



Maeda - CREC - SELI Joint Venture

Contract No. DC/2007/12 - Design and
Construction of Tsuen Wan Drainage Tunnel

Monthly EM&A Report (June 2009)



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Date July 2009

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Executive Summary

1. Drainage Services Department (DSD) has awarded the contract for the Design and Construction of Tsuen Wan Drainage Tunnel (hereafter referred to as the “Project”) to Maeda-CREC-SELI Joint Venture (MCSJV). MCSJV has appointed Hyder Consulting Limited (HCL) as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) works in accordance with the Environmental Monitoring and Audit Manual (EM&A Manual) and Environmental Permit (EP). Commencement of the construction work had been notified to the Environmental Protection Department (EPD) in January 2008. This Monthly EM&A Report summarises the EM&A works undertaken in June 2009.
2. According to the EM&A Manual, there are four designated air quality monitoring locations, five designated noise monitoring locations and four water quality monitoring locations during the construction phase: (i) Sik Sik Yuen Ho Fung College (ASR 1, NSR 1 and Intake I-1); (ii) Hong Hoi Chee Hong Temple (ASR 3, NSR 3 and Intake I-2); (iii) Squatters (NSR 6 and Intake I-3); (iv) Beach Tower (Long Beach Gardens) (ASR 8, NSR 8 and Outfall O-1); and (v) Greenview Terrace (Block 1) (ASR 9, NSR 9 and Outfall O-1).
3. During the non restricted hours, major construction activities undertaken by the Contractor at TWDT included site cleaning and tidying and tree transplanting at I-1, I-2, I-3 and Outfall; drilling rig at Outfall; soil nailing at I-1 and Outfall; breaking up exiting boulder at I-1, I-3 and Outfall; formation of access road at I-3 and Outfall; erosion control mat and green wire mesh at Outfall; Excavation and Lateral Support (ELS) at I-1; construction of skin wall at I-3; construction of transformer room at Outfall; and construction of gabion wall and rock fill platform at I-3. No construction activities were carried out during restricted hours.
4. No exceedance has been recorded for air quality and noise monitoring during the reporting month.
5. No water quality monitoring was done on 3 June due to thunderstorm warning. Exceedances for water quality monitoring are summarized in the following table:

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Nil
SS	One recorded at I-1 on 10 June	Four recorded at I-2 and I-3 on 5, 10 and 26 June

6. The exceedances were considered not to be project-related as no direct disturbance was observed contributed by the project construction activities. Detail interpretation could be referred to Section 4.3 of this report.
7. The status of waste generation in the reporting month are:
 - A total of 332.2 m³ C&D material was disposed of to public fill at Tuen Mun and 6, 665 m³ inert C&D materials were reused in other Contracts. Detail information could be referred to Section 5.1.1 of this report.

- About 8.7m³ general waste was disposed of to NENT Landfill;
 - About 300 kg of paper/cardboard packaging was recycled;
 - About 10 kg of metals was generated in the reporting month;
 - About 25 kg of plastic waste was disposed of in the reporting month; and
 - No chemical waste was disposed of in the reporting month
8. In this reporting month, two site inspections and one monthly site audit were carried out by ET and Independent Environmental Checker (IEC) respectively, to ensure proper implementation of environmental mitigation measures specified in the EM&A Manual and compliance with environmental legislation. All observations, which were recorded on the inspection checklists, were passed to the Contractor together with the ET's recommendations.
9. As advised by the Contractor and verified by ET:
- No non-compliance regarding the site inspection was received in the reporting month;
 - No environmental complaint was received during the reporting month; and
 - No summons and prosecution was received in this reporting month.
10. The major construction works for the upcoming three months will be:
- Site cleaning and tidying at I-1, I-2, I-3 and Outfall;
 - Tree transplanting at I-1, I-2, I-3 and Outfall;
 - Drilling rig at Outfall;
 - Soil nailing at I-1, Outfall;
 - Breaking up exiting boulder at I-1, I-3, and Outfall;
 - Formation of access road at I-3 and Outfall;
 - Erosion control mat and green wire mesh at Outfall;
 - Excavation and Lateral Support (ELS) at I-1;
 - Construction of skin wall at I-3;
 - Formation of steel platform at I-2
 - Formation of shaft at I-2; and
 - Launching chamber at Outfall.

1 INTRODUCTION

- 1.1.1 The Drainage Services Department (DSD) proposed to construct a tunnel with an internal diameter of 6.5m and a length of 5.13km, with the purpose to alleviate the flooding risk in Tsuen Wan and Kwai Chung.
- 1.1.2 This project is a Designated Project under Schedule 2 Part I Category Q, of the Environmental Impact Assessment Ordinance (EIAO) as part of the proposed Tsuen Wan Drainage Tunnel (TWDT) passes underneath the existing Tai Mo Shan Country Park. An Environmental Impact Assessment (EIA) Study has therefore been undertaken to provide information on the nature and extent of environmental impacts arising from the construction and operation of the proposed designed project and related activities taking place concurrently. From the EIA the recommendations for monitoring contained herein, are made.
- 1.1.3 The Maeda-CREC-SELI Joint Venture (MCSJV) was awarded by DSD with the Contract – Design and Construction of Tsuen Wan Drainage Tunnel.
- 1.1.4 Hyder was commissioned by the MCSJV as the Environmental Team (ET) to implement an EM&A program in accordance with the EM&A Manual. The proposed tunnel section flows from the junction of Shing Mun Road and Wo Yi Hop Road and discharges to south of Yau Kom Tau underneath Castle Peak Road as shown in Appendix A.
- 1.1.5 The construction works of the Project was commenced in January 2008. This is the fifteenth monthly EM&A report summarising the impact monitoring results and audit findings of the EM&A program in June 2009.

2 PROJECT INFORMATION

2.1 Project Organization and Management Structure

2.1.1 The organization chart and lines of communication with respect to the on-site environmental management are shown in Appendix B.

2.2 Construction Progress

2.2.1 The overall project programme from the detail design to completion of all civil works shall take approximately 54 months. The construction programme is presented in Appendix C.

2.2.2 The major construction activities undertaken in the reporting month were:

- Site cleaning and tidying at I-1, I-2, I-3 and Outfall;
- Tree transplanting at I-1, I-2, I-3 and Outfall;
- Drilling rig at Outfall;
- Soil nailing at I-1 and Outfall;
- Breaking up exiting boulder at I-1, I-3 and Outfall;
- Formation of access road at I-3 and Outfall;
- Erosion control mat and green wire mesh at Outfall;
- Excavation and Lateral Support (ELS) at I-1;
- Construction of skin wall at I-3;
- Construction of transformer room at Outfall; and
- Construction of gabion wall and rock fill platform at I-3.

2.2.3 No construction activities were undertaken for TWDT during the restricted hours.

2.3 Mitigation Measures

2.3.1 The implemented environmental mitigation measures and their statuses are given in Appendix D.

2.4 Status of License and Permit

2.4.1 A summary of relevant permits and licences for the Project is given in Appendix E.

3 Summary of EM&A Requirement

3.1 Air Quality

Air Quality Parameters

- 3.1.1 1-hour Total Suspended Particulates (TSP) levels are measured at the designated air monitoring locations in accordance with the EM&A Manual. Information such as date of monitoring, duration, weather condition, equipment used and monitoring results were recorded on the field data sheet developed for the Project. The monitoring results are presented in Section 4.

Monitoring Methodology

- 3.1.2 1-hour TSP monitoring is carried out under typical weather conditions (with no adverse weather such as typhoon signal or rain storm warning) three times every six days using High Volume Air Samplers (HVASs). Monitoring should be conducted in accordance with the standard sampling method as set out in High Volume Method for Total Suspended Particulates, Part 50 Chapter 1 Appendix B, Title 40 of the Code of Federal Regulations of the USEPA.
- 3.1.3 After each sampling, the filter paper loaded with dust is kept in a clean and tightly sealed plastic bag. The filter paper is then re-conditioned in desiccators for 24 hours before obtaining the weight under laboratory conditions.
- 3.1.4 The average concentrations of the TSP are calculated based on the following information obtained from monitoring:
- Flow rate;
 - Weight of the filter paper before and after sampling; and
 - Sampling period indicated by the elapsed-time meter.
- 3.1.5 All samples should be kept in good condition (i.e. stored in sealed plastic bags, with brief description of the monitoring dates and locations) for a period of 6 months before disposal. Sample analysis is carried out by ALS Technichem (HK) Pty Limited (HOKLAS Registration Number 066).

Monitoring Equipment and Calibration

- 3.1.6 High Volume Air Samplers (HVASs) are used for 1-hour TSP monitoring to comply with the USEPA specifications in Appendix B Part 5 - Reference Method for the Determination of Suspended Particulate matter in the Atmosphere (High-Volume Method) of the Code of Federal Regulation dated June 1, 1991.
- 3.1.7 All HVASs are calibrated before commencement of monitoring using standard orifice 5-points calibration method with orifice calibrator to determine the actual flow rate of each HVAS. This shall be used for the calculation of the TSP level. Calibration Kit Model - TE5025A is used for calibration of the HVAS. Recalibration of the HVAS shall be carried out after motor maintenance, at least once every six months, which is about the

expected life of carbon brush. The air quality monitoring equipment used during the reporting month is shown in Table 3-1 below. The calibration certificates are included in Appendix F.

Equipment Type	Model	Serial Number	Calibration Orifice Number	Location
HVAS	BM2000HX	4994	517N / 1559	ASR 1
HVAS	BM2000HX	5875	517N / 1559	ASR 3
HVAS	TE5005X	0390	517N / 1559	ASR 8
HVAS	TE5005X	0646	517N / 1559	ASR 9

Table 3-1 Air Quality Monitoring Equipment

Monitoring Location

3.1.8 Four designated air quality-monitoring locations were identified in the contract specific EM&A manual. They are listed in Table 3-2 below and shown in Appendix G.

Monitoring Station ID	Name of Premises	Floor Level
ASR1	Sik Sik Yuen Ho Fung College	G/F
ASR3	Hong Hoi Chee Hong Temple	Podium
ASR8	Beach Tower (Long Beach Gardens)	G/F
ASR9	Greenview Terrace (Block 1)	G/F

Table 3-2 Air Quality Monitoring Locations

Action and Limit Levels

3.1.9 The Action and Limit Levels for the 1-hour TSP monitoring is shown in Table 3-3. In case exceedances of Action and/or Limit levels for air quality occur, Event Contingency Plans (ECPs) would be implemented. The ECPs for Action and Limit levels exceedances are shown in Table 3-4.

Station	1-hr TSP Level in $\mu\text{g}/\text{m}^3$	
	Action Level	Limit Level
ASR 1	307	500
ASR 3	327	500
ASR 8	337	500
ASR 9	329	500

Table 3-3 Action & Limit Levels for Air Quality

EVENT	ACTION			
	ET	IEC	SOR	CONTRACTOR
ACTION LEVEL				
Exceedance for one sample	<ul style="list-style-type: none"> Identify source, investigate the causes of exceedance and propose remedial measures; Inform IEC and SOR; Repeat measurement to confirm finding; Increase monitoring frequency to daily. 	<ul style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method. 	<ul style="list-style-type: none"> Notify Contractor. 	<ul style="list-style-type: none"> Rectify any unacceptable practice; Amend working methods if appropriate.
Exceedance for two or more consecutive samples	<ul style="list-style-type: none"> Identify source; Inform IEC and SOR; Advise SOR 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 SOR; If exceedance stops, cease additional monitoring. 	<ul 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. 	<ul style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial measures properly implemented. 	<ul style="list-style-type: none"> Submit proposals for remedial to SOR within 3 working days of notification; Implement the agreed proposals; Amend proposal if appropriate.
LIMIT LEVEL				
Exceedance for one sample	<ul style="list-style-type: none"> Identify source, investigate the causes of exceedance and propose remedial measures; 	<ul style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and 	<ul style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial 	<ul style="list-style-type: none"> Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within 3 working

EVENT	ACTION			
	ET	IEC	SOR	CONTRACTOR
	<ul style="list-style-type: none"> • Inform IEC, SOR, Contractor and EPD; • Repeat measurement to confirm finding; • Increase monitoring frequency to daily; • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SOR informed of the results. 	<ul style="list-style-type: none"> • Contractor on possible remedial measures; • Advise SOR on the effectiveness of the proposed remedial measures; • Supervise implementation of remedial measures. 	<ul style="list-style-type: none"> • measures properly implemented. 	<ul style="list-style-type: none"> • days of notification; • Implement the agreed proposals; • Amend proposal if appropriate.
Exceedance for two or more consecutive samples	<ul style="list-style-type: none"> • Notify IEC, SOR, Contractor and EPD; • Identify source; • 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 SOR to discuss the remedial actions to be taken; • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SOR informed of the results; • If exceedance stops, cease additional monitoring. 	<ul style="list-style-type: none"> • Discuss amongst SOR, ET, and Contractor on the potential remedial actions; • Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise SOR accordingly; • Supervise the implementation of remedial measures. 	<ul style="list-style-type: none"> • Confirm receipt of notification of exceedance in writing; • Notify Contractor; • In consultation 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. 	<ul style="list-style-type: none"> • Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC within 3 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 SOR until the exceedance is abated.

Table 3-4 Event/Action Plan for Air Quality

3.2 Noise

Noise Parameters

- 3.2.1 The construction noise level is measured in terms of equivalent A-weighted sound pressure level (L_{eq}) measured in decibels (dB(A)). Monitoring of $L_{eq(30\text{ min})}$ is carried out at the noise monitoring locations on a weekly basis during normal construction working hours (0700-1900 hours from Monday to Saturday except public holidays). For all other time periods (i.e. restricted hours), $L_{eq(5\text{ min})}$ would be employed for comparison with the Noise Control Ordinance (NCO) criteria if necessary.
- 3.2.2 The two statistical sound levels L_{10} and L_{90} : the level exceeded for 10 and 90 percent of the time respectively, are also recorded during monitoring. Major noise sources observed, both on-site and off-site, are recorded on the field data sheet. All measurements are recorded to the nearest 0.1 dB(A) and presented in round numbers in this report. Results are presented in Section 4.

Monitoring Methodology

- 3.2.3 Sound level meters, which comply with the International Electrotechnical Commission Publication 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications as referred to the Technical Memorandum (TM) issued under the Noise Control Ordinance, are used. Noise levels for the A-weighted levels $L_{eq(30\text{ min})}$, L_{10} and L_{90} are measured throughout the impact monitoring. Average, by sound power, of six consecutive 5 minutes readings is used to provide $L_{eq(30\text{ min})}$ for non-restricted hours (07:00-19:00 hours from Monday to Saturday except public holidays). A facade correction of 3dB(A) is applied to the measurements that are carried out under free field conditions.
- 3.2.4 During the impact monitoring, parameters such as dates, weather condition, equipment used, measurement results and major noise sources are recorded on the field data record sheet. Monitoring would not be carried out in the presence of fog, rain or strong wind with a steady speed exceeding 5 m/s. In relation to the monitored noise levels, other noise sources such as road traffic might make a significant contribution to the overall noise environment. Therefore, noise monitoring activities would take into account such influencing factors, which were not present during the baseline monitoring period.

Monitoring Equipment and Calibration

- 3.2.5 Bruel & Kjaer (B&K) Precision Integrating Sound Level Meters of Type 2238/6 in compliance with the International Electrotechnical Commission Publication 651: 1979 (Type 1) and 804: 1985 (Type 1) Specifications, stated in the Technical Memorandum (TM) issued under the NCO, are used for noise monitoring in this reporting month.
- 3.2.6 Prior to and following each noise measurement, the accuracy of the sound level meters is checked using an acoustic calibrator (B&K Type 4231, (S/N 1770806) generating a known sound pressure level at a known frequency. Measurements are considered as valid only if the calibration levels from before and after the noise measurement agrees to within 1.0 dB(A). The sound level meters and the calibrator are calibrated annually to ensure they perform to the same level of accuracy as stated in the manufacturer's

specifications. The noise monitoring equipment used during the reporting month is shown in Table 3-5 below. The calibration certificates are included in Appendix F.

Equipment Type	Manufacturer	Type Number	Serial Number	Location
Sound Level Meter	Bruel & Kjaer	2238	2448529	NSR1, NSR3, NSR6, NSR8 and NSR9
Sound Level Meter	Bruel & Kjaer	2236	1774423	NSR9
Sound Level Calibrator	Bruel & Kjaer	4231	1770806	NSR1, NSR3, NSR6, NSR8 and NSR9

Table 3-5 Noise Monitoring Equipment

Monitoring Location

3.2.7 Five designated noise monitoring locations were identified in the contract specific EM&A manual. They are listed in Table 3-6 below and shown in Appendix G. All the locations below are in façade measurement.

Monitoring Station ID	Name of Premises	Floor Level
NSR1	Sik Sik Yuen Ho Fung College	G/F
NSR3	Hong Hoi Chee Hong Temple	Podium
NSR6	Squatters	G/F
NSR8	Beach Tower (Long Beach Gardens)	G/F
NSR9	Greenview Terrace (Block 1)	G/F

Table 3-6 Noise Monitoring Locations

Construction Groundborne Noise

3.2.8 Prediction of construction groundborne noise indicates the criteria will be achieved at most NSRs except exceedances are predicted at Hong Hoi Chee Hong Temple (NSR3) and Squatters (NSR6). It is recommended to restrict the TBM operation in non-restricted period (i.e. 0700 - 1900) at these NSRs. In order to ensure proper control of groundborne noise is executed by the contractor, a monitoring requirement is recommended at the Hong Hoi Chee Hong Temple at Intake 2 and Squatters at Intake 3 for compliance checking. According to the monitoring schedule, TBM operation will be carried out for about 3 months in the vicinity of Hong Hoi Chee Hong Temple at Intake 2 and Squatters at Intake 3. If groundborne noise criterion is exceeded, the monitoring shall continue daily until acceptance has been restored against the criterion. Otherwise the monitoring can be discontinued.

3.2.9 The criteria including Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (TM-Places) under the NCO stipulates that noise transmitted primarily through the structural elements of

building, or buildings, shall be 10 dB(A) less than the relevant ANLs. Daytime groundborne construction noise criterion of 60 dB(A) therefore applies with reference to TM-EIAO 70 dB(A) criterion for schools and taking account of the minus 10 dB(A) requirement under the NCO TM-Places. Following the same principle for groundborne noise criteria, groundborne construction noise levels inside domestic premises relying on opened window for ventilation will be limited to 65 dB(A), with reference to the daytime airborne noise criterion of 75 dB(A) in accordance with TM-EIAO.

Action and Limit Levels

3.2.10 The Action and Limit levels for construction noise are defined in Table 3-7. If non-compliance of the criteria occurs, actions in accordance with the Action Plan in Table 3-8 would be carried out.

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

* For educational establishments the limit level shall be 70dB(A) and reduced to 65dB(A) during examination periods between 0700-1900 hrs on normal weekdays.

Table 3-7 Action & Limit Levels for Noise

Event	Action			
	ET Leader	IEC	SOR	Contractor
Action Level	<ul style="list-style-type: none"> Notify IEC and the Contractor. Carry out investigation. Report the results of investigation to IEC and the Contractor. Discuss with the Contractor and formulate remedial measures. Increase monitoring frequency to check mitigation measures. 	<ul style="list-style-type: none"> Review with analysed results submitted by ET. Review the proposed remedial measures by the Contractor and advise SOR accordingly. Supervise the implement of remedial measures. 	<ul style="list-style-type: none"> Confirm receipt of notification of exceedance in writing. Notify the Contractor. Require the Contractor to propose remedial measures for the analysed noise problem. Ensure remedial measures are properly implemented. 	<ul style="list-style-type: none"> Submit noise mitigation proposals to IEC. Implement noise mitigation proposals.
Limit Level	<ul style="list-style-type: none"> Identify the source. Notify IEC, SOR, EPD and the Contractor. Repeat measurement to confirm findings. Increase monitoring frequency. 	<ul style="list-style-type: none"> Discuss amongst SOR, ET Leader and the Contractor on the potential remedial actions. Review the Contractor's remedial actions whenever 	<ul style="list-style-type: none"> Confirm receipt of notification of exceedance in writing. Notify the Contractor. Require the Contractor to propose remedial measures for the analysed noise 	<ul style="list-style-type: none"> Take immediate action to avoid further exceedance. Submit proposals for remedial actions to IEC within 3 working days of notification. Implement the agreed

Event	Action			
	ET Leader	IEC	SOR	Contractor
	<ul style="list-style-type: none"> Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. Inform IEC, SOR, and EPD the causes & actions taken for the exceedances. Assess effectiveness of the Contractor's remedial actions and keep IEC, EPD and SOR informed of the results. If exceedance stops, cease additional monitoring. 	<ul style="list-style-type: none"> necessary to assure their effectiveness and advise SOR accordingly. Supervise the implementation of remedial measures. 	<ul style="list-style-type: none"> problem. Ensure remedial measures are properly implemented. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated. 	<ul style="list-style-type: none"> proposals. Resubmit proposals if problem still not under control. Stop the relevant activity of works as determined by the SOR until the exceedance is abated.

Table 3-8 Event/Action Plan for Noise

3.3 Water Quality

3.3.1 As there is no dredging or reclamation required for the project, the water quality impact would be insignificant with the protection measures recommended in Section 5.6 of the EIA report. However in view of the sensitive nature of the rivers/streams and bathing beaches in the Study Area, it is suggested that a programme of monitoring should be established to confirm the mitigation measures are protecting these water bodies.

Water Quality Parameters

3.3.2 Monitoring for Dissolved Oxygen (DO), temperature, turbidity, pH and suspended solids (SS) should be undertaken at designated monitoring locations. It should be noted that DO, temperature, turbidity and pH should be measured in-situ whereas SS is assayed in a laboratory.

3.3.3 In association with the water quality parameters, other relevant data should also be measured, such as monitoring location/position, time, weather conditions, and any special phenomena and description of work underway at the construction site etc.

Monitoring Methodology

3.3.4 In accordance with the EM&A Manual, the water quality monitoring for all specified parameters shall be measured at all designated monitoring locations including control

points at an interval of 3 days per week. DO, temperature, turbidity, pH and SS shall be undertaken at designated monitoring locations.

- 3.3.5 It should be noted that water samples for all monitoring parameters should be collected, stored, preserved and analysis according to Standard Methods, APHA 17 ed. and/or methods agreed by the Director of Environmental Protection.
- 3.3.6 Each sample shall be analysed in accordance with the APHA Standard Methods for the Examination of Water and Wastewater, 18th edition, or an equivalent method approved by the EPD. If an in-house or non-standard method is proposed, details of the method verification may require to be submitted to the EPD. In any circumstance, the sample testing should comply with a comprehensive quality assurance and quality control programme. The laboratory should be prepared to demonstrate the quality programmes to the EPD when requested.

Monitoring Equipment and Calibration

- 3.3.7 All the water samples collected should be transferred to clearly labelled and pre-cleaned sample containers with necessary preservatives immediately after collection. The sample containers should be provided by a HOKLAS accredited laboratory. Sufficient quantity of samples should be collected for all laboratory analyses. Following sampling, samples should be stored in a cool box at temperature of between 0 and 4°C, and transported to the laboratory within the sample retention time as advised by the laboratory under proper chain-of-custody system. The water quality monitoring equipment used during the reporting month is shown in Table 3-9 below.

Equipment Type	Manufacturer	Model	Quantity
pH Meter / DO / Temperature Meter	WTW	PH/Oxi 340i	1
Tuiboldimeter	EUTECH	TN-100	1

Table 3-9 Water Quality Monitoring Equipment

- 3.3.8 All pH meters, DO meters and turbidimeters shall be checked and calibrated prior to use. DO meters and turbidimeters shall be calibrated by a laboratory accredited under HOKLAS or any other international accreditation scheme, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring. Responses of sensors and electrodes shall be checked with certified standard solutions before each use. Wet bulb calibrations for all DO meters shall be carried out before measurement at each monitoring location. For the on site calibration of field equipment, BS 127:1993, "Guide to field and on-site test methods for the analysis of waters" should be observed. The calibration certificates are included in Appendix F.

Monitoring Location

- 3.3.9 Four designated monitoring locations were identified in the contract specific EM&A Manual for water quality monitoring. While the construction of the outfall does not require dredging or reclamation, monitoring of water quality is only required during which

the rip rap is placed. These four monitoring stations are listed in Table 3-10 below and shown in Appendix G.

Monitoring Station ID	Name of Premises
I-1	Intake I-1
I-1-C	Control of Intake I-1
I-2	Intake I-2
I-2-C	Control of Intake I-2
I-3	Intake I-3
I-3-C*	Control of Intake I-3
O-1 (FT)	Outfall 1 During Flood Tide
O-1 (ET)	Outfall 1 During Ebb Tide
O-1-C (FT)	Control of Outfall O-1 During Flood Tide
O-1-C (ET)	Control of Outfall O-1 During Ebb Tide

The upper stream location (I-3-C) had been relocated from end of February 2009 due to coarse stone blockage.

Table 3-10 Water Quality Monitoring Locations

- 3.3.10 Note that there are two control stations for Outfall O-1, one for sampling during flood tide and one for sampling during ebb tide. Only one of those control stations for Outfall O-1 shall be sampled during each sampling. Control station to be sampled will be determined based on the tidal information provided by the Hong Kong Observatory.

Action and Limit Levels

- 3.3.11 The Action and Limit levels for water quality monitoring parameters are defined in Table 3-11. In case of any exceedance, appropriate actions will be undertaken in accordance with the Event and Action Plan as described in Table 3-12.

Parameters	Action	Limit
DO in mg/l (Surface, Middle & Bottom)	<u>Surface & Middle</u> 5%-ile of baseline data for surface and middle layer.	<u>Surface & Middle</u> 4mg/l except 5mg/l for FCZ or 1%-ile of baseline data for surface and middle layer
	<u>Bottom</u> 5%-ile of baseline data for bottom layer.	<u>Bottom</u> 2mg/l or 1%-ile of baseline data for bottom layer
SS in mg/l (depth-averaged)	95%-ile of baseline data or 120% of upstream control station's SS at the same tide of the same day	99%-ile of baseline or 130% of upstream control station's SS at the same tide of the same day and specific sensitive receiver water quality requirements (e.g. required suspended solids levels for concerned sea water intakes)
Turbidity (Tby) in NTU (depth-averaged)	95%-ile of baseline data or 120% of upstream control station's Tby at the same tide of the same day	99%-ile of baseline or 130% of upstream control station's Tby at the same tide of the same day

Notes:

- For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
- For SS and Tby, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
- All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary.

Table 3-11 Action/Limit Levels for Water Quality

Event	ET Leader	IEC	SOR	Contractor
Action Level being exceeded by one sampling day	<ul style="list-style-type: none"> Repeat in-situ measurement to confirm finding; Identify source(s) of impact; Inform IEC and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC and Contractor; and Repeat measurement on next day of exceedance. 	<ul style="list-style-type: none"> Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the SOR accordingly; and Assess the effectiveness of the implemented mitigation measures. 	<ul style="list-style-type: none"> Discuss with IEC on the proposed mitigation measures; and Make agreement on the mitigation measures to be implemented. 	<ul style="list-style-type: none"> Inform the SOR and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IEC and propose mitigation measures to IEC and SOR; and Implement the agreed mitigation measures.
Action Level being exceeded by more than one consecutive sampling day	<ul style="list-style-type: none"> Repeat in-situ measurement to confirm finding; Identify source(s) of impact; Inform IEC and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC and Contractor; Ensure mitigation measures are implemented; Prepare to increase the monitoring frequency to daily; and Repeat 	<ul style="list-style-type: none"> Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the SOR accordingly; and Assess the effectiveness of the implemented mitigation measures. 	<ul style="list-style-type: none"> Discuss with IEC on the proposed mitigation measures; Make agreement on the mitigation measures to be implemented; and Assess the effectiveness of the implemented mitigation measures. 	<ul style="list-style-type: none"> Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IEC and propose mitigation measures to IEC and SOR within 3 working days; and Implement the agreed mitigation measures.

Event	ET Leader	IEC	SOR	Contractor
	measurement on next day of exceedance.			
Limit Level being exceeded by one sampling day	<ul style="list-style-type: none"> Repeat in-situ measurement to confirm finding; Identify source(s) of impact; Inform IEC, Contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, SOR and Contractor; Ensure mitigation measures are implemented; and Increase the monitoring frequency to daily until no exceedance of Limit level. 	<ul style="list-style-type: none"> Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the SOR accordingly; and Assess the effectiveness of the implemented mitigation measures. 	<ul style="list-style-type: none"> Discuss with IEC, ET and Contractor on the proposed mitigation measures; and Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; and Assess the effectiveness of the implemented mitigation measures. 	<ul style="list-style-type: none"> Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IEC and SOR and propose mitigation measures to IEC and SOR within 3 working days; and Implement the agreed mitigation measures.
Limit Level being exceeded by more than one consecutive sampling day	<ul style="list-style-type: none"> Repeat in-situ measurement to confirm finding; Identify source(s) of impact; Inform IEC, Contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with 	<ul style="list-style-type: none"> Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the SOR accordingly; and Assess the effectiveness of the implemented mitigation 	<ul style="list-style-type: none"> Discuss with IEC, ET and Contractor on the proposed mitigation measures; and Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of 	<ul style="list-style-type: none"> Inform the SOR and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IEC and SOR

Event	ET Leader	IEC	SOR	Contractor
	IEC, SOR and Contractor; <ul style="list-style-type: none"> • Ensure mitigation measures are implemented; and • 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days. 	measures.	the implemented mitigation measures; and <ul style="list-style-type: none"> • Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level. 	and propose mitigation measures to IEC and SOR within 3 working days; <ul style="list-style-type: none"> • Implement the agreed mitigation measures; and • As directed by the Engineer, to slow down or to stop all or part of the marine work or construction activities.

Table 3-12 Event/Action Plan for Water Quality

4 MONITORING RESULT

4.1 Air Quality

4.1.1 The air quality monitoring schedule of the reporting period is given in Appendix H.

1-hr TSP Monitoring

4.1.2 Results of 1-hours TSP level are shown in Table 4-1. All measurements were recorded to the nearest $0.1\mu\text{g}/\text{m}^3$ and presented in round numbers in this report. Detail results including weather conditions, and graphical presentations are presented in Appendix I.

Station	Monitoring Date	Monitoring Result ($\mu\text{g}/\text{m}^3$)	Action/Limit Levels ($\mu\text{g}/\text{m}^3$)
ASR 1	02-Jun-09	84.8	307/500
		67.6	
		60.2	
		94.5	
	08-Jun-09	69.4	
		56.9	
		43.3	
		56.9	
	12-Jun-09	55.8	

Station	Monitoring Date	Monitoring Result (µg/m3)	Action/Limit Levels (µg/m3)	
	18-Jun-09	34.2		
		46.7		
		54.6		
	24-Jun-09	33.0		
		23.9		
		38.7		
	30-Jun-09	52.4		
		39.8		
		41.0		
	ASR 3	02-Jun-09	61.6	
			64.0	
			14.5	
08-Jun-09		39.7		
		39.7		
		90.8		
12-Jun-09		10.2		
		26.1		
		35.2	327/500	
18-Jun-09		72.6		
		32.9		
		40.9		
24-Jun-09	22.7			
	35.2			
	29.5			
30-Jun-09	44.3			
	57.9			
	43.1			
ASR 8	02-Jun-09	34.9	337/500	
		42.2		
	08-Jun-09	30.1		
		18.3		

Station	Monitoring Date	Monitoring Result (µg/m ³)	Action/Limit Levels (µg/m ³)
		20.9	
		23.5	
		68.0	
	12-Jun-09	267.9	
		45.7	
		45.7	
	18-Jun-09	20.9	
		35.3	
		126.8	
	24-Jun-09	73.2	
		47.1	
		85.0	
	30-Jun-09	88.9	
		47.1	
ASR 9		31.8	329/500
	02-Jun-09	40.0	
		40.0	
		34.5	
	08-Jun-09	30.0	
		11.1	
		83.4	
	12-Jun-09	42.3	
		37.8	
		47.8	
	18-Jun-09	55.6	
		44.5	
		116.8	
	24-Jun-09	64.5	
		43.4	
	30-Jun-09	66.7	
		51.1	

Station	Monitoring Date	Monitoring Result (µg/m3)	Action/Limit Levels (µg/m3)
		65.6	

Note: *Italic* indicates the occurrence of exceedance of *Action level*

Bold indicates the occurrence of exceedance of **Limit Level**

Table 4-1 Air Quality Monitoring Results

4.1.3 No project related exceedance was recorded in the reporting month.

4.2 Noise

4.2.1 The noise monitoring schedule of the reporting period is given in Appendix H. Results of measured noise level, in terms of Leq (30min), during the construction are shown in Table 4-2. All measurements including L10 and L90 are recorded to the nearest 0.1 dB(A) and presented in round numbers in this report. Detail results including weather conditions and graphical presentation are presented in Appendix I.

Station	Monitoring Date	Leq (30 min) dB(A)	Limit Levels dB(A)
NSR 1	02-Jun-09	64.5	
	08-Jun-09	62.4	
	18-Jun-09	63.0	70 / 65*
	24-Jun-09	63.8	
	30-Jun-09	64.0	
NSR 3	02-Jun-09	63.3	75
	08-Jun-09	67.1	
	18-Jun-09	64.7	
	24-Jun-09	64.2	
	30-Jun-09	61.5	
NSR 6	02-Jun-09	61.6	
	08-Jun-09	61.6	
	18-Jun-09	62.3	
	24-Jun-09	63.5	
	30-Jun-09	62.6	
NSR 8	02-Jun-09	59.4	
	08-Jun-09	62.1	
	18-Jun-09	63.8	
	24-Jun-09	63.2	

Station	Monitoring Date	L_{eq} (30 min) dB(A)	Limit Levels dB(A)
NSR 9	30-Jun-09	61.8	
	02-Jun-09	72.4	
	08-Jun-09	70.2	
	18-Jun-09	70.2	
	24-Jun-09	70.3	
	30-Jun-09	71.5	

* Noise Limit Level at NSR 1 was reduced from 70 dB(A) to 65 dB(A) during the examination period from 5-19 June 2009.

Table 4-2 Noise Monitoring Results

4.2.2 No exceedances of Action / Limit Levels were recorded during the reporting month.

4.3 Water Quality Monitoring

4.3.1 The water quality monitoring schedule of the reporting period is given in Appendix H. Summaries of exceedances for water quality monitoring are provided in Table 4-3 to Table 4-5.

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Nil
SS	One recorded on 10 June	Nil
Total	One	Nil

Table 4-3 Summary of Exceedances for I-1

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Nil
SS	Nil	Two recorded on 5 and 26 June
Total	Nil	Two

Table 4-4 Summary of Exceedances for I-2

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Nil
SS	Nil	Two recorded on 10 and 26 June
Total	Nil	Two

Table 4-5 Summary of Exceedances for I-3

- 4.3.2 Results of measured water quality parameters during the reporting month are shown in Table 4-6 and detailed results including weather conditions and graphical presentations are enclosed in Appendix I.
- 4.3.3 No water quality monitoring was done on 3 June due to thunderstorm warning.
- 4.3.4 The exceedance of Action Level of SS (120% higher than I-1-C) recorded at I-1 on 10 June was below baseline Action / Limit Level and was within the range of baseline SS concentration. Site cleanliness and tidiness, fabricate of temporary steel bridge, weld steel mesh and shotcrete to skin wall were undertaken during the measurement. No direct disturbance was observed from the site. The exceedance was considered to be contributed by natural variation and no action was therefore required.
- 4.3.5 The exceedance of Control Limit Level of SS (130% higher than I-2-C) recorded at I-2 on 5 June was above baseline Action Level but below baseline Limit level. The exceedance of Control Limit Level of SS (130% higher than I-2-C) recorded at I-2 on 26 June was below baseline Action / Limit Level. However, the measured SS levels were still within the range of baseline SS concentration. Site tidiness & cleanliness, disposal of C&D materials, installation of safe net and demolition of piling platform were undertaken during the measurement. No direct disturbance was observed from the site. The exceedances were considered to be contributed by natural variation and no action was therefore required.
- 4.3.6 The exceedances of Control Limit Level of SS (130% higher than I-3-C) recorded at I-3 on 10 and 26 June were below both baseline Action and Limit Level and were within the range of baseline SS concentration. Site cleanliness and tidiness, erect formwork for skin wall, formation of access road and excavation, backfilling for access were undertaken during the measurement. No direct disturbance was observed from the site. The exceedances were considered to be contributed by natural variation and no action was therefore required.
- 4.3.7 The above mentioned exceedances were considered as non project related, however, proper mitigation measures had been implemented during measurements. Details of the above mentioned investigations could be referred to the notifications of exceedances as enclosed in Appendix J, which have been provided to the IEC for review.

Station	Date	Temperature	DO (mg/L)	Action/Limit Level for DO (mg/L)	pH	Turbidity (NTU)	Action/Limit Level for Turbidity (NTU)	SS (mg/L)	Action/Limit Level for SS (mg/L)
I-1	01-Jun-09	26.50	6.58	3.42 / 3.34	7.21	5.21	9.75 / 12.47	2.0	8.85 / 10.17
	03-Jun-09	-	-		-	-		-	
	05-Jun-09	26.50	6.09		7.30	6.09		5.7	
	08-Jun-09	27.40	5.96		7.32	6.29		2.0	
	10-Jun-09	27.20	6.59		7.23	6.37		4.2	
	12-Jun-09	26.40	6.26		7.23	4.25		2.0	
	15-Jun-09	27.30	6.56		7.42	4.27		2.0	
	17-Jun-09	27.70	6.33		7.33	6.25		2.0	
	19-Jun-09	26.20	6.04		7.04	6.27		2.0	
	22-Jun-09	26.50	6.04		7.33	5.13		2.0	
	24-Jun-09	28.65	5.63		7.25	6.24		2.0	
	26-Jun-09	27.40	5.44		7.30	5.16		5.5	
	29-Jun-09	28.40	5.37		7.32	6.06		2.0	

Station	Date	Temperature	DO (mg/L)	Action/Limit Level for DO (mg/L)	pH	Turbidity (NTU)	Action/Limit Level for Turbidity (NTU)	SS (mg/L)	Action/Limit Level for SS (mg/L)
I-1-C	01-Jun-09	26.20	6.41	- / -	7.21	5.39	- / -	2.0	- / -
	03-Jun-09	-	-		-	-		-	
	05-Jun-09	26.30	6.18		7.32	6.18		8.1	
	08-Jun-09	27.20	5.75		7.32	6.42		2.0	
	10-Jun-09	27.20	6.52		7.22	6.43		3.3	
	12-Jun-09	26.40	6.14		7.25	4.48		2.0	
	15-Jun-09	27.40	6.50		7.43	5.29		2.0	
	17-Jun-09	27.75	6.27		7.32	6.43		2.0	
	19-Jun-09	26.20	6.12		7.02	6.39		2.0	
	22-Jun-09	26.25	5.88		7.33	5.28		2.0	
	24-Jun-09	28.45	5.52		7.21	6.39		2.0	
	26-Jun-09	27.20	5.66		7.32	5.24		4.6	
	29-Jun-09	28.35	5.44		7.22	6.19		2.0	

Station	Date	Temperature	DO (mg/L)	Action/Limit Level for DO (mg/L)	pH	Turbidity (NTU)	Action/Limit Level for Turbidity (NTU)	SS (mg/L)	Action/Limit Level for SS (mg/L)
I-2	01-Jun-09	25.35	6.57	3.66 / 3.63	7.44	5.29	6.63 / 6.99	2.0	7.68 / 8.34
	03-Jun-09	-	-		-	-		-	
	05-Jun-09	26.50	6.07		7.27	5.25		8.3	
	08-Jun-09	27.30	5.80		7.32	5.09		2.0	
	10-Jun-09	27.40	6.45		7.25	5.20		4.0	
	12-Jun-09	26.40	6.27		7.22	5.18		2.0	
	15-Jun-09	27.70	6.50		7.34	5.21		2.0	
	17-Jun-09	27.40	6.64		7.26	4.32		2.0	
	19-Jun-09	26.40	5.81		7.20	5.24		2.0	
	22-Jun-09	25.30	6.07		7.30	5.30		2.0	
	24-Jun-09	28.50	5.27		7.24	5.40		2.0	
	26-Jun-09	27.35	5.35		7.34	5.27		4.6	
	29-Jun-09	28.40	5.42		7.42	5.36		2.0	

Station	Date	Temperature	DO (mg/L)	Action/Limit Level for DO (mg/L)	pH	Turbidity (NTU)	Action/Limit Level for Turbidity (NTU)	SS (mg/L)	Action/Limit Level for SS (mg/L)
I-2-C	01-Jun-09	25.30	6.55	- / -	7.44	5.35	- / -	2.0	- / -
	03-Jun-09	-	-		-	-		-	
	05-Jun-09	26.50	6.05		7.27	5.29		3.7	
	08-Jun-09	27.30	6.05		7.32	5.20		2.0	
	10-Jun-09	27.40	6.40		7.25	5.45		4.1	
	12-Jun-09	26.50	6.14		7.22	5.25		2.0	
	15-Jun-09	27.80	6.57		7.44	5.33		2.0	
	17-Jun-09	27.55	6.59		7.27	4.48		2.0	
	19-Jun-09	26.50	5.97		7.22	5.33		2.0	
	22-Jun-09	25.45	5.97		7.30	5.44		2.0	
	24-Jun-09	28.50	5.24		7.22	5.63		2.0	
	26-Jun-09	27.50	5.44		7.33	5.43		3.3	
	29-Jun-09	28.30	5.34		7.42	5.44		2.0	

Station	Date	Temperature	DO (mg/L)	Action/Limit Level for DO (mg/L)	pH	Turbidity (NTU)	Action/Limit Level for Turbidity (NTU)	SS (mg/L)	Action/Limit Level for SS (mg/L)
I-3	01-Jun-09	26.20	6.38	3.65 / 3.51	7.40	3.30	3.99 / 4.18	2.0	6.13 / 7.23
	03-Jun-09	-	-		-	-		-	
	05-Jun-09	26.70	6.26		7.33	3.34		2.2	
	08-Jun-09	27.40	6.44		7.25	3.19		2.0	
	10-Jun-09	27.30	6.35		7.24	3.33		5.2	
	12-Jun-09	25.40	6.40		7.25	3.30		2.0	
	15-Jun-09	27.45	6.42		7.53	3.25		2.0	
	17-Jun-09	27.40	6.30		7.26	3.53		2.0	
	19-Jun-09	26.20	6.02		7.20	3.13		2.0	
	22-Jun-09	26.40	5.82		7.30	3.21		2.0	
	24-Jun-09	27.60	5.17		7.23	3.37		2.0	
	26-Jun-09	27.50	5.74		7.42	3.26		3.2	
	29-Jun-09	28.25	5.77		7.32	3.64		2.0	

Station	Date	Temperature	DO (mg/L)	Action/Limit Level for DO (mg/L)	pH	Turbidity (NTU)	Action/Limit Level for Turbidity (NTU)	SS (mg/L)	Action/Limit Level for SS (mg/L)
I-3-C	01-Jun-09	25.40	6.43	- / -	7.40	3.49	- / -	2.0	- / -
	03-Jun-09	-	-		-	-		-	
	05-Jun-09	26.70	6.32		7.31	3.49		5.4	
	08-Jun-09	27.50	6.18		7.28	3.34		2.0	
	10-Jun-09	27.30	6.45		7.23	3.51		3.8	
	12-Jun-09	25.50	6.30		7.23	3.47		2.0	
	15-Jun-09	27.50	6.40		7.54	3.43		2.0	
	17-Jun-09	27.90	6.38		7.27	3.33		2.0	
	19-Jun-09	26.30	6.06		7.20	3.22		2.0	
	22-Jun-09	26.25	5.81		7.32	3.34		2.0	
	24-Jun-09	27.50	5.18		7.23	3.66		2.0	
	26-Jun-09	27.40	5.56		7.22	3.51		2.0	
	29-Jun-09	28.40	5.63		7.23	3.73		2.0	

Note: *Italic* indicates the occurrence of exceedance of *Action level*.
Bold indicates the occurrence of exceedance of **Limit level**.

Table 4-6 Water Quality Monitoring Results

4.4 Summary of Project-Related Exceedances

4.4.1 Table 4-7 summarises the project-related exceedance results recorded in June 2009. Note that exceedances that are considered not related to the construction activities are not included in this table.

Environmental Monitoring	Total No. of Measurement	Action Level Exceedance	% of Action Level Exceedance	Limit Level Exceedance	% of Limit Level Exceedance
Air Quality	72	0	0	0	0
Noise	25	0	0	0	0
Water	72	0	0	0	0

Note: Exceedances that are considered not related to the construction activities are not included in this table.

Table 4-7 Summary of Project-Related Exceedances

5 WASTE MANAGEMENT

5.1.1 The status of waste management is summarized in Table 5-1 below.

Status of waste management	Quantity
Inert C&D Material Disposed of to Public Fill at Tuen Mun (m ³)	332.2
Inert C&D Material Reused in other Contracts* (m ³)	6,665
Metals Generated (kg)	10
Paper / Cardboard Packaging (kg)	300
Plastics (kg)	25
Chemical Waste (kg)	Nil
General Waste Disposed of to NENT Landfill (m ³)	8.7

* Other Contracts include Proposed Residential Development at So Kwun Wat on Lot T.M.T.L 465, DC/2007/17, HY/2007/09 and Proposed Rural Theme Park-Yuen Long, Tai Tong Lychee Garden.

Table 5-1 Waste Generated in June 2009

6 NON-COMPLIANCE AND DEFICIENCY

6.1 Site Audit by ET

6.1.1 ET has carried out two site inspections in the reporting month. All observations together with the appropriate recommended mitigation measures where necessary were recorded in the audit checklists that were passed to the Contractor. Major environmental deficiencies observed during site inspection/audits and recommendation, which were made by the ET, are summarised in Table 6-1 below. No non-compliance was observed.

Inspection Date	Observation	Recommendation	Status
4 Jun 09	<ol style="list-style-type: none"> 1. C&D waste debris were observed without tarpaulin sheet cover at Outfall. 2. Dark smoke emission from an excavator was observed at Outfall. 3. Silts were observed settled in the discharge point at Outfall. 	<ol style="list-style-type: none"> 1. The Contractor was reminded to either dispose debris off regularly or cover it with tarpaulin. 2. The Contractor was requested to provide proper maintenance to avoid dark smoke emission from excavator. 3. The Contractor was requested to regularly remove the settled silts to ensure the quality of discharge . 	<ol style="list-style-type: none"> 1. During the site inspection on 26 June 09, the said debris was disposed off at Outfall. (Closed) 2. During site inspection on 2 July 09, no dark smoke emission was observed from excavator. (Closed) 3. During site inspection on 2 July, the settled silts at Outfall discharge has been reduced, but the observation would be continued monitored in next month for further improvement. (Outstanding)
26 Jun 09	<ol style="list-style-type: none"> 1. Equipments and waste were observed along the grating area at Outfall. 2. The site was observed to be dirty and untidy at Outfall. 3. The unused sedimentation tank was observed without tarpaulin sheet cover at Intake I-1. 	<ol style="list-style-type: none"> 1. The Contractor was reminded to clear up the equipments and waste observed along the grating area I. 2. The Contractor was reminded to maintain site cleanliness and tidiness regularly. 3. The Contractor was reminded to either cover the unused sedimentation tank with tarpaulin or spray it with larvicidal. 	<ol style="list-style-type: none"> 1. During the site inspection on 2 July 2009, the said equipments and waste were removed. (Closed) 2. During the site inspection on 2 July 2009, the site cleanliness and tidiness was maintained. (Closed) 3. During the site inspection on 2 July 2009, the unused sedimentation tank was covered by tarpaulin. (Closed)

Table 6-1 Site Inspection by ET

7 COMPLAINT

- 7.1.1 A complaint hotline at **9850 3241** of the Contractor has been established for the Project.
- 7.1.2 No complaint was received during the reporting month.
- 7.1.3 The environmental complaint (CIR-003) was closed. The complaint was valid because it was considered due to on-site construction works. The Contractor had implemented the noise mitigation measures such as switching off the idling plants and enclosing the breaking tip tightly with the sound insulation sheet as well as noise insulation materials. Noise monitoring

frequency was increased in order to check the effectiveness of the mitigation measures. The investigation report had been submitted on 17 June 2009. Detail of the complaint investigation can be referred to Appendix K.

7.1.4 Cumulative statistics of environmental complaints are shown in Table 7-1.

Complaints Received in the Reporting Month	Cumulative Number of Complaints
0	3

Table 7-1 Cumulative Statistic of Environmental Complaint

8 SUMMARY OF NOTIFICATION OF SUMMONS, SUCCESSFUL PROSECUTIONS AND CORRECTIVE ACTIONS

8.1.1 No summons and successful prosecution was received during the reporting month.

8.1.2 Cumulative statistics of Notification of Summons, Successful Prosecutions and Convictions are shown in Table 8-1.

Notification of Summons		Successful Prosecution	
June 09	Cumulative	June 09	Cumulative
0	0	0	0

Table 8-1 Cumulative Statistics of Notification of Summons and Successful Prosecutions

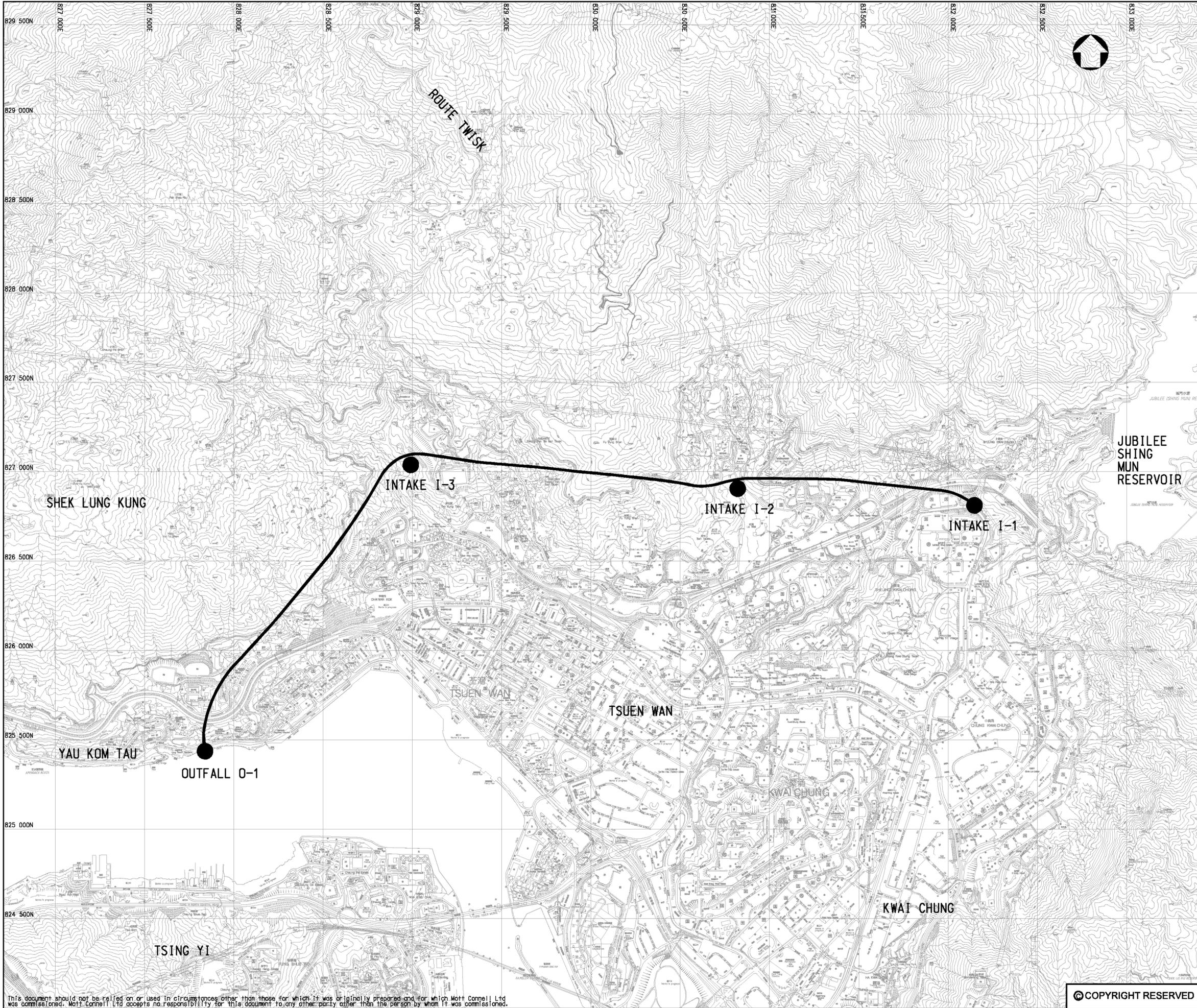
9 FUTURE KEY ISSUE

9.1.1 The forecast of construction works for the upcoming three months are:

- Site cleaning and tidying at I-1, I-2, I-3 and Outfall;
- Tree transplanting at I-1, I-2, I-3 and Outfall;
- Drilling rig at Outfall;
- Soil nailing at I-1 and Outfall;
- Breaking up exiting boulder at I-1, I-3, and Outfall;
- Formation of access road at I-3 and Outfall;
- Erosion control mat and green wire mesh at Outfall;
- Excavation and lateral support (ELS) at I-1;
- Construction of skin wall at I-3;
- Formation of shaft at I-2;
- Formation of steel platform at I-2; and
- Launching chamber at Outfall.

Appendix A

Site Map and Works Area



Key Plan:

Notes:

1. CO-ORDINATES REFER TO HONG KONG METRIC GRID (1980).
2. ALL LEVELS ARE IN METRES ABOVE PRINCIPAL DATUM (P.D.).
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

Key to symbols

LEGENDS :

- TUNNEL ALIGNMENT
- INTAKE/OUTFALL STRUCTURES

B1	MAR 05	EL	FOR EMAA MANUAL	<i>M</i>	<i>De</i>
Rev	Date	Drawn	Description	Ch'kd	App'd

Client

The Government of the Hong Kong
Special Administrative Region
Drainage Services Department

Consulting Engineers
Mott Connell Ltd.
in Association with
MVA Hong Kong Ltd EDAW Earth Asia Ltd Environmental Resources
WL/Delft Hydraulics Ltd Chesterton Petty Ltd Management

Project
**Drainage Improvement in
Tsuen Wan and Kwai Chung -
Tsuen Wan Drainage Tunnel -
Investigation**

Title
**TUNNEL ALIGNMENT
AND SURROUNDING AREA**

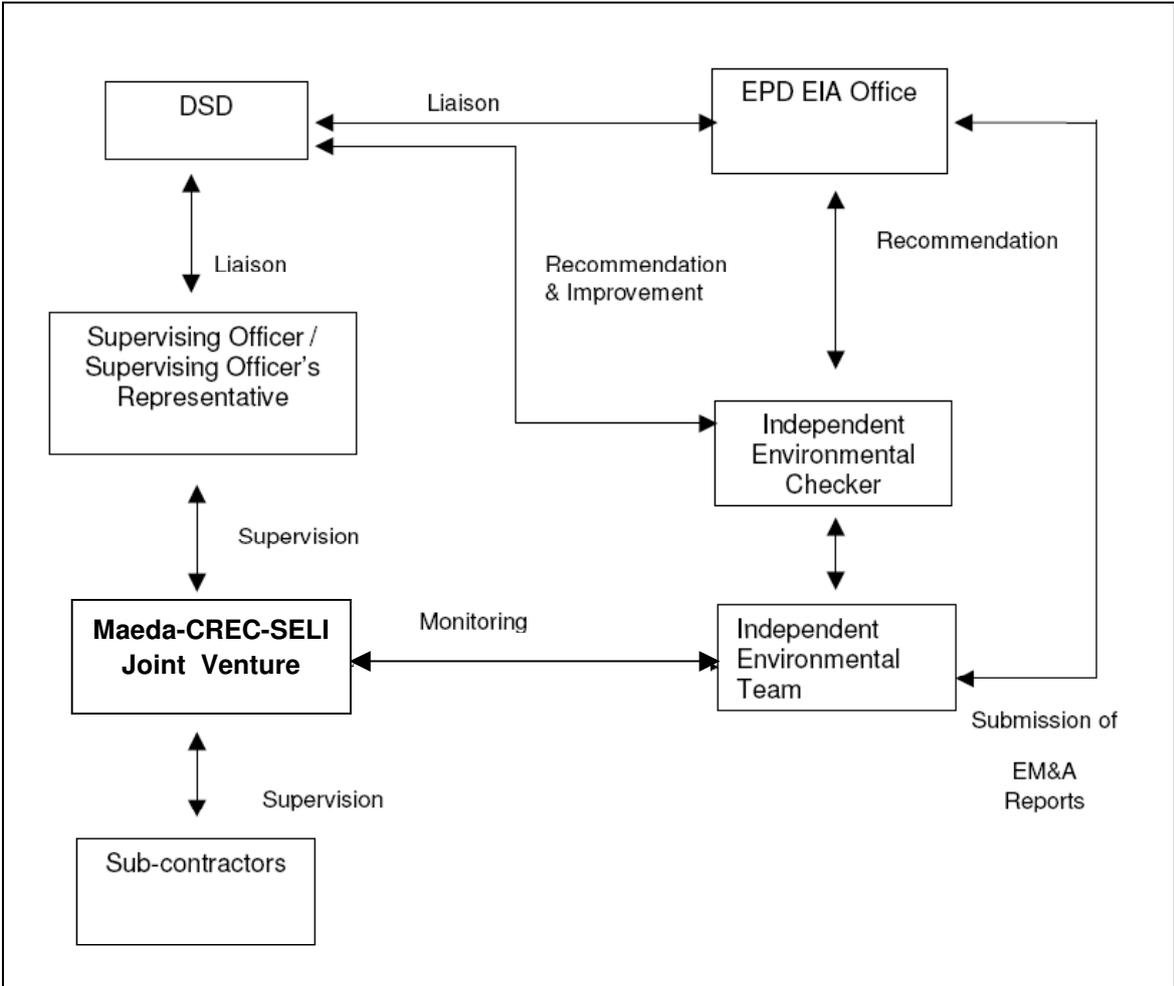
Designed	CF	<i>cf</i>	Eng.Chk.	MT	<i>M</i>
Drawn	HL	HL	Approved	TMC	<i>De</i>
Dwg.Chk.	KN	<i>KN</i>	Scale		
Project	204417				Status
CAD file	J:\204417\DRAWING\FIGURE EMAA MANUAL\FIGURE1.1.dgn				
Drawing No.	FIGURE 1.1				Rev 01

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Appendix B

Organization Chart



Appendix C

Construction Programme

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012
Preliminaries															
Project Dates															
01R0000002	Tender Issue Date	2	0	0	26JUN07A		26JUN07A		100						
01R0000004	Tender Closing Date	2	0	0	05OCT07A		05OCT07A		100						
01R0000006	Letter of Acceptance Issued Date	2	0	0	14DEC07		14DEC07A		100						
01R0000008	Contract Commencement Date	2	0	0	28DEC07		28DEC07A		100						
01R0000010	Completion of Section 1 of the Works	2	0	0		27JUL11*		01DEC11	0	-127					
01R0000012	Completion of Section 2 of the Works	2	0	0		27JUL11*		27JUL11	0	0					
01R0000014	Completion of Section 3 of the Works	2	0	0		27JUL11*		27SEP11	0	-62					
01R0000016	Completion of Section 4 of the Works	2	0	0		27JUL11*		27JUL11	0	0					
01R0000018	Completion of Section 5 of the Works	2	0	0		27JUL11*		01DEC11	0	-127					
01R0000020	Completion of Section 6 of the Works	2	0	0		27JUL11*		27JUL11	0	0					
01R0000022	Completion of Section 7 of the Works	2	0	0		26JUL12*		30NOV12	0	-127					
Possession of Area															
01R00A0102	Possession Portion A - 90d of DOC	2	0	0	26MAR08		27FEB08A		100						
01R00A0104	Handover of Section 1 of Works at Portion A	2	0	0		13MAY11		23JUL11	0	4					
01R00B0102	Possession of Portion B - 90d of DOC	2	0	0	26MAR08		07MAR08A		100						
01R00B0104	Handover of Portion B	2	0	0		16JUL11		27SEP11	0	-62					
01R00C0102	Possession of Portion C - 90d of DOC	2	0	0	26MAR08		26MAR08A		100						
01R00C0104	Handover of Portion C	2	0	0		05MAY11		02JUL11	0	25					
01R00D0102	Possession of Portion D on DOC	2	0	0	28DEC07		28DEC07A		100						
01R00D0104	Handover of Portion D	2	0	0		17JUN11		01DEC11	0	-127					
01R00E0102	Possession of Portion E - 650d of DOC	2	0	0	07OCT09		07OCT09		0	0					
01R00E0104	Handover of Portion E	2	0	0		17JUN11		01DEC11	0	-127					
01R00F0102	Possession of Portion F on DOC	2	0	0	28DEC07		28DEC07A		100						
01R00F0104	Handover of Portion F	2	0	0		28JAN11		13AUG11	0	-17					
01R00G0102	Possession of Portion G - 700d of DOC	2	0	0	26NOV09		26NOV09		0	0					
01R00G0104	Handover of Portion G	2	0	0		02JUN11		02JUN11	0	55					
01R00I0102	Possession of Portion I on DOC	2	0	0	28DEC07		28DEC07A		100						
01R00I0104	Handover of Portion I	2	0	0		27JUL11		04NOV08	0	0					
01R00J0102	Possession of Portion J	2	0	0	01DEC08*		16MAR09		0	-42					
01R00J0104	Handover of Portion J	2	0	0		12JUN09*		17MAR10	0	0					
01R0H10102	Possession of Portion H1 on DOC	2	0	0	28DEC07		28DEC07A		100						

14 days after LOA

Permanent land allocation area was possessed on 19/03/08

The exact date to be agreed with WSD allows 50 days from the date of WSD Tunnel Shutdown

Start Date 29JUN07
 Finish Date 30DEC12
 Data Date 28AUG08
 Run Date 30SEP08 15:51
 © Primavera Systems, Inc.

