



CONTRACT NO. DE/2005/03

**SUPPLY AND INSTALLATION OF ELECTRICAL AND MECHANICAL EQUIPMENT FOR
EXPANSION OF SHEK WU HUI SEWAGE TREATMENT WORKS**

ENVIRONMENTAL MONITORING AND AUDIT

QUARTERLY EM&A SUMMARY REPORT NO. 4

FROM MARCH TO MAY 2007

for

Biwater Man Lee Limited

Submitted by

Kingsford Environmental (H.K.) Ltd.

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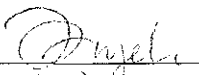
Revision: B
Approved by: SL

Revision Date: 7/6/07
Distribution Date: 7/6/07

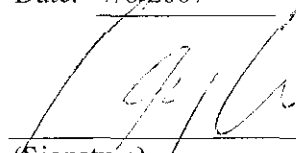
CUSTOMER: **Biwater Man Lee Limited**

PROJECT NAME: **Supply and Installation of Electrical and Mechanical Equipment for Expansion of Shek Wu Hui Sewage Treatment Works**

PROJECT NO.: 81869

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Date: 7/6/2007

Review and Approved by:  Mr. S. Lau
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Date: 7/6/2007

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Document Title : Quarterly EM&A Report No.4 Controlled Copy No.: _____
Document No. : RPT:QRPTNo.4/RevB/81869
Distributed to : Biwater Man Lee Limited Date : 7/6/2007

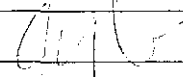
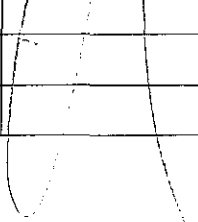
REVISION RECORD				
Rev. No.	Revision Notification	Date	Approved By	Signature
A	Report issued to Client	30/5/2007	S. Lau	
B	Report issued to Client	7/6/2007	S. Lau	

TABLE OF CONTENTS

Approval & Distribution Sheet

Executive Summary

- 1 Introduction
- 2 Basic Project Information
- 3 Environmental Requirements
- 4 Implementation Status of Environmental Protection
- 5 Summary of Deficiencies and Remedial Actions
- 6 Summary of Complaints and Remedial Actions
- 7 Summary of Summons and Prosecutions
- 8 Comments, Conclusions and Recommendations

Tables:

- Table 1 Master Construction Program for E&M Works
Table 2 Contact Information for Key Environmental Personnel
Table 3 Status of Permits and Licenses
Table 4 Site Inspections/Audits for March to May 2007
Table 5 Work Activities from March to May 2007
Table 6 Type and Quantity of Waste Disposed of from March to May 2007

Appendices:

- 1 Reporting Structure and Contractor Project Management Structure
- 2 Master Construction Work Program and Contractor's Schedule
- 3 EM&A Key Requirements List, Relevant Contract Requirements and Remedial Action
- 4 Permits
- 5 Site Layout of Work Areas, Sensitive Receivers, Locations of Monitoring and Control Stations, Action and Limited Levels and Event/Action Plan
- 6 Deficiency Investigation Reports
- 7 Complaint Reports
- 8 Summons and Prosecutions Records

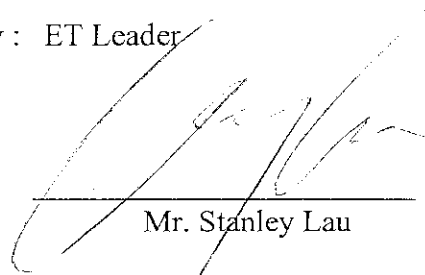
APPROVAL & DISTRIBUTION SHEET

DOCUMENT DATE: 7 June 2007

APPROVAL

Certified by : ET Leader

Signature:



Mr. Stanley Lau

Date: 7 June 2007

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E&M Contractor (The Biwater Man Lee Limited)	Mr. W. S. Lui	1
Independent Environmental Checker (CH2M HILL Hong Kong Limited)	Mr. Billy Yu	1

EXECUTIVE SUMMARY

This is the fourth Quarterly Environmental Monitoring and Audit (EM&A) Summary Report for the Drainage Services Department Contract No. DE/2005/03 entitled “Supply and Installation of Electrical and Mechanical Equipment for Expansion of Shek Wu Hui Sewage Treatment Works”. The E&M Contractor has employed an independent Environmental Team (ET), Kingsford Environmental (H.K.) Ltd., to monitor the implementation of the environmental protection measures, as required in the contract.

The ET’s duties are to review/comment on the contractor’s method statements regarding actions, investigate complaints, provide monthly and quarterly reports on the environmental status, and certification of reports and all submissions under the EP in accordance to the requirement of the EM&A manual and the Environmental Permit. The Independent Environmental Checker (IEC) for the project is to review and verify the reports and all submissions under the EP.

For the environmental monitoring activities, Action and Limit (A/L) Levels are defined levels of impact recorded which represent levels at which a prescribed response is required. Action Limit is an indication of a deteriorating ambient environment for which appropriate remedial actions are likely to be necessary to prevent environmental quality from falling outside the Limit Levels. If these are exceeded, construction works should not be preceded without appropriate remedial action, including critical review of the methods. Baseline monitoring was conducted by the Civil Contractor in November 2005 (Report No. 01284R0012).

In the fourth quarter (March – May 2007), the major site activities mainly consisted of outstanding works at pH Control System, installation of scraper for density current baffles at Final Sedimentation Tank Nos. 2, 5 and 8 and installation work of density current baffles at Final Sedimentation Tank No. 2. In addition, demolish work for existing E&M equipment for DAF No.3 in SAS Consolidation House were commenced in this quarter.

Weekly site inspections, as recommended in the EM&A Manual, by an ET technician were commenced, as required. Joint site audits with the ER, the Contractors and environmental teams were also conducted in this quarter.

No deficiencies were found during the site inspections in this quarter. Thus, the work activities and mitigation measures were in compliance with the environmental protection regulations and contract requirements during this quarter.

Three monthly EM&A meetings were attended for the months of March to May 2007 with all of the parties (DSD, civil and E&M contractors, ETs, and the IEC) to review the environmental issues and communication between the parties.

There were no complaints received or notifications of summons or successful prosecutions during the quarter.

There was no reporting change during the reporting quarter.

The planned activities for June – August 2007 as regards E&M equipment are mainly to carry out 1) outstanding works for pH Control System, 2) modification work of scrapper for density current baffles at Final Sedimentation Tank No. 7, 3) installation of density current baffles at Final Sedimentation Tank Nos. 1 to 4 and 4) demolish work for existing E&M equipment for DAF No.3 and installation of new E&M equipment in SAS Consolidation House.

1 Introduction

This is the fourth Quarterly Environmental Monitoring and Audit (EM&A) Summary Report for the Drainage Services Department Contract No. DE/2005/03 entitled “Supply and Installation of Electrical and Mechanical Equipment for Expansion of Shek Wu Hui Sewage Treatment Works”. The report was prepared by the Environmental Team, Kingsford Environmental (H.K.) Ltd., of the E&M Contractor, Biwater Man Lee Limited. This report is submitted to the Client, the Drainage Services Department, and her Independent Environmental Checker, CH2M HILL Hong Kong Limited, for the project. In addition, this report is to be submitted to EPD in accordance with the requirement of the environmental permit (EP218-2005) and EM&A manual of the project.

This report presents the summary results of the environmental auditing of the project activities conducted during the months of March to May 2007. The auditing works include regular site inspections for verification of the mitigation measures implementation as recommended in the EM&A Manual and as detailed in the Project Profile for the project.

The contact information for the key personnel is shown in Appendix 1.

2 Basic Project Information

The major parties involved in the project with respect to environmental protection are shown in Appendix 1 (Ref.: EM&A Manual). These include the E&M Contractor and their Environmental Team, the DSD Client, and the Independent Environmental Checker, or IEC and EPD. A chart showing the duties of the parties regarding inspections and follow-up is also shown.

The E&M Contractor’s management and project team is shown in Appendix 1. The ET consists of an ET Leader and 2 environmental technicians. The ET site inspections are co-ordinated with the E&M Contractor’s Site Agent.

The works for the installation of the E&M equipment and for testing and commissioning of the various systems has commenced on 19 June 2006 and to be completed by 16 November 2008. The master construction program schedule from the Particular Specification and the Contractors current detailed work schedule are attached in Appendix 2. The major E&M work packages are listed below in Table 1.

Table 1: Master Construction Program for E&M Works

Section	Task Description	Date
I	- Submissions and approval of Process Design, Equipment, Schematics, GA and Civil Works Requirements.	14 Feb '06 – 13 Jun '06
II	- E&M equipment installation, T&C for Density Current Baffles for 3 Existing Final Sedimentation Tanks.	19 Jun '06 – 16 Sep '06
III	- E&M equipment installation, T&C for pH Control System for Bioreactors.	19 Jun '06 – 16 Oct '06
IV	- E&M equipment installation, T&C for Density Current Baffles for 4 Existing Final Sedimentation Tanks.	18 May '07 – 14 Sep '07
V	- E&M equipment installation, T&C for SAS Thickening Centrifuges.	18 May '07 – 14 Oct '07
VI	- E&M equipment installation, T&C for New Air Blower House No. 2.	14 Jul '07 – 18 Jun '08 (Earliest) 12 Nov '07 – 17 Oct '08 (Latest)
VII	- E&M equipment installation, T&C for New Flow Division Pump Pits. - E&M equipment installation, T&C for Bioreactor No. 5. - E&M equipment installation, T&C for Final Sedimentation Tank Distribution Chamber.	12 Sep '07 – 19 Jun '08 (Earliest) 10 Jan '08 – 17 Oct '08 (Latest)
VIII	- E&M equipment installation, T&C for New Final Sedimentation Tanks. - E&M equipment installation, T&C for RAS/SAS Pumping Station.	11 Nov '07 – 19 Jun '08 (Earliest) 10 Mar '08 – 17 Oct '08 (Latest)
IX	- E&M equipment installation, T&C for New Sludge Conditioning Tanks. - E&M equipment installation, T&C for Press House Extension. - E&M equipment installation, T&C for DG Store and Chemical Waste Store.	15 Mar '08 – 18 Jul '08 (Earliest) 14 Jul '08 – 16 Nov '08 (Latest)
X	- E&M equipment installation, Remaining Works.	14 Feb '06 – 16 Nov '08

The contact information for the key personnel is shown in Table 2.

Name	Title	Telephone	Fax
Mr. P. W. Lam (DSD)	Engineer's Representative	2594-7305	2827-8532
Mr. K. K. Chcong (DSD)	Engineer's Representative	2594-7338	2827-8532
Mr. W. S. Lui (BML)	Site Agent	2671-2350	2671-2351
Mr. K. H. Lau (BML)	Deputy Site Agent	2671-2350	2671-2351
Mr. S. M. Ho (BML)	Site Waste Manager/Co-ordinator	2671-2350	2671-2351
Mr. Stanley Lau (KEL)	ET Leader	2612-2817	2614-7012
Ms. Angela Lau (KEL)	ET Site Inspector	2612-2817	2614-7012
Mr. Billy Yu (CH2M)	The Independent Environmental Checker	2507-2203	2507-2293

3 Environmental Requirements

The works performed for this contract shall comply with the relevant Hong Kong government ordinances, regulations, guidelines, practice notes, etc. as regards environmental protection, as detailed in the Project Profile, the Environmental Monitoring and Audit Manual and Environmental Permit.

The EM&A Manual specifies environmental auditing to ensure that the mitigation measures recommended in the Project Profile are effectively implemented. A summary of the required environmental protection and mitigation measures for the construction phase extracted from Appendix B of the Manual ("Implementation Schedule of Mitigation Measures") is attached in Appendix 3.

The environmental aspects for the construction phase include plant noise, dust, water quality, and waste materials (including chemicals). Action and Limit (A/L) Levels are defined levels of impact recorded by the environmental monitoring activities which represent levels at which a prescribed response is required. The Event and Action Plans (EAPs) is to provide, in association with the monitoring and audit activities, procedures for ensuring that if any significant environmental incident (either accidental or through inadequate implementation of mitigation measures) does occur, the cause will be quickly identified and remediated, and the risk of a similar event recurring is reduced. This also applies to the exceedances of A/L criteria identified in the EM&A Manual. A summary of the event/action plan for the construction phase and operation phase extracted from EM&A Manual is attached in Appendix 5.

