Stanger Asia

ENVIRONMENTAL MONITORING AND AUDIT REPORT

FOR

CONTRACT No. DC/2001/09

SAN TIN EASTERN MAIN DRAINAGE CHANNEL

MARCH 2003

Report No.: ET 11569

Certified by: _____ Date: 16/04/2003

Mr. Chris Shenfield
Environmental Team Leader
For Stanger Asia Limited

Verified by: _____ Date: 14 April 2003

Ms. Jacquelyn Anderson
Independent Environmental Checker
For Hyder Consulting Limited

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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

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EXECUTIVE SUMMARY.

This is the 3rd 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 2003.

Construction Activities for the Reported Period.

- Excavation at Portions A, B and C.
- Construction of Interim Flood Relief Channel.
- Installation of Band Drains.
- Construction of Temporary Border Road.
- Construction of Stone Columns.
- Utilities Diversion.
- Earth work at Portions A, B and C.
- Pre-drilling for Border Road Bridge Pile.

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 fifteen 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 Tung Chan Wai NM1(A) for normal working hours (0700-1900 hours), four occasions for the evening period (1900-2300 hours) and five 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 eight occasions at WM1 (Upstream station) and WM2 (Downstream station). There were no exceedances to set Action and Limit Levels recorded.

Waste Management.

657 tonnes of non-inert C&D waste was generated from the works in this month. 493.6 tonnes was disposed at NENT Landfill and 163.4 tonnes was disposed at WENT Landfill Sites.

Complaints and Notifications of Summonses and Successful Prosecutions.

No complaints or notification of summonses received this reported period.

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Site Inspections.

Four site inspections were conducted by the Environmental Team (ET) in this reported period. The major observations by the ET, actions by the Contractor and outcomes are summarised in the following table.

Observations by ET	Actions by the Contractor	Outcome
Construction dust generated by excavations.	Contractor to apply water spray before handling the dusty materials.	Situation improved.
Stagnant water observed near site office.	Stagnant water has been removed and the area filled with soil.	No stagnant water observed.
Stockpiles of debris/ site clearance waste observed.	Contractor has removed some stockpiles.	Situation improving.

An audit by the Independent Environmental Checker (IEC) was conducted on 26th March 2003. The major observations were summarised in the following table.

Observations by IEC	Actions by the Contractor	Outcome
Road running along site boundary was muddy, especially outside of the site office.	Contractor has arranged for occasional cleaning.	Situation improved.
Area outside of the wheel washing facilities was muddy. Not all vehicles found to be using the wheel washing facilities.	Contractor has arranged for occasional cleaning. Notice displayed to remind the drivers to use the wheel washing facilities.	Situation improved.
One site exit did not have wheel washing facilities provided.	All vehicles were diverted to use one site exit as far as practicable.	Situation improved.
The site haul road was muddy and not paved / protected by coarse stone ballast.	Muddy haul either compacted or protected by aggregate.	Situation improved.

Site inspection was carried out by Environmental Protection Department on 28th March 2003. The major observations were summarised in the following table.

Observations by EPD	Actions by the Contractor	Outcome
Main haul road was dusty	The contractor has arranged the water browser to dampen the haul road more frequently.	The haul road is wet.
Vehicle left the site without wheel washing.	The contractor has arranged security guard to divert all the vehicles passing through the wheel wash bay.	Situation improved.

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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
Excavation of Portion B	· Noise impact · Dust impact	· Plant that may be in intermittent use to be shutdown between work periods or shall be throttled down to a minimum. · Dampen the excavation area. · Stockpiles shall be covered or removed on a regular basis.
Construction of Interim Flood Relief Channel.	· Dust impact	· Dusty material shall be dampened prior to handling.
Installation of sheet piles	· Noise and Vibration Impact	· Avoid concurrent noisy operations.
Pre-drilling for Border Road Bridge Pile.	· Water impact	· Wastewater generated shall be reused as far as practicable.
Earth work at Portion A and B.	· Dust Impact	· Dusty material shall be dampened prior to handling.
Installation of Band Drains.	· Noise impact	· Avoid concurrent noisy operations.
Construction of Stone column	· Dust Impact · Water Impact	· Dusty material shall be dampened prior to handling. · Wastewater generated shall be reused as far as practicable.

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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/2001/19. 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 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 2003 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 2003. 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.

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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 Ms. Jacquelyn Anderson of Hyder Consulting Limited. (Tel: 2911 2233, Fax: 2805 5028).

Ir Elvis M. Kong 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 Chris Shenfield – Senior 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 XII. Details of the construction activities are listed below.

- Excavation at Portions A, B and C.
- Construction of Interim Flood Relief Channel.
- Installation of Band Drains.
- Construction of Temporary Border Road.
- Construction of Stone Columns.
- Utilities Diversion.
- Earth Work at Portions A, B and C.
- Pre-drilling for Border Road Bridge Pile.

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3. ENVIRONMENTAL PERMITS AND LICENSES.

The summary of the status of all environmental permits, licenses and notification for this project as at March 2003 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 for Septic Tank System	1S41N/1	20-Mar-03	--	Issued
Construction Noise Permit	GW-TW0006-03	29-Jan-03	31-Jul-03	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

Methodolog.y

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., & 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

- 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 Environmental Schedule, 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.

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

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.

Clean filter papers of size 8"x10" with no pinholes were labeled 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

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

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. 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).

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

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.

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.

However, there will be no direct discharge from site into the Shenzhen River within the first 8 months of the contract until a temporary channel diversion scheme has been completed by the Contractor within this area.

Therefore the initial baseline and impact monitoring will be conducted at WM1 and WM2 to assist in the commencement of the project, and the baseline monitoring for WM3 and WM4 be commenced at least 1 month prior to any construction activities adjacent to the Shenzhen River or, any direct discharge from the site is to be made. 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 (^{o}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.

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^{o}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^{o}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.

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

(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.

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 and WM2	Dissloved Oxygen (mg/L and % saturation), Total Suspended Solids, pH, Turbidity, Ammoniacal Nitrogen, Water Temperature and water depth	Twice per week

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

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 mg/L (5%-ile of baseline data)	0.55 (1%-ile of baseline data)
Suspended Solids (mg/L), Turbidity (NTU), Ammoniacal Nitrogen (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

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:

Generation Period	Waste Generated
Site clearance.	Topsoil, subsoil, concrete, brick, aggregates, tiles, paving and vegetable matter.
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 filling materials.
Construction of Pumping Station	Timber.

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

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 point of the site.
- Excavation was undertaken during periods of low flow.
- Open material storage stockpiles were covered with tarpaulin or similar fabric to prevent material washing away.
- Debris and rubbish on site was collected, handled and disposed properly.
- Waste storage areas were maintained and cleaned in a regular basis.
- Pumping out the stagnant water.
- Clean the wheelwash bay from time to time.
- Designate a chemical waste storage area.
- Half of the Engineered Bund planned has been constructed.

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 2003

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						March 1
2 Noise[3]	3 Water (14:30) 1-hr TSP	4	5 Noise[1,2] 1-hr TSP	6 Water (15:47) 1-hr TSP 24 – hr TSP	7 Site Inspection	8 1-hr TSP
9 Noise[3]	10 Water (18:05) 1-hr TSP	11	12 1-hr TSP 24 – hr TSP	13 Noise[1,2]	14 Site Inspection	15 Water (12:09) 1-hr TSP
16 Noise[3]	17 Water (13:25) 1-hr TSP	18 1-hr TSP 24 – hr TSP	19	20 Noise[1,2] Site Inspection 1-hr TSP Water (15:14)	21	22 1-hr TSP
23 Noise[3]	24 1-hr TSP 24 – hr TSP	25	26 Site Inspection	27 Noise[1,2] Water (11:04) 1-hr TSP	28	29 Water (12:40) 1-hr TSP
30 Noise[3] 24 – hr TSP	31 1-hr TSP					

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 (twice per week) at stations WM1 (upstream) and WM2 (downstream).
5. 24-hr TSP (once in every 6 days) conducted at Site Office..
. 1-hr TSP (three times in every 6 days) conducted at Site Office. 7. Site inspection: once a week

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

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 fifteen 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)
06-Mar-2003	108	N
12-Mar-2003	144	N
18-Mar-2003	127	N
24-Mar-2003	151	N
30-Mar-2003	129	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-2003	224	N
05-Mar-2003	197	N
06-Mar-2003	233	N
08-Mar-2003	217	N
10-Mar-2003	266	N
12-Mar-2003	289	N
15-Mar-2003	200	N
17-Mar-2003	264	N
18-Mar-2003	214	N
20-Mar-2003	207	N
22-Mar-2003	204	N
24-Mar-2003	260	N
27-Mar-2003	311	N
29-Mar-2003	287	N
31-Mar-2003	264	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.

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Table 6.4 - Day Time Noise Levels for NM1(A)

Date	Measurement Time	NM1 (A), dB(A)	Exceedance (Y/N)	Type of measurement
02-Mar-2003	13:00	52.2	N	Facade
05-Mar-2003	17:15	54.0	N	Facade
	19:00	50.5	N	Facade
09-Mar-2003	14:15	52.3	N	Facade
13-Mar-2003	15:15	51.7	N	Facade
	19:00	50.7	N	Facade
16-Mar-2003	13:30	51.8	N	Facade
20-Mar-2003	17:00	53.4	N	Facade
	19:15	52.0	N	Facade
23-Mar-2003	13:45	52.5	N	Facade
27-Mar-2003	9:30	53.4	N	Facade
	19:00	51.5	N	Facade
30-Mar-2003	15:00	51.4	N	Facade
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)

6.4 Water Quality Monitoring.

Water quality in terms of pH, dissolved oxygen, turbidity, ammoniacal nitrogen, suspended solids and temperature, was carried out on eight occasions at WM1 and WM2 this reported period.

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 6.10.

Table 6.5 – Summary of Water Quality Monitoring Data

Parameters	WM1	WM2	Exceedance (Y/N) and Date of Exceedance (if any)
	Averaged (Range)	Averaged (Range)	
Temperature, °C	18.0 (15.0-21.5)	17.8 (15.5-21.0)	-
PH	7.50 (7.10-7.90)	7.40 (7.08-7.79)	N
Dissolved Oxygen, %	9.1 (6.3-12.4)	7.3 (5.6-10.7)	-
Dissolved Oxygen, mg/L	0.89 (0.60-1.28)	0.71 (0.60-0.99)	N
Turbidity, NTU	46.3 (22.5-81.7)	35.1 (18.8-73.7)	N
Suspended Solids, mg/L	90 (40-137)	69 (37-119)	N
Ammoniacal Nitrogen, mg/L	51.4 (23.8-77.3)	40.7 (24.1-60.8)	N

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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.

7.4 Site Inspections.

Four site inspections were carried out by the ET this reported period. Observations by the ET, actions by the Contractor and outcomes are summarised below. Site inspection reports are given in Appendix VII of this report.

Table 7.1 – Summary of Findings, Actions and Outcomes of Site Inspections by (ET)

Observations by ET	Actions by the Contractor	Outcome
Construction dust generated by excavations.	Contractor to apply water spray before handling the dusty materials.	Situation improved.
Stagnant water observed near site office.	Stagnant water has been removed and the area filled with soil.	No stagnant water observed.
Stockpiles of debris/ site clearance waste observed.	Contractor has removed some of the stockpiles.	Situation is improving.

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An audit by the Independent Environmental Checker (IEC) was conducted on 26th March 2003. Major observations are summarised in the following table.

Table 7.2 – Summary of Findings, Actions and Outcomes of Site Inspection by (IEC)

Observations by IEC	Actions by the Contractor	Outcome
Road running along site boundary was muddy, especially outside of the site office.	Contractor has arranged for occasional cleaning.	Situation improved.
Area outside of the wheel washing facilities was muddy. Not all vehicles found to be using the wheel washing facilities.	Contractor has arranged for occasional cleaning. Notice displayed to remind the drivers to use the wheel washing facilities.	Situation improved.
One site exit did not have wheel washing facilities provided.	All vehicles were diverted to use one site exit as far as practicable.	Situation improved.
The haul road was muddy and was not paved / protected by coarse stone ballast.	Muddy haul road compacted or protected by aggregate.	Situation improved.

Site inspection was carried out by Environmental Protection Department on 28th March 2003. The major observations were summarised in the following table.

Table 7.3 – Summary of Findings, Actions and Outcomes of Site Inspection by EPD.

Observations by EPD	Actions by the Contractor	Outcome
Main haul road was dusty	The contractor has arranged the water browser to dampen the haul road more frequently.	The haul road is wet.
Vehicle left the site without wheel washing.	The contractor has arranged security guard to divert all the vehicles passing through the wheel wash bay.	Situation improved.

8. WASTE MANAGEMENT.

A total of 657 tonnes non-inert C&D waste was generated works in this month. 493.6 tonnes was disposed at NENT Landfill and 163.4 tonnes was disposed at WENT Landfill Sites.

9. COMPLAINTS, NOTIFICATIONS OF SUMMONSES AND SUCCESSFUL PROSECUTIONS.

No complaints received this month. Complaint Log is attached in Appendix IX. Cumulative statistics on complaints, notifications of summonses and successful prosecutions are attached in Appendix X.

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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 2003

Works Activities	Predicted Impacts	Proposed Mitigation Measures
Excavation of Portion B	· Noise · Dust	· Plant that may be in intermittent use to be shut down between work periods or shall be throttled down to a minimum. · Dampen the excavation area. · Stockpiles shall be covered or removed on a regular basis.
Construction of Interim Flood Relief Channel.	· Dust	· Dusty materials to be dampened prior to handling.
Installation of sheetpiles	· Noise	· Avoid concurrent noisy operations.
Pre-drill for Border Road Bridge Pile.	· Water	· Waste water generated shall be reused as far as practicable.
Earth work at Portion A and B.	· Dust	· Dusty materials shall be dampened prior to handling.
Installation of Band Drains.	· Noise	· Avoid concurrent noisy operations.
Construction of Stone column	· Dust · Water	· Dusty materials to be dampened prior to handling. · Waste water generated shall be reused as far as practicable.

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 also found to be acceptable this reported period with no exceedances to any set Action or Limit levels.

Figures

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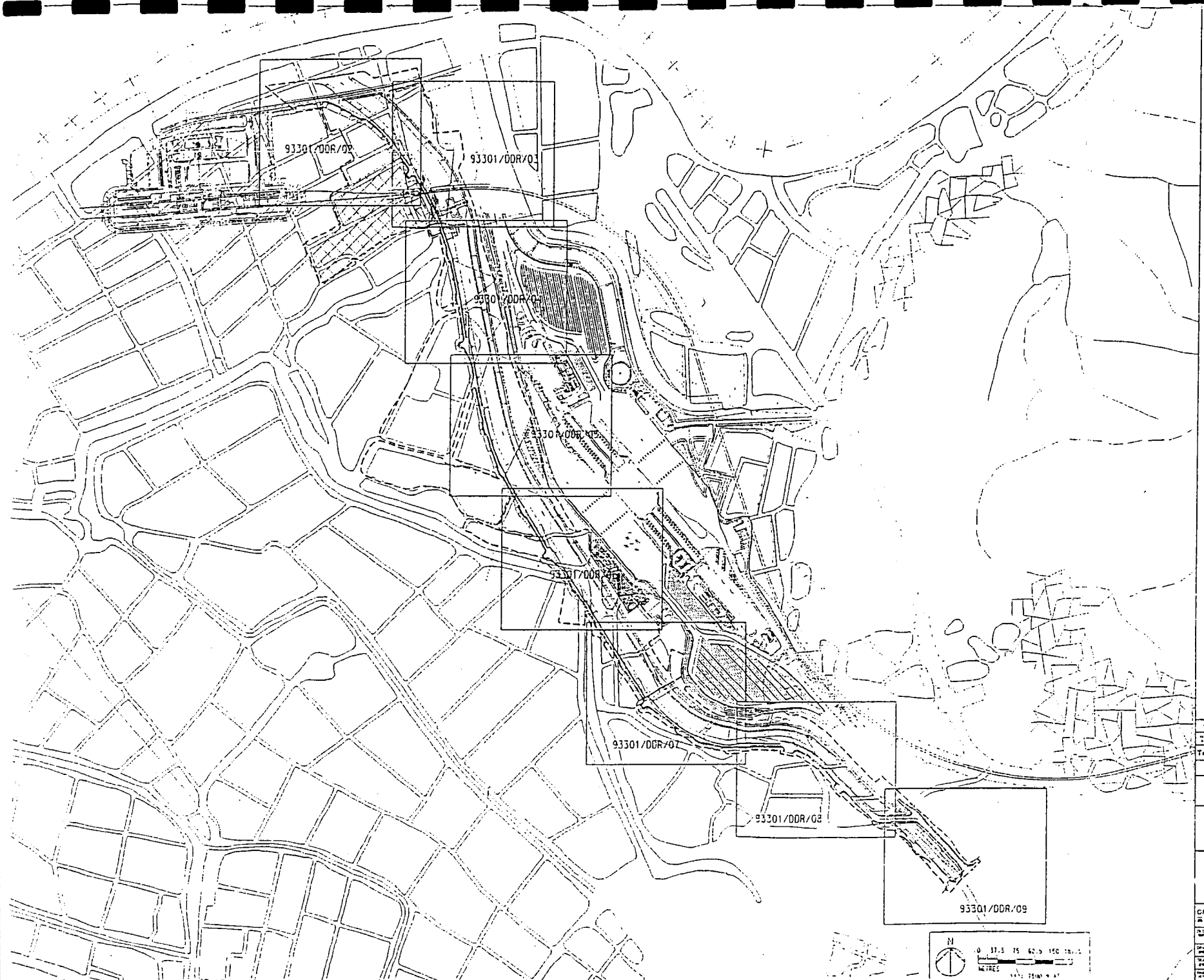