Early Bar
 Target Bar
 Progress Bar
 Critical Activity

WP00
Maeda-CREC-SELI JV
CONTRACT NO. DC/2007/12
Design and Construction of
Tsuen Wan Drainage Tunnel
Works Programme
 Sheet 1 of 52

UPDATE UP TO 28 Aug 2008			
Date	Revision	Checked	Approved
13FEB08	Draft Works Programme Rev. 1		
22SEP08	Works Programme Rev. 0		

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	Year					
											2008	2009	2010	2011	2012	
01R0H10104	Handover of Portion H1	2	0	0		24SEP12		30DEC12	0	0						
01R0H20102	Possession of Portion H2 - 300d of DOC	2	0	0	22OCT08		22OCT08		0	0						
01R0H20104	Handover of Portion H2	2	0	0		24SEP12		30DEC12	0	0						
Section of Works - DOP to Completion																
01R1000202	S1-Works in Portions A to F except works in S2-7	2	1,308	1,308	28DEC07	27JUL11	28DEC07A	01DEC11	19	-127						
01R1000204	S1-Maintenance Period (365 days)	2	365	365	28JUL11	26JUL12	02DEC11	30NOV12	0	-127						
01R20A0206	S2-Slope Stabilization works within Portion A	2	1,218	1,247	26MAR08	26JUL11	27FEB08A	27JUL11	15	0						
01R20A0208	S2-Maintenance Period (365 days)	2	365	365	27JUL11	25JUL12	28JUL11	26JUL12	0	0						
01R30B0210	S3-Slope Stabilization works within Portion B	2	1,218	1,238	26MAR08	26JUL11	07MAR08A	27SEP11	14	-62						
01R30B0212	S3-Maintenance Period (365 days)	2	365	365	27JUL11	25JUL12	28SEP11	26SEP12	0	-62						
01R40C0214	S4-Slope Stabilization works within Portion C	2	1,218	1,219	26MAR08	26JUL11	26MAR08A	27JUL11	13	0						
01R40C0216	S4-Maintenance Period (365 days)	2	365	365	27JUL11	25JUL12	28JUL11	26JUL12	0	0						
01R50D0218	S5-Slope Stabilization works within Portion D	2	1,308	1,308	28DEC07	27JUL11	28DEC07A	01DEC11	19	-127						
01R50D0220	S5-Maintenance Period (365 days)	2	365	365	28JUL11	26JUL12	02DEC11	30NOV12	0	-127						
01R60G0222	S6-Works within Portion G	2	608	609	26NOV09	26JUL11	26NOV09	27JUL11	0	0						
01R60G0224	S6-Maintenance Period (365 days)	2	365	365	27JUL11	25JUL12	28JUL11	26JUL12	0	0						
01R7000226	S7-Landscape softworks & establishment works	2	1,673	1,673	28DEC07	26JUL12	28DEC07A	30NOV12	15	-127						
01R7000228	S7-Maintenance Period (30 days)	2	30	30	27JUL12	25AUG12	01DEC12	30DEC12	0	-127						
Facilities for the SO as per ER 12																
01R0000302	Provide temporary accommodation	2	7	7	28DEC07	03JAN08	28DEC07A	15JAN08A	100							
01R0000304	Design the SO's principle office	2	30	95	28DEC07	26JAN08	28DEC07A	28AUG08	99	53						
01R0000305	Erect Hoarding/Signboard/Gate/Fencing	1	35	35	28JAN08	11MAR08	28MAR08A	04NOV08	60	0						
01R0000306	Erect SO's principle office in Portion H1/H2	1	60	100	28JAN08	14APR08	19MAY08A	13SEP08	85	0						
01R0000308	Provide secondary offices, directed by SO	2	64	64	14MAR08	16MAY08	14SEP08	16NOV08	0	0						
01R0000310	Provide transport for the SO as per App. ER,M	2	90	90	28DEC07	26MAR08	28DEC07A	02MAY08A	100							
01R0000311	Provide survey equipments as per App. ER,M	2	30	30	28DEC07	26JAN08	28DEC07A	19AUG08A	100							
01R0000314	Maintain & Service the Principle Office	2	1,594	1,539	15APR08	25AUG12	14SEP08	30NOV12	0	0						
01R0000316	Maintain & Service the Secondary Office	2	1,585	1,504	24APR08	25AUG12	19OCT08	30NOV12	0	0						
01R0000318	Maintain & Service the transportation	2	1,688	1,785	12JAN08	25AUG12	12JAN08A	30NOV12	8	0						
01R0000319	Maintain & Service the survey equipments	2	1,673	1,748	27JAN08	25AUG12	18FEB08A	30NOV12	6	0						
01R0000372	Demolish & removal of Principle Office	2	0	30			01DEC12	30DEC12	0	0						
Contractor's Accommodation as per ER.B																
01R0001402	Design Contractor's main office	2	30	30	28DEC07	26JAN08	01FEB08A	19MAY08A	100							
01R0001406	Maintain & service Contractor's office	2	1,594	1,597	15APR08	25AUG12	18JUL08A	30NOV12	0	0						
01R0001408	Demolish & removal of Contractor's main office	2	30	30	26AUG12	24SEP12	01DEC12	30DEC12	0	0						
01R000141	Erect Contractor's main office in Portion H1	1	0	50*			19MAY08A	17JUL08A	100							
01R0001412	Construct base slab	1	0	10			19MAY08A	30MAY08A	100							

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012
01R0001413	Install steel frames	1	0	12			31MAY08A	21JUN08A	100						
01R0001414	Install wall/roof panels, windows etc	1	0	6			23JUN08A	30JUN08A	100						
01R0001415	Install & E& M/ceiling/floor panels	1	0	8			02JUL08A	12JUL08A	100						
01R0001416	Site clearance	1	0	1			14JUL08A	17JUL08A	100						
01R0001417	Install furnitures/internet & move in	1	0	2			14JUL08A	17JUL08A	100						
Works Programme & Monthly Report as per SCC 27															
01R0000502	Prepare/Submit draft Works Programme	2	7	7	14DEC07	20DEC07	14DEC07A	21DEC07A	100						
01R0000504	SO's review/comment on draft Works Programme	2	14	14	21DEC07	03JAN08	22DEC07A	23JAN08A	100						
01R0000505	Prepare/Submit draft Works Programme Rev. 1	2	0	28			24JAN08A	15FEB08A	100						
01R0000506	Prepare/Submit 1st 3-Month Rolling Programme	2	14	14	14DEC07	27DEC07	14DEC07A	03JAN08A	100						
01R0000507	SO's approval on draft Works Programme	2	0	14			16FEB08A	28MAR08A	100						
01R0000508	Submit Detailed Works Programme	2	7	7	04JAN08	10JAN08	28AUG08	03SEP08	0	172					
01R0000510	SO's Approval of Works Programme	2	7	7	11JAN08	17JAN08	04SEP08	10SEP08	0	172					
01R0000512	Monthly Update for all Programme	2	1,682	1,779	18JAN08	25AUG12	18JAN08A	30NOV12	13	30					
01R0000514	Contractor's Monthly Progress Report	2	1,678	1,775	22JAN08	25AUG12	22JAN08A	30NOV12	12	30					
Safety Plan as per SCC 35															
01R0000602	Submit draft Safety Plan	2	14	14	14DEC07	27DEC07	14DEC07A	29DEC07A	100						
01R0000604	Hold an ad hoc meeting with RE on Safety Plan	2	7	7	28DEC07	03JAN08	31DEC07A	09JAN08A	100						
01R0000606	Submit 6 copies of the Safety Plan	2	35	35	14DEC07	17JAN08	14DEC07A	26FEB08A	100						
01R0000608	Submit updated safety organiza. chart monthly	2	1,682	1,747	18JAN08	25AUG12	20MAR08A	30DEC12	9	0					
17R0000602	Fulfill all relevant safety obligation	2	1,703	1,830	28DEC07	25AUG12	28DEC07A	30DEC12	7	0					
Contractor's All Insurances															
01R0000704	Submit documents for all insurances are effected	2	21	21	14DEC07	03JAN08	14DEC07A	02SEP08	71	0					
Quality System as per ER 9.3															
01R0000802	Appoint a Quality Manager	2	14	14	28DEC07	10JAN08	28DEC07A	02JAN08A	100						
01R0000804	Submit proposed Quality System for SO's consent	2	28	28	14DEC07	10JAN08	14DEC07A	22JAN08A	100						
01R0000806	Submit QSSP for approval of the SO	2	28	28	28DEC07	24JAN08	28DEC07A	14MAR08A	100						
01R0000808	Maintain & update Quality System	2	1,675	1,802	25JAN08	25AUG12	25JAN08A	30DEC12	13	0					
Environment															
01R0000902	Nominate Environmental Officer	2	14	14	14DEC07	27DEC07	14DEC07A	21DEC07A	100						
01R0000903	Establish a billing account for disposal	2	21	21	14DEC07	03JAN08	14DEC07A	02JAN08A	100						
01R0000904	Submit draft EMP	2	21	21	14DEC07	03JAN08	14DEC07A	02JAN08A	100						
01R0000906	Revise draft EMP within 7 days of SO's notice	2	14	14	04JAN08	17JAN08	04JAN08A	21FEB08A	100						
01R0000908	Submit final version of EMP	2	45	45	14DEC07	27JAN08	14DEC07A	21FEB08A	100						

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	Year					
											2008	2009	2010	2011	2012	
01R0000910	Review/update/submit EMP monthly	2	1,642	1,769	28JAN08	26JUL12	28JAN08A	30NOV12	5	30						
01R0000912	Employ IET	2	21	21	14DEC07	03JAN08	14DEC07A	02JAN08A	100							
01R0000914	Submit Baseline Monitoring Plan	2	21	21	28DEC07	17JAN08	28DEC07A	18JAN08A	100							
01R0000915	Seek for EPD's Agreement on WQML & schedule	2	21	21	18JAN08	07FEB08	18JAN08A	31JAN08A	100							
01R0000916	Carry out baseline monitoring	2	37	37	31JAN08	07MAR08	11FEB08A	20MAR08A	100							
01R0000918	Prepare/submit reports for baseline monitoring	2	20	20	27FEB08	17MAR08	21MAR08A	28MAR08A	100							
01R0000920	Impact monitoring & reporting	2	1,592	1,705	18MAR08	26JUL12	01APR08A	30NOV12	2	30						
17R0000902	Fulfill all relevant environmental obligation	2	1,673	1,800	28DEC07	26JUL12	28DEC07A	30NOV12	5	30						
Excavation Permit/Utilities per SCC 54 & SCC 83																
01R0001002	Nominate IIUMS co-ordinator	2	7	7	14DEC07	20DEC07	14DEC07A	15JAN08A	100							
01R0001004	SO approve IIUMS co-ordinator	2	14	14	21DEC07	03JAN08	16JAN08A	29FEB08A	100							
01R0001006	Submit brand name of UGS detection equipment	2	7	7	28DEC07	03JAN08	28DEC07A	18FEB08A	100							
01R0001008	Utilities detection & report to the SO	2	21	21	04JAN08	24JAN08	29FEB08A	05APR08A	100							
01R0001010	Liaison with UUs	2	21	21	04JAN08	24JAN08	04JAN08A	29FEB08A	100							
01R0001012	Apply XP for site entrance construction	2	7	7	25JAN08	31JAN08	21JAN08A	08MAR08A	100							
01R0001014	HyD process XP for site entrance construction	2	20	20	01FEB08	20FEB08	10MAR08A	28MAY08A	100							
01R0001016	HyD issue XP for site entrance construction	2	0	0		20FEB08		28MAY08A	100							
01R0001018	Apply XP for GI works at I-1 & I-2	2	0	1			22APR08A	20MAY08A	100							
01R0001020	HyD process XP for GI works at I-1 & I-2	2	0	30			23APR08A	26SEP08	0	137						
01R0001022	HyD issue XP for GI works at I-1 & I-2	1	0	0				26SEP08	0	109						
01R0001024	Apply XP for trial grout at Fault F1	2	0	1			22APR08A	20MAY08A	100							
01R0001026	HyD process XP for trial grout at Fault F1	2	0	30			23APR08A	22JUL08A	100							
01R0001028	HyD issue XP for trial grout at Fault F1	1	0	0				22JUL08A	100							
Pre-construction Condition Survey																
Preliminaries																
01R0001102	Appoint a Qualified Structural Engineer	2	30	30	28DEC07	26JAN08	28DEC07A	19MAR08A	100							
01R0001104	Submit nos. & extent of the affected EBS	2	30	30	28DEC07	26JAN08	28DEC07A	19MAR08A	100							
PCS Stage 1 between I-1 & I-2																
01R0001118	Carry out stg 1 PCS between I-1 & I-2	2	0	6			22APR08A	23APR08A	100							
01R0001120	Prepare/submit reports for stg 1 PCS bet I-1&I-2	2	0	60			24APR08A	23SEP08	55	138						
01R0001122	Review/accept reports for stg 1 PCS bet I-1&I-2	2	0	60			31MAY08A	07OCT08	77	138						
PCS Stage 1 between I-2 & I-3																
01R0001130	Carry out stg 1 PCS between I-2 & I-3	2	0	5			25MAR08A	30APR08A	100							
01R0001132	Prepare/submit reports for stg 1 PCS bet I-2&I-3	2	0	60			24APR08A	23SEP08	55	-50						
01R0001134	Review/accept reports for stg 1 PCS bet I-2&I-3	2	0	60			24MAY08A	07OCT08	77	-50						
PCS Stage 1 between I-3 & O-1																
01R0001142	Carry out stg 1 PCS between I-3 & O-1	2	0	5			25MAR08A	26MAR08A	100							
01R0001144	Prepare/submit reports for stg 1 PCS bet I-3&O-1	2	0	60			26MAR08A	11SEP08	75	180						
01R0001146	Review/accept reports for stg 1 PCS bet I-3&O-1	2	0	60			31MAY08A	25SEP08	77	180						

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012		
PCS Stage 1 at vicinity of O-1																	
01R0001106	Carry out stg 1 PCS at vicinity of O-1	2	72	5	28JAN08	28APR08	25MAR08A	29MAR08A	100								
01R0001108	Prepare/submit reports for stg 1 PCS at O-1	2	72	60	05FEB08	07MAY08	31MAR08A	10SEP08	77	-54							
01R0001110	Review/accept reports for stg 1 PCS at O-1	2	0	60			27MAY08A	24SEP08	77	-54							
PCS Stage 2 between I-1 & I-2																	
01R0001124	Carry out stg 2 PCS between I-1 & I-2	2	0	5			22APR08A	02JUN08A	100								
01R0001126	Prepare/submit reports for stg 2 PCS bet I-1&I-2	2	0	60			24APR08A	23SEP08	55	138							
01R0001128	Review/accept reports for stg 2 PCS bet I-1&I-2	2	0	60			11JUN08A	07OCT08	77	138							
PCS Stage 2 between I-2 & I-3																	
01R0001136	Carry out stg 2 PCS between I-2 & I-3	2	0	5			30APR08A	07JUN08A	100								
01R0001138	Prepare/submit reports for stg 2 PCS bet I-2&I-3	2	0	60			02MAY08A	23SEP08	55	-50							
01R0001140	Review/accept reports for stg 2 PCS bet I-2&I-3	2	0	60			13JUN08A	07OCT08	77	-50							
PCS Stage 2 between I-3 & O-1																	
01R0001148	Carry out stg 2 PCS between I-3 & O-1	2	0	5			09MAY08A	13JUN08A	100								
01R0001150	Prepare/submit reports for stg 2 PCS bet I-3&O-1	2	0	60			04JUN08A	11SEP08	75	207							
01R0001152	Review/accept reports for stg 2 PCS bet I-3&O-1	2	0	60			19JUN08A	25SEP08	77	207							
PCS Stage 2 at Vicinity of O-1																	
01R0001112	Carry out stg 2 PCS at vicinity of O-1	2	0	12			01APR08A	06JUN08A	100								
01R0001114	Prepare/submit reports for stg 2 PCS at O-1	2	0	60			02JUN08A	10SEP08	77	-54							
01R0001116	Review/accept reports for stg 2 PCS at O-1	2	0	60			17JUN08A	24SEP08	77	-54							
Pre-const. condition construction survey; I-1																	
01R0001154	Prepare/submit reports for EBS at I-1	2	0	28			28AUG08	24SEP08	0	161							
01R0001156	Review/accept reports for EBS at I-1	2	0	28			25SEP08	22OCT08	0	186							
Pre-const. condition construction survey; I-2																	
01R0001158	Prepare/submit reports for EBS at I-2	2	0	28			28AUG08	24SEP08	0	-27							
01R0001160	Review/accept reports for EBS at I-2	2	0	28			25SEP08	22OCT08	0	-2							
Pre-const. condition construction survey; I-3																	
01R0001162	Prepare/submit reports for EBS at I-3	2	0	28			28AUG08	24SEP08	0	218							
01R0001164	Review/accept reports for EBS at I-3	2	0	28			25SEP08	22OCT08	0	243							
Pre-const. condition construction survey; O-1																	
01R0001166	Prepare/submit reports for EBS at O-1	2	0	28			28AUG08	24SEP08	0	-44							
01R0001168	Review/accept reports for EBS at O-1	2	0	28			25SEP08	22OCT08	0	16							
Pre-const. condition construction survey; Tunnel																	
01R0001170	Prepare/submit reports for EBS along Tunnel align	2	0	28			28AUG08	24SEP08	0	-9							
01R0001172	Review/accept reports for EBS along Tunnel align	2	0	28			25SEP08	22OCT08	0	16							
Traffic																	
01R0001202	Appoint Traffic Consultant/Traffic Engineer	2	14	14	14DEC07	27DEC07	14DEC07A	03JAN08A	100								
01R0001204	Eng's Approval of Traffic Consultant	2	7	7	28DEC07	03JAN08	28DEC07A	28FEB08A	100								
01R0001206	Prepare/submit TTA Schemes (ingress & egress)	2	14	14	04JAN08	17JAN08	04JAN08A	31JAN08A	100								

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	Year					
											2008	2009	2010	2011	2012	
01R0001216	Obtain endorsement of TTA schemes from TMLG	2	21	21	18JAN08	07FEB08	01FEB08A	01APR08A	100		1st TMLG scheduled on 11/03/08 1st TMLG was held on 12/02/08					
01R0001234	Approval of TTA schemes by the Authorities	2	28	14	08FEB08	06MAR08	02APR08A	19APR08A	100		HyD & Police ER.B1 1.15 (9) refers					
01R0001236	Approval of TTA schemes by the Authorities	2	0	14			02APR08A	19APR08A	100		HyD & Police ER.B1 1.15 (9) refers					
Management of Sub-contractors as per SCC 44																
01R0001302	Submit a Sub-contractor Management Plan	2	30	30	14DEC07	12JAN08	14DEC07A	12JAN08A	100		within 30 days of LOA					
01R0001304	Submit Quarterly the Updated SMP	2	1,597	1,642	12APR08	25AUG12	03JUL08A	30DEC12	3	0						
Trees																
Siu Ho Wan as a New Tree Transplanting Area																
VO028-02	Receive VO28 for new tree transplanting area	1	0	0				16AUG08A	100		Area Within Sui Ho Wan Sewage Treatment Works					
VO028-04	Preparation works for new T.T. area	2	0	20			18AUG08A	07SEP08	45	-115						
01R0001502	Appoint Landscape Specialist Contractor	2	14	14	14DEC07	27DEC07	14DEC07A	14JAN08A	100							
01R0001504	SO's Approval of Landscape Contractor	2	7	7	28DEC07	03JAN08	15JAN08A	28FEB08A	100							
01R0001506	Nominate competent person to oversee tree works	2	45	45	14DEC07	27JAN08	14DEC07A	29JAN08A	100		ERB 26.02A; within 45 days of LOA					
01R0001510	Obtain Tree Removal Permit by Others	2	90	90	28DEC07	26MAR08	28DEC07A	06MAR08A	100		ER 1.5.3 (2); within 3 mths from DOC					
01R0001512	Remove / Transplant Trees start	2	0	0	27MAR08		08SEP08		0	-115	ER 1.5.3(2) within 3 months from DOC					
Survey																
01R0001602	Appoint Surveyors	2	14	14	28DEC07	10JAN08	28DEC07A	10JAN08A	100							
01R0001604	SO's Approval of Surveyor	2	7	7	11JAN08	17JAN08	11JAN08A	16APR08A	100							
01R0001608	Initial Survey	1	28	28	18JAN08	22FEB08	18JAN08A	10MAR08A	100							
01R0001610	Maintain & carry out survey works	2	1,000	1,378	23FEB08	11JUL11	23FEB08A	01DEC11	8	0						
Smart Card System as per ER B.30																
01R0001802	Submit Smart Card Sys for SO's Approval	2	7	7	28DEC07	03JAN08	28DEC07A	15JAN08A	100		As per ER.B30 30.06(2)SOR.s approval obtained on 13/02/08					
01R0001804	Install & start Operating Smart-Card System	2	60	60	28DEC07	25FEB08	28DEC07A	23FEB08A	100							
01R0001806	Operate & Maintain Smart-Card System	2	1,643	1,771	26FEB08	25AUG12	25FEB08A	30DEC12	4	0						
Procurement of Sub-contractor																
01R0001904	Spoil Disposal	2	60	60	14DEC07	11FEB08	28AUG08	26OCT08	0	184						
01R0001906	Earthwork for Outfall O-1	2	60	60	14DEC07	11FEB08	14DEC07A	05JUN08A	100		awarded to Kin Lee					
01R0001910	Re-bar Supply	2	90	90	14DEC07	12MAR08	14DEC07A	30MAY08A	100		awarded to VSC Steel Co. Ltd by PR					
01R0001912	Soil Nailing	2	60	60	28DEC07	25FEB08	28DEC07A	02APR08A	100		Geotech Eng Ltd					
01R0001914	H-piling Works	2	90	90	14DEC07	12MAR08	14DEC07A	09MAY08A	100		awarded to Kin Wing					
01R0001916	Fabrication of Pre-cast Lining	2	80	80	14DEC07	02MAR08	02JUN08A	26SEP08	63	9						
01R0001920	Drainage/Road Works for Access Road at I-3	2	90	60	14DEC07	12MAR08	08AUG08A	06OCT08	56	742						
01R0001922	Temp. steel decking over Shing Mun Nullah at I-1	2	90	90	14DEC07	08APR08	14DEC07A	25APR08A	100		awarded to Long Faith					
01R0001924	Design/Install Communication System	2	45	94	17MAY08	30JUN08	28JUN08A	29SEP08	45	545		awarded to Shun Hing				

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											2008	2009	2010	2011	2012
01R0001925	Design/install Flow Monitoring Devices	2	45	78	17MAY08	30JUN08	14JUL08A	29SEP08	27	703	awarded to Soldata				
01R0001936	Procurement & delivery of Communication System	2	180	180	03JAN09	01JUL09	09MAR09	04SEP09	0	545					
01R0001938	Procurement/delivery of Flow Measurement Devices	2	120	120	30OCT08	26FEB09	09MAR09	06JUL09	0	703					
01R0018A02	Supply TBM/Main Tunnel Construction	2	0	7			14DEC07A	21DEC07A	100		awarded to Sell				
01R0018A04	Security	2	0	17			17DEC07A	02JAN08A	100						
01R0018A06	Progress Photo/Vedio	2	0	25			29DEC07A	22JAN08A	100						
01R0018A08	Webpage/Physical Model/3D Animation	2	0	48			14DEC07A	14FEB08A	100		awarded to Intelibuild				
01R0018A10	Hoarding/Fencing Erection	2	0	60			04JAN08A	03MAR08A	100		awarded to Chi Yau				
01R0018A12	Erection of Contractor's Office	2	0	67			28DEC07A	03MAR08A	100		awarded to Ming Kee				
01R0018A14	Remote Control CCTV	2	0	60			04JAN08A	03MAR08A	100		awarded to Pilot Electronic				
01R0018A16	Concrete Supply	2	0	45			14DEC07A	11MAR08A	100		Anderson				
01R0018A18	Geotechnical Instrumentation	2	0	60			15JAN08A	14MAR08A	100		awarded to Soldata				
01R0018A20	Drilling/Grouting for Geotchnical Instrumentat.	2	0	60			16JAN08A	15MAR08A	100		awarded to Lam				
01R0018A22	Site Clearance	2	0	60			26JAN08A	25MAR08A	100		awarded to King Shing				
01R0018A24	Erection of SOR's Office	2	0	95			02JAN08A	05APR08A	100		awarded to Long Faith				
01R0018A26	Carry out Grout Trial at Fault F1	2	0	90			02APR08A	30JUN08A	100		awarded to Dril Tech				
01R0018A28	Design/Fabricate Segmental Lining Mould	2	0	90			23APR08A	21JUL08A	100		awarded to Korea Mould				
01R0018A30	Construction of Skin Walls	2	0	90			21JUL08A	26SEP08	67	179					
01R0018A32	Design/Fabricate/Supply/Install Conveyor Belt	2	0	90			14JUL08A	11OCT08	50	250					
01R0018A34	Supply of Locomotive	2	0	90			14JUL08A	11OCT08	50	199					
01R0018A36	Excavation Works at I-1	2	0	60			28AUG08	26OCT08	0	182					
01R0018A38	Construction of Steel Platform at O-1	2	0	50			28AUG08	16OCT08	0	115					
01R0018A40	Construction of Steel Platform at I-2	2	0	50			28AUG08	16OCT08	0	59					
01R0018A42	Pre-excavation Grouting for Shaft Excavation	2	0	60			28AUG08	26OCT08	0	-37					
01R0018A44	Strengthening Works for WSD Tunnel No. 3	2	0	60			28AUG08	26OCT08	0	98					
01R0018A46	Excavation/Construction of TBM Launching Chamber	2	0	70			28AUG08	05NOV08	0	2					
01R0018A48	Construction of Subgrade Structure at I-1	2	0	90			28AUG08	25NOV08	0	465					
01R0018A50	Shaft Excavation by RCD at I-2	2	0	90			28AUG08	25NOV08	0	-43					
01R0018A52	Excavation/Construction of Shafts/Adits/Chambers	2	0	90			28AUG08	25NOV08	0	127					
01R0018A54	Construction of Hopper at O-1	2	0	90			28AUG08	25NOV08	0	205					
01R0018A56	Suttering of Spiral Ramp	2	0	90			28AUG08	25NOV08	0	542					
01R0018A58	Open Cut Excavation & Construction at I-3	2	0	90			28AUG08	25NOV08	0	219					
01R0018A60	Lining Formworks for Underground Structures	2	0	90			28AUG08	25NOV08	0	787					
01R0018A61	Tunnel Data Management System (TDMS)	2	0	90			28AUG08	25NOV08	0	58					
01R0018A62	Supply of Rail Track	2	0	90			28AUG08	25NOV08	0	110					
01R0018A64	Supply of Aggregate	2	0	120			28AUG08	25DEC08	0	124					
01R0018A66	Marine Works at O-1	2	0	200			28AUG08	15MAR09	0	575					
01R0018A68	Construct Box Culvert/Cascade/Spiral Ramp at O-1	2	0	200			28AUG08	15MAR09	0	372					
01R0018A70	Metal Works	2	0	200			28AUG08	15MAR09	0	792					
01R0018A72	Pipe Jacking Works at Lo Wai	2	0	250			28AUG08	04MAY09	0	597					
01R0018A74	Finishing Works	2	0	250			28AUG08	04MAY09	0	764					

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012		
Others																	
01R0001928	Submit Contractor's Management Team	2	0	0		10JAN08		10JAN08A	100								
01R0001930	Submit Photographer for Monthly Progress Photo	2	0	0	27JAN08		28JAN08A		100								
01R0001932	Install Project Signboards at Potions A,B,C & D	2	120	30	28DEC07	25APR08	28AUG08	26SEP08	0	0							
01R0001934	Presentation of TDMS to SOR/ Employer; ER 4.4.6	2	60	6	22JUN08	20AUG08	26NOV08	01DEC08	0	58							
01R0001940	Prepare/submit Operation & Maintenance Manual	2	90	90	02AUG11	30OCT11	07DEC11	05MAR12	0	300							
01R0001942	Prepare/submit As-built Drawings	2	90	90	28JUL11	25OCT11	02DEC11	29FEB12	0	305							
01R0001944	Produce 2 documentary video for tunnel	2	30	30	28JUL11	26AUG11	02DEC11	31DEC11	0	365							
Construction Risk Assessment (CRA) as per ER 7																	
PCRA for Works at Portion A (I-1)																	
01R00PCRA2	Prepare/submit PCRA for works at I-1	2	0	21			07APR08A	20AUG08A	100								
01R00PCRA4	DC review & certify PCRA for works at I-1	2	0	60			22MAY08A	26SEP08	50	128							
01R00PCRA6	SOR review & accept PCRA at works at I-1	2	0	60			12MAY08A	24OCT08	50	128							
01R00PCRA8	GEO review/agree DCRA	2	0	28			27SEP08	24OCT08	0	128							
PCRA for Works at Portion B (I-2)																	
01R00PCRB2	Prepare/submit PCRA for works at I-2	2	0	21			14APR08A	20AUG08A	100								
01R00PCRB4	DC review & certify PCRA for works at I-2	2	0	60			22MAY08A	26SEP08	50	-62							
01R00PCRB6	SOR review & accept PCRA at works at I-2	2	0	60			22MAY08A	24OCT08	50	-62							
01R00PCRB8	GEO review/agree DCRA	2	0	28			27SEP08	24OCT08	0	-62							
PCRA for Works at Portion C (I-3)																	
01R00PCRC2	Prepare/submit PCRA for works at I-3	2	0	21			01APR08A	20AUG08A	100								
01R00PCRC4	DC review & certify PCRA for works at I-3	2	0	60			21MAY08A	26SEP08	50	181							
01R00PCRC6	SOR review & accept PCRA at works at I-3	2	0	60			21MAY08A	24OCT08	50	181							
01R00PCRC8	GEO review/agree DCRA	2	0	28			27SEP08	24OCT08	0	181							
PCRA for Works at Portion D/E (O-1)																	
01R00PCRD2	Prepare/submit PCRA for works at O-1	2	0	21			01APR08A	20AUG08A	100								
01R00PCRD4	DC review & certify PCRA for works at O-1	2	0	60			21MAY08A	26SEP08	50	-77							
01R00PCRD6	SOR review & accept PCRA at works at O-1	2	0	60			12MAY08A	24OCT08	50	-77							
01R00PCRD8	GEO review/agree DCRA	2	0	28			27SEP08	24OCT08	0	-77							
PCRA for Works at Portion F/J (Main Tunnel)																	
01R00PCRF2	Prepare/submit PCRA for main tunnel works	2	0	21			09JUN08A	07SEP08	50	-53							
01R00PCRF4	DC review & certify PCRA for main tunnel works	2	0	60			14JUL08A	07OCT08	50	-53							
01R00PCRF6	SOR review & accept PCRA for main tunnel works	2	0	60			16JUL08A	04NOV08	50	-53							
01R00PCRF8	GEO review/agree DCRA	2	0	28			08OCT08	04NOV08	0	-53							
DCRA for Works at Portion A (I-1)																	
01R00DCRA2	Prepare/submit DCRA for works at I-1	2	0	14			18OCT08	31OCT08	0	128							
01R00DCRA4	DC review & certify DCRA for works at I-1	2	0	21			01NOV08	21NOV08	0	128							
01R00DCRA6	SOR review & accept DCRA at works at I-1	2	0	49			01NOV08	19DEC08	0	128							
01R00DCRA8	GEO review/agree DCRA	2	0	28			22NOV08	19DEC08	0	128							

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DCRA for Works at Portion B (I-2)																	
01R00DCRB2	Prepare/submit DCRA for works at I-2	2	0	14			18OCT08	31OCT08	0	-60							
01R00DCRB4	DC review & certify DCRA for works at I-2	2	0	21			01NOV08	21NOV08	0	-60							
01R00DCRB6	SOR review & accept DCRA at works at I-2	2	0	49			01NOV08	19DEC08	0	-60							
01R00DCRB8	GEO review/agree DCRA	2	0	28			22NOV08	19DEC08	0	-60							
DCRA for Works at Portion C (I-3)																	
01R00DCRC2	Prepare/submit DCRA for works at I-3	2	0	14			18OCT08	31OCT08	0	185							
01R00DCRC4	DC review & certify DCRA for works at I-3	2	0	21			01NOV08	21NOV08	0	185							
01R00DCRC6	SOR review & accept DCRA at works at I-3	2	0	49			01NOV08	19DEC08	0	185							
01R00DCRC8	GEO review/agree DCRA	2	0	28			22NOV08	19DEC08	0	185							
DCRA for Works at Portion D/E (O-1)																	
01R00DCRD2	Prepare/submit DCRA for works at O-1	2	0	14			18OCT08	31OCT08	0	-77							
01R00DCRD4	DC review & certify DCRA for works at O-1	2	0	21			01NOV08	21NOV08	0	-42							
01R00DCRD6	SOR review & accept DCRA at works at O-1	2	0	49			01NOV08	19DEC08	0	-42							
01R00DCRD8	GEO review/agree DCRA	2	0	28			22NOV08	19DEC08	0	-42							
DCRA for Works at Portion F/J (Main Tunnel)																	
01R00DCRF2	Prepare/submit DCRA for main tunnel works	2	0	21			22OCT08	11NOV08	0	-53							
01R00DCRF4	DC review & certify DCRA for main tunnel works	2	0	21			12NOV08	02DEC08	0	-53							
01R00DCRF6	SOR review & accept DCRA for main tunnel works	2	0	49			12NOV08	30DEC08	0	-53							
01R00DCRF8	GEO review/agree DCRA	2	0	28			03DEC08	30DEC08	0	-53							
Physical Models & Other Material Display																	
01R0002302	Prepare/submit a physical model as per ER 4.4.8	2	90	255	14DEC07	12MAR08	15FEB08A	26OCT08	73	0							
01R0002304	Prepare/submit a 3-D animation model	2	90	255	14DEC07	12MAR08	15FEB08A	26OCT08	73	0							
Internet Website as per ER 4.4.7																	
01R0002402	Propose the design of web page	2	30	30	28DEC07	26JAN08	28DEC07A	09FEB08A	100								
01R0002404	Produce the web page for approval of SO	2	30	211	27JAN08	25FEB08	10MAR08A	06OCT08	81	0							
01R0002406	SO's approval of web page	2	30	30	26FEB08	26MAR08	07OCT08	05NOV08	0	0							
01R0002408	Submit updated web pages monthly	2	1,613	1,500	27MAR08	25AUG12	06NOV08	30DEC12	0	0							
Schedule of Milestones for Cost Centre No. 1R																	
01R0002501	1R 1; On provision of SO's Accommodation	2	0	0		14APR08		13SEP08	0	1,569							
01R0002502	1R 2; On providing documents of effected CWI	2	0	0		03JAN08		03JAN08A	100								
01R0002503	1R 3; On providing documents of effected TPI	2	0	0		03JAN08		03JAN08A	100								
01R0002504	1R 4; On Pproviding documents of effected PII	2	0	0		03JAN08		03JAN08A	100								
01R0002505	1R 5; On delivery of all Land Transport for SO	2	0	0		26MAR08		02MAY08A	100								
01R0002506	1R 6; On install. of computer facilities for SO	2	0	0		14APR08		13SEP08	0	1,569							
01R0002507	1R 7; On accept. of detailed CRA incl. PCS	2	0	0		25SEP09		31OCT08	0	1,521							
01R0002508	1R 8; On acceptance of Physical Model by the SO	2	0	0		12MAR08		26OCT08	0	1,526							

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01R0002509	1R 9; On acceptance of 3-D Animation Model	2	0	0		12MAR08		26OCT08	0	1,526						◆ 3-D animation model completed as per ER 4.4.9
01R0002510	1R 10; On satisf. operation of CCTV for 3 mth	2	0	0		31JUL08		05FEB09	0	1,424						◆ for 3 mths of the remote CCTV intalled in
01R0002511	1R 11; On acceptance of O&MM	2	0	0		30OCT11		05MAR12	0	300						O&MM completed as per ER 4.4.11 ◆
01R0002512	1R 12; On acceptance of as-built drwgs.	2	0	0		25OCT11		29FEB12	0	305						built drwgs. completed as per ER 4.4.12 ◆
01R0002513	1R 13; On acceptance of T.R/Video/Brouchure	2	0	0		26AUG11		31DEC11	0	365						ER 4.4.13 ◆ tunnel report 8
01R0002514	1R 14; On complete all wks for 3 mth frm DOC	2	0	0		27MAR08		27MAR08A	100							◆ of all obligations by this C.S. 3-mths from DOC
01R0002515	1R 15; On complete all wks for 6 mth frm DOC	2	0	0		26JUN08		27JUN08A	100							◆ of all obligations by this CS 6 mths from DOC
01R0002516	1R 16; On complete all wks for 9 mth frm DOC	2	0	0		25SEP08		25SEP08	0	1,400						◆ of all obligations by this CS 9 mths from DOC
01R0002517	1R 17; On complete all wks for 12 mth frm DOC	2	0	0		26DEC08		26DEC08	0	1,308						◆ of all obligation by this CS 12 mths frm DOC
01R0002518	1R 18; On complete all wks for 15 mth frm DOC	2	0	0		27MAR09		27MAR09	0	1,217						◆ of all obligations by this CS 15 mths frm DOC
01R0002519	1R 19; On complete all wks for 18 mth frm DOC	2	0	0		26JUN09		26JUN09	0	1,126						◆ of all obligations by this CS 18 mths frm DOC
01R0002520	1R 20; On complete all wks for 21 mth frm DOC	2	0	0		25SEP09		25SEP09	0	1,035						◆ of all obligations by this CS 21 mths frm DOC
01R0002521	1R 21; On complete all wks for 24 mth frm DOC	2	0	0		26DEC09		26DEC09	0	943						◆ of all obligations by this CS 24 mths frm DOC
01R0002522	1R 22; On complete all wks for 27 mth frm DOC	2	0	0		27MAR10		27MAR10	0	852						◆ of all obligations by this CS 27 mths frm DOC
01R0002523	1R 23; On complete all wks for 30 mth frm DOC	2	0	0		26JUN10		26JUN10	0	761						◆ of all obligations by this CS 30 mths
01R0002524	1R 24; On complete all wks for 33 mth frm DOC	2	0	0		25SEP10		25SEP10	0	670						◆ of all obligations by this CS 33 m
01R0002525	1R 25; On complete all wks for 36 mth frm DOC	2	0	0		26DEC10		26DEC10	0	578						◆ of all obligations by this CS 3
01R0002526	1R 26; On complete all wks for 39 mth frm DOC	2	0	0		27MAR11		27MAR11	0	487						of all obligations by this CS 39 mths frm DOC ◆
01R0002527	1R 27; On complete all wks for 42 mth frm DOC	2	0	0		26JUN11		26JUN11	0	396						of all obligations by this CS 42 mths frm DOC ◆
01R0002528	1R 28; On complete all wks for 45 mth frm DOC	2	0	0		25SEP11		25SEP11	0	305						of all obligations by this CS 45 mths frm DOC ◆
01R0002529	1R 29; On issuance of completion certificates	2	0	0		13AUG11		29DEC11	0	367						of completion except Section 7 ◆
01R0002530	1R 30; On complete all wks for 3 mth frm CMP	2	0	0		26OCT11		01MAR12	0	304						of all obligations 3 mths frm DOM excl. Sec. 7 ◆
01R0002531	1R 31; On complete all wks for 6 mth frm CMP	2	0	0		25JAN12		31MAY12	0	213						of all obligations 6 mths frm DOM excl. Sec. 7 ◆
01R0002532	1R 32; On complete all wks for 9 mth frm CMP	2	0	0		25APR12		30AUG12	0	122						of all obligations 9 mths frm DOM excl. Sec. 7 ◆
01R0002533	1R 33; On issuance of maintenance certificate	2	0	0		25AUG12		30DEC12	0	0						certificate ◆
Schedule of Milestones for Cost Centre No. 16R																
16R7003001	16R 1; On completion of landscape wks; Portion A	2	0	0		13MAY11		16JUL11	0	533						◆
16R7003002	16R 2; On completion of landscape wks; Portion B	2	0	0		16JUL11		27SEP11	0	460						◆
16R7003003	16R 3; On completion of landscape wks; Portion C	2	0	0		05MAY11		02JUL11	0	547						◆
16R7003004	16R 4; On completion of landscape wks; Portion D	2	0	0		17JUN11		01DEC11	0	395						◆
16R7003005	16R 5; On completion of establish wks; Portion A	2	0	0		12MAY12		15JUL12	0	168						◆
16R7003006	16R 6; On completion of establish wks; Portion B	2	0	0		15JUL12		26SEP12	0	95						◆
16R7003007	16R 7; On completion of establish wks; Portion C	2	0	0		04MAY12		01JUL12	0	182						◆
16R7003008	16R 8; On completion of establish wks; Portion D	2	0	0		16JUN12		30NOV12	0	30						◆
Schedule of Milestones for Cost Centre No. 17R																
17R0003101	17R 1; On complet of all wks for 3 mth frm DOC	2	0	0		27MAR08		27MAR08A	100							◆ of all safety & env. obligations 3 mths frm DOC
17R0003102	17R 2; On complet of all wks for 6 mth frm DOC	2	0	0		26JUN08		27JUN08A	100							◆ of all safety & env. obligations 6 mths frm DOC
17R0003103	17R 3; On complet of all wks for 9 mth frm DOC	2	0	0		26SEP08		26SEP08	0	1,556						◆ of all safety & env. obligations 9 mths frm DOC

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012
17R0003104	17R 4; On complet of all wks for 12 mth frm DOC	2	0	0		26DEC08		26DEC08	0	1,465					◆ of all safety & env. obligations 12 mths frm DOC
17R0003105	17R 5; On complet of all wks for 15 mth frm DOC	2	0	0		27MAR09		27MAR09	0	1,374					◆ of all safety & env. obligations 15 mths frm DOC
17R0003106	17R 6; On complet of all wks for 18 mth frm DOC	2	0	0		27JUN09		27JUN09	0	1,282					◆ of all safety & env. obligations 18 mths frm DOC
17R0003107	17R 7; On complet of all wks for 21 mth frm DOC	2	0	0		26SEP09		26SEP09	0	1,191					◆ of all safety & env. obligations 21 mths frm DOC
17R0003108	17R 8; On complet of all wks for 24 mth frm DOC	2	0	0		26DEC09		26DEC09	0	1,100					◆ of all safety & env. obligations 24 mths frm DOC
17R0003109	17R 9; On complet of all wks for 27 mth frm DOC	2	0	0		28MAR10		28MAR10	0	1,008					◆ of all safety & env. obligations 27 mths frm DOC
17R0003110	17R 10; On complet all wks for 30 mth frm DOC	2	0	0		27JUN10		27JUN10	0	917					◆ of all safety & env. obligations 30 mths frm DOC
17R0003111	17R 11; On complet all wks for 33 mth frm DOC	2	0	0		26SEP10		26SEP10	0	826					◆ of all safety & env. obligations 33 mths frm DOC
17R0003112	17R 12; On complet all wks for 36 mth frm DOC	2	0	0		26DEC10		26DEC10	0	735					◆ of all safety & env. obligations 36 mths frm DOC
17R0003113	17R 13; On complet all wks for 39 mth frm DOC	2	0	0		28MAR11		28MAR11	0	643					◆ of all safety & env. obligations 39 mths frm DOC
17R0003114	17R 14; On complet all wks for 42 mth frm DOC	2	0	0		27JUN11		27JUN11	0	552					◆ of all safety & env. obligations 42 mths frm DOC
17R0003115	17R 15; On complet all wks for 45 mth frm DOC	2	0	0		26SEP11		26SEP11	0	461					◆ of all safety & env. obligations 45 mths frm DOC
17R0003116	17R 16; On complet all wks for 48 mth frm DOC	2	0	0		26DEC11		26DEC11	0	370					◆ of all safety & env. obligations 48 mths frm DOC
17R0003117	17R 17; On complet of all wks for 3 mth frm CMP	2	0	0		26OCT11		01MAR12	0	304					excl. Section 7 ◆ of all safety & env. obligations 3 mths frm CMP
17R0003118	17R 18; On complet of all wks for 6 mth frm CMP	2	0	0		25JAN12		31MAY12	0	213					excl. Section 7 ◆ of all safety & env. obligations 6 mths frm CMP
17R0003119	17R 19; On complet of all wks for 9 mth frm CMP	2	0	0		26APR12		31AUG12	0	121					of all safety & env. obligations 9 mths frm CMP excluding Section 7 ◆
17R0003120	17R 20; On issuance of maintenance certificate	2	0	0		25AUG12		30DEC12	0	0					certificate ◆
Design/Design Check for Permanent Works															
Project -wide Packages															
Project Design Plan (PDP)															
02L10D0102	Employ Independent Designer	2	7	7	14DEC07	20DEC07	14DEC07A	20DEC07A	100						
02L10D0104	Prepare & submit Project Design Plan (PDP)	2	28	28	14DEC07	10JAN08	14DEC07A	26FEB08A	100						per ER 5.4.1, within 28 days of LOA
02L10D0106	SO's review & comment on PDP	2	28	28	11JAN08	07FEB08	27FEB08A	18MAR08A	100						
02L10D0108	Provide further information of (PDP)	2	14	28	08FEB08	21FEB08	19MAR08A	21AUG08A	100						
02L10D0110	SO approves PDP	2	14	14	22FEB08	06MAR08	14MAY08A	04SEP08	93	0					
02L10D0112	Employ Independent Design Checker	2	14	14	28DEC07	10JAN08	28DEC07A	01FEB08A	100						
02L10D0114	Approval of Design Checker by the SO	2	28	28	11JAN08	07FEB08	02FEB08A	28FEB08A	100						
Design for Communication System															
02L1FE0102	Design preparation for the AIP submission	2	15	15	01JUL08	15JUL08	30SEP08	14OCT08	0	545					
02L1FE0103	Design (AIP) submission for the DC's approval	1	0	1			15OCT08	15OCT08	0	440					
02L1FE0104	Design (AIP) certification by the Design Checker	2	15	28	16JUL08	30JUL08	16OCT08	12NOV08	0	545					
02L1FE0106	Design (AIP) submission for the SO's approval	1	1	1	31JUL08	31JUL08	15OCT08	15OCT08	0	446					
02L1FE0108	Design (AIP) review by the SO	2	30	60	01AUG08	30AUG08	23OCT08	21DEC08	0	545					
02L1FE0110	AIP submission for rel. authorities' approval	1	0	1			30AUG08	15OCT08	0	471					
02L1FE0112	Design (AIP) review by the rel. authorities	2	1	28	01SEP08	01SEP08	23OCT08	19NOV08	0	575					
02L1FE0114	Obtain rel. authorities's approval for AIP	1	28	1	02SEP08	29SEP08	20NOV08	20NOV08	0	463					
02L1FE0116	Obtain SO's consent for design (AIP)	2	1	0	30SEP08	30SEP08		22DEC08	0	545					
02L1FE0118	Design preparation for the DDA submission	2	0	30			02OCT08	30NOV08	0	545					
02L1FE0119	Design (DDA) submission for the DC's approval	1	0	1				30DEC08	0	439					
02L1FE0120	Design (DDA) certification by the Design Checker	2	30	28	17SEP08	16OCT08	31DEC08	27JAN09	0	545					

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
02L1FE0122	Design (DDA) submission for the SO's approval	1	15	1	17OCT08	31OCT08	30DEC08	30DEC08	0	444						
02L1FE0124	Design (DDA) review by the SO	2	1	60	01NOV08	01NOV08	07JAN09	07MAR09	0	545						
02L1FE0126	DDA submission for rel. authorities' approval	1	30	1	02NOV08	01DEC08	30DEC08	30DEC08	0	472						
02L1FE0128	Design (DDA) review by the rel. authorities	2	0	28		01DEC08	07JAN09	03FEB09	0	577						
02L1FE0130	Obtain rel. authorities's approval for DDA	1	1	1	02DEC08	02DEC08	04FEB09	04FEB09	0	470						
02L1FE0132	Obtain SO's consent for design (DDA)	2	28	0	03DEC08	30DEC08		08MAR09	0	545						
Design for Flow Measurement System																
02L1FE0202	Design preparation for the AIP submission	2	15	15	01JUL08	15JUL08	30SEP08	14OCT08	0	703						
02L1FE0203	Design (AIP) submission for the DC's approval	1	0	1			15OCT08	15OCT08	0	572						
02L1FE0204	Design (AIP) certification by the Design Checker	2	15	28	16JUL08	30JUL08	16OCT08	12NOV08	0	703						
02L1FE0206	Design (AIP) submission for the SO's approval	1	1	1	31JUL08	31JUL08	15OCT08	15OCT08	0	577						
02L1FE0208	Design (AIP) review by the SO	2	30	60	01AUG08	30AUG08	23OCT08	21DEC08	0	703						
02L1FE0210	AIP submission for rel. authorities' approval	1	0	1		30AUG08	15OCT08	15OCT08	0	601						
02L1FE0212	Design (AIP) review by the rel. authorities	2	0	28			23OCT08	19NOV08	0	734						
02L1FE0214	Obtain rel. authorities's approval for AIP	1	0	1			20NOV08	20NOV08	0	595						
02L1FE0216	Obtain SO's consent for design (AIP)	2	0	0				22DEC08	0	703						
02L1FE0218	Design preparation for the DDA submission	2	0	30			30NOV08	29DEC08	0	703						
02L1FE0219	Design (DDA) submission for the DC's approval	1	0	1			30DEC08	30DEC08	0	571						
02L1FE0220	Design (DDA) certification by the Design Checker	2	30	28	15AUG08	13SEP08	31DEC08	27JAN09	0	703						
02L1FE0222	Design (DDA) submission for the SO's approval	1	15	1	14SEP08	28SEP08	30DEC08	30DEC08	0	577						
02L1FE0224	Design (DDA) review by the SO	2	1	60	29SEP08	29SEP08	07JAN09	07MAR09	0	703						
02L1FE0226	DDA submission for rel. authorities' approval	1	30	1	30SEP08	29OCT08	30DEC08	30DEC08	0	601						
02L1FE0228	Design (DDA) review by the rel. authorities	2	0	28		29OCT08	07JAN09	03FEB09	0	735						
02L1FE0230	Obtain rel. authorities's approval for DDA	1	0	1			04FEB09	04FEB09	0	596						
02L1FE0232	Obtain design (DDA) approval from the SO	2	0	0				08MAR09	0	703						
Design Packages for Works in Portion A																
Temp. Steel Decking Design Over Shing Mun Nullah																
02L1AA0102	Design preparation by the Designer	2	14	14	08FEB08	21FEB08	22FEB08A	15MAY08A	100							
02L1AA0104	Design certification by the Design Checker	2	14	14	22FEB08	06MAR08	16MAY08A	26MAY08A	100							
02L1AA0106	Design submission for the SO's approval	1	1	1	07MAR08	07MAR08	26MAY08A	26MAY08A	100							
02L1AA0108	Design review by the SO	2	28	21	08MAR08	04APR08	27MAY08A	30JUN08A	100							
02L1AA0110	Obtain design approval from the SO	2	0	0		04APR08		30JUN08A	100							
ELS Design for Spiral Ramp/Cascade/Box Culvert																
02L1AA0202	Design preparation for the DDA submission	2	15	158	22FEB08	07MAR08	02MAY08A	29SEP08	18	134						
02L1AA0203	Design submission for the DC's approval	1	0	2			10JUL08A	30SEP08	50	120						
02L1AA0204	Design (DDA) certification by the Design Checker	2	15	30	08MAR08	22MAR08	11AUG08A	20OCT08	50	147						
02L1AA0206	Design (DDA) submission for the SO's approval	1	1	2	25MAR08	25MAR08	12AUG08A	21OCT08	50	120						
02L1AA0208	Design (DDA) review by the SO	2	21	68	26MAR08	15APR08	13AUG08A	25NOV08	22	151						
02L1AA0216	SO submit design (DDA) for approval of GEO	1	1	1	08MAY08	08MAY08	28OCT08	28OCT08	0	124						
02L1AA0218	Design (DDA) review/approval by the GEO	2	0	28		09MAY08	29OCT08	25NOV08	0	151						

7 days after ICE certification

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
02L1AA0238	Obtain SO's consent for design (DDA)	2	0	0		17JUL08		26NOV08	0	151						
Temp. Platform Design for H-Piling																
02L1AA0302	Design preparation by the Designer	2	15	15	22FEB08	07MAR08	02JAN09*	16JAN09	0	653						
02L1AA0303	Design submission for the DC's approval	1	0	1			17JAN09	17JAN09	0	528						
02L1AA0304	Design certification by the Design Checker	2	15	28	08MAR08	22MAR08	18JAN09	14FEB09	0	653						
02L1AA0306	Design submission for the SO's approval	1	1	1	25MAR08	25MAR08	17JAN09	17JAN09	0	528						
02L1AA0308	Design review by the SO	2	28	42	26MAR08	22APR08	18JAN09	28FEB09	0	653						
02L1AA0310	Obtain design approval from the SO	2	0	0				28FEB09	0	653						
Cascade & Box Culver Design for Portion A																
02L1AA0402	Design preparation for the AIP submission	2	30	30	08MAR08	06APR08	02JUN08A	11JUL08A	100							
02L1AA0403	Design (AIP) submission for the DC's approval	1	0	1			12JUL08A	12JUL08A	100							
02L1AA0404	Design (AIP) certification by the Design Checker	2	15	28	07APR08	21APR08	14JUL08A	04SEP08	75	435						
02L1AA0406	Design (AIP) submission for the SO's approval	1	1	1	22APR08	22APR08	15JUL08A	15JUL08A	100							
02L1AA0408	Design (AIP) review by the SO	2	60	66	23APR08	21JUN08	16JUL08A	10OCT08	50	435						
02L1AA0410	AIP submission for rel. authorities' approval	1	0	1		21JUN08	14JUL08A	19AUG08A	100							
02L1AA0412	Design (AIP) review by the rel. authorities	2	1	28	23JUN08	23JUN08	15JUL08A	11SEP08	50	463						
02L1AA0414	Obtain rel. authorities's approval for AIP	1	28	1	24JUN08	21JUL08	12SEP08	12SEP08	0	377						
02L1AA0416	SO submit design (AIP) for approval of GEO	1	1	1	22JUL08	22JUL08	12SEP08	12SEP08	0	353						
02L1AA0418	Design (AIP) review/approval by the GEO	2	0	28		23JUL08	13SEP08	10OCT08	0	435						
02L1AA0420	Obtain SO's consent for design (AIP)	2	30	0	01JUL08	30JUL08		11OCT08	0	435						
02L1AA0422	Design preparation for the DDA submission	2	15	30	31JUL08	14AUG08	19SEP08	18OCT08	0	435						
02L1AA0423	Design (DDA) submission for the DC's approval	1	0	1			20OCT08	20OCT08	0	355						
02L1AA0424	Design (DDA) certification by the Design Checker	2	1	28	15AUG08	15AUG08	21OCT08	17NOV08	0	436						
02L1AA0426	Design (DDA) submission for the SO's approval	1	60	1	16AUG08	14OCT08	20OCT08	20OCT08	0	353						
02L1AA0428	Design (DDA) review by the SO	2	0	66		14OCT08	21OCT08	25DEC08	0	434						
02L1AA0430	DDA submission for rel. authorities' approval	1	1	1	15OCT08	15OCT08	27OCT08	27OCT08	0	379						
02L1AA0432	Design (DDA) review by the rel. authorities	2	28	28	16OCT08	12NOV08	28OCT08	24NOV08	0	465						
02L1AA0434	Obtain rel. authorities's approval for DDA	1	1	1	13NOV08	13NOV08	25NOV08	25NOV08	0	376						
02L1AA0436	SO submit design (DDA) for approval of GEO	1	0	1		14NOV08	25NOV08	25NOV08	0	354						
02L1AA0438	Design (DDA) review/approval by the GEO	2	0	28			26NOV08	23DEC08	0	436						
02L1AA0440	Obtain SO's consent for design (DDA)	2	0	0				26DEC08	0	434						
Impact Assessment on WSD Wo Yip Hop V. S. P. H.																
02L1AA0502	Design preparation for the DDA submission	2	15	30	07APR08	21APR08	02MAY08A	16JUN08A	100							
02L1AA0503	Design (DDA) submission for the DC's approval	1	0	1			26JUN08A	26JUN08A	100							
02L1AA0504	Design (DDA) certification by the Design Checker	2	15	60	22APR08	06MAY08	27JUN08A	26SEP08	50	175						
02L1AA0506	Design (DDA) submission for the SO's approval	1	1	1	07MAY08	07MAY08	14JUL08A	14JUL08A	100							
02L1AA0508	Design (DDA) review by the SO	2	30	66	08MAY08	06JUN08	15JUL08A	01NOV08	20	175						
02L1AA0510	DDA submission for rel. authorities' approval	1	0	1		06JUN08	10JUL08A	10JUL08A	100							
02L1AA0512	Design (DDA) review by the rel. authorities	2	0	28			14JUL08A	10SEP08	50	226						
02L1AA0514	Obtain rel. authorities's approval for DDA	1	0	1			11SEP08	11SEP08	0	181						
02L1AA0516	SO submit design (DDA) for approval of GEO	1	0	1			04OCT08	04OCT08	0	143						

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012
02L1AA0518	Design (DDA) review/approval by the GEO	2	0	28			05OCT08	01NOV08	0	175					
02L1AA0520	Obtain SO's consent for design (DDA)	2	0	0				02NOV08	0	175					
Temporary Platform for Pipe Piling															
02L1AA0602	Design preparation by the Designer	2	0	11			21JUL08A	23AUG08A	100						
02L1AA0603	Design submission for the DC's approval	1	0	1			01AUG08A	25AUG08A	100						
02L1AA0604	Design certification by the Design Checker	2	0	21			02AUG08A	26AUG08A	100						
02L1AA0606	Design submission for the SO's approval	1	0	1			08AUG08A	28AUG08	0	112					
02L1AA0608	Design review by the SO	2	0	28			09AUG08A	25SEP08	0	138					
02L1AA0610	Obtain design approval from the SO	2	0	0				25SEP08	0	138					
Overhead Gantry For Retrieval of TBM															
02L1AA0702	Design preparation by the Designer	2	0	15			26SEP08	10OCT08	0	154					
02L1AA0703	Design submission for the DC's approval	1	0	1			11OCT08	11OCT08	0	126					
02L1AA0704	Design certification by the Design Checker	2	0	28			12OCT08	08NOV08	0	155					
02L1AA0706	Design submission for the SO's approval	1	0	1			11OCT08	11OCT08	0	126					
02L1AA0708	Design review by the SO	2	0	42			12OCT08	22NOV08	0	155					
02L1AA0710	Obtain design approval from the SO	2	0	0				22NOV08	0	155					
Temporary Drainage Management Plan for Portion A															
02L1AA0802	TDMP preparation by the Designer	2	0	28			18AUG08A	14SEP08	36	605					
02L1AA0804	TDMP submission for the DC's approval	1	0	1			16SEP08	16SEP08	0	493					
02L1AA0806	TDMP certification by the Design Checker	2	0	28			17SEP08	14OCT08	0	610					
02L1AA0808	TDMP submission for the SO's approval	1	0	1			16SEP08	16SEP08	0	488					
02L1AA0810	TDMP review by the SO	2	0	90			17SEP08	15DEC08	0	604					
02L1AA0812	TDMP submission for DSD's approval	1	0	1			16SEP08	16SEP08	0	488					
02L1AA0814	TDMP review by the DSD	2	0	90			17SEP08	15DEC08	0	604					
02L1AA0816	Obtain DSD's approval for DDA	1	0	1			16DEC08	16DEC08	0	487					
02L1AA0818	Obtain SO's consent for TDMP	2	0	0				16DEC08	0	604					
Geotechnical Instrumentation Stg 1 for GL Works															
3DL1AAG102	Design preparation by the Designer	2	0	14			22FEB08A	28APR08A	100						
3DL1AAG104	Design certification by the Design Checker	2	0	7			29APR08A	16JUN08A	100						
3DL1AAG106	Design submission for the SO's approval	1	0	1			10MAY08A	10MAY08A	100						
3DL1AAG108	Design review by the SO	2	0	14			12MAY08A	28AUG08	93	161					
3DL1AAG110	Obtain design approval from the SO	2	0	0				28AUG08	0	161					
3DL1AAG112	Install Geotechnical Instruments	1	0	6			26MAY08A	26MAY08A	100						
3DL1AAG114	Baseline Monitoring	2	0	14			27MAY08A	31MAY08A	100						
Geotechnical Instrumentation Stg 2 for Deep Exc.															
3DL1AAG210	Obtain design approval from the SO	2	0	0				28AUG08	0	161					
3DL1AAG212	Install Geotechnical Instruments	1	0	28			07AUG08A	04OCT08	64	109					
3DL1AAG214	Baseline Monitoring	2	0	3			05OCT08	07OCT08	0	136					
3DL1AAG216	Monitor/report Geotechnical Instrumentation	2	0	1,643			02JUN08A	30NOV12	5	0					

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012												
Design Packages for Works in Portion B																											
Piling Platform to Construct H-pile Wall																											
02L1BB0202	Design preparation by the Designer	2	0	15			24MAR08A	09MAY08A	100																		
02L1BB0204	Design certification by the Design Checker	2	0	14			10MAY08A	08AUG08A	100																		
02L1BB0206	Design submission for the SO's approval	1	0	1			21MAY08A	08AUG08A	100																		
02L1BB0208	Design review by the SO	2	0	21			22MAY08A	28AUG08	95	-51																	
02L1BB0210	Obtain design approval from the SO	2	0	0				28AUG08	0	-51																	
Temp. Platform to Construct Air Vent/Drop Shafts																											
02L1BB0302	Design preparation by the Designer	2	15	22	07MAR08	21MAR08	04AUG08A	26AUG08A	100																		
02L1BB0303	Design submission for the DC's approval	1	0	1			27AUG08A	27AUG08A	100																		
02L1BB0304	Design certification by the Design Checker	2	15	30	22MAR08	05APR08	28AUG08	26SEP08	0	28																	
02L1BB0306	Design submission for the SO's approval	1	1	1	07APR08	07APR08	27SEP08	27SEP08	0	22																	
02L1BB0308	Design review by the SO	2	28	28	08APR08	05MAY08	28SEP08	25OCT08	0	29																	
02L1BB0310	Obtain design approval from the SO	2	0	0		05MAY08		25OCT08	0	29																	
Temporary Drainage Management Plan																											
02L1BB0402	TDMP preparation by the Designer	2	15	14	22MAR08	05APR08	05MAY08A	04AUG08A	100																		
02L1BB0403	TDMP submission for the DC's approval	1	0	1			05AUG08A	05AUG08A	100																		
02L1BB0404	TDMP certification by the Design Checker	2	15	28	06APR08	20APR08	06AUG08A	07SEP08	50	86																	
02L1BB0406	TDMP submission for the SO's approval	1	1	1	21APR08	21APR08	28AUG08	28AUG08	0	50																	
02L1BB0408	TDMP review by the SO	2	28	90	22APR08	19MAY08	29AUG08	26NOV08	0	62																	
02L1BB0410	TDMP submission for DSD's approval	1	0	1		19MAY08	28AUG08	28AUG08	0	47																	
02L1BB0412	TDMP review by the DSD	2	0	90			29AUG08	26NOV08	0	58																	
02L1BB0414	Obtain DSD's approval for DDA	1	0	1			27NOV08	27NOV08	0	47																	
02L1BB0416	Obtain SO's consent for TDMP	2	0	0				27NOV08	0	62																	
Temp. Support Design for MAA/MAS/VDS/DC/AVS																											
02L1BB0502	Design preparation for the AIP submission	2	30	30	07MAR08	05APR08	02JUN08A	10JUL08A	100																		
02L1BB0503	Design (AIP) submission for the DC's approval	1	0	1			11JUL08A	11JUL08A	100																		
02L1BB0504	Design (AIP) certification by the Design Checker	2	15	60	06APR08	20APR08	12JUL08A	26SEP08	50	-43																	
02L1BB0506	Design (AIP) submission for the SO's approval	1	1	1	21APR08	21APR08	24JUL08A	24JUL08A	100																		
02L1BB0508	Design (AIP) review by the SO	2	60	66	22APR08	20JUN08	25JUL08A	03NOV08	39	-43																	
02L1BB0510	AIP submission for rel. authorities' approval	1	0	1		20JUN08	12JUL08A	12JUL08A	100																		
02L1BB0512	Design (AIP) review by the rel. authorities	2	1	28	21JUN08	21JUN08	14JUL08A	10SEP08	50	9																	
02L1BB0514	Obtain rel. authorities's approval for AIP	1	15	1	22JUN08	06JUL08	11SEP08	11SEP08	0	7																	
02L1BB0516	SO submit design (AIP) for approval of GEO	1	1	1	07JUL08	07JUL08	04OCT08	04OCT08	0	-34																	
02L1BB0518	Design (AIP) review/approval by the GEO	2	0	28		08JUL08	05OCT08	01NOV08	0	-41																	
02L1BB0520	Obtain SO's consent for design (AIP)	2	30	0	16JUN08	15JUL08		04NOV08	0	-43																	
02L1BB0522	Design preparation for the DDA submission	2	15	30	16JUL08	30JUL08	13OCT08	11NOV08	0	37																	
02L1BB0523	Design (DDA) submission for the DC's approval	1	0	1			12NOV08	12NOV08	0	32																	
02L1BB0524	Design (DDA) certification by the Design Checker	2	1	28	31JUL08	31JUL08	13NOV08	10DEC08	0	37																	
02L1BB0526	Design (DDA) submission for the SO's approval	1	60	1	01AUG08	29SEP08	12NOV08	12NOV08	0	33																	

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
02L1BB0528	Design (DDA) review by the SO	2	0	66		29SEP08	13NOV08	17JAN09	0	38						
02L1BB0530	DDA submission for rel. authorities' approval	1	1	1	30SEP08	30SEP08	19NOV08	19NOV08	0	54						
02L1BB0532	Design (DDA) review by the rel. authorities	2	28	28	01OCT08	28OCT08	20NOV08	17DEC08	0	69						
02L1BB0534	Obtain rel. authorities's approval for DDA	1	1	1	29OCT08	29OCT08	18DEC08	18DEC08	0	53						
02L1BB0536	SO submit design (DDA) for approval of GEO	1	0	1		30OCT08	18DEC08	18DEC08	0	29						
02L1BB0538	Design (DDA) review/approval by the GEO	2	0	28			19DEC08	15JAN09	0	40						
02L1BB0540	Obtain SO's consent for design (DDA)	2	0	0				18JAN09	0	38						
Temp. Support Design for MA and MA/MT Connection																
02L1BB0602	Design preparation for the AIP submission	2	30	110	21APR08	20MAY08	09JUN08A	26SEP08	73	704						
02L1BB0603	Design (AIP) submission for the DC's approval	1	0	1			27SEP08	27SEP08	0	572						
02L1BB0604	Design (AIP) certification by the Design Checker	2	15	28	21MAY08	04JUN08	28SEP08	25OCT08	0	706						
02L1BB0606	Design (AIP) submission for the SO's approval	1	1	1	05JUN08	05JUN08	27SEP08	27SEP08	0	570						
02L1BB0608	Design (AIP) review by the SO	2	60	66	06JUN08	04AUG08	28SEP08	02DEC08	0	704						
02L1BB0610	AIP submission for rel. authorities' approval	1	0	1		04AUG08	04OCT08	04OCT08	0	594						
02L1BB0612	Design (AIP) review by the rel. authorities	2	1	28	05AUG08	05AUG08	05OCT08	01NOV08	0	733						
02L1BB0614	Obtain rel. authorities's approval for AIP	1	15	1	06AUG08	20AUG08	03NOV08	03NOV08	0	594						
02L1BB0616	SO submit design (AIP) for approval of GEO	1	1	1	21AUG08	21AUG08	03NOV08	03NOV08	0	572						
02L1BB0618	Design (AIP) review/approval by the GEO	2	0	28		22AUG08	04NOV08	01DEC08	0	705						
02L1BB0620	Obtain SO's consent for design (AIP)	2	30	0	31JUL08	29AUG08		03DEC08	0	704						
02L1BB0622	Design preparation for the DDA submission	2	15	30	30AUG08	13SEP08	11NOV08	10DEC08	0	704						
02L1BB0623	Design (DDA) submission for the DC's approval	1	0	1			11DEC08	11DEC08	0	571						
02L1BB0624	Design (DDA) certification by the Design Checker	2	1	28	16SEP08	16SEP08	12DEC08	08JAN09	0	706						
02L1BB0626	Design (DDA) submission for the SO's approval	1	60	1	17SEP08	15NOV08	11DEC08	11DEC08	0	569						
02L1BB0628	Design (DDA) review by the SO	2	0	66		15NOV08	12DEC08	15FEB09	0	704						
02L1BB0630	DDA submission for rel. authorities' approval	1	1	1	17NOV08	17NOV08	18DEC08	18DEC08	0	596						
02L1BB0632	Design (DDA) review by the rel. authorities	2	28	28	18NOV08	15DEC08	19DEC08	15JAN09	0	735						
02L1BB0634	Obtain rel. authorities's approval for DDA	1	1	1	16DEC08	16DEC08	16JAN09	16JAN09	0	596						
02L1BB0636	SO submit design (DDA) for approval of GEO	1	0	1		17DEC08	16JAN09	16JAN09	0	574						
02L1BB0638	Design (DDA) review/approval by the GEO	2	0	28			17JAN09	13FEB09	0	706						
02L1BB0640	Obtain SO's consent for design (DDA)	2	0	0				16FEB09	0	704						
Permanent Design for MAA/MAS/VDS/DC/AVS																
02L1BB0702	Design preparation for the AIP submission	2	30	30	21MAY08	19JUN08	02JUN08A	03JUL08A	100							
02L1BB0703	Design submission for the DC's approval	1	0	1			23JUL08A	23JUL08A	100							
02L1BB0704	Design (AIP) certification by the Design Checker	2	15	60	20JUN08	04JUL08	24JUL08A	26SEP08	50	586						
02L1BB0706	Design (AIP) submission for the SO's approval	1	1	1	05JUL08	05JUL08	04JUL08A	04JUL08A	100							
02L1BB0708	Design (AIP) review by the SO	2	60	66	06JUL08	03SEP08	05JUL08A	01NOV08	50	586						
02L1BB0710	AIP submission for rel. authorities' approval	1	0	1		03SEP08	03JUL08A	03JUL08A	100							
02L1BB0712	Design (AIP) review by the rel. authorities	2	1	28	04SEP08	04SEP08	04JUL08A	03OCT08	50	614						
02L1BB0714	Obtain rel. authorities's approval for AIP	1	15	1	05SEP08	19SEP08	04OCT08	04OCT08	0	496						
02L1BB0716	SO submit design (AIP) for approval of GEO	1	1	1	20SEP08	20SEP08	04OCT08	04OCT08	0	473						
02L1BB0718	Design (AIP) review/approval by the GEO	2	0	28		22SEP08	05OCT08	01NOV08	0	586						

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
02L1BB0720	Obtain SO's consent for design (AIP)	2	30	0	31AUG08	29SEP08		02NOV08	0	586						
02L1BB0722	Design preparation for the DDA submission	2	15	30	30SEP08	14OCT08	11OCT08	09NOV08	0	586						
02L1BB0723	Design submission for the DC's approval	1	0	1			10NOV08	10NOV08	0	474						
02L1BB0724	Design (DDA) certification by the Design Checker	2	1	28	15OCT08	15OCT08	11NOV08	08DEC08	0	588						
02L1BB0726	Design (DDA) submission for the SO's approval	1	60	1	16OCT08	14DEC08	10NOV08	10NOV08	0	473						
02L1BB0728	Design (DDA) review by the SO	2	0	66		14DEC08	11NOV08	15JAN09	0	586						
02L1BB0730	DDA submission for rel. authorities' approval	1	1	1	15DEC08	15DEC08	10NOV08	10NOV08	0	504						
02L1BB0732	Design (DDA) review by the rel. authorities	2	28	28	16DEC08	12JAN09	18NOV08	15DEC08	0	617						
02L1BB0734	Obtain rel. authorities's approval for DDA	1	1	1	13JAN09	13JAN09	16DEC08	16DEC08	0	498						
02L1BB0736	SO submit design (DDA) for approval of GEO	1	0	1		14JAN09	16DEC08	16DEC08	0	473						
02L1BB0738	Design (DDA) review/approval by the GEO	2	0	28			17DEC08	13JAN09	0	588						
02L1BB0740	Obtain SO's consent for design (DDA)	2	0	0				16JAN09	0	586						
Permanent Design for MA and MA/MT Connection																
02L1BB0802	Design preparation for AIP submission	2	30	90	20JUN08	19JUL08	09JUN08A	12OCT08	49	400						
02L1BB0803	Design (AIP) submission for the DC's approval	1	0	1			13OCT08	13OCT08	0	326						
02L1BB0804	Design (AIP) certification by the Design Checker	2	15	28	20JUL08	03AUG08	24JUL08A	28OCT08	50	400						
02L1BB0806	Design (AIP) submission for the SO's approval	1	1	2	04AUG08	04AUG08	25JUL08A	13OCT08	50	342						
02L1BB0808	Design (AIP) review by the SO	2	60	66	05AUG08	03OCT08	26JUL08A	03DEC08	50	400						
02L1BB0810	AIP submission for rel. authorities' approval	1	0	1		03OCT08	25JUL08A	07AUG08A	100							
02L1BB0812	Design (AIP) review by the rel. authorities	2	1	28	04OCT08	04OCT08	26JUL08A	04NOV08	50	428						
02L1BB0814	Obtain rel. authorities's approval for AIP	1	15	1	05OCT08	19OCT08	05NOV08	05NOV08	0	347						
02L1BB0816	SO submit design (AIP) for approval of GEO	1	1	1	20OCT08	20OCT08	05NOV08	05NOV08	0	326						
02L1BB0818	Design (AIP) review/approval by the GEO	2	0	28		21OCT08	06NOV08	03DEC08	0	400						
02L1BB0820	Obtain SO's consent for design (AIP)	2	30	0	29SEP08	28OCT08		04DEC08	0	400						
02L1BB0822	Design preparation for the DDA submission	2	15	30	29OCT08	12NOV08	12NOV08	11DEC08	0	400						
02L1BB0823	Design (DDA) submission for the DC's approval	1	0	1			12DEC08	12DEC08	0	325						
02L1BB0824	Design (DDA) certification by the Design Checker	2	1	28	13NOV08	13NOV08	13DEC08	09JAN09	0	403						
02L1BB0826	Design (DDA) submission for the SO's approval	1	60	1	14NOV08	12JAN09	12DEC08	12DEC08	0	323						
02L1BB0828	Design (DDA) review by the SO	2	0	66		12JAN09	13DEC08	16FEB09	0	401						
02L1BB0830	DDA submission for rel. authorities' approval	1	1	1	13JAN09	13JAN09	12DEC08	12DEC08	0	353						
02L1BB0832	Design (DDA) review by the rel. authorities	2	28	28	14JAN09	10FEB09	20DEC08	16JAN09	0	432						
02L1BB0834	Obtain rel. authorities's approval for DDA	1	1	1	11FEB09	11FEB09	17JAN09	17JAN09	0	350						
02L1BB0836	SO submit design (DDA) for approval of GEO	1	0	1		12FEB09	17JAN09	17JAN09	0	325						
02L1BB0838	Design (DDA) review/approval by the GEO	2	0	28			18JAN09	14FEB09	0	403						
02L1BB0840	Obtain SO's consent for design (DDA)	2	0	0				17FEB09	0	401						
ELS for Perm. Approach Channel Construction																
02L1BB0902	Design preparation by the Designer	2	15	14	06APR08	20APR08	02OCT08*	15OCT08	0	41						
02L1BB0903	Design submission for the DC's approval	1	0	1			16OCT08	16OCT08	0	35						
02L1BB0904	Design certification by the Design Checker	2	15	28	21APR08	05MAY08	17OCT08	13NOV08	0	41						
02L1BB0906	Design submission for the SO's approval	1	1	1	06MAY08	06MAY08	16OCT08	16OCT08	0	35						
02L1BB0908	Design review by the SO	2	21	42	07MAY08	27MAY08	17OCT08	27NOV08	0	41						

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012
02L1BB0910	Obtain design approval from the SO	2	0	0		27MAY08		27NOV08	0	41					
Geotechnical Instrumentation Stg 1 for GL Works															
3DL1BBG102	Design preparation by the Designer	2	0	14			22FEB08A	05MAY08A	100						
3DL1BBG104	Design certification by the Design Checker	2	0	7			06MAY08A	29AUG08	75	-42					
3DL1BBG106	Design submission for the SO's approval	1	0	1			10MAY08A	10MAY08A	100						
3DL1BBG108	Design review by the SO	2	0	14			12MAY08A	14JUL08A	100						
3DL1BBG110	Obtain design approval from the SO	2	0	0				14JUL08A	100						
3DL1BBG112	Install Geotechnical Instruments	1	0	6			11JUN08A	19JUL08A	100						
3DL1BBG114	Baseline Monitoring	2	0	14			21JUL08A	26JUL08A	100						
Geotechnical Instrumentation Stg 2 for Deep Exc.															
3DL1BBG202	Design preparation by the Designer	2	0	40			31AUG08	09OCT08	0	-42					
3DL1BBG204	Design certification by the Design Checker	2	0	14			10OCT08	23OCT08	0	-42					
3DL1BBG206	Design submission for the SO's approval	1	0	1			10OCT08	10OCT08	0	-33					
3DL1BBG208	Design review by the SO	2	0	28			11OCT08	07NOV08	0	-42					
3DL1BBG210	Obtain design approval from the SO	2	0	0				07NOV08	0	-42					
3DL1BBG212	Install Geotechnical Instruments	1	0	18			08NOV08	28NOV08	0	-34					
3DL1BBG214	Baseline Monitoring	2	0	14			29NOV08	12DEC08	0	-39					
3DL1BBG216	Monitor/report Geotechnical Instrumentation	2	0	1,587			28JUL08A	30NOV12	2	0					
Design Packages for Works in Portion C															
Piling Platform for H-pile Wall A															
02L1CC0002	Design preparation by the Designer	2	0	15			12MAY08A	27JUN08A	100						
02L1CC0004	Design certification by the Design Checker	2	0	14			22MAY08A	03JUL08A	100						
02L1CC0006	Design submission for the SO's approval	1	0	1			04JUL08A	04JUL08A	100						
02L1CC0008	Design review by the SO	2	0	14			05JUL08A	29JUL08A	100						
02L1CC0010	Obtain design approval from the SO	2	0	0				29JUL08A	100						
Design for Temp. Access Road to Wall B															
02L1CC0102	Design preparation by the Designer	2	15	40	08FEB08	22FEB08	02OCT08*	03NOV08	18	714					
02L1CC0103	Design submission for the DC's approval	1	0	1			04NOV08	04NOV08	0	591					
02L1CC0104	Design certification by the Design Checker	2	15	28	23FEB08	08MAR08	05NOV08	02DEC08	0	729					
02L1CC0106	Design submission for the SO's approval	1	1	1	10MAR08	10MAR08	04NOV08	04NOV08	0	591					
02L1CC0108	Design review by the SO	2	28	42	11MAR08	07APR08	05NOV08	16DEC08	0	729					
02L1CC0110	Obtain design approval from the SO	2	0	0		07APR08		16DEC08	0	729					
Piling Platform for H-pile Wall B															
02L1CC0202	Design preparation by the Designer	2	0	15			04NOV08	18NOV08*	0	714					
02L1CC0203	Design submission for the DC's approval	1	0	1			19NOV08	19NOV08	0	578					
02L1CC0204	Design certification by the Design Checker	2	0	28			20NOV08	17DEC08	0	714					
02L1CC0206	Design submission for the SO's approval	1	0	1			19NOV08	19NOV08	0	578					
02L1CC0208	Design review by the SO	2	0	42			20NOV08	31DEC08	0	714					
02L1CC0210	Obtain design approval from the SO	2	0	0				31DEC08	0	714					

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012		
Temp. Support Design for MAA/MAS/VDS/DC/AVS																	
02L1CC0302	Design preparation for the AIP submission	2	30	103	09MAR08	07APR08	26JUN08A	06OCT08	61	213							
02L1CC0303	Design (AIP) submission for the DC's approval	1	0	1			08OCT08	08OCT08	0	171							
02L1CC0304	Design (AIP) certification by the Design Checker	2	15	28	08APR08	22APR08	09OCT08	05NOV08	0	214							
02L1CC0306	Design (AIP) submission for the SO's approval	1	1	1	23APR08	23APR08	08OCT08	08OCT08	0	170							
02L1CC0308	Design (AIP) review by the SO	2	60	66	24APR08	22JUN08	09OCT08	13DEC08	0	212							
02L1CC0310	AIP submission for rel. authorities' approval	1	0	1		22JUN08	08OCT08	08OCT08	0	200							
02L1CC0312	Design (AIP) review by the rel. authorities	2	1	28	23JUN08	23JUN08	16OCT08	12NOV08	0	242							
02L1CC0314	Obtain rel. authorities's approval for AIP	1	15	1	24JUN08	08JUL08	13NOV08	13NOV08	0	193							
02L1CC0316	SO submit design (AIP) for approval of GEO	1	1	1	09JUL08	09JUL08	13NOV08	13NOV08	0	170							
02L1CC0318	Design (AIP) review/approval by the GEO	2	0	28		10JUL08	14NOV08	11DEC08	0	214							
02L1CC0320	Obtain SO's consent for design (AIP)	2	30	0	18JUN08	17JUL08		14DEC08	0	212							
02L1CC0322	Design preparation for the DDA submission	2	15	30	18JUL08	01AUG08	22NOV08	21DEC08	0	212							
02L1CC0323	Design (DDA) submission for the DC's approval	1	0	1			22DEC08	22DEC08	0	170							
02L1CC0324	Design (DDA) certification by the Design Checker	2	1	28	02AUG08	02AUG08	23DEC08	19JAN09	0	214							
02L1CC0326	Design (DDA) submission for the SO's approval	1	60	1	03AUG08	01OCT08	22DEC08	22DEC08	0	168							
02L1CC0328	Design (DDA) review by the SO	2	0	66		01OCT08	23DEC08	26FEB09	0	212							
02L1CC0330	DDA submission for rel. authorities' approval	1	1	1	02OCT08	02OCT08	22DEC08	22DEC08	0	200							
02L1CC0332	Design (DDA) review by the rel. authorities	2	28	28	03OCT08	30OCT08	30DEC08	26JAN09	0	242							
02L1CC0334	Obtain rel. authorities's approval for DDA	1	1	1	31OCT08	31OCT08	29JAN09	29JAN09	0	198							
02L1CC0336	SO submit design (DDA) for approval of GEO	1	0	1		01NOV08	29JAN09	29JAN09	0	174							
02L1CC0338	Design (DDA) review/approval by the GEO	2	0	28			30JAN09	26FEB09	0	212							
02L1CC0340	Obtain SO's consent for design (DDA)	2	0	0				27FEB09	0	212							
Temp. Support Design for MA and MA/MT Connection																	
02L1CC0402	Design preparation for the AIP submission	2	30	30	08MAY08	06JUN08	18AUG08A	18OCT08	20	514							
02L1CC0403	Design (AIP) submission for the DC's approval	1	0	1			20OCT08	20OCT08	0	419							
02L1CC0404	Design (AIP) certification by the Design Checker	2	15	28	07JUN08	21JUN08	21OCT08	17NOV08	0	515							
02L1CC0406	Design (AIP) submission for the SO's approval	1	1	1	23JUN08	23JUN08	20OCT08	20OCT08	0	417							
02L1CC0408	Design (AIP) review by the SO	2	60	66	24JUN08	22AUG08	21OCT08	25DEC08	0	513							
02L1CC0410	AIP submission for rel. authorities' approval	1	0	1		22AUG08	27OCT08	27OCT08	0	437							
02L1CC0412	Design (AIP) review by the rel. authorities	2	1	28	23AUG08	23AUG08	28OCT08	24NOV08	0	541							
02L1CC0414	Obtain rel. authorities's approval for AIP	1	15	1	24AUG08	07SEP08	25NOV08	25NOV08	0	436							
02L1CC0416	SO submit design (AIP) for approval of GEO	1	1	1	08SEP08	08SEP08	25NOV08	25NOV08	0	415							
02L1CC0418	Design (AIP) review/approval by the GEO	2	0	28		09SEP08	26NOV08	23DEC08	0	515							
02L1CC0420	Obtain SO's consent for design (AIP)	2	30	0	18AUG08	16SEP08		26DEC08	0	513							
02L1CC0422	Design preparation for the DDA submission	2	15	30	17SEP08	01OCT08	04DEC08	02JAN09	0	513							
02L1CC0423	Design submission for the DC's approval	1	0	1			03JAN09	03JAN09	0	415							
02L1CC0424	Design (DDA) certification by the Design Checker	2	1	28	02OCT08	02OCT08	04JAN09	31JAN09	0	515							
02L1CC0426	Design (DDA) submission for the SO's approval	1	60	1	03OCT08	01DEC08	03JAN09	03JAN09	0	413							
02L1CC0428	Design (DDA) review by the SO	2	0	66		01DEC08	04JAN09	10MAR09	0	513							
02L1CC0430	DDA submission for rel. authorities' approval	1	1	1	02DEC08	02DEC08	10JAN09	10JAN09	0	437							

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
02L1CC0432	Design (DDA) review by the rel. authorities	2	28	28	03DEC08	30DEC08	11JAN09	07FEB09	0	543						
02L1CC0434	Obtain rel. authorities's approval for DDA	1	1	1	31DEC08	31DEC08	09FEB09	09FEB09	0	440						
02L1CC0436	SO submit design (DDA) for approval of GEO	1	0	1		02JAN09	09FEB09	09FEB09	0	416						
02L1CC0438	Design (DDA) review/approval by the GEO	2	0	28			10FEB09	09MAR09	0	514						
02L1CC0440	Obtain SO's consent for design (DDA)	2	0	0				10MAR09	0	513						
Permanent Design for MAA/MAS/VDS/DC/AVS																
02L1CC0502	Design preparation for the AIP submission	2	30	103	08APR08	07MAY08	26JUN08A	06OCT08	61	650						
02L1CC0503	Design submission for the DC's approval	1	0	1			08OCT08	08OCT08	0	527						
02L1CC0504	Design (AIP) certification by the Design Checker	2	15	28	08MAY08	22MAY08	09OCT08	05NOV08	0	651						
02L1CC0506	Design (AIP) submission for the SO's approval	1	1	1	23MAY08	23MAY08	08OCT08	08OCT08	0	525						
02L1CC0508	Design (AIP) review by the SO	2	60	66	24MAY08	22JUL08	09OCT08	13DEC08	0	649						
02L1CC0510	AIP submission for rel. authorities' approval	1	0	1		22JUL08	15OCT08	15OCT08	0	550						
02L1CC0512	Design (AIP) review by the rel. authorities	2	1	28	23JUL08	23JUL08	16OCT08	12NOV08	0	678						
02L1CC0514	Obtain rel. authorities's approval for AIP	1	15	1	24JUL08	07AUG08	13NOV08	13NOV08	0	550						
02L1CC0516	SO submit design (AIP) for approval of GEO	1	1	1	08AUG08	08AUG08	13NOV08	13NOV08	0	527						
02L1CC0518	Design (AIP) review/approval by the GEO	2	0	28		09AUG08	14NOV08	11DEC08	0	651						
02L1CC0520	Obtain SO's consent for design (AIP)	2	30	0	18JUL08	16AUG08		14DEC08	0	649						
02L1CC0522	Design preparation for the DDA submission	2	15	30	17AUG08	31AUG08	22NOV08	21DEC08	0	649						
02L1CC0523	Design submission for the DC's approval	1	0	1			22DEC08	22DEC08	0	526						
02L1CC0524	Design (DDA) certification by the Design Checker	2	1	28	01SEP08	01SEP08	23DEC08	19JAN09	0	652						
02L1CC0526	Design (DDA) submission for the SO's approval	1	60	1	02SEP08	31OCT08	22DEC08	22DEC08	0	524						
02L1CC0528	Design (DDA) review by the SO	2	0	66		31OCT08	23DEC08	26FEB09	0	650						
02L1CC0530	DDA submission for rel. authorities' approval	1	1	1	01NOV08	01NOV08	29DEC08	29DEC08	0	552						
02L1CC0532	Design (DDA) review by the rel. authorities	2	28	28	02NOV08	29NOV08	30DEC08	26JAN09	0	681						
02L1CC0534	Obtain rel. authorities's approval for DDA	1	1	1	01DEC08	01DEC08	29JAN09	29JAN09	0	554						
02L1CC0536	SO submit design (DDA) for approval of GEO	1	0	1		02DEC08	29JAN09	29JAN09	0	529						
02L1CC0538	Design (DDA) review/approval by the GEO	2	0	28			30JAN09	26FEB09	0	650						
02L1CC0540	Obtain SO's consent for design (DDA)	2	0	0				27FEB09	0	650						
Permanent Design for MA and MA/MT Connection																
02L1CC0602	Design preparation for the AIP submission	2	30	84	07JUN08	06JUL08	01JUL08A	26OCT08	29	750						
02L1CC0603	Design (AIP) submission for the DC's approval	1	0	1					100							
02L1CC0604	Design (AIP) certification by the Design Checker	2	15	28	07JUL08	21JUL08	26JUL08A	10NOV08	50	750						
02L1CC0606	Design (AIP) submission for the SO's approval	1	1	1	22JUL08	22JUL08	26JUL08A	26JUL08A	100							
02L1CC0608	Design (AIP) review by the SO	2	60	66	23JUL08	20SEP08	28JUL08A	16DEC08	47	750						
02L1CC0610	AIP submission for rel. authorities' approval	1	0	1		20SEP08	25JUL08A	08AUG08A	100							
02L1CC0612	Design (AIP) review by the rel. authorities	2	1	28	22SEP08	22SEP08	26JUL08A	17NOV08	50	778						
02L1CC0614	Obtain rel. authorities's approval for AIP	1	15	1	23SEP08	07OCT08	18NOV08	18NOV08	0	630						
02L1CC0616	SO submit design (AIP) for approval of GEO	1	1	1	08OCT08	08OCT08	18NOV08	18NOV08	0	609						
02L1CC0618	Design (AIP) review/approval by the GEO	2	0	28		09OCT08	19NOV08	16DEC08	0	750						
02L1CC0620	Obtain SO's consent for design (AIP)	2	30	0	17SEP08	16OCT08		17DEC08	0	750						
02L1CC0622	Design preparation for the DDA submission	2	15	30	17OCT08	31OCT08	25NOV08	24DEC08	0	750						

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
02L1CC0623	Design (DDA) submission for the DC's approval	1	0	1			27DEC08	27DEC08	0	607						
02L1CC0624	Design (DDA) certification by the Design Checker	2	1	28	01NOV08	01NOV08	28DEC08	24JAN09	0	750						
02L1CC0626	Design (DDA) submission for the SO's approval	1	60	1	02NOV08	31DEC08	27DEC08	27DEC08	0	606						
02L1CC0628	Design (DDA) review by the SO	2	0	66		31DEC08	28DEC08	03MAR09	0	748						
02L1CC0630	DDA submission for rel. authorities' approval	1	1	1	02JAN09	02JAN09	03JAN09	03JAN09	0	630						
02L1CC0632	Design (DDA) review by the rel. authorities	2	28	28	03JAN09	30JAN09	04JAN09	31JAN09	0	779						
02L1CC0634	Obtain rel. authorities's approval for DDA	1	1	1	31JAN09	31JAN09	02FEB09	02FEB09	0	633						
02L1CC0636	SO submit design (DDA) for approval of GEO	1	0	1		02FEB09	02FEB09	02FEB09	0	608						
02L1CC0638	Design (DDA) review/approval by the GEO	2	0	28			03FEB09	02MAR09	0	749						
02L1CC0640	Obtain SO's consent for design (DDA)	2	0	0				04MAR09	0	748						
Boulder Assessment & Design for Stabili. Measure																
02L1CC0702	Boulder Surevey	1	15	30	23FEB08	08MAR08	02JUN08A	15AUG08A	100							
02L1CC0704	Prepare/submit boulder surevey report	1	15	25	09MAR08	23MAR08	14JUL08A	05SEP08	68	163						
02L1CC0706	SO review boulder survey report	2	1	14	25MAR08	25MAR08	06SEP08	19SEP08	0	201						
Temporary Drainage Management Plan																
02L1CC0802	TDMP preparation by the Designer	2	0	14			04AUG08A	03SEP08	50	210						
02L1CC0803	TDMP submission for the DC's approval	1	0	1			04SEP08	04SEP08	0	171						
02L1CC0804	TDMP certification by the Design Checker	2	0	28			05SEP08	02OCT08	0	210						
02L1CC0806	TDMP submission for the SO's approval	1	0	1			04SEP08	04SEP08	0	171						
02L1CC0808	TDMP review by the SO	2	0	90			05SEP08	03DEC08	0	210						
02L1CC0810	TDMP submission for DSD's approval	1	0	1			04SEP08	04SEP08	0	171						
02L1CC0812	TDMP review by the DSD	2	0	90			05SEP08	03DEC08	0	210						
02L1CC0814	Obtain DSD's approval for DDA	1	0	1			04DEC08	04DEC08	0	166						
02L1CC0816	Obtain SO's consent for TDMP	2	0	0				04DEC08	0	210						
ELS for Permanent Approach Channel Construction																
02L1CC0902	Design preparation by the Designer	2	0	15			03NOV08*	17NOV08	0	643						
02L1CC0903	Design submission for the DC's approval	1	0	1			18NOV08	18NOV08	0	520						
02L1CC0904	Design certification by the Design Checker	2	0	28			19NOV08	16DEC08	0	643						
02L1CC0906	Design submission for the SO's approval	1	0	1			18NOV08	18NOV08	0	520						
02L1CC0908	Design review by the SO	2	0	42			19NOV08	30DEC08	0	643						
02L1CC0910	Obtain design approval from the SO	2	0	0				30DEC08	0	643						
Geotechnical Instrumentation Stg 1 for GL Works																
3DL1CCG102	Design preparation by the Designer	2	0	14			22FEB08A	29APR08A	100							
3DL1CCG104	Design certification by the Design Checker	2	0	7			30APR08A	26MAY08A	100							
3DL1CCG106	Design submission for the SO's approval	1	0	1			10MAY08A	26MAY08A	100							
3DL1CCG108	Design review by the SO	2	0	14			12MAY08A	14JUL08A	100							
3DL1CCG110	Obtain design approval from the SO	2	0	0				14JUL08A	100							
3DL1CCG112	Install Geotechnical Instruments	1	0	19			24JUN08A	09AUG08A	100							
3DL1CCG114	Baseline Monitoring	2	0	14			26JUL08A	16AUG08A	100							
Geotechnical Instrumentation Stg 2 for Deep Exc.																
3DL1CCG202	Design preparation by the Designer	2	0	60			28AUG08	26OCT08	0	256						

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
3DL1CCG204	Design certification by the Design Checker	2	0	14			27OCT08	09NOV08	0	256						
3DL1CCG206	Design submission for the SO's approval	1	0	1			10NOV08	10NOV08	0	206						
3DL1CCG210	Design review by the SO	2	0	28			11NOV08	08DEC08	0	256						
3DL1CCG212	Obtain design approval from the SO	2	0	0				08DEC08	0	256						
3DL1CCG214	Install Geotechnical Instruments	1	0	18			09DEC08	31DEC08	0	206						
3DL1CCG216	Baseline Monitoring	2	0	14			01JAN09	14JAN09	0	254						
3DL1CCG218	Monitor/report Geotechnical Instrumentation	2	0	1,566			18AUG08A	30NOV12	1	0						
Design Packages for Works in Portion D																
Temp. Access Rd Design at P. D; +14mPD to +69mPD																
02L1DD0102	Design preparation by the Designer	2	14	14	17JAN08	30JAN08	17JAN08A	16APR08A	100							
02L1DD0104	Design certification by the Design Checker	2	14	150	01FEB08	14FEB08	17APR08A	13SEP08	89	-90						
02L1DD0106	Design submission for the SO's approval	1	1	2	15FEB08	15FEB08	25APR08A	16SEP08	50	-77						
02L1DD0108	Design review by the SO	2	28	90	16FEB08	14MAR08	26APR08A	14OCT08	83	-92						
02L1DD0110	Design review by GEO	2	0	28		14MAR08	17SEP08	14OCT08	0	-92						
02L1DD0112	Obtain design approval from the SO	2	0	0				14OCT08	0	-92						
Boulder Assessment & Design for Stabili. Measure																
02L1DD0302	Boulder Surevey	1	15	14	31JAN08	14FEB08	03APR08A	11APR08A	100							
02L1DD0304	Prepare/submit boulder surevey report	1	14	25	15FEB08	28FEB08	12APR08A	26MAY08A	100							
02L1DD0306	SO review boulder survey report	2	1	14	29FEB08	29FEB08	27MAY08A	16JUN08A	100							
Site Formation Design; +69mPD to +40mPD																
02L1DD0402	Design preparation by the Designer	2	14	14	17JAN08	30JAN08	17JAN08A	16APR08A	100							
02L1DD0404	Design certification by the Design Checker	2	14	150	27JAN08	09FEB08	17APR08A	13SEP08	89	-17						
02L1DD0406	Design submission for the SO's approval	1	1	2	11FEB08	11FEB08	25APR08A	16SEP08	50	-15						
02L1DD0408	Design review by the SO	2	14	90	12FEB08	25FEB08	26APR08A	14OCT08	83	-19						
02L1DD0410	Design review by GEO	2	0	28		25FEB08	17SEP08	14OCT08	0	-19						
02L1DD0412	Obtain design approval from the SO	2	1	0	26FEB08	26FEB08		14OCT08	0	-19						
Site Formation Design; +40mPD to +24mPD																
02L1DD0502	Design preparation by the Designer	2	14	14	15FEB08	28FEB08	14APR08A	03MAY08A	100							
02L1DD0504	Design certification by the Design Checker	2	14	145	29FEB08	13MAR08	05MAY08A	26SEP08	79	-29						
02L1DD0506	Design submission for the SO's approval	1	1	2	14MAR08	14MAR08	10MAY08A	26SEP08	50	-24						
02L1DD0508	Design review by the SO	2	14	90	15MAR08	28MAR08	12MAY08A	24OCT08	77	-29						
02L1DD0510	Design review by GEO	2	0	28		28MAR08	27SEP08	24OCT08	0	-29						
02L1DD0512	Obtain design approval from the SO	2	1	0	29MAR08	29MAR08		24OCT08	0	-29						
Site Formation Design; +24mPD to 14mPD																
02L1DD0602	Design preparation by the Designer	2	14	60	29FEB08	13MAR08	28AUG08	26OCT08	0	-18						
02L1DD0603	Design submission for the DC's approval	1	0	1			27OCT08	27OCT08	0	-15						
02L1DD0604	Design certification by the Design Checker	2	14	28	14MAR08	27MAR08	28OCT08	24NOV08	0	-18						
02L1DD0606	Design submission for the SO's approval	1	1	1	28MAR08	28MAR08	27OCT08	27OCT08	0	-15						
02L1DD0608	Design review by the SO	2	14	63	29MAR08	11APR08	28OCT08	29DEC08	0	-18						
02L1DD0610	Design review by GEO	2	0	28		11APR08	02DEC08	29DEC08	0	-18						

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
02L1DD0612	Obtain design approval from the SO	2	1	0	12APR08	12APR08		29DEC08	0	-18						
TBM Launching Chamber Design																
02L1DD0702	Design (AIP) preparation by the Designer	2	15	60	14MAR08	28MAR08	21APR08A	26JUL08A	100							
02L1DD0703	Design (AIP) submission for the DC's approval	1	0	1			28JUL08A	20AUG08A	100							
02L1DD0704	Design (AIP) certification by the Design Checker	2	15	37	29MAR08	12APR08	21AUG08A	03OCT08	0	-77						
02L1DD0706	Design (AIP) submission for the SO's approval	1	1	1	14APR08	14APR08	28JUL08A	28JUL08A	100							
02L1DD0708	Design (AIP) review by the SO	2	30	66	15APR08	14MAY08	29JUL08A	08NOV08	46	-77						
02L1DD0710	AIP submission for rel. authorities' approval	1	0	1		14MAY08	28AUG08	28AUG08	0	-28						
02L1DD0712	Design (AIP) review by the rel. authorities	2	1	28	15MAY08	15MAY08	13SEP08	10OCT08	0	-47						
02L1DD0714	Obtain rel. authorities's approval for AIP	1	28	0	16MAY08	12JUN08		10OCT08	0	-38						
02L1DD0716	SO submit Design (AIP) for approval of GEO	1	1	1	13JUN08	13JUN08	11OCT08	11OCT08	0	-63						
02L1DD0718	Design (AIP) review/approval by the GEO	2	0	28		14JUN08	12OCT08	08NOV08	0	-77						
02L1DD0720	Obtain SO's consent for design (AIP)	2	30	0	23MAY08	21JUN08		09NOV08	0	-77						
02L1DD0722	Design preparation for the DDA submission	2	15	30	22JUN08	06JUL08	18OCT08	16NOV08	0	-77						
02L1DD0723	Design (DDA) submission for the DC's approval	1	0	1			17NOV08	17NOV08	0	-61						
02L1DD0724	Design (DDA) certification by the Design Checker	2	1	28	07JUL08	07JUL08	18NOV08	15DEC08	0	-75						
02L1DD0726	Design (DDA) submission for the SO's approval	1	30	1	08JUL08	06AUG08	17NOV08	17NOV08	0	-63						
02L1DD0728	Design (DDA) review by the SO	2	0	66		06AUG08	18NOV08	22JAN09	0	-77						
02L1DD0730	DDA submission for rel. authorities' approval	1	1	1	07AUG08	07AUG08	24NOV08	24NOV08	0	-39						
02L1DD0732	Design (DDA) review by the rel. authorities	2	28	28	08AUG08	04SEP08	25NOV08	22DEC08	0	-46						
02L1DD0734	Obtain rel. authorities's approval for DDA	1	1	1	05SEP08	05SEP08	23DEC08	23DEC08	0	-39						
02L1DD0736	SO submit design (DDA) for approval of GEO	1	0	1		06SEP08	23DEC08	23DEC08	0	-64						
02L1DD0738	Design (DDA) review/approval by the GEO	2	0	28			24DEC08	20JAN09	0	-75						
02L1DD0740	Obtain SO's consent for design (DDA)	2	0	0				23JAN09	0	-77						
Hopper Design																
02L1DD0802	Design preparation by the Designer	2	15	14	28MAY08	11JUN08	13OCT08*	26OCT08	0	37						
02L1DD0803	Design submission for the DC's approval	1	0	1			27OCT08	27OCT08	0	32						
02L1DD0804	Design certification by the Design Checker	2	15	28	12JUN08	26JUN08	28OCT08	24NOV08	0	37						
02L1DD0806	Design submission for the SO's approval	1	1	1	27JUN08	27JUN08	27OCT08	27OCT08	0	32						
02L1DD0808	Design review by the SO	2	30	42	28JUN08	27JUL08	28OCT08	08DEC08	0	37						
02L1DD0810	Obtain design approval from the SO	2	0	0		27JUL08		08DEC08	0	37						
Steel Platform Design																
02L1DD0902	Design preparation by the Designer	2	30	45	12JUN08	11JUL08	25AUG08A	08OCT08	7	41						
02L1DD0903	Design submission for the DC's approval	1	0	1			09OCT08	09OCT08	0	47						
02L1DD0904	Design certification by the Design Checker	2	15	28	12JUL08	26JUL08	10OCT08	06NOV08	0	55						
02L1DD0906	Design submission for the SO's approval	1	1	1	28JUL08	28JUL08	09OCT08	09OCT08	0	47						
02L1DD0908	Design review by the SO	2	30	42	29JUL08	27AUG08	10OCT08	20NOV08	0	55						
02L1DD0910	Obtain design approval from the SO	2	0	0		27AUG08		20NOV08	0	55						
Overhead Gantry Support & Noise Enclosure Design																
02L1DD1002	Design preparation by the Designer	2	30	14	28APR08	27MAY08	09OCT08	22OCT08	0	41						
02L1DD1003	Design submission for the DC's approval	1	0	1			23OCT08	23OCT08	0	35						

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
02L1DD1004	Design certification by the Design Checker	2	15	28	28MAY08	11JUN08	24OCT08	20NOV08	0	41						
02L1DD1006	Design submission for the SO's approval	1	1	1	12JUN08	12JUN08	23OCT08	23OCT08	0	35						
02L1DD1008	Design review by the SO	2	30	42	13JUN08	12JUL08	24OCT08	04DEC08	0	41						
02L1DD1010	Obtain design approval from the SO	2	0	0		12JUL08		04DEC08	0	41						
ELS Design for Spiral Ramp & Vehicular Access																
02L1DD1102	Design preparation for the AIP submission	2	30	30	29MAR08	27APR08	03NOV08*	02DEC08	0	175						
02L1DD1103	Design (DDA) submission for the DC's approval	1	0	1			03DEC08	03DEC08	0	152						
02L1DD1104	Design (DDA) certification by the Design Checker	2	21	28	28APR08	18MAY08	04DEC08	31DEC08	0	193						
02L1DD1106	Design (DDA) submission for the SO's approval	1	1	1	19MAY08	19MAY08	03DEC08	03DEC08	0	151						
02L1DD1108	Design (DDA) review by the SO	2	60	66	20MAY08	18JUL08	04DEC08	07FEB09	0	191						
02L1DD1110	DDA submission for rel. authorities' approval	1	0	1		18JUL08	10DEC08	10DEC08	0	176						
02L1DD1112	Design (DDA) review by the rel. authorities	2	1	28	19JUL08	19JUL08	11DEC08	07JAN09	0	222						
02L1DD1114	Obtain rel. authorities's approval for DDA	1	21	1	20JUL08	09AUG08	08JAN09	08JAN09	0	179						
02L1DD1116	SO submit design (DDA) for approval of GEO	1	1	1	11AUG08	11AUG08	08JAN09	08JAN09	0	154						
02L1DD1118	Design (DDA) review/approval by the GEO	2	0	28		12AUG08	09JAN09	05FEB09	0	193						
02L1DD1120	Obtain SO's consent for design (DDA)	2	30	0	21JUL08	19AUG08		08FEB09	0	191						
ELS Design for Box Culvert & Open Channel																
02L1DD1202	Design preparation for the AIP submission	2	30	30	12JUL08	10AUG08	03DEC08	01JAN09	0	175						
02L1DD1203	Design (DDA) submission for the DC's approval	1	0	1			02JAN09	02JAN09	0	141						
02L1DD1204	Design (DDA) certification by the Design Checker	2	30	28	11AUG08	09SEP08	03JAN09	30JAN09	0	177						
02L1DD1206	Design (DDA) submission for the SO's approval	1	1	1	10SEP08	10SEP08	02JAN09	02JAN09	0	140						
02L1DD1208	Design (DDA) review by the SO	2	60	66	11SEP08	09NOV08	03JAN09	09MAR09	0	175						
02L1DD1210	DDA submission for rel. authorities' approval	1	0	1		09NOV08	09JAN09	09JAN09	0	165						
02L1DD1212	Design (DDA) review by the rel. authorities	2	1	28	10NOV08	10NOV08	10JAN09	06FEB09	0	206						
02L1DD1214	Obtain rel. authorities's approval for DDA	1	28	1	11NOV08	08DEC08	07FEB09	07FEB09	0	168						
02L1DD1216	SO submit design (DDA) for approval of GEO	1	1	1	09DEC08	09DEC08	07FEB09	07FEB09	0	143						
02L1DD1218	Design (DDA) review/approval by the GEO	2	0	28		10DEC08	08FEB09	07MAR09	0	177						
02L1DD1220	Obtain SO's consent for design (DDA)	2	30	0	18NOV08	17DEC08		10MAR09	0	175						
Temporary Drainage Management Plan																
02L1DD1302	TDMP preparation by the Designer	2	0	14			05MAY08A	02SEP08	57	223						
02L1DD1303	TDMP submission for the DC's approval	1	0	1			03SEP08	03SEP08	0	178						
02L1DD1304	TDMP certification by the Design Checker	2	0	28			04SEP08	01OCT08	0	223						
02L1DD1306	TDMP submission for the SO's approval	1	0	1			03SEP08	03SEP08	0	184						
02L1DD1308	TDMP review by the SO	2	0	90			04SEP08	02DEC08	0	230						
02L1DD1310	TDMP submission for DSD's approval	1	0	1			03SEP08	03SEP08	0	184						
02L1DD1312	TDMP review by the DSD	2	0	90			11SEP08	09DEC08	0	223						
02L1DD1314	Obtain DSD's approval for DDA	1	0	1			10DEC08	10DEC08	0	177						
02L1DD1316	Obtain SO's consent for TDMP	2	0	0				10DEC08	0	223						
Geotechnical Instrumentation Stg 1 for GL Works																
3DL1DDG102	Design preparation by the Designer	2	0	14			22FEB08A	24APR08A	100							
3DL1DDG104	Design certification by the Design Checker	2	0	7			25APR08A	16JUN08A	100							

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
3DL1DDG106	Design submission for the SO's approval	1	0	1			25APR08A	16JUN08A	100							
3DL1DDG108	Design review by the SO	2	0	14			26APR08A	14JUL08A	100							
3DL1DDG110	Obtain design approval from the SO	2	0	0				14JUL08A	100							
3DL1DDG112	Install Geotechnical Instruments	1	0	10			04JUN08A	05JUL08A	100							
3DL1DDG114	Initial reading	2	0	14			18JUN08A	09JUL08A	100							
Geotechnical Instrumentation Stg 2 for Deep Exc.																
3DL1DDG202	Design preparation by the Designer	2	0	14			17NOV08*	30NOV08	0	-88						
3DL1DDG204	Design certification by the Design Checker	2	0	14			01DEC08	14DEC08	0	-88						
3DL1DDG206	Design submission for the SO's approval	1	0	1			01DEC08	01DEC08	0	-72						
3DL1DDG208	Design review by the SO	2	0	28			02DEC08	29DEC08	0	-88						
3DL1DDG210	Obtain design approval from the SO	2	0	0				29DEC08	0	-88						
3DL1DDG212	Install Geotechnical Instruments	1	0	18			30DEC08	20JAN09	0	-72						
3DL1DDG214	Baseline Monitoring	2	0	14			21JAN09	03FEB09	0	-88						
3DL1DDG216	Monitor/report Geotechnical Instrumentation	2	0	1,605			10JUL08A	30NOV12	3	0						
Design Packages for Works in Portion F																
Main Tunnel Design																
02L1FF0102	Design preparation for the AIP submission	2	30	30	08FEB08	08MAR08	08FEB08A	30APR08A	100							
02L1FF0103	Design (AIP) submission for the DC's approval	1	0	1			02MAY08A	02MAY08A	100							
02L1FF0104	Design (AIP) certification by the Design Checker	2	15	28	09MAR08	23MAR08	03MAY08A	21JUL08A	100							
02L1FF0106	Design (AIP) submission for the SO's approval	1	1	1	25MAR08	25MAR08	10JUL08A	10JUL08A	100							
02L1FF0108	Design (AIP) review by the SO	2	60	66	26MAR08	24MAY08	11JUL08A	15OCT08	26	-85						
02L1FF0110	AIP submission for rel. authorities' approval	1	0	1		24MAY08	08JUL08A	08JUL08A	100							
02L1FF0112	Design (AIP) review by the rel. authorities	2	1	28	26MAY08	26MAY08	09JUL08A	05SEP08	68	-46						
02L1FF0114	Obtain rel. authorities's approval for AIP	1	28	1	27MAY08	23JUN08	06SEP08	06SEP08	0	-40						
02L1FF0116	SO submit design (AIP) for approval of GEO	1	1	1	24JUN08	24JUN08	28AUG08	28AUG08	0	-55						
02L1FF0118	Design (AIP) review/approval by the GEO	2	0	28		25JUN08	29AUG08	25SEP08	0	-65						
02L1FF0120	Obtain SO's consent for design (AIP)	2	30	0	03JUN08	02JUL08		16OCT08	0	-85						
02L1FF0122	Design preparation for the DDA submission	2	15	30	03JUL08	17JUL08	24SEP08	23OCT08	0	-25						
02L1FF0123	Design (DDA) submission for the DC's approval	1	0	1			24OCT08	24OCT08	0	-19						
02L1FF0124	Design (DDA) certification by the Design Checker	2	1	28	18JUL08	18JUL08	25OCT08	21NOV08	0	-23						
02L1FF0126	Design (DDA) submission for the SO's approval	1	60	1	19JUL08	16SEP08	24OCT08	24OCT08	0	-20						
02L1FF0128	Design (DDA) review by the SO	2	0	66		16SEP08	25OCT08	29DEC08	0	-25						
02L1FF0130	DDA submission for rel. authorities' approval	1	1	1	17SEP08	17SEP08	31OCT08	31OCT08	0	5						
02L1FF0132	Design (DDA) review by the rel. authorities	2	28	28	18SEP08	15OCT08	01NOV08	28NOV08	0	6						
02L1FF0134	Obtain rel. authorities's approval for DDA	1	1	1	16OCT08	16OCT08	29NOV08	29NOV08	0	5						
02L1FF0136	SO submit design (DDA) for approval of GEO	1	0	1		17OCT08	29NOV08	29NOV08	0	-20						
02L1FF0138	Design (DDA) review/approval by the GEO	2	0	28			30NOV08	27DEC08	0	-23						
02L1FF0140	Obtain SO's consent for design (DDA)	2	0	0				30DEC08	0	-25						
Impact Assessment on WSD Yau Kam Tau WTW																
02L1FF0202	Design preparation for the DDA submission	2	30	60	09MAR08	07APR08	29APR08A	30JUN08A	100							

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
02L1FF0203	Design (DDA) submission for the DC's approval	1	0	1			03JUL08A	03JUL08A	100							
02L1FF0204	Design (DDA) certification by the Design Checker	2	15	30	08APR08	22APR08	04JUL08A	07SEP08	63	236						
02L1FF0206	Design (DDA) submission for the SO's approval	1	1	1	23APR08	23APR08	15JUL08A	15JUL08A	100							
02L1FF0208	Design (DDA) review by the SO	2	45	66	24APR08	07JUN08	16JUL08A	14OCT08	55	236						
02L1FF0210	DDA submission for rel. authorities' approval	1	0	1		07JUN08	10JUL08A	10JUL08A	100							
02L1FF0212	Design (DDA) review by the rel. authorities	2	1	28	10JUN08	10JUN08	11JUL08A	14SEP08	50	266						
02L1FF0214	Obtain rel. authorities's approval for DDA	1	28	1	11JUN08	08JUL08	16SEP08	16SEP08	0	212						
02L1FF0216	SO submit design (DDA) for approval of GEO	1	1	1	09JUL08	09JUL08	16SEP08	16SEP08	0	188						
02L1FF0218	Design (DDA) review/approval by the GEO	2	0	28		10JUL08	17SEP08	14OCT08	0	236						
02L1FF0220	Obtain SO's consent for design (DDA)	2	30	0	18JUN08	17JUL08		15OCT08	0	236						
Impact Assessment on WSD Tai Lam Chung WT No. 3																
02L1FF0302	Design preparation for the DDA submission	2	30	32	08FEB08	08MAR08	14APR08A	27JUN08A	100							
02L1FF0303	Design submission for the DC's approval	1	0	1			27JUN08A	27JUN08A	100							
02L1FF0304	Design (DDA) certification by the Design Checker	2	15	90	09MAR08	23MAR08	28JUN08A	25SEP08	68	32						
02L1FF0306	Design (DDA) submission for the SO's approval	1	1	1	25MAR08	25MAR08	15JUL08A	15JUL08A	100							
02L1FF0308	Design (DDA) review by the SO	2	50	66	26MAR08	14MAY08	16JUL08A	31OCT08	55	32						
02L1FF0310	DDA submission for rel. authorities' approval	1	0	1		14MAY08	10JUL08A	10JUL08A	100							
02L1FF0312	Design (DDA) review by the rel. authorities	2	1	28	15MAY08	15MAY08	11JUL08A	02OCT08	61	61						
02L1FF0314	Obtain rel. authorities's approval for DDA	1	28	1	16MAY08	12JUN08	03OCT08	03OCT08	0	51						
02L1FF0316	SO submit design (DDA) for approval of GEO	1	1	1	13JUN08	13JUN08	03OCT08	03OCT08	0	26						
02L1FF0318	Design (DDA) review/approval by the GEO	2	0	28		14JUN08	04OCT08	31OCT08	0	32						
02L1FF0320	Obtain SO's consent for design (DDA)	2	30	0	23MAY08	21JUN08		01NOV08	0	32						
Impact Assessment on KCRC West Rail Tunnel																
02L1FF0402	Design preparation for the DDA submission	2	30	30	08APR08	07MAY08	28APR08A	26JUN08A	100							
02L1FF0403	Design submission for the DC's approval	1	0	1			26JUN08A	26JUN08A	100							
02L1FF0404	Design (DDA) certification by the Design Checker	2	15	90	08MAY08	22MAY08	27JUN08A	24SEP08	69	352						
02L1FF0406	Design (DDA) submission for the SO's approval	1	1	1	23MAY08	23MAY08	15JUL08A	15JUL08A	100							
02L1FF0408	Design (DDA) review by the SO	2	60	66	24MAY08	22JUL08	16JUL08A	29OCT08	50	353						
02L1FF0410	DDA submission for rel. authorities' approval	1	0	1		22JUL08	14JUL08A	14JUL08A	100							
02L1FF0412	Design (DDA) review by the rel. authorities	2	1	28	23JUL08	23JUL08	15JUL08A	31JUL08A	100							
02L1FF0414	Obtain rel. authorities's approval for DDA	1	28	1	24JUL08	20AUG08	01AUG08A	01AUG08A	100							
02L1FF0416	SO submit design (DDA) for approval of GEO	1	1	1	21AUG08	21AUG08	02OCT08	02OCT08	0	287						
02L1FF0418	Design (DDA) review/approval by the GEO	2	0	28		22AUG08	03OCT08	30OCT08	0	352						
02L1FF0420	Obtain SO's consent for design (DDA)	2	30	0	31JUL08	29AUG08		31OCT08	0	352						
Impact Assessment on WSD Tsuen Wan Reservoir G.																
02L1FF0502	Design preparation for the DDA submission	2	30	30	08MAY08	06JUN08	05MAY08A	02JUL08A	100							
02L1FF0503	Design submission for the DC's approval	1	0	1			03JUL08A	03JUL08A	100							
02L1FF0504	Design (DDA) certification by the Design Checker	2	15	90	07JUN08	21JUN08	04JUL08A	01OCT08	61	440						
02L1FF0506	Design (DDA) submission for the SO's approval	1	1	1	23JUN08	23JUN08	15JUL08A	15JUL08A	100							
02L1FF0508	Design (DDA) review by the SO	2	60	60	24JUN08	22AUG08	16JUL08A	06NOV08	10	440						
02L1FF0510	DDA submission for rel. authorities' approval	1	0	1		22AUG08	10JUL08A	10JUL08A	100							

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012
02L1FF0512	Design (DDA) review by the rel. authorities	2	1	28	23AUG08	23AUG08	11JUL08A	08OCT08	50	1,542					
02L1FF0514	Obtain rel. authorities's approval for DDA	1	28	1	24AUG08	20SEP08	09OCT08	09OCT08	0	1,252					
02L1FF0516	SO submit design (DDA) for approval of GEO	1	1	1	22SEP08	22SEP08	09OCT08	09OCT08	0	360					
02L1FF0518	Design (DDA) review/approval by the GEO	2	0	28		23SEP08	10OCT08	06NOV08	0	440					
02L1FF0520	Obtain SO's consent for design (DDA)	2	30	0	01SEP08	30SEP08		07NOV08	0	440					
Grout Trial at Foul Zone F1															
02L1FF0602	MS preparation for the DDA submission	2	0	12			02MAY08A	20MAY08A	100						
02L1FF0606	Ms (DDA) submission for the SO's approval	1	0	1			21MAY08A	21MAY08A	100						
02L1FF0608	MS (DDA) review by the SO	2	0	24			22MAY08A	17JUL08A	100						
02L1FF0620	Obtain SO's consent for MS (DDA)	2	0	0				17JUL08A	100						
Geotechniucal Instrumentation															
3DL1FFGI02	Design preparation by the Designer	2	0	60			28AUG08	26OCT08	0	-19					
3DL1FFGI04	Design certification by the Design Checker	2	0	14			27OCT08	09NOV08	0	-19					
3DL1FFGI06	Design submission for the SO's approval	1	0	1			10NOV08	10NOV08	0	-15					
3DL1FFGI08	Design review by the SO	2	0	56			11NOV08	05JAN09	0	-18					
3DL1FFGI10	DDA submission for rel. authorities' approval	1	0	1			10NOV08	10NOV08	0	-16					
3DL1FFGI12	Design (DDA) review by the rel. authorities	2	0	56			11NOV08	05JAN09	0	-19					
3DL1FFGI14	Obtain rel. authorities's approval for DDA	1	0	1			06JAN09	06JAN09	0	-13					
3DL1FFGI16	Obtain design approval from the SO	2	0	0				06JAN09	0	-19					
3DL1FFGI18	Install geotechnical instrumentsation	1	0	90			07JAN09	29APR09	0	-13					
3DL1FFGI20	Baseline Monitoring	2	0	14			30APR09	13MAY09	0	-15					
3DL1FT0208	Maintain/monitor geotechnical instrumentation	2	1,104	1,297	01NOV08	26JUL12	14MAY09	30NOV12	0	0					
Design Packages for Works in Portion G															
Drainage Impact Assessment															
02L1GG0102	Design preparation for the AIP submission	2	30	30	15AUG08	13SEP08	03NOV08*	02DEC08	0	381					
02L1GG0103	Design (AIP) submission for the DC's approval	1	0	1			03DEC08	03DEC08	0	312					
02L1GG0104	Design (AIP) certification by the Design Checker	2	15	28	14SEP08	28SEP08	04DEC08	31DEC08	0	384					
02L1GG0106	Design (AIP) submission for the SO's approval	1	1	1	29SEP08	29SEP08	03DEC08	03DEC08	0	310					
02L1GG0108	Design (AIP) review by the SO	2	60	58	30SEP08	28NOV08	04DEC08	30JAN09	0	382					
02L1GG0110	AIP submission for rel. authorities' approval	1	0	1		28NOV08	10DEC08	10DEC08	0	323					
02L1GG0112	Design (AIP) review by the rel. authorities	2	1	28	29NOV08	29NOV08	11DEC08	07JAN09	0	400					
02L1GG0114	Obtain rel. authorities's approval for AIP	1	15	1	30NOV08	14DEC08	08JAN09	08JAN09	0	326					
02L1GG0116	Obtain SO's consent for design (AIP)	2	1	0	15DEC08	15DEC08		31JAN09	0	382					
02L1GG0118	Design preparation for the DDA submission	2	0	30		16DEC08	09JAN09	07FEB09	0	382					
02L1GG0119	Design (DDA) submission for the DC's approval	1	0	1			09FEB09	09FEB09	0	312					
02L1GG0120	Design (DDA) certification by the Design Checker	2	30	28	24NOV08	23DEC08	10FEB09	09MAR09	0	383					
02L1GG0122	Design (DDA) submission for the SO's approval	1	15	1	24DEC08	07JAN09	09FEB09	09FEB09	0	310					
02L1GG0124	Design (DDA) review by the SO	2	1	58	08JAN09	08JAN09	10FEB09	08APR09	0	381					
02L1GG0126	DDA submission for rel. authorities' approval	1	60	1	09JAN09	09MAR09	16FEB09	16FEB09	0	1,124					
02L1GG0128	Design (DDA) review by the rel. authorities	2	0	28		09MAR09	17FEB09	16MAR09	0	1,383					

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008					2009					2010					2011					2012					
02L1GG0130	Obtain rel. authorities's approval for DDA	1	1	1	10MAR09	10MAR09	17MAR09	17MAR09	0	1,122																										
02L1GG0132	Obtain SO's consent for design (DDA)	2	28	0	11MAR09	07APR09		09APR09	0	381																										
Temp. Platform Design for H-Piling at Portion G																																				
02L1GG0202	Design preparation for the DDA submission	2	30	30	14SEP08	13OCT08	03DEC08	01JAN09	0	454																										
02L1GG0203	Design (DDA) submission for the DC's approval	1	0	1			02JAN09	02JAN09	0	369																										
02L1GG0204	Design (DDA) certification by the Design Checker	2	15	28	14OCT08	28OCT08	03JAN09	30JAN09	0	458																										
02L1GG0206	Design (DDA) submission for the SO's approval	1	1	1	29OCT08	29OCT08	02JAN09	02JAN09	0	369																										
02L1GG0208	Design (DDA) review by the SO	2	28	58	30OCT08	26NOV08	03JAN09	01MAR09	0	456																										
02L1GG0210	DDA submission for rel. authorities' approval	1	0	1		26NOV08	09JAN09	09JAN09	0	1,153																										
02L1GG0212	Design (DDA) review by the rel. authorities	2	0	28			10JAN09	06FEB09	0	1,421																										
02L1GG0214	Obtain rel. authorities's approval for DDA	1	0	1			07FEB09	07FEB09	0	1,154																										
02L1GG0228	Obtain design (DDA) approval from the SO	2	0	0		24JAN09		02MAR09	0	456																										
ELS Design for Pipe Jacking at Portion G																																				
02L1GG0302	Design preparation for the DDA submission	2	15	15	14OCT08	28OCT08	02JAN09	16JAN09	0	644																										
02L1GG0303	Design (DDA) submission for the DC's approval	1	0	1			17JAN09	17JAN09	0	523																										
02L1GG0304	Design (DDA) certification by the Design Checker	2	15	28	29OCT08	12NOV08	18JAN09	14FEB09	0	647																										
02L1GG0306	Design (DDA) submission for the SO's approval	1	1	1	13NOV08	13NOV08	17JAN09	17JAN09	0	521																										
02L1GG0308	Design (DDA) review by the SO	2	28	58	14NOV08	11DEC08	18JAN09	16MAR09	0	645																										
02L1GG0310	DDA submission for rel. authorities' approval	1	0	1		11DEC08	24JAN09	24JAN09	0	1,140																										
02L1GG0314	Design (DDA) review by the rel. authorities	2	0	28			25JAN09	21FEB09	0	1,406																										
02L1GG0316	Obtain rel. authorities's approval for DDA	1	0	1			23FEB09	23FEB09	0	1,141																										
02L1GG0318	Obtain design (DDA) approval from the SO	2	0	0				17MAR09	0	645																										
Design Packages for Works in Portion J																																				
Geotechniucal Instrumentation																																				
3DL1JJG102	Design preparation by the Designer	2	0	25			21APR08A	25JUN08A	100																											
3DL1JJG104	Design (DDA) certification by the Design Checker	2	0	103			26JUN08A	06OCT08	33	22	to be endorsed by All Reservoir Panel Engineer																									
3DL1JJG106	Design (DDA) submission for the SO's approval	1	0	1			15JUL08A	15JUL08A	100																											
3DL1JJG108	Design (DDA) review by the SO	2	0	70			16JUL08A	10NOV08	50	22																										
3DL1JJG110	DDA submission for rel. authorities' approval	1	0	1			10JUL08A	10JUL08A	100																											
3DL1JJG112	Design (DDA) review by the rel. authorities	2	0	28			11JUL08A	03NOV08	0	29																										
3DL1JJG114	Obtain rel. authorities's approval for DDA	1	0	1			04NOV08	04NOV08	0	25																										
3DL1JJG116	Obtain design approval from the SO	2	0	0				11NOV08	0	22																										
WSD Tunnel No. 3- Method for Strengthening Works																																				
02L1JJMS01	Receive VO-031 for revised construction details	1	0	0				19SEP08*	0	-35																										
02L1JJMS02	Method statement submission	2	0	28			20SEP08	17OCT08	0	-42																										
02L1JJMS03	M. S. submission for the DC's approval	1	0	1			18OCT08	18OCT08	0	-33																										
02L1JJMS04	M. S. certification by the Design Checker	2	0	28			19OCT08	15NOV08	0	-41	to be endorsed by All Reservoir Panel Engineer																									
02L1JJMS06	M.S. submission for the SO's approval	1	0	1			17NOV08	17NOV08	0	-35																										
02L1JJMS08	M. S. review by the SO	2	0	28			18NOV08	15DEC08	0	-42																										
02L1JJMS10	M.S. submission for rel. authorities' approval	1	0	1			16DEC08	16DEC08	0	-36																										

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
02L1JJMS12	M.S. review by the rel. authorities	2	0	28			17DEC08	13JAN09	0	-42						
02L1JJMS14	Rel. authorities's approval for M.S.	1	0	1			14JAN09	14JAN09	0	-33						
02L1JJMS16	Obtain M.S. approval from the SO	2	0	0				14JAN09	0	-42						
Schedule of Milestones for Cost Centre No. 2L																
02L10D1002	2L 1; On submission of PDP to the SO	2	0	0		10JAN08		10JAN08A	100							
02L10D1004	2L 2; On acceptance of PDP by the SO	2	0	0		06MAR08		04SEP08	0	1,578						
02L10D1006	2L 3; On submission of AIP to the SO; Portion A	2	0	0		22APR08		15OCT08	0	1,537						
02L10D1008	2L 4; On acceptance of AIP by the SO; Portion A	2	0	0		21JUN08		11OCT08	0	1,541						
02L10D1010	2L 5; On subumission of DDA to the SO; Portion A	2	0	0		15AUG08		20OCT08	0	1,532						
02L10D1012	2L 6; On acceptance of DDA by the SO; Portion A	2	0	0		14OCT08		26DEC08	0	1,465						
02L10D1014	2L 7; On submission of AIP to the SO; Portion B	2	0	0		04AUG08		15OCT08	0	1,537						
02L10D1016	2L 8; On acceptance of AIP by the SO; Portion B	2	0	0		03OCT08		04DEC08	0	1,487						
02L10D1018	2L 9; On submission of DDA to the SO; Portion B	2	0	0		13NOV08		12DEC08	0	1,479						
02L10D1020	2L 10; On acceptance of DDA by the SO; Portion B	2	0	0		12JAN09		17FEB09	0	1,412						
02L10D1022	2L 11; On submission of AIP to the SO; Portion C	2	0	0		22JUL08		26OCT08	0	1,526						
02L10D1024	2L 12; On acceptance of AIP by the SO; Portion C	2	0	0		20SEP08		26DEC08	0	1,465						
02L10D1026	2L 13; On submission of DDA to the SO; Portion C	2	0	0		01NOV08		03JAN09	0	1,457						
02L10D1028	2L 14; On acceptance of DDA by the SO; Portion C	2	0	0		31DEC08		10MAR09	0	1,391						
02L10D1030	2L 15; On acceptance of AIP by the SO; Portion D	2	0	0		09NOV08		09NOV08	0	1,512						
02L10D1032	2L 16; On acceptance of DDA by the SO; Portion D	2	0	0		18MAR09		23JAN09	0	1,437						
02L10D1034	2L 17; On submission of AIP to the SO; Portion F	2	0	0		25MAR08		10JUL08A	100							
02L10D1036	2L 18; On acceptance of AIP by the SO; Portion F	2	0	0		24MAY08		16OCT08	0	1,536						
02L10D1038	2L 19; On submission of DDA to the SO; Portion F	2	0	0		18JUL08		24OCT08	0	1,528						
02L10D1040	2L 20; On acceptance of DDA by the SO; Portion F	2	0	0		16SEP08		29NOV08	0	1,492						
02L10D1042	2L 21; On acceptance of AIP by the SO; Portion G	2	0	0		11DEC08		31JAN09	0	1,429						
02L10D1044	2L 22; On acceptance of DDA by the SO; Portion G	2	0	0		07FEB09		09APR09	0	1,361						
02L10D1046	2L 23; On completion of all works under this CC	2	0	0		18MAR09		09APR09	0	1,361						
Construction of Main Tunnel																
Trial Grout at Fault Zone F1																
3AL1FT0002	HyD issue XP	2	0	0				23JUL08A	100							
3AL1FT0004	Advance notice to HyD/Road advice	1	0	6			24JUL08A	30JUL08A	100							
3AL1FT0006	Trial pit excavation	1	0	4			31JUL08A	04AUG08A	100							
3AL1FT0010	Scaffolding, mobilize & set up	1	0	7			05AUG08A	13AUG08A	100							
3AL1FT0012	Drill & test for 2m Arrangement Test	1	0	45			14AUG08A	16OCT08	11	116						
3AL1FT0014	Backfill drilled holes, demobilization & Tidy up	1	0	6			17OCT08	23OCT08	0	116						
3AL1FT0016	Drill & test for single hole arrangement test	1	0	17			11AUG08A	04SEP08	59	154						
3AL1FT0018	Backfill drilled hole, demobilization & tidy up	1	0	1			05SEP08	05SEP08	0	154						

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012		
TBM Manufacture/Testing/Delivery																	
TBM & Back-ups																	
3AL1FT0302	TBM & Excavation Sys Procurement	2	30	30	14DEC07	12JAN08	14DEC07A	12JAN08A	100								
3AL1FT0304	TBM design & manufacturing	2	252	252	21DEC07	28AUG08	21DEC07A	28SEP08	87	95							
3AL1FT0306	TBM workshop tests	2	7	7	29AUG08	04SEP08	29SEP08	05OCT08	0	95							
3AL1FT0308	TBM dismounting & packing	2	21	21	05SEP08	25SEP08	06OCT08	26OCT08	0	95							
3AL1FT0310	TBM shipment to Hong Kong	2	45	45	26SEP08	09NOV08	31MAY09	14JUL09	0	-121							
Conveyor Belt System																	
3AL1FTCB02	Procure sub-contract for conveyor belt sys.	2	0	0				13SEP08*	0	42							
3AL1FTCB06	Design/procurement/manufacture of CBS	2	0	200			14SEP08	01APR09	0	42							
3AL1FTCB16	CBS delivey to Hong Kong	1	0	30			05SEP09	12OCT09	0	-96							
3AL1FTCB26	Assembly & commissioning of CBS	1	0	40			13OCT09	28NOV09	0	-96							
Manufacture Pre-cast Lining/Delivery																	
3AL1FT0401	Procure sub-contract for segment mould	1	0	0				21JUL08A	100								
3AL1FT0402	Procure sub-contract for segment lining	1	0	0		03MAR08		26SEP08	0	6							
3AL1FT0403	Approval of Segmental Lining Design (AIP)	1	0	0		08MAR08		16OCT08	0	-70							
3AL1FT0404	Design of segment mould	2	60	60	09MAR08	07MAY08	16JUN08A	16AUG08A	100								
3AL1FT0406	Manufacture & delivery of segment moulds	2	180	135	08MAY08	03NOV08	17OCT08	28FEB09	0	-85							
3AL1FT0408	Prepare/submit QA Sys & Fabrication MS	2	60	30	08MAY08	06JUL08	17OCT08	15NOV08	0	-12							
3AL1FT0410	SO approve QA system & Fabrication MS	1	28	28	07JUL08	07AUG08	17NOV08	18DEC08	0	-11							
3AL1FT0412	Approval of Tunnel Linig Design	2	0	0		17OCT08		30DEC08	0	-25							
3AL1FT0416	Manufactur of segments	1	320	400	04NOV08	01DEC09	02MAR09	09JUL10	0	-67							
3AL1FT0418	Delivery of Segments	1	320	400	09DEC08	08JAN10	23JUN09	26OCT10	0	-67							
Strengthening Works at Exist. WSD Tai Lam Tunnel																	
10AR1JT051	Approval of Method of Construction by SO/WSD	2	0	0				14JAN09	0	-42							
10AR1JT052	Obtain WSD's agreement for Tunnel Shutdown Date	2	0	0		26SEP08		14JAN09	0	-42							
10AR1JT053	Tunnel Shutdown Commences	1	0	0		01OCT08	16MAR09		0	-36							
10AR1JT054	Preparatory works; temp. ventilation & lighting	1	0	18	01DEC08*		16MAR09	06APR09	0	-36							
10AR1JT055	Verify method statement	1	3	6	01DEC08	03DEC08	07APR09	16APR09	0	-36							
10AR1JT056	Carry out strengthening works	1	58	58	04DEC08	16FEB09	17APR09	26JUN09	0	-36							
10AR1JT057	Site clearance & demobilization	1	2	12	17FEB09	18FEB09	27JUN09	11JUL09	0	-36							
10AR1JT058	WSD Tunnel starts operation	1	0	0	19FEB09		13JUL09		0	-36							
Geotechnical Instrumetation at WSD Tunnel																	
3AL1FT0602	Approval of Geotechnical Instrumentation Design	2	0	0		26SEP08		11NOV08	0	107							
3AL1FT0604	Procure/delivery/caliber of instrumentations	2	90	90	27SEP08	15JAN09	12NOV08	09FEB09	0	107							
3AL1FT0612	Obtain WSD's agreement for Tunnel Shutdown date	2	0	0		22FEB09		01OCT09*	0	-127							
3AL1FT0614	WSD Tunnel shutdown for instrumentation works	1	0	0	24APR09		01DEC09		0	-106							

zero free float constraint

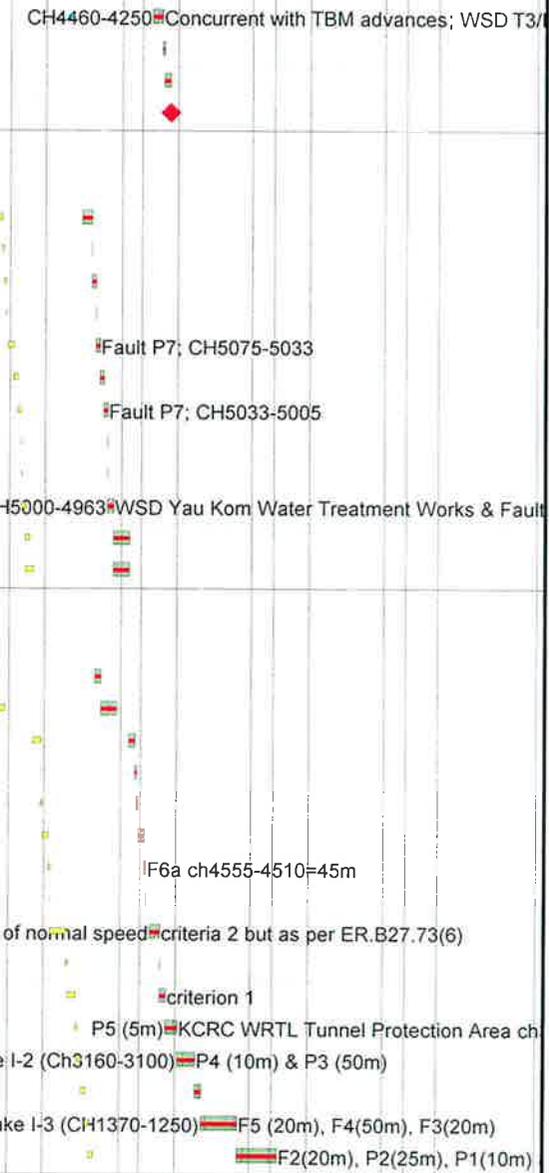
zero free float constraint
zero free float constraint

50 pieces (10 rings) per day; 2 pours

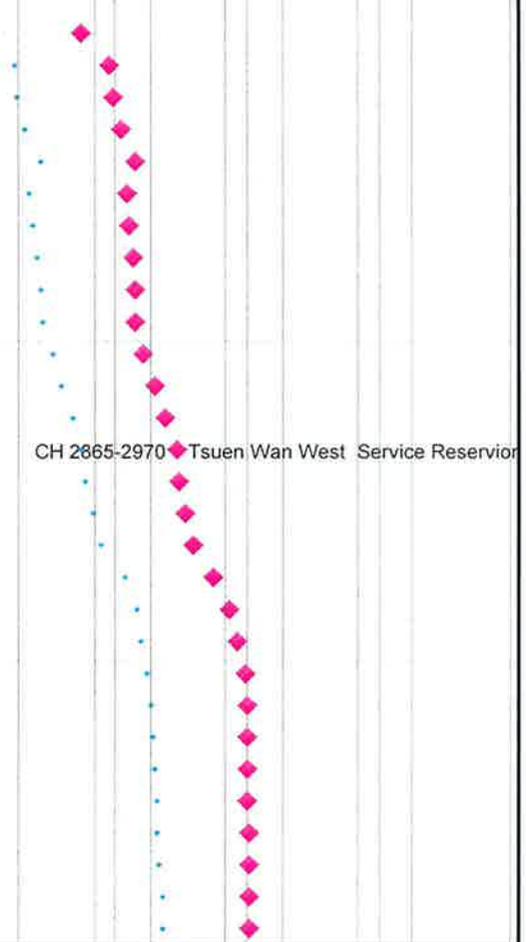
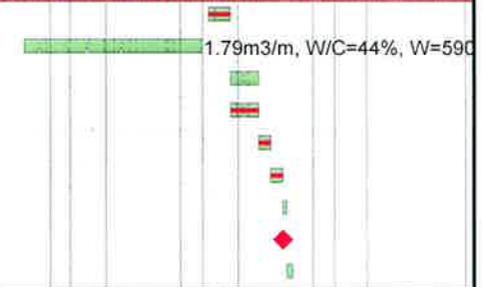
Clause 4.2.10
2 months in advance of tunnel shutdown date
Possession of Portion J assumes as 1 Dec 08
ER 4.4.5. (3) all works within 80 days
to be completed by May

for all submittals
minimum vibration, deformation & water inflow
As per ER Clause 4.2.10
2 months in advance of shutdown date

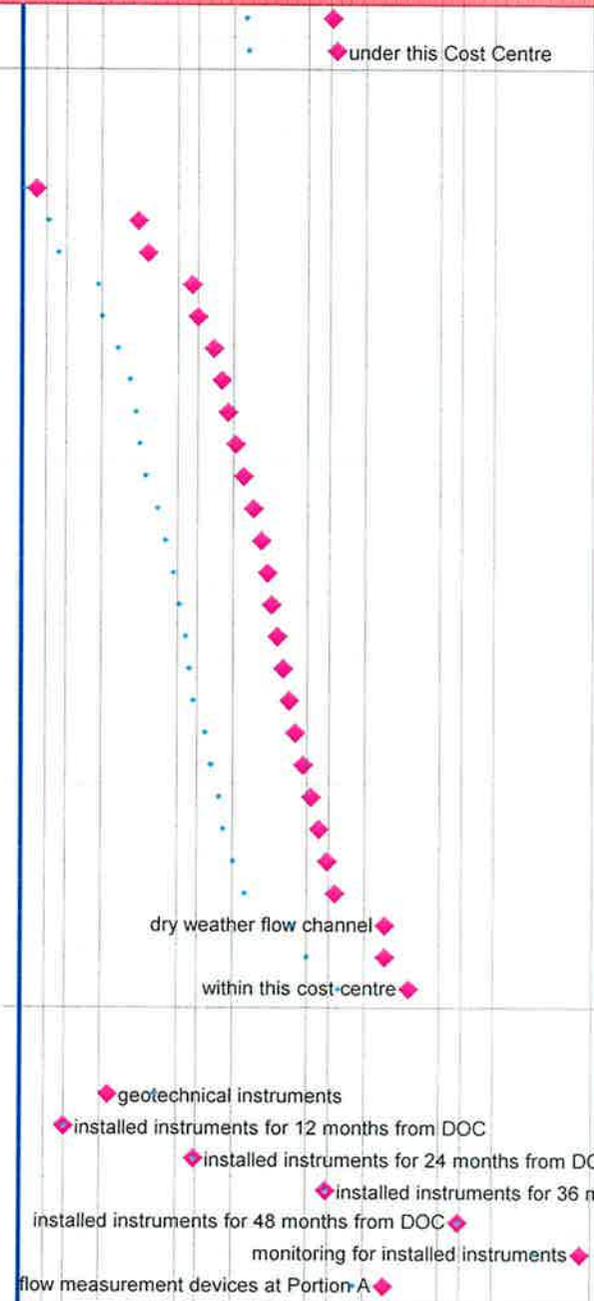
ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
3AL1FT0616	Preparatory works; temp. ventilation & lighting	1	3	18	24APR09	26APR09	01DEC09	21DEC09	0	-106						
3AL1FT0618	Verify method statement	1	3	6	24APR09	26APR09	22DEC09	30DEC09	0	-106						
3AL1FT0620	Joint survey & install geo. instrumentations	1	45*	18	27APR09	10JUN09	31DEC09	21JAN10	0	-106						
3AL1FT0622	Baseline monitoring	1	2	6	11JUN09	12JUN09	22JAN10	28JAN10	0	-106						
3AL1FT0624	Monitoring of geotechnical instrumentation	1	0	20	13JUN09		29JAN10	24FEB10	0	-106						
3AL1FT0626	Subsequent inspection/ repair damages (if any)	1	0	6			25FEB10	03MAR10	0	0						
3AL1FT0628	Site clearance & demobilization	1	0	12			04MAR10	17MAR10	0	0						
3AL1FT0630	WSD Tunnel starts operation	1	0	0			18MAR10		0	0						
TBM Assembly & Initial Driving; Day Time Work																
3AL1FT0702	TBM initial assembly & start-up test	1	25	25	10NOV08	08DEC08	15JUL09	12AUG09	0	-96						
3AL1FT0704	TBM mobilization to tunnel face (CH5085)	1	2	2	09DEC08	10DEC08	13AUG09	14AUG09	0	-96						
3AL1FT0706	Install back-up system (3 decks + 3 platforms)	1	7	7	11DEC08	18DEC08	15AUG09	22AUG09	0	-96						
3AL1FT0708	TBM advances; CH5084-5075	1	2	2	19DEC08	20DEC08	24AUG09	25AUG09	0	-96						
3AL1FT0710	TBM advances; P7 CH5075-5033	1	11	11	22DEC08	06JAN09	26AUG09	07SEP09	0	-96						
3AL1FT0712	Install back-up system (6 decks)	1	10	10	07JAN09	17JAN09	08SEP09	18SEP09	0	-96						
3AL1FT0714	TBM advances; P7 CH5033-5005	1	7	7	19JAN09	29JAN09	19SEP09	26SEP09	0	-96						
3AL1FT0716	Install back-up system (1 decks)	1	1	1	30JAN09	30JAN09	28SEP09	28SEP09	0	-96						
3AL1FT0718	TBM advances; CH 5005-5000	1	1	1	31JAN09	31JAN09	29SEP09	29SEP09	0	-96						
3AL1FT0719	TBM advances; WSDYKWTW/F6c CH5000-4963	1	9	9	02FEB09	11FEB09	30SEP09	12OCT09	0	-96						
3AL1FT0720	Install conveyor belt system	1	10	40	12FEB09	23FEB09	13OCT09	28NOV09	0	-96						
3AL1FT0722	Install noise enclosure	1	20	40	12FEB09	06MAR09	13OCT09	28NOV09	0	-96						
Main Tunnel Works; Day & Night Work																
3AL1FT0802	Apply to EPD for CNP for 24 hrs. tunnel work	1	14	12	23OCT08	05NOV08	27AUG09	09SEP09	0	-96						
3AL1FT0804	EPD process/approve CNP application	1	45	36	06NOV08	20DEC08	10SEP09	23OCT09	0	-96						
3AL1FT0806	TBM advances; WSD YKTWTW/F6c CH4963-4830	1	16	12	07MAR09	25MAR09	30NOV09	12DEC09	0	-96						
3AL1FT0808	TBM advances; CH4830-4760	1	3	6	26MAR09	28MAR09	14DEC09	19DEC09	0	-96						
3AL1FT0810	TBM advances; F6b CH4760-4740	1	3	2	30MAR09	01APR09	21DEC09	22DEC09	0	-96						
3AL1FT0812	TBM advances; CH4740-4560	1	9	12	02APR09	16APR09	23DEC09	08JAN10	0	-96						
3AL1FT0814	TBM advances; F6a CH4560-4510	1	6	4	17APR09	23APR09	09JAN10	13JAN10	0	-96						
3AL1FT0816	TBM advances; CH4510-4460	1	2	3	24APR09	25APR09	14JAN10	16JAN10	0	-96						
3AL1FT0818	TBM advances; WSD T3/P6 CH4460-4250	1	36	20	27APR09	10JUN09	29JAN10	24FEB10	0	-106						
3AL1FT0820	TBM advances; P6 CH4250-4220	1	4	2	11JUN09	15JUN09	25FEB10	26FEB10	0	-106						
3AL1FT0822	TBM advances; CH4220-3940	1	18	14	16JUN09	07JUL09	27FEB10	15MAR10	0	-106						
3AL1FT0824	TBM advances; CH3940-3560	1	3	24	08JUL09	10JUL09	16MAR10	16APR10	0	-106						
3AL1FT0826	TBM advances CH3560-2970	1	12	40	11JUL09	24JUL09	17APR10	04JUN10	0	-106						
3AL1FT0828	TBM advances; WSD WS Reservoir CH2970-2860	1	6	13	25JUL09	31JUL09	05JUN10	21JUN10	0	-106						
3AL1FT0830	TBM advances; CH2860-1250	1	10	83	01AUG09	12AUG09	22JUN10	28SEP10	0	-106						
3AL1FT0832	TBM advances; CH1250-0	1	13	91	13AUG09	27AUG09	29SEP10	18JAN11	0	-106						



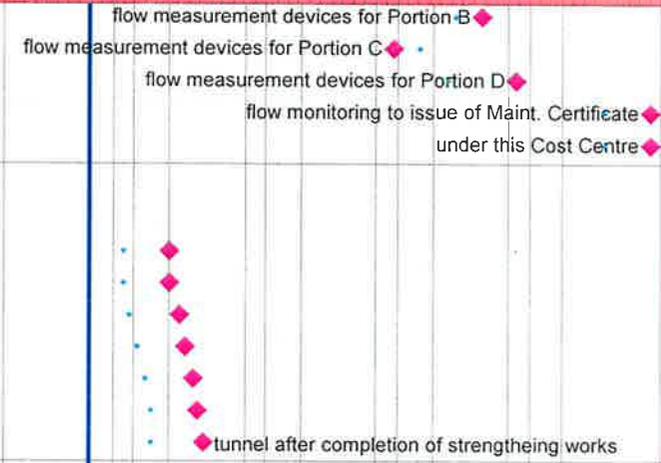
ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	Year						
											2008	2009	2010	2011	2012		
3AL1FT0890	Desemby & demobilization of TBM	1	0	50			19JAN11	21MAR11	0	-15							
3AL1FT0892	Back grouting (daytime); CH5100-00	1	0	400			26AUG09	30DEC10	0	50							
3AL1FT0894	Complete maintennce access & dry weather channel	1	0	60			22MAR11	04JUN11	0	13							
3AL1FT0896	Installation of communication system (Daytime)	1	0	60			22MAR11	04JUN11	0	-15							
3AL1FT0898	Testing & Commissioning; daytime	1	0	28			07JUN11	09JUL11	0	-15							
3AL1FT0900	Authorities' inspection/remedial works; daytime	1	0	30			11JUL11	13AUG11	0	-15							
3AL1FT0902	Contractor serve notice for Works completion	2	0	7			14AUG11	20AUG11	0	477							
3AL1FT0904	Handover of Portion F	1	0	0				13AUG11	0	-15							
3AL1FT0906	SO issues completion certificate	2	0	21			21AUG11	10SEP11	0	477							
Schedule of Milestones for Cost Centre No. 6aR																	
6AR1FT0902	6aR 1; On completion of grouting at P7	2	0	0		29JAN09		26SEP09	0	1,191							
6AR1FT0904	6aR 2; On completion of grouting at F6c	2	0	0		25MAR09		12DEC09	0	1,114							
6AR1FT0906	6aR 3; On completion of grouting at F6b	2	0	0		01APR09		22DEC09	0	1,104							
6AR1FT0908	6aR 4; On completion of grouting at F6a	2	0	0		23APR09		13JAN10	0	1,082							
6AR1FT0910	6aR 5; On completion of grouting at WSD T. 3	2	0	0		10JUN09		24FEB10	0	1,040							
6AR1FT0912	6aR 6; On completion of 20% grout by lth at P6	2	0	0		07MAY09		03FEB10	0	1,061							
6AR1FT0914	6aR 7; On completion of 40% grout by lth at P6	2	0	0		16MAY09		09FEB10	0	1,055							
6AR1FT0916	6aR 8; On completion of 60% grout by lth at P6	2	0	0		26MAY09		18FEB10	0	1,046							
6AR1FT0918	6aR 9; On completion of 80% grout by lth at P6	2	0	0		05JUN09		24FEB10	0	1,040							
6AR1FT0920	6aR 10; On completion of grouting works at P6	2	0	0		15JUN09		26FEB10	0	1,038							
6AR1FT0922	6aR 11; On completion of grouting wks at P5	2	0	0		10JUL09		16MAR10	0	1,020							
6AR1FT0924	6aR 12; On completion of grouting wks at P4	2	0	0		31JUL09		19APR10	0	986							
6AR1FT0926	6aR 13; On completion of grouting wks at P3	2	0	0		05SEP09		20MAY10	0	955							
6AR1FT0928	6aR 14; On completion of grouting wks at WSD's	2	0	0		29SEP09		21JUN10	0	923							
6AR1FT0930	6aR 15; On completion of grouting wks at F5	2	0	0		10OCT09		28JUN10	0	916							
6AR1FT0932	6aR 16; On completion of grouting wks at F4	2	0	0		28OCT09		12JUL10	0	902							
6AR1FT0934	6aR 17; On completion of grouting wks at F3	2	0	0		19NOV09		06AUG10	0	877							
6AR1FT0936	6aR 18; On completion of grouting wks at F2	2	0	0		27JAN10		30SEP10	0	822							
6AR1FT0938	6aR 19; On completion of grouting wks at P2	2	0	0		27FEB10		10NOV10	0	781							
6AR1FT0940	6aR 20; On completion of grouting wks at P1	2	0	0		13MAR10		02DEC10	0	759							
6AR1FT0942	6aR 21; On completion of 10% grout by lth at F1	2	0	0		31MAR10		28DEC10	0	733							
6AR1FT0944	6aR 22; On completion of 20% grout by lth at F1	2	0	0		09APR10		29DEC10	0	732							
6AR1FT0946	6aR 23; On completion of 30% grout by lth at F1	2	0	0		14APR10		30DEC10	0	731							
6AR1FT0948	6aR 24; On completion of 40% grout by lth at F1	2	0	0		19APR10		31DEC10	0	730							
6AR1FT0950	6aR 25; On completion of 50% grout by lth at F1	2	0	0		23APR10		03JAN11	0	727							
6AR1FT0952	6aR 26; On completion of 60% grout by lth at F1	2	0	0		28APR10		04JAN11	0	726							
6AR1FT0954	6aR 27; On completion of 70% grout by lth at F1	2	0	0		04MAY10		05JAN11	0	725							
6AR1FT0956	6aR 28; On completion of 80% grout by lth at F1	2	0	0		10MAY10		06JAN11	0	724							
6AR1FT0958	6aR 29; On completion of 90% grout by lth at F1	2	0	0		11MAY10		07JAN11	0	723							



ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012
6AR1FT0960	6aR 30; On completion of grouting works at F1	2	0	0		14MAY10		08JAN11	0	722					
6AR1FT0970	6aR 31; On completion of all works under this CC	2	0	0		20MAY10		18JAN11	0	712					
Schedule of Milestones for Cost Centre No. 3aL															
3AL1FT1002	3aL 1; On providing evidence of procuring TBM	2	0	0		19JAN08		19JAN08A	100						
3AL1FT1004	3aL 2; On providing evidence of TBM Factory Test	2	0	0		04SEP08		05OCT08	0	1,547					
3AL1FT1006	3aL 3; On delivery of all parts of TBM to the Si	2	0	0		09NOV08		14JUL09	0	1,265					
3AL1FT1008	3aL 4; On completion of site comm. & test. of TB	2	0	0		08DEC08		12AUG09	0	1,236					
3AL1FT1010	3aL 5; On completion of 5% perm. tunnel lining	2	0	0		25MAR09		12DEC09	0	1,114					
3AL1FT1012	3aL 6; On completion of 10% perm. tunnel lining	2	0	0		09APR09		31DEC09	0	1,095					
3AL1FT1014	3aL 7; On completion of 15% perm. tunnel lining	2	0	0		22MAY09		11FEB10	0	1,053					
3AL1FT1016	3aL 8; On completion of 20% perm. tunnel lining	2	0	0		22JUN09		06MAR10	0	1,030					
3AL1FT1018	3aL 9; On completion of 25% perm. tunnel lining	2	0	0		10JUL09		23MAR10	0	1,013					
3AL1FT1020	3aL 10; On completion of 30% perm. tunnel lining	2	0	0		24JUL09		16APR10	0	989					
3AL1FT1022	3aL 11; On completion of 35% perm. tunnel lining	2	0	0		10AUG09		07MAY10	0	968					
3AL1FT1024	3aL 12; On completion of 40% perm. tunnel lining	2	0	0		09SEP09		04JUN10	0	940					
3AL1FT1026	3aL 13; On completion of 45% perm. tunnel lining	2	0	0		03OCT09		24JUN10	0	920					
3AL1FT1028	3aL 14; On completion of 50% perm. tunnel lining	2	0	0		24OCT09		10JUL10	0	904					
3AL1FT1030	3aL 15; On completion of 55% perm. tunnel lining	2	0	0		09NOV09		26JUL10	0	888					
3AL1FT1032	3aL 16; On completion of 60% perm. tunnel lining	2	0	0		27NOV09		11AUG10	0	872					
3AL1FT1034	3aL 17; On completion of 65% perm. tunnel lining	2	0	0		09DEC09		26AUG10	0	857					
3AL1FT1036	3aL 18; On completion of 70% perm. tunnel lining	2	0	0		21DEC09		10SEP10	0	842					
3AL1FT1038	3aL 19; On completion of 75% perm. tunnel lining	2	0	0		22JAN10		27SEP10	0	825					
3AL1FT1040	3aL 20; On completion of 80% perm. tunnel lining	2	0	0		05FEB10		20OCT10	0	802					
3AL1FT1042	3aL 21; On completion of 85% perm. tunnel lining	2	0	0		01MAR10		11NOV10	0	780					
3AL1FT1044	3aL 22; On completion of 90% perm. tunnel lining	2	0	0		15MAR10		03DEC10	0	758					
3AL1FT1046	3aL 23; On completion of 95% perm. tunnel lining	2	0	0		07APR10		28DEC10	0	733					
3AL1FT1048	3aL 24; On completion of perm. tunnel lining	2	0	0		14MAY10		18JAN11	0	712					
3AL1FT1050	3aL 25; On completion of maint. access/flow chan	2	0	0		24SEP10		04JUN11	0	575					
3AL1FT1052	3aL 26; On completion of provision of communic.	2	0	0		01NOV10		04JUN11	0	575					
3AL1FT1054	3aL 27; On completion of all works under this CC	2	0	0		28JAN11		13AUG11	0	505					
Schedule of Milestones for Cost Centre No. 3dL															
3DL10T1202	3dL 1; On complet. of install geo instrument.	2	0	0		02SEP09		29APR09	0	1,341					
3DL10T1204	3dL 2; Maint./monit. geo. inst. for 12 mth	2	0	0		26DEC08		26DEC08	0	1,465					
3DL10T1206	3dL 3; Maint./monitor geo. inst. for 24	2	0	0		26DEC09		26DEC09	0	1,100					
3DL10T1208	3dL 4; Maint./monitor geo. inst. for 36	2	0	0		26DEC10		26DEC10	0	735					
3DL10T1210	3dL 5; Maint./monitor geo. inst. for 48	2	0	0		26DEC11		26DEC11	0	370					
3DL10T1212	3dL 6; On completion of maint. & monit. of geo.	2	0	0		26JUL12		30NOV12	0	30					
3DL10T1214	3dL 7; On installation of FMD at Portion A	2	0	0		12MAR11		04JUN11	0	575					



ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
3DL10T1216	3dL 8; On installation of FMD at Portion B	2	0	0		10JUN11		24AUG11	0	494						
3DL10T1218	3dL 9; On installation of FMD at Portion C	2	0	0		05MAR11		22DEC10	0	739						
3DL10T1220	3dL 10; On installation of FMD at Portion D	2	0	0		19MAY11		24NOV11	0	402						
3DL10T1222	3dL 11; On completion of maint. & monit. of FMD	2	0	0		26JUL12		30NOV12	0	30						
3DL10T1224	3dL 12; On completion of all works under this CC	2	0	0		26JUL12		30NOV12	0	30						
Schedule of Milestones for Cost Centre No. 10aR																
10AR1JT131	10aR 1; On installation of temp. ventilation	2	0	0		03DEC08		06APR09	0	1,364						
10AR1JT132	10aR 2; On installation temp. lighting	2	0	0		03DEC08		06APR09	0	1,364						
10AR1JT133	10aR 3; On completion of 25% strengthening wks	2	0	0		20DEC08		06MAY09	0	1,334						
10AR1JT134	10aR 4; On completion of 50% strengthening wks	2	0	0		10JAN09		23MAY09	0	1,317						
10AR1JT135	10aR 5; On completion of 75% strengthening wks	2	0	0		31JAN09		11JUN09	0	1,298						
10AR1JT136	10aR 6; On completion of strengthening works	2	0	0		16FEB09		26JUN09	0	1,283						
10AR1JT137	10aR 7; On recharge of the water after wrk comp	2	0	0		18FEB09		11JUL09	0	1,268						
Construction of Intake I-1																
Preliminary Works																
VO-07; Transperant Hoarding at I-1																
VO007-02	Receive VO7 for transparent hoarding	1	0	0				19MAY08A	100							
VO007-04	Procure/prepare/install transparent hoarding	1	0	70			20MAY08A	11AUG08A	100							
01R1AI1102	Possession of site	1	0	0			19MAR08A		100							
01R1AI1104	Obtain TTA (ingress & egress) approval	2	0	0			19APR08A		100							
01R1AI1106	Site clearance	1	0	30			21APR08A	26MAY08A	100							
01R1AI1108	Obtain tree	1	0	6		26MAR08	13MAY08A	31JUL08A	100							
01R1AI1110	Hoarding erection enclosing the Site	1	0	18	07MAR08		23MAY08A	11AUG08A	100							
01R1AI1112	Site entrance construction	1	0	6	26MAR08		23JUN08A	25JUL08A	100							
01R1AI1114	Install wheel wathing facilities	1	30	7	27MAR08	02MAY08	03JUN08A	07JUN08A	100							
01R1AI1116	Erect SOR's secondary site office	1	30	6	27MAR08	02MAY08	28AUG08	03SEP08	0	0						
01R1AI1118	Footing for temp. bridge span over Shing M. Nul.	1	0	26			10JUN08A	16JUL08A	100							
01R1AI1120	Decking for temp. bridge span over Shing M. Nul.	1	0	13			17JUL08A	01AUG08A	100							
01R1AI1122	Install remote control CCTV as per ER 4.4.10	1	30	12	27MAR08	02MAY08	04SEP08	18SEP08	0	0						
16R1AI1101	Tree Identification & Report	2	0	14			14MAR08A	01APR08A	100							
16R7AI1102	1st tree pruning for small 3 nos. trees	1	72	1	27MAR08	23JUN08	03JUN08A	03JUN08A	100							
16R7AI1104	2nd tree pruning for small 3 nos. trees	1	0	1			04JUL08A	04JUL08A	100							
16R7AI1106	Final pruning & uplifting of 3 nos. small trees	1	0	2			08SEP08	09SEP08	0	183						
16R7AI1108	Confirm location for trees to be transplanted	1	0	51			02APR08A	27AUG08A	100							
16R7AI1110	1st pruning for big 4 nos. trees along S. Mun Rd	1	0	2			08SEP08	09SEP08	0	601						
16R7AI1112	2nd pruning for big 4 nos. trees along S. Mun Rd	1	0	2			08NOV08	10NOV08	0	601						
16R7AI1114	Final pruning/uplifting for big 4 nos. big trees	1	0	6			09JAN09	15JAN09	0	601						



90d after DOC

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012						
Piling Works																					
Piling Works Above Inclined Access Ramp																					
11R2AI1202	Erect piling platform for lower piles	1	0	12			17AUG10	30AUG10	0	99											
11R2AI1204	Mobilize piling rig & set up	1	0	6			31AUG10	06SEP10	0	99											
11R2AI1208	350mm dia. pre-bored H-piles (lower); 29 nos.	1	72	29	02JUL10	24SEP10	07SEP10	12OCT10	0	99											
11R2AI1210	Relocate piling rig & set up for upper piling	1	0	6			13OCT10	20OCT10	0	99											
Piling Works Along Crest Platform																					
11R2AI1212	Erect piling platform for lower piles	1	0	12			28SEP10	12OCT10	0	99											
11R2AI1216	350mm dia. pre-bored H-piles (upper); 36 nos.	1	0	36			21OCT10	01DEC10	0	99											
11R2AI1218	Demobilize piling rig	1	0	6			02DEC10	08DEC10	0	99											
Skin Wall & Crest Platform																					
11R2AI1220	Excavate & hack off grout	1	0	6			21OCT10	27OCT10	0	131											
11R2AI1222	Fix rebar/erect fwk/concrete skin wall	1	0	10			28OCT10	08NOV10	0	131											
11R2AI1224	Fix rebar/erect fwk/concrete capping beam	1	0	10			09NOV10	19NOV10	0	131											
11R2AI1226	Backfill & construct U-channel	1	0	4			20NOV10	24NOV10	0	131											
11R2AI1228	Fix rebar/erect fwk/concrete crest platform	1	0	12			25NOV10	08DEC10	0	131											
Skin Wall & Inclined Access Ramp																					
11R2AI1230	Excavate & hack off grout	1	0	8			09DEC10	17DEC10	0	99											
11R2AI1232	Fix rebar/erect fwk/concrete skin wall	1	0	12			18DEC10	04JAN11	0	99											
11R2AI1234	Fix rebar/erect fwk/concrete capping beam	1	0	8			05JAN11	13JAN11	0	99											
11R2AI1236	Backfill & construct U-channel	1	0	4			14JAN11	18JAN11	0	99											
11R2AI1238	Fix rebar/erect fwk/concrete inclined ramp	1	0	12			19JAN11	01FEB11	0	99											
Permanent Soil Nailing Works																					
11R2AI1302	Erect working platform & mobilization	1	24	8	03MAY08	31MAY08	17MAY08A	24MAY08A	100												
11R2AI1304	Install test nails & proof loading test; 2 nos.	1	12	8	02JUN08	16JUN08	24JUN08A	08JUL08A	100												
11R2AI1306	Soil nailing for A to C rows; 69 nos.	1	12	16	17JUN08	30JUN08	02JUL08A	14JUL08A	100												
11R2AI1308	Soil nailing for D to F rows; 71 nos.	1	24	29	17JUN08	15JUL08	15JUL08A	05SEP08	72	102											
11R2AI1310	Construct soil nail heads; 140 nos.	1	24	22	16JUL08	12AUG08	19JUL08A	06SEP08	68	102											
11R2AI1312	Demobilization	1	0	3			08SEP08	10SEP08	0	102											
Construction of Spiral Ramp & Cascade																					
Temp. Pipe-pile cofferdam																					
04L1AI1202	Erect piling platform	1	0	43			08OCT08	26NOV08	0	102											
04L1AI1203	Mobilization & set up piling rig	1	0	3			21OCT08	23OCT08	0	102											
04L1AI1204	Install 273 mm dia. temp. pipe piles; 144 nos.	1	0	43			24OCT08	12DEC08	0	102											
04L1AI1208	Demobilization & tidy up	1	0	3			13DEC08	16DEC08	0	102											
Excavation from Existing GL to +103.5mPD																					
04L1AI1402	Bulk excavation; soil (80m3)	1	4	2	16SEP08	19SEP08	20DEC08	22DEC08	0	99											
04L1AI1404	Install test tie-back & proof load test; 1 no.	1	10	6	20SEP08	02OCT08	23DEC08	31DEC08	0	99											
04L1AI1406	Install working tie-backs; 10 nos.	1	10	6	03OCT08	15OCT08	23DEC08	31DEC08	0	99											

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012
Excavation from +103.5mPD to +100.5mPD															
04L1AI1408	Bulk excavation; soil (240m3)	1	4	3	16OCT08	20OCT08	02JAN09	05JAN09	0	99					
04L1AI1410	Install test tie-back & proof load test; 1 no.	1	10	6	21OCT08	31OCT08	06JAN09	12JAN09	0	99					
04L1AI1412	Install working tie-backs; 10 nos.	1	10	6	01NOV08	12NOV08	06JAN09	12JAN09	0	99					
Excavation from +100.5mPD to +97.5mPD															
04L1AI1414	Bulk excavation; soil (510m3)	1	6	4	13NOV08	19NOV08	13JAN09	16JAN09	0	99					
04L1AI1416	Install test tie-back & proof load test; 1 no.	1	10	6	20NOV08	01DEC08	17JAN09	23JAN09	0	99					
04L1AI1418	Install working tie-backs; 22 nos.	1	10	6	02DEC08	12DEC08	17JAN09	23JAN09	0	99					
Excavation from +97.5mPD to +94.5mPD															
04L1AI1420	Bulk excavation; soil (950m3)	1	12	6	13DEC08	29DEC08	24JAN09	03FEB09	0	99					
04L1AI1422	Install test tie-back & proof load test; 1 no.	1	10	6	30DEC08	10JAN09	04FEB09	10FEB09	0	99					
04L1AI1424	Install working tie-backs; 37 nos.	1	12	10	12JAN09	24JAN09	04FEB09	14FEB09	0	99					
Excavation from +94.5mPD to +91.5 mPD															
04L1AI1426	Bulk excavation; soil (1130m3)	1	12	8	29JAN09	11FEB09	16FEB09	24FEB09	0	99					
04L1AI1428	Bulk excavation; rock (650m3)	1	24	9	12FEB09	11MAR09	25FEB09	06MAR09	0	112					
04L1AI1430	Install test tie-back & proof load test; 1 no.	1	10	6	05FEB09	16FEB09	23FEB09	28FEB09	0	99					
04L1AI1432	Install working tie-backs; 43 nos.	1	18	18	17FEB09	09MAR09	02MAR09	21MAR09	0	99					
Excavation from +91.5mPD to + 88.5mPD															
04L1AI1434	Bulk excavation; soil (1860m3)	1	18	10	12MAR09	01APR09	23MAR09	02APR09	0	99					
04L1AI1436	Bulk excavation; rock (420m3)	1	18	6	26MAR09	20APR09	07APR09	16APR09	0	99					
04L1AI1438	Install test tie-back & proof load test; 1 no.	1	10	6	26MAR09	07APR09	07APR09	16APR09	0	99					
04L1AI1440	Install working tie-backs; 27 nos.	1	12	12	08APR09	24APR09	17APR09	30APR09	0	99					
Excavation from +88.5mPD to +72.5mPD															
07R1AI1442	Set up for dewatering	1	0	8			04MAY09	12MAY09	0	99					
07R1AI1444	Rock excavation/mucking out/temp. support	1	30	145	01AUG09	04SEP09	13MAY09	03NOV09	0	99					
Construction of Vehicular Access															
04L1AI1444	Cast base slab	1	0	6			04NOV09	10NOV09	0	99					
04L1AI1446	Cast walls	1	0	12			11NOV09	24NOV09	0	99					
04L1AI1448	Cast roof slab	1	88	12	20OCT09	03FEB10	25NOV09	08DEC09	0	99					
Construction of Spiral Ramp Structure															
07R1AI1402	Cast base slab	1	12	12	20OCT09	03NOV09	09DEC09	22DEC09	0	99					
07R1AI1404	Cast ramp up to +76.51mPD	1	192	15	04NOV09	30JUN10	16JAN10	02FEB10	0	99					
07R1AI1406	Cast ramp up to +80.81mPD	1	12	15	02JUL10	15JUL10	03FEB10	23FEB10	0	99					
07R1AI1408	Cast ramp up to +85.1mPD	1	0	15			24FEB10	12MAR10	0	99					
07R1AI1410	Cast ramp up to +89.41mPD	1	0	15			13MAR10	30MAR10	0	99					
07R1AI1412	Cast ramp up to +93.71mPD	1	0	15			31MAR10	21APR10	0	99					
07R1AI1414	Cast ramp up to +98.01mPD	1	0	15			22APR10	10MAY10	0	99					
07R1AI1416	Cast ramp up to +102.31mPD	1	0	15			11MAY10	28MAY10	0	99					
07R1AI1418	Backfill spiral ramp; 9840m3	1	0	21			29MAY10	23JUN10	0	270					
07R1AI1420	Construct RC spiral ramp top	1	0	15			20APR11	11MAY11	0	24					

13,000m3 @90m3/day with 2 work fronts

After retrieval of TBM

@ 5m3/5minutes @480m3/day following removal of tower crane

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012						
Dismantle & removal of TBM																					
04L1AI1450	Erect tower crane/testing	1	24	18	16APR10	14MAY10	23DEC09	15JAN10	0	99											
04L1AI1451	Erect gantry crane & testing	1	0	24			16JAN10	12FEB10	0	168											
04L1AI1452	Disassembly & demobilization of TBM	1	50	50	15MAY10	15JUL10	19JAN11	21MAR11	0	3											
04L1AI1454	Dismante/remove gantry crane	1	72	12	16JUL10	09OCT10	22MAR11	04APR11	0	24											
04L1AI1456	Dismantle/remove tower crane	1	0	12			06APR11	19APR11	0	24											
Construction of Box Culvert Structure																					
04L1AI1462	Cast lower base slab	1	0	12			17FEB10	02MAR10	0	168											
04L1AI1463	Cast upper base	1	0	6			22MAR11	28MAR11	0	3											
04L1AI1464	Cast walls 1st lift	1	0	18			29MAR11	19APR11	0	3											
04L1AI1466	Cast walls 2nd lift, 200mm down from soffit	1	0	18			20APR11	14MAY11	0	3											
04L1AI1468	Cast roof slabs	1	0	18			16MAY11	04JUN11	0	3											
Construction of Cascade Structure																					
04L1AI1472	Cast base slabs	1	0	12			29MAY10	11JUN10	0	99											
04L1AI1474	Cast walls 1st lift	1	0	18			12JUN10	05JUL10	0	99											
04L1AI1476	Cast walls 2nd lift, 200mm down from soffit	1	0	18			06JUL10	26JUL10	0	99											
04L1AI1478	Cast roof slabs	1	0	18			27JUL10	16AUG10	0	99											
Modification of Existing Channel in Dry Season																					
07R1AI1502	Modify half channel bed at tunnel entrance; Ph 1	1	36	36	01NOV10*	11DEC10	01NOV10*	11DEC10	0	68											
07R1AI1504	Modify rem. half channel bed; Phase 2	1	36	36	13DEC10	26JAN11	13DEC10	26JAN11	0	68											
07R1AI1506	Install steelworks; Phase 3	1	36	36	27JAN11	12MAR11	27JAN11	12MAR11	0	68											
Remaining Works Prior to Handover																					
07R1AI1602	Backfill & compaction above box culvert; ~13m	1	72	22	11OCT10	06JAN11	07JUN11	02JUL11	0	3											
07R1AI1606	Finishing & reinstatement works; Portion A	1	48	36	14FEB11	11APR11	03JUN11	16JUL11	0	3											
07R1AI1608	Pre-handover inspections and remedial works	1	48	30	14MAR11	13MAY11	18JUN11	23JUL11	0	3											
07R1AI1610	Contractor serve notice for Works completion	2	7	7	14MAY11	20MAY11	24JUL11	30JUL11	0	341											
07R1AI1612	SO issues completion certificate	2	21	21	21MAY11	10JUN11	31JUL11	20AUG11	0	341											
16R7AI1602	Landscaping works at Portion A	1	72	30	14FEB11	13MAY11	11JUN11	16JUL11	0	3											
16R7AI1604	Establishment Works at Portion A	2	365	365	14MAY11	12MAY12	17JUL11	15JUL12	0	11											
3DL1AI1602	Install flow measurement devices at Intake I-1	1	24	12	14FEB11	12MAR11	23MAY11	04JUN11	0	15											
3DL1AI1604	Maintain & monitor flow monitoring	2	365	365	13MAR11	11MAR12	05JUN11	03JUN12	0	53											
Schedule of Milestones for Cost Center No. 4L																					
04L1AI1802	4L 1; On completion of 50% excavation	2	0	0		24APR09		30APR09	0	1,340											
04L1AI1804	4L 2; On completion of excavation	2	0	0		03FEB10		03NOV09	0	1,153											
04L1AI1806	4L 3; On completion of 25% concreting	2	0	0		05AUG10		02MAR10	0	1,034											
04L1AI1808	4L 4; On completion of 50% concreting	2	0	0		26AUG10		05JUL10	0	909											
04L1AI1810	4L 5; On completion of 75% concreting	2	0	0		16SEP10		04JUN11	0	575											

ty came from Outfall after initial TBM setup

before TBM retrieval

after retrieval of TBM & gantry crane

150nos. climber, 200nos. woodland 63nos. trees, 2072nos

- ◆ for Cascade at Intake I-1
- ◆ for Cascade at Intake I-1
- ◆ for Cascade at Intake I-1
- ◆ for Cascade at Intake I-1
- ◆ for Cascade at Intake I-1

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	Year						
											2008	2009	2010	2011	2012		
04L1AI1812	4L 6; On completion of Cascade	2	0	0		09OCT10		16AUG10	0	867							
04L1AI1814	4L 7; On completion of connecting BC	2	0	0		19OCT09		04JUN11	0	575							
04L1AI1816	4L 8; On completion of all works under this CC	2	0	0		13MAY11		23JUL11	0	526							
Schedule of Milestones for Cost Centre No. 7R																	
07R1AI1902	7R 1; On completion of trash grills	2	0	0		12MAR11		12MAR11	0	659							
07R1AI1904	7R 2; On completion of 25% excavation	2	0	0		29DEC08		03FEB09	0	1,426							
07R1AI1906	7R 3; On completion of 50% excavation	2	0	0		11MAR09		06MAR09	0	1,395							
07R1AI1908	7R 4; On completion of 75% excavation	2	0	0		02JUN09		08SEP09	0	1,209							
07R1AI1910	7R 5; On completion of all excavation	2	0	0		04SEP09		03NOV09	0	1,153							
07R1AI1912	7R 6; On completion of spiral ramp to +80mPD	2	0	0		22DEC09		23FEB10	0	1,041							
07R1AI1914	7R 7; On completion of spiral ramp to +90mPD	2	0	0		02MAR10		17MAY10	0	958							
07R1AI1916	7R 8; On completion of spiral ramp to +100mPD	2	0	0		10MAY10		22JUL10	0	892							
07R1AI1918	7R 9; On completion of spiral access ramp	2	0	0		15JUL10		11MAY11	0	599							
07R1AI1920	7R 10; On completion of all works under this CC	2	0	0		13MAY11		23JUL11	0	526							
Schedule of Milestones for Cost Centre No. 11R																	
11R2AI1R02	11R 1; On completion of soil nailing works	2	0	0		12AUG08		06SEP08	0	1,576							
11R2AI1R04	11R 2; On completion of piling at platform	2	0	0		19SEP08		01DEC10	0	760							
11R2AI1R06	11R 3; On completion of piling at branch access	2	0	0		13OCT08		12OCT10	0	810							
11R2AI1R08	11R 4; On completion of all works under this CC	2	0	0		24SEP10		08DEC10	0	753							
Construction of Intake I-2																	
Preliminary Works																	
Diversion of CLP Overhead Cable																	
01R1BU0102	Diversion of CLP overhead cable	2	0	30				02OCT08*	31OCT08	0	-44						
Diversion of 100mm Watermain																	
01R1BU0202	Diversion of 100mm dia. watermain	2	0	54				22SEP08*	14NOV08	0	-58						
VO 11; Transperant Hoarding at I-2																	
VO011-02	Receive VO11 for transparent hoarding	1	0	0					14JUL08A	100							
VO011-04	Procure/prepare/install transparent hoarding	1	0	51				15JUL08A	16OCT08	22	-52						
01R1BI2102	Possession of Portion B -90d of DOC	2	0	0				26MAR08A		100							
01R1BI2104	Obtain TTA (ingress & egress) approval	2	0	0					19APR08A	100							
01R1BI2108	Site clearance	1	0	30		06MAR08	02MAY08A	05SEP08	75	-52							
01R1BI2112	Erect hoarding	1	30	30	27MAR08	02MAY08	05JUN08A	16OCT08	0	-52							
01R1BI2116	Install remote control CCTV as per ER 4.4.10	1	30	12	27MAR08	02MAY08	17OCT08	30OCT08	0	0							
16R7BI2002	Tree transplanting; 1 no.	1	72	72	03APR08	30JUN08	17OCT08	12JAN09	0	516							

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012						
Stream Diversion/Approach Channel/H-Pile Wall																					
Revised Layout of Pile Wall at I-2																					
VO022-02	Received VO22 for revised layout of pile wall	1	0	0				10JUL08A	100												
VO022-04	SOR confirmed to demolish exit. ret. wall	1	0	38			11JUL08A	21AUG08A	100												
VO022-06	Demolish existing retaining wall	1	0	1			13SEP08	13SEP08	0	-46											
VO022-16	Reinstate piling platform	1	0	2			16SEP08	17SEP08	0	-46											
Phase 1, Stg 1- Construct 550 dia. H-pile Wall																					
12R3BI2202	Form temp. access ramp along west side of stream	1	24	44	05APR08	03MAY08	10JUN08A	31JUL08A	100												
12R3BI2204	Additional SI & engineering works	1	6	26	05MAY08	10MAY08	25AUG08A	24SEP08	15	-52											
12R3BI2206	Mobilize piling rig & set up	1	10	5	13MAY08	23MAY08	25SEP08	30SEP08	0	-52											
12R3BI2208	Construct 59 nos. pre-bored H-piles	1	12	50	24MAY08	06JUN08	02OCT08	29NOV08	0	-52											
12R3BI2210	Demobilize piling rig	1	30	1	07JUN08	14JUL08	01DEC08	01DEC08	0	-52											
12R3BI2212	Construct skin wall/capring beam/u-channel	1	1	90	15JUL08	15JUL08	02DEC08	23MAR09	0	-52											
12R3BI2230	Excavate/construct modified river channel	1	0	30			17FEB09	23MAR09	0	-52											
12R3BI2232	Construct PC block bund	1	0	12			17MAR09	30MAR09	0	-52											
12R3BI2234	Divert channel to West	1	0	0				30MAR09	0	-52											
Phase 1, Stg 2- Construct D.W.F.C at West																					
08R1BI2236	Construct temp. concrete block bund	1	12	12	28APR11	12MAY11	02DEC08	15DEC08	0	-28											
08R1BI2238	Excavate for new low flow channel	1	6	24	13MAY11	19MAY11	16DEC08	15JAN09	0	-28											
08R1BI2240	Construct new low flow channel	1	0	24			16JAN09	16FEB09	0	-28											
08R1BI2242	Remove temp. concrete block bund	1	0	12			17FEB09	02MAR09	0	-28											
Phase 2, Stg 5 - Construct Vortex Shaft																					
08R1BI2244	Excavate for Vortex	1	0	12			02NOV09*	14NOV09	0	243											
08R1BI2246	Construct Vortex	1	0	24			16NOV09	12DEC09	0	243											
Phase 3, Stg 1 - Construct A. C. (South & East)																					
08R1BI2248	Remove steel deck stg 2	1	0	12			14DEC09	29DEC09	0	243											
08R1BI2250	Excavate for South & East part of A.C.	1	0	12			30DEC09	13JAN10	0	243											
08R1BI2252	Construct South & East part of A. C.	1	0	24			14JAN10	10FEB10	0	243											
Phase 3, Stg 2-Construct A. C. (West)																					
08R1BI2254	Construct temp. concrete block bund	1	0	12			01NOV10*	13NOV10	0	32											
08R1BI2256	Excavate for western portion guide wall & slab	1	0	12			15NOV10	27NOV10	0	32											
08R1BI2258	Construct western portion of guide wall & slab	1	0	24			29NOV10	28DEC10	0	32											
08R1BI2260	Remove concrete block bund	1	0	6			29DEC10	05JAN11	0	32											
Phase 3, Stg 3 - Construct A. C. (North & East)																					
08R1BI2262	Construct temp. concrete block bund	1	0	6			06JAN11	12JAN11	0	32											
08R1BI2264	Excavate for L-shaped retaining wall	1	0	12			13JAN11	26JAN11	0	32											
08R1BI2266	Construct L-shaped retaining wall	1	0	18			27JAN11	19FEB11	0	32											
08R1BI2268	Excavate eastern portion of guide wall & slab	1	0	12			21FEB11	05MAR11	0	32											
08R1BI2270	Construction of boulder traps; 7nos.	1	0	24			21FEB11	19MAR11	0	64											
08R1BI2272	Construct eastern portion of guide wall & slab	1	0	24			07MAR11	02APR11	0	32											

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	Year				
											2008	2009	2010	2011	2012
08R1BI2274	Construct trash grill	1	0	12			04APR11	18APR11	0	32					
08R1BI2276	Remove temp. concrete block bund	1	0	6			19APR11	28APR11	0	32					
Phase 4- Construct Remaining Approach Channel															
08R1BI2278	Remove gantry crane	1	0	12			26JUL11	08AUG11	0	-52					
08R1BI2280	Close out last section of guide wall	1	0	12			09AUG11	22AUG11	0	-52					
08R1BI2282	Remove steel deck stg 1	1	0	12			23AUG11	05SEP11	0	-52					
Excavate & Construct Vortex/Drop Shaft															
Phase 2, Stg 1- Temporary Steel Deck Stage 1															
05L1BI2301	Excavate for foundation	1	0	12			13OCT08	25OCT08	0	24					
05L1BI2302	Construct foundation for steel deck	1	24	18	07JUN08	07JUL08	27OCT08	15NOV08	0	24					
05L1BI2304	Install steel deck	1	6	18	05SEP08	11SEP08	17NOV08	06DEC08	0	24					
Phase 2, Stg 3- Ground Treatment Works for D. S.															
05L1BI2306	Rock excavation from GL (+99mPD to +93mPD)	1	24	12	12SEP08	13OCT08	12FEB09	25FEB09	0	-27					
05L1BI2308	Construct temp. RC ring wall; +93mPD to +102mPD	1	0	20			26FEB09	20MAR09	0	-27					
05L1BI2310	Setting up	1	18	2	14OCT08	03NOV08	31MAR09	01APR09	0	-35					
05L1BI2312	Probing & curtain grouting around shaft	1	160	35	11NOV08	30MAY09	02APR09	19MAY09	0	-35					
Phase 2, Stg 4 - Temporary Steel Deck Stage 2															
05L1BI2314	Excavate for foundation	1	32	12	21OCT10	26NOV10	31MAR09	17APR09	0	-52					
05L1BI2316	Construct foundation for steel deck/gantry	1	6	18	01NOV10*	06NOV10	18APR09	11MAY09	0	-52					
05L1BI2318	Install steel deck/gantry/Noise enclosure	1	24	24	27NOV10	24DEC10	12MAY09	09JUN09	0	-52					
05L1BI2320	Excavate shaft; +93mPD to +65mPD (28m)	1	36	118	28DEC10	11FEB11	10JUN09	29OCT09	0	-52					
05L1BI2322	Construct permanent lining; 28m @ 3m/ 3days	1	0	28			22JUN11	25JUL11	0	-52					
Excavate & Construct Air Vent Shaft															
Phase 2, Stg 2 - Construct Air Vent Shaft															
05L1BI2418	Foundation of shaft collar/install pipe for RCD	1	0	14			01NOV08*	17NOV08	0	-48					
05L1BI2420	Mobilize & set up probing	1	0	2			18NOV08	19NOV08	0	-48					
05L1BI2422	Probing & curtain grouting around shaft	1	0	16			20NOV08	08DEC08	0	-48					
05L1BI2426	Mobilize & set up RCD for excavation	1	0	6			09DEC08	15DEC08	0	-48					
05L1BI2428	Bore shaft with RCD; 34m @1m/day	1	0	34			20DEC08	04FEB09	0	-52					
05L1BI2430	Demobilize RCD rig	1	0	6			05FEB09	11FEB09	0	-52					
05L1BI2432	Install permanent liner	1	0	12			12FEB09	25FEB09	0	12					
05L1BI2434	Concrete liner	1	0	6			26FEB09	04MAR09	0	12					
05L1BI2436	Construct upstand wall	1	0	12			05MAR09	18MAR09	0	12					
Excavate & Construct Man Access Shaft															
05L1BI2502	Sheet piling cofferdam	1	24	12	01NOV08*	28NOV08	24MAR09	07APR09	0	109					
05L1BI2504	Probing & curtain grouting around shaft	1	24	31	29NOV08	29DEC08	08APR09	19MAY09	0	109					
05L1BI2506	Set up for excavation incl. noise enclosure	1	0	12			20MAY09	03JUN09	0	109					
05L1BI2508	Excavation/muck out/temporary support	1	0	127			04JUN09	03NOV09	0	109					

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
05L1BI2522	Construct base	1	0	4			14SEP10	17SEP10	0	109						
05L1BI2524	Set up for 37m shaft construction (wall only)	1	0	6			18SEP10	25SEP10	0	109						
05L1BI2526	Construct wall/stair; 25 landings @ 3 days/land	1	0	75			27SEP10	24DEC10	0	109						
05L1BI2530	Construct wall above ground level	1	0	8			28DEC10	06JAN11	0	109						
05L1BI2532	Construct shaft roof	1	0	12			07JAN11	20JAN11	0	109						
Excavate & Construct Deaeration Chamber																
05L1BI2602	Probing/grout/excavate/muckout/temp.support	1	132	72	01JUN09	05NOV09	30OCT09	25JAN10	0	-52						
05L1BI2604	Drill/excavate/muckout/temp. support for bench	1	32	50	10SEP10	20OCT10	26JAN10	27MAR10	0	-52						
05L1BI2607	Drill/excavate/muckout/temp. support for bottom	1	0	50			29MAR10	01JUN10	0	-52						
05L1BI2608	Set up for lining construction	1	0	12			02APR11	16APR11	0	-52						
05L1BI2610	Construct base; 3 bays	1	0	9			18APR11	30APR11	0	-52						
05L1BI2612	Construct walls 2 lifts; 3 bays	1	0	24			02MAY11	30MAY11	0	-52						
05L1BI2614	Const. crown/underpin. of air vent & drop shafts	1	0	18			31MAY11	21JUN11	0	-52						
Excavate & Construct Main Adit Tunnel																
3BL1BI2102	Probing/grout/temp. support/excavation/muck out	1	200	200	06NOV09	13JUL10	02JUN10	29JAN11	0	-52						
3BL1BI2104	Construct permanent lining	1	50	50	14JUL10	09SEP10	31JAN11	01APR11	0	-52						
Excavate & Construct Man Access Adit																
05L1BI2802	Remove working platform & install temp. ladder	1	240	12	06NOV09	28AUG10	04NOV09	17NOV09	0	109						
05L1BI2806	Probing/gorut/excavate/muckout/temporary support	1	36	90	27NOV10	11JAN11	18NOV09	09MAR10	0	109						
05L1BI2808	Set up for 7.2m raise (shaft) excavation	1	0	2			10MAR10	11MAR10	0	109						
05L1BI2810	Excavate/removal of rock/temporary support	1	0	24			12MAR10	13APR10	0	109						
05L1BI2812	Set up for 9.3m lower adit excavation	1	0	2			14APR10	15APR10	0	109						
05L1BI2814	Excavate/removal of rock/temporary support	1	0	31			16APR10	24MAY10	0	109						
05L1BI2816	Set up for 7m lower adit construction	1	0	6			25MAY10	31MAY10	0	109						
05L1BI2818	Construction of permanent lining	1	0	20			01JUN10	24JUN10	0	109						
05L1BI2822	Construct base of raise shaft	1	0	4			25JUN10	29JUN10	0	109						
05L1BI2824	Set up for 9m raise stairway const. (wall only)	1	0	2			30JUN10	02JUL10	0	109						
05L1BI2826	Construct wall & stair; 7 landings @4days/landin	1	0	28			03JUL10	04AUG10	0	109						
05L1BI2830	Set up for 23m upper adit construction	1	0	2			05AUG10	06AUG10	0	109						
05L1BI2834	Construction of permanent lining	1	0	32			07AUG10	13SEP10	0	109						
Junction Between Main Tunnel & Adit Tunnel																
3BL1BI2106	Temp. support & excavation breakthrough	1	12	48	12JAN11	25JAN11	28APR11	24JUN11	0	-27						
3BL1BI2108	Construct collar between MT & AT	1	36	48	26JAN11	11MAR11	25JUN11	20AUG11	0	-27						

after construction of man access adit!

top heading : 4m deep 17m, @0.2m/day = 72
 4.5m deep 22*4.5*3=891m3, 17.8m3/day
 4.5m deep 22*4.5*9=891m3, 17.8m3/day

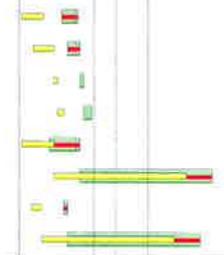
60m @ 0.3m/day

26m, @ 0.3m/day & night

@ 0.3m/day & night

@0.3m/day & night

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012
Remaining Works Prior to Handover															
08R1BI2102	Finishing & reinstatement works; Portion B	1	48	36	18APR11	17JUN11	09AUG11	20SEP11	0	-52					
08R1BI2103	Pre-handover inspections and remedial works	1	48	30	20MAY11	16JUL11	23AUG11	27SEP11	0	-52					
08R1BI2104	Contractor serve notice for Works completion	2	7	7	17JUL11	23JUL11	28SEP11	04OCT11	0	275					
08R1BI2105	SO issues completion certificate	2	21	21	24JUL11	13AUG11	05OCT11	25OCT11	0	275					
16R7BI2102	Landscaping works at Portion B	1	72	72	18APR11	16JUL11	05JUL11	27SEP11	0	-52					
16R7BI2104	Establishment Works at Portion B	2	365	365	17JUL11	15JUL12	28SEP11	26SEP12	0	-62					
3DL1BI2101	Install flow measurement devices at Intake I-2	1	24	12	13MAY11	10JUN11	11AUG11	24AUG11	0	-52					
3DL1BI2105	Maintain & monitor flow monitoring	2	365	365	11JUN11	09JUN12	25AUG11	23AUG12	0	0					
Schedule of Milestones for Cost Centre No. 3bL															
3BL1BI2A02	3bL 1; On establishing tunnelling equipments	2	0	0		05NOV09		08JUN10	0	936					
3BL1BI2A04	3bL 2; On completion of 12.5% perm. tunnel linin	2	0	0		20JUL10		20JUL10	0	894					
3BL1BI2A06	3bL 3; On completion of 25% perm. tunnel lining	2	0	0		27JUL10		30AUG10	0	853					
3BL1BI2A08	3bL 4; On completion of 37.5% perm. tunnel linin	2	0	0		04AUG10		12OCT10	0	810					
3BL1BI2A10	3bL 5; On completion of 50% perm. tunnel lining	2	0	0		11AUG10		23NOV10	0	768					
3BL1BI2A12	3bL 6; On completion of 62.5% perm. tunnel linin	2	0	0		19AUG10		06JAN11	0	724					
3BL1BI2A14	3bL 7; On completion of 75% perm. tunnel lining	2	0	0		26AUG10		19FEB11	0	680					
3BL1BI2A16	3bL 8; On completion of 87.5% perm. tunnel linin	2	0	0		02SEP10		21MAR11	0	650					
3BL1BI2A18	3bL 9; On completion of perm. tunnel lining	2	0	0		09SEP10		01APR11	0	639					
3BL1BI2A20	3bL 10; On completion of all works under this CC	2	0	0		11MAR11		20AUG11	0	498					
Schedule of Milestones for Cost Centre No. 5L															
05L1BI2M02	5L 1; On completion of 25% of excavation	2	0	0		30MAY09		03NOV09	0	1,153					
05L1BI2M04	5L 2; On completion of 50% of excavation	2	0	0		14SEP09		04FEB09	0	1,425					
05L1BI2M06	5L 3; On completion of 75% of excavation	2	0	0		09MAR10		25JAN10	0	1,070					
05L1BI2M08	5L 4; On completion of all excavation	2	0	0		28AUG10		27MAR10	0	1,009					
05L1BI2M10	5L 5; On completion of drop shaft & vortex shaft	2	0	0		11FEB11		25JUL11	0	524					
05L1BI2M12	5L 6; On completion of de-aeration chamber	2	0	0		20OCT10		21JUN11	0	558					
05L1BI2M14	5L 7; On completion of air vent shaft	2	0	0		08JAN11		18MAR09	0	1,383					
05L1BI2M16	5L 8; On completion of man access shaft	2	0	0		02MAR11		20JAN11	0	710					
05L1BI2M18	5L 9; On completion of man access adit	2	0	0		11JAN11		13SEP10	0	839					
05L1BI2M20	5L 10; On completion of all works under this CC	2	0	0		16JUL11		27SEP11	0	460					
Schedule of Milestones for Cost Centre No. 8R															
08R1BI2R02	8R 1; On completion of approach channel	2	0	0		12MAY11		22AUG11	0	496					
08R1BI2R04	8R 2; On completion of trash grill	2	0	0		25FEB11		18APR11	0	622					
08R1BI2R06	8R 3; On completion of all works under this CC	2	0	0		16JUL11		27SEP11	0	460					



- ♦ equipment for tunnelling at Intake I-2
- ♦ for Adit Tunnel at Intake I-2
- ♦ for Adit Tunnel at Intake I-2
- ♦ for Adit Tunnel at Intake I-2
- ♦ for Adit Tunnel at Intake I-2
- ♦ for Adit Tunnel at Intake I-2
- ♦ for Adit Tunnel at Intake I-2
- ♦ for Adit Tunnel at Intake I-2
- ♦ for Adit Tunnel at Intake I-2
- ♦ under this Cost Centre

- ♦ below G.L. except for Adit at Intake I-2
- ♦ below G.L. except for Adit at Intake I-2
- ♦ below G.L. except for Adit at Intake I-2
- ♦ below G.L. except for Adit Intake I-2
- ♦ vortex shaft at Intake I-2
- ♦ chamber at Intake I-2
- ♦ shaft at Intake I-2
- ♦ shaft at Intake I-2
- ♦ adit at Intake I-2
- ♦ under this Cost Centre

- ♦ channel and associated decking at Intake I-2
- ♦ at Intake I-2
- ♦ under this Cost Centre

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012		
Schedule of Milestones for Cost Centre No. 12R																	
12R3BI2S02	12R 1; On completion of 50% pile retain, wall	2	0	0		14JUL08		06NOV08	0	1,515							
12R3BI2S04	12R 2; On completion of pile retain, wall	2	0	0		13SEP08		29NOV08	0	1,492							
12R3BI2S06	12R 3; On completion of boulder traps	2	0	0		11MAR11		19MAR11	0	652							
12R3BI2S08	12R 4; On completion of all works under this CC	2	0	0		16JUL11		27SEP11	0	460							
Construction of Intake I-3																	
Preliminary Works																	
01R1CI3102	Possession of Portion C -90d of DOC	2	0	0			26MAR08A		100								
01R1CI3104	Site clearance	1	0	40			22APR08A	20SEP08	50	0							
01R1CI3106	Haarding at slope crest	1	0	48			03JUN08A	30JUL08A	100								
01R1CI3108	Erect chain link fence enclosing the Site	1	0	60		26MAR08	22SEP08	02DEC08	0	0							
01R1CI3110	Set-up wheel washing facilities	1	0	6		06MAR08	30JUN08A	03JUL08A	100								
01R1CI3118	Install remote control CCTV as per ER 4.4.10	1	30	12	27MAR08	02MAY08	22SEP08	06OCT08	0	0							
Tree Transplanting Works																	
16R7CI3202	Tree inspection & report	2	72	7	27MAR08	23JUN08	01APR08A	26APR08A	100								
16R7CI3204	Tree transplant for upper parts; 8 nos.	1	72	86*	22APR08	18JUL08	04JUN08A	13SEP08	83	147							
16R7CI3206	1st stg tree pruning	1	0	2			04JUN08A	21JUN08A	100								
16R7CI3208	2nd stg tree pruning	1	0	2			04JUL08A	04JUL08A	100								
16R7CI3210	Final stg. tree pruning & tree uplifting	1	0	6			08SEP08	13SEP08	0	147							
16R7CI3212	Tree transplanting at Ch250-Ch200; 20 nos.	1	0	152*			21JUN08A	19DEC08	38	145							
16R7CI3214	1st stg tree pruning	1	0	3			21JUN08A	15JUL08A	100								
16R7CI3216	2nd stg tree pruning	1	0	3			15JUL08A	12NOV08	50	145							
16R7CI3218	Final stg tree pruning & tree uplifting	1	0	8			11DEC08	19DEC08	0	145							
16R7CI3220	Tree transplanting at Ch100-Ch0; 33 nos.	1	0	66*			04DEC08	25FEB09	0	536							
16R7CI3222	1st stg tree pruning	1	0	4			04DEC08	08DEC08	0	536							
16R7CI3224	2nd stg tree pruning	1	0	4			09JAN09	13JAN09	0	536							
16R7CI3226	Final stg tree pruning & tree uplifting	1	0	10			14FEB09	25FEB09	0	536							
H-Pile Retaining Wall for Wall A																	
Piling Works																	
13R4CI3402	Mobilize & set up piling rig	1	0	6			11AUG08A	16AUG08A	100								
13R4CI3404	350mm dia. pre-bored H-piles, Wall A; 347nos.	1	0	80			18AUG08A	26NOV08	6	145							
Skin Wall																	
13R4CI3406	Excavate for skin wall construction; 2130m3	1	0	60			27SEP08	08DEC08	0	145							
13R4CI3408	Hack off piles; piles 1 to 347	1	0	60			14OCT08	22DEC08	0	597							
13R4CI3410	Construct skin wall;	1	0	60			28OCT08	08JAN09	0	597							
13R4CI3412	Excavate for capping beams;	1	0	24			23DEC08	22JAN09	0	597							

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012
13R4CI3414	Construct for capping beams;	1	0	24			02JAN09	02FEB09	0	597					
13R4CI3416	Construct U-channels	1	0	24			09JAN09	09FEB09	0	597					
Soil Nailing Works															
Soil Nailing Without Earthwork															
13R1CI3502	Scaffolding platform for soil nailing	1	0	18			08SEP08	29SEP08	0	633					
13R1CI3504	Mobilize & set up drilling & grouting plants	1	0	4			12SEP08	17SEP08	0	633					
13R1CI3506	Install & grout soil nails; 431 nos. + 9 Test N.	1	0	69			18SEP08	09DEC08	0	633					
Soil Nailing After Earthwork at ARCH 210-270															
13R1CI3508	Install & grout soil nails; 153 nos. + 3 Test N.	1	0	29			27DEC08*	03FEB09	0	620					
Soil Nailing After Earthwork at Turning Area															
13R1CI3510	Install & grout soil nails; 149 nos. + 4 Test N.	1	0	28			19JAN09*	23FEB09	0	603					
Soil Nailing After Earthwork at ARCH 90-0															
13R1CI3512	Install & grout soil nails; 304 nos. + 11 Test N	1	0	30			14FEB09*	20MAR09	0	510					
Access Road Construction															
Phase 1															
09R1CI3602	Excavate/backfill access road; Ch 460 to 260	1	0	50			14OCT08	10DEC08	0	145					
09R1CI3604	Drainage work from Ch460 to 260; 200m	1	0	50			02NOV09*	31DEC09	0	284					
09R1CI3606	Backfill & prepare road formation; CH460-260	1	0	18			02JAN10	22JAN10	0	331					
09R1CI3608	Laying of Sub-base/Road Kerbs; CH460-260	1	0	16			01APR10	23APR10	0	284					
09R1CI3610	Concrete paving; CH460-260	1	0	16			05MAY10	24MAY10	0	284					
09R1CI3614	Excavate/backfill access road; Ch 260 to 0	1	0	50			11DEC08	13FEB09	0	145					
09R1CI3616	Construction of Drainage System; CH0-260	1	0	65			02JAN10	22MAR10	0	284					
09R1CI3618	Backfill & prepare road formation; CH0-260	1	0	24			23MAR10	23APR10	0	284					
09R1CI3620	Laying of Sub-base/Road Kerbs; CH0-260	1	0	24			24APR10	24MAY10	0	284					
09R1CI3622	Concrete paving; CH0-260	1	0	24			25MAY10	22JUN10	0	284					
13R1CI3612	Boulder Treatment; 5050m3	1	0	60			11DEC08	25FEB09	0	536					
H-Pile Retaining Wall for Wall B															
Piling Works															
13R4CI3702	Mobilize & set up piling rig	1	0	6			21MAR09	27MAR09	0	510					
13R4CI3704	350mm dia. pre-bored H-piles, Wall B; 98 nos.	1	0	53			28MAR09	05JUN09	0	510					
Skin Wall															
13R4CI3706	Excavate for skin wall; 48m3	1	0	18			06JUN09	26JUN09	0	510					
13R4CI3708	Hack off piles; piles 1 to 106	1	0	24			20JUN09	18JUL09	0	510					
13R4CI3710	Construct skin wall;	1	0	24			06JUL09	01AUG09	0	510					
13R4CI3712	Excavate for capping beams;	1	0	24			03AUG09	29AUG09	0	510					
13R4CI3714	Construct for capping beams;	1	0	24			10AUG09	05SEP09	0	510					
13R4CI3716	Construct U-channels	1	0	24			17AUG09	12SEP09	0	510					

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012		
Channel Modification Works (Dry Season)																	
Phase 2																	
09R1CI3802	Mobilize drilling rig & backhoe	1	6	1	02NOV09*	07NOV09	02JAN09	02JAN09	0	145							
09R1CI3804	Breaking of large boulders	1	10	24	09NOV09	19NOV09	03JAN09	03FEB09	0	145							
09R1CI3806	Excavation of the stream bed & make good	1	36	24	20NOV09	04JAN10	04FEB09	03MAR09	0	145							
09R1CI3808	Laying of rock armour	1	24	24	05JAN10	01FEB10	04MAR09	31MAR09	0	145							
09R1CI3810	Construct working platform	1	24	12	05JAN10	01FEB10	18MAR09	31MAR09	0	145							
09R1CI3812	Divert channel to south west	1	24	12	02FEB10	04MAR10	18MAR09	31MAR09	0	145							
Excavation for AVS/VS/DC/MAS/MAA																	
Phase 2																	
06L1CI3902	Mobilize drilling rig & grouting plant	1	0	1			01APR09	01APR09	0	145							
06L1CI3904	Drill & grout 25m deep, 90 nos. grout holes	1	0	50			02APR09	06JUN09	0	145							
06L1CI3906	Mobilize drilling rig, backhoe & crane	1	0	1			08JUN09	08JUN09	0	145							
06L1CI3908	Excavate/mucking out/temporary support	1	0	200			09JUN09	04FEB10	0	145							
Excavation & Construction of Main Adit																	
Phase 3																	
3CL1CI3102	Excavation/mucking out/temporary support	1	40	40	22OCT09	08DEC09	05FEB10	26MAR10	0	145							
3CL1CI3104	Construction of permanent lining	1	24	24	09DEC09	08JAN10	27MAR10	28APR10	0	145							
Construction of Man Access Adit (MAA)																	
Phase 3																	
06L1CI3112	Cast invert; 1 bay	1	0	7			05FEB10	12FEB10	0	250							
06L1CI3114	Cast walls	1	0	12			17FEB10	02MAR10	0	250							
06L1CI3116	Cast crown	1	0	12			03MAR10	16MAR10	0	250							
Construction of Man Access Shaft (MAS)																	
Phase 3																	
06L1CI3122	Cast base	1	53	3	02JUL09	01SEP09	17MAR10	19MAR10	0	250							
06L1CI3124	Set up formworks	1	24	6	02SEP09	29SEP09	20MAR10	26MAR10	0	250							
06L1CI3126	Construct wall/stair; 14 landings @ 6 days/land.	1	0	84			27MAR10	12JUL10	0	250							
06L1CI3128	Construct wall above ground level	1	0	6			13JUL10	19JUL10	0	250							
06L1CI3129	Construct shaft roof	1	0	12			20JUL10	02AUG10	0	250							
Construction of Deaeration Chamber (DC)																	
Phase 3																	
06L1CI3132	Construct base	1	0	9			29APR10	10MAY10	0	145							
06L1CI3134	Construct walls 2 lifts	1	0	12			11MAY10	25MAY10	0	145							
06L1CI3136	Const. crown/underpin of air vent & drop shafts	1	0	18			26MAY10	15JUN10	0	145							
Construction of Vortex Shaft (VS)																	
Phase 3																	
06L1CI3142	Set up formworks	1	0	6			17JUN10	23JUN10	0	210							
06L1CI3144	Construction of drop shaft; 4m high	1	0	6			24JUN10	30JUN10	0	210							

curtain grouting 15m/rig; use 3 rigs, 2250/15/3=50

6000m3, 30m3/day = 200

10m, @0.3m/day

@ 4 days/ landing 22m & 14 landings

@4m/4days

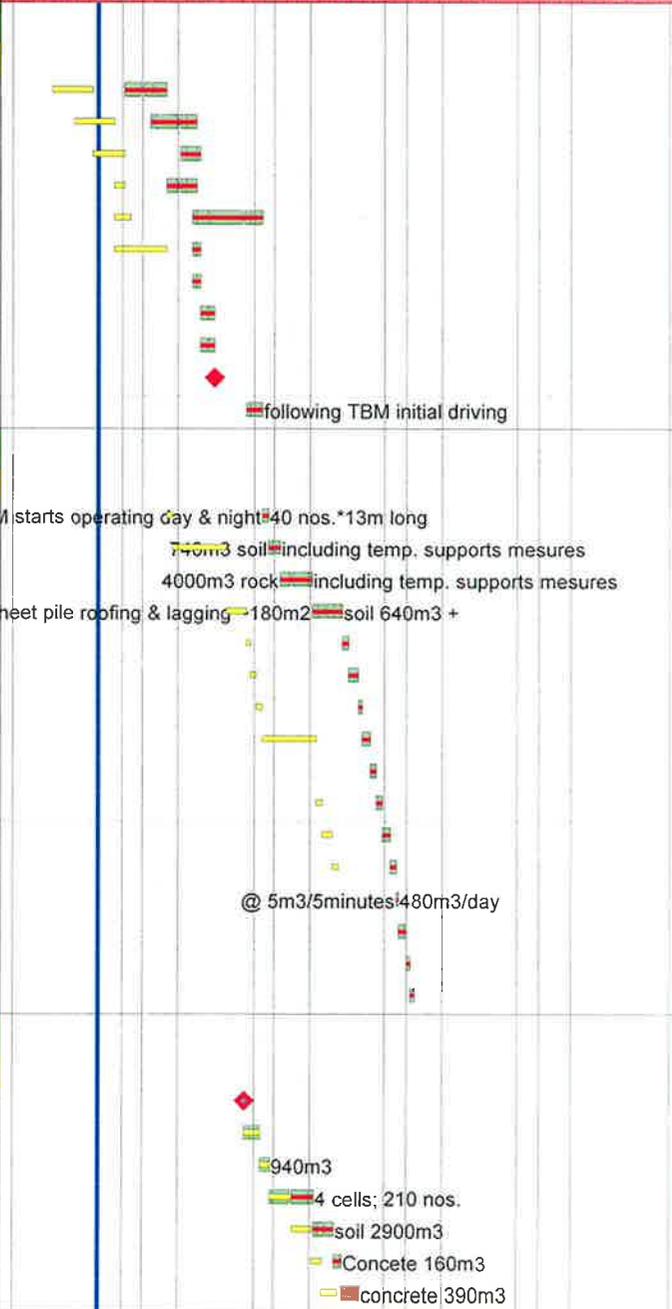
ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012
06L1CI3146	Construction of vortex structure	1	0	24			10JUL10	06AUG10	0	210					
06L1CI3148	Construct remaining of the vortex	1	0	18			24AUG10	13SEP10	0	210					
Construction of Air Vent Shaft Shaft (AVS)															
Phase 3															
06L1CI3152	Set up formworks	1	0	6			17JUN10	23JUN10	0	220					
06L1CI3514	Cast 15m high circular wall	1	0	15			24JUN10	12JUL10	0	220					
06L1CI3516	Construct upstand wall	1	0	12			13JUL10	26JUL10	0	220					
Backfill Around Structure															
Phase 3															
06L1CI3162	Granular fill up to +54mPD; 623m3	1	0	7			02JUL10	09JUL10	0	210					
06L1CI3164	Granular fill above +54mPD; 1400m3	1	0	14			07AUG10	23AUG10	0	210					
Construction of Approach Channel															
Phase 3															
09R1CI3172	Open excavation for Approach Channel	1	0	60			12APR10	23JUN10	0	145					
09R1CI3174	Construction of Approach Channel	1	0	122			24JUN10	17NOV10	0	145					
09R1CI3176	Construction of boulder trap; 7 nos.	1	0	24			24JUN10	22JUL10	0	243					
09R1CI3178	Construction of trash grill	1	0	12			18NOV10	01DEC10	0	145					
09R1CI3179	Removal of concrete bolck bund	1	0	6			02DEC10	08DEC10	0	145					
Junction Between Main Tunnel & Adit Tunnel															
3CL1CI3106	Temp. support & excavation breakthrough	1	12	48	22JUN10	06JUL10	26FEB11	27APR11	0	-27					
3CL1CI3108	Construct collar between MT & AT	1	36	48	07JUL10	17AUG10	28APR11	24JUN11	0	21					
Remaining Works Prior to Handover to Client															
09R1CI3142	Finishing & reinstatement works; Portion C	1	48	36	07FEB11	02APR11	13MAY11	24JUN11	0	21					
09R1CI3143	Pre-handover inspections and remedial works	1	48	30	07MAR11	05MAY11	27MAY11	02JUL11	0	21					
09R1CI3144	Contractor serve notice for Works completion	2	7	7	06MAY11	12MAY11	03JUL11	09JUL11	0	519					
09R1CI3146	SO issues completion certificate	2	21	21	13MAY11	02JUN11	10JUL11	30JUL11	0	519					
16R7CI3142	Landscaping works at Portion C	1	120	120	06DEC10	05MAY11	02FEB11	02JUL11	0	21					
16R7CI3144	Establishment Works at Portion C	2	365	365	06MAY11	04MAY12	03JUL11	01JUL12	0	25					
3DL1CI3141	Install flow measurement devices at Intake I-3	1	24	12	07FEB11	05MAR11	09DEC10	22DEC10	0	145					
3DL1CI3143	Maintain & monitor flow monitoring	2	365	365	06MAR11	04MAR12	23DEC10	22DEC11	0	217					
Schedule of Milestones for Cost Centre No. 3cL															
3CL1CI3A02	3cL 1; On establishing tunnelling equipments	2	0	0		21OCT09		11FEB10	0	1,053					
3CL1CI3A04	3cL 2; On completion of 12.5% perm. tunnel linin	2	0	0		11DEC09		24FEB10	0	1,040					
3CL1CI3A06	3cL 3; On completion of 25% perm. tunnel lining	2	0	0		15DEC09		05MAR10	0	1,031					
3CL1CI3A08	3cL 4; On completion of 37.5 perm. tunnel lining	2	0	0		18DEC09		15MAR10	0	1,021					
3CL1CI3A10	3cL 5; On completion of 50% perm. tunnel lining	2	0	0		22DEC09		24MAR10	0	1,012					

rock, 2940m3; @50m3/day =60 days

- ◆ equipment for tunnelling at Intake I-3
- ◆ Adit Tunnel at Intake I-3
- ◆ Adit Tunnel at Intake I-3
- ◆ Adit Tunnel at Intake I-3
- ◆ Adit Tunnel at Intake I-3

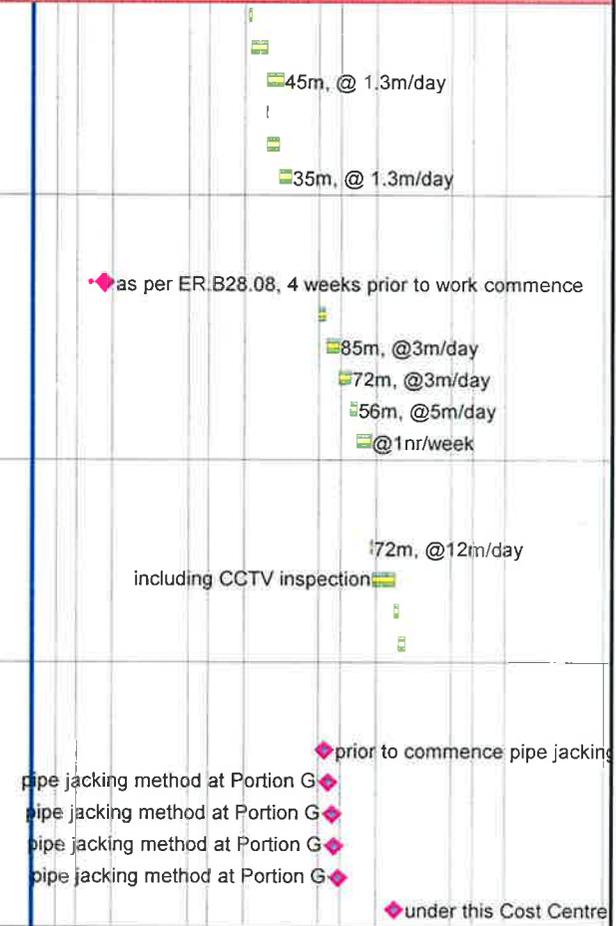
ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012
3CL1CI3A12	3cL 6; On completion of 62.5% perm. tunnel linin	2	0	0		28DEC09		07APR10	0	998					
3CL1CI3A14	3cL 7; On completion of 75% perm. tunnel lining	2	0	0		31DEC09		16APR10	0	989					
3CL1CI3A16	3cL 8; On completion of 87.5% perm. tunnel linin	2	0	0		08JAN10		28APR10	0	977					
3CL1CI3A18	3cL 9; On completion of perm. tunnel lining	2	0	0		20JUL10		24JUN11	0	555					
3CL1CI3A20	3cL 10; On completion of all works under this CC	2	0	0		17AUG10		24JUN11	0	555					
Schedule of Milestones for Cost Centre No. 6L															
06L1CI3M02	6L 1; On completion of 50% of excavation	2	0	0		21OCT09		29SEP09	0	1,188					
06L1CI3M04	6L 2; On completion of excavation works	2	0	0		05NOV10		04FEB10	0	1,060					
06L1CI3M08	6L 3; On completion of vortex shaft	2	0	0		08JAN11		13SEP10	0	839					
06L1CI3M10	6L 4; On completion of de-aeration chamber	2	0	0		18FEB10		15JUN10	0	929					
06L1CI3M12	6L 5; On completion of vent shaft	2	0	0		09FEB09		26JUL10	0	888					
06L1CI3M14	6L 6; On completion of man access shaft	2	0	0		23NOV09		02AUG10	0	881					
06L1CI3M16	6L 7; On completion of man access adit	2	0	0		29SEP09		16MAR10	0	1,020					
06L1CI3M18	6L 8; On completion of all works under this CC	2	0	0		05MAY11		13SEP10	0	839					
Schedule of Milestone for Cost Centre No. 9R															
09R1CI3R02	9R 1; On completion of access road	2	0	0		26MAR10		22JUN10	0	922					
09R1CI3R04	9R 2; On completion of 25% of excavation at G.L	2	0	0		05SEP08		30OCT08	0	1,522					
09R1CI3R06	9R 3; On completion of 50% of excavation at G.L	2	0	0		24FEB09		04DEC08	0	1,487					
09R1CI3R08	9R 4; On completion of 75% of excavation at G.L	2	0	0		12MAY09		10DEC08	0	1,481					
09R1CI3R10	9R 5; On completion of excavation at G.L.	2	0	0		23JUL09		13FEB09	0	1,416					
09R1CI3R12	9R 6; On completion of 50% of approach channel	2	0	0		20NOV10		21AUG10	0	862					
09R1CI3R14	9R 7; On completion of approach channel	2	0	0		21JAN11		17NOV10	0	774					
09R1CI3R16	9R 8; On completion of trash grill	2	0	0		19FEB11		01DEC10	0	760					
09R1CI3R18	9R 9; On completion of all works under this CC	2	0	0		05MAY11		02JUL11	0	547					
Schedule of Milestones for Cost Centre No. 13R															
13R4CI3S01	13R 1; On completion of 30% soil nailing	2	0	0		28AUG08		05NOV08	0	1,516					
13R4CI3S02	13R 2; On completion of 60% soil nailing	2	0	0		25NOV08		23FEB09	0	1,406					
13R4CI3S03	13R 3; On completion of all soil naing works	2	0	0		12MAY09		20MAR09	0	1,381					
13R4CI3S04	13R 4; On completion of 10% piles by number	2	0	0		26MAY08		27AUG08	0	1,586					
13R4CI3S05	13R 5; On completion of 20% piles by number	2	0	0		05JUN08		06SEP08	0	1,576					
13R4CI3S06	13R 6; On completion of 30% piles by number	2	0	0		17JUN08		18SEP08	0	1,564					
13R4CI3S07	13R 7; On completion of 40% piles by number	2	0	0		27JUN08		29SEP08	0	1,553					
13R4CI3S08	13R 8; On completion of 50% piles by number	2	0	0		09JUL08		11OCT08	0	1,541					
13R4CI3S09	13R 9; On completion of 60% piles by number	2	0	0		19JUL08		22OCT08	0	1,530					
13R4CI3S10	13R 10; On completion of 70% piles by number	2	0	0		30JUL08		01NOV08	0	1,520					
13R4CI3S11	13R 11; On completion of 80% piles by number	2	0	0		07AUG08		26NOV08	0	1,495					
13R4CI3S12	13R 12; On completion of 90% piles by number	2	0	0		28AUG08		22APR09	0	1,348					

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012						
Form Temporary Launching Platform																					
10R1DO0302	Cut slope (72 to 40mPD)/install perm. soil nails	1	90	96	26APR08	13AUG08	07NOV08	05MAR09	0	-96											
10R1DO0304	Cut slope & form launching platform; 40 to 24mPD	1	90	100	25JUN08	11OCT08	22JAN09	29MAY09	0	-96											
10R1DO0306	Cut rock benching & form platform; 14 to 24 mPD	1	72	42	14AUG08	08NOV08	15APR09	05JUN09	0	-96											
3AL1DO0302	Excavate/Const. TBM launching chamber; 15m long	1	24	65	13OCT08	08NOV08	07MAR09	29MAY09	0	-96											
3AL1DO0304	Install steel platform, hopper & other facilities	1	40	163*	13OCT08	27NOV08	18MAY09	28NOV09	0	-96											
3AL1DO0306	Construct foundation for steel platform	1	120	18	13OCT08	07MAR09	18MAY09	08JUN09	0	-96											
3AL1DO0308	Construct foundation for hopper	1	0	18			18MAY09	08JUN09	0	-96											
3AL1DO0310	Install crane/gantry/ rail system	1	0	30			09JUN09	14JUL09	0	-96											
3AL1DO0312	Install steel platform	1	0	30			09JUN09	14JUL09	0	-96											
3AL1DO0314	Commence TBM initial assembly	1	0	0			15JUL09		0	-96											
3AL1DO0316	Install hopper	1	0	40			13OCT09	28NOV09	0	-96											
Construct Spiral Ramp & Associ. Vehicular Access																					
10R1DO0402	Install 273mm dia. temp. pipe piles; 40 nos.	1	12	12	07MAR09	20MAR09	30NOV09	12DEC09	0	-85											
10R1DO0404	Soil excavation & install wailing & tie backs	1	120	24	21MAR09	17AUG09	14DEC09	13JAN10	0	-85											
10R1DO0406	Rock excavation for spiral ramp; 4000m3	1	0	70			14JAN10	13APR10	0	-85											
10R1DO0408	Excavation for vehicular access underneath CPR	1	48	70	18AUG09	14OCT09	14APR10	08JUL10	0	-85											
10R1DO0410	Construct base for vehicular access	1	8	12	15OCT09	23OCT09	09JUL10	22JUL10	0	-85											
10R1DO0412	Construct wall & roof for vehicular access	1	16	24	24OCT09	12NOV09	23JUL10	19AUG10	0	-85											
10R1DO0414	Construct base of spiral ramp; Outfall O-1	1	12	12	13NOV09	26NOV09	20AUG10	02SEP10	0	-85											
10R1DO0416	Cast spiral ramp up to +6.73mPD	1	120	15	27NOV09	27APR10	03SEP10	20SEP10	0	-85											
10R1DO0418	Cast spiral ramp up to +11.58mPD	1	0	15			21SEP10	09OCT10	0	-85											
10R1DO0420	Cast spiral ramp up to +16.00mPD	1	12	15	28APR10	12MAY10	11OCT10	28OCT10	0	-85											
10R1DO0422	Cast spiral ramp up to +20.00mPD	1	24	15	13MAY10	10JUN10	29OCT10	15NOV10	0	-85											
10R1DO0424	Cast spiral ramp up to +24.23mPD	1	12	15	11JUN10	25JUN10	16NOV10	02DEC10	0	-85											
10R1DO0425	Backfill spiral ramp; 1700m3	1	0	4			03DEC10	07DEC10	0	-85											
10R1DO0426	Construct spiral ramp top; Outfall O-1	1	0	20			08DEC10	03JAN11	0	-85											
10R1DO0428	Construct vehicular access bet. tunnel & s. ramp	1	0	10			04JAN11	14JAN11	0	-85											
10R1DO0430	Commission of Spiral Ramp	1	0	6			15JAN11	21JAN11	0	-85											
Construct Lower Part Box Culvert & Open Channel																					
10R1DO0502	Site possession of Portion E-650d of DOC	2	0	0	08OCT09		08OCT09		0	-78											
10R1DO0504	Divert exist. outfall "W" under CPR arch bridge	1	36	36	08OCT09	19NOV09	08OCT09	19NOV09	0	-65											
10R1DO0506	Excavate & form pipe roofing platform @+2.3mPD	1	24	24	20NOV09	17DEC09	20NOV09	17DEC09	0	-65											
10R1DO0508	Install temp. pile for pipe roofing	1	48	96	18DEC09	18FEB10	18DEC09	20APR10	0	-65											
10R1DO0510	Excavate for box-culvert; 2 cells	1	44	44	19FEB10	15APR10	21APR10	12JUN10	0	-65											
10R1DO0512	Construct base slabs of box culvert; 2 cells	1	20	20	16APR10	10MAY10	14JUN10	08JUL10	0	-65											
10R1DO0514	Construct wall & roof of box culvert; 2 cells	1	40	40	11MAY10	28JUN10	09JUL10	24AUG10	0	-65											



ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
16R7DO0902	Landscaping works at Portion D	1	120	120	19JAN11	17JUN11	12JUL11	01DEC11	0	-106						
16R7DO0904	Establishment Works at Portion D	2	365	365	18JUN11	16JUN12	02DEC11	30NOV12	0	-127						
3DL1DO0902	Install flow measurement devices at Outfall O-1	1	24	12	18APR11	19MAY11	11NOV11	24NOV11	0	-106						
3DL1DO0903	T & C for flow measurement system	1	0	28			31OCT11	01DEC11	0	-106						
3DL1DO0904	Maintain & monitor flow monitoring	2	365	365	20MAY11	18MAY12	02DEC11	30NOV12	0	0						
Schedule of Milestones for Cost Centre No. 10R																
10R1DO1002	10R 1; On completion of 20% excavation works	2	0	0		09JUL08		06NOV08	0	1,515						
10R1DO1004	10R 2; On completion of 40% excavation works	2	0	0		03SEP08		05MAR09	0	1,396						
10R1DO1006	10R 3; On completion of 60% excavation works	2	0	0		08NOV08		29MAY09	0	1,311						
10R1DO1008	10R 4; On completion of 80% excavation works	2	0	0		14OCT09		08JUL10	0	906						
10R1DO1010	10R 5; On completion all excavation works	2	0	0		18FEB11		20SEP11	0	467						
10R1DO1012	10R 6; On completion of cascade structure	2	0	0		16APR11		17NOV11	0	409						
10R1DO1014	10R 7; On completion of spiral ramp to +16mPD	2	0	0		23FEB10		28OCT10	0	794						
10R1DO1016	10R 8; On completion of spiral access ramp	2	0	0		25JUN10		21JAN11	0	709						
10R1DO1018	10R 9; On completion box-culvert & open channel	2	0	0		07MAR11		24JUN11	0	555						
10R1DO1020	10R 10; On completion of seabed protection wks	2	0	0		04APR11		04APR11	0	636						
10R1DO1022	10R 11; On completion of all works under this CC	2	0	0		17JUN11		01DEC11	0	395						
Schedule of Milestones for Cost Centre No. 14R																
14R5DO1102	14R 1; On complet. of remove exist. rock armour	2	0	0		22JUL10		22JUL10	0	892						
14R5DO1104	14R 2; On complet. of 50% soil nailing by number	2	0	0		20JUN08		31DEC08	0	1,460						
14R5DO1106	14R 3; On completion all soiling works	2	0	0		13AUG08		05MAR09	0	1,396						
14R5DO1108	14R 4; On completion of all works under this CC	2	0	0		08NOV08		29MAY09	0	1,311						
Drainage Improvement Works at Portion G																
Preliminary Works																
01R6GG0102	SO consent Drainage Impact Assessment Report.	1	90	0	30MAY09	27AUG09		09APR09	0	306						
01R6GG0112	Obtain TTA (ingress & egress) approval	2	0	0		25NOV09		25NOV09	0	0						
01R6GG0114	Possession of Portion G -700d of DOC	2	0	0	26NOV09		26NOV09		0	0						
01R6GG0116	Site clearance/Site Establishment	1	30	30	10DEC09	16JAN10	10DEC09	16JAN10	0	107						
3DL6GG0104	Obtain approval for Geotechnical Instrumentation	2	0	0		25NOV09		25NOV09	0	0						
3DL6GG0106	Installation of Geotechnical Instrumentation	1	12	12	26NOV09	09DEC09	26NOV09	09DEC09	0	0						
3DL6GG0108	Monitor/report Geotechnical Instrumentation	1	770	904	10DEC09	20JUL12	10DEC09	29DEC12	0	0						
Piling Works																
15R6GG0200	Obtain SO's consent for temp. works design	1	0	0		24JAN09		02MAR09	0	368						
15R6GG0202	Mobilization & set up for temp. platform	1	3	3	18JAN10	20JAN10	18JAN10	20JAN10	0	107						
15R6GG0204	Construct steel working platform for H-piling	1	110	110	21JAN10	08JUN10	21JAN10	08JUN10	0	107						

ID	Activity Description	Cal ID	Target Dur	Orig Dur	Target Start	Target Finish	Early Start	Early Finish	% Comp	Total Float	2008	2009	2010	2011	2012	
15R6GG0206	Mobilization & set up for H-piling; Wall 1	1	3	3	23APR10	26APR10	23APR10	26APR10	0	107						
15R6GG0208	52 nos. 600mm dia. H-piles; Wall 1 @1.5 nr/day	1	35	35	27APR10	08JUN10	27APR10	08JUN10	0	107						
15R6GG0210	Excavate & construct skin wall 1 at Portion G	1	35	35	09JUN10	21JUL10	09JUN10	21JUL10	0	107						
15R6GG0212	Mobilization & set up for H-piling; Wall 2	1	3	3	09JUN10	11JUN10	09JUN10	11JUN10	0	107						
15R6GG0214	40 nos. 600mm dia. H-piles; Wall 2 @1.5 nr/day	1	27	27	12JUN10	15JUL10	12JUN10	15JUL10	0	107						
15R6GG0216	Excavate & construct skin wall 2 at Portion G	1	27	27	16JUL10	16AUG10	16JUL10	16AUG10	0	107						
Drainage Improvement Works																
15R6GG0301	Obtain approval of ELS design package incl MS	2	0	0		07FEB09		17MAR09	0	645						
15R6GG0302	Install ELS & excavate shaft for pipe jacking	1	18	18	01NOV10*	20NOV10	01NOV10*	20NOV10	0	45						
15R6GG0304	Construct 1.5m dia. drainage by pipe jacking	1	30	30	22NOV10	28DEC10	22NOV10	28DEC10	0	45						
15R6GG0306	Construct 1.5m dia. drainage by open trenching	1	24	24	29DEC10	26JAN11	29DEC10	26JAN11	0	45						
15R6GG0308	Construct .75m & 1.5m U and Stepped Channel	1	12	12	27JAN11	12FEB11	27JAN11	12FEB11	0	45						
15R6GG0310	Construct 3 nos. manhole & 2 nos. catchpit	1	35	35	14FEB11	25MAR11	14FEB11	25MAR11	0	45						
Remaining Works Prior to Handover to Client																
15R6GG0312	Reinstate carriageway & footway	1	6	6	26MAR11	01APR11	26MAR11	01APR11	0	45						
15R6GG0402	Pre-handover inspections and remedial works	1	48	48	02APR11	02JUN11	02APR11	02JUN11	0	45						
15R6GG0404	Contractor serve notice for Works completion	2	7	7	03JUN11	09JUN11	03JUN11	09JUN11	0	549						
15R6GG0408	SO issues completion certificate	2	21	21	10JUN11	30JUN11	10JUN11	30JUN11	0	549						
Schedule of Milestones for Cost Centre No. 15R																
15R6GG0502	15R 1; On completion of all temp. works	2	0	0		20NOV10		20NOV10	0	771						
15R6GG0504	15R 2; On completion of 25% of pipejacking	2	0	0		30NOV10		30NOV10	0	761						
15R6GG0506	15R 3; On completion of 50% of pipejacking	2	0	0		08DEC10		08DEC10	0	753						
15R6GG0508	15R 4; On completion of 75% of pipejacking	2	0	0		17DEC10		17DEC10	0	744						
15R6GG0510	15R 5; On completion of all pipejacking	2	0	0		28DEC10		28DEC10	0	733						
15R6GG0512	15R 6; On completion of all wks under this CC	2	0	0		02JUN11		02JUN11	0	577						



Appendix D

Implementation Status of Environmental Mitigation Measures

IMPLEMENTATION SCHEDULE June 2009

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
Air Quality					
3.6.1	<p>Specific</p> <p>As mentioned in Section 3.5, exceedances of 1-hour and 24-hour average TSP guideline levels have been predicted at most of the ASRs. Hence, mitigation measures are considered necessary in order to suppress the potential dust impact.</p> <p>The dust suppression measures set out in the <i>Air Pollution Control (Construction Dust) Regulation</i>, in fact, are more extensive. Therefore, it is expected that with watering the construction site every four times daily together with strict implementation of dust suppression measures as stipulated in the <i>Air Pollution Control (Construction Dust) Regulation</i>, the dust level is expected to be reduced by over 75%.</p> <p>General</p> <p>To further ensure compliance with the guideline and AQO limit at the ASRs at all time, it is recommended to implement the <i>Air Pollution Control (Construction Dust) Regulation</i> and include good site practice in the contract clauses to minimize cumulative dust impact. In addition, a comprehensive dust monitoring and audit programme is recommended to ensure proper implementation of the identified mitigation measures. Details of the monitoring and audit requirements are provided in a separate EM&A Manual.</p> <ul style="list-style-type: none"> • effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building or if a canopy is provided at the first floor level, from the first floor level, up to the highest level of the scaffolding where a scaffolding is erected around the perimeter of a building under construction; • dump truck for material transport should be totally enclosed by impervious sheeting; • any excavated dusty materials or stockpile of dusty materials should be covered entirely by impervious sheeting or sprayed with water so as to maintain the entire surface wet, and recovered or backfilled or reinstated within 24 hours of the excavation or unloading; • stockpile of dusty materials should not extend beyond the pedestrian barriers, fencing or traffic cones; • dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; 	DSD's Contractor	Construction Work Sites	Air Pollution Control (Construction Dust) Regulation	<p>✓</p> <p>✓</p> <p>N/A</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
3.6.1	<ul style="list-style-type: none"> • 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; • where a site boundary adjoins a road, street or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length except for a site entrance or exit; • every main haul road should be sealed with concrete and kept clear of dusty materials or sprayed with water so as to maintain the entire road surface wet; • the portion of road leading only to a construction site that is within 30m of a designated vehicle entrance or exit should be kept clear of dusty materials; • stockpile of dusty materials should be either covered entirely by impervious sheeting, placed in an area sheltered on the top and the 3 sides; or sprayed with water so as to maintain the entire surface wet; • all dusty materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty material wet; • vehicle speed should be limited to 10 kph except on completed access roads; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites; • the load of dusty materials carried by vehicle leaving a construction site should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle; and • the working area of excavation should be sprayed with water immediately before, during and immediately after the operations so as to maintain the entire surface wet. 	DSD's Contractor	Construction Work Sites	Air Pollution Control (Construction Dust) Regulation	<p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p>
Noise					
4.6.1	<p>During Construction</p> <p>Appropriate mitigation measures such as the use of quiet equipment and movable barriers will be developed to ensure that noise can be reduced to acceptable levels without causing programme delays</p> <p><i>Good Site Practice</i></p> <p>Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during construction:</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 works; • machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; 	DSD's Contractor	Construction Work Sites	PN 2/93 Noise from Construction Activities & EIAO	<p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p> <p style="text-align: center;">✓</p>

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
4.6.1	<ul style="list-style-type: none"> plant known to emit noise strongly in one direction should, where possible, be orientated to direct noise away from the NSRs; 	DSD's Contractor	Construction Work Sites	PN 2/93 Noise from Construction Activities & EIAO	✓
	<ul style="list-style-type: none"> mobile plant should be sited as far away from NSRs as possible; and 				✓
	<ul style="list-style-type: none"> material stockpiles and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 				✓
	<i>For Drill and Blast Works</i> <ul style="list-style-type: none"> Charge mass per delay should be decreased by minimising the number of blastholes firing on each delay. 				N/A
	<ul style="list-style-type: none"> Smaller blasthole patterns and longer delays should be used between dependent charges. 				N/A
	<ul style="list-style-type: none"> Times of blasting should be established to suit the situation and firing blasts when neighbours are busy with their daily tasks (and at a regular time such as lunch time). 				N/A
	<i>For TBM Tunnelling</i> <ul style="list-style-type: none"> For the tunnel excavation, it is anticipated that beyond the initial length (say within 30m), excavation will be carried out well within the tunnel and door should be provided to further minimize the noise nuisance to the nearby receivers. 				N/A
4.6.2	<p>During Operation</p> <p>Good site practice and noise management can significantly reduce the impact of maintenance activities on nearby NSRs. The following package of measures should be followed during construction</p> <ul style="list-style-type: none"> only well-maintained plant should be operated on-site; machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; and plant known to emit noise strongly in one direction should, where possible, be orientated to direct noise away from the NSRs. 	DSD's Contractor	Project Area	NCO & EIAO	N/A
Water Quality					
5.9.1	<p>During Construction</p> <p>Mitigation measures and a spill control and response plan have been prepared for works at the intakes and work sites.</p> <p><i>Precautions to be taken at any time of year when rainstorms are likely:</i></p> <ul style="list-style-type: none"> Temporarily exposed surfaces should be covered e.g. by tarpaulin. Temporary access roads should be protected by crushed stone or gravel. Trenches should be dug and backfilled in short sections. Measures should be taken to minimize the ingress of rainwater into trenches. <p><i>Actions to be taken when a rainstorm is imminent or forecast:</i></p> <ul style="list-style-type: none"> Silt removal facilities, should be checked to ensure that they can function properly. 	DSD's Contractor	Construction Work Sites	Practice Note for Professional Persons with regard to site drainage (ProPECC PN 1/94) and WQO	✓
					✓
					✓
					✓
					✓

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
5.9.1	<ul style="list-style-type: none"> Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric. 	DSD's Contractor	Construction Work Sites	WQO	✓
	<ul style="list-style-type: none"> All temporary covers to slopes and stockpiles should be secured. 				✓
	<p><i>Actions to be taken during or after rainstorms:</i></p> <ul style="list-style-type: none"> Silt removal facilities should be checked and maintained to ensure satisfactory working conditions. 				✓
	<p><u>Spill Control and Response Plan</u></p>				
	<p>1 Prevention and Precaution Measures</p>				
	<p><i>General Precautions</i></p>				✓
	<ul style="list-style-type: none"> No discharge of silty water into watercourses. 				✓
	<ul style="list-style-type: none"> All materials to be used during construction and operation shall be identified and their hazard potential evaluated. 				✓
	<ul style="list-style-type: none"> Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken with the areas appropriately equipped to control these discharges. 				✓
	<ul style="list-style-type: none"> Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials. 				✓
	<ul style="list-style-type: none"> Any construction plant which causes pollution to catchwaters or water gathering ground due to leakage of oil or fuel shall be removed off-site immediately. 				✓
	<ul style="list-style-type: none"> Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport 				✓
	<ul style="list-style-type: none"> Chemical waste containers shall be suitably labelled to notify and warn the personnel who are handling the wastes to avoid accidents. 				✓
	<ul style="list-style-type: none"> Storage areas shall be selected at safe locations on site and adequate space shall be allocated to the storage area. 				✓
	<ul style="list-style-type: none"> Prevent obstructions and tripping hazards. 				✓
	<p><i>Storage Precautions</i></p>				✓
	<ul style="list-style-type: none"> All chemical storage containers shall be correctly labelled. 				✓
	<ul style="list-style-type: none"> Solid and impermeable enclosure walls or storage shelves shall be used. 				✓
<ul style="list-style-type: none"> Only compatible chemical wastes shall be stored in the same storage area. 	✓				
<ul style="list-style-type: none"> The storage areas shall be inspected to detect any leakages or defective containers on a regular basis. 	✓				
<ul style="list-style-type: none"> Suitable notices warning of hazards, emergency response plans, telephone numbers etc shall be posted around the site, including storage areas. 	✓				
<ul style="list-style-type: none"> Large and heavy containers shall be stored at ground level. 	✓				

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
	<ul style="list-style-type: none"> Chemical waste containers shall be stored below eye level. 				✓
5.9.1	<ul style="list-style-type: none"> Adequate space for handling of the containers shall be provided Spill response kits shall be located adjacent/near to the storage areas. A log of chemical wastes shall be maintained. Incompatible chemicals shall be stored separately. 	DSD's Contractor	Construction Work Sites	WQO	✓ ✓ ✓ ✓
	2 Responses/Action Plan				
	All Workers shall be made aware of emergency telephone numbers and the location of all relevant pollution control equipment. Training be given in emergency response/action plans. The action include the following steps:				✓
	<ul style="list-style-type: none"> Only trained personnel who are equipped with protective clothing and equipment shall be allowed to enter the spillage area for clean up. 				✓
	<ul style="list-style-type: none"> Spills shall be transferred appropriate back into containers using suitable equipment. 				✓
	<ul style="list-style-type: none"> Absorbent materials shall be used to clean up the spills and shall be disposed of as chemical wastes. 				✓
	<ul style="list-style-type: none"> Where appropriate suitable solvents may be used to clean the contaminated area after removal of all contaminated materials. 				✓
	<ul style="list-style-type: none"> All necessary protective devices, safety equipment, containers and clean up materials for emergency use shall be maintained to a high standard. 				✓
	3 Spill Clean Up and Disposal				
	Effect the response plan.				✓
	Control the leakage and absorb the spillage using suitably absorbent materials.				✓
	Provide safety equipment and personal protective equipment for handling of chemical wastes would be similar to that for handling of chemicals.				✓
	<i>Safety equipment includes but is not limited to:</i>				✓
	<ul style="list-style-type: none"> Fire extinguishers. 				✓
	<ul style="list-style-type: none"> Spades, brushes, dustpan, mop and bucket (or similar readily available on site). 				✓
	<ul style="list-style-type: none"> Absorbent material such as dry sand, tissues and toweling (all materials readily available on-site). 				✓
	<ul style="list-style-type: none"> Containers including plaster bags, drums, etc. 				✓
	<ul style="list-style-type: none"> Absorbing materials. 				✓
	<ul style="list-style-type: none"> Pumps. 				✓
	<i>Personal protective equipment includes as appropriate:</i>				✓
	<ul style="list-style-type: none"> First-aid kits. 				✓
	<ul style="list-style-type: none"> Safety helmet and goggles. 				✓
	<ul style="list-style-type: none"> Gloves which can resist chemical reaction. 				✓

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
5.9.1	<ul style="list-style-type: none"> Protective boot and clothing. 	DSD's Contractor	Construction Work Sites	WQO	✓
	<ul style="list-style-type: none"> Respirators and gas masks. 				✓
	<ul style="list-style-type: none"> Face visor and masks. 				✓
5.9.2	<p>Emergency Responses to Spillages</p> <p>Emergency plans and clean up procedures will need to be provided by the Contractor recognising his specific working methods and construction programme, activities and sequences. Agreement must be sought prior to commencement of the construction work but the following principles should be considered.</p> <p><i>The emergency plans should include the procedures for:</i></p> <ul style="list-style-type: none"> spill prevention and precaution; response actions; and spill clean up and disposal. <p><i>Spill prevention and precaution embraces good site practice and covers:</i></p> <ul style="list-style-type: none"> good housekeeping practices; chemical storage requirements; and chemical transfer and transport. 	DSD's Contractor	Project Area		✓
	✓				
	✓				
5.9.3	<p>During Operation</p> <p>Regular inspection of the tunnels is essential to monitor the structural integrity and proper functioning of the drainage tunnel, which allows repairing of structural deterioration when it begins to develop. It is recommended that routine inspection shall be carried out at least two times per year for the drainage tunnel at the beginning and end of wet season from April to September.</p>	DSD's Contractor	Project Area		N/A
Waste Management					
6.5.1	<p>During Construction</p> <p><i>Vegetation Removed from Site Clearance</i> Wastes generated from site clearance shall be sorted and excavated topsoil segregated from roots for re-use in landscaping works, thus eliminating the need for off-site disposal.</p>	DSD's Contractor	Construction Work Sites	Waste Disposal Ordinance (Cap.354); Waste Disposal (Chemical Wastes) (General) Regulation (Cap 354) and ETWBTC No. 15/2003, Waste anagement on Construction Site	✓
	<p><i>Construction and Demolition Materials</i> The Contractor should reuse any C&D material on-site. C&D waste should be segregated and stored in different containers to other wastes to encourage the re-use or recycling of materials and their proper disposal. The use of wooden hoardings shall not be allowed. An alternative material, which can be reused or recycled, for example, metal (aluminium, alloy, etc) shall be used.</p>				✓

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
6.5.1	As referred to the section 6.4.1, the 317,936m ³ of inert surplus material generated by the project is suitable for public fill. The public fill reception facility at Tuen Mun Area 38 provides a suitable facility for the reuse of surplus inert C&D material generated from the project.	DSD's Contractor	Construction Work Sites	WDO (Cap.354), ETWBTC No. 15/2003, ETWBTC No. 12/2002 and ETWBTC No. 31/2004	✓
	Under the contract, the contractor will be required to minimise the generation of C&D material and reuse it on site through the following:				
	(a) to plan in the design and construction, methods to minimise the generation of C&D material;				
	(b) to submit a Waste Management Plan (WMP) in accordance with Environment Transport and Works Bureau Technical Circular (ETWBTC) No. 15/2003 or any superseding circular(s);				
	(c) to reuse recycled aggregates in accordance with ETWBTC No. 12/2002 or any superseding circular(s);				
	(d) to observe the requirements of the Trip-Ticket System, stipulated in ETWBTC No. 31/2004 or any superceding circular(s), for disposal of C&D material;				
	(e) to incorporate a Waste Management System into the WMP for effective management and control of C&D materials to avoid/reduce/minimise the generation of C&D material during construction.				
	The contractor will be required to properly sort into inert C&D materials, metals, timber and other non-inert C&D material in the workplace to prevent cross-contamination.				✓
	In addition, DSD will conduct site inspection to monitor the contractors' performance in the implementation of the WMP and other relevant specified requirements.	DSD	Construction Work Sites	WDO (Cap.354) and ETWBTC No. 15/2003	✓
	<i>Excavated Materials</i> Excavated materials should be segregated from other wastes to avoid contamination thereby ensuring acceptability at public filling areas and avoiding the need for disposal at landfill.	DSD's Contractor	Construction Work Sites	WDO (Cap.354) and ETWBTC No. 15/2003	✓
	<i>Municipal Waste</i> Temporary refuse collection facilities should be set-up by the contractor and wastes should be stored in appropriate containers prior to collection and disposal.				
	Domestic effluent generated by the workforce will be directed to foul sewer or chemical toilets if public facilities are not available.				
6.5.1	<i>Waste Management Plan</i> A Waste Management Plan (WMP) for the construction of the Project should be prepared as part of the contractors submission. It will provide recommendations for appropriate recycling or disposal route and should include method statement for stockpiling and transportation of the excavated material and other construction wastes should also be included in the WMP and approved before the commencement of construction. All mitigation measures arising from the approved WMP shall be fully implemented.	DSD's Contractor	Construction Work Sites	WDO (Cap.354), ETWBTC No. 15/2003 and ETWBTC No. 33/2002	✓

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
	For the purpose of enhancing the management of C&D material including rock, and to minimize its generation at source, a C&D Material Management Plan (C&DMMP) has been prepared for this project and would be processed in accordance with the Environment, Transport and Works Bureau Technical Circular (Works) No. 33/2002 - Management of Construction and Demolition Material Including Rock.				N/A
Ecology					
7.7.1	<p>Avoidance</p> <p>The surface structures are located mainly on existing disturbed areas (ie pollution and urbanisation) and have generally avoided the natural stream sections of higher species diversity and abundance of aquatic organisms.</p> <p>The major construction activities at streams are scheduled to avoid wet season of high water flow which may adversely affect the downstream natural habitats due to the construction runoff.</p>	DSD's Contractor	Construction Work Sites	EIAO	✓
7.7.2	<p>Minimisation</p> <p>The previous discussion in Section 7.6.4 has indicated that the impacts on ecological resources due to the construction and operation of the proposed Project are generally expected to be low. The following mitigation measures to minimise impacts and disturbance to the surrounding habitats, are recommended.</p> <p><i>Measures for Construction Runoff</i> Install sheet piles/cofferdam/weir along the boundary of the works area within the stream habitats in particular Sam Dip Tam Stream and Tso Kung Tam Stream before the commencement of works to prevent construction runoff during construction. Provision of adequate designed sand/ silt removal facilities such as sand traps, silt traps and sediment basin in the areas which could potentially be affected may be required.</p> <p><i>Good Construction Practice</i></p> <p>Erect fences along the boundary of the works area before the commencement of works to prevent tipping, vehicle movements, and encroachment of personnel onto adjacent areas, particularly the stream habitats.</p> <p>Avoid any damage and disturbance, particularly those caused by filling and illegal dumping, to the remaining and surrounding natural stream habitats.</p> <p>Regularly check the work site boundaries to ensure that they are not breached and that no damage occurs to surrounding areas.</p> <p>Prohibit and prevent open fires within the site boundary during construction and provide temporary fire fighting equipment in the work areas.</p> <p>Treat any damage that may have occurred to individual major trees in the adjacent area with surgery.</p>				✓
		DSD's Contractor	Construction Work Sites	EIAO	✓
					✓
					✓
					✓
					✓

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
	Reinstate temporary work sites/disturbed areas, particularly stream of natural bottom and bank, plantation, intertidal habitat, and the areas located within the proposed Ecological Park, immediately after completion of the construction works, ie through on-site tree/shrub planting and reprovision of natural or semi-natural bottom (also refer to Section 7.7.3), in order to facilitate the recolonisation of the wildlife recorded during the baseline surveys. Tree/shrub species used should make reference from those in the surrounding area	DSD's Contractor	Construction Work Sites	EIAO	✓
7.7.3	<p>Compensation</p> <p>Provide natural stream bed (approximately 0.03 ha) for the new Dry Weather Flow Channel (created from village-orchard) by laying natural stones at Intake I-2 (Figure 7.7). The reinstated stream bed shall mimic the existing natural conditions with certain portion of big boulders creating the lentic and lotic zones for the aquatic fauna, and while it will be developed during detailed design may draw on concepts shown in Figure 2.18.</p> <p>Provide natural stream bed (approximately 0.5 ha,) for the Approach Channel and Dry Weather Flow Channel by laying natural stones at Intake I-3 (Figure 7.8). The reinstated stream bed shall mimic the existing natural conditions (rocky bottom with very limited aquatic plants) with certain portion of big boulders creating the lentic and lotic zones for the aquatic fauna, and while it will be developed during detailed design may draw on concepts shown in Figure 2.18.</p> <p>Provide natural bottom (ie retain the existing stream bed or reinstate the stream bed by providing boulders/ rocks, riprap or gabion) for the affected stream sections (Figure 7.8) in order to allow natural colonisation of aquatic fauna.</p> <p>Provide at least 2.2 ha of compensatory planting on the permanent and temporary affected plantation areas, particularly the slopes along access road and adjacent to Intake I-3 and cascade at Outfall O-1, after construction to stabilise the slope to present soil erosion and consequent stream sedimentation. Among the 2.2 ha compensatory planting, at least 0.5 ha of compensatory tree planting on the new formed slope along the access road of the Intake I-3 and 0.5 ha of compensatory tree planting over the cascade (by constructing intermediate platform) at Outfall O-1 will be provided (location refer to Figures 7.4 – 7.6). Species used for planting should take reference from the species identified in Appendix F and be native to Hong Kong or South China region.</p> <p>Provide armour rocks for the affected intertidal habitat in order to allow natural colonisation of intertidal organisms.</p>				N/A N/A N/A N/A N/A

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
Cultural Heritage					
8.6	As no impacts on recorded archaeological sites or area with archaeological potential were identified within the Study Area, no mitigation measure for archaeological resources is considered necessary.				N/A
	The construction methods to be employed should seek to avoid potential vibration impacts to Kuen Yuen Tung Monastery at Lo Wai, the Western Monastery, Yuen Yuen Home for the Aged, Hong Hoi Chee Hong Temple, Chiu Yum Tsing Yuen, Tse's Grave, Wan Lin Bridge and Sam Dip Tam Rock Carving in Sam Dip Tam and the Tin Hau Temple, Yam Kom Tau Village Rural Committee and the Yeung's Ancestral Hall in Yau Kom Tau as these sites fall within 50 m of the Preferred Option of the drainage tunnel alignment or associated Intakes/Outfall construction activities. Construction works that generates excessive vibration in close proximity to these sites should be restricted to protect the building from adverse vibration impacts and to ensure that the building structures will not be damaged as a result of these impacts.	DSD's Contractor	Construction Work Sites	EIAO	✓
	In order to ensure that no structural or superficial damage will be caused by the construction activities, a precautionary approach involving a pre-construction condition survey and establishment of appropriate vibration limits for the potentially impacted structures should be adopted. Protection measures for the potentially impacted structures, if considered necessary from the pre-construction condition survey, should be implemented prior to the commencement of construction works. Vibration monitoring during the construction phase should be undertaken as part of the EM&A programme.	Qualified archaeologist/ built heritage specialist	Construction Work Sites	EIAO	✓
Fisheries					
10.6	In accordance with the guidelines in the <i>EIAO-TM</i> on fisheries impact assessment the general policy for mitigating impacts to fisheries, in order of priority are avoidance, minimization and compensation.	DSD's Contractor	Construction Work Sites	EIAO	N/A
	Impacts to fisheries resources and fishing operations have largely been avoided during the construction and operation of the drainage tunnel through the avoidance of dredging, reclamation and filling activities. Good construction practice and associated measures were recommended in Water Quality Assessment in Section 5 to control water quality impacts to within acceptable levels and are also expected to control impacts to fisheries resources. Hence, no fisheries-species mitigation measures are required during construction and operation of the drainage tunnel.				N/A

Remarks: ✓ Compliance of mitigation measure
 × Non-compliance of mitigation measure
 N/A Not applicable

Appendix E

Status of License and Permit



Updated Status of Environmental Permit & Licence

Application Date	Environmental Permit / Licence	Issued Date	Ref No.	Account No.	Permit / Licence No.	Permit / Licence Validity Date	Remarks
2 Jan 2008	Registration as a Waste Producer	3 Jan 2008	001026707	----	----	----	Contractor had received the acknowledge receipt on 3 Jan 2008.
2 Jan 2008	Waste Disposal (Chemical Waste) (General) - Chemical Waste Producer	26 Feb 2008	----	5111-324-M2703-01	----	----	----
2 Jan 2008	Waste Disposal (Charges for Disposal of Construction Waste) Regulation - Billing Account	17 Jan 2008	----	7006574	----	----	----
10 Jan 2008	Notification Pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation	10 Jan 2008	001026901	----	----	----	Contractor had received the acknowledge receipt on 10 Jan 2008.
25 Feb 2008	Water Pollution Control Ordinance – Outfall O-1	7 Aug 2008	001028154	----	EP760/323/0129971	7 Aug 2008 - 31 Aug 2013	Contractor had received the acknowledge receipt on 3 March 2008. Public Notice had been issued on 16 June 2008. Application fees had been paid on 28 July 2008. Licence had been issued on 7 Aug 2008.
9 Apr 2008	Notification of Change in the Registration of Chemical Waste Producer	29 Apr 2008	----	5111-324-M2703-01	----	----	MCSJV's Managing Director had been changed from Mr. Richard Myrans to Mr. Christopher Shaw.
10 Apr 2008	Further Environmental Permit	6 May 2008	FEP-088/2008	----	FEP-01/275/2007	----	Contractor had received the acknowledge receipt on 17 April 2008. FEP had been issued on 6 May 2008.
18 Apr 2008	Water Pollution Control Ordinance – Intake I-1	19 Jun 2008	001029978	----	EP760/327/0133151	19 Jun 2008 - 30 Jun 2013	Contractor had received the acknowledge receipt on 8 May 2008. Application fees had been paid on 13 June 2008. Licence had been issued on 19 June 2008.
18 Apr 2008	Water Pollution Control Ordinance – Intake I-2	2 Jul 2008	001029959	----	EP760/321/0130201	2 Jul 2008 - 31 Jul 2013	Contractor had received the acknowledge receipt on 8 May 2008. Application fees had been paid on 26 June 2008. Licence had been issued on 2 July 2008.
18 Apr 2008	Water Pollution Control Ordinance – Intake I-3	5 Aug 2008	001029960	----	EP760/323/0133241	5 Aug 2008 - 31 Aug 2013	Contractor had received the acknowledge receipt on 8 May 2008. Public Notice had been issued on 16 June 2008. Application fees had been paid on 28 July 2008. Licence had been issued on 5 Aug 2008.
18 Apr 2008	Water Pollution Control Ordinance – Portion I	26 Jun 2008	001029974	----	EP760/350/0133341	26 Jun 2008 - 30 Jun 2013	Contractor had received the acknowledge receipt on 8 May 2008. Application fees had been paid on 13 June 2008. Licence had been issued on 26 June 2008.
3 Jun 2008	Variation of Environmental Permit	27 Jun 2008	VEP-264/2008	----	EP-275/2007/A	----	Application was submitted by DSD on 3 June 2008. Licence had been issued on 27 June 2008.

18 Jun 2008	Variation of Environmental Permit	27 Jun 2008	VEP-266/2008	----	FEP-01/275/2007/A	----	Contractor had received the acknowledge receipt on 23 June 2008. Licence had been issued on 27 June 2008.
23 Jul 2008	Water Pollution Control Ordinance – Intake I-1 (Intersection of Wo Yi Hop Lane and Ho Fung College)	27 Aug 2008	001031974	----	EP760/325/013536I	27 Aug 2008 - 31 Aug 2013	Contractor had received the acknowledge receipt on 25 July 2008. Application fees had been paid on 19 Aug 2008. Licence had been issued on 27 Aug 2008.
2 Sep 2008	Variation of Environmental Permit	25 Sep 2008	VEP-271/2008	----	EP-275/2007/B	----	Application was submitted by DSD on 2 Sept 2008. Licence had been issued on 25 Sept 2008.
21 Nov 2008	Construction Noise Permit 1) Chai Wan Kok Valve House (Near Summit Terrace - Tusen Wan) 2) Valve House (Near The Wonderland - Castle Peak Road- Ting Kau)	----	001034930	----	----	----	Contractor had applied the permit on 21 Nov 2008. Contractor had received the acknowledge receipt on 2 Dec 2008. Notice of Refusal had been received on 6 Dec 2008.
13 Jan 2009	Construction Noise Permit - Outfall O-1	----	301201	----	----	----	Contractor had applied the permit on 13 Jan 2009. Contractor had received the acknowledge receipt on 13 Jan 2009. Notice of Refusal had been received on 20 Jan 2009.
19 Jan 2009	Construction Noise Permit - Intake I-1	3 Feb 2009	301401	----	GW-RW0052-09	23 Feb 2009 - 22 Aug 2009	Contractor had applied the permit on 19 Jan 2009. Contractor had received the acknowledge receipt on 20 Jan 2009. CNP had been issued on 3 Feb 2009.
22 Jan 2009	Construction Noise Permit - Intake I-3	----	301474	----	----	----	Contractor had applied the permit on 22 Jan 2009. Contractor had received the acknowledge receipt on 22 Jan 2009. Notice of Refusal had been received on 2 Feb 2009.
3 Feb 2009	Construction Noise Permit - Outfall O-1	----	301841	----	----	----	Contractor had applied the permit on 3 Feb 2009. Contractor had received the acknowledge receipt on 6 Feb 2009. Notice of Refusal had been received on 12 Feb 2009.
25 Feb 2009	Construction Noise Permit - Intake I-3	10 Mar 2009	302429	----	GW-RW0079-09	16 March 2009 - 15 Sept 2009	Contractor had applied the permit on 25 Feb 2009. Contractor had received the acknowledge receipt on 26 Feb 2009. CNP had been issued on 10 March 2009.
2 Mar 2009	Construction Noise Permit - Outfall O-1	12 Mar 2009	302525	----	GW-RW0080-09	16 March 2009 - 15 May 2009	Contractor had applied the permit on 2 March 2009. Contractor had received the acknowledge receipt on 2 March 2009. CNP had been issued on 12 March 2009.
23 Mar 2009	Construction Noise Permit - Intake I-1	3 Apr 2009	303326	----	GW-RW0108-09	6 April 2009 - 5 Oct 2009	Contractor had applied the permit on 23 March 2009. Contractor had received the acknowledge receipt on 24 March 2009. CNP had been issued on 3 April 2009.
29 Apr 2009	Water Pollution Control Ordinance – Intake I-3 (Additional Discharge Point)	----	305058	----	----	----	Contractor had applied the Licence on 29 April 2009. Contractor had received the acknowledge receipt on 11 May 2009. Waiting for EPD further notification.
12 May 2009	Construction Noise Permit - Outfall O-1	29 May 2009	305266	----	GW-RW0198-09	29 May 2009 - 24 Nov 2009	Contractor had applied the permit on 12 May 2009. Contractor had received the acknowledge receipt on 15 May 2009. CNP had been issued on 29 May 2009.

Appendix F

Calibration Certificates

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Ho Fung College
Calibration Date: 08-Apr-09
Calibration Due Date: 08-Jun-09
Time: 17:15

Sampler Model:	BM2000HX
Serial No.:	4994
Calibrator Orifice no.:	517N
Slope (m):	2.02953
Intercept (b):	-0.01939
Correction coeff. (r)	0.9999

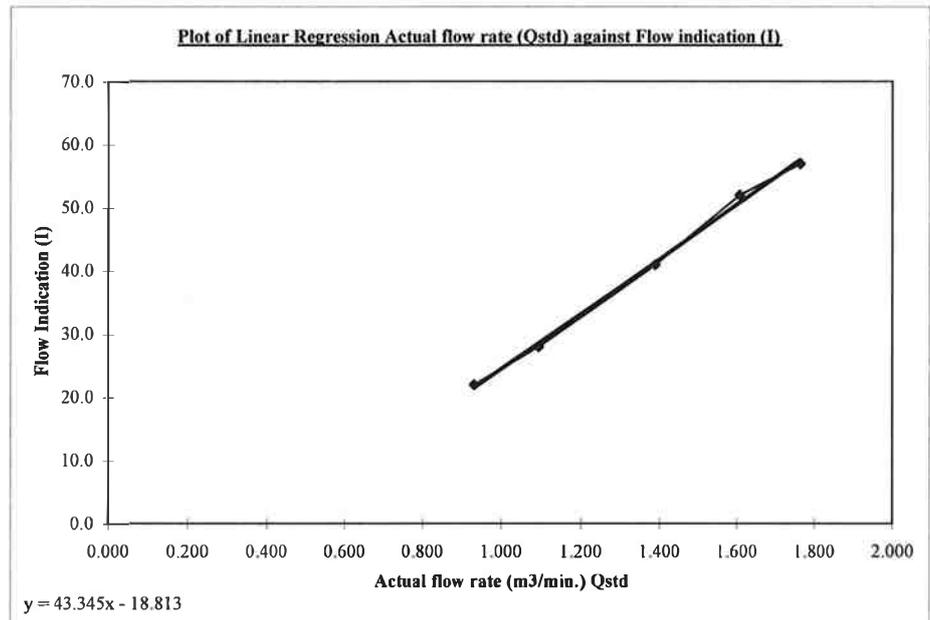
$$\text{Flow (corrected)} = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

Standard pressure (mmHg) Pstd:	749.3
Standard temp. (K) Tstd:	296.0
Calibration pressure (mmHg) Pa:	762.4
Calibration temp. (K) Ta:	294.3

$$Q_{std} = \frac{1}{m} \times \left(\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b \right)$$

Sample no.	Pressure Drop (H), inch	Flow (corrected), m ³ /min	Actual flow rate (Qstd), m ³ /min	Flow indication (I), arbitrary
1	12.3	3.560	1.764	57.0
2	10.2	3.242	1.607	52.0
3	7.6	2.798	1.388	41.0
4	4.7	2.201	1.094	28.0
5	3.4	1.872	0.932	22.0

Correlation Coefficient : 0.9987



Remark
 1HPa = 0.750062 mmHg

Calibrated by: Mak Kei Ho
 (*MKH*)

Date: 16-4-09

Checked by: Tang Hiu Yeung
 (*HY*)

Date: 16-4-09

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Ho Fung College
Calibration Date: 05-Jun-09
Calibration Due Date: 05-Aug-09
Time: 11:20

Sampler Model:	BM2000HX
Serial No.:	4994
Calibrator Orifice no.:	1559
Slope (m):	1.97702
Intercept (b):	-0.00070
Correction coeff. (r)	0.99992

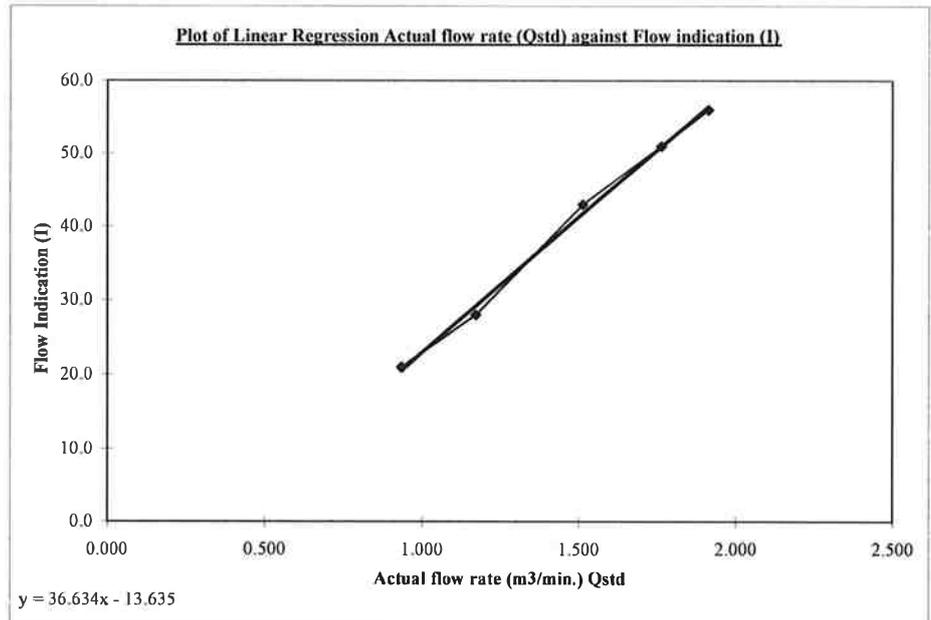
Standard pressure (mmHg) Pstd:	765.8
Standard temp. (K) Tstd:	293.00
Calibration pressure (mmHg) Pa:	752.1
Calibration temp. (K) Ta:	301.0

$$Flow(\text{corrected}) = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

$$Qstd = \frac{1}{m} \times \left(\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b \right)$$

Sample no.	Pressure Drop (H), inch	Flow (corrected), m ³ /min	Actual flow rate (Qstd), m ³ /min	Flow indication (I), arbitrary
1	14.7	3.781	1.913	56.0
2	12.5	3.486	1.764	51.0
3	9.2	2.991	1.513	43.0
4	5.5	2.313	1.170	28.0
5	3.5	1.845	0.933	21.0

Correlation Coefficient : 0.9981



Remark
 1HPa = 0.750062 mmHg

Calibrated by: Mak Kei Ho
 (*Mak Kei Ho*)

Date: 8-6-09

Checked by: Tang Hiu Yeung
 (*Tang Hiu Yeung*)

Date: 8-6-09

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Heng Hoi Chi Hong Ship Temple
Calibration Date: 08-Apr-09
Calibration Due Date: 08-Jun-09
Time: 16:40

Sampler Model:	BM2000HX
Serial No.:	5875
Calibrator Orifice no.:	517N
Slope (m):	2.02953
Intercept (b):	-0.01939
Correction coeff. (r)	0.9999

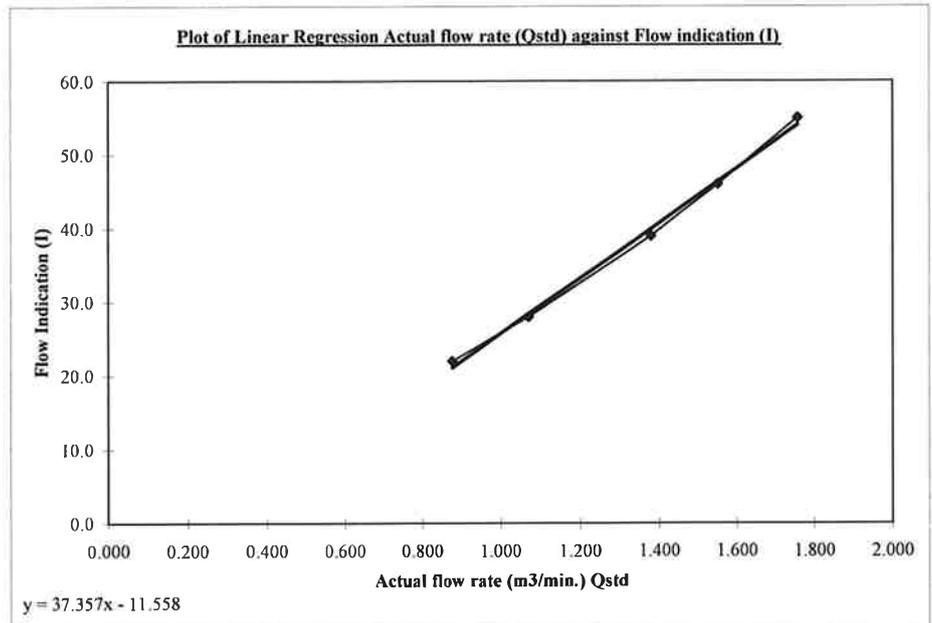
Standard pressure (mmHg) Pstd:	749.3
Standard temp. (K) Tstd:	296.0
Calibration pressure (mmHg) Pa:	762.4
Calibration temp. (K) Ta:	294.3

$$\text{Flow (corrected)} = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

$$Q_{std} = \frac{1}{m} \times \left(\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b \right)$$

Sample no.	Pressure Drop (H), inch	Flow (corrected), m ³ /min	Actual flow rate (Qstd), m ³ /min	Flow indication (I), arbitrary
1	12.2	3.545	1.756	55.0
2	9.5	3.129	1.551	46.0
3	7.5	2.780	1.379	39.0
4	4.5	2.153	1.070	28.0
5	3.0	1.758	0.876	22.0

Correlation Coefficient : 0.9980



Remark
 1HPa = 0.750062 mmHg

Calibrated by: Mak Kei Ho
 (Ho)

Date: 16-4-09

Checked by: Tang Hiu Yeung
 (Yeung)

Date: 16-4-09

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Heng Hoi Chi Hong Ship Temple
Calibration Date: 05-Jun-09
Calibration Due Date: 05-Aug-09
Time: 12:35

Sampler Model:	BM2000HX
Serial No.:	5875
Calibrator Orifice no.:	1559
Slope (m):	1.97702
Intercept (b):	-0.00070
Correction coeff. (r)	0.99992

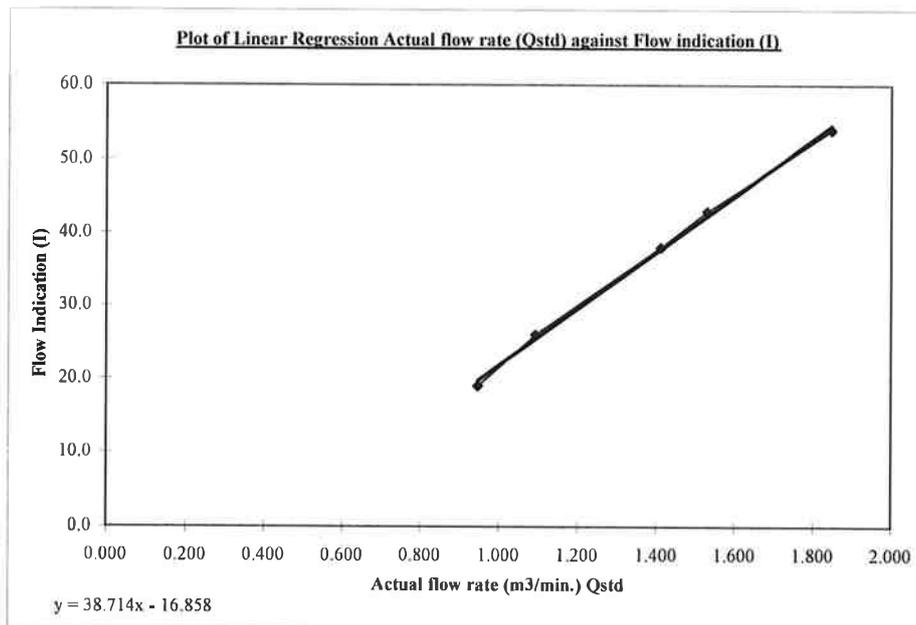
Standard pressure (mmHg) Pstd:	765.8
Standard temp. (K) Tstd:	293.00
Calibration pressure (mmHg) Pa:	752.1
Calibration temp. (K) Ta:	301.0

$$\text{Flow (corrected)} = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

$$Q_{std} = \frac{1}{m} \times \left(\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b \right)$$

Sample no.	Pressure Drop (H), inch	Flow (corrected), m ³ /min	Actual flow rate (Qstd), m ³ /min	Flow indication (I), arbitrary
1	13.7	3.650	1.846	54.0
2	9.4	3.023	1.530	43.0
3	8.0	2.789	1.411	38.0
4	4.8	2.160	1.093	26.0
5	3.6	1.871	0.947	19.0

Correlation Coefficient : 0.9988



Remark
 1HPa = 0.750062 mmHg

Calibrated by: Mak Kei Ho
 ()

Date: 8-6-09

Checked by: Tang Hiu Yeung
 ()

Date: 8-6-09

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Greenview Terrance
Calibration Date: 08-Apr-09
Calibration Due Date: 08-Jun-09
Time: 12:20

Sampler Model:	TE5005X
Serial No.:	0646
Calibrator Orifice no.:	517N
Slope (m):	2.02953
Intercept (b):	-0.01939
Correction coeff. (r)	0.9999

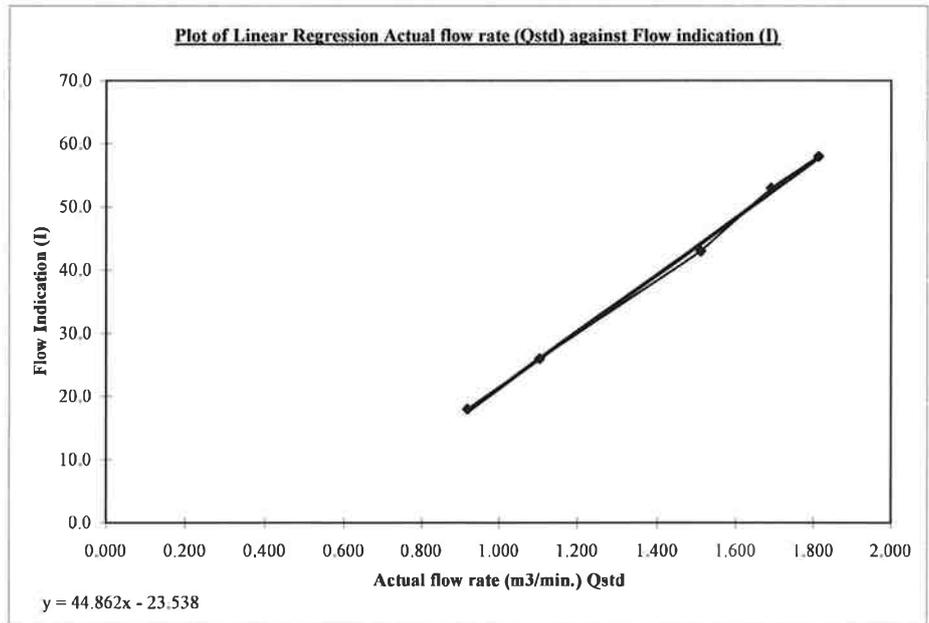
Standard pressure (mmHg) Pstd:	749.3
Standard temp. (K) Tstd:	296.0
Calibration pressure (mmHg) Pa:	762.4
Calibration temp. (K) Ta:	294.3

$$\text{Flow (corrected)} = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

$$Q_{std} = \frac{1}{m} \times \left(\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b \right)$$

Sample no.	Pressure Drop (H), inch	Flow (corrected), m ³ /min	Actual flow rate (Qstd), m ³ /min	Flow indication (I), arbitrary
1	13.0	3.660	1.813	58.0
2	11.3	3.412	1.691	53.0
3	9.0	3.045	1.510	43.0
4	4.8	2.224	1.105	26.0
5	3.3	1.844	0.918	18.0

Correlation Coefficient : 0.9991



Remark
 1HPa = 0.750062 mmHg

Calibrated by: Mak Kei Ho
 (*Ho*)

Date: 16-4-09

Checked by: Tang Hiu Yeung
 (*Hy*)

Date: 16-4-09

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Greenview Terrace
Calibration Date: 05-Jun-09
Calibration Due Date: 05-Aug-09
Time: 09:45

Sampler Model:	TE5005X
Serial No.:	0646
Calibrator Orifice no.:	1559
Slope (m):	1.97702
Intercept (b):	-0.00070
Correction coeff. (r)	0.99992

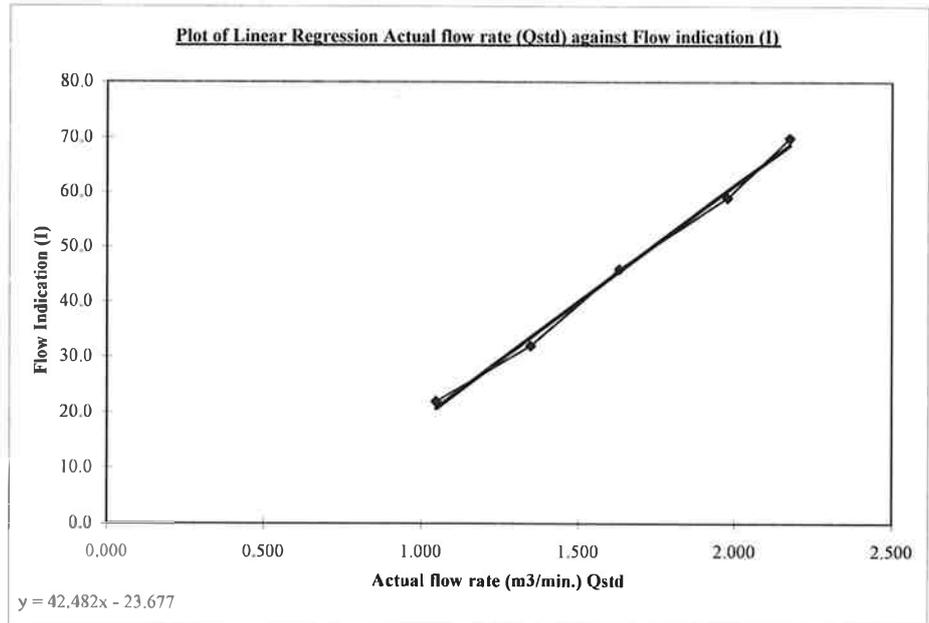
Standard pressure (mmHg) Pstd:	765.8
Standard temp. (K) Tstd:	293.00
Calibration pressure (mmHg) Pa:	752.1
Calibration temp. (K) Ta:	301.0

$$\text{Flow (corrected)} = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

$$Q_{std} = \frac{1}{m} \times \left(\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b \right)$$

Sample no.	Pressure Drop (H), inch	Flow (corrected), m ³ /min	Actual flow rate (Qstd), m ³ /min	Flow indication (I), arbitrary
1	19.0	4.298	2.174	70.0
2	15.7	3.907	1.977	59.0
3	10.7	3.225	1.632	46.0
4	7.3	2.664	1.348	32.0
5	4.4	2.068	1.047	22.0

Correlation Coefficient : 0.9975



Remark
1HPa = 0.750062 mmHg

Calibrated by: Mak Kei Ho
 (*Mk*)

Date: 8-6-09

Checked by: Tang Hiu Yeung
 (*Th*)

Date: 8-6-09

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Long Beach Gardan
Calibration Date: 08-Apr-09
Calibration Due Date: 08-Jun-09
Time: 11:55

Sampler Model:	TE5005X
Serial No.:	0390
Calibrator Orifice no.:	517N
Slope (m):	2.02953
Intercept (b):	-0.01939
Correction coeff. (r)	0.9999

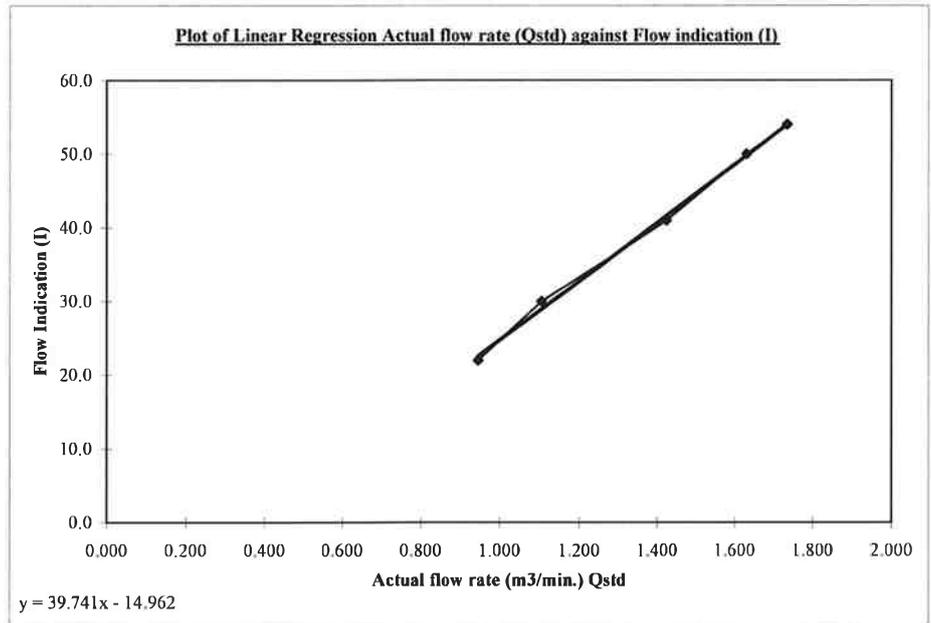
Standard pressure (mmHg) Pstd:	749.3
Standard temp. (K) Tstd:	296.0
Calibration pressure (mmHg) Pa:	762.4
Calibration temp. (K) Ta:	294.3

$$\text{Flow (corrected)} = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

$$Q_{std} = \frac{1}{m} \times \left(\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b \right)$$

Sample no.	Pressure Drop (H), inch	Flow (corrected), m ³ /min	Actual flow rate (Qstd), m ³ /min	Flow indication (I), arbitrary
1	11.9	3.501	1.735	54.0
2	10.5	3.289	1.630	50.0
3	8.0	2.871	1.424	41.0
4	4.8	2.224	1.105	30.0
5	3.5	1.899	0.945	22.0

Correlation Coefficient : 0.9987



Remark
 1HPa = 0.750062 mmHg

Calibrated by: Mak Kei Ho
 (*Mak Kei Ho*)

Date: 16-4-09

Checked by: Tang Hiu Yeung
 (*Tang Hiu Yeung*)

Date: 16-4-09

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
 Monitoring Location: Long Beach Gardan
 Calibration Date: 05-Jun-09
 Calibration Due Date: 05-Aug-09
 Time: 08:15

Sampler Model:	TE5005X
Serial No.:	0390
Calibrator Orifice no.:	1559
Slope (m):	1.97702
Intercept (b):	-0.00070
Correction coeff. (r)	0.99992

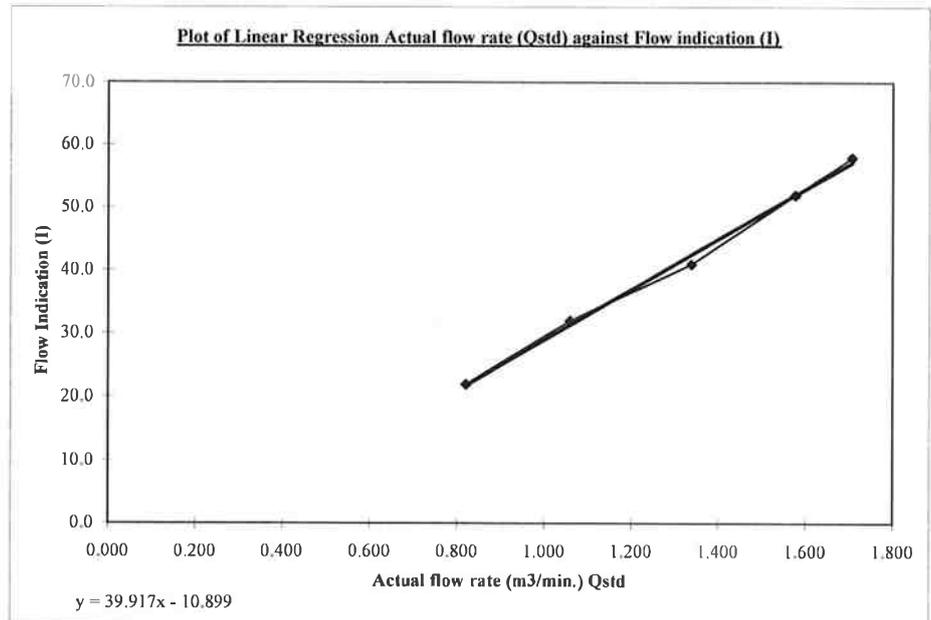
$$Flow\ (corrected) = \sqrt{H \times \frac{P_a}{P_{std}} \times \frac{T_{std}}{T_a}}$$

Standard pressure (mmHg) Pstd:	765.8
Standard temp. (K) Tstd:	293.00
Calibration pressure (mmHg) Pa:	752.1
Calibration temp. (K) Ta:	301.0

$$Q_{std} = \frac{1}{m} \times \left(\sqrt{H \times \frac{P_a}{P_{std}} \times \frac{T_{std}}{T_a}} - b \right)$$

Sample no.	Pressure Drop (H), inch	Flow (corrected), m ³ /min	Actual flow rate (Qstd), m ³ /min	Flow indication (I), arbitrary
1	11.7	3.373	1.706	58.0
2	10.0	3.118	1.578	52.0
3	7.2	2.646	1.339	41.0
4	4.5	2.092	1.058	32.0
5	2.7	1.620	0.820	22.0

Correlation Coefficient : 0.9980



Remark
 1HPa = 0.750062 mmHg

Calibrated by: **Mak Kei Ho**
 (*Mk*)

Date: 8-6-09

Checked by: **Tang Hiu Yeung**
 (*Hy*)

Date: 8-6-09



Calibration Certificate

Certificate No. **83174**

Page 1 of 4 Pages

Customer : Hyder Consulting Limited

Address : 47/F., Hopewell Centre, 183 Queens Road East, Wanchai, Hong Kong

Order No. : Q81258

Date of receipt : 9-Jul-08

Item Tested

Description : Sound Level Meter

Manufacturer : B&K

Model : 2238

Serial No. : 2448529

Test Conditions

Date of Test : 9-Jul-08

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Calibration procedure : Z01.

Test Results

All results were within the IEC 651 Type 1, IEC 804 Type 1 & IEC 1260 Class 1 specification.

The results are shown in the attached page(s).

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C081456	18-Mar-09	SCL-HKSAR
S024	Sound Level Calibrator	71791	16-Jul-08	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

Calibrated by : 
P.F. Wong

Approved by : 
Alan Chu

Date: 10-Jul-08



Calibration Certificate

Certificate No. **83174**

Page 2 of 4 Pages

Results :

1. SPL Accuracy

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Range	Freq. Wgt.	Bandwidth	Center Freq.		
20 ~ 100	A	BB/F	--	94.03	93.9
	A	BB/S	--		93.9
	C	BB/F	--		93.9
40 ~ 120	A	BB/F	--	94.03	94.0
	A	BB/F	--	113.97	113.8
40 ~ 120	--	1/3 - Oct./F	1 kHz	94.03	94.0
				113.97	113.8
40 ~ 120	--	1/1 - Oct./F	1 kHz	94.03	94.0
				113.97	113.8

IEC 651 Type 1 Spec. : ± 0.7 dB

Uncertainty : ± 0.1 dB

2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB

Uncertainty : ± 0.01 dB

3. Linearity

3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range) ± 0.7 dB
130	114.0	114.2	0.2	
130	104.0	104.2	0.2	
120	94.0	94.0 (Ref.)	--	
110	84.0	83.8	0.2	
100	74.0	73.9	0.1	
90	64.0	63.9	0.1	
80	54.0	54.0	0.0	

Uncertainty : ± 0.1 dB



Calibration Certificate

Certificate No. **83174**

Page 3 of 4 Pages

3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	83.8	0.2	± 0.4 dB
	94.0	94.0 (Ref.)	--	
	95.0	95.0	0.0	± 0.2 dB
	104.0	104.2	0.2	± 0.3 dB
	105.0	105.2	0.2	± 1.0 dB

Uncertainty : ± 0.1 dB

4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	- 39.5	- 39.4 dB, ± 1.5 dB
63 Hz	- 26.4	- 26.2 dB, ± 1.5 dB
125 Hz	- 16.5	- 16.1 dB, ± 1 dB
250 Hz	- 9.0	- 8.6 dB, ± 1 dB
500 Hz	- 3.5	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref)	0 dB, ± 1 dB
2 kHz	+ 1.4	+ 1.2 dB, ± 1 dB
4 kHz	+ 1.2	+ 1.0 dB, ± 1 dB
8 kHz	- 0.8	- 1.1 dB, + 1.5 dB ~ -3 dB
16 kHz	- 6.3	- 6.6 dB, + 3 dB ~ -∞

Uncertainty : ± 0.1 dB

5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	± 0.5 dB
1/10	40.0	40.0	
1/10 ²	40.0	40.0	
1/10 ³	40.0	40.0	± 1.0 dB
1/10 ⁴	40.0	39.5	

Uncertainty : ± 0.1 dB



Calibration Certificate

Certificate No. **83174**

Page 4 of 4 Pages

6. Filter Characteristics

6.1 1/1 – Octave Filter

Frequency	Attenuation (dB)	IEC 1260 Class 1 Spec. (dB)
125 Hz	- 64.2	< - 61
250 Hz	- 45.0	< - 42
500 Hz	- 21.1	< - 17.5
707 Hz	- 3.8	- 2 ~ - 5
1 kHz (Ref)	--	--
1.414 kHz	- 3.7	- 2 ~ - 5
2 kHz	- 20.8	< - 17.5
4 kHz	- 44.6	< - 42
8 kHz	- 63.8	< - 61

Uncertainty : ± 0.25 dB

6.2 1/3 – Octave Filter

Frequency	Attenuation (dB)	IEC 1260 Class 1 Spec.(dB)
326 Hz	- 64.7	< - 61
530 Hz	- 47.3	< - 42
772 Hz	- 22.5	< - 17.5
891 Hz	- 3.6	+ 0.3 ~ - 5.0
1 kHz (Ref)	--	--
1.122 kHz	- 3.5	+ 0.3 ~ - 5.0
1.296 kHz	- 22.4	< - 17.5
1.887 kHz	- 46.9	< - 42
3.070 kHz	- 65.2	< - 61

Uncertainty : ± 0.25 dB

Remarks : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric pressure : 1 000 hPa.

----- END -----



Calibration Certificate

Certificate No. **83175**

Page 1 of 4 Pages

Customer : Hyder Consulting Limited

Address : 47/F., Hopewell Centre, 183 Queens Road East, Wanchai, Hong Kong

Order No. : Q81258

Date of receipt : 9-Jul-08

Item Tested

Description : Digital Sound Level Meter

Manufacturer : B&K

Model : Type 2236

Serial No. : 1774423

Test Conditions

Date of Test : 9-Jul-08

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Calibration procedure : Z01.

Test Results

All results were within the IEC 651 Type 1, IEC 804 Type 1 & IEC 1260 Class 1 specification.

The results are shown in the attached page(s).

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C081456	18-Mar-09	SCL-HKSAR
S024	Sound Level Calibrator	71791	16-Jul-08	NIM-PRC & SCL-HKSAR
S031	6½ dgt. Multimeter	76189	28-Dec-08	NIM-PRC

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

Calibrated by : 
P.F. Wong

Approved by : 
Alan Chu

Date: 10-Jul-08

This Certificate is issued by:

Hong Kong Calibration Ltd.

Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.

Tel: 2425 8801 Fax: 2425 8646

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Calibration Certificate

Certificate No. **83175**

Page 2 of 4 Pages

Results :

1. SPL Accuracy

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Range	Parameter	Frequency Wt.	Freq. Response		
20 - 100	SPL	dBA	F	94.03	94.0
			S		94.0
		dBC	F		94.1
		dBL	F		94.1
		1 kHz	F		94.0
40 - 120	SPL	dBA	F	94.03	94.0
		1 kHz	F		94.0
	SPL	dBA	F	113.97	114.0
			S		114.0
		dBC	F		114.0
		dBL	F		114.0
		1 kHz	F		114.0

IEC 651 Type 1 Spec. : ± 0.7 dB

Uncertainty : ± 0.1 dB

2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB

Uncertainty : ± 0.01 dB

3. Linearity

3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range)
130	114.0	114.1	0.1	± 0.7 dB
130	104.0	104.2	0.2	
120	94.0	94.0 (Ref.)	--	
110	84.0	83.9	0.1	
100	74.0	73.8	0.2	
100	64.0	63.8	0.2	
100	54.0	53.9	0.1	

Uncertainty : ± 0.1 dB



Calibration Certificate

Certificate No. 83175

Page 4 of 4 Pages

6. Filter Response

Filter Setting	Attenuation (dB)	IEC 1260 Class 1 Spec.
125 Hz	- 64.0	< - 61
250 Hz	- 44.8	< - 42
500 Hz	- 20.8	< - 17.5
707 Hz	- 3.5	- 2 ~ - 5
1 kHz (Ref.)	0.0 (Ref.)	--
1.414 kHz	- 4.0	- 2 ~ - 5
2 kHz	- 21.2	< - 17.5
4 kHz	- 45.0	< - 42
8 kHz	- 64.3	< - 61

Uncertainty : ± 0.2 dB

- Remark : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 000 hPa

----- END -----

Calibration Certificate

Certificate No. **83175**

Page 3 of 4 Pages

3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	83.8	0.2	± 0.4 dB
	94.0	94.0 (Ref.)	--	
	95.0	95.1	0.1	± 0.2 dB
	104.0	104.2	0.2	± 0.3 dB
	105.0	105.0	0.0	± 1.0 dB

Uncertainty : ± 0.1 dB

4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	- 39.9	- 39.4 dB, ± 1.5 dB
63 Hz	- 26.6	- 26.2 dB, ± 1.5 dB
125 Hz	- 16.5	- 16.1 dB, ± 1 dB
250 Hz	- 8.9	- 8.6 dB, ± 1 dB
500 Hz	- 3.4	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref)	0 dB, ± 1 dB
2 kHz	+ 1.3	+ 1.2 dB, ± 1 dB
4 kHz	+ 1.1	+ 1.0 dB, ± 1 dB
8 kHz	- 1.1	- 1.1 dB, + 1.5 dB ~ -3 dB
16 kHz	- 7.2	- 6.6 dB, + 3 dB ~ -∞

Uncertainty : ± 0.1 dB

5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	--
1/10	40.0	40.0	± 0.5 dB
1/10 ²	40.0	39.9	
1/10 ³	40.0	39.8	± 1.0 dB
1/10 ⁴	40.0	39.2	

Uncertainty : ± 0.1 dB



輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C090563

Certificate of Calibration

This is to certify that the equipment

Description : Acoustical Calibrator

Manufacturer : Bruel & Kjaer

Model No. : 4231

Serial No. : 1770806

*has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C090563.*

The equipment is supplied by

Co. Name : Hyder Consulting Limited

*Address : 47/F., Hopewell Centre, 183 Queen's Road East,
Wanchai, Hong Kong*

Date of Issue : 6 February 2009

Certified by :


C F Leung

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

Calibration and Testing Laboratory of Sun Creation Engineering Limited

c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

Tel: 2927 2606

Fax: 2744 8986

E-mail: callab@suncreation.com

Website: www.suncreation.com



1412 Honour Ind. Centre
6 Sun Yip St. Chai Wan
Hong Kong

CERTIFICATE OF CALIBRATION
IN - HOUSE

Date Of Issue : _____ Serial No : IC 42b / /EL

Item Being Calibrated : Turbidity Standards (Gelex) Date Of Calibration : 8/4/09
 Item Stock No : Std1,2,3,4 Operator : K.K
 Environment Temp. °C 22 Procedure No Used : IC 42 (Revision No. 0)
 Primary Standards used 20, 100 and 800 NTU Formazin standards prepared fr 03681
 Ref. Equip.used/ Stock No : Serial No. 215619

Gelex Standards	Turbidity of standard solution used (NTU)	Measured Value (NTU)	R ²	Requirement R ²
0 - 10 NTU	1	1.05	1	> 0.996
	5	5.23		
	10	10.47		
10 - 100 NTU	20	20.1	0.9967	> 0.996
	50	52.8		
	80	79.9		
100 - 1000 NTU	100	99.7	0.993	> 0.996
	400	452		
	800	807		

Comments : *The equipment and Gelex Standards complies / ~~does not comply~~ with the Manufacturer's recommendation.*

Input data checked by : h

Certified by: [Signature]
Operations Manager



1412 Honour Ind. Centre
6 Sun Yip St, Chai Wan
Hong Kong

CERTIFICATE OF CALIBRATION
IN - HOUSE

Date Of Issue : _____ Serial No : IC 42a / / EL

21977/1

Item Being Calibrated : **Turbidity Standards (Gelex)** Date Of Calibration : 8/4/09
 Item Stock No : Std1,2,3,4 Operator : K.K
 Environment Temp. °C 22 Procedure No Used : IC 42 (Revision No. 0)
 Primary Standards used 20, 100 and 800 NTU Formazin standards prepared fr 03681
 Ref. Equip.used/ Stock No : Serial No. 215619

Gelex Standards	Last assigned value Date: (NTU)	New measured value (NTU)	Agreement %	Requirement %
0 - 10 NTU	0	0	0	± 5
10 - 100 NTU	16.86	16.51	-2.08	± 5
100 - 1000 NTU	100	95.7	-4.30	± 5
100 - 1000 NTU	861	868	0.81	± 5

Comments : *The equipment and Gelex Standards complies / does not comply with the Manufacturer's recommendation.*

Input data checked by : 

Certified by: 
Operations Manager

CERTIFICATE OF ANALYSIS



Batch: HK0906207
Date of Issue: 06/04/2009
Client: HYDER CONSULTING LTD
Client Reference:

Calibration of DO System

Item : Multi-parameter Instrument / Mehrparameter-Meßgerät
Model No. : WTW pH / Oxi 340i
Serial No. : 08101283
Equipment No.: --
Calibration Method : This meter was calibrated in accordance with standard method APHA (18th Ed.) 4500-0C & G
Date of Calibration : 06 April, 2009

Testing Results :

Expected Reading	Recording Reading
4.70 mg/L	4.87 mg/L
6.64 mg/L	6.70 mg/L
8.52 mg/L	8.68 mg/L
Allowing Deviation	±0.2 mg/L


Ms Wong Wai Man, Alice
Laboratory Manager - Hong Kong

CERTIFICATE OF ANALYSIS



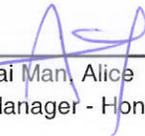
Batch: HK0906207
Date of Issue: 06/04/2009
Client: HYDER CONSULTING LTD
Client Reference:

Calibration of pH System

Item : Multi-parameter Instrument / Mehrparameter-MeBgerat
Model No. : WTW pH / Oxi 340i
Serial No. : 08101283
Equipment No. : --
Calibration Method : This meter was calibrated in accordance with standard method APHA (19th Ed.) 4500-H⁺B
Date of Calibration : 06 April, 2009

Testing Results :

Expected Reading	Recording Reading
4.00	4.11
7.00	7.02
10.0	9.85
Allowing Deviation	± 0.2


Ms Wong Wai Man, Alice
Laboratory Manager - Hong Kong

CERTIFICATE OF ANALYSIS



Batch: HK0906207
Date of Issue: 06/04/2009
Client: HYDER CONSULTING LTD
Client Reference:

Calibration of Thermometer

Item : Multi-parameter Instrument / Mehrparameter-MeBgerat
Model No. : WTW pH / Oxi 340i
Serial No. : 08101283
Equipment No. : --
Calibration Method : In-house Method
Date of Calibration : 06 April, 2009

Testing Results :

Reference Temperature (°C)	Recorded Temperature (°C)
22.0 °C	22.3 °C
33.0 °C	33.5 °C
Allowing Deviation	±2.0°C


Ms Wong Wai Man, Alice
Laboratory Manager - Hong Kong

Appendix G

Monitoring Locations

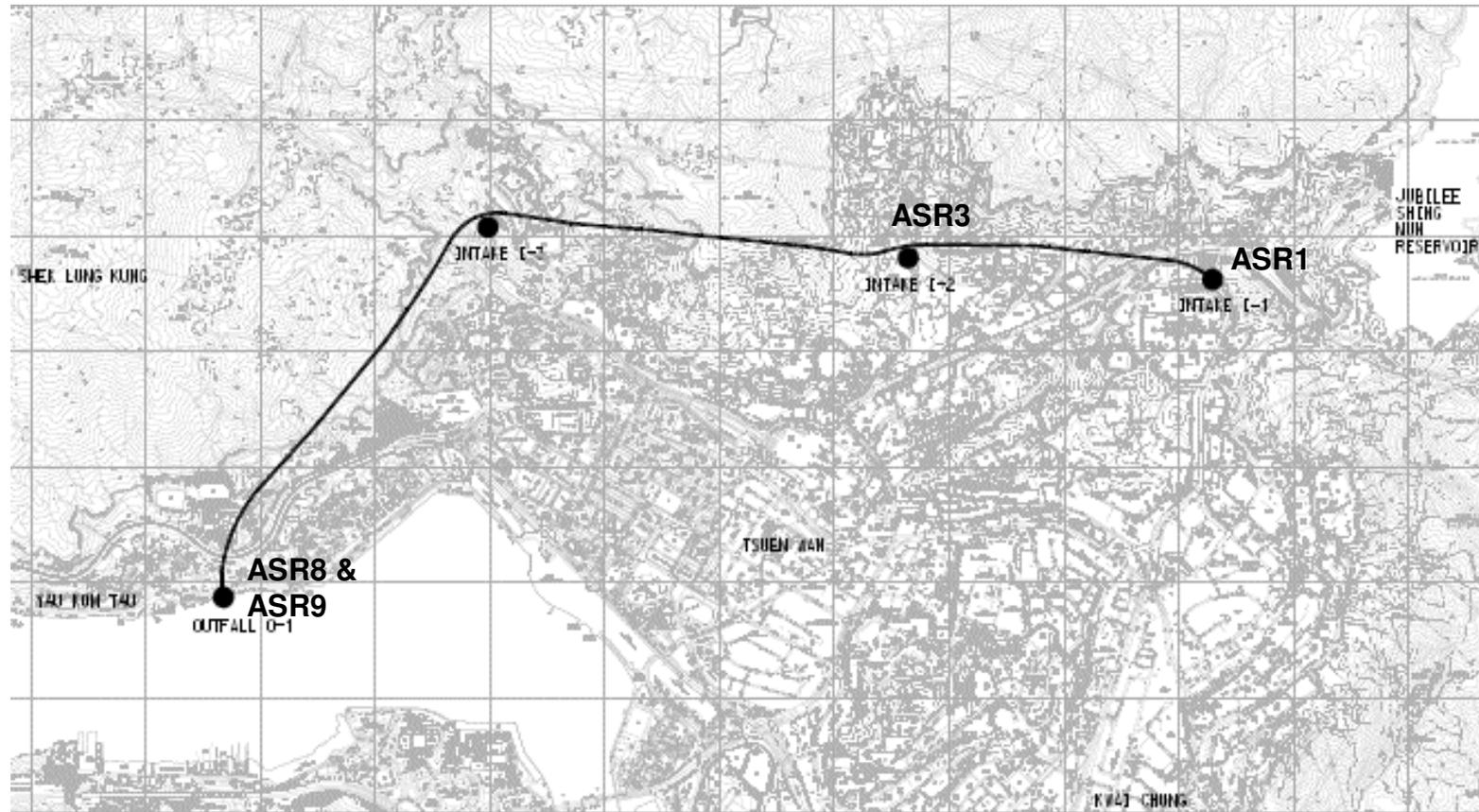


Figure 1 Air Quality Monitoring Stations

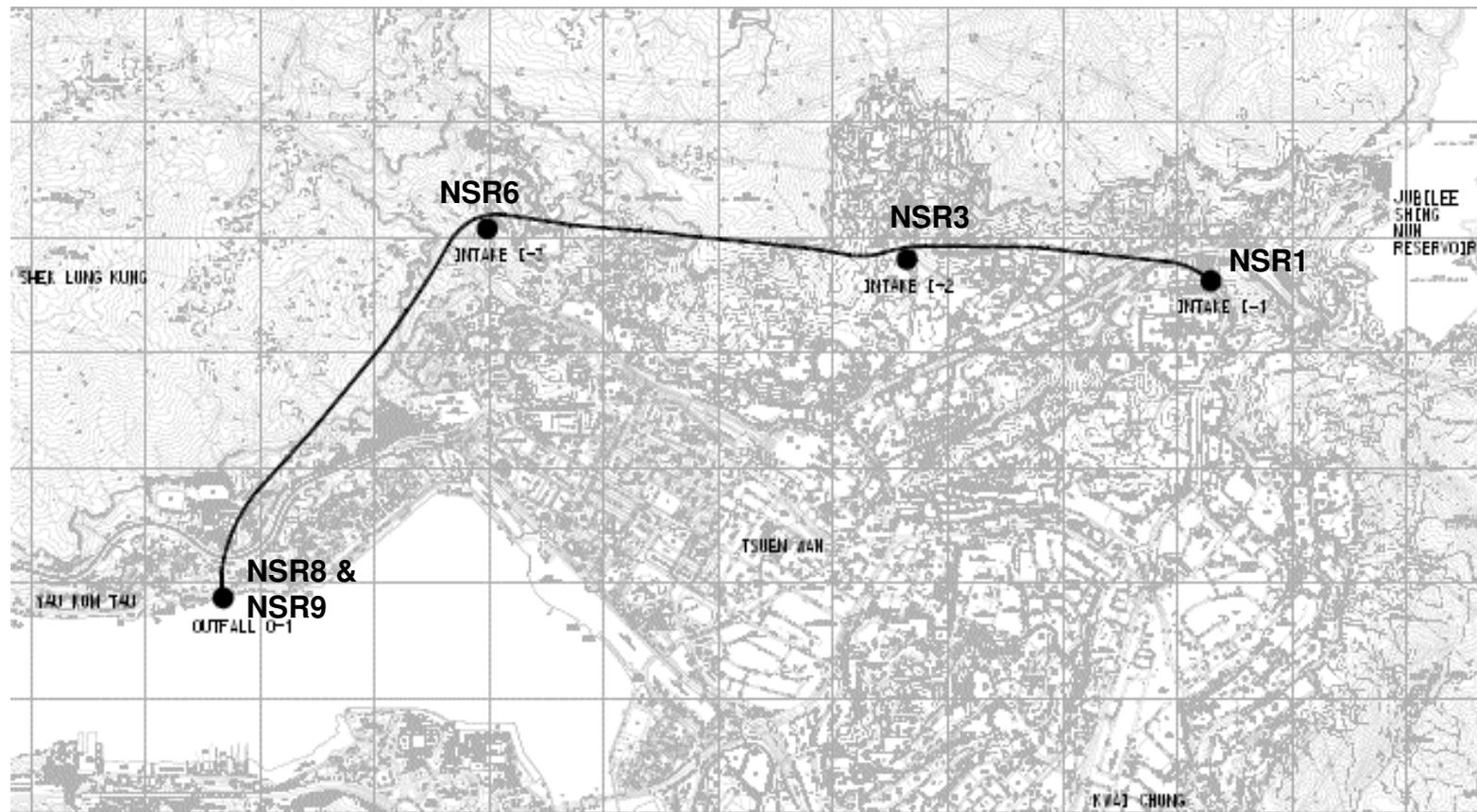


Figure 2 Noise Monitoring Stations

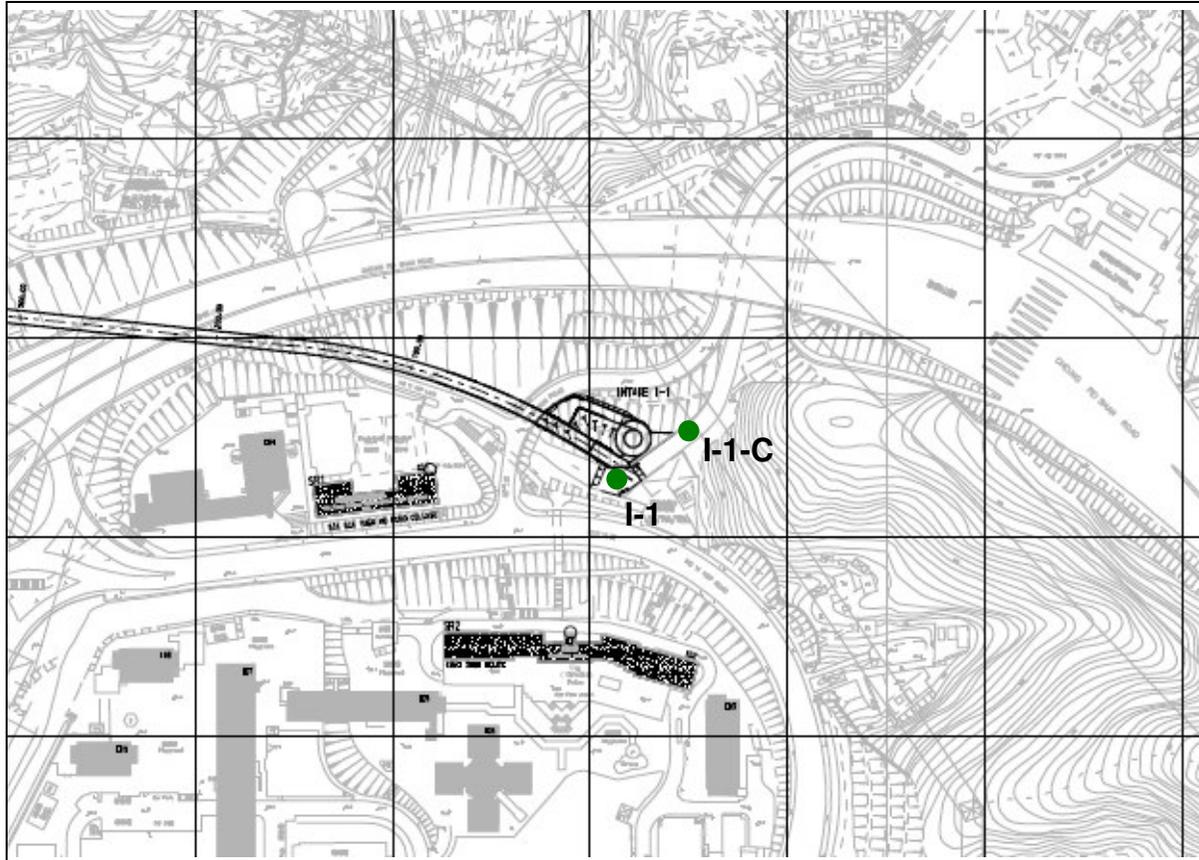


Figure 3 Water Quality Monitoring Stations: I-1 & I-1-C at Intake I-1

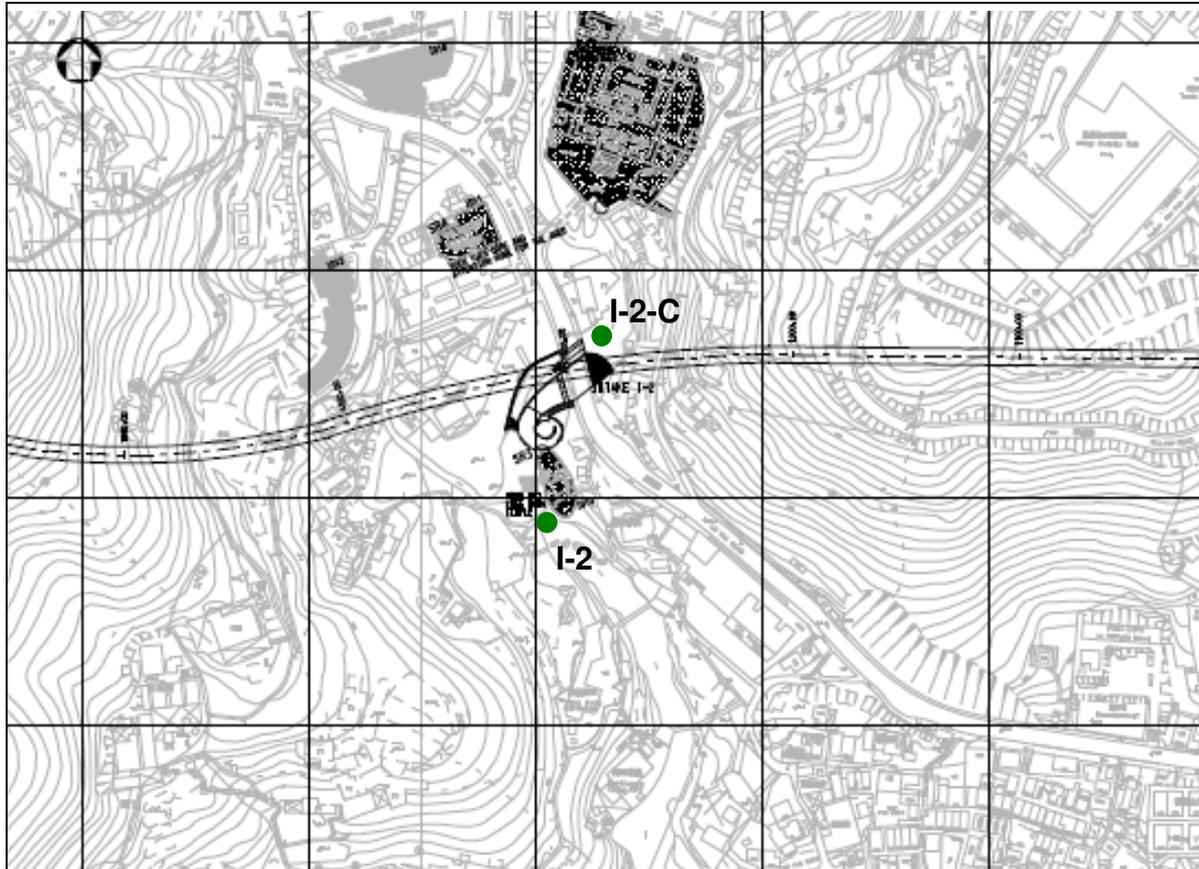


Figure 4 Water Quality Monitoring Stations: I-2 & I-2-C at Intake I-2

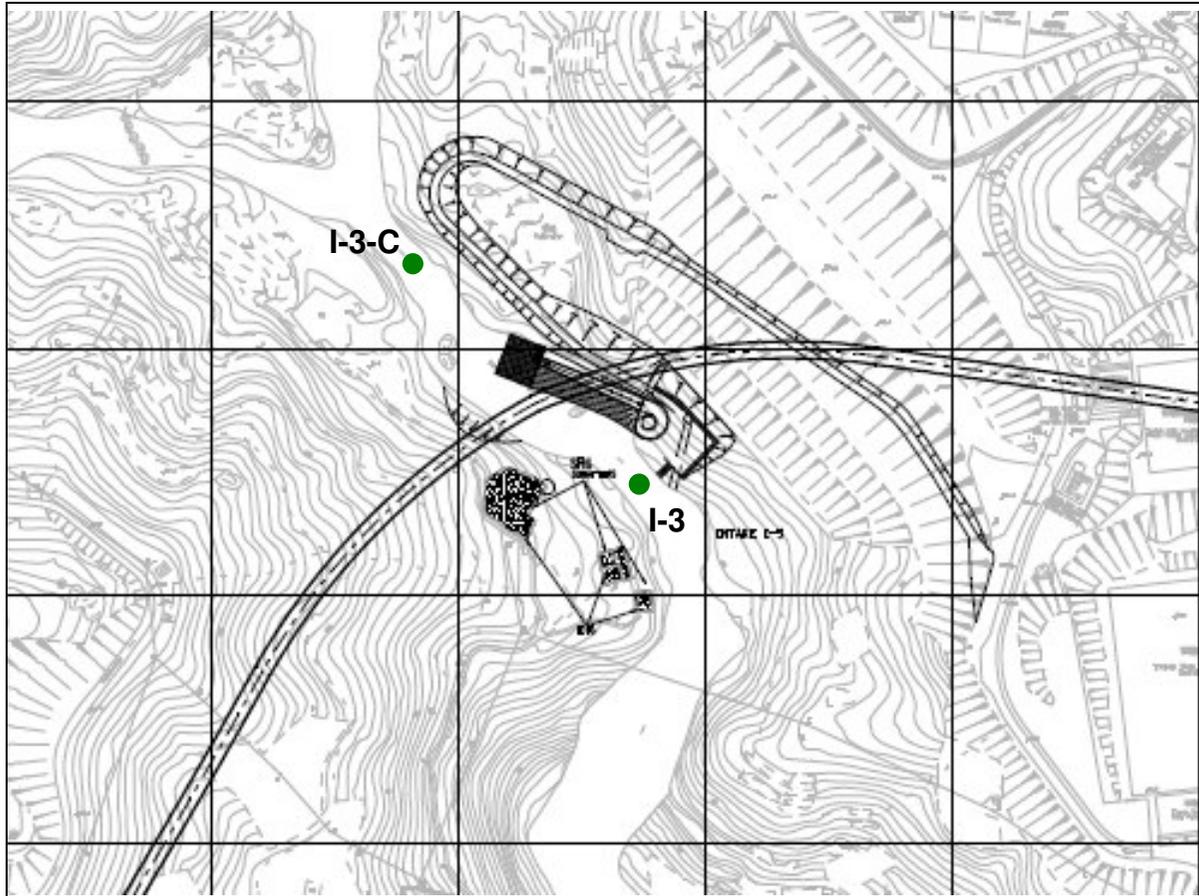


Figure 5 Water Quality Monitoring Stations: I-3 & I-3-C at Intake I-3

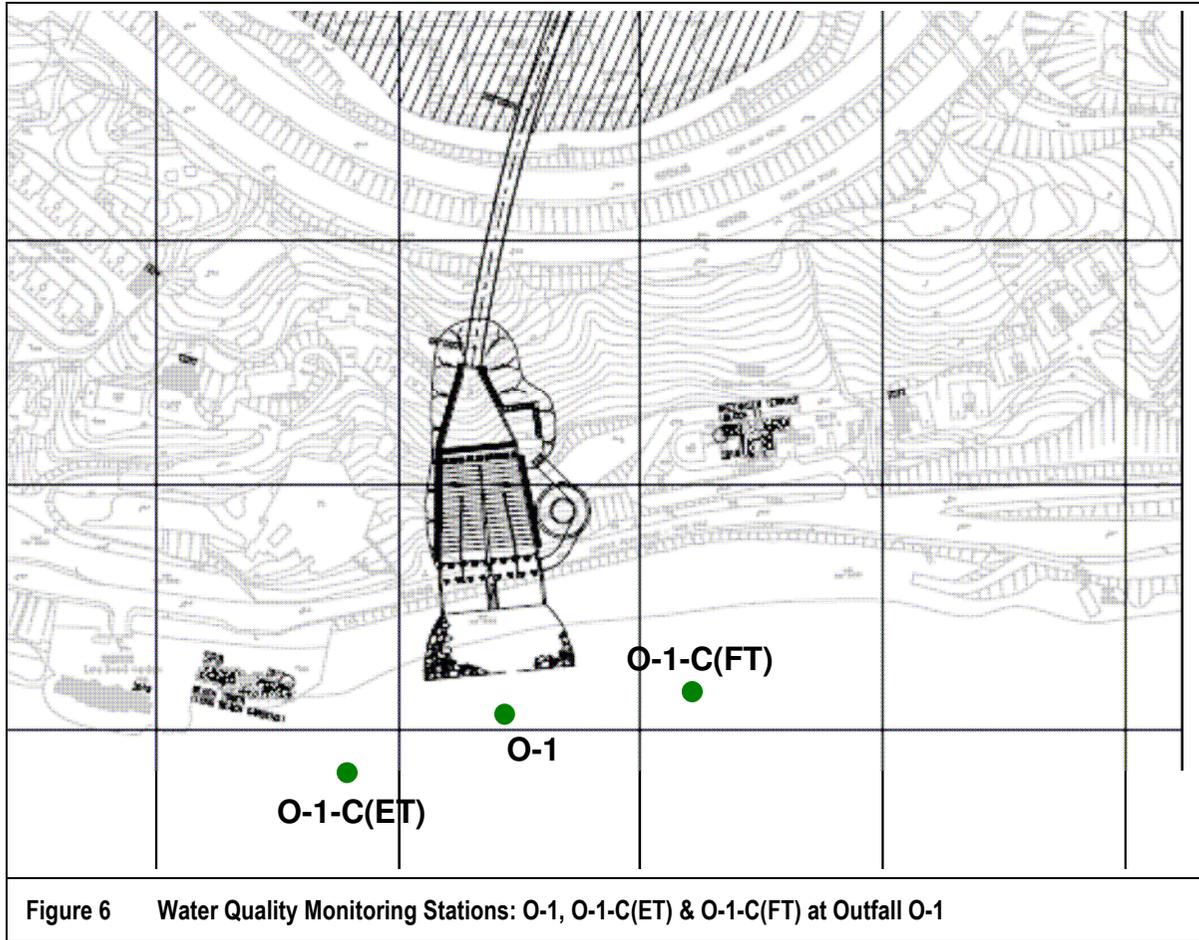


Figure 6 Water Quality Monitoring Stations: O-1, O-1-C(ET) & O-1-C(FT) at Outfall O-1

Appendix H

EM&A Schedule

**Contract No. DC/2007/12 – Design and Construction of
Tsuen Wan Drainage Tunnel
Impact Monitoring Programme – June 2009**

Date		Air	Noise	Water
01-Jun-09	Mon			✓
02-Jun-09	Tue	✓	✓	
03-Jun-09	Wed			
04-Jun-09	Thu			
05-Jun-09	Fri			✓
06-Jun-09	Sat			
07-Jun-09	Sun			
08-Jun-09	Mon	✓	✓	✓
09-Jun-09	Tue			
10-Jun-09	Wed			✓
11-Jun-09	Thu			
12-Jun-09	Fri	✓		✓
13-Jun-09	Sat			
14-Jun-09	Sun			
15-Jun-09	Mon			✓
16-Jun-09	Tue			
17-Jun-09	Wed			✓
18-Jun-09	Thu	✓	✓	
19-Jun-09	Fri			✓
20-Jun-09	Sat			
21-Jun-09	Sun			
22-Jun-09	Mon			✓
23-Jun-09	Tue			
24-Jun-09	Wed	✓	✓	✓
25-Jun-09	Thu			
26-Jun-09	Fri			✓
27-Jun-09	Sat			
28-Jun-09	Sun			
29-Jun-09	Mon			✓
30-Jun-09	Tue	✓	✓	

Note:

Shaded area indicates public holiday.

Air – Monitoring 1-hour TSP is undertaken three times per every six days

Noise – Noise measurements is undertaken once every week at (0700-1900 Monday to Saturday)

Water – Water measurements is undertaken three times per week

**Contract No. DC/2007/12 – Design and Construction of
Tsuen Wan Drainage Tunnel
Impact Monitoring Programme – July 2009 (Tentative)**

Date		Air	Noise	Water
01-July-09	Wed			
02-July-09	Thu			✓
03-July-09	Fri			
04-July-09	Sat			✓
05-July-09	Sun			
06-July-09	Mon	✓	✓	✓
07-July-09	Tue			
08-July-09	Wed			✓
09-July-09	Thu			
10-July-09	Fri	✓		✓
11-July-09	Sat			
12-July-09	Sun			
13-July-09	Mon			✓
14-July-09	Tue			
15-July-09	Wed			✓
16-July-09	Thu	✓	✓	
17-July-09	Fri			✓
18-July-09	Sat			
19-July-09	Sun			
20-July-09	Mon			✓
21-July-09	Tue			
22-July-09	Wed	✓	✓	✓
23-July-09	Thu			
24-July-09	Fri			✓
25-July-09	Sat			
26-July-09	Sun			
27-July-09	Mon			✓
28-July-09	Tue	✓	✓	
29-July-09	Wed			✓
30-July-09	Thu			
31-July-09	Fri			✓

Note:

Shaded area indicates public holiday.

Air – Monitoring 1-hour TSP is undertaken three times per every six days

Noise – Noise measurements is undertaken once every week at (0700-1900 Monday to Saturday)

Water – Water measurements is undertaken three times per week

**Contract No. DC/2007/12 – Design and Construction of
Tsuen Wan Drainage Tunnel
Impact Monitoring Programme – August 2009 (Tentative)**

Date		Air	Noise	Water
01-Aug-09	Sat			
02-Aug-09	Sun			
03-Aug-09	Mon	✓	✓	✓
04-Aug-09	Tue			
05-Aug-09	Wed			✓
06-Aug-09	Thu			
07-Aug-09	Fri	✓		✓
08-Aug-09	Sat			
09-Aug-09	Sun			
10-Aug-09	Mon			✓
11-Aug-09	Tue			
12-Aug-09	Wed			✓
13-Aug-09	Thu	✓	✓	
14-Aug-09	Fri			✓
15-Aug-09	Sat			
16-Aug-09	Sun			
17-Aug-09	Mon			✓
18-Aug-09	Tue			
19-Aug-09	Wed	✓	✓	✓
20-Aug-09	Thu			
21-Aug-09	Fri			✓
22-Aug-09	Sat			
23-Aug-09	Sun			
24-Aug-09	Mon			✓
25-Aug-09	Tue	✓	✓	
26-Aug-09	Wed			✓
27-Aug-09	Thu			
28-Aug-09	Fri			✓
29-Aug-09	Sat			
30-Aug-09	Sun			
31-Aug-09	Mon	✓	✓	✓

Note:

Shaded area indicates public holiday.

Air – Monitoring 1-hour TSP is undertaken three times per every six days

Noise – Noise measurements is undertaken once every week at (0700-1900 Monday to Saturday)

Water – Water measurements is undertaken three times per week

**Contract No. DC/2007/12 – Design and Construction of
Tsuen Wan Drainage Tunnel
Impact Monitoring Programme – September 2009 (Tentative)**

Date		Air	Noise	Water
01-Sept-09	Tue			
02-Sept-09	Wed			✓
03-Sept-09	Thu			
04-Sept-09	Fri	✓		✓
05-Sept-09	Sat			
06-Sept-09	Sun			
07-Sept-09	Mon			✓
08-Sept-09	Tue			
09-Sept-09	Wed			✓
10-Sept-09	Thu	✓	✓	
11-Sept-09	Fri			✓
12-Sept-09	Sat			
13-Sept-09	Sun			
14-Sept-09	Mon			✓
15-Sept-09	Tue			
16-Sept-09	Wed	✓	✓	✓
17-Sept-09	Thu			
18-Sept-09	Fri			✓
19-Sept-09	Sat			
20-Sept-09	Sun			
21-Sept-09	Mon			✓
22-Sept-09	Tue	✓	✓	
23-Sept-09	Wed			✓
24-Sept-09	Thu			
25-Sept-09	Fri			✓
26-Sept-09	Sat			
27-Sept-09	Sun			
28-Sept-09	Mon	✓	✓	✓
29-Sept-09	Tue			
30-Sept-09	Wed			✓

Note:

Shaded area indicates public holiday.

Air – Monitoring 1-hour TSP is undertaken three times per every six days

Noise – Noise measurements is undertaken once every week at (0700-1900 Monday to Saturday)

Water – Water measurements is undertaken three times per week

Appendix I

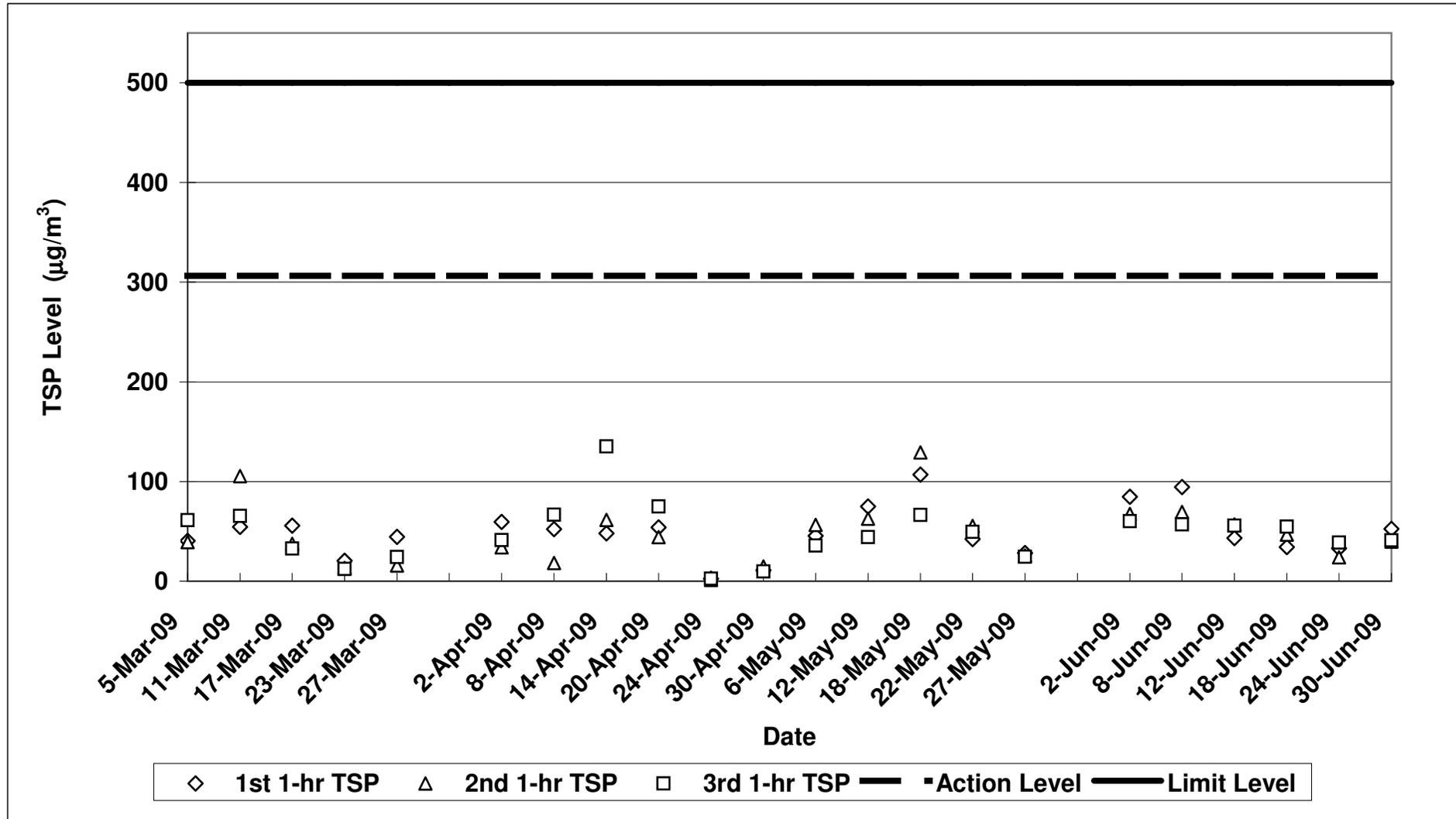
Monitoring Results

Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel

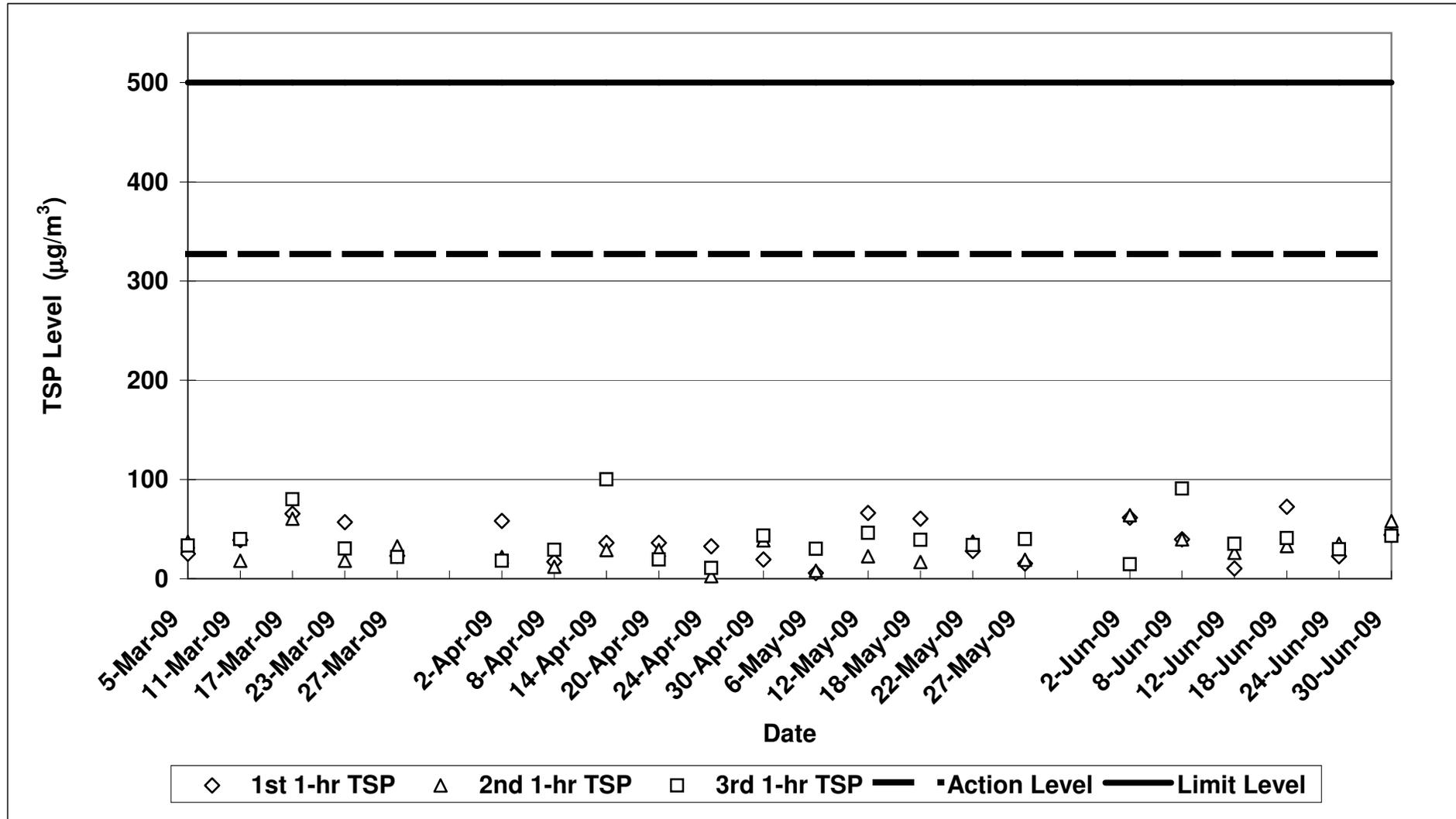
Air Quality Impact Monitoring Results (1-Hour TSP)

Location	Monitoring Date	Weather Conditions	Wind Speed with Direction (m/s)	Temp (°C)	Timer-I	Timer-F	Time (mins)	Flow-I (CFM)	Flow-F (CFM)	Flow-I (m³/min)	Flow-F (m³/min)	Flow-avg (m³/min)	Volume (m³)	Weight-I (g)	Weight-F (g)	Weight-diff. (g)	1-hr TSP (µg/m³)	Average 1-Hr TSP (µg/m³)	Action/Limit Levels (µg/m³)	Observation / Site Condition	Remark
Sik Sik Yuen Ho Fung College - Intake (ASR1)	2-Jun-09	Cloudy	0.4E	29	575242	575342	60.0	40	40	1.36	1.36	1.36	81.41	2.846	2.8529	0.0069	84.8	70.8	306.6/500	Excavation by backhoe	Nil
		Cloudy	0.4E	29	575342	575442	60.0	40	40	1.36	1.36	1.36	81.41	2.8546	2.8601	0.0055	67.6				
		Cloudy	0.4E	29	575442	575542	60.0	40	40	1.36	1.36	1.36	81.41	2.8291	2.8340	0.0049	60.2				
	8-Jun-09	Cloudy	0.5E	27	575542	575642	60.0	40	40	1.46	1.46	1.46	87.84	2.8942	2.9025	0.0083	94.5	73.6	306.6/500	Excavation by backhoe	Nil
		Cloudy	0.5E	27	575642	575742	60.0	40	40	1.46	1.46	1.46	87.84	2.9028	2.9089	0.0061	69.4				
		Cloudy	0.5E	27	575742	575842	60.0	40	40	1.46	1.46	1.46	87.84	2.9089	2.9039	0.0050	56.9				
	12-Jun-09	Cloudy	0.4E	26	575842	575942	60.0	40	40	1.46	1.46	1.46	87.84	2.8022	2.8060	0.0038	43.3	52.0	306.6/500	Nil	Nil
		Cloudy	0.4E	26	575942	576042	60.0	40	40	1.46	1.46	1.46	87.84	2.8203	2.8343	0.0050	56.9				
		Cloudy	0.4E	26	576042	576142	60.0	40	40	1.46	1.46	1.46	87.84	2.8313	2.8362	0.0049	55.8				
	18-Jun-09	Sunny	0.3E	30	576142	576242	60.0	40	40	1.46	1.46	1.46	87.84	2.8912	2.8942	0.0030	34.2	45.2	306.6/500	Excavation by backhoe	Nil
		Sunny	0.3E	30	576242	576342	60.0	40	40	1.46	1.46	1.46	87.84	2.9068	2.9109	0.0041	46.7				
		Sunny	0.3E	30	576342	576442	60.0	40	40	1.46	1.46	1.46	87.84	2.9041	2.9089	0.0048	54.6				
	24-Jun-09	Cloudy	0.5E	28	576442	576542	60.0	40	40	1.46	1.46	1.46	87.84	2.8227	2.8299	0.0029	33.0	31.9	306.6/500	Excavation by backhoe	Nil
		Cloudy	0.5E	28	576542	576642	60.0	40	40	1.46	1.46	1.46	87.84	2.8008	2.8022	0.0021	23.9				
		Cloudy	0.5E	28	576642	576742	60.0	40	40	1.46	1.46	1.46	87.84	2.8313	2.8347	0.0034	38.7				
	30-Jun-09	Sunny	0.4E	30	576742	576842	60.0	40	40	1.46	1.46	1.46	87.84	2.8724	2.8770	0.0046	52.4	44.4	306.6/500	Excavation by backhoe	Nil
		Sunny	0.4E	30	576842	576942	60.0	40	40	1.46	1.46	1.46	87.84	2.8760	2.8795	0.0035	39.8				
		Sunny	0.4E	30	576942	577042	60.0	40	40	1.46	1.46	1.46	87.84	2.8213	2.8249	0.0036	41.0				
Hong Hai Chee Hong Temple - Intake (ASR3)	2-Jun-09	Cloudy	0.4E	29	543900	543990	60.0	40	40	1.38	1.38	1.38	82.81	2.8214	2.8295	0.0051	61.6	46.7	327.4/500	Excavation by backhoe	Nil
		Cloudy	0.4E	29	543990	543990	60.0	40	40	1.38	1.38	1.38	82.81	2.8140	2.8190	0.0050	64.0				
		Cloudy	0.4E	29	543990	543990	60.0	40	40	1.38	1.38	1.38	82.81	2.8110	2.8122	0.0012	14.5				
	8-Jun-09	Cloudy	0.4E	27	543990	544090	60.0	40	40	1.47	1.47	1.47	88.12	2.8924	2.8959	0.0035	39.7	56.7	327.4/500	Excavation by backhoe	Nil
		Cloudy	0.4E	27	544090	544190	60.0	40	40	1.47	1.47	1.47	88.12	2.9041	2.9076	0.0035	39.7				
		Cloudy	0.4E	27	544190	544290	60.0	40	40	1.47	1.47	1.47	88.12	2.8446	2.8526	0.0080	90.8				
	12-Jun-09	Cloudy	0.5E	26	544290	544390	60.0	40	40	1.47	1.47	1.47	88.12	2.8112	2.8121	0.0009	10.2	23.8	327.4/500	Excavation by backhoe	Nil
		Cloudy	0.5E	26	544390	544490	60.0	40	40	1.47	1.47	1.47	88.12	2.8250	2.8283	0.0023	28.1				
		Cloudy	0.5E	26	544490	544590	60.0	40	40	1.47	1.47	1.47	88.12	2.8242	2.8273	0.0031	35.2				
	16-Jun-09	Sunny	0.4E	30	544590	544690	60.0	40	40	1.47	1.47	1.47	88.12	2.8441	2.8505	0.0064	72.6	48.8	327.4/500	Excavation by backhoe	Nil
		Sunny	0.4E	30	544690	544790	60.0	40	40	1.47	1.47	1.47	88.12	2.8435	2.8464	0.0029	32.9				
		Sunny	0.4E	30	544790	544890	60.0	40	40	1.47	1.47	1.47	88.12	2.8432	2.8468	0.0036	40.9				
	24-Jun-09	Cloudy	0.3E	28	544890	544990	60.0	40	40	1.47	1.47	1.47	88.12	2.8091	2.8111	0.0020	22.7	29.1	327.4/500	Excavation by backhoe	Nil
		Cloudy	0.3E	28	544990	545090	60.0	40	40	1.47	1.47	1.47	88.12	2.833	2.8361	0.0031	35.2				
		Cloudy	0.3E	28	545090	545190	60.0	40	40	1.47	1.47	1.47	88.12	2.838	2.8406	0.0026	29.5				
	30-Jun-09	Cloudy	0.4E	31	545190	545290	60.0	40	40	1.47	1.47	1.47	88.12	2.8727	2.8766	0.0039	44.3	48.4	327.4/500	Excavation by backhoe	Nil
		Sunny	0.4E	31	545290	545390	60.0	40	40	1.47	1.47	1.47	88.12	2.8807	2.8858	0.0051	57.9				
		Sunny	0.4E	31	545390	545490	60.0	40	40	1.47	1.47	1.47	88.12	2.885	2.8888	0.0038	43.1				
Long Beach Gardens - Outfall (ASR8)	2-Jun-09	Cloudy	0.4E	29	598780	598880	60.0	40	40	1.38	1.38	1.38	82.98	2.8098	2.8127	0.0029	34.9	35.8	336.6/500	Excavation by backhoe	Nil
		Cloudy	0.4E	29	598880	598980	60.0	40	40	1.38	1.38	1.38	82.98	2.8335	2.8370	0.0035	42.2				
		Cloudy	0.4E	29	598980	599080	60.0	40	40	1.38	1.38	1.38	82.98	2.8289	2.8314	0.0025	30.1				
	8-Jun-09	Cloudy	0.5E	27	599080	599180	60.0	40	40	1.28	1.28	1.28	76.51	2.8258	2.8272	0.0014	18.3	20.9	336.6/500	Excavation by backhoe	Nil
		Cloudy	0.5E	27	599180	599280	60.0	40	40	1.28	1.28	1.28	76.51	2.8408	2.8424	0.0016	20.9				
		Cloudy	0.5E	27	599280	599380	60.0	40	40	1.28	1.28	1.28	76.51	2.8403	2.8421	0.0018	23.5				
	12-Jun-09	Cloudy	0.3E	26	599380	599480	60.0	40	40	1.28	1.28	1.28	76.51	2.7941	2.7993	0.0052	68.0	127.2	336.6/500	No major construction work was observed. High level of TSP at 2nd measurement could be contributed by the nearby traffic.	Nil
		Cloudy	0.3E	26	599480	599580	60.0	40	40	1.28	1.28	1.28	76.51	2.8054	2.8059	0.0005	267.9				
		Cloudy	0.3E	26	599580	599680	60.0	40	40	1.28	1.28	1.28	76.51	2.8056	2.8091	0.0035	45.7				
	18-Jun-09	Sunny	0.5E	30	599680	599780	60.0	40	40	1.28	1.28	1.28	76.51	2.8290	2.8325	0.0035	45.7	34.0	336.6/500	Excavation by backhoe	Nil
		Sunny	0.5E	30	599780	599880	60.0	40	40	1.28	1.28	1.28	76.51	2.8347	2.8363	0.0016	20.9				
		Sunny	0.5E	30	599880	599980	60.0	40	40	1.28	1.28	1.28	76.51	2.8542	2.8569	0.0027	35.3				
	24-Jun-09	Cloudy	0.4E	28	599980	600080	60.0	40	40	1.28	1.28	1.28	76.51	2.8318	2.8415	0.0097	126.8	82.3	336.6/500	Excavation by backhoe	Nil
		Cloudy	0.4E	28	600080	600180	60.0	40	40	1.28	1.28	1.28	76.51	2.8762	2.8818	0.0056	73.2				
		Cloudy	0.4E	28	600180	600280	60.0	40	40	1.28	1.28	1.28	76.51	2.8889	2.8925	0.0036	47.1				
	30-Jun-09	Sunny	0.5E	30	600280	600380	60.0	40	40	1.28	1.28	1.28	76.51	2.8733	2.8798	0.0065	85.0	73.6	336.6/500	Excavation by backhoe	Nil
		Sunny	0.5E	30	600380	600480	60.0	40	40	1.28	1.28	1.28	76.51	2.847	2.8538	0.0068	89.9				
		Sunny	0.5E	30	600480	600580	60.0	40	40	1.28	1.28	1.28	76.51	2.8818	2.8854	0.0036	47.1				
Greenview Terrace - Outfall (ASR9)	2-Jun-09	Cloudy	0.5E	29	530680	530780	60.0	40	40	1.42	1.42	1.42	84.98	2.8549	2.8576	0.0027	31.8	37.3	329.2/500	Excavation by backhoe	Nil
		Cloudy	0.5E	29	530780	530880	60.0	40	40	1.42	1.42	1.42	84.98	2.8713	2.8747	0.0034	40.0				
		Cloudy	0.5E	29	530880	530980	60.0	40	40	1.42	1.42	1.42	84.98	2.8468	2.8502	0.0034	40.0				
	8-Jun-09	Cloudy	0.4E	29	530980	531080	60.0	40	40	1.50	1.50	1.50	89.94	2.7931	2.7962	0.0031	34.5	25.2	329.2/500	Excavation by backhoe	Nil
		Cloudy	0.4E	29	531080	531180	60.0	40	40	1.50	1.50	1.50	89.94	2.8286	2.8313	0.0027	30.0				
		Cloudy	0.4E	29	531180	531280	60.0	40	40	1.50	1.50	1.50	89.94	2.8229	2.8239	0.0010	11.1				
	12-Jun-09	Cloudy	0.4E	26	531280	531380	60.0	40	40	1.50	1.50	1.50	89.94	2.8197	2.8272	0.0075	83.4	54.5	329.2/500	Excavation by backhoe	Nil
		Cloudy	0.4E	26	531380	531480	60.0	40	40	1.50	1.50	1.50	89.94	2.8254	2.8292	0.0038	42.3				

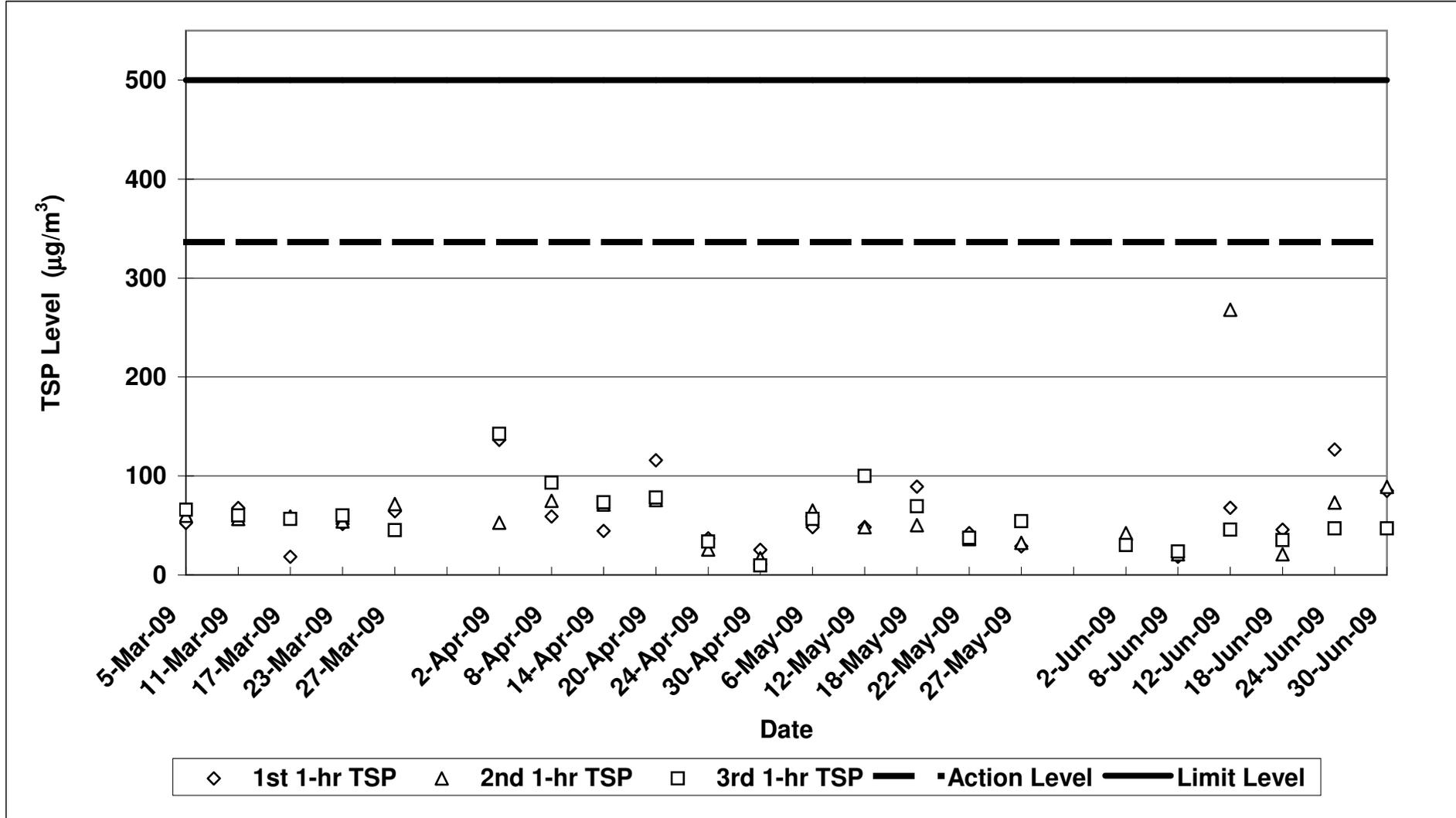
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Air Quality Monitoring (1-hr TSP) Results at Sik Sik Yuen Ho Fung College - Intake (ASR1)
 Mar-09 to Jun-09**



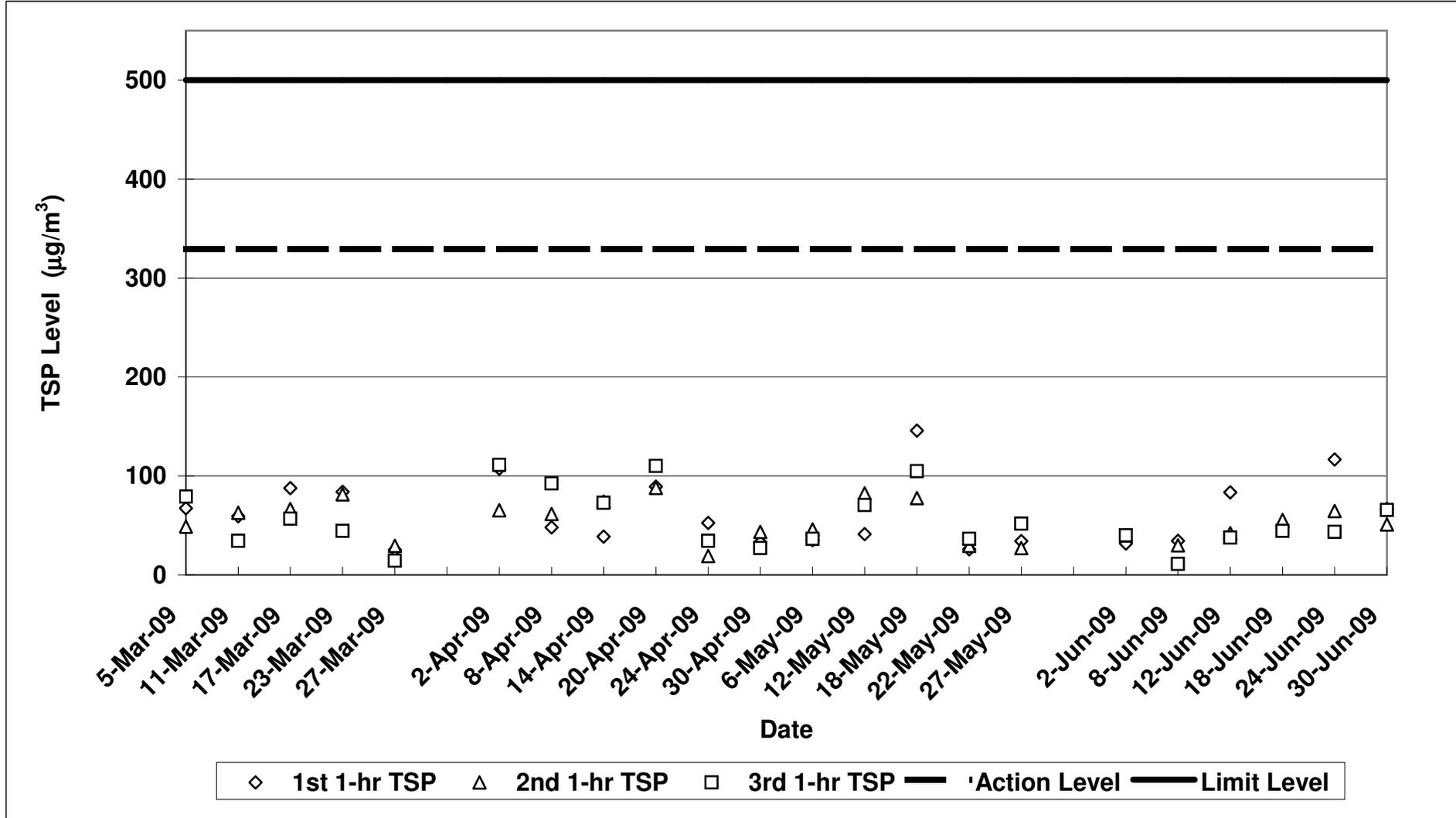
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Air Quality Monitoring (1-hr TSP) Results at Hong Hoi Chee Hong Temple - Intake (ASR3)
 Mar-09 to Jun-09**



**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Air Quality Monitoring (1-hr TSP) Results at Long Beach Gardens - Outfall (ASR8)
 Mar-09 to Jun-09**



**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Air Quality Monitoring (1-hr TSP) Results at Greenview Terrance - Outfall (ASR9)
 Mar-09 to Jun-09**



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel

Noise Impact Monitoring Results

Monitoring Locations	Date	Weather Conditions	Temperature (°C)	Wind Speed (m/s)	Wind Direction	Start Time	End Time	BL ¹ dB(A)	LL ² dB(A)	L _{eq} (30min) dB(A)	L ₁₀ (30min) dB(A)	L ₉₀ (30min) dB(A)	CNL ³ dB(A)	Observation / Site Condition	Remark
Sik Sik Yuen Ho Fung College NSR 1	02-Jun-09	Cloudy	29	0.4	E	17:00	17:30	66.1	70	64.5	67.1	61.5	-	Excavation by backhoe	Traffic noise
	08-Jun-09	Cloudy	26	0.5	E	17:00	17:30	66.1	65	62.4	65.5	59.6	-	Excavation by backhoe	Traffic noise
	18-Jun-09	Sunny	30	0.3	E	08:30	09:00	66.1	65	63.0	66.0	60.0	-	Excavation by backhoe	Traffic noise
	24-Jun-09	Cloudy	30	0.5	E	15:15	15:45	66.1	70	63.8	66.4	60.7	-	Excavation by backhoe	Nil
	30-Jun-09	Sunny	30	0.4	E	13:20	13:50	66.1	70	64.0	67.3	63.3	-	Nil	Traffic noise
Hong Hoi Chee Hong Temple NSR 3	02-Jun-09	Cloudy	29	0.4	E	08:30	09:00	57.9	75	63.3	66.2	60.2	-	Nil	Nil
	08-Jun-09	Cloudy	26	0.4	E	08:30	09:00	57.9	75	67.1	69.5	64.4	-	Nil	Traffic noise , water fall
	18-Jun-09	Sunny	30	0.4	E	11:30	12:00	57.9	75	64.7	67.6	59.5	-	Nil	Traffic noise
	24-Jun-09	Cloudy	28	0.3	E	08:30	09:00	57.9	75	64.2	67.2	59.0	-	Nil	Traffic noise , water fall
	30-Jun-09	Sunny	30	0.4	E	08:30	09:00	57.9	75	61.5	64.5	57.0	-	Excavation by backhoe	Traffic noise
Squatters NSR 6	02-Jun-09	Cloudy	29	0.5	E	14:00	14:30	61.2	75	61.6	64.5	57.2	-	Excavation by backhoe	Water fall
	08-Jun-09	Cloudy	26	0.3	E	10:00	10:30	61.2	75	61.6	64.5	59.2	-	Excavation by backhoe	Water fall
	18-Jun-09	Sunny	30	0.4	E	14:15	14:45	61.2	75	62.3	65.4	59.6	-	Nil	Water fall
	24-Jun-09	Cloudy	30	0.5	E	14:20	14:50	61.2	75	63.5	66.5	60.3	-	Nil	Water fall
	30-Jun-09	Sunny	30	0.5	E	16:30	17:00	61.2	75	62.6	64.7	57.9	-	Nil	Water fall
Long Beach Gardens NSR 8	02-Jun-09	Cloudy	29	0.4	E	10:20	10:50	60.9	75	59.4	62.5	56.2	-	Excavation by backhoe	Traffic noise
	08-Jun-09	Cloudy	26	0.5	E	14:20	14:50	60.9	75	62.1	64.9	59.2	-	Nil	Traffic noise
	18-Jun-09	Sunny	30	0.5	E	15:20	15:50	60.9	75	63.8	66.7	60.5	-	Nil	Traffic noise
	24-Jun-09	Cloudy	30	0.4	E	09:50	10:20	60.9	75	63.2	65.6	60.0	-	Excavation by backhoe	Traffic noise
	30-Jun-09	Sunny	30	0.5	E	09:50	10:20	60.9	75	61.8	64.4	58.4	-	Excavation by backhoe	Traffic noise
Greenview Terrace NSR 9	02-Jun-09	Cloudy	29	0.5	E	09:20	09:50	59.7	75	72.4	74.4	68.2	-	Excavation by backhoe	Traffic noise
	08-Jun-09	Cloudy	26	0.4	E	15:20	15:50	59.7	75	70.2	73.2	67.3	-	Nil	Nil
	18-Jun-09	Sunny	30	0.4	E	17:20	17:50	59.7	75	70.2	73.1	66.9	-	Nil	Traffic noise
	24-Jun-09	Cloudy	30	0.4	E	11:20	11:50	59.7	75	70.3	73.4	67.4	-	Excavation by backhoe	Nil
	30-Jun-09	Sunny	30	0.4	E	10:45	11:15	59.7	75	71.5	74.5	68.7	-	Soil Nailing,Excavation & Breaking by backhoe	Traffic noise

1: Baseline Noise Level

2: Limit Level

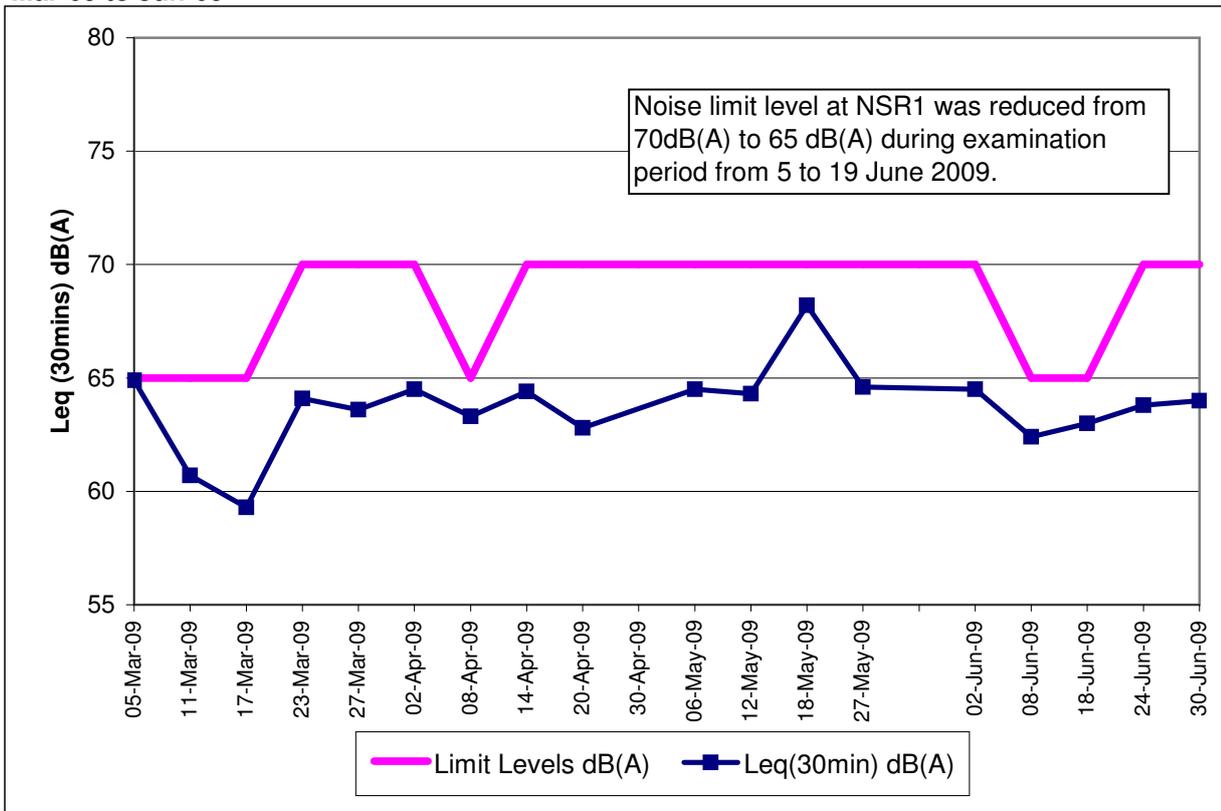
3: Corrected Noise Level

Note:

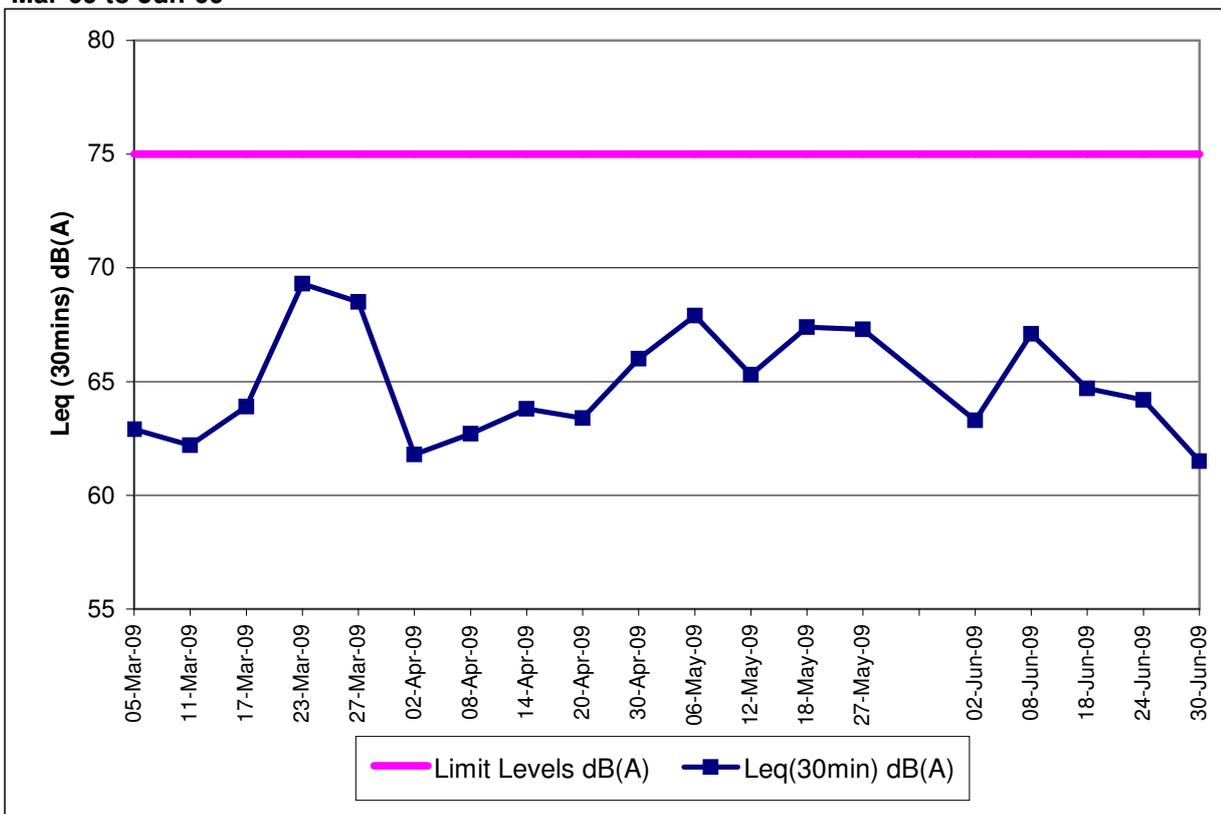
The limit level of NSR1 is 65dB(A) during school examination period.

Red Bold indicates an exceedance of Limit Level

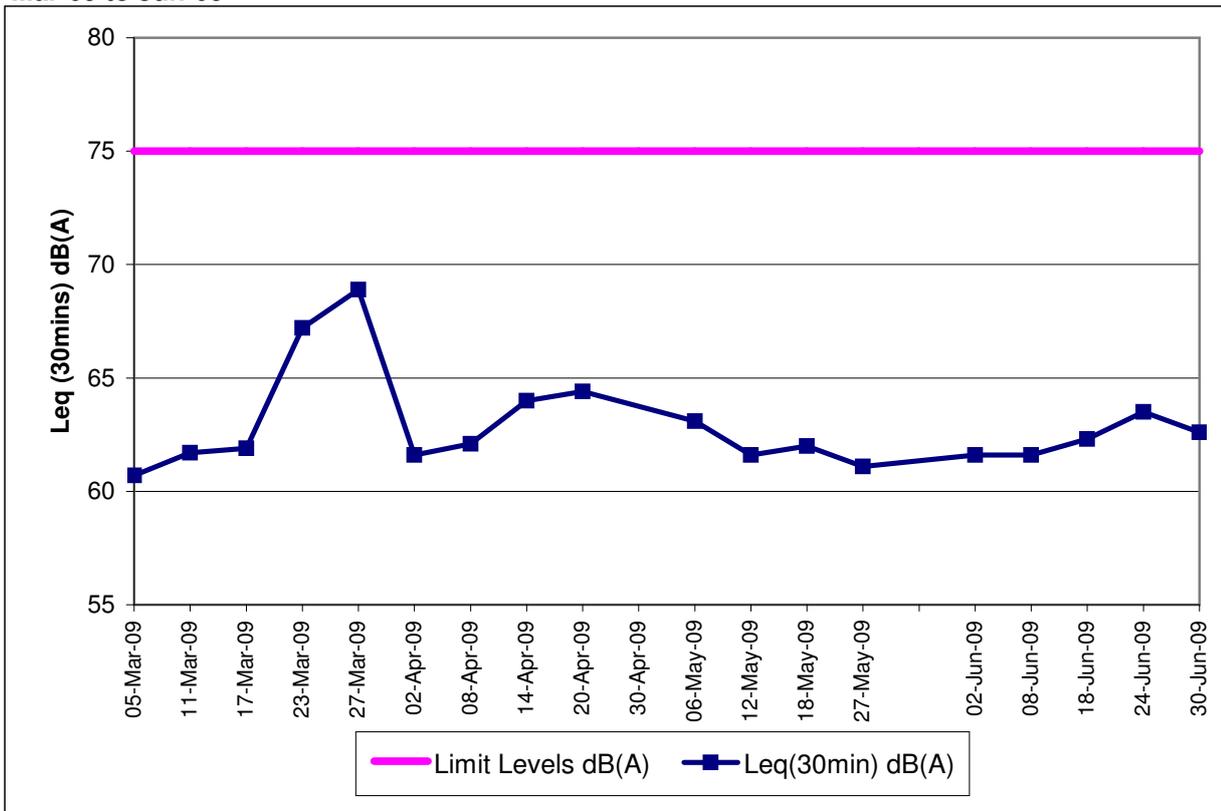
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Sik Sik Yuen Ho Fung College (NSR 1)
Mar-09 to Jun-09**



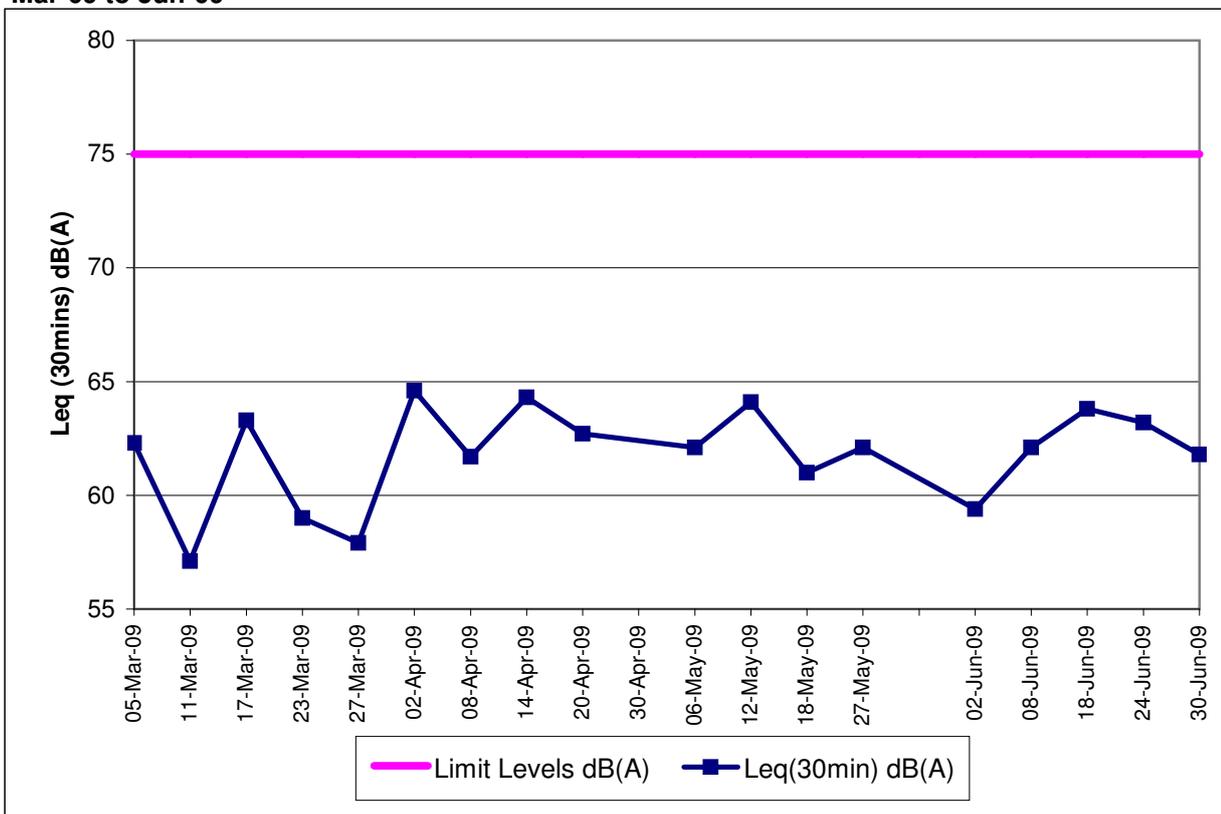
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Hong Hoi Chee Hong Temple (NSR 3)
Mar-09 to Jun-09**



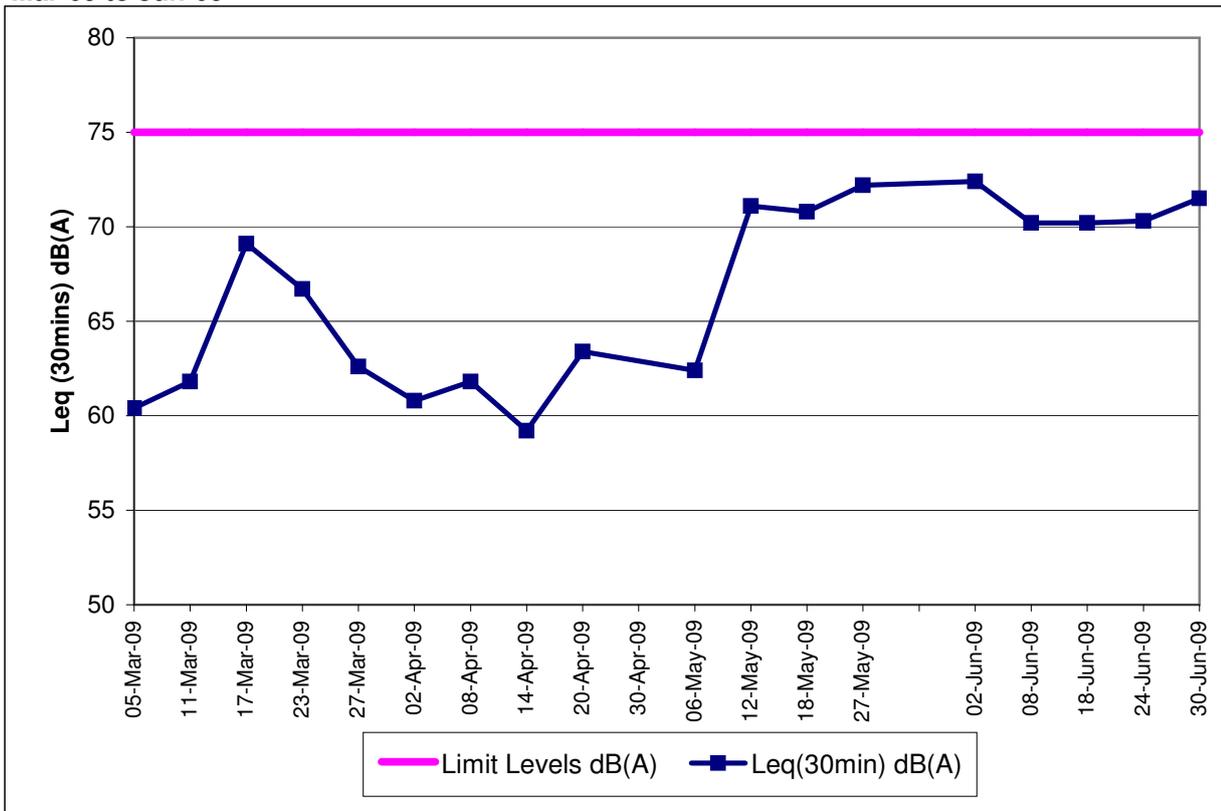
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Noise Monitoring Results at Squatters (NSR 6)
 Mar-09 to Jun-09**



**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Noise Monitoring Results at Long Beach Gardens (NSR 8)
 Mar-09 to Jun-09**



**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Greenview Terrace (NSR 9)
Mar-09 to Jun-09**

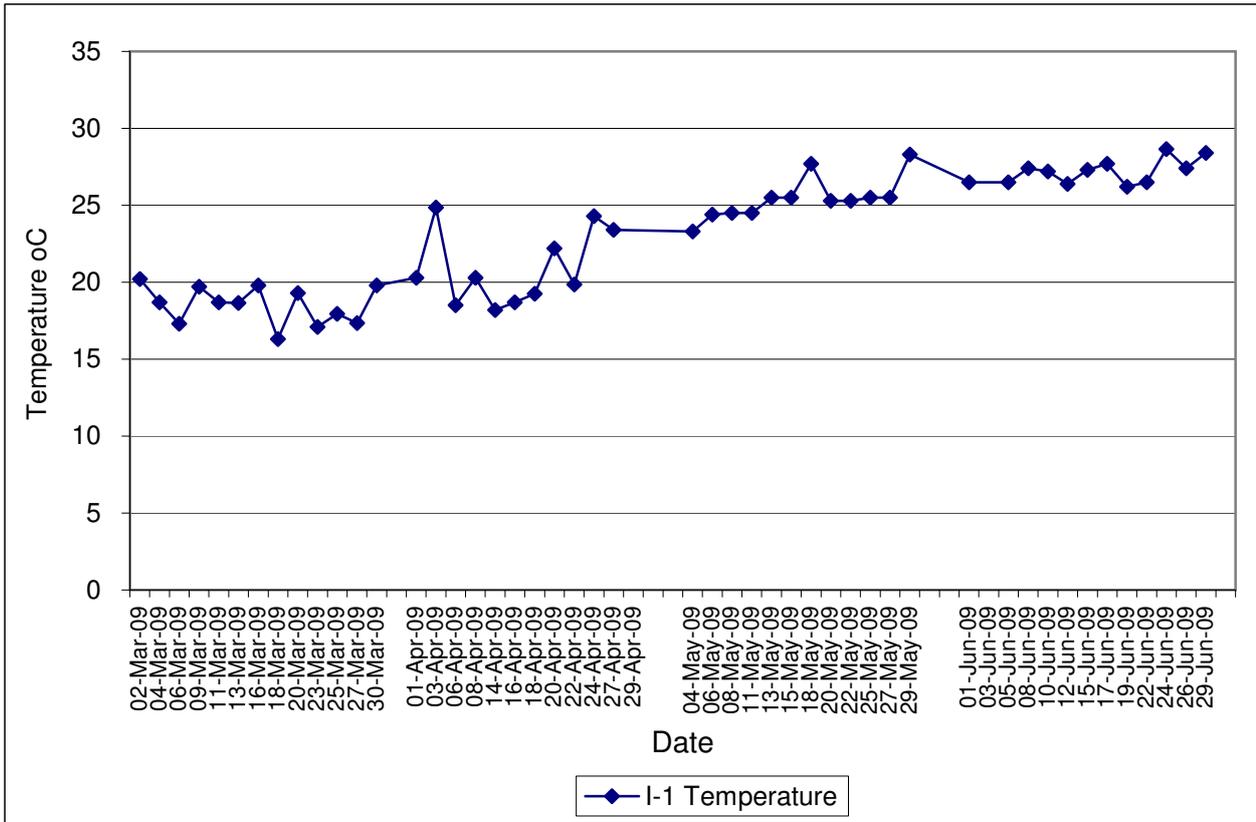


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel

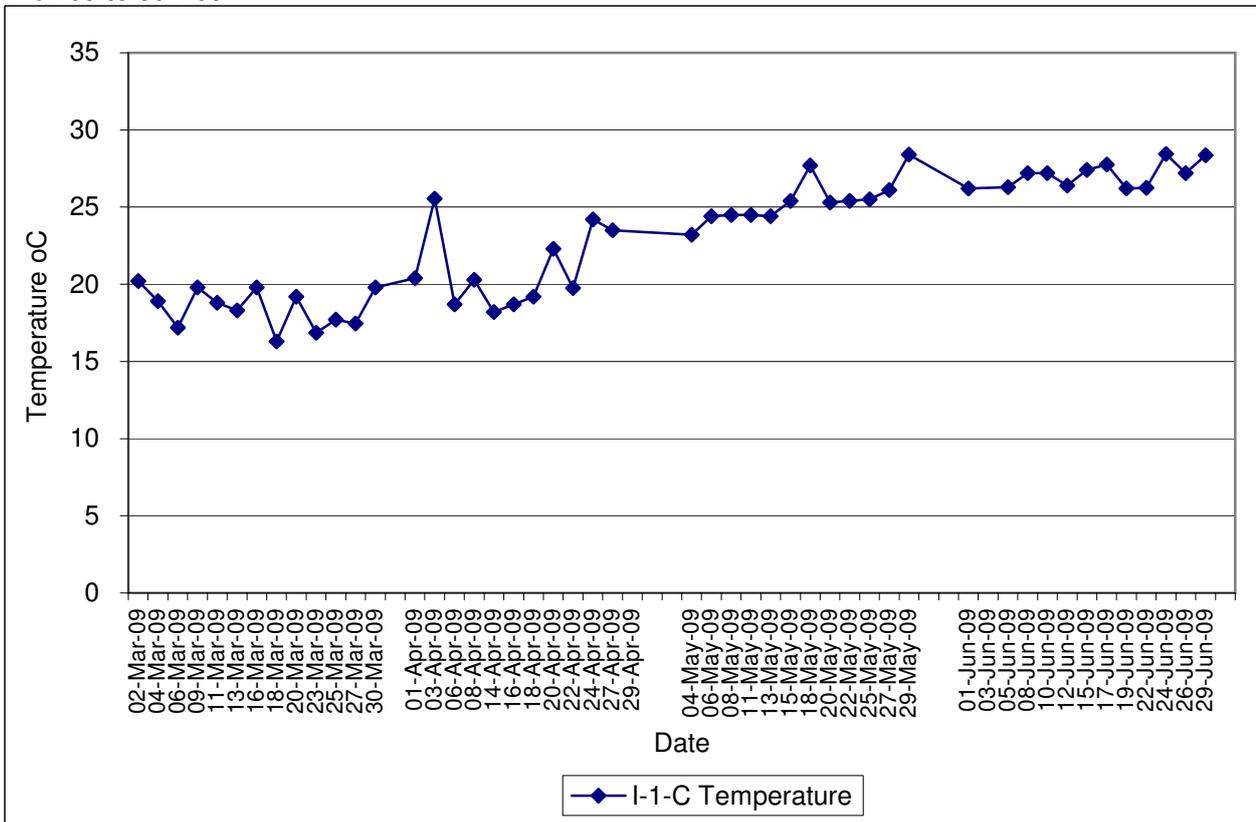
Water Quality Impact Monitoring Results

Monitoring Locations	Date	Start Time	Weather	Water Depth(m)	Temp			DO(mg/L)			Action/Limit Level of DO(mg/L)	pH			Turbidity(NTU)			Action/Limit Level of Tby	SS (mg/L)			Action/Limit Level of SS(mg/L)	Remarks:	Action to be taken
					1	2	Avg	1	2	Avg		1	2	Avg	1	2	Avg		1	2	Avg			
Sik Sik Yuen Ho Fung College I-1	01-Jun-09	09:37	Cloudy	<1	26.50	26.50	26.50	6.57	6.58	6.58	7.21	7.21	7.21	5.22	5.20	5.21	2.0	2.0	2.0	8.85 / 10.17	Nil	Nil		
	03-Jun-09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Monitoring was cancelled due to thunderstorm warning	Nil	
	05-Jun-09	09:18	Cloudy	<1	26.50	26.50	26.50	6.07	6.11	6.09	7.30	7.30	7.30	6.08	6.10	6.09	5.6	5.8	5.7	-	Nil	Nil		
	08-Jun-09	13:35	Cloudy	<1	27.40	27.40	27.40	5.88	6.03	5.96	7.32	7.32	7.32	6.33	6.25	6.29	2.0	2.0	2.0	-	Nil	Nil		
	10-Jun-09	09:19	Cloudy	<1	27.20	27.20	27.20	6.52	6.65	6.59	7.23	7.23	7.23	6.38	6.35	6.37	4.1	4.2	4.2	-	Nil	Nil		
	12-Jun-09	09:55	Cloudy	<1	26.40	26.40	26.40	6.25	6.26	6.26	7.23	7.23	7.23	4.23	4.26	4.25	2.0	2.0	2.0	-	Nil	Nil		
	15-Jun-09	09:27	Sunny	<1	27.30	27.30	27.30	6.57	6.55	6.56	7.42	7.42	7.42	4.21	4.32	4.27	2.0	2.0	2.0	-	Nil	Nil		
	17-Jun-09	10:35	Sunny	<1	27.70	27.70	27.70	6.34	6.31	6.33	7.32	7.33	7.33	6.32	6.17	6.25	2.0	2.0	2.0	-	Nil	Nil		
	19-Jun-09	09:37	Cloudy	<1	26.20	26.20	26.20	6.05	6.02	6.04	7.05	7.03	7.04	6.32	6.21	6.27	2.0	2.0	2.0	-	Nil	Nil		
	22-Jun-09	09:45	Cloudy	<1	26.50	26.50	26.50	6.06	6.02	6.04	7.33	7.33	7.33	5.15	5.11	5.13	2.0	2.0	2.0	-	Nil	Nil		
	24-Jun-09	13:25	Cloudy	<1	28.70	28.60	28.65	5.61	5.64	5.63	7.23	7.26	7.25	6.25	6.22	6.24	2.0	2.0	2.0	-	Nil	Nil		
	26-Jun-09	09:35	Cloudy	<1	27.40	27.40	27.40	5.44	5.43	5.44	7.30	7.30	7.30	5.17	5.14	5.16	5.3	5.6	5.5	-	Nil	Nil		
	29-Jun-09	13:26	Fine	<1	28.40	28.40	28.40	5.37	5.36	5.37	7.32	7.32	7.32	6.07	6.05	6.06	2.0	2.0	2.0	-	Nil	Nil		
	Sik Sik Yuen Ho Fung College I-1-C	01-Jun-09	09:15	Cloudy	<1	26.20	26.20	26.20	6.42	6.40	6.41	7.21	7.21	7.21	5.41	5.36	5.39	2.0	2.0	2.0	-	Nil	Nil	
03-Jun-09		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Monitoring was cancelled due to thunderstorm warning	Nil	
05-Jun-09		09:07	Cloudy	<1	26.30	26.30	26.30	6.18	6.17	6.18	7.32	7.32	7.32	6.18	6.17	6.18	8.5	7.7	8.1	-	Nil	Nil		
08-Jun-09		13:15	Cloudy	<1	27.20	27.20	27.20	5.73	5.77	5.75	7.32	7.32	7.32	6.41	6.43	6.42	2.0	2.0	2.0	-	Nil	Nil		
10-Jun-09		09:09	Cloudy	<1	27.20	27.20	27.20	6.52	6.51	6.52	7.22	7.22	7.22	6.42	6.44	6.43	3.6	3.0	3.3	-	Backhoe excavation	Nil		
12-Jun-09		09:30	Cloudy	<1	26.40	26.40	26.40	6.14	6.14	6.14	7.25	7.25	7.25	4.42	4.54	4.48	2.0	2.0	2.0	-	Backhoe excavation	Nil		
15-Jun-09		09:00	Sunny	<1	27.40	27.40	27.40	6.52	6.48	6.50	7.44	7.42	7.43	5.36	5.22	5.29	2.0	2.0	2.0	-	Backhoe excavation x2	Nil		
17-Jun-09		10:15	Sunny	<1	27.80	27.70	27.75	6.25	6.28	6.27	7.32	7.32	7.32	6.45	6.41	6.43	2.0	2.0	2.0	-	Backhoe excavation x2	Nil		
19-Jun-09		09:16	Cloudy	<1	26.20	26.20	26.20	6.11	6.13	6.12	7.02	7.02	7.02	6.37	6.40	6.39	2.0	2.0	2.0	-	Backhoe excavation x2	Nil		
22-Jun-09		09:25	Cloudy	<1	26.20	26.30	26.25	5.92	5.83	5.88	7.32	7.33	7.33	5.25	5.30	5.28	2.0	2.0	2.0	-	Backhoe excavation	Nil		
24-Jun-09		13:00	Cloudy	<1	28.40	28.50	28.45	5.53	5.51	5.52	7.21	7.21	7.21	6.41	6.37	6.39	2.0	2.0	2.0	-	Nil	Nil		
26-Jun-09		09:15	Cloudy	<1	27.20	27.20	27.20	5.64	5.68	5.66	7.32	7.32	7.32	5.22	5.26	5.24	4.4	4.8	4.6	-	Nil	Nil		
29-Jun-09		13:15	Fine	<1	28.40	28.30	28.35	5.42	5.46	5.44	7.22	7.22	7.22	6.17	6.20	6.19	2.0	2.0	2.0	-	Nil	Nil		
Hong Hoi Chee Hong Temple I-2		01-Jun-09	10:55	Cloudy	<1	25.40	25.30	25.35	6.58	6.56	6.57	7.44	7.44	7.44	5.27	5.30	5.29	2.0	2.0	2.0	-	Nil	Nil	
	03-Jun-09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Monitoring was cancelled due to thunderstorm warning	Nil	
	05-Jun-09	10:35	Cloudy	<1	26.50	26.50	26.50	6.08	6.06	6.07	7.27	7.27	7.27	5.27	5.23	5.25	8.5	8.0	8.3	-	Nil	The contractor had enhanced mitigation measures. Details can be referred to Appendix J.		
	08-Jun-09	10:41	Cloudy	<1	27.30	27.30	27.30	5.78	5.82	5.80	7.32	7.32	7.32	5.12	5.06	5.09	2.0	2.0	2.0	-	Nil	Nil		
	10-Jun-09	10:39	Cloudy	<1	27.40	27.40	27.40	6.43	6.47	6.45	7.25	7.25	7.25	5.21	5.18	5.20	3.6	4.4	4.0	-	Nil	Nil		
	12-Jun-09	10:58	Cloudy	<1	26.40	26.40	26.40	6.27	6.27	6.27	7.22	7.22	7.22	5.16	5.20	5.18	2.0	2.0	2.0	-	Nil	Nil		
	15-Jun-09	10:51	Sunny	<1	27.70	27.70	27.70	6.53	6.47	6.50	7.32	7.35	7.34	5.17	5.25	5.21	2.0	2.0	2.0	-	Nil	Nil		
	17-Jun-09	12:00	Sunny	<1	27.40	27.40	27.40	6.63	6.65	6.64	7.26	7.26	7.26	4.33	4.30	4.32	2.0	2.0	2.0	-	Nil	Nil		
	19-Jun-09	10:48	Cloudy	<1	26.40	26.40	26.40	5.82	5.80	5.81	7.20	7.20	7.20	5.27	5.20	5.24	2.0	2.0	2.0	-	Nil	Nil		
	22-Jun-09	11:32	Cloudy	<1	25.30	25.30	25.30	6.07	6.06	6.07	7.30	7.30	7.30	5.32	5.27	5.30	2.0	2.0	2.0	-	Nil	Nil		
	24-Jun-09	14:37	Cloudy	<1	28.50	28.50	28.50	5.28	5.26	5.27	7.22	7.25	7.24	5.42	5.38	5.40	2.0	2.0	2.0	-	Nil	Nil		
	26-Jun-09	10:37	Cloudy	<1	27.40	27.30	27.35	5.36	5.34	5.35	7.34	7.34	7.34	5.27	5.26	5.27	4.3	4.8	4.6	-	Nil	Nil		
	29-Jun-09	14:46	Fine	<1	28.40	28.40	28.40	5.42	5.41	5.42	7.42	7.42	7.42	5.33	5.39	5.36	2.0	2.0	2.0	-	Nil	Nil		
	Hong Hoi Chee Hong Temple I-2-C	01-Jun-09	10:25	Cloudy	<1	25.30	25.30	25.30	6.53	6.57	6.55	7.44	7.44	7.44	5.36	5.33	5.35	2.0	2.0	2.0	-	Nil	Nil	
03-Jun-09		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Monitoring was cancelled due to thunderstorm warning	Nil	
05-Jun-09		10:11	Cloudy	<1	26.50	26.50	26.50	6.03	6.07	6.05	7.27	7.27	7.27	5.31	5.27	5.29	3.6	3.7	3.7	-	Nil	Nil		
08-Jun-09		10:23	Cloudy	<1	27.30	27.30	27.30	6.02	6.07	6.05	7.32	7.32	7.32	5.22	5.18	5.20	2.0	2.0	2.0	-	Nil	Nil		
10-Jun-09		10:22	Cloudy	<1	27.40	27.40	27.40	6.38	6.42	6.40	7.25	7.25	7.25	5.44	5.46	5.45	4.2	3.9	4.1	-	Piling	Nil		
12-Jun-09		10:44	Cloudy	<1	26.50	26.50	26.50	6.12	6.15	6.14	7.22	7.22	7.22	5.23	5.26	5.25	2.0	2.0	2.0	-	Nil	Nil		
15-Jun-09		10:33	Sunny	<1	27.80	27.80	27.80	6.51	6.62	6.57	7.44	7.44	7.44	5.32	5.33	5.33	2.0	2.0	2.0	-	Nil	Nil		
17-Jun-09		11:25	Sunny	<1	27.50	27.60	27.55	6.55	6.62	6.59	7.27	7.27	7.27	4.42	4.53	4.48	2.0	2.0	2.0	-	Nil	Nil		
19-Jun-09		10:35	Cloudy	<1	26.50	26.50	26.50	5.96	5.98	5.97	7.22	7.22	7.22	5.32	5.33	5.33	2.0	2.0	2.0	-	Nil	Nil		
22-Jun-09		11:11	Cloudy	<1	25.40	25.50	25.45	6.02	5.92	5.97	7.30	7.30	7.30	5.43	5.44	5.44	2.0	2.0	2.0	-	Nil	Nil		
24-Jun-09		14:22	Cloudy	<1	28.50	28.50	28.50	5.25	5.23	5.24	7.22	7.22	7.22	5.61	5.65	5.63	2.0	2.0	2.0	-	Nil	Nil		
26-Jun-09		10:17	Cloudy	<1	27.50	27.50	27.50	5.43	5.44	5.44	7.33	7.32	7.33	5.41	5.44	5.43	3.2	3.4	3.3	-	Nil	Nil		
29-Jun-09		14:22	Fine	<1	28.30	28.30	28.30	5.33	5.34	5.34	7.42	7.42	7.42	5.42	5.46	5.44	2.0	2.0	2.0	-	Nil	Nil		
Squatters I-3		01-Jun-09	11:55	Cloudy	<1	26.20	26.20	26.20	6.32	6.44	6.38	7.40	7.40	7.40	3.31	3.28	3.30	2.0	2.0	2.0	-	Nil	Nil	
	03-Jun-09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Monitoring was cancelled due to thunderstorm warning	Nil	
	05-Jun-09	11:50	Cloudy	<1	26.70	26.70	26.70	6.28	6.24	6.26	7.33	7.33	7.33	3.35	3.32	3.34	2.0	2.3	2.2	-	Nil	Nil		
	08-Jun-09	16:55	Cloudy	<1	27.40	27.40	27.40	6.21	6.67	6.44	7.25	7.25	7.25	3.17										

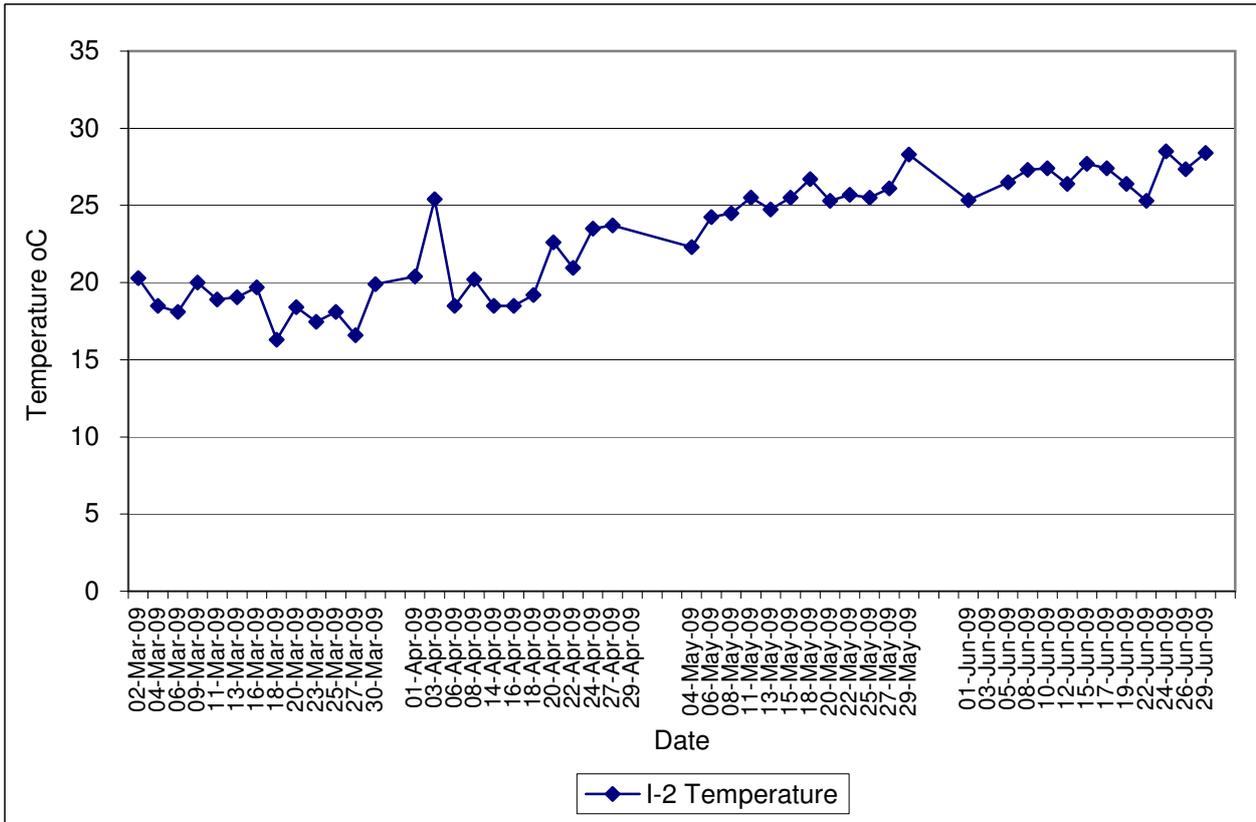
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
 Mar-09 to Jun-09**



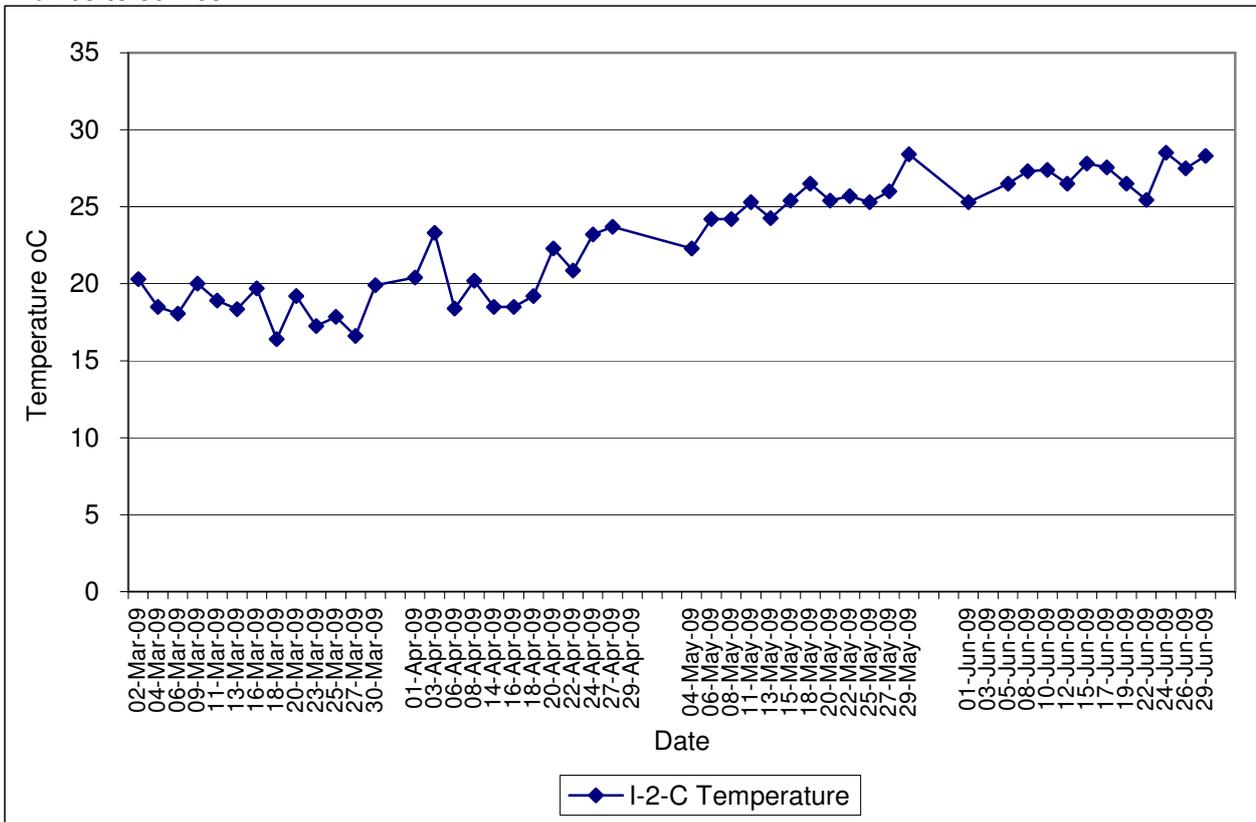
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
 Mar-09 to Jun-09**



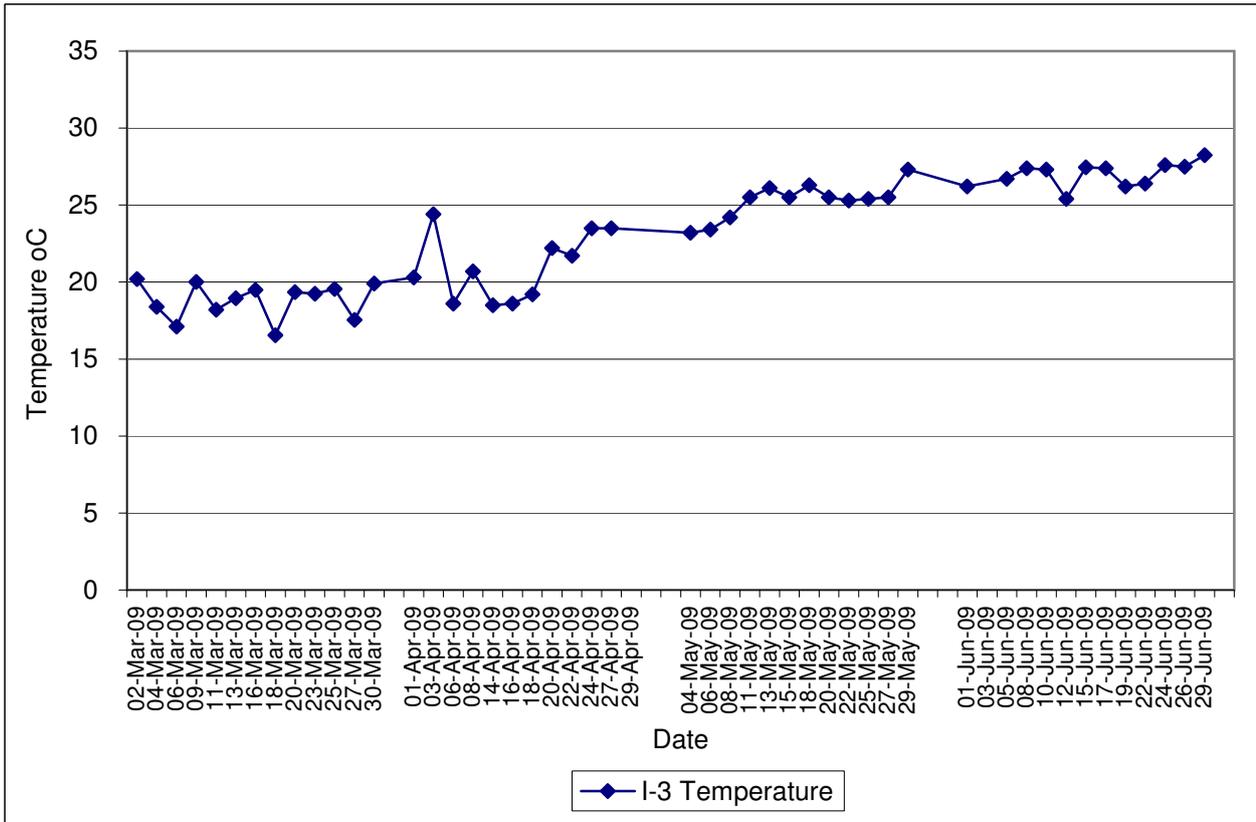
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Mar-09 to Jun-09



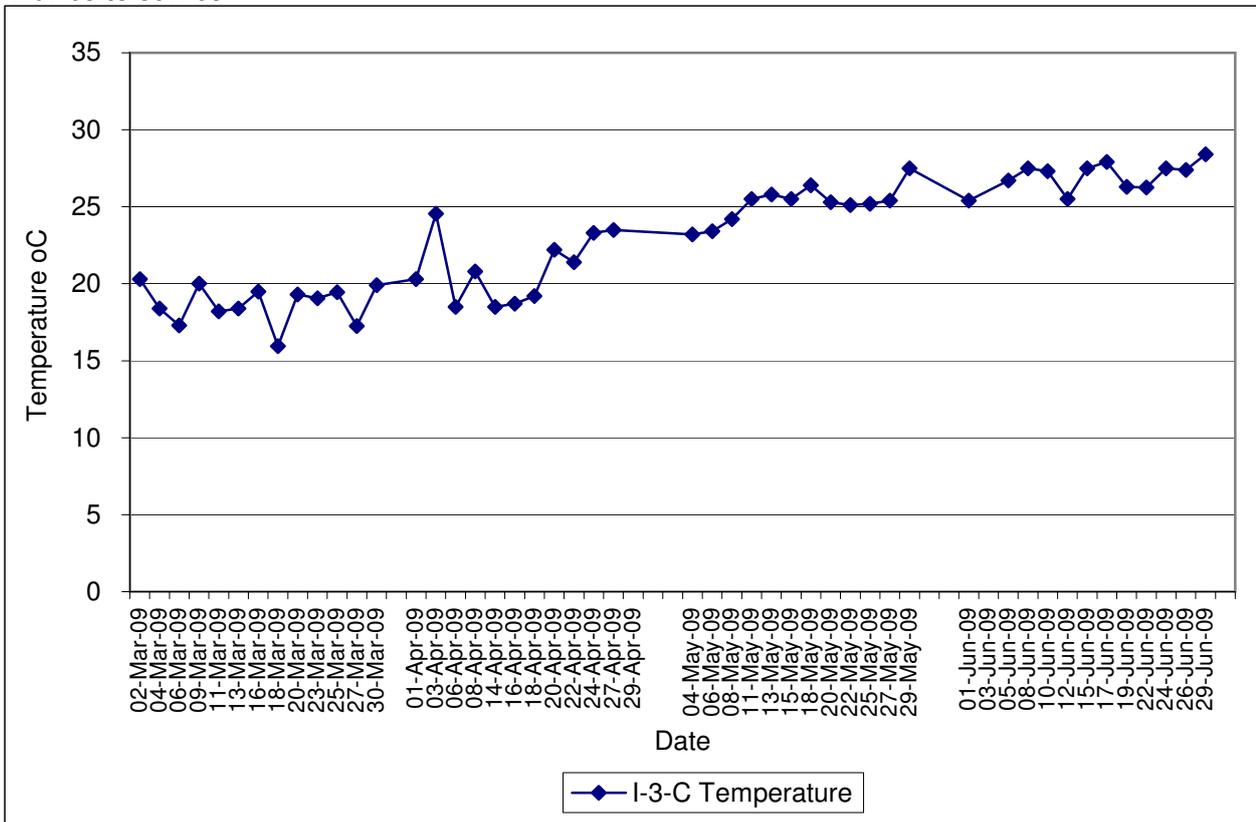
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Mar-09 to Jun-09



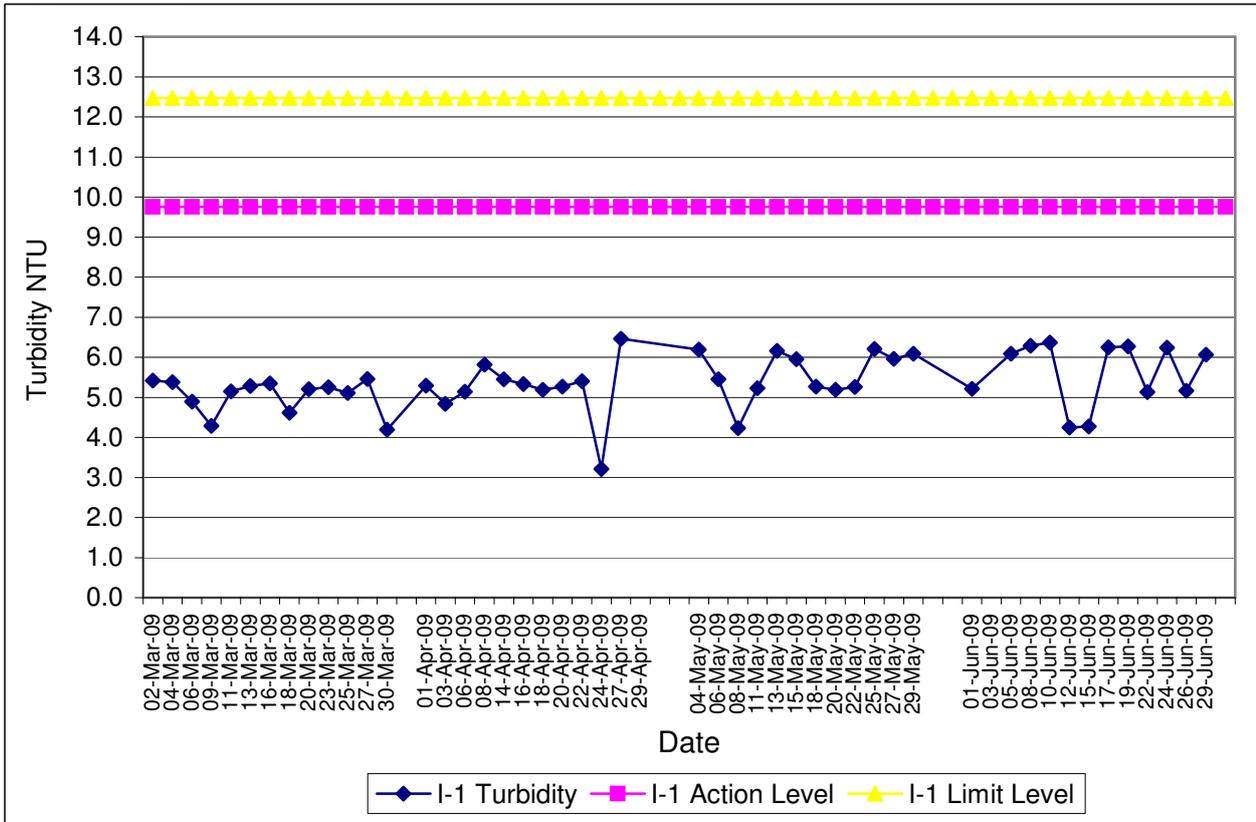
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Mar-09 to Jun-09



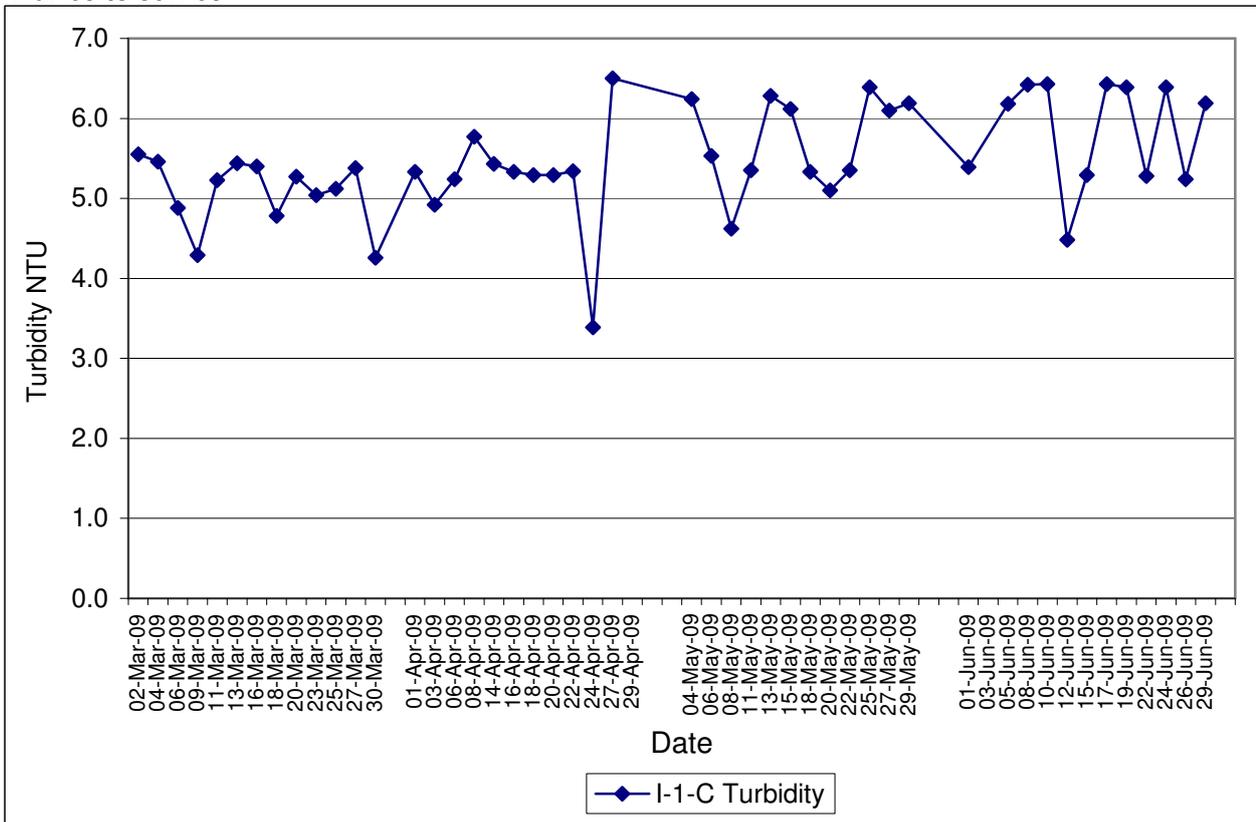
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Mar-09 to Jun-09



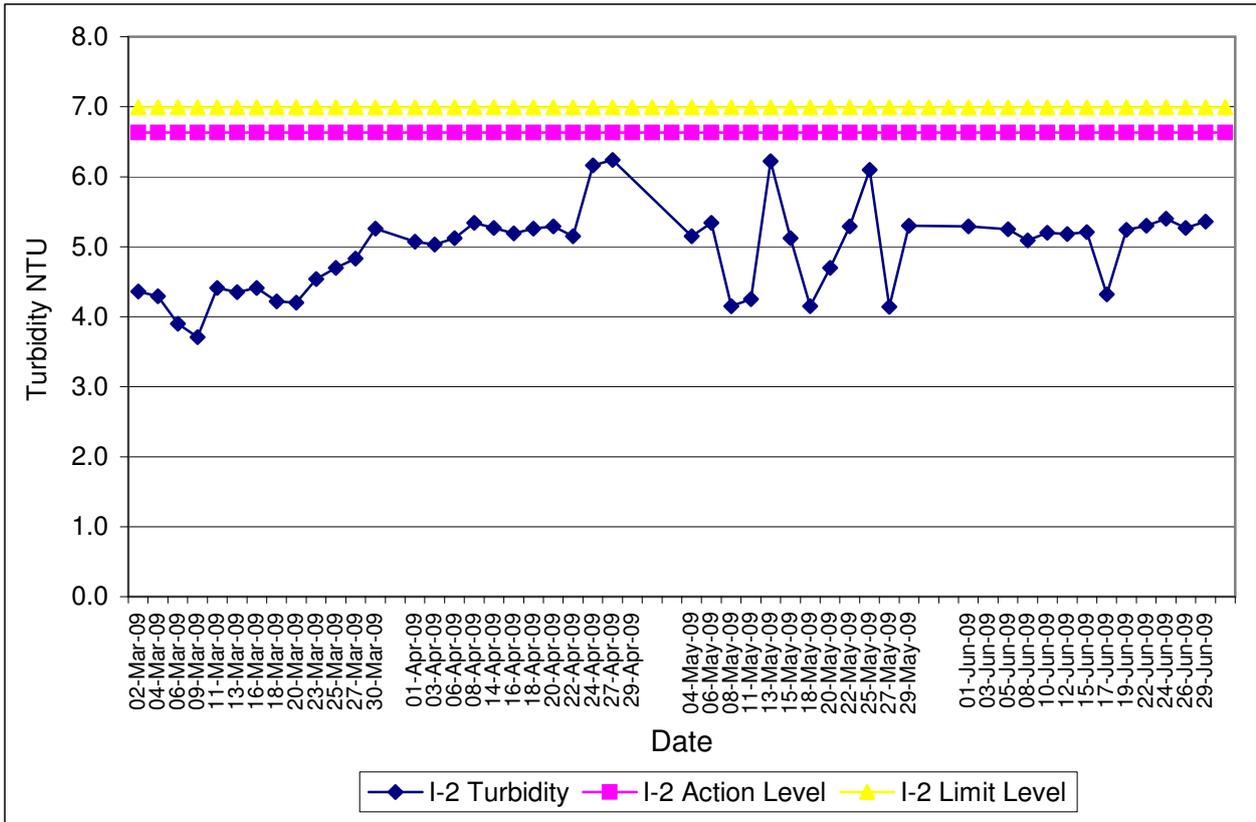
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
 Mar-09 to Jun-09**



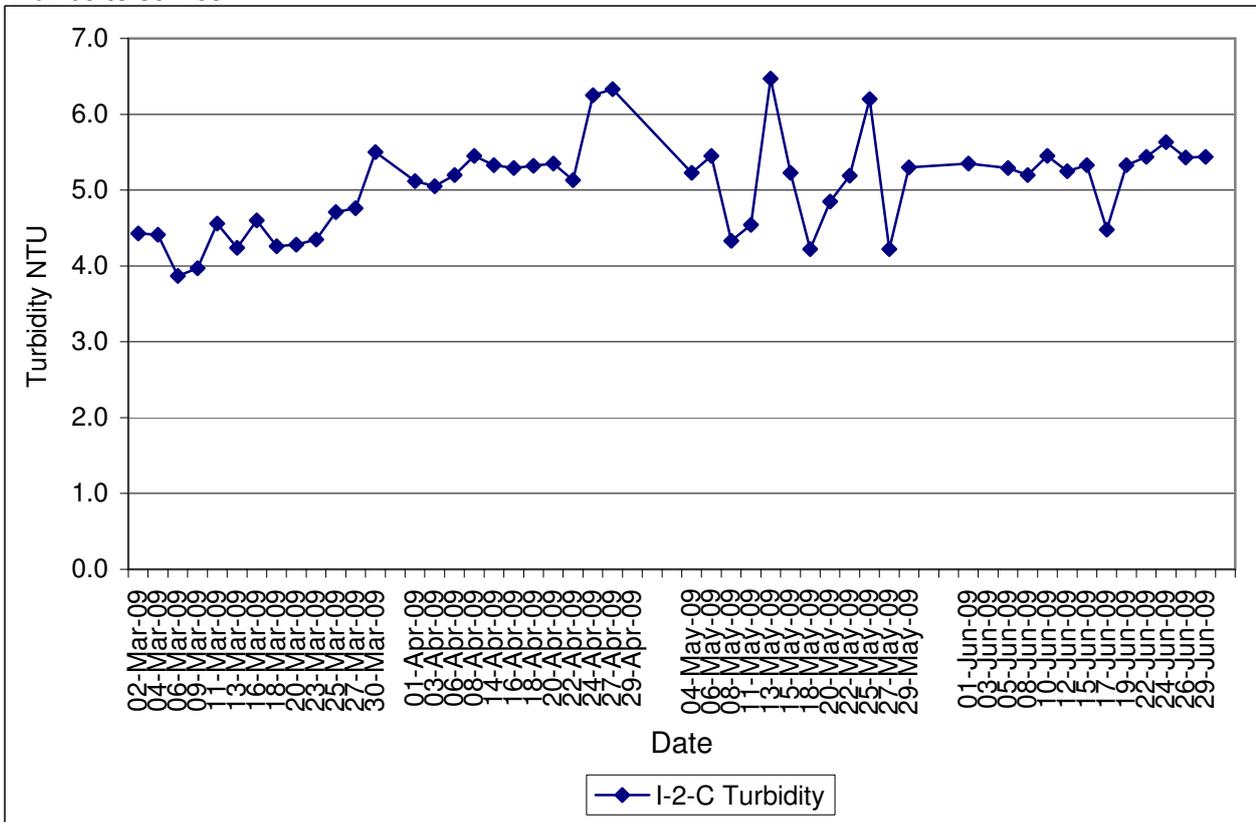
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
 Mar-09 to Jun-09**



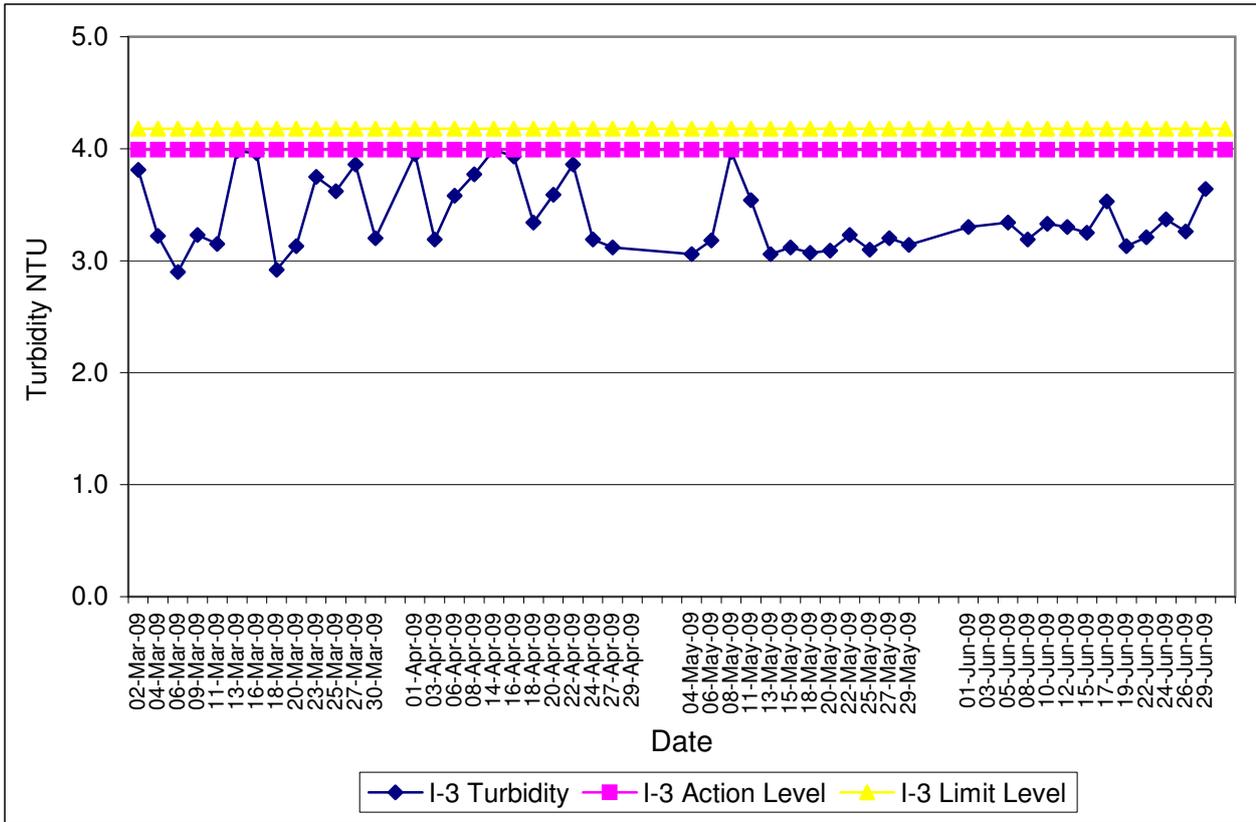
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Mar-09 to Jun-09



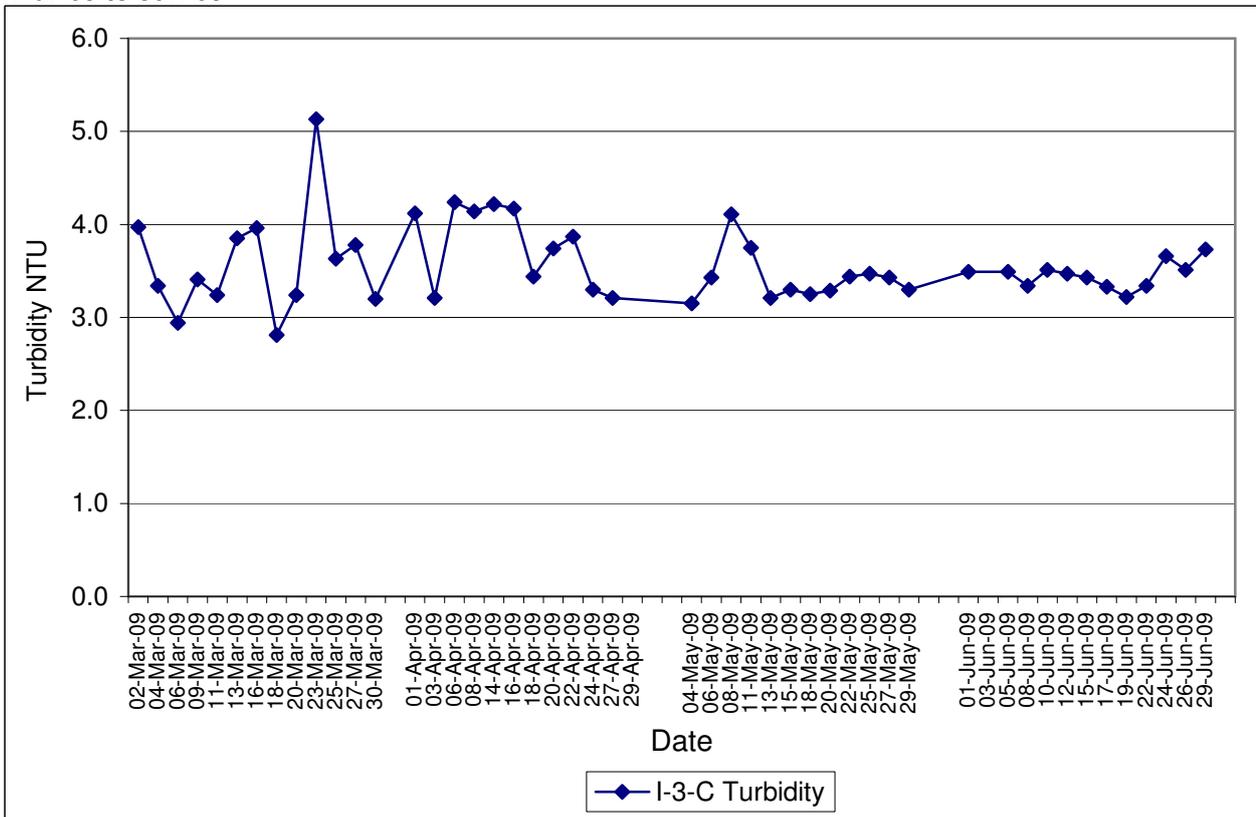
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Mar-09 to Jun-09



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Mar-09 to Jun-09

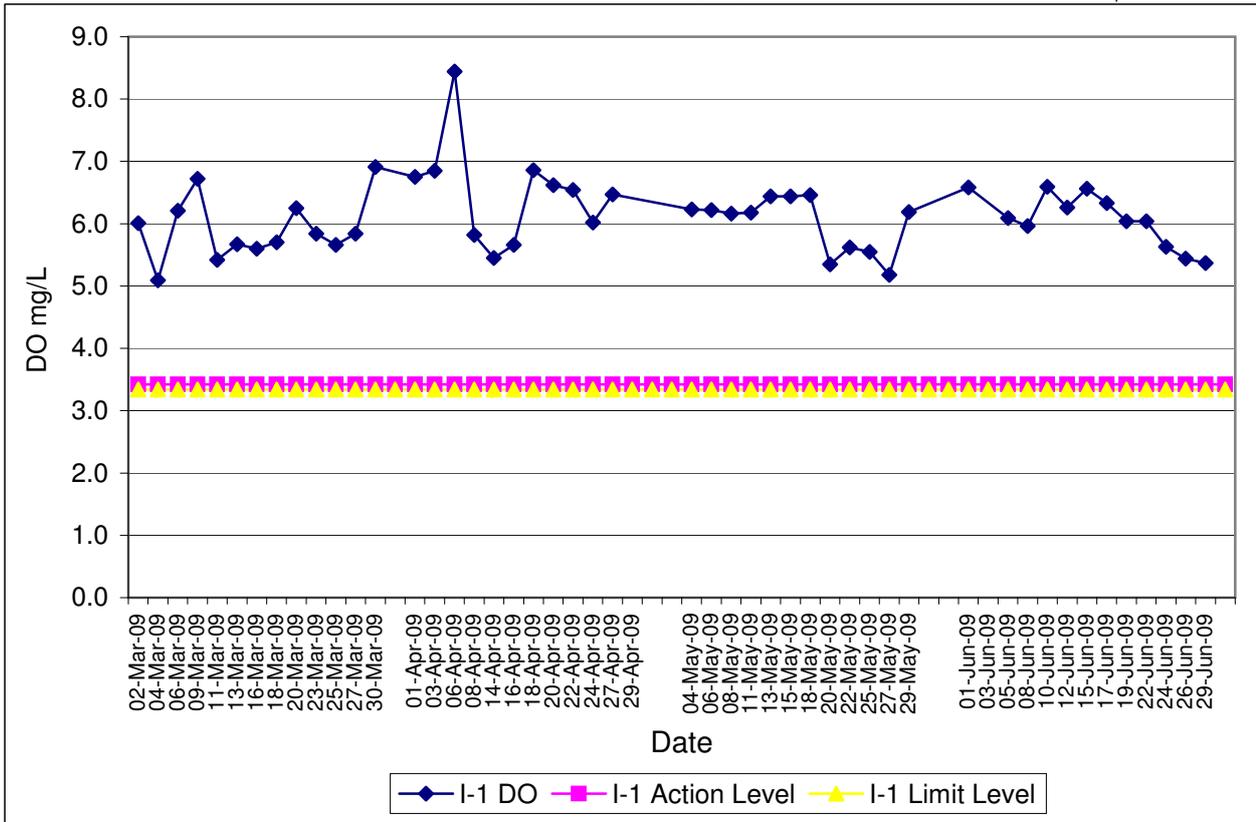


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Mar-09 to Jun-09

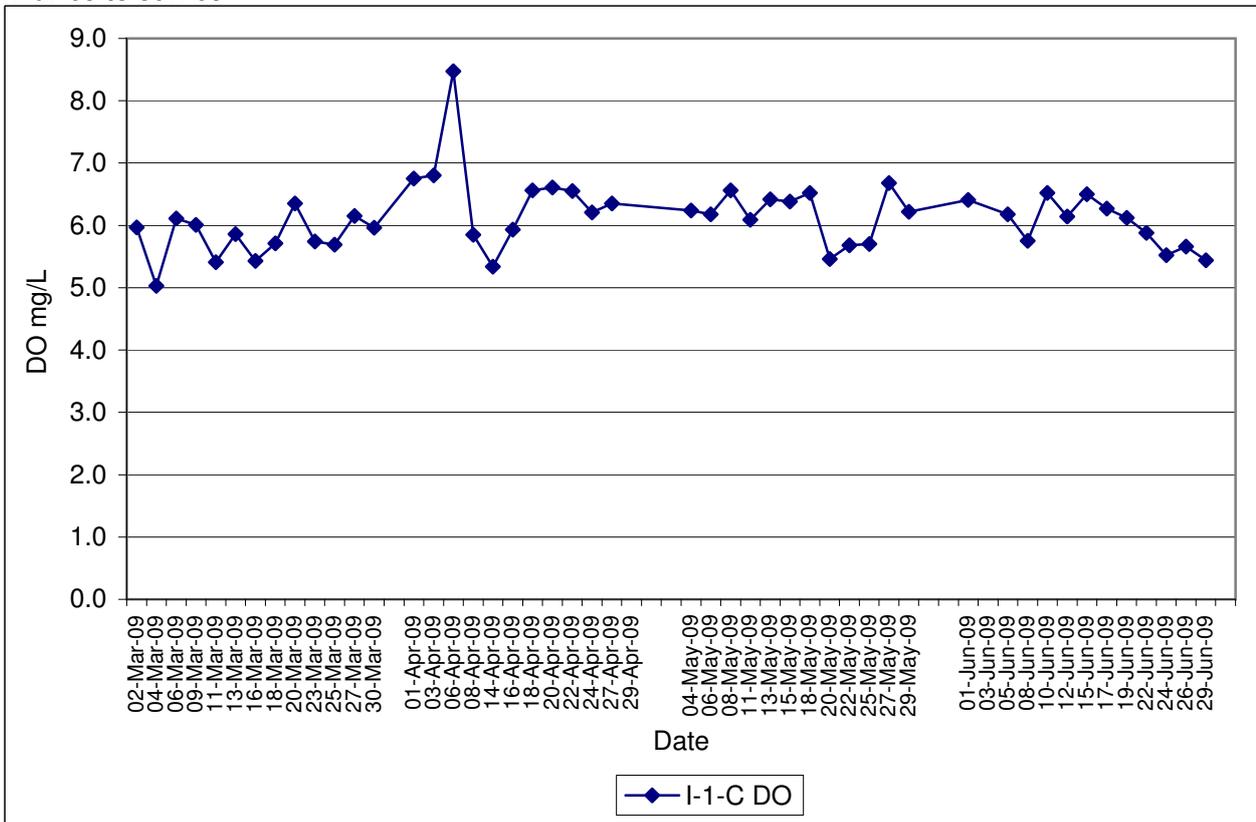


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
Mar-09 to Jun-09

Note: Exceedances of Action / Limit Levels occur when the levels of DO are below the respective limit levels.

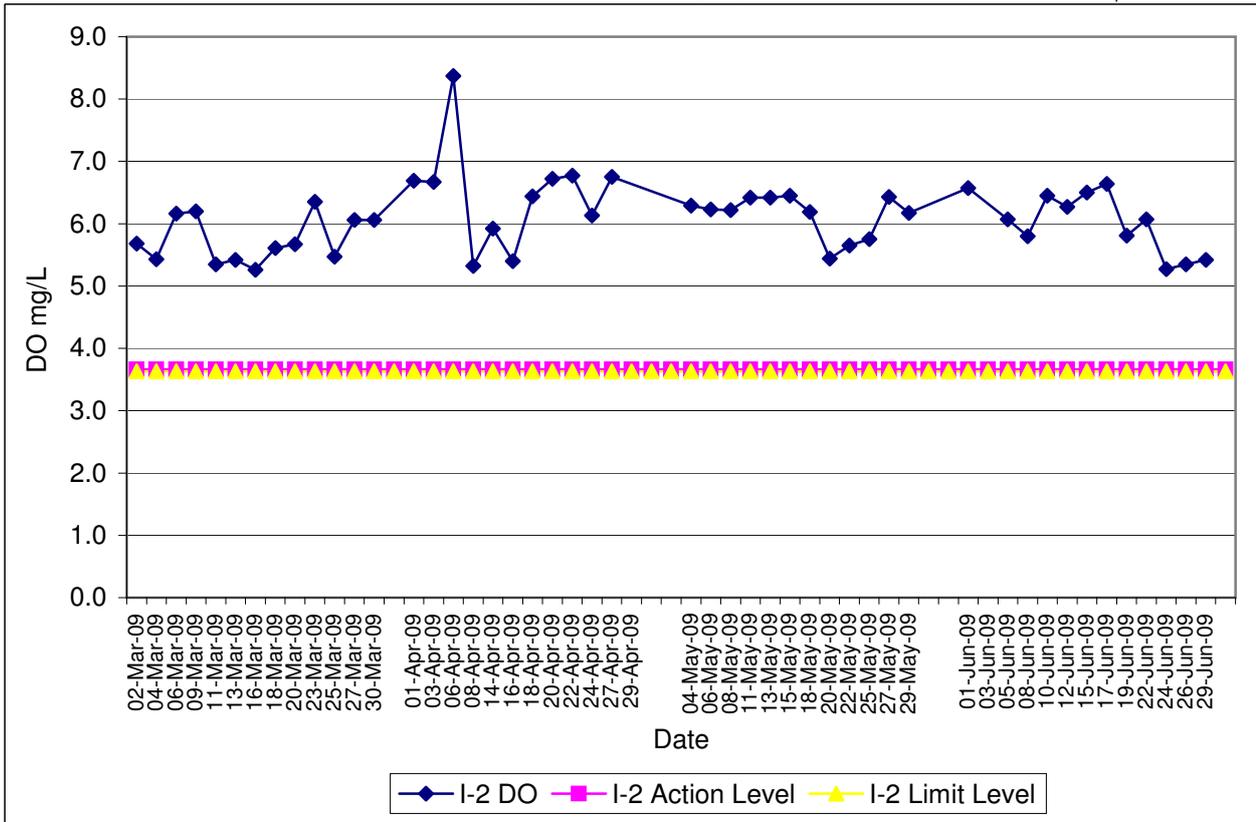


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
Mar-09 to Jun-09

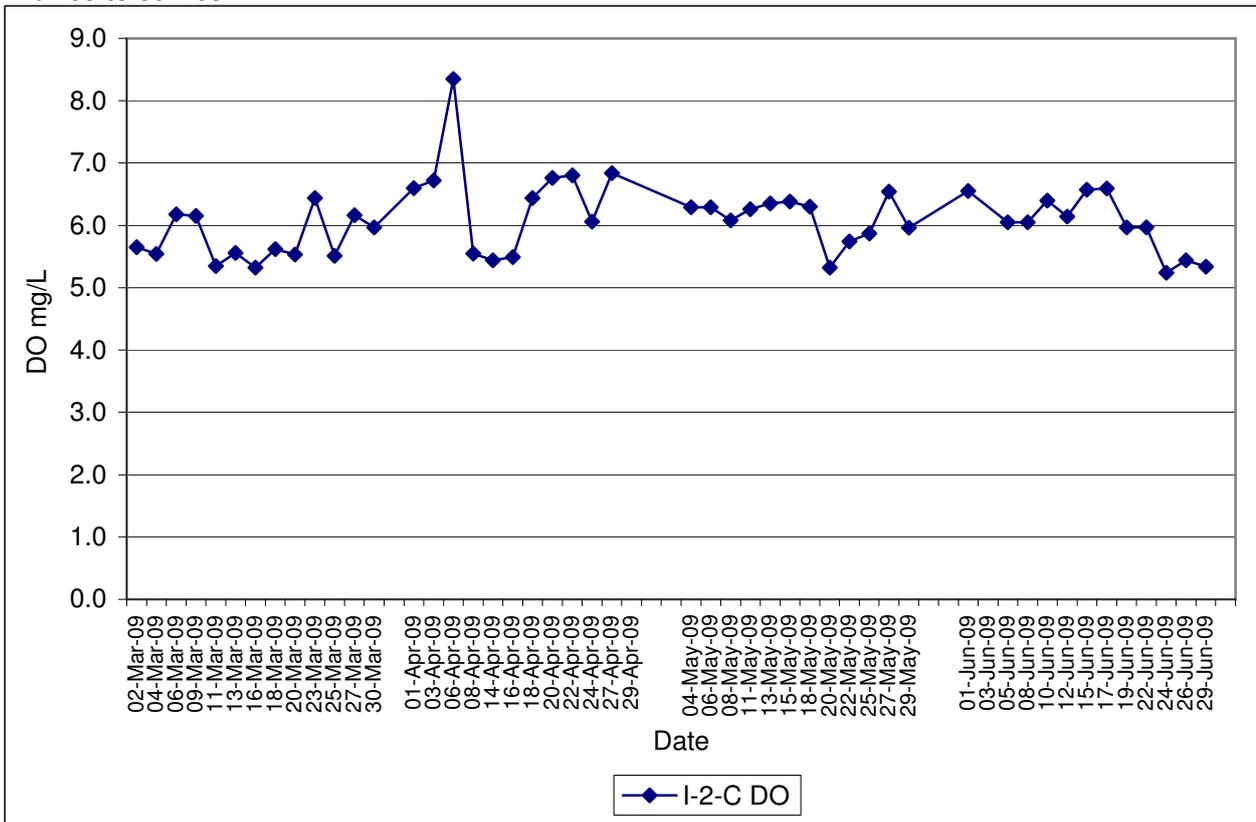


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Mar-09 to Jun-09

Note: Exceedances of Action / Limit Levels occur when the levels of DO are below the respective limit levels.



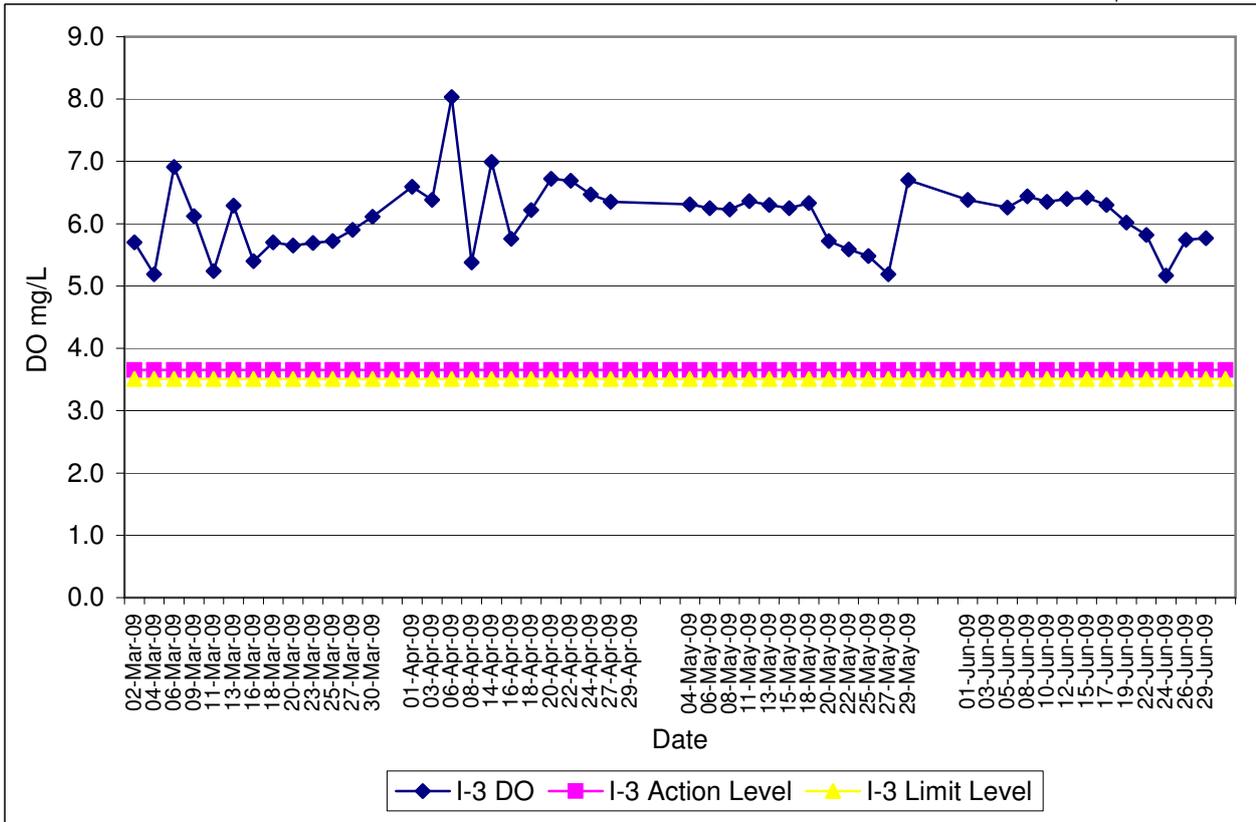
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Mar-09 to Jun-09



**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)**

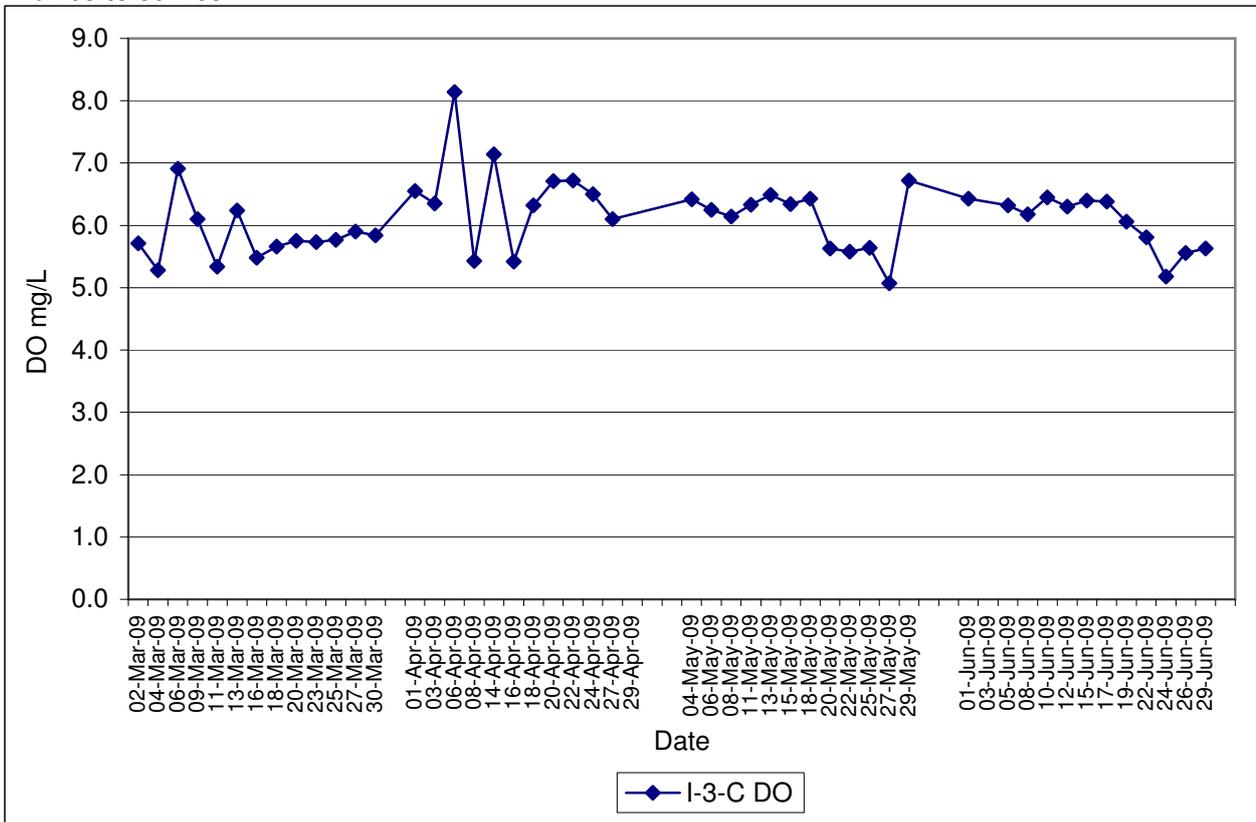
Mar-09 to Jun-09

Note: Exceedances of Action / Limit Levels occur when the levels of DO are below the respective limit levels.

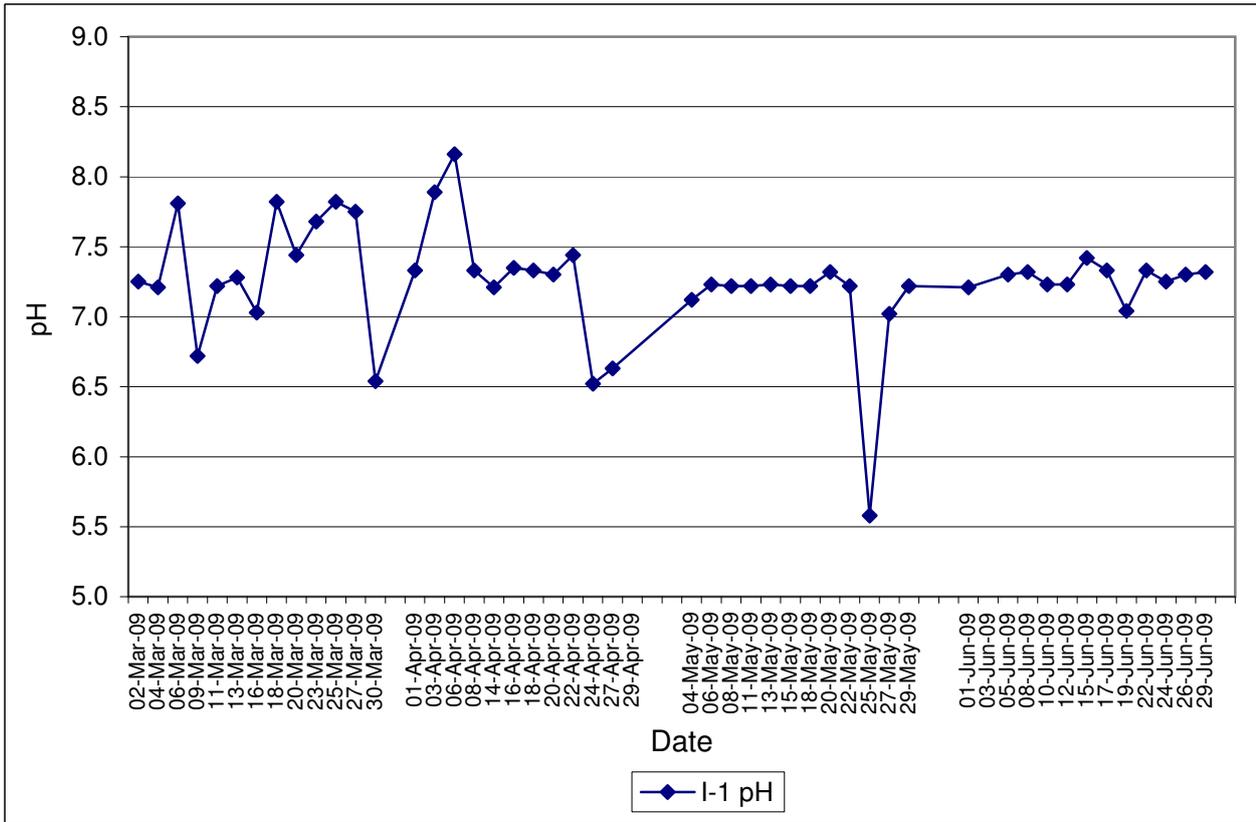


**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)**

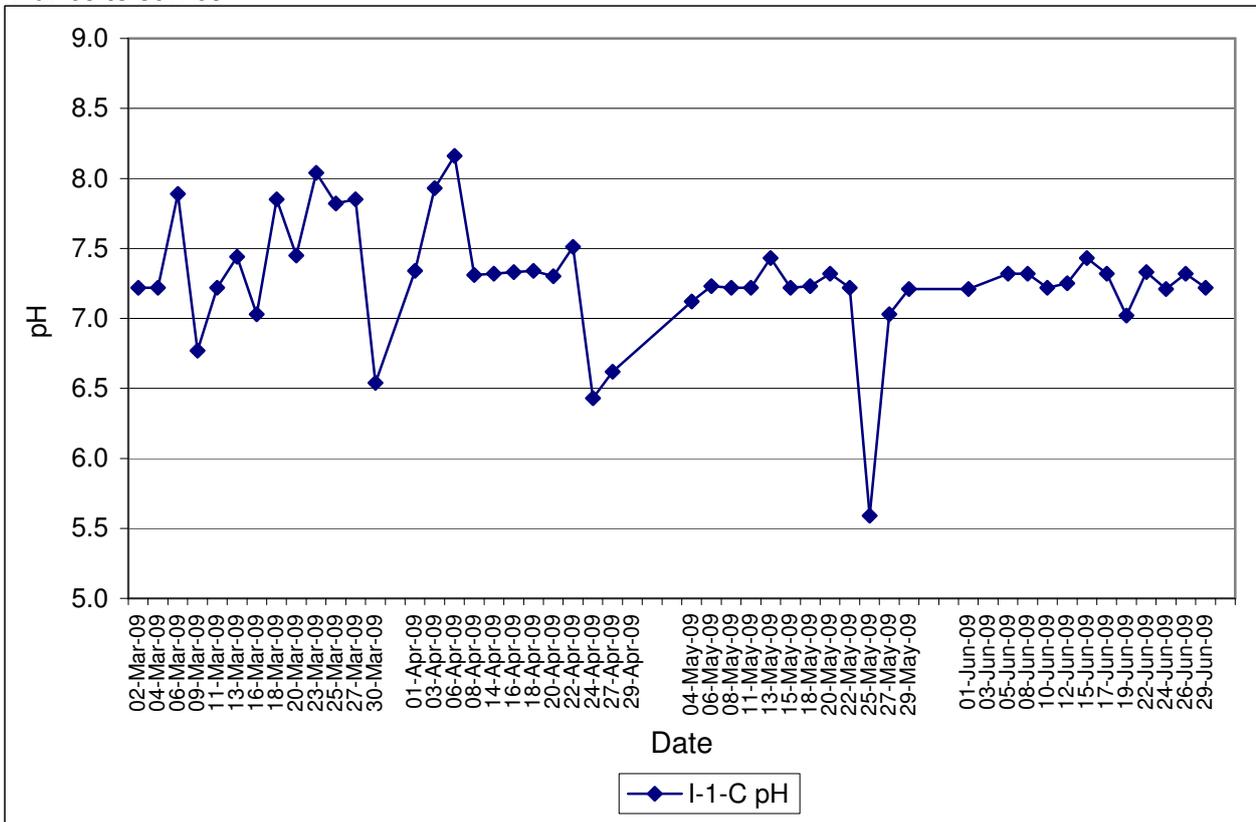
Mar-09 to Jun-09



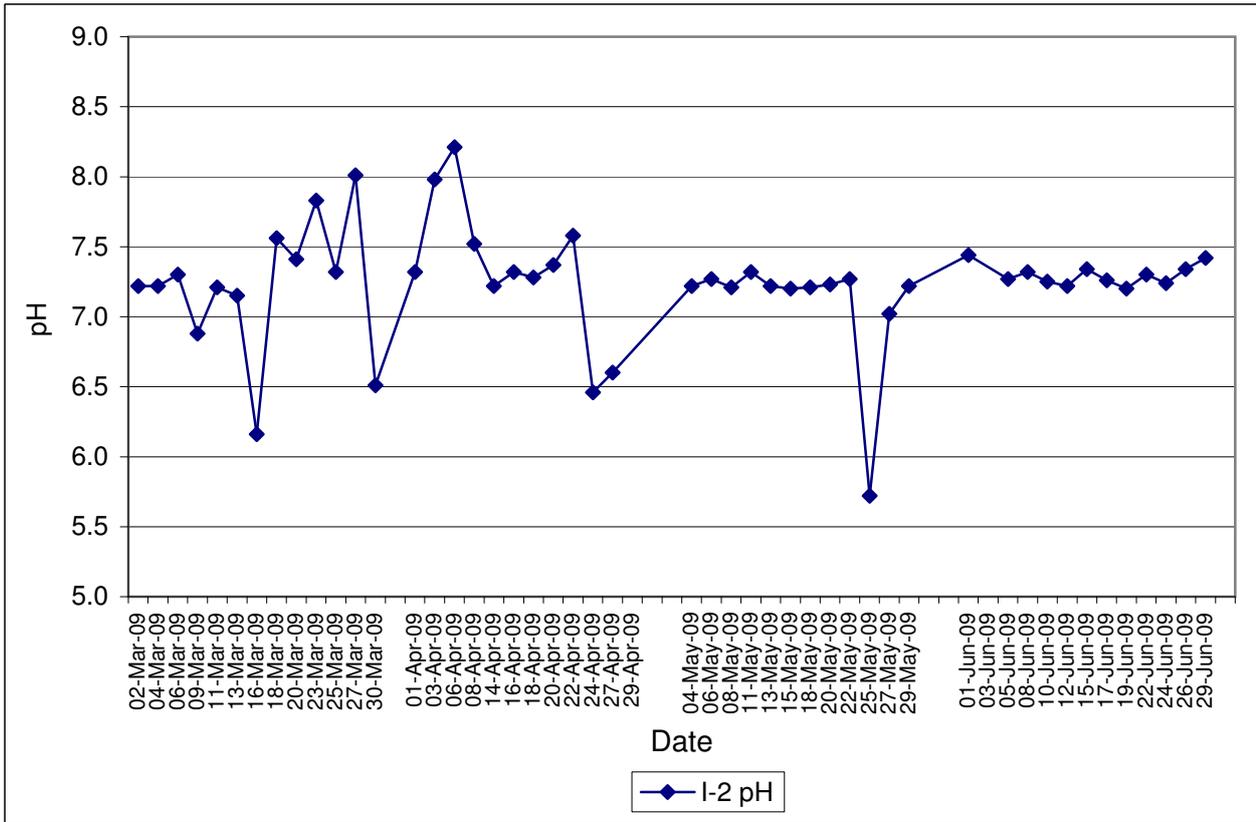
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
 Mar-09 to Jun-09**



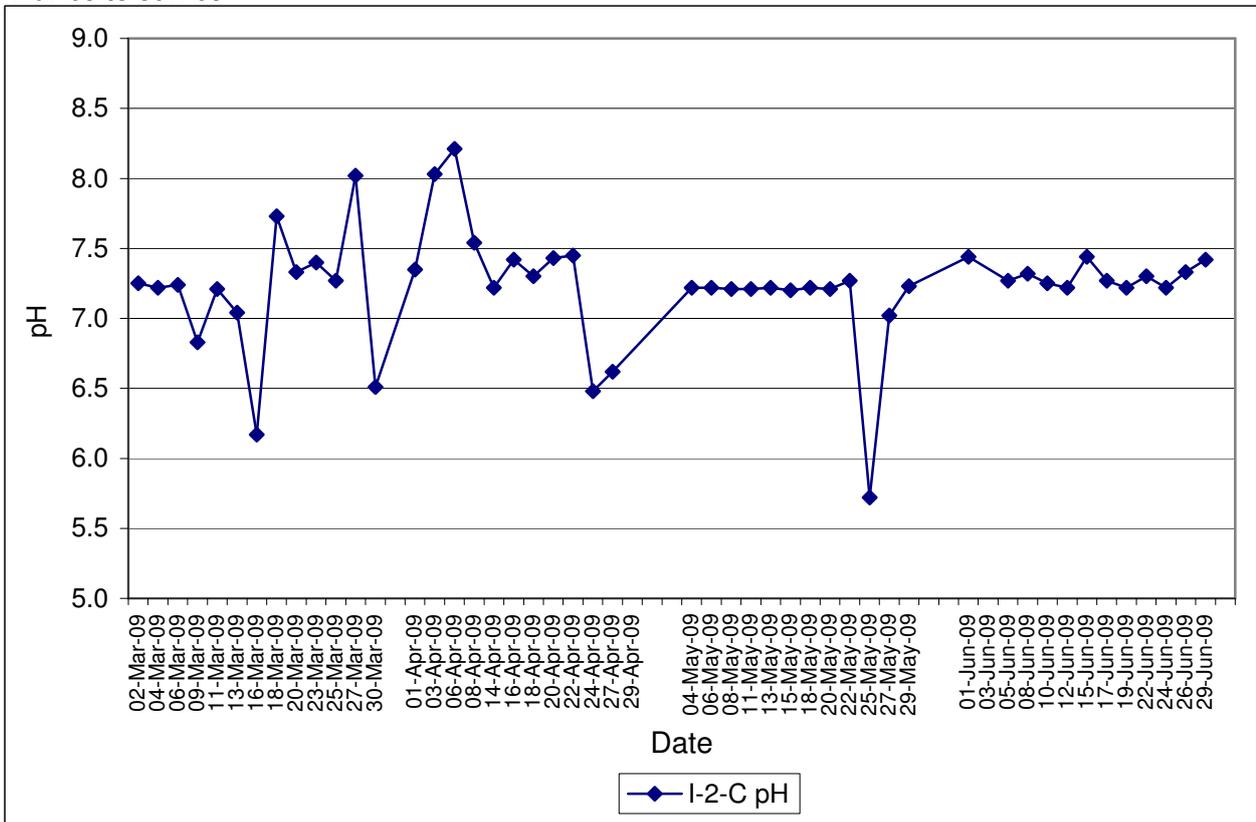
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
 Mar-09 to Jun-09**



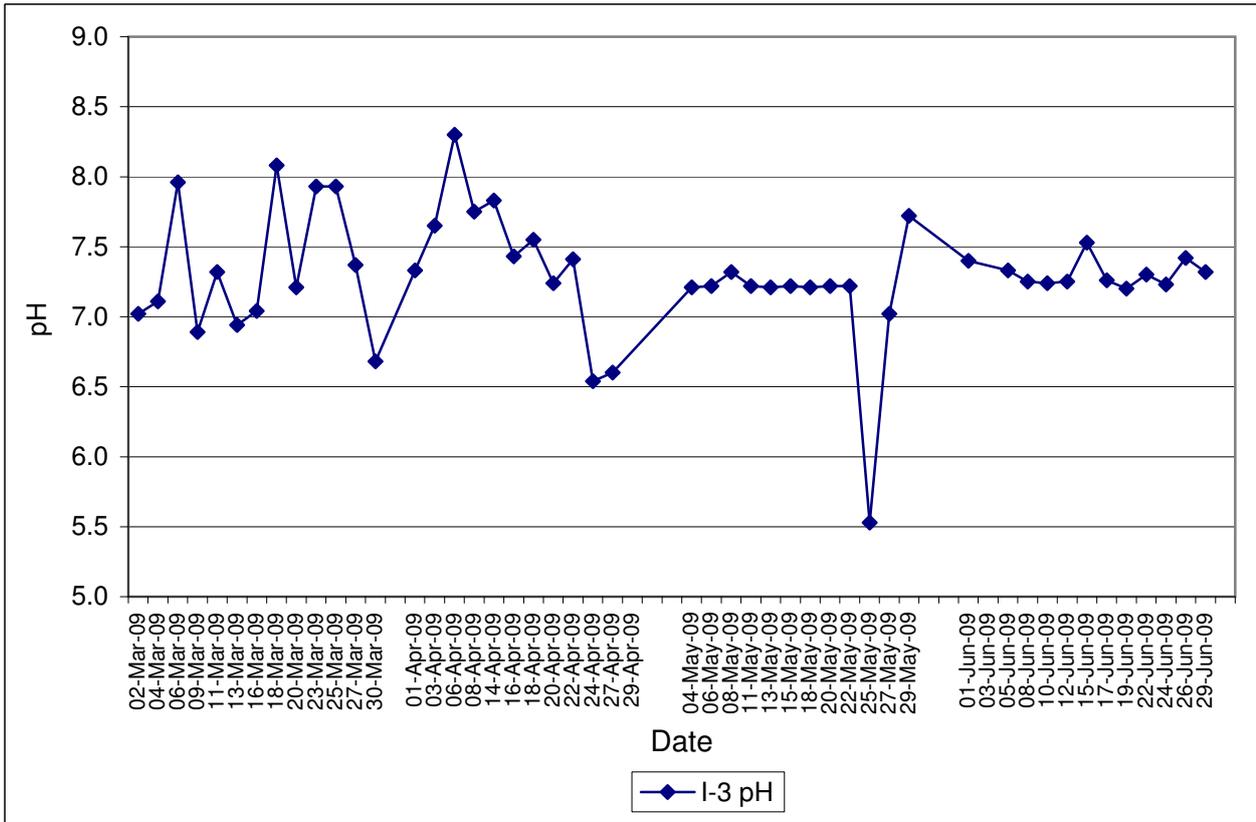
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
 Mar-09 to Jun-09**



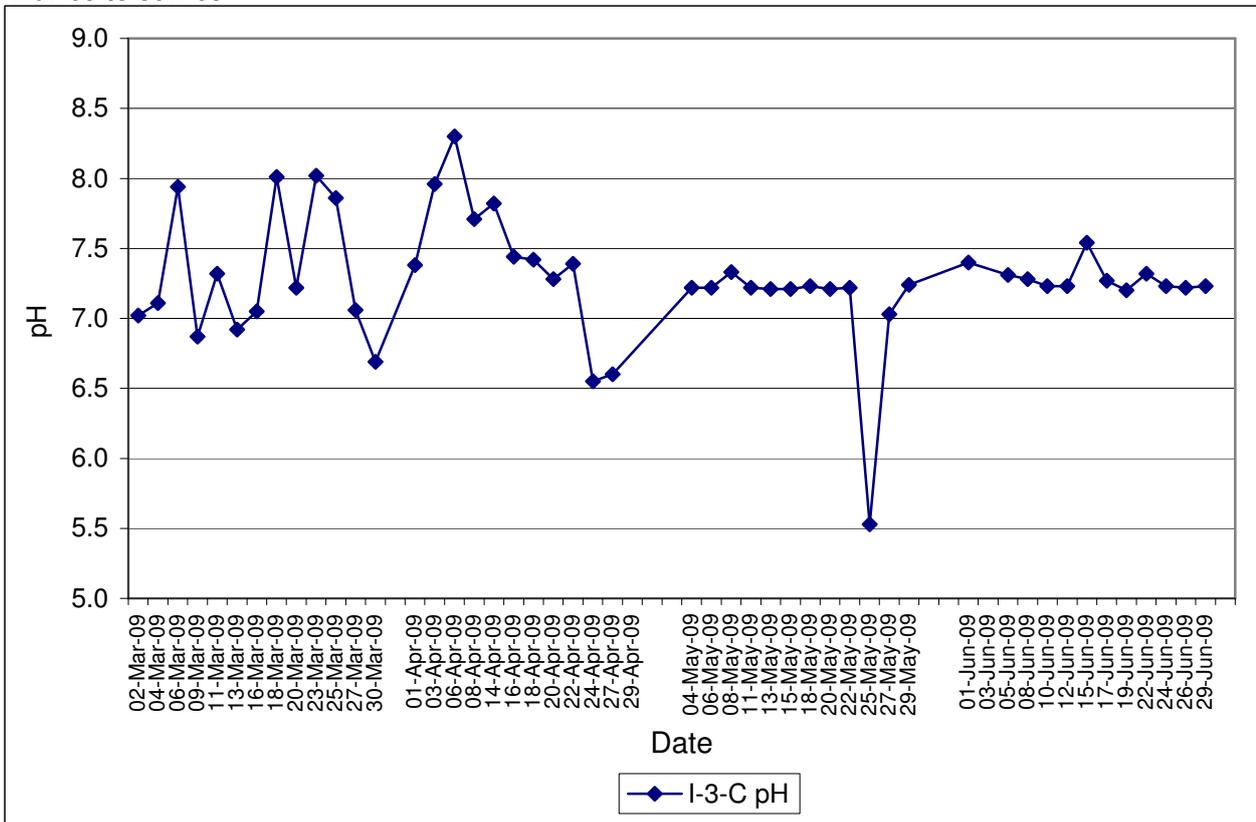
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
 Mar-09 to Jun-09**



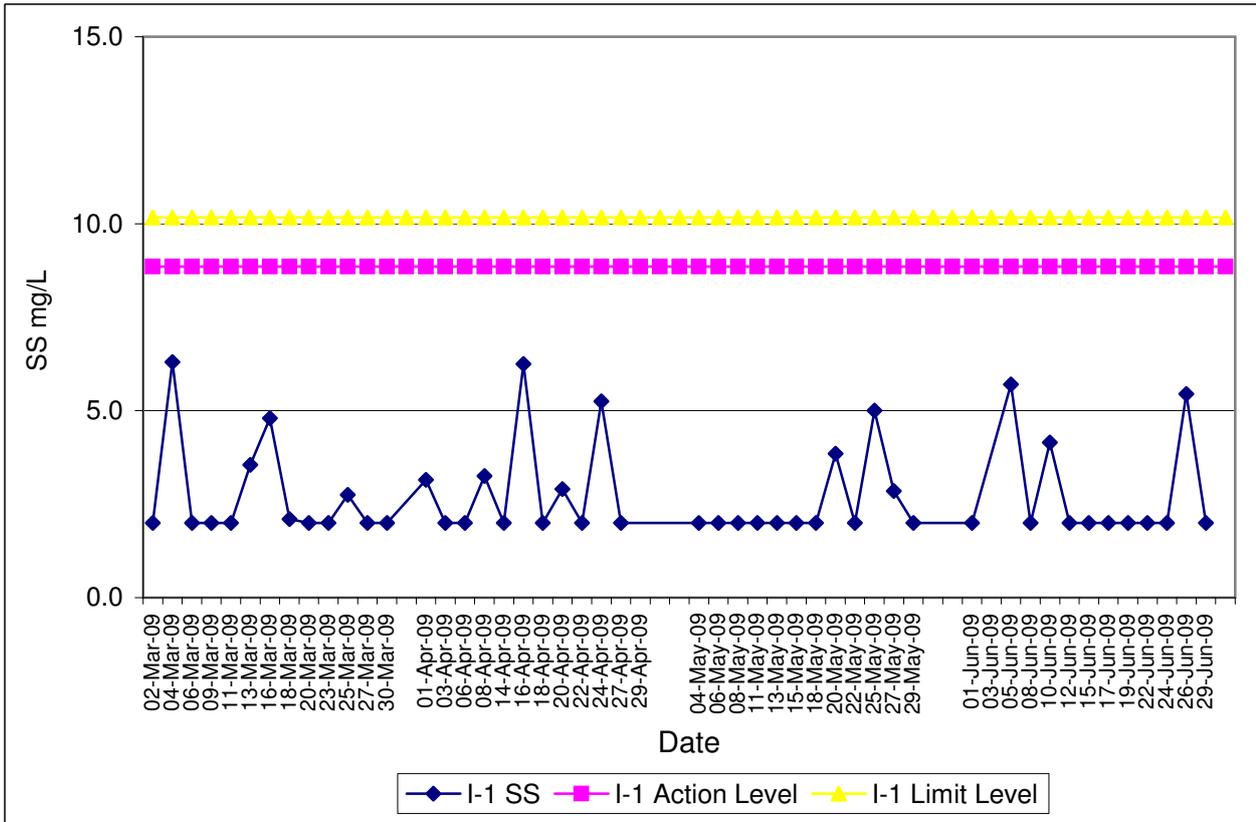
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Mar-09 to Jun-09



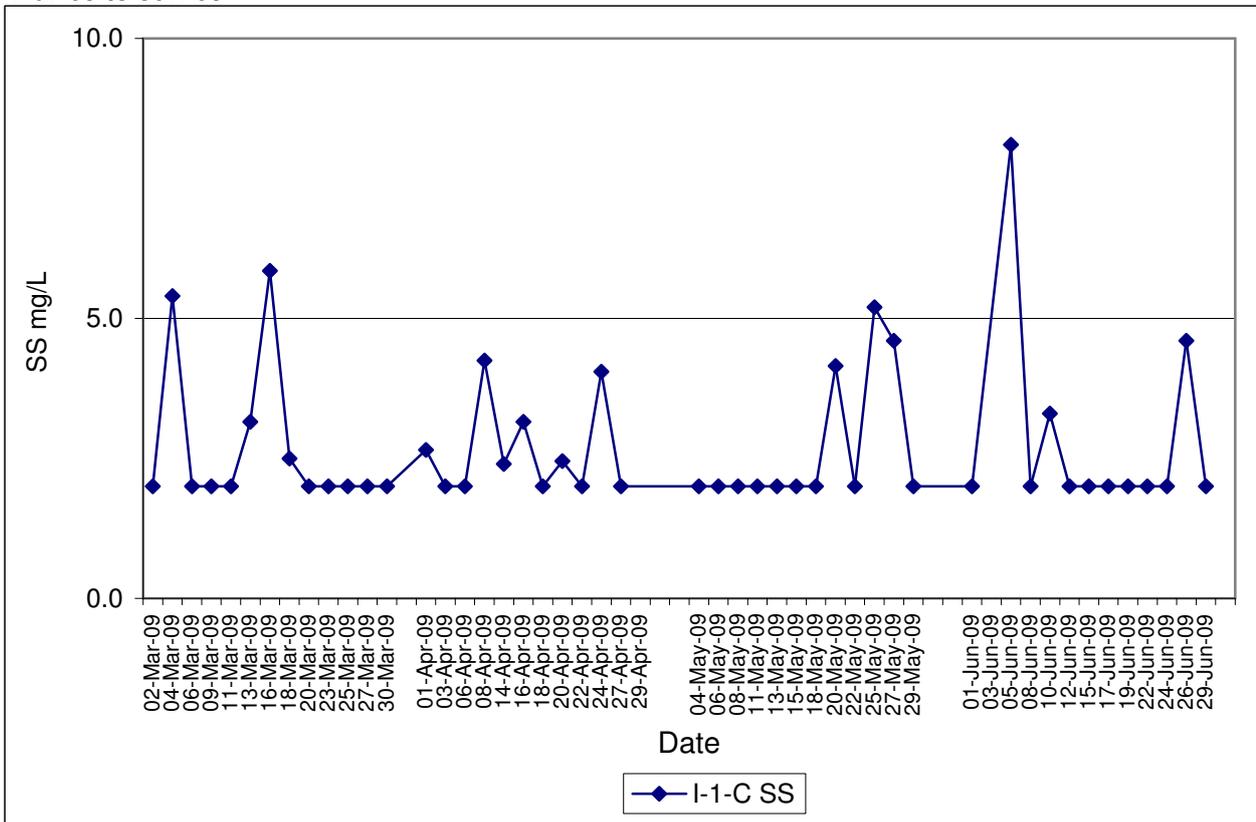
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Mar-09 to Jun-09



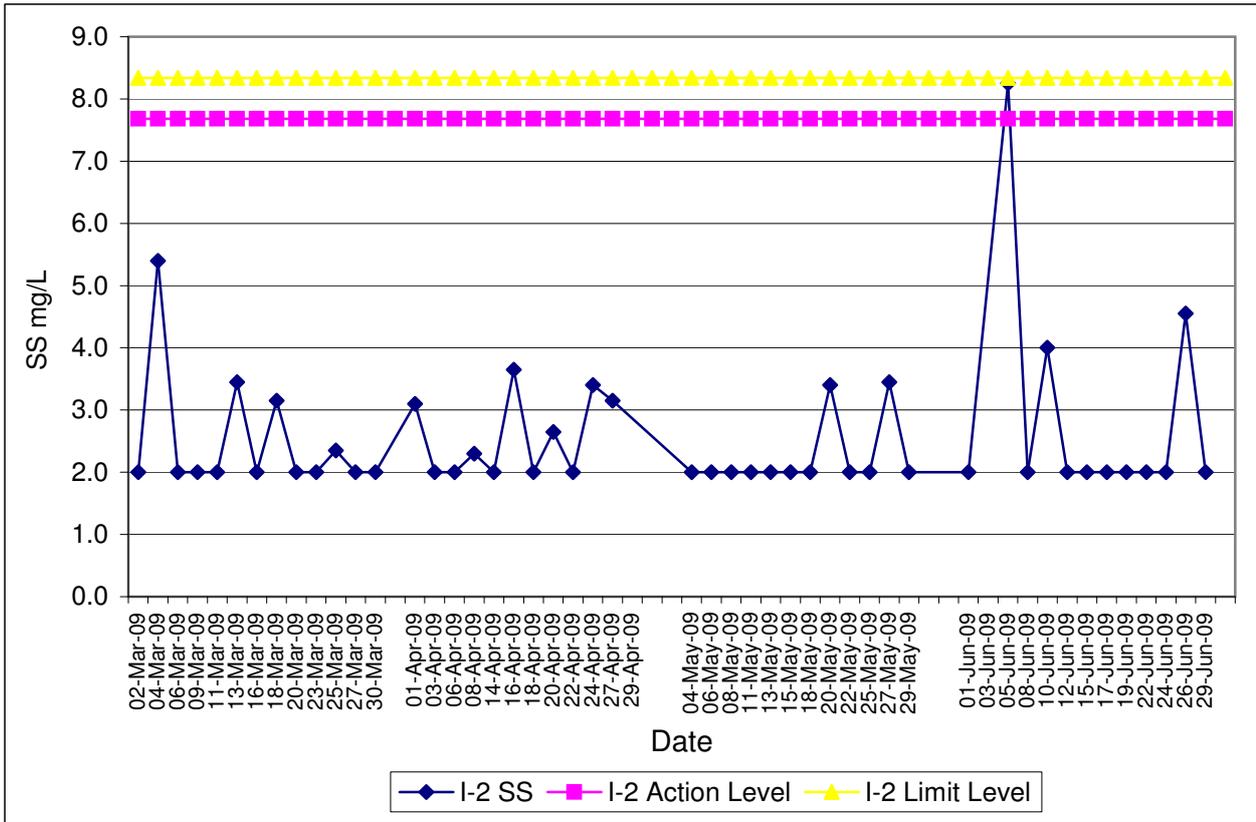
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
 Mar-09 to Jun-09**



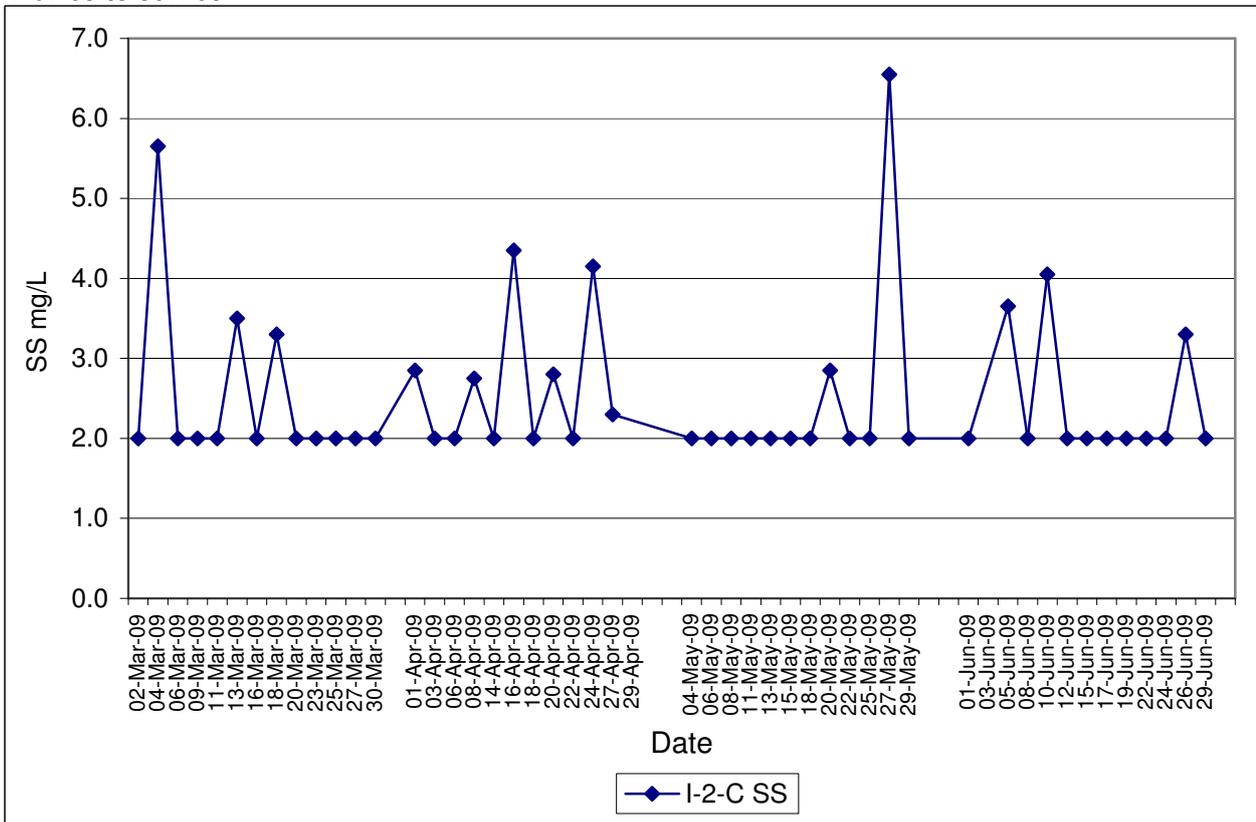
**Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
 Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
 Mar-09 to Jun-09**



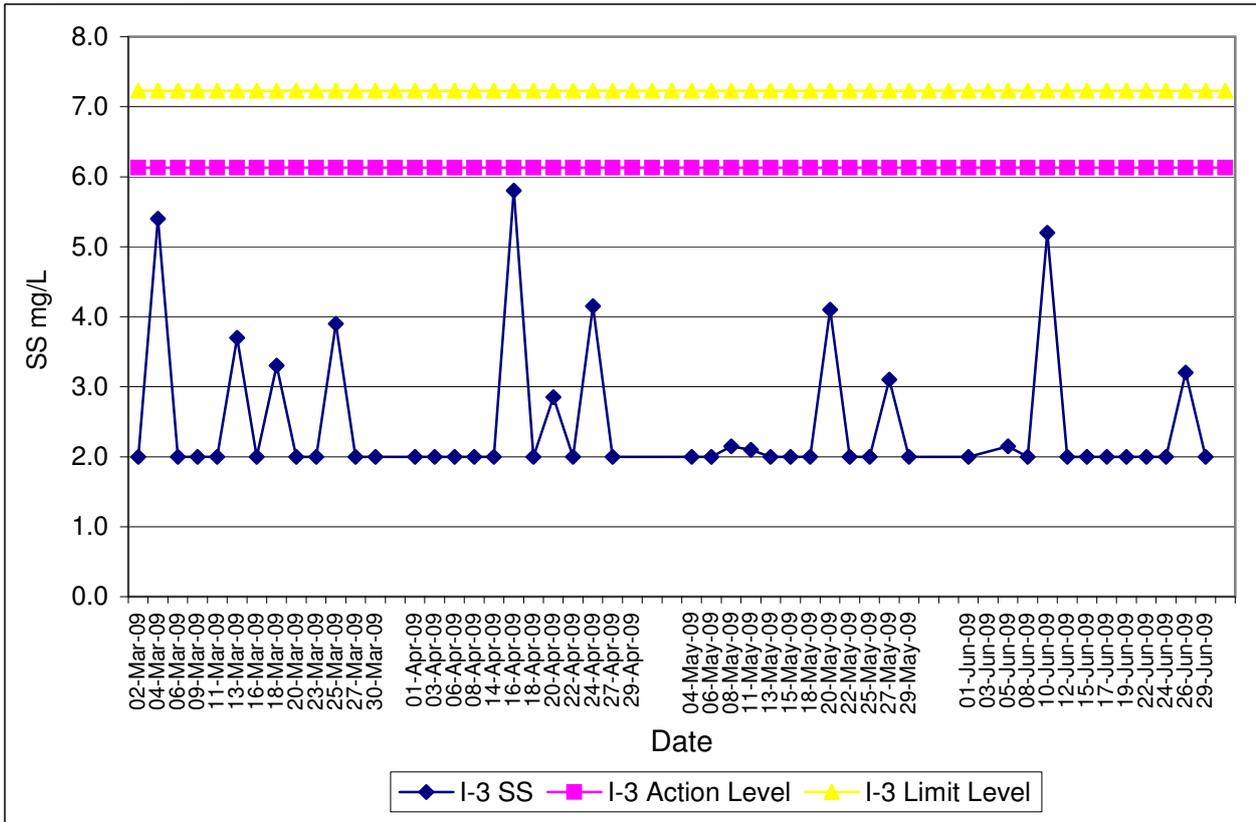
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Mar-09 to Jun-09



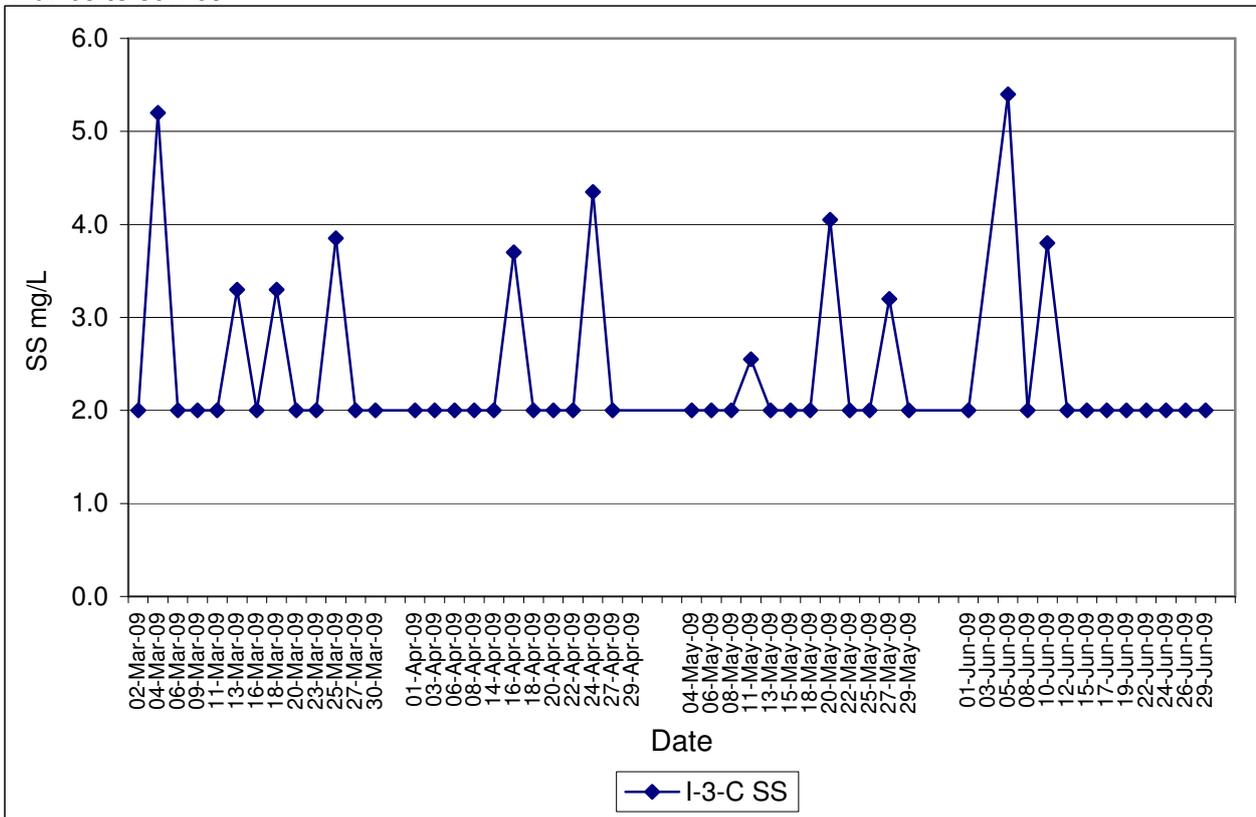
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Mar-09 to Jun-09



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Mar-09 to Jun-09



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Mar-09 to Jun-09



Appendix J

Interim Notifications of Environmental Quality Limits Exceedances

Interim Notifications of Environmental Quality Limits Exceedances

Incident Report on Action Level or Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	05-Jun-09
Time	10:35 AM
Monitoring Location	Hong Hoi Chee Hong Temple (I-2)
Parameter	Suspended Solid
Action & Limit Levels	7.68 / 8.34
Measured Level	8.3 (higher than 130% of control station's SS)
Possible reason for Action or Limit Level Non-compliance	A low SS level of 3.7 is recorded at Control Station (I-2-C)
Actions taken / to be taken	The measured SS level was above Baseline Action Level but below Baseline Limit Level. However, the measured SS level was still within the range of baseline SS concentration (1-8.5mg/L). Site tidiness & cleanliness and disposal of C&D materials were undertaken during the measurement and no direct disturbance was observed from the site. Thus, the exceedance is considered to be contributed by natural variation and no action should be required.
Remarks	Following mitigation measures were provided: (1) exposed surfaces were covered by tarpaulin. (2) sandbags were used to avoid wastewater from site activities directly running down to the river of I-2. (3) sand/silts removal facilities was installed at the location of I-2.

Prepared by: Terence Kong

Designation: Environmental Team Leader

Signature:



Date: 16-Jun-09

Photographic record for exceedance of Suspended Solid recorded at Hong Hoi Chee Hong Temple (I-2) on 05-Jun-09



Site photo



Photo taken at I-2

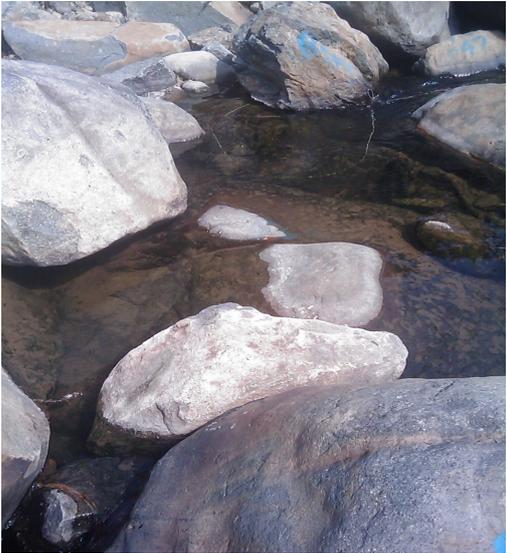


Photo taken at I-2-C

Interim Notifications of Environmental Quality Limits Exceedances

Incident Report on Action Level or Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	10-Jun-09
Time	9:09 AM
Monitoring Location	Sik Sik Yuen Ho Fung College (I-1)
Parameter	Suspended Solid
Action & Limit Levels	8.85 / 10.17
Measured Level	4.2 (higher than 120% of control station's SS)
Possible reason for Action or Limit Level Non-compliance	A low SS level of 3.3 is recorded at Control Station (I-1-C)
Actions taken / to be taken	The measured SS level was below baseline Action / Limit Level and was within the range of baseline SS concentration (1- 10.5mg/L). Site cleanliness and tidiness, fabricate of temporary steel bridge, weld steel mesh and shotcrete to skin wall and no direct disturbance was observed from the site. Thus, the exceedance is considered to be contributed by natural variation and no action should be required.
Remarks	Following mitigation measures were provided: (1) sandbags were used at the gap of the bridge to avoid wastewater from site activities directly running down to the river of I-1. (2) The working site was segregated with a wall as shown in the following photo. (3) Sand/silts removal facilities was installed at the location of I-1.

Prepared by: Terence Kong

Designation: Environmental Team Leader

Signature:



Date: 16-Jun-09

Photographic record for exceedance of Suspended Solid recorded at Sik Sik Yuen Ho Fung College (I-1) on 10-Jun-09



Site photo



Photo taken at I-1



Photo taken at I-1-C

Interim Notifications of Environmental Quality Limits Exceedances

Incident Report on Action Level or Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	10-Jun-09
Time	12:00 PM
Monitoring Location	Squatters (I-3)
Parameter	Suspended Solid
Action & Limit Levels	6.13 / 7.23
Measured Level	5.2 (higher than 130% of control station's SS)
Possible reason for Action or Limit Level Non-compliance	A low SS level of 3.8 is recorded at Control Station (I-3-C)
Actions taken / to be taken	The measured SS level was below baseline Action / Limit Level and was within the range of baseline SS concentration (1- 7.5mg/L). Site cleanliness and tidiness, erect formwork for skin wall and excavation, backfilling for access and no direct disturbance was observed from the site. Thus, the exceedance is considered to be contributed by natural variation and no action should be required.
Remarks	Following mitigation measures were provided: (1) Gabion wall has been constructed to avoid any water from rainstorm and from site activities directly running down to the river of I-3. (2) Sedimentation Pond and Sand/silts removal facilities was installed at the location of I-3.

Prepared by: Terence Kong

Designation: Environmental Team Leader

Signature:



Date: 16-Jun-09

Photographic record for exceedance of Suspended Solid recorded at Squatters (I-3) on 10-Jun-09



Site photo



Photo taken at I-3



Photo taken at I-3-C

Interim Notifications of Environmental Quality Limits Exceedances

Incident Report on Action Level or Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	26-Jun-09
Time	10:37 AM
Monitoring Location	Hong Hoi Chee Hong Temple (I-2)
Parameter	Suspended Solid
Action & Limit Levels	7.68 / 8.34
Measured Level	4.6 (higher than 130% of control station's SS)
Possible reason for Action or Limit Level Non-compliance	A low SS level of 3.3 is recorded at Control Station (I-2-C)
Actions taken / to be taken	The measured SS level was below baseline Action / Limit Level and was within the range of baseline SS concentration (1- 8.5mg/L). Site cleanliness and tidiness, installation of safe net and demolition of piling platform were carried out and no direct disturbance was observed from the site. Thus, the exceedance is considered to be contributed by natural variation and no action should be required.
Remarks	Following mitigation measures were provided: (1) exposed surfaces were covered by tarpaulin. (2) sandbags were used to avoid wastewater from site activities directly running down to the river of I-2. (3) sand/silts removal facilities was installed at the location of I-2.

Prepared by: Terence Kong

Designation: Environmental Team Leader

Signature:



Date: 06-Jul-09

Photographic record for exceedance of Suspended Solid recorded at Hong Hoi Chee Hong Temple (I-2) on 26-Jun-09



Site photo



Photo taken at I-2



Photo taken at I-2-C

Interim Notifications of Environmental Quality Limits Exceedances

Incident Report on Action Level or Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	26-Jun-09
Time	12:36 PM
Monitoring Location	Squatters (I-3)
Parameter	Suspended Solid
Action & Limit Levels	6.13 / 7.23
Measured Level	3.2 (higher than 130% of control station's SS)
Possible reason for Action or Limit Level Non-compliance	A low SS level of 2.0 is recorded at Control Station (I-3-C)
Actions taken / to be taken	The measured SS level was below baseline Action / Limit Level and was within the range of baseline SS concentration (1- 7.5mg/L). Site cleanliness and tidiness and formation of access road were carried out and no direct disturbance was observed from the site. Thus, the exceedance is considered to be contributed by natural variation and no action should be required.
Remarks	Following mitigation measures were provided: (1) gabion wall has been constructed to avoid any water from rainstorm and from site activities directly running down to the river of I-3. (2) Sedimentation pond and sand/silts removal facilities was installed at the location of I-3.

Prepared by: Terence Kong

Designation: Environmental Team Leader

Signature:



Date: 06-Jul-09

Photographic record for exceedance of Suspended Solid recorded at Squatters (I-3) on 26-Jun-09



Site photo



Photo taken at I-3



Photo taken at I-3-C

Appendix K

Complaint Log

COMPLAINT LOG

Log Ref.	Data/Location	Complainant / Data of Contract	Details of Complaint	Investigation / Mitigation Action	File Closed
CIR-001	9 March 2009 at Outfall	EPD	EPD has received a complaint (EPD ref: EP3/N22/RW/04846-09) regarding to muddy effluent discharged from the outfall of the construction site from a public on 9 March 2009. Site investigation was also carried out by EPD with the Contractor on the same day.	<p><u>Findings/ Observations</u></p> <p>In the afternoon on 9 March 2009, the Contractor was carrying out regular maintenance for removing silt accumulated in the wastewater treatment plant. During the maintenance works, some residual silt inside the plant was accidentally leaked out to the outfall discharge outlet. The reason was that a flexible pipe for disposing silt was found connecting to the concrete platform of the outfall discharge outlet.</p> <p><u>Conclusion/Remedial Action</u></p> <p>The complaint was valid and it was due to maintenance works at the wastewater treatment plant at the outfall area. The contractor had cleaned up the silt at discharge outlet and the channel at the outfall area on 12 March 2009 as shown in the attached photo. The ET will closely inspect the discharge outlet and the channel during the routine site inspections and provide advice to the Contractor. The Contractor was also advised to provide mitigation measures during any occasion of the maintenance work on the wastewater treatment plant. The discharge pipe of the treatment plant should be plugged and ensure not functioned when carrying out maintenance works on the wastewater treatment plant in order to prevent the discharge of silt or muddy water to the outlet.</p> <p>Flexible pipe for discharge of sludge should not be placed on the concrete platform under the outfall discharge outlet. For disposal of slit or sludge in the wastewater treatment plant, tanker should be used.</p>	Closed
CIR-002	8 May 2009 at Outfall	EPD	EPD has received a complaint (EPD ref: EP3/N22/RW/09755-09) regarding to construction dust from the outfall construction site on 8 May	<p><u>Findings/ Observations</u></p> <p>Regular 1-hour TSP monitoring, in accordance with EM&A Manual, are performed by Environmental Team. The monitoring station concerned is ASR9 (i.e. at the podium level of Greenview Terrace facing to the construction site).</p> <p>The closest date for the 1-hour TSP concentration monitoring was on 6 May 2009 and 12</p>	

Log Ref.	Data/Location	Complainant / Data of Contract	Details of Complaint	Investigation / Mitigation Action	File Closed
			<p>2009. Site investigation was also carried out by EPD with the Contractor on 14 May 2009.</p>	<p>May 2009 at Greenview Terrace, ASR9. Soil nailing works and loading & unloading excavated materials were observed during monitoring. In accordance with the EM&A Manual and the Baseline Monitoring Report, all 1-hour TSP concentrations at ASR9 were below the established Action and Limit Levels. No exceedance was recorded on 6 and 12 May 2009.</p> <p>The contractor and the environmental team were also undertaken site investigation on the subject area in response to the complaint. It was confirmed that the air quality mitigation measures as recommended in EIA have been provided by the Contractor. The mitigation measures are as follows:</p> <ul style="list-style-type: none"> • Water spraying was provided to the exposed surface. • Several automatic sprinklers were provided at the outfall construction site for water spraying of the haul road. • Water spraying was provided during dust generating works (e.g. rock breaking and soil nailing works). <p><u>Conclusion/Remedial Action</u></p> <p>Based on the site inspection and monitoring results, the complaint is considered not justifiable since no action & limit level exceedance on construction dust are identified. Air quality mitigation measures as recommended in EIA have been implemented in order to control and minimise the air quality impact and nuisance arising from the construction activities. Nevertheless, in view of the recent dry and sunny weather, the haul road and the exposed area would be dry very quickly. The Contractor was recommended to provide more frequent water spraying especially in the dry and sunny weather.</p>	
CIR-003	14 May 2009 at Outfall	EPD	<p>EPD has received a complaint (EPD ref: EP/RW/080206) regarding to daytime construction rock breaking at 7:15 am and dusty at the outfall construction site on 14 May</p>	<p>The closest date to the complaint for the 1-hour TSP monitoring & daytime construction noise monitoring was on 12, 18 and 27 May 2009 at Greenview Terrace, ASR9 and NSR9. Soil nailing, excavation, rock breaking, loading and unloading the materials were observed during monitoring period. The measured noise levels complied with the limit level in accordance with the EIAO-TM. All 1-hour TSP concentrations at ASR9 were below the established Action and Limit Levels. No 1-hour TSP exceedance was recorded.</p> <p>The contractor and the environmental team were also undertaken site investigation on the</p>	Closed

Log Ref.	Data/Location	Complainant / Data of Contract	Details of Complaint	Investigation / Mitigation Action	File Closed
			2009.	<p>subject area in response to the complaint. Air quality mitigation measures as recommended in EIA have been implemented by the Contractor. However, noise mitigation measures could be further improved.</p> <p>Based on our site inspection and monitoring results, the complaint for dust is considered not justifiable since no action & limit level exceedance on construction dust is identified. Air quality mitigation measures as recommended in EIA have also been implemented in order to control and minimise the air quality impact arising from the construction activities. In view of the recent dry and sunny weather, the haul road and the exposed area would be dry very quickly. The Contractor was recommended to enhance water spraying especially in the dry and sunny weather.</p> <p>On the other hand, the complaint for noise is considered due to works and the Contractor was agreed to improve the on-site noise mitigation measures such as the following measures. ET's site inspection and the joint inspection with relevant parties was conducted on 29 May 2009 and 4 June 2009 respectively to confirm all the below measures have been implemented.</p> <ul style="list-style-type: none"> • For the idling plant, it should be switched off to reduce noise level generated. • The sound insulation sheets and noise insulation materials should be placed to enclose the breaking tip tightly and also aside or surrounding the breaking activities as recommended in the following photos 1-3 in noise mitigation measures. • Noise monitoring frequency was increased in order to check the effectiveness of the mitigation measures. The additional measurement was taken on 27 May, 8 June, 10 June and 12 June 2009 after all the measures implemented. The noise levels ($L_{eq, 30 \text{ min}}$) were 70.9 dB (A), 70.5 dB (A), 70.3 dB (A) and 70.3 dB (A) respectively, which comply with the limit level in accordance with the EIAO-TM. Soil nailing, excavation and rock breaking were observed during monitoring period. The measures were well in place and seemed effective during the measurement. 	

Signed by Environmental Team Leader:



Date:

30 June 2009

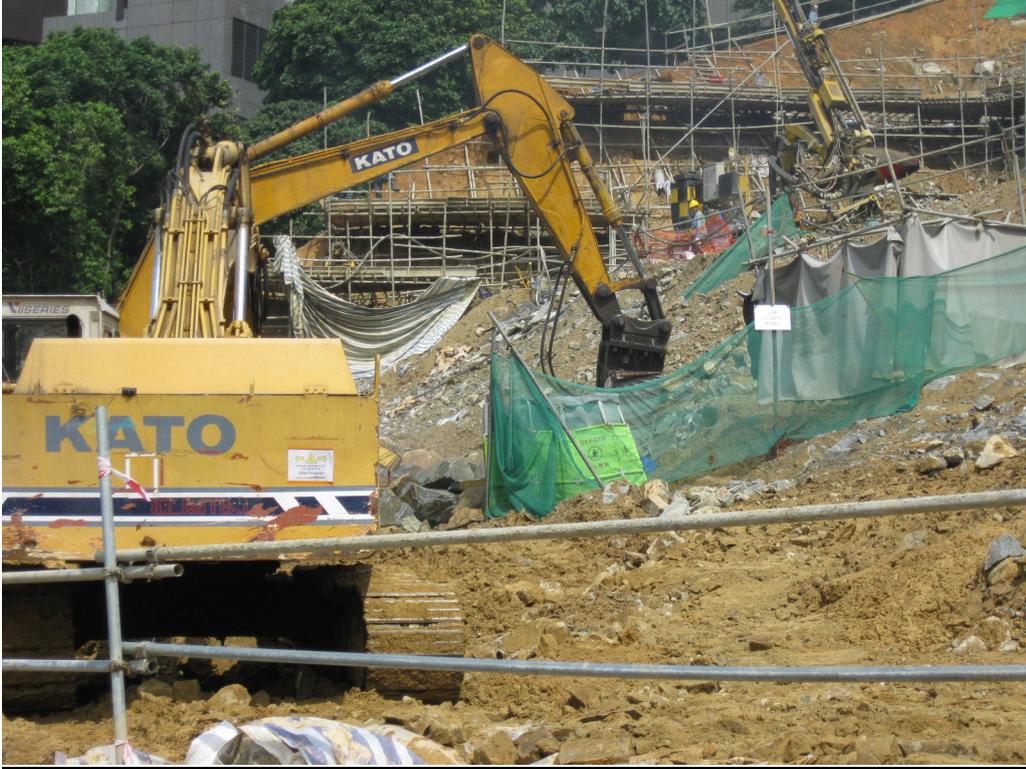
Noise Mitigation Measures



1. Sound insulation sheet erected with the green net.



2. Sound insulation sheet surrounding the rock breaking activities as far as possible.



3. Noise insulation material for rock breaking.

Air Quality Mitigation Measures



1. Water spraying for the exposed area.



2. Automatic sprinkler spraying the haul road.



3. Water spraying during rock breaking.



4. Water Spraying for soil nail work.