Stanger Asia

ENVIRONMENTAL MONITORING AND AUDIT REPORT

FOR

CONTRACT No. DC/2001/09

SAN TIN EASTERN MAIN DRAINAGE CHANNEL

MARCH 2005

Report No.: ET 12489

Certified by: _____ Date: 11-4-05

Mr. Jeff Tsang
Environmental Team Leader
Stanger Asia Limited

Verified by: _____ Date: 18/4/05

Dr. Guiyi Li
Independent Environmental Checker
Hyder Consulting Limited

Unit A 16/F., KTA Centre, 13 On Cheung Street, Tsuen Wan, New Territories, HONG KONG. Tel: 852 2602 1207 Fax: 852 2687 0046 E-mail address: stanger@stanger.com.hk

Stanger Asia

CONTENTS

		Page
EXECUTIVE SUMMARY		1
1.	**INTRODUCTION**	
1.1	Background	4
1.2	Report Structure	4
2.	**PROJECT INFORMATION**	
2.1	Site Description	5
2.2	Project Organization	5
2.3	Construction Programme	5
3.	**ENVIRONMENTAL PERMITS AND LICENSES**	6
4.	**SUMMARY OF EM&A REQUIREMENTS**	
4.1	Air Quality	6
4.2	Noise	8
4.3	Water Quality	10
4.4	Event and Action Plan	13
4.5	Schedule for the Generation of Waste	13
5.	**IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES**	14
6.	**MONITORING RESULTS**	
6.1	Completed Monitoring Works	14
6.2	Air Quality Monitoring	15
6.3	Noise Monitoring	15
6.4	Water Quality Monitoring	16
7.	**AUDIT REPORT**	
7.1	Air Quality Monitoring	17
7.2	Noise Monitoring	17
7.3	Water Quality Monitoring	17
7.4	Site Inspections	17
8.	**WASTE MANAGEMENT**	18
9.	**COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS**	18
10.	**FUTURE KEY ISSUES**	19
11.	**CONCLUSION**	19

LIST OF FIGURES

2.1	The Site Layout Plan
4.1	Air Monitoring Station
4.2	Noise Monitoring Station

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

LIST OF FIGURES (Continued)

4.3 Water Monitoring Stations
6.1 Graphical Plot for 24-hour TSP Levels
6.2 Graphical Plot for 1-hour TSP Levels
6.3 Graphical Plot for Noise Levels
6.4 Graphical Plot for Temperature (WM1 & WM2)
6.5 Graphical Plot for Temperature (WM3 & WM4)
6.6 Graphical Plot for pH (WM1 & WM2)
6.7 Graphical Plot for pH (WM3 & WM4)
6.8 Graphical Plot for Dissolved Oxygen (%)(WM1 & WM2)
6.9 Graphical Plot for Dissolved Oxygen (%)(WM3 & WM4)
6.10 Graphical Plot for Dissolved Oxygen (mg/L) (WM1 & WM2)
6.11 Graphical Plot for Dissolved Oxygen (mg/L) (WM3 & WM4)
6.12 Graphical Plot for Turbidity (WM1 & WM2)
6.13 Graphical Plot for Turbidity (WM3 & WM4)
6.14 Graphical Plot for Suspended Solids (WM1 & WM2)
6.15 Graphical Plot for Suspended Solids (WM3 & WM4)
6.16 Graphical Plot for Ammoniacal Nitrogen (WM1 & WM2)
6.17 Graphical Plot for Ammoniacal Nitrogen (WM3 & WM4)

TABLES

Table 3.1 Summary of the Environmental Permits and Licenses
Table 4.1 Co-ordinates of AM1
Table 4.2 Air Quality Monitoring Frequency
Table 4.3 Action and Limit Levels for the project
Table 4.4 Co-ordinates of NM1(A)
Table 4.5 Noise Monitoring Frequency
Table 4.6 Action and Limit Levels for Construction Noise
Table 4.7 Water Quality Monitoring Frequency
Table 4.8 Action and Limit Level for Water Quality
Table 4.9 Waste generation schedule
Table 6.1 Completed Monitoring Works for March 2005
Table 6.2 Results of 24-hour TSP Monitoring Data
Table 6.3 Results of 1-hour TSP Monitoring Data
Table 6.4 Noise Levels for NM1(A)
Table 6.5 Summary of Water Quality Monitoring Data
Table 7.1 Summary of Observations, Actions and Outcomes of Site Inspection by IEC, ER and ET
Table 10.1 Works Programme for April 2005

APPENDICES

I Organization Chart
II Calibration Certificates of the Monitoring Equipment
III Event and Action Plans

APPENDICES

IV Implementation Status of Mitigation Measures
V Noise Monitoring Results
VI Water Quality Monitoring Results
VII Air Quality Monitoring Results
VIII Complaint Log
IX Cumulative Statistics on Complaints
X Monitoring Schedule for the Following Month
XI Master Construction Programme

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

EXECUTIVE SUMMARY

This is the 27th monthly Environmental Monitoring and Audit (EM&A) report for Contract No. DC/2001/19 – San Tin Eastern Main Drainage Channel and it covers the monitoring works conducted during March 2005.

Construction Activities for the Reported Period

- San Tin Tsuen Road widening
- Geotechnical Instrument monitoring
- Laying Grasscrete
- RE wall construction
- Water Main and Drainage Laying Works
- Backfilling the excavated area
- Drainage works on embankment and utilities works
- Construction of footpath and carriageway
- Construction works of Ha Wan Nullah
- Landscape works for grasscrete

Air Quality Monitoring

The site office (AM1) has been identified as the location for the monitoring of 24-hour and 1-hour Total Suspended Particulates (TSP). Monitoring of 24-hour TSP was carried out on five occasions, there were no exceedances to the set Action and Limit levels for this parameter during the reported period. Monitoring of 1-hour TSP was carried out on seventeen occasions, there were no exceedances to set Action and Limit levels for either parameter during the reported period.

Noise Monitoring

Monitoring of construction noise was carried out on four occasions at Yan Shau Wai NM1(A) for normal working hours (0700-1900 hours), four occasions for the evening period (1900-2300 hours) and four occasions for holidays period. There were no exceedances to the Limit level for noise during the reported period.

Water Quality Monitoring

Water quality in terms of pH, dissolved oxygen, suspended solids, temperature, turbidity and ammoniacal nitrogen, was carried out on four occasions at WM1, WM4 (upstream stations) and WM2, WM3 (downstream stations). There were no exceedances to set Action and Limit Levels recorded.

Waste Management

2,035m^3 C&D material was generated from the works in this month and were sent to WENT Landfill for disposal. About 60m^3 general refuse was disposed. No chemical waste was collected by a licensed collector in this reporting month.

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Complaints, Notifications of Summons and Successful Prosecutions

No complaint, notifications of summons and successful prosecutions were received in this reported period.

Site Inspections

Five weekly site inspections were conducted jointly by Independent Environmental Checker (IEC), Engineers' Representative (ER) and Environmental Team on 3, 10, 16, 24 and 30 March 2005. Major observations are summarised in the following table.

Observations	Actions by Contractor	Outcome
The water in the sedimentation tank near wheel washing bay was muddy and some of the muddy water was found not passing the tanks. (24 and 30 March 2005)	Desilting was undertaken. Two tanks were employed to treat the wastewater.	The effectiveness of this mitigation measure will be closely monitored.
Some of the muddy water generated by wheel washing was discharged to the public road. (10, 16 and 30 March 2005)	Several concrete blocks were placed to divert the wastewater back to the site.	No significant amount of muddy water observed on the public road. (31 March 2005)
General waste was observed at site exit and bridge of border road. (3 and 30 March 2005)	Some of the general refuse were removed.	The deficiency was rectified. (31 March 2005)
The stream water was discharged to the Shenzhen River by passing through the exposed area because of the broken water hose. (3, 10 and 16 March 2005)	The water hose was fixed.	The deficiency was rectified. (18 March 2005)
The door of the backhoe was not closed during operation. (10 March 2005)	The Contractor has asked the worker to close the door at once.	The noise nuisance was reduced to minimal.
Stagnant water was found at the inflatable dam. (16 March 2005)	The stagnant water was removed and the inflatable dam was covered by tarpaulin sheet.	No stagnant water was observed in that area. (23 March 2005)
Stagnant water was found at the CH1100. (30 March 2005)	The stagnant water was removed.	No stagnant water was observed in that area. (31 March 2005)

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Future Key Issues

The tentative works activities, predicted impacts and areas of environmental concern for the following month are summarised in the following table.

Works Activities	Predicted Impacts	Proposed Mitigation Measures
Backfilling the excavated area	· Noise and Vibration · Air	· Avoid concurrent operation with other noisy works. · Control dust generation during unloading of the fill material
Landscape works for grasscrete	· Air	· Control dust generation during unloading of the soil.
Geotechnical Instrument Monitoring	· Water	· Treat the water to the acceptable quality before discharge.
Main Channel Construction	· Water · Waste	· The section should be dewatered completely before excavation. · The excavated soil / mud should be disposed off-site as soon as practicable.
Drainage works, watermain laying works	· Air	· The idle stockpile of soil should be covered properly.
Construction works for Ha Wan Nullah	· Water	· The works area should be dewatered completely before excavation.
General	· Water	· Maintain the IFRC in good condition in the coming wet season.

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

1. INTRODUCTION

1.1 Background

Stanger Asia Ltd. has been commissioned by the Hsin Chong Construction Co., Ltd. to provide an Environmental Team (ET) to monitor air, noise, water quality and waste management for Contract No. DC/2001/09. The team is to take a pro-active role in all issues, which may be of environmental concern during the construction of the San Tin Eastern Main Drainage Channel.

The Independent Environmental Checker (IEC) appointed for this project is Hyder Consulting Limited.

In this report, the air, noise, water quality and waste management monitoring works conducted for March 2005 will be detailed and reviewed. All monitoring works were carried in accordance to "*Main Drainage Channels and Poldered* Village Protection Scheme for San Tin, NWNT: *Environmental Impact Assessment Study, Environmental Monitoring and Audit Manual*".

1.2 Report Structure

The purpose of this report is to detail and review the air, noise and water quality monitoring works undertaken for March 2005. The impact forecast for the next reporting month and the schedules of monitoring works for the following month is also given.

The report follows the format given below:

Section 1	Introduction and background information to the content of this report.
Section 2	This section gives the information of the project.
Section 3	This section summarises all the environmental permits and licenses.
Section 4	Summary of the EM&A requirements is presented.
Section 5	This section details the implemented mitigation measures.
Section 6	Details monitoring results.
Section 7	Audit the monitoring results.
Section 8	The status for solid and liquid waste management for the site is overviewed.
Section 9	Complaints, notifications of summons and successful prosecutions are summarized.
Section 10	This section gives the predicted impacts of the construction activities.
Section 11	This section gives a conclusion in relation to all monitoring activities.

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

2. PROJECT INFORMATION

2.1 Site Description

The works mainly comprise the removal and disposal of contaminated materials, the construction of a reinforced concrete channel, footpaths, drainage works, roadworks, water and landscape works from the Castle Peak Road at San Tin to the Shenzen River some 2.5km downstream.

The site layout plan is shown in Figure 2.1, Figure 2.2 and Figure 2.2 a.

2.2 Project Organization

Ir. C.L. Leung / Ir. Gary K.C. Yip are the Engineers' Representatives for the Drainage Services Department, Government of the HKSAR. (Tel: 25747400, Fax: 28278700).

The Independent Environmental Checker (IEC) for this project is headed by Dr. Gui Yi Li for Hyder Consulting Limited. (Tel: 2911 2233, Fax: 2805 5028).

Mr. Victor Lau is the Site Agent for Hsin Chong Construction Co., Ltd. (Tel: 2482 9587, Fax: 2482 9113).

The Environmental Team (ET) for the project is Stanger Asia Ltd. The team is headed by Mr Jeff L. H. Tsang – Environmental Scientist. (Tel: 26821203, Fax: 26820046).

The Organization Chart with the key personnel contacts names and telephone numbers is given in Appendix I.

2.3 Construction Programme

The overall construction programme is given in Appendix XI. Details of the construction activities are listed below.

- San Tin Tsuen Road widening
- Geotechnical Instrument monitoring
- Laying Grasscrete
- RE wall construction
- Water Main and Drainage Laying Works
- Backfilling the excavated area
- Drainage works on embankment and utilities works
- Construction of footpath and carriageway
- Construction works of Ha Wan Nullah
- Landscape works for grasscrete

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

3. ENVIRONMENTAL PERMITS AND LICENSES

The summary of the status of all environmental permits, licenses and notification for this project as at March 2005 is summarized in the following table.

Table 3.1 Summary of the Environmental Permits and Licenses

Description	Licence/Permit No.	Date of Issue	Date of Expiry	Status
Environmental Permit	EP-124/2002	28-Mar-02	--	Issued
Registration of Chemical Waste Producer	WPN5113-542-H2913-22	24-Jan-03	--	Issued
Notification of Works Under APCO	--	--	--	Notified
Effluent Discharge Licence	1S49/1	04-Aug-03	31-Aug-08	Issued
Effluent Discharge Licence for Septic Tank System	1S41N/1	20-Mar-03	--	Issued
Construction Noise Permit	GW-RN0444-04	09-Sep-04	08-Mar-05	Issued
Construction Noise Permit	GW-RN0060-05	09-Mar-05	08-Sep-05	Issued

4. SUMMARY OF EM&A REQUIREMENTS

4.1 Air Quality

Monitoring Location

The project has one designated location for the monitoring of air quality, which is the Site Offices. This monitoring location has been coded AM1 and it's co-ordinates given in the following table. The air monitoring location is shown in Figure 4.1.

Table 4.1 Coordinates of AM1

Station	HK Metric Grid – Easting	HK Metric Grid - Northing
AM1	826006	840543

Methodology

Measurement of 24-hour and 1-hour TSP levels were carried out in accordance to the high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50). When positioning the high volume samplers, the following requirements have been observed:

- a horizontal platform with appropriate support to secure the high volume sampler against gusty wind, should be provided;

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

- horizontal distance between the high volume samplers and an obstacle, such as buildings, must be at least twice the height of the obstacle protruding above the high volume samplers;
- a minimum separation of 2 m should be provided from walls, parapets, and penthouses for rooftop high volume samplers;
- a minimum separation of 2 m should be provided from any supporting structure measured horizontally;
- there should not be any furnace or incinerator flues nearby;
- there should be unrestricted airflow around the high volume samplers;
- a minimum separation of 20 m should be provided from the dripline;
- any wire fence and gate employed to protect the high volume samplers should not cause any obstruction during monitoring.

All relevant data including elapsed time, meter reading for the start and finish of the sampling period, identification and weight of the filter paper, and other special phenomena were recorded.

Monitoring Equipment and Calibration Details

Andersen GMW Model GS2310 high volume samplers were used to carry out the monitoring of 24-hour and 1-hour TSP. The high volume sampler is in compliance with the specifications as listed in the EM&A Manul, given below:

- 0.6 – 1.7 m^3/min (20-60 SCFM) adjustable flow range;
- equipped with a timing / control device with 5 minutes accuracy over 24 hours operations;
- installed with elapsed-time meter with 2 minutes accuracy over 24 hours operations;
- capable of providing a minimum exposed area of 406 cm^2 (63 in^2);
- flow control accuracy: 2.5% deviation over 24-hr sampling period;
- equipped with shelter to protect the filter and sampler;
- incorporated with an electronic mass flow rate controller or other equivalent devices;
- equipped with a flow recorder for continuous monitoring;
- provided with peaked roof inlet, incorporated with manometer;
- able to hold and seal the filter paper to the sampler housing at horizontal position;
- easy to change filter; and
- capable of operating continuously for 24-hr period.

The high volume sampler is calibrated at bi-monthly intervals. The calibration kit (Andersen Model G2535) comprising pressure plates and a transfer standard is traceable to the internationally recognized standard. Calibration records for the high volume sampler is given in Appendix II of this report.

Laboratory Measurement

Laboratory measurements were carried out in Stanger Asia Ltd. own HOKLAS accredited laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments.

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Clean filter papers of size 8"x10" with no pinholes were labelled before sampling. They were conditioned in a dessicator with less than 50% relative humidity for over 24 hours and pre-weighed before use for sampling.
After sampling, the filter papers loaded with dust were kept in a clean and tightly sealed plastic bag. The filter papers were then returned to the laboratory for reconditioning in the dessicator with less than 50% relative humidity followed by accurate weighing on an electronic balance regularly calibrated against a traceable standard and readable to 0.1 mg.

Stanger Asia Ltd. operates comprehensive quality assurance and quality control programmes. For QA/AC procedures, all filters were equilibrated and weighed repeatedly until the difference of two consecutive results was less than 0.5 mg.

Monitoring Parameters Frequency

Table 4.2 Air Quality Monitoring Frequency

Monitoring Location	Parameter	Frequency
AM1	24-hr TSP	Once in every six days
	1-hr TSP	Three times in every six days

Action and Limit Levels

The Action levels for air quality monitoring was established from the baseline monitoring data prior to the commencement of the construction of the project. The Limit levels for air quality monitoring has been set in line with statutory guidelines for air quality in Hong Kong. Action and Limit levels for both 24-hour and 1-hour TSP are given in the following table.

Table 4.3 Action and Limit Levels for the Project

Parameter Monitored	Action Level, $\mu g/m^3$	Limit Level, $\mu g/m^3$
1-hour TSP	390	500
24-hour TSP	225	260

4.2 Noise

Monitoring Location

The project has two designated Noise Monitoring Stations, Tung Chan Wai (NM1) and the pumping station (NM2). Noise monitoring for the pumping station (NM2) shall only be carried out on two occasions, day 1 and day 60 of the commissioning stage. For NM1, however, due to distance from the works area to the village, and the expanse of container activities in between, a small residential dwelling at Yan Shau Wai slightly to the north of the Tung Chan Wai has been identified as being a more representative monitoring location. This monitoring location was coded as NM1(A) and construction phase noise impact monitoring was conducted at this station, it's co-ordinates are listed in the following table. The noise monitoring location is shown in Figure 4.2.

Table 4.4 Coordinates of NM1(A)

Station	HK Metric Grid – Easting	HK Metric Grid - Northing
NM1(A)	825982	840137

Methodology

Monitoring was carried out in accordance to procedures recommended in the Environmental Schedule for the monitoring of construction noise as follows:

- measurements shall be recorded to the nearest 0.1dB.
- Weather conditions, including a measurement of wind speed, should be recorded for the measurement. Where the steady wind speed exceeds 5 m/s, or gusts are above 10 m/s, or in the presence of fog or rain, measurements should be treated as invalid, and repeated in more appropriate conditions.

This noise meter was programmed to measure A-weighted equivalent continuous sound pressure level over 5-minute intervals. Acoustic information measured by the noise meter over the 30 minute (daytime period) or 15 minute (evening or holidays period) was recorded and stored with a record number assigned to each measurement. Additional supplementary acoustical data in terms of L_{10} and L_{90} were also recorded for reference and auditing.

Due to the fact that dBs are logarithmic values, they cannot be simply added together and averaged. Therefore, the individual dB values are converted to linear values. After calculation, the values are converted back to dB by taking the logarithm and dividing the product by ten. The equation is expressed as follows:

Average Noise Level, $L_{eq(30\ min)}$dB(A)

$$= 10 \log_{10}[\{10^{(L\ eq(5\ min)i/10)} + 10^{(L\ eq(5\ min)i/10)} + ...\}/n]$$

while n is the number of the data.
i is the i^{th} data.

Monitoring Equipment and Calibration Details.

Noise levels were determined using a Brüel & Kjaer Modular precision sound level meter type 2231 / 2238. The meter complies with the International Electrotechnical Commission Publication (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications, as referred to in the Technical Memorandum issued under the Noise Control Ordinance (NCO).

A Brüel & Kjaer Sound level calibrator type 4231 was used for the on-site calibration of the meter. This calibrator complies with the IEC Publication 942 (1988) Class1 and ANSI S1.40 – 1984. Noise measurements were only accepted to be valid if the calibration levels from before and after the measurement agreed to within 1.0dB. The sound level meter and calibrator are calibrated annually by the manufacturer.

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Wind speeds were measured by a portable anemometer, TSI model 8330 VelociCheck, with direction being determined with a compass.

The calibration certificate of the sound level meter and sound level calibrator are given in Appendix II.

Monitoring Parameters and Frequency

Table 4.5 Noise Monitoring Frequency

Monitoring location	Monitoring period	Parameter	Frequency
NM1 (A)	Between 0700-1900 hours on normal weekdays.	$L_{Aeq(30\ min)}$, L_{90} & L_{10}	Once a week.
	Between 1900-2300 hours.	$L_{Aeq(5\ min)}$, L_{90} & L_{10}	
	Between 2300-0700 hours of the next day.		
	Between 0700-1900 hours on holidays.		

Action and Limit Levels

Table 4.6 Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
Daytime (0700-1900 hrs) on normal weekdays, e.g. Monday through to Saturday excluding Public Holidays.	When one complaint is received within 2 weeks on the same location.	$L_{Aeq(30min)}$ 75dB(A)
Daytime on holidays: and 1900 to 2300 hours an all other days.		$L_{Aeq(5min)}$ 70dB(A)
All night time periods (2300 to 0700 hours)		$L_{Aeq(5min)}$ 55dB(A)

4.3 Water Quality

Monitoring Locations

The EM&A Manual for this project has proposed one upstream station (WM1), one down stream station (WM2) within the San Tin Drainage Channel and, one upstream station (WM3) and one downstream station (WM4) at the discharge point for the San Tin Drainage Channel, once completed, within the Shenzhen River to be monitored for water quality.

The designated monitoring stations are shown in Figure 4.3.

Methodology

Surface water quality shall be monitored for the following parameters: Dissolved Oxygen (mg/L and % saturation), Temperature (°C), pH value, Turbidity (NTU), Water Dept (m), Suspended Solids (mg/L) and Ammoniacal Nitrogen (mg/L). As the depth of the designated monitoring locations is less than 1.5m, only one sample was taken from mid-depth of the water column. For *in situ* parameters, three measurements at each station shall be taken. Suspended solids and ammoniacal nitrogen shall be determined in the laboratory. All the measurements were taken during the mid-ebb tide.

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

During monitoring works the following shall also be recorded:

- monitoring location;
- depth of water;
- time;
- weather conditions including ambient temperature;
- water temperature;
- any special phenomena or activities at the construction site.

Monitoring Equipment

(a) Suspended Solids and Ammoniacal Nitrogen.

As the depth of water being sampled was generally less than 50cm, the "grab sampling" technique was employed for the taking of water samples for the determination of suspended solids and ammoniacal nitrogen at all designated monitoring locations.

Samples were kept in high-density polythene bottles, packed in ice and cooled to 4°C or below without being frozen for delivery to the laboratory as soon as possible after collection.

(b) Thermometer

A standard certified laboratory mercury thermometer with an accuracy of at least 0.5°C Celsius was employed, calibrated against a certified thermometer of 0.1 degree Celsius scale. This thermometer was employed for measuring both ambient and water temperatures.

(c) Depth Detector

As the depth of water being sampled was generally less than 50cm, a clearly marked depth gauge was employed to determine water depth at all designated monitoring locations.

(d) Dissolved Oxygen and Temperature Measuring Equipment

A YSI model 58 meter, YSI 5739 probe, YSI 5795A submersible stirrer with reel and cable with employed.
This meter measures oxygen in the ranges of 0-200% saturation and 0-20mg/L O_2 and has automatic temperature and salinity correction facility. It operates from a DC power source and measures temperature in the range of 0-45°C.

(e) Turbidity Meter

A Hach model 2100P shall be employed.

The meter measures turbidity in the range of 0-1000NTU. It operates from a DC power source.

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

The calibration certificates for the monitoring equipment are attached in Appendix II.

Laboratory Analysis

Samples were returned to Stanger Asia Ltd. own HOKLAS accredited laboratory, for the determination of suspended solids and ammoniacal nitrogen. Suspended solids content was determined employing Method 2540D (APHA 20th Edition) and ammoniacal nitrogen in accordance with APHA Method No. 4500-NH_3 B & D, 18th Edition. Methods are referenced from the "*Standard Methods for the Examination of Water and Wastewater*" (APHA, AWWA, WEF). The laboratory operates a QA/QC scheme for these analysis inclusive of duplicate and spike recovery analysis.

Monitoring Parameters and Frequency

Table 4.7 Water Quality Monitoring Frequency

Monitoring Locations	Parameter	Frequency
WM1 to WM4	Dissolved oxygen (mg/L and % saturation), total suspended solids, pH, turbidity, ammoniacal nitrogen, water temperature and depth.	Once per week

Note: According to S 4.6 of the EM&A Manual, the water quality frequency can be reduced from twice to once per week provided that no exceedance were recorded during the first three months. As no exceedance has been recorded since the commencement of the Project, the frequency of monitoring was reduced to once per week as from February 2004.

Action and Limit Levels

Since baseline dissolved oxygen, suspended solids and the ammoniacal nitrogen have exceeded the criteria stated in Table 4.7a of the EM&A Manual, another set of Action and Limit level have been derived in accordance with the "*EM&A Guidelines for Development Projects in Hong Kong*" published in February 1998 issued by EPD.

Table 4.8 Action and Limit Level for Water Quality

Parameter	Action Level	Limit Level
Dissolved Oxygen in (mg/L)	0.59 (5%-ile of baseline data) for WM2 (downstream station)	0.55 (1%-ile of baseline data) for WM2 (downstream)
	0.46 (5%-ile of baseline data) for WM3 (downstream station mid-ebb tide)	0.39 (1%-ile of baseline data) for WM3 (downstream station mid-ebb tide)
SS (mg/L), Turbidity (NTU), NH_3-N (mg/L)	120% of upstream control station at the same tide of same day	130% of upstream control station at the same tide of same day
pH	-	6-9

Note: For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
For SS and Tby, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
For pH, non-compliance of the water quality limits occurs when monitoring result is larger than pH value 9 or lower than pH value 6.

