REVISION HISTORY				
Rev	**Description of Change**	**Prepared by**	**Approved by**	**Effective Date**
A	1st Submission	DW	JL	15/11/2003
B	2nd Submission ▪ General amendment	DW	JL	01/02/2004

1. INTRODUCTION

1.1 Project Details

Title:	Ngong Ping Sewage Treatment Plant, Trunk Sewers and Effluent Export Pipeline
Nature:	To construct sewage infrastructures which include sewers falling within country park and conservation area for servicing the Ngong Ping area on the Landau Island
Location:	Ngong Ping and the carriageways of Ngong Ping Road, Sham Wat Road, Keung Shan Road and Shek Pik Reservior Road on Lantau Island The location of the project is shown in Appendix B
Scale and Scope:	The project mainly consists of the following sewage infrastructures: • A tertiary sewage treatment plant located at Ngong Ping; and • An effluent export pipeline of about 5.5km, conveying treated effluent from the NPSTP to Tung Wan for discharge
Contract Commencement Date:	18 August 2003
Estimated Completion Date:	17 Oct 2005

1.2 Objectives for Waste Management Plan

In accordance with EP-157/2003 Condition 3.11, a Waste Management Plan that describe the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities and shall include the recommended mitigation measures on waste management in the approved EIA report (Register no.: AEIER-065/2002) shall be deposited with the Director.

The main objectives of this WMP include:

- To provide reference to the waste management requirement, both statutory and non-statutory;
- To detail the roles and responsibilities of the contractor personnel responsible for waste management and appropriate mitigation measures;
- To establish the waste management procedures for collection, transportation, storage and disposal of waste.

1.3 Structure of the Waste Management Plan

Following this introductory section, the WMP is set out as follows:

- Section 2 sets out the legislative framework in Hong Kong
- Section 3 sets out provides details on the organization structure of the project and the responsibilities of the key personnel of the site team for waste management
- Section 4 provides the types of wastes that would be generated and the estimated amounts of them generated from the whole project
- Section 5 provides the waste flow of the project
- Section 6 provides details of the requirements and procedures for the construction waste management and the mitigation measures
- Section 7 sets out all documents that shall be properly kept and recorded
- Section 8 provides details of training to enhance the waste management awareness of the staff and subcontractors
- Section 9 provides details of the waste monitoring and audit procedures to ensure compliance with prescribed waste management practices

2. ENVIROMENTAL LEGISLATION AND STANDARDS

2.1 Statutory Requirements

The following legislation relates to the handling, treatment and disposal of wastes in Hong Kong, and shall be observed with regard to all wastes generated and requiring disposal due to the construction, where applicable:

- Waste Disposal Ordinance (Cap 354)
- Waste Disposal (Chemical Waste) (General) Regulation (Cap 354)
- Land (Miscellaneous Provisions) Ordinance (Cap 28)
- Public health and Municipal Services Ordinance (Cap 132) – Public Cleansing and Prevention of Nuisances (Urban Council) and (Regional Council) By-Laws
- Dumping at Sea Ordinance (Cap 466)
- Foreshore and Sea-Bed (Reclamations) Ordinance (Cap 127)
- Air Pollution Control Ordinance (Cap 466) (for asbestos wastes)
- Factories and Industrial undertakings (Construction Sites Safety) Regulations (Cap 59)
- Factories and Industrial Undertakings (Asbestos) (Approval of Respiratory Protective Equipments) Notice

The Waste Disposal Ordinance (WDO) prohibits the unauthorized disposal of wastes. Construction waste is not directly defined in the WDO, but is considered to fall within the category of “trade waste”. The illegal tipping or flytipping of wastes on unauthorized sites is also controlled under the WDO.

Under the Waste Disposal (Chemical Waste) (General) Regulation all producers of chemical wastes (including asbestos) must register with EPD and treat their wastes either utilizing on-site plant licensed by EPD, or arranging for a licensed collector to take the wastes to a licensed facility. The regulation also prescribes the storage facilities to be provided on site, including labeling an warning signs, and requires the preparation of written procedures and training to deal with emergencies such as spillages, leakages or accidents arising from the storage of chemical wastes.

Construction wastes that are wholly inert would be taken to public dumps. Public dumps usually form part of land reclamation schemes operated by the Civil Engineering Department (CED). The Land (Miscellaneous Provisions) Ordinance requires that individuals or companies who deliver suitable construction wastes to public dumps obtain dumping licenses. CED issues the licenses under delegated powers from the Director of Lands.

The Public Cleansing and Prevention of Nuisances By-Laws provide further controls on the illegal tipping of wastes on unauthorized (unlicensed) sites.

The Contractor would obtain all necessary permits and licenses under these ordinances including, but not limited to:

- Chemical waste permits/ licenses under the Waste Disposal Ordinance (Cap 354)
- Public dumping license under the Land (Miscellaneous Provisions) Ordinance (Cap 28)

2.2 Non-statutory Requirements

The following guidelines related to waste management and disposal would be adhered to during construction of the project:

- Waste Disposal Plan for Hong Kong (1989), Planning, Environmental and Lands Branch, Hong Kong Government Secretarial
- Environmental Guidelines for Planning in Hong Kong. Hong Kong Planning Standards and Guidelines (1990)
- New Disposal Arrangements for Construction Waste. EPD and CED (1992)
- Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes (2002), Environmental Protection Department
- Code of Practice on the Handling Transportation and Disposal of Asbestos Waste, Environmental Protection Department
- Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste
- Works Branch Technical Circular No. 12/00, Fill Management
- Works Branch Technical Circular No. 32/92, The Use of Tropical Hard Wood on Construction Site
- Works Branch Technical Circular No. 2/93, Public Dumps
- Works Branch Technical Circular No. 16/96, Wet Soil in Public Dumps
- Works Bureau Technical Circular No. 4/98, Use of Public Fill in Reclamation & Earth Filling Projects
- Works Branch Technical Circular No. 25/99, 25/99A and 25/99 Incorporation of Information on Construction and Demolition Material Management in Public Works Sub-committee Papers
- Environmental, Transport and Works Branch Technical Circular No. 33/02, Management of Construction and Demolition Material Including Rocks
- Works Branch Technical Circular No. 6/02 and 6/02A, Enhanced Specification for Site Cleanliness and Tidiness
- Works Bureau Technical Circular No. 21/02, Trip Ticket System for Disposal of Construction and Demolition Material
- Environmental, Transport and Works Branch Technical Circular No. 33/02, Management of Construction and Demolition Material Including Rock
- Works Bureau Technical Circular No. 15/03, Waste Management on Construction Sites
- Works Bureau Technical Circular No. 22/03, Additional Measures to Improve Site Cleanliness and Control Mosquito Breeding on Construction Site
- Waste Reduction Framework Plan, 1998 to 2007, Planning, Environmental and Lands Bureau, Government Secretariat, 5 November 1998
- A Guide to the Registration of Chemical Waste Producers
- A Guide to the Chemical Waste Control Scheme
- 200 Review of the Waste Reduction Framework Plan, Waste Reduction Committee
- Site Practice for Waste Reduction in Construction Industry (2001), EPD
- A Guide to the Control on Import and Export of Waste (1999), EPD

3. WASTE MANAGEMENT

3.1 Organization Structure for Waste Management

Appendix A of this WMP contains an Organization Chart showing the reporting channels and functional relationships of the various personnel currently employed and to be employed in the future on the project.

All significant contracts with Sub-contractors and consultants who are required to carry out on-site operations will contain provisions requiring compliance with this WMP, or an approved equivalent.

3.1.1 Contact list of key personnel

The key environmental contacts of the project are shown in the following table.

The Key Project Contacts

Party	Name	Role	Phone No.	Fax No.
CLIENT	W C MOK	Project Engineer	2594 7271	2827 8526
EPD	Local Control Office (Urban West & Island)	Hotline	2417 6072	N/A
RSS	Zorro T Y YUEN	Engineer's Representative	2109 9905 6407 4300	2109 9955
	Edmund P W CHAN	Resident Engineer (civil)	2109 9905 64074301	2109 9955
	Stephanie W Y HO	Assistant Resident Engineer (C1)	2109 9905 6407 4303	2109 9955
	C M LEUNG	Assistant Resident Engineer (C2)	2109 9905 6407 4304	2109 9955
JV	Wilson LAU	Project Manager	2109 9933 9091 1980	2109 9926
	Doris WONG	Environmental Coordinator	2272 3194 9756 2022	2375 3655
ETL	C L LAW	ET Leader	2946 7791	2695 3944
CH2M	David YEUNG	IEC	2872 2934	2507 2293

3.1.2 Regular Information Flow

Several means of communication are developed to promote the flow of information among the different parties. They are summarized in follows.

Means of Communications on Environmental Matters

Means	Frequency	Purpose/Action	Responsible Party
Environmental Correspondence	As required	Written communication among the site team and the Engineer	All correspondence sent to contractor should be copied to site team for review
Notice of Non-Com-pliance, Com-plaint	As required	Written notification to site team requesting appropriate actions	The Engineer, IEC or ET
		Written notification to inform the Engineer, IEC & ET	Site team
Licences and Permits	As required	On receipt of a license or permit, the original should be kept at the site office and should be copied to the Engineer.	Site team
Site Safety and Environmental Committee Meeting	Monthly	Face to face communications between the site team and other disciplines	Site team to arrange and attend, inform other site team members of any waste management concerns after the meeting
Weekly Safety and Environmental Walk	Weekly	Assess the contractor's effort and performance on Waste Management on site	Site team to arrange and attend the weekly safety and environmental walk, inform other site team members of any improvement areas on waste management
Induction Training	Mandatory for new workers and sub-contractors	Promote awareness of waste management among workers and sub-contractors	Site team

Means	Frequency	Purpose/Action	Responsible Party
Internal Site Inspection	Monthly	Promote awareness of waste management among workers and sub-contractors via continual, casual conversations	Site team to nominate site representative
External Site Inspection	Monthly	Record to be submitted to the Engineer	IEC
Environmental Records	Continually	Records of training, permits, communications, inspection checklist etc., to be kept at site office	Site team

3.1.3 Communication Procedures in the Event of Non-compliance and Complaint

Non-compliance

When non-compliance is identified through the audit programme or any other means, procedures provided in following table should be followed.

Step	Action	Responsible Party			
		ER	IEC	ET	Contractor
1	The party who identifies the non-compliance shall notify other parties on the same day.	■	■	■	■
2	Check workers and sub-contractors' work methods and remind them of their contractual obligations.				■
3	Discuss about the non-compliance and remedial measures within 2 working days if practicable.	■	■	■	■
4	Implement remedial measures within 4 working days if practicable.				■
5	May increase site inspection frequency to assess the effectiveness of remedial measures.				■
6	If NC continues, discuss about the further actions needed. Go to step 3.	■	■	■	■
7	If NC stops, Inform the Engineer the whole process of the close out of the NC.				■

Complaint

Upon receipt of a complaint, procedures provided in following table should be followed.

Communication Procedures in the Event of a Complaint

Step	Action	Responsible Party	
		ER	Contractor
1	The party who receives the complaint shall notify other parties on the same day.	■	■
2	Check workers and sub-contractors' work methods and remind them of their contractual obligations.		■
3	Discuss about the complaint and remedial measures within 2 working day if practicable.	■	■
4	Implement remedial measures within 4 working days if practicable.		■
5	Assess the effectiveness of the remedial actions. Notify the Engineer of the monitoring results.		■
6	May increase site inspection frequency to assess effectiveness of remedial measures.	■	■
7	Party who received the complaint shall inform the complainant of the actions taken.	■	■

3.2 Responsibilities of Key Personnel

All personnel in the site team are required to implement waste management and measures within their work area. A summary of the responsibilities of key personnel:

Project Manager

- Maintain overall control of the project
- Be responsible for waste management strategy planning in Contractor to sub-contractor
- Oversee the implementation of the WMP according to the environmental policy
- Ensure appropriate waste management mitigation measures are properly implemented
- Participate and provide necessary support to ET for the preparation and review of WMP
- Ensure that works are undertaken in accordance with the recommendations made and instructions given by the ER, IEC and ET
- Ensure the recommendations and instruction from ER, IEC and ET are implemented to improve the waste management practice and carry out immediate action to rectify the non-compliance of waste management requirements
- Liaise with the ER and IEC on the waste management issues
- Ensure follow up actions are properly undertaken in the event of non-compliance of the WMP
- Assign a site staff to assist him in the day-to-day supervision and in enforcing the on-site mitigation measures
- Be responsible for the provision of resources and facilities for the implementation of WMP
- Monitor al documents regarding to waste management including disposal license, C&D material disposal delivery record and waste flow tables etc.

Site Agent

- Assist the Project Manager in the implementation of WMP
- Monitor and control works including those of sub-contractors to ensure compliance of WMP
- Be responsible for the day-to-day overview of site practices the matters in relation to waste management and mitigation measures
- Report to the Project Manager regarding non-compliance of any waste management issues
- Implement the mechanism for recording all C&D materials removed off site
- Supervise and arrange the maintenance of waste management facilities
- Update the WMP

Environmental Coordinator

- Coordinate client, the Engineer's Representative, various Government Departments, Public, Environmental Team and Quensh Department on waste management matters
- Ensure all necessary statutory permits and licence being applied

- Ensure that the waste management is implemented through regular internal audits
- Arrange routine joint site inspection with ET and review environmental inspection report
- Carry out auditing and inspections of performance of waste management and mitigation measures. Report performance to project-in-charge and follow-up non-compliance and improvement
- Coordinate the environmental monitoring and audits by various external and internal parties
- Arrange general induction training for the site staff and discuss environmental matters and keep all training records at the site office
- Maintain relevant environmental records

Engineer

- Assist the Site Agent in the implementation of WMP
- Monitoring and control works including those of sub-contractors to ensure compliance of WMP
- Report to the Project Manager/ Site Agent regarding non-compliance of waste management issues
- Ensure the remedial actions or mitigation measures are carried out as planned

Foreman

- Assist the Engineer in the implementation of WMP
- Control works including those of sub-contractors to fulfill the requirement of waste management issues
- Report to Engineer any non-compliance of waste management issues
- Maintain the on-site waste management facilities including sorting area, temporary storage area and general refuse bins, etc
- Carry out the remedial actions or mitigation measures to rectify non-compliance
- Carry out routine maintenance of waste management facilities and keep proper maintenance records shall be kept in site offices

Sub-contractor

- Carry out the waste management practices instructed by the Engineers and General Foreman
- Report promptly to foreman any non-compliance of waste management issues

Environmental Team (ET)

- Provide specialist advice on waste management issues to the contractor
- Conduct weekly environmental site inspections and investigate and inspection contractor equipment and work methodologies with respect to waste management mitigation measures stipulated in the WMP, and anticipate waste management issues that may require mitigation
- Report the implementation status of waste management mitigation measures from site inspections to the Engineer and IEC

- Follow the procedures stipulated in the agreed Event and Action Plans in the event of non-compliance or complaint

Independent Environmental Checker (IEC)

- Conduct monthly site audit to ensure the WMP is in place and recommend any changes as appropriate
- Review and audit all aspects of the EM&A programme
- Liaise with the ET on complaint investigation and recommend and/ or instruct mitigation measures as appropriate
- Liaise with the ET on all environmental performance matters

4. Waste Generation and Disposal

The following types of waste would be generated from the above construction activities:

- Excavated material
- C&D material containing inert and non-inert materials
- Chemical waste
- General refuse

The estimated amount of waste to be generated, and disposal sites are provide in the following table.

Waste Type	Examples	Disposal Site	Estimated Quantity
Excavated material	• Rock • Soil	Mui Wo Public Fill Stockpiling Area (MWPFSA)	84,960 m^3
C&D material – public fill (inert)	• Broken concrete • Brick • Aggregate	Mui Wo Public Fill Stockpiling Area (MWPFSA)	2,500 m^3
C&D material – C&D waste (non-inert)	• Wood • Bamboo • Plastic	Outlying Islands Transfer Facilities at Mui Wo (OITF)	500 m^3
Chemical waste	• Used oil • Spent solvent	Chemical waste treatment centre	6700 kg
General Refuse	• Packaging waste • Office waste	Outlying Islands Transfer Facilities at Mui Wo (OITF)	20,000 kg

Contractor or any person is not allowed to dump any waste, spoil, excavated materials or materials alike arising from the Project, etc. in any environmental sensitive areas, such as Lantau North Country Park, the Lantau South Country Park or the Water Gathering Grounds, etc.

5. WASTE FLOW TABLES (WFT)

A mechanism for recording all C&D materials removed off site each month will be developed. It will record:

- The quantity of inert C&D materials generated from the project
- The quantity of broken concrete generated from the project
- The quantities of different C&D wastes generated from the project
- The quantity of inert C&D materials being reused on site or other project(s)
- The quantity of inert C&D materials being disposed to public filling area
- The quantity of all recyclable materials collected by potential recycling contractors

The records will be reported in a monthly basis, using the "Monthly Summary Waste Flow Table" attached in Appendix D. The table will be completed and submitted to the Engineer by not later than 15th day of month following the reporting month or if it is a General Holiday, the day following the General Holiday.

The estimated and actual quantities of C&D materials that will be generated each year from the project will be reported, using the "Yearly Summary Waste Flow Table" attached in Appendix E. The table will be updated in a half-year basis and submitted to the Engineer by not later than 1st of June and December of each year, of if it is a General Holiday, the day following the General Holiday, throughout the construction period for submitting the yearly summary WFT.

A summary table, "Summary Table for Work Process or Activities Requiring Timber for Temporary Works", containing the description, justification and the estimated quantity for every works process / activity requiring the use of timbers for temporary works construction irrespective of the quantity of timber used shall be provided. A format of the summary table is shown in Appendix F. The table shall be submitted to the Engineer together with the Monthly Summary WFT for monitoring and review.

In addition, a summary table, "Reusable and/or Recyclable Materials Recovered on Site", containing the natural, the recycling contractor, which receives the materials, the date of removal and the quantity of the reusable and/ or recycled materials recovered on site. Surplus public fill will also be transported to other land formation sites or other construction site for reuse if feasible. The disposal sites must be clearly identified prior to any disposal/ reuse, with written agreement from the relevant third party. Information on the suitability of re-using the material and the assessment results of potential environmental impact of such disposal action have to be submitted to the Engineer, ET Leader and IEC for approval. Such disposal/ reuse action should not cause any off-site environmental impact. Prior notification to EPD on those other land formation sites/ other projects is required.

6. WASTE MANAGEMENT PLANNING, MITITGATION MEASURES AND PROTOCOLS

6.1 Introduction

The purpose of this section is to describe the proposed mitigation measure considered to ensure that all wastes generated during the construction are managed on-site, transported and disposed of in a manner that is both environmentally acceptable and in full compliance with statutory and contractual requirements.

6.2 Excavated Material

Excavated materials are not considered likely to cause adverse impacts with respect to their disposal, since they will be reused on-site as far as possible.

6.2.1 Mitigation Measures for Excavated Material

6.2.1.1 Avoidance / Minimization Measures

- Design for reusing excavated materials as back-fill material to balance cut and fill could reduce the generation of excavated materials. If cut and fill could not be balanced on-site, all inert portion of C&D material shall be disposed of at the Mui Wo Public Fill Stockpiling Area.

6.2.1.2 Reuse and Recycle

- Suitable excavated materials shall be sorted to recover the inert portions (e.g. soil and broken rock) for reuse

- The excavated materials for reuse as back-filling materials shall be properly managed in avoiding contamination. The stockpile management is proposed in this section

6.2.1.3 Disposal Methods

- All surplus excavated materials shall be transported to Mui Wo Public Fill Stockpiling Area

- During the delivery of the materials, either covering trucks or by transporting wastes in enclosed containers will be employed to minimize windblown liter and dust

- Contractor or any person is not allowed to dump any waste, spoil, excavated materials or materials alike arising from the Project, etc. in any environmental sensitive areas, such as Lantau North Country Park, the Lantau South Country Park or the Water Gathering Grounds, etc.

6.3 C&D Materials

C&D materials include public fill (inert material) and C&D wastes (non-inert material). Public fill will comprise broken concrete, brick and aggregates, etc. C&D wastes will comprise unwanted materials generated during construction, including rejected

structures and materials, materials which have been over ordered or are surplus to requirement and materials, which have been used and discarded.

6.3.1 Mitigation Measures for C&D Waste

6.3.1.1 Avoidance / Minimization of C&D Material

- Surplus materials shall be returned to stock in centralized area with suitable protective measures. If possible, surplus materials shall be exchange with other sites, to minimize material wastage

- Avoid, reduce or minimize the use of timber in temporary works construction as far as possible

- The design of formwork will be maximized the use of standard wooden panels so that high reuse levels can be achieved

- Careful design and planning and good site management will be maintained to minimize over ordering and generation of waste materials such as concrete, mortars and cement grouts

- Right amount of raw materials shall be ordered at the right time with proper control and documentation on material flow to minimize over-ordering

- Raw materials will be fully utilized to avoid wastage

- Current operation procedures including any waste reduction measures will be reviewed, especially during installation and cutting, to avoid unnecessary use

- Broken items or offcuts will be considered for sections when small lengths are required

6.3.1.2 Reuse and Recycle

- Identify suitable inert C&D materials (e.g. broken concrete from demolition or road improvement works) by on-site sorting, for recycling into aggregates and recover the materials

- Where necessary, alternatives such as metal scaffolding, steel formwork or plastic facing will be considered to increase the potential for reuse.

- If possible, items such as hoardings, formworks, scaffoldings or trench supports will be reused

- Identify and list out the work processes or activities that will generate recyclable materials during construction

- Suitable metal shall be recovered on site for collection by recycling contractors

- Demolition debris from demolition works shall be sorted to recover on site broken concrete, reinforcement bars, mechanical and electrical fittings as well as other building services fittings / materials that have established recycling outlets

6.3.1.3 Disposal Methods

- All inert portion of C&D materials (Public fill) shall be transported to Mui Wo Public Fill Stockpiling Area

- To conserve the capacities of landfill sites, C&D waste with more than 30% (by weight) inert material will not be disposed of at landfills. On-site sorting shall be properly implemented

- All non-inert portion of C&D materials (C&D waste) shall be transported to Outlying Islands Transfer Facilities at Mui Wo

- In order to minimize the impacts of demolition works, the wastes will be cleared as quickly as possible after demolition. The demolition and clearance works will therefore be undertaken simultaneously.

- The disposal of bentonite slurry generated during construction works should follow the requirements of ProPECC Note 1/94: Construction Site Drainage

- Contractor or any person is not allowed to dump any waste, spoil, excavated materials or materials alike arising from the Project, etc. in any environmental sensitive areas, such as Lantau North Country Park, the Lantau South Country Park or the Water Gathering Grounds, etc.

6.4 On-site Sorting of C&D Materials

Sorting is important to recover waste for reuse and recycle. To facilitate sorting, specific areas should be allocated for on-site sorting of C&D materials. C&D materials contain a mixture of inert and non-inert material. The inert potion is “Public Fill” and the non-inert portion is the C&D waste. The on-site sorting shall include the separation of C&D material into inert and non-inert materials.

- A system of work for on-site sorting of C&D materials, including identification of the source of generation, estimated quantity, arrangement for on-site sorting and / or collection, temporary storage areas, frequency of collection by recycling contractors or frequency of removal off site shall be established before the commencement of the construction

- Sorting at source will be our basis concept of on-site sorting, which can avoid double handling as far as possible.

- Sufficient spaces will be identified and provided during the construction stage for the collection, temporary storage and on-site sorting of C&D materials.

- Proper protective measures, such as fences and tarpaulin, will be provided, in order to protective the temporary stockpiled materials for later use

- In order to reduce the impacts to the public, except for those sorted inert C&D materials to be reused on site, all other sorted non-inert materials shall be removed off site as soon as practicable in order to optimise the use of the on-site storage space. If the non-inert materials need to be stored on site for a short period, the materials shall be centralized and stored at specific areas far away the sensitive receivers.

- Sorted inert C&D materials for disposal to public filling outlets shall contain no observable non-inert materials. The inert C&D materials that are suitable for recycling into aggregates and recover the materials for delivery to designated recycling facility shall be identified and sorted away from other C&D materials

- Chemical wastes generated on the site shall be sorted and handled according the handling procedures of chemical waste mentioned in this section

- General refuse generated on the site shall be sorted away from the inert C&D materials or reusable / recyclable C&D materials

6.5 Identification of Temporary Storage Area

Shall identify and provide sufficient space for the temporary storage of C&D materials to facilitate collection and/or sorting on the Site. The space provided should be commensurate with the estimated quantity for each type of C&D materials generated on the Site as indicated in the WFTs.

Except for those inert C&D materials to be reused on site, shall remove all other C&D materials off site as soon as practicable in order to optimize the use of the on-site storage space.

The location for temporary storage areas of sorted C&D materials are shown in Appendix C – NPSTP Layout Plan.

6.6 Stockpile Management

The materials stockpiled on-site will be managed in order to prevent any potential impacts. Following measures will be considered in order to properly manage the stockpiled materials:

- The stockpiles of materials should be placed in the locations away from water gathering ground and any stream courses so as to avoid releasing materials into the water bodies. Measures such as providing sand bag barriers shall be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system

- Location to minimize visual impacts and nuisance related to noise and air quality (dust) to any sensitive receivers

- All surplus spoil should be removed from the water gathering ground as soon as practicable

- Minimizing land take by reducing the size of the stockpiles and associated working areas

- Keeping the on-site storage of construction materials covered with tarpaulin or similar fabric all the times (this should also assist in reducing potential odor nuisance)

- Providing fencing to separate sensitive habitats and landscape areas to prevent accidental stockpiling in these areas

- In areas outside the water gathering ground where a large amount of exposed soils exist, earth bunds or sand bags should be provided

- Preventing surface water pollution from stockpile areas by use appropriate direction of surface run-off

- Any washout of construction or excavated materials shall be diverted to the drainage system via sediment traps

- Designating appropriate haulage routes

- Keeping the movement of stockpiled material to minimum

6.7 Chemical Waste

Chemical waste, as defined under the Waste Disposal (Chemical Waste)(General) Regulation, includes any substance being scrap material, or unwanted substances specified under Schedule 1 of the Regulation. Substances likely to be generated by construction activities arise from the maintenance of construction plant and equipment. These include, but need not be limited to the following:

- Scrap batteries or spent acid/alkali from their maintenance
- Used engine oils, hydraulic fluids and waste fuel;
- Spent mineral oils/cleaning fluids from mechanical machinery; and
- Spent solvents/solution, some of which may be halogenated, from equipment cleaning activities.

It is anticipated that the quantity of chemical waste, such as lubricating oil and solvent produced from plant maintenance, will be small.

6.7.1 Mitigation Measures for Chemical Waste

Storage, handling, transport and disposal of chemical waste will be arranged in accordance with the Code of Practice on the Packaging, Labeling and Storage of Chemical Waste published by EPD.

General:

- Shall register as a Chemical Waste Producer with EPD

Containers used for the storage of chemical wastes:

- Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed
- Have a capacity of less than 450 l unless the specifications have been approved by EPD
- Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulation

Labeling:

- Every container of chemical waste would bear an appropriate label, which would contain the particulars details. The waste produced would ensure that the information contained on the label is accurate and sufficient so as to enable proper and safe handling, storage and transport of the chemical waste

Storage area:

- Be clearly labeled and used solely for the storage of chemical waste
- Be enclosed on at least 3 sides
- Have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20% of the total volume of waste stored in that area, whichever is the greatest
- Be covered to prevent rainfall entering
- Be arranged so that incompatible materials are adequately separated

Disposal:

- Be via a licensed waste collector
- To a licensed disposal facility, such as Chemical Waste Treatment Centre

Spillage:

- Establish source of spill or discharge and determine nature of material, where possible halt discharge
- Commencing at the source of the spill, establish all current and potential impacted areas
- Commence containment of spill using bunds made from available materials and ground water cut-off trenches where necessary

- After spill is contained remove material (including contaminated soil where necessary) using pumps and/or absorbent materials

- Dispose of materials as chemical wastes

An Emergency Plan would be developed and implemented to deal with any accidental spillage of chemicals on site. Please refer to the Emergency Plan for details of the response actions of chemical spillage.

6.8 General Refuse

The presence of a construction site with large numbers of workers and site offices will result in general refuse requiring disposal. This will mainly consist of food waste, aluminum cans and waste paper.

6.8.1 Mitigation Measures for General Refuse

- Temporary storage areas shall be identify and provided for the temporary storage of general refuse to facilitate collection

- General refuse generated on-site will be stored in enclosed bins or compaction units separate from construction and chemical wastes

- Cardboard and paper packaging (for plant, equipment and materials) shall be recovered on site, properly stockpiled in dry condition and covered to prevent cross contamination by other C&D materials

- Separate labeled bins will be provided to segregate the waste generated by workforce. Waste recycle collector will be employed to collect the segregated waste

- The burning of refuse on-site is prohibited by law and will not be undertaken

6.9 Mechanism for Recording C&D Materials Removed off Site

6.9.1 Trip-ticket System

Surplus C&D material disposal arrangement shall follow the policy set down in WBTC No. 21/02 “Trip-ticket System for Disposal of Construction and Demolition Material”, in order to prevent the illegal dumping of the surplus C&D materials. A ticket system for the disposal of C&D materials shall be developed, as follows:

- Provide a Construction and Demolition Material Disposal Delivery Form (C&DMDDF) to each and every vehicular trip transporting C&D materials. A sample of this form is attached as Appendix K.

- Prior to the vehicle leaving the site, the C&DMDDF shall be completed

- For each vehicular trip, the completed C&DMDDF shall be presented to the operator of the Designated Public Filing Facility prior to the disposal of C&D materials

- A stamped form together with a computer printout receipt shall be received to acknowledge the disposal of public fill

- The stamped form and the original receipts shall be submitted to the Engineer's Representative for their review

6.9.2 Recording System for Recycling Materials Removal

A mechanism for recording the recyclable materials removed off site will be developed before the commencement of works.

All recycling materials removed by the recycling contractors will be properly recorded before the removal. The natures and quantities of the recycling materials, the date of removal and the name of the recycling contractor will be recorded in Appendix G.

6.10 Site Cleanliness

To maintain the site in a clean and tidy condition during the construction, the following general measures will be considered to implement on site at all times. Foreman will be responsible for the implementing the site cleanliness proposal.

- Maintenance of passageways, common accesses and public area free of obstructions;

- Common areas to which site staff have access such as lockers, toilets, mess room and wash rooms are maintained in clean and sanitary conditions at all times;

- Waste skips or garbage bins with suitable covers shall be provided at designated locations. All waste disposal points shall be maintained and cleaned regularly;

- Proper sorting, storage, collect and/ or disposal of waste materials off site in accordance with this Waste Management Plan;

- Properly store and stack all construction materials;

- Properly maintain the material storage areas; and properly organize the storage materials for better utilization of storage spaces and safe stacking if appropriate;

- Proper secure and maintain the hoardings, barriers, guarding, lighting and signing of works;

- Proper placement and storage of tools and equipment after work;

- Pest control will be implemented for site offices and within site, if necessary. The use of pesticide is not allowed within the Water Gathering Grounds;

- Prevent and remove water ponds and flooring; clear drains and channels to prevent flooring; and

- Conduct Daily and Weekly Site Cleanliness Inspections to ensure the implementation of the general measures on site cleanliness. Checklists for daily and weekly site cleanliness shall be established, completed and kept records for review, attached as Appendix H and I.

6.11 Waste Management Protocols

All wastes generated through the construction phase will be managed in accordance with the protocols set out in the following tables.

6.11.1 General Waste Management

Requirement			Responsibility
Activity		Frequency	
1	All staff involved in the day to day handling and management of waste shall, as a minimum, be instructed in the requirements as set out in this WMP and the importance of waste minimization	Prior to commencement and as new staff are appointed	Contractor to implement, IEC & ET to audit
2	All works areas shall be cleaned of general litter and refuse	Daily	Contractor to implement, IEC & ET to audit
3	General refuse and litter should be stored in enclosed bins or compaction units separate from construction or chemical wastes. A reputable waste collector should be used to remove general waste and litter off site for disposal.	Daily, or every other day.	Contractor to implement, IEC & ET to audit
4	Refuse should not be burned at any construction site	At all times	Contractor to observe
5	Separately labeled bins should be provided, where practical, to allow segregation of recycling collectors could be assisted.	Throughout Construction phase	Contractor to implement, IEC & ET to audit
6	Office wastes should be reduced through recycling of paper.	Throughout Construction phase	Contractor to implement
7	The Contractor shall aim to minimize waste generation through the following hierarchy: • Avoidance and minimization (not generating waste through changing or improving practices and design) • Reuse of materials, segregate the inert material from mixed waste and collect paper/cardboard, timber and metal for recovering, thus avoiding disposal (generally with only limited processing) • Recovery and recycling, thus avoiding disposal (although reprocessing may be required) • Treatment and disposal according to relevant regulations, guidelines and good practice	Throughout the construction phase	Contractor to implement

6.11.2 Storage, Collection, Reuse and Transport of Waste

Requirement			Responsibility
	Activity	Frequency	
1	All stockpiled spoil > 50 m^3 should be covered with tarpaulin or other appropriate fabric to prevent runoff during rainstorms, or dust during dry and windy periods	In advance of predicted rainstorms or particularly windy periods	Contractor to implement, IEC & ET to audit
2	All vehicles transporting wastes should have properly fitting tail boards and sides and materials should be securely covered	All vehicles transporting waste	Contractor to implement, IEC & ET to audit
3	Only waste hauliers licensed for specific waste categories should be retained	Throughout the construction phase	Contractor to implement, IEC & ET to audit
4	All wastes should be stored in a manner ensuring that they are held securely without loss or leakage	Throughout the construction phase	Contractor to implement, IEC & ET to audit
5	All wastes should be removed from site in a timely manner	At the earliest opportunity and in accordance with requirements	Contractor to implement
6	All waste storage areas should be cleaned and maintained regularly	As necessary	Contractor to implement, IEC & ET to audit
7	All necessary disposal permits should be obtained from the appropriate authorities for each waste category	Prior to commencement of disposal	Contractor to implement, IEC & ET to audit
8	All waste should be disposed of to appropriate land filing or public dumping site	Throughout construction phase	Contractor to implement, IEC & ET to audit
9	The Contractor's construction managers should keep records of quantities of chemical wastes generated, recycled and disposal and agree the location of these records with the Engineer	Throughout construction phase	Contractor to implement, IEC & ET to audit
10	Surplus public fill will be transported to other contracts to satisfy fill requirements, other land formation sites for reuse or public filling areas	Throughout construction phase	Contractor to implement

11	The handling and disposal of bentonite slurries should follow the Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94)	Throughout construction phase	Contractor to implement, IEC & ET to audit
12	The following properties of wastes should be noted: • Waste for landfill disposal should not contain > 30% (by weight) inert material • Waste for public dump/filling areas should be 100% inert	Throughout construction phase	Contractor to observe
13	Set up on-site sorting procedure for the waste which could be reused and recycled	Throughout construction phase	Contractor to implement, IEC & ET to audit
14	Set up monitoring system for truck management (such as ticketing system) to avoid any illegal dumping.	Throughout construction phase	Contractor to implement, IEC & ET to audit
15	Record the quantities of wastes generated recycled and disposed.	Throughout construction phase	Contractor to implement, IEC & ET to audit

6.11.3 Management of Chemical Waste and Asbestos

Requirement			Responsibility
	Activity	Frequency	
1	Where practical, processes shall be identified that pre-empty the production of chemical waste	Throughout construction phase	Contractor to implement
2	Chemical waste (as defined by Schedule 1 or the Waste Disposal (Chemical Waste)(General) Regulation) should be handled in accordance with the Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes	Throughout construction phase	Contractor to implement, IEC & ET to audit
3	Asbestos waste is stored, handled and disposed of in accordance with the Code of Practice on the Handling. Transportation and Disposal of Asbestos Waste	Throughout all asbestos abatement works	Contractor to implement, IEC & ET to audit

7 RECORDING

Any records, such as permits, site inspection checklists & reports, etc, relating to the implementation of the WMP, shall be kept adequately and be properly recorded.

The records include:

- Further Environmental Permit
- Training Records
- Inspection Checklists and Records
- Records of Trip-tickets system
- Any other records related

8. TRAINING

Company shall arrange and provide training on waste management in the site specific induction and its refresher training for all employee and subcontractors involved in the works.

The training shall cover the waste management policy, targets, measures for on-site sorting of C&D materials and measurement on waste management performance on the site.

An auditable record will be maintained for all environmental training undertaken.

9. WASTE MANAGEMENT MONITORING AND AUDIT

9.1 Waste Management Inspection

The aims and objectives of waste management inspection and audit are:

- To ensure that the waste arising from works are handled, stored, collected, transported and disposed of in an environmentally acceptable manner;
- To ensure that the handling, storage, collection and disposal of waste arising from the demolition works comply with the relevant requirements under the Waste Disposal Ordinance and its regulations; and
- To encourage the reuse and recycling of materials.

The Environmental Team (ET) and a contractor assigned person will audit the waste management practice during the weekly environmental site inspection to evaluate the overall performance of the implementation of the WMP and ensure the appropriate control measures are properly implemented. The Weekly Environmental Site Inspection Checklist is provided in Appendix J. The results of the Site Inspection would be reported in the monthly Environmental Monitoring and Audit reports.

The information regarding the types, quantity and disposal outlets, etc. of the wastes generated during the construction should also be reported in the monthly EM&A report.

In the event of any identified non-compliance against the provisions of this WMP, actions would be taken in according to the Event and Action Plan for non-compliance as shown in the following table.

Event Action Plan for Non-compliance

Step	Day	Action	Contractor/ ET	ER	IEC
1	1	Create a new non-compliance record within 1 working day after making an observation during a site audit accompanied by the Environmental Coordinator or his delegate. ET sends a Notice of Non-Compliance (NNC) to the Contractor, ER and IEC. The NNC would include the observations and the reasons for non-compliance.	■		
2	2	Propose corrective actions within 1 working day after the receipt of the NNC.	■	□	
3	2	Review and agree with the proposed corrective actions and make additional recommendations as required.		■ □	■ □

4	2	Implement the proposed corrective actions once they have been agreed.	■		
5	-	Check the implementation of the corrective actions at the next site audit. Close the non-compliance record if the implementation of the corrective actions is satisfactory.	■ □		
6	-	Propose preventive actions within 3 working days after the closure of the non-compliance record.	■	□	

■ Action party
□ Comments on the non-compliance record where applicable
ET - Contractor Environmental Team
IEC - Independent Environmental Checker/ Environmental Project Office
ER - Engineer/ Engineer Representative

9.2 Performance Monitoring

The following items should be included in the agenda for discussion at every monthly Site Safety Management Committee Meeting, Progress Meeting or other established channels for performance monitoring as agreed by the Engineer:

- Review the WMP including the quantities and types of C&D materials generated, reused and disposed of off-site; the amount of fill materials imported to the Site and quantity of timber used in temporary works for each construction process/activity;

- Monitor the achievement of the WMP to assess its effectiveness; and

- Monitor the follow-up action on defects and deficiencies identified.

APPENDIXES

A **Project Organization Chart**
B **Site Location Plan**
C **NPSTP Layout Plan**
D1 **Monthly Summary Waste Flow Table for Year 2003**
D2 **Monthly Summary Waste Flow Table for Year 2004**
D3 **Monthly Summary Waste Flow Table for Year 2005**
E **Yearly Summary Waste Flow Table**
F **Summary Table for Work Process or Activities Requiring Timber for Temporary Works**
G **Reusable and/or Recyclable Materials Recovered on Site**
H **Daily Site Cleanliness Inspection Checklist**
I **Weekly Site Cleanliness Inspection Checklist**
J **Site Inspection Checklist**
K **Sample of C&D Material Disposal Delivery Form**

APPENDIX A Project Organization Chart

APPENDIX B Site Location Plan

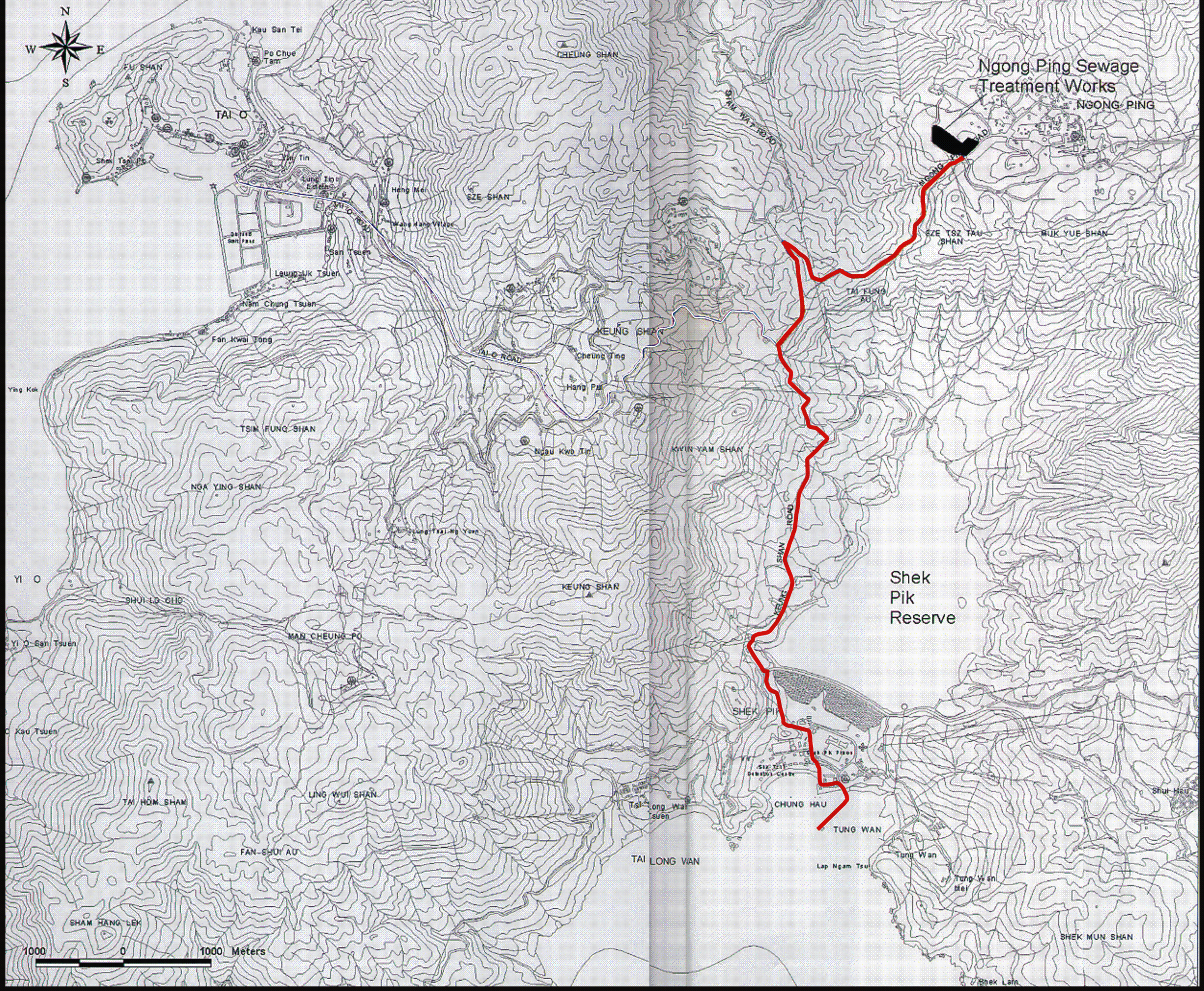
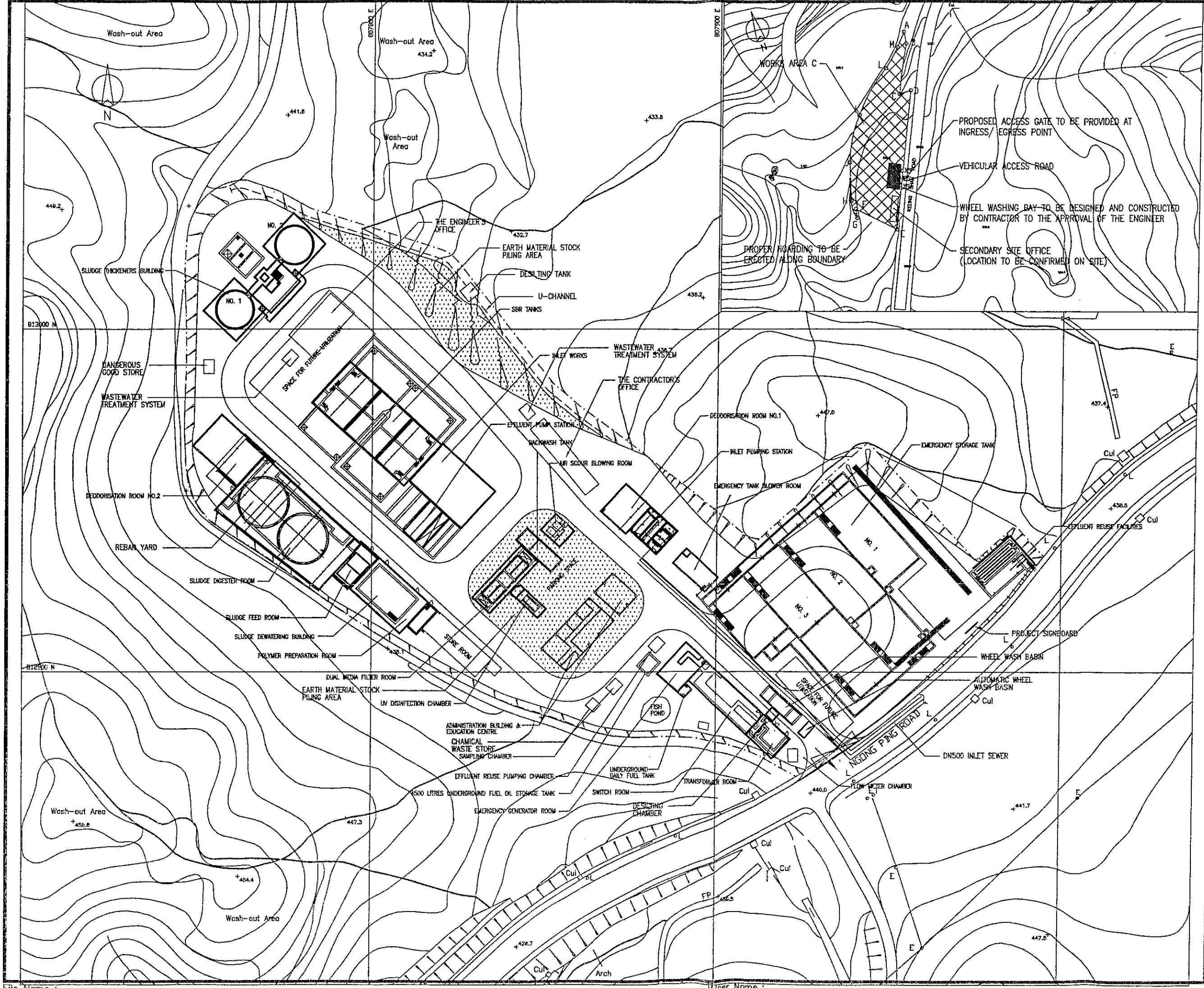


Figure 1 Project Location
圖 1 工程地點

Environmental Permit No.: EP-157/2003
環境許可證編號: EP-157/2003

APPENDIX C NPSTP Layout Plan



NOTE :

- SITE HOARDING
- ENTRANCE GATE
- TRAFFIC DIRECTION

Rev.	Date	Description	Checked

DRAINAGE SERVICES DEPARTMENT

Contractor

KIER - LEADER - KENWORTH JV

Title CONTRACT NO. DC/2003/01
NGONG PING SEWAGE TREATMENT PLANT
TRUNK SEWERS & EFFLUENT EXPORT PIPELINE

GENERAL SITE LAYOUT

Contractor's Signatures for Approval	Date
Design Supervisor : K.C.	09/03
Checkers : A.W.	09/03
Authorised Representative : A.C.	09/03

Drawing No. DC/2003/01/W/TW/004

Scale 1 : 1000 (A3) Rev. –

File Name :

User Name :

Plot Date :

APPENDIX D1 Monthly Summary Waste Flow Table for Year 2003

Name of Department : ~~ArchSD / CED~~ / DSD / ~~EMSD / HyD / TDD / WSD~~ **Contract No. : DC/2003/01**

Project Title: Ngong Ping Sewage Treatment Plant, Trunk Sewers and Effluent Export Pipeline

APPENDIX D1 MONTHLY SUMMARY WASTE FLOW TABLE FOR YEAR 2003

Month	Quantities of Inert C&D Materials Generated Monthly										Quantities of C&D Wastes Generated Monthly									
	Total Quantity Generated		Borken Concrete (2)		Reused in the Contract		Reused in other Projects		Disposal as Public Fill		Metals		Paper / Cardboard Packaging		Plastics (1)		Chemical Waste		Other, e.g. general refuse	
	[in 1000m^3]		[in 1000m^3]		[in 1000m^3]		[in 1000m^3]		[in 1000m^3]		[in 1000kg]		[in 1000kg]		[in 1000kg]		[in 1000kg]		[in 1000kg]	
	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.
JAN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FEB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MAR	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
APR	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
JUNE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SUB-TOTAL	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
JULY	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SEPT	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
OCT	5	7.69	0.125	0	1.47	0	0	0	3.405	7.69	0	0	1	0	0	0	0.33	0	1	0
NOV	6.5	14.9	0.125	0	1.91	0	0	0	4.465	14.9	0	0	1	0	0	0	0.33	0	1	23.75
DEC	6.5	6.35	0.125	0	1.91	0	0	0	4.465	6.35	0	0	1	0	0	0	0.34	0	1	30
TOTAL	18	28.94	0.375	0	5.29	0	0	0	12.335	28.94	0	0	3	0	0	0	1	0	3	53.75

Notes : **(1) Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material**

(2) Broken concrete for recycling into aggregates

APPENDIX D2 Monthly Summary Waste Flow Table for Year 2004

Name of Department : ~~ArchSD / CED~~ / DSD / ~~EMSD / HyD / TDD / WSD~~ **Contract No. : DC/2003/01**

Project Title: Ngong Ping Sewage Treatment Plant, Trunk Sewers and Effluent Export Pipeline

APPENDIX D2 MONTHLY SUMMARY WASTE FLOW TABLE FOR YEAR 2004

Month	Quantities of Inert C&D Materials Generated Monthly										Quantities of C&D Wastes Generated Monthly									
	Total Quantity Generated		Borken Concrete (2)		Reused in the Contract		Reused in other Projects		Disposal as Public Fill		Metals		Paper / Cardboard Packaging		Plastics (1)		Chemical Waste		Other, e.g. general refuse	
	[in 1000m^3]		[in 1000m^3]		[in 1000m^3]		[in 1000m^3]		[in 1000m^3]		[in 1000kg]		[in 1000kg]		[in 1000kg]		[in 1000kg]		[in 1000kg]	
	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.
JAN	4.58	2.79	0.125	0	1.35	0	0	0	3.105	2.79	0	0	1	0	0	0	0.33	0.2	1	4.62
FEB	4.58		0.125		1.35		0		3.105		0		1		0		0.33		1	
MAR	4.58		0.125		1.35		0		3.105		0		1		0		0.34		1	
APR	4.58		0.125		1.35		0		3.105		0		1		0		0.33		1	
MAY	4.58		0.125		1.35		0		3.105		0		1		0		0.33		1	
JUNE	4.58		0.125		1.35		0		3.105		0		1		0		0.34		1	
SUB-TOTAL	27.48		0.75		8.1		0		18.63		0		6		0		2		6	
JULY	4.58		0.125		1.35		0		3.105		0		1		0		0.33		1	
AUG	4.58		0.125		1.35		0		3.105		0		1		0		0.33		1	
SEPT	4.58		0.125		1.35		0		3.105		0		1		0		0.34		1	
OCT	4.58		0.125		1.35		0		3.105		0		1		0		0.33		1	
NOV	4.58		0.125		1.35		0		3.105		0		1		0		0.33		1	
DEC	4.58		0.125		1.35		0		3.105		0		1		0		0.34		1	
TOTAL	54.96		1.5		16.2		0		37.26		0		12		0		4		12	

Notes : **(1) Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material**

(2) Broken concrete for recycling into aggregates

APPENDIX D3 Monthly Summary Waste Flow Table for Year 2005

Name of Department : ~~ArchSD / CED~~ / DSD / ~~EMSD / HyD / TDD / WSD~~ **Contract No. : DC/2003/01**

Project Title: Ngong Ping Sewage Treatment Plant, Trunk Sewers and Effluent Export Pipeline

APPENDIX D3 MONTHLY SUMMARY WASTE FLOW TABLE FOR YEAR 2005

Month	Quantities of Inert C&D Materials Generated Monthly										Quantities of C&D Wastes Generated Monthly									
	Total Quantity Generated		Borken Concrete (2)		Reused in the Contract		Reused in other Projects		Disposal as Public Fill		Metals		Paper / Cardboard Packaging		Plastics (1)		Chemical Waste		Other, e.g. general refuse	
	[in 1000m^3]		[in 1000m^3]		[in 1000m^3]		[in 1000m^3]		[in 1000m^3]		[in 1000kg]		[in 1000kg]		[in 1000kg]		[in 1000kg]		[in 1000kg]	
	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.
JAN	2.4		0.125		0.71		0		1.565		0		1		0		0.34		1	
FEB	2.4		0.125		0.71		0		1.565		0		1		0		0.34		1	
MAR	2.4		0.125		0.71		0		1.565		0		1		0		0.34		1	
APR	2.4		0.125		0.71		0		1.565		0		1		0		0.34		1	
MAY	2.4		0.125		0.71		0		1.565		0		1		0		0.34		1	
JUNE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SUB-TOTAL	12		0.625		3.55		0		7.825		0		5		0		1.7		5	
JULY	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SEPT	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
OCT	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	12		0.625		3.55		0		7.825		0		5		0		1.7		5	

Notes : **(1) Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material**

(2) Broken concrete for recycling into aggregates

APPENDIX E Yearly Summary Waste Flow Table

Name of Department : ~~ArchSD / CED~~ / DSD / ~~EMSD / HyD / TDD / WSD~~ **Contract No. : DC/2003/01**

Project Title: Ngong Ping Sewage Treatment Plant, Trunk Sewers and Effluent Export Pipeline

APPENDIX E YEARLY SUMMARY WASTE FLOW TABLE

Year	Annual Quantities of Inert C&D Materials [in 1000m^3]										Annual Quantities of C&D Wastes									
	Total Quantity Generated		Borken Concrete (4)		Reused in the Contract		Reused in other Projects		Disposal as Public Fill		Metals		Paper / Cardboard Packaging		Plastics (3)		Chemical Waste		Other, e.g. general refuse	
	[a]		[b]		[c]		[d]		[a-b-c-d]		[in 1000kg]		[in 1000kg]		[in 1000kg]		[in 1000kg]		[in 1000kg]	
	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.
2003	18	**28.94**	0.375	**0**	5.29	**0**	**0**	**0**	12.335	**28.94**	**0**	**0**	3	**0**	**0**	**0**	1	**0**	**3**	**53.75**
2004	54.96		1.5		16.2		**0**		37.26		**0**		12		**0**		4		**12**	
2005	12		0.625		3.55		**0**		7.825		**0**		5		**0**		1.7		**5**	
Grand Total	84.96		2.5		25.04		0		57.42		0		20		0		6.7		20	

Notes :

(1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the site

(2) Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material

(3) Broken concrete for recycling into aggregates

APPENDIX F Summary Table for Work Process or Activities Requiring Timber for Temporary Works

Name of Department : ~~ArchSD / CED~~ / DSD / ~~EMSD / HyD / TDD / WSD~~ **Contract No. : DC/2003/01**
Project Title: Ngong Ping Sewage Treatment Plant, Trunk Sewers and Effluent Export Pipeline

Appendix F SUMMARY TABLE FOR WORK PROCESSES OR ACTIVITIES REQUIRING TIMBER FOR TEMPORARY WORKS

Contract No. :
Contract Title :

Item No.	Description of Works Process or Activity (a)	Justification for Using Timber in Temporary Construction works	Est. Quantities of Timber Used (m^3)	Actual Quantites Used (m^3)	Remarls
1					
2					
3					
4					
5					
6					
7					
		Total Estimated Quantity of Timber Used :			

Notes : (a) The Contractor shall list out all the work items requiring timber for use in temporary construction works. Several minor work items may be grouped into one for ease of updating.

(b) The summary table shall be submitted to the *Architect / Engineer / Supervising Officer's Representative monthly together with the Waste Flow table for review and monitoring.

APPENDIX G Reusable and/or Recyclable Materials Recovered on Site

Appendix G Reusable and/or Recyclable Materials Recovered on Site

Item No.	Natures of reusable and/or recyclable materials recovered	Recycling contractors	Date of removal	Quantities of recovered materials (m^3)
1				
2				
3				
4				
5				
6				
7				
			Total Estimated Quantity of Timber Used :	

Remarks

APPENDIX H Daily Site Cleanliness Inspection Checklist

Contract No. : DC/2003/01
Ngong Ping Sewage Treatment Plant
Trunk Sewers and Effluent Export Pipeline

Daily Cleaning Record

Contract No. : DC/2003/01
Contract Title : Ngong Ping Sewage Treatment Plant Trunk Sewers and Effluent Export Pipeline

Date :		Time :	Position of Site :		
Items	Location	Description	Condition		Remark
			Good	Bad	
1.		Maintenance of passageways, common accesses and public areas free of obstruction;			
2.		Proper storage and stacking of materials;			
3.		Proper placement and storage of tools and equipment after Works;			
4.		Proper sorting, storage and / or disposal of waste materials off site;			
5.		Proper securing of hoarding, barriers, guarding, lighting and signing of works;			
6.		Prevention and removal of water ponds and flooding;			
7.		Clearing of stockpiling and wastes arising from the Works;			
8.		Conditions of cleanliness and tidiness of the Site including public cleaning areas / zones.			

Checked by : _____
Contractor

Verified by : _____
RSS

APPENDIX I Weekly Site Cleanliness Inspection Checklist

Contract No. : DC/2003/01
Ngong Ping Sewage Treatment Plant
Trunk Sewers and Effluent Export Pipeline

Weekly Tidying Record

Contract No. : DC/2003/01
Contract Title : Ngong Ping Sewage Treatment Plant Trunk Sewers and Effluent Export Pipeline

Date :		Time :	Position of Site :		
Items	Location	Description	Condition		Remark
			Good	Bad	
1.		Thorough cleansing of passageways, common accesses and public areas;			
2.		Re-organizing of storage materials for better utilization of storage spaces and safe stacking;			
3.		Maintenance and re-conditioning of tools and equipment;			
4.		Cleansing of external covers for plant and equipment;			
5.		Collection and removal of disposed waste materials off site;			
6.		Cleansing re-conditioning and / or replacement of hoarding, barriers, guarding, lighting and signage of works to good working conditions;			
7.		Cleaning of drains and channels to prevent flooding.			

Checked by : _____
Contractor

Verified by : _____
RSS

APPENDIX J Site Inspection Checklist

SITE INSPECTION CHECKLIST - IMPLEMENTATION STATE OF THE MITIGATION MEASURES

Inspection Date : Inspected by Name :
Time : Signature :

Weather
Condition : Sunny / Fine / Overcast / Drizzle / Rain / Storm / Hazy Temperature :
Wind : Calm / Light / Breeze / Strong Humidity : High / Moderate / Low

Environmental Protection Measures / Mitigation Measures	Implementation Stages*			Remark
	Yes	No	N/A	
Air Quality Mitigation Measurements:				
Site clearance and demolition of existing structures				
• The working area for the uprooting of trees, shrubs, or vegetation or for the removal of boulders, poles, pillars or temporary or permanent structures should be sprayed with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet.				
• All demolished items (including trees, shrubs, vegetation, boulders, poles, pillars, structures, debris, rubbish and other items arising from site clearance) that may dislodge dust particles should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition.				
• Open burning should be prohibited.				
Site boundary and entrance				
• Vehicle washing facilities including a high pressure water jet should be provided at every discernible or designated vehicle exit point.				
• The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores.				
• The public road around the site entrance should be kept clean and free from dust.				
• Where a site boundary adjoins a road, street, service and or other area accessible to the public, hoarding of not less than 2.4m from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit				
Access road				
• The portion of any road leading only to a construction site that is within 30m of a discernible or designated vehicle entrance or exit should be kept clear of dusty materials.				
• Every main haul road (i.e. any course inside a construction site having a vehicle passing rate of higher than 4 in any 30 minutes) should be paved with concrete, bituminous materials, hardcores or metal plates, and kept clear of dusty materials; or sprayed with water or a dust suppression chemical so as to maintain the entire road surface wet.				

Environmental Protection Measures / Mitigation Measures	Implementation Stages*			Remark
	Yes	No	N/A	
Use of vehicle				
• Vehicle speed should be within 15 km/hr.				
• Site vehicle movements should be confined to designated road.				
• Immediately before leaving a construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.				
• Where a vehicle leaving a construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.				
Excavation and earth moving				
• The working area of any excavation or earth moving operation should be sprayed with water or a dusty suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet.				
• Exposed earth shall be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabilizer within 6 months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.				
Stockpiling of dusty materials				
• Any stockpile of dusty material should be either covered entirely by impervious sheeting; placed in an area sheltered on the top and the 3 sides; or sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.				
Site Machinery and Equipments				
• All machinery and equipments should be well maintained e.g. without black smoke emission.				
Noise Mitigation Measures				
• The Contractor shall use quiet or 'silenced' plant equipment. All site plant equipment shall be well maintained.				
• It would be appropriate to restrict the number of operating PME within certain parts of the site that are very close to the NSRs in order to reduce the level of noise impacts.				
• The contractor should site noisy equipment and activities as far from sensitive receivers as practical. Also, temporary site offices (and other similar structures) should be located, as far as is possible, such that sensitive receivers are screened by these structures from the line of sight of the construction areas.				
• Intermittent noisy activities should be scheduled to minimise exposure of nearby NSRs to high levels of construction noise. For example, noisy activities could be scheduled at times coinciding with periods when the schools are likely to be unoccupied. Prolonged operation of noisy equipment close to the schools should be avoided.				
• Idle equipment should be turned off or throttled down. Noisy equipment should be properly maintained and used no more often than is necessary.				
• Construction activities should be planned so that parallel operation of several sets of equipment close to a given receiver is avoided.				
• Where possible, the numbers of concurrently operating items of plant should be reduced through sensitive programming.				

Environmental Protection Measures / Mitigation Measures	Implementation Stages*			Remark
	Yes	No	N/A	
• Construction plant should be properly maintained and operated. Construction equipment often has silencing measures built in or added on, e.g. compressor panels, and mufflers. Silencing measures should be properly maintained and utilised.				
• Noise enclosures, noise barriers or portable noise barriers should be used where necessary.				
• Air compressors and hand held breakers should have valid noise label.				
• Compressors and generators should operate with doors closed.				
Water Quality Mitigation Measures				
• A discharge licence should be applied from EPD for discharging effluent from the construction site. The discharge quality is required to meet the requirements specified in the discharge licence. As project location is an environmentally sensitive area, all the runoff and wastewater generated from the works areas within the water gathering ground should be treated so that it satisfies with all the standards listed in the Technical Memorandum for Group A inland waters.				
• Exposed stockpiles should be covered with tarpaulin or impervious sheets at all time, especially wet season.				
• Any exposed soil surfaces should also be properly protected to minimise dust emission. Hydroseeding could be applied to protect exposed slope surfaces, if any.				
• No earth, building materials, soil and other materials should be allowed to be stockpiled on site within the water gathering ground.				
• All surplus spoil should be removed from the water gathering ground as soon as practicable. All mud and debris should be removed from any waterworks access roads and associated drainage systems within the water gathering ground.				
• In areas outside the water gathering ground where a large amount of exposed soils exist, earth bunds or sand bags should be provided.				
• The stockpiles of materials should be placed in the locations away from any stream courses so as to avoid releasing materials into the water bodies.				
• Final surfaces of earthworks should be compacted and protected by permanent work.				
• Haul roads should be paved with concrete and the temporary access roads are protected using crushed stone or gravel, wherever practicable.				
• Drainage system should be adequate and well maintained to prevent flooding and overflow.				
• Channels, earth bunds or temporary ditches should be used to divert the surface runoff to the sedimentation tanks prior to discharge.				
• The sedimentation tanks for settling surface runoff prior to discharge should have adequate capacity and free from silt and sediment.				
• Wheel washing facilities should be provided at all site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles.				
• Sand and silt settled in the wheel washing bay, ditches and silt removal facilities should be cleaned and removed regularly (e.g. at least weekly) or as necessary.				

Environmental Protection Measures / Mitigation Measures	Implementation Stages*			Remark
	Yes	No	N/A	
• Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.				
• To avoid introducing additional pollution loads into the nearby waters, it is recommended to provide chemical toilets in the works areas.				
• Provision of temporary toilet facilities within the water gathering ground is subject to the approval of the Director of Water Supplies.				
• All waste should be cleared away daily and disposed outside the water gathering ground.				
• The toilet facilities should not be less than 30 m from any watercourse.				
• A licensed waste collector should be deployed to clean the chemical toilets and temporary storage tank on a regular basis.				
• Collected sewage and wastewater could then be transported to the sewage treatment plants for disposal.				
• Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the project.				
• Any service shop and minor maintenance facilities should be located outside the water gathering ground and should be on hard standings within a bunded area, and sumps and oil interceptors should be provided.				
• Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken with the areas appropriately equipped to control these discharges.				
• Washing the chemicals away is not acceptable as they will contaminate the water gathering ground.				
• Storage of oils/chemicals/waste within the water gathering ground should be limited to absolute minimum volume and are to be removed from sites at the earliest opportunity. No storage and discharge of flammable or toxic solvents, petroleum oil or tar and other toxic substances should be allowed within the water gathering ground.				
• Any construction plant which causes pollution to catchwater or water gathering ground due to leakage of oil or fuel should be removed off site immediately.				
• Any soil contaminated with fuel leaked from the plant should be removed off site and the voids arising from removal of contaminated soil should be replaced by suitable material to the approval of the Director of Water Supplies.				
• Any chemicals to be used including disinfectants and deodorants within the water gathering ground should be subject to the approval of the Director of Water Supplies.				
Waste Management				
Construction Waste Management				
• Relevant licence / permits for disposal of construction waste or excavated materials available for inspection.				
• Excavated material to be generated from construction works to be re-used on-site as far as practicable to reduce off-site disposal.				
• Any mud and debris should be removed from any waterworks access roads and associated drainage systems within the water gathering ground.				

Environmental Protection Measures / Mitigation Measures	Implementation Stages*			Remark
	Yes	No	N/A	
• Provision of sufficient waste disposal points and regular collection for disposal. Appropriate measures should be employed to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.				
• 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.				
• Prior to disposal of C&D waste, recyclable materials should be salvaged for reuse (such as wood and metal) and inert waste utilised as public fill to minimise the quantity of waste to be disposed of to landfill.				
• In order to monitor the disposal of C&D material and solid wastes at public filling areas and landfills, and to control fly-tipping, a trip-ticket system should be included as one of the contractual requirements.				
• Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials.				
• If surplus excavated spoil would be reused in land formation projects, the sites for such land formation projects must be clearly identified with written agreement from the relevant third party before such disposal. Assessment of potential environmental impact of such disposal has to be conducted and the above information has to be submitted to EPD for approval before action is taken.				
Chemical Waste Management				
• It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.				
• After use, chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Spent chemicals should be stored and collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licensed facility in accordance with the Chemical Waste (General) Regulation.				
• Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility.				
• Chemical waste should be transported by a registered chemical waste collector to a facility licensed to receive chemical waste.				
• Chemical storage area should				
• Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition.				
• Be enclosed on at least 3 sides and securely closed.				
• Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest.				
• Have adequate ventilation.				
• Be covered to prevent rainfall entering (water collected within the bund must be tested and disposal as chemical waste if necessary).				
• Be arranged so that incompatible materials are adequately separated.				
• Warning panels should be displayed at the storage area.				
• Chemical storage area should be cleaned and maintained regularly.				

Environmental Protection Measures / Mitigation Measures	Implementation Stages*			Remark
	Yes	No	N/A	
• All generators, fuel and oil storage should be within bundle areas.				
• Oil leakage from machinery, vehicle and plant should be prevented.				
Good Site Practices				
• Nomination of approved personnel, such as site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.				
• Training of site personnel in proper waste management and chemical handling procedures.				
• Good site practices should be adopted to clean the rubbish and litter on the construction sites so as to prevent the rubbish and litter from dropping into the nearby environment. Construction sites should be cleaned on a regular basis.				
• Proper storage and site practices to minimise the potential for damage or contamination of construction materials.				
• The Environmental Permit should be displaced conspicuously on site.				
• Construction noise permits should be posted at site entrance or available for site inspection.				
• The Storage of oils/chemicals/waste within the boundary of the water gathering ground should be limited to the absolute minimum volume and are to be removed from sites at the earliest opportunity.				
• Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.				
• Any unused chemicals or those with remaining functional capacity should be recycled.				
• No canteen should be provided within the water gathering ground.				
• Provision of temporary toilet facilities within the water gathering ground should be subject to the approval of Director of Water Supplies. All waste should be cleared away daily and disposed outside the water gathering ground. The toilet facilities should not be less than 30 m from any watercourses.				
• Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors.				
• To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.				
• A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods.				
• A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be bunded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system. The collection area for waste should be sited away from the Country Park and ecological sensitive areas.				
• Suitable collection sites around site offices will be required. For environmental hygiene reasons and to minimize odor, refuse should not be stored for a period exceeding 48 hours, however, removal every 24 hours is preferable.				
• Minimize windblown litter and dust during transportation by either covering trucks or transporting wastes in enclosed container.				
• Remove wastes in a timely manner.				

Remarks:

APPENDIX K C&D Material Disposal Delivery Form

Construction and Demolition Material Disposal Delivery Form
拆建廢物處置運送表格

Part A

Department (部門): _____ Contract No. (合約編號): _____

Contractor (承建商): _____

Contract Title (合約名稱): _____

Location of Site (建築工地地址): _____

Location of Public Filling Facility/Landfill (填土區 / 堆填區地址)*:

_____

Vehicle Registration No. (車輛登記編號): _____

Date (日期): _____

Approximate Load (估計負載) *: Full (裝滿) / Three Quarter (三分之一) / Half (一半) / One Quarter (四分之一)

Remark (意見): _____

_____

_____

* *Delete whichever inappropriate (刪除不適用者)*

Part B

Time of Departure (開出時間): _____

_____
Authorized Chop of
Engineer's Representative /
Architect's Representative *
(工程師代表/建築師代表授權蓋印)

_____
Authorized Chop of
Operator of Designated
Public Filling Facility / Landfill *
(填土區/堆填區經營者授權蓋印)