The job nature of the E&M contractor is mainly for installation of E&M equipment, all hand-held's breakers, bulldozer, concrete lorry mixer, dump truck and hand-held's poker, vibratory would not be used so that the impact from noise and dust would be low. Also, the distance to the nearest sensitive receivers is large. Therefore, the potential environmental impact imposed to the sensitive receivers would be low. Routine environmental monitoring would only be considered when deficiencies and complaints were received.

The Environmental Permit conditions, i.e. section 1.39 of the Particular Specification, are shown in Appendix 3. The Permit is attached in Appendix 4.

4 Implementation Status of Environmental Protection

The status of permits and licenses is summarized in Table 3 and shown in Appendix 4.

Table 3: Status of Permits and Licenses

Description	Permit No.	Valid Period		Ref.	Status
		From	To		
Environmental Permit	EP-218/2005	16/06/05	End of Project	PS1.39*	Granted

* Particular Specification of Contract No. DE/2005/03

Weekly site inspections were conducted during this quarter, as required. Frequency of the site inspections depends upon the work activities as regards environmental protection. The site inspections and audits conducted during this quarter are summarized in Table 4.

Table 4: Site Inspections/Audits for March to May 2007

Month	Date of Site Inspections/Audits	
	by ER/ET/BML	by EPD
Mar 2007	8, 13, 21 and 26	n/a
Apr 2007	3, 10, 16, 17 and 27	n/a
May 2007	3, 10, 11, 15, 22 and 29	n/a

The work activities and dates of occurrence of each activity in this quarter are summarized in Table 5. Site layouts showing the areas of the work activities and the nearest sensitive receivers are attached in Appendix 5.

In the fourth quarter (March – May 2007), the major site activities mainly consisted of outstanding works at pH Control System, installation of scrapper for density current baffles at Final Sedimentation Tank Nos. 2, 5 and 8 and installation work of density current baffles at Final Sedimentation Tank No. 2. In addition, demolish work for existing E&M equipment for DAF No.3 in SAS Consolidation House were commenced in this quarter.

Table 5: Work Activities from March to May 2007

<i>pH Control System</i>	
Outstanding Works	26 Feb '07 – 7 Mar '07
<i>Final Sedimentation Tank No. 8</i>	
Installation of scrapper for density current baffles	17 Mar '07 - 17 Mar '07
<i>Final Sedimentation Tank No.5</i>	
Installation of scrapper for density current baffles	26 May '07 – 26 May '07
<i>Final Sedimentation Tank No.2</i>	
Installation of E&M equipment	18 May '07 – 16 Jun '07*
<i>SAS Consolidation House</i>	
Demolition of existing E&M equipment for DAF No. 3	18 May '07 - 14 Jun '07*

* *Scheduled dates only for completion of the activities.*

Air Quality

Appropriate mitigation measures for the activities are in place in this quarter. Plastic covers with stakes/weights are readily available and used for covering of exposed material for control of dust. Water spray is available for dust suppression, if necessary.

During this quarter, no dusty material was found from the site areas or activities.

Water Quality

The plastic covers for exposed soil, etc. are available for minimization of silt in the run-off water during rainstorms, if necessary. Note that wastewater generated from the off-site project office was collected in a storage tank and tanker-away regularly by a licensed collector.

Anti-mosquito preventive measures, e.g. regular removal of stagnant water (if possible) and/or spraying larvicide (if necessary) at any site area, are taken for mosquito control and prevention, particularly for control of Dengue Fever and Japanese Encephalitis diseases.

No surface run-off or exposed soil was observed for the site activities during this quarter.

Due to the rain in end of May 2007, accumulations of rainwater were observed in the effluent channel and hopper at Final Sedimentation Tank No. 2. The accumulated rainwater in effluent channel and hopper were sprayed with larvicidal oil. The accumulated rainwater should be drained away regularly, if possible, while mosquito larvicide is only applied when it is not feasible to drain away the water immediately. In addition, the accumulated sewage/sludge was observed in the sludge storage tank at SAS consolidation House in end of May 2007. The accumulated sewage/sludge should be drained away into drain inlet/foul sewer.

Noise

Plants with low noise emittance are preferred and are operated/maintained to reduce noise. In this quarter, work was carried out during normal working hours (7am – 7pm Monday to Saturday) or otherwise specified in the contract. In the event of a schedule change such that construction work would be performed during the restricted hours (11pm – 7am and during general public holidays including Sundays), a Construction Noise Permit would be required.

During this quarter, the work activities and equipment used did not generate significant noise for noise sensitive receivers (NSRs).

Waste / Chemical Management

The construction waste materials are preferred to be removed promptly from the site. Recyclable hard inert C&D materials should be taken to a public filling area (the fill bank at WENT landfill at Nim Wan) whereas the non-inert C&D waste should be disposed of to NENT landfill at Ta Kwu Ling or other disposal site approved by the control authority. Note that the inert C&D materials should be reduced, reused and recycled if possible, before disposal. Any substance identified as chemical waste would be disposed of properly by a licensed collector. A trip ticket system for the disposal of C&D waste should be conducted as required by the Waste Management Plan. Rubbish bins are provided on-site for collecting general refuses as necessary. The general refuse would be removed regularly and disposed to landfills by a licensed collector. A proper record of each waste disposal, including the new bar-coded disposal delivery form, would be kept to verify proper handling and disposal.

A refuse bins and waste storage/sorting area were provided for the collection of general refuse and sorting the C&D materials. No accumulation of the collected wastes in the refuse bins was observed in the project office/work areas during the site inspections this quarter.

No C&D waste and only general refuse was disposed during the reporting period by the licensed waste collector this quarter.

No chemical waste was generated during this quarter.

The type and quantity of waste for final disposal during March – May 2007 is shown in Table 6. Note that the new bar-coded disposal delivery form for each disposal of C&D wastes continued to be kept.

Table 6: Type and Quantity of Waste Disposed of from March to May 2007

Types of Waste	Quantity
Inert C&D Material	Nil
Non-inert C&D Waste	Nil
Chemical Waste	Nil
General Refuse*	3960L

* Included the site office

5 Summary of Deficiencies and Remedial Actions

A procedure for the EM&A site inspections, deficiency and remedial action reporting system was approved by the ER (Appendix 3), as required in the EM&A Manual (section 6.1.2). The site inspection checklists, reporting and interaction between the relevant parties was detailed.

There were no deficiencies noted from the site inspections in this quarter (March – May 2007).

6 Summary of Complaints and Remedial Actions

No complaints were received during this quarter (March – May 2007). In the event of complaints, the procedure for handling of the complaints is detailed in the EM&A Manual.

7 Summary of Summons and Prosecutions

No notification of summons and no prosecutions occurred in this quarter (March – May 2007).

8 Comments, Conclusions and Recommendations

The required weekly site inspections have been conducted. No deficiencies, i.e. non-compliances, were noted.

The planned activities for the coming three months (June – August 2007) as regards E&M equipment are to carry out outstanding works for the following system/area:-

- pH Control System
- Final Sedimentation Tank No. 7
- Final Sedimentation Tank Nos. 1 to 4
- SAS Consolidation House

The anticipated environmental issues for June – August 2007 will be as follows:-

- pH control System
 - The anticipated environmental issues will be related to:-
 - the waste disposal from E&M equipment installation.
 - the stagnant water, as testing/ commissioning of equipment/system will be involved.
 - the chemical handling (if any) during the T&C period.
- Final Sedimentation Tank No. 7
 - The anticipated environmental issues will be related to the waste disposal from the E&M equipment installation.
- Final Sedimentation Tank Nos. 1 to 4
 - The anticipated environmental issues will be related to the waste disposal from the E&M equipment installation.
 - The anticipated environmental issue will be related to stagnant water, as testing/commissioning of equipment/system will be involved.
- SAS Consolidation House
 - The anticipated environmental issues will be related to:-
 - the waste disposal from the demolition of the existing E&M equipment and the E&M equipment installation,
 - the dust from the demolition of the existing concrete structure and building of equipment plinths in the existing SAS Consolidation House and,
 - the chemical waste disposal and chemical handling (if any) from the demolition of the existing E&M equipment
 - Stagnant water, as testing/commissioning of equipment/system will be involved.

Appendix 1

Reporting Structure and Contractor Project Management Structure

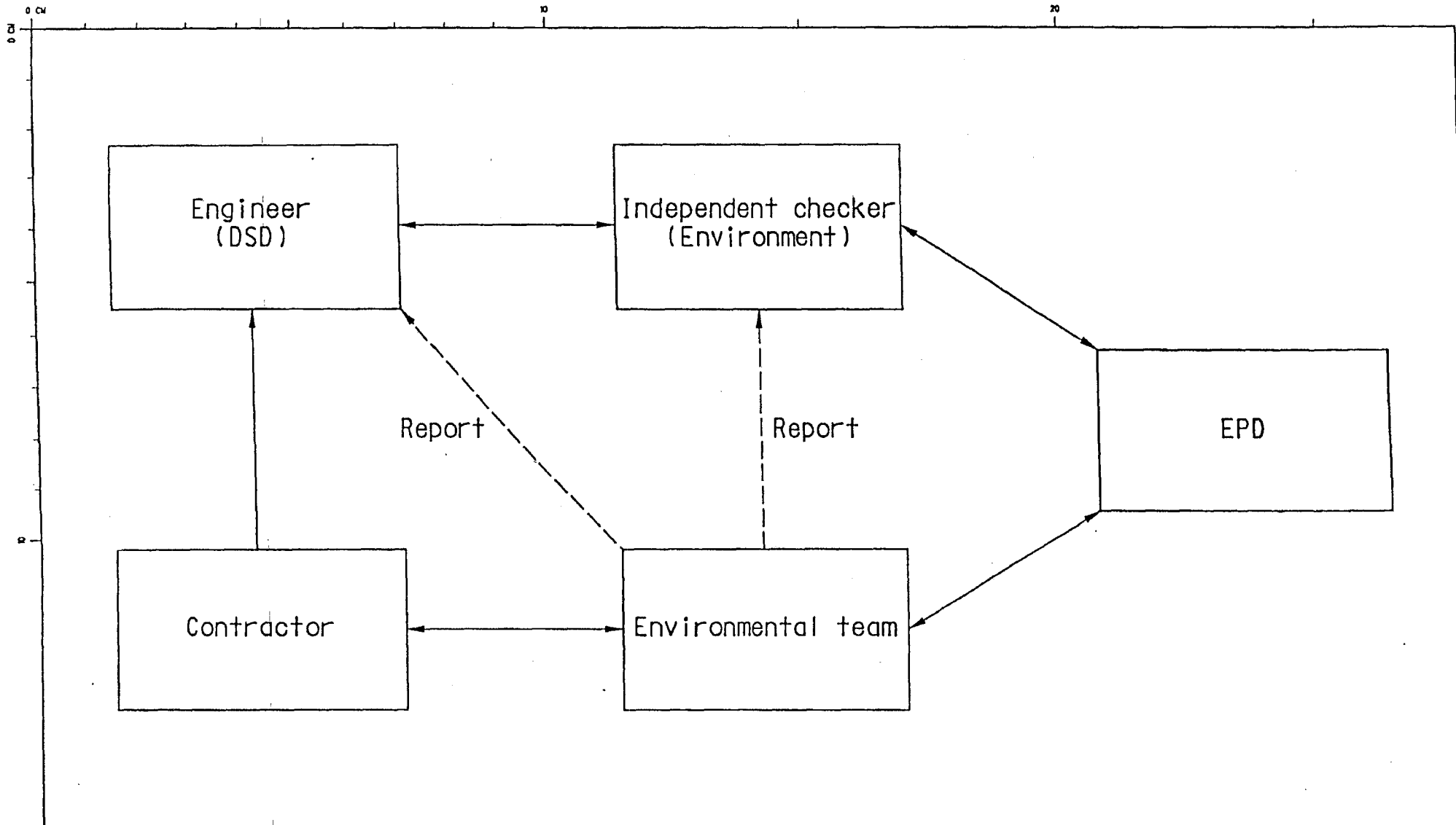


Figure Title

EXPANSION OF SHEK WU HUI SEWAGE TREATMENT WORKS
PROJECT ORGANISATION DURING CONSTRUCTION PHASE

Figure No.

