

ENVIRONMENTAL MONITORING AND AUDIT REPORT

FOR

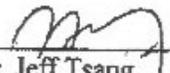
CONTRACT No. DC/2001/09

SAN TIN EASTERN MAIN DRAINAGE CHANNEL

OCTOBER - DECEMBER 2004

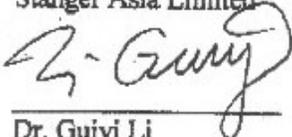
Report No.: ET 12383

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EXECUTIVE SUMMARY

This is the 8th quarterly Environmental Monitoring and Audit (EM&A) report for Contract No. DC/2001/09 – San Tin Eastern Main Drainage Channel and it covers the monitoring works conducted from 1 October to 31 December 2004.

Construction activities for the reported period

- Band drain installation
- Surcharge for storage pond
- Backfilling granular material
- Reinstatement of Wave wall
- Geo-technical Instrument Monitoring
- Widening of San Tin Tsuen Road
- Construction of Flow Diversion Chamber
- Rubber Dam Body Installation
- Marine Disposal and Type 3 Sediment treatment
- Toe block and dry weather construction
- Mini-pile Construction
- Reinstatement of concrete block
- Construction of Pile Cap
- Laying Grasscrete

Air Quality Monitoring

The site office (AM1) has been identified as the location for the monitoring of 24 and 1-hour Total Suspended Particulates (TSP). Monitoring of 24-hour TSP was carried out on sixteen 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 forty-seven 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 thirteen occasions at Yan Shau Wai NM1(A) for normal working hours (0700-1900 hours), thirteen occasions for the evening period (1900-2300 hours) and thirteen 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 thirteen occasions at WM1, WM4 (upstream stations) and WM2, WM3 (downstream stations). There were no exceedances to set Action and Limit Levels recorded.

Waste Management

A total of 2,595.5m³ C&D waste was generated from the works in this reporting period and transported to the WENT Landfill Site for disposal. 27,741m³ Type I and Type II contaminated soil was delivered to East Sha Chau for disposal. 162m³ general refuse was disposed. 400L chemical waste was collected by a licensed collector in this reporting quarter.

Complaints and Notifications of Summonses and Successful Prosecutions

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

Site Inspections

Fourteen weekly Site Inspections were conducted jointly by the Independent Environmental Checker (IEC), the Engineers' Representative (ER) and the ET.

The major observations / non-conformance, actions by the Contractor and the environmental outcomes are summarised in the Section 7.1 of this report.

1. INTRODUCTION

1.1 Background

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

In this report, the air, noise, water quality and waste management monitoring works conducted from 1 October to 31 December 2004 will be detailed and reviewed. All monitoring works were carried out 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 in this reported period.

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 | This section details monitoring results. |
| Section 7 | The site environmental audits are summarized in this section. |
| 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 in this section. |
| Section 10 | This section gives a conclusion in relation to all monitoring activities. |

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, construction of footpaths, drainage works, road works, construction of a pumping station, water and landscape works from the Castle Peak Road at San Tin to the Shenzhen River some 2.5km downstream.

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

2.2 Project Organization

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

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

Mr. Raymond W. M.. Suen is the Site Agent for Hsin Chong Construction Co., Ltd. (Tel: 2482 9587, Fax: 2482 9113).

The Environmental Team (ET) for the project is Stanger Asia Ltd. The team is headed by Mr Jeff L. H. Tsang. (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 VI. Details of the construction activities carried out in this quarter are listed below.

- Band drain installation
- Surcharge for storage pond
- Backfilling granular material
- Reinstatement of Wave wall
- Geo-technical Instrument Monitoring
- Widening of San Tin Tsuen Road
- Construction of Flow Diversion Chamber
- Rubber Dam Body Installation
- Marine Disposal and Type 3 Sediment treatment
- Toe block and dry weather construction
- Mini-pile Construction
- Reinstatement of concrete block
- Construction of Pile Cap
- Laying Grasscrete

3. ENVIRONMENTAL PERMITS AND LICENSES

The summary of the status of all environmental permits, licenses and notification for this project as at this quarter 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 |
| Notification of Works Under APCO | -- | -- | -- | Notified |
| Registration of Chemical Waste Producer | WPN5113-542-H2913-22 | 24-Jan-03 | -- | Issued |
| Construction Noise Permit | GW-RN0444-04 | 09-Sep-04 | 08-Mar-05 | Issued |
| Effluent Discharge Licence for Septic Tank System | 1S41N/1 | 20-Mar-03 | -- | Issued |
| Effluent Discharge Licence | 1S49/1 | 04-Aug-03 | 31-Aug-08 | Issued |
| Dumping Permit ^{1,2} | EP/MD/05-063 | 29-Sep-04 | 28-Oct-04 | Issued |
| Dumping Permit ^{1,2} | EP/MD/05-076 | 29-Oct-04 | 28-Nov-04 | Issued |
| Dumping Permit ^{1,2} | EP/MD/05-086 | 29-Nov-04 | 28-Dec-04 | Issued |

Note: 1. Nature of material: Category M&H Excavated Sediment Requiring Type 2 - Confined Marine Disposal. Disposal Site: East Sha Chau.

2. According to the PS, Type 1 and Type 2 Contaminated Excavated Sediment shall be dumped at East Sha Chau.

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 Office. This monitoring location has been coded AM1 and its co-ordinates are 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 |

Air Sensitive Receivers

Representative Air Sensitive Receivers (ASRs) have been identified and their horizontal separation between the eastern channels associated with the MDC are given in the following table and the locations are shown in Figure 4.4.

Table 4.2 Identified ASRs and Proximity to the Works.

| ASRs | Name | Distance to Eastern MDC (m) |
|------|---------------------------|-----------------------------|
| 1 | Lok Ma Chau Control Point | 80 |
| 2 | Ha Wan Tsuen | 280 |
| 3 | Ki Lun Tsuen | 500 |
| 4 | Yan Shau Wai | 500 |
| 5 | Tung Chan Wai | 270 |
| 6 | Wing Ping Tsuen | 370 |

Methodology

Measurement of 24-hour and 1-hour TSP levels were carried out in accordance to the high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50). 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.

Laboratory Measurement

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

*Monitoring Parameters Frequency***Table 4.3 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 were established from the baseline monitoring data obtained prior to the commencement of the construction of the project. The Limit levels for air quality monitoring have 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 4.4 Action and Limit Levels for the Project

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

4.2 Noise

Monitoring Location

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

Table 4.5 Coordinates of NM1(A)

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

Noise Sensitive Receivers

Noise Sensitive Receivers (NSRs) have been identified. They are low-rise residential (2 to 3 storeys high) and their approximate distances from the nearest channel associated with the MDCs are given in the following table. The locations are shown in Figure 4.5.

Table 4.6 Identified NSRs and their Area Sensitivity Rating

| NSRs | Name | Distance to Eastern MDC (m) | Area Sensitivity Rating |
|------|------------------|-----------------------------|-------------------------|
| 1 | Ha Wan Tsuen | 280 | A |
| 2 | Pun Uk Tsuen | 570 | A |
| 3 | Chau Tau Tsuen | 540 | A |
| 4 | Ki Lun Tsuen | 500 | A |
| 5 | Yan Shau Wai | 320 | A |
| 6 | Tung Chan Wai | 270 | A |
| 7 | On Lung Tsuen | 530 | A |
| 8 | Fan Tin Tsuen | 580 | A |
| 9 | Wing Ping Tsuen | 370 | B |
| 10 | San Lung Tsuen | 680 | A |
| 11 | Tsing Lung Tsuen | 830 | B |

Methodology

Monitoring was carried out in accordance to procedures recommended in the EM&A Manual for the monitoring of construction noise. Wind speed was measured by a portable anemometer, TSI model 8330 VelociCheck, with the wind direction being determined with a compass.

Monitoring Parameters and Frequency

Table 4.7 Noise Monitoring Frequency

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

Action and Limit Levels

Action and Limit levels for the monitoring of construction noise are those recommended in the EM&A Manual for the project.

Table 4.8 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. | $L_{Aeq(30\text{min})}$ 75dB(A) |
| Daytime on holidays: and 1900 to 2300 hours an all other days. | | $L_{Aeq(5\text{min})}$ 70dB(A) |
| All night time periods (2300 to 0700 hours) | | $L_{Aeq(5\text{min})}$ 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 within the Shenzhen River to be monitored for water quality. The designated monitoring stations are shown in Figure 4.3.

Water Quality Sensitive Receivers

WSRs during construction include the surrounding water bodies along the Eastern MDC, either in direct contact (existing stream channel and Shenzhen River) or indirect contact (adjacent fishponds). The locations are shown in Figure 4.6.

Methodology

Surface water quality shall be monitored for the following parameters: Dissolved Oxygen (mg/L and % saturation), Temperature (°C), pH value, Turbidity (NTU), Water Depth (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.

Laboratory Analysis

Samples were returned to Stanger Asia Ltd. owns HOKLAS accredited laboratory, for the determination of suspended solids and ammoniacal nitrogen. Methods are referenced from the “*Standard Methods for the Examination of Water and Wastewater*” (APHA, AWWA, WEF). Suspended solids content was determined employing Method 2540D (APHA 20th Edition) and Ammoniacal Nitrogen in accordance with APHA Method No. 4500-NH₃ B & D, (APHA 18th Edition). The laboratory operates a QA/QC scheme for these analysis inclusive of blank, duplicate and spike recovery analysis.

Monitoring Parameters and Frequency

Table 4.9 Water Quality Monitoring Frequency

| Monitoring Locations | Parameter | Frequency |
|----------------------|---|---------------|
| WM1 to WM4 | Dissolved Oxygen (mg/L and % saturation), Total Suspended Solids, pH, Turbidity, Ammoniacal Nitrogen, Water Temperature and water depth | Once per week |

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

Action and Limit Levels

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

Table 4.10 Action and Limit Level for Water Quality

| Parameter | Action Level | Limit Level |
|--|---|---|
| Dissolved Oxygen in (mg/L) | 0.59 (5%-ile of baseline data) for WM2 (downstream station) | 0.55 (1%-ile of baseline data) for WM2 (downstream) |
| | 0.46 (5%-ile of baseline data) for WM3 (downstream station) | 0.39 (1%-ile of baseline data) for WM3 (downstream station) |
| 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 |

Note: For DO, exceedance of the water quality limits occurs when monitoring result is lower than the limits.

For SS and Tby, exceedance of the water quality limits occurs when monitoring result is higher than the limits.

For pH, exceedance of the water quality limits occurs when monitoring result is lower than 6 or higher than 9.

4.4 Event and Action Plans

The Event and Action Plans for air, noise and water are attached in Appendix II of this report. Since the Discharge Standards for Water Quality were not applicable, as detailed 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.

5. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

The contractor implemented various environmental mitigation measures as recommended in the EIA report, EM&A Manual and Environmental Permit. The implementation status during this quarter is attached in Appendix III.

6. MONITORING RESULTS

6.1 Air Quality Monitoring

Monitoring of 24-hour and 1-hour TSP monitoring is summarised in the following tables. The results are presented graphically in Figures 6.1 and 6.2.

Table 6.1 Results of 24-hour TSP Monitoring Data

| Location | Number of Monitoring | Number of Exceedance | |
|--------------|----------------------|------------------------------|-------------|
| | | Action Level | Limit Level |
| AM1 | 16 | 0 | 0 |
| Action Level | | 225 $\mu\text{g}/\text{m}^3$ | |
| Limit Level | | 260 $\mu\text{g}/\text{m}^3$ | |

Table 6.2 Results of 1-hour TSP Monitoring Data

| Location | No. of Monitoring | No. of Exceedance | |
|--------------|-----------------------|-------------------|-------------|
| | | Action Level | Limit Level |
| AM1 | 47 | 0 | 0 |
| Action Level | 390 µg/m ³ | | |
| Limit Level | 500 µg/m ³ | | |

6.2 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 at the designated location NM1(A) this reported period. The results for noise monitoring are summarised in the table below. The results are presented graphically in Figure 6.3.

Table 6.3 Results of Noise Levels for NM1(A)

| Locations | Parameters | Number of Monitoring | Number of Exceedance |
|--|------------|----------------------|----------------------|
| NM1(A) | Daytime | 13 | 0 |
| NM1(A) | Evening | 13 | 0 |
| NM1(A) | Holidays | 13 | 0 |
| Limit Level for 1900-2300 normal weekdays and 0700-2100 holidays | | | 70 dB(A) |
| Limit Level for 0700-1900 normal weekdays | | | 75 dB(A) |

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

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

6.3 Water Quality Monitoring

Water quality monitoring in terms of pH, dissolved oxygen, turbidity, ammoniacal nitrogen, suspended solids and temperature, were conducted at WM1, WM2, WM3 and WM4 in this reported period. Results are summarised in the following tables. Graphical presentations of the results are shown in Figures 6.4 – 6.17.

Table 6.4 Summary of Water Quality Monitoring Data

| Parameters | Number of Monitoring (WM1 to WM4) | Number of Exceedance | |
|---------------------------|-----------------------------------|----------------------|-------------|
| | | Action Level | Limit Level |
| Temperature, °C | 13 | - | - |
| pH | 13 | 0 | 0 |
| Dissolved Oxygen, % | 13 | - | - |
| Dissolved Oxygen, mg/L | 13 | 0 | 0 |
| Turbidity, NTU | 13 | 0 | 0 |
| Suspended Solids, mg/L | 13 | 0 | 0 |
| Ammoniacal Nitrogen, mg/L | 13 | 0 | 0 |

Quarterly Assessment of Impacts from Construction Activities

A quarterly assessment of impacts on water quality from construction activities at the project site, including comparison of the difference between the quarterly mean and 1.3 times of the ambient mean, which is defined as 30% increase of the baseline data of the related parameters is summarized in the following table.

Table 6.5 Quarterly Assessment of Impacts from Construction Activities

| Parameters | Quarterly Mean | | 30 % increase of Baseline data | | Exceedance (Y/N) | |
|---------------------------|----------------|------|--------------------------------|-------------|------------------|-----|
| | WM2 | WM3 | WM2 | WM3 | WM2 | WM3 |
| pH | 7.30 | 7.34 | 5.16 - 9.58 | 5.04 - 9.36 | N | N |
| Dissolved Oxygen, mg/L | 0.94 | 1.06 | 0.64 | 0.56 | N | N |
| Turbidity, NTU | 100 | 94.1 | 51.1 | 75.7 | Y | Y |
| Suspended Solids, mg/L | 130 | 110 | 92 | 83 | Y | Y |
| Ammoniacal Nitrogen, mg/L | 61.9 | 69.4 | 52.0 | 36.1 | Y | Y |

- Notes: 1. For pH, both 30% increase and 30% decrease of baseline data are calculated for comparison.
 2. For dissolved oxygen, 30% decrease of baseline data is calculated for comparison.

Based on the above table, the quarterly means of Turbidity (WM2 and WM3), Suspended Solids (WM2 and WM3) and Ammoniacal Nitrogen (WM2 and WM3) are higher than the 130 % ambient mean of these parameters. However, as there was no exceedance to either the Action or Limit levels for these parameters during this quarter, the higher than ambient levels noted for Turbidity and Ammoniacal Nitrogen are not considered to be site-related. Thus, no additional mitigation measures have been proposed.

7. ENVIRONMENTAL AUDIT

7.1 Site Inspections

Fourteen weekly Site Inspections were conducted jointly by the IEC, the ER and the ET. The major observations / non-conformance, actions by the Contractor and outcomes are summarised in the following tables.

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

| Observations | Actions by Contractor | Outcome |
|--|--|---|
| October 2004 | | |
| The capacity of the sedimentation tank at Border was full of silt. (27 October 2004) | The silt was removed occasionally and several sand bags were placed. | The effectiveness of this mitigation measure will be closely monitored. |
| Soil trails observed at the public road near site exit. (14 October 2004) | The soil was removed manually occasionally. | No soil trails were observed. (16 October 2004) |

Table 7.1 (cont'd) Summary of Findings, Actions and Outcomes of Site Inspection by the IEC, ER and ET

| Observations | Actions by Contractor | Outcome |
|---|--|---|
| Stagnant water generated by road cleaning observed in a trench at border road. (6 October 2004) | Mosquito oil has been applied to the tank. | No mosquito breeding observed. (8 October 2004) |
| Wheel washing facilities should be provided at the site entrance near CH100. (6 October 2004) | Manual wheel washing facilities have been provided at the site entrances. | The vehicles were cleaned before leaving the site. (8 October 2004) |
| No label was attached to a chemical drum. (27 October 2004) | The chemical drums were removed off-site. | Situation rectified. (30 October 2004) |
| The Haul road was dusty. (14, 21 and 27 October 2004) | The public road was sprayed with water manually from time to time. | No significant fugitive dust generated. Situation will be reviewed by ET and IEC. |
| Ground water was discharging through the soil area. (21 st and 27 th October 2004) | The groundwater was diverted to the IFRC directly. | The environmental outcome was satisfactory. (30 th October 2004) |
| C&D waste observed near pump house and border road. (6, 21 & 27 October 2004) | The C&D waste were collected and removed. | The outcome was satisfactory. (30 October 2004) |
| The surcharging near the Control Point was not protected by tarpaulin sheet or hydroseeding. (6 October 2004) | The surcharge was compacted as far as possible. | The situation will be reviewed by ET and IEC. |
| November 2004 | | |
| The sedimentation tank at Border was full of silt. (3, 10 and 17 November 2004) | The silt was removed occasionally and several sand bags were placed. | The effectiveness of this mitigation measure will be closely monitored. |
| Accumulation of general waste observed at border road. (10, 17, 24 and 29 November 2004) | Most of the general refuse were removed. | The ET and IEC will closely monitor the situation. |
| Uncovered stockpile observed at border road and wheel washing basin area. (10, 17 and 29 November 2004) | The stockpiles were removed or the height of the stockpiles was lowered as far as practicable. | The situation was improved. |
| Buckets of oil observed in wheel washing bay and border road. (10 and 17 November 2004) | The buckets were removed and disposed of as chemical waste. | The environmental outcome was satisfactory. (12 November 2004) |

Table 7.1 (cont'd) Summary of Findings, Actions and Outcomes of Site Inspection by the IEC, ER and ET

| Observations | Actions by Contractor | Outcome |
|--|---|--|
| Soil trails observed at the border road. (24 November 2004) | The soil was removed manually occasionally. | No soil trails were observed. (26 November 2004) |
| The Haul road was dusty. (3, 24 and 29 November 2004) | The haul road was sprayed with water manually or water truck from time to time. | No significant fugitive dust generated. Situation will be reviewed by ET and IEC. |
| Ground water was discharging through the soil area.(10 and 17 November 2004) | The groundwater was diverted to the IFRC directly. | The environmental outcome was satisfactory. (12 November 2004) |
| C&D waste such as used wood formwork observed near pump house and container yard. (3 November 2004) | The C&D waste were collected and removed. | The outcome was satisfactory. (6 November 2004) |
| Sewage water was discharging through the soil area. (29 November 2004) | The groundwater was diverted to the IFRC directly. | The environmental outcome was satisfactory. (30 November 2004) |
| The oil drum was found placed on site without drip tray. (17 November 2004) | The site office and the oil drums at that area were removed. | The situation was rectified. (23 November 2004) |
| December 2004 | | |
| Stagnant water was observed in the channel near container yard and border road area. (9, 17 and 22 December 2004) | The contractor has pumped out the stagnant water from time to time. | The effectiveness of this mitigation measure will be closely monitored. |
| The sedimentation tank at border road was full of silt. (22 and 31 December 2004) | The silt was removed occasionally and several sand bags were placed. | The effectiveness of this mitigation measure will be closely monitored. |
| The water in the wheel washing bay was muddy. (31 December 2004) | Desilting was undertaken. | To be reported. |
| Oil drum without drip tray was observed at border road. (9, 17 and 22 December 2004) | The oil drum has been removed. | The environmental outcome was satisfactory. |
| Buckets of oil observed at border road. (9 and 17 December 2004) | The buckets were removed and disposed of as chemical waste. | The environmental outcome was satisfactory. (22 December 2004) |

Table 7.1 (cont'd) Summary of Findings, Actions and Outcomes of Site Inspection by the IEC, ER and ET

| Observations | Actions by Contractor | Outcome |
|---|---|---|
| The generator at the border road was not placed in the drip tray. (22 December 2004) | The drip tray was provided to the generator. | No land contamination was observed. (28 December 2004) |
| Accumulation of general waste observed at wheel washing area, pump house and border road (9, 22 and 31 December 2004) | Most of the general refuse were removed. | The ET and IEC will closely monitor the situation. |
| Uncovered stockpiles observed at border road and border road area. (17 December 2004) | The stockpiles of soil were used for backfilling or the height of the stockpiles was lowered as far as practicable. | The situation was improved. |
| The Haul road at border road was dusty. (17 and 31 December 2004) | The haul road was sprayed with water manually or water truck from time to time. | No significant fugitive dust generated. Situation will be reviewed by ET and IEC. |
| Fugitive dust emission observed during unloading of rock near pump house. (31 December 2004) | The rock was sprayed with water at the site entrance. | To be reported. |

8. SOLID AND LIQUID WASTE MANAGEMENT STATUS

A total of 2,595.5m³ C&D waste was generated from the works in this reporting period and transported to the WENT Landfill Site for disposal. 27,741m³ Type I and Type II contaminated soil was delivered to East Sha Chau for disposal. 162m³ general refuse was disposed. 400L chemical waste was collected by a licensed collector in this reporting quarter.

9. COMPLAINTS, NOTIFICATIONS OF SUMMONSES AND SUCCESSFUL PROSECUTIONS

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

Complaint Log is attached in Appendix IX. Cumulative statistics on complaint, is attached in Appendix X.

10. CONCLUSIONS

This Quarterly Environmental Monitoring and Audit Report details the monitoring works carried out during the period from 1 October to 31 December 2004.

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

Results for water quality were found to be acceptable this reported period with no exceedances to any set Action or Limit levels.

In addition, no complaint, notification of summons and successful prosecutions were received this month.

Figures

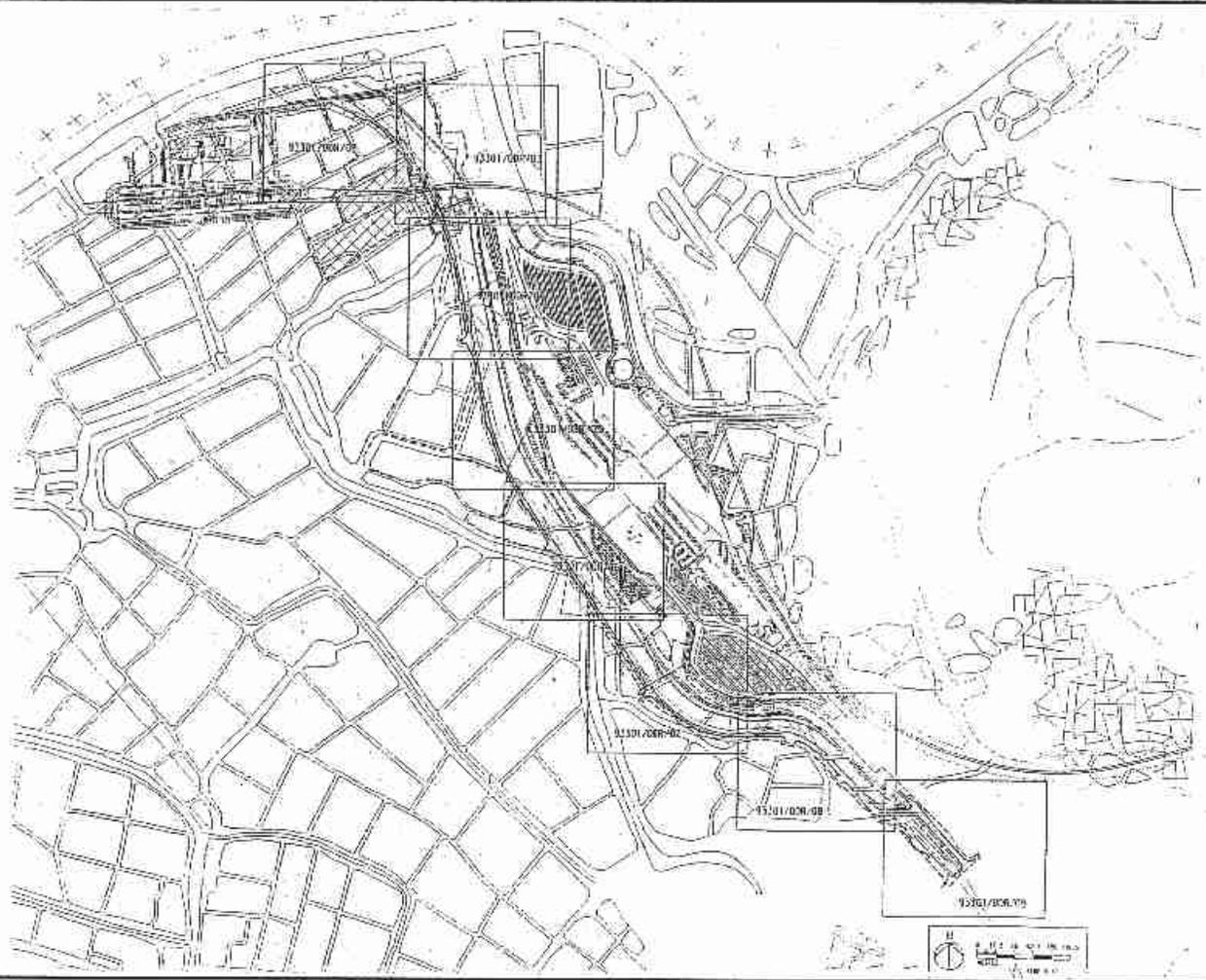


Figure 2.1 - General Layout Plan

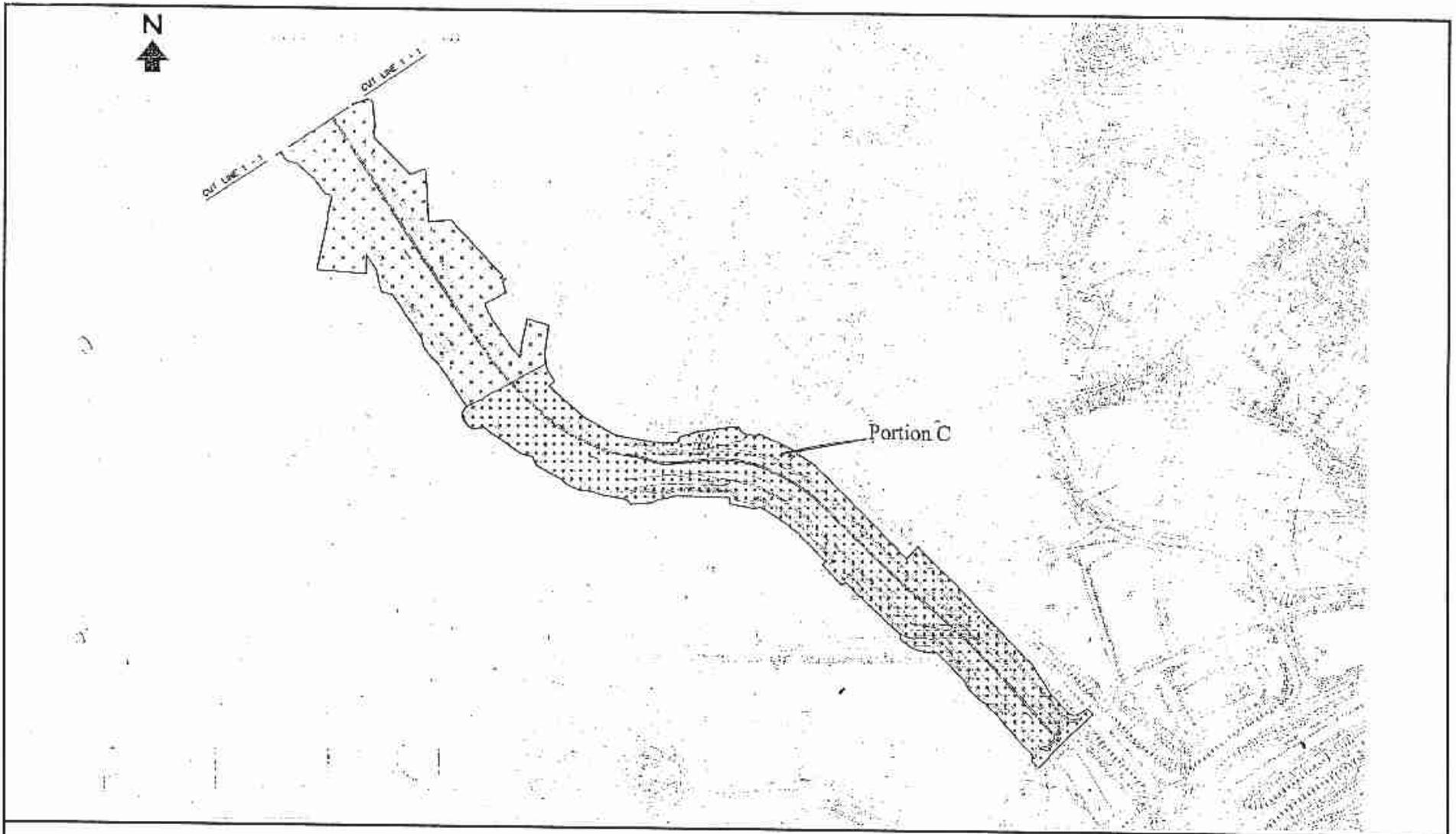


Figure 2.2 - Portion of the Site

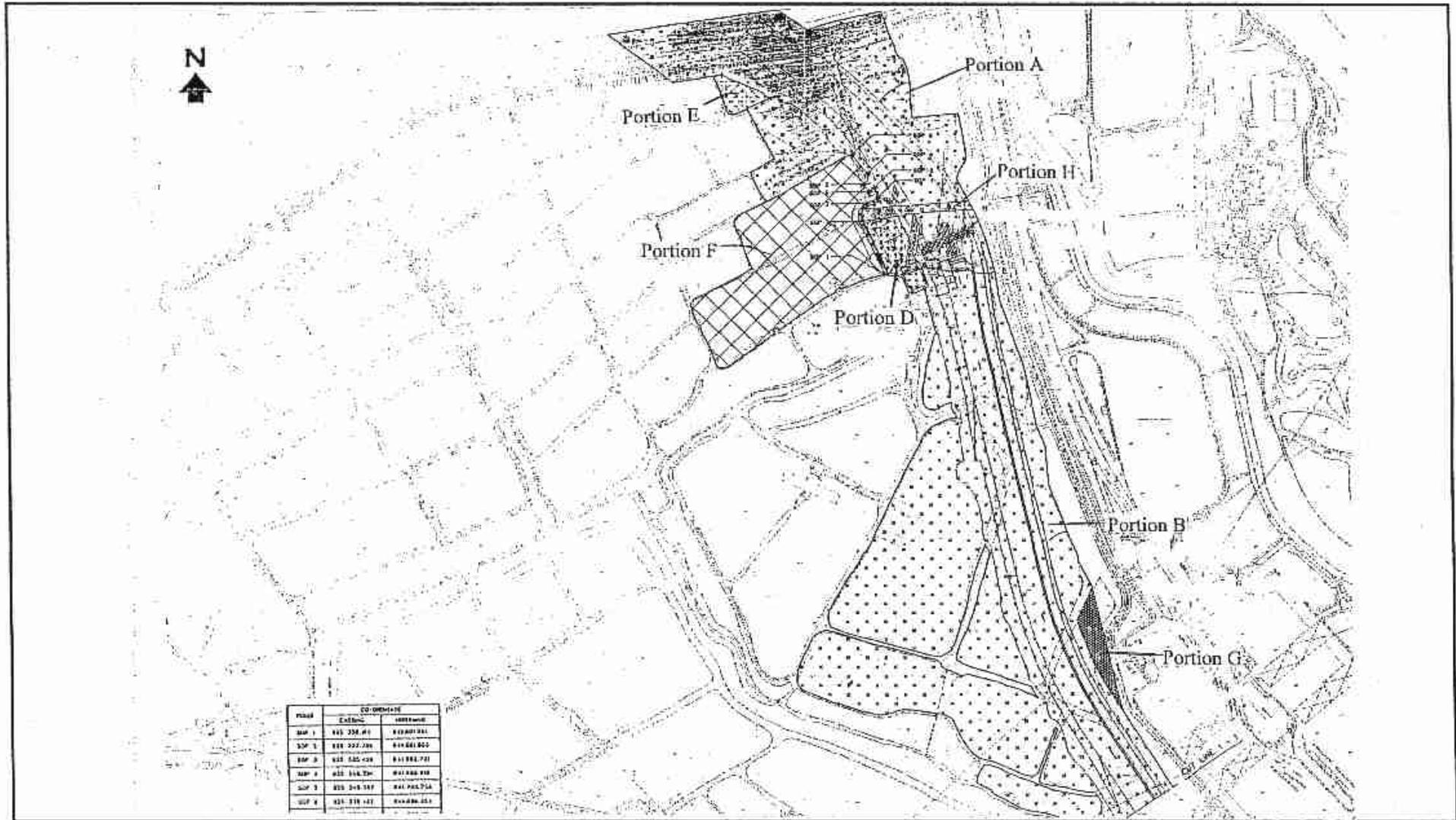


Figure 2.2a - Portion of the Site

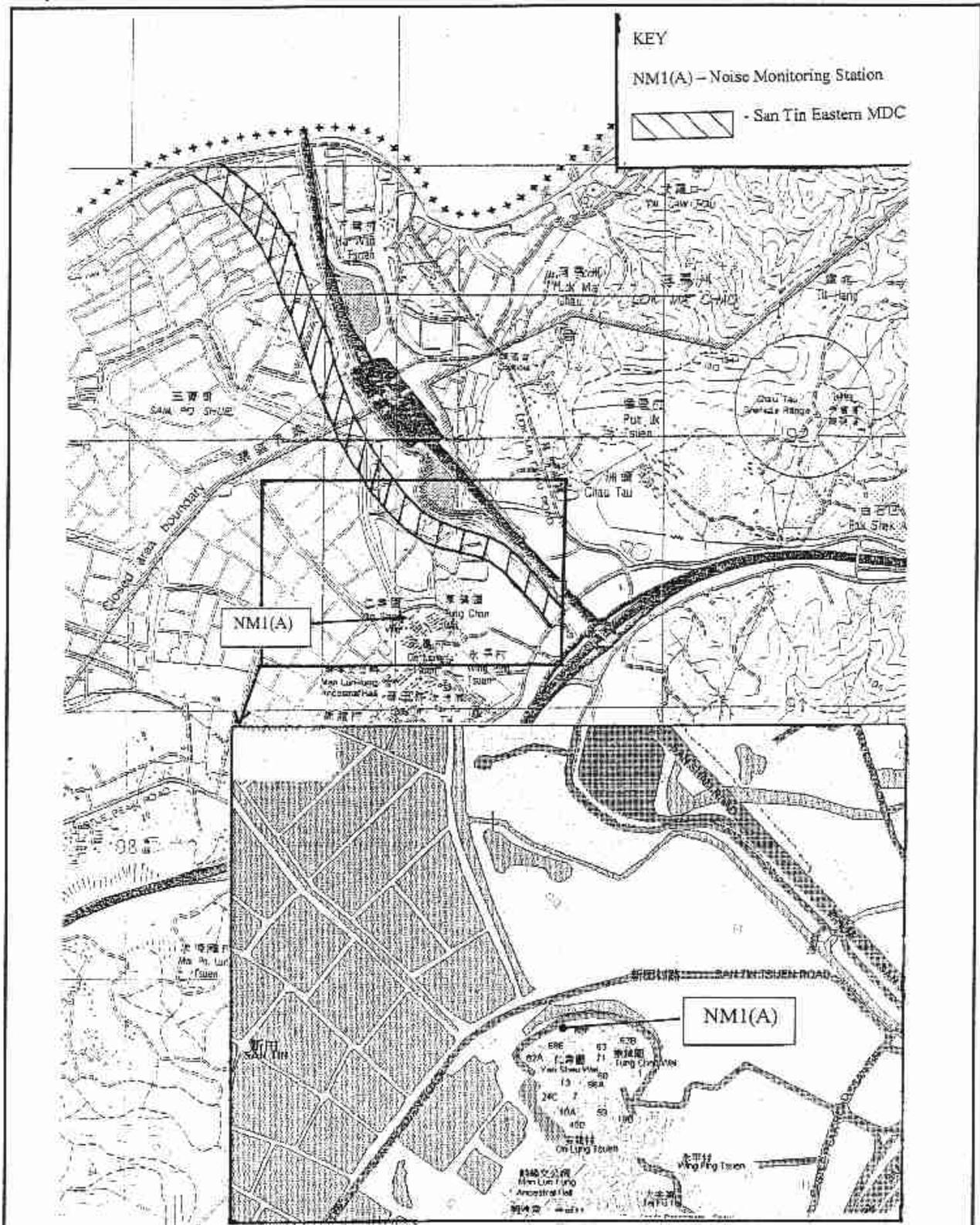


Figure 4.2 - Location of Noise Monitoring Station

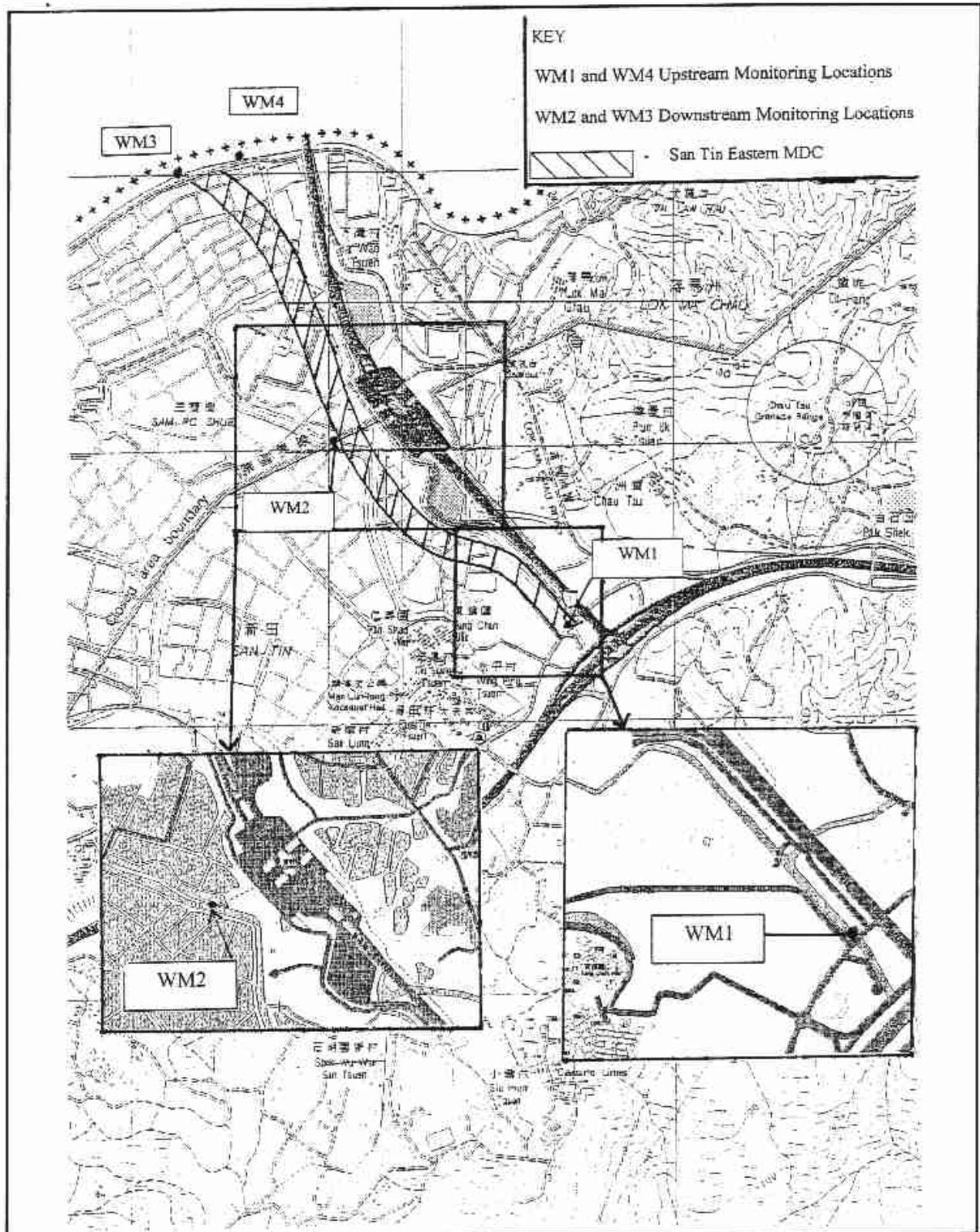


Figure 4.3 - Locations of Water Quality Monitoring Station

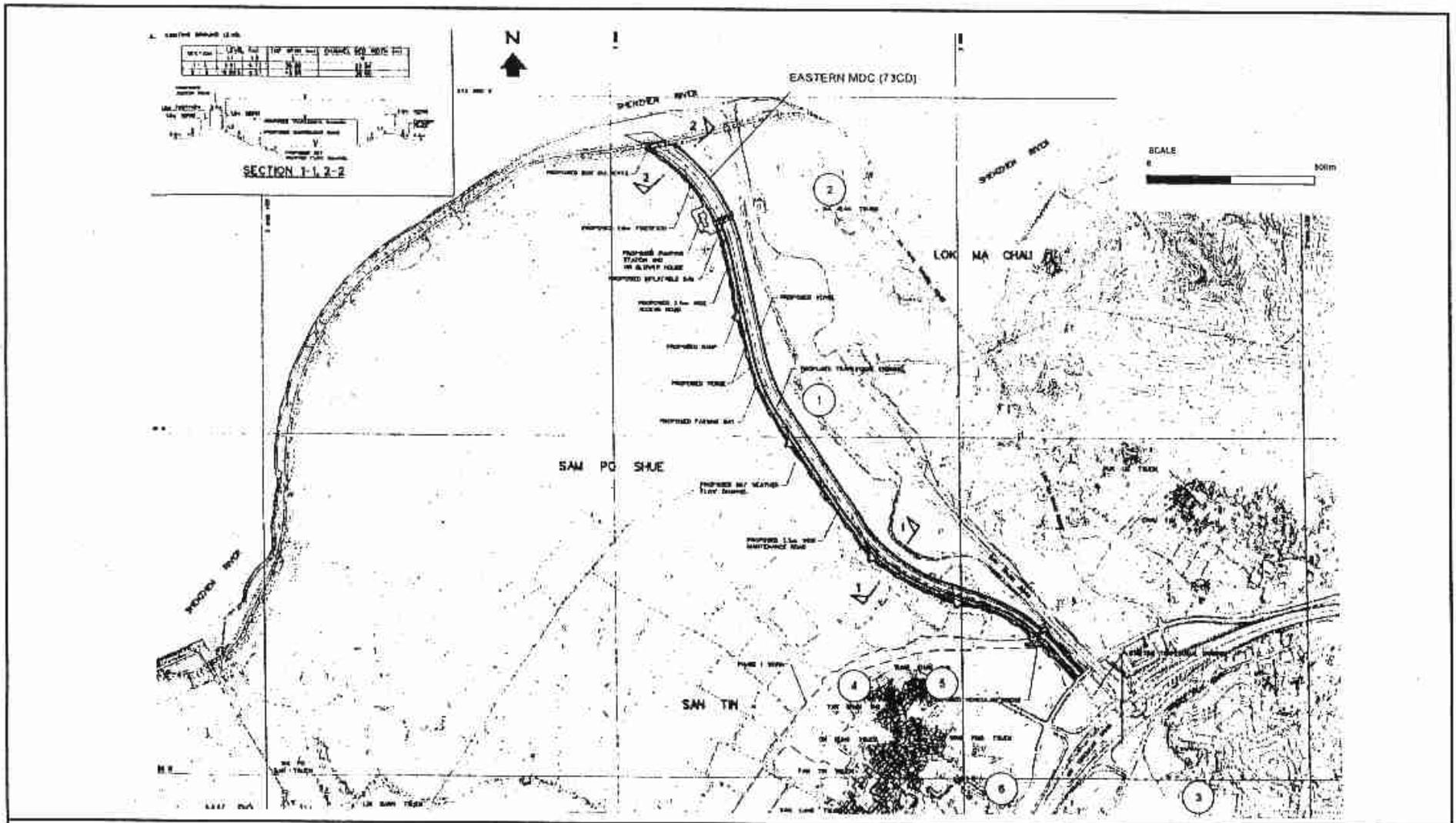


Figure 4.4 - Location of Representative ASRs

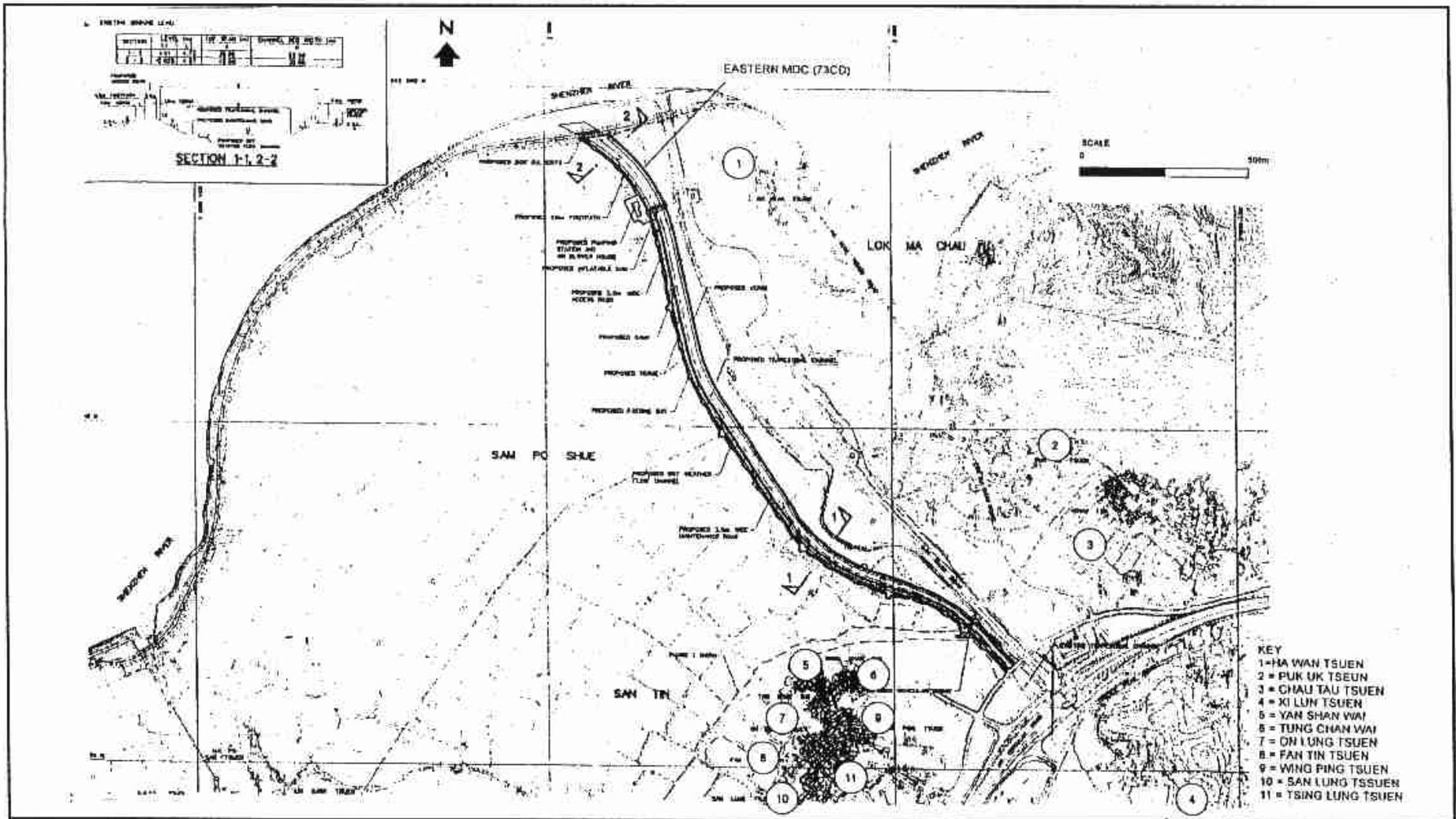


Figure 4.5 - Location of Representative NSRs

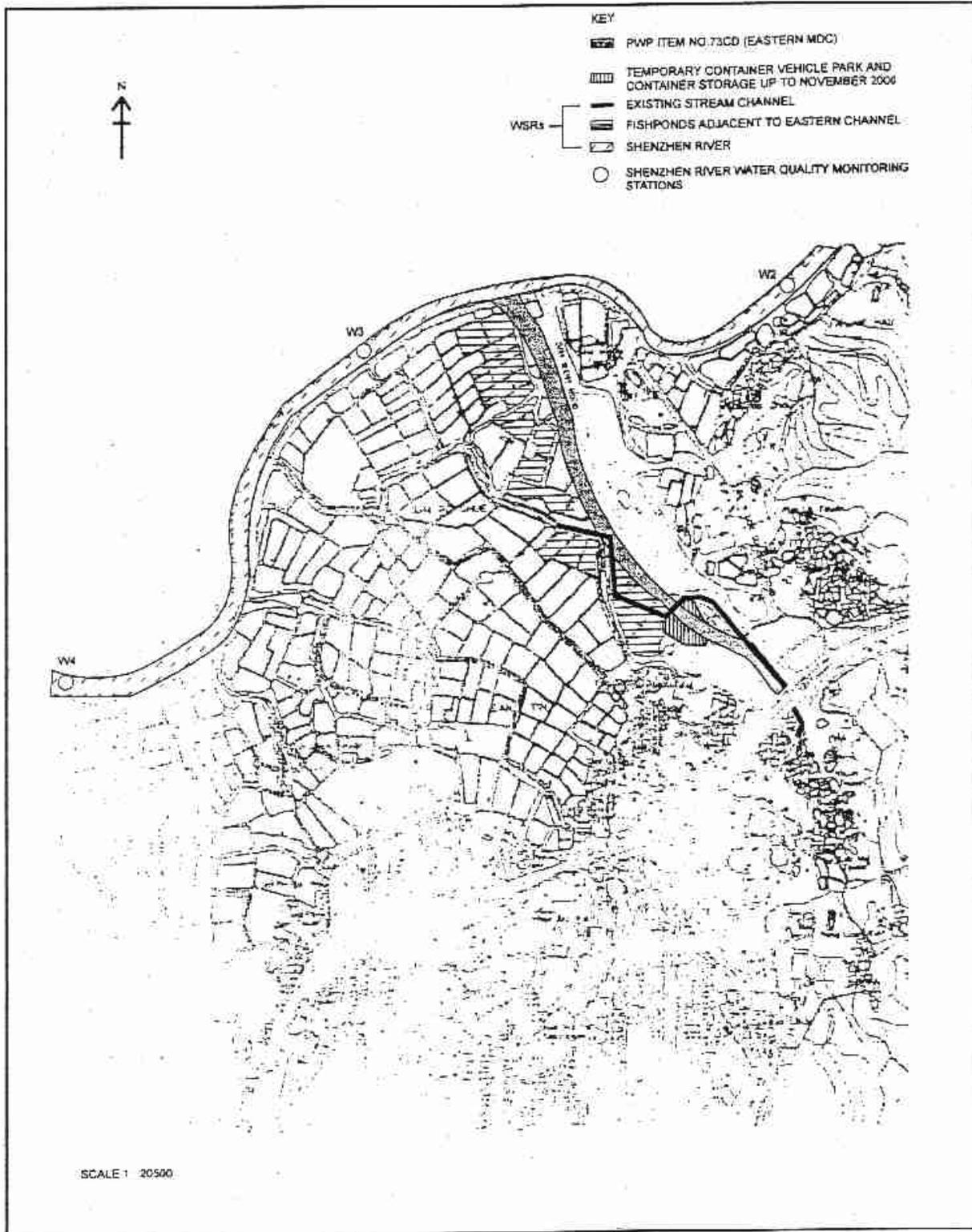


Figure 4.6 - Water Quality Sensitive Receivers

Figure 6.2 - Graphical Plot of 1-hr TSP Levels

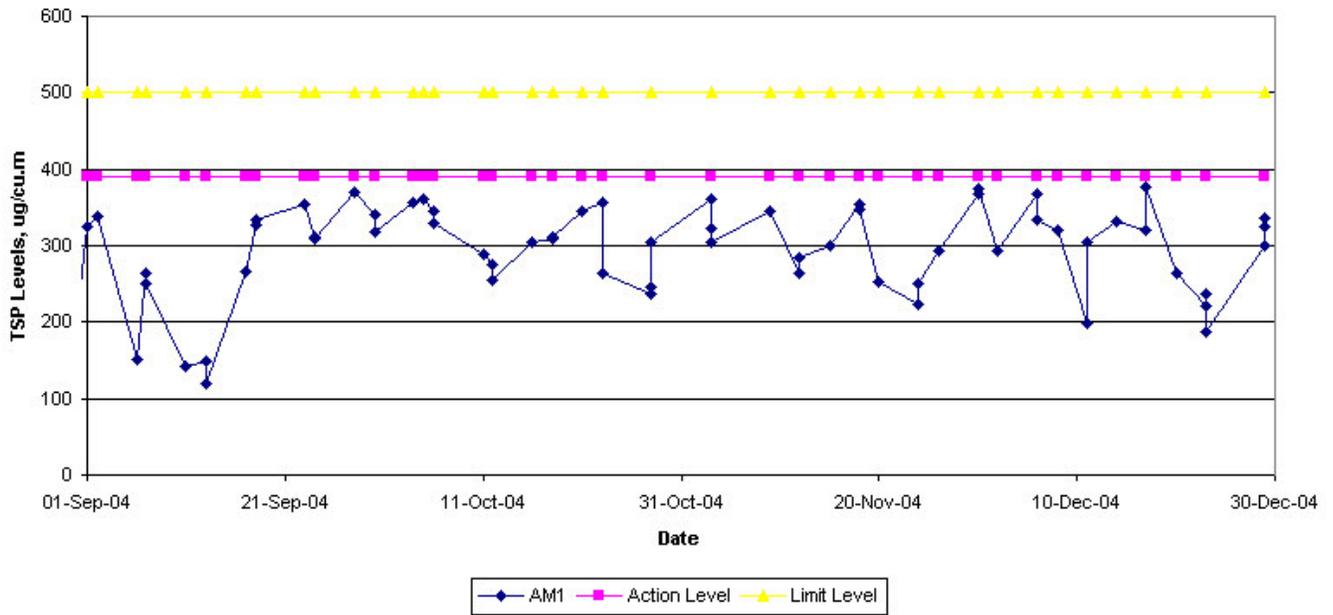


Figure 6.1 - Graphical Plot of 24-hr TSP Levels

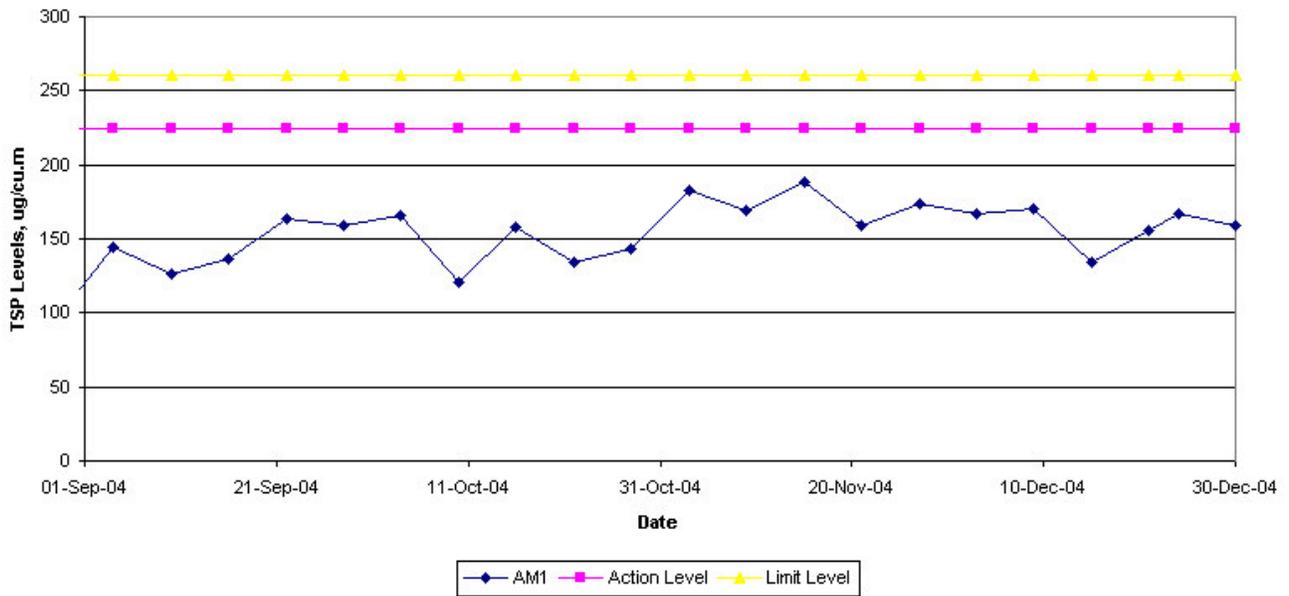


Figure 6.3 - Graphical Plot of Noise Level

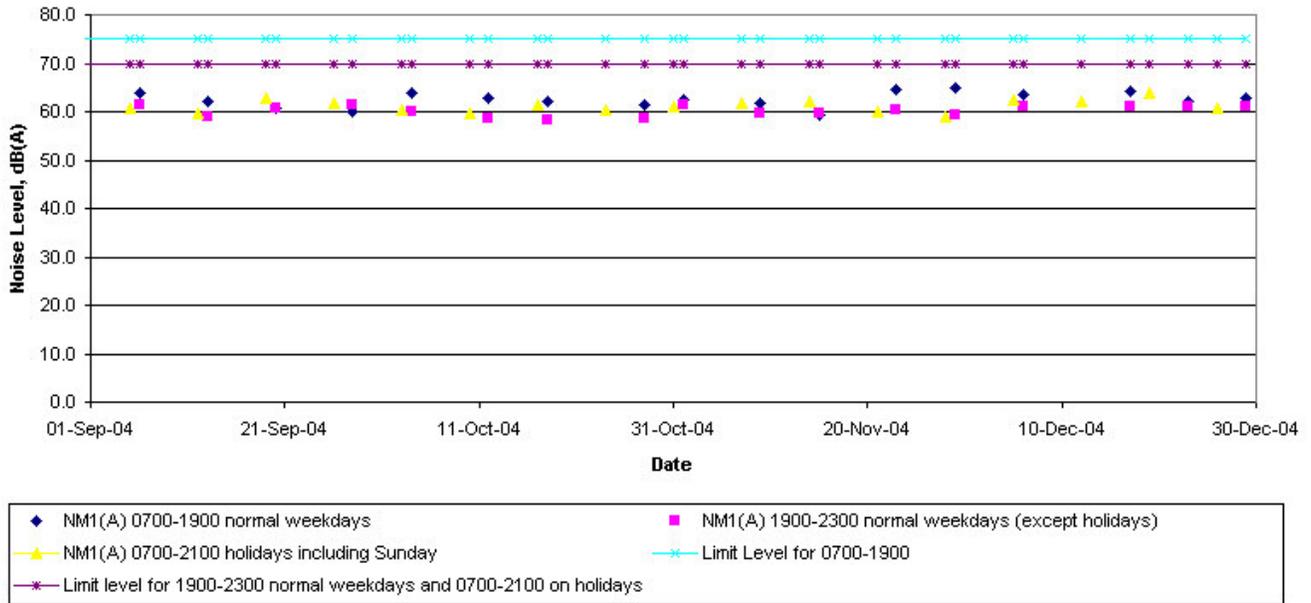


Figure 6.4 - Graphical Plot for Temperature (WM1 & WM2)

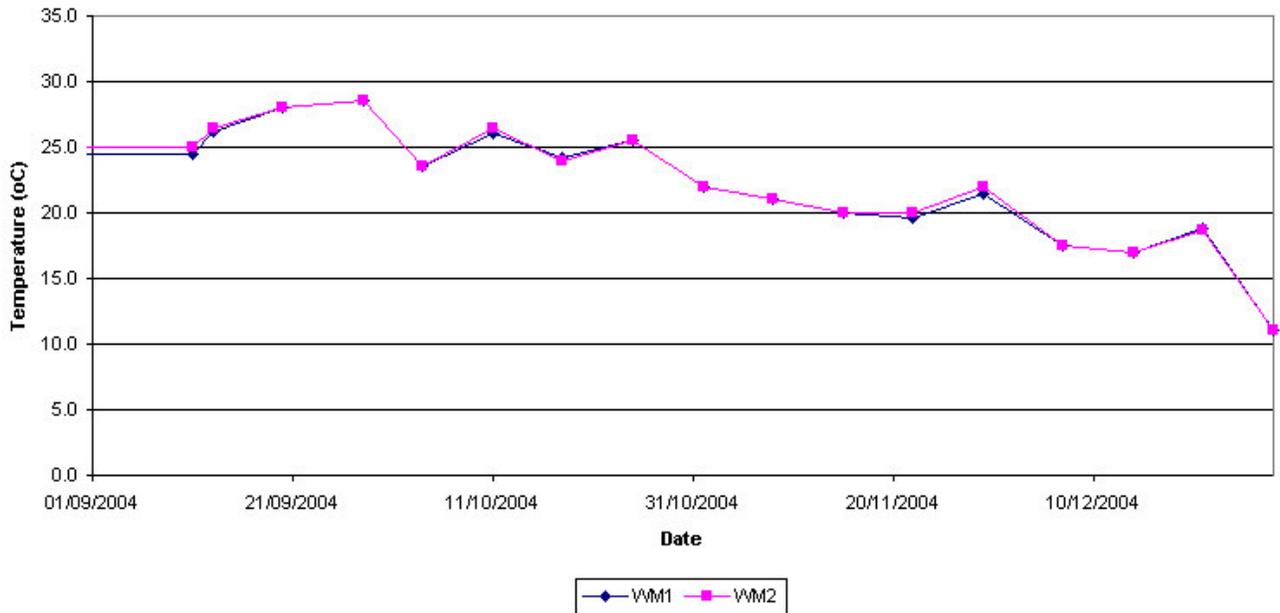


Figure 6.5 - Graphical Plot for Temperature (WM3 and WM4)

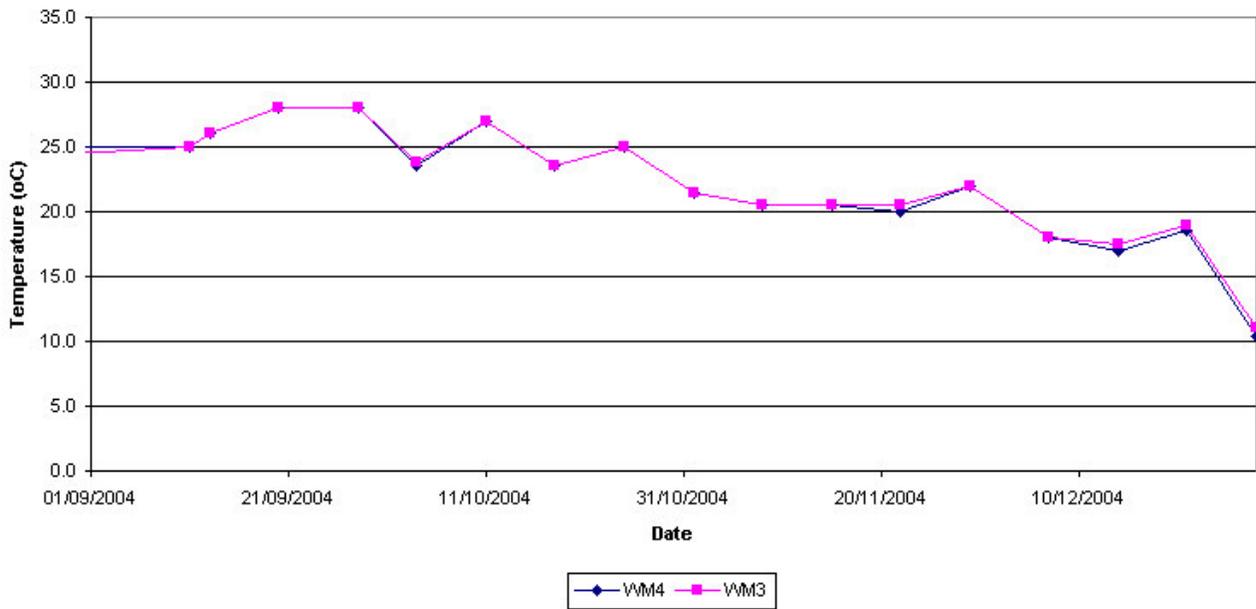


Figure 6.6 - Graphical Plot for pH (WM1 & WM2)

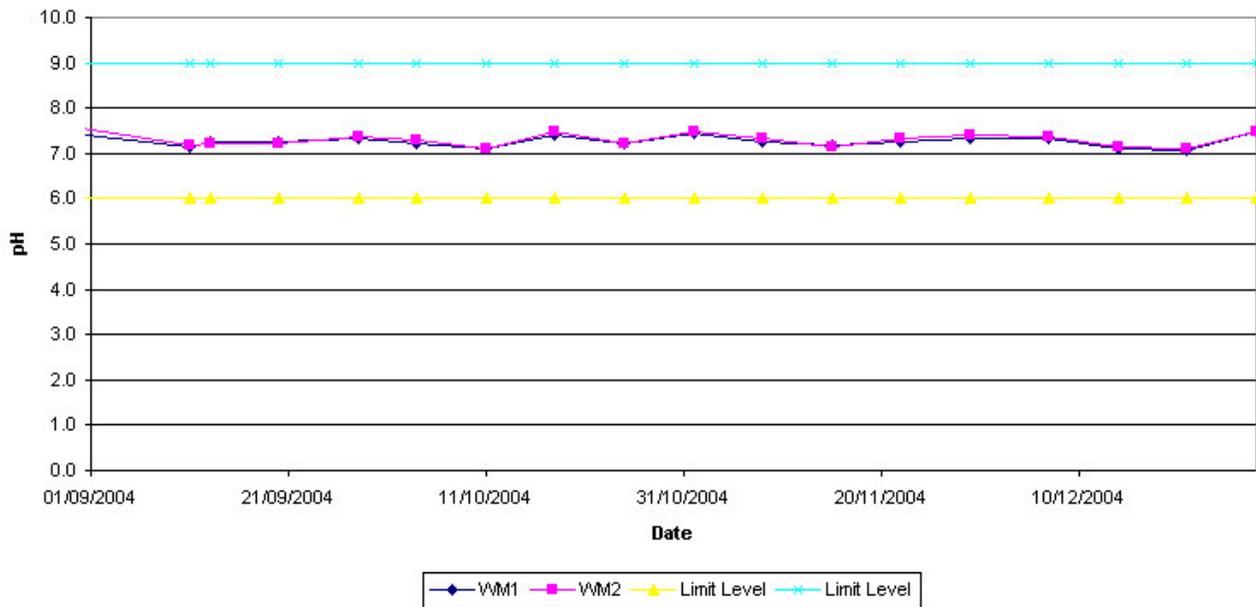


Figure 6.7 - Graphical Plot for pH (WM3 & WM4)

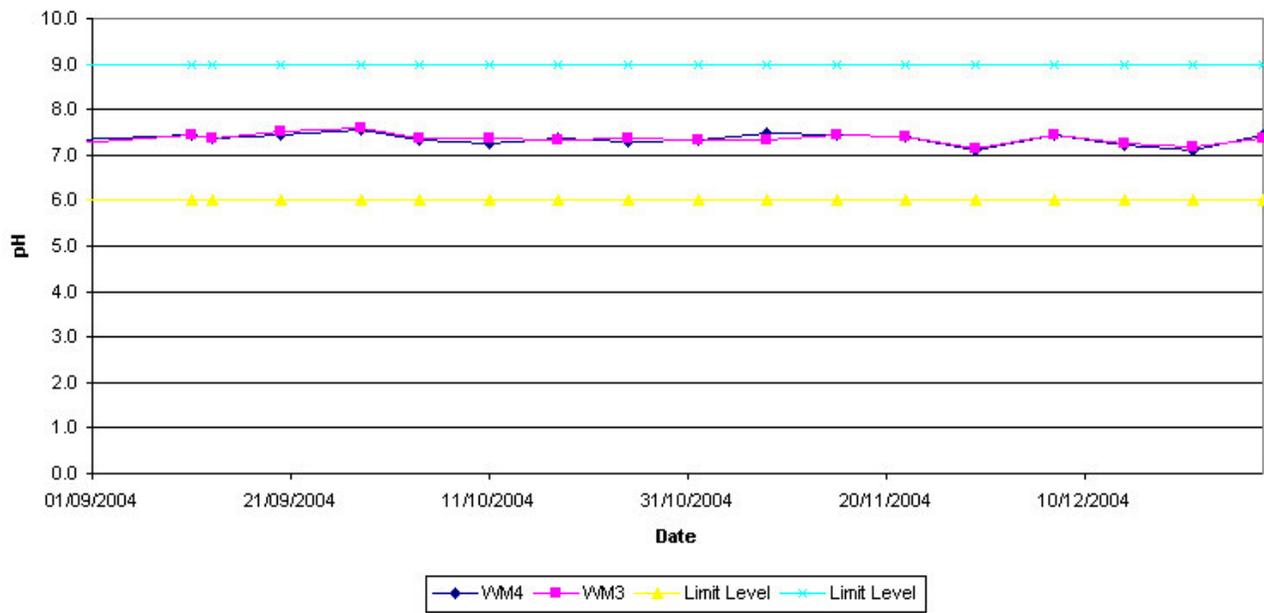


Figure 6.8 - Graphical Plot for Dissolved Oxygen (%) (WM1 & WM2)

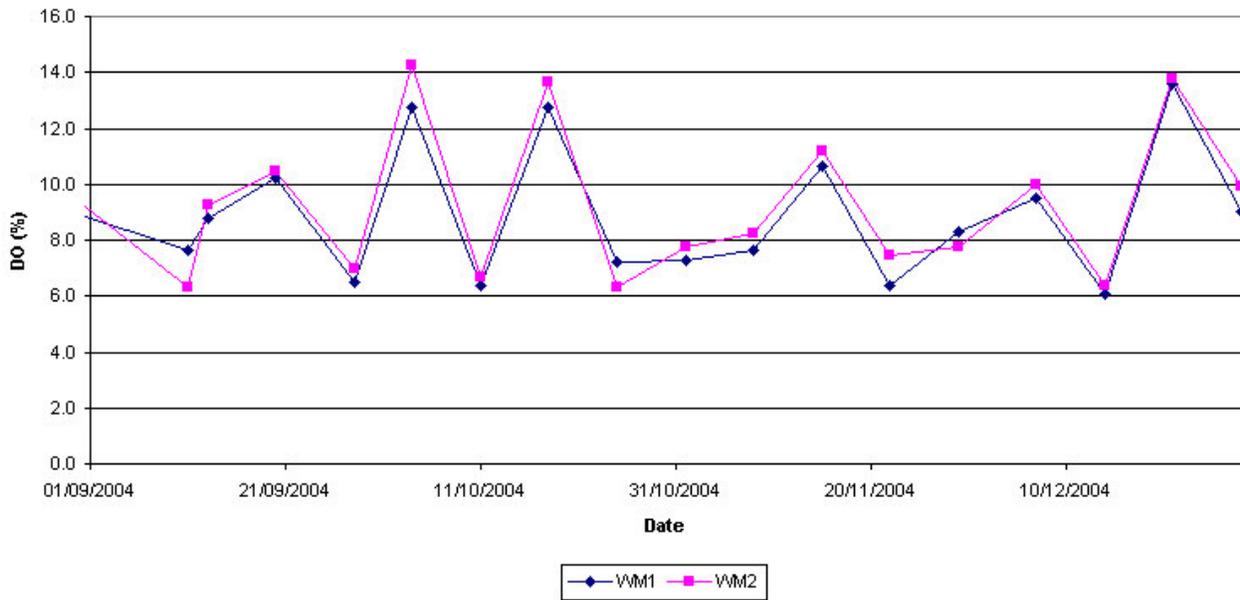


Figure 6.9- Graphical Plot for Dissolved Oxygen (%) (WM3 & WM4)

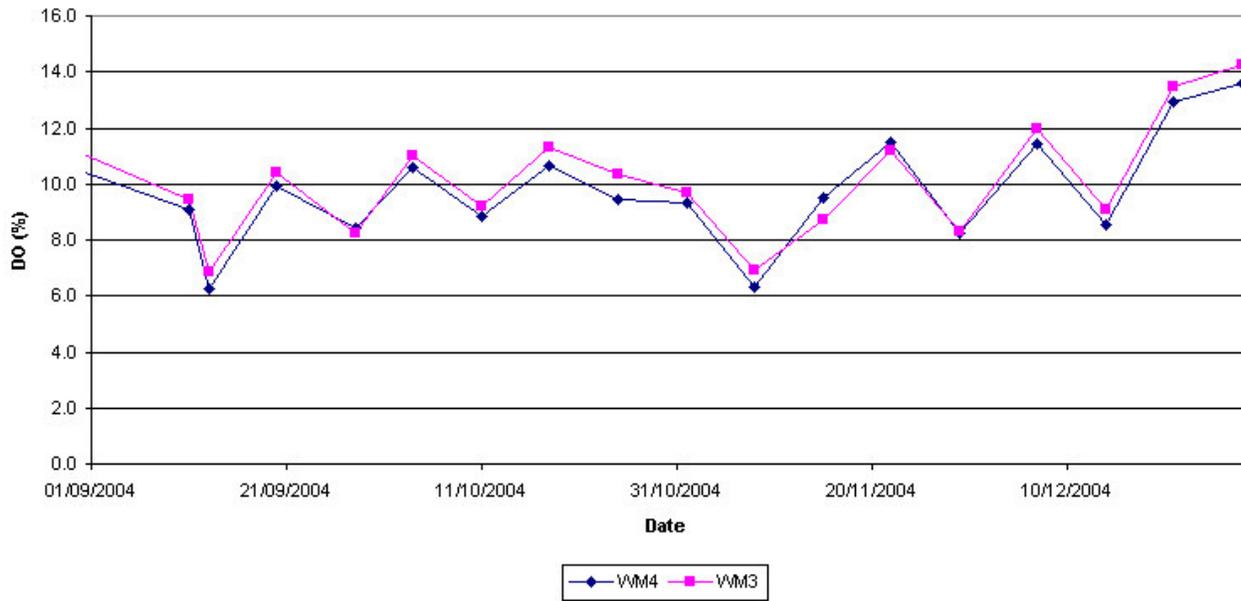


Figure 6.10 - Graphical Plot for Dissolved Oxygen (mg/L) (WM1 & WM2)

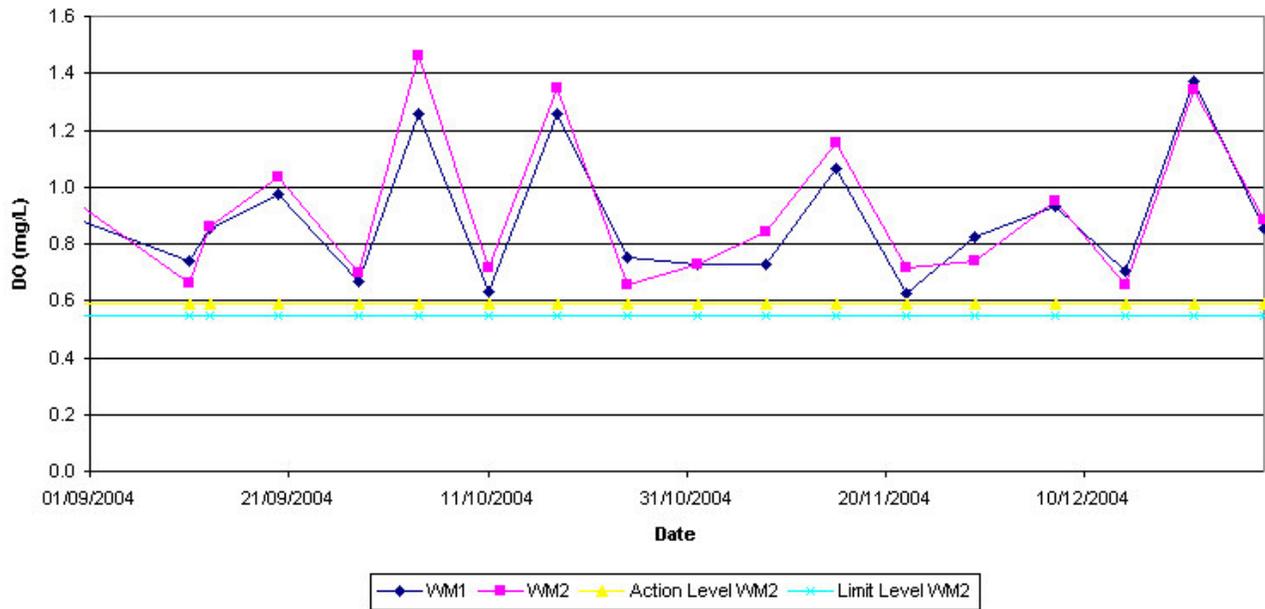


Figure 6.11 - Graphical Plot for Dissolved Oxygen (mg/L) (WM3 & WM4)

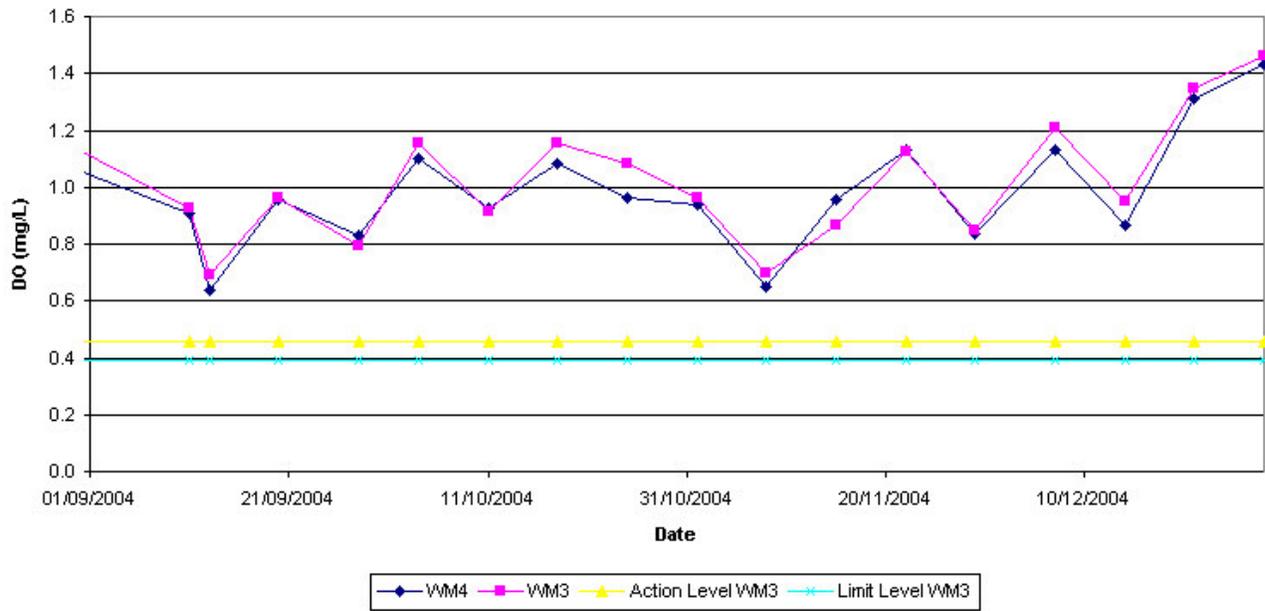


Figure 6.12 - Graphical Plot of Turbidity (WM1 & WM2)

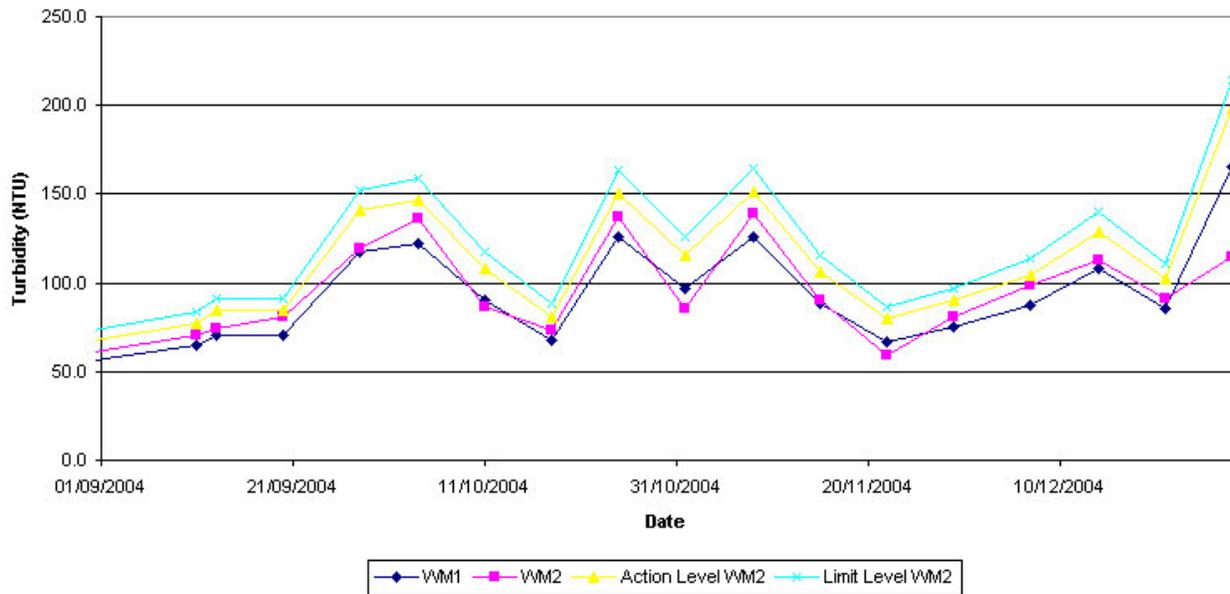


Figure 6.13 - Graphical Plot of Turbidity (WM3 & WM4)

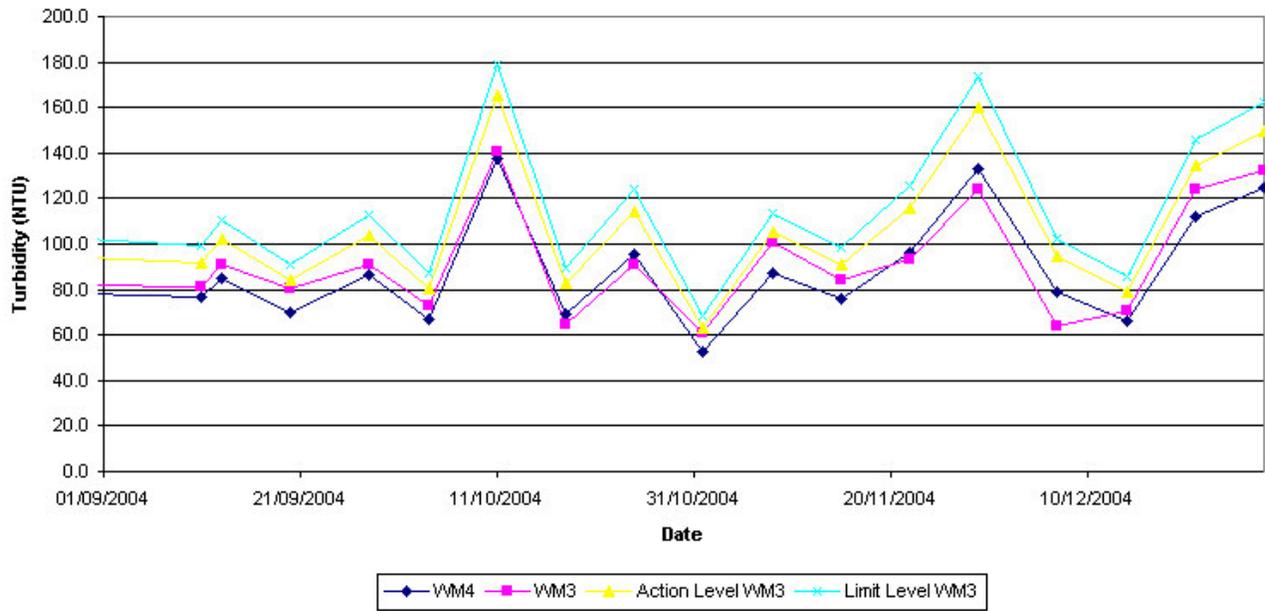


Figure 6.14 - Graphical Plot for Suspended Solids (WM1 & WM2)

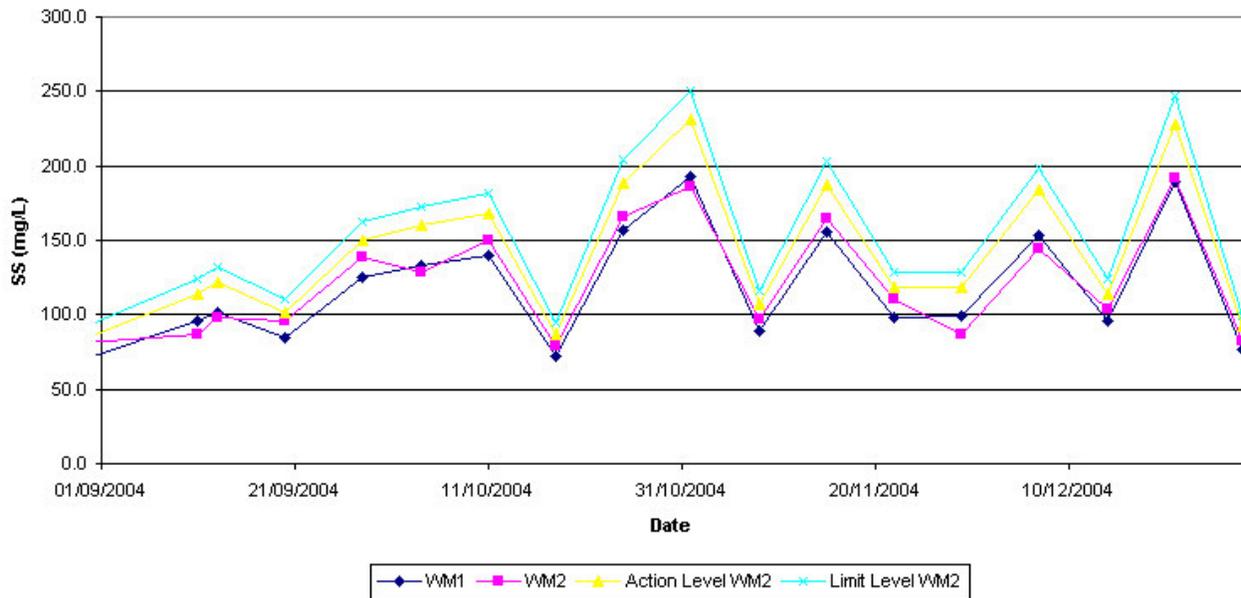


Figure 6.15 - Graphical Plot for Suspended Solids (WM3 & WM4)

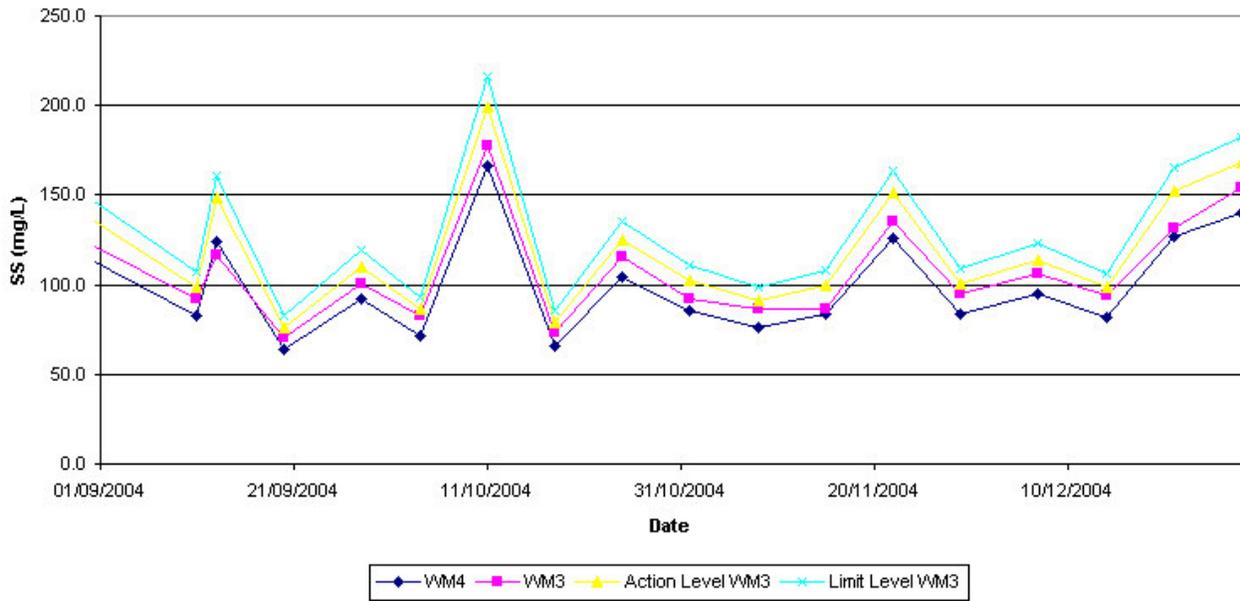


Figure 6.16 - Graphical Plot of Ammoniacal Nitrogen (WM1 & WM2)

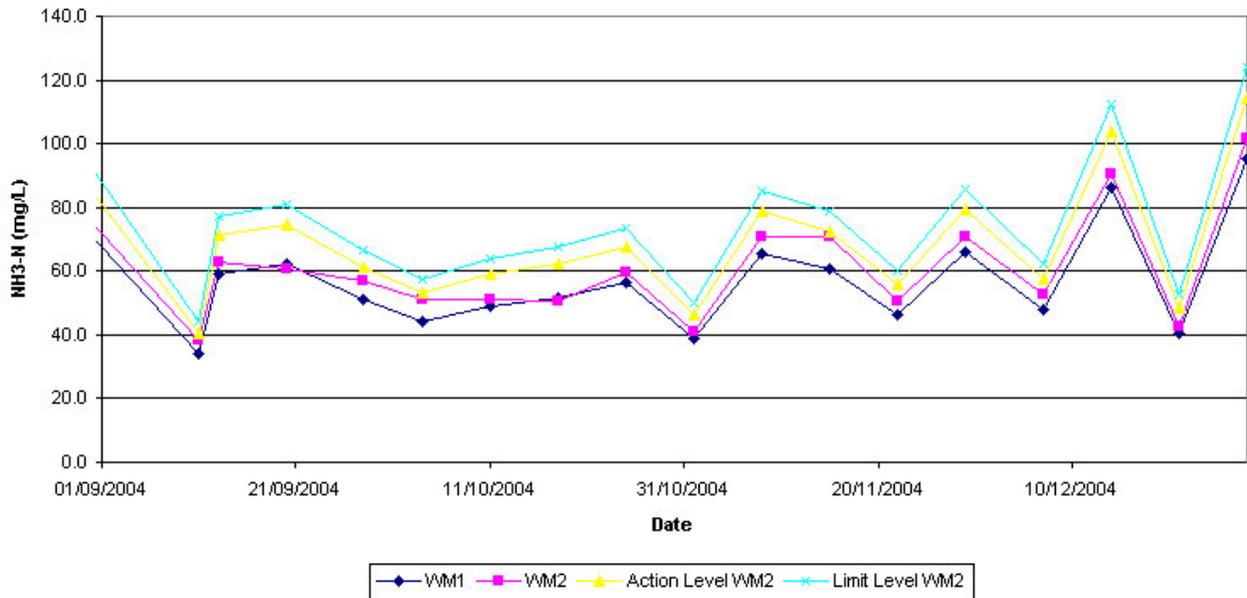
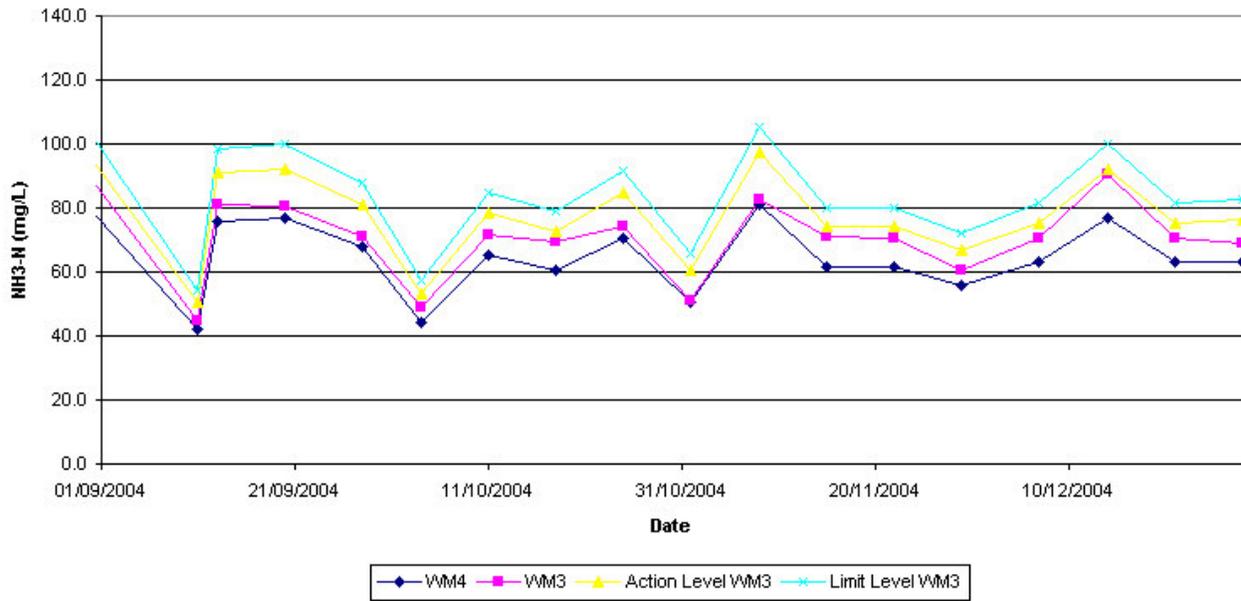
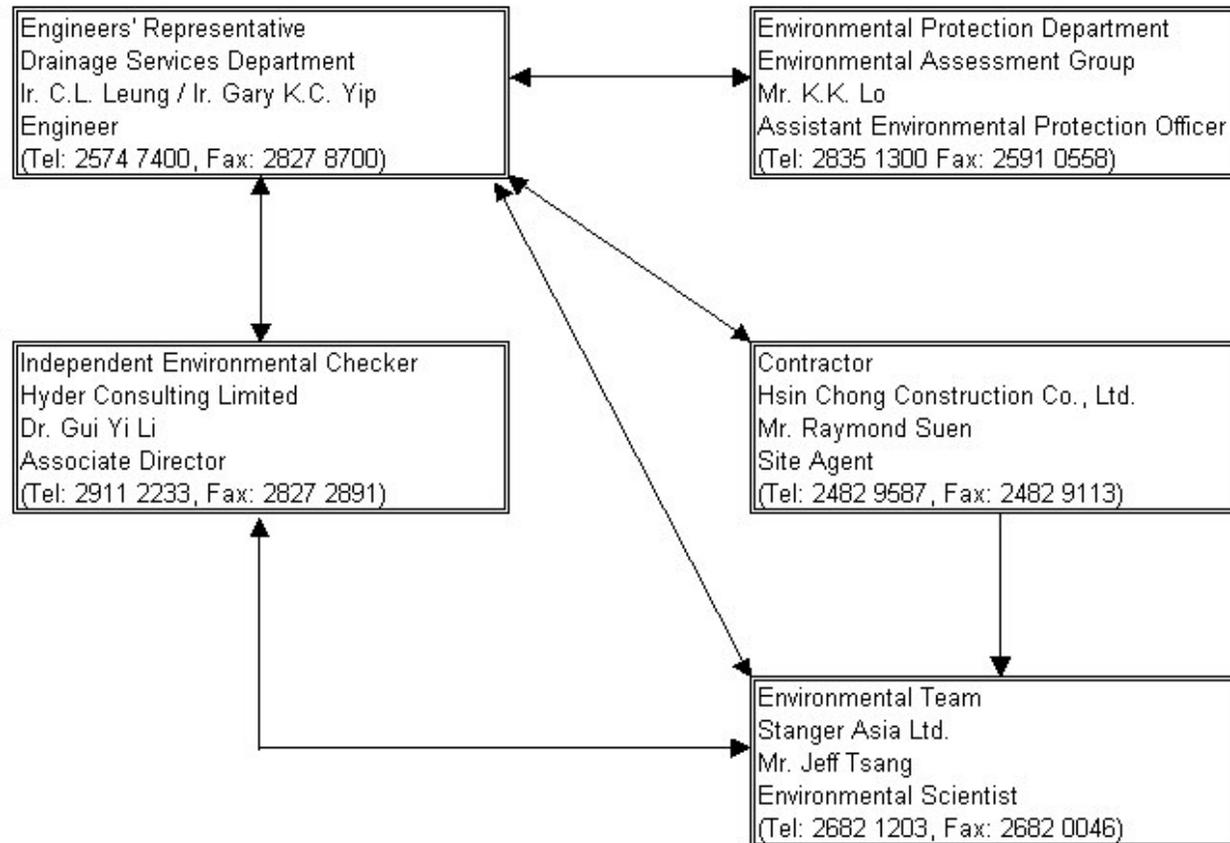


Figure 6.17 - Graphical Plot of Ammoniacal Nitrogen (WM3 & WM4)



Appendix I
Organization Chart

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



Appendix II

Event and Actions Plans

Event and Action Plan for Water Quality.

| EVENT | ACTION | | | |
|-----------------------------|---|--|---|--|
| | ET Leader | IC(E) | ER | CONTRACTOR |
| Action Level | | | | |
| Exceedance for one sample. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 1. Check monitoring data submitted by ET. 2. Check Contractor's working methods. | <ol style="list-style-type: none"> 1. Notify Contractor. | <ol style="list-style-type: none"> 1. Rectify any unacceptable practice. 2. Amend working methods if appropriate. |
| Exceedance for two samples. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Ensure remedial measures are properly implemented. | <ol style="list-style-type: none"> 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. |

Event and Action Plan for Water Quality.

| EVENT | ACTION | | | |
|---|--|---|---|---|
| | ET Leader | IC(E) | ER | CONTRACTOR |
| Limit Level | | | | |
| Exceedance for one sample. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Ensure remedial measures are properly implemented. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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 be taken. 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. |

Event and Action Plan for Construction Noise

| EVENT | ACTION | | | |
|--------------|---|--|--|---|
| | ET Leader | IC(E) | ER | CONTRACTOR |
| Action Level | | | | |
| | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IC(E). 2. Implement noise mitigation proposals. |
| Limit Level | | | | |
| | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. |

Event and Action Plan for Pumping Station Noise During Commissioning

| EVENT | ACTION | | | |
|--------------|--|--|---|--|
| | ET Leader | IC(E) | ER | CONTRACTOR |
| Action Level | | | | |
| | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IC(E). 2. Implement noise mitigation proposals. |
| Limit Level | | | | |
| | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. |

Event and Action Plan for Air Quality

| EVENT | ACTION | | | |
|--|---|---|--|--|
| | ET Leader | IC(E) | ER | CONTRACTOR |
| Action Level | | | | |
| Exceedance for one sample | <ol style="list-style-type: none"> 1. Identify sources. 2. Inform IC(E) and ER. 3. Repeat measurements to confirm finding. 4. Increase monitoring frequency to daily. | <ol style="list-style-type: none"> 1. Check monitoring data submitted by ET. 2. Check Contractor's working methods. | <ol style="list-style-type: none"> 1. Notify Contractor. | <ol style="list-style-type: none"> 1. Rectify unacceptable practice. 2. Amend working methods if appropriate. |
| Exceedance for two or more consecutive samples | <ol style="list-style-type: none"> 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 if required. 6. If exceedance continues, arrange meeting with IC(E) and ER. If exceedance stops, cease additional monitoring. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Ensure remedial actions properly implemented. | <ol style="list-style-type: none"> 1. Submit proposals for remedial actions to IC(E) within 3 days. 2. Implement the agreed proposals. 3. Amend proposals if appropriate. |

Event and Action Plan for Air Quality

| EVENT | ACTION | | | |
|--|---|--|---|---|
| | ET Leader | IC(E) | ER | CONTRCATOR |
| Limit Level | | | | |
| Exceedance for one sample | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Ensure remedial actions properly implemented. | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. |

Appendix III

Implementation Status of Mitigation Measures

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

| 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 utilised 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 utilised 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(A) | Prior to commencement of construction | ET Leader | Implemented |
| | | | Construction noise monitoring shall be carried out; | Monitoring location NM1(A) | 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 |

| 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 | <p>If excavation on wet stream is not avoidable, the following shall be implemented:</p> <ul style="list-style-type: none"> - 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 | <p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p> |
| 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 | Improvement is required |
| | | 4.4.4.6-8 | The boundaries of earthworks shall marked and surrounded by dykes or embankments for flood protection. | All works area | All period during construction phase | Site Agent / Engineer | Implemented |
| | | 4.4.4.6-8 | Open material storage stockpiles shall be covered with tarpaulin or similar fabric to prevent material washing away. | All works area | All period during construction phase | Site Agent / Engineer | Implemented |

| 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 | Improvement is required. |
| | | | The adequate maintenance of drainage systems to prevent flooding and overflow. | All works area | All period during stream channel excavation | Site Agent / Engineer | Implemented |
| | | | All temporary drainage pipes and culverts provided to facilitate run-off discharge shall be adequately designed to facilitate rapid discharge of storm flows. All sediment traps shall be regularly cleaned and maintained. The temporarily diverted drainage shall be reinstated to its original condition, when construction work is completed or the temporary diversion is no longer required. | All works area | All period during stream channel excavation | Site Agent / Engineer | Partially implemented |
| | | | Sand and silt in wash water from wheel washing facilities shall be settled out and removed before discharge into temporary drainage pipes or culverts. A section of the haul road between the wheel washing bay and the public road shall be paved with backfill to prevent wash water or other site run-off from entering the public road. | All works area | All period during stream channel excavation | Site Agent / Engineer | Implemented |
| 11. | General Construction Construction Runoff and Drainage | 4.4.4.10 4.4.4.11 | Debris and rubbish on site shall be collected, handled and disposed of properly. | All works area | All period during construction phase | Site Agent / Engineer | Improvement is required |
| | | | 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 | |

| No. | Parameter | EIA Ref. | Mitigation Measures/Key EM&A Requirements | Location | Timing | Responsibility | Implementation Status |
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| 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 | Marine dumping | Site Agent / Engineer | Implemented |
| | | 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 | Marine dumping | Site Agent / Engineer | Implemented |
| | | 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 | Marine dumping | Site Agent / Engineer | Implemented |
| | | 4.4.412 | Water tight trucks shall be used for transportation of marine disposal of excavated material. | Marine dumping route/area | Marine dumping | Site Agent / Engineer | Implemented |
| | | 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 Marine dumping grounds | Marine dumping | Site Agent / Engineer | Implemented |
| | | 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 | Implemented |
| | | 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 | Implemented |
| | | 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 | Implemented |

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|-----------------|---------------------------------------|----------|---|--------------------------------|---------------------------------------|-----------------------|-----------------------|
| 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 | Implemented |
| | | 4.4.414 | The Contractor must be able to position the dumping vessel to an accuracy of ± 10 m. Barge loading shall be monitored to ensure that loss of material does not take place during transportation. | Marine dumping grounds | Maine dumping | Site Agent / Engineer | Implemented |
| | | 4.4.414 | Transport barges or vessels shall be equipped with automatic self monitoring devices as specified by the EPD. | Marine dumping grounds | Marine dumping | Site Agent / Engineer | Implemented |
| | | 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 | Marine dumping | Site Agent / Engineer | Implemented |
| 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 | Prior to commencement of construction | ET Leader | Implemented |
| | | EM&A 4.6 | Construction phase water quality monitoring shall be carried out. | Monitoring locations, WM1, WM2 | All period during construction phase | ET Leader | Implemented |

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

| No. | Parameter | EIA Ref. | Mitigation Measures/Key EM&A Requirements | Location | Timing | Responsibility | Implementation Status |
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| 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 |
| | | 5.4.5.9 and 5.4.5.6 | The handling and disposal of bentonite slurries shall be undertaken in accordance with <i>Practice Note for Professional Persons – Construction Site Drainage (ProPECC PN 1/94)</i> 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 |
| | | | 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 <i>Code of Practice on the Packaging, Handling and Storage of Chemical Wastes</i> . | 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 <i>Schedule 2 of the Chemical Waste Regulation</i> . | 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 to remove general refuse from the site, separately from construction and chemical wastes, on a daily or every second day basis to minimize odour, pest and litter impacts. The burning of refuse on construction sites is prohibited by law. | All works areas | All period during construction phase | Site Agent / Engineer | Implemented |
| 19. (cont'd) | | 5.4.5.18 | General refuse shall be largely by food service activities on site, so reusable rather than disposable dishware shall be used if feasible. Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated or easily accessible; separate, labeled bins for their deposit shall be provided if feasible. | All works areas | All period during construction phase | Site Agent / Engineer | Implemented |
| | | 5.4.5.19 | Office wastes can be reduced through recycling if volumes are large enough to warrant collection. Participation in a local collection scheme shall be considered if one is available. | All works areas | All period during construction phase | Site Agent / Engineer | Implemented |
| 20. | Dust | 5.4.5.20 | Wetting the surface of the stockpiled soil with water in dry season unless during emergency; covering the stockpile soil with sheets; minimize disturbance of the stockpile soil; and enclosure of the stockpiling area. | All works areas | All period during construction phase | Site Agent / Engineer | Partially implemented |
| 21. | Water Quality | 5.5.5.20 | There shall be a separate surface water drainage system for the stockpiling area; silt traps shall be installed for surface water drainage system and the stockpile material shall be covered with tarpaulin during heavy rainstorm. | All works areas | All period during construction phase | Site Agent / Engineer | Implemented |
| 22. | Excavated Materials/ Contamin'd Sediment | 5.4.5.21 | Sampling and analysis of the sediment to confirm the level of contamination is required prior to construction of the MDC. A sediment Quality Report shall be submitted to FMC and EPD for allocation of final disposal site and issuance of disposal permit. This is to ensure that specific disposal requirements and precautionary handling procedures can be determined; DSD to advise FMC on the quality and quantity of the contaminated sediment arising during the detailed design stage. | Proposed Sediment sampling points of MDC | Before construction phase | Site Agent / Engineer | Not required for the contractor |
| | | 5.4.5.21 | The use of bulk earth-moving equipment to minimize the contact of contaminated material with construction workers. | All excavation/ Dredging area | During excavation/ Dredging of MDC | Site Agent / Engineer | Implemented |

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

| No. | Parameter | EIA Ref. | Mitigation Measures/Key EM&A Requirements | Location | Timing | Responsibility | Implementation Status |
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| 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 Flood storage pond, San Tin villages Flood storage pond, San Tin villages | Already accomplished (design stage) | DSD's 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. | | 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. | | 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; earthen bottom in channel. 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 Eastern MDC downstream of inflatable dam | Project design and construction phases Throughout operational lifetime of channel | DSD's Engineer and TDD (design) Site Agent / Engineer DSD's Engineer | Not applicable in this stage Not applicable in this stage |

| No. | Parameter | EIA Ref. | Mitigation Measures/Key EM&A Requirements | Location | Timing | Responsibility | Implementation Status |
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| 24. (cont' d) | | 3.6.4.11- 3.6.4.12 Annex 3- J | Design, construction and management of constructed wetland area east of Eastern MDC: to provide wetland habitats useful to wildlife, with varied water depth, and planting of wetland vegetation and trees/bamboos; details as specified in Annex 3-J | Location shown in EIA Report Figure 3.6c, east of Eastern MDC and west of San-Sham Road | Construction of wetlands simultaneous with or immediately on completion of Eastern MDC construction. Management to begin upon completion of wetland construction and to continue throughout lifetime of channel. | DSD and TDD (design) Site Agent / Engineer (earthworks vegetation) DSD (maintenance of outlet pipes and flag valves) Lands Dept. (lands administration) AFD (vegetation management) | Implemented |
| | | 3.6.4.13 | Design of Eastern MDC upstream of inflatable dam: Grasscrete lining of channel except DWF channel; channel banks at 1 in 2 slope. 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. | Eastern MDC Upstream of inflatable dam | Project design and construction phases | DSD and TDD (design) and Site Agent / Engineer (construction) DSD and TDD (design); Site Agent / Engineer (implementation Including establishment phase) | Not applicable in this stage Not applicable in this stage |
| | | | | At sites along Eastern MDC as marked in Final EIA Report Figure 3.6e | Simultaneous with or immediately following completion of channel construction | | |
| 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. | all works area | During construction phase | Site Agent / Engineer | Implemented |

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| 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 | Throughout operational lifetime of channel | DSD's Engineer | Not applicable in this stage |
| | | | | Eastern MDC | Throughout operational lifetime of channel | DSD and TDD/Appointed ecologist (first three years); to be determined thereafter | 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 |

| No. | Parameter | EIA Ref. | Mitigation Measures/Key EM&A Requirements | Location | Timing | Responsibility | Implementation Status |
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| 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/ Contamination 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 |

| 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 |

| 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 any 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 |

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

| 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, 9.9.2.1 | Planting to reflect existing fish pond group/individual tree/shrub groupings and ecological mitigation in design and species selection, with consideration given to early planting. | Western Embankment | During construction phase | Site Agent / Engineer | Not applicable in this stage. |
| 37. | Pumping station design and detailing | 9.9.1.4 | Design pumping station building to reflect the scale of other buildings/structures in the local area. | Pumping station | Design stage of pumping station | DSD's Engineer | Not applicable in this stage |
| 38. | Soil Conservat'n | 9.9.2.1 | Consideration should be given to undertake landscaping works early in the construction phase, as well as to as conserve soil as a planting medium, such as from pond0bund materials. | Whole site | All period during construction | Site Agent / Engineer | Implemented |
| 39. | Planting Work Monitoring | EM&A 6.2.1. Task 6 | Monitoring of planting work for the ecological and landscape mitigation shall be undertaken. | Planting to eastern embankment, constructed wetland and western embankment | Once per year for first 3 years of operation | TDD/ Appointed consultant | Not applicable in this stage |

Notes:

EM&A = Agreement No. CE 43/96 Main Drainage Channels and Poldered Village Protection Scheme of San Tin, NWNT: Environmental Impact Assessment Study – Environmental Monitoring and Audit Manual

EIA = Agreement No. CE 43/96 Main Drainage Channels and Poldered Village Protection Scheme for San Tin: Environmental Impact Assessment Study – Final Assessment Report

ET Leader = Environmental Team Leader

DSD = Drainage Services Department

GW-TM = General Works Technical Memorandum

PELBTC = Planning Environmental Lands Bureau Technical Circular

TDD = Territory Development Department

PME = Powered Mechanical Equipment

Appendix IV
Complaint Log

APPENDIX V

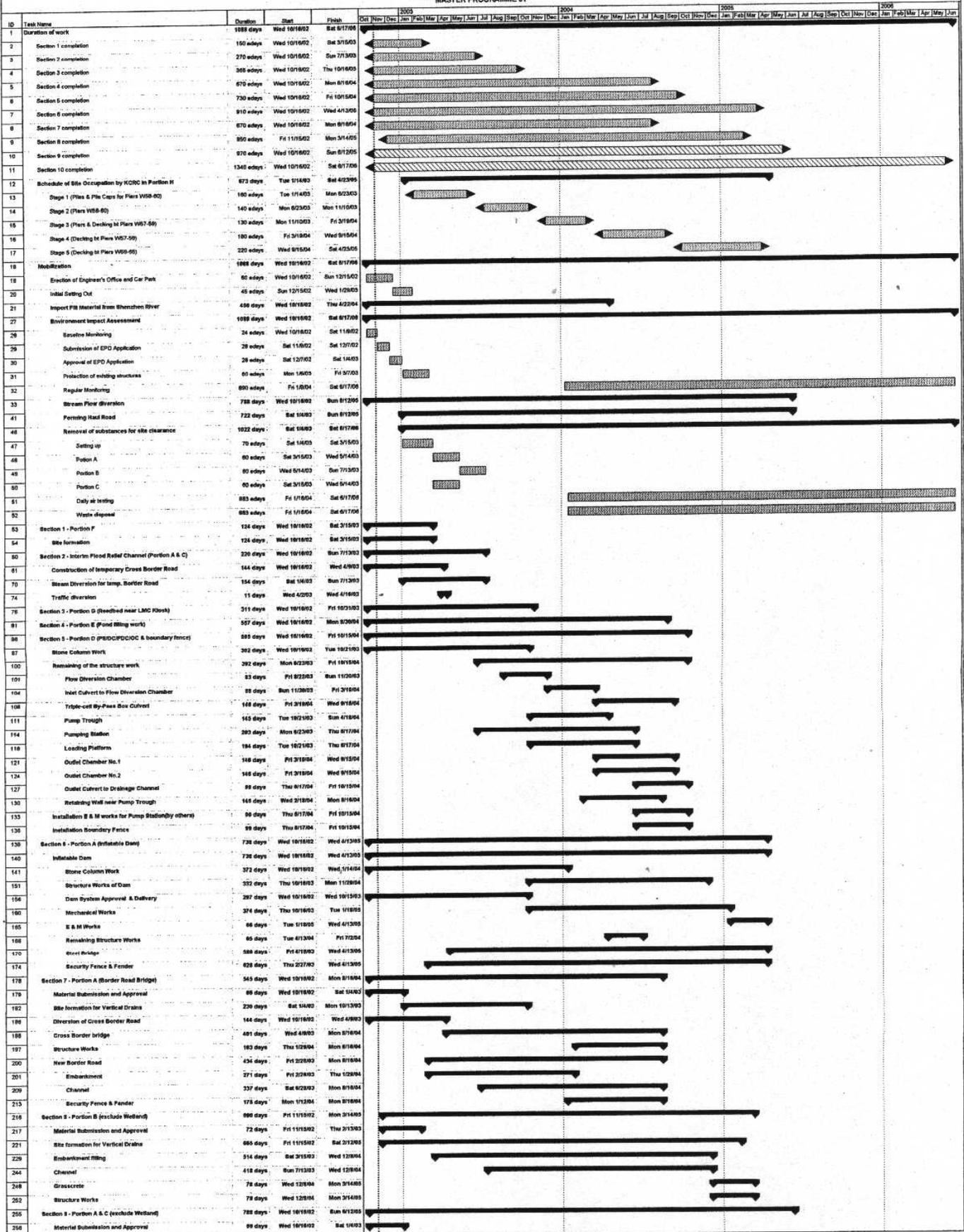
Cumulative Statistics on Complaints and Successful Prosecutions

| 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 Quarter | | | | Cumulative Number to Date |
| | | Air | Noise | Water | Waste | |
| Air | --- | --- | --- | --- | --- | --- |
| Noise | --- | --- | --- | --- | --- | --- |
| Water | 1 | --- | --- | --- | --- | 1 |
| Waste | --- | --- | --- | --- | --- | --- |
| Total | 1 | --- | --- | --- | --- | 1 |

| CONTRACT No. DC/2001/09 – CONSTRUCTION OF SAN TIN EASTERN MAIN DRAINAGE CHANNEL - Cumulative Statistics on Successful Prosecutions | | | | | | |
|---|--------------------------------|---|-------|-------|-------|---------------------------|
| Environmental Parameters | Cumulative No. Brought Forward | No. of Successful Prosecutions this month (Offence Date) | | | | Cumulative Number to Date |
| | | Air | Noise | Water | Waste | |
| Air | 2 | --- | --- | --- | --- | 2 |
| Noise | --- | --- | --- | --- | --- | --- |
| Water | --- | --- | --- | --- | --- | --- |
| Waste | --- | --- | --- | --- | --- | --- |
| Total | 2 | --- | --- | --- | --- | 2 |

APPENDIX VI

Master Construction Programme



Prepared by: Elvix Kong
 Date: 17 Oct 2002
 Version: MPD1

Task: Critical Task Progress: Rolled Up Task: Rolled Up Progress: Project Summary:

Task Progress: Milestone: Rolled Up Critical Task: Split: External Task:

Critical Task: Summary: Rolled Up Milestone:

