for the environmental monitoring to ensure the scientific integrity of the data produced. Sources of error in the impact monitoring will be properly controlled with the following QA/QC procedures:

- (a) Appropriate field monitoring and sampling techniques, including monitoring equipment, storage and delivery of samples;
- (b) Well organized systematic field-data system e.g. all baseline monitoring information, field observation, results, weather conditions and water sampling information, etc. will be recorded in the field monitoring record sheets. The laboratory analysis records will be maintained by the HOKLAS following HOKLAS requirements;
- (c) HOKLAS requirements for QA/QC of all laboratory testing to ensure acceptable accuracy and reproducibility of the laboratory analysis indicated by consistent agreement between duplicate samples, validity of the analytical results by compliance with the required blanks and recovery of standard addition.

#### 2.5.4 Records

All impact monitoring data will be clearly and systematically documented in both hardware and software format and the software copy will be available for inspection upon request. All the document and data will be kept for at least one year after completion of the Project. Field Data Sheets used to record the impact monitoring information, field observation, results, weather conditions and water sampling information, etc., will be properly maintained and kept by the ET. The copies of laboratory analysis records from ALS will be kept by the ET throughout the at least one year after completion of the EM&A program of the Project.

### 2.6 REPORTING

#### 2.6.1 General Requirements for Report Submission

General requirements for Monthly EM&A report submission as stipulated in the EIA, EP and EM&A Manual are summarized below.

Table 2-6 Requirements for Report Submission

Report	Submission
Monthly EM&A Report	<ul style="list-style-type: none"> <li>• Within 10 working days of the end of each reporting month.</li> </ul>
Quarterly EM&A Summary Report	<ul style="list-style-type: none"> <li>• Within 10 working days of the end of each reporting quarter.</li> </ul>
Final EM&A Summary Report	<ul style="list-style-type: none"> <li>• One month after completion of post project monitoring</li> </ul>

### 2.6.2 Cut-Off Day of the Reporting Month

It is also agreed among the ER, IEC, CRBC, ET and EPD that, in order to avoid unnecessary delay of the EM&A report submission due to the time required for laboratory analyses for those environmental monitoring samples collected at the ends or near the ends of the reporting months, in particular on eve of public holidays, the cutoff day is 25<sup>th</sup> of each month. That is to say, the reporting month is counted from 26<sup>th</sup> of the previous month to 25<sup>th</sup> of the reporting month.

## 3 MONITORING RESULTS

The environmental monitoring results will be compared against the Action and Limit Levels established based on the baseline monitoring results. Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan enclosed in **Appendix F**. The environmental monitoring results are presented in tabulation below and graphical plots in **Appendix G**.

### 3.1 AIR QUALITY

#### 3.1.1 Action and Limit Levels

According to the Baseline Monitoring Report for KT14A, the Action and Limit Levels for 24-Hr and 1-Hr TSP are summarized in **Table 3-1-1**.

Table 3-1-1 Summary of Air Quality Monitoring Results at KT14A-A8(a)

Monitoring Station	Action Level ( $\mu\text{g}/\text{m}^3$ )		Limit Level ( $\mu\text{g}/\text{m}^3$ )	
	1-Hr TSP	24-Hr TSP	1-Hr TSP	24-Hr TSP
KT14A - A8(a)	310	144	500	260

#### 3.1.2 Results

Results of air quality monitoring at KT14A-A8(a) during the Reporting Period are summarized in Tables 3-1-2. Details of 24-hr TSP data and graphical plots of trends of monitored parameters at KT14A-A8(a) over the past four reporting periods are presented in **Appendix G**.

Table 3-1-2 Summary of Air Quality Monitoring Results at KT14A-A8(a)

1-Hour TSP ( $\mu\text{g}/\text{m}^3$ )						24-Hour TSP ( $\mu\text{g}/\text{m}^3$ )	
Date	Start Time	1st Hr	2nd Hr	3rd Hr	Average	Date	Results
30-Oct-08	13:30	146	130	149	142	31-Oct-08	22
5-Nov-08	12:50	105	110	109	108	4-Nov-08	25
11-Nov-08	12:15	134	129	119	127	10-Nov-08	40
17-Nov-08	9:45	150	168	179	166	15-Nov-08	38
22-Nov-08	9:30	158	163	150	157	21-Nov-08	23
Action Level		310				150	
Limit Level		500				260	

#### 3.1.4 Discussion

As shown in **Tables 3-1-2**, the 1-HR TSP and 24-Hr TSP results fluctuated well below the Action level. No exceedance of Action and Limit levels was recorded during the Reporting Period. Neither Notification of Exceedance (hereinafter 'NOE') of air quality criteria nor corrective action was required.

## 3.2 CONSTRUCTION NOISE

#### 3.2.1 Action and Limit Levels

The Action and Limit levels for construction noise at KT14A-N8 are summarized in **Table 3-2-1**.

Table 3-2-1 Action and Limit Levels of Construction Noise Monitoring

Time Period	Action Level in dB(A)	Limit Level in dB(A)
0700-1900 hrs on normal weekdays	When one documented complaint is received	75* dB(A)

Note: \* Reduces to 70dB(A) for schools and 65dB(A) during the school examination periods.

### 3.2.2 Results

The baseline monitoring for N8 was performed under free field conditions, where the access were granted by the sensitive receiver's owner, and the 3dB(A) façade correction was made. The impact noise monitoring, however, is performed under non-free field conditions of the same location due to denial of the access. The change of noise monitoring from free field to non-free field will omit 3dB(A) façade correction, but will neither introduce any difference in detection and minimization of the of construction noise impacts, nor alter the existing construction noise A/L levels. Nevertheless, the ET will write to formally inform and get approval from the IEC and EPD before issuance of the next monthly EM&A report (December 2008).

Construction noise monitoring results at KT14A-N8 during the Reporting Period are summarized in Tables 3-2-2. The noise monitoring data of Leq 10 and Leq 90 have been recorded and are available for reference or inspection upon request. Graphical plots of trends of monitored parameters at KT14A-N8 over the past four months are presented in **Appendix G**.

Table 3-2-2 Summary of Construction Noise Monitoring Results at KT14A-N8

Date	Start Time	1st Leq5	2nd Leq5	3rd Leq5	4th Leq5	5th Leq5	6 <sup>th</sup> Leq5	Leq30
30-Oct-08	13:15	55.5	51.3	56.8	57.9	60.0	56.5	57.0
5-Nov-08	12:00	67.2	67.3	68.4	68.5	69.4	69.7	68.5
11-Nov-08	12:15	53.4	52.5	43.7	48.3	44.7	56.4	52.0
17-Nov-08	9:45	56.7	59.0	58.7	62.0	60.4	58.8	59.6
22-Nov-08	9:30	54.3	53.8	54.5	56.1	55.4	54.7	54.9
Limit Level								75 dB(A)

### 3.2.3 Discussion

As shown in **Tables 3-2-2**, all the construction noise results fluctuated well below the Limit level. Neither exceedance of Limit levels nor documented construction complaint was recorded during the Reporting Period. Neither NOE of construction noise nor corrective action was therefore required.

## 3.3 WATER QUALITY

### 3.3.1 Action and Limit Levels

#### Existing Water Quality Action and Limit Levels

The existing water quality Action and Limit levels were established using one of the approaches stipulated in the EM&A Manual - up-stream control station approach. They are summarized in **Table 3-3-1**.

Table 3-3-1 Existing Water Quality Action and Limit Levels Using up-stream control station approach

Parameter	Monitoring Location	Type of Station	Action Level	Limit Level
DO (mg/L)	W8A	Control	NA	NA
	W8B	Impact	6.378	4.00
Turbidity (NTU)	W8A	Control	NA	NA
	W8B	Impact	120% of the results of upstream control station's of the same day	130% of the results of upstream control station's of the same day
pH	W8A	Control	NA	NA
	W8B	Impact	9.2 (95%-ile of baseline results)	9.3 (99%-ile of baseline results)
SS (mg/L)	W8A	Control	NA	NA
	W8B	Impact	120% of the results of upstream control station's of the same day	130% of the results of upstream control station's of the same day
Ammonia (µg/L)	W8A	Control	NA	NA
	W8B	Impact	120% of the results of upstream control station's of the same day	130% of the results of upstream control station's of the same day
Zinc (µg/L)	W8A	Control	NA	NA
	W8B	Impact	120% of the results of upstream control station's of the same day	130% of the results of upstream control station's of the same day

Discussion and Recommendation on Re-Establishment of Water Quality Action and Limit Levels

Discussion

It is noted that abnormally high frequency of exceedance of the existing water quality criteria has occurred since the commencement of the water quality monitoring at W8B of KT14A. Particular attention has been paid to the water quality exceedances during 26 August to 2 October 2008, when no construction activities were commenced. This implies that the exceedances are not related to the works under the Project.

In order to identify the source of the exceedances which are not related to the works under the Project, a thorough review of the water quality Action and Limit levels, together with the site inspection of the water quality monitoring locations W8A and W8B, has been conducted. Findings of the review reveal that the up-stream control station approach is not appropriate for establishment of the KT14A water quality Action and Limit levels, as W8A is not suitable to be used as the up-stream control station of W8B. The findings are summarized as follows:

1. Significant change of the ambient water quality conditions is found, as shown by the comparison of the baseline monitoring data during March to April 2008 with the water monitoring results during 26 August to 2 October 2008, when no construction activities were commenced. To the contrary of the baseline conditions, the water quality at the 'Impact Monitoring Station' W8B has become worse than that of the 'Up-Stream Control Station' W8A, causing persisting exceedances of the existing water quality criteria at W8B all the time.
2. Site inspection conducted at KT14A after site clearance reveals that the stream water does not flow directly or wholly from W8A to W8B, posing doubts about the appropriateness of W8A as an up-stream control station for W8B. As a matter of fact, the stream water at W8A mainly comprises surface water and domestic wastewater from Strong Sing Garden area, while the stream water at W8B is from upper stream of the open drainage rectangular channel ((4500(W) x 2600(H)) constructed by KCRC - West Rail under Contract CC-601) that receives wastewater from different catchment area.

Recommendation

1. In order to maintain capability of the EM&A program to detect and minimize any water quality impacts generated from the construction of the Project, it is recommended that the water quality Action and Limit Levels for KT14A are re-established using another approach set out in the EM&A Manual: Action and Limit levels are respectively set at 95%-ile and 99%-ile of the KT14A baseline monitoring results.
2. As the monitoring data at W8A and W8B were obtained during 26 August to 2 October 2008, when no construction activities were commenced, they are more representative of water quality baseline conditions immediately prior to commencement of the construction activities under the Project. It is recommended that the monitoring data at W8A and W8B obtained during 26 August to 2 October 2008, when no construction activities were commenced, are combined to the baseline monitoring results obtained during March and April 2008, with exception of the outliers which are shown in the foot note '#' of **Table 3-3-2** and used as a whole for re-establishment of the KT14A water quality Action and Limit levels.
3. The recommended Action and Limit levels have been proposed to the ER and IEC for approval prior to seek EPD's formal approval. They are summarized as follows:

Table 3-3-2 Proposed Water Quality Action and Limit Levels for KT14A

Parameter	Monitoring Location	Type of Station	Action Level	Limit Level
DO* (mg/L)	W8A	Impact Monitoring Station	2.22	1.80
	W8B	Impact Monitoring Station	4.06	4.04
Turbidity (NTU)	W8A	Impact Monitoring Station	36.5	39.6
	W8B	Impact Monitoring Station	18.6	52.0
pH <sup>+</sup>	W8A	Impact Monitoring Station	6.5 – 8.5	6.0 – 9.0
	W8B	Impact Monitoring Station	6.5 – 8.5	6.0 – 9.0
SS (mg/L)	W8A	Impact Monitoring Station	70	95
	W8B	Impact Monitoring Station	29	39
Ammonia (mg/L)	W8A	Impact Monitoring Station	40.8	43.7
	W8B	Impact Monitoring Station	3.46	4.44

Parameter	Monitoring Location	Type of Station	Action Level	Limit Level
Zinc (µg/L)	W8A	Impact Monitoring Station	136	166
	W8B	Impact Monitoring Station	54	63

- \* A/L levels of DO are respectively set at 5%-ile and 1%-ile of baseline level
- + A/L levels of pH are respectively set at out side the ranges of 6.5 - 8.5 and 6 – 9 as generally used for environmental water quality standards.
- # Zn obtained at W8A on 18 March (458 ug/L) and 2 September 2008 (228 ug/L), as well as Turbidity, SS and Zn obtained at W8B on 2 September 2008 (161.5 NTU, 473 mg/L and 492 ug/L respectively) and SS and Zn obtained at W8B on 24 September 2008 (492 mg/L and 107 ug/L respectively) are considered as outliers and excluded from A/L level calculation

### 3.3.2 Results

Water quality monitoring results at KT14A-W8A and KT14A-W8B during the Reporting Period are presented in tabulation in **Appendix G**, where graphical plots of trends of the monitored parameters over the past four months are also presented.

According to the existing A/L levels, a total of thirteen (13) exceedances of environmental quality criteria (A/L/Levels), namely six (6) DO exceedances, one (1) Turbidity exceedances, five (5) SS exceedances and one (1) Zn exceedances, were recorded during the Reporting Period, as summarized below as summarized in **Table 3-3-3**.

Table 3-3-3 Summary of Exceedances of Existing Action and Limit Levels

Location	Exceedance	DO	Turbidity	pH	SS	NH <sub>4</sub> +N	Zc	Total
W8B	Action Level	6	0	0	0	0	0	6
	Limit Level	0	1	0	5	0	1	7

### 3.3.3 Discussion

According to the construction information provided by CRBC and observed during regular site inspection and environmental audit, no construction wastewater was discharged to the stream within KT14A during the Reporting Period. The DO, Turbidity, SS and Zn exceedances are therefore considered not related to the works under the Project, but due to inappropriate A/L levels, in addition to the changes of the ambient water quality conditions of the parameters. As a matter of fact, higher levels of the parameters can be found from the baseline monitoring data, in particular from the outliers that were recorded most recently prior to commencement of the construction activities, e.g 161.5 NTU for turbidity, 473 mg/L for SS, and 492 mg/L for Zinc, although they were excluded from A/L level calculation a shown in the foot note # of **Table 3-3-2**

Nevertheless, NOE were issued upon confirmation of the monitoring results, while investigation of the NOE was conducted upon receipt of the information of construction activities and the implemented mitigation measures provided by CRBC. NOE and the associated investigation reports have been in progress of the IEC's endorsement. They have not yet closed.

## 3.4 WASTE MANAGEMENT

In order to comply with the waste management requirements, CRBC has

- (a) Been assigned since 9 Jan 2008 a Billing Account (account number 7006524) under the **Waste Disposal (Charges for Disposal of Construction Waste) Regulation**;
- (b) Been issued Discharge License No. 1U461/1 under Section 20 of the **Water Pollution Control Ordinance** has been issued;
- (c) Been register as a Chemical Waste Producer under the Waste Disposal (Chemical Waste) (General) Regulation (the Waste Producer Number assigned is WPN: 5611-531-C3124-28 dated 2 May 08); and

**4 NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS, SUCCESSFUL PROSECUTIONS AND OTHERS**

**4.1 NON-COMPLIANCE**

Apart from the exceedances of water quality A/L levels summarized in Table 3-3-3, no non-compliance or deficiency was identified during regular site inspection and environmental audit. No associated remedial actions were recommended. Exceedance of environmental quality criteria has been discussed in **Section 3.1 to 3.4**. No other non-compliance or deficiency was identified during regular site inspection and environmental audit. No associated remedial actions were recommended.

**4.2 ENVIRONMENTAL COMPLAINTS**

No written or verbal complaints were received for each environmental issue during the Reporting Period. No associated remedial actions were recommended.

**4.3 NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS**

No notifications of summons and successful prosecutions were recorded during the Reporting Period. No associated remedial actions were recommended.

**4.4 OTHERS**

**4.4.1 Waste Management Status**

All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil and sediment

Waste generated, re-used, recycled and disposed of during the Reporting Period is shown in **Appendix I: Monthly Summary Waste Flow Table for 2008**.

**4.4.2 Site Inspection and Environmental Audit**

In this reporting period, one occasion of weekly environmental site inspection and audit were conducted on 24 October 2008 jointly by the ER, EO and ET during the Reporting Period. No adverse environmental impacts were registered during the Reporting Period, indicating the mitigation measures implemented were effective and sufficient for the construction activities or preparation work and site clearance undertaken. Minor deficiencies found in the site inspection and audit was in general rectified within the specified deadlines. Findings of the site inspection and environmental audit are summarized below.

Table 4-4 Summary of Findings of Site Inspection and Environmental Audit

Date	Findings / Deficiencies	Follow-Up Status
31 Oct 2008	No adverse environmental impacts were observed during the site inspection. However, as dry season has approached, construction dust suppression measures, in particular construction dust suppression measures including watering of dry and dusty haul roads within the Site during dusty construction activities on dry and windy days, are reminded to be fully implemented.	Reminded measures based on the observation were observed on 6 Nov 2008.
6 Nov 2008	Haul road within the site were observed dry on excavation site. Watering is reminded.	Reminded measures based on the observation were observed on 13 Nov 2008.
13 Nov 2008	Vehicle movement was observed on excavation site. Thorough wheel washing of the vehicles leaving the site is reminded.	Reminded measures based on the observation were observed on 20 Nov 2008.
20 Nov 2008	Stock piles of dusty materials were observed. Construction dust suppression measures e.g. covering with tarpaulin sheeting or watering or preferably removal from site or appropriate disposal is reminded	Reminded measures based on the observation to be followed-up on the forth coming site inspection.



#### 4.4.3 Works to be Undertaken in the Forth-Coming Month

Works to be undertaken in the forth-coming month are shown in the construction program enclosed in **Appendix C**. The activities undertaken in the Reporting Period including construction, preparation and site clearance activities will also be continued in the forth-coming month.

#### 4.4.4 Future Key Issues and Mitigation Measures for the Forth-Coming Month

As dry season has approached, construction dust will become a key environmental issue during dusty construction activities including vehicle movement in dry and windy days. The implemented air quality mitigation measures should be properly maintained and improved as appropriate.