3

Scale

DIAGRAMMATIC

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SEWERAGE PROJECTS DIVISION



DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

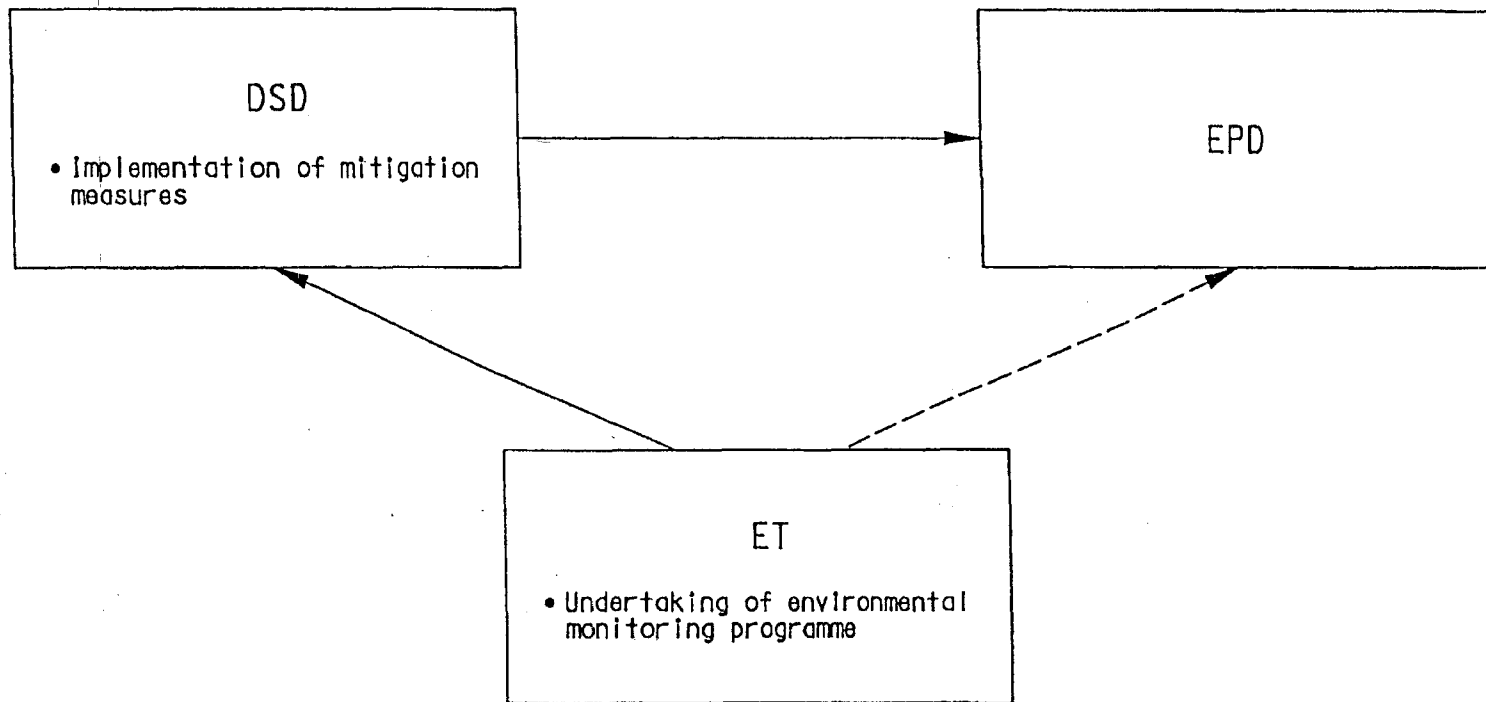


Figure Title

EXPANSION OF SHEK WU HUI SEWAGE TREATMENT WORKS
PROJECT ORGANISATION DURING OPERATION PHASE

Figure No.

4

Scale

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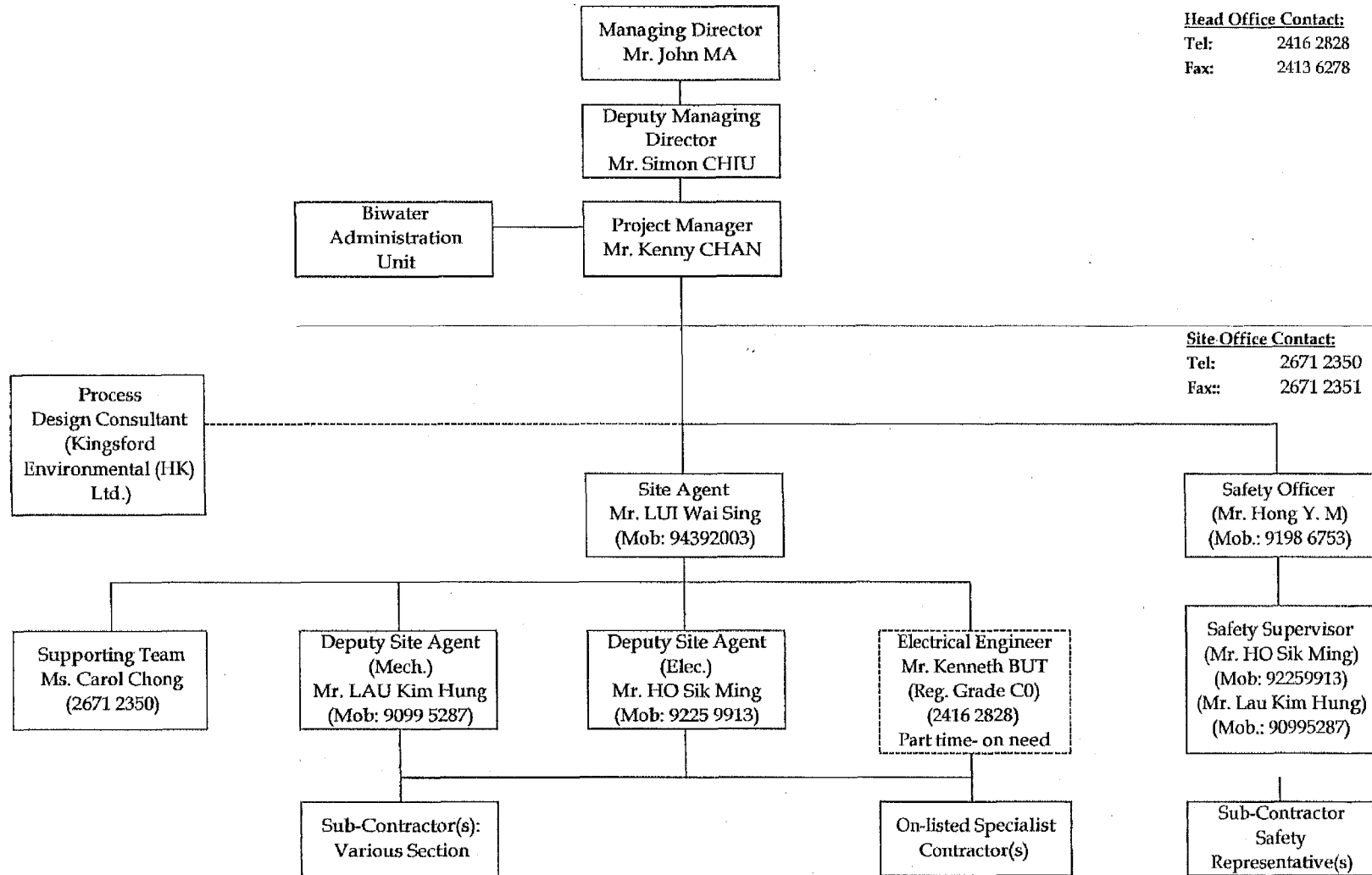


DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

Contract No.: DE/2005/03
 Supply & Installation of Electrical & Mechanical Equipment for
 Expansion of Shek Wu Hui Sewage Treatment Works

Revision: H
 Date: 10/Aug/06

Biwater Man Lee Limited
Project Team Organisation Chart: Key Member



Head Office Contact:
 Tel: 2416 2828
 Fax: 2413 6278

Site Office Contact:
 Tel: 2671 2350
 Fax: 2671 2351

Note: Waste management team/ organisation shall be refer to WMP.

Contact Information for Key Personnel

Name	Title	Telephone	Fax
Mr. P. W. Lam (DSD)	Engineer's Representative	2594-7305	2827-8532
Mr. K. K. Cheung (DSD)	Engineer's Representative	2594-7338	2827-8532
Mr. W. S. Lui (BML)	Site Agent	2671-2350	2671-2351
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Ms. Angela Lau (KEL)	ET Site Inspector	2612-2817	2614-7012
Mr. Billy Yu (CH2M)	The Independent Environmental Checker	2507-2203	2507-2293

Appendix 2

Master Construction Work Program

and Contractor's Schedule

Appendix 3

**EM&A Manual Key Requirements List,
Relevant Contract Requirements
& Remedial Action**

APPENDIX B IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES**Implementation Schedule for Air Quality Control**

PP Ref [#]	Environmental Protection Measures	Location / Timing	Implementation Agent	Implementation Stages *			Relevant Legislation & Guidelines
				D	C	O	
Annex 1 S1.7.1	Dust mitigation measures stipulated in the <i>Air Pollution Control (Construction Dust) Regulation</i> shall be incorporated to control dust emission from the Site. Notice shall be given to the authority prior to commencement of works.	Work sites / during construction period	Contractor		√		Air Pollution Control (Construction Dust) Regulation
Annex 1 S1.7.6 – S1.7.9	Exposed area of inlet screw pumping station excluding its inlet chamber; and sludge holding tanks should be covered, with the foul air drawn through deodorizers and discharged after treatment. Exposed area of grit channels, flume channels and effluent launder channels of primary sedimentation tanks should be covered.	SWHSTW / during design and operation stage	DSD	√		√	

The section number in the Project Profile for Expansion of Shek Wu Hui Sewage Treatment Works (Application No. DIR-121/2005)

* D = Design, C = Construction and O = Operation

Implementation Schedule for Water Quality Control

PP Ref#	Environmental Protection Measures	Location / Timing	Implementation Agent	Implementation Stages *			Relevant Legislation & Guidelines
				D	C	O	
Annex 2 S2.4.4	The practices outlined in Practice Note for Professional Persons on Construction Site Drainage, Professional Persons Environmental Protection Department, 1994 (ProPECC PN 1/94) including the use of sediment traps, wheel washing facilities for vehicles leaving the site, adequate maintenance of drainage systems to prevent flooding and overflow, sewage collection and treatment, and comprehensive waste management (collection, handling, transportation, disposal) procedures should be adopted to minimize the potential water quality impact from construction site runoff and various construction activities.	Work site / During the construction period	Contractor		√		ProPECC PN 1/94; WPCO, Waste Disposal Ordinance

PP Ref [#]	Environmental Protection Measures	Location / Timing	Implementation Agent	Implementation Stages *			Relevant Legislation & Guidelines
				D	C	O	
Annex 2 S2.4.4	<p><i>Construction Runoff and Drainage</i></p> <ul style="list-style-type: none"> At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed and internal drainage works and erosion and sedimentation control facilities implemented. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system will be undertaken by the contractor prior to the commencement of construction. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps should be 5 minutes under maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flow rate of $0.1\text{m}^3\text{s}^{-1}$ a sedimentation basin of 30m^3 would be required and for a flow rate of $0.5\text{m}^3\text{s}^{-1}$ the basin would be 150m^3. The detailed design of the sand/silt traps will be undertaken by the contractor prior to the commencement of construction. Ideally, construction works should be programmed to minimize surface excavation works during the rainy season (April to September). All exposed earth areas should be compacted and vegetated as soon as possible after earthworks have been completed, or alternatively, within 14 days of cessation of earthworks where practicable. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means. The overall slope of the site should be kept to a minimum to reduce the erosive potential of surface water flows, and all trafficked areas and access roads protected by coarse stone ballast. An additional advantage accruing from the use of crushed stone is the positive traction gained during prolonged periods of inclement weather and the reduction of surface sheet flows. 	Work site / During the construction period	Contractor		√		ProPECC PN 1/94; WPCO, Waste Disposal Ordinance

PP Ref [#]	Environmental Protection Measures	Location / Timing	Implementation Agent	Implementation Stages *			Relevant Legislation & Guidelines
				D	C	O	
Annex 2 S2.4.4	<p><i>Construction Runoff and Drainage (Cont'd)</i></p> <ul style="list-style-type: none"> All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas. Measures should be taken to minimize the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. Open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50m³ should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers. Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storms events, especially for areas located near steep slopes. 	Work site / During the construction period	Contractor		√		ProPECC PN 1/94; WPCO, Waste Disposal Ordinance