4.4 Event and Action Plans

The Event and Action Plans for air, noise and water are attached in Appendix III of this report. Since the Discharge Standards for Water Quality were not applicable as explained in Section 4.3 above, another Event and Action Plan for Water Quality was derived according to the "*EM&A Guidelines for Development Projects in Hong Kong*" published in February 1998 issued by EPD as a substitute to Table 4.7b of the EM&A Manual.

4.5 Schedule for the Generation of Waste

During the construction of the San Tin Eastern Main Drainage Channel, different types of waste will be generated as followed:

Table 4.9 Waste Generation Schedule

Generation Period	Waste Generated
Site clearance.	Topsoil, subsoil, concrete, brick, aggregates, tiles, paving and vegetation.
Earthwork.	Rock, hardcore and rubble.
During construction.	Steel and other metals, recyclable or reusable waste, chemical waste and general refuse.
Earthwork for drainage channel.	Contaminated soil.
Excavation for drainage channel and outfall at border road.	Excessive fill materials.

5. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

The contractor implemented various environmental mitigation measures as recommended in the EIA report and Environmental Permit. The implementation status is attached in Appendix IV and summarised as follows:

- Vehicle washing facilities were provided at the exit points of the site and the border road exit point. Wheel wash bay was cleaned periodically.
- Sedimentation tanks were employed to treat the wastewater generated by wheel washing.
- Water bowser was in operation.
- General refuse and C&D material were removed regularly.
- The sand trap was installed at the exit point of IFRC.
- The channel section was dewatered before excavation.
- The public roads were kept clean and free from soil.
- The oil drums were removed or put in drip trays.
- The idle equipment were turned off to avoid air and noise nuisance.
- The doors of the equipment were closed to avoid noise nuisance.
- Stagnant water was pumped out or removed regularly.

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

6. MONITORING RESULTS

6.1 Completed Monitoring Works

Table 6.1 gives the completed monitoring works for the reported period.

Table 6.1 Completed Monitoring Works for March 2005

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2 Site Inspection	3 1-hr TSP x 2	4 24-hr TSP	5 1-hr TSP
6 Noise[3]	7 Noise [1,2] Water (12:17)	8	9 1-hr TSP x 2 Site Inspection	10 24-hr TSP	11 1-hr TSP	12
13 Noise[3]	14 Noise [1,2] Water (16:16)	15 1-hr TSP x 2	16 Site Inspection 24-hr TSP	17 1-hr TSP	18	19
20 Noise[3]	21 1-hr TSP x 2 Noise [1,2] Water (11:52)	22 24-hr TSP	23 1-hr TSP x 3 Site Inspection	24	25	26
27 Noise[3]	28 24-hr TSP	29 1-hr TSP x 3 Noise [1,2] Water (15:46)	30 Site Inspection	31		

Notes:
1. Noise: daytime noise monitoring (once per week), (6 x 5 minutes)
2. Noise: restricted hours (1900-2300 normal weekdays) noise monitoring (once per week), (3 x 5 minutes)
3. Noise: restricted hours (0700-2100 holidays) noise monitoring (once per week), (3 x 5 minutes).
4. Water: water quality monitoring (once per week) at stations WM1, WM4 (upstream) and WM2, WM3
5. 24-hr TSP (once in every 6 days) conducted at Site Office
6. 1-hr TSP (three times in every 6 days) conducted at Site Office. 7. Site inspection: once a week

6.2 Air Quality Monitoring

Impact monitoring of 24-hour TSP was conducted on five occasions, with the monitoring of 1-hour TSP being conducted on seventeen occasions at monitoring location AM1 this reported period. The monitoring records for 24-hour and 1-hour TSP are given in the following table. Details of monitoring results are given in Appendix VII. The results are presented graphically in Figures 6.1 and 6.2.

Table 6.2 Results of 24-hour TSP Monitoring Data

Date	AM1, $\mu g/m^3$	Exceedance (Y/N)
04-Mar-05	137	N
10-Mar-05	105	N
16-Mar-05	124	N
22-Mar-05	133	N
28-Mar-05	149	N
Action Level	225 $\mu g/m^3$	
Limit Level	260 $\mu g/m^3$	

Table 6.3 Results of 1-hour TSP Monitoring Data

Date	AM1, $\mu g/m^3$	Exceedance (Y/N)
03-Mar-05	198	N
03-Mar-05	164	N

Table 6.3 (cont'd) Results of 1-hour TSP Monitoring Data

Date	AM1, $\mu g/m^3$	Exceedance (Y/N)
05-Mar-05	188	N
09-Mar-05	197	N
09-Mar-05	233	N
11-Mar-05	265	N
15-Mar-05	244	N
15-Mar-05	210	N
17-Mar-05	290	N
21-Mar-05	188	N
21-Mar-05	169	N
23-Mar-05	244	N
23-Mar-05	273	N
23-Mar-05	267	N
29-Mar-05	288	N
29-Mar-05	294	N
29-Mar-05	237	N
Action Level	390 $\mu g/m^3$	
Limit Level	500 $\mu g/m^3$	

6.3 Noise Monitoring

Monitoring of daytime construction noise, 0700-1900 hrs on normal weekdays, evening noise, 1900-2300 hrs on normal weekdays, 0700-2100 hrs on general holidays including Sunday were carried out on a total of twelve occasions, at the designated location NM1(A) this reported period. Noise levels measured during the given time periods are summarised in the table below. Details of monitoring results are given in Appendix V. The results are also presented graphically in Figure 6.3.

Table 6.4 Noise Levels for NM1(A)

Date	Measurement Time	NM1 (A), dB(A)	Exceedance (Y/N)	Type of measurement
06-Mar-05	15:15	61.6	N	Façade
07-Mar-05	16:30	62.5	N	Façade
	19:15	61.0	N	Façade
13-Mar-05	16:00	62.8	N	Façade
14-Mar-05	14:00	63.1	N	Façade
	19:15	60.8	N	Façade
20-Mar-05	13:00	63.3	N	Façade
21-Mar-05	17:15	61.3	N	Façade
	19:15	61.4	N	Façade
27-Mar-05	14:15	59.7	N	Façade
29-Mar-05	14:00	64.4	N	Façade
	19:05	60.2	N	Façade
Limit Level for 1900-2300 normal weekdays and 0700-2100 holidays				70 dB(A)
Limit Level for 0700-1900 normal weekdays75 dB(A)				75 dB(A)

Note: 1. The Area Sensitive Rating is A for NM1(A).

2. The Limit Levels are set according to the Table 3.7a of the EM&A Manual.

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

6.4 Water Quality Monitoring

Water quality in terms of pH, dissolved oxygen, turbidity, ammoniacal nitrogen, suspended solids and temperature, was conducted on four occasions was carried out at WM1, WM4 (upstream stations) and WM2, WM3 (downstream stations).

Results for water quality monitoring are summarised in the following tables. Details of monitoring results with daily Action and Limit levels are presented in Appendix VI. Graphical presentations of the results are shown in Figure 6.4 – Figure 6.17.

Table 6.5 Summary of Water Quality Monitoring Data

Parameters	WM2	WM3	Exceedance (Y/N) and Date of Exceedance (if any)
	Averaged (Range)	Averaged (Range)	
Temperature, °C	16.3 (12.0-20.0)	16.0 (13.0-20.0)	-
pH	7.25 (7.08-7.38)	7.25 (7.09-7.51)	N
Dissolved Oxygen, %	8.53 (7.40-10.70)	8.56 (6.40-9.90)	-
Dissolved Oxygen, mg/L	0.87 (0.77-1.08)	0.85 (0.64-0.99)	N
Turbidity, NTU	90.8 (60.4-147)	105 (80.3-124)	N
Suspended Solids, mg/L	101 (90-120)	108 (80-129)	N
Ammoniacal Nitrogen, mg/L	65.4 (50.0-81.0)	65.0 (42.2-80.9)	N

7. AUDIT REPORT

7.1 Air Quality Monitoring

No exceedance to set Action and Limit levels for either 24 or 1-Hour TSP monitoring was recorded in this reported period.

No significant trend was observed for this month's monitoring data.

7.2 Noise Monitoring

No exceedance to Limit Level was recorded in this reported period.

7.3 Water Quality Monitoring

There were no exceedances to Action Level and Limit Level for all parameters in this reported period.

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

7.4 Site Inspections

Five weekly site inspections were conducted jointly by the IEC, ER and ET on 3, 10, 16, 24 and 30 March 2005. Major observations are summarised in the following tables.

Table 7.1 Summary of Observations, Actions and Outcomes of Site Inspection by ER, IEC and ET

Observations	Actions by Contractor	Outcome
The water in the sedimentation tank near wheel washing bay was muddy and some of the muddy water was found not passing the tanks. (24 and 30 March 2005)	Desilting was undertaken. Two tanks were employed to treat the wastewater.	The effectiveness of this mitigation measure will be closely monitored.
Some of the muddy water generated by wheel washing was discharged to the public road. (10, 16 and 30 March 2005)	Several concrete blocks were placed to divert the wastewater back to the site.	No significant amount of muddy water observed on the public road. (31 March 2005)
General waste was observed at site exit and bridge of border road. (3 and 30 March 2005)	Some of the general refuse were removed.	The deficiency was rectified. (31 March 2005)
The stream water was discharged to the Shenzhen River by passing through the exposed area because of the broken water hose. (3, 10 and 16 March 2005)	The water hose was fixed.	The deficiency was rectified. (18 March 2005)
The door of the backhoe was not closed during operation. (10 March 2005)	The Contractor has asked the worker to close the door at once.	The noise nuisance was reduced to minimal.
Stagnant water was found at the inflatable dam. (16 March 2005)	The stagnant water was removed and the inflatable dam was covered by tarpaulin sheet.	No stagnant water was observed in that area. (23 March 2005)
Stagnant water was found at the CH1100. (30 March 2005)	The stagnant water was removed.	No stagnant water was observed in that area. (31 March 2005)

8. WASTE MANAGEMENT

2,035m^3 C&D material was generated from the works in this month and were sent to WENT Landfill for disposal. About 60m^3 general refuse was disposed. No chemical waste was collected by a licensed collector in this reporting month.

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

9. COMPLAINTS, NOTIFICATIONS OF SUMMONSES AND SUCCESSFUL PROSECUTIONS

No complaint, notifications of summons and successful prosecutions were received in this reported period.

Complaint Log is attached in Appendix VIII. Cumulative statistics on complaints are attached in Appendix IX.

10. FUTURE KEY ISSUES

The following are the scheduled construction activities for the next reported period. Scheduled monitoring activities for the following month are given in Appendix XI.

Table 10.1 Works Programme for April 2005

Works Activities	Predicted Impacts	Proposed Mitigation Measures
Backfilling the excavated area	· Noise and Vibration · Air	· Avoid concurrent operation with other noisy works. · Control dust generation during unloading of the fill material
Landscape works for grasscrete	· Air	· Control dust generation during unloading of the soil.
Geotechnical Instrument Monitoring	· Water	· Treat the water to the acceptable quality before discharge.
Main Channel Construction	· Water · Waste	· The section should be dewatered completely before excavation. · The excavated soil / mud should be disposed off-site as soon as practicable.
Drainage works, watermain laying works	· Air	· The idle stockpile of soil should be covered properly.
Construction works for Ha Wan Nullah	· Water	· The works area should be dewatered completely before excavation.
General	· Water	· Maintain the IFRC in good condition in the coming wet season.

11. CONCLUSION

All results for the air quality monitoring conducted this month were acceptable with no exceedance to set Action or Limit levels for either 24 or 1-hour TSP level being recorded. No untoward results or trends in results were noted. All impact noise monitoring gave results that complied with the proposed Limit exceedance levels NM1(A).

Results for water quality were found to be acceptable this reported period with no exceedances to any set Action or Limit levels. In addition, no complaint, notifications of summons and successful prosecutions were received in this reported period.