In addition, special attention should also be paid to construction noise, water quality, ecology and other environmental issues identified in the EM&A Manual. Mitigation measures recommended in the EIA and summarized in Mitigation Measure Implementation Schedule (EMIS) should be fully implemented.

## 5 CONCLUSIONS AND RECOMMENDATIONS

- i) This is the second monthly EM&A report for KT14A, covering the construction period from 26 October to 25 November 2008.
- ii) Monitoring results of the Reporting Period demonstrated no exceedances of environmental quality criteria of air quality and construction noise.

According to the existing A/L levels, a total of thirteen (13) exceedances of environmental quality criteria (A/L/Levels), namely six (6) DO exceedances, one (1) Turbidity exceedances, five (5) SS exceedances and one (1) Zn exceedances, were recorded during the Reporting Period, as summarized below as summarized in **Table 3-3-3**.

Table 3-3-3 Summary of Exceedances of Existing Action and Limit Levels

Location	Exceedance	DO	Turbidity	pH	SS	NH <sub>4</sub> <sup>+</sup> N	Zc	Total
W8A	Action Level	N.A	N.A	N.A	N.A	N.A	N.A	N.A
	Limit Level	N.A	N.A	N.A	N.A	N.A	N.A	N.A
W8B	Action Level	6	0	N.A	0	0	0	6
	Limit Level	0	1	N.A	5	0	1	7
Total	Action Level	6	0	N.A	0	0	0	6
	Limit Level	0	1	N.A	5	0	1	7

- iii) For water quality however, a total of eight (8) exceedances of environmental quality criteria (A/L/Levels), namely two (2) Turbidity Limit level exceedances, five (5) SS Limit level exceedances and one (1) Zn Limit level exceedance, were recorded during the Reporting Period, as summarized below:

location	Exceedance	DO	Turbidity	pH	SS	NH <sub>4</sub> <sup>+</sup> N	Zc	Total
W2	Action Level	0	0	0	0	0	0	0
	Limit Level	0	2	0	2	0	1	5
W6	Action Level	0	0	0	0	0	0	0
	Limit Level	0	10	0	8	0	1	19
Total	Action Level	0	0	0	0	0	0	0
	Limit Level	0	12	0	10	0	2	24

- iv) The Turbidity, SS and Zn exceedances are considered not related to the works under the Project, but due to natural fluctuation of the ambient conditions of the parameters, as higher levels of the parameters was found from the baseline monitoring data, in particular from the outliers that were recorded most recently prior to commencement of the construction activities.
- v) No documented complaints, notifications of summons and successful prosecutions were received during the Reporting Period. No adverse environmental impacts were observed during the weekly site inspection and environmental audit of the Reporting Period, indicating the implemented mitigation measures for air quality, construction noise and ecology were effective. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.
- vi) As dry season has approached, construction dust will become a key environmental issue. Construction dust suppression measures should be fully implemented. The implemented construction dust mitigation measures should also be maintained and improved, as necessary, during dusty works including vehicle movement on dry and windy days.
- vii) On the other hand, water quality mitigation measures to avoid ingress of turbidity and other water quality pollutants via site surface water runoff into the river within KT14A should be properly maintained or improved, as appropriate.
- viii) In addition, special attention should also be paid to construction noise and other environmental issues identified in the EM&A Manual. Mitigation measures recommended in the EIA and summarized in Mitigation Measure Implementation Schedule should be fully implemented.

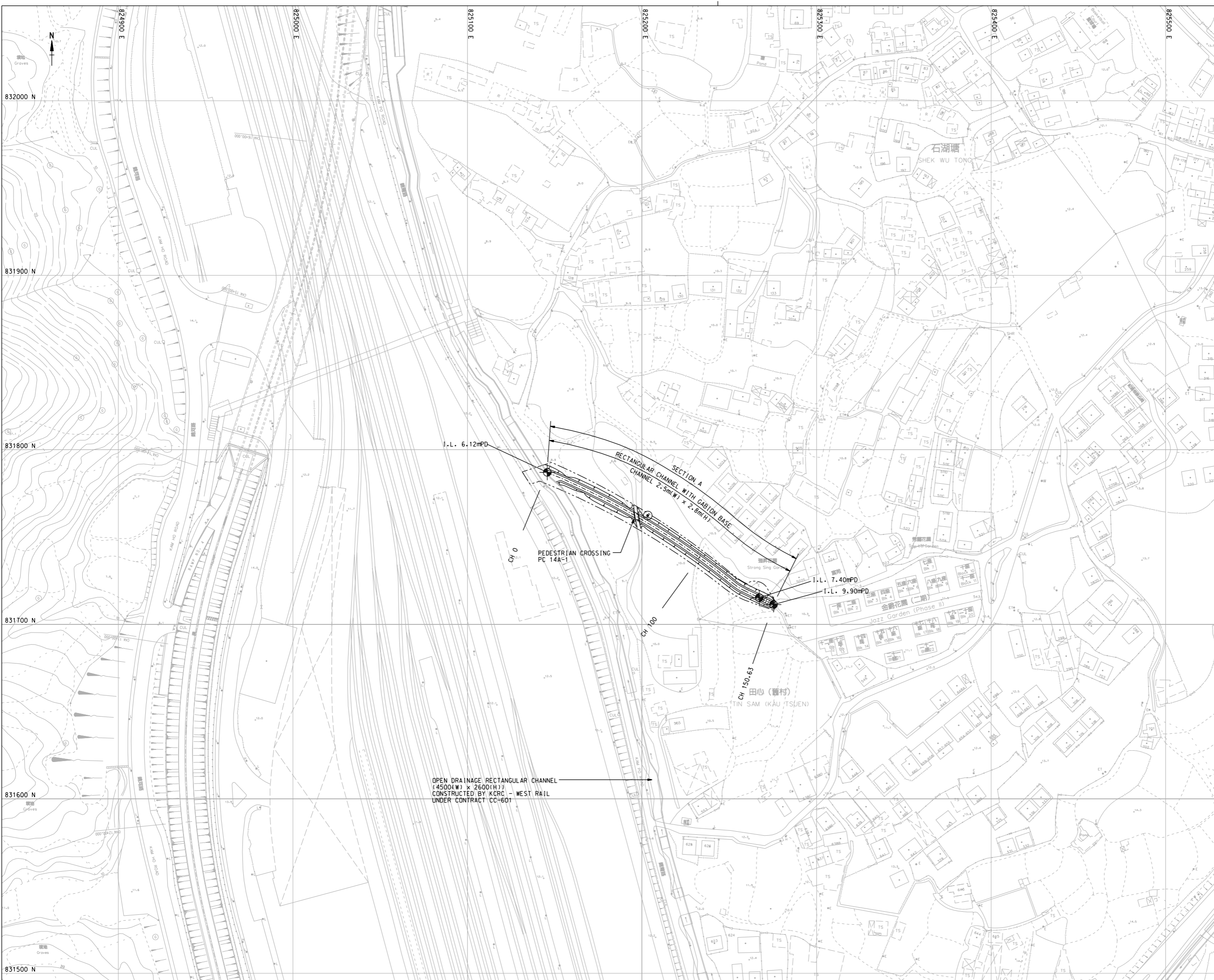
END OF TEXT

**Appendix A**

**Location Plan and**

**Environmental Monitoring Locations under the Project**

NOTES :  
1. FOR NOTES AND LEGEND REFER TO DRAWING NO. 021.



Revision	Date	Description	Initial	
	Designed	Checked	Drawn	Verified
Initial	BW	WLC	LWL	KIL
Date	09/07	09/07	09/07	09/07
Approved				

CONTRACT NO. DC /2007 /17

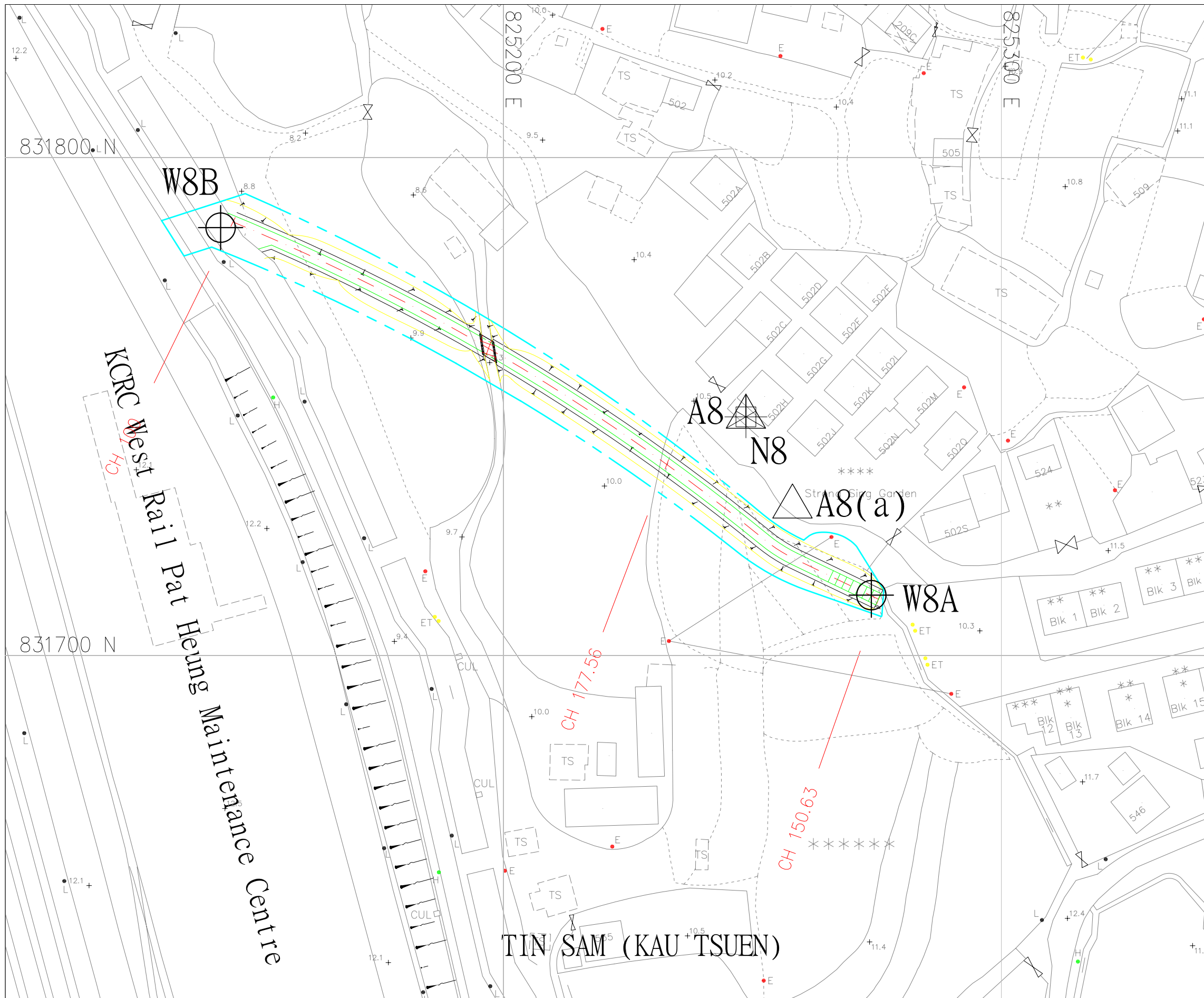
Contract title  
DRAINAGE IMPROVEMENT WORKS  
IN CHEUNG PO, MA ON KONG,  
YUEN KONG SAN TSUEN AND TIN SAM  
TSUEN OF YUEN LONG DISTRICT AND  
SEWERAGE AT TSENG TAU CHUNG TSUEN,  
TUEN MUN

Drawing title  
CHANNEL KT14  
GENERAL LAYOUT PLAN  
(SHEET 1 OF 2)





Drawing no.	Scale
024	1:1000 A1 1:2000 A3



Plot Date : 9/25/2007



Legends

-  Construction Noise Monitoring Location
-  Air Quality Monitoring Location
-  Water Quality Monitoring Location
-  Monitoring Location access is not allow (Air or Noise or Water) for measurement

Table

Monitoring Parameter	Location ID	Address	Remarks
Water	W8A	E825274 / N831712	
Water	W8B	E825143 / N831786	
Air	A8		Replaced by A8(a)
Air	A8(a)	Entrance of Strong Sing Garden	Recommended Location
Noise	N8	No. 205H of Strong Sing Garden	

Note:

Air Monitoring Location A8 are proposed to relocate at the entrance of Strong Sing Garden A8(a) due to request of the property management. The relocated monitoring point is considered suitable as representative sensitive receiver for Strong Sing Garden.

Drawing:

Air, Noise and Stream Water Monitoring Location at KT-14A

Contract No. DC/2007/17-  
Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen of Yuen Long District and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun

**AUES**

## **Appendix B**

### **Construction Program**

**Contract No. : DC/2007/17**

**Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen of Yuen Long District and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun  
Monthly Programme (December 2008)**

ID	Task Name	Duration	Start	Finish	30/11/2008			7/12/2008			14/12/2008			21/12/2008			28/12/2008											
					Sun	o	Tue	c	Thu	Fri	Sat	Sun	o	Tue	c	Thu	Fri	Sat	Sun	o	Tue	c	Thu	Fri	Sat	Sun	o	Tue
47	<b>Section B</b>	<b>25 days</b>	<b>2008/12/1</b>	<b>2008/12/31</b>																								
48	Excavation to Channel Formation & Laying of Rock Fill Material	24 days	2008/12/1	2008/12/30																								
49	Bay 1 (B CH300.00 - B CH316.00)	12 days	2008/12/1	2008/12/13																								
50	Bay 2 (B CH300.00 - B CH292.00) - Transition	12 days	2008/12/15	2008/12/30																								
51	<b>Construction of Channel Structures</b>	<b>1 day</b>	<b>2008/12/31</b>	<b>2008/12/31</b>																								
52	Bay 1 (B CH300.00 - B CH316.00)	1 day	2008/12/31	2008/12/31																								
53																												
54	<b>Section III (Channel KT14A)</b>	<b>25 days</b>	<b>2008/12/1</b>	<b>2008/12/31</b>																								
55	Regular Environmental Impact Monitoring	25 days	2008/12/1	2008/12/31																								
56	Regular Tree Survey	25 days	2008/12/1	2008/12/31																								
57	Regular Structural Condition Survey	25 days	2008/12/1	2008/12/31																								
58	<b>Construction of Rectangular Channel</b>	<b>22 days</b>	<b>2008/12/4</b>	<b>2008/12/31</b>																								
59	Bay 1 (CH0.00 - CH11.00)	17 days	2008/12/4	2008/12/23																								
60	Excavation	5 days	2008/12/4	2008/12/9																								
61	Installation of Sheet Piling	4 days	2008/12/5	2008/12/9																								
62	Cast Blinding Layer	1 day	2008/12/10	2008/12/10																								
63	Construction of Base Slab	4 days	2008/12/11	2008/12/15																								
64	Backfilling to the Kicker Level	1 day	2008/12/16	2008/12/16																								
65	Construction of Vertical Wall	4 days	2008/12/17	2008/12/20																								
66	Backfilling	1 day	2008/12/22	2008/12/22																								
67	Removal of Sheet Piling	1 day	2008/12/23	2008/12/23																								
68	Bay 2 (CH11.00 - CH23.00)	11 days	2008/12/16	2008/12/30																								
69	Excavation	5 days	2008/12/16	2008/12/20																								
70	Installation of Sheet Piling	4 days	2008/12/17	2008/12/20																								
71	Cast Blinding Layer	1 day	2008/12/22	2008/12/22																								
72	Construction of Base Slab	4 days	2008/12/23	2008/12/29																								
73	Backfilling to the Kicker Level	1 day	2008/12/30	2008/12/30																								
74	Bay 3 (CH23.00 - CH35.00)	2 days	2008/12/30	2008/12/31																								
75	Excavation	2 days	2008/12/30	2008/12/31																								
76	Installation of Sheet Piling	1 day	2008/12/31	2008/12/31																								
77																												
78	<b>Section IV (Channel KT14B &amp; KT14C)</b>	<b>25 days</b>	<b>2008/12/1</b>	<b>2008/12/31</b>																								
79	Regular Environmental Impact Monitoring	25 days	2008/12/1	2008/12/31																								
80	Regular Tree Survey & Protection	25 days	2008/12/1	2008/12/31																								
81	Regular Structural Condition Survey	25 days	2008/12/1	2008/12/31																								
82	<b>Construction of Kam Sheung Road (Portion 8B)</b>	<b>25 days</b>	<b>2008/12/1</b>	<b>2008/12/31</b>																								
83	Construction of Channel between existing and CP9	25 days	2008/12/1	2008/12/31																								
84	<b>Construction of Rectangular Channel of KT14B</b>	<b>25 days</b>	<b>2008/12/1</b>	<b>2008/12/31</b>																								
85	Bay 12 (CH110.00 - CH122.00)	12 days	2008/12/1	2008/12/13																								
86	Excavation	5 days	2008/12/1	2008/12/5																								
87	Cast Blinding Layer	1 day	2008/12/6	2008/12/6																								
88	Construction of Base Slab & Vertical Wall	5 days	2008/12/8	2008/12/12																								
89	Backfilling	1 day	2008/12/13	2008/12/13																								
95	Bay 13-2 (CH125.00 - CH134.00)	12 days	2008/12/1	2008/12/13																								
96	Excavation	5 days	2008/12/1	2008/12/5																								
97	Cast Blinding Layer	1 day	2008/12/6	2008/12/6																								

Task Progress Summary External Tasks Deadline   
 Split Milestone Project Summary Page 2 External Milestone

**Contract No. : DC/2007/17**  
**Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen of Yuen Long District and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun**  
**Three Months Rolling Programme (January 2009 to March 2009)**