NOTES

LEGEND

---- SITE BOUNDARY

TENDER DRAWING

Territory Development Department

NT NORTH DEVELOPMENT OFFICE

CONSTRUCTION OF THE SAI TH EASTERN MAIN DRAINAGE CHANNEL

GENERAL LAYOUT PLAN

Figure 2.1

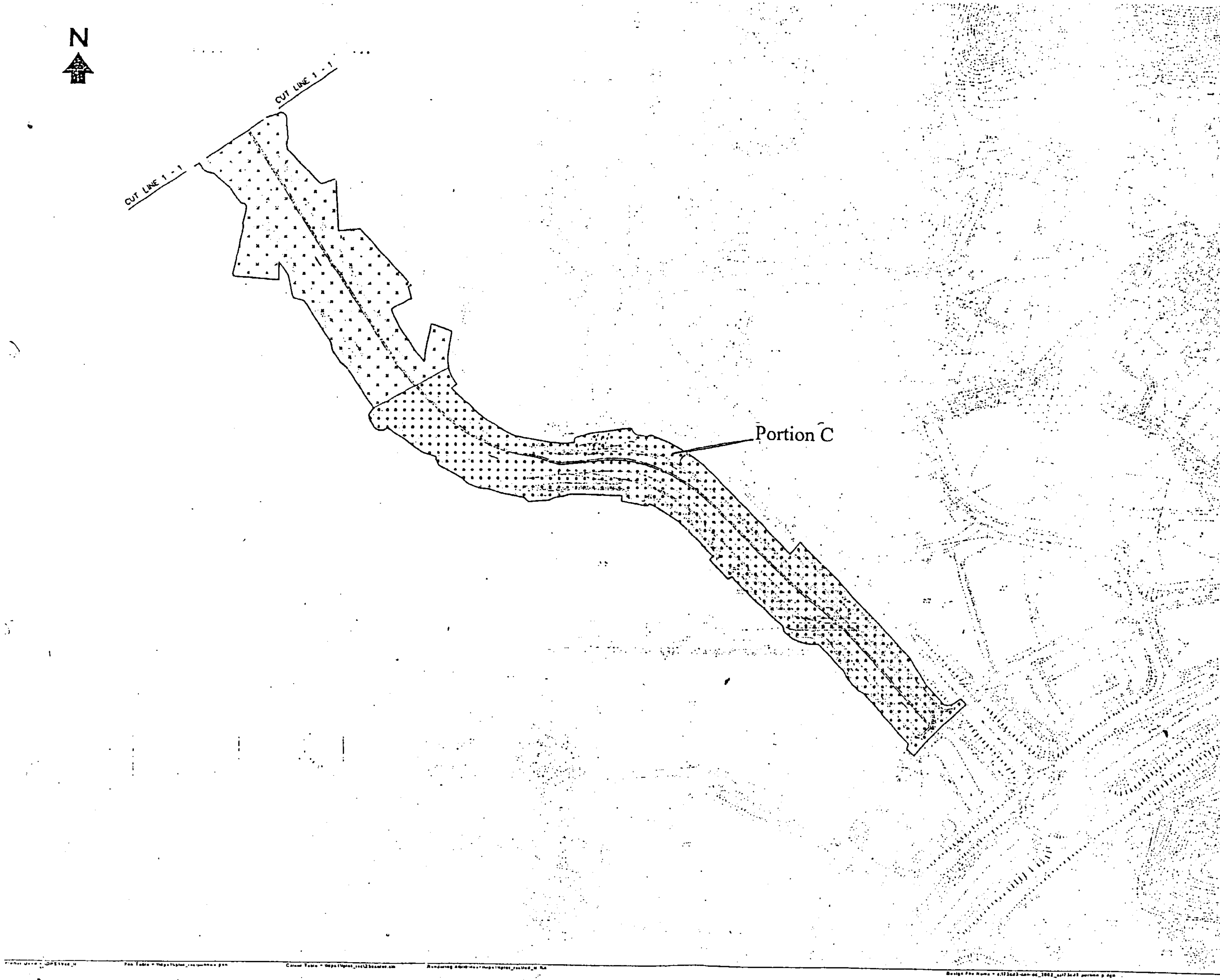
DRG.NO 93301/DDR/01

DEC 2001/09

EY

1 : 3500

TENDER DRAWING



NOTES:

LEGENDS:

AREA SUBJECT TO DELAYED POSSESSION

FOR TENDER PURPOSES ONLY

No	date	description	initial
REVISION			

	signature	name	date
designed			24.3.02
drawn			25.3.02
checked			25.4.02
vetted			27.3.02
approved		Chief Engineer	28.3.02

contract no. DC / 2001 / 09

file no. DP / 8 / 7073CD

project no. 7073 CD

contract

CONSTRUCTION OF THE SAN TIN EASTERN MAIN DRAINAGE CHANNEL

drawing title

Figure 2.2

PORTIONING OF SITE

SHEET 1 OF 21

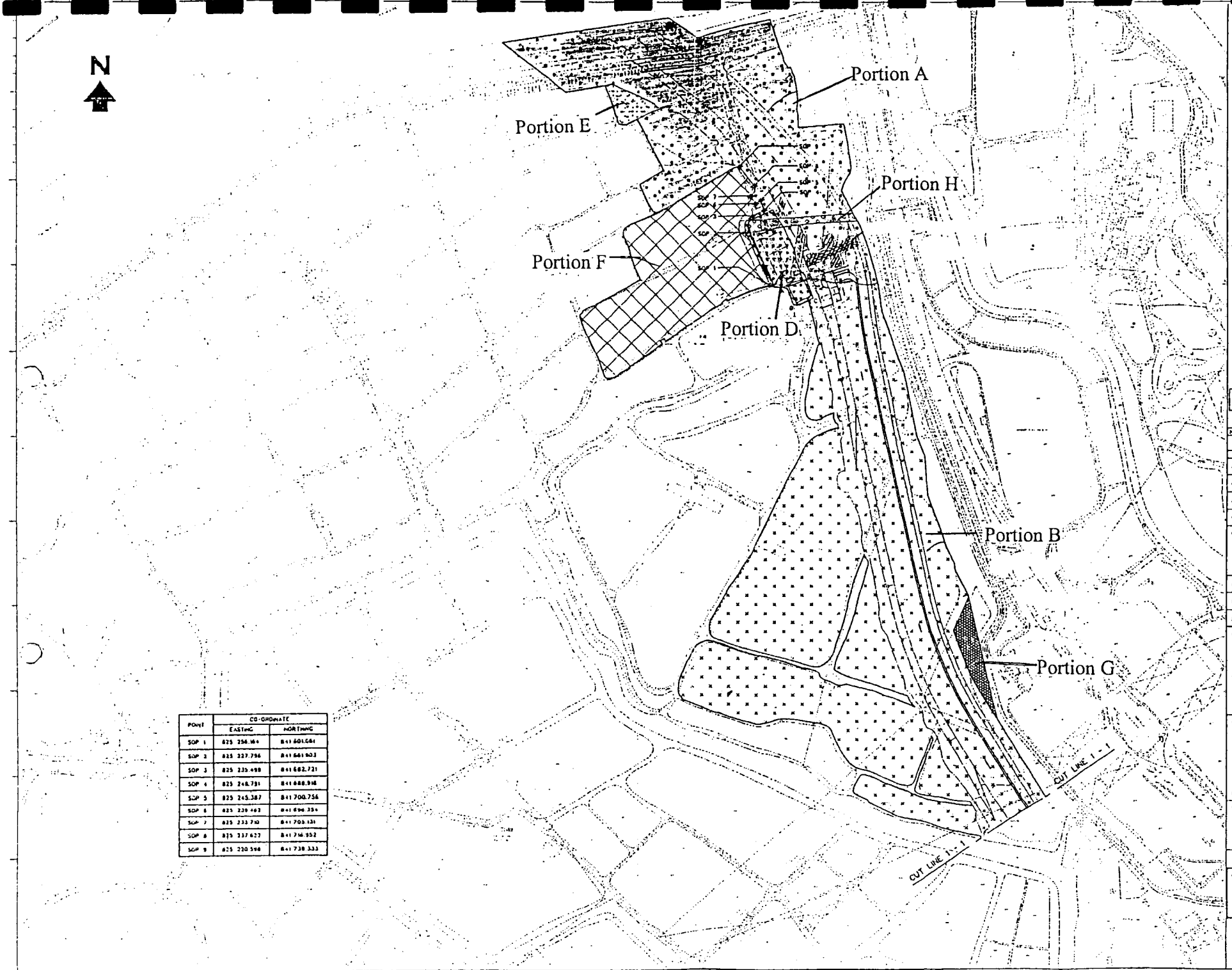
drawing no. DDN/73CD/3028

scale 1 : 2000 OR AS SHOWN

office

DRAINAGE PROJECTS DIVISION

DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION



POINT	CO-ORDINATE	
	EASTING	NORTHING
SOP 1	825 256.164	841 601.681
SOP 2	825 327.796	841 661.803
SOP 3	825 235.498	841 682.721
SOP 4	825 248.791	841 888.918
SOP 5	825 245.387	841 700.756
SOP 6	825 239.462	841 696.354
SOP 7	825 233.710	841 705.131
SOP 8	825 337.627	841 716.952
SOP 9	825 220.598	841 738.333

NOTES:

1. FOR GENERAL NOTES AND LEGENDS REFER TO DRG. No. DDN/73CD/3028

FOR TENDER PURPOSES ONLY

No.	date	description	initial
REVISION			

	name	date
designed	K.C. IP	24.1.02
drawn	C.K. LI	25.1.02
checked	K.S. KWONG	25.1.02
vetted	[illegible]	27.3.02