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Stanger Asia

Figures

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

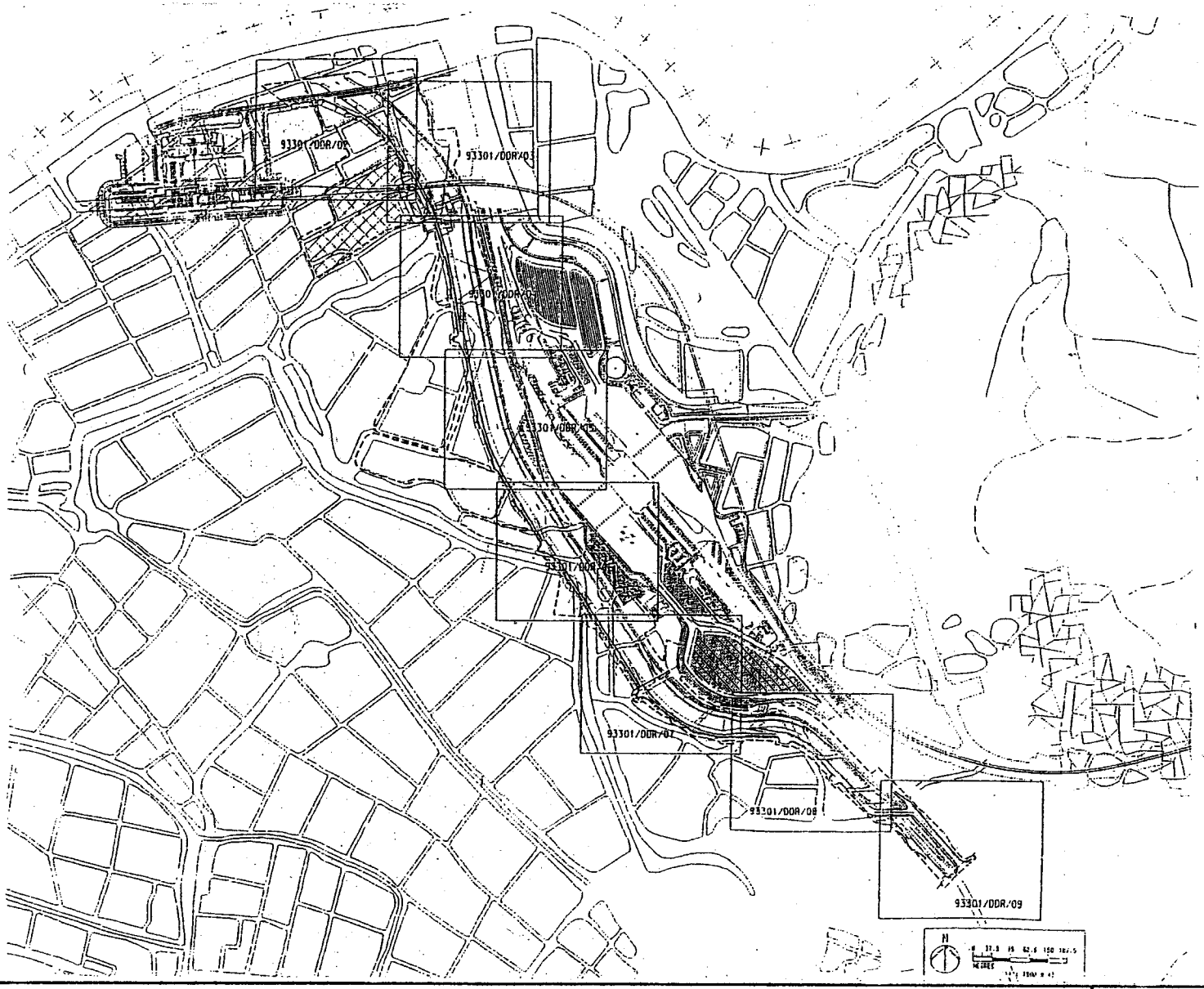


Figure 2.1 - General Layout Plan

Stanger Asia

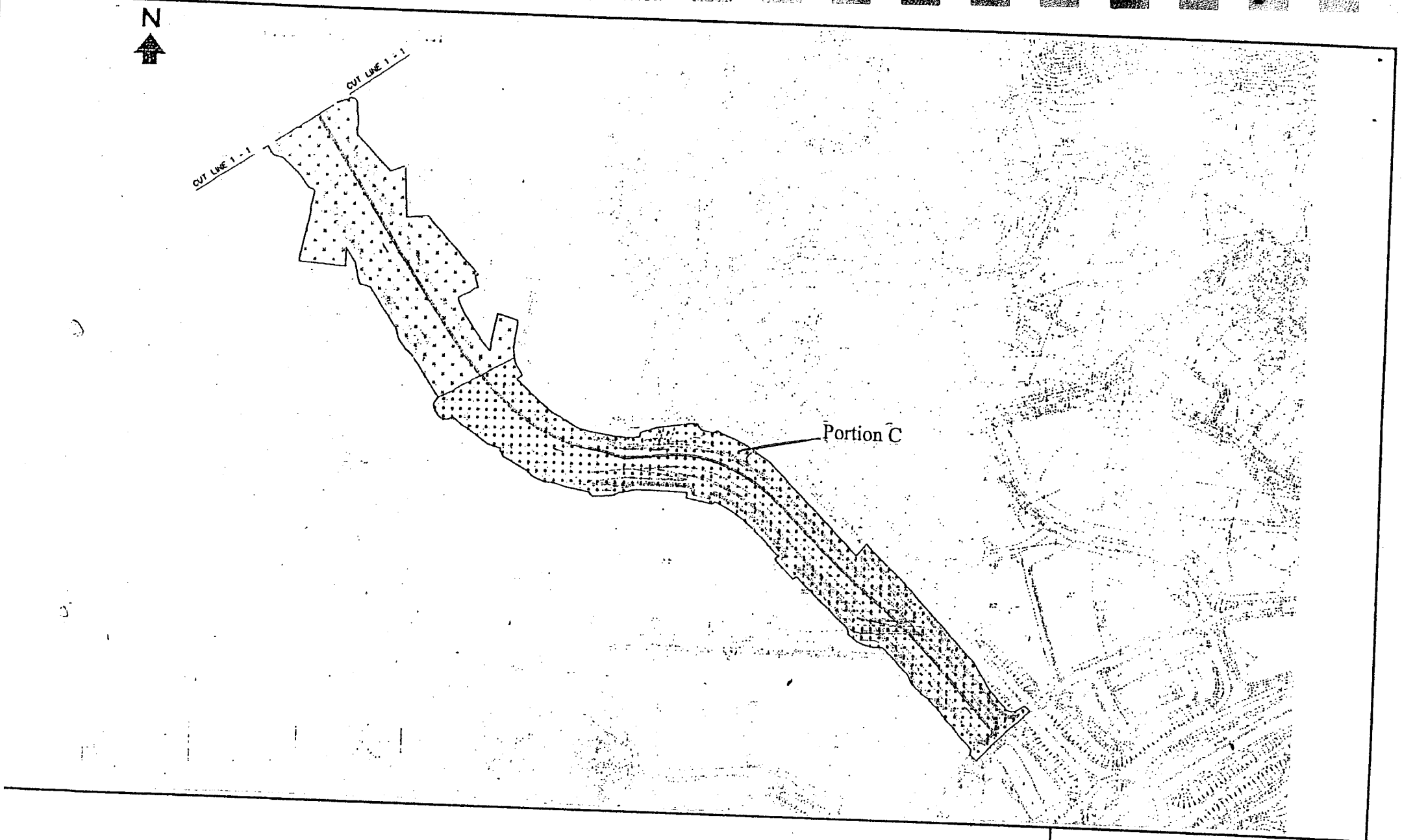


Figure 2.2 - Portion of the Site

Stanger Asia

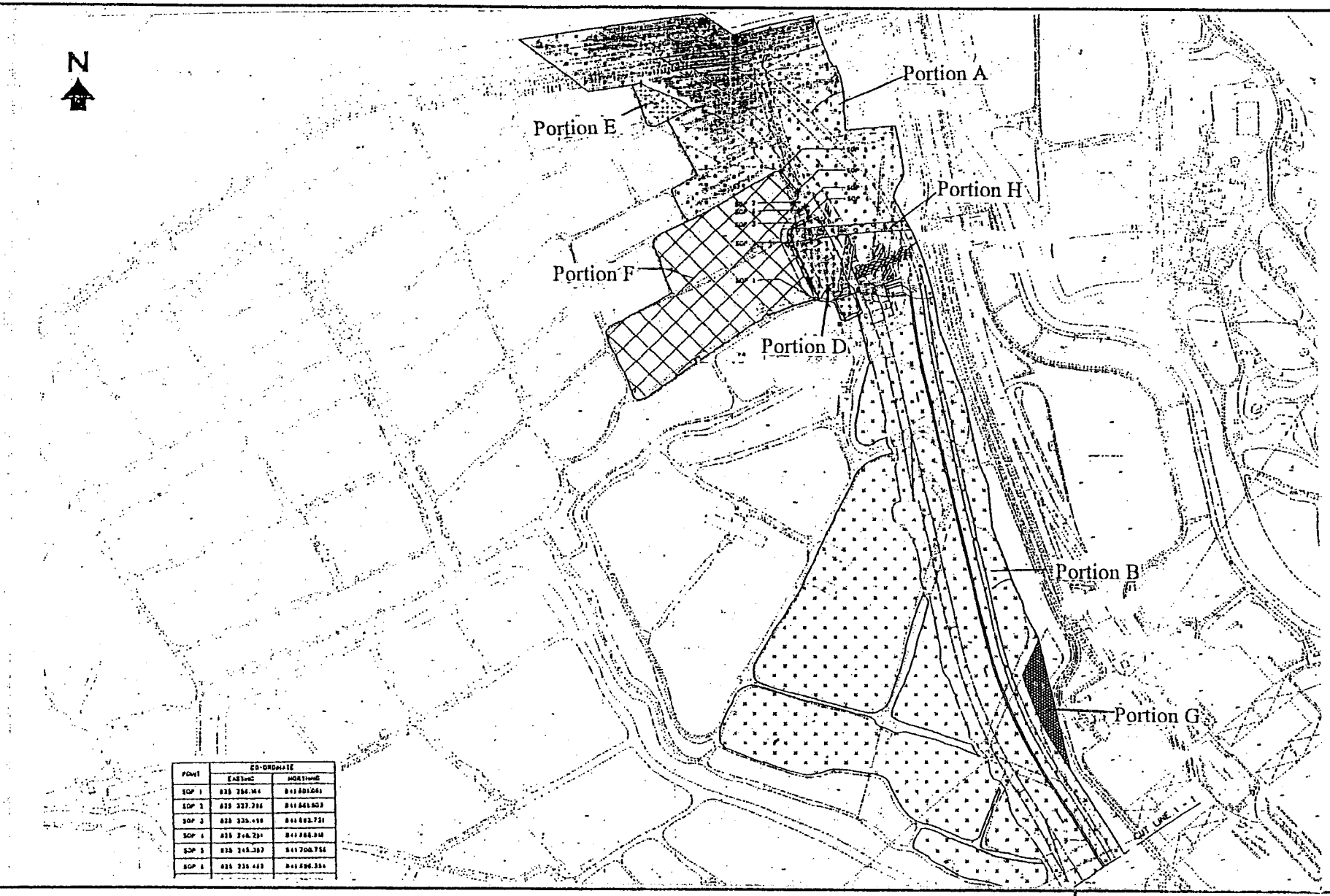


Figure 2.2a - Portion of the Site

Stanger Asia

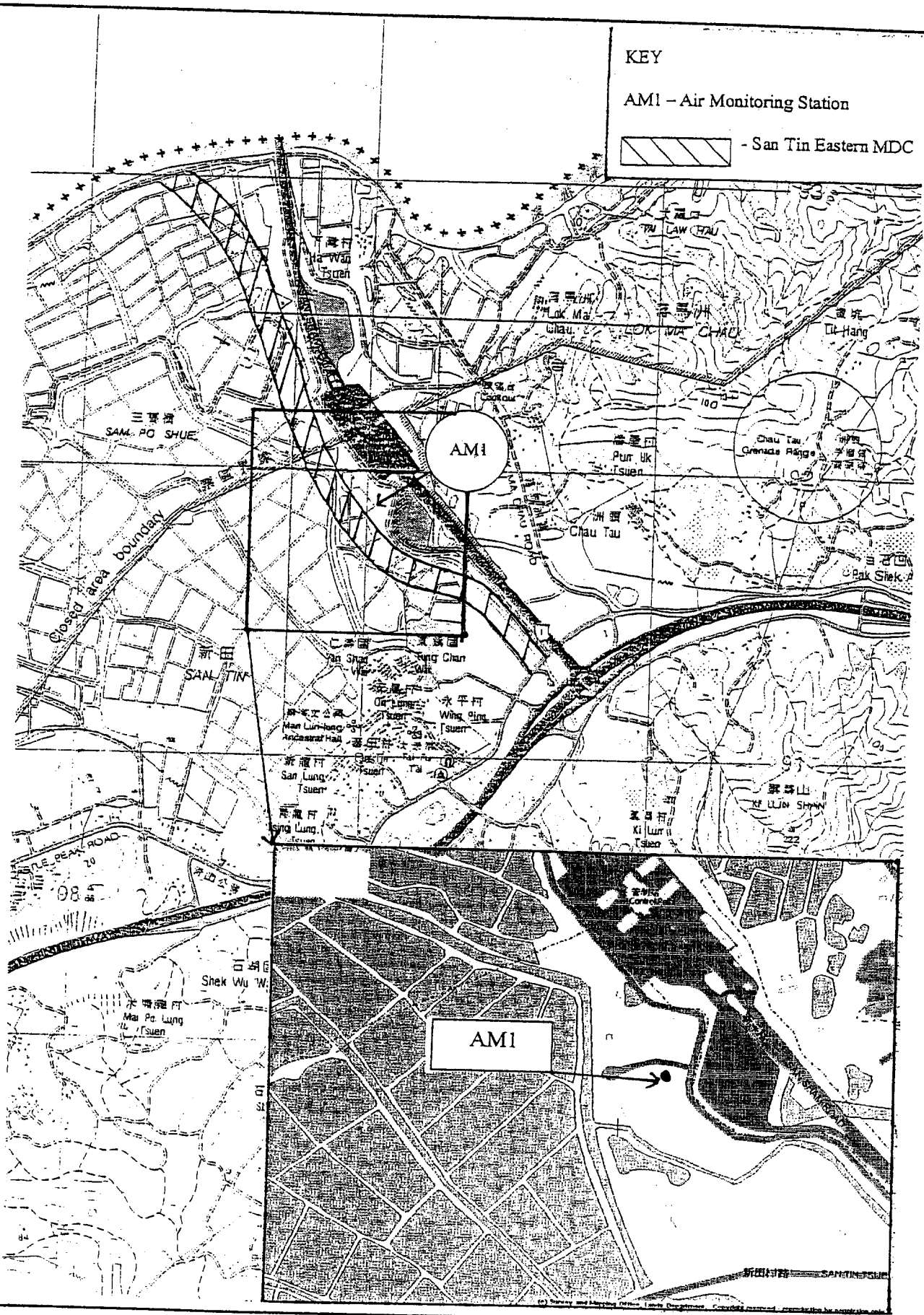


Figure 4.1 - Location of Air Quality Monitoring Station

Stanger Asia

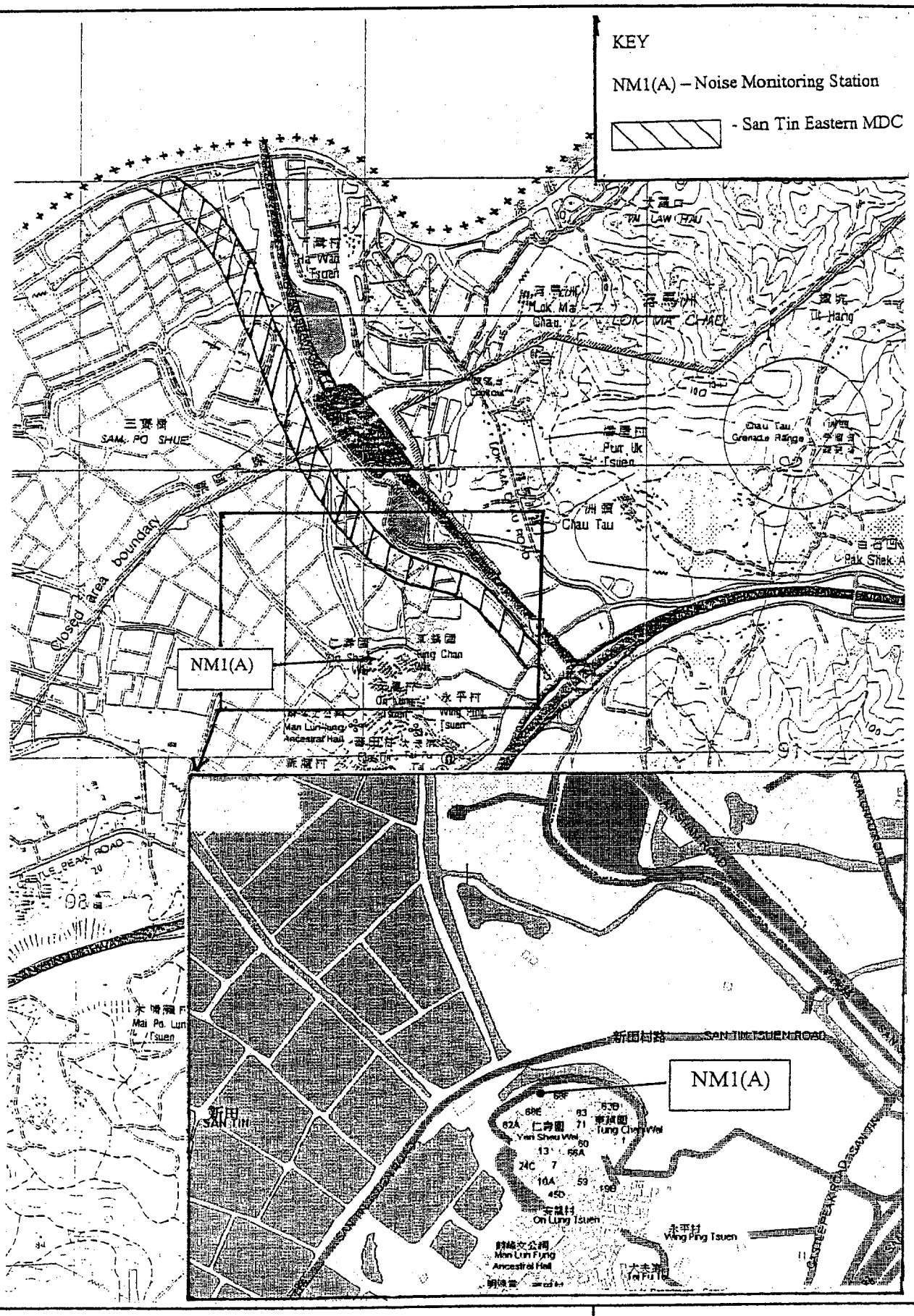


Figure 4.2 - Location of Noise Monitoring Station

Stanger Asia

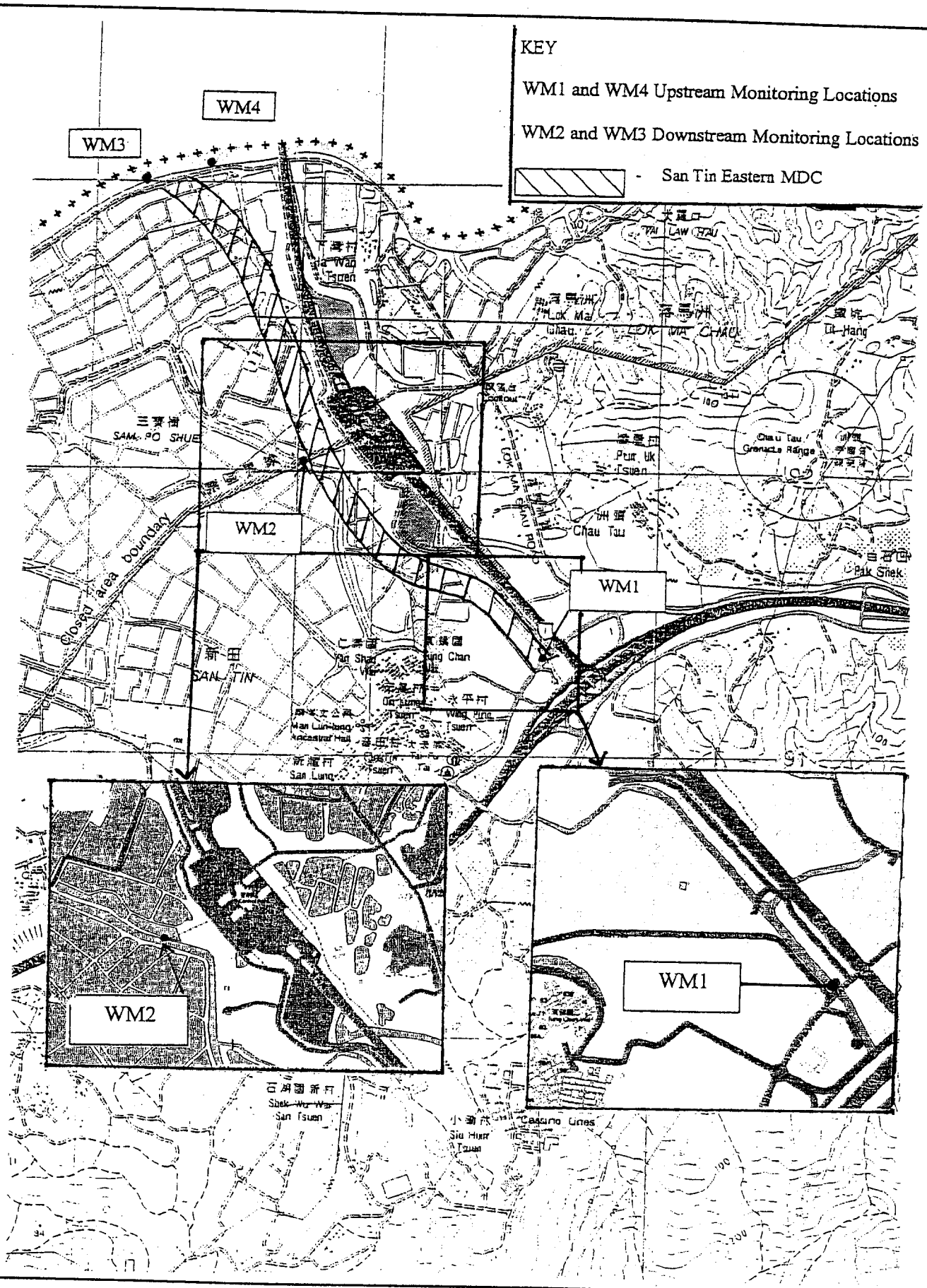


Figure 4.3 - Locations of Water Quality Monitoring Station

Stanger Asia

Figure 6.1 - Graphical Plot of 24-hr TSP Levels

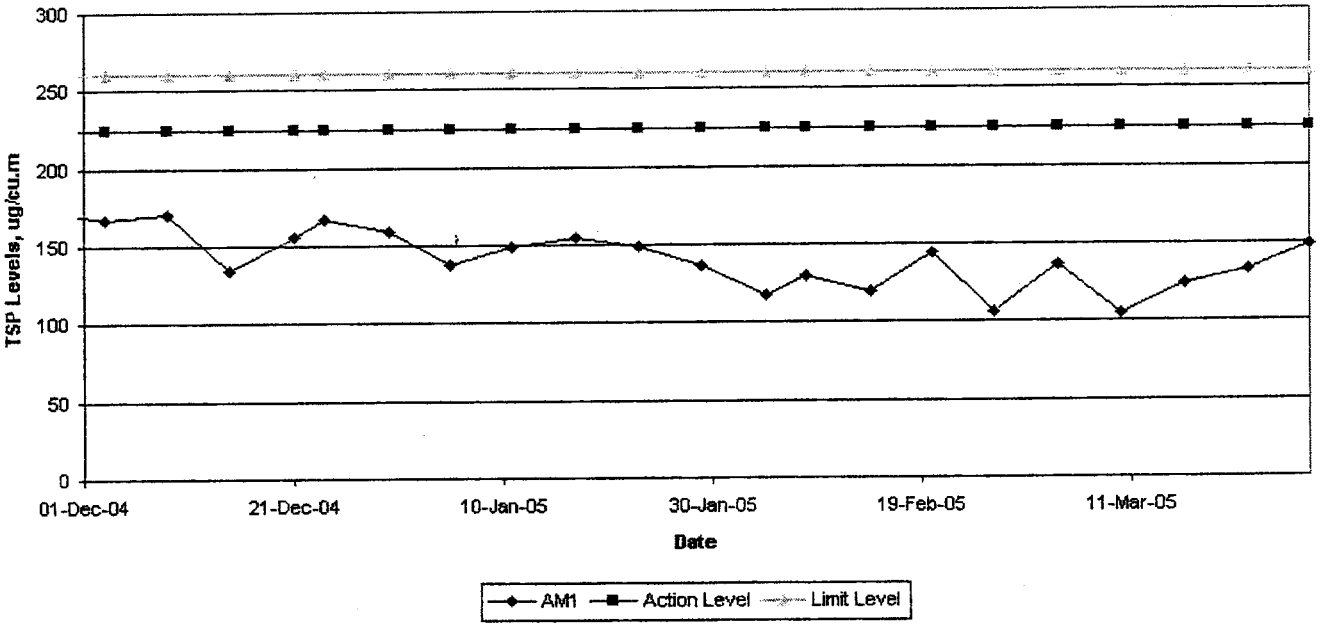
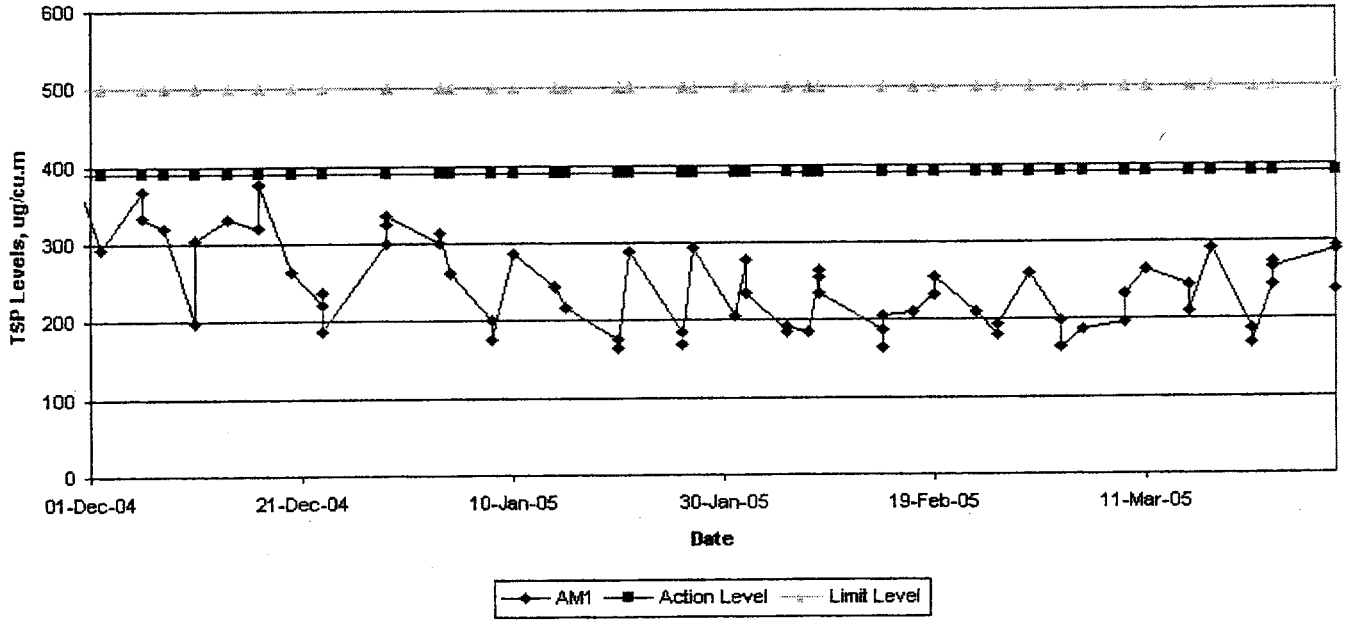


Figure 6.2 - Graphical Plot of 1-hr TSP Levels



G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Figure 6.3 - Graphical Plot of Noise Level

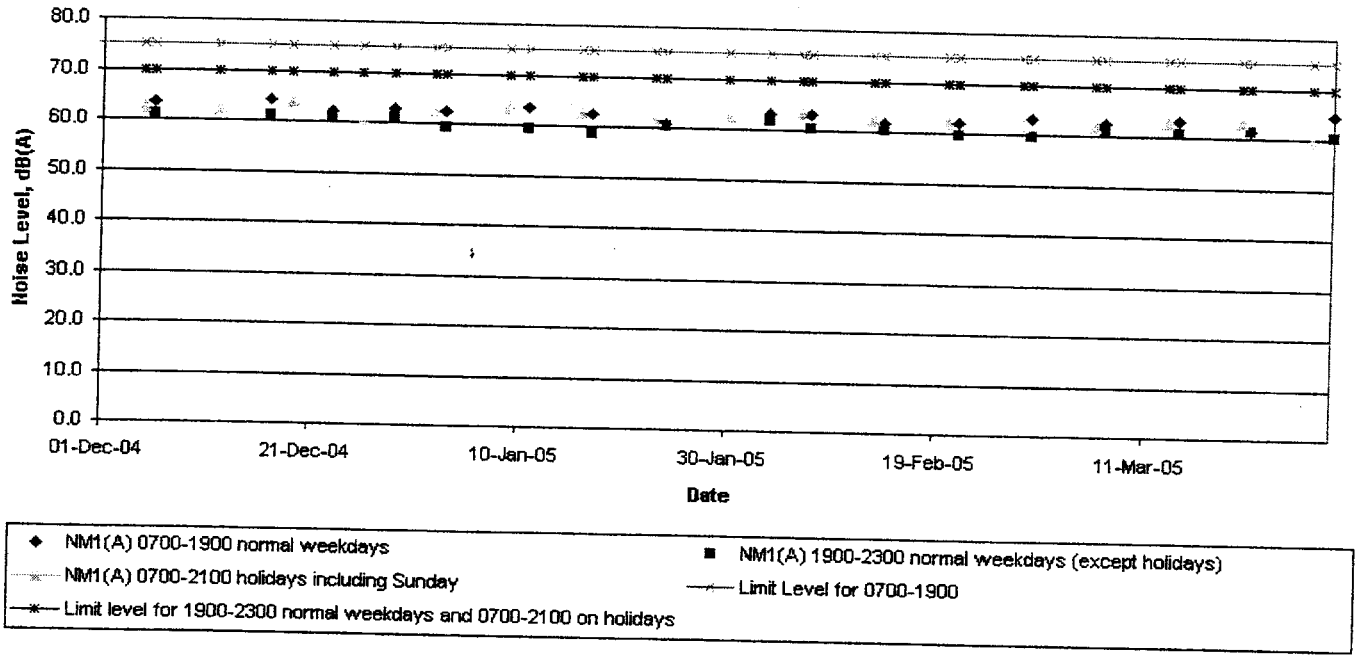
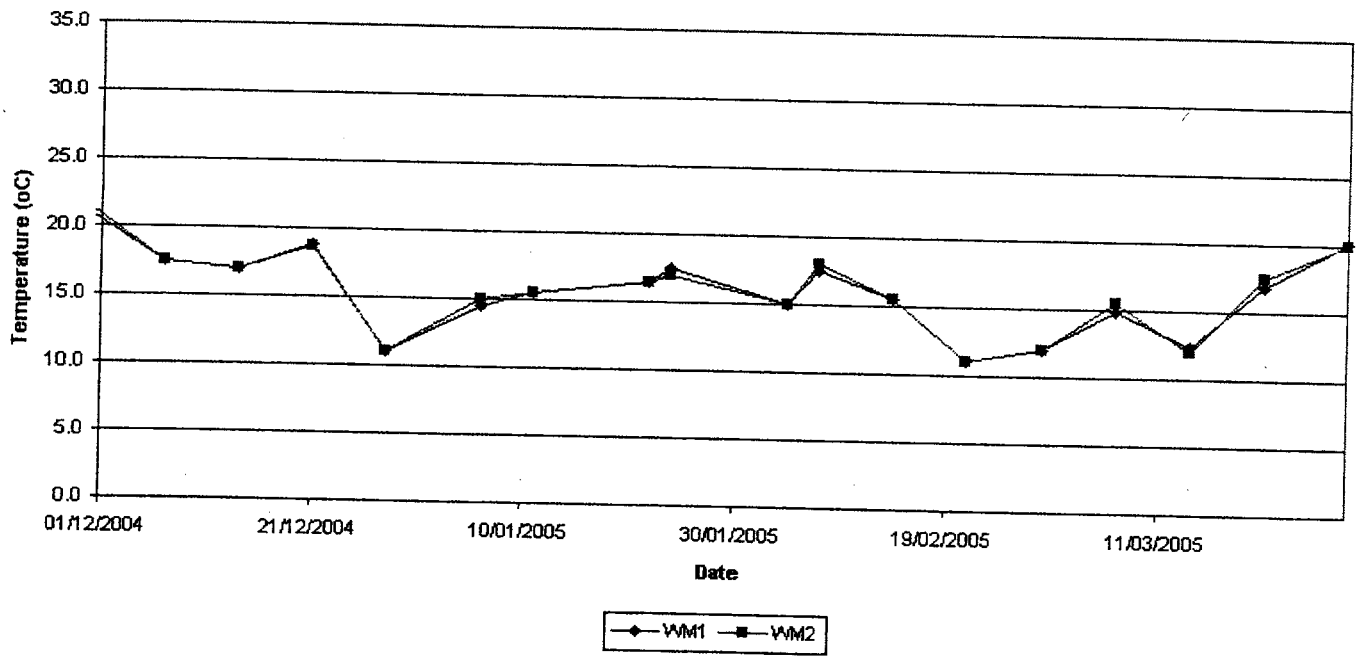


Figure 6.4 - Graphical Plot for Temperature (WM1 & WM2)



G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Figure 6.5 - Graphical Plot for Temperature (WM3 and WM4)

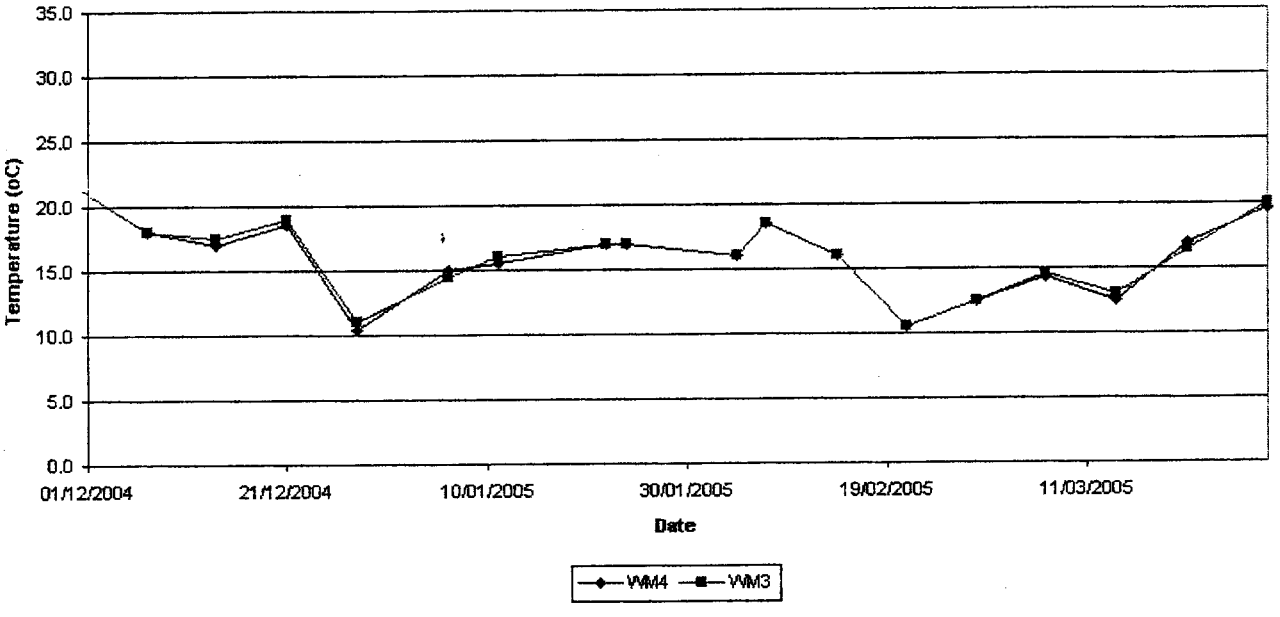


Figure 6.6 - Graphical Plot for pH (WM1 & WM2)

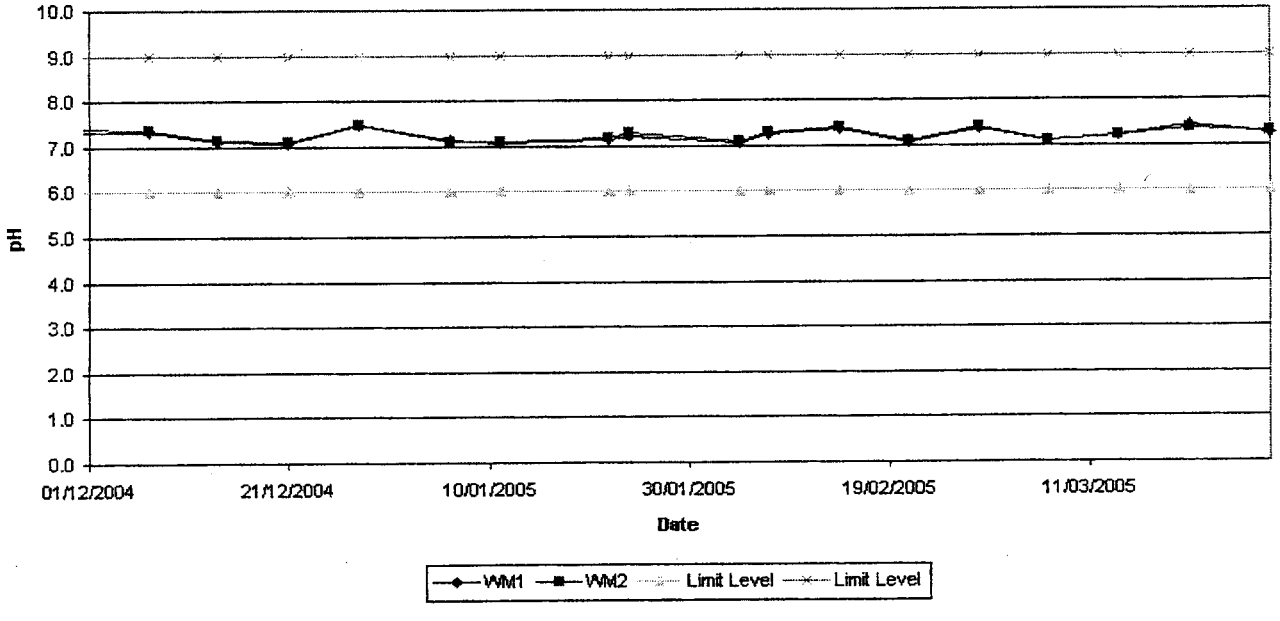


Figure 6.7 - Graphical Plot for pH (WM3 & WM4)