Task No.	Task Name	Duration	Start	Finish	Jan 2009					Feb 2009				Mar 2009				Apr 2009					
					28/12	4/1	11/1	18/1	25/1	1/2	8/2	15/2	22/2	1/3	8/3	15/3	22/3	29/3					
1	Section I (Channel KT12)	73 days	2009/1/2	2009/3/31	[Gantt bar]																		
31																							
32	Section II (Channel KT13)	73 days	2009/1/2	2009/3/31	[Gantt bar]																		
113																							
114	Section III (Channel KT14A)	73 days	2009/1/2	2009/3/31	[Gantt bar]																		
115	Regular Environmental Impact Monitoring	73 days	2009/1/2	2009/3/31	[Dotted bar]																		
116	Regular Tree Survey	73 days	2009/1/2	2009/3/31	[Dotted bar]																		
117	Regular Structural Condition Survey	73 days	2009/1/2	2009/3/31	[Dotted bar]																		
118	Construction of Rectangular Channel	73 days	2009/1/2	2009/3/31	[Gantt bar]																		
119	Bay 2 (CH11.00 - CH23.00)	5 days	2009/1/2	2009/1/7	[Gantt bar]																		
120	Construction of Vertical Wall	3 days	2009/1/2	2009/1/5	[Gantt bar]																		
121	Backfilling	1 day	2009/1/6	2009/1/6	[Gantt bar]																		
122	Removal of Sheet Piling	1 day	2009/1/7	2009/1/7	[Gantt bar]																		
123	Bay 3 (CH23.00 - CH35.00)	17 days	2009/1/2	2009/1/21	[Gantt bar]																		
124	Excavation	3 days	2009/1/2	2009/1/5	[Gantt bar]																		
125	Installation of Sheet Piling	4 days	2009/1/3	2009/1/7	[Gantt bar]																		
126	Cast Blinding Layer	1 day	2009/1/8	2009/1/8	[Gantt bar]																		
127	Construction of Base Slab	4 days	2009/1/9	2009/1/13	[Gantt bar]																		
128	Backfilling to the Kicker Level	1 day	2009/1/14	2009/1/14	[Gantt bar]																		
129	Construction of Vertical Wall	4 days	2009/1/15	2009/1/19	[Gantt bar]																		
130	Backfilling	1 day	2009/1/20	2009/1/20	[Gantt bar]																		
131	Removal of Sheet Piling	1 day	2009/1/21	2009/1/21	[Gantt bar]																		
132	Bay 4 (CH35.00 - CH48.00)	17 days	2009/1/14	2009/2/5	[Gantt bar]																		
133	Excavation	5 days	2009/1/14	2009/1/19	[Gantt bar]																		
134	Installation of Sheet Piling	4 days	2009/1/15	2009/1/19	[Gantt bar]																		
135	Cast Blinding Layer	1 day	2009/1/20	2009/1/20	[Gantt bar]																		
136	Construction of Base Slab	4 days	2009/1/21	2009/1/24	[Gantt bar]																		
137	Backfilling to the Kicker Level	1 day	2009/1/29	2009/1/29	[Gantt bar]																		
138	Construction of Vertical Wall	4 days	2009/1/30	2009/2/3	[Gantt bar]																		
139	Backfilling	1 day	2009/2/4	2009/2/4	[Gantt bar]																		
140	Removal of Sheet Piling	1 day	2009/2/5	2009/2/5	[Gantt bar]																		
141	Bay 5 (CH48.00 - CH52.00)	11 days	2009/1/20	2009/2/4	[Gantt bar]																		
142	Excavation	5 days	2009/1/29	2009/2/3	[Gantt bar]																		
143	Installation of Sheet Piling	4 days	2009/1/30	2009/2/3	[Gantt bar]																		
144	Cast Blinding Layer	1 day	2009/2/4	2009/2/4	[Gantt bar]																		
145	Construction of Base Slab	4 days	2009/1/20	2009/1/23	[Gantt bar]																		
146	Backfilling to the Kicker Level	1 day	2009/1/24	2009/1/24	[Gantt bar]																		
147	Construction of Vertical Wall	4 days	2009/1/29	2009/2/2	[Gantt bar]																		
148	Backfilling	1 day	2009/2/3	2009/2/3	[Gantt bar]																		
149	Removal of Sheet Piling	1 day	2009/2/4	2009/2/4	[Gantt bar]																		
150	Bay 6 (CH52.00 - CH56.00)	16 days	2009/1/24	2009/2/14	[Gantt bar]																		
151	Excavation	5 days	2009/1/24	2009/2/2	[Gantt bar]																		
152	Installation of Sheet Piling	4 days	2009/1/29	2009/2/2	[Gantt bar]																		
153	Cast Blinding Layer	1 day	2009/2/3	2009/2/3	[Gantt bar]																		
154	Construction of Base Slab	4 days	2009/2/3	2009/2/6	[Gantt bar]																		
155	Backfilling to the Kicker Level	1 day	2009/2/7	2009/2/7	[Gantt bar]																		
156	Construction of Vertical Wall & Top Slab	4 days	2009/2/9	2009/2/12	[Gantt bar]																		
157	Backfilling	1 day	2009/2/13	2009/2/13	[Gantt bar]																		
158	Removal of Sheet Piling	1 day	2009/2/14	2009/2/14	[Gantt bar]																		
159	Bay 7 (CH56.00 - CH64.00)	17 days	2009/2/7	2009/2/26	[Gantt bar]																		
160	Excavation	5 days	2009/2/7	2009/2/12	[Gantt bar]																		
161	Installation of Sheet Piling	4 days	2009/2/9	2009/2/12	[Gantt bar]																		
162	Cast Blinding Layer	1 day	2009/2/13	2009/2/13	[Gantt bar]																		
163	Construction of Base Slab	4 days	2009/2/14	2009/2/18	[Gantt bar]																		
164	Backfilling to the Kicker Level	1 day	2009/2/19	2009/2/19	[Gantt bar]																		
165	Construction of Vertical Wall	4 days	2009/2/20	2009/2/24	[Gantt bar]																		

Task [Dotted bar] Progress [Solid bar] Summary [Arrow bar] External Tasks [Dashed bar] Deadline [Dotted bar]

Split [Dotted bar] Milestone [Diamond] Project Summary [Arrow bar] External Milestone [Diamond]



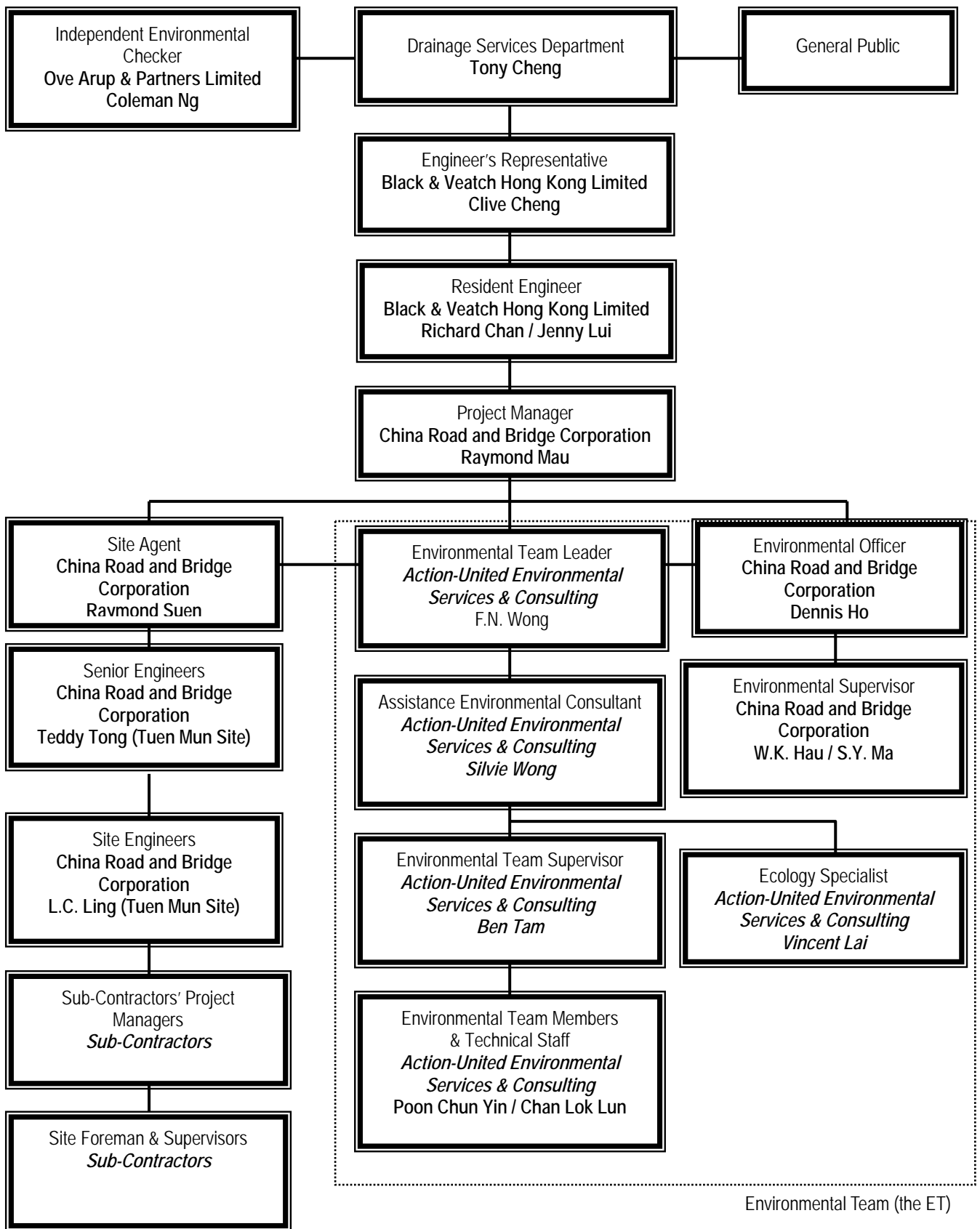
**Contract No. : DC/2007/17**  
**Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen of Yuen Long District and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun**  
**Three Months Rolling Programme (January 2009 to March 2009)**

Task No.	Task Name	Duration	Start	Finish	Jan 2009					Feb 2009				Mar 2009				Apr 2009	
					28/12	4/1	11/1	18/1	25/1	1/2	8/2	15/2	22/2	1/3	8/3	15/3	22/3	29/3	
166	Backfilling	1 day	2009/2/25	2009/2/25															
167	Removal of Sheet Piling	1 day	2009/2/26	2009/2/26															
168	<b>Bay 8 (CH64.00 - CH76.00)</b>	17 days	2009/2/19	2009/3/10															
169	Excavation	5 days	2009/2/19	2009/2/24															
170	Installation of Sheet Piling	4 days	2009/2/20	2009/2/24															
171	Cast Blinding Layer	1 day	2009/2/25	2009/2/25															
172	Construction of Base Slab	4 days	2009/2/26	2009/3/2															
173	Backfilling to the Kicker Level	1 day	2009/3/3	2009/3/3															
174	Construction of Vertical Wall	4 days	2009/3/4	2009/3/7															
175	Backfilling	1 day	2009/3/9	2009/3/9															
176	Removal of Sheet Piling	1 day	2009/3/10	2009/3/10															
177	<b>Bay 9 (CH76.00 - CH88.00)</b>	17 days	2009/3/3	2009/3/21															
178	Excavation	5 days	2009/3/3	2009/3/7															
179	Installation of Sheet Piling	4 days	2009/3/4	2009/3/7															
180	Cast Blinding Layer	1 day	2009/3/9	2009/3/9															
181	Construction of Base Slab	4 days	2009/3/10	2009/3/13															
182	Backfilling to the Kicker Level	1 day	2009/3/14	2009/3/14															
183	Construction of Vertical Wall	4 days	2009/3/16	2009/3/19															
184	Backfilling	1 day	2009/3/20	2009/3/20															
185	Removal of Sheet Piling	1 day	2009/3/21	2009/3/21															
186	<b>Bay 10 (CH88.00 - CH100.00)</b>	15 days	2009/3/14	2009/3/31															
187	Excavation	5 days	2009/3/14	2009/3/19															
188	Installation of Sheet Piling	4 days	2009/3/16	2009/3/19															
189	Cast Blinding Layer	1 day	2009/3/20	2009/3/20															
190	Construction of Base Slab	4 days	2009/3/21	2009/3/25															
191	Backfilling to the Kicker Level	1 day	2009/3/26	2009/3/26															
192	Construction of Vertical Wall	4 days	2009/3/27	2009/3/31															
193	<b>Bay 11 (CH100.00 - CH112.00)</b>	5 days	2009/3/26	2009/3/31															
194	Excavation	5 days	2009/3/26	2009/3/31															
195	Installation of Sheet Piling	4 days	2009/3/27	2009/3/31															
196	<b>Laying of Gabion Block Inside the Channel Structures</b>	48 days	2009/2/4	2009/3/31															
197	Bay 1 (CH0.00 - CH11.00)	15 days	2009/2/4	2009/2/20															
198	Bay 2 (CH11.00 - CH23.00)	15 days	2009/2/21	2009/3/10															
199	Bay 3 (CH23.00 - CH35.00)	15 days	2009/3/11	2009/3/27															
200	Bay 4 (CH35.00 - CH48.00)	3 days	2009/3/28	2009/3/31															
201																			
202	Section IV (Channel KT14B & KT14C)	73 days	2009/1/2	2009/3/31															
388																			
389	Section V (For Section I, II, III & IV)	73 days	2009/1/2	2009/3/31															
391																			
392	Section VI - Portion 9A & 9B (Tuen Mun Sewerage Work)	73 days	2009/1/2	2009/3/31															
396																			
397	Section VII - Portion 10A, 10B & 10C (Tuen Mun Sewerage Work)	73 days	2009/1/2	2009/3/31															

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			

**Appendix C**

**Environmental Management Organization and  
Contacts of Key Personnel**



Environmental Management Organization

**Contact Details of Key Personnel**

<b>Organization</b>	<b>Project Role</b>	<b>Name of Key Staff</b>	<b>Tel No.</b>	<b>Fax No.</b>
DSD	Employer	Mr. Tony Cheng	2594 7264	2827-8526
B&V	Engineer's Representative	Mr. Clive Cheng	2478-9161	2478-9369
B&V	Resident Engineer	Mr. Richard Chan	2478-9161	2478-9369
B&V	Resident Engineer	Mr. Jenny Lui	2478-9161	2478-9369
OAP	Independent Environmental Checker	Mr. Coleman Ng	2268 3097	2268 3950
CRBC	Project Director	Mr. Wang Yanhua	22831688	2283-1689
CRBC	Project Manager	Mr. Raymond Mau	9048-3669	2283-1689
CRBC	Site Agent	Mr. Raymond Suen	9779-8871	2283-1689
CRBC	Senior Engineer (Tuen Mun Site)	Mr. Teddy Tong	6283 9684	2283-1689
CRBC	Site Engineer (Tuen Mun Site)	Mr. L.C. Ling	6770 4010	2283-1689
CRBC	Environmental Officer	Mr. Dennis Ho	6474-6975	2283-1689
CRBC	Environmental / Construction Supervisor (Tuen Mun and Yuen Long site)	Mr. W.K. Hau	6283 9696	2283-1689
CRBC	Environmental / Construction Supervisor (Yuen Long site)	Mr. S.Y. Ma	9401 6296-	2283-1689
CRBC	Safety Officer	Kenny Sze	9374-8954	2283-1689
AUES	Environmental Team Leader	Mr. FN Wong	2959-6059	2959-6079
AUES	Assistance Environmental Consultant	Miss Nocola Hon	2959-6059	2959-6079
AUES	Environmental Site Inspector	Mr. Ben Tam	2959-6059	2959-6079
AUES	Ecologist	Mr. Vincent Lai	2959-6059	2959-6079

**Legend:**

*DSD (Employer) – Drainage Services Department*

*B&V (Engineer) – Black & Veatch Hong Kong Limited*

*CRBC (Main Contractor) – China Road and Bridge Corporation*

*OAP (IEC) – Ove Arup & Partners Ltd*

*AUES (ET) – Action-United Environmental Services & Consulting*

## **Appendix D**

- (a) Monitoring Schedules**
- (b) Meteorological Data**

**Impact EM&A Program for October 2008 –KT14A**

**October 2008 Monitoring Schedule for KT 14A**

Date		Air Quality		Noise Leq 30min	Water Quality	Ecology Surveys
		1-Hour TSP	24-Hour TSP			
1-Oct-08	Wed					
2-Oct-08	Thu				W8A & W8B	
3-Oct-08	Fri					
4-Oct-08	Sat				W8A & W8B	
5-Oct-08	Sun					
6-Oct-08	Mon	A8(a)		N8	W8A & W8B	
7-Oct-08	Tue					
8-Oct-08	Wed		A8(a)			
9-Oct-08	Thu				W8A & W8B	
10-Oct-08	Fri					
11-Oct-08	Sat				W8A & W8B	
12-Oct-08	Sun					
13-Oct-08	Mon	A8(a)		N8	W8A & W8B	
14-Oct-08	Tue		A8(a)			
15-Oct-08	Wed				W8A & W8B	
16-Oct-08	Thu					
17-Oct-08	Fri				W8A & W8B	
18-Oct-08	Sat	A8(a)		N8		
19-Oct-08	Sun					
20-Oct-08	Mon		A8(a)		W8A & W8B	
21-Oct-08	Tue					
22-Oct-08	Wed				W8A & W8B	
23-Oct-08	Thu					
24-Oct-08	Fri	A8(a)		N8	W8A & W8B	
25-Oct-08	Sat		A8(a)			
26-Oct-08	Sun					
27-Oct-08	Mon				W8A & W8B	
28-Oct-08	Tue					
29-Oct-08	Wed				W8A & W8B	
30-Oct-08	Thu	A8(a)		N8		
31-Oct-08	Fri		A8(a)		W8A & W8B	

	Monitoring Day
	Sunday or Public Holiday

**A(1) Environmental Monitoring Schedule – November 2008**

Date		Air Quality		Noise Leq 30min	Water Quality
		1-Hour TSP	24-Hour TSP		
1-Nov-08	Sat				
<b>2-Nov-08</b>	<b>Sun</b>				
3-Nov-08	Mon				
4-Nov-08	Tue				
5-Nov-08	Wed				
6-Nov-08	Thu				
7-Nov-08	Fri				
8-Nov-08	Sat				
<b>9-Nov-08</b>	<b>Sun</b>				
10-Nov-08	Mon				
11-Nov-08	Tue				
12-Nov-08	Wed				
13-Nov-08	Thu				
14-Nov-08	Fri				
15-Nov-08	Sat				
<b>16-Nov-08</b>	<b>Sun</b>				
17-Nov-08	Mon				
18-Nov-08	Tue				
19-Nov-08	Wed				
20-Nov-08	Thu				
21-Nov-08	Fri				
22-Nov-08	Sat				
<b>23-Nov-08</b>	<b>Sun</b>				
24-Nov-08	Mon				
25-Nov-08	Tue				
26-Nov-08	Wed				
27-Nov-08	Thu				
28-Nov-08	Fri				
29-Nov-08	Sat				
<b>30-Nov-08</b>	<b>Sun</b>				

	Monitoring Day
	Sunday or Public Holiday

**Remarks: Impact Monitoring Frequency**

**Air Quality** :Once every 6 days for 24-Hr TSP and three times every 6 days for 1-Hr TSP, when the highest construction dust impacts are anticipated.