approved

Chief Engineer 28.3.02 Date

contract no. DC / 2001 / 09

file no. DP / 8 / 7073CD

project no. 7073 CD

contract

CONSTRUCTION OF THE SAN TIN EASTERN MAIN DRAINAGE CHANNEL

drawing title

Figure 2.2 a

PORTIONING OF SITE

SHEET 2 OF 21

drawing no. DDN/73CD/3029

scale 1 : 2000 OR AS SHOWN

office

DRAINAGE PROJECTS DIVISION

DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

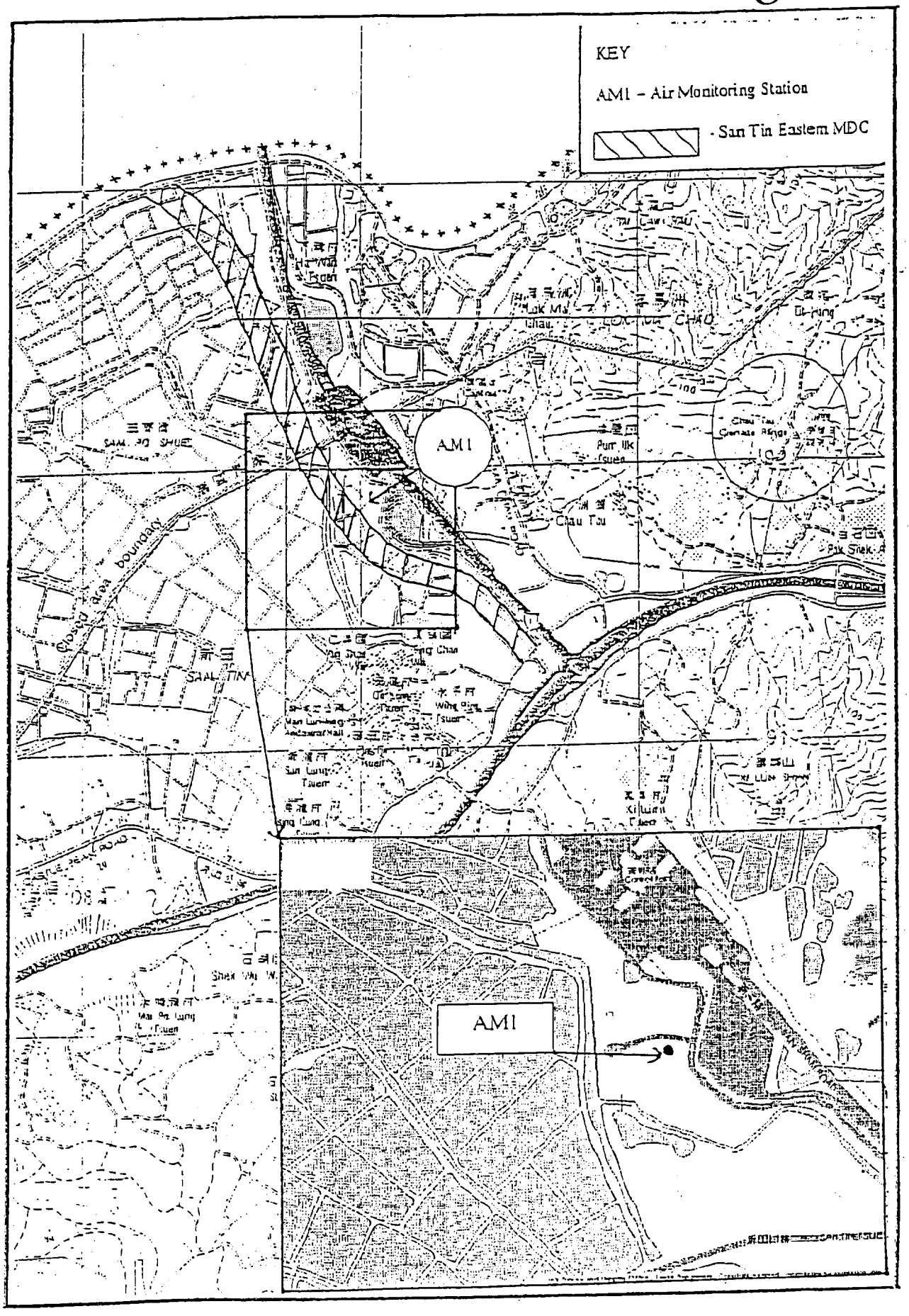


Figure 4.1 - Air Monitoring Station

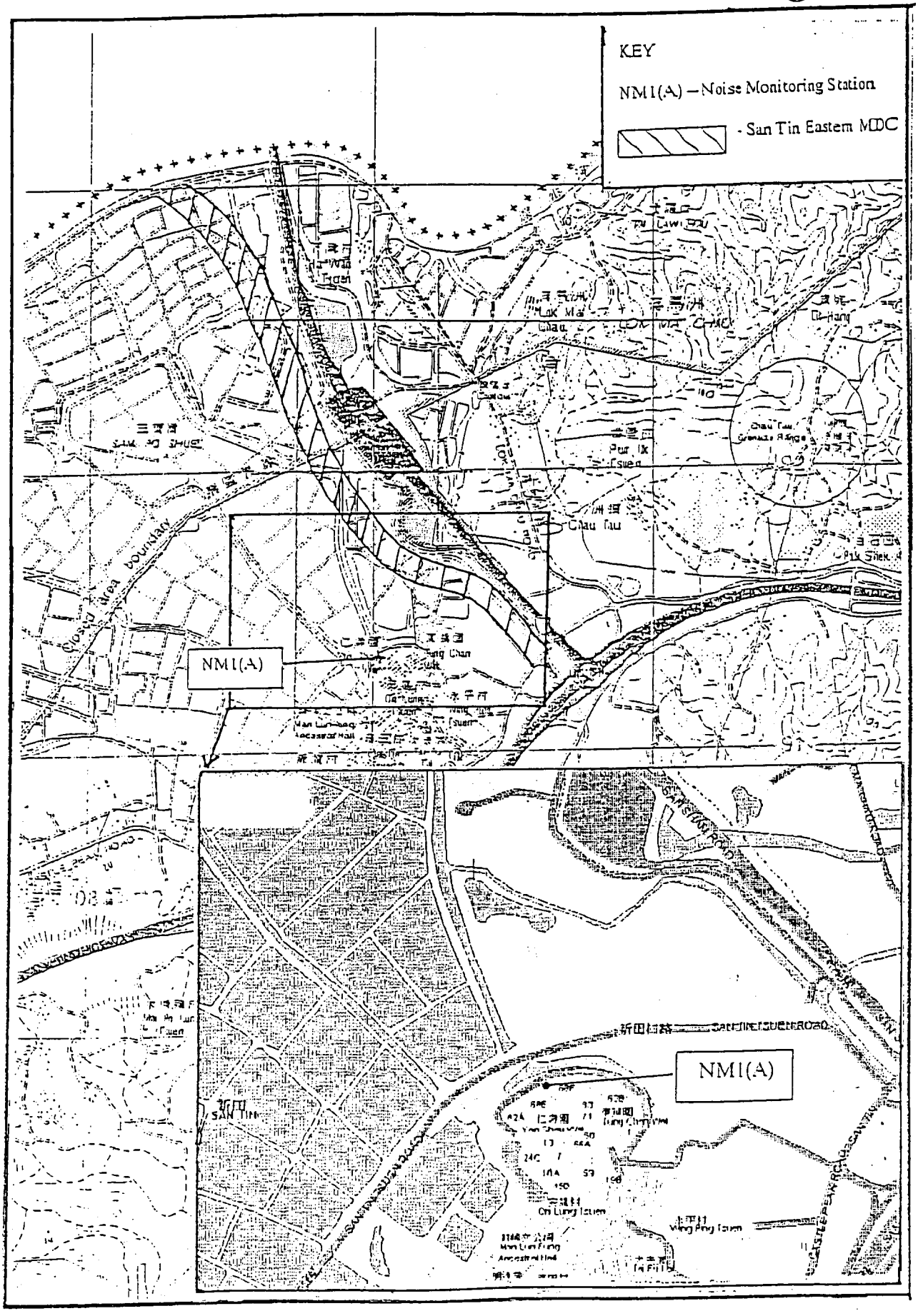


Figure 4.2 - Noise Monitoring Station

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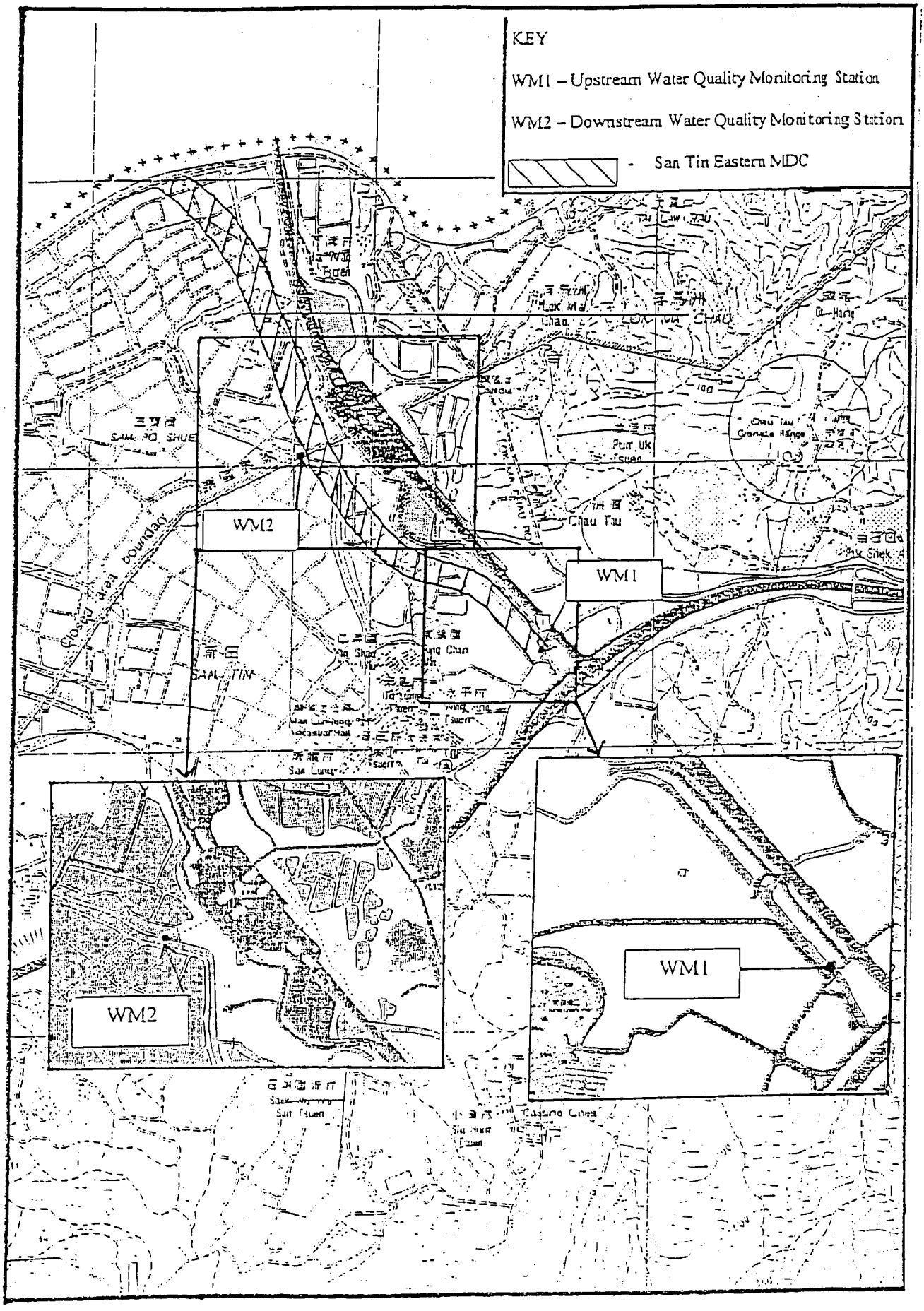

Figure 4.3 - Water Monitoring Stations

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Figure 6.1 - Graphical Plot of 24-hr TSP Levels

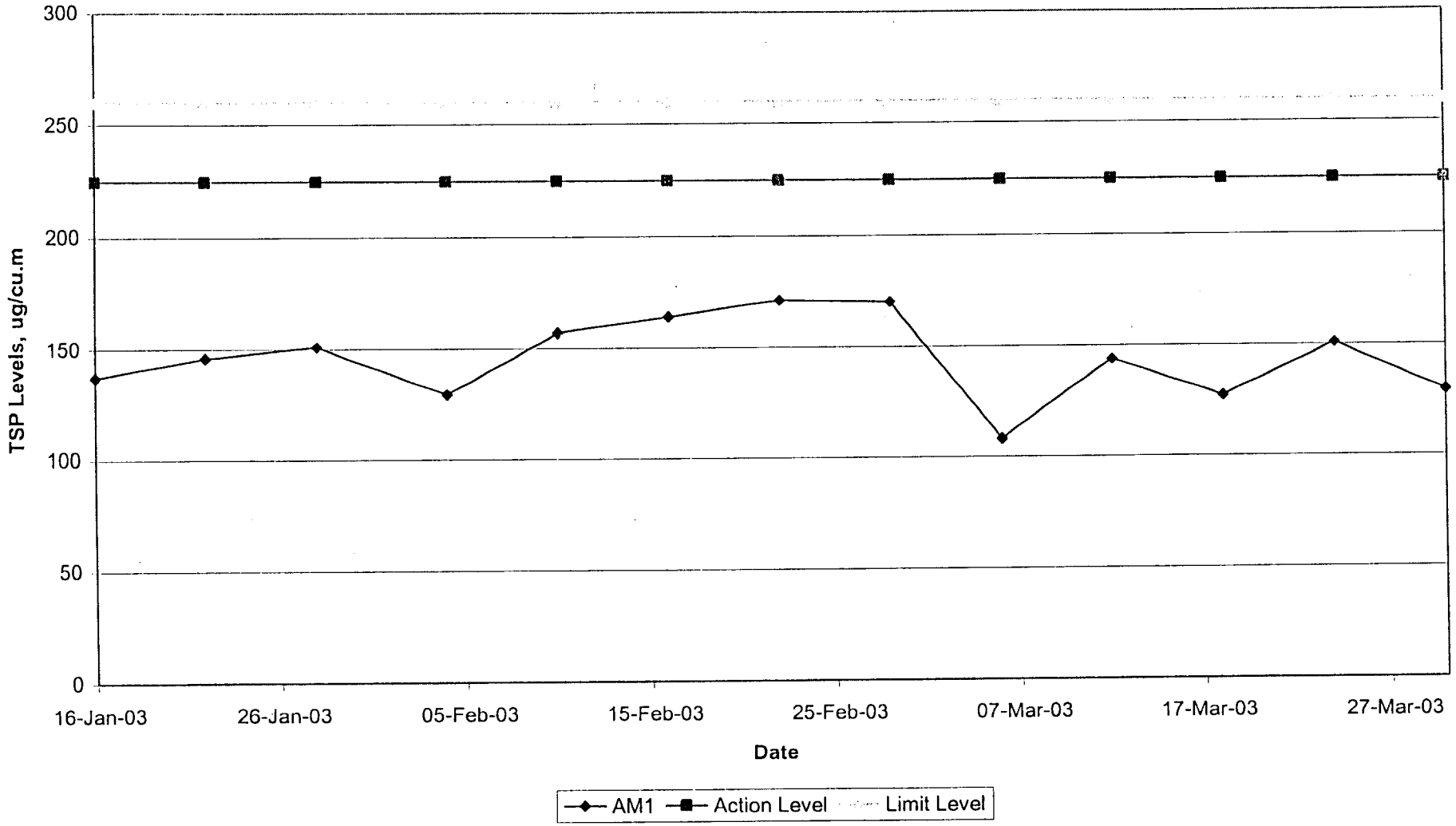

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Figure 6.2 - Graphical Plot of 1-hr TSP Levels

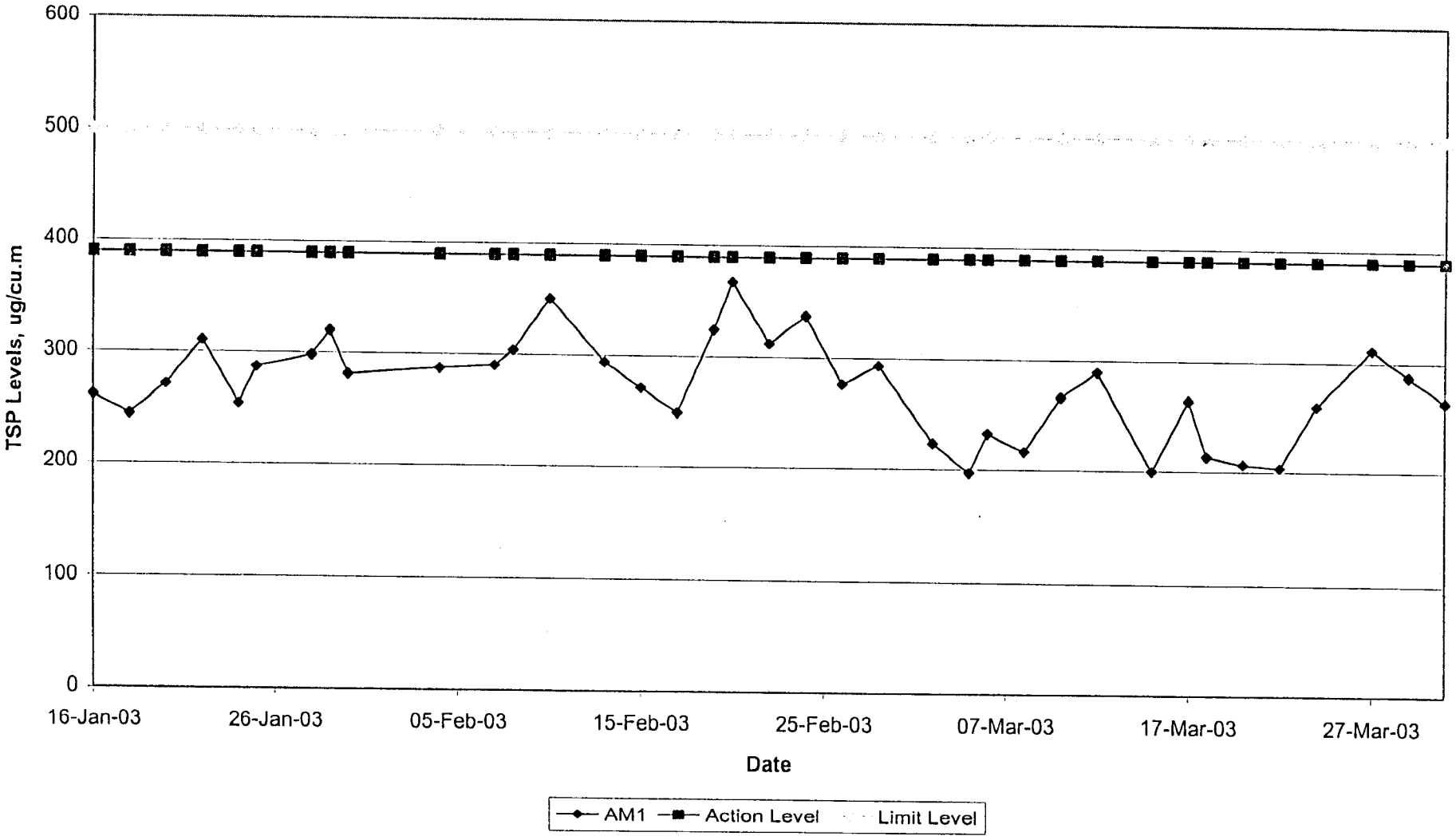

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Figure 6.3 - Graphical Plot of Noise Level

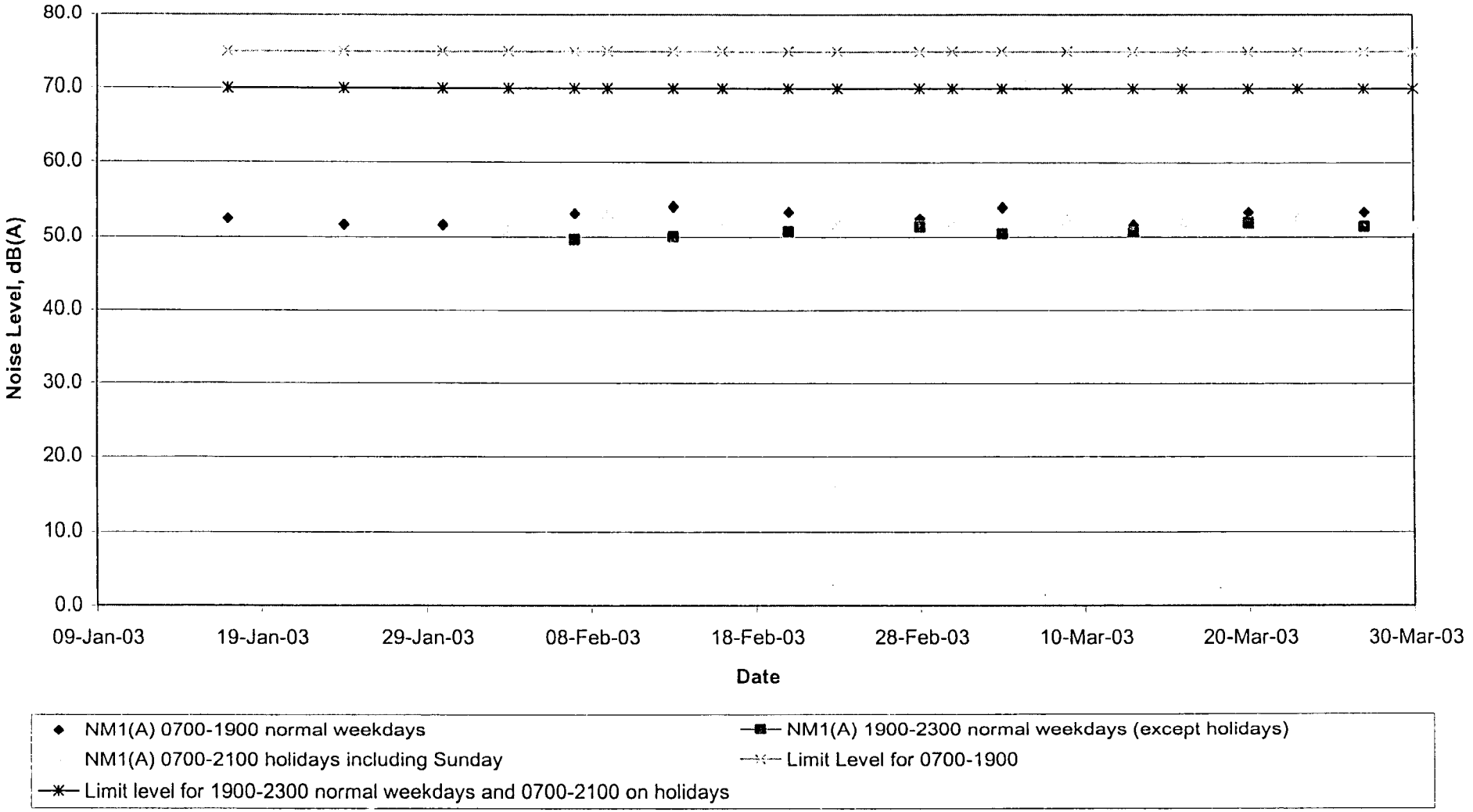

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Figure 6.4 - Graphical Plot for Temperature