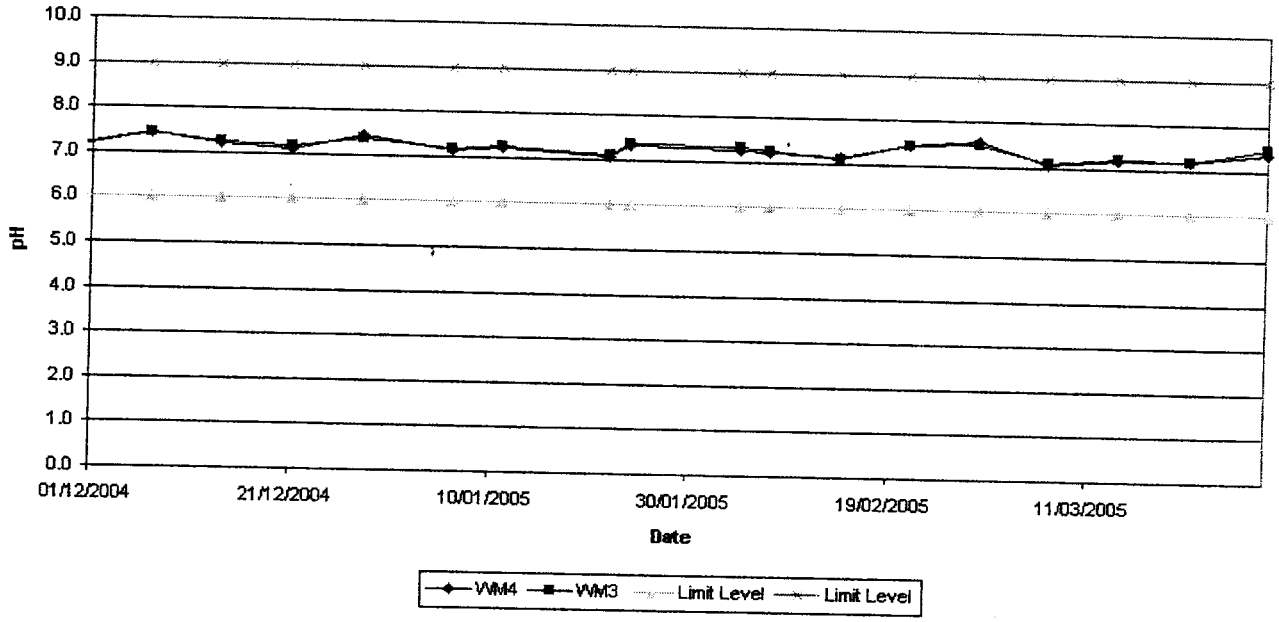
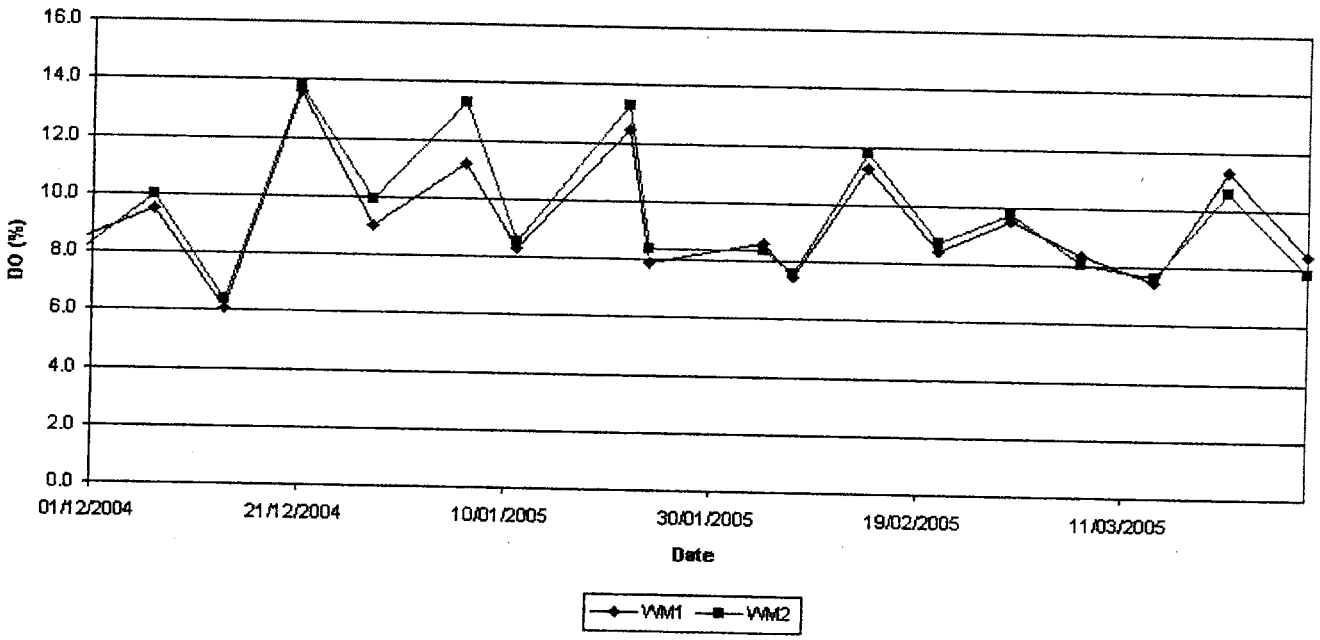


Figure 6.8 - Graphical Plot for Dissolved Oxygen (%) (WM1 & WM2)



G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Figure 6.9- Graphical Plot for Dissolved Oxygen (%) (WM3 & WM4)

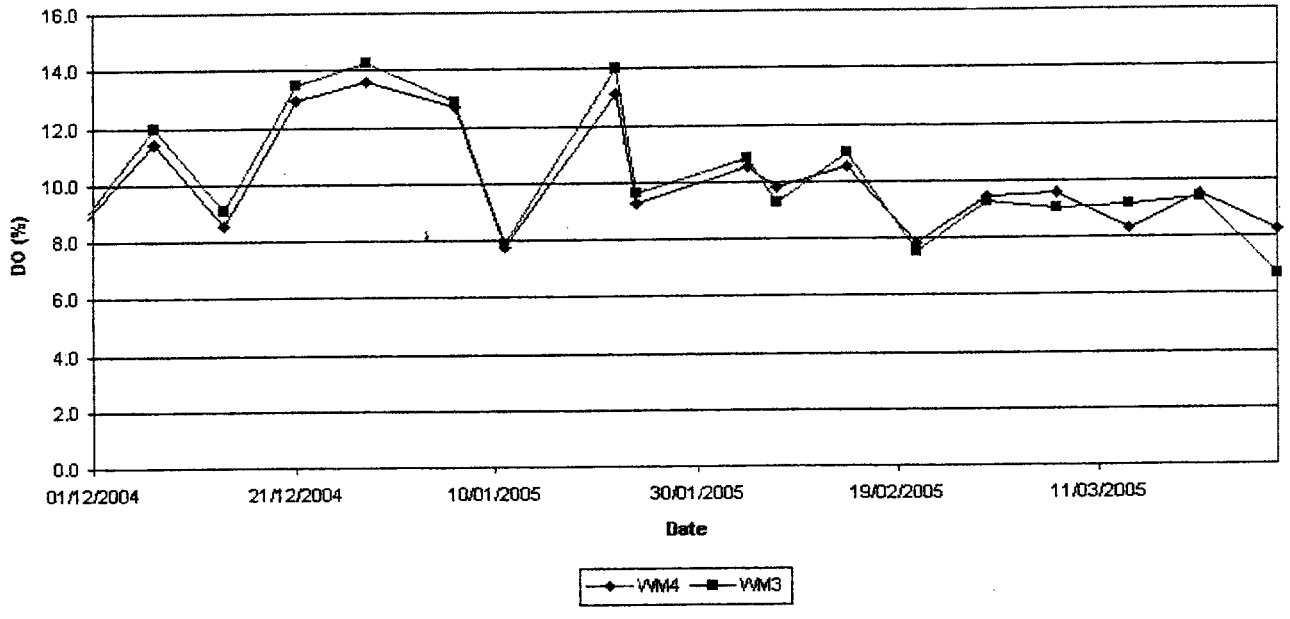
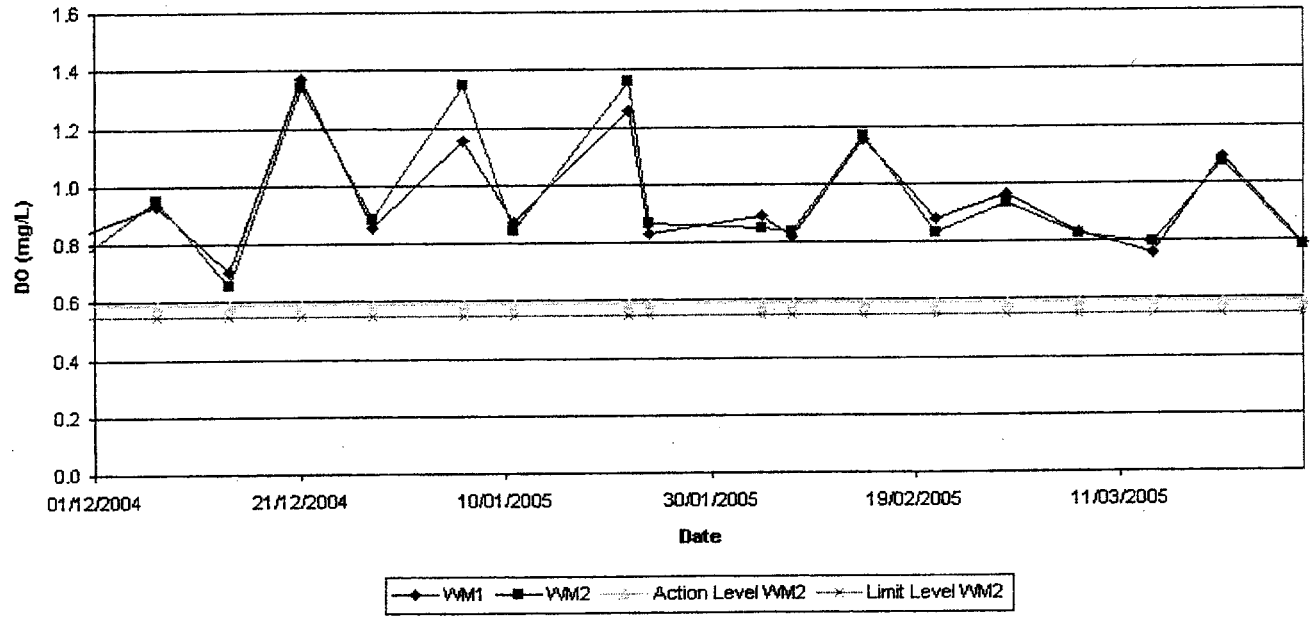


Figure 6.10 - Graphical Plot for Dissoloved Oxygen (mg/L) (WM1 & WM2)



G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Figure 6.11 - Graphical Plot for Dissoloved Oxygen (mg/L) (WM3 & WM4)

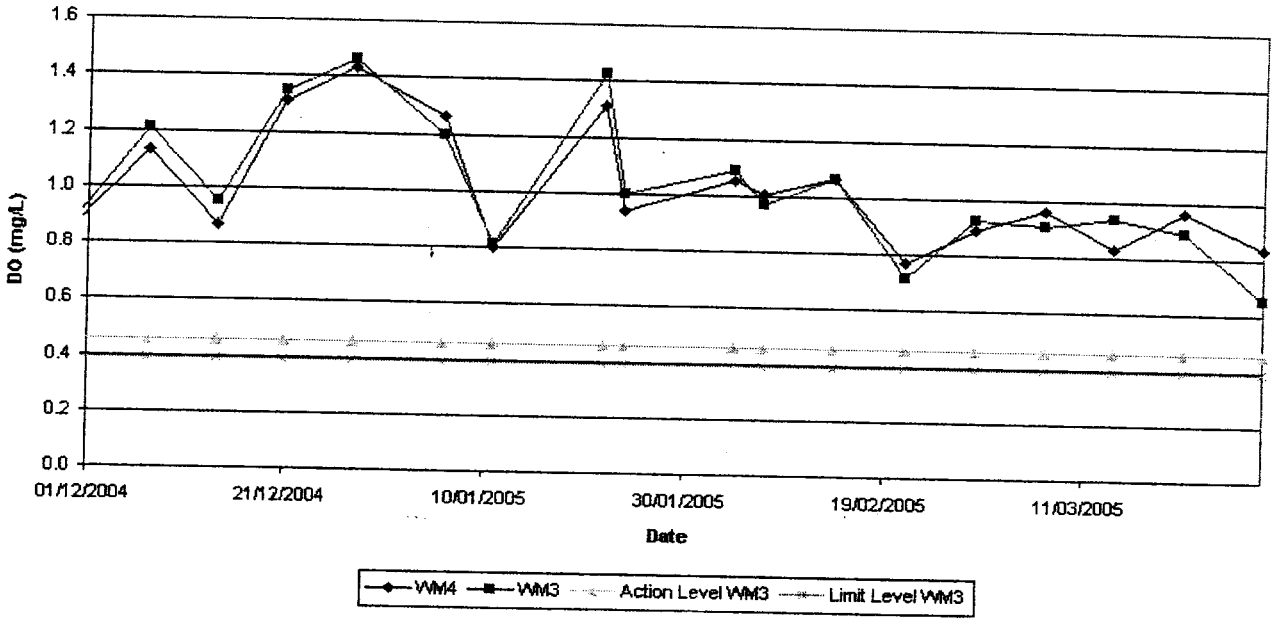
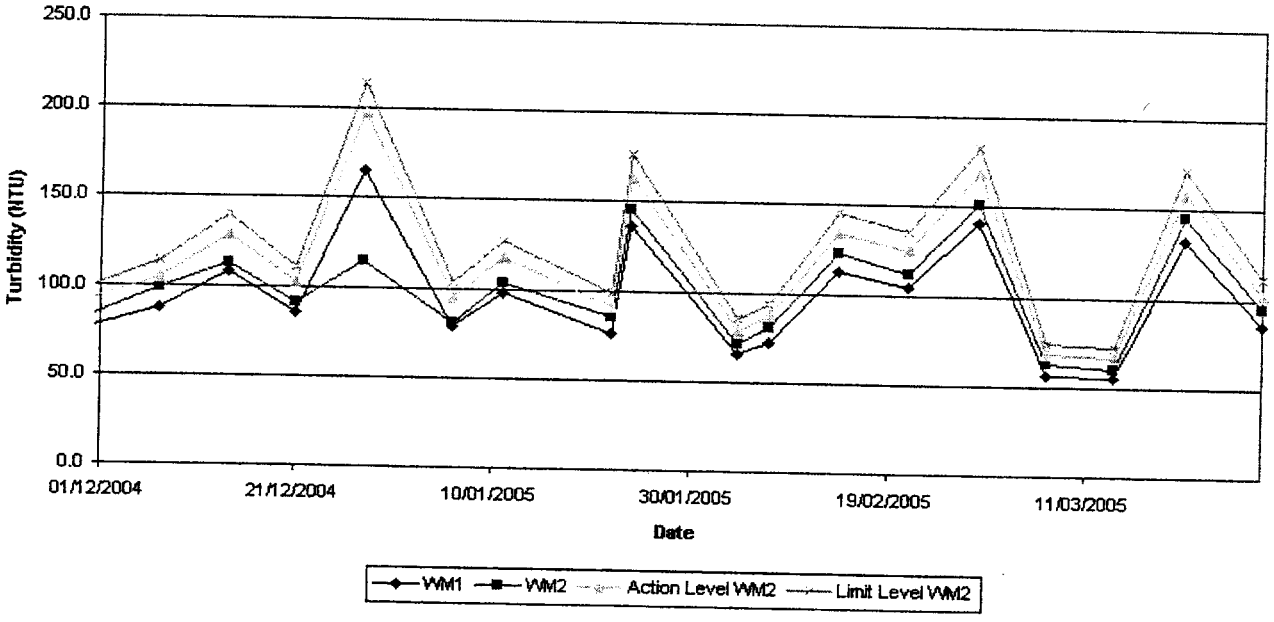


Figure 6.12 - Graphical Plot of Turbidity (WM1 & WM2)



G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Figure 6.13 - Graphical Plot of Turbidity (WM3 & WM4)

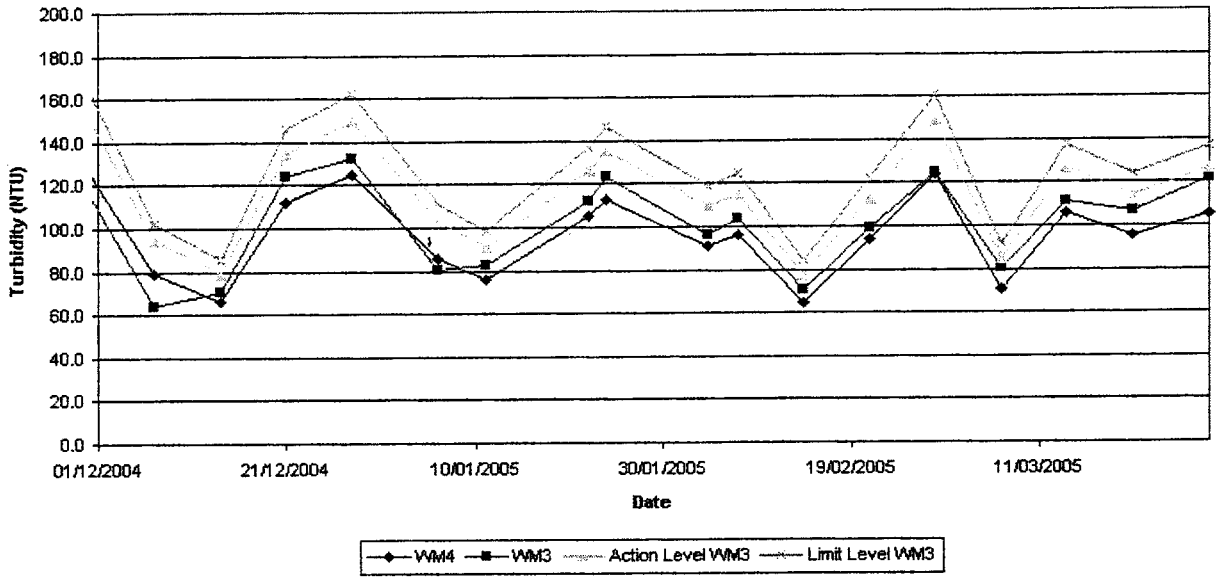
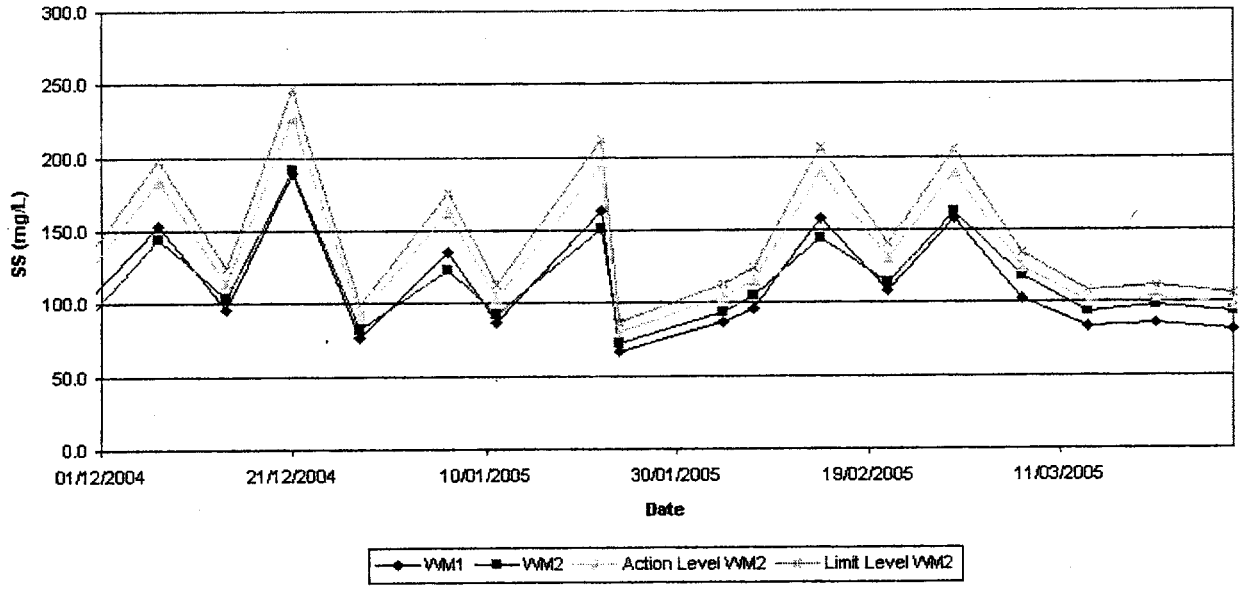


Figure 6.14 - Graphical Plot for Suspended Solids (WM1 & WM2)



G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Figure 6.15 - Graphical Plot for Suspended Solids (WM3 & WM4)