**Noise** :Once a week during 0700-1900 on normal weekdays for Leq30min

**Water Quality** :Three times a week with intervals of at least 36 hours between two consecutive monitoring events

(A2) Environmental Monitoring Schedule - December 2008

Date		Air Quality		NOISE LEQ 30MIN	WATER QUALITY	ECOLOGY SURVEYS
		1-Hour TSP	24-Hour TSP			
1-Dec-08	Mon				W8A & W8B	
2-Dec-08	Tue					
3-Dec-08	Wed		A8(a)		W8A & W8B	
4-Dec-08	Thu	A8(a)		N8		
5-Dec-08	Fri				W8A & W8B	
6-Dec-08	Sat					
7-Dec-08	Sun					
8-Dec-08	Mon				W8A & W8B	
9-Dec-08	Tue		A8(a)			
10-Dec-08	Wed	A8(a)		N8	W8A & W8B	
11-Dec-08	Thu					
12-Dec-08	Fri				W8A & W8B	
13-Dec-08	Sat					
14-Dec-08	Sun					
15-Dec-08	Mon		A8(a)		W8A & W8B	
16-Dec-08	Tue	A8(a)		N8		
17-Dec-08	Wed				W8A & W8B	
18-Dec-08	Thu					
19-Dec-08	Fri				W8A & W8B	
20-Dec-08	Sat		A8(a)			
21-Dec-08	Sun					
22-Dec-08	Mon	A8(a)		N8	W8A & W8B	
23-Dec-08	Tue					
24-Dec-08	Wed		A8(a)		W8A & W8B	
25-Dec-08	Thu					
26-Dec-08	Fri					
27-Dec-08	Sat	A8(a)		N8	W8A & W8B	
28-Dec-08	Sun					
29-Dec-08	Mon				W8A & W8B	
30-Dec-08	Tue					
31-Dec-08	Wed		A8(a)		W8A & W8B	

	Monitoring Day
	Sunday or Public Holiday

Remarks: Impact Monitoring Frequency

**Air Quality** :Once every 6 days for 24-Hr TSP and three times every 6 days for 1-Hr TSP, when the highest construction dust impacts are anticipated.

**Noise** :Once a week during 0700-1900 on normal weekdays for Leq30min

**Water Quality** :Three times a week with intervals of at least 36 hours between two consecutive monitoring events



**(B) Meteorological Data Extracted from HKO in the Reporting Period**

**Meteorological Data Extracted from HKO during the Reporting Period**

Date	Weather	Lau Fau Shan Weather Station					
		Total Rainfall (mm)	Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction	
26-Oct-08	Sun	cloudy/sunny intervals/moderate/fresh	0	27.4	11.7	70.5	E/SE
27-Oct-08	Mon	fine/haze/moderate	Trace	27.3	10.5	74.3	E/NE
28-Oct-08	Tue	fine/cloudy/rain/moderate/fresh	0.1	26	9.7	73.5	E
29-Oct-08	Wed	sunny intervals/cloudy/moderate	0	27.5	10.2	6.9	E/SE
30-Oct-08	Thu	fine/moderate/fresh/rain	0	28	9	71.5	E/SE
31-Oct-08	Fri	sunny intervals/cloudy/moderate/fresh	0	28.5	12.5	71.7	E
1-Nov-08	Sat	cloudy/sunny intervals/rain/moderate/fresh	0.2	27.1	15.5	70.7	E
2-Nov-08	Sun	cloudy/rain/moderate/fresh	2.6	27.7	13.5	77	E/SE
3-Nov-08	Mon	cloudy/rain/thunderstorm/moderate/fresh	51.2	23.7	12	91	E/NE
4-Nov-08	Tue	cloudy/rain/moderate/fresh	Trace	25.1	17	81	E/NE
5-Nov-08	Wed	cloudy/sunny intervals/rain/moderate/fresh	0.3	26.6	15	76	E/NE
6-Nov-08	Thu	sunny periods/cloudy/moderate	0	27.6	11	75.5	E
7-Nov-08	Fri	fine/cloudy/rain/moderate	Trace	27.9	9	76.5	E/SE
8-Nov-08	Sat	cloudy/rain/fresh/strong	Trace	27.5	16.5	78	N/NW
9-Nov-08	Sun	fine/very dry/fresh/strong	Trace	Maintenance	27.5	Maintenance	N/NE
10-Nov-08	Mon	fine/very dry/fresh/strong	0	19.5	26	Maintenance	N/NE
11-Nov-08	Tue	fine/very dry/moderate/fresh	0	18.9	20.5	45	NE
12-Nov-08	Wed	fine/very dry/moderate	0	19.6	15	42	E/NE
13-Nov-08	Thu	fine/dry/moderate	Trace	21.5	11	45	E
14-Nov-08	Fri	fine/dry/moderate	Trace	23.7	9.2	61.5	E/NE
15-Nov-08	Sat	fine/moderate	0	24.1	7.2	66	E/NE
16-Nov-08	Sun	fine/moderate	0	25.8	13.2	54	E/SE
17-Nov-08	Mon	fine/moderate	0	24.8	12	68.5	E/SE
18-Nov-08	Tue	fine/dry/haze/cloudy/fresh/strong	0	21.2	14.5	64	E/NE
19-Nov-08	Wed	fine/dry/cool/moderate/fresh	0	18.7	21.5	47	NE
20-Nov-08	Thu	fine/dry/cool/moderate/fresh	0	16.9	12.7	42.5	E/NE
21-Nov-08	Fri	fine/dry/moderate/fresh	0	18.7	8.2	52.5	E/NE
22-Nov-08	Sat	sunny periods/dry/cloudy/moderate	0	20.6	8.5	59	E/NE
23-Nov-08	Sun	fine/moderate/fresh	Trace	22.9	10	96.5	W/SW
24-Nov-08	Mon	fine/dry/moderate/fresh	0	22.6	15	95.5	N/NE
25-Nov-08	Tue	fine/dry/moderate	0	21.7	15	50	E/NE

**Appendix E**

**Calibration Certificates and**

**HOKLAS-Accreditation Certificate**

# CERTIFICATE OF ANALYSIS



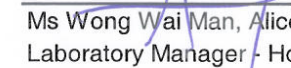
Batch: HK0817539  
Date of Issue: 17/10/2008  
Client: ACTION UNITED ENVIRO SERVICES  
Client Reference:

## Calibration of Thermometer

Item : YSI Multimeter  
Model No. : YSI 550A  
Serial No. : 05F2063AZ  
Equipment No.: - -  
Calibration Method : In-house Method  
Date of Calibration : 17 October, 2008

## Testing Results :

Reference Temperature (°C)	Recorded Temperature (°C)
23.2 °C	23.3°C
31.5 °C	31.4 °C
Allowing Deviation	±0.2 mg/L

  
Ms Wong Wai Man, Alice  
Laboratory Manager - Hong Kong

# CERTIFICATE OF ANALYSIS



Batch: HK0817539  
Date of Issue: 17/10/2008  
Client: ACTION UNITED ENVIRO SERVICES  
Client Reference:

## Calibration of DO System

Item : YSI Multimeter

Model No. : YSI 550A

Serial No. : 05F2063AZ

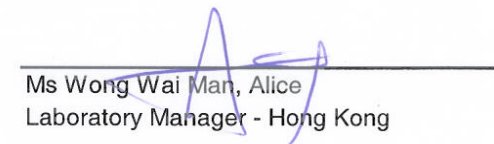
Equipment No. : --

Calibration Method : This meter was calibrated in accordance with standard method APHA (18th Ed.) 4500-0C & G

Date of Calibration : 17 October, 2008

## Testing Results :

Expected Reading	Recording Reading
4.88 mg/L	4.76 mg/L
6.52 mg/L	6.38 mg/L
7.89 mg/L	7.86 mg/L
Allowing Deviation	±0.2 mg/L

  
Ms Wong Wai Man, Alice  
Laboratory Manager - Hong Kong

# CERTIFICATE OF ANALYSIS



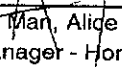
Batch: HK0815012  
Date of Issue: 19/09/2008  
Client: ACTION UNITED ENVIRO SERVICES  
Client Reference:

## Calibration of Turbidity System

Item : HACH Turbidimeter  
Model No. : HACH 2100P  
Serial No. : 950900008735  
Equipment No. : EQ091  
Calibration Method : This meter was calibrated in accordance with standard method APHA (19th Ed.) 2130B  
Date of Calibration : 01 September, 2008

### Testing Results :

Expected Reading	Recording Reading
0.00	0.23
1.00	1.08
2.00	2.17
4.00	3.78
16.0	15.1
40.0	37.5
80.0	74.9
160	149
Allowing Deviation	± 0.2

  
Ms Wong Wai Man, Alice  
Laboratory Manager - Hong Kong

# CERTIFICATE OF ANALYSIS



**Batch:** HK0817540  
**Date of Issue:** 17/10/2008  
**Client:** ACTION UNITED ENVIRO SERVICES  
**Client Reference:**

## Calibration of Salinity System

**Item :** HAND REFRACTOMETER  
**Model No. :** ATAGO  
**Serial No. :** 289468  
**Equipment No. :** EQ114  
**Calibration Method :** This meter was calibrated in accordance with standard method APHA (19th Ed.) 2520 A and B  
**Date of Calibration :** 17 October, 2008

## Testing Results :

Expected Reading	Recording Reading
10 g/L	10 g/L
20 g/L	19 g/L
30 g/L	28 g/L
40 g/L	38 g/L
Allowing Deviation	±10%

  
Ms Wong Wai Man, Alice  
Laboratory Manager - Hong Kong

# CERTIFICATE OF ANALYSIS



Batch: HK0810119  
Date of Issue: 09/07/2008  
Client: ACTION UNITED ENVIRO SERVICES  
Client Reference:

## Calibration of pH System

Item : HANNA pH Meter

Model No. : HI98107

Serial No. : S388220


Equipment No. : 0800542

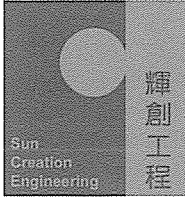
Calibration Method : This meter was calibrated in accordance with standard method APHA (19th Ed.) 4500-H<sup>+</sup>B

Date of Calibration : 27 June, 2008

### Testing Results :

Expected Reading	Recording Reading
4.00	3.8
7.00	6.9
10.0	10.0
Allowing Deviation	± 0.2

  
Ms Wong Wai Man, Alice  
Laboratory Manager - Hong Kong



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C082016

## Certificate of Calibration

*This is to certify that the equipment*

*Description : Integrating Sound Level Meter (EQ006)*

*Manufacturer : Bruel & Kjaer*

*Model No. : 2238*

*Serial No. : 2285762*

*has been calibrated for the specific items and ranges.  
The results are shown in the Calibration Report No. C082016.*

*The equipment is supplied by*

*Co. Name : Action-United Environmental Services and Consulting*

*Address : Unit A, 20/F., Gold King Industrial Building,  
35-41 Tai Lin Pai Road, Kwai Chung, N.T.*

*Date of Issue : 22 April 2008*

*Certified by :*

*K C Lee*

The test equipment used for testing are traceable to the National Standards as specified in this report.  
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited

c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

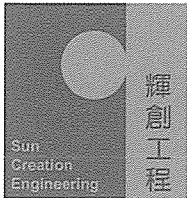
Tel: 2927 2606

Fax: 2744 8986

E-mail: callab@suncreation.com

Website: www.suncreation.com





輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C082016

## Calibration Report

### ITEM TESTED

DESCRIPTION : Integrating Sound Level Meter (EQ006)  
MANUFACTURER : Bruel & Kjaer  
MODEL NO. : 2238  
SERIAL NO. : 2285762

### TEST CONDITIONS

AMBIENT TEMPERATURE :  $(23 \pm 2)^{\circ}\text{C}$  RELATIVE HUMIDITY :  $(55 \pm 20)\%$   
LINE VOLTAGE : ---

### TEST SPECIFICATIONS

Calibration check

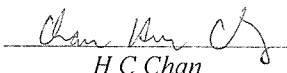
DATE OF TEST : 21 April 2008

JOB NO. : IC08-0992

### TEST RESULTS

The results apply to the particular unit-under-test only.  
All results are within manufacturer's specification.  
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :  
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Tested by :   
H C Chan

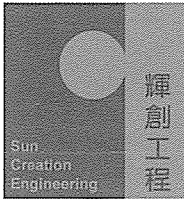
Date : 22 April 2008

The test equipment used for testing are traceable to the National Standards as specified in this report.  
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited

c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong  
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

Page 1 of 4



# Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
2. Self-calibration using the B&K acoustic calibrator 4231, S/N 2326408 was performed before the test.
3. The results presented are the mean of 3 measurements at each calibration point.
4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C080037
CL281	Multifunction Acoustic Calibrator	DC080007

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

Range (dB)	UUT Setting			Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq. (kHz)		
20 - 100	L <sub>AFP</sub>	A	F	94.00	1	93.9	± 0.7

6.1.2 Linearity

Range (dB)	UUT Setting			Applied Value		UUT Reading (dB)
	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq. (kHz)	
40 - 120	L <sub>AFP</sub>	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		113.9

IEC 651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

Range (dB)	UUT Setting			Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq. (kHz)		
20 - 100	L <sub>AFP</sub>	A	F	94.00	1	94.0	Ref.
	L <sub>ASP</sub>		S			94.0	± 0.1
	L <sub>AIP</sub>		I			94.0	± 0.1

The test equipment used for testing are traceable to the National Standards as specified in this report. This report shall not be reproduced except in full and with prior written approval from this laboratory.

# Calibration Report

## 6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Burst Duration		
30 - 110	L <sub>AFP</sub>	A	F	106.00	Continuous	106.0	Ref.
	L <sub>AFMax</sub>				200 ms	104.9	-1.0 ± 1.0
	L <sub>ASP</sub>	S	Continuous		106.0	Ref.	
	L <sub>ASMax</sub>		500 ms		101.9	-4.1 ± 1.0	

## 6.3 Frequency Weighting

### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq.		
20 - 100	L <sub>AFP</sub>	A	F	94.00	31.5 Hz	54.8	-39.4 ± 1.5
					63 Hz	67.6	-26.2 ± 1.5
					125 Hz	77.6	-16.1 ± 1.0
					500 Hz	90.6	-3.2 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	95.0	+1.2 ± 1.0
					4 kHz	94.8	+1.0 ± 1.0
					8 kHz	92.6	-1.1 (+1.5 ; -3.0)
					12.5 kHz	88.8	-4.3 (+3.0 ; -6.0)

### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq.		
20 - 100	L <sub>CFP</sub>	C	F	94.00	31.5 Hz	91.0	-3.0 ± 1.5
					63 Hz	93.0	-0.8 ± 1.5
					125 Hz	93.5	-0.2 ± 1.0
					500 Hz	93.8	0.0 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	93.7	-0.2 ± 1.0
					4 kHz	93.1	-0.8 ± 1.0
					8 kHz	90.7	-3.0 (+1.5 ; -3.0)
					12.5 kHz	86.9	-6.2 (+3.0 ; -6.0)

The test equipment used for testing are traceable to the National Standards as specified in this report.  
This report shall not be reproduced except in full and with prior written approval from this laboratory.