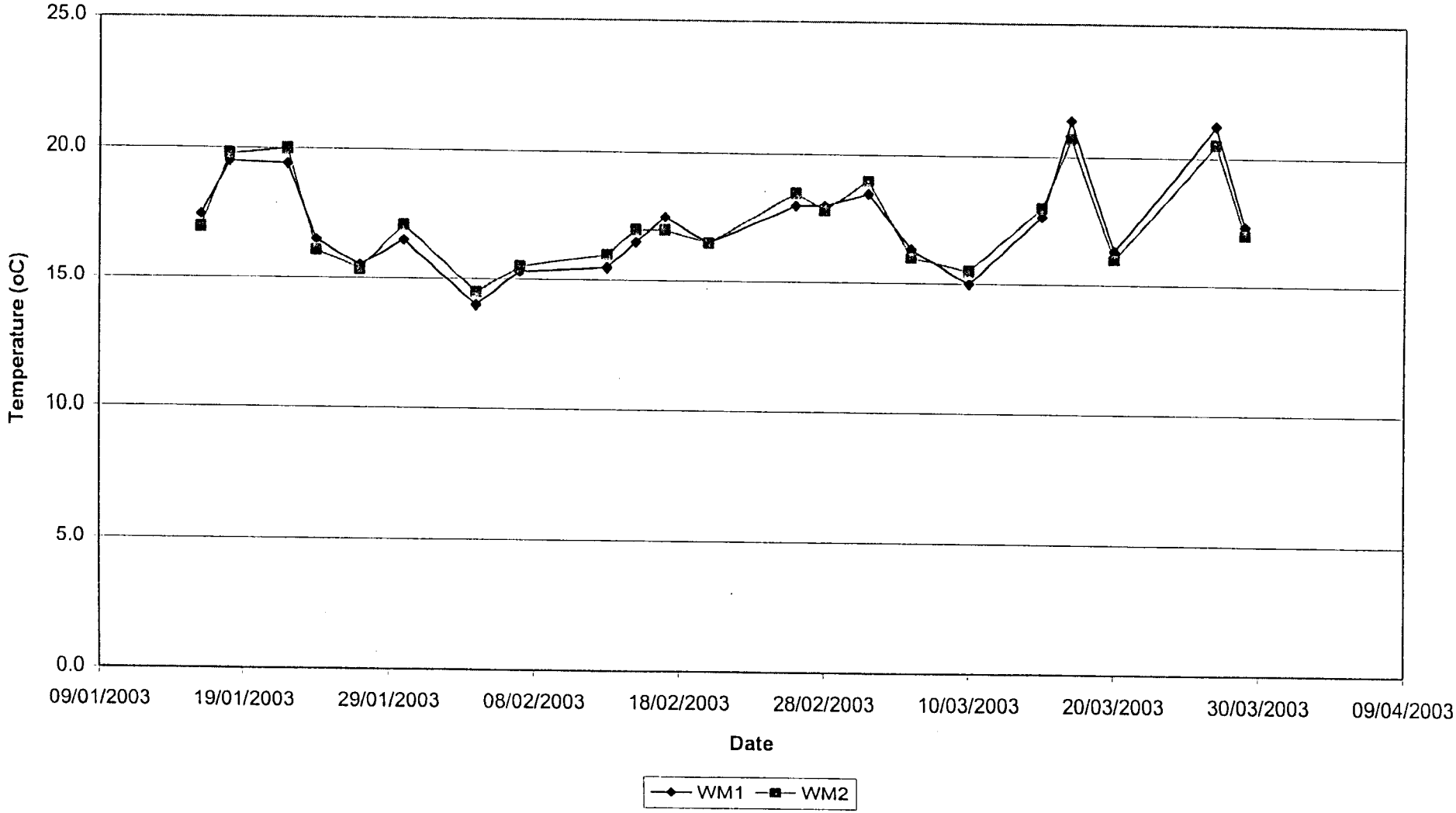

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Figure 6.5 - Graphical Plot for Dissoloved Oxygen (mg/L)

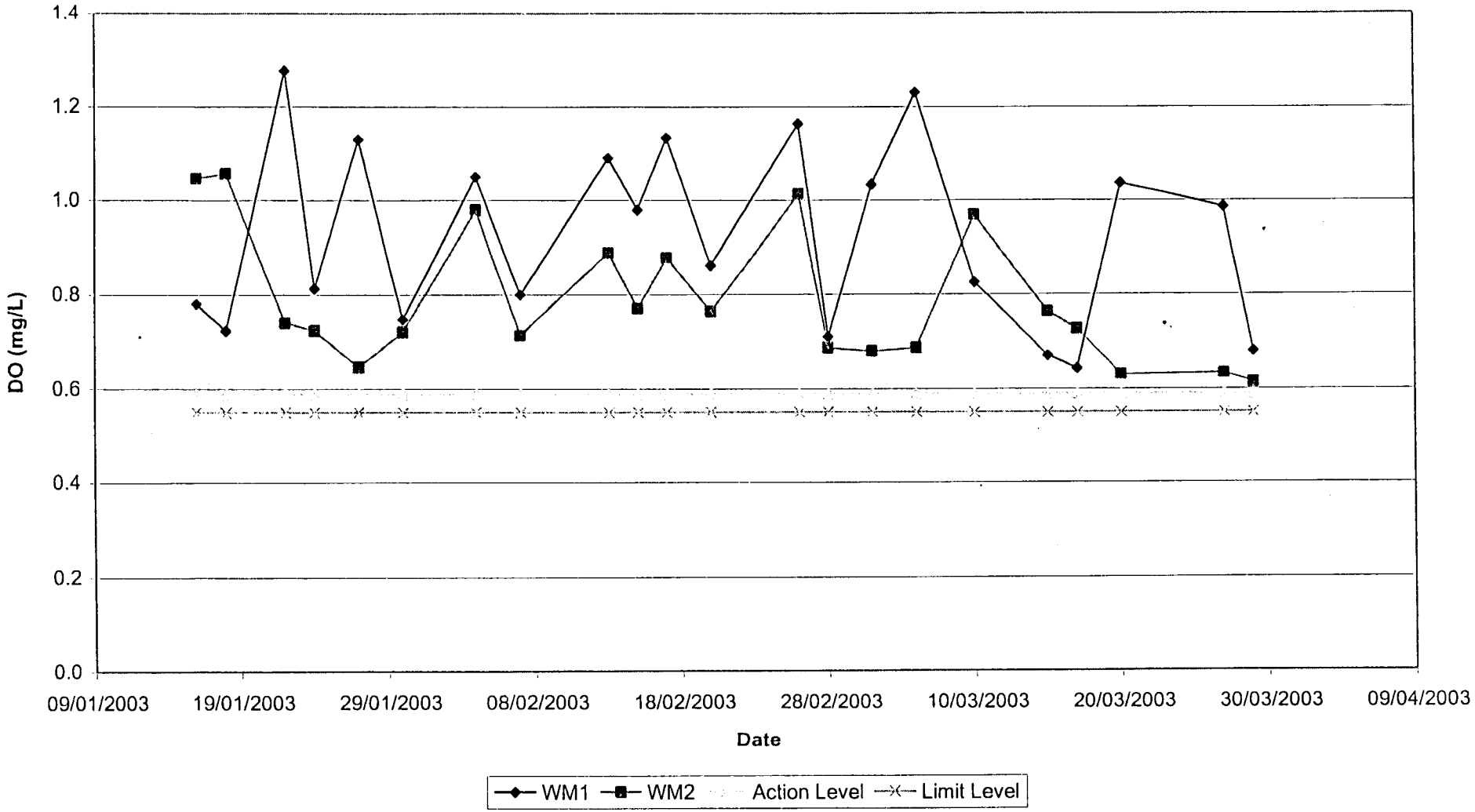

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Figure 6.6 - Graphical Plot for Dissolved Oxygen (%)

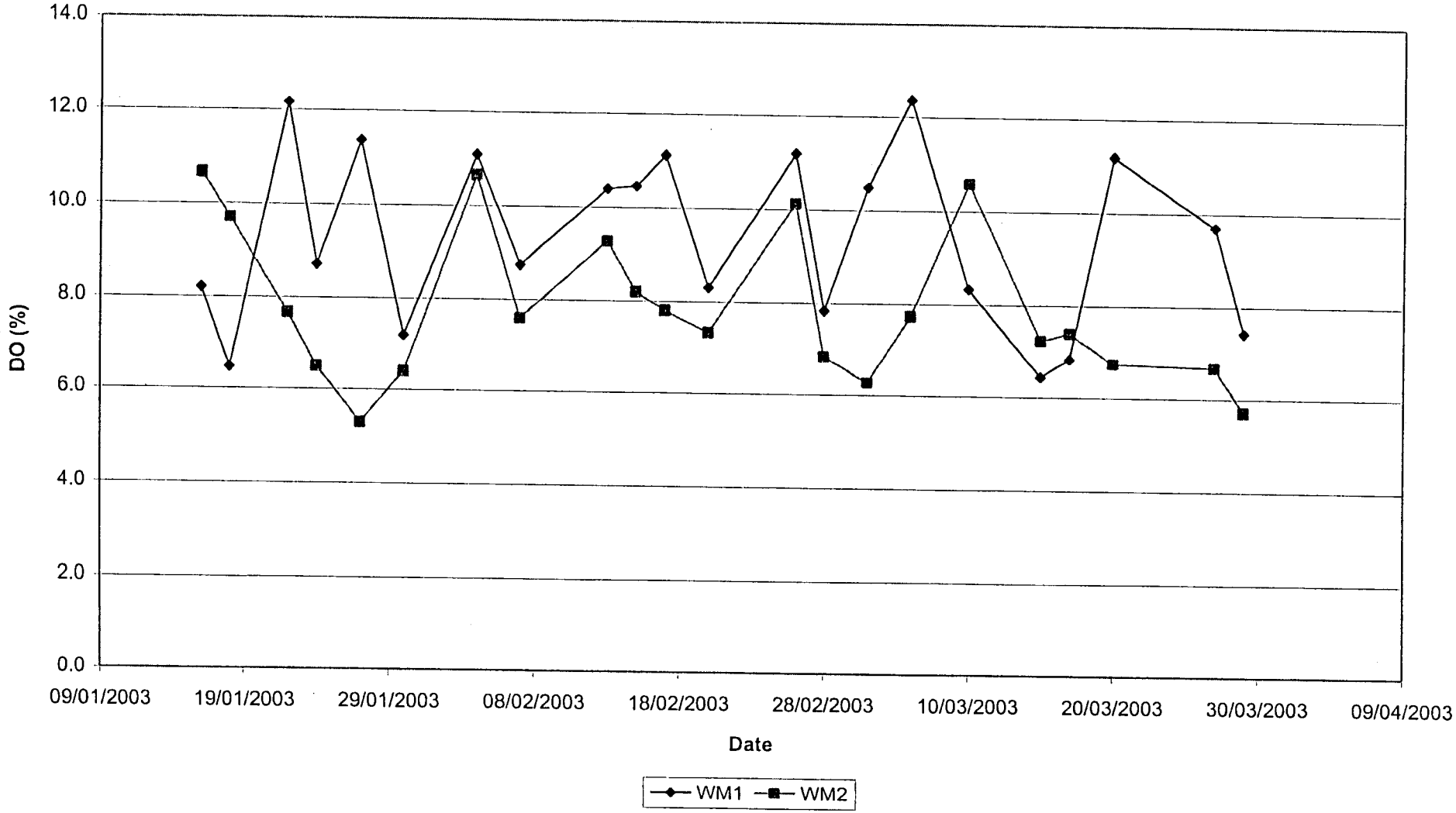

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Figure 6.7 - Graphical Plot for pH

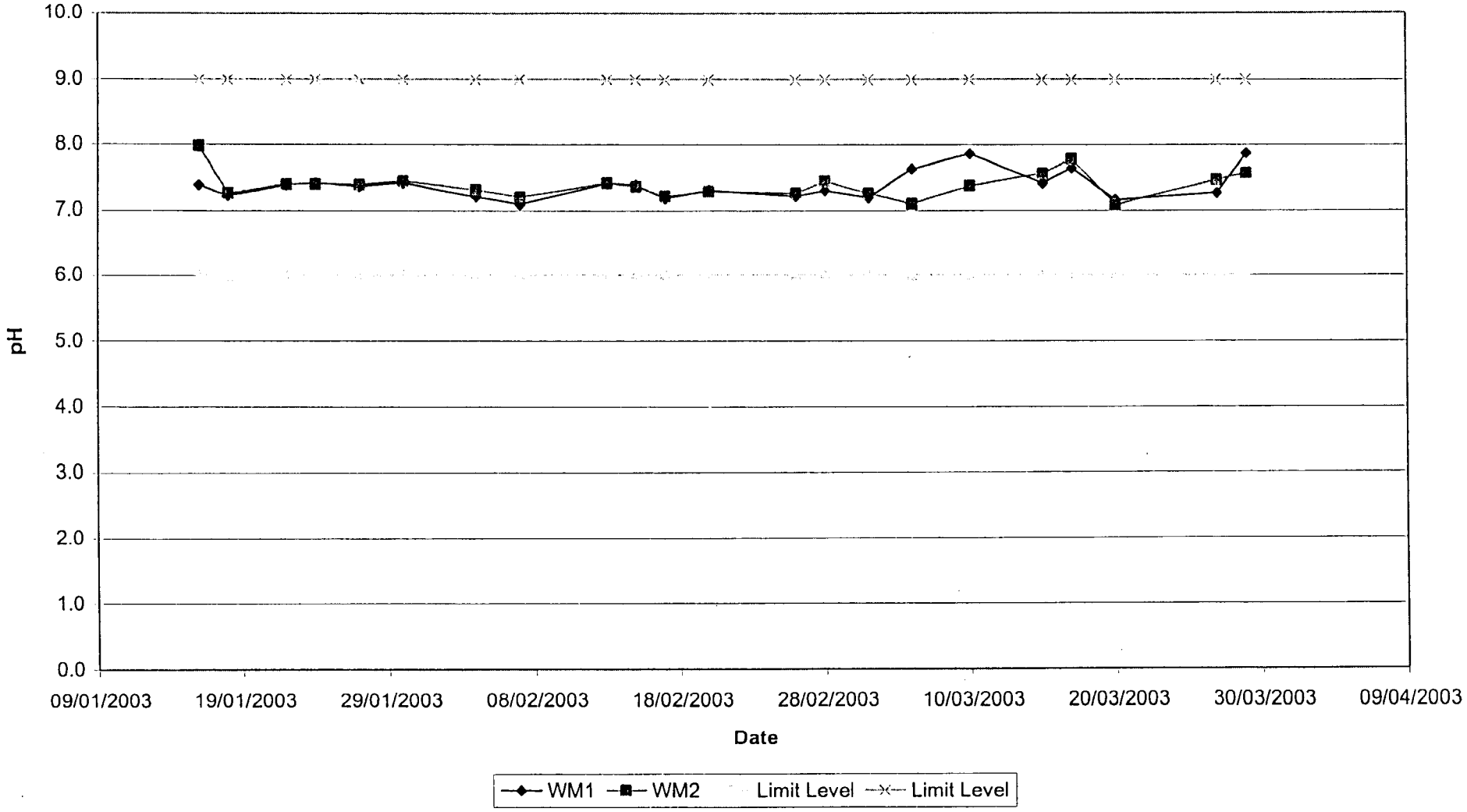

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Figure 6.8 - Graphical Plot of Turbidity