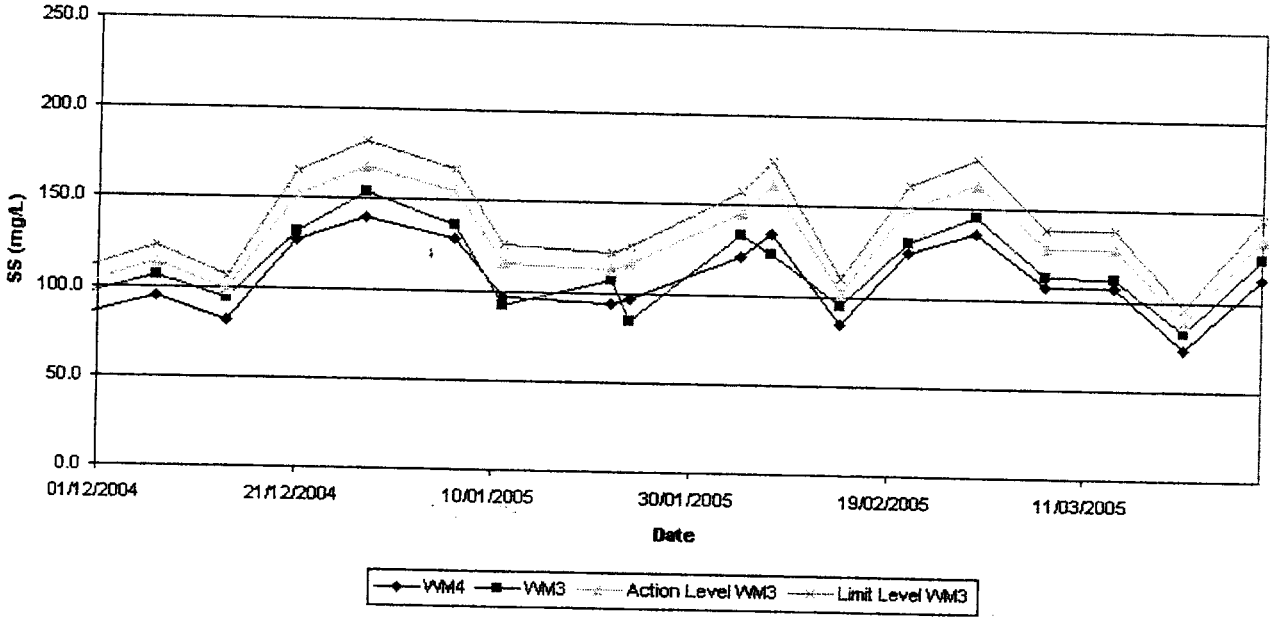
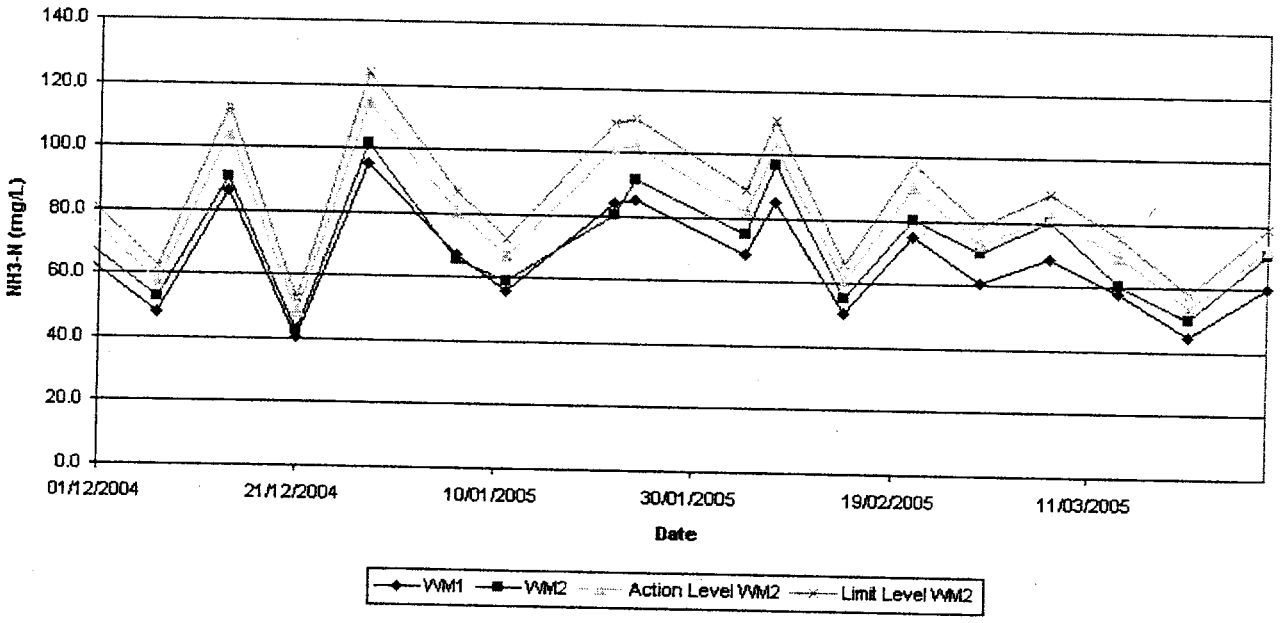
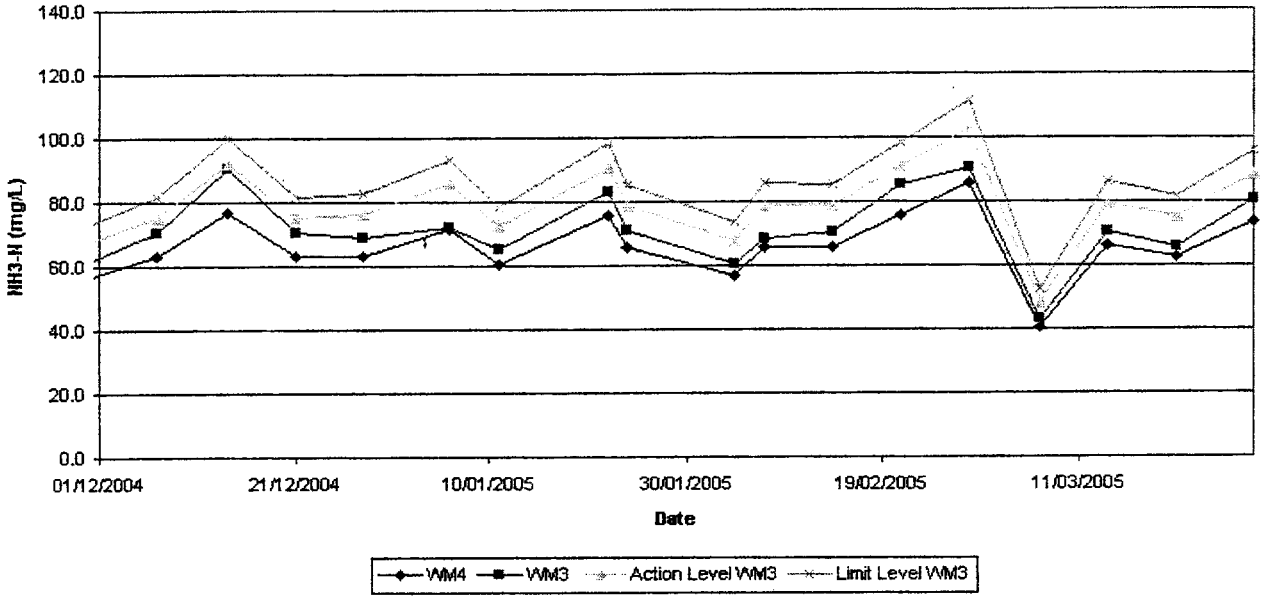


Figure 6.16 - Graphical Plot of Ammoniacal Nitrogen (WM1 & WM2)



G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Figure 6.17 - Graphical Plot of Ammoniacal Nitrogen (WM3 & WM4)



G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Stanger Asia

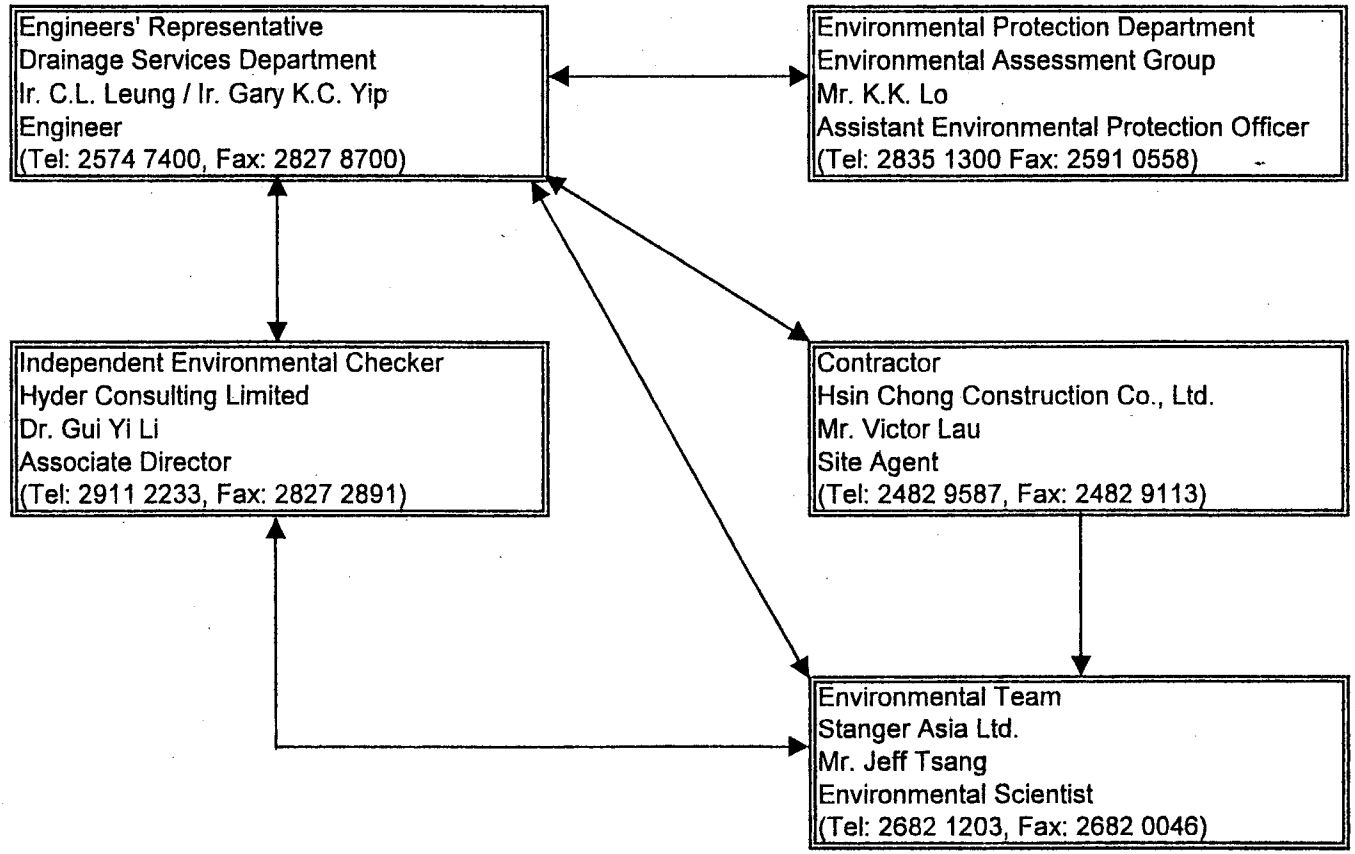
Appendix I

Organization Chart

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Stanger Asia

Project Organization (Environmental)
Construction of San Tin Eastern Main Channel
Contract No. DC/2001/09



Stanger Asia

Appendix II

Calibration Certificates of the Monitoring Equipment

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Stanger Asia

WORKSHEET FOR CALIBRATION OF TEMPERATURE MEASURING DEVICE

(One point check - all devices except Ref. LIG - without ES correction)

Equipment No. : CH 2364
Manufacturer : Brannan
Serial No. : C0074
Model or Type : Mercury in glass
Immersion Depth (mm) : 58mm (at the 25° mark)

Calibration No. : 04/2795
Date Calibrated : 10-12-04
Department : Chemical
~~Date Next Calibration~~ : 10-3-05

Ref. Device Used	Ref. Calib. Correction °C
RF2358	0.10

CERTIFIED TRUE COPY
.....
NAME: S.C.F. LAU/Y.Y. PANG
For Stanger Asia Limited

Ref. (I) Reading, °C	Test Sensor Reading, °C (Set A) 1	2	3	4	Ref. (II) Reading, °C	Test Sensor Reading, °C (Set B) 4	3	2	1	Ref. (III) Reading, °C
24.00	23.80				24.00				23.80	24.00
24.00	23.80				24.00				23.80	24.00
24.00	23.80				24.00				23.80	24.00
24.00	23.80				24.00				23.80	24.00
24.00	23.80				24.00				23.80	24.00
Mean Device Readings, R	23.80				Mean Reference Reading	24.00				
Calibration Correction, Tc=T - R	0.30				"True" Reference Reading, T	24.10				
Tc within Ut'	Yes									

Note: the mean of ref I and ref III should be equal to Ref. II within ±0.05°C

ACJV Check of Thermocouple Devices (Not applicable for other devices)

Cool environment			Warm Environment		
Environment Temperature			Environment Temperature		
Indicated Temperature of ice bath			Indicated Temperature of ice bath		
Deviation (D1)			Deviation (D2)		

Uncertainty at Full Calibration (Uc) : ——— | D1 - D2 | = ———

ACJV is ok if | D1 - D2 | <= Uc

Checked using: RF 2358
Ref. Device was read to the nearest 0.05°C by eye / ~~to nearest 0.01°C by x10 scale magnifier~~
Method: Procedure CAL004
Note:

Tested by: ———
Calibration Technician

Approved for general use by ———
Quality Manager

Checked by: ———
Calibration Officer

APPROVED FOR USE BY
.....
POSITION
Lab. Supervisor

Stanger Asia

WORKSHEET FOR CALIBRATION OF TEMPERATURE MEASURING DEVICE

(One point check - all devices except Ref. LIG - without ES correction)

Equipment No. : CH 2039

Manufacturer : Zeal

Serial No. : N.A.

Model or Type : L.Z.G. Thermometer

Immersion Depth (mm) : 76

Calibration No. : 05/442

Date Calibrated : 17/2/05

Department : Chemical

Date Next Calibration : 17/5/05

Ref. Device Used	Ref. Calib. Correction °C
RF 2358	0.10

APPROVED FOR USE BY

POSITION Lab. Supervisor

Ref. (I) Reading, °C	Test Sensor Reading, °C (Set A) 1	2	3	4	Ref. (II) Reading, °C	Test Sensor Reading, °C (Set B) 4	3	2	1	Ref. (III) Reading, °C
24.90	25.0				24.90				25.0	24.90
24.90	25.0				24.90				25.0	24.90
24.90	25.0				24.90				25.0	24.90
24.90	25.0				24.90				25.0	24.90
24.90	25.0				24.90				25.0	24.90
Mean Device Readings, R	25.0				Mean Reference Reading	24.90				
Calibration Correction, Tc=T - R	0.0				"True" Reference Reading, T	25.00				
Tc within Ut'	YES									

Note: the mean of ref I and ref III should be equal to Ref. II within ±0.05°C

ACJV Check of Thermocouple Devices (Not applicable for other devices)

Cool environment			Warm Environment		
Environment Temperature			Environment Temperature		
Indicated Temperature of ice bath			Indicated Temperature of ice bath		
Deviation (D1)			Deviation (D2)		

Uncertainty at Full Calibration (Uc) : | D1 - D2 | =

ACJV is ok if | D1 - D2 | <= Uc

Checked using: RF 2358

Method: Ref. Device was read to the nearest 0.05°C by eye ~~/ to nearest 0.01°C by x10 scale magnifier~~

Note: Procedure CAL004

Tested by: _____
Calibration Technician

Checked by: _____
Calibration Officer

Approved for general use by

_____
Quality Manager

Stanger Asia

SOMP ENV066 : CALIBRATION RECORD OF YSI MODEL 30 HANDHELD SALINITY, CONDUCTIVITY & TEMPERATURE SYSTEM

Calibration No. 04/4305

Equipment No. EM 3694

Serial No. 00F0285AA

Date of Calibration: 17/12/2004

Due Date of Next Calibration: 17/03/2005

APPROVED FOR USE BY
Dennis Tsui
POSITION
Env. Scientist

Stock Calibration Standard Potassium Chloride No. 316

Stock Calibration Check Potassium Chloride No. 648

Volumetric glassware employed: V20, V17, V100, V105, V109, V119

Calibration Check of the Salinity, Conductivity and Temperature System	
Calibration Check Solutions, ppt	Meter reading, ppt
0.0	0.0
10.0	10.3
20.0	21.0
30.0	31.6
40.0	43.5
Allowing deviation : ± 10%	

Tested by : _____ Dennis Tsui

Checked By : _____ Jeff Tsang

Stanger Asia

SOMP ENV066 : CALIBRATION RECORD OF YSI MODEL 30 HANDHELD SALINITY, CONDUCTIVITY & TEMPERATURE SYSTEM

Calibration No. 05/773

Equipment No. EM 3694

Serial No. 00F0285AA

Date of Calibration: 17/03/2005

Due Date of Next Calibration: 17/06/2005

Stock Calibration Standard Potassium Chloride No. 316

Stock Calibration Check Potassium Chloride No. 648

APPROVED FOR USE BY
Dennis Tsui
POSITION
QA Section

Volumetric glassware employed: V22, V19, V90, V106, V110, V120

Calibration Check of the Salinity, Conductivity and Temperature System	
Calibration Check Solutions, ppt	Meter reading, ppt
0.0	0.0
10.0	10.5
20.0	21.2
30.0	31.8
40.0	43.0
Allowing deviation : ± 10%	

Tested by : Dennis Tsui

Checked By : Arthur Cheng

Stanger Asia

SOMP ENV064 : CALIBRATION RECORD OF DISSOLVED OXYGEN METER

Calibration No.: 05 | 531

Dissolved Oxygen Meter Equipment No.: EM 4277

Dissolved Oxygen Serial No.: 01D0624

Dissolved Oxygen Probe Serial No.: 950825

Date of Calibration.: 26-02-2005

Due Date of Next Calibration.: 26-05-2005

Molarity of sodium thiosulphate solution: 0.0252M

Potassium Bi-iodate No.: 480

APPROVED FOR USE BY
Dennis Tan
POSITION
Env Scientist

Standardisation of Sodium Thiosulphate Solution			
Standard Solution	Initial burette reading B, mL	Final burette reading C, mL	Vol. of $Na_2S_2O_3$ used A, mL = (C – B)
Standard 1	0.00	20.10	20.10
Standard 2	0.00	20.15	20.15
Standard 3	0.00	20.15	20.15
		Average Value	20.13

Calibration of the Dissolved Oxygen Meter					
Standard Solutions	Initial burette reading B, mL	Final burette reading C, mL	Vol. of $Na_2S_2O_3$ used A, mL = (C – B)	D.O. by titration, mg/L	Meter reading, mg/L
A	0.00	2.10	2.10	2.11	2.19
B	0.00	4.60	4.60	4.63	4.62
C	0.00	6.55	6.55	6.59	6.53
D	0.00	7.65	7.65	7.70	7.65
Allowing deviation : ± 10%					

Tested by : _____ Checked By : _____

Stanger Asia

SOMP ENV069: CALIBRATION RECORD OF PORTABLE pH METER

Calibration No.: 04/4304

APPROVED FOR USE BY
Dennis Tsui
POSITION
Env. Scientist

Equipment No.: EM3089

Serial No.: 011906

Date of Calibration: 18/12/2004

Due Date of Next Calibration: 18/03/2005

Calibration Buffers No.: No.916: pH 7.00, No.837: pH 11.00

Two Point Calibration accepted: Y / N

Calibration Checking Standards No.:

No.QCS962: pH 4.00, No.QCS963: pH 7.42, No.QCS964: pH 10.01

Volumetric glassware employed: V10, V25, V107

Calibration Check of the pH meter	
Calibration Check Solutions, pH at 25°C	pH Meter reading, pH at 25°C
4.00	4.11
7.42	7.35
10.01	10.20
Allowing deviation : ± 10%	

Tested by : Dennis Tsui

Checked By : Jeff Tsang

Stanger Asia

SOMP ENV069: CALIBRATION RECORD OF PORTABLE pH METER

Calibration No.: 05/772

Equipment No.: EM3089

Serial No.: 011906

Date of Calibration: 18/03/2005

Due Date of Next Calibration: 18/06/2005

APPROVED FOR USE BY
Dennis Tsui
POSITION
Snr. Scientist

Calibration Buffers No.: No.916: pH 7.00, No.837: pH 11.00

Two Point Calibration accepted: (Y) / N

Calibration Checking Standards No.:

No.QCS973: pH 4.00, No.QCS974: pH 7.42, No.QCS975: pH 10.01

Volumetric glassware employed: V12, V27, V109

Calibration Check of the pH meter	
Calibration Check Solutions, pH at 25°C	pH Meter reading, pH at 25°C
4.00	4.09
7.42	7.40
10.01	10.05
Allowing deviation : ± 10%	

Tested by : _____ Dennis Tsui

Checked By : _____ Arthur Cheng

Stanger Asia

SOMP ENV062: CALIBRATION RECORD OF TURBIDIMETER

Date of Calibration: 26/02/2005

Due Date of Next Calibration: 26/05/2005

Equipment No.: EM 1506

Manufacturer: HACH

Model: 2100P

Serial No.: 950600008082

Calibration No.: 05/532

Turbidimeter Calibration standard (HACH): No.1: 20 NTU
No.2: 100 NTU
No.3: 800 NTU

APPROVED FOR USE BY
Dennis Tm
POSITION
Env. Scientist

Stock Calibration standard No.: 895

Three-point calibration accepted: (Y) / N

Stock Calibration checking standards No. QCS 984

Turbidity value - Checking standards (NTU)		
Actual value	Measured value	Accepted*: Y/N
0	0	Y
5	5.04	Y
10	10.1	Y
50	52.1	Y
100	106	Y
400	395	Y

*Allowing Deviation: +/- 10%

Tested by: _____ Checked by: _____

Stanger Asia

SOMP ENV052 : CALIBRATION RECORD OF HIGH VOLUME SAMPLER (TSP)

Date: 10/01/2005

Temp.: 15 °C

At. Press: 767 mm Hg

Calibrated by: Dennis Tsui

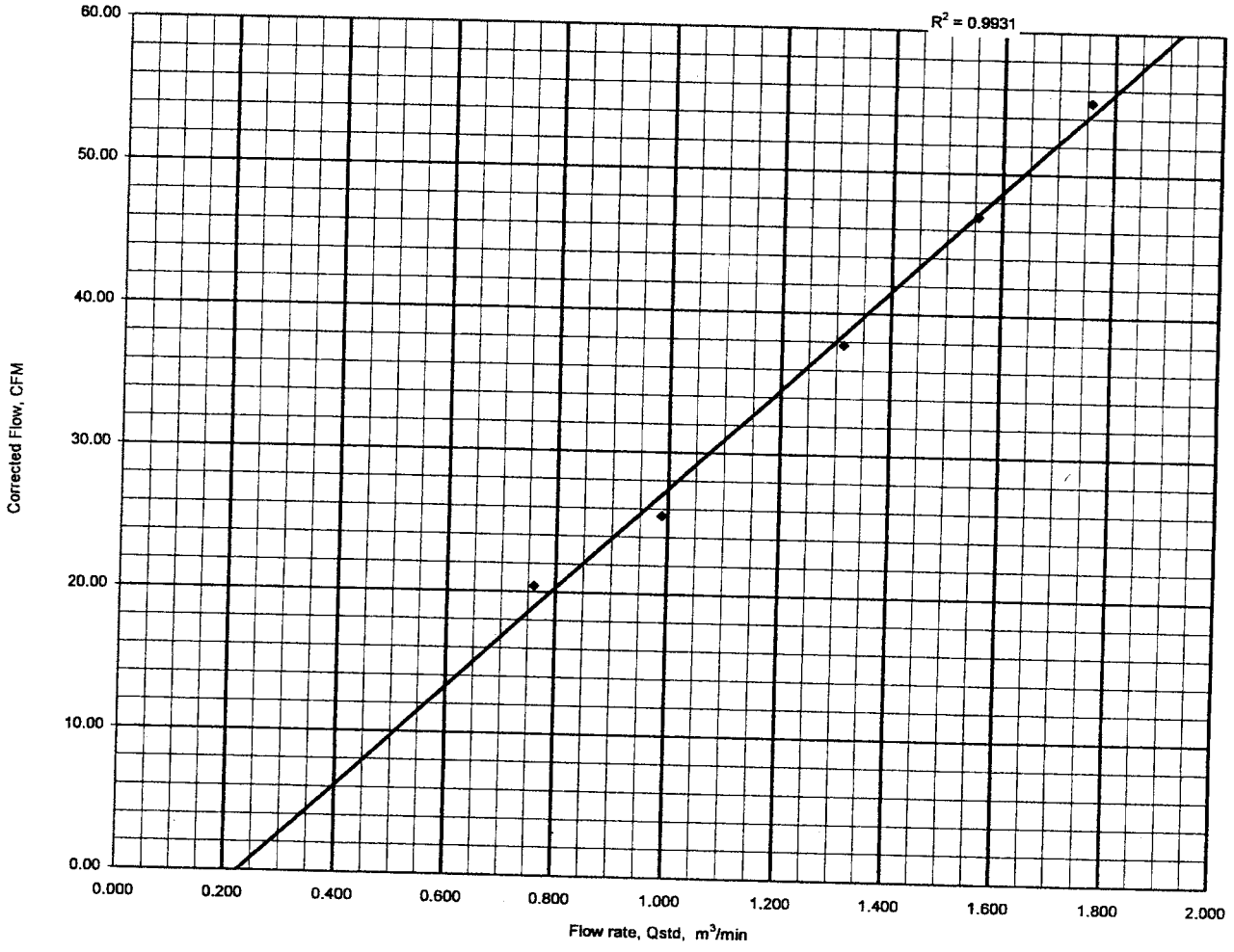
Next Calibration Due Date: 10/03/2005

Equipment No.: EM4073
Serial No.:
Calibration No.:

Plate	Flow Rate (m^3/min)	True in.H2O	Corrected Flow (CFM)
18	1.758	11.6	55.09
13	1.556	9.1	46.93
10	1.314	6.5	37.75
7	0.989	3.7	25.50
5	0.761	2.2	20.40

Remarks: The correlation coefficient is larger than 0.99 indicates the calibration is linear.
Slope= 35.426622
Intercept= -8.048661

Location : San Tin Eastern Main Channel



Tester: Dennis Tsui

Checked By: Jeff Tsang

Stanger Asia

SOMP ENV052 : CALIBRATION RECORD OF HIGH VOLUME SAMPLER (TSP)

Date: 10/03/2005

Temp.: 21 °C

At. Press: 760 mm Hg

Calibrated by: Dennis Tsui

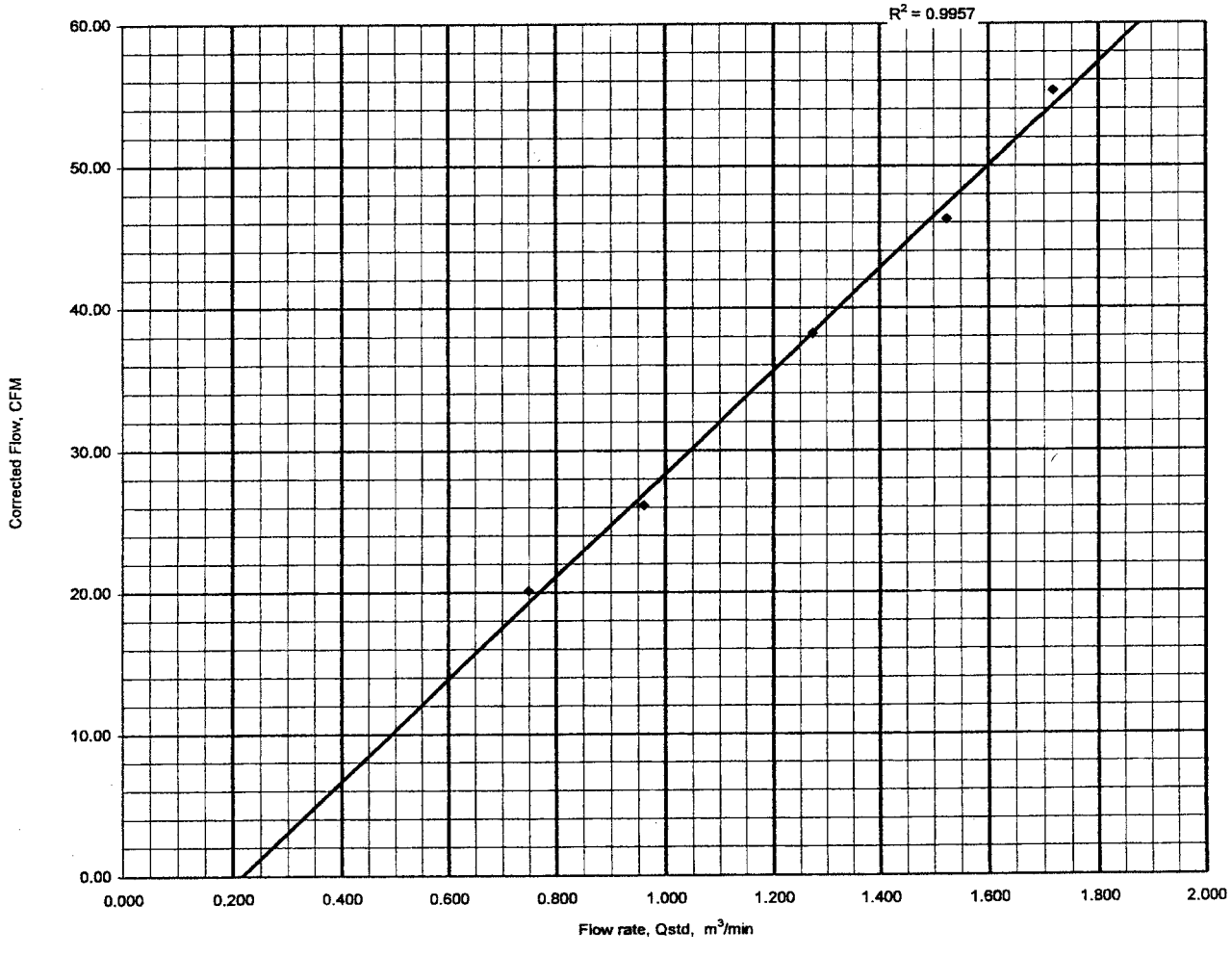
Next Calibration Due Date: 10/05/2005

Equipment No.: EM4073
Serial No.:
Calibration No.:

Plate	Flow Rate (m^3/min)	True in.H2O	Corrected Flow (CFM)
18	1.717	11.4	55.28
13	1.524	9.0	46.23
10	1.274	6.3	38.19
7	0.961	3.6	26.13
5	0.749	2.2	20.10

Remarks: The correlation coefficient is larger than 0.99 indicates the calibration is linear.
Slope= 36.162745
Intercept= -7.833881

Location : San Tin Eastern Main Channel



Tester: Dennis Tsui

Checked By: Arthur Cheng

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心12樓 Tel: (852) 2873 6860 Fax: (852) 2555 7533 Website: www.cigismec.com

EM3076

HOKLAS 028

CERTIFICATE OF CALIBRATION

Certificate No.: 04CA0724 01 **Page:** 1 of 2 Pages

Item tested

Description:	Sound Level Calibrator
Manufacturer:	B&K, Denmark
Type/Model No.:	4231
Serial/Equipment No.:	2175728
Adaptors used:	Yes

CERTIFIED TRUE COPY
NAME: S.C.F. LAU/Y.Y. PANG
For Stanger Asia Limited

Item submitted by

Client:	Stanger Asia Limited
Request No.:	04CA0724 01
Date of request:	23/07/2004

Date of test: 24/07/2004

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	10/12/2004	NIM
Preamplifier	B&K 2673	2239857	06/12/2004	NIM
Measuring amplifier	B&K 2610	2346941	10/12/2004	NIM
Signal generator	DS 360	33873	14/11/2004	NIM
Digital multi-meter	34401A	US36087050	23/12/2004	SCM
Audio analyzer	8903B	GB41300350	09/12/2004	NIM
Universal counter	53132A	MY40003662	12/12/2004	NIM

Ambient conditions

Temperature:	23 ± 3 °C
Relative humidity:	50 ± 15 %
Air pressure:	1013 ± 15 hPa

APPROVED FOR USE BY
Dennis Tsui
POSITION
Snr. Scientist

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using equivalent insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of Annex B of IEC 60942: 1997 for the Class 1 for the conditions under which the test was performed, with sound pressure level 94 dB at frequency 1000 Hz.
This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate

Approved Signatory: Date: 24/07/2004 Company Chop:

Huang Jian Min/Qian Xing

SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心12樓 Tel: (852) 2873 6860 Fax: (852) 2555 7533 Website: www.cigismec.com

SM3236

HOKLAS 028

CERTIFICATE OF CALIBRATION

(Continuation Page)

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and equivalent insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	94 dB Setting				Estimated Uncertainty dB
	Test 1 dB	Test 2 dB	Test 3 dB	Mean dB	
1000	94.03	94.02	94.03	94.03	±0.08

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz STF = 0.001 dB

Estimated uncertainty ±0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 kHz was:

At 1000 Hz Actual Frequency = 999.9 Hz

Estimated uncertainty ±0.1 Hz

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to a Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz TND = 0.5%

Estimated uncertainty ±0.1%

The uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95 %. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: J. Q. Feng Checked by:
Date: 24/07/2004 Date: 24/07/2004

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

EM3251

Brüel & Kjær

SPECTRIS CHINA LIMITED
思百吉中國有限公司

CERTIFICATE OF CALIBRATION

Certificate No. : 2KS040718-1 **Page 1 of 2**

Calibration of :

Description	:	Sound Level Meter	,	Microphone
Manufacture	:	Brüel & Kjær		
Type No.	:	2238	,	4188
Serial No.	:	2160231	,	2141528

Client : Stanger Asia Limited.
G/F & 1/F, Dinwai Industrial Bldg.,
13 On Chuen Street, Fanling,
New Territories, Hong Kong.

CERTIFIED TRUE COPY

NAME: S.C.F. LAU/Y.Y. PANG
For Stanger Asia Limited

Calibration Conditions :

Air Temperature	:	23.2	**°C**
Air Pressure	:	101.2	**kPa**
Relative Humidity	:	59	**%**

APPROVED FOR USE BY
Dennis Tsui
POSITION
Tech. Scientist

Test Specifications :

The Sound Level Meter has been calibrated in accordance with the requirements as specified in IEC 60651 and IEC 60804 type 1, and vendor specific procedures.

The measurements has been performed with the assistance of :
Brüel & Kjær's Sound Level Meter Calibration System B&K 9600 CAL2238A, Ver.25.10.1999
The standard(s) and instrument(s) used in the calibration are traceable to international standard and are calibrated on a schedule which is adjusted to maintain the required accuracy level.

Test Result :

A list of the performed (sub) tests is stated on page 2 of this certificate. Actual Measurement are documented on worksheet.

Date of Calibration : 17 September, 2004
Calibrated By :

Fox Ng

Certificate issued : 20 September, 2004
Approved signatory :

Jacky Leung

BM 3241

spectris

CERTIFICATE OF CALIBRATION

Certificate No. : 2KS040718-1 **Page 2 of 2**

Results :

List of performed (sub) test with test status:

"OK" Means the result of the (sub)test is Inside the tolerances stated in the test specifications.

" - " Means the result of the (sub)test is Outside these tolerances.

Test :	Subtest :	Status :
Noise	A	OK
Noise	C	OK
Noise	Lin	OK
Frequency Weighting	A	OK
Frequency Weighting	C	OK
Frequency Weighting	Lin	OK
Level Range Control	1000 Hz	OK
Linearity Range	SPL 10dB 4000 Hz	OK
Linearity Range	SPL 1dB 1000 Hz	OK
Linearity Range	Leq	OK
Linearity Range	SEL	OK
RMS Detector	CF 3	OK
RMS Detector	CF 5	OK
RMS Detector	CF 10	OK
RMS Detector	Symmetry	OK
Time Weighting	Difference Indication	OK
Time Weighting	Single Burst FAST	OK
Time Weighting	Single Burst SLOW	OK
Time Weighting	Single Burst IMPULSE	OK
Time Weighting	Repetitive Burst	OK
Time Weighting	Peak	OK
Time Averaging		OK
Pulse Range		OK
Overload	SPL	OK
Overload	SEL	OK
Acoustic Response	A	OK
Acoustic Response	Lin	OK

Calibration Equipment :

Brüel & Kjær's Sound Level Meter Calibration System B&K 9600 CAL2238A, Ver.25.10.1999

Description :	Make & Model :	Serial No. :	Last Cal. Date :	Traceable to:
Digital Multi-meter	Datron 1281	27361	08 Oct, 2003	HKSCL (HOKLAS)
Sine/Noise Generator	B&K 1049	1314978	Test	B&K Conformance
Test Waveform Generator	B&K 5918	1482949	Test	B&K Conformance
Acoustical Calibrator	B&K 4226	1551627	22 Jun, 2004	NPL via B&K (UKAS)

Calibrated By : Fax Ng
Date : 17 September, 2004

Checked By : Terry
Date : 20 September, 2004

Event and Action Plan for Construction Noise

EVENT	ACTION			
	ET Leader	IC(E)	ER	CONTRACTOR
Action Level				
	1. Notify IC(E) and Contractor. 2. Carry out investigation. 3. Report the results of the investigation to the IC(E) and Contractor. 4. Discuss with the Contractor and formulate remedial measures. 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET. 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IC(E). 2. Implement noise mitigation proposals.
Limit Level				
	1. Notify IC(E), ER, EPD and Contractor. 2. Identify source. 3. Repeat measurements to confirm finding. 4. Increase monitoring frequency. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Inform IC(E), ER and EPD the causes & actions taken for the exceedances. 7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions. 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 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.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Event and Action Plan for Water Quality.

EVENT	ACTION			
	ET Leader	IC(E)	ER	CONTRACTOR
Limit Level				
Exceedane for one sample.	1. Identify source, investigate the causes of exceedance and propose remedial measures. 2. Inform ER, IC(E) and Contractor. 3. Repeat measurements to confirm finding. 4. Increase monitoring frequency to daily until no exceedance is found. 5. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results.	1. Check monitoring data submitted by ET. 2. Check Contractor's working method. 3. Discuss with ET and Contractor on possible remedial measures. 4. Advise the ER on the effectiveness of the proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Ensure remedial measures are properly implemented.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IC(E) within 3 working days. 3. Implement the agreed proposals. 4. Amend proposals if appropriate.
Exceedance for two or more consecutive samples.	1. Identify source, investigate the causes of exceedance and propose remedial measures. 2. Inform ER, IC(E), Contractor and EPD. 3. Repeat measurements to confirm finding. 4. Increase monitoring frequency to daily. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Arrange meeting with IC(E) and ER to discuss the remedial actions to betaken. 7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET and Contractor on the potential remedial actions. 2. Review Contractor's remedial actions whenever necessary to assure effectiveness and advise ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. In consultation with the IC(E) agree with the Contractor on the remedial measures to be implemented. 4. Ensure remedial measures are properly implemented. 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.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification. 3. Implement agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant portion of the works as determined by the ER until the exceedance is abated.

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Event and Action Plan for Water Quality.

EVENT	ACTION			
	ET Leader	IC(E)	ER	CONTRACTOR
Action Level				
Exceedance for one sample.	1. Identify source, investigate the causes of exceedance and propose remedial measures. 2. Inform ER, IC(E) and Contractor. 3. Repeat measurements to confirm finding. 4. Increase monitoring frequency to daily until no exceedance is found.	1. Check monitoring data submitted by ET. 2. Check Contractor's working methods.	1. Notify Contractor.	1. Rectify any unacceptable practice. 2. Amend working methods if appropriate.
Exceedance for two samples.	1. Identify source, investigate the causes of exceedance and propose remedial measures. 2. Inform ER, IC(E) and Contractor. 3. Repeat measurements to confirm finding. 4. Increase monitoring frequency to daily until no exceedance is found.	1. Check monitoring data submitted by ET. 2. Check Contractor's working methods. 3. Discuss with ET and Contractor on possible remedial measures. 4. Advise the ER on the effectiveness of the proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Ensure remedial measures are properly implemented.	1. Submit proposals for remedial actions to IC(E) within 3 working days of notification. 2. Implement the agreed proposals. 3. Amend proposals if appropriate.

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Appendix III

Event and Actions Plans

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Event and Action Plan for Pumping Station Noise During Commissioning

EVENT	ACTION			
	ET Leader	IC(E)	ER	CONTRACTOR
Action Level				
	1. Notify IC(E) and DSD. 2. Carry out investigation. 3. Report the results of the investigation to the IC(E) and DSD. 4. Discuss with the DSD and formulate remedial measures. 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET. 2. Review the proposed remedial measures by the DSD and advise the ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify DSD. 3. Require DSD to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IC(E). 2. Implement noise mitigation proposals.
Limit Level				
	1. Notify IC(E), ER, EPD and DSD. 2. Identify source. 3. Repeat measurements to confirm finding. 4. Increase monitoring frequency. 5. Carry out analysis of DSD's working procedures to determine possible mitigation to be implemented. 6. Inform IC(E), ER and EPD the causes & actions taken for the exceedances. 7. Assess effectiveness of DSD's remedial actions and keep IC(E), EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and DSD on the potential remedial actions. 2. Review DSD's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify DSD. 3. Require DSD to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control.

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Event and Action Plan for Air Quality

EVENT	ACTION			
	ET Leader	IC(E)	ER	CONTRACTOR
Action Level				
Exceedance for one sample	1. Identify sources. 2. Inform IC(E) and ER. 3. Repeat measurements to confirm finding. 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET. 2. Check Contractor's working methods.	1. Notify Contractor.	1. Rectify unacceptable practice. 2. Amend working methods if appropriate.
Exceedance for two or more consecutive samples	1. Identify source. 2. Inform IC(E) and ER. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Discuss with IC(E) and Contractor for remedial actions required. 6. If exceedance continues, arrange meeting with IC(E) and ER. 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET. 2. Check Contractor's working methods. 3. Discuss with ET and Contractor on possible remedial measure. 4. Advise ER on the effectiveness of the proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Ensure remedial actions properly implemented.	1. Submit proposals for remedial actions to IC(E) within 3 days. 2. Implement the agreed proposals. 3. Amend proposals if appropriate.

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Event and Action Plan for Air Quality

EVENT	ACTION			
	ET Leader	IC(E)	ER	CONTRCATOR
Limit Level				
Exceedance for one sample	1. Identify source. 2. Inform ER and EPD. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily. 5. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results.	1. Check monitoring data submitted by ET. 2. Check Contractor's working methods. 3. Discuss with ET and Contractor on possible remedial measures. 4. Advise ER on the effectiveness of the proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Ensure remedial actions properly implemented.	1. Take immediate action to avoid further exceedances. 2. Submit proposals for remedial actions to ER within 3 working days of notification. 3. Implement the agreed proposals. 4. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	1. Notify IC(E), ER, Contractor and EPD the causes & actions taken for the exceedances. 2. Identify source. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Arrange meeting with EPD and ER to discuss the remedial actions to be taken. 7. Assess effectiveness of Contractor's remedial actions and keep EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring.	1. Discuss among ER, ET and Contractor on possible remedial measures. 2. Revise Contractor's remedial measures whenever necessary to ensure their effectiveness and advise the ER accordingly. 3. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. In consultation with IC(E), agree with the Contractor remedial measures to be implemented. 4. Ensure remedial measures properly implemented. 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.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Appendix IV

Implementation Status of Mitigation Measures

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
Air Quality							
1.	Dust	8.4.4.1	Vehicle washing facilities shall be provided at the exit point of the site;	Entrance/exit of site	All period during construction phase	Site Agent / Engineer	Partially Implemented,
		8.4.4.1	Any debris or materials shall be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and 3 sides;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		8.4.4.1	Water spray or dust suppression chemical shall be provided during material handling and excavation;	Whole site	All period during construction phase	Site Agent / Engineer	Partially Implemented
		8.4.4.1	The load on the vehicle shall be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented,
2.	Odour	8.4.4.2	Any odorous dredged material shall be placed remote from air sensitive receivers;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		8.4.4.2	Any odorous permitted stockpiled material shall be removed within 2 days of work to reduce the amount of time available for decomposition;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		8.4.4.2	Any odorous permitted stockpiled material shall be covered with plastic tarpaulin sheets in the stockpile area.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
3.	Monitoring	EM&A 2.7	The 24 hour TSP level monitored at the monitoring station shall be comply with the Limit level of 260μgm^3;	Whole site	All period during construction phase	ET Leader	Implemented
		EM&A 2.7	The hourly TSP level monitored at the monitoring station shall comply with the Limit level of 500μgm^3.	Whole site	All period during construction phase	ET Leader	Implemented

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
Noise							
4.	Construction Activities	7.4.4.2	Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the re-profiling works;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		7.4.4.2	Plant and mobile plant (i.e. trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		7.4.4.2	Plant known to emit noise strongly in one direction, shall be orientated so that the noise is directed away from the NSRs;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		7.4.4.2	Silencers or mufflers on construction equipment shall be uitlised and shall be properly maintained during the re-profiling works;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		7.4.4.2	Mobile plant shall be sited far away from the NSR's;	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		7.4.4.2	Material stockpiles and other structures shall be effectively uitlised to screen noise from on-site construction activities; and	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		7.4.4.2	The Contractor shall select the models of PMEs that are quieter than the standard types given in GW-TM.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
5.	Operation Activities	7.5.4.1	Considering sensitivity of the Deep Bay buffer zone area, it is recommended that a maximum noise of $L_{eq(5min.)}$ 75 dB(A) be achieved at 1m from the louver of the pumping station through good engineering design.	Pumping Station	Design and Operation Phases	DSD's Engineer	Not applicable to construction phase
6.	Monitoring	EM&A 3	The baseline noise monitoring shall be carried out;	Monitoring location, NM1	Prior to commencement of construction	ET Leader	Implemented
			Construction noise monitoring shall be carried out;	Monitoring location, NM1	All period during construction phase	ET Leader	Implemented
			Operational noise shall be carried out 1m from the louvre of the pumping station during commissioning stage.	Monitoring location, NM2	Commissioning/ operational phase	DSD's Engineer	Not applicable to construction phase

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
Water Quality							
7.	Construction Excavation of Sediment	4.4.4.3-4	If excavation on wet stream is not avoidable, the following shall be implemented: - Minimise disturbance to the stream bed while excavating; - Minimise leakage of excavating material during lifting; - Prevent loss of material during transport of excavated material; - Prevent discharge of excavated material except at approved locations; - To minimize the leakage and loss of sediments during excavation, tightly sealed closed grab excavators shall be employed in river sections where material to be handled is wet.	Stream Channel	All period during stream channel excavation	Site Agent / Engineer	Implemented Implemented Implemented Implemented Implemented
8.	Construction Works Timing	4.4.4.5	Excavation shall be undertaken during periods of low flow (dry season).	Stream Channel	All period stream channel excavation	Site Agent / Engineer	Implemented
9.	Construction Runoff and Drainage	4.4.4.6-8	Exposed soil areas shall be minimized to reduce the potential for increased siltation, contamination of run-off and erosion. In addition, no site run-off shall enter fishponds. Construction run-off impacts associated with above ground construction activities shall be controlled through the use of appropriate mitigation measures which include:	All works area	All period during construction phase	Site Agent / Engineer	
		4.4.4.6-8	Temporary ditches shall be provided to facilitate run-off discharge into appropriate watercourses, via a silt retention pond.	All works area	All period during construction phase	Site Agent / Engineer	Improvement is required.
		4.4.4.6-8	The boundaries of earthworks shall marked and surrounded by dykes or embankments for flood protection.	All works area	All period during construction phase	Site Agent / Engineer	Implemented
		4.4.4.6-8	Open material storage stockpiles shall be covered with tarpaulin or similar fabric to prevent material washing away.	All works area	All period during construction phase	Site Agent / Engineer	Implemented

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
10. (cont' d)	Construction Excavation of Sediment	4.4.4.6-8	Exposed soil areas shall be minimized to reduce the potential for increased siltation and contamination of run-off.	All works area	All period during stream channel excavation	Site Agent / Engineer	Implemented
			Earthwork final surfaces shall be well compacted and subsequent permanent work shall be immediately preformed.	All works area	All period during stream channel excavation	Site Agent / Engineer	Implemented
			The use of sediment traps.	All works area	All period during stream channel excavation	Site Agent / Engineer	Partially Implemented
			The adequate maintenance of drainage systems to prevent flooding and overflow.	All works area		Site Agent / Engineer	Implemented
			All temporary drainage pipes and culverts provided to facilitate run-off discharge shall be adequately designed to facilitate rapid discharge of storm flows. All sediment traps shall be regularly cleaned and maintained. The temporarily diverted drainage shall be reinstated to its original condition, when construction work is completed or the temporary diversion is no longer required.	All works area	All period during stream channel excavation	Site Agent / Engineer	Partially Implemented
			Sand and silt in wash water from wheel washing facilities shall be settled out and removed before discharge into temporary drainage pipes or culverts. A section of the haul road between the wheel washing bay and the public road shall be paved with backfill to prevent wash water or other site run-off from entering the public road.	All works area	All period during stream channel excavation	Site Agent / Engineer	Implemented,
			Oil interceptors shall be provided in the drainage system downstream of any significant oil and grease sources. They shall be regularly maintained to prevent the release of oils and grease into the storm water drainage system after accidental spillage. The interceptor shall have a bypass to prevent flushing during heavy rain.	All works area	All period during stream channel excavation	Site Agent / Engineer	Implemented
11.	General Construction Construction Runoff and Drainage	4.4.4.10	Debris and rubbish on site shall be collected, handled and disposed of properly.	All works area	All period during construction phase	Site Agent / Engineer	Improvement is required.
		4.4.4.11	All fuel tanks and storage areas shall be provided with locks and placed on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching the downstream.	All works area	All period during construction phase	Site Agent / Engineer	Implemented

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
12.	Marine Disposal of Excavated Sediment	4.4.412	The decks of the marine dumping disposal barges and floating pontoons shall be kept tidy and free of oil or other substances or articles which might be accidentally or otherwise washed overboard.	Marine dumping route/area	All period during construction phase	Site Agent / Engineer	Marine dumping was completed.
		4.4.412	All off-site vessels and barges shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement of propeller wash.	Marine dumping route/area	All period during construction phase	Site Agent / Engineer	
		4.4.412	The works shall cause no visible foam, oil, grease, scum, litter or other objectionable matter to be present on the water at the loading berth or dumping grounds.	Marine dumping route/area	All period during construction phase	Site Agent / Engineer	
		4.4.412	Water tight trucks shall be used for transportation of marine disposal of excavated material.	Marine dumping route/area	All period during construction phase	Site Agent / Engineer	
		4.4.413	Additional provisions shall be required upon confirmation that marine sediments are contaminated. Location and depths of areas of contaminated marine sediments shall be indicated in the construction contract. The Contractor shall ensure that contaminated sediments are excavated, transported and placed in approved special dumping grounds in accordance with relevant Technical circulars.	Marine dumping grounds	All period during construction phase	Site Agent / Engineer	
		4.4.414	Transport of contaminated marine mud to the marine disposal grounds shall be by split barge of not less than 750m^3 capacity, well maintained and capable of rapid opening and discharge.	Marine dumping grounds	Marine dumping	Site Agent / Engineer	
		4.4.414	The material shall be placed in the pit by bottom dumping, at a location within the pit specified by the FMC.	Marine dumping grounds	Marine dumping	Site Agent / Engineer	
		4.4.414	Discharge shall be undertaken rapidly and the hoppers shall then immediately be closed, material adhering to the sides of the hopper shall not be washed out of the hopper and the hopper shall remain closed until the barge next returns to the disposal site.	Marine dumping grounds	Marine dumping	Site Agent / Engineer	

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
12. (cont' d)	Marine Disposal of Excavated Sediment	4.4.414	The dumping vessel shall be stationary throughout the dumping operation.	Marine dumping grounds	Marine dumping	Site Agent / Engineer	Marine dumping was completed
		4.4.414	The Contractor must be able to position the dumping vessel to an accuracy of ±10m. Barge loading shall be monitored to ensure that loss of material does not take place during transportation.	Marine dumping grounds	All period during construction phase	Site Agent / Engineer	
		4.4.414	Transport barges or vessels shall be equipped with automatic self monitoring devices as specified by the EPD.	Marine dumping grounds	All period during construction phase	Site Agent / Engineer	
		4.4.414	The Contractor shall follow procedures as outlined in the Guidance Note for Dumping and Additional Conditions on Disposal of Contaminated Marine Mud at East Sha Chau Contaminated Mud Disposal.	Marine Dumping grounds	All period during construction phase	Site Agent / Engineer	
13.	Sewage Effluents	4.4.415	Construction work force sewage is expected to be handled by portable chemical toilets along the alignment if connection to a public sanitary sewer system is not feasible. Appropriate and adequate portable toilets shall be provided by licensed contractors who shall be responsible for appropriate disposal and maintenance of these facilities.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
14.	Monitoring	EM&A 4.5	The baseline water quality monitoring shall be carried out.	Monitoring locations, WM1, WM2, WM3 and WM4.	Prior to commencement of construction	ET Leader	Implemented
		EM&A 4.6	Construction phase water quality monitoring shall be carried out.	Monitoring locations, WM1 and WM2	All period during construction phase	ET Leader	Implemented