## Calibration Report

### 6.4 Time Averaging

UUT Setting				Applied Value					UUT	IEC 60804	
Range (dB)	Mode	Freq. Weight	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)	Reading (dB)	Type I Spec. (dB)	
30 - 110	Leq	A	10 sec.	4	1	1/10	110.0	100	100.2	± 0.5	
								1/10 <sup>2</sup>	90	90.2	± 0.5
			60 sec.					1/10 <sup>3</sup>	80	79.8	± 1.0
			5 min.					1/10 <sup>4</sup>	70	69.5	± 1.0

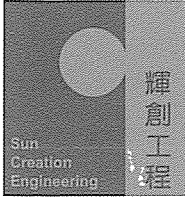
Remarks : - Mfr's Spec. : IEC 651 & IEC 60804 Type 1

- Uncertainties of Applied Value :
  - 94 dB : 31.5 Hz - 125 Hz : ± 0.40 dB
  - 500 Hz : ± 0.30 dB
  - 1 kHz : ± 0.20 dB
  - 2 kHz : ± 0.40 dB
  - 4 kHz : ± 0.50 dB
  - 8 kHz : ± 0.70 dB
  - 12.5 kHz : ± 1.20 dB
  - 104 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
  - 114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
  - Burst equivalent level : ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

The values given in this Calibration Report only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C082026

## Certificate of Calibration

*This is to certify that the equipment*

*Description : Acoustical Calibrator (EQ016)*

*Manufacturer : Bruel & Kjaer*

*Model No. : 4231*

*Serial No. : 2292167*

*has been calibrated for the specific items and ranges.  
The results are shown in the Calibration Report No. C082026.*

*The equipment is supplied by*

*Co. Name : Action-United Environmental Services and Consulting*

*Address : Unit A, 20/F., Gold King Industrial Building,  
35-41 Tai Lin Pai Road, Kwai Chung, N.T.*

*Date of Issue : 22 April 2008*

Certified by :

*K/C Lee*

The test equipment used for testing are traceable to the National Standards as specified in this report.  
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited

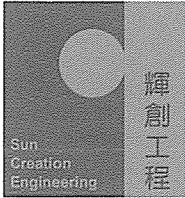
c/o 4/F, Tsing Shan Wan Exchange Building, I Hing On Lane, Tuen Mun, New Territories, Hong Kong

Tel: 2927 2606

Fax: 2744 8986

E-mail: callab@suncreation.com

Website: www.suncreation.com



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C082026

## Calibration Report

### ITEM TESTED

DESCRIPTION : Acoustical Calibrator (EQ016)  
MANUFACTURER : Bruel & Kjaer  
MODEL NO. : 4231  
SERIAL NO. : 2292167

### TEST CONDITIONS

AMBIENT TEMPERATURE :  $(23 \pm 2)^{\circ}\text{C}$  RELATIVE HUMIDITY :  $(55 \pm 20)\%$   
LINE VOLTAGE : ---

### TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 21 April 2008

JOB NO. : IC08-0992

### TEST RESULTS

The results apply to the particular unit-under-test only.  
All results are within manufacturer's specification & user's specified acceptance criteria.  
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested by :   
H C Chan

Date : 22 April 2008

The test equipment used for testing are traceable to the National Standards as specified in this report.  
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c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong  
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

Page 1 of 2

## Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours before the commencement of the test.
2. The results presented are the mean of 3 measurements at each calibration point.
3. Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
TST150A	Measuring Amplifier	C080751
CL129	Universal Counter	C072995
CL281	Multifunction Acoustic Calibrator	DC080007

4. Test procedure : MA100N.

5. Results :

### 5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	User's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.3	± 0.2
114 dB, 1 kHz	114.0		

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 0.1 %	± 0.1

Remarks : - The user's specified acceptance criteria (user's spec.) is a customer pre-defined operating tolerance of the UUT, suitable for one's own intended use.

- The uncertainties are for a confidence probability of not less than 95 %.

#### Note :

The values given in this Calibration Report only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Strong Sing Garden	Date of Calibration: 24-Oct-08
Location ID : KT14-1 (A8(a))	Next Calibration Date: 24-Dec-08
	Technician: Mr. Ben Tam

### CONDITIONS

Sea Level Pressure (hPa)	1016.4	Corrected Pressure (mm Hg)	762.3
Temperature (°C)	17.0	Temperature (K)	290

### CALIBRATION ORIFICE

Make-> TISCH	Qstd Slope ->
Model-> 515N	Qstd Intercept ->
	1.54431
	-0.01988

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.6	4.6	9.2	2.007	55	56.60	Slope = 42.4171 Intercept = -29.3558 Corr. coeff. = 0.9984
13	3.8	3.8	7.6	1.825	47	48.37	
10	3	3	6	1.623	37	38.08	
7	2.1	2.1	4.2	1.360	27	27.79	
5	1.1	1.1	2.2	0.988	13	13.38	

**Calculations :**

$$Qstd = 1/m[\text{Sqrt}(H20(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K )

Pstd = actual pressure during calibration ( mm Hg )

**For subsequent calculation of sampler flow:**

$$1/m(( I )[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

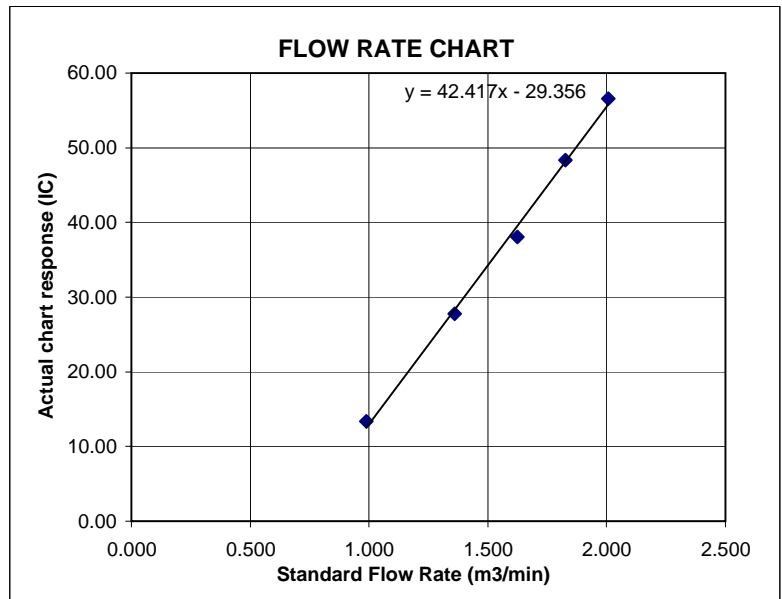
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

### Shui Mei Tsuen

Location : Strong Sing Garden	Date : 24-Oct-08
Sampler : AS-1-RSP (895-1576)	Technician: Ben Tam

#### CONDITIONS

Sea Level Pressure (hPa)	1010.3	Corrected Pressure (mm Hg)	757.725
Temperature (°C)	27	Temperature (K)	300

#### CALIBRATION ORIFICE

Make-> GRASEBY	Qstd Slope ->	2
Model-> 25A	Qstd Intercept ->	-0.021774
Serial # -> 127P	Date Certified ->	20/7/1995

#### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	3.5	3.5	7	1.328	40	39.73	Slope = 34.0322 Intercept = -5.3524 Corr. coeff. = 0.9940
13	3	3	6	1.231	37	36.75	
10	2.4	2.4	4.8	1.102	33	32.77	
7	1.7	1.7	3.4	0.929	25	24.83	
5	1.1	1.1	2.2	0.749	21	20.86	

#### Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K )

Pstd = actual pressure during calibration ( mm Hg )

#### For subsequent calculation of sampler flow:

$$1/m(( I )[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

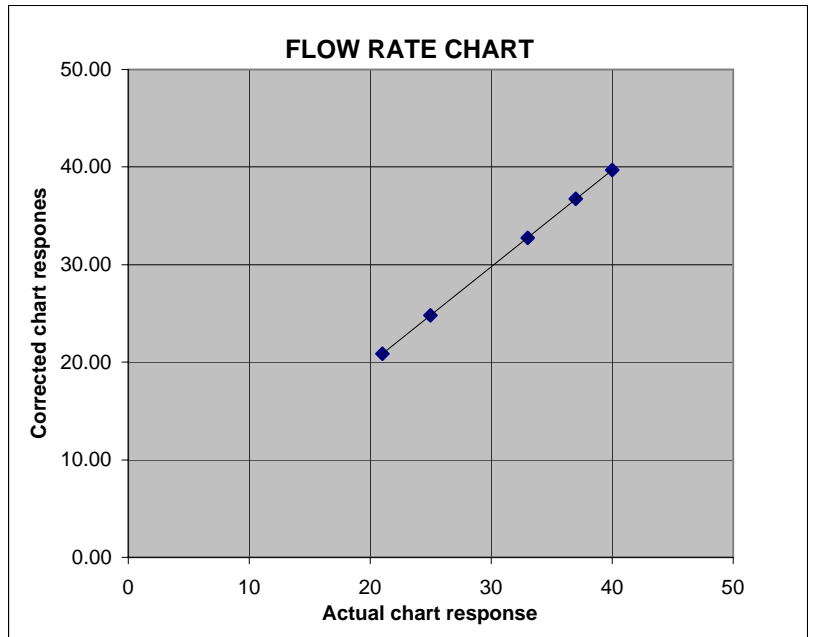
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





Hong Kong Accreditation Service  
香港認可處

**Certificate of Accreditation**  
**認可證書**

*This is to certify that*  
特此證明

**ALS TECHNICHEM (HK) PTY LIMITED**

11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, New Territories, Hong Kong  
香港葵涌永業街1-3號忠信針織中心11樓

*has been accepted by the HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a  
為香港認可處執行機關根據認可諮詢委員會建議而接受的*

**HOKLAS Accredited Laboratory**  
「香港實驗所認可計劃」認可實驗所

*This laboratory meets the requirements of ISO / IEC 17025 : 2005 – General requirements for the competence  
此實驗所符合ISO / IEC 17025 : 2005 – 《測試及校正實驗所能力的通用規定》所訂的要求，  
of testing and calibration laboratories and it has been accredited for performing specific tests or calibrations as  
獲認可進行載於香港實驗所認可計劃《認可實驗所名冊》內下述測試類別中的指定  
listed in the HOKLAS Directory of Accredited Laboratories within the test category of  
測試或校正工作*

**Environmental Testing**  
**環境測試**

*This laboratory is accredited in accordance with the recognised International Standard ISO / IEC 17025 : 2005.  
本實驗所乃根據公認的國際標準 ISO / IEC 17025 : 2005 獲得認可。*

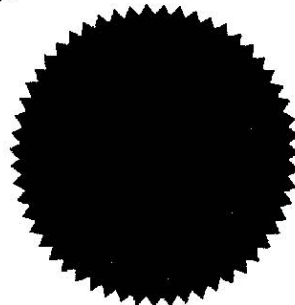
*This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory  
這項認可資格演示在指定範疇所需的技術能力及實驗所質量管理體系的運作  
quality management system (refer joint ISO-ILAC-IAF Communiqué dated 18 June 2005).  
(見國際標準化組織、國際實驗所認可合作組織及國際認可論壇於二零零五年六月十八日的聯合公報)。*

*The common seal of the Hong Kong Accreditation Service is affixed hereto by the authority of the HKAS Executive  
香港認可處根據認可處執行機關的權限在此蓋上通用印章*

CHAN Sing Sing, Terence, Executive Administrator  
執行幹事 陳成城  
Issue Date : 3 May 2006  
簽發日期：二零零六年五月三日

Registration Number : **HOKLAS 066**  
註冊號碼：

Date of First Registration : 15 September 1995  
首次註冊日期：一九九五年九月十五日



## **Appendix F**

### **Event Action Plan**

**Event/Action Plan for Air Quality**

EVENT	ACTION			
	ET	IEC	Engineer	Contractor
<b>ACTION LEVEL</b>				
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>Identify source</li> <li>Inform IEC and Engineer</li> <li>Repeat measurement to confirm finding</li> <li>Increase monitoring frequency to daily</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET</li> <li>Check Contractor's working method</li> </ol>	Notify Contractor	<ol style="list-style-type: none"> <li>Rectify any unacceptable practice</li> <li>Amend working methods if appropriate</li> </ol>
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>Identify source</li> <li>Inform IEC and Engineer</li> <li>Repeat measurements to confirm findings</li> <li>Increase monitoring frequency to daily</li> <li>Discuss with IEC and Contractor on remedial actions required</li> <li>If exceedance continues, arrange meeting with IEC and Engineer</li> <li>If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET</li> <li>Check Contractor's working method</li> <li>Discuss with ET and Contractor on possible remedial measures</li> <li>Advise Engineer on the effectiveness of the proposed remedial measures</li> <li>Supervise implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing</li> <li>Notify Contractor</li> <li>Ensure remedial measures properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>Submit proposals for remedial actions to IEC within 3 working days of notification</li> <li>Implement the agreed proposals</li> <li>Amend proposal if appropriate</li> </ol>
<b>LIMIT LEVEL</b>				
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>Identify source</li> <li>Inform Engineer and EPD</li> <li>Repeat measurement to confirm finding</li> <li>Increase monitoring frequency to daily</li> <li>Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and Engineer informed of the results</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET</li> <li>Check Contractor's working method</li> <li>Discuss with ET and Contractor on possible remedial measures</li> <li>Advise Engineer on the effectiveness of the proposed remedial measures</li> <li>Supervise implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing</li> <li>Notify Contractor</li> <li>Ensure remedial measures properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>Take immediate action to avoid further exceedance</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification</li> <li>Implement the agreed proposals</li> <li>Amend proposal if appropriate</li> </ol>
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>Notify IEC, Engineer and EPD</li> <li>Identify source</li> <li>Repeat measurement to confirm findings</li> <li>Increase monitoring frequency to daily</li> <li>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented.</li> <li>Arrange meeting with IEC and Engineer to discuss the remedial actions to be taken</li> <li>Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and Engineer informed of the results</li> <li>If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>Discuss amongst Engineer, ET and Contractor on potential remedial actions</li> <li>Review Contractor's remedial actions whether necessary to assure their effectiveness and advise the Engineer accordingly</li> <li>Supervise implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing</li> <li>Notify Contractor</li> <li>In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented</li> <li>Discuss amongst Environmental Team Leader and the Contractor potential remedial actions</li> <li>Ensure remedial measures properly implemented</li> <li>If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated</li> </ol>	<ol style="list-style-type: none"> <li>Take immediate action to avoid further exceedance</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification</li> <li>Implement the agreed proposals</li> <li>Resubmit proposals if problem still not under control</li> <li>Stop the relevant portion of works as determined by the Engineer until the exceedance is abated</li> </ol>

**Event/Action Plan for Construction Noise**

EVENT	ACTION			
	ET Leader	IEC	Engineer	Contractor
<b>ACTION LEVEL</b>	<ol style="list-style-type: none"> <li>1. Notify Contractor and Engineer</li> <li>2. Carry out investigation</li> <li>3. Report the results of investigation to the IEC and Contractor</li> <li>4. Discuss with the Contractor and formulate remedial measures</li> <li>5. Increase monitoring frequency to check mitigation effectiveness</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analysed results submitted by ET</li> <li>2. Review the proposed remedial measures by the Contractor and advice the Engineer accordingly</li> <li>3. Supervise implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem</li> <li>4. Ensure remedial measures properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals for remedial actions to IEC</li> <li>2. Implement the agreed proposals</li> </ol>
<b>LIMIT LEVEL</b>	<ol style="list-style-type: none"> <li>1. Notify IEC, Engineer, EPD and Contractor</li> <li>2. Identify source</li> <li>3. Repeat measurement to confirm findings</li> <li>4. Increase monitoring frequency</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented</li> <li>6. Inform IEC, Engineer and EPD the causes &amp; actions taken for the exceedances</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and Engineer informed of the results</li> <li>8. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst Engineer, ET and Contractor on potential remedial actions</li> <li>2. Review Contractor's remedial actions whether necessary to assure their effectiveness and advice the Engineer accordingly</li> <li>3. Supervise implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem</li> <li>4. Ensure remedial measures properly implemented</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance</li> <li>2. Submit proposals for remedial actions to IEC within 3 working days of notification</li> <li>3. Implement the agreed proposals</li> <li>4. Resubmit proposals if problem still not under control</li> <li>5. Stop the relevant portion of works as determined by the Engineer until the exceedance is abated</li> </ol>

**Event and Action Plan for Stream Water Quality**

<b>Event</b>	<b>ET Leader</b>	<b>IEC</b>	<b>Engineer</b>	<b>Contractor</b>
<b>ACTION LEVEL</b> (being exceeded by one sampling day)	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings</li> <li>2. Identify source(s) of impact</li> <li>3. Inform IEC and Contractor</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods</li> <li>5. Discuss mitigation measures IEC and Contractor</li> <li>6. Repeat measurement on next day of exceedance</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and Contractor on the mitigation measures</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advice Engineer accordingly</li> <li>3. Assess the effectiveness of the implemented mitigation measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with IEC on the proposed mitigation measures</li> <li>2. Make agreement on the mitigation measures to be implemented</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm notification of the non-compliance in writing</li> <li>2. Rectify unacceptable practice</li> <li>3. Check all plant and equipment</li> <li>4. Consider changes of working methods</li> <li>5. Discuss with ET and Contractor and propose mitigation measures to IEC and Engineer</li> <li>6. Implement the agreed mitigation measures</li> </ol>
<b>ACTION LEVEL</b> (being exceeded by more than one sampling day)	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings</li> <li>2. Identify source(s) of impact</li> <li>3. Inform IEC, Contractor and EPD</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods</li> <li>5. Discuss mitigation measures IEC, Engineer and Contractor</li> <li>6. Repeat measurement on next day of exceedance</li> <li>7. Ensure mitigation measures are implemented</li> <li>8. Prepare to increase the monitoring frequency to daily</li> <li>9. Repeat measurement on next day of exceedance</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and Contractor on the mitigation measures</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advice Engineer accordingly</li> <li>3. Assess the effectiveness of the implemented mitigation measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with IEC on the proposed mitigation measures</li> <li>2. Make agreement on the mitigation measures to be implemented</li> <li>3. Assess the effectiveness of the implemented mitigation measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm notification of the non-compliance in writing</li> <li>2. Rectify unacceptable practice</li> <li>3. Check all plant and equipment</li> <li>4. Consider changes of working methods</li> <li>5. Discuss with ET and IEC and propose mitigation measures to IEC and Engineer within 3 working days</li> <li>6. Implement the agreed mitigation measures</li> </ol>
<b>LIMIT LEVEL</b> (being exceeded by one sampling days)	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings</li> <li>2. Identify source(s) of impact</li> <li>3. Inform IEC, Contractor and EPD</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods</li> <li>5. Discuss mitigation measures IEC, Engineer and Contractor</li> <li>6. Ensure mitigation measures are implemented</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit level</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and Contractor on the mitigation measures</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advice Engineer accordingly</li> <li>3. Assess the effectiveness of the implemented mitigation measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with IEC, ET and Contractor on the proposed mitigation measures</li> <li>2. Request Contractor to critically review the working methods</li> <li>3. Make agreement on the mitigation measures to be implemented</li> <li>4. Assess the effectiveness of the implemented mitigation measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm notification of the non-compliance in writing</li> <li>2. Rectify unacceptable practice</li> <li>3. Check all plant and equipment</li> <li>4. Consider changes of working methods</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within 3 working days</li> <li>6. Implement the agreed mitigation measures</li> </ol>
<b>LIMIT LEVEL</b> (being exceeded by more than one sampling days)	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings;</li> <li>2. Identify source(s) of impact;</li> <li>3. Inform Contractor, Engineer, IEC and EPD;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit level</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and Contractor on the mitigation measures</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advice Engineer accordingly</li> <li>3. Assess the effectiveness of the implemented mitigation measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with IEC, ET and Contractor on the proposed mitigation measures</li> <li>2. Request Contractor to critically review the working methods</li> <li>3. Make agreement on the mitigation measures to be implemented</li> <li>4. Assess the effectiveness of the implemented mitigation measures</li> <li>5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until daily until no exceedance of Limit level</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm notification of the non-compliance in writing</li> <li>2. Rectify unacceptable practice</li> <li>3. Check all plant and equipment</li> <li>4. Consider changes of working methods</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within 3 working days</li> <li>6. Implement the agreed mitigation measures;</li> <li>7. As directed by Engineer, to slow down or to stop all or part of the construction activities</li> </ol>

## Appendix G

### (A) Environmental Monitoring Data

(A)(1) Air Quality

(A)(2) Water Quality

### (B) Graphical Plots

(B)(1) Air Quality

(B)(2) Construction Noise

(B)(3) Water Quality

(A) Environmental Monitoring Data



DSD Contract No. DC/2007/17 - Drainage Improvement Works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen of Yuen Long District  
and Sewerage at Tseng Tau Chung Tsuen, Tuen Mun.  
24-Hr TSP - KT14A (A8(a))

						Cal Graph Slope	42.4171													
						Cal Graph Interce	-29.356													
DATE									STANDARD			BLANK	BLANK	BLANK	BLANK	INITIAL	FINAL	WEIGHT		
	SAMPLE	ELAPSED	ELAPSED	ELAPSED	MIN	MAX	AVG	AVG	AVG	FLOW	AIR	SAMPLE	INTIAL	FINAL	DIFF	FILTER	FILTER	DUST	24-Hr TSP	
	NUMBER	TIME	TIME	TIME	CHART	CHART	CHART	TEMP	PRESS	RATE	VOLUME	NUMBER	WEIGHT	WEIGHT	WEIGHT	WEIGHT	WEIGHT	COLLECTED	in Air	
		INITIAL	FINAL	(min)	READING	READING	READING	(oC)	(hPa)	(m3/min)	(std m3)		(g)	(g)	(g)	(g)	(g)	(g)	(ug/M <sup>3</sup> )	
31-Oct-08	SZ26	685.11	709.29	1450.80	34	35	34.5	25.2	1016.0	1.50	2179	NA	3.6459	3.6419	-0.0040	3.6201	3.6638	0.0437	22	
4-Nov-08	SZ44	709.29	733.97	1480.80	34	35	34.5	26.3	1013.6	1.50	2220	NA	3.6459	3.6419	-0.0040	3.5993	3.6511	0.0518	25	
10-Nov-08	SZ72	733.97	758.21	1454.40	34	35	34.5	19.6	1018.3	1.51	2197	NA	3.6459	3.6419	-0.0040	3.6066	3.6900	0.0834	40	
15-Nov-08	SZ86	758.21	782.34	1447.80	34	35	34.5	23.9	1014.8	1.50	2176	NA	3.6459	3.6419	-0.0040	3.6127	3.6903	0.0776	38	
21-Nov-08	SA13	782.34	806.57	1453.80	31	32	31.5	19.7	1021.2	1.44	2093	NA	3.6459	3.6419	-0.0040	3.6232	3.6671	0.0439	23	

## Summary of Water Quality Monitoring Results - KT14A

Date 27-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	11:45	0.15	28.4	28.4	1.82	1.81	23.3	23.2	9.1	9.4	0	0.0	7.1	7.1	8	8.0	10.7	10.70	24	24.0
			28.4		1.8		23.0		9.6		0		7.1		8		10.7		24	
W8B	11:35	0.06	29.7	29.7	5.98	5.97	78.7	78.5	12.5	12.4	0	0.0	7	7.0	21	21.0	0.12	0.12	18	18.0
			29.7		5.95		78.3		12.2		0		7		21		0.12		18	

Date 29-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	12:45	0.14	10.8	10.8	1.85	1.87	23.7	24.1	10.8	10.7	0	0.0	7	7.0	8	8.0	12.4	12.40	24	24.0
			10.8		1.89		24.4		10.6		0		7		8		12.4		24	
W8B	12:55	0.06	11.4	11.4	5.81	5.81	75.8	75.8	11.4	11.3	0	0.0	7.1	7.1	11	11.0	0.08	0.08	16	16.0
			11.4		5.8		75.7		11.1		0		7.1		11		0.08		16	

Date 31-Oct-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	13:40	0.12	27.3	27.3	2.48	2.47	29.6	29.4	14.1	14.4	0	0.0	6.7	6.7	11	11.0	11.3	11.30	27	27.0
			27.3		2.45		29.1		14.6		0		6.7		11		11.3		27	
W8B	13:50	0.07	27.5	27.5	4.13	4.14	49.1	49.2	16.2	16.0	0	0.0	6.9	6.9	36	36.0	0.03	0.03	74	74.0
			27.5		4.14		49.2		15.8		0		6.9		36		0.03		74	

Date 3-Nov-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	10:20	0.12	26.6	26.6	1.87	1.86	23.4	23.2	16.7	17.0	0	0.0	7.2	7.2	11	11.0	14.3	14.30	40	40.0
			26.6		1.85		23.0		17.2		0		7.2		11		14.3		40	
W8B	10:10	0.08	24.7	24.7	6.17	6.18	74.4	74.5	18.3	18.2	0	0.0	7.1	7.1	18	18.0	0.56	0.56	20	20.0
			24.7		6.18		74.5		18.0		0		7.1		18		0.56		20	

Date 5-Nov-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	10:00	0.14	27.2	27.2	2	2.02	25.2	25.5	18.7	18.8	0	0.0	7.3	7.3	15	15.0	21.6	21.65	41	41.0
			27.2		2.03		25.8		18.8		0		7.3		15		21.69		41	
W8B	9:50	0.08	27.3	27.3	6.82	6.81	85.9	85.7	50.8	50.5	0	0.0	7.2	7.2	28	28.0	0.06	0.06	22	22.0
			27.3		6.8		85.4		50.1		0		7.2		28		0.06		22	

Date 7-Nov-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8C	11:20	0.13	28.0	28.0	2.02	2.01	25.8	25.6	15.4	15.4	0	0.0	7.3	7.3	10	10.0	14.6	14.60	29	29.0
			28.0		2		25.3		15.3		0		7.3		10		14.6		29	
W8D	11:30	0.09	30.4	30.4	6.35	6.36	84.3	84.6	8.3	8.3	0	0.0	7.2	7.2	12	12.0	0.1	0.10	10	10.0
			30.4		6.37		84.9		8.3		0		7.2		12		0.1		10	

Date 10-Nov-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	10:35	0.13	23.7	23.7	2.94	2.96	34.7	35.0	15.1	15.2	0	0.0	7.3	7.3	23	23.0	16.6	16.60	43	43.0
			23.7		2.97		35.3		15.3		0		7.3		23		16.6		43	
W8B	10:45	0.08	23.1	23.1	7.64	7.62	89.1	88.8	11.2	11.1	0	0.0	7.3	7.3	8	8.0	0.2	0.20	<10	10.0
			23.1		7.6		88.4		11.0		0		7.3		8		0.2		<10	

Date 12-Nov-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	9:10	0.14	22.3	22.3	3.13	3.15	39.1	39.5	11.5	11.6	0	0.0	7.2	7.2	11	11.0	15.2	15.20	30	30.0
			22.3		3.17		39.8		11.7		0		7.2		11		15.2		30	
W8B	9:00	0.09	21.9	21.9	5.84	5.86	73.6	73.9	10.9	10.7	0	0.0	7.1	7.1	6	6.0	0.13	0.13	<10	10.0
			21.9		5.87		74.1		10.4		0		7.1		6		0.13		<10	

## Summary of Water Quality Monitoring Results - KT14A

Date 14-Nov-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	11:20	0.13	24.9	24.9	2.57	2.55	30.9	30.5	15.7	15.7	0	0.0	7.2	7.2	17	17.0	15.1	15.10	28	28.0
			24.9		2.53		30.1		15.6		0		7.2		17		15.1		28	
W8B	11:30	0.10	26.5	26.5	7.71	7.73	96.1	96.4	6.7	6.6	0	0.0	7.2	7.2	7	7.0	0.12	0.12	<10	10.0
			26.5		7.74		96.6		6.5		0		7.2		7		0.12		<10	

Date 17-Nov-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	11:15	0.14	25.5	25.5	2.73	2.72	33.2	32.9	21.3	21.5	0	0.0	7.2	7.2	16	16.0	16.1	16.10	24	24.0
			25.5		2.7		32.6		21.7		0		7.2		16		16.1		24	
W8B	11:05	0.08	26.1	26.1	7.97	7.90	98.6	97.5	13.6	13.7	0	0.0	7	7.0	8	8.0	0.32	0.32	11	11.0
			26.1		7.83		96.4		13.8		0		7		8		0.32		11	

Date 19-Nov-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	11:40	0.14	22.4	22.4	3.2	3.23	37.1	37.5	16.9	16.7	0	0.0	6.9	6.9	20	20.0	15.4	15.40	21	21.0
			22.4		3.26		37.8		16.5		0		6.9		20		15.4		21	
W8B	11:30	0.07	21.2	21.2	8.38	8.30	94.0	93.6	12.8	13.0	0	0.0	7.1	7.1	10	10.0	0.13	0.13	11	11.0
			21.2		8.21		93.1		13.1		0		7.1		10		0.13		11	

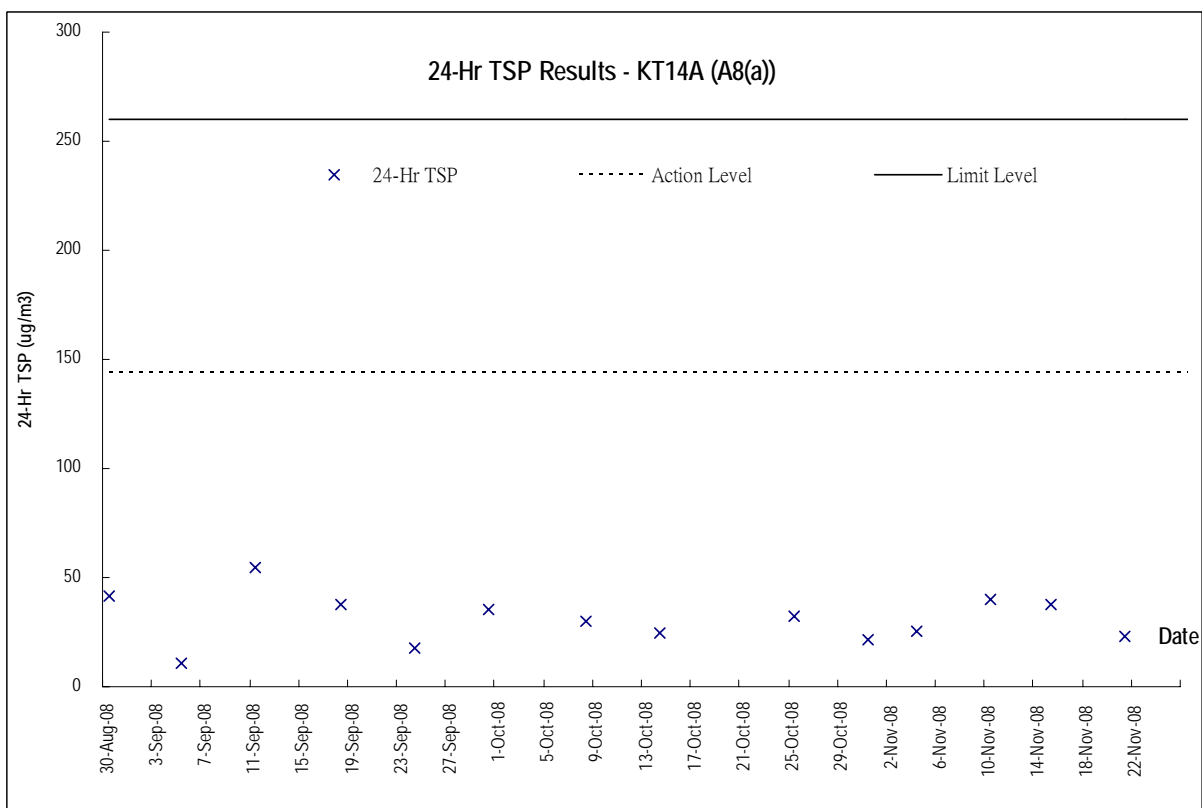
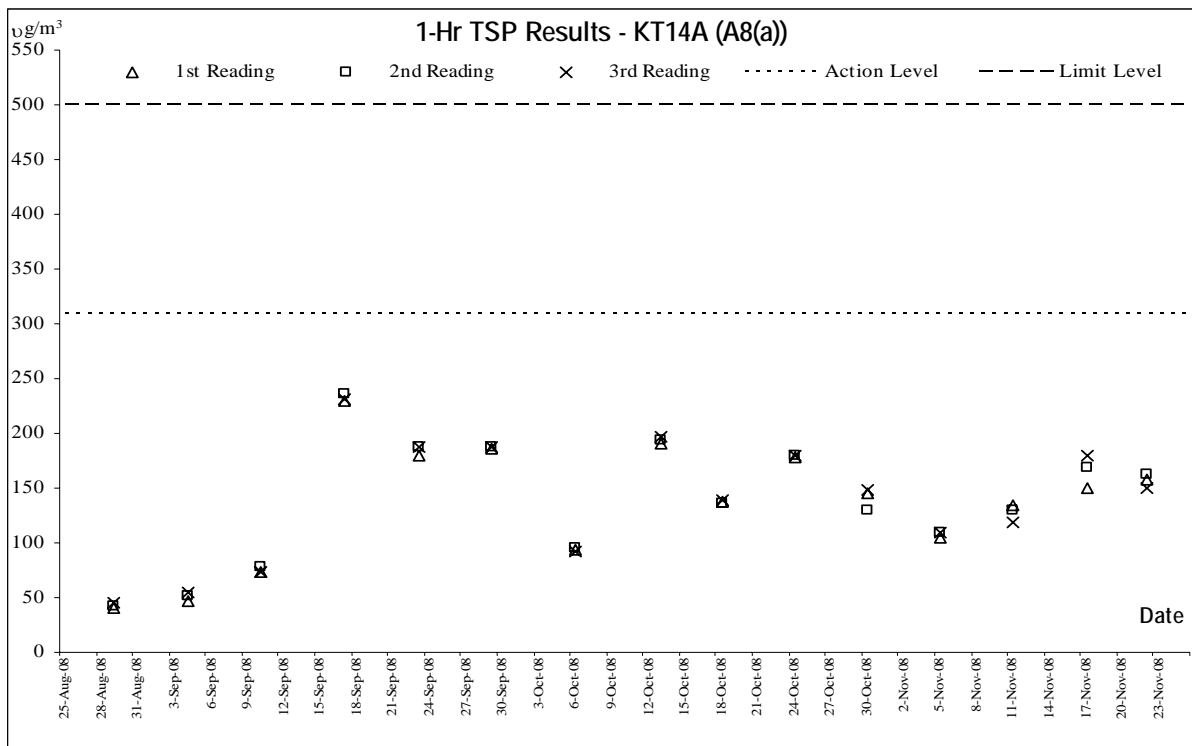
Date 21-Nov-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	11:50	0.16	22.4	22.4	3.05	3.10	35.2	35.8	13.5	13.6	0	0.0	6.9	6.9	14	14.0	18.4	18.40	26	26.0
			22.4		3.14		36.4		13.7		0		6.9		14		18.4		26	
W8B	12:00	0.10	23.2	23.2	9.01	8.96	105.9	104.5	5.1	5.1	0	0.0	7	7.0	<2	2.0	0.29	0.29	<10	10.0
			23.2		8.91		103.1		5.1		0		7		<2		0.29		<10	

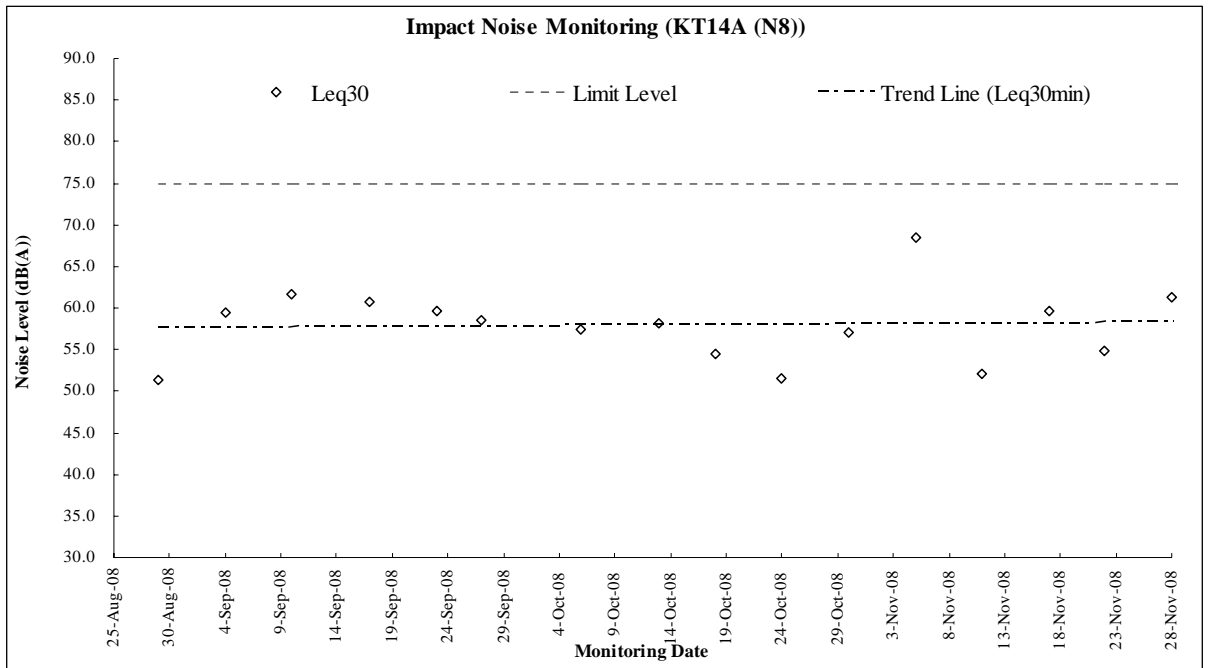
Date 24-Nov-08																				
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DOS (%)		Turbidity (NTU)		Salinity		pH		SS		Ammonia N		Zinc	
W8A	9:40	0.14	23.4	23.4	2.52	2.55	29.2	29.6	27.2	27.1	0	0.0	6.8	6.8	17	17.0	18.8	18.80	30	30.0
			23.4		2.58		29.9		27.0		0		6.8		17		18.8		30	
W8B	9:30	0.08	23.3	23.3	7.58	7.51	89.4	88.6	24.8	24.2	0	0.0	6.9	6.9	12	12.0	7.28	7.28	14	14.0
			23.3		7.43		87.8		23.5		0		6.9		12		7.28		14	

## (B) Graphical Plots

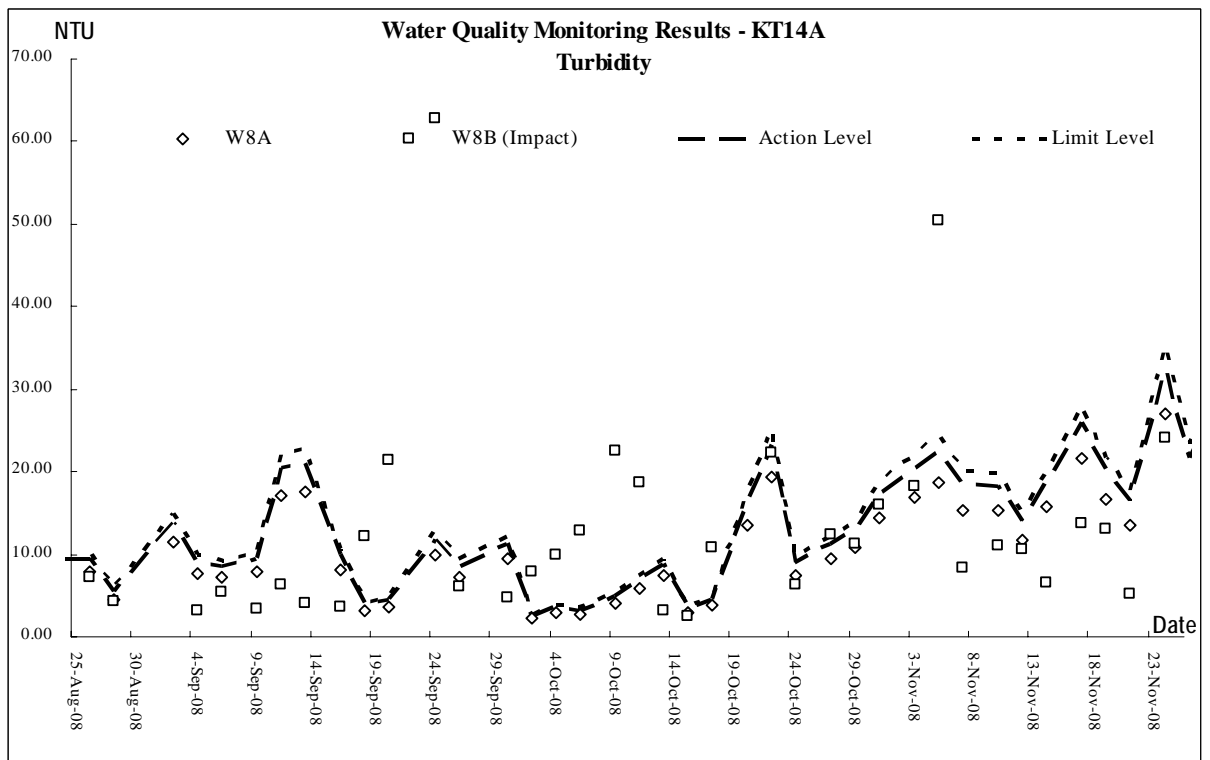
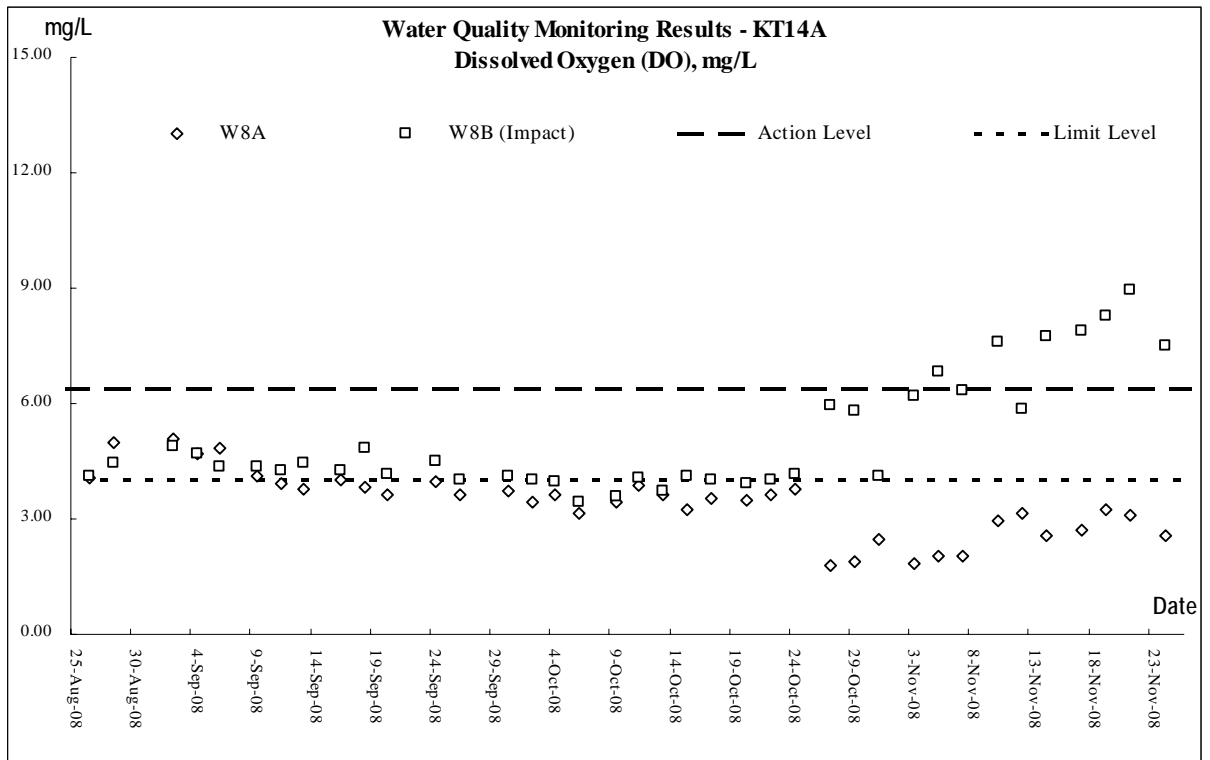
## (B)(1) Air Quality

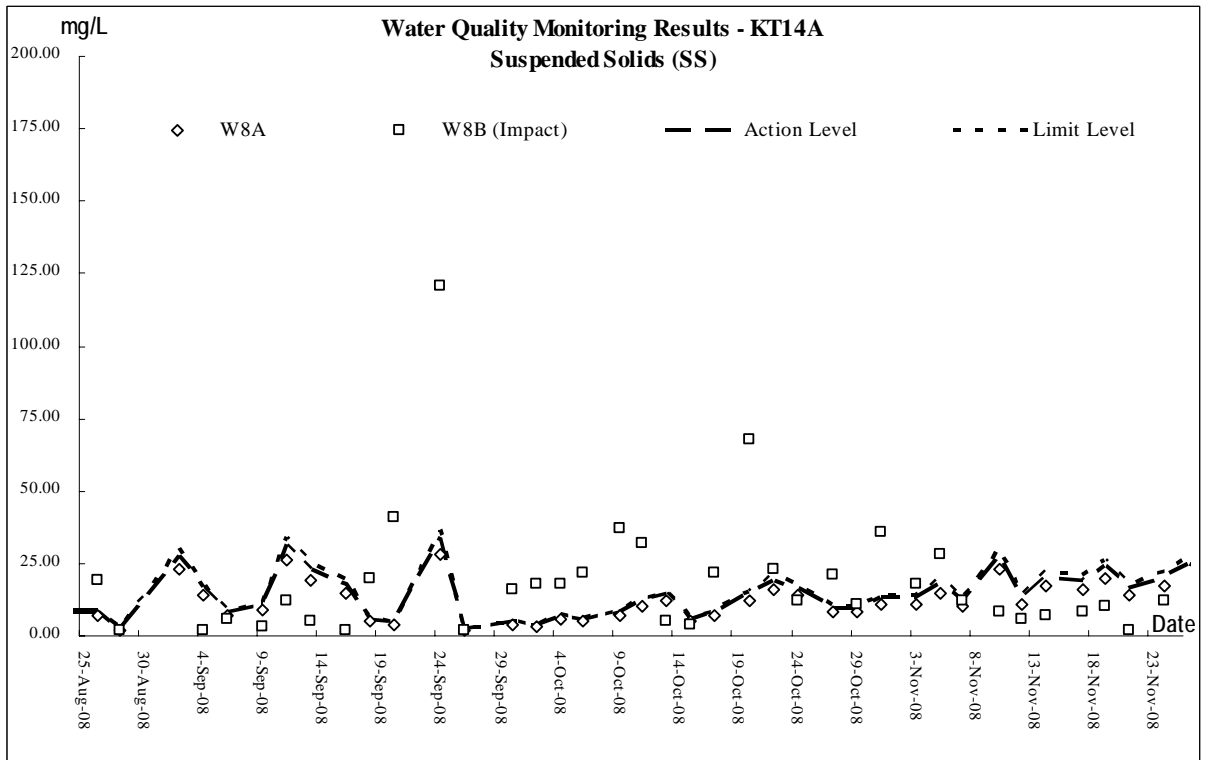
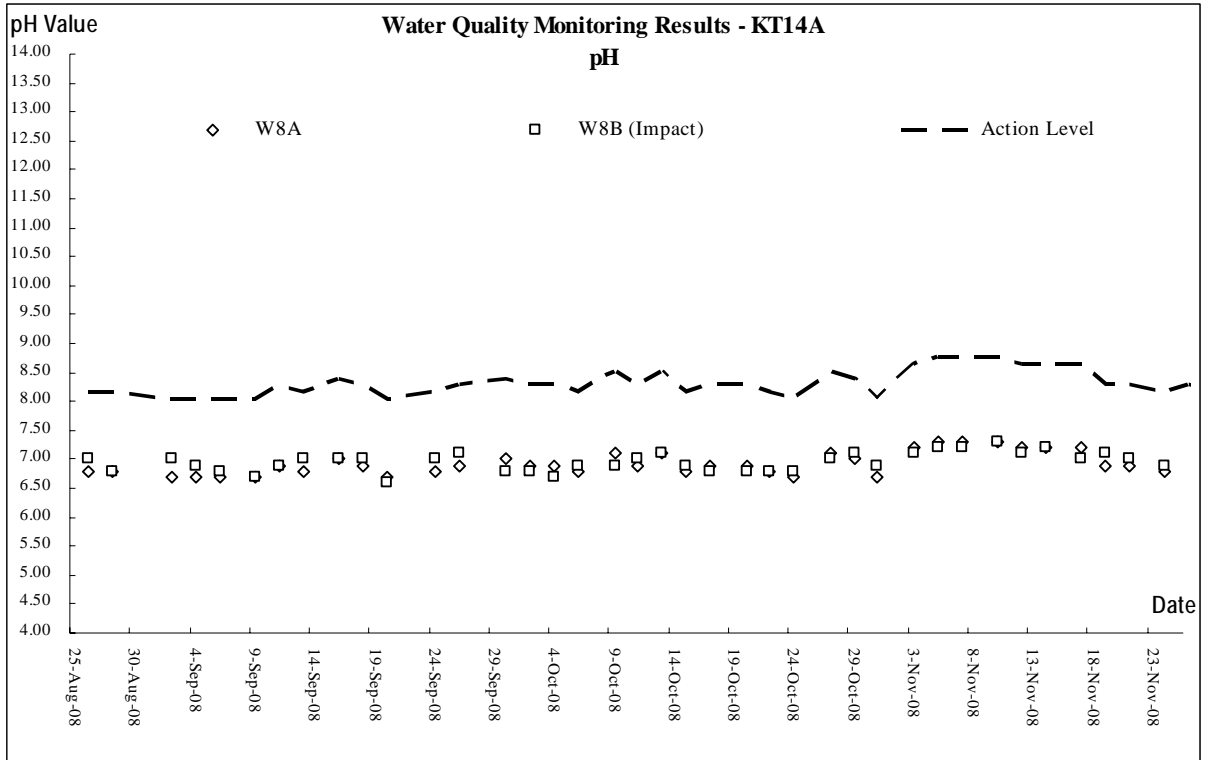


## (B)(2) Construction Noise

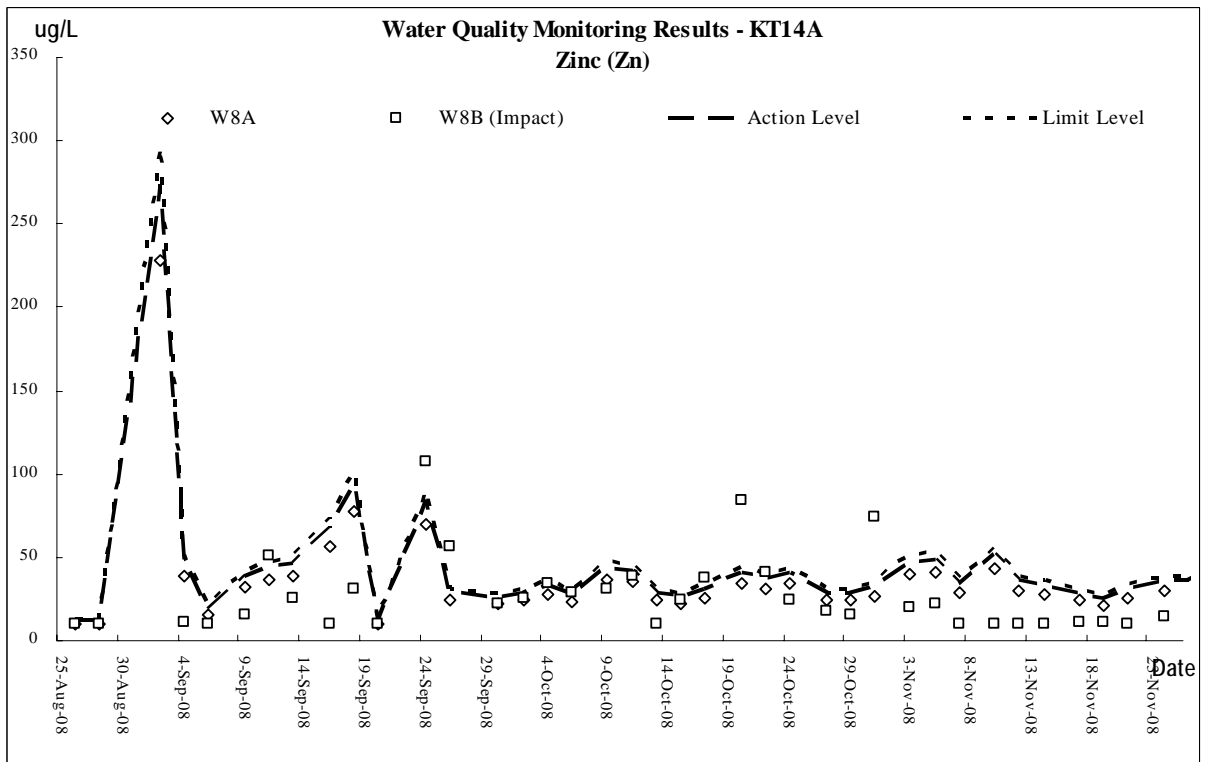
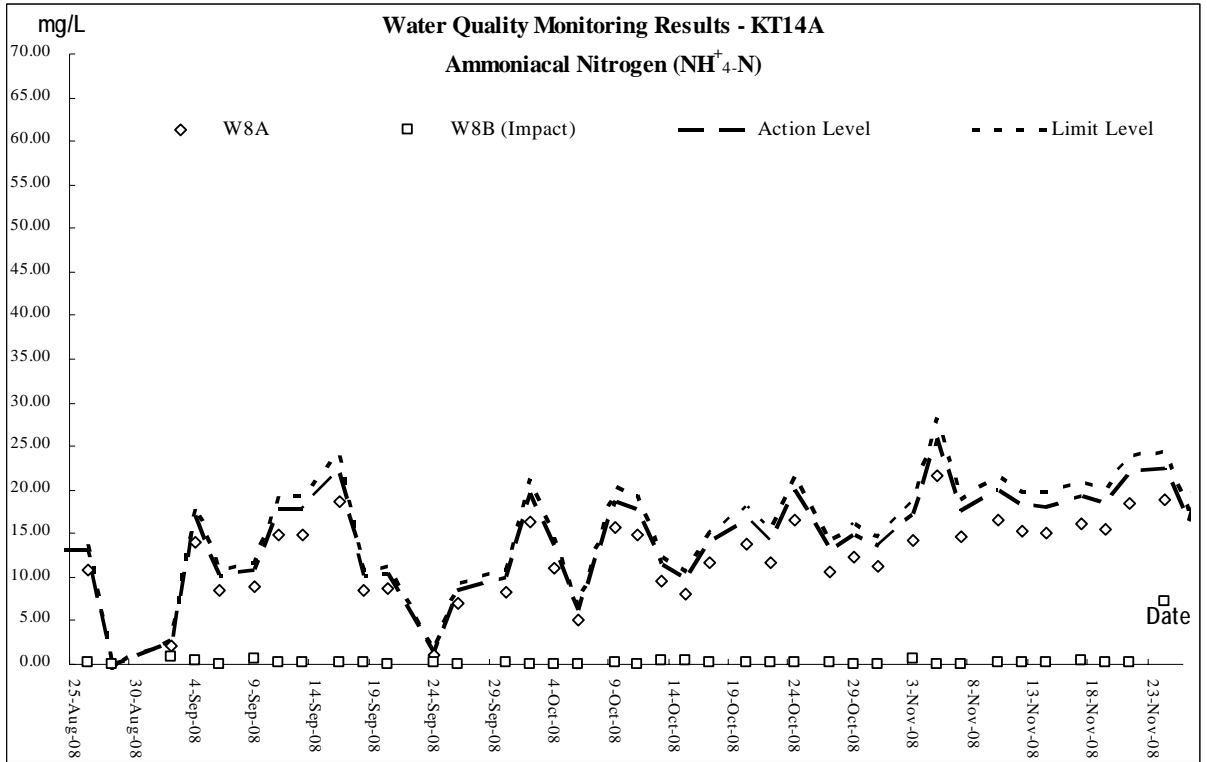