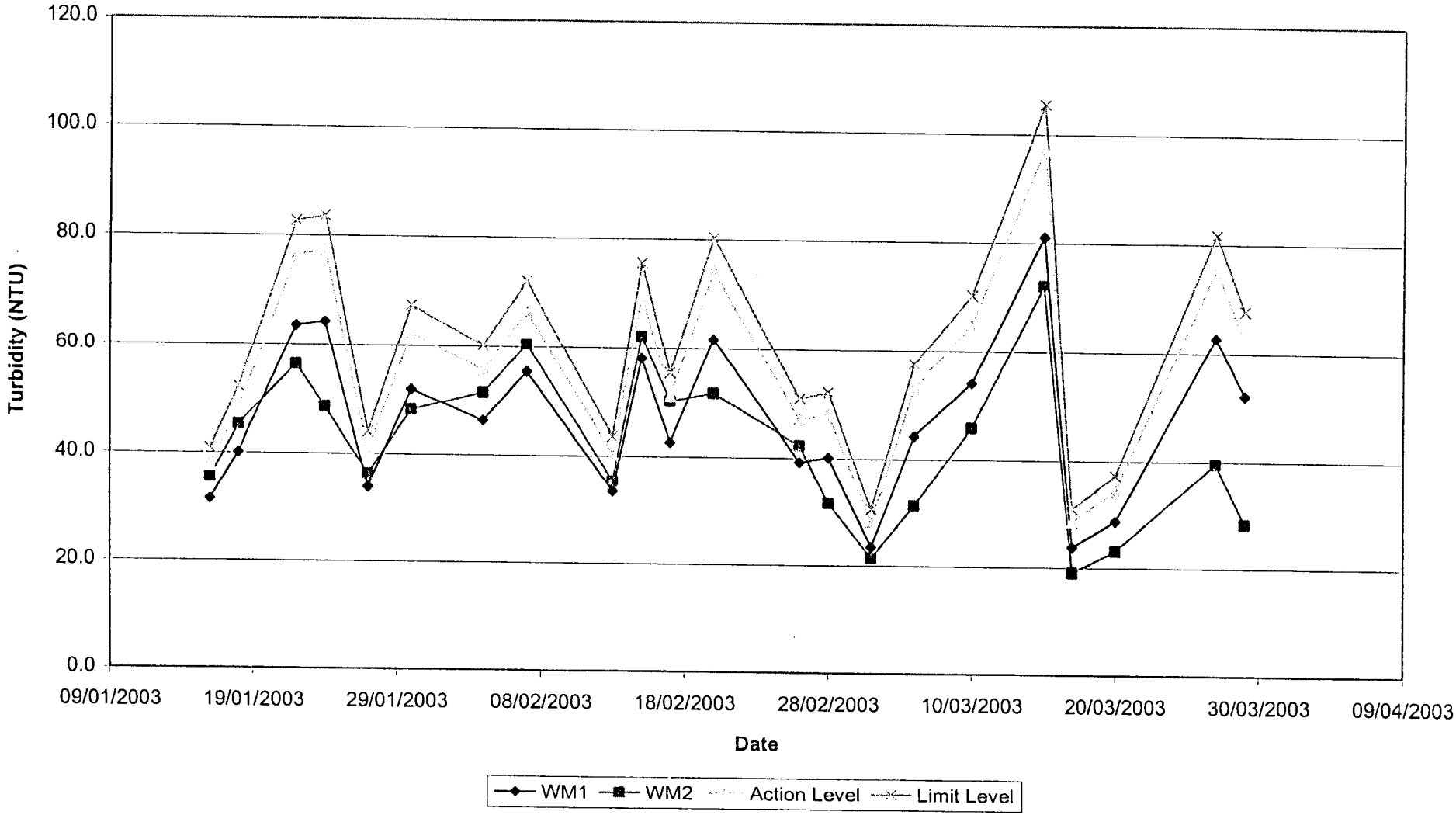

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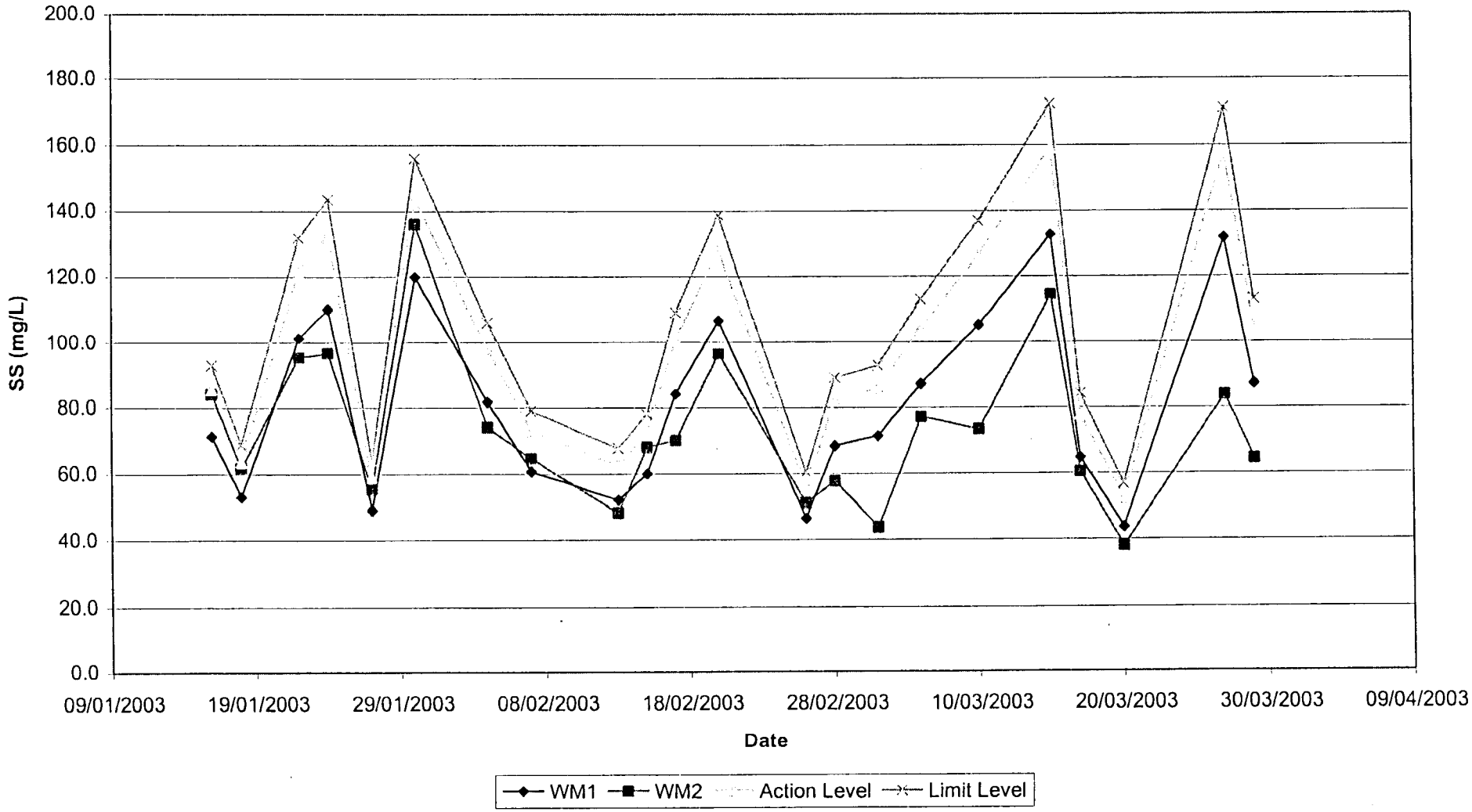
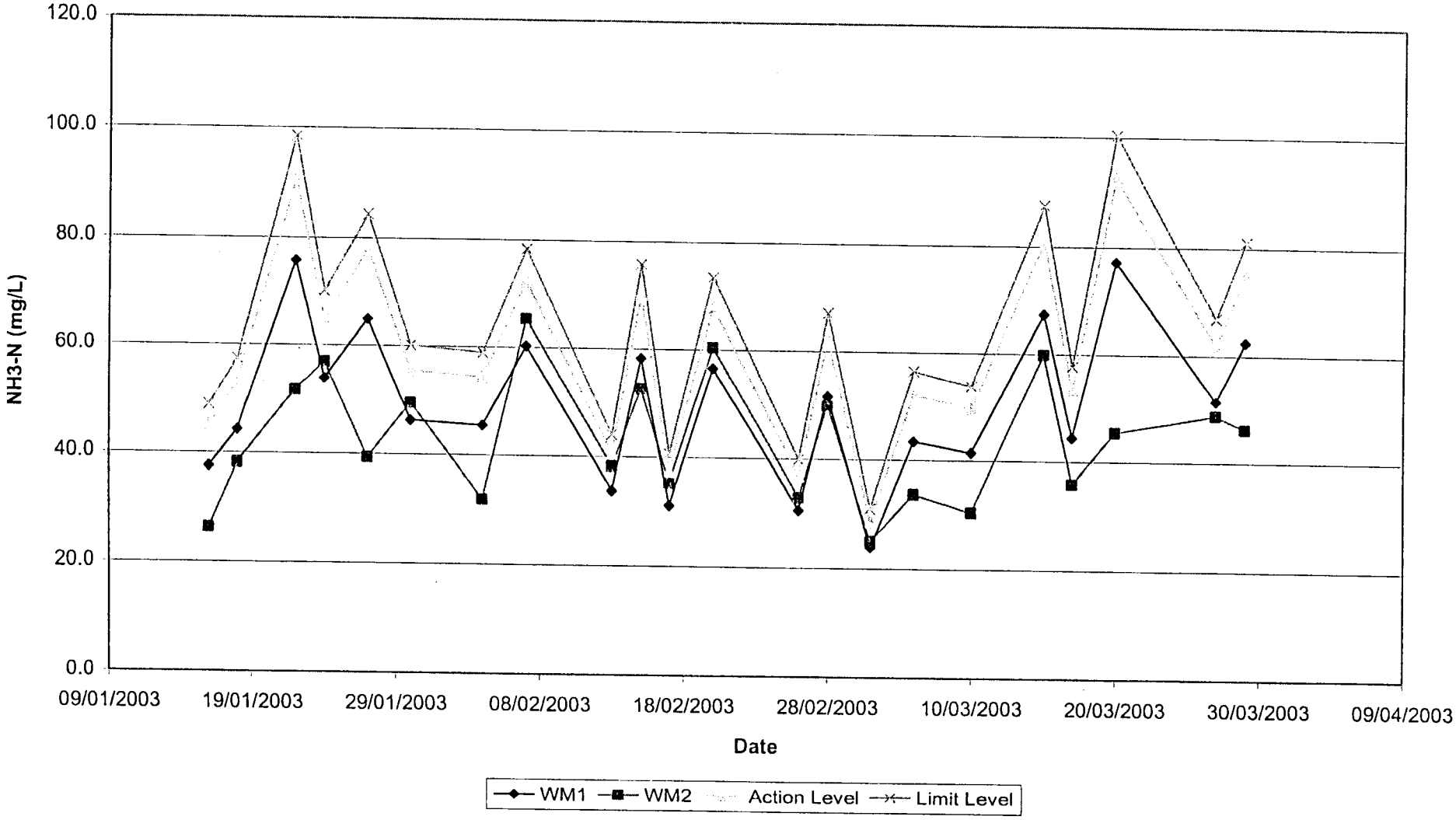
Figure 6.9 - Graphical Plot for Suspended Solids



G/F., 1/F. & 2/F., Pin Wu Industrial Building, 13 On Chuan Street, Fanling, New Territories, HONG KONG. Tel: 852-2682 1203. Fax: 852-2682 0046. E-mail address: stanger@stanger.com.hk

Figure 6.10 - Graphical Plot of Ammoniacal Nitrogen



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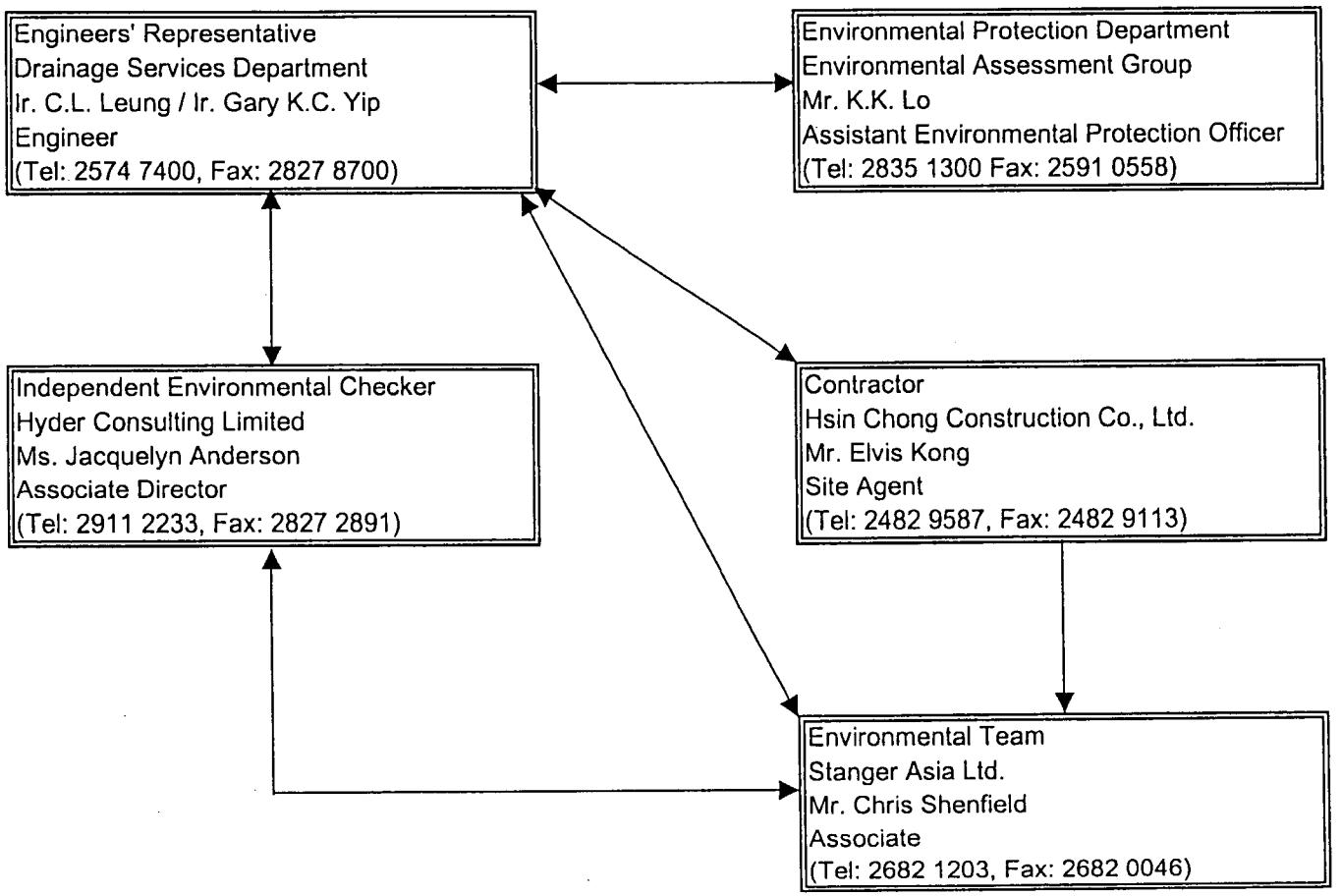
Appendix I

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/2001/19



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

SOMP ENV062: CALIBRATION RECORD OF TURBIDIMETER

Date of Calibration: 28/02/2003

Due Date of Next Calibration: 28/05/2003

Equipment No.: EM 860

Manufacturer: HACH

Model: 2100P

Serial No.: 930300002705

Calibration No.: 654/03

CERTIFIED TRUE COPY

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

Turbidimeter Calibration standard (HACH): No.1: 20 NTU

No.2: 100 NTU

No.3: 800 NTU

Stock Calibration standard No.: 681

Three-point calibration accepted: (Y) / N

Stock Calibration checking standards No. QCS 709

Turbidity value - Checking standards (NTU)		
Actual value	Measured value	Accepted*: Y/N
0	0.01	Y
5	5.09	Y
10	10.3	Y
50	51.5	Y
100	101	Y
400	409	Y

*Allowing Deviation: +/- 10%

APPROVED FOR USE BY

POSITION

Env. Scientist

Tested by: _____ Checked by: _____

Stanger Asia

SOMP ENV069: CALIBRATION RECORD OF PORTABLE pH METER

Calibration No.: 289/03

Equipment No.: EM3089

Serial No.: 011906

Date of Calibration: 18/12/2002

Due Date of Next Calibration: 18/03/2003

Calibration Buffers No.: No. 622 : pH 7.00, No. 624 : pH 11.00

Two Point Calibration accepted (Y) / N

Calibration Checking Standards No.:

No.QCS700: pH 4.00, No.QCS701: pH 7.42, No.QCS702: pH 10.01

Volumetric glassware employed: V12, V82, V83

Calibration Check of the pH meter	
Calibration Check Solutions, pH at 25°C	pH Meter reading, pH at 25°C
4.00	3.98
7.42	7.38
10.01	9.99
Allowing deviation : ± 10%	

Tested by : _____ Checked By : _____

Stanger Asia

SOMP ENV069: CALIBRATION RECORD OF PORTABLE pH METER

Equipment No.: EM3089

Serial No.: 011906

Date of Calibration: 18/03/2003

Due Date of Next Calibration: 18/06/2003

Calibration Buffers No.: No. 622 : pH 7.00, No. 624 : pH 11.00

Two Point Calibration accepted: (Y) / N

Calibration Checking Standards No.:

No.QCS719: pH 4.00, No.QCS720: pH 7.42, No.QCS721: pH 10.01

Volumetric glassware employed: V12, V13, V83

Calibration Check of the pH meter	
Calibration Check Solutions, pH at 25°C	pH Meter reading, pH at 25°C
4.00	3.97
7.42	7.36
10.01	9.98
Allowing deviation : ± 10%	

Tested by : _____ Checked By : _____

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Stanger Asia

SOMP ENV064 : CALIBRATION RECORD OF DISSOLVED OXYGEN METER

Calibration No.: 053/03

Dissolved Oxygen Meter Equipment No.: EM 4277

Dissolved Oxygen Serial No.: 01D0624

Dissolved Oxygen Probe Serial No.: 950825

Date of Calibration.: 28-02-2003

Due Date of Next Calibration.: 28-05-2003

Molarity of sodium thiosulphate solution: 0.0252M

Potassium Bi-iodate No.: 77

CERTIFIED TRUE COPY

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

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	20.10	20.10
Standard 3	0.00	20.10	20.10
		Average Value	20.10

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	0.40	0.40	0.40	0.39
B	0.00	4.15	4.15	4.17	4.10
C	0.00	5.60	5.60	5.63	5.60
D	0.00	8.80	8.80	8.84	8.80
Allowing deviation : ± 10%					

Tested by : _____ Checked By : _____

APPROVED FOR USE BY
POSITION

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

Calibration No. 3501/02

Equipment No. EM 3694

Serial No. 00F0285AA

Date of Calibration: 20/12/2002

Due Date of Next Calibration: 20/03/2003

Stock Calibration Standard Potassium Chloride No. ES 414

Stock Calibration Check Potassium Chloride No. 71

Volumetric glassware employed: V15, V23, V24, V68, V69, V103

Calibration Check of the Salinity, Conductivity and Temperature System	
Calibration Check Solutions, ppt	Meter reading, ppt
0.0	0.0
10.0	10.1
20.0	20.3
30.0	30.8
40.0	40.5
Allowing deviation : ± 10%	

Tested by : _____ Checked By : _____

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Stanger Asia

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

Equipment No. EM 3694

Serial No. 00F0285AA

Date of Calibration: 20/03/2003

Due Date of Next Calibration: 20/06/2003

Stock Calibration Standard Potassium Chloride No. ES 414

Stock Calibration Check Potassium Chloride No. 71

Volumetric glassware employed: V16, V22, V24, V68, V69, V99

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	19.8
30.0	30.2
40.0	41.5
Allowing deviation : ± 10%	

Tested by : _____ Checked By : _____

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CALIBRATION OF TEMPERATURE MEASURING DEVICE

(Full Calibration LIG Devices - without ES correction)

Equipment No.	:	ET2361	Calibration No.	:	1520/00
Manufacturer	:	Brannan	Date Calibrated	:	1-Jun-00
Serial No.	:	N. A.	Department	:	Environmental Lab
Model or Type	:	L.I.G. Thermometer	Date Next Calibration	:	1-Dec-00 (One Pt.)
Immersion Depth (mm)	:	76mm		:	1-Jun-03 (Full Cal.)

"True"** Temp. °C	Mean Device Reading, °C 1	2	3	4	Ref. Used	
23.09	23.0				RF2358	
28.11	28.0				RF2358	
34.14	34.0				RF2358	
c	0.000					← the intercept of the linear fit
m	1.004					← the gradient of the linear fit
Ut	0.15					← the calibration uncertainty. (the uncertainty if linear correction applied).
Ut'	0.31					← the limit of performance. (the error & uncertainty readings taken as read)

CERTIFIED TRUE COPY

...SCHEMBRI/Y.Y. PANG
... Asia Limited

Checked using: RF2358 (Liquid-In-Glass Thermometer)
Ref. Device was read to the nearest 0.05°C by eye

Method: Procedure CAL004

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POSITION Lab. Supervisor

Note:

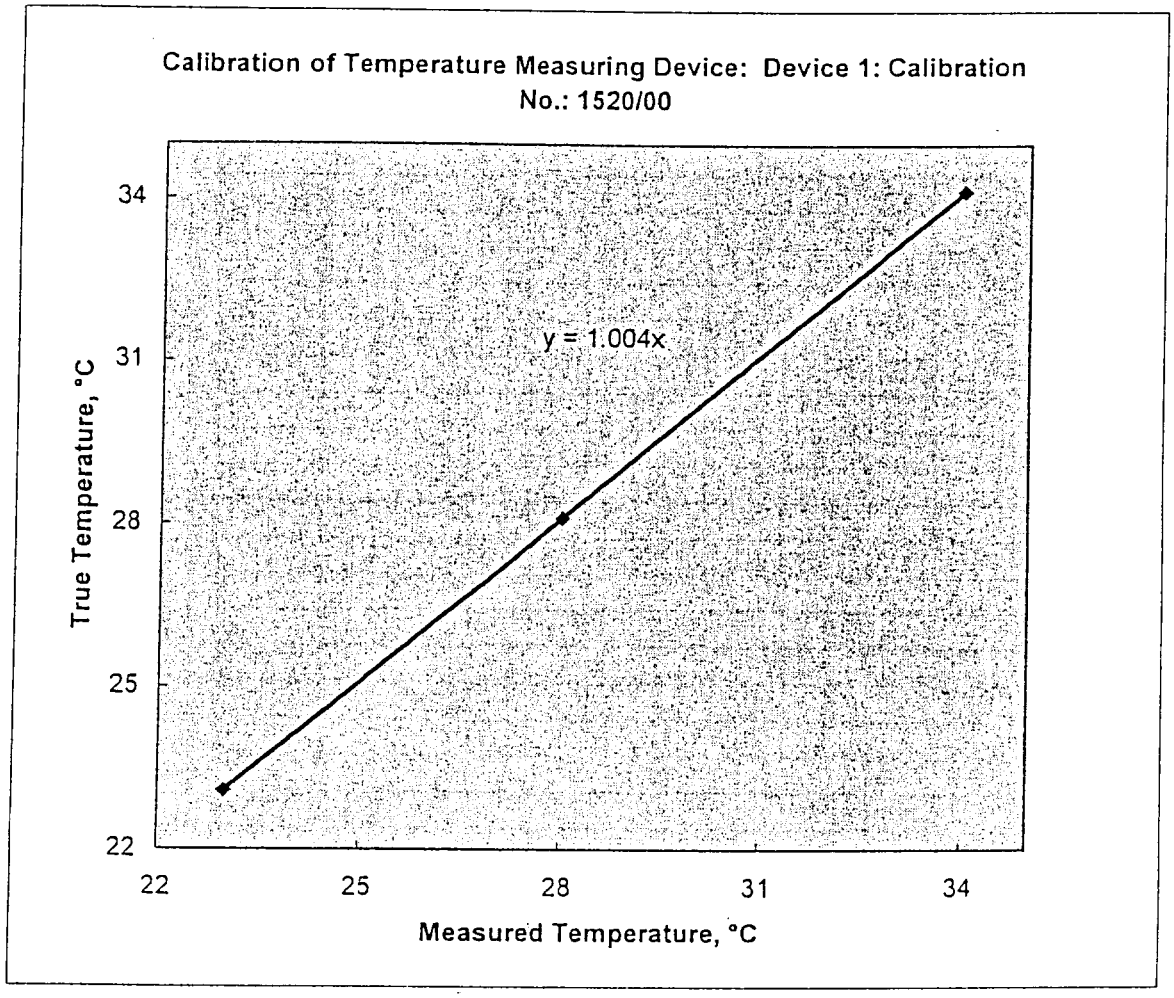
i) If both Ut and Ut' are > acceptance criteria the device needs servicing and should not be used.
ii) If Ut is less than the acceptance criteria, but not Ut', the linear correction to reading must be applied to measurements.
iii) If Ut' is less than the acceptance criteria, the measurements can be taken as read.
iv) If Ut>=Ut', the linear correction makes no significant improvements to the reading obtained, either (i) or (iii) will apply.

** Temperature reading of reference device has been corrected using calibration data.
Emergent stem temperature correction was not required.
Reference device calibrations are traceable to national standards of measurement.

Calibrated by:
Calibration Technician
Checked by:
Calibration Officer

Approved by:
Calibration Engineer

Stanger Asia



Stanger Asia

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

Date: 13/01/2003

Temp.: 16 °C

At. Press: 765 mm Hg

Calibrated by: Dennis Tsui

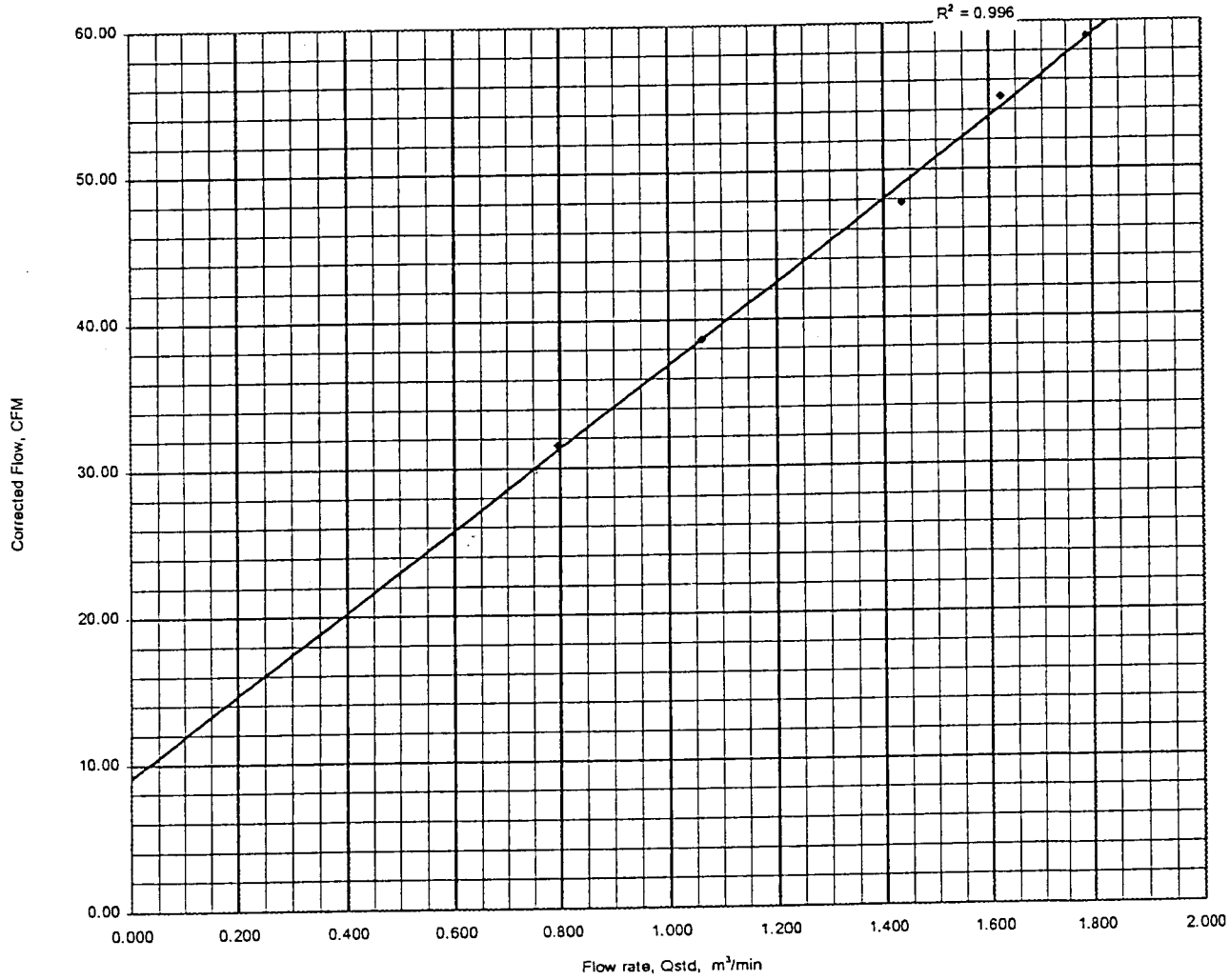
Next Calibration Due Date: 13/03/2003

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

Plate	Flow Rate (m^3/min)	True In.H2O	Corrected Flow (CFM)
18	1.789	11.6	58.99
13	1.622	9.5	54.92
10	1.435	7.4	47.80
7	1.063	4.0	38.65
5	0.796	2.2	31.53

Remarks: The correlation coefficient is larger than 0.99 indicates the calibration is linear.
Slope= 27.799298
Intercept= 9.109547

Location : San Tin Eastern Main Channel



Tester: Dennis Tsui

Checked By: Chris Shenfield

G/F., 3/F., & 4/F., Dim 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

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

Date: 13/03/2003

Temp.: 19 °C

At. Press: 767 mm Hg

Calibrated by: Dennis Tsui

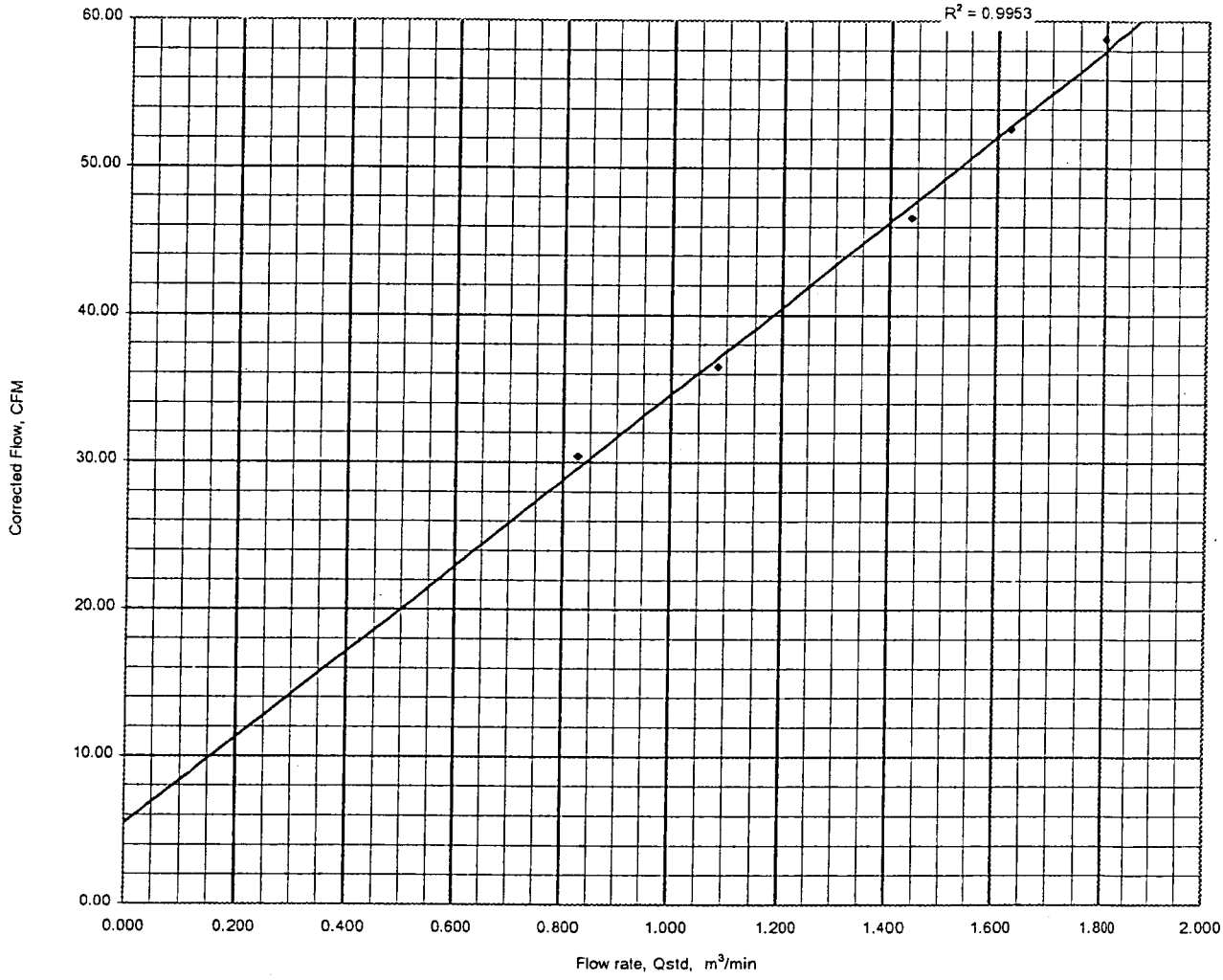
Next Calibration Due Date: 13/05/2003

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

Plate	Flow Rate (m^3/min)	True In.H2O	Corrected Flow (CFM)
18	1.797	11.8	58.76
13	1.624	9.6	52.68
10	1.439	7.5	46.61
7	1.084	4.2	36.47
5	0.827	2.4	30.39

Remarks: The correlation coefficient is larger than 0.99 indicates the calibration is linear.
Slope= 29.194236
Intercept= 5.4544927

Location : San Tin Eastern Main Channel



Tester: Dennis Tsui

Checked By: Jeff Tsang

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TM 3236

SPECTRIS CHINA LIMITED
思百吉中國有限公司

Brüel & Kjær

CERTIFICATE OF CALIBRATION

Certificate No. : 2KS020725-2 **Page 1 of 2**

Calibration of :

Description	:	Acoustical Calibrator
Manufacture	:	Brüel & Kjær
Type No.	:	4231
Serial No.	:	2175728

Client :

Stanger Asia Ltd
G/F & 1/F Din Wai Ind'L BLDG
13 On Chuen Street
Fanling
New Territories

CERTIFIED TRUE COPY
NAME: J. SCHEMBRI/Y.Y. PANG
For Stanger Asia Limited

Calibration Conditions :

Air Temperature	:	23.2	**°C**
Air Pressure	:	101.2	**kPa**
Relative Humidity	:	54	**%**

Test Specifications :

The Acoustical Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by Brüel & Kjær, or equivalent. 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.

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POSITION
Bnv. Scientist

Test Result :

A list of the performed (sub) tests is stated on page 2 of this certificate. Details of the measurement result are documented on the attached Calibration Report.

Date of Calibration : 27 July, 2002
Calibrated By :

Daniel Ho

Certificate issued : 30 July, 2002
Approved signatory :

Jonathan Kwan

Unit 706 7/F., Miramar Tower, 132 Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong
香港九龍尖沙咀彌敦道132號美麗華大廈7樓706室
Tel : (852) 2548 7486
Fax : (852) 2858 1168

spectris

CERTIFICATE OF CALIBRATION

Certificate No. : 2KS020725-2 **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 :
SPL	94 dB SPL	OK
	114 dB SPL	OK
Frequency		OK
2nd Harmonic	94 dB SPL	OK
	114 dB SPL	OK

Calibration Equipment :

Description :	Make & Model :	Serial No. :	Last Cal. Date :	Traceable to:
Digital Multi-meter	Datron 1281	27361	24 Sept., 2001	Fluke (UKAS)
Frequency Counter	Philips PM6671	SM 6043	30 Nov., 2001	HKSCL(HOKLAS)
Acoustical Calibrator	B&K 4226	1843103	10 Aug, 2001	NPL via B&K(UKAS)

Calibrated By : Daniel Ho
Date : 27 July, 2002

Checked By : Metha
Date : 30 July, 2002

ZH 3259

Brüel & Kjær

SPECTRIS CHINA LIMITED
思百吉中國有限公司

CERTIFICATE OF CALIBRATION

Certificate No. : 2KS020725-1 **Page 1 of 2**

Calibration of :

Description	:	Sound Level Meter	,	Microphone
Manufacture	:	Brüel & Kjær		
Type No.	:	2231	,	4155
Serial No.	:	2000323	,	1932434

Client :

Stanger Asia Ltd
G/F & 1/F Din Wai Ind'L BLDG
13 On Chuen Street
Fanling
New Territories

CERTIFIED TRUE COPY
NAME: J. SCHEMBRI/Y.Y. PANG
For Stanger Asia Limited

Calibration Conditions :

Air Temperature	:	23.1	**°C**
Air Pressure	:	101.3	**kPa**
Relative Humidity	:	53	**%**

Test Specifications :

The Sound Level Meter has been calibrated in accordance with the requirements as specified in IEC 651 and IEC 804 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 WT8052, Ver.25.03.1994
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.

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POSITION

Date of Calibration: 27 July, 2002
Calibrated By :

Daniel Ho

Certificate issued : 30 July, 2002
Approved signatory :

Jonathan Kwan

Unit 706 7/F., Miramar Tower, 132 Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong
香港九龍尖沙咀彌敦道132號美麗華大廈7樓706室
Tel : (852) 2548 7486
Fax : (852) 2858 1168

spectris

CERTIFICATE OF CALIBRATION

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
Noise	Lin Lim	OK
Frequency Weighting	A	OK
Frequency Weighting	C	OK
Frequency Weighting	Lin	OK
Frequency Weighting	Lin Lim	OK
Frequency Weighting	Random	OK
Level Range Control	4000 Hz	OK
Linearity Range	SPL 10dB 1000 Hz	OK
Linearity Range	SPL 1dB 4000 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 Averaging		OK
Pulse Range		OK
Overload	SPL	OK
Overload	SEL	OK
Internal Reference		OK
Acoustic Response	A	OK
Acoustic Response	Lin	OK

Calibration Equipment :

Brüel & Kjær's Sound Level Meter Calibration System B&K 9600 WT8052, Ver.25.03.1994

Description :	Make & Model :	Serial No. :	Last Cal. Date :	Traceable To
Digital Multi-meter	Datron 1281	27361	24 Sept, 2001	Fluke (UKAS)
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	1843103	10 August, 2001	NPL via B&K(UKAS)

Calibrated By : Daniel Ho
Date : 27 July, 2002

Checked By :
Date : 30 July, 2002

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 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.

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Event and Action Plan for Water Quality.

EVENT	ACTION			
Limit Level	ET Leader	IC(E)	ER	CONTRACTOR
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.

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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.

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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.

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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.

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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.

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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	Implemented, required to enforce the driver to use the facilities.
		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	Not implemented, required to enfore
		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

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., & 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
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	Implemented
		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	Implemented
		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

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	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	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	Implemented
		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., & 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
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	No marine dumping in this stage.
		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	No marine dumping in this stage.
		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	No marine dumping in this stage.
		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	No marine dumping in this stage.
		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	No marine dumping in this stage.
		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	No marine dumping in this stage.
		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	No marine dumping in this stage.
		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	No marine dumping in this stage.

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	No marine dumping in this stage.
		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	No marine dumping in this stage.
		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	No marine dumping in this stage.
		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	No marine dumping in this stage.
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	Baseline Monitoring of WM3 and WM4 will be carried out in the coming month.
		EM&A 4.6	Construction phase water quality monitoring shall be carried out.	Monitoring locations, WM1, WM2, Wm3 and WM4.	All period during construction phase	ET Leader	Implemented

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
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	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	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

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	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

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
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	The stockpile has been covered entirely with impervious sheet.
		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	Not applicable in this stage
		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	Not applicable in this stage
		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	Not applicable in this stage
		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	Not applicable in this stage
		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	Not applicable in this stage
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.

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) Site Agent / Engineer	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	DSD's Engineer	Not applicable in this stage

HONG KONG Tel: 852 2682 1703 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)	Not applicable in this stage
		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

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

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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	Not applicable to contractor.

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

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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

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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

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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	Implemented
		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

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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	Implemented
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

Summary report on Noise Monitoring Results

Location: NM1(A) (Tung Chan 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}	
05-Mar-03	17:15	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	52.3	55.0	53.0	54.0
							53.1	56.0	54.1	
							53.9	55.3	54.3	
							51.9	54.3	53.6	
							53.1	55.5	54.2	
							53.3	55.8	54.8	
13-Mar-03	15:15	<5	93.8	93.8	Sunny	-	50.6	53.3	51.8	51.7
							51.3	52.5	51.7	
							50.5	53.7	51.5	
							51.2	52.4	51.9	
							50.6	52.8	51.2	
							50.5	53.0	52.0	
20-Mar-03	17:00	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road, villager's activities	51.6	54.5	53.6	53.4
							52.1	54.0	53.8	
							52.5	53.9	53.0	
							52.3	53.6	53.1	
							51.7	53.8	52.9	
							51.6	54.2	53.8	
27-Mar-03	09:30	<5	93.8	93.8	Sunny	Vehicle Noise at San Tin Road	52.8	55.5	54.0	53.4
							52.9	56.0	53.5	
							51.0	55.7	53.4	
							51.7	55.8	53.5	
							52.0	56.1	53.0	
							52.9	55.9	53.1	

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Summary report on Noise Monitoring Results

Location: NM1(A) (Tung Chan 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)
05-Mar-03	19:00	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	49.5	51.2	50.5	50.5
							49.4	51.2	50.9	
							49.2	50.8	50.1	
13-Mar-03	19:00	<5	93.8	93.8	Fine	-	49.6	50.6	50.2	50.7
							49.4	52.0	51.0	
							49.9	51.5	50.9	
20-Mar-03	19:15	<5	93.8	93.8	Fine	-	50.4	52.7	51.6	52.0
							50.8	53.4	52.2	
							50.0	53.8	52.2	
27-Mar-03	19:00	<5	93.8	93.8	Fine	-	50.5	53.7	52.0	51.5
							49.6	52.8	51.4	
							49.6	52.5	51.2	

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)
02-Mar-03	13:00	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	51.1	54.0	52.0	52.2
							50.9	53.8	52.5	
							50.9	53.8	52.0	
09-Mar-03	14:15	<5	93.8	93.8	Cloudy	Vehicle Noise at San Tin Road	51.8	53.9	52.0	52.3
							51.9	53.8	52.3	
							51.9	54.0	52.5	
16-Mar-03	13:30	<5	93.8	93.8	Sunny	-	50.3	53.0	52.0	51.8
							49.8	53.6	51.9	
							49.9	53.7	51.5	
23-Mar-03	13:45	<5	93.9	93.8	Cloudy	-	51.0	54.0	52.0	52.5
							51.5	53.8	52.5	
							51.7	53.6	52.9	
30-Mar-03	15:00	<5	93.8	93.8	Cloudy	-	50.9	52.0	51.0	51.4
							50.8	52.5	51.8	
							50.7	52.9	51.5	

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Appendix VI

Water Quality Monitoring Data

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Summary 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
03-Mar-03	WM1	14:30	Sunny	<1.5	0.7	18.5	7.19	10.4	1.01	22.5	-	67	-	23.8	-
					0.7	18.5	7.19	10.5	1.04	23.5	-	70	-	23.9	-
					0.7	18.5	7.20	10.6	1.05	24.5	-	77	-	24.1	-
	WM2	15:05	Sunny	<1.5	0.8	19.0	7.25	6.2	0.67	20.5	28.2	45	85.6	25.1	28.7
					0.8	19.0	7.26	6.3	0.69	20.7	/	44	/	24.1	/
					0.8	19.0	7.26	6.3	0.68	23.0	30.6	42	92.7	26.1	31.1
06-Mar-03	WM1	15:45	Cloudy	<1.5	0.7	16.0	7.63	12.4	1.20	43.7	-	81	-	43.1	-
					0.7	16.5	7.60	12.4	1.21	43.9	-	88	-	43.4	-
					0.7	16.5	7.66	12.3	1.28	45.1	-	92	-	43.7	-
	WM2	16:15	Cloudy	<1.5	0.8	16.0	7.09	7.6	0.67	30.7	53.1	76	104.4	33.9	52.1
					0.8	16.0	7.10	7.7	0.69	31.1	/	77	/	33.7	/
					0.8	16.0	7.11	7.9	0.70	32.3	57.5	78	113.1	33.8	56.4
10-Mar-03	WM1	17:40	Cloudy	<1.5	0.8	15.0	7.87	8.2	0.81	55.1	-	101	-	41.0	-
					0.8	15.0	7.86	8.3	0.83	53.5	-	105	-	41.5	-
					0.8	15.0	7.85	8.5	0.84	53.7	-	110	-	41.7	-
	WM2	18:15	Cloudy	<1.5	0.7	15.5	7.37	10.5	0.95	46.1	64.9	76	126.4	30.0	49.7
					0.7	15.5	7.36	10.6	0.97	46.7	/	74	/	30.8	/
					0.7	15.5	7.39	10.7	0.99	44.7	70.3	70	136.9	30.8	53.8
15-Mar-03	WM1	12:00	Cloudy	<1.5	0.7	17.5	7.40	6.3	0.64	80.0	-	129	-	68.7	-
					0.7	18.0	7.43	6.4	0.67	81.7	-	137	-	66.7	-
					0.7	17.5	7.40	6.6	0.70	81.6	-	132	-	66.5	-
	WM2	12:25	Cloudy	<1.5	0.8	18.0	7.56	7.1	0.77	71.1	97.3	117	159.2	60.8	80.8
					0.8	18.0	7.57	7.2	0.78	71.6	/	119	/	59.8	/
					0.8	18.0	7.55	7.4	0.74	73.7	105.4	108	172.5	58.8	87.5
17-Mar-03	WM1	13:30	Sunny	<1.5	0.9	21.0	7.61	6.7	0.67	23.7	-	64	-	44.1	-
					0.9	21.5	7.65	6.8	0.66	23.8	-	69	-	44.3	-
					0.9	21.5	7.66	7.0	0.60	23.9	-	61	-	44.7	-
	WM2	14:00	Sunny	<1.5	0.9	20.5	7.77	7.1	0.71	18.8	28.6	60	77.6	36.1	53.2
					0.9	20.5	7.79	7.2	0.70	18.9	/	58	/	36.7	/
					0.9	21.0	7.78	7.9	0.77	19.5	30.9	63	84.1	34.9	57.7

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Date	Location	Time	Weather	Depth (m)	Salinity (ppt)	Temperature (°C)	pH	DO (%)	DO (mg/L)	Turbidity (NTU)	Action / Limit	SS (mg/L)	Action / Limit	NH_3-N (mg/L)	Action / Limit
20-Mar-03	WM1	15:00	Cloudy	<1.5	1.0	16.0	7.19	11.1	0.98	28.0	-	47	-	77.1	-
					1.0	16.5	7.19	11.1	1.05	28.9	-	44	-	77.2	-
					1.0	16.5	7.10	11.4	1.08	29.1	-	40	-	77.3	-
	WM2	15:30	Cloudy	<1.5	0.9	16.0	7.09	6.9	0.64	22.5	34.4	39	52.4	45.1	92.6
					0.9	16.0	7.08	6.7	0.63	22.9	/	38	/	45.3	/
					0.9	16.0	7.09	6.6	0.62	24.0	37.3	37	56.8	45.7	100.4
27-Mar-03	WM1	11:15	Sunny	<1.5	0.8	21.5	7.25	9.8	1.00	61.1	-	130	-	50.4	-
					0.8	21.0	7.27	9.7	1.01	63.7	-	131	-	51.7	-
					0.8	21.0	7.26	9.6	0.95	63.8	-	134	-	52.0	-
	WM2	11:40	Sunny	<1.5	1.0	20.5	7.44	6.5	0.65	39.7	75.4	81	158.0	49.8	61.6
					1.0	20.5	7.46	6.8	0.64	39.6	/	83	/	49.7	/
					1.0	20.5	7.49	6.7	0.61	39.4	81.7	87	171.2	46.5	66.8
29-Mar-03	WM1	12:30	Cloudy	<1.5	0.8	17.5	7.88	7.1	0.70	51.1	-	84	-	61.3	-
					0.8	17.0	7.81	7.3	0.70	53.4	-	88	-	63.1	-
					0.8	17.5	7.90	7.9	0.64	52.0	-	89	-	62.9	-
	WM2	13:00	Cloudy	<1.5	0.8	17.0	7.54	5.8	0.60	29.7	62.6	62	104.4	46.7	74.9
					0.8	17.0	7.55	5.7	0.61	28.7	/	64	/	46.9	/
					0.8	17.0	7.60	5.6	0.63	26.5	67.8	67	113.1	44.9	81.2

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Appendix VII

Air Quality Monitoring Results

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Summary 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-03	2.8495	2.8663	1608.91	1609.91	1.00	Cloudy	NE	1.25	224
05-Mar-03	2.8482	2.8630	1609.91	1610.91	1.00	Rainy	NE	1.25	197
06-Mar-03	2.8424	2.8599	1610.91	1611.91	1.00	Cloudy	N	1.25	233
08-Mar-03	2.8457	2.8620	1636.29	1637.29	1.00	Cloudy	N	1.25	217
10-Mar-03	2.8400	2.8600	1637.29	1638.29	1.00	Cloudy	E	1.25	266
12-Mar-03	2.8350	2.8565	1638.29	1639.29	1.00	Sunny	NE	1.24	289
15-Mar-03	2.8420	2.8570	1664.11	1665.11	1.00	Cloudy	NE	1.25	200
17-Mar-03	2.8485	2.8683	1665.11	1666.11	1.00	Sunny	NE	1.25	264
18-Mar-03	2.8441	2.8602	1666.11	1667.11	1.00	Cloudy	NE	1.25	214
20-Mar-03	2.8337	2.8491	1691.38	1692.38	1.00	Cloudy	N	1.24	207
22-Mar-03	2.8458	2.8610	1692.38	1693.38	1.00	Cloudy	E	1.24	204
24-Mar-03	2.8468	2.8661	1693.38	1694.38	1.00	Cloudy	NE	1.24	260
27-Mar-03	2.8500	2.8731	1718.44	1719.44	1.00	Sunny	NE	1.24	311
29-Mar-03	2.8306	2.8520	1719.44	1720.44	1.00	Cloudy	NE	1.24	287
31-Mar-03	2.8406	2.8602	1744.53	1745.53	1.00	Sunny	SE	1.24	264

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Summary 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)	$\mu g/m^3$
06-Mar-03	2.8403	3.0378	1611.91	1636.29	24.38	Cloudy	1.25	108
12-Mar-03	2.8342	3.0944	1639.29	1663.58	24.29	Sunny	1.24	144
18-Mar-03	2.8368	3.0680	1667.11	1691.38	24.27	Cloudy	1.25	127
24-Mar-03	2.8396	3.1099	1694.38	1718.44	24.06	Cloudy	1.24	151
30-Mar-03	2.8385	3.0697	1720.44	1744.53	24.09	Cloudy	1.24	129

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Appendix VIII

Site Inspection Reports

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

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CONTRACT No.DC/2001/09 SAN TIN EASTERN MAIN DRAINAGE CHANNEL
WEEKLY ENVIRONMENTAL SITE INSPECTION REPORT – No. STEMDC2003/08

Date of Inspection:	07/03/2003	**Current Weather:**	Cloudy
Time of Inspection:	16:15	**Weather Previous 24 Hrs.:**	Drizzle

1. Works in Progress:

1.1 General site clearance.
1.2 Construction of temporary border road.
1.3 Excavation near channel outlet.

2. Air Quality:

2.1. Stockpile of debris / site clearance waste noted.
2.2. Fugitive dust was generated by site traffic and from uncovered materials on trucks.
2.3 Construction dust generated during excavation of soil.

Recommendations:
- Any debris or materials shall be covered entirely by impervious sheet or removed.
- The haul road shall be dampened more frequently.
- Apply water spray during handling of dusty materials.
- The load on the vehicle shall be covered entirely by clean impervious sheeting.

3. Noise:

3.1 No significant construction noise noted.

Recommendations:
- None at present.

4. Waste Management:

4.1 No cover observed for site clearance waste.

Recommendations:
- Any stockpiles should be covered or removed.

5. Water Quality:

5.1 Direct discharge to the former fish pond noted.
5.2 Stagnant water noted near site office.

Recommendations:
- The discharge shall be treated before pumping to the former fish pond.
- The stagnant water shall be removed.

6. Status and Performance of Mitigation Measures:

6.1 Wheel wash facilities provided.
6.2 Water browser was in operation.
6.3 Chemical waste storage provided.

Inspection carried out by: _____ Dated: 07/03/03
Arthur Cheng
Environmental Scientist

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

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CONTRACT No.DC/2001/09 SAN TIN EASTERN MAIN DRAINAGE CHANNEL
WEEKLY ENVIRONMENTAL SITE INSPECTION REPORT – No. STEMDC2003/09

Date of Inspection:	14/03/2003	**Current Weather:**	Sunny
Time of Inspection:	14:15	**Weather Previous 24 Hrs.:**	Sunny

1. Works in Progress:

1.1 General site clearance.
1.2 Construction of temporary border road.
1.3 Filling of existing ponds.

2. Air Quality:

2.1. Stockpile of debris / site clearance waste noted.
2.2. Fugitive dust was generated by site traffic and from uncovered materials on trucks.
2.3 Construction dust generated during excavation of soil.

Recommendations:
- Any debris or materials shall be covered entirely by impervious sheet or removed.
- The haul road shall be dampened more frequently.
- Apply water spray during handling of dusty materials.
- The load on the vehicle shall be covered entirely by clean impervious sheeting.
- Vehicles hall adhere to speed limit.

3. Noise:

3.1 No significant construction noise noted.

Recommendations:
- None at present.

4. Waste Management:

4.1 No cover observed for site clearance waste.

Recommendations:
- Any stockpiles should be covered or removed.

5. Water Quality:

5.1 Wastewater was diverted to the former fishponds.
5.2 Stagnant water near site office was filled.

Recommendations:
- Only approved fishponds shall be used for storage of wastewater.

6. Status and Performance of Mitigation Measures:

6.1 Wheel wash facilities provided.
6.2 Water browser was in operation.
6.3 Chemical waste storage provided.

Inspection carried out by: _____ Dated: 14/03/03
Arthur Cheng
Environmental Scientist

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CONTRACT No.DC/2001/09 SAN TIN EASTERN MAIN DRAINAGE CHANNEL WEEKLY ENVIRONMENTAL SITE INSPECTION REPORT – No. STEMDC2003/10			
Date of Inspection:	20/03/2003	**Current Weather:**	Cloudy
Time of Inspection:	16:15	**Weather Previous 24 Hrs.:**	Cloudy

1. Works in Progress:

1.1 Construction of temporary border road.
1.2 Filling of existing ponds.
1.3 Construction of Stone columns.
1.4 Construction of Interim Flood Relief Channel.

2. Air Quality:

2.1. Fugitive dust was generated by site traffic and from uncovered materials on trucks.

Recommendations:
- Apply water spray during handling of dusty materials.

3. Noise:

3.1 No significant construction noise noted.

Recommendations:
- None at present.

4. Waste Management:

4.1 Accumulation of site clearance waste observed.

Recommendations:
- The waste shall be removed more frequently.

5. Water Quality:

5.1 No discharge in this moment.

Recommendations:
- None at present.

6. Status and Performance of Mitigation Measures:

6.1 Wheel wash facilities provided.
6.2 Water browser was in operation.
6.3 Chemical waste storage provided.
6.4 Engineer Bund was being constructed.

Inspection carried out by: _____ Dated: 20/03/03

Dennis Tsui
Environmental Scientist

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

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CONTRACT No.DC/2001/09 SAN TIN EASTERN MAIN DRAINAGE CHANNEL
WEEKLY ENVIRONMENTAL SITE INSPECTION REPORT – No. STEMDC2003/11

Date of Inspection:	26/03/2003	**Current Weather:**	Sunny
Time of Inspection:	16:15	**Weather Previous 24 Hrs.:**	Sunny

1. Works in Progress:

1.1 Construction of temporary border road.
1.2 Construction of Stone columns.
1.3 Construction of Interim Flood Relief Channel.
1.4 Earthwork at Portion A, B and C.

2. Air Quality:

2.1. The access road near the wheel wash bay was muddy.
2.2 The public road near the site office was muddy.
2.3 The vehicles left the site without cleaning the wheels.

Recommendations:
- Clean the road more frequently.
- Erect the notice board near the wheel washing bay to remind the drivers using the facilities.

3. Noise:

3.1 No significant construction noise noted.

Recommendations:
- None at present.

4. Waste Management:

4.1 Accumulation of site clearance waste observed.

Recommendations:
- The waste shall be removed more frequently.

5. Water Quality:

5.1 No discharge in this moment.

Recommendations:
- None at present.

6. Status and Performance of Mitigation Measures:

6.1 Wheel wash facilities provided.
6.2 Water browser was in operation.
6.3 Chemical waste storage provided.
6.4 Engineer Bund was being constructed.

Inspection carried out by: _____ Dated: 26/03/03
Dennis Tsui
Environmental Scientist

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Appendix IX

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

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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

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 X

Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

G/F., 1/F., & 3/F., Din Wai Industrial Building, 13 On Chuen Street, Fanling, New Territories, HONG KONG. Tel: 852-2632 1203 Fax: 852-2632 0046 E-mail address: stanger@stanger.com.hk

CONTRACT No. DC/2001/09 – CONSTRUCTION OF SAN TIN EASTERN MAIN DRAINAGE CHANNEL - Cumulative Statistics on Complaints					
Environmental Parameters	Cumulative No. Brought Forward	No. of Complaints This Month			Cumulative Number to Date
		Air	Noise	Water	
Air	0	---	---	---	
Noise	0	---	---	---	
Water	0	---	---	---	
Waste	0	---	---	---	
Total	0	---	---	---	

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APPENDIX XI

Monitoring Schedule for the Following Month

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 0946 E-mail address: stanger@stanger.com.hk

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Construction of San Tin Eastern Main Channel
Environmental Monitoring Schedule
April 2003

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		April 1 Water (14:01) 1-hr TSP	2	3 Site Inspection Noise[1,2]	4 Water (15:15) 1-hr TSP	5 24 – hr TSP
6 Noise[3]	7 Water (16:50) 1-hr TSP	8	9 Noise[1,2] 1-hr TSP	10 Site Inspection 1-hr TSP	11 1-hr TSP 24 – hr TSP	12 Water (11:07) 1-hr TSP
13 Noise[3]	14	15 1-hr TSP Water (12:59)	16	17 1-hr TSP 24 – hr TSP Water (14:11) Noise[1,2] Site Inspection	18	19
20	21 Noise[3]	22 Water (17:52) 1-hr TSP x 2	23 Noise[1,2] 1-hr TSP 24 – hr TSP	24 Site Inspection 1-hr TSP	25 1-hr TSP Water (10:46)	26
27 Noise[3]	28	29 Noise[1,2] 1-hr TSP 24 – hr TSP Water (13:01)	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 (twice per week) at stations WM1 (upstream) and WM2 (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*

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APPENDIX XII

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
THREE-MONTH ROLLING -- (BASED ON MASTER PROGRAMME MP02)

Date Feb. 2003

ID	Task Name	Duration	Start	Finish
1	Duration of work	1340 days	Wed 10/16/02	Fri 6/16/06
2	Section 1 completion	150 days	Wed 10/16/02	Fri 3/14/03
3	Section 2 completion	270 days	Wed 10/16/02	Sat 7/12/03
4	Section 3 completion	365 days	Wed 10/16/02	Wed 10/15/03
5	Section 4 completion	670 days	Wed 10/16/02	Sun 8/15/04
6	Section 5 completion	730 days	Wed 10/16/02	Thu 10/14/04
7	Section 6 completion	910 days	Wed 10/16/02	Tue 4/12/05
8	Section 7 completion	670 days	Sat 2/22/03	Wed 12/22/04
9	Section 8 completion	850 days	Wed 11/27/02	Fri 3/25/05
10	Section 9 completion	970 days	Wed 10/16/02	Sat 6/11/05
11	Section 10 completion	1340 days	Wed 10/16/02	Fri 6/16/06
12	Schedule of Site Occupation by KCRC in Portion H	830 days	Tue 1/14/03	Fri 4/22/05
13	Stage 1 (Piles & Pile Caps for Piers W58-60)	160 days	Tue 1/14/03	Sun 6/22/03
18	Mobilization	135 days	Wed 10/16/02	Thu 2/27/03
20	Initial Setting Out	45 days	Sun 12/15/02	Tue 1/28/03
21	Import Fill Material from Shenzhen River	135 days	Wed 10/16/02	Thu 2/27/03
24	Formation of berthing at Shenzhen River	30 days	Mon 12/30/02	Tue 1/28/03
25	Relocation of XPM Mesh Fence	30 days	Wed 1/29/03	Thu 2/27/03
26	Section 2 - Interim Flood Relief Channel (Portion A, B, C)	270 days	Wed 10/16/02	Sat 7/12/03
28	Site Clearance	38 days	Fri 12/6/02	Sun 1/12/03
29	Removal of Contaminated Material	110 days	Mon 1/13/03	Fri 5/2/03
31	Section 3 - Portion G (Reedbed near LMC Kiosk)	365 days	Wed 10/16/02	Wed 10/15/03
32	Approval of Materials & Submission	80 days	Wed 10/16/02	Fri 1/3/03
33	Site Clearance	65 days	Sat 1/4/03	Sun 3/9/03
34	Site formation	65 days	Mon 3/10/03	Tue 5/13/03
[illegible]	Section 4 - Portion E (Pond filling work)	670 days	Wed 10/16/02	Sun 8/15/04
[illegible]	Submission & Approval of Materials	80 days	Wed 10/16/02	Fri 1/3/03
39	Site Clearance	65 days	Sat 1/4/03	Sun 3/9/03
40	Site formation	90 days	Mon 3/10/03	Sat 6/7/03
42	Section 5 - Portion D (PS/DC/FDC/OC & boundary fence)	730 days	Wed 10/16/02	Thu 10/14/04
43	Stone Column Work	370 days	Wed 10/16/02	Mon 10/20/03
44	Submission & Approval	134 days	Wed 10/16/02	Wed 2/26/03
45	Installation	200 days	Fri 2/28/03	Mon 9/15/03
48	Pumping Station + Box Culvert	80 days	Fri 2/28/03	Sun 5/18/03
90	Section 6 - Portion A (Inflatable Dam)	910 days	Wed 10/16/02	Tue 4/12/05
91	Inflatable Dam	910 days	Wed 10/16/02	Tue 4/12/05
92	Stone Column Work	456 days	Wed 10/16/02	Tue 1/13/04
93	Submission & Approval	134 days	Wed 10/16/02	Wed 2/26/03
94	Formation preparation	216 days	Wed 10/16/02	Mon 5/19/03
106	Dam System Approval & Delivery	364 days	Wed 10/16/02	Tue 10/14/03
107	Submission & Approval	164 days	Wed 10/16/02	Thu 4/17/03
117	Police Gantry—Steel Bridge	910 days	Wed 10/16/02	Tue 4/12/05
121	Security Fence & Fender	910 days	Wed 10/16/02	Tue 4/12/05
125	Section 7 - Portion A (Border Road Bridge)	670 days	Sat 2/22/03	Wed 12/22/04
126	Material Submission and Approval	46 days	Sat 2/22/03	Tue 4/8/03
155	Section 8 - Portion B (excluding Wetland)	850 days	Wed 11/27/02	Fri 3/25/05
156	Material Submission and Approval	90 days	Wed 11/27/02	Mon 2/24/03
160	Site formation for Vertical Drains	30 days	Tue 2/25/03	Wed 3/26/03
161	Site Clearance	30 days	Tue 2/25/03	Wed 3/26/03
162	Ground Improvement & Vertical Drains	490 days	Thu 3/27/03	Wed 7/28/04
188	Section 9 - Portion A & C (excluding Wetland)	970 days	Wed 10/16/02	Sat 6/11/05
191	Material Submission and Approval	80 days	Wed 10/16/02	Fri 1/3/03
192	Site formation for Vertical Drains	30 days	Sat 1/4/03	Sun 2/2/03
193	Site Clearance	30 days	Sat 1/4/03	Sun 2/2/03
194	Ground Improvement & Vertical Drains	710 days	Sat 1/4/03	Mon 12/13/04
228	Vehicular bridge near Castle Peak Road	970 days	Wed 10/16/02	Sat 6/11/05
237	Submission and Approval of Temporary Border Road	80 days	Wed 10/16/02	Fri 1/3/03
240	Site formation for Vertical Drains	282 days	Sat 1/4/03	Sun 10/12/03
241	Submission & Approval of Materials	120 days	Sat 1/4/03	Sat 5/3/03
244	Diversion of Cross Border Road	175 days	Wed 10/16/02	Tue 4/8/03
246	Temporary Border Road & Diversion	110 days	Thu 12/5/02	Mon 3/24/03
247	Utilities Diversion & Commissioning of Border Road	7 days	Tue 3/25/03	Mon 3/31/03
250	Section 10 - Remainder of Works	1340 days	Wed 10/16/02	Fri 6/16/06
252	Construction of Wetland	1316 days	Sat 11/9/02	Fri 6/16/06
253	Site clearance	90 days	Sat 11/9/02	Thu 2/6/03
254	Filling + Formation	763 days	Fri 2/28/03	Thu 3/31/05
256	Drainage Pipe and Watermain Work	964 days	Wed 10/16/02	Sun 6/5/05
257	Procurment of Drainage Pipe materials	360 days	Wed 10/16/02	Fri 10/10/03
258	Procurment of watermain materials	360 days	Wed 10/16/02	Fri 10/10/03

Jan '03 | Feb '03 | Mar '03 | Apr
12/30 | 1/6 | 1/13 | 1/20 | 1/27 | 2/3 | 2/10 | 2/17 | 2/24 | 3/3 | 3/10 | 3/17 | 3/24 | 3/31

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

Prepared by Kenlet Kwong
Date 4th Feb. 2003
Version TMP02 - 1