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
Waste Management							
15.	General	5.4.5.2	Training and instruction shall be given to construction staff to increase awareness and draw attention to waste management issues and the need to minimize waste generation.	All works area	All period during construction phase	Site Agent / Engineer	Implemented
		5.4.5.2	The Contractor shall prepare an on-site management plan of the construction works which should take into account the recommended mitigation measures in the EIA report. Site specific factors such as the designation of areas of segregation and temporary storage of reusable and recyclable materials should be incorporated.	All works area	Before construction phase	Site Agent / Engineer	Implemented
16.	Storage, Collection and Transportation of Waste	5.4.5.3	Wastes shall be handled and stored in a manner to ensure that they are held securely without loss or leakage.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
			Licensed waste hauliers shall be used and they shall only collect wastes prescribed by their permits.	Waste/refuse Storage areas	All period during construction phase	Site Agent / Engineer	Implemented
			Wastes shall be removed	Waste/refuse Storage areas	Daily during construction	Site Agent / Engineer	Partially Implemented
			Waste storage areas shall be maintained and cleaned on a daily basis.	Waste/refuse Storage areas	All period during construction phase	Site Agent / Engineer	Partially Implemented
			Windblown litter and dust during transportation shall be minimized by either covering trucks or transporting wastes in enclosed containers.	Waste handling trucks	After waste collection & before trucks leave the construction site	Site Agent / Engineer	Implemented
16. (cont'd)		5.4.5.3	Obtain the necessary waste disposal permits from the appropriate authorities.	-	Before construction of the Eastern MDC	Site Agent / Engineer	Implemented
		5.4.5.3	Wastes shall be disposed of at licensed waste disposal facilities.	-	All period during construction phase	Site Agent / Engineer	Implemented
		5.4.5.3	Develop procedures such as ticketing system to facilitate tracking of loads, particularly for chemical waste, and to ensure that illegal disposal of wastes does not occur; and	-	All period during construction phase	Site Agent / Engineer & ET Leader	Implemented
		5.4.5.3	Maintain records of the quantities of wastes generated, recycled and disposed.	-	All period during construction phase	Site Agent / Engineer & ET Leader	Implemented

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
17.	Construction and Demolition Waste	5.4.5.5	Careful design, planning and good site management shall be adopted to minimize over-ordering and generation of waste materials such as concrete, mortars and cement grouts.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
			The handling and disposal of bentonite slurries shall be undertaken in accordance with *Practice Note for Professional Persons -- Construction Site Drainage (ProPECC PN 1/94)* on construction site drainage.	All works areas	All period during construction phase	Site Agent / Engineer	No bentonite used in this stage
			Cover open stockpiles of construction and demolition materials, and temporarily exposed slopes by tarpaulin or similar fabric, particularly during rainy season.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
		5.4.5.9 and 5.4.5.6	Construction and demolition material shall be segregated to inert and non-inert parts. The inert portion shall be re-used at areas of reclamation or land formation, or to public filling area shall such a allocation is deemed necessary. The non-inert portion shall be disposed of to landfill.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
18.	Chemical Waste	5.4.5.12	Chemical waste produced shall be handled in accordance with the *Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.*	Chemical waste arising points	All period during construction phase	Site Agent / Engineer	Implemented
		5.4.5.13	Containers used for the storage of chemical wastes shall be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450litres unless the specifications have been approved by EPD; and display a label in English and Chinese in accordance with instructions prescribed in *Schedule 2 of the Chemical Waste Regulation.*	Chemical waste arising points	All period during construction phase	Site Agent / Engineer	Implemented
		5.4.5.14	The chemical waste storage area shall be clearly labeled and used solely for storage of chemical waste, enclosed on at least 3 sides; have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% of the total volume of waste stored in that area; have adequate ventilation; be covered to prevent rainfall entering; and be arranged so that incompatible materials are adequately separated.	Chemical waste arising points	All period during construction phase	Site Agent / Engineer	Implemented
			Disposal of chemical waste shall be via a licensed waste collector; and to a facility licensed to receive chemical waste; or to a reuser of waste.	Chemical waste arising points	All period during construction phase	Site Agent / Engineer	Implemented

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
19.	General Refuse	5.4.5.17	General refuse on-site shall be stored in enclosed bins separate from construction and chemical wastes. A reputable waste collector shall be employed by the Contractor top remove general refuse from the site, separately from construction and chemical wastes, on a daily or every second day basis to minimize odour, pest and litter impacts. The burning of refuse on construction sites is prohibited by law.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
19. (cont' d)		5.4.5.18	General refuse shall be largely by food service activities on site, so reusable rather than disposable dishware shall be used if feasible. Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated or easily accessible; separate., labeled bins for their deposit shall be provided if feasible.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
		5.4.5.19	Office wastes can be reduced through recycling if volumes are large enough to warrant collection. Participation in a local collection scheme shall be considered if one is available.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
20.	Dust	5.4.5.20	Wetting the surface of the stockpiled soil with water in dry season unless during emergency; covering the stockpile soil with sheets; minimize disturbance of the stockpile soil; and enclosure of the stockpiling area.	All works areas	All period during construction phase	Site Agent / Engineer	Partially Implemented
21.	Water Quality	5.5.5.20	There shall be a separate surface water drainage system for the stockpiling area; silt traps shall be installed for surface water drainage system and the stockpile material shall be covered with tarpaulin during heavy rainstorm.	All works areas	All period during construction phase	Site Agent / Engineer	Implemented
22.	Excavated Materials/ Contamin'd Sediment	5.4.5.21	Sampling and analysis of the sediment to confirm the level of contamination is required prior to construction of the MDC. A sediment Quality Report shall be submitted to FMC and EPD for allocation of final disposal site and issuance of disposal permit. This is to ensure that specific disposal requirements and precautionary handling procedures can be determined; DSD to advise FMC on the quality and quantity of the contaminated sediment arising during the detailed design stage.	Proposed Sediment sampling points of MDC	Before construction phase	Site Agent / Engineer	Not required for the contractor
		5.4.5.21	The use of bulk earth-moving equipment to minimize the contact of contaminated material with construction workers.	All excavation/ Dredging area	During excavation/ Dredging of MDC	Site Agent / Engineer	Implemented

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
22.		5.4.5.21	Minimising exposure to any contaminated material by the wearing of protective gear such as gloves, providing adequate hygiene and washing facilities and preventing eating during excavation.	All excavation/ Dredging area	During excavation/ Dredging of MDC	Site Agent / Engineer	Implemented
23. (cont'd)		5.4.5.21	Any contaminated mud or sediment excavated shall not be allowed to stockpile on site and shall be immediately removed from site once excavated.	All excavation/ Dredging area	During excavation / dredging of MDC	Site Agent / Engineer	Implemented
		5.4.5.21	Excavated sediment shall be transported by water-tight trucks to potential marine barging points, then to sea going barges for transfer to designated marine disposal grounds.	All excavation/ Dredging area	During excavation / dredging of MDC	Site Agent / Engineer	Implemented
		5.4.5.21	Permitted waste hauliers shall be used to collect and transport contaminated sediments for disposal.	All excavation/ Dredging area	During excavation / dredging of MDC	Site Agent / Engineer	Implemented
		5.4.5.21	All vessels for marine transportation of excavated sediment shall be fitted with tight fitting seals to their bottom openings to prevent leakage of materials.	All excavation/ Dredging area	During excavation / dredging of MDC	Site Agent / Engineer	Implemented
		5.4.5.21	Loading of barges and hoppers shall be controlled to prevent splashing of excavated material to the surrounding water, and barges or hoppers shall under no circumstances to be filled to a level which shall cause the overflowing of materials or polluted water during loading or transportation.	All excavation/ Dredging area	During excavation / dredging of MDC	Site Agent / Engineer	Implemented
		5.4.5.21	The decks of any off-site barges (for disposal to marine dumping grounds) and floating pontoons shall be kept tidy and free of oil or any other substances or articles which might be accidentally or otherwise washed overboard.	All excavation/ Dredging area	During excavation / dredging of MDC	Site Agent / Engineer	Implemented
Ecology							
24.	Habitat Mitigation	3.6.4.2	Isolate working area from remainder of TOAs and other temporarily affected ponds by constructing earth bund across ponds within the works boundary 50m from the west edge of the Eastern MDC. Do not drain pond area outside the 50M limit during bund construction, or refill them immediately following bund construction. Remove bunds, reinstate the 50m wide working area portion of the affected ponds upon completion of construction. Provide access for fish ponds affected by the project.	All other TOAs and all other fish ponds drained down for project construction at Eastern MDC works site	Design and construction stage	Site Agent / Engineer	Implemented

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
24. (cont'd)		3.6.4.5	Deletion from design of maintenance access road on eastern MDC embankment (already accomplished)	Eastern embankment of Eastern MDC	Already accomplished (design stage)	Site Agent / Engineer	Not required for contractor
		3.6.4.6	Design and construction of flood storage pond at San Tin Village: grasscrete sides at 1 in 2 slope, concrete bottom.	Flood storage pond, San Tin villages	Design and construction stage	DSD's Engineer	Not required for contractor
		3.6.4.6-3.6.4.8	Management of flood storage pond at San Tin Villages: maintain water depth of 0.3m to 0.85m through pond design and pump operation except during maintenance or exceptional circumstances. Allow up to 150m of sediment to accumulate on bottom; Avoid dredging clear to the bottom; Allow vegetation to colonise banks; Cut back vegetation only on maintenance-need basis; Allow fish to colonise pond naturally.	Flood storage pond, San Tin villages	Throughout operational lifetime of pond	DSD's Engineer	Not required for contractor
		3.6.4.9	Maintenance of Tsing Lung Tsuen drainage channel: Do not cut back vegetation along sides of channel except as required for channel maintenance.	Channel outside San Tin villages polder	Throughout operational lifetime of pond	DSD's Engineer	Not applicable in this stage
		3.6.4.10	Design and construction of tidal portion of Eastern MDC: Grasscrete sides at 1 in 2 slope; earthern bottom in channel.	Eastern MDC downstream of inflatable dam	Project design and construction phases	DSD's Engineer and TDD (design)	Not applicable in this stage
			Maintenance of tidal portion of Eastern MDC: Minimise cutting back of vegetation to lowest levels compatible with maintaining flood capacity. Minimise dredging of channel bottom in this zone to lowest levels compatible with maintaining flood capacity.	Eastern MDC downstream of inflatable dam	Throughout operational lifetime of channel	Site Agent / Engineer DSD's Engineer	Not applicable in this stage

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
24. (cont' d)		3.6.4.11-3.6.4.12 Annex 3-J	Design, construction and management of constructed wetland area east of Eastern MDC: to provide wetland habitats useful to wildlife, with varied water depth, and planting of wetland vegetation and trees/bamboos; details as specified in Annex 3-J	Location shown in EIA Report Figure 3.6c, east of Eastern MDC and west of San-Sham Road	Construction of wetlands simultaneous with or immediately on completion of Eastern MDC construction. Management to begin upon completion of wetland construction and to continue throughout lifetime of channel.	DSD and TDD (design) Site Agent / Engineer (earthworks vegetation) DSD (maintenance of outlet pipes and flag valves) Lands Dept. (lands administration) AFD (vegetation management)	Implemented
		3.6.4.13	Design of Eastern MDC upstream of inflatable dam: Grasscrete lining of channel except DWF channel; channel banks at 1 in 2 slope.	Eastern MDC Upstream of inflatable dam	Project design and construction phases	DSD and TDD (design) and Site Agent / Engineer (construction)	Not applicable in this stage
			Hydroseeding of outer embankments of Eastern MDC. Plant stands of bamboos and trees at sites along Eastern MDC embankments as shown in Figure 3.6e; species and density as described in Annex 3-J. Replace any dead plantings during one-year establishment Period with species approved by TDD and AFD.	At sites along Eastern MDC as marked in Final EIA Report Figure 3.6e	Simultaneous with or immediately following completion of channel construction	DSD and TDD (design); Site Agent / Engineer (implementation Including establishment phase)	Not applicable in this stage
25.	Water quality	3.6.4.20 – 3.6.4.21	Water quality control measures: Implement and enforce water quality control measures outlined in implementation schedule for water section. Dredging of existing stream channel shall only be undertaken in dry season unless during emergency conditions.	On work site	During construction phase	Site Agent / Engineer	Implemented

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
26.	Wildlife Disturbance	3.6.4.22	Noise and disturbance control measures: Restrict movements of construction equipment and site workers to areas within the site boundary (including Temporary Works Areas) and approved entry/exit points under terms of contract; supervision by contractor. ET to brief site workers on the need to remain within the site and avoid disturbance to surrounding habitats. Tape off excavation areas. Implement and enforce measures recommended in Implementation Schedule item 5.	On works site	During construction phase	The Contractor and ET Leader	Implemented
27.	Habitat Mitigation	3.6.5.2	Maintenance of Eastern MDC: Minimise dredging frequency and clearance of in-channel vegetation without compromising flood capacity of channel to unacceptable levels. Conduct dredging of existing stream channel only in dry season except under emergency conditions; follow relevant guidelines in the Water section of the Implementation Schedule during dredging. Operation of inflatable dam in Eastern MDC: Periodic review of dam operation in relation to ecological value of the Eastern MDC, as specified in EM&A Manual Section 6.2.1.	Eastern MDC Eastern MDC	Throughout operational lifetime of channel Throughout operational lifetime of channel	DSD's Engineer DSD and TDD/Appointed ecologist (first three years); to be determined thereafter	Not applicable in this stage Not applicable in this stage
28.	Habitat Mitigation – Monitoring	EM&A 6.2.2 Task 1	Monitoring of bird use of San Tin Villages flood storage pond methodology as per EM&A Manual.	San Tin Villages Flood storage pond (see Final EIA Report, Figure 3.6c for location)	4 times per year for first 3 years of pond operation	Appointed ecologist /TDD	Not applicable in this stage

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
Land Contamination							
29.	General	6.4.3.1	Determine the potential extent of any land contamination by developing a current Contamination Assessment Plan (CAP) for sites to be investigated. This CAP will be prepared and approved by EPD prior to site investigation. Depending on the investigation requirements, a contamination assessment report (CAR) will be prepared after contamination investigation activities have concluded.	Selected portions of site(s) which require specific contamination investigation	Prior to construction phase (as required)	DSD's Engineer	Not applicable to the contractor
		6.6.1. 1-7	Prepare the CAP for approval prior to the construction phase. Upon completion of subsequent CAR, discuss the results and data with EPD to determine the most appropriate course of action (which may or may not include mitigation works).	Selected portions of site(s) which require specific contamination investigation	Prior to construction phase (as required); and prior to development as required.	DSD's Engineer	Not applicable to the contractor
		Annex 6-A	Perform the typical site investigation activities as per the CAP presented in Annex 6-A 9to be approved by EPD), and in accordance with applicable guidelines such as the ProPECC PN3/94 Guidance note.	Selected portions of site(s) which require specific contamination investigation	Prior to construction phase (as required)	DSD's Engineer	Not applicable to the contractor
		6.6.1.8	No soils shall be stockpiled. If this cannot be avoided, they shall be covered with tarpaulin to minimize the potential for run-off and prevent any pollution, especially during heavy rainstorms.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	Vehicles containing any contaminated materials shall be covered to limit potential dust emissions, or contaminated wastewater run-off during transportation or under wet conditions.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	All appropriate licenses and permits shall be obtained for working with contaminated material in accordance with appropriate regulations.	Whole site	Design phase	DSD's Engineer	Implemented

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
29. (cont' d)		6.6.1.8	All excavation activities in contaminated areas and the handling of contaminated groundwater shall be performed by the contractor and observed by and directed, as required, by the environmental specialist.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	Only licensed contractors shall be utilized for hauling the contaminated soil to the specified disposal location, and specific operational procedures shall be implemented for the activities.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	Liaison shall be maintained with EPD to ensure that all excavation activities have been performed to requirements.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	If the size of the excavation increases, engineering and other concerns may limit the depth or extent of excavation along the property boundaries, as required. Decisions on this matter shall be addressed by appropriate works contractor's engineering personnel and the environmental specialist as required, based on filed conditions.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	Procedures shall be developed to ensure that illegal disposal of wastes does not occur, and records of quantities of wastes Generated and disposed of shall be maintained.	Whole site	All period during construction phase	DSD's Engineer./ Site Agent / Engineer	Implemented
30.	Health & Safety/ Contaminatio n Exposure During Construction Works	6.4.3.2	No unauthorized persons shall be allowed into the work area, and necessary precautions shall be taken to prohibit unauthorized entry into the Site or works areas.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.4.3.2	Eating, drinking, smoking or any practice that increases the probability of hand to mouth transfer and ingestion of material is prohibited in any area designated as being contaminated.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.4.3.2	Food, beverages. Tobacco products, etc. are prohibited in any area designated as being contaminated. Adequate warning signs shall be posted to this effect.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.4.3.2	Hands must be thoroughly washed upon leaving the work area, and before eating, drinking or any other activities.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
30. (cont' d)		6.4.3.2	Contact with contaminated surfaces or with surfaces suspected of being contaminated shall be avoided. Whenever possible, one shall not walk through puddles, mud or other discoloured surfaces; kneel on the ground; lean, sit or place equipment on drums, containers, vehicles or the ground.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.4.3.2	No trench or other excavation greater than 1m deep shall be entered unless the atmosphere has been tested and found to be safe, or the sides of the excavation have been shored up or prepared in such a way, as required, to remain stable. Personnel and equipment in the contaminated area shall be minimized, consistent with effective site operations.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.4.3.2	During site operations with contaminated soil, all field personnel must be on the alert for potentially hazardous materials including odorous solids or liquids, and accumulations or seepage of liquids which are tarry, oily, fuming, bubbling, or discoloured.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.4.3.2	Adequate first aid kits shall be present on site.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		8.4.5.1	The use of dust control measures, such as water sprays, shall be employed to minimise dust emissions and the possible spread of contamination during dry, dusty or windy conditions.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.4.3.2	Prior to starting work workers shall determine the location of The nearest telephone and washing facilities. If accidental contact is made with hazardous or unknown chemicals the contact point shall immediately be washed, and if necessary, medical aid sought.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
31.	Contamin'd Soil Disposal	6.6.1.8	All soil disposal activities shall be subject to the conditions and approval of the Facilities Management Group, under the authority of the EPD.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	A record of all correspondence with the Facilities Management Group regarding the disposal of soils from this site shall be maintained.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	All contaminated soil shall be disposed of at the designated landfill subject to approval of the EPD and Facilities Management Group.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	For contaminated soil disposal, trip tickets shall be issued to ensure proof of disposal at the landfill facility.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	All trucks/lorries leaving the site containing contaminated materials shall be sheeted/covered to limit potential dust emissions in dry conditions, and contaminated waste water run-off under wet conditions.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	Wheel washing of vehicles leaving the site shall be undertaken to ensure that nay contaminated materials or dusts are not carried over onto the public highway.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	Upon completion of the soil excavation activities, additional confirmatory soil samples shall be collected, as required, for analysis.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	Upon completion of the soil excavation programme, clean fill material may be imported and placed in the excavations as required, to bring the site level to grade.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
32.	Contamin'd Ground Water Disposal (if required)	6.6.1.8	A discharge license shall be obtained from EPD for the disposal of any groundwater from the site in accordance with the appropriate protocols to meet applicable regulations.	Whole site	All period during construction phase	Site Agent / Engineer	The license has been issued.
		6.6.1.8	The Contractor shall ensure that surface waters and run-off are diverted around any areas currently being worked, to minimise potential run-off into the excavation, thereby increasing the volume of groundwater requiring potential disposal. This includes blocking or protecting surface drains to prohibit any uncontrolled discharges.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	Surface run-off may contain increased sediment loads, suspended solids, or contaminants. The Contractor shall control site run-off to prevent high levels of suspended solids from entering surrounding waters through the use of appropriate mitigation measures such as sediment traps.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	Groundwater shall be pumped at such a rate as to ensure that it does not create ground stability and subsidence problems for the surrounding work areas or any buildings. The actual rate of pumping, if required, shall be dependant upon field observations and following discussion with the environmental specialist and the Contractor's engineers.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	Where the level of the contamination of groundwater encountered is found to be below the specified levels in the WPCO requiring treatment, the groundwater shall be discharged, as required directly through a flexible hose or pipeline. Prior agreement with the EPD Local Control Office is required.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	Upon completion of the soil excavation activities, additional confirmatory soil samples shall be collected, as required, for analysis.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented
		6.6.1.8	Upon completion of the soil excavation programme, clean fill material may be imported and placed in the excavations as required, to bring the site level to grade.	Whole site	All period during construction phase	Site Agent / Engineer	Implemented

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

No.	Parameter	EIA Ref.	Mitigation Measures/Key EM&A Requirements	Location	Timing	Responsibility	Implementation Status
33.	Future Issues	6.6.1.8	Follow appropriate protocols.	Whole site	All period during construction phase or operational phase, as necessary	Site Agent / Engineer	Implemented
Landscape and Visual							
35.	Planting to eastern embankment and constructed wetland (and associated planting)	9.9.1.1, 3, 9.9.2.1	Planting to assist screening function of border crossing area and also to assist to provide and ecological and landscape resource within the constructed wetland, with consideration given to early planting. The PELBTC No. 3/94 Tree Preservation should be followed in the design process.	Eastern embankment to perimeter of Lok Ma Chau border crossing	During design and construction phase	Site Agent / Engineer	Not applicable in this stage
36.	Planting to western embankment	9.9.1.2, 3 9.9.21	Planting to reflect existing fish pond group/individual tree/shrub groupings and ecological mitigation in design and species selection, with consideration given to early planting.	Western Embankment	During construction phase	Site Agent / Engineer	Not applicable in this stage.
37.	Pumping station design and detailing	9.9.1.4	Design pumping station building to reflect the scale of other buildings/structures in the local area.	Pumping station	Design stage of pumping station	DSD's Engineer	Not applicable in this stage
38.	Soil Conservat'n	9.9.2.1	Consideration should be given to undertake landscaping works early in the construction phase, as well as to as conserve soil as a planting medium, such as from pond0bund materials.	Whole site	All period during construction	Site Agent / Engineer	Implemented
39.	Planting Work Monitoring	EM&A 6.2.1. Task 6	Monitoring of planting work for the ecological and landscape mitigation shall be undertaken.	Planting to eastern embankment, constructed wetland and western embankment	Once per year for first 3 years of operation	TDD/ Appointed consultant	Not applicable in this stage

Notes:
EM&A = Agreement No. CE 43/96 Main Drainage Channels and Poldered Village Protection Scheme of San Tin, NWNT: Environmental Impact Assessment Study – Environmental Monitoring and Audit Manual
ET Leader = Environmental Team Leader DSD = Drainage Services Department
EIA = Agreement No. CE 43/96 Main Drainage Channels and Poldered Village Protection Scheme for San Tin: Environmental Impact Assessment Study – Final Assessment Report
GW-TM = General Works Technical Memorandum PELBTC = Planning Environmental Lands Bureau Technical Circular PME = Powered Mechanical Equipment
TDD = Territory Development Department

Appendix V

Noise Monitoring Results

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Stanger Asia

Report on Noise Monitoring

Location: NM1(A) (Yan Shau Wai)
Time Period: 0700-1900 hours on normal weekdays.

Date	Start Time	Wind Speed, m/s	Calibration before measurement, dB(A)	Calibration after measurement, dB(A)	Weather	Noise Sources	Noise Level, dB(A) (5 min)			Averaged Noise Levels $L_{eq\ (30\ mins)}$, dB(A)
							L_{90}	L_{10}	L_{eq}	
07-Mar-05	16:30	<5	93.8	93.8	Sunny	Vehicle Noise at San Tin Road	59.4	64.9	62.8	62.5
							59.0	64.0	62.8	
							59.0	64.6	62.0	
							59.1	64.3	62.5	
							59.8	64.2	62.4	
							58.8	64.0	62.4	
14-Mar-05	14:00	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	61.0	65.6	63.1	63.1
							61.2	65.8	63.1	
							61.0	66.0	62.8	
							61.5	66.1	62.7	
							61.7	66.2	63.4	
							61.9	66.4	63.5	
21-Mar-05	17:15	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	57.5	63.0	61.0	61.3
							57.4	63.0	61.3	
							57.3	62.8	61.7	
							57.4	62.7	61.8	
							57.6	62.9	61.0	
							57.5	62.9	60.8	
29-Mar-05	14:00	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	62.0	66.0	64.0	64.4
							62.3	66.0	64.3	
							62.5	66.3	64.3	
							62.7	66.4	64.2	
							62.9	66.5	64.5	
							62.1	66.1	64.8	

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Report on Noise Monitoring

Location: NM1(A) (Yan Shau Wai)
Time Period: 1900-2300 hours on normal weekdays (except general holidays).