### (B)(3) Water Quality









## **Appendix H**

### **Monthly Summary Waste Flow Table for 2008**

**Monthly Summary Waste Flow Table**

Date: 30-Nov-08  
Year/Month: Nov-08

<b>Monthly Summary Waste Flow Table for <u>November 2008</u></b>										
Year	Actual Quantities of Inert C & D Materials Generated Monthly					Estimated Annual Quantities of C & D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see note 4)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Metals	Paper/ Cardboard packaging	Plastics (see note 3)	Chemical Waste	Others, e.g. General refuse
	(in '000M <sup>3</sup> )	(in '000M <sup>3</sup> )	(in '000M <sup>3</sup> )	(in '000M <sup>3</sup> )	(in '000M <sup>3</sup> )	(in '000KG)	(in '000KG)	(in '000KG)	(in '000KG)	(in '000M <sup>3</sup> )
Jan	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0	0	0	0	0	0
Mar	0	0	0	0	0	0	0	0	0	0
Apr	0	0	0	0	0	0	0	0	0	0
May	0.08	0.04	0.04	0	0	0	0	0	0	0
Jun	0.00	0.001	0.001	0	0	0	0	0	0	0
Sub-Total	0.08	0.041	0.041	0	0	0	0	0	0	0
Jul	0.021	0.003	0.018	0	0	0	0	0	0	0
Aug	0.899	0.005	0.894	0	0	0	0	0	0	0.01
Sep	5.055	0.003	3.480	0	1.572	0	0	0	0	0.06
Oct	4.044	0.002	2.526	0	1.516	0	0	0	0	0
Nov	6.647	0.011	5.262	0	1.374	0	0	0	0	0.012
Dec										
Total	16.749	0.065	12.221	0.000	4.462	0.000	0.000	0.000	0.000	0.082

- Notes:
- (1) The performance targets are given in PS Clause 28.10(14)
  - (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
  - (3) Plastics refer to plastic bottles/ containers, plastic sheets/ foam form packaging material
  - (4) Broken concrete for recycling into aggregates

## **Appendix I**

### **Updated Environmental Mitigation Measures Schedule**

Mitigation Measure Implementation Schedule – Construction Noise

Construction Noise Impact Mitigation								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Noise 1	<p>The Contractor is required to adopt Level 1 and 2 site-specific direct technical measures as specified below during the construction phase</p> <p><i>Level 1 Mitigation Measures</i></p> <ul style="list-style-type: none"> <li>The use of equipment with sound power level lower than that stipulated in the Technical Memorandum on Noise from Construction Works Other Than Percussive Piling is recommended as the first level mitigation (Level 1 mitigation) for all construction works under this Project.</li> <li>Quiet plant is defined as PME whose actual sound power level is less than the value specified in the Technical Memorandum on Noise from Construction Works Other Than Percussive Piling for the same piece of equipment. BS5228 also provides examples of quiet construction plant and their sound power level. The quiet plant used in the noise calculation including the BS5228 reference number is shown in Attachment 1 for reference</li> </ul> <p><i>Level 2 Mitigation Measures</i></p> <ul style="list-style-type: none"> <li>In addition to the use of quiet plant purpose-built site noise barriers shall be used as hoarding where construction works would be undertaken close (about 30m or less) to the NSRs (Figure 5.4). Temporary noise barrier with a minimum height of 3m shall be erected along the part of site boundary closest to the NSRs. Notwithstanding the required minimum height these barriers shall be constructed in a way such that no construction works and PME can be visible from the NSRs nearby. The minimum height is estimated assuming the construction equipment activities will be located on the channel bed 2m below the surrounding ground level.</li> </ul>	Prevent noise impact at sensitive receivers	To be implemented at the works site of KT14 during the Construction Phase (Figure 5.4 show locations of proposed temporary noise barriers.)	Construction Contractor		√		EIAO

Construction Noise Impact Mitigation								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Noise 1 (Cont'd)	<ul style="list-style-type: none"> <li>Stationary equipment shall be placed on the channel bed during construction works.</li> <li>For the construction works which are predicted to exceed 75dB(A) (Leq30min) at nearby NSR and whose line of sight cannot be blocked by the temporary noise barrier (i.e. further away from the hoardings), movable (mobile) noise barrier of more than 3m high shall be provided. A typical example is shown in Figure 5.7.</li> <li>The noise barriers or screens shall be constructed of appropriate material with a minimum surface density of 10kg/m<sup>2</sup>. Generators and compressors, shall be completely screened by construction barriers giving a total noise reduction of 10dB(A) or more. The location of the proposed temporary noise barriers for KT14 is shown on Figures 5.4.</li> </ul>	Prevent noise impact at sensitive receivers	To be implemented at the works site of KT14 during the Construction Phase (Figure 5.4 show locations of proposed temporary noise barriers.)	Construction Contractor		√		EIAO

**Mitigation Measure Implementation Schedule – Air Quality**

Air Quality Impact Mitigation								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Air 1	The Contractor shall prevent dust nuisance arising from the construction activities. The Contractor is required to follow all the requirements for dust control stipulated in the Air Pollution Control (Construction Dust) Regulation	Prevent dust nuisance	To be implemented at all works are of KT14 site during the Construction Phase.	Construction Contractor		√		Air Pollution Control Ordinance  Air Pollution Control (Construction Dust Regulation)
Air 2	<p>The following dust suppression measures shall be installed as part of construction practice, and these shall be incorporated in the Contract Specification and implemented to minimize dust nuisance to within acceptable levels.</p> <ul style="list-style-type: none"> <li>i) The Contractor shall frequently clean and water the site to minimise fugitive dust emissions.</li> <li>ii) Effective water sprays shall be used during the delivery and handling of aggregate, and other similar materials, when dust is likely to be created and to dampen all stored materials during dry and windy weather.</li> <li>iii) Watering of exposed surfaces shall be exercised at least three times a day.</li> <li>iv) Areas within the site where there is a regular movement of vehicles must be regularly watered at minimum three times a day.</li> <li>v) The Contractor shall restrict all motorised vehicles within the site, excluding those on public roads, to a maximum speed of 15 km per hour and confine haulage and delivery vehicles to designated road ways inside the site.</li> <li>vi) Any stockpiles of construction materials that are likely to generate fugitive dust shall be covered with tarpaulins including the materials on lorries or trucks.</li> </ul>	Prevent dust nuisance	To be implemented at all works are of KT14 site during the Construction Phase.	Construction Contractor		√		Air Pollution Control Ordinance  Air Pollution Control (Construction Dust Regulation)

Air Quality Impact Mitigation								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Air 2 (Cont'd)	<p>vii) Wheel washing facilities shall be installed and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads. Water in the wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The Contractor shall submit details of proposals for the wheel cleaning facility. Such wheel washing facilities shall be usable prior to any earthworks excavating activity on the site. The Contractor shall also provide a hard-surfaced road between any washing facility and the public road.</p> <p>viii) Any materials dropped on paved roads will need to be cleaned up immediately to prevent dust nuisance.</p>	Prevent dust nuisance	To be implemented at all works are of KT14 site during the Construction Phase.	Construction Contractor		√		<p>Air Pollution Control Ordinance</p> <p>Air Pollution Control (Construction Dust Regulation)</p>



**Mitigation Measure Implementation Schedule – Water Quality**

Water Quality Impact Mitigation								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Water 1	Wash facilities for workers and wheel wash waste result in muddy construction site runoff. Temporary earth hunds and sand barriers shall be used to direct such runoff to a designated settlement area within the site.	Prevent additional pollution load being added to stream due to KT14 works	To be implemented at the works sites of KT14 during the Construction Phase	Construction Contractor		√		WPCO & ProPECC PN1/94
Water 1 (Cont'd)	The settlement area shall be located within the temporary site area. Construction site runoff shall be settled in this settlement area, while runoff from the surface should be channelled through a local site drainage system into the settlement area. When solids build up in the settlement area, and certainly before the onset of the wet season (Apr-Oct) solids shall be excavated from the base of the settlement area. No excavation shall be allowed in rainy weather.	Prevent additional pollution load being added to stream due to KT14 works	To be implemented at the works sites of KT14 during the Construction Phase	Construction Contractor		√		WPCO & ProPECC PN1/94
Water 2	All discharged waters, including sewage and site runoff, should comply with the appropriate standards in the Technical Memorandum on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters, prior to discharge. Licensed contractors shall dispose the collected sewage to the government sewers. No sewage shall be allowed to enter wash facilities or sediment setting area.	Prevent additional pollution load being added to stream due to KT14 works	To be implemented at the works sites of KT14 during the Construction Phase	Construction Contractor		√		WPCO & ProPECC PN1/94

**Mitigation Measure Implementation Schedule – Waste Management**

Waste Management								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
	<p><i>Waste Management Plan</i></p> <p>Upon appointment, the main contractor of each construction contract should submit a Waste Management Plan (WMP) to the Engineer for approval. The WMP shall describe the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities and shall take into account the recommended mitigation measures in the Project Profile report. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. All mitigation measures numbered Waste 1 to 6 shall be included in the WMP</p>	<p>Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline.</p>	<p>To be implemented at the works sites of KT14 during the Construction Phase.</p>	<p>Construction Contractor</p>		<p>√</p>		<p>WBTC No. 2/93, 2/93B, 16/96, 4/98, 4/98A, 25/99 25/99A, 25/99C, 12/2000, 19/2001</p> <p>ETWB TC No. 33/2002, 34/2002, 15/2003, 31/2004</p>
Waste 1	<p>i) Trip-ticket system – In order to monitor the disposal of C&amp;D and solid wastes at public filling facilities and landfills, and control fly-tipping, a trip-ticket system shall be included.</p> <p>ii) Records of wastes – A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) shall be proposed.</p> <p>iii) Training – Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling.</p>	<p>Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline.</p>	<p>To be implemented at the works sites of KT14 during the Construction Phase.</p>	<p>Construction Contractor</p>		<p>√</p>		<p>WBTC No. 2/93, 2/93B, 16/96, 4/98, 4/98A, 25/99 25/99A, 25/99C, 12/2000, 19/2001</p> <p>ETWB TC No. 33/2002, 34/2002, 15/2003, 31/2004</p>

Waste Management								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Waste 2	<p><i>Site Clearance Waste / Demolition Waste</i></p> <p>All construction waste shall be sorted on site into inert and non-inert components. Non-inert materials (wood, glass, metals and plastics) shall be recycled or reused and disposed to landfill only as a last resort. Inert materials (soil, rubble, sand, rock, brick and concrete) shall be separated and reused on site prior to final disposal at public filling facilities. The final disposal site for public fill shall be the Public Filling Facility at Tuen Mun Area 38. The final disposal site for construction and demolition waste shall be the North East New Territories (NENT) Landfill.</p>	<p>Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline.</p>	<p>To be implemented at the works sites of KT14 during the Construction Phase.</p>	<p>Construction Contractor</p>		<p>√</p>		<p>WBTC No. 2/93, 2/93B, 16/96, 4/98, 4/98A, 25/99A, 25/99C, 12/2000, 19/2001</p> <p>ETWB(TC) W No. 33/2002, 34/2002, 15/2003, 31/2004</p>
Waste 3	<p>Excavated Material</p> <p>Any excavated material from the stream shall not be stockpiled, and shall be removed from site on the same day. The material shall be stored in covered impermeable skips while awaiting removal from site.</p> <p>Any leachate from skips shall be treated to meet discharge standard from Government sewers before being collected along with toilet waste by licensed contractor.</p>	<p>Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline.</p> <p>Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline.</p>	<p>To be implemented at the works sites of KT14 during the Construction Stage.</p> <p>To be implemented at the works sites of KT14 during the Construction Stage</p>	<p>Construction Contractor during Construction Stage</p> <p>Construction Contractor during Construction Stage</p>		<p>√</p> <p>√</p>		<p>ETWB(TC) W No. 34/2002,</p> <p>WBTC 12/2000</p> <p>ETWB(TC) W No. 34/2002,</p> <p>WBTC 12/2000</p>

<b>Waste Management</b>								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Waste 4	<p><i>Recycling the Use of Non-Reusable Materials on Site</i></p> <p>Hoarding, shutters, form works and false works made of reusable materials such as steel or plastic concrete panels shall be used as a preferred alternative to non-reusable materials such as wood and timber, with reference to WBTC No. 19/2001 – Metallic Site Hoarding and Signboards.</p>	<p>Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline</p>	<p>To be implemented at the works sites of KT14 during the Construction Phase</p>	<p>Construction Contractor</p>		√		<p>WBTC 19/2001</p>
Waste 5	<p><i>Chemical Waste</i></p> <p>Any Contractor generating waste oil, lubricants, paints or other chemicals as a result of his activities should register in a chemical waste producer. Storage, handling, transport and disposal of chemical waste should be arranged in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published by EPD. Chemical waste should be collected by licensed collector.</p> <p>The Contractor shall provide a storage area with hard standing, impermeable surface for storing chemicals on site to prevent inadvertent release of waste oil or other chemicals into nearby water bodies. Oil and fuel bunkers should be bunded and/or enclosed on three sides to prevent discharge due to accidental spillages or breaches of tanks. Bunded area should be of sufficient capacity to accommodate 110% of the volume of the largest container or 20% of the total volume of waste, whichever is largest. For construction plant that is likely to leak oil, absorbent inert materials e.g. sand, shall be placed beneath it. This material should be replaced on a regular basis and the contaminated material disposed as chemical wastes. Storage areas should have adequate ventilation and be covered to prevent rain entering.</p>	<p>Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline</p>	<p>To be implemented at the works sites of KT14 during the Construction Phase</p>	<p>Construction Contractor</p>		√		<p>WDO Waste Disposal (Chemical Waste) General Regulation)</p>

<b>Waste Management</b>								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Waste 5 (Cont'd)	Grease traps shall be installed for site drains. These traps shall be cleared at least once a week. A licensed contractor shall regularly clear the traps and dispose waste oils. No chemicals should be allowed to discharge into water courses, either by direct discharge, or as contaminants carried in surface water runoff from the construction site.  Training on safety codes and relevant manuals related to the chemicals stored on site should be obligatory for the personnel who handle the chemicals on site.	Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline	To be implemented at the works sites of KT14 during the Construction Phase	Construction Contractor		√		WDO Waste Disposal (Chemical Waste) General Regulation)
Waste 6	Domestic garbage generated by site staff shall be stored at dry locations in covered impermeable skips. It should be collected daily and disposed to the nearest Refuse Collection Point or arranged for collection by licensed contractors. The Engineer is responsible for checking that no chemical waste, sewage, excavated material or sorted reusable material is disposed as domestic garbage.	Planning for waste reduction, re-use, recycling and proper disposal and form compliance with Waste Disposal Ordinance and other guideline	To be implemented at all of KT14 construction site	Construction Contractor		√		Public Health and Municipal Services Ordinance

**Mitigation Measure Implementation Schedule – Landscape / Visual**

Landscape / Visual Impact Mitigation								
Item Ref:	Mitigation Measures	Objectives of Proposed Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent(s)	Implementation Stage			Relevant Legislation & Guidelines
					Design	Construction	Operation	
Land 1	A survey of existing trees shall be completed in accordance with Works Branch Technical Circular No. 14/2002. Management and Maintenance of Natural Vegetation and Landscape Works, and Tree Preservation during detailed design stage. The results of the survey shall form consideration in the detail design for the proposed Secondary Channels KT14, in order that any significant trees shall be protected during both the design and construction periods. Parameters assessed in the survey shall include species, health, form, transplant-ability and amenity value (assessed according to form, size, age, condition and situation of the tree). All surveyed trees should be checked with species listed under the “Animals and Plants (Protection of Endangered Species) Ordinance (CAP 187)” and Forestry and Countryside Ordinance (CAP. 96)” to ensure that no endangered species are affected. Where tree felling is unavoidable, compensatory planting proposal shall be prepared and submitted to EPD and LandsD for approval.	Protect visual quality of project area and proposed works  Ensure protection of trees.	To be implemented along KT14 during the Detail Design Phase and Construction Phase.	Design Engineer to conduct tree survey during detailed design stage.  Construction Contractor to follow the results during construction	√			Works Bureau Technical Circular No. 14/2002
					√			
		Protect visual quality of project area and proposed works  Ensure protection of trees	To be implemented along KT14 during the Detail Design Phase and Construction Phase.	Design Engineer to conduct tree survey during detailed design stage.  Construction Contractor to follow the results during construction				

Note:

- EIAO Environmental Impact Assessment Ordinance
- WDO Waste Disposal Ordinance
- WPCO Water Pollution Control Ordinance
- TMEIA Technical Memorandum on Environmental Impact Assessment Process