PP Ref [#]	Environmental Protection Measures	Location / Timing	Implementation Agent	Implementation Stages *			Relevant Legislation & Guidelines
				D	C	O	
Annex 2 S2.4.4	<p><i>Construction Runoff and Drainage (Cont'd)</i></p> <ul style="list-style-type: none"> All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing bay should be provided at every site exits and wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfill toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. On-site drainage system should be equipped with oil interceptors to separate oil/fuel from contaminated storm water. 	Work site / During the construction period	Contractor		√		ProPECC PN 1/94; WPCO, Waste Disposal Ordinance
Annex 2 S2.4.4	<p><i>General Construction Activities</i></p> <ul style="list-style-type: none"> Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts. All fuel tanks and storage areas should be provided with locks and sited 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 water sensitive receivers nearby. 	Work site / During the construction period	Contractor		√		ProPECC PN 1/94; WPCO, Waste Disposal Ordinance
Annex 2 S2.4.4	<p><i>Sewage from Construction Workforce</i></p> <ul style="list-style-type: none"> Sewage from construction workforce should be handled by portable chemical toilets or sewage holding tanks with the sewage regularly collected by a reputable sewage collector for disposal at, for example, SWHSTW. Sewage from on-site toilets should be diverted to and stored within sewage holding tanks for later disposal. 	Work site / During the construction period	Contractor		√		ProPECC PN 1/94; WPCO, Waste Disposal Ordinance
Annex 2 S2.5.3 – S2.5.11	The implementation programme of the village sewerage should be monitored to achieve the target sewerage connection to communal sewers.	SWHSTW/ During the operation period	DSD			√	ProPECC PN 1/94; WPCO, Waste Disposal Ordinance

PP Ref#	Environmental Protection Measures	Location / Timing	Implementation Agent	Implementation Stages *			Relevant Legislation & Guidelines
				D	C	O	
Annex 2 S2.5.12	Standby equipment will provide further safeguard on proper functioning of all key treatment facilities e.g. standby air blowers to ensure adequate air supply for the biological treatment process and standby pumps to prevent any overflow of sewage due to mechanical failure of pumps. In the remote case that untreated effluent is discharged, an emergency contingency plan has been formulated to minimize the impact of emergency discharges and facilitate subsequent management of emergency. If there is a power failure, the plant manager will start up the emergency generator to provide electricity supplies for the pumps and regularly monitor the quality of effluent discharge.	SWHSTW/ During the design and operation period	DSD	√		√	ProPECC PN 1/94; WPCO, Waste Disposal Ordinance
Annex 2 S2.7.2	Routine monitoring of the effluent quality from the SWHSTW should be conducted in order to satisfy the conditions of the WPCO discharge licence.	SWHSTW/ During the operation period	DSD			√	ProPECC PN 1/94; WPCO, Waste Disposal Ordinance

The section number in the Project Profile for Expansion of Shek Wu Hui Sewage Treatment Works (Application No. DIR-121/2005)

* D = Design, C = Construction and O = Operation

Implementation Schedule for Waste Management

PP Ref#	Environmental Protection Measures	Location / Timing	Implementation Agent	Implementation Stages *			Relevant Legislation & Guidelines
				D	C	O	
Annex 3 S3.5.1	<p><i>Waste Reduction Measures at Planning and Design Stage</i></p> <ul style="list-style-type: none"> The levels of structures should be designed such that excavation could be minimized as far as practicable. Excavated materials generated from construction works to be re-used on-site as far as practicable to reduce off-site disposal. Control measures recommended under the prevailing ETWB circulars should be strictly followed to ensure proper management of the C&D materials with an aim to minimize the generation of C&D material and maximize the use of inert C&D material. 	Work site / During the planning and design stage	DSD	√			ProPECC PN 1/94; WPCO, Waste Disposal Ordinance

PP Ref [#]	Environmental Protection Measures	Location / Timing	Implementation Agent	Implementation Stages *			Relevant Legislation & Guidelines
				D	C	O	
Annex 3 S3.5.1	<p><i>Waste Reduction Measures at Construction Stage</i></p> <ul style="list-style-type: none"> Measures recommended in the ETWB TCW No. 15/2003 should be followed to require the contractor to prepare and implement an enhanced Waste Management Plan (WMP) to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. For the demolition works, the contractor shall submit a method statement for the works as part of the WMP. The Contractor shall include in the method statement the sequence of demolition and the work programme to facilitate effective recovery of reusable and/or recyclable portions of the C&D materials at the earliest stage, so as to minimise the need for subsequent sorting. Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal. Separate labelled bins shall be provided to segregate aluminium cans from other general refuse generated by the work force, and to encourage collection of by individual collectors. Any unused chemicals or those with remaining functional capacity shall be recycled. Maximising the use of reusable steel formwork to reduce the amount of C&D material. Prior to disposal of C&D waste, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill. Proper storage and site practices to minimise the potential for damage or contamination of construction materials. Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. Minimize over ordering of concrete, mortars and cement grout by doing careful check before ordering. 	Work site / During the construction period	Contractor		√		ProPECC PN 1/94; WPCO, Waste Disposal Ordinance

PP Ref [#]	Environmental Protection Measures	Location / Timing	Implementation Agent	Implementation Stages *			Relevant Legislation & Guidelines
				D	C	O	
Annex 3 S3.5.2 – S3.5.5	<p><i>Good Site Practices</i></p> <ul style="list-style-type: none"> • nomination of approved personnel, such as a site manager, to be responsible for good site practices, and making arrangements for collection of all wastes generated at the site and effective disposal to an appropriate facility. • training of site personnel in proper waste management and chemical waste handling procedures; • Provision of sufficient waste disposal points and regular collection for disposal; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; • a Waste Management Plan should be prepared and should be submitted to the Engineer for approval; and • a recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be proposed. • In order to monitor the disposal of C&D material at landfills and public filling facilities, as appropriate, and to control fly tipping, a trip-ticket system should be included as one of the contractual requirements to be implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. The measures recommended in ETWB TCW No. 31/2004 should be followed. 	Work site / During the construction period	Contractor		√		ProPECC PN 1/94; WPCO, Waste Disposal Ordinance

PP Ref [#]	Environmental Protection Measures	Location / Timing	Implementation Agent	Implementation Stages *			Relevant Legislation & Guidelines
				D	C	O	
Annex 3 S 3.5.6	<p><i>General Refuse</i></p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material; 	Work sites / During the construction period	Contractor		√		EIAO-TM and Noise Control Ordinance
Annex 3 S 3.5.7	<p><i>Construction and Demolition Material</i></p> <ul style="list-style-type: none"> The C&D material generated from the site formation and demolition works should be sorted on-site into inert C&D material (that is, public fill) and C&D waste. In order to minimise the impact resulting from collection and transportation of C&D material for off-site disposal, the excavated material comprising fill material should be reused on-site as backfilling material as far as practicable. C&D waste, such as wood, plastic, steel and other metals should be reused or recycled and, as a last resort, disposed of to landfill. A suitable area should be designated within the site for temporary stockpiling of C&D material and to facilitate the sorting process. 	Work sites / During the construction period	Contractor		√		EIAO-TM and Noise Control Ordinance

PP Ref#	Environmental Protection Measures	Location / Timing	Implementation Agent	Implementation Stages *			Relevant Legislation & Guidelines
				D	C	O	
Annex 3 S 3.5.8	<p><i>Chemical Wastes</i></p> <ul style="list-style-type: none"> When chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the requirements stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used. Appropriate labels should be securely attached on each chemical waste container indicating the chemical characteristics of the chemical waste, such as explosives, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed waste collector to transport and dispose of the chemical wastes in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. 	Work sites / During the construction period	Contractor		√		EIAO-TM and Noise Control Ordinance

The section number in the Project Profile for Expansion of Shek Wu Hui Sewage Treatment Works (Application No. DIR-121/2005)

* D = Design, C = Construction and O = Operation

Implementation Schedule for Noise Control

PP Ref [#]	Environmental Protection Measures	Location / Timing	Implementation Agent	Implementation Stages *			Relevant Legislation & Guidelines
				D	C	O	
Annex 4 S4.7.1	Use of quiet PME	Work sites / During the construction period	Contractor		√		EIAO-TM and Noise Control Ordinance
Annex 4 S4.7.3	<p><i>Good Site Practice</i></p> <ul style="list-style-type: none"> • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction phase; • Silencers or mufflers on construction equipment should be utilised, if found necessary, to further reduce noise, and should be properly maintained during the construction phase; • Mobile plant should be sited as far away from NSRs as possible; • Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • Plant known to emit noise strongly in one direction, should, where possible, be orientated so that the noise is directed away from nearby NSRs; and • Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities. 	Work sites / During the construction period	Contractor		√		EIAO-TM and Noise Control Ordinance

The section number in the Project Profile for Expansion of Shek Wu Hui Sewage Treatment Works (Application No. DIR-121/2005)

* D = Design, C = Construction and O = Operation

- (a) All contract preliminaries items to be provided to the Engineer's Representatives office for central acceptance and distribution. The Engineer's Representative would nominate designated officer(s) to accept these items. The Contractor shall not provide the items directly to individual site supervisory staff.
- (b) Measuring and testing equipment shall be provided for the use of the Engineer as stated in Appendix 1. All equipment shall be new and shall be a type agreed by the Engineer.
- (c) Equipment provided for the use of the Engineer shall be maintained in a clean and serviceable condition and all consumables shall be replenished when required. The Contractor shall replace or repair any defective equipment within one month. Measuring and testing equipment shall be calibrated before it is used and at regular intervals agreed by the Engineer. Equivalent replacements shall be provided for equipment which is out of service.
- (d) The equipment will be returned to the Contractor at the end of the Defects Liability Period or at a time to be advised by the Engineer if earlier.
- (e) Any equipment or facility to be provided for the use by the Engineer's staff is only required to meet the minimum requirement stipulated in the Contract. Where such is impracticable (e.g. When the model just satisfying the minimum requirement is outdated or out of stock), the Contractor may provide at his own cost equipment or facilities slightly exceeding the minimum requirement. However, extravagant or out of the norm overprovision is unnecessary and could result in embarrassment on the Engineer and hence should be avoided. In the event that a much higher quality than that stipulated shall be provided for legitimate reason, the Contractor shall give prior notification to the Employer of such over-provision.



1.39 Environmental Permit Conditions and Waste Management Plan

1.39.1 Reference to EIA Report, EM&A Manual

The Project Profile and Environmental Monitoring & Auditing Manual are available for inspection at Environmental Impact Assessment Ordinance Register Office. The concerned Environmental Permit is attached in Appendix 12 of this Particular Specification.

1.39.2 Environmental Permit

- (a) Further to General Conditions of Contract Clause 30 the Contractor shall conform in all respects with the conditions of the Environmental Permit a copy of which is reproduced in Appendix 12.
- (b) For the purpose of this Contract, the "Environmental Permit" means any environmental permit issued by the Director of Environmental Protection in respect of the Works or project which the Works form a part thereof under the Environmental Impact Assessment Ordinance (Cap. 499) including any variation of the environmental permit.

- (c) The Contractor shall be responsible for displaying a copy of the most updated Environmental Permit at the locations as stipulated under the Environmental Permit or as directed by the Engineer.
- (d) It is unnecessary for the Contractor to apply for and hold an environmental permit since he may rely on the Environmental Permit obtained by the Employer. Should for any reason the Contractor choose to apply for and hold an Environmental Permit he shall do so at his own risk and cost and it shall not form the basis of any claim for extension of time.
- (e) The Contractor shall ensure full compliance with all conditions of the Environmental Permit before and during carrying out the construction works on the Site. Any non-compliance may constitute a contravention of the EIAO (Cap. 499) and shall be definite ground for enforcement action. The Contractor shall assume all the responsibilities under the Permit as if the Contractor is the Permit holder as far as it is applicable to this Contract. The Contractor is required to indemnify the Employer against any charge for any non-compliance with the Environmental Permit. The Contractor will not be compensated for any additional cost incurred due to the Contractor's non-compliance with any conditions of the Environmental Permit.
- (f) The Environmental Permit shall not remove the responsibility of the Contractor to comply with any legislation currently in force such as the Noise Control Ordinance (Cap.400), Air Pollution Control Ordinance (Cap.311), Water Pollution Control Ordinance (Cap.358), Dumping at Sea Ordinance (Cap.466), the Waste Disposal Ordinance (Cap.354), and others.
- (g) The Contractor shall make copies of the Environmental Permit available at all times for inspection by the Director of EPD at all Portions of the Site.
- (h) The Contractor shall give a copy of this Environmental Permit to the person(s) in charge of the Site.
- (i) The Contractor shall provide sufficient copies of finalized submissions as required by the Engineer to the Director of EPD for public inspections.
- (j) The onus to obtain approvals from the Director of Environmental Protection as required by the Environmental Permit shall be rested on the Contractor. The Contractor is reminded to take early steps to obtain these approvals to reduce possible delay caused to the programme of works.

1.39.3 Environmental Team and Responsibilities of the Contractor

- (a) With reference to the Environmental Permit, the Contractor shall engage and establish an Environmental Team (ET) which shall be independent to the Contractor to undertake environmental audit work during the construction phase of the Contract. The specified Environmental Team (ET) shall be established prior to the commencement of any Works.
- (b) The Environmental Team shall be headed by an environmental engineer who has at least 7 years experience in environmental monitoring and auditing (EM&A) or

environmental management. The environmental engineer shall be supported by environmental technicians who shall have relevant experience in environmental monitoring and auditing accepted by the Engineer. The environmental technicians shall be considered as members of the Environmental Team.

- (c) The Environmental Team shall be supervised by an Independent Environmental Checker (IEC) employed by the Employer to assist the Engineer to implement the EM&A requirements as contained in the EM&A Manual.
- (d) The Contractor shall propose for the approval of the Engineer the employment of the Environmental Team and ET leader.
- (e) The duties of the Environmental Team shall include regular environmental audits and shall be responsible for the implementation of the EM&A programme in accordance with the EM&A requirements as contained in the EM&A Manual and to ensure that environmental mitigation measures recommended in the Environmental Permit are enforced. The ET shall carry out site inspections to investigate and audit the Contractor's site practices, equipment and work methodologies with respect to pollution control and environmental mitigation, and anticipate environmental issues for proactive action before problems arise.
- (f) In the event of non-compliance, the Environmental Team shall immediately inform the Contractor, the Engineer and IEC in order that appropriate action can be implemented. The Environmental Team is also responsible for preparing monthly EM&A reports for submission to the Contractor, the Engineer, IEC and EPD. The Environmental Team shall assist the Contractor and the Engineer in formulating corrective actions and liaising with government departments as necessary.
- (g) The environmental engineer may be engaged part time, but with sufficient presence on the Site to properly fulfil the duties as stipulated in sub-clause (e). The number of environmental technicians to be employed are not fixed but they shall perform the duties to the satisfaction of the Engineer. There shall be at least one environmental technician engaged full time on Site. If the Engineer considers the environmental technician(s) cannot perform the duties to his satisfaction, the Contractor shall engage additional full time environmental technician(s) as ordered by the Engineer at no extra cost.
- (h) The EM&A reports shall be in an agreed format by the Engineer and shall include the following:
 - (i) summary of major points;
 - (ii) summary of the construction activities for the month;
 - (iii) monitoring data;
 - (iv) audit/review of the data;
 - (v) compliance check and report on exceedances;
 - (vi) remedial measures adopted to restore the adverse condition;
 - (vii) record of complaints and remedial measures;
 - (viii) forecast of work programme and schedule;
 - (ix) proposal for changes to mitigation measures, as appropriate; and
 - (x) comments and conclusions.

- (i) The costs of provision of labour and testing instruments for assessment of environmental issues, pollution complaints, etc. if required, shall be included in this Contract.
- (j) The Contractor shall submit within 14 days of the date of the Employer's letter of acceptance of the Tender three copies of a waste management plan (WMP) for the Engineer's approval. The WMP shall meet the requirements set out in Appendix 11 – Waste Management Plan (WMP). The Contractor shall review the WMP at monthly intervals and shall submit a revised and updated WMP if necessary. If and when the Engineer is of the opinion that the WMP does not meet the requirements of the Contract, the Engineer may by notice in writing require the Contractor to revise or update the WMP and the Contractor shall comply with that requirement within 7 days of the date of the notice.

1.39.4 Waste Management Plan

- (a) The Contractor shall note the change of terminology related to public filling, viz:

Existing Terminology	New Terminology
Public dumping	Public filling
Public dumping material	Public fill
Public Dumping Sub-Committee	Public Filling Sub-Committee
Barging point	Public filling barging point, barging point
Public dump site	Public filling area
Intermediate sorting plant	C&D material sorting facility
Construction waste	Construction & demolition (C&D) waste (for disposal of at land sites)
Inert and non-inert construction waste	Construction & demolition (C&D) material
Inert construction waste	Public fill
Non-inert construction waste	Construction & demolition (C&D) waste
Stockpiling area	Stockpiling area, buffer storage area

- (b) The Contractor shall submit within 14 days of the date of the Employer's letter of acceptance of the Tender three copies of a waste management plan (WMP) for the Engineer's approval. The Contractor shall review the WMP at monthly intervals and shall submit a revised and updated WMP if necessary. If and when the Engineer is of the opinion that the WMP does not meet the requirements of the Contract, the Engineer may by notice in writing require the Contractor to revise or update the WMP and the Contractor shall comply with that requirement within 7 days of the date of the notice.
- (c) The Contractor shall include in the WMP, a chart setting out the roles and responsibilities of the Contractor's personnel responsible for waste management and appropriate mitigation measures.
- (d) The Contractor shall include in the WMP an analysis of when, what quantities

**THIS PROCEDURE IS ISSUED AS AN UNCONTROLLED DOCUMENT
NO FURTHER AMENDMENT WILL BE ISSUED**

***Environmental Monitoring and Audit
Site Inspections and Remedial Action Reporting System***

Document Reference Number	EP006 SHEK WU HUI STW
Controlled Process	No
Version	2.0
Status	
Created	5/09/06
Modified	5/09/06
Approved	Approved
Process Owner	Environmental Team Leader
Prepared By	S. Lau
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Table Of Contents

1. Process Summary	3
2. Process Detail	3
2.0 Start chart	3
2.1 Collect updated E&M Contractor's works schedule	3
2.2 Collect relevant E&M Contractor's method statements	4
2.3 Collect previous site inspections and related correspondence	4
2.4 Review/comment on method statements	4
2.5 Contact E&M Contractor site representative before each inspection.....	4
2.6 Conduct regular site inspection with the approved checklist and site plan	4
2.7 Contact E&M Contractor's site representative after the inspection.....	5
2.8 Was an environmental complaint received?.....	5
2.9 Follow the EM&A Manual procedure "Handling of Environmental Complaints"	5
2.10 Was an environmental deficiency found?.....	5
2.11 Submit inspection results and, if applicable, deficiency and recommendations.....	6
2.12 Describe deficiency and formulate recommendations for immediate remedial action	6
2.13 Conduct investigation.....	6
2.14 Submit investigation report.....	6
2.15 Submit monthly EM&A report.....	6
2.16 Finish	6
3. Process Chart	7

Appendix A Procedure for Handling of Environmental Complaints

1. **Process Summary**

This procedure details the site inspections and deficiency/remedial action reporting system for environmental auditing purposes for the project " Supply and Installation of E&M Equipment for Expansion of Shek Wu Hui Sewage Treatment Works " (Drainage Services Department Contract No. DE/2005/03). Regular site inspections are required on weekly basis according to the project's Environmental Monitoring and Audit Manual. Identification of deficiencies and development of remedial actions are required.

The E&M Contractor referred herein is Biwater Man Lee Limited, the Environmental Team (ET) is Kingsford Environmental (H.K.) Ltd., and the Independent Checker (Environmental) or IEC referred herein is CH2M HILL Hong Kong Limited, and the ER referred herein is the Engineer's Representative of the Drainage Services Department (DSD).

Regular site inspections will be performed by the ET's environmental technician(s) at least once per week. This procedure includes preparation for inspections, and employs a checklist and site layout plan to document each site inspection. Environmental conditions and status of mitigation measures/key EM&A requirements summarised from the EM&A Manual will be documented on the checklist. Reporting of inspection results, including any deficiencies found and corrective actions taken, and deficiency investigation/follow-up is detailed.

This procedure details communication and reporting between the ET, the E&M Contractor, the IEC and the ER. The documents referred herein will form part of the monthly EM&A Report.

The procedure for handling of environmental complaints (detailed in the EM&A Manual) is provided in Appendix A.

2. **Process Detail**

Please refer to section 3 for the process chart

2.0 *Start chart*

PERFORMED BY No Performer
The next figure is 2.1 Collect updated E&M Contractor's works schedule

2.1 *Collect updated E&M Contractor's works schedule*

2.1.1 DEFINITION

The works schedule should be provided by the Contractor's representative (Site Agent, or as authorized) at least a week before the work commences.

PERFORMED BY ET Leader
The next figure is 2.2 Collect relevant E&M Contractor's method statements

2.2 *Collect relevant E&M Contractor's method statements*

2.2.1 DEFINITION

The method statements for the entire week should be provided by the Contractor's representative (Site Agent, or as authorized) at least a week before the work commences.

The method statements should contain the following information:

- list of involved site staff
- work activities*
- detailed work schedule
- list of equipment, materials (including chemicals)
- environmental protection/mitigation strategy

* The detailed work procedures could be reviewed by the technician at the E&M Contractor's site office, as needed.

PERFORMED BY ET Leader
The next figure is 2.3 Collect previous site inspections and related correspondence

2.3 *Collect previous site inspections and related correspondence*

2.3.1 DEFINITION

This previous information should be used when conducting the site inspection.

PERFORMED BY ET Leader
The next figure is 2.4 Review/comment on method statements

2.4 *Review/comment on method statements*

2.4.1 DEFINITION

Review/comments to be provided to E&M Contractor in writing within two (2) working days. E&M Contractor to supply method statement to IEC. IEC's comments on method statement to be incorporated.

PERFORMED BY ET Leader
The next figure is 2.5 Contact E&M Contractor site representative before each inspection

2.5 *Contact E&M Contractor site representative before each inspection*

PERFORMED BY ET Environmental Technician

The next figure is 2.6 Conduct regular site inspection with the approved checklist and site plan

2.6 *Conduct regular site inspection with the approved checklist and site plan*

2.6.1 DEFINITION

Regular inspection is carried out by an ET technician at least weekly, as required. In case of significant environmental problems are identified, *ad hoc*/subsequent inspections will also be carried out.

The technician is to complete the Daily Site inspection Checklist (attached) for the agreed scope (i.e. if item is not included in the scope, mark "N/A"). If a required item is not complied with, describe the deficiency in the "comments" column, and in any case, note the relevant environmental conditions observed. Technician to also observe conditions related to upcoming inspections.

The No. refers to each item of the Site Inspection Checklist Attachment (attached), which status of mitigation measures/key EM&A requirements summarised from the EM&A Manual. Technician to note the full details as repeated in the Site Inspection Checklist Attachment.

The technician should identify the relevant site locations on the site plan (attached) and on the Checklist by using a code, such as "A", "1", etc., for the scope of the inspection.

Technician to photograph site areas inspected.

PERFORMED BY ET Environmental Technician
The next figure is 2.7 Contact E&M Contractor's site representative after the inspection

2.7 Contact E&M Contractor's site representative after the inspection

2.7.1 DEFINITION

The results of the inspection should be discussed with the site representative on the day of the inspection. Note actions/plans regarding any non-compliance in the "comments" section. Also, the representative and technician shall both sign the checklist. A copy of the completed checklists and the site plan shall be provided to the representative.

PERFORMED BY ET Environmental Technician
The next figure is 2.8 Was an environmental deficiency found?

2.8 Was an environmental complaint received?

2.8.1 DEFINITION

When an environmental complaint was received from the Engineer or ER, as originated from the general public, EPD or E/ER/other governmental departments, the ET leader shall follow a procedure for dealing with complaints as provided in the EM&A Manual.

PERFORMED BY ET Leader
The next figure for "No" is 2.11 Submit inspection results and, if applicable, deficiency and recommendations
The next figure for "Yes" is 2.9 Follow the EM&A procedure "Handling of Environmental Complaints"

2.9 Follow the EM&A Manual procedure "Handling of Environmental Complaints"

PERFORMED BY ET Leader

2.10 Was an environmental deficiency found?

2.10.1 DEFINITION

Deficiency is defined as a breach of the environmental requirements for the project, particularly if it may (or does) result in non-compliance with environmental laws/regulations.

PERFORMED BY ET Environmental Technician
The next figure for "No" is 2.11 Submit inspection results and, if applicable, deficiency and recommendations

The next figure for "Yes" is 2.12 Describe deficiency and formulate recommendations for immediate remedial action

2.11 Submit inspection results and, if applicable, deficiency and recommendations

2.11.1 DEFINITION

Submit the inspection results and, if applicable, description of the deficiency and recommendations for corrective action in writing to the E&M Contractor within 24 hours of the site inspection. Recommendations for the upcoming site activities may also be included. E&M Contractor to supply to the IEC and then to the ER.

PERFORMED BY ET Leader
The next figure is 2.15 Submit monthly EM&A report

2.12 Describe deficiency and formulate recommendations for immediate remedial action

2.12.1 DEFINITION

The deficiency shall be fully described and recommendations formulated with rationale for appropriate and effective corrective actions. Corrective actions shall be co-ordinated with the E&M Contractor.

PERFORMED BY ET Leader
The next figure is 2.11

2.13 Conduct investigation

2.13.1 DEFINITION

Investigate the deficiency and evaluate correction actions, in consultation with the EM&A Contractor. This may involve applicable measurements or monitoring.

PERFORMED BY ET Environmental Technicians
The next figure is 2.14 Submit investigation report

2.14 Submit investigation report

2.14.1 DEFINITION

Submit the results of the investigation to the E&M Contractor in a separate written report. E&M Contractor to supply to the IEC and then to the ER.

PERFORMED BY ET Leader
The next figure is 2.15 Submit monthly EM&A report

2.15 Submit monthly EM&A report

2.15.1 DEFINITION

The monthly Report will include the documents related to the site inspections including the completed checklists for the calendar month, the site locations inspected, photos, documents related to deficiencies, complaints, etc.

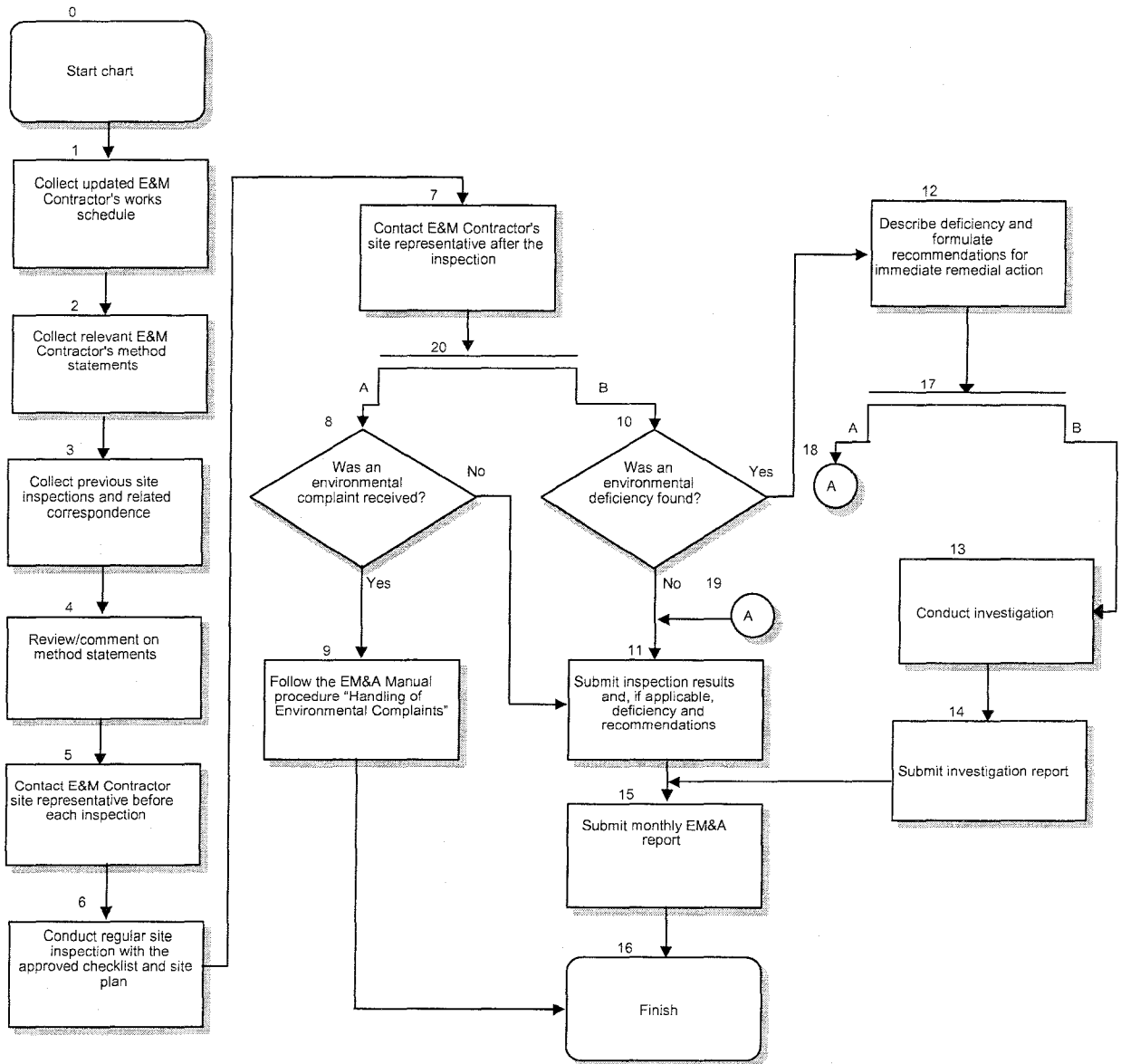
PERFORMED BY ET Leader
The next figure is 2.16 Finish

2.16 Finish

PERFORMED BY No Performer

3. Process Chart

EP006 SHEK WU HUI STW
Environmental Monitoring and Audit: Site Inspections and Remedial Action Reporting System
 Version: 1.0 Owner: Environmental Team Leader
 Created: 2006/3/28 Modified: 2006/5/9 Approved



**SHEK WU HUI SEWAGE TREATMENT WORKS – CONTRACT NO. DE/2005/03
ENVIRONMENTAL MONITORING AND AUDIT**

ENVIRONMENTAL SITE INSPECTION CHECKLIST

Inspection Date: _____ Time: _____

Inspected By: _____

IEC: _____ E&M Contractor Representative: _____

DSD Representative: _____ Environmental Team Inspector: _____

Weather

Condition Sunny Fine Overcast Drizzle Rain Storm Hazy

Temperature °C Humidity %

Wind Calm Light Breeze Strong Direction

Ref. No. ⁽¹⁾	Brief Description of Mitigation	Site Location ⁽²⁾	Activity Compliance				Action Required/ Responsible Party ⁽³⁾
			Yes	No	N/A	Unk	
Air Quality - Dust							
1	Water spray						
2	Cover debris						
3	Wet & cover stockpile						
4	Skip hoist						
5	Vehicle washing						
6	Clear of dusty material						
7	Water spray on road						
8	Cement bags						
9	Dusty material						
10	Cover belt conveyor						
Water Quality							
11	Storm drains						
12	Sand/silt removal facilities						
13	Exposed soil surface						
14	Rainwater silt removal						
15	Open stockpiles						
16	Groundwater silt removal						

**SHEK WU HUI SEWAGE TREATMENT WORKS – CONTRACT NO. DE/2005/03
ENVIRONMENTAL MONITORING AND AUDIT**

Ref. No. ⁽¹⁾	Brief Description of Mitigation	Site Location ⁽²⁾	Activity Compliance				Action Required/ Responsible Party ⁽³⁾
			Yes	No	N/A	Unk	
17	Large object						
18	Sewage discharged						
19	Fuel/chemical storage						
20	Storage area condition						
21	Clean-up actions						
Noise Control							
22	Comply with ordinance						
23	Working equipment & sound-reducing measures						
24	Equipment condition						
25	Well-maintained plant						
26	Intermittent use of machines/plants						
27	Noise in one direction						
28	Silencers/mufflers						
29	Away from NSRs						
30	Trial for equipment/sound-reducing measures						
Waste Disposal							
31	Construction wastes						
32	Licensed waste collector						
33	Removal of construction wastes						
34	Waste storage areas						
35	Windblown litter/dust						
36	Waste disposal permits						
37	Licensed waste disposal facilities						
38	Careful design, planning & good site management						
39	Bentonite slurries						
40	Chemical wastes handling						
41	Chemical waste storage						
42	Condition of chemical waste storage area						

**SHEK WU HUI SEWAGE TREATMENT WORKS – CONTRACT NO. DE/2005/03
ENVIRONMENTAL MONITORING AND AUDIT**

Ref. No. ⁽¹⁾	Brief Description of Mitigation	Site Location ⁽²⁾	Activity Compliance				Action Required/ Responsible Party ⁽³⁾
			Yes	No	N/A	Unk	
43	Disposal of chemical wastes						
44	General refuse						
45	Chemical waste separation						
46	Strictly prohibited of refuse burning						
47	Environmental Permit and other documents on-site						
48	Environmental Permit and license displayed						
49	Waste records						

Summary / Remarks⁽⁴⁾

(Note: Refer to attached site layout)

Signatures

IEC

DSD Representative

Name:

Name:

E&M Contractor Representative

Environmental Team Leader

Name:

Name:

- (1) Refer to Site Inspection Checklist Attachment for complete description (Summarized EM&A Manual) of referenced mitigation measure or requirement.
- (2) Indicate exact locations as indicated (by code) on the attached site layout.
- (3) Note actions/plans and responsible party regarding any non-compliance in this column.
- (4) To be filled out by the environmental team.

Mitigation Measures / Keys EM&A Requirements - Air Quality
 Ref.: EM&A Manual

Legislation: Air Pollution Control Ordinance (Cap. 311)
 Air Pollution Control (Construction Dust) Regulation

No.	Requirements - Dust Control Measures	Location (Where)	Timing for Implementation (When)
1	- Water be sprayed to minimize dust generation.	Area in which demolition of the existing structure of the STW takes place.	Prior to and immediately after demolition activities.
2	- Any debris from the demolition or construction of the Project shall be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and at three sides.	General work area / Debris collection area.	All period during the construction of the Project.
3	- Any dusty material remaining after a stockpile of cement or other materials is removed shall be wetted and cleared from the surface of roads.	All works area.	All period during the construction of the Project.
4	- Any skip hoist for material transport shall be totally enclosed by impervious sheeting.	All works area.	All period during the construction of the Project.
5	- Vehicle washing facilities, including a high pressure water jet, shall be provided. Every vehicle shall be washed to remove any dusty materials from its body and wheels.	Designated vehicle exit point in the Project area.	For vehicles immediately before leaving the STW construction site.
6	- Selective area shall be paved with concrete, bituminous materials, hardcore or metal plates and kept clear of dusty materials.	Area where vehicle washing takes place and the section of road between the washing facilities and the exist point, and the main haul road to the Project area.	All period during the construction of the Project.
7	- Water shall be sprayed to keep the entire road surface wet and to minimize dust generation.	The main haul road to the Project area.	All period during the construction of the Project.
8	- Every stock of more than 20 bags of cement shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and at 3 sides.	Cement storage area.	All period during the construction of the Project.
9	- Cement bags or any other dusty materials collected during the work shall be disposed of in totally enclosed containers.	All works area.	All period during the construction of the Project.
10	- Every belt conveyor used for the transfer of dusty materials shall be enclosed. Every transfer point between any two belt conveyors shall be totally enclosed.	All works area.	All period during the construction of the Project.

Mitigation Measures / Keys EM&A Requirements - Water Quality
 Ref.: EM&A Manual

Legislation: Water Pollution Control Ordinance (Cap. 358)
 Practise Note for Professional Persons - Construction Site Drainage (ProPECC PN1/94)

No.	Mitigation measures to minimize and control of water quality impact	Location (Where)	Timing for Implementation (When)
11	- Surface run-off shall be directed into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins.	All works area.	All period during the construction phase in particular during rainy seasons.
12	- Silt removal facilities, channels and manholes shall be maintained and the deposited silt and grit shall be removed regularly to ensure the effectiveness of the systems.	All works area.	On a regular basis, in particular, at the onset of and after each rainstorm during the construction of the Project.
13	- Temporarily exposed soil surfaces shall be covered e.g. By tarpaulin, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds.	All works area.	When foundation excavation is to be carried out during raining seasons.
14	- Rainwater pumped out from trenches, such as those excavated for pipelaying, shall be discharged into storm drains via silt removal facilities.	All works area.	All period during the construction of the Project.
15	- Open stockpiles of construction materials (e.g. aggregates and sand) on site shall be covered with tarpaulin or similar fabric during rainstorms.	All works area.	All period during the construction phase in particular during rainy seasons.
16	- Groundwater pumped out of wells, etc. for the lowering of ground water level in foundation construction of the expansion facilities shall be discharged into storm drains after the removal of silt in silt removal facilities.	All works area.	All period during the construction of the Project.
17	- Wastewater generated from concreting, plastering; internal decoration, cleaning work and other similar activities, shall undergo large object removal by installing bar traps at the drain inlets.	All works area.	All period during the construction of the Project.
18	- Sewage from toilets, kitchens and similar facilities for the construction workers shall be discharged into a foul sewer or chemical toilets.	All works area.	All period during the construction of the Project.
19	- All fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas.	Fuel tanks and chemical storage areas.	All period during the construction of the Project.
20	- The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled oil, fuel and chemicals from reaching the receiving waters.	Fuel tanks and chemical storage areas.	All period during the construction of the Project.
21	- Guidelines and procedures for immediate clean-up actions following any spillages of oil, fuel or chemicals should be provided.	All works area.	All period during the construction of the Project.

Mitigation Measures / Keys EM&A Requirements - Noise Control
 Ref.: EM&A Manual

Legislation: Noise Control Ordinance (Cap. 400)
 Practise Note for Professional Persons - Noise from Construction Activities - Non-statutory Controls (ProPECC PN2/93)
 Technical Memorandum on Noise from Construction Work Other than Percussive Piling
 Technical Memorandum on Noise from Construction Work in Designated Areas

No.	Construction activities limited to the daytime hours (0700-1900) on Mon-Sat. Mitigation measures to be followed	Location (Where)	Timing for Implementation (When)
22	- The Contractor shall comply with and observe the Noise Control Ordinance and its subsidiary regulations in force in Hong Kong.	All works area.	All period during the construction of the Project.
23	- Before the commencement of any work, the Engineer may require the methods of working equipment and sound-reducing measures intended to be used on the Site to be made available for the Project.	All works area.	All period during the construction of the Project.
24	- All plant and equipment to be used on the Site are properly maintained in a good operating condition.	All works area.	All period during the construction of the Project.
25	- Only well-maintained plant shall be operated on-site and plant shall be serviced regularly.	All works area.	All period during the construction of the Project.
26	- Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum.	All works area.	Time between work periods.
27	- Plant known to emit noise strongly in one direction, shall, where possible, be orientated so that the noise is directed away from noise sensitive receivers (NSRs).	All works area.	All period during the construction of the Project.
28	- Silencers or mufflers on construction equipment shall be utilized if found necessary to further reduce noise, and shall be properly maintained during the construction phase.	All works area.	All period during the construction of the Project.
29	- Mobile plant shall be sited as far away from NSRs as possible.	All works area.	All period during the construction of the Project.
30	- The plant equipment and sound-reducing measures if necessary to be used on the site, shall be made available for trial.	All works area.	Before the commencement of any work.

Mitigation Measures / Keys EM&A Requirements - Waste Management
 Ref.: EM&A Manual

Legislation: Waste Disposal Ordinance (Cap. 354)
 Waste Disposal (Chemical Waste) (General) Regulation
 Code of Practice on the Packaging, Handling and Storage of Chemical Waste
 Professional Persons Environmental Consultative Committee Practice Note 3/94-Contaminated Land Assessment
 and Remediation (ProPECC PN 3/94)

No.	Requirements	Location (Where)	Timing for Implementation (When)
31	- Construction wastes shall be handled and stored in a manner to ensure that they are held securely without loss or leakage.	All works area.	All period during the construction of the Project.
32	- Licensed waste hauliers for chemical wastes and for dumping at public filling area shall be used and they shall only collect wastes prescribed by their permits.	All works area.	All period during the construction of the Project.
33	- Construction wastes shall be removed in a timely manner.	Waste Storage areas.	Every 2 days during construction phase.
34	- Waste storage areas shall be maintained and cleaned regularly.	Waste Storage areas.	All period during the construction of the Project.
35	- 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 leaving the construction site.
36	- The necessary waste disposal permits from the appropriate authorities shall be obtained, if required.	All works area.	Before construction of the Project.
37	- Wastes shall be disposed of at licensed waste disposal facilities.	All works area.	All period during the construction of the Project.
38	- 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 grous.	All works area.	All period during the construction of the Project.
39	- The handling and disposal of bentonite slurries shall be undertaken in accordance with Practice Notice for Professional Persons - Construction Site Drainage on construction site drainage.	All works area.	All period during the construction of the Project.
40	- Chemical waste that is produced, during construction shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.	Chemical waste arising points.	All period during the construction of the Project.
41	- 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, and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the	Chemical waste arising points.	All period during the construction of the Project.
42	- The chemical waste storage area shall also have adequate ventilation, be covered to prevent rainfall entering, and be arranged so that incompatible materials are adequately separated.	Chemical waste storage area.	All period during the construction of the Project.
43	- Disposal of chemical waste shall be via a licensed waste collector, and to a facility licensed to receive chemical waste.	Chemical waste storage area.	All period during the construction of the Project.
44	- General refuse shall be stored in enclosed bins.	All works area.	All period during the construction of the Project.
45	- Construction / demolition waste should be separated from chemical wastes.	All works area.	All period during the construction of the Project.
46	- Burning of refuse in construction sites is strictly prohibited.	All works area.	All period during the construction of the Project.
47	- Environmental Permit and other documents referred to in Part A of the EP readily available at all times on-site for inspection by the Director or his authorized officers.	All works area.	All period during the construction of the Project.
48	- Environmental Permit and other license/ permit displayed at all vehicular site entrance/exists or at a convenient location for public's information at all times	All works area.	All period during the construction of the Project.
49	- Waste records were properly maintained on-site and inspected, including the trip-ticket record quantities generated/recycled/ disposed.	All works area.	All period during the construction of the Project.

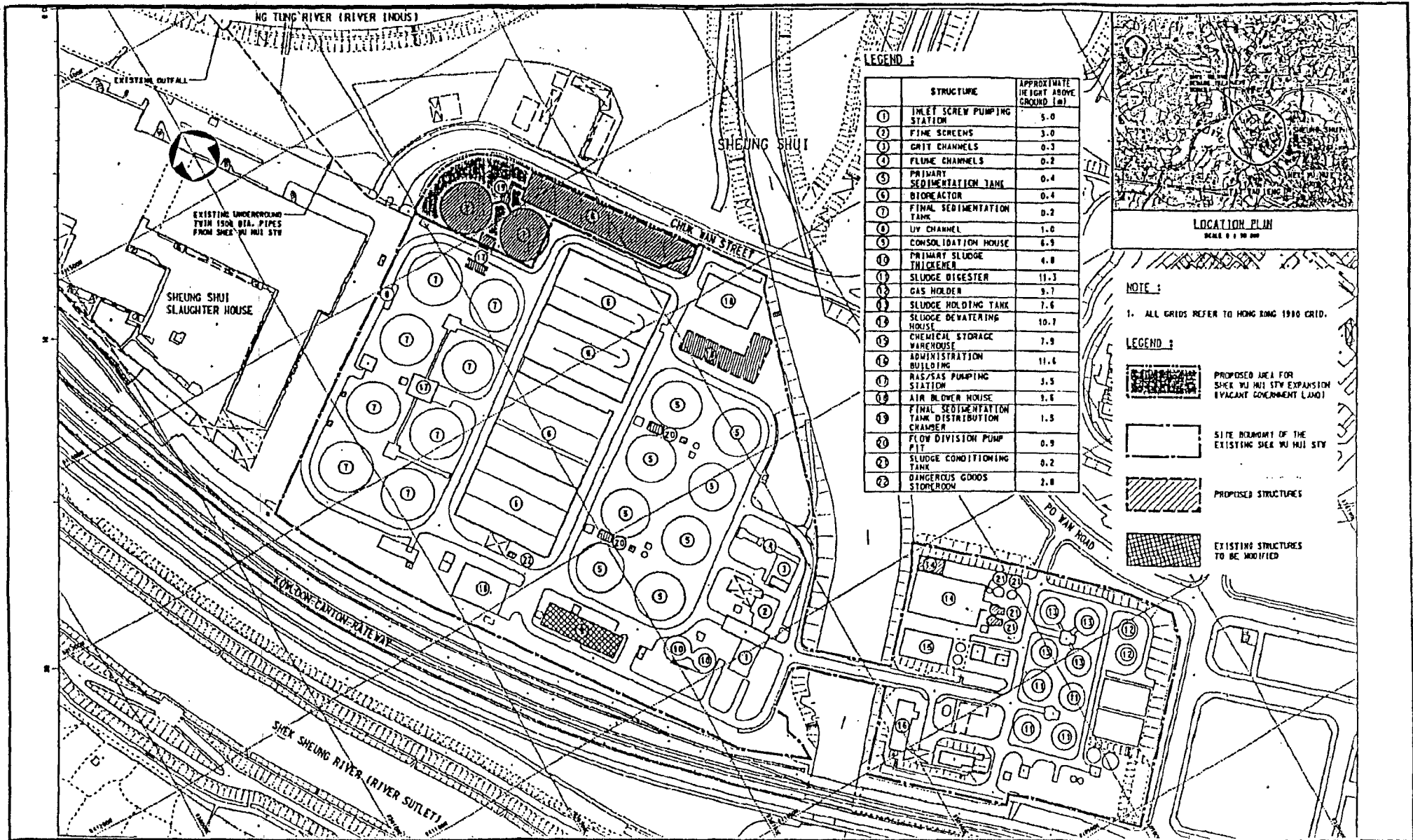


Figure 1- Expansion of Shek Wu Hui Sewage Treatment Works – General Layout of Shek Wu Hui Sewage Treatment Works Upon Project Completion

圖一 - 石湖墟污水處理廠擴建工程—石湖墟污水處理廠於工程完成後的平面圖

Environmental Permit No. : EP-218/2005

環境許可證編號： EP-218/2005



***Appendix A Procedure for Handling of Environmental
Complaints***

6.3 Environmental Complaints

- 6.3.1 Complaints shall be referred to the ET Leader for action. The ET Leader shall undertake the following procedures upon receipt of any complaint:
- (i) log complaint and date of receipt onto the complaint database and inform the IEC and the ER immediately;
 - (ii) investigate the complaint to determine its validity, and assess whether the source of the problem is due to works activities;
 - (iii) identify mitigation measures in consultation with the IEC if a complaint is valid and due to works;
 - (iv) advise the Contractor if mitigation measures are required;
 - (v) review the Contractor's response to identified mitigation measures, and the updated situation;
 - (vi) if the complaint is transferred from the EPD, submit interim report to the EPD on status of the complaint investigation and follow-up action within the time frame assigned by the EPD;
 - (vii) undertake additional monitoring and audit to verify the situation if necessary, and review that circumstances leading to the complaint do not recur;
 - (viii) report investigation results and subsequent actions to complainant (if the source of complaint is EPD, the results shall be reported within the timeframe assigned by the EPD); and
 - (ix) record the complaint, investigation, the subsequent actions and the results in the monthly EM&A reports.
- 6.3.2 During the complaint investigation work undertaken by the EI Leader, the Contractor and the ER shall cooperate with the ET Leader by providing all necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the Contractor shall promptly carry out the mitigation. The ER shall ensure that the measures have been carried out by the Contractor.
- 6.3.3 A flow chart of the complaint response procedures is shown in **Figure 6.1** and a sample template for the Interim Notification is annexed in **Appendix D**

Appendix 4

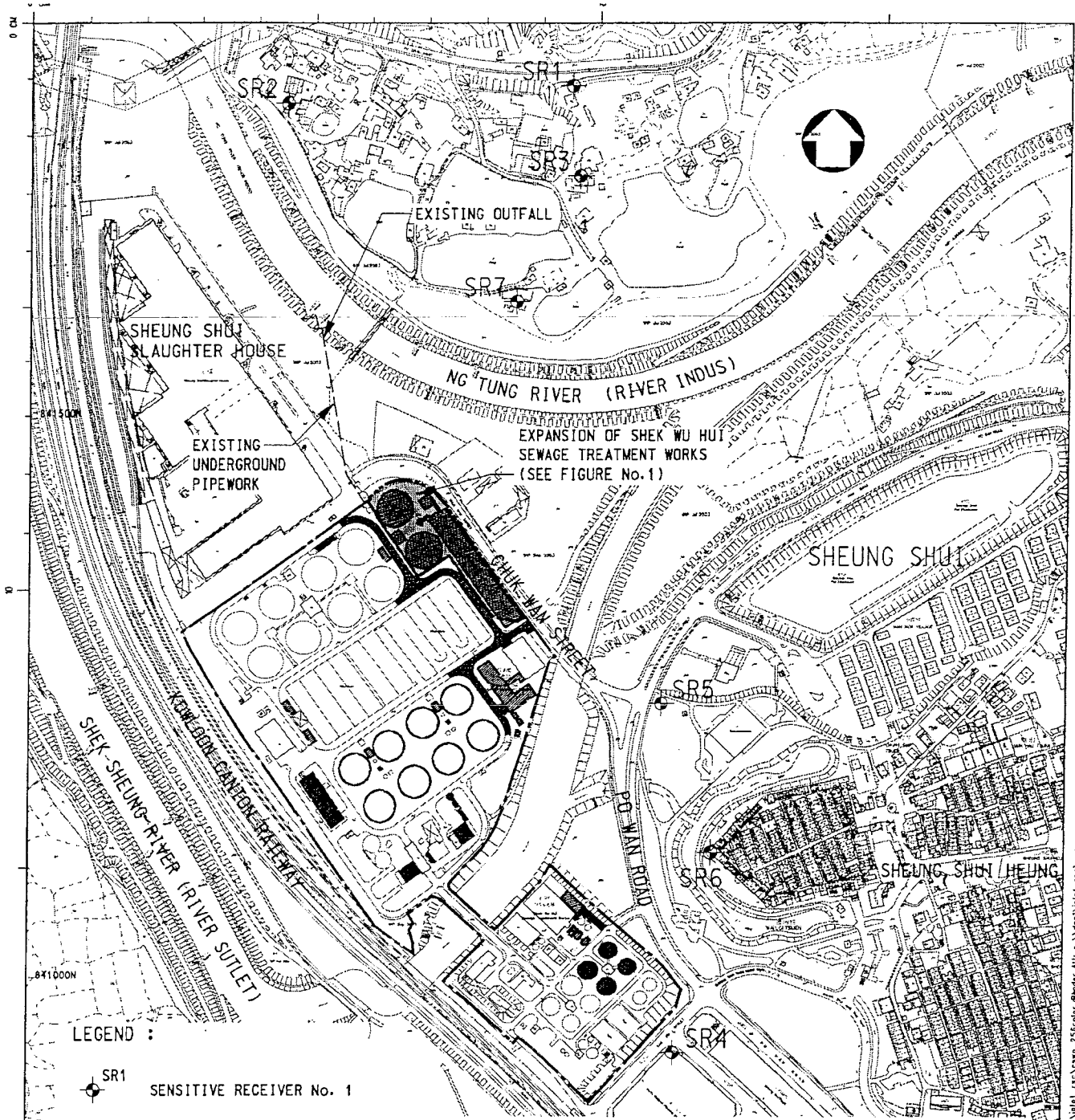
Permits


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Appendix 5

**Site Layout of Work Areas, Sensitive Receivers,
Locations of Monitoring and Control Stations,
Action and Limited Levels and Event/ Action Plan**


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LEGEND :

SR1 SENSITIVE RECEIVER No. 1

EXISTING SENSITIVE RECEIVERS		TYPE OF USE	TYPE OF SENSITIVE RECEIVERS (ASR / NSR)
SR1	ANCESTOR OF LIU TEMPLE (TAK YEUNG TONG)	WORSHIP	ASR & NSR
SR2	FU TEI AU TSUEN	RESIDENTIAL	ASR & NSR
SR3	FU TEI AU TSUEN	RESIDENTIAL	ASR & NSR
SR4	WAREHOUSE / TRADING AREA	INDUSTRIAL	ASR ONLY
SR5	SHEUNG SHUI HEUNG SITTING-OUT AREA AND BASKETBALL COURT	RECREATIONAL OPEN SPACE	ASR ONLY
SR6	WAI LOI TSUEN	RESIDENTIAL	ASR & NSR
SR7	TEMPORARY DOMESTIC STRUCTURE	RESIDENTIAL	ASR & NSR

NOTE : THERE ARE NO PLANNED SENSITIVE RECEIVERS IN THE VICINITY OF SHEK WU HUI SEWAGE TREATMENT WORKS.

Figure Title EXPANSION OF SHEK WU HUI SEWAGE TREATMENT WORKS LOCATION PLAN OF SENSITIVE RECEIVERS	Figure No.	2	Scale	1:5 000
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olfactory senses to detect any odour.

2.6.9 The observer should bring along a log book to record the findings. The log book should be kept in the plant office where it can be inspected when necessary. The findings should include the following:

- the prevailing weather condition;
- the wind direction;
- location where odour is spotted;
- possible source of odour;
- perceived intensity of the odour; and
- duration of odour.

2.6.10 The perceived intensity is to be divided into 5 levels which are ranked in the descending order as follows:

- Extreme
- Strong
- Moderate
- Slight
- Not detectable

2.7 Compliance Assessment

→ 2.7.1 Action and Limit (A/L) levels that provide an appropriate framework for the interpretation of monitoring results have to be agreed between ET, IEC, EPD and the Engineer before commencement of the air quality monitoring. The air quality monitoring data shall be checked against the agreed A/L levels. Recommended A/L levels are listed in **Table 2.5**.

Table 2.5 Proposed Action and Limit Levels for Impact Monitoring

Parameter	Action Level ⁽¹⁾	Limit Level
TSP (24 hour average)	<ul style="list-style-type: none"> • $BL \leq 200 \text{ g m}^{-3}$, $AL = (BL * 1.3 + LL)/2$ • $BL > 200 \text{ g m}^{-3}$, $AL = LL$ 	260 g m^{-3}
TSP (1 hour average)	<ul style="list-style-type: none"> • $BL \leq 384 \text{ g m}^{-3}$, $AL = (BL * 1.3 + LL)/2$ • $BL > 384 \text{ g m}^{-3}$, $AL = LL$ 	500 g m^{-3}
H ₂ S (at ASRs only)	<ul style="list-style-type: none"> • $BL \leq 1.92 \text{ ppb}$, $AL = (BL * 1.3 + LL)/2$ • $BL > 1.92 \text{ ppb}$, $AL = LL$ 	2.5 ppb
Incidence of odour complaints	Any incidence of odour complaint received through the Odour Complaint Register	Two or more complaints through the Odour Complaint Register within three months

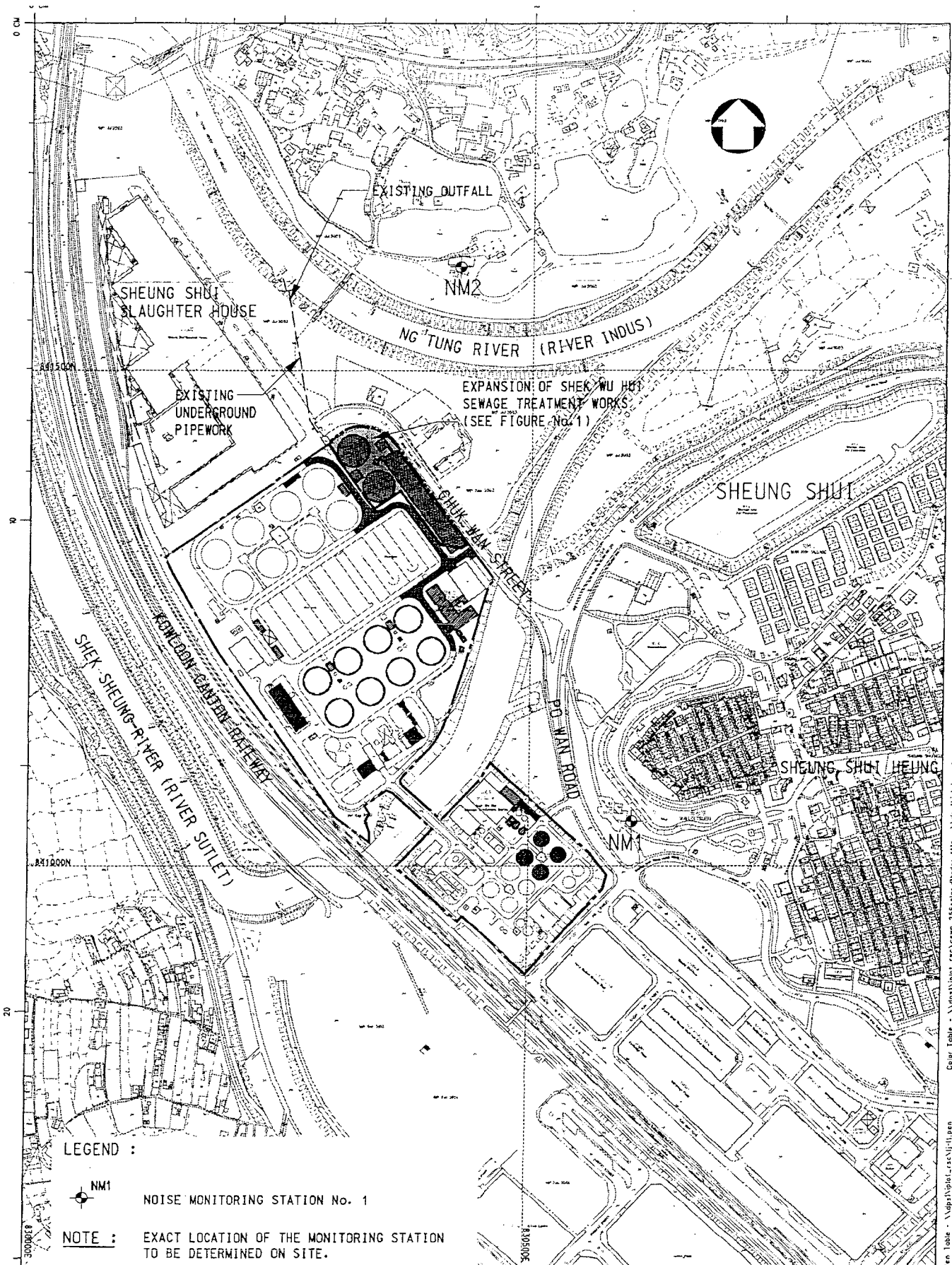
(1) BL = Baseline level, AL = Action level, LL = Limit level.

Event and Action Plan (EAP) for Air Quality


2.7.2 The EAP is based on the prescription of procedures and actions associated with the measurement of certain defined levels of air pollution recorded by the environmental monitoring process and the agreed A/L levels. In case TSP A/L level exceedances occur, the ET, the IEC, the Engineer and the Contractor shall observe the relevant actions of the respective EAP listed in **Tables 2.6** whereas relevant sections in DSD shall be responsible for the implementation of the EAP as listed in **Table 2.7** in the event of odour exceedance/complaint for construction and operational phase respectively.

Table 2.6 Event/Action Plan for Air Quality Monitoring (Construction Phase)


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



LEGEND :

 **NM1** NOISE MONITORING STATION No. 1

NOTE : EXACT LOCATION OF THE MONITORING STATION TO BE DETERMINED ON SITE.

Figure Title	Figure No.	Scale
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5.6 Impact Monitoring for Construction Noise

- 5.6.1 Noise monitoring shall be carried out at all designated monitoring stations. The monitoring frequency shall depend on the scale of the construction activities. The following is an initial guide on the regular monitoring frequency for each station on a weekly basis when noise generating activities are underway:
- one set of measurements between 0700 and 1900 hours on normal weekdays.
- 5.6.2 If construction works are extended to include works during the hours of 1900 - 0700. Applicable permits under NCO shall be obtained by the Contractor.
- 5.6.3 In case of non-compliance with the construction noise criteria, more frequent monitoring, as specified in the Action Plan in **Table 5.3**, shall be carried out. This additional monitoring shall be continued until the recorded noise levels are rectified or proved to be irrelevant to the construction activities.
- 5.6.4 Before commencement of impact monitoring, the ET Leader shall inform IEC of the impact monitoring programme such that the IEC can conduct an on-site audit to ensure the accuracy of the monitoring results.

5.7 Event and Action Plan (EAP) for Construction Noise

- 5.7.1 The Action and Limit levels for construction noise are defined in **Table 5.2**. Shall non-compliance of the criteria occur, action in accordance with the Action Plan in **Table 5.3** shall be implemented.

Table 5.2 Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700 – 1900 hours on normal weekdays	When one documented complaint is received	75 dB(A)

Table 5.3 Event/Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	<ol style="list-style-type: none"> 1. Notify IEC and ER; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER 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 IEC; 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to check mitigation effectiveness; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, 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 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 IEC 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 6

Deficiency Investigations Reports

(Not Applicable)

Appendix 7

Complaint Reports

(Not Applicable)

Appendix 8

Summons and Prosecutions Records

(Not Applicable)