Date	Start Time	Wind Speed, m/s	Calibration before measurement, dB(A)	Calibration after measurement, dB(A)	Weather	Noise Sources	Noise Level, dB(A) (5 min) L_{90}	L_{10}	L_{eq}	Averaged Noise Levels $L_{eq\ (30\ mins)}$, dB(A)
07-Mar-05	19:15	<5	93.8	93.8	Sunny	Vehicle Noise at San Tin Road	58.4	62.9	61.0	61.0
							58.3	62.8	61.0	
							58.3	62.9	61.0	
14-Mar-05	19:15	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	57.5	63.1	60.7	60.8
							57.4	63.1	60.9	
							57.3	63.4	60.7	
21-Mar-05	19:15	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	57.0	63.1	61.0	61.4
							57.0	63.4	61.5	
							57.3	63.5	61.7	
29-Mar-05	19:05	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	57.9	64.0	60.0	60.2
							57.8	64.0	60.4	
							57.0	64.1	60.3	

Time Period: 0700-2100 hours on general holidays including Sunday

Date	Start Time	Wind Speed, m/s	Calibration before measurement, dB(A)	Calibration after measurement, dB(A)	Weather	Noise Sources	Noise Level, dB(A) (5 min) L_{90}	L_{10}	L_{eq}	Averaged Noise Levels $L_{eq\ (30\ mins)}$, dB(A)
06-Mar-05	15:15	<5	93.8	93.8	Sunny	Vehicle Noise at San Tin Road	58.7	64.3	61.7	61.6
							58.9	64.0	61.8	
							59.1	64.1	61.2	
13-Mar-05	16:00	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	60.1	65.0	62.9	62.8
							60.4	65.1	62.8	
							60.5	65.3	62.7	
20-Mar-05	13:00	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	61.0	66.0	63.0	63.3
							61.0	66.4	63.4	
							61.4	66.7	63.5	
27-Mar-05	14:15	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	57.8	62.9	59.9	59.7
							57.9	62.8	59.7	
							58.4	62.7	59.6	

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Appendix VI

Water Quality Monitoring Data

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Report on Water Quality Monitoring

Date	Location	Time	Weather	Depth (m)	Salinity (ppt)	Temperature (oC)	pH	DO (%)	DO (mg/L)	Turbidity (NTU)	Action / Limit	SS (mg/L)	Action / Limit	NH_3-N (mg/L)	Action / Limit
07-Mar-05	WM1	12:30	Sunny	<1.5	3.1	14.5	7.12	8.5	0.84	56.8	-	100	-	68.4	-
					3.2	15.0	7.11	8.3	0.83	56.8	-	104	-	68.4	-
					3.3	15.0	7.13	8.2	0.82	56.9	-	105	-	68.5	-
	WM2	12:45	Sunny	<1.5	3.3	15.5	7.08	8.0	0.80	65.5	68.2	120	123.6	80.0	82.1
					3.3	15.5	7.09	7.9	0.84	61.3	/	118	/	80.0	/
					3.3	15.5	7.10	8.3	0.83	61.4	73.9	117	133.9	81.0	89.0
	WM4	13:05	Sunny	<1.5	3.5	14.0	7.05	9.5	0.95	70.4	-	105	-	39.9	-
					3.5	14.5	7.05	9.6	0.96	70.5	-	109	-	40.0	-
					3.5	14.5	7.06	9.6	0.97	70.9	-	107	-	41.1	-
	WM3	13:15	Sunny	<1.5	3.6	14.0	7.09	9.0	0.90	80.3	84.7	114	128.4	42.2	48.4
					3.6	15.0	7.12	9.1	0.91	80.4	/	113	/	43.3	/
					3.6	15.0	7.13	9.0	0.92	80.9	91.8	112	139.1	44.4	52.4
14-Mar-05	WM1	16:00	Cloudy	<1.5	2.9	12.0	7.20	7.4	0.77	55.3	-	80	-	56.6	-
					2.9	12.5	7.22	7.5	0.76	55.4	-	84	-	58.8	-
					2.9	12.5	7.18	7.5	0.75	55.8	-	87	-	58.7	-
	WM2	16:20	Cloudy	<1.5	2.8	12.0	7.20	7.5	0.78	60.4	66.6	90	100.4	60.4	69.6
					2.8	12.0	7.22	7.4	0.80	60.5	/	94	/	60.5	/
					2.7	12.0	7.24	8.1	0.81	60.7	72.2	97	108.8	60.7	75.4
	WM4	16:35	Cloudy	<1.5	2.6	12.5	7.18	8.5	0.84	104.0	-	105	-	66.3	-
					2.6	12.5	7.17	8.3	0.83	105.0	-	107	-	66.4	-
					2.5	12.5	7.16	8.1	0.82	109.0	-	109	-	66.5	-
	WM3	16:45	Cloudy	<1.5	2.4	13.0	7.24	8.9	0.90	110.0	127.2	110	128.4	70.3	79.7
					2.4	13.0	7.20	9.9	0.99	111.0	/	112	/	70.5	/
					2.4	13.0	7.22	8.7	0.93	112.0	137.8	114	139.1	70.5	86.3
21-Mar-05	WM1	12:00	Cloudy	<1.5	3.1	16.5	7.42	11.2	1.10	130.0	-	87	-	44.9	-
					3.1	17.0	7.44	11.3	1.11	133.0	-	86	-	44.7	-
					3.2	17.0	7.45	11.4	1.05	134.0	-	85	-	44.9	-
	WM2	12:15	Cloudy	<1.5	3.2	17.5	7.38	10.5	1.06	144.0	158.8	100	103.2	50.3	53.8
					3.2	17.5	7.36	10.6	1.07	145.0	/	98	/	50.4	/
					3.2	17.5	7.38	10.7	1.08	147.0	172.0	97	111.8	50.0	58.3
	WM4	12:35	Cloudy	<1.5	2.9	17.0	7.18	9.7	0.98	95.3	-	70	-	62.3	-
					2.8	17.0	7.18	9.5	0.99	95.7	-	75	-	62.7	-
					2.8	17.0	7.19	9.4	0.92	95.6	-	76	-	62.9	-
	WM3	12:45	Cloudy	<1.5	2.8	16.5	7.18	9.1	0.91	110.0	114.6	80	88.4	65.5	75.2
					2.9	16.5	7.16	9.3	0.89	105.0	/	84	/	65.7	/
					2.9	16.5	7.15	9.7	0.87	106.0	124.2	85	95.8	65.9	81.4

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Report on Water Quality Monitoring

Date	Location	Time	Weather	Depth (m)	Salinity (ppt)	Temperature (oC)	pH	DO (%)	DO (mg/L)	Turbidity (NTU)	Action / Limit	SS (mg/L)	Action / Limit	NH_3-N (mg/L)	Action / Limit
29-Mar-05	WM1	15:45	Cloudy	<1.5	3.3	20.0	7.25	8.2	0.80	85.3	-	79	-	60.3	-
					3.3	20.0	7.24	8.3	0.79	85.7	-	82	-	60.4	-
					3.3	20.5	7.26	8.7	0.78	86.1	-	84	-	60.5	-
	WM2	16:05	Cloudy	<1.5	3.3	20.0	7.29	7.7	0.77	92.4	102.8	90	98.0	70.3	72.5
					3.3	20.0	7.31	7.8	0.78	95.3	/	94	/	70.9	/
					3.3	20.0	7.32	7.9	0.80	95.7	111.4	96	106.2	70.5	78.5
	WM4	16:20	Cloudy	<1.5	3.2	19.5	7.34	8.1	0.82	104.0	-	110	-	71.4	-
					3.2	19.5	7.36	8.2	0.84	105.0	-	114	-	74.5	-
					3.2	20.0	7.44	8.4	0.85	107.0	-	115	-	75.1	-
	WM3	16:30	Cloudy	<1.5	3.4	20.0	7.45	6.4	0.64	120.0	126.4	120	135.6	80.3	88.4
					3.4	20.0	7.49	6.7	0.65	122.0	/	124	/	80.7	/
					3.4	20.0	7.51	6.9	0.67	124.0	136.9	129	146.9	80.9	95.8

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Appendix VII

Air Quality Monitoring Results

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Stanger Asia

Report on 24-hour TSP monitoring

Location: AM1 (Site Office)

Date	Filter Weight, g		Elapse Time, hr		Sampling	Weather	Flow rate	TSP Level,
	Initial	Final	Initial	Final	Time, hr	Condition	(std. m^3/min)	$\mu g/m^3$
04-Mar-05	2.8421	3.0920	4995.88	5020.13	24.25	Sunny	1.25	137
10-Mar-05	2.8224	3.0070	5023.88	5047.07	23.19	Cloudy	1.26	105
16-Mar-05	2.8115	3.0392	5050.07	5074.33	24.26	Sunny	1.26	124
22-Mar-05	2.8583	3.1042	5077.33	5101.77	24.44	Sunny	1.26	133
28-Mar-05	2.8568	3.1310	5104.77	5129.08	24.31	Sunny	1.26	149

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Stanger Asia

Report on 1-hour TSP monitoring

Location: AM1 (Site Office)

Date	Filter Weight, g		Elapse Time, hr		Sampling	Weather	Wind	Flow rate	TSP Level,
	Initial	Final	Initial	Final	Time, hr	Condition	Direction	(std. m^3/min)	$\mu g/m^3$
03-Mar-05	2.8292	2.8442	4993.88	4994.88	1.00	Cloudy	N	1.25	198
03-Mar-05	2.8041	2.8165	4994.88	4995.88	1.00	Cloudy	N	1.25	164
05-Mar-05	2.8258	2.8398	5020.13	5021.13	1.00	Sunny	N	1.25	188
09-Mar-05	2.8046	2.8193	5021.13	5022.13	1.00	Sunny	NE	1.25	197
09-Mar-05	2.8238	2.8412	5022.13	5023.13	1.00	Sunny	NE	1.25	233
11-Mar-05	2.8158	2.8360	5047.07	5048.07	1.00	Cloudy	NE	1.26	265
15-Mar-05	2.8128	2.8313	5048.07	5049.07	1.00	Cloudy	NE	1.26	244
15-Mar-05	2.8308	2.8468	5049.07	5050.07	1.00	Cloudy	NE	1.26	210
17-Mar-05	2.8230	2.8451	5074.33	5075.33	1.00	Sunny	NE	1.26	290
21-Mar-05	2.8447	2.8591	5075.33	5076.33	1.00	Cloudy	NE	1.26	188
21-Mar-05	2.8429	2.8558	5076.33	5077.33	1.00	Cloudy	NE	1.26	169
23-Mar-05	2.8116	2.8303	5101.77	5102.77	1.00	Sunny	N	1.26	244
23-Mar-05	2.8607	2.8815	5102.77	5103.77	1.00	Sunny	N	1.26	273
23-Mar-05	2.8374	2.8578	5103.77	5104.77	1.00	Sunny	N	1.26	267
29-Mar-05	2.8093	2.8312	5129.08	5130.08	1.00	Sunny	NE	1.26	288
29-Mar-05	2.8206	2.8430	5130.08	5131.08	1.00	Sunny	NE	1.26	294
29-Mar-05	2.8032	2.8213	5131.08	5132.08	1.00	Sunny	NE	1.26	237

G/F. & 1/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Appendix VIII

Complaint Log

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

CONTRACT No. DC/2001/09 – CONSTRUCTION OF SAN TIN EASTERN MAIN DRAINAGE CHANNEL - ENVIRONMENTAL COMPLAINTS LOG.						
Complaint Log No.	Date of Receipt	Received From and Received By	Nature of Complaint	Date Investigated	Outcome	Date of Reply and to Whom
STEMDC 001	28th July 2003	EPD	Dead fish in the pond caused bad odour and potential mosquito breeding.	29th July 2003	No visible cause can be identified attributed to construction activities.	29th July 2003
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852- 2682 1203 Fax: 852- 2682 0046 E-mail address: stanger@stanger.com.hk

APPENDIX IX

Cumulative Statistics on Complaints, Notifications of Summonses and Successful Prosecutions

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

Stanger Asia

Construction of San Tin Eastern Main Drainage Channel
Environmental Monitoring Schedule
April 2005

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3 24-hr TSP Noise[3]	4 Noise [1,2] 1-hr TSP x 3 Water (11:19)	5	6	7	8 Site Inspection	9 1-hr TSP x 3 24-hr TSP
10 Noise[3]	11 1-hr TSP Water (15:11)	12	13	14	15 Noise [1,2] 1-hr TSP x 2 24-hr TSP Site Inspection	16 1-hr TSP
17 Noise[3]	18	19 Water (11:26)	20	21 Noise [1,2] 1-hr TSP x 2 24-hr TSP	22 1-hr TSP Site Inspection	23
24 Noise[3]	25 Water (14:15)	26	27 Noise [1,2] 1-hr TSP x 2 24-hr TSP	28 1-hr TSP	29 Site Inspection	30

Notes:
1. *Noise: daytime noise monitoring (once per week), (6 x 5 minutes)*
2. *Noise: restricted hours (1900-2300 normal weekdays) noise monitoring (once per week), (3 x 5 minutes)*
3. *Noise: restricted hours (0700-2100 holidays) noise monitoring (once per week), (3 x 5 minutes).*
4. *Water: water quality monitoring (once per week) at stations WM1 & WM3 (upstream) and WM2 and WM4 (downstream).*
5. *24-hr TSP (once in every 6 days) conducted at Site Office*
6. *1-hr TSP (three times in every 6 days) conducted at Site Office.*
7. *Site inspection: once a week*

G/F., & 1/F., KTA Centre, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

APPENDIX XI

Master Construction Programme

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203 Fax: 852-2682 0046 E-mail address: stanger@stanger.com.hk

HSIN CHONG CONSTRUCTION CO LTD
Contract No DC/2001/09
Construction of the San Tin Eastern Main Drainage Channel
MASTER PROGRAMME 01

Date: Mon 11/6/02
Version: 1

ID	Task Name	Duration	Start	Finish
1	Duration of work	1668 days	Wed 10/16/02	Sat 8/17/06
2	Section 1 completion	160 edays	Wed 10/16/02	Sat 3/15/03
3	Section 2 completion	270 edays	Wed 10/16/02	Sun 7/13/03
4	Section 3 completion	365 edays	Wed 10/16/02	Thu 10/16/03
5	Section 4 completion	670 edays	Wed 10/16/02	Mon 8/16/04
6	Section 5 completion	730 edays	Wed 10/16/02	Fri 10/15/04
7	Section 6 completion	810 edays	Wed 10/16/02	Wed 4/13/05
8	Section 7 completion	670 edays	Wed 10/16/02	Mon 8/16/04
9	Section 8 completion	850 edays	Fri 11/15/02	Mon 3/14/05
10	Section 9 completion	970 edays	Wed 10/16/02	Sun 8/12/05
11	Section 10 completion	1340 edays	Wed 10/16/02	Sat 8/17/06
12	Schedule of Site Occupation by KCRC in Portion H	873 days	Tue 1/14/03	Sat 4/23/05
13	Stage 1 (Piles & Pile Caps for Piers W58-80)	180 edays	Tue 1/14/03	Mon 8/23/03
14	Stage 2 (Piers W58-80)	140 edays	Mon 8/23/03	Mon 11/10/03
15	Stage 3 (Piers & Decking bt Piers W57-59)	130 edays	Mon 11/10/03	Fri 3/19/04
16	Stage 4 (Decking bt Piers W57-59)	180 edays	Fri 3/19/04	Wed 9/15/04
17	Stage 5 (Decking bt Piers W59-95)	220 edays	Wed 9/15/04	Sat 4/23/05
18	Mobilization	1668 days	Wed 10/16/02	Sat 8/17/06
19	Erection of Engineer's Office and Car Park	60 edays	Wed 10/16/02	Sun 12/15/02
20	Initial Setting Out	45 edays	Sun 12/15/02	Wed 1/29/03
21	Import Fill Material from Shenzhen River	458 days	Wed 10/16/02	Thu 8/22/04
27	Environment Impact Assessment	1668 days	Wed 10/16/02	Sat 8/17/06
28	Baseline Monitoring	24 edays	Wed 10/16/02	Sat 11/9/02
29	Submission of EPD Application	28 edays	Sat 11/9/02	Sat 12/7/02
30	Approval of EPD Application	28 edays	Sat 12/7/02	Sat 1/4/03
31	Protection of existing structures	60 edays	Mon 1/6/03	Fri 3/7/03
32	Regular Monitoring	890 edays	Fri 1/6/04	Sat 8/17/06
33	Stream Flow diversion	788 days	Wed 10/16/02	Sun 8/12/05
41	Forming Haul Road	722 days	Sat 1/4/03	Sun 8/12/05
46	Removal of substances for site clearance	1622 days	Sat 1/4/03	Sat 8/17/06
47	Setting up	70 edays	Sat 1/4/03	Sat 3/15/03
48	Potion A	60 edays	Sat 3/15/03	Wed 5/14/03
49	Portion B	60 edays	Wed 5/14/03	Sun 7/13/03
50	Portion C	60 edays	Sat 3/15/03	Wed 5/14/03
51	Daily ok testing	883 edays	Fri 1/16/04	Sat 8/17/06
52	Waste disposal	883 edays	Fri 1/16/04	Sat 8/17/06
53	Section 1 - Portion F	124 days	Wed 10/16/02	Sat 3/15/03
54	Site formation	124 days	Wed 10/16/02	Sat 3/15/03
60	Section 2 - Interim Flood Relief Channel (Portion A & C)	270 days	Wed 10/16/02	Sun 7/13/03
61	Construction of temporary Cross Border Road	144 days	Wed 10/16/02	Wed 4/9/03
70	Steam Diversion for temp. Border Road	154 days	Sat 1/4/03	Sun 7/13/03
74	Traffic diversion	11 days	Wed 4/2/03	Wed 4/16/03
78	Section 3 - Portion G (Reedbed near LMC Kiosk)	311 days	Wed 10/16/02	Fri 10/31/03
91	Section 4 - Portion E (Pond filling work)	537 days	Wed 10/16/02	Mon 8/30/04
96	Section 5 - Portion D (PS/D/C/PDC/DC & boundary fence)	593 days	Wed 10/16/02	Fri 10/15/04
97	Stone Column Work	382 days	Wed 10/16/02	Tue 10/21/03
100	Remaining of the structure work	282 days	Mon 8/23/04	Fri 10/15/04
101	Flow Diversion Chamber	83 days	Fri 8/23/04	Sun 11/28/04
104	Inlet Culvert to Flow Diversion Chamber	85 days	Sun 11/28/04	Fri 3/18/04
108	Triple-cell By-Pass Box Culvert	148 days	Fri 3/18/04	Wed 8/18/04
111	Pump Trough	145 days	Tue 10/21/03	Sun 4/18/04
114	Pumping Station	293 days	Mon 8/23/04	Thu 8/17/04
118	Loading Platform	194 days	Tue 10/21/03	Thu 8/17/04
121	Outlet Chamber No.1	148 days	Fri 3/18/04	Wed 8/18/04
124	Outlet Chamber No.2	148 days	Fri 3/18/04	Wed 8/18/04
127	Outlet Culvert to Drainage Channel	99 days	Thu 8/17/04	Fri 10/15/04
130	Retaining Wall near Pump Trough	146 days	Wed 3/18/04	Mon 8/16/04
133	Installation E & M works for Pump Station(by others)	99 days	Thu 8/17/04	Fri 10/15/04
136	Installation Boundary Fence	99 days	Thu 8/17/04	Fri 10/15/04
139	Section 6 - Portion A (Inflatable Dam)	735 days	Wed 10/16/02	Wed 4/13/05
140	Inflatable Dam	735 days	Wed 10/16/02	Wed 4/13/05
141	Stone Column Work	373 days	Wed 10/16/02	Wed 5/14/04
151	Structure Works of Dam	322 days	Thu 10/16/03	Mon 11/29/04
156	Dam System Approval & Delivery	297 days	Wed 10/16/02	Wed 10/15/03
160	Mechanical Works	374 days	Thu 10/16/03	Tue 1/15/05
165	E & M Works	96 days	Tue 1/18/05	Wed 4/13/05
168	Remaining Structure Works	63 days	Tue 4/13/04	Fri 7/2/04
170	Steel Bridge	588 days	Fri 4/18/03	Wed 4/13/05
174	Security Fence & Fender	529 days	Thu 2/27/03	Wed 4/13/05
178	Section 7 - Portion A (Border Road Bridge)	545 days	Wed 10/16/02	Mon 8/16/04
179	Material Submission and Approval	96 days	Wed 10/16/02	Sat 1/4/03
182	Site formation for Vertical Drains	230 days	Sat 1/4/03	Mon 10/13/03
186	Diversion of Cross Border Road	144 days	Wed 10/16/02	Wed 4/9/03
188	Cross Border bridge	491 days	Wed 4/9/03	Mon 8/16/04
197	Structure Works	183 days	Thu 1/29/04	Mon 8/16/04
200	New Border Road	434 days	Fri 2/20/03	Mon 8/16/04
201	Embankment	271 days	Fri 2/20/03	Thu 1/29/04
209	Channel	337 days	Sat 8/2/03	Mon 8/16/04
213	Security Fence & Fender	175 days	Mon 1/12/04	Mon 8/16/04
216	Section 8 - Portion B (exclude Wetland)	699 days	Fri 11/15/02	Mon 3/14/05
217	Material Submission and Approval	72 days	Fri 11/15/02	Thu 2/13/03
221	Site formation for Vertical Drains	695 days	Fri 11/15/02	Sat 2/12/05
229	Embankment filling	514 days	Sat 3/15/03	Wed 12/8/04
244	Channel	418 days	Sun 7/13/03	Wed 12/8/04
248	Grasscrete	78 days	Wed 12/8/04	Mon 3/14/05
252	Structure Works	79 days	Wed 12/8/04	Mon 3/14/05
255	Section 9 - Portion A & C (exclude Wetland)	788 days	Wed 10/16/02	Sun 8/12/05
256	Material Submission and Approval	96 days	Wed 10/16/02	Sat 1/4/03

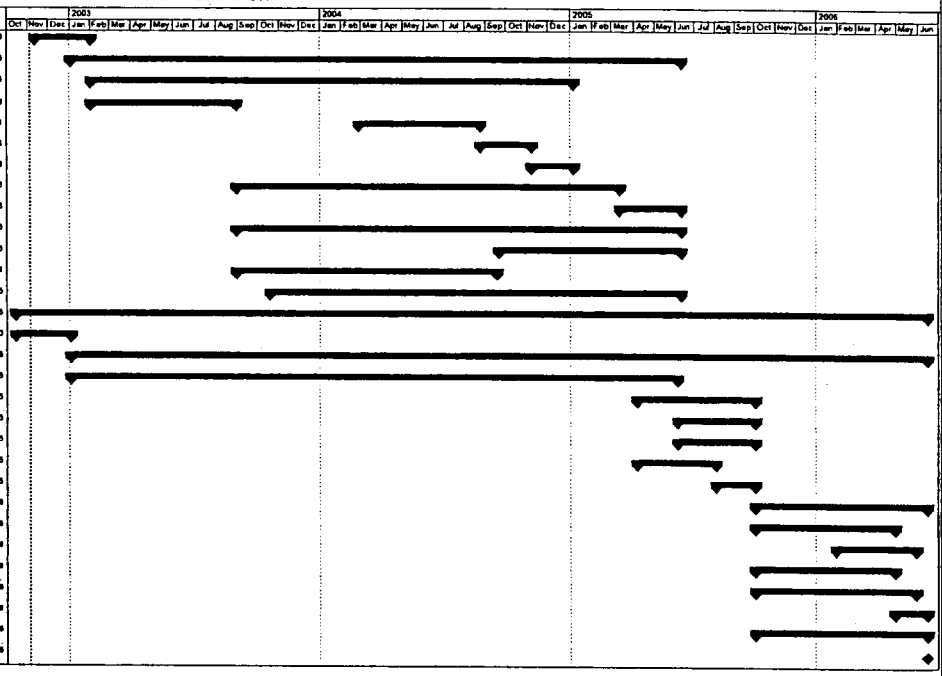
Prepared by : Elvis Kong
Date: 17 Oct 2002
Version: MP01

Task
Task Progress
Critical Task
Critical Task Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary

HSIN CHONG CONSTRUCTION CO LTD
Contract No DC/2001/06
Construction of the San Tin Eastern Main Drainage Channel
MASTER PROGRAMME 01

Date Mon 11/4/02
Version. 1

ID	Task Name	Duration	Start	Finish
259	Site formation for Vertical Drains	66 days	Wed 11/13/02	Mon 2/3/03
262	Ground Improvement	722 days	Sat 1/4/03	Sun 6/12/05
267	Embankment filling	573 days	Mon 2/3/03	Fri 1/7/05
268	Stage I filling	172 days	Mon 2/3/03	Mon 9/1/03
272	Stage II filling	148 days	Sat 2/28/04	Thu 8/26/04
276	Stage III filling	66 days	Thu 8/26/04	Mon 11/8/04
280	Stage IV excavation	46 days	Mon 11/8/04	Fri 1/7/05
282	Channel	454 days	Mon 8/1/03	Mon 3/14/05
286	Grasscrete	72 days	Mon 3/14/05	Sun 6/12/05
288	Structure Works	526 days	Mon 8/1/03	Sun 6/12/05
290	Retaining Wall	311 days	Wed 9/22/04	Sun 6/12/05
296	Box Culvert	313 days	Mon 9/1/03	Sat 6/18/04
300	Vehicular bridge near Castle Peak Road	497 days	Mon 10/20/03	Sun 6/12/05
309	Section 10 - Remainder of Works	1668 days	Wed 10/16/02	Sat 6/17/06
310	Material Submission and Approval	89 days	Wed 10/16/02	Sat 1/4/03
313	Construction of Wetland	1622 days	Sat 1/4/03	Sat 6/17/06
317	Drainage Pipe and Watermain Work	717 days	Sat 1/4/03	Mon 6/6/05
330	Utilities Installation	148 days	Thu 4/7/05	Tue 10/4/05
331	Portion A	99 days	Mon 8/8/05	Tue 10/4/05
335	Portion B	98 days	Mon 6/6/05	Tue 10/4/05
339	Portion C	100 days	Thu 4/7/05	Fri 8/5/05
343	Remaining of the Works	48 days	Fri 8/5/05	Tue 10/4/05
347	Roads and Paving work	267 days	Tue 10/4/05	Sat 6/17/06
348	Portion A	168 days	Tue 10/4/05	Tue 5/2/06
351	Portion B	97 days	Wed 2/1/06	Thu 6/1/06
358	Portion C	168 days	Tue 10/4/05	Tue 5/2/06
361	Railing & Traffic Signs	163 days	Tue 10/4/05	Thu 6/1/06
368	Roadmarking Works	36 days	Tue 5/2/06	Sat 6/17/06
371	Landscaping Works	207 days	Tue 10/4/05	Sat 6/17/06
378	Completion of Works	0 days	Sat 6/17/06	Sat 6/17/06



Prepared by : Elvis Kong
Date 17 Oct 2002
Version. MP01

Task
Task Progress
Critical Task
Critical Task Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary