Maeda - CREC - SELI Joint Venture

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

Monthly EM&A Report (April 2011)

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Report No	EB000364R0622	
Certified By	**F.C. Tsang** ET Leader	
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Report No	EB000364R0622	
Date	17 May 2011	

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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 April 2011.

2. According to the EM&A Manual, there are four designated air quality monitoring locations, five designated noise monitoring locations and five 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 Tsuen Wan Drainage Tunnel included site cleaning and tidying at Outfall, I-1, I-2 and I-3; drilling, excavation and rock splitting at spiral ramp at Outfall; tunnel boring machine (TBM) drilling of the tunnel and mucking out of tunnel spoil at Outfall; removal of existing retaining wall and hanging support for existing utilities at fast lane of Castle Peak Road (CPR) at Outfall; excavation and soil nailing for box culvert construction at fast lane of CPR east bound at Outfall; excavation and disposal of excavated material from existing arch bridge underneath CPR at Outfall; placing levelling stone and bagged concrete to formation of sea wall at Portion E; installation of precast sea wall blocks at Portion E; drilling and excavation of vortex shaft at I-3; construction of PB wall structure skin wall and copping beam at I-3; construction of boulder traps at I-3; installation of concrete blocks for temporary bund wall at I-3; drilling, excavation and rock splitting of man access shaft and vortex drop shaft I-2; pipe jacking at Portion G at I-2; pre-bored H-pile construction for skin wall at Portion G at I-2; construction of approach channel structure at I-2; construction of 750 step channel and catchpit at Portion G at I-2; cascade and channel modification concrete structure works at I-1; construction of horizontal pipe pile (pipe roofing) for TBM break-through at I-1; and construction of vehicular access at I-1.

4. As recommended in the EIA report, no TBM operation was undertaken during restricted hours from chainage 3308 m to 3143 m.

5. No exceedances have been recorded for air quality monitoring during the reporting month.

6. No exceedances have been recorded for air borne noise monitoring and ground borne noise monitoring during the reporting month.

7. Exceedances for river water quality monitoring are summarised in the following table:

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Nil
SS	Two records at I-1 on 8 and 18 April 2011	One record at I-1 on 6 April 2011

8. Exceedances for marine water quality monitoring are summarised in the following table:

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Nil
SS	Three records at O-1(FT) on 8, 11 and 13 April 2011	Nil

9. The status of waste generation in the reporting month is:

- A total of 3,105.4 m^3 C&D material was disposed of to public fill at Tuen Mun. A quantity of 181.0 m^3 and 17,946.7 m^3 inert C&D materials were reused in the Contract and other Contracts, respectively. Detail information could be referred to Section 5.1.1 of this report.
- About 34.8 m^3 general waste was disposed of to NENT Landfill;
- No paper/cardboard was recycled in the reporting month;
- No metal was generated in the reporting month;
- No plastic waste was disposed of in the reporting month; and
- About 4,341.4 kg chemical waste was disposed of in the reporting month.

10. 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 site inspection checklists, were passed to the Contractor together with the ET's recommendations.

11. 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 the reporting month.

12. The major construction works for the upcoming three months will be:

- Site cleaning and tidying at Outfall, I-1, I-2 and I-3;
- TBM drilling of the tunnel and mucking out of tunnel spoil at Outfall;
- Drilling, excavation and rock splitting at spiral ramp at Outfall;
- Removal of existing retaining wall and hanging support for existing utilities at fast lane of CPR at Outfall;
- Excavation and soil nailing for box culvert construction at fast lane of CPR east bound at Outfall;
- Removal of existing sea wall and armour rocks for basin scheme at Portion E;
- Placing levelling stone and bagged concrete to formation of sea wall at Portion E;
- Installation of precast seawall blocks and panels for construction of outfall apron at Portion E;

- Drilling and excavation of vortex shaft at I-3;
- Construction of PB wall structure skin wall and copping beam and backfilling at I-3;
- Construction of approach channel at I-3;
- Construction of boulder traps at I-3;
- Drilling, excavation and rock splitting of man access shaft and vortex drop shaft at I-2;
- Pipe jacking at Portion G at I-2;
- Pre-bored H-pile construction for skin wall at Portion G at I-2;
- Construction of approach channel structure at I-2;
- Construction of 750 step channel and catchpit at Portion G at I-2;
- Cascade and channel modification concrete structure works at I-1;
- Construction of horizontal pipe pile (pipe roofing) for TBM break-through at I-1; and
- Construction of vehicular access at I-1.

1 INTRODUCTION

1.1.1 The Drainage Services Department (DSD) proposed to construct a tunnel with an internal diameter of 6.5 m and a length of 5.13 km, 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 designated 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 programme 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 thirty-seventh monthly EM&A report summarising the impact monitoring results and audit findings of the EM&A programme in April 2011.

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 Outfall, I-1, I-2 and I-3;
- Drilling, excavation and rock splitting at spiral ramp at Outfall;
- Tunnel boring machine (TBM) drilling of the tunnel and mucking out of tunnel spoil at Outfall;
- Removal of existing retaining wall and hanging support for existing utilities at fast lane of Castle Peak Road (CPR) at Outfall;
- Excavation and soil nailing for box culvert construction at fast lane of CPR east bound at Outfall;
- Excavation and disposal of excavated material from existing arch bridge underneath CPR at Outfall;
- Placing levelling stone and bagged concrete to formation of sea wall at Portion E;
- Installation of precast sea wall blocks at Portion E;
- Drilling and excavation of vortex shaft at I-3;
- Construction of PB wall structure skin wall and copping beam at I-3;
- Construction of boulder traps at I-3;
- Installation of concrete blocks for temporary bund wall at I-3;
- Drilling, excavation and rock splitting of man access shaft and vortex drop shaft I-2;
- Pipe jacking at Portion G at I-2;
- Pre-bored H-pile construction for skin wall at Portion G at I-2;
- Construction of approach channel structure at I-2;
- Construction of 750 step channel and catchpit at Portion G at I-2;
- Cascade and channel modification concrete structure works at I-1;
- Construction of horizontal pipe pile (pipe roofing) for TBM break-through at I-1; and
- Construction of vehicular access at I-1.

2.2.3 As confirmed by the Contractor, no marine mud dredging works for basin scheme at Portion E was conducted in the reporting month.

2.2.4 As recommended in the EIA report, no TBM operation was undertaken during restricted hours from chainage 3308 m to 3143 m.

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 One-hour total suspended particulates (TSP) levels were 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 One-hour TSP monitoring was 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 was 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 was kept in a clean and tightly sealed plastic bag. The filter paper was then re-conditioned in desiccators for 24 hours before obtaining the weight under laboratory conditions.

3.1.4 The average concentrations of the TSP were 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 were 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 was carried out by ALS Technichem (HK) Pty Limited (HOKLAS Registration Number 066).

Monitoring Equipment and Calibration

3.1.6 High Volume Air Samplers (HVASs) were 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 were 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 was used for the calculation of the TSP level. Calibration Kit Model - TE5025A was used for calibration of the HVAS. Recalibration of the HVAS was carried out after motor maintenance, at least once every six months, which was 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	1785	ASR 1
HVAS	BM2000HX	5875	1785	ASR 3
HVAS	TE5005X	1059	1785	ASR 8
HVAS	TE5005X	1713	1785	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 are 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-hour TSP Level in $\mu g/m^3$	
	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	• 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.	• Check monitoring data submitted by ET; • Check Contractor's working method.	• Notify Contractor.	• Rectify any unacceptable practice; • Amend working methods if appropriate.
Exceedance for two or more consecutive samples	• 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.	• 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.	• Confirm receipt of notification of exceedance in writing; • Notify Contractor; • Ensure remedial measures properly implemented.	• 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	• Identify source, investigate the causes of exceedance and propose remedial measures;	• Check monitoring data submitted by ET; • Check Contractor's working method; • Discuss with ET and	• Confirm receipt of notification of exceedance in writing; • Notify Contractor; • Ensure remedial	• Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC within 3 working

EVENT	ACTION			
	ET	IEC	SOR	CONTRACTOR
	• 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.	Contractor on possible remedial measures; • Advise SOR on the effectiveness of the proposed remedial measures; • Supervise implementation of remedial measures.	measures properly implemented.	days of notification; • Implement the agreed proposals; • Amend proposal if appropriate.
Exceedance for two or more consecutive samples	• 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.	• 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.	• 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.	• 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 was measured in terms of equivalent A-weighted sound pressure level (L_{eq}) measured in decibels (dB(A)). Monitoring of $L_{eq(30\ min)}$ was 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), $L_{eq(5\ min)}$ 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, were also recorded during monitoring. Major noise sources observed, both on-site and off-site, were recorded on the field data sheet. All measurements were recorded and presented to the nearest 0.1 dB(A) 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, were used. Noise levels for the A-weighted levels $L_{eq(30min)}$, L_{10} and L_{90} were measured throughout the impact monitoring. An average, by sound power, of six consecutive 5 minutes readings was used to provide $L_{eq(30\ min)}$ for non-restricted hours (07:00-19:00 hours from Monday to Saturday except public holidays). A facade correction of 3 dB(A) was applied to the measurements that were 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 were 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 Rion Precision Sound Level Meters of Type NL-31 and B&K Integrating Sound Level Meter of Type 2238 in compliance with the International Electrotechnical Commission Publication specifications (Paragraph 3.2.3) were 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 was checked using an acoustic calibrator (B&K 4231) generating a known sound pressure level at a known frequency. Measurements were considered as valid only if the calibration levels from before and after the noise measurement agreed to within 1.0 dB(A). Sound level meters and calibrators were calibrated annually to ensure they performed to the same level of accuracy as stated in the manufacturer's specifications.

The noise monitoring equipments used during the reporting month are 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	Rion	NL-31	00410224	NSR1, NSR3, NSR6, NSR8 and NSR9
Sound Level Meter	B&K	2238	2562782	
Sound Level Meter	B&K	2238	2448529	
Sound Level Calibrator	B&K	4231	2699361	

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 facade 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)	Podium (up to 6 July2009) Roof* (since 16 July 2009)

* The noise monitoring location of NSR9 had been adjusted to rooftop since 16 July 2009.

Table 3-6 Noise Monitoring Locations

Construction Ground Borne Noise

3.2.8 Prediction of construction ground borne noise indicates the criteria will be achieved at most NSRs except exceedances 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 hours) at these NSRs. In order to ensure proper control of ground borne 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. Ground borne noise impact monitoring will be carried out only when operation of TBM is conducted within area under monitoring requirement. Detail of the monitoring area and period can be referred to a stand-alone document of *Ground Borne Noise Monitoring Methodology*.

3.2.9 Ground borne noise impact monitoring will be carried out once per week during the monitoring period at NSR 3 and NSR 6, respectively. Parameters such as date, weather condition, equipments used, measurement results and major noise sources will be

recorded on the field data record sheet. Monitoring should be carried out at the ground floor inside the building with all windows, doors and openings being closed. Electrical appliances, such as air conditioners and television, and any other that may emit sound during operation will be switched off or removed to minimise disturbance to the monitoring. If ground borne noise criterion is exceeded, the monitoring shall continue daily until acceptance has been restored against the criterion. Otherwise the monitoring can be discontinued.

3.2.10 The ground borne noise monitoring at NSR 6 was conducted from 1 March 2011 (chainage section 3406 m) to 14 April 2011 (chainage section 2991 m), in order to cover the ground borne noise monitoring zone for NSR 6. For NSR 3, the monitoring will be commenced around late June 2011 in estimation according to the progress of works. A layout plan showing the chainage and the location of ground borne noise monitoring station at NSR 6 is shown in Figure 7 of Appendix G.

3.2.11 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 ground borne construction noise criterion of 60 dB(A) therefore applies with reference to Technical Memorandum on Environmental Impact Assessment Process (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 ground borne noise criteria, ground borne 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 the TM-EIAO.

Action and Limit Levels

3.2.12 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.

3.2.13

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

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

Table 3-7 Action & Limit Levels for Air Borne Noise

Event	Action			
	ET Leader	IEC	SOR	Contractor
Action Level	• Notify IEC and the Contractor. • Carry out investigation.	• Review with analysed results submitted by ET. • Review the proposed	• Confirm receipt of notification of exceedance in writing. • Notify the Contractor.	• Submit noise mitigation proposals to IEC. • Implement noise

Event	Action			
	ET Leader	**IEC**	**SOR**	**Contractor**
	• 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.	remedial measures by the Contractor and advise SOR accordingly. • Supervise the implement of remedial measures.	• Require the Contractor to propose remedial measures for the analysed noise problem. • Ensure remedial measures are properly implemented.	mitigation proposals.
Limit Level	• Identify the source. • Notify IEC, SOR, EPD and the Contractor. • Repeat measurement to confirm findings. • Increase monitoring frequency. • Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. • Inform IEC, SOR, and EPD the causes and 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.	• Discuss amongst SOR, ET Leader and the Contractor on the potential remedial actions. • Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise SOR accordingly. • Supervise the implementation of remedial measures.	• 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. • 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.	• 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 activity of works as determined by the SOR until the exceedance is abated.

Table 3-8 Event/Action Plan for Airborne Noise

3.2.14 The Action and Limit levels for construction ground borne noise are defined in Table 3-9. If non-compliance of the criteria occurs, actions in accordance with the Action Plan in Table 3-10 would be carried out.

Monitoring Station ID		NSR 3	NSR 6
Name of Premises		**Hong Hoi Chee Hong Temple**	**Squatters**
Action Level		When one documented complaint is received	
Limit Level	Working days during daytime (0700-1900 hours) ($L_{eq(30min)}$)	65 dB(A)	65 dB(A)

Table 3-9 Action & Limit Levels for Ground Borne Noise

Event	Action			
	ET Leader	**IEC**	**SOR**	**Contractor**
Action Level	• 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 daily until exceedance is abated.	• Review with analysed results submitted by ET. • Review the proposed remedial measures by the Contractor and advise SOR accordingly. • Supervise the implementation of remedial measures.	• 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.	• Submit noise mitigation proposals to IEC. • Implement noise mitigation proposals.
Limit Level	• Identify the source. • Notify IEC, SOR, EPD and the Contractor. • 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. • Increase monitoring frequency to daily until	• Discuss amongst SOR, ET Leader and the Contractor on the potential remedial actions. • Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise SOR accordingly. • Supervise the implementation of remedial measures.	• 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. • If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work	• 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 activity of works as determined by the SOR until the exceedance is abated.

Event	Action			
	ET Leader	IEC	SOR	Contractor
	exceedance is abated.		until the exceedance is abated.	

Table 3-10 Event/Action Plan for Ground Borne Noise

3.3 Water Quality

3.3.1 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 effectiveness of these mitigation measures in 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 were measured at all designated monitoring locations including control points at an interval of 3 days per week. DO, temperature, turbidity, pH and SS measurements were undertaken at designated monitoring locations.

3.3.5 It should be noted that water samples for all monitoring parameters were collected, stored, preserved and analysed according to Standard Methods, APHA 17 ed. and/or methods agreed by the Director of Environmental Protection.

3.3.6 Each sample was 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. 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 were transferred to clearly labelled and pre-cleaned sample containers with necessary preservatives immediately after collection. The sample containers were provided by a HOKLAS accredited laboratory. About 1 L of

samples was collected for all laboratory analysis. Following sampling, samples should be stored in a cool box at temperature between 0 and 4 ^{o}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 3-11 below.

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

Table 3-11 Water Quality Monitoring Equipment

3.3.8 All in situ monitoring equipment were checked and calibrated prior to use. They were 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 were checked with certified standard solutions before each use. Wet bulb calibrations for all DO meters were 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" was observed. The calibration certificates are included in Appendix F.

Monitoring Location

3.3.9 Five designated impact monitoring locations (three river stations and two marine stations) and five control locations (three river control stations and two marine control stations) were identified in the contract specific EM&A Manual for river and marine water quality monitoring. These monitoring stations are listed in Table 3-12 below and shown in Appendix G.

Monitoring Station ID	Name of Premises
River	
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
Marine	
O-1 (FT) and (ET)	Outfall O-1 during Flood Tide and 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 3-12 Water Quality Monitoring Locations

3.3.10 Note that there were 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 was sampled during each sampling. Control station to be sampled was 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 3-13. In case of any exceedance, appropriate actions would be undertaken in accordance with the Event and Action Plan as described in Table 3-14.

Parameters	Action	Limit
DO in mg/L (Surface, Middle and Bottom)	Surface and Middle 5%-ile of baseline data for surface and middle layer. Bottom 5%-ile of baseline data for bottom layer.	Surface and Middle 4 mg/L except 5 mg/L for FCZ or 1%-ile of baseline data for surface and middle layer Bottom 2 mg/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

Parameters	Action	Limit
		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 limit.
- 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 necessary.

Table 3-13 Action/Limit Levels for Water Quality

Event	ET Leader	IEC	SOR	Contractor
Action Level being exceeded by one sampling day	• 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.	• 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.	• Discuss with IEC on the proposed mitigation measures; and • Make agreement on the mitigation measures to be implemented.	• 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	• 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	• 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.	• 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.	• 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	• 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.	• 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.	• 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.	• 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	• 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	• 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	• 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	• 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; • Ensure mitigation measures are implemented; and • Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	measures.	the implemented mitigation measures; and • 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; • 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 3-14 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-hour TSP Monitoring

4.1.2 Results of 1-hour TSP level are shown in Table 4-1. All measurements were recorded and presented to the nearest 0.1 µg/m^3 in this report. Detailed results including weather conditions and graphical presentations are presented in Appendix I.

Station	Monitoring Date	Monitoring Result (µg/m^3)	Action/Limit Levels (µg/m^3)
ASR 1	04-Apr-11	81.3	307/500
		118.8	
		100.7	
	08-Apr-11	69.7	
		55.5	
		107.1	
	14-Apr-11	90.4	
		91.6	
		147.2	
	20-Apr-11	102.0	
		77.4	
		86.5	
	26-Apr-11	81.3	
		180.7	
		109.7	
	29-Apr-11	151.0	
		139.4	
		116.2	
ASR 3	04-Apr-11	88.1	327/500
		122.4	
		209.4	
	08-Apr-11	64.9	
		67.3	
		122.4	
	14-Apr-11	82.0	
		77.1	
		112.6	
	20-Apr-11	99.2	
		78.4	
		90.6	

Station	Monitoring Date	Monitoring Result (µg/m^3)	Action/Limit Levels (µg/m^3)
	26-Apr-11	148.1	
		113.9	
		82.0	
	29-Apr-11	149.4	
		128.6	
		128.6	
ASR 8	04-Apr-11	86.9	337/500
		98.4	
		89.5	
	08-Apr-11	46.0	
		60.1	
		84.4	
	14-Apr-11	129.1	
		126.6	
		102.3	
	20-Apr-11	164.9	
		101.0	
		117.6	
	26-Apr-11	190.5	
		84.4	
		95.9	
	29-Apr-11	147.0	
		126.6	
		148.3	
ASR 9	04-Apr-11	107.1	329/500
		144.6	
		90.3	
	08-Apr-11	42.6	
		58.1	
		98.1	
	14-Apr-11	120.0	
		216.8	
		117.5	
	20-Apr-11	206.5	
		132.9	
		118.7	
	26-Apr-11	277.5	
		207.8	
		160.0	
	29-Apr-11	143.3	
		180.7	

Station	Monitoring Date	Monitoring Result ($\mu g/m^3$)	Action/Limit Levels ($\mu g/m^3$)
		140.7	

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 air quality exceedance was recorded in the reporting month.

4.2 Noise

Air Borne Noise Monitoring

4.2.1 The air borne noise monitoring schedule of the reporting period is given in Appendix H. Results of measured noise level, in terms of $L_{eq\ (30min)}$, during the construction are shown in Table 4-2. All measurements including L_{10} and L_{90} are recorded and presented to the nearest 0.1 dB(A) in this report. Detailed results including weather conditions and graphical presentation are presented in Appendix I.

Station	Monitoring Date	$L_{eq\ (30\ min)}$ dB(A)	Limit Levels dB(A)
NSR 1	04-Apr-11	64.2	70
	14-Apr-11	62.6	
	20-Apr-11	64.2	
	26-Apr-11	64.4	
NSR 3	04-Apr-11	67.3	75
	14-Apr-11	68.4	
	20-Apr-11	60.9	
	26-Apr-11	62.6	
NSR 6	04-Apr-11	63.7	
	14-Apr-11	66.2	
	20-Apr-11	58.2	
	26-Apr-11	63.3	
NSR 8	04-Apr-11	65.5	
	14-Apr-11	63.7	
	20-Apr-11	68.8	

Station	Monitoring Date	$L_{eq\ (30\ min)}$ dB(A)	Limit Levels dB(A)
	26-Apr-11	65.1	
NSR 9	04-Apr-11	74.1	
	14-Apr-11	68.3	
	20-Apr-11	68.8	
	26-Apr-11	73.4	

Table 4-2 Air Borne Noise Monitoring Results

4.2.2 No project related air borne noise exceedance was recorded in the reporting month.

Ground Borne Noise Monitoring

4.2.3 The ground borne noise monitoring schedule of the reporting period is given in Appendix H. Results of measured noise level, in terms of $L_{eq\ (30min)}$, during the monitoring period are shown in Table 4-3. All measurements including L_{10} and L_{90} are recorded and presented to the nearest 0.1 dB(A) in this report. Detailed results including weather conditions and graphical presentation are presented in Appendix I.

Station	Monitoring Date	TBM Location Chainage (m)	$L_{eq\ (30\ min)}$ dB(A)	Limit Levels dB(A)
NSR 6	04-Apr-11	3121	43.9	65
	14-Apr-11	2991	46.5	

Table 4-3 Ground Borne Noise Monitoring Results

4.2.4 No project related ground borne noise exceedance was recorded in 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 4-4 to Table 4-8.

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Nil
SS	Two records on 8 and 18 April 2011	One record on 6 April 2011
Total	2	1

Table 4-4 Summary of Exceedances for I-1

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Nil
SS	Nil	Nil
Total	Nil	Nil

Table 4-5 Summary of Exceedances for I-2

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Nil
SS	Nil	Nil
Total	Nil	Nil

Table 4-6 Summary of Exceedances for I-3

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Nil
SS	Three records on 8, 11 and 13 April 2011	Nil
Total	3	Nil

Table 4-7 Summary of Exceedances for O-1(FT)

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Nil
SS	Nil	Nil
Total	Nil	Nil

Table 4-8 Summary of Exceedances for O-1(ET)

4.3.2 Results of measured water quality parameters during the reporting month are shown in Table 4-9. Detailed results including weather conditions and graphical presentations are enclosed in Appendix I.

River Water Quality Monitoring

4.3.3 Three non-project related exceedances were recorded for the river water quality monitoring within the reporting month.

Exceedances of Suspended Solids Level

Action Level at I-1 on 8 April 2011

4.3.4 One exceedance of SS action level was recorded at I-1 on 8 April 2011. The measured SS level (9.45 mg/L) was above the baseline action level, but lower than the SS level of the control station (I-1-C) (10.00 mg/L). General site cleaning, rebar fixing at cascade bay 3, formwork preparing, removal of masonry wall, pipe roof corning drilling and geotechnical instrumentation monitoring were undertaken during the measurement. No direct disturbance was observed from the site. Thus, the exceedance was considered to be contributed by high SS level of the upstream location and natural variation. Therefore, no action was required.

Action Level at I-1 on 18 April 2011

4.3.5 One exceedance of SS action level was recorded at I-1 on 18 April 2011. The measured SS level (2.70 mg/L) was below the baseline action level, but higher than 120% of SS level of the control station (I-1-C) (2.10 mg/L). General site cleaning, formwork at Cascade Bay 3 and 4, construction of H-pile platform, pipe roof drilling and geotechnical instrumentation monitoring were undertaken during the measurement. No direct disturbance was observed from the site. Thus, the exceedance was considered to be contributed by natural variation and no action was required.

Limit Level at I-1 on 6 April 2011

4.3.6 One exceedance of SS limit level was recorded at I-1 on 6 April 2011. The measured SS level (10.95 mg/L) was above the baseline limit level, but lower than 120% of SS level of the control station (I-1-C) (10.60 mg/L). General site cleaning, rebar fixing at cascade bay 1, dismantling of formwork at vehicle access, removal of hoarding and masonry wall and geotechnical instrumentation monitoring were undertaken during the measurement. No direct disturbance was observed from the site. Thus, the exceedance was considered to be contributed by high SS level at upstream location and natural variation. Therefore, no action was required.

Marine Water Quality Monitoring

4.3.7 Three exceedances were recorded for the marine water quality monitoring within the reporting month.

Exceedances of Suspended Solids Level

Action Level at O-1(FT) on 8, 11 and 13 April 2011

4.3.8 Three exceedances of SS action levels were recorded at O-1(FT) on 8, 11 and 13 April 2011. The measured SS levels (depth-averaged) at O-1(FT) (5.35, 5.27 and 3.90 mg/L, respectively) were below the baseline action/limit level but were higher than 120% of the control station's SS level (O-1-C(FT)) (4.20, 4.27 and 3.03 mg/L, respectively) at the same tide of the same day. The construction activities conducted includes laying non-woven geo-textile and backfilling grade 200 rockfill behind installed seawall blocks on 8 April 2011, installation of temporary concrete blocks and placing levelling stone on 11 April 2011 and installation of bagged concrete for seawall formation on 13 April 2011.

During monitoring, silt curtain was deployed along the Portion E boundary line and extended from seawater level to seabed and floating type silt curtain was also employed at the inner side. Since there was no other marine works during monitoring, the exceedances were considered to be contributed by natural variation and no further action was required.

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-Apr-11	23.90	6.90	3.42 / 3.34	8.06	3.89	9.75 / 12.47	4.30	8.85 / 10.17
	04-Apr-11	19.50	7.53		8.05	5.10		4.45	
	06-Apr-11	22.70	7.13		8.11	9.42		**10.95**	
	08-Apr-11	21.90	6.97		8.11	5.16		*9.45*	
	11-Apr-11	28.50	6.76		8.02	7.59		8.20	
	13-Apr-11	23.70	7.27		8.18	4.59		4.50	
	15-Apr-11	24.35	7.10		8.12	4.47		4.20	
	18-Apr-11	26.00	7.23		8.06	4.78		*2.70*	
	20-Apr-11	24.05	7.17		7.96	3.70		2.25	
	26-Apr-11	27.00	7.18		8.10	3.49		<2.00	
	28-Apr-11	28.10	6.94		8.07	2.61		<2.00	
	30-Apr-11	24.25	7.16		8.07	2.42		2.10	

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

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-Apr-11	23.90	7.10	- / -	8.06	3.93	- / -	4.35	- / -
	04-Apr-11	19.50	7.43		8.06	5.50		4.60	
	06-Apr-11	22.60	7.25		8.10	9.54		10.60	
	08-Apr-11	21.90	7.08		8.10	5.09		10.00	
	11-Apr-11	28.60	6.73		8.03	7.77		7.75	
	13-Apr-11	23.70	7.33		8.18	4.68		4.80	
	15-Apr-11	24.40	7.25		8.12	4.63		5.20	
	18-Apr-11	26.10	7.19		8.06	4.92		2.10	
	20-Apr-11	24.00	7.03		7.95	3.79		<2.00	
	26-Apr-11	26.90	7.11		8.11	3.55		<2.00	
	28-Apr-11	28.00	6.99		8.07	2.48		<2.00	
	30-Apr-11	24.30	7.35		8.08	2.51		<2.00	

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

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-Apr-11	22.55	6.68	3.66 / 3.63	8.70	1.29	6.63 / 6.99	<2.00	7.68 / 8.34
	04-Apr-11	19.70	7.58		8.89	1.59		<2.00	
	06-Apr-11	22.00	7.56		8.91	1.52		<2.00	
	08-Apr-11	21.85	7.37		8.01	1.91		<2.00	
	11-Apr-11	28.05	7.08		8.06	1.82		<2.00	
	13-Apr-11	23.40	7.46		8.40	1.27		<2.00	
	15-Apr-11	25.10	7.14		8.01	1.09		<2.00	
	18-Apr-11	26.10	7.25		8.11	2.14		<2.00	
	20-Apr-11	24.20	7.24		8.00	1.60		<2.00	
	26-Apr-11	26.70	7.10		7.99	1.69		<2.00	
	28-Apr-11	28.15	7.26		8.01	1.87		<2.00	
	30-Apr-11	24.05	7.33		8.06	1.97		3.20	

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

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-Apr-11	23.00	6.78	- / -	8.72	1.29	- / -	<2.00	- / -
	04-Apr-11	19.80	7.71		8.88	1.56		<2.00	
	06-Apr-11	21.85	7.83		8.90	1.50		<2.00	
	08-Apr-11	22.00	7.37		8.02	1.95		<2.00	
	11-Apr-11	28.10	7.00		8.05	1.93		<2.00	
	13-Apr-11	23.50	7.57		8.40	1.69		<2.00	
	15-Apr-11	25.00	7.06		8.02	1.14		<2.00	
	18-Apr-11	26.20	7.15		8.10	2.20		2.50	
	20-Apr-11	24.20	7.21		7.99	1.68		<2.00	
	26-Apr-11	26.60	7.19		7.99	1.70		<2.00	
	28-Apr-11	28.30	7.19		8.02	1.91		2.05	
	30-Apr-11	24.20	7.43		8.07	1.99		6.15	

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

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-Apr-11	23.30	7.34	3.65 / 3.51	9.51	1.53	3.99 / 4.18	<2.00	6.13 / 7.23
	04-Apr-11	20.55	7.67		9.37	1.86		<2.00	
	06-Apr-11	22.45	7.38		9.12	1.95		<2.00	
	08-Apr-11	22.10	7.40		9.77	1.96		<2.00	
	11-Apr-11	28.15	6.90		9.70	1.90		<2.00	
	13-Apr-11	23.30	7.60		9.35	1.76		<2.00	
	15-Apr-11	25.00	7.59		9.08	1.14		<2.00	
	18-Apr-11	26.40	7.09		9.50	1.92		<2.00	
	20-Apr-11	24.30	7.10		9.72	1.46		<2.00	
	26-Apr-11	26.00	7.20		9.91	1.17		<2.00	
	28-Apr-11	27.90	7.17		9.90	2.21		<2.00	
	30-Apr-11	24.65	7.11		8.97	1.91		<2.00	

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

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-Apr-11	23.10	7.41	- / -	9.50	1.50	- / -	<2.00	- / -
	04-Apr-11	20.50	7.91		9.37	1.83		<2.00	
	06-Apr-11	22.30	7.35		9.10	1.92		<2.00	
	08-Apr-11	22.10	7.48		9.75	1.97		<2.00	
	11-Apr-11	28.20	6.83		9.71	1.92		<2.00	
	13-Apr-11	23.30	7.49		9.36	1.69		<2.00	
	15-Apr-11	25.10	7.49		9.07	1.20		<2.00	
	18-Apr-11	26.50	7.08		9.50	1.98		<2.00	
	20-Apr-11	24.30	7.04		9.73	1.45		<2.00	
	26-Apr-11	26.00	7.22		9.90	1.13		<2.00	
	28-Apr-11	27.75	7.21		9.91	2.29		<2.00	
	30-Apr-11	24.70	7.20		8.90	1.96		<2.00	

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

Station	Date	Depth	Temperature (℃) (depth-averaged)	DO (mg/L)	Action / Limit Level for DO (mg/L)	pH (depth-averaged)	Turbidity (NTU) (depth-averaged)	Action / Limit Level for Turbidity (NTU)	SS (mg/L) (depth-averaged)	Action / Limit Level for SS (mg/L)
O-1(FT)	01-Apr-11	Surface	22.15	7.39	6.84 / 6.81	8.31	3.58	10.35 / 13.15	5.47	14.10 / 18.08
		Middle		7.27						
		Bottom		7.33	6.99 / 6.96					
	04-Apr-11	Surface	19.60	7.68	6.84 / 6.81	8.41	1.13		2.55	
		Middle		7.38						
		Bottom		7.39	6.99 / 6.96					
	06-Apr-11	Surface	20.52	7.80	6.84 / 6.81	8.43	2.34		4.97	
		Middle		7.79						
		Bottom		7.93	6.99 / 6.96					
	08-Apr-11	Surface	22.63	7.18	6.84 / 6.81	8.39	1.81		*5.35*	
		Middle		7.40						
		Bottom		7.36	6.99 / 6.96					
	11-Apr-11	Surface	26.10	7.38	6.84 / 6.81	8.58	2.24		*5.27*	
		Middle		7.21						
		Bottom		7.46	6.99 / 6.96					
	13-Apr-11	Surface	22.62	7.61	6.84 / 6.81	8.59	1.13		*3.90*	
		Middle		7.51						
		Bottom		7.58	6.99 / 6.96					

Station	Date	Depth	Temperature (℃) (depth-averaged)	DO (mg/L)	Action / Limit Level for DO (mg/L)	pH (depth-averaged)	Turbidity (NTU) (depth-averaged)	Action / Limit Level for Turbidity (NTU)	SS (mg/L) (depth-averaged)	Action / Limit Level for SS (mg/L)
O-1(FT)	15-Apr-11	Surface	27.05	7.54	6.84 / 6.81	8.61	1.25	10.35 / 13.15	2.37	14.10 / 18.08
		Middle		7.44						
		Bottom		7.51	6.99 / 6.96					
	18-Apr-11	Surface	25.38	7.18	6.84 / 6.81	8.57	3.63		5.38	
		Middle		7.22						
		Bottom		7.06	6.99 / 6.96					
	20-Apr-11	Surface	24.30	7.05	6.84 / 6.81	8.37	3.51		4.32	
		Middle		7.06						
		Bottom		7.16	6.99 / 6.96					
	26-Apr-11	Surface	27.40	7.40	6.84 / 6.81	8.37	3.35		2.57	
		Middle		7.31						
		Bottom		7.22	6.99 / 6.96					
	28-Apr-11	Surface	27.87	7.27	6.84 / 6.81	8.49	2.17		8.10	
		Middle		7.10						
		Bottom		7.20	6.99 / 6.96					
	30-Apr-11	Surface	24.03	7.06	6.84 / 6.81	8.38	2.11		4.07	
		Middle		7.24						
		Bottom		7.24	6.99 / 6.96					

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

Station	Date	Depth	Temperature (℃) (depth-averaged)	DO (mg/L)	Action / Limit Level for DO (mg/L)	pH (depth-averaged)	Turbidity (NTU) (depth-averaged)	Action / Limit Level for Turbidity (NTU)	SS (mg/L) (depth-averaged)	Action / Limit Level for SS (mg/L)
O-1-C(FT)	01-Apr-11	Surface	22.30	7.32	- / -	8.31	3.64	- / -	6.10	- / -
		Middle		7.26						
		Bottom		7.36	- / -					
	04-Apr-11	Surface	19.77	7.71	- / -	8.41	1.15		3.12	
		Middle		7.51						
		Bottom		7.45	- / -					
	06-Apr-11	Surface	20.55	7.67	- / -	8.43	2.42		4.40	
		Middle		7.62						
		Bottom		7.84	- / -					
	08-Apr-11	Surface	22.73	7.57	- / -	8.39	1.82		4.20	
		Middle		7.36						
		Bottom		7.46	- / -					
	11-Apr-11	Surface	26.07	7.36	- / -	8.59	2.25		4.27	
		Middle		7.26						
		Bottom		7.22	- / -					
	13-Apr-11	Surface	22.57	7.51	- / -	8.59	1.15		3.03	
		Middle		7.76						
		Bottom		7.65	- / -					

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

Station	Date	Depth	Temperature (℃) (depth-averaged)	DO (mg/L)	Action / Limit Level for DO (mg/L)	pH (depth-averaged)	Turbidity (NTU) (depth-averaged)	Action / Limit Level for Turbidity (NTU)	SS (mg/L) (depth-averaged)	Action / Limit Level for SS (mg/L)
O-1-C(FT)	15-Apr-11	Surface	26.98	7.60	- / -	8.60	1.24	- / -	2.52	- / -
		Middle		7.31						
		Bottom		7.51	- / -					
	18-Apr-11	Surface	25.40	7.05	- / -	8.57	3.63		5.02	
		Middle		7.21						
		Bottom		7.05	- / -					
	20-Apr-11	Surface	24.27	7.16	- / -	8.37	4.72		7.90	
		Middle		7.04						
		Bottom		7.09	- / -					
	26-Apr-11	Surface	27.43	7.28	- / -	8.38	3.94		2.42	
		Middle		7.18						
		Bottom		7.26	- / -					
	28-Apr-11	Surface	27.80	7.27	- / -	8.49	2.20		9.22	
		Middle		7.19						
		Bottom		7.07	- / -					
	30-Apr-11	Surface	24.03	7.21	- / -	8.38	2.07		3.98	
		Middle		7.30						
		Bottom		7.25	- / -					

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

Station	Date	Depth	Temperature (℃) (depth-averaged)	DO (mg/L)	Action / Limit Level for DO (mg/L)	pH (depth-averaged)	Turbidity (NTU) (depth-averaged)	Action / Limit Level for Turbidity (NTU)	SS (mg/L) (depth-averaged)	Action / Limit Level for SS (mg/L)
O-1(ET)	01-Apr-11	Surface	23.18	7.37	7.02 / 6.94	8.29	3.01	11.87/13.44	5.38	13.25/14.39
		Middle		7.22						
		Bottom		7.33	6.7 / 6.48					
	04-Apr-11	Surface	19.55	7.68	7.02 / 6.94	8.41	1.65		4.62	
		Middle		7.54						
		Bottom		7.72	6.7 / 6.48					
	06-Apr-11	Surface	20.75	7.84	7.02 / 6.94	8.45	1.42		2.62	
		Middle		7.99						
		Bottom		7.71	6.7 / 6.48					
	08-Apr-11	Surface	22.52	7.45	7.02 / 6.94	8.39	2.08		2.45	
		Middle		7.48						
		Bottom		7.40	6.7 / 6.48					
	11-Apr-11	Surface	26.53	7.51	7.02 / 6.94	8.59	2.12		3.87	
		Middle		7.56						
		Bottom		7.58	6.7 / 6.48					
	13-Apr-11	Surface	22.73	7.67	7.02 / 6.94	8.58	1.48		4.73	
		Middle		7.63						
		Bottom		7.75	6.7 / 6.48					

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

Station	Date	Depth	Temperature (℃) (depth-averaged)	DO (mg/L)	Action / Limit Level for DO (mg/L)	pH (depth-averaged)	Turbidity (NTU) (depth-averaged)	Action / Limit Level for Turbidity (NTU)	SS (mg/L) (depth-averaged)	Action / Limit Level for SS (mg/L)
O-1(ET)	15-Apr-11	Surface	26.88	7.45	7.02 / 6.94	8.60	1.53	11.87/13.44	3.70	13.25/14.39
		Middle		7.57						
		Bottom		7.29	6.7 / 6.48					
	18-Apr-11	Surface	25.18	7.15	7.02 / 6.94	8.54	3.62		4.02	
		Middle		7.12						
		Bottom		7.29	6.7 / 6.48					
	20-Apr-11	Surface	24.55	7.46	7.02 / 6.94	8.37	2.14		3.25	
		Middle		7.09						
		Bottom		7.14	6.7 / 6.48					
	26-Apr-11	Surface	27.07	7.23	7.02 / 6.94	8.37	2.13		2.48	
		Middle		7.31						
		Bottom		7.20	6.7 / 6.48					
	28-Apr-11	Surface	27.58	7.23	7.02 / 6.94	8.47	2.22		3.00	
		Middle		7.22						
		Bottom		7.40	6.7 / 6.48					
	30-Apr-11	Surface	23.70	7.18	7.02 / 6.94	8.40	2.15		3.72	
		Middle		7.13						
		Bottom		7.27	6.7 / 6.48					

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

Station	Date	Depth	Temperature (℃) (depth-averaged)	DO (mg/L)	Action / Limit Level for DO (mg/L)	pH (depth-averaged)	Turbidity (NTU) (depth-averaged)	Action / Limit Level for Turbidity (NTU)	SS (mg/L) (depth-averaged)	Action / Limit Level for SS (mg/L)
O-1-C(ET)	01-Apr-11	Surface	23.67	7.43	- / -	8.29	3.24	- / -	4.68	- / -
		Middle		7.27						
		Bottom		7.26	- / -					
	04-Apr-11	Surface	19.43	7.59	- / -	8.42	1.61		6.60	
		Middle		7.56						
		Bottom		7.54	- / -					
	06-Apr-11	Surface	20.72	7.49	- / -	8.44	1.38		2.55	
		Middle		7.66						
		Bottom		7.54	- / -					
	08-Apr-11	Surface	22.50	7.38	- / -	8.40	2.09		3.03	
		Middle		7.50						
		Bottom		7.53	- / -					
	11-Apr-11	Surface	26.53	7.42	- / -	8.58	2.25		3.65	
		Middle		7.51						
		Bottom		7.64	- / -					
	13-Apr-11	Surface	22.85	7.84	- / -	8.57	1.55		4.05	
		Middle		7.61						
		Bottom		7.69	- / -					

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

Station	Date	Depth	Temperature (℃) (depth-averaged)	DO (mg/L)	Action / Limit Level for DO (mg/L)	pH (depth-averaged)	Turbidity (NTU) (depth-averaged)	Action / Limit Level for Turbidity (NTU)	SS (mg/L) (depth-averaged)	Action / Limit Level for SS (mg/L)
O-1-C(ET)	15-Apr-11	Surface	26.87	7.42	- / -	8.61	1.53	- / -	3.92	- / -
		Middle		7.52						
		Bottom		7.36	- / -					
	18-Apr-11	Surface	25.27	7.21	- / -	8.54	3.66		4.15	
		Middle		7.25						
		Bottom		7.19	- / -					
	20-Apr-11	Surface	24.57	7.25	- / -	8.37	2.36		3.57	
		Middle		7.12						
		Bottom		7.10	- / -					
	26-Apr-11	Surface	27.05	7.13	- / -	8.37	2.51		2.38	
		Middle		7.17						
		Bottom		7.25	- / -					
	28-Apr-11	Surface	27.57	7.30	- / -	8.47	2.23		2.73	
		Middle		7.22						
		Bottom		7.29	- / -					
	30-Apr-11	Surface	23.78	7.29	- / -	8.40	2.24		3.62	
		Middle		7.31						
		Bottom		7.20	- / -					

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

Table 4-9 Water Quality Monitoring Results

4.4 Summary of Project-Related Exceedances

4.4.1 Table 4-10 summarises the project-related exceedance results recorded in April 2011. 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
Air Borne Noise	20	0	0	0	0
Ground Borne Noise	2	0	0	0	0
Water	120	0	0	0	0

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

Table 4-10 Summary of Project-Related Exceedances

5 WASTE MANAGEMENT

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

Status of waste management	Quantity
Inert C&D Material Disposed of to Public Fill at Tuen Mun (m^3)	3,105.4
Inert C&D Material Reused in this Contracts (m^3)	181.0
Inert C&D Material Reused in other Contracts* (m^3)	17,946.7
Metals Generated (kg)	Nil
Paper / Cardboard Packaging (kg)	Nil
Plastics (kg)	Nil
Chemical Waste (kg)	4,341.4
General Waste Disposed of to NENT Landfill (m^3)	34.8

* Other Contracts include DC/2007/08, YL/2009/01, HY/2007/10, HY/2008/09, Wo Shang Wai, DC/2007/17, CV/2009/14, Tailor Recycle Aggregate, XRL 823A and 823B, XRL 825 and TW7.

Table 5-1 Waste Generated in April 2011

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
8 April 2011	1. Unused empty drums at man access shaft were found at Intake I-2.	1. The Contractor was reminded to remove on-site unused empty drums and disposal in proper manner.	1. Unused empty drums at man access shaft were found removed and disposal in proper manner on 9 April 2011. (Closed)
21 April 2011	1. Temporary slope was not covered by tarpaulin sheet properly at Intake I-3.	1. The Contractor was reminded to cover temporary slope by tarpaulin sheet properly.	1. Temporary slope was found covered by tarpaulin sheet properly on 21 April 2011. (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 environmental complaint was received during the reporting month. Details of the past complaint investigation and observations can be referred to Appendix K.

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

Complaints Received in the Reporting Month	Cumulative Number of Complaints
0	21

Table 7-1 Cumulative Statistics of Environmental Complaints

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 and conviction	
April 2011	Cumulative	April 2011	Cumulative
0	0	0	0

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

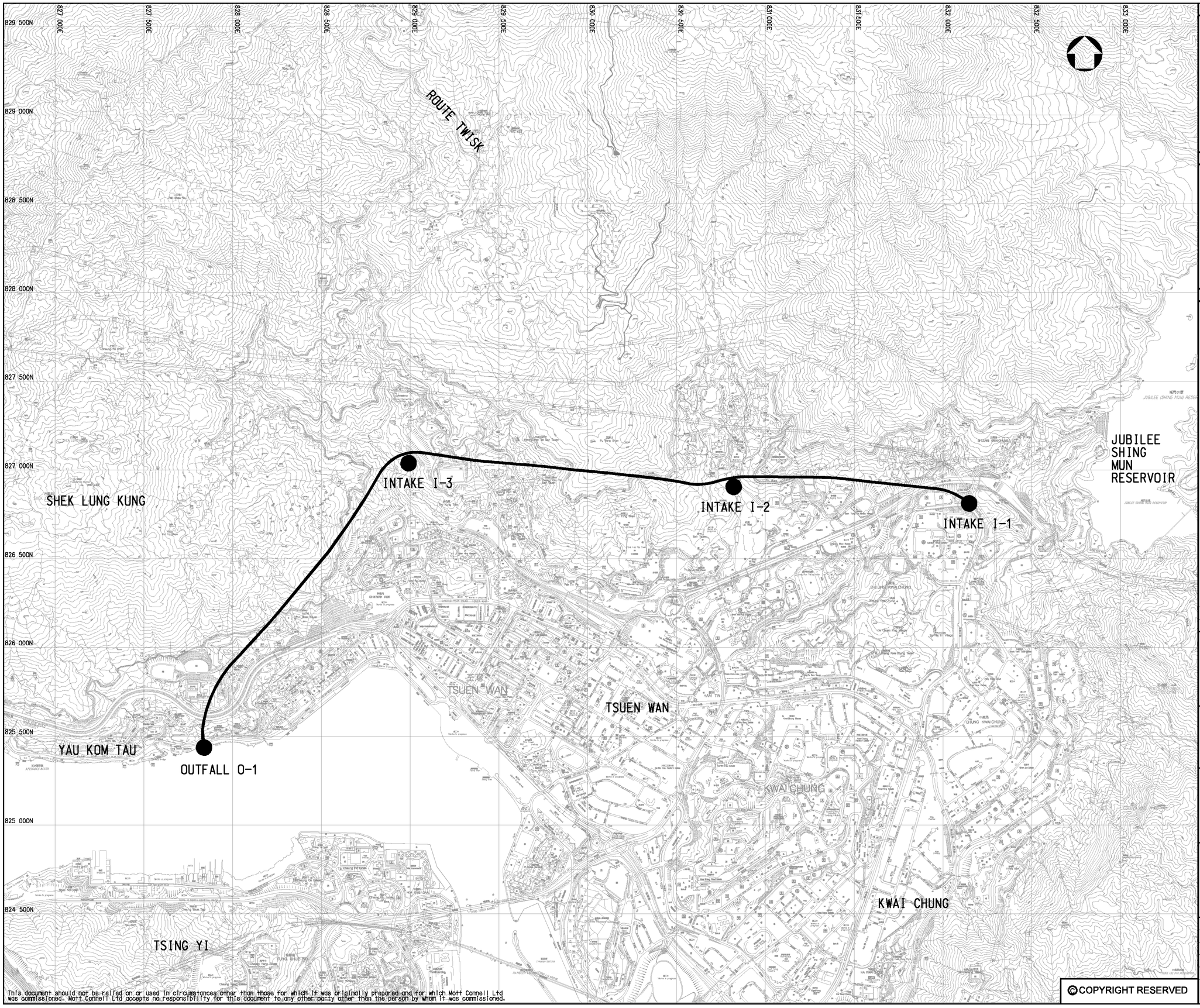
9 FUTURE KEY ISSUE

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

- Site Cleaning and tidying at Outfall, I-1, I-2 and I-3;
- TBM drilling of the tunnel and mucking out of tunnel spoil at Outfall;
- Drilling, excavation and rock splitting at spiral ramp at Outfall;
- Removal of existing retaining wall and hanging support for existing utilities at fast lane of CPR at Outfall;
- Excavation and soil nailing for box culvert construction at fast lane of CPR east bound at Outfall;
- Removal of existing sea wall and armour rocks for basin scheme at Portion E;
- Placing levelling stone and bagged concrete to formation of sea wall at Portion E;
- Installation of precast seawall blocks and panels for construction of outfall apron at Portion E;
- Drilling and excavation of vortex shaft at I-3;
- Construction of PB wall structure skin wall and copping beam and backfilling at I-3;
- Construction of approach channel at I-3;
- Construction of boulder traps at I-3;
- Drilling, excavation and rock splitting of man access shaft and vortex drop shaft at I-2;
- Pipe jacking at Portion G at I-2;
- Pre-bored H-pile construction for skin wall at Portion G at I-2;
- Construction of approach channel structure at I-2;
- Construction of 750 step channel and catchpit at Portion G at I-2;
- Cascade and channel modification concrete structure works at I-1;
- Construction of horizontal pipe pile (pipe roofing) for TBM break-through at I-1; and
- Construction of vehicular access at I-1.

Appendix A

Site Map and Works Area



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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

Rev	Date	Drawn	Description	Ch'k'd	App'd
B1	MAR 05	EL	FOR EM&A MANUAL	MT	

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
WL/Delft Hydraulics Ltd
EDAW Earth Asia Ltd
Chesterton Petty Ltd
Environmental Resources Management

Project

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

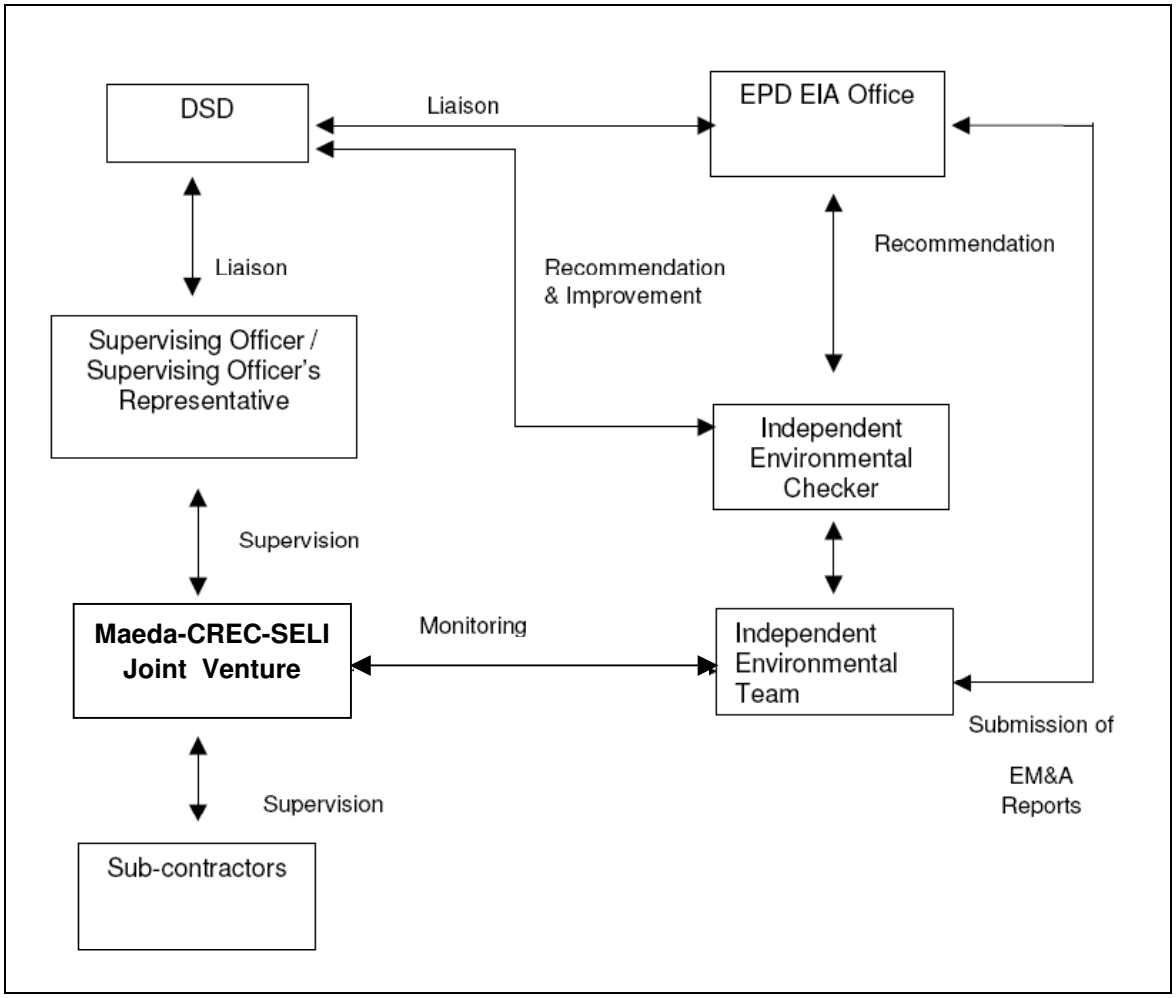
Title

TUNNEL ALIGNMENT AND SURROUNDING AREA

Designed	CF		Eng.Chk.	MT	
Drawn	HL	HL	Approved	TMC	
Dwg.Chk.	KN		Scale		
Project	204417				Status
CAD file	J:\204417\DRAWING\FIGURE EM&A MANUAL\FIGURE1.1.dgn				
Drawing No.	FIGURE 1.1				Rev 01

Appendix B

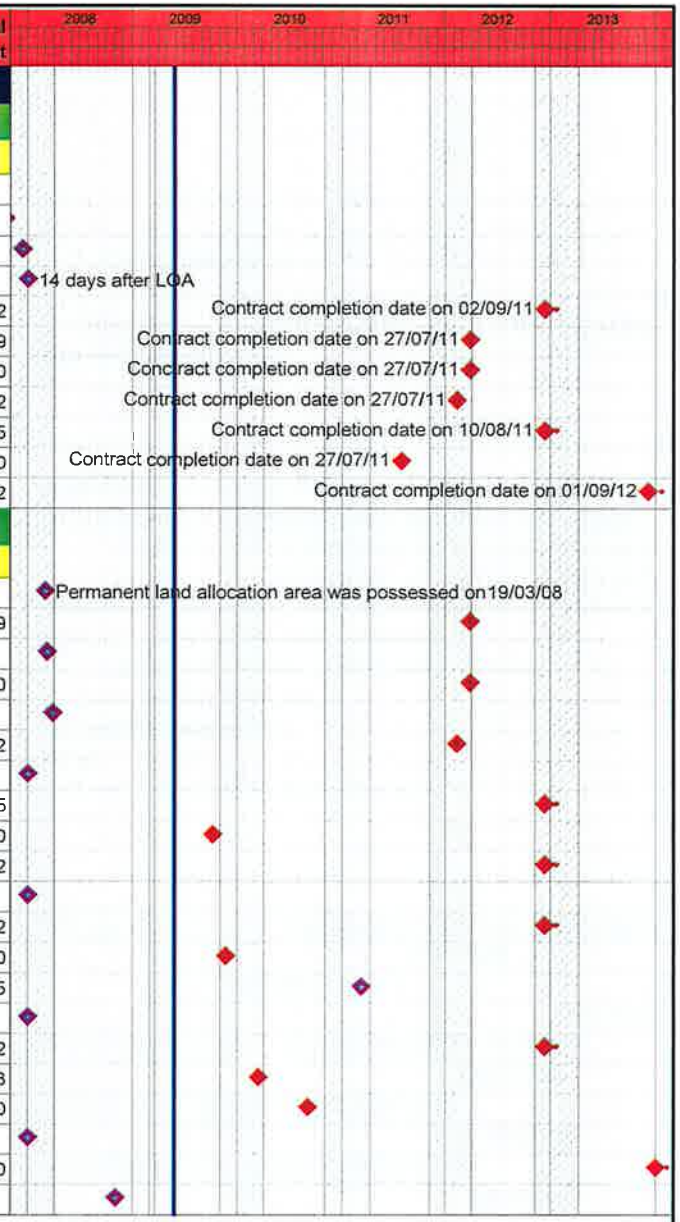
Organization Chart


DSD
Liaison
EPD EIA Office
Liaison
Recommendation
& Improvement
Recommendation
Supervising Officer /
Supervising Officer's
Representative
Independent
Environmental
Checker
Supervision
Maeda-CREC-SELI
Joint Venture
Monitoring
Independent
Environmental
Team
Submission of
EM&A
Reports
Supervision
Sub-contractors

Appendix C

Construction Programme

ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
Preliminaries									
Project Dates									
01R0000002	Tender Issue Date	0	0	26JUN07A		26JUN07A		2	
01R0000004	Tender Closing Date	0	0	05OCT07A		05OCT07A		2	
01R0000006	Letter of Acceptance Issued Date	0	0	14DEC07A		14DEC07A		2	
01R0000008	Contract Commencement Date	0	0	28DEC07A		28DEC07A		2	
01R0000010	Completion of Section 1 of the Works	0	0		07DEC12		18JAN13	2	-462
01R0000012	Completion of Section 2 of the Works	0	0		22MAR12		22MAR12	2	-239
01R0000014	Completion of Section 3 of the Works	0	0		23MAR12		23MAR12	2	-240
01R0000016	Completion of Section 4 of the Works	0	0		04FEB12		04FEB12	2	-192
01R0000018	Completion of Section 5 of the Works	0	0		07DEC12		18JAN13	2	-485
01R0000020	Completion of Section 6 of the Works	0	0		27JUL11		27JUL11	2	0
01R0000022	Completion of Section 7 of the Works	0	0		07DEC13		18JAN14	2	-462
Possession of Area									
01R00A0102	Possession Portion A - 90d of DOC	0	0	27FEB08A		27FEB08A		2	
01R00A0104	Handover of Section 1 of Works at Portion A	0	0		22MAR12		22MAR12	2	-239
01R00B0102	Possession of Portion B - 90d of DOC	0	0	07MAR08A		07MAR08A		2	
01R00B0104	Handover of Portion B	0	0		23MAR12		23MAR12	2	-240
01R00C0102	Possession of Portion C - 90d of DOC	0	0	26MAR08A		26MAR08A		2	
01R00C0104	Handover of Portion C	0	0		04FEB12		04FEB12	2	-192
01R00D0102	Possession of Portion D on DOC	0	0	28DEC07A		28DEC07A		2	
01R00D0104	Handover of Portion D	0	0		07DEC12		18JAN13	2	-485
01R00E0102	Possession of Portion E - 650d of DOC	0	0	07OCT09		07OCT09		2	0
01R00E0104	Handover of Portion E	0	0		07DEC12		18JAN13	2	-462
01R00F0102	Possession of Portion F on DOC	0	0	28DEC07A		28DEC07A		2	
01R00F0104	Handover of Portion F	0	0		07DEC12		18JAN13	2	-462
01R00G0102	Possession of Portion G - 700d of DOC	0	0	26NOV09		26NOV09		2	0
01R00G0104	Handover of Portion G	0	0		11MAR11		11MAR11	2	175
01R00I0102	Possession of Portion I on DOC	0	0	28DEC07A		28DEC07A		2	
01R00I0104	Handover of Portion I	0	0		07DEC12		18JAN13	2	-462
01R00J0102	Possession of Portion J	0	0	15MAR10		15MAR10		2	-268
01R00J0104	Handover of Portion J	0	0		03SEP10		03SEP10	2	0
01R0H10102	Possession of Portion H1 on DOC	0	0	28DEC07A		28DEC07A		2	
01R0H10104	Handover of Portion H1	0	0		30DEC13		10FEB14	2	0
01R0H20102	Possession of Portion H2 - 300d of DOC	0	0	04NOV08A		04NOV08A		2	



Start Date	29JUN07
Finish Date	30DEC13
Data Date	28MAY09
Run Date	22OCT09 10:37

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Early Bar
Target Bar
Progress Bar
Critical Activity

AD04

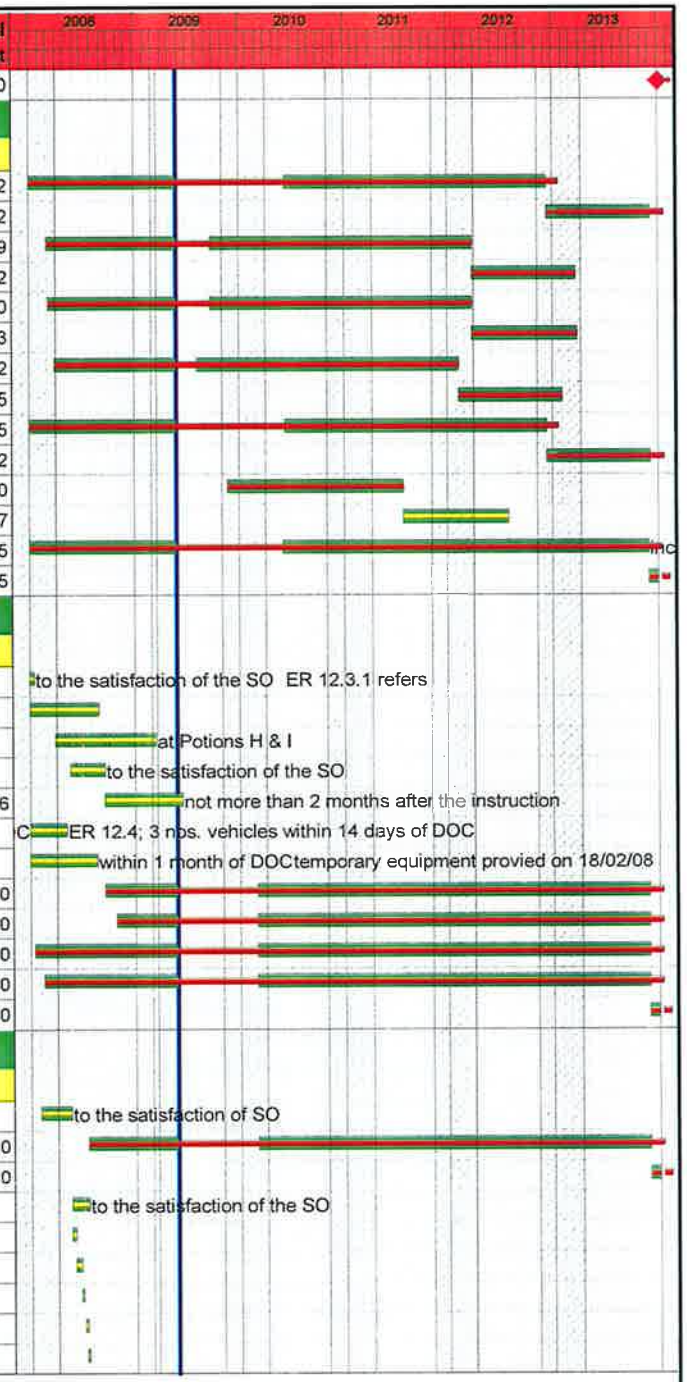
Maeda-CREC-SELI JV
CONTRACT NO. DC/2007/12
Design and Construction of
Tsuen Wan Drainage Tunnel
Addendum to Works Programme "WP04"

Sheet 1 of 58

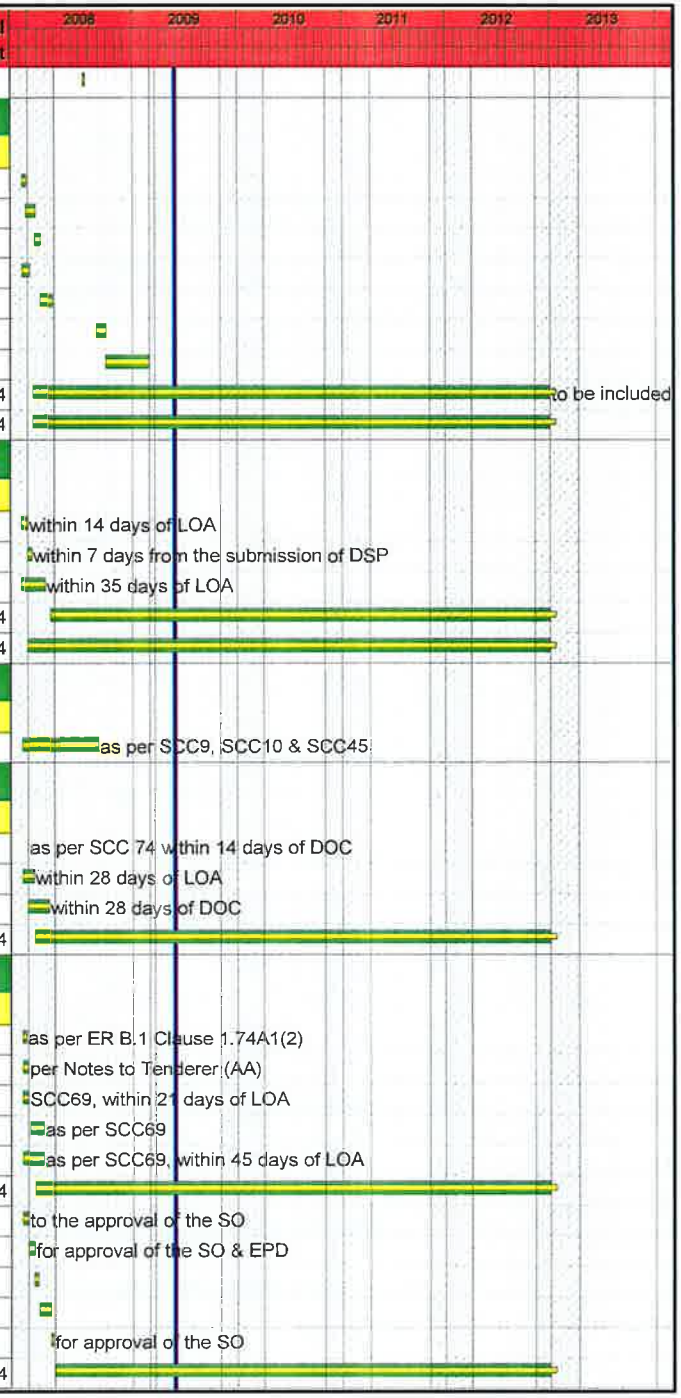
Addendum to Works Programme "WP04"

Date	Revision	Checked	Approved
22JUN09	Works Program Revision "WP02"		
10AUG09	Works Program Revision "WP3D"		
04SEP09	WP3D-TBM Halft Speed at WSD Tunnel#3		
07OCT09	WP3E		
22OCT09	WP04		

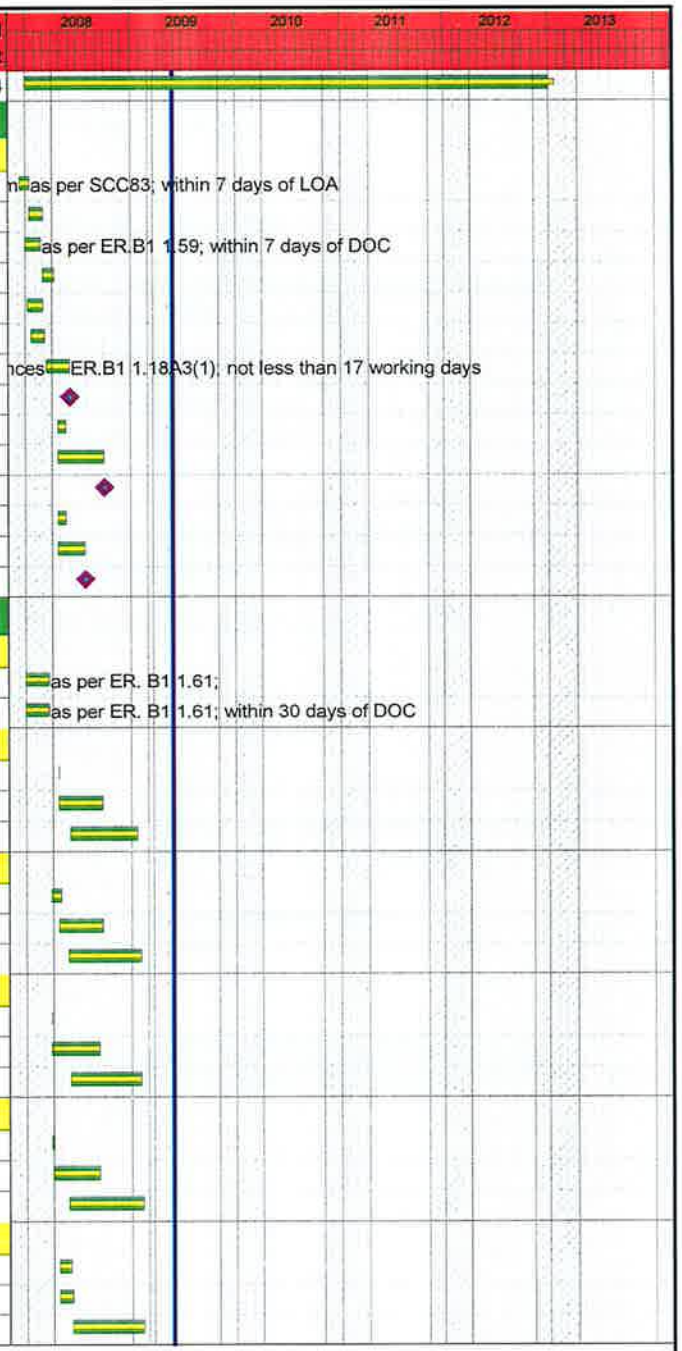
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
01R0H20104	Handover of Portion H2	0	0		30DEC13		10FEB14	2	0
Section of Works - DOP to Completion									
01R1000202	S1-Works in Portions A to F except works in S2-7	1,308	1,308	28DEC07A	07DEC12	28DEC07A	18JAN13	2	-462
01R1000204	S1-Maintenance Period (365 days)	365	365	08DEC12	07DEC13	19JAN13	18JAN14	2	-462
01R20A0206	S2-Slope Stabilization works within Portion A	1,247	1,247	27FEB08A	22MAR12	27FEB08A	22MAR12	2	-239
01R20A0208	S2-Maintenance Period (365 days)	365	365	23MAR12	22MAR13	23MAR12	22MAR13	2	-202
01R30B0210	S3-Slope Stabilization works within Portion B	1,238	1,238	07MAR08A	23MAR12	07MAR08A	23MAR12	2	-240
01R30B0212	S3-Maintenance Period (365 days)	365	365	24MAR12	23MAR13	24MAR12	23MAR13	2	-203
01R40C0214	S4-Slope Stabilization works within Portion C	1,219	1,219	26MAR08A	04FEB12	26MAR08A	04FEB12	2	-192
01R40C0216	S4-Maintenance Period (365 days)	365	365	05FEB12	03FEB13	05FEB12	03FEB13	2	-155
01R50D0218	S5-Slope Stabilization works within Portion D	1,308	1,308	28DEC07A	07DEC12	28DEC07A	18JAN13	2	-485
01R50D0220	S5-Maintenance Period (365 days)	365	365	08DEC12	07DEC13	19JAN13	18JAN14	2	-462
01R60G0222	S6-Works within Portion G	609	609	26NOV09	27JUL11	26NOV09	27JUL11	2	0
01R60G0224	S6-Maintenance Period (365 days)	365	365	28JUL11	26JUL12	28JUL11	26JUL12	2	37
01R7000226	S7-Ladscape softworks & establishment works	1,673	1,673	28DEC07A	30NOV13	28DEC07A	11JAN14	2	-455
01R7000228	S7-Maintenance Period (30 days)	30	30	01DEC13	30DEC13	12JAN14	10FEB14	2	-455
Facilities for the SO as per ER 12									
01R0000302	Provide temporary accommodation	7	7	28DEC07A	15JAN08A	28DEC07A	15JAN08A	2	
01R0000304	Design the SO's principle office	95	95	28DEC07A	28AUG08A	28DEC07A	28AUG08A	2	
01R0000305	Erect Hoarding/Signboard/Gate/Fencing	35	35	28MAR08A	16MAR09A	28MAR08A	16MAR09A	1	
01R0000306	Erect SO's principle office in Portion H1/H2	100	100	19MAY08A	13SEP08A	19MAY08A	13SEP08A	1	
01R0000308	Provide secondary offices, directed by SO	64	64	14SEP08A	13JUN09	14SEP08A	13JUN09	2	276
01R0000310	Provide transport for the SO as per App. ER,M	90	90	28DEC07A	02MAY08A	28DEC07A	02MAY08A	2	
01R0000311	Provide survey equipments as per App. ER,M	30	30	28DEC07A	19AUG08A	28DEC07A	19AUG08A	2	
01R0000314	Maintain & Service the Principle Office	1,539	1,539	14SEP08A	30NOV13	14SEP08A	11JAN14	2	0
01R0000316	Maintain & Service the Secondary Office	1,495	1,495	28OCT08A	30NOV13	28OCT08A	11JAN14	2	0
01R0000318	Maintain & Service the transportation	1,785	1,785	12JAN08A	30NOV13	12JAN08A	11JAN14	2	0
01R0000319	Maintain & Service the survey equipments	1,748	1,748	18FEB08A	30NOV13	18FEB08A	11JAN14	2	0
01R0000372	Demolish & removal of Principle Office	30	30	01DEC13	30DEC13	12JAN14	10FEB14	2	0
Contractor's Accommodation as per ER.B									
01R0001402	Design Contractor's main office	30	30	01FEB08A	19MAY08A	01FEB08A	19MAY08A	2	
01R0001406	Maintain & service Contractor's office	1,597	1,597	18JUL08A	30NOV13	18JUL08A	11JAN14	2	0
01R0001408	Demolish & removal of Contractor's main office	30	30	01DEC13	30DEC13	12JAN14	10FEB14	2	0
01R000141	Erect Contractor's main office in Portion H1	50*	50*	19MAY08A	17JUL08A	19MAY08A	17JUL08A	1	
01R0001412	Construct base slab	10	10	19MAY08A	30MAY08A	19MAY08A	30MAY08A	1	
01R0001413	Install steel frames	12	12	31MAY08A	21JUN08A	31MAY08A	21JUN08A	1	
01R0001414	Install wall/roof panels, windows etc	6	6	23JUN08A	30JUN08A	23JUN08A	30JUN08A	1	
01R0001415	Install & E& M/ceiling/floor panels	8	8	02JUL08A	12JUL08A	02JUL08A	12JUL08A	1	
01R0001416	Site clearance	1	1	14JUL08A	17JUL08A	14JUL08A	17JUL08A	1	



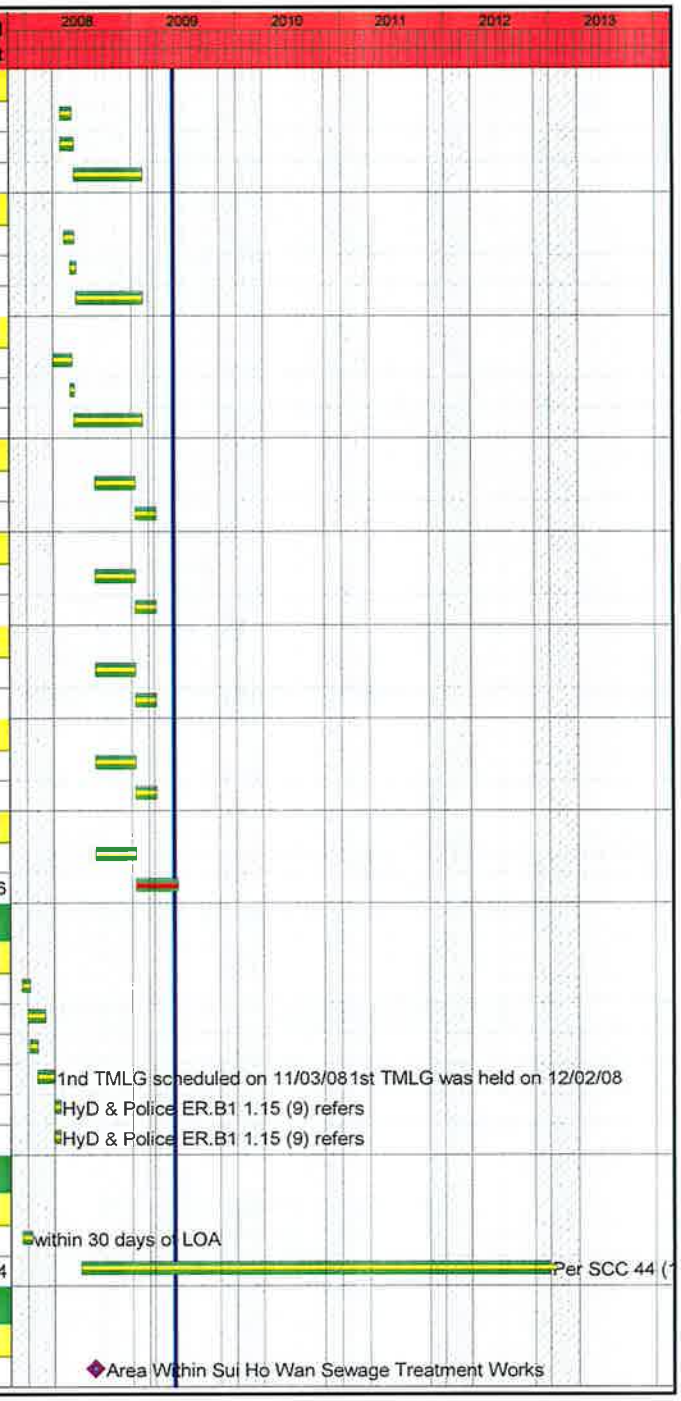
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
01R0001417	Install furnitures/internet & move in	2	2	14JUL08A	17JUL08A	14JUL08A	17JUL08A	1	
Works Programme & Monthly Report as per SCC 27									
01R0000502	Prepare/Submit draft Works Programme	7	7	14DEC07A	21DEC07A	14DEC07A	21DEC07A	2	
01R0000504	SO's review/comment on draft Works Programme	14	14	22DEC07A	23JAN08A	22DEC07A	23JAN08A	2	
01R0000505	Prepare/Submit draft Works Programme Rev. 1	28	28	24JAN08A	15FEB08A	24JAN08A	15FEB08A	2	
01R0000506	Prepare/Submit 1st 3-Month Rolling Programme	14	14	14DEC07A	03JAN08A	14DEC07A	03JAN08A	2	
01R0000507	SO's approval on draft Works Programme	14	14	16FEB08A	28MAR08A	16FEB08A	28MAR08A	2	
01R0000508	Submit Revised Works Programme	14	14	28AUG08A	30SEP08A	28AUG08A	30SEP08A	2	
01R0000510	SO's Approval of Revised Works Programme	14	14	02OCT08A	28FEB09A	02OCT08A	28FEB09A	2	
01R0000512	Monthly Update for all Programme	1,779	1,779	18JAN08A	31DEC12	18JAN08A	18JAN13	2	364
01R0000514	Contractor's Monthly Progress Report	1,775	1,775	22JAN08A	31DEC12	22JAN08A	18JAN13	2	364
Safety Plan as per SCC 35									
01R0000602	Submit draft Safety Plan	14	14	14DEC07A	29DEC07A	14DEC07A	29DEC07A	2	
01R0000604	Hold an ad hoc meeting with RE on Safety Plan	7	7	31DEC07A	09JAN08A	31DEC07A	09JAN08A	2	
01R0000606	Submit 6 copies of the Safety Plan	35	35	14DEC07A	26FEB08A	14DEC07A	26FEB08A	2	
01R0000608	Submit updated safety orgainiza. chart monthly	1,747	1,747	20MAR08A	31DEC12	20MAR08A	18JAN13	2	364
17R0000602	Fulfill all relevant safety obligation	1,830	1,830	28DEC07A	31DEC12	28DEC07A	18JAN13	2	364
Contractor's All Insurances									
01R0000704	Submit documents for all insurances are effected	21	21	14DEC07A	02SEP08A	14DEC07A	02SEP08A	2	
Quality System as per ER 9.3									
01R0000802	Appoint a Quality Manager	14	14	28DEC07A	02JAN08A	28DEC07A	02JAN08A	2	
01R0000804	Submit proposed Quality System for SO's consent	28	28	14DEC07A	22JAN08A	14DEC07A	22JAN08A	2	
01R0000806	Submit QSSP for approval of the SO	28	28	28DEC07A	14MAR08A	28DEC07A	14MAR08A	2	
01R0000808	Maintain & update Quality System	1,802	1,802	25JAN08A	31DEC12	25JAN08A	18JAN13	2	364
Environment									
01R0000902	Nominate Environmental Officer	14	14	14DEC07A	21DEC07A	14DEC07A	21DEC07A	2	
01R0000903	Establish a billing account for disposal	21	21	14DEC07A	02JAN08A	14DEC07A	02JAN08A	2	
01R0000904	Submit draft EMP	21	21	14DEC07A	02JAN08A	14DEC07A	02JAN08A	2	
01R0000906	Revise draft EMP within 7 days of SO's notice	14	14	04JAN08A	21FEB08A	04JAN08A	21FEB08A	2	
01R0000908	Submit final version of EMP	45	45	14DEC07A	21FEB08A	14DEC07A	21FEB08A	2	
01R0000910	Review/update/submit EMP monthly	1,769	1,769	28JAN08A	31DEC12	28JAN08A	18JAN13	2	364
01R0000912	Employ IET	21	21	14DEC07A	02JAN08A	14DEC07A	02JAN08A	2	
01R0000914	Submit Baseline Monitoring Plan	21	21	28DEC07A	18JAN08A	28DEC07A	18JAN08A	2	
01R0000915	Seek for EPD's Agreement on WQML & schedule	21	21	18JAN08A	31JAN08A	18JAN08A	31JAN08A	2	
01R0000916	Carry out baseline monitoring	37	37	11FEB08A	20MAR08A	11FEB08A	20MAR08A	2	
01R0000918	Prepare/submit reports for baseline monitoring	20	20	21MAR08A	28MAR08A	21MAR08A	28MAR08A	2	
01R0000920	Impact monitoring & reporting	1,705	1,705	01APR08A	31DEC12	01APR08A	18JAN13	2	364



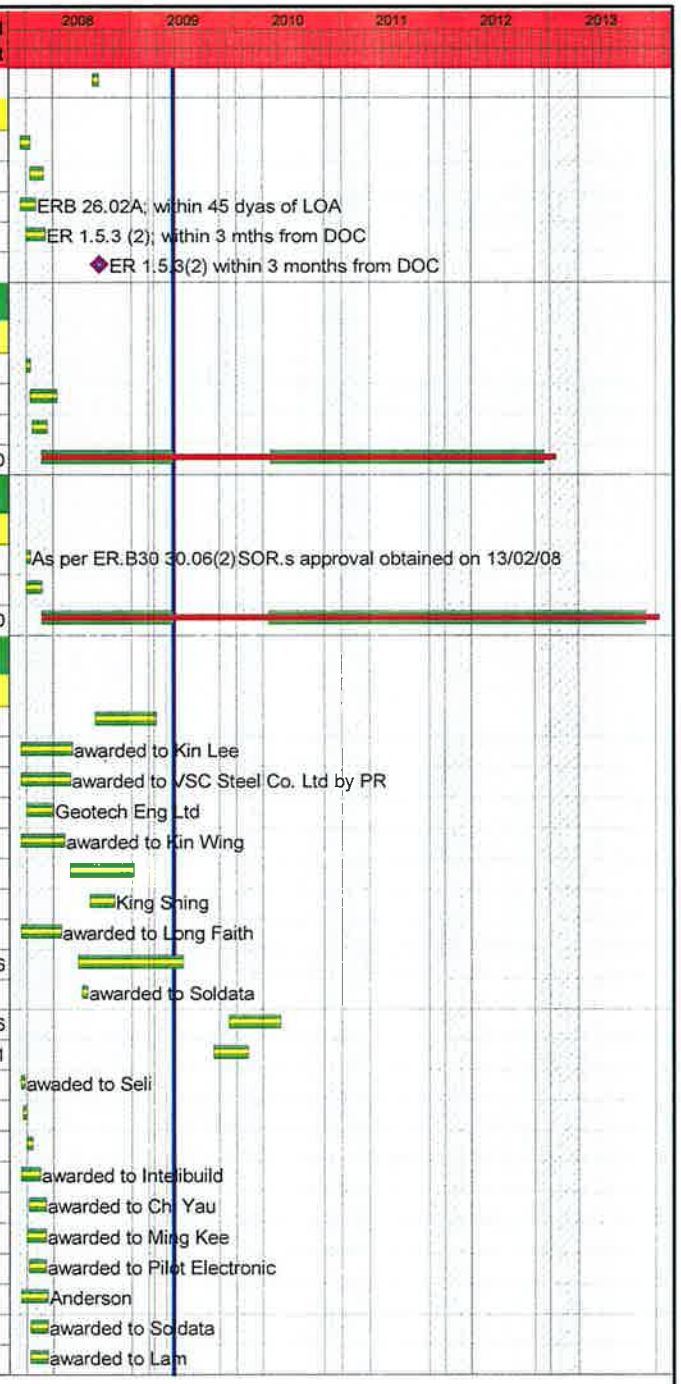
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
17R0000902	Fulfill all relevant environmental obligation	1,800	1,800	28DEC07A	31DEC12	28DEC07A	18JAN13	2	364
Excavation Permit/Utilities per SCC 54 & SCC 83									
01R0001002	Nominate IIUMS co-ordinator	7	7	14DEC07A	15JAN08A	14DEC07A	15JAN08A	2	
01R0001004	SO approve IIUMS co-ordinator	14	14	16JAN08A	29FEB08A	16JAN08A	29FEB08A	2	
01R0001006	Submit brand name of UGS detection equipment	7	7	28DEC07A	18FEB08A	28DEC07A	18FEB08A	2	
01R0001008	Utilities detection & report to the SO	21	21	29FEB08A	05APR08A	29FEB08A	05APR08A	2	
01R0001010	Liaison with UUs	21	21	04JAN08A	29FEB08A	04JAN08A	29FEB08A	2	
01R0001012	Apply XP for site entrance construction	7	7	21JAN08A	08MAR08A	21JAN08A	08MAR08A	2	
01R0001014	HyD process XP for site entrance construction	20	20	10MAR08A	28MAY08A	10MAR08A	28MAY08A	2	
01R0001016	HyD issue XP for site entrance construction	0	0		28MAY08A		28MAY08A	2	
01R0001018	Apply XP for GI works at I-1 & I-2	1	1	22APR08A	20MAY08A	22APR08A	20MAY08A	2	
01R0001020	HyD process XP for GI works at I-1 & I-2	30	30	23APR08A	26SEP08A	23APR08A	26SEP08A	2	
01R0001022	HyD issue XP for GI works at I-1 & I-2	0	0		26SEP08A		26SEP08A	1	
01R0001024	Apply XP for trial grout at Fault F1	1	1	22APR08A	20MAY08A	22APR08A	20MAY08A	2	
01R0001026	HyD process XP for trial grout at Fault F1	30	30	23APR08A	22JUL08A	23APR08A	22JUL08A	2	
01R0001028	HyD issue XP for trial grout at Fault F1	0	0		22JUL08A		22JUL08A	1	
Pre-construction Condition Survey									
Preliminaries									
01R0001102	Appoint a Qualified Structural Engineer	30	30	28DEC07A	19MAR08A	28DEC07A	19MAR08A	2	
01R0001104	Submit nos. & extent of the affected EBS	30	30	28DEC07A	19MAR08A	28DEC07A	19MAR08A	2	
PCS Stage 1 between I-1 & I-2									
01R0001118	Carry out stg 1 PCS between I-1 & I-2	6	6	22APR08A	23APR08A	22APR08A	23APR08A	2	
01R0001120	Prepare/submit reports for stg 1 PCS bet I-1&I-2	60	60	24APR08A	22SEP08A	24APR08A	22SEP08A	2	
01R0001122	Review/accept reports for stg 1 PCS bet I-1&I-2	60	60	31MAY08A	20JAN09A	31MAY08A	20JAN09A	2	
PCS Stage 1 between I-2 & I-3									
01R0001130	Carry out stg 1 PCS between I-2 & I-3	5	5	25MAR08A	30APR08A	25MAR08A	30APR08A	2	
01R0001132	Prepare/submit reports for stg 1 PCS bet I-2&I-3	60	60	24APR08A	22SEP08A	24APR08A	22SEP08A	2	
01R0001134	Review/accept reports for stg 1 PCS bet I-2&I-3	60	60	24MAY08A	04FEB09A	24MAY08A	04FEB09A	2	
PCS Stage 1 between I-3 & O-1									
01R0001142	Carry out stg 1 PCS between I-3 & O-1	5	5	25MAR08A	26MAR08A	25MAR08A	26MAR08A	2	
01R0001144	Prepare/submit reports for stg 1 PCS bet I-3&O-1	60	60	26MAR08A	11SEP08A	26MAR08A	11SEP08A	2	
01R0001146	Review/accept reports for stg 1 PCS bet I-3&O-1	60	60	31MAY08A	04FEB09A	31MAY08A	04FEB09A	2	
PCS Stage 1 at vicinity of O-1									
01R0001106	Carry out stg 1 PCS at vicinity of O-1	5	5	25MAR08A	29MAR08A	25MAR08A	29MAR08A	2	
01R0001108	Prepare/submit reports for stg 1 PCS at O-1	60	60	31MAR08A	10SEP08A	31MAR08A	10SEP08A	2	
01R0001110	Review/accept reports for stg 1 PCS at O-1	60	60	27MAY08A	09FEB09A	27MAY08A	09FEB09A	2	
PCS Stage 2 between I-1 & I-2									
01R0001124	Carry out stg 2 PCS between I-1 & I-2	5	5	22APR08A	02JUN08A	22APR08A	02JUN08A	2	
01R0001126	Prepare/submit reports for stg 2 PCS bet I-1&I-2	60	60	24APR08A	10JUN08A	24APR08A	10JUN08A	2	
01R0001128	Review/accept reports for stg 2 PCS bet I-1&I-2	60	60	11JUN08A	09FEB09A	11JUN08A	09FEB09A	2	



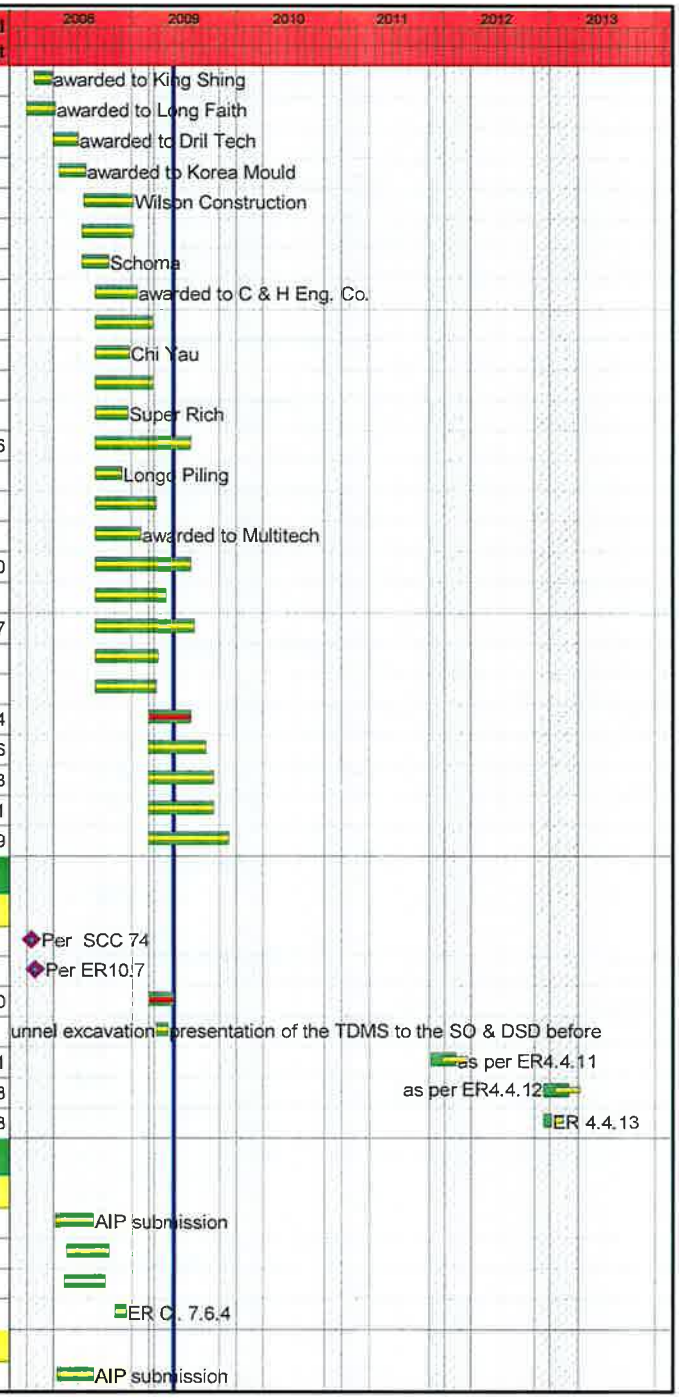
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
PCS Stage 2 between I-2 & I-3									
01R0001136	Carry out stg 2 PCS between I-2 & I-3	5	5	30APR08A	07JUN08A	30APR08A	07JUN08A	2	
01R0001138	Prepare/submit reports for stg 2 PCS bet I-2&I-3	60	60	02MAY08A	12JUN08A	02MAY08A	12JUN08A	2	
01R0001140	Review/accept reports for stg 2 PCS bet I-2&I-3	60	60	13JUN08A	09FEB09A	13JUN08A	09FEB09A	2	
PCS Stage 2 between I-3 & O-1									
01R0001148	Carry out stg 2 PCS between I-3 & O-1	5	5	09MAY08A	13JUN08A	09MAY08A	13JUN08A	2	
01R0001150	Prepare/submit reports for stg 2 PCS bet I-3&O-1	60	60	04JUN08A	18JUN08A	04JUN08A	18JUN08A	2	
01R0001152	Review/accept reports for stg 2 PCS bet I-3&O-1	60	60	19JUN08A	09FEB09A	19JUN08A	09FEB09A	2	
PCS Stage 2 at Vicinity of O-1									
01R0001112	Carry out stg 2 PCS at vicinity of O-1	12	12	01APR08A	06JUN08A	01APR08A	06JUN08A	2	
01R0001114	Prepare/submit reports for stg 2 PCS at O-1	60	60	02JUN08A	16JUN08A	02JUN08A	16JUN08A	2	
01R0001116	Review/accept reports for stg 2 PCS at O-1	60	60	17JUN08A	09FEB09A	17JUN08A	09FEB09A	2	
Pre-const. condition structural survey; I-1									
01R0001154	Prepare/submit reports for EBS at I-1	28	28	28AUG08A	10JAN09A	28AUG08A	10JAN09A	2	
01R0001156	Review/accept reports for EBS at I-1	28	28	12JAN09A	24MAR09A	12JAN09A	24MAR09A	2	
Pre-const. condition structural survey; I-2									
01R0001158	Prepare/submit reports for EBS at I-2	28	28	28AUG08A	10JAN09A	28AUG08A	10JAN09A	2	
01R0001160	Review/accept reports for EBS at I-2	28	28	12JAN09A	24MAR09A	12JAN09A	24MAR09A	2	
Pre-const. condition structural survey; I-3									
01R0001162	Prepare/submit reports for EBS at I-3	28	28	28AUG08A	10JAN09A	28AUG08A	10JAN09A	2	
01R0001164	Review/accept reports for EBS at I-3	28	28	12JAN09A	24MAR09A	12JAN09A	24MAR09A	2	
Pre-const. condition structural survey; O-1									
01R0001166	Prepare/submit reports for EBS at O-1	28	28	28AUG08A	10JAN09A	28AUG08A	10JAN09A	2	
01R0001168	Review/accept reports for EBS at O-1	28	28	12JAN09A	24MAR09A	12JAN09A	24MAR09A	2	
Pre-const. condition structural survey; Tunnel									
01R0001170	Prepare/submit reports for EBS along Tunnel alig	28	28	28AUG08A	15JAN09A	28AUG08A	15JAN09A	2	
01R0001172	Review/accept reports for EBS along Tunnel align	28	28	16JAN09A	10JUN09	16JAN09A	10JUN09	2	-16
Traffic									
01R0001202	Appoint Traffic Consultant/Traffic Engineer	14	14	14DEC07A	03JAN08A	14DEC07A	03JAN08A	2	
01R0001204	Eng's Approval of Traffic Consultant	7	7	28DEC07A	28FEB08A	28DEC07A	28FEB08A	2	
01R0001206	Prepare/submit TTA Schemes (ingress & egress)	14	14	04JAN08A	31JAN08A	04JAN08A	31JAN08A	2	
01R0001216	Obtain endorsement of TTA schemes from TMLG	21	21	01FEB08A	01APR08A	01FEB08A	01APR08A	2	
01R0001234	Approval of TTA schemes by the Authorities	14	14	02APR08A	19APR08A	02APR08A	19APR08A	2	
01R0001236	Approval of TTA schemes by the Authorities	14	14	02APR08A	19APR08A	02APR08A	19APR08A	2	
Management of Sub-contractors as per SCC 44									
01R0001302	Submit a Sub-contractor Management Plan	30	30	14DEC07A	12JAN08A	14DEC07A	12JAN08A	2	
01R0001304	Submit Quarterly the Updated SMP	1,642	1,642	03JUL08A	31DEC12	03JUL08A	18JAN13	2	364
Trees									
Siu Ho Wan as a New Tree Transplanting Area									
VO028-02	Receive VO28 for new tree transplanting area	0	0		16AUG08A		16AUG08A	1	



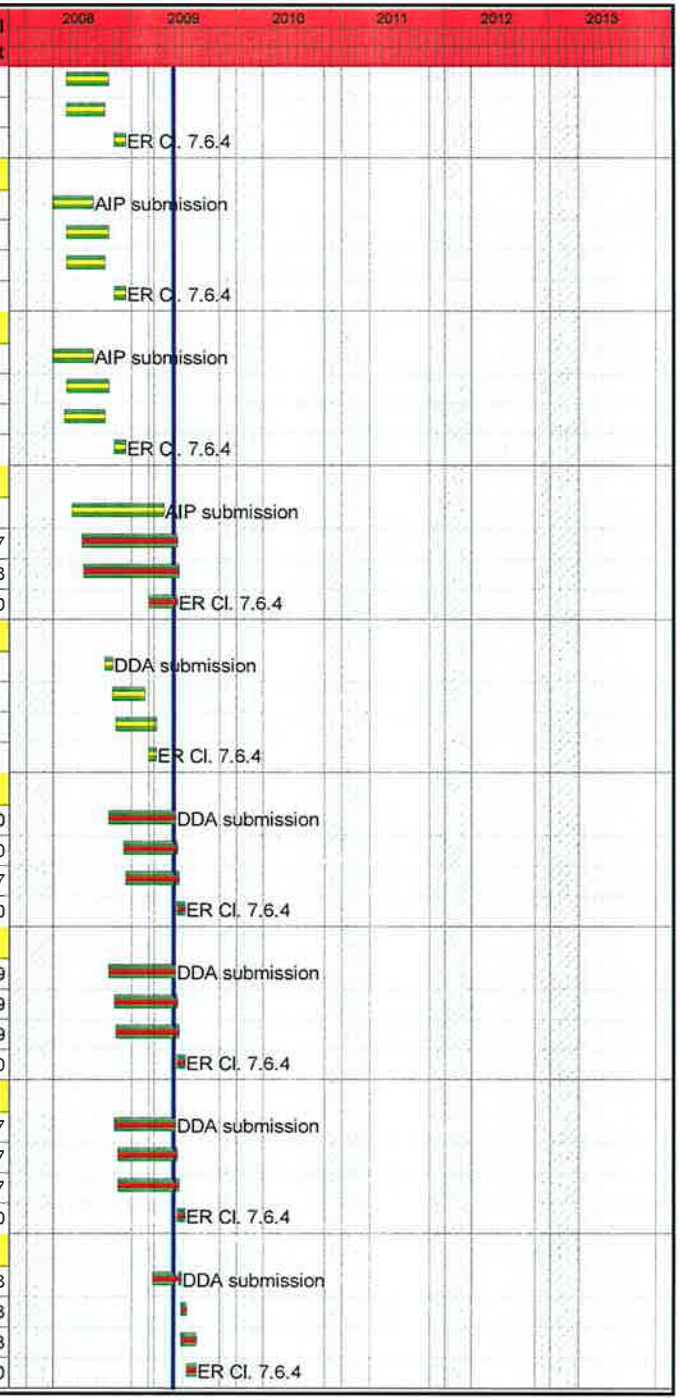
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
VO028-04	Preparation works for new T.T. area	20	20	18AUG08A	07SEP08A	18AUG08A	07SEP08A	2	
01R0001502	Appoint Landscape Specialist Contractor	14	14	14DEC07A	14JAN08A	14DEC07A	14JAN08A	2	
01R0001504	SO's Approval of Landscape Contractor	7	7	15JAN08A	28FEB08A	15JAN08A	28FEB08A	2	
01R0001506	Nominate competent person to oversee tree works	45	45	14DEC07A	29JAN08A	14DEC07A	29JAN08A	2	
01R0001510	Obtain Tree Removal Permit by Others	90	90	28DEC07A	06MAR08A	28DEC07A	06MAR08A	2	
01R0001512	Remove / Transplant Trees start	0	0	08SEP08A		08SEP08A		2	
Survey									
01R0001602	Appoint Surveyors	14	14	28DEC07A	10JAN08A	28DEC07A	10JAN08A	2	
01R0001604	SO's Approval of Surveyor	7	7	11JAN08A	16APR08A	11JAN08A	16APR08A	2	
01R0001608	Initial Survey	28	28	18JAN08A	10MAR08A	18JAN08A	10MAR08A	1	
01R0001610	Maintain & carry out survey works	1,378	1,378	23FEB08A	07DEC12	23FEB08A	18JAN13	2	0
Smart Card System as per ER B.30									
01R0001802	Submit Smart Card Sys for SO's Approval	7	7	28DEC07A	15JAN08A	28DEC07A	15JAN08A	2	
01R0001804	Install & start Operating Smart-Card System	60	60	28DEC07A	23FEB08A	28DEC07A	23FEB08A	2	
01R0001806	Operate & Maintain Smart-Card System	1,771	1,771	25FEB08A	30NOV13	25FEB08A	11JAN14	2	0
Procurement of Sub-contractor									
01R0001904	Spoil Disposal	60	60	28AUG08A	27MAR09A	28AUG08A	27MAR09A	2	
01R0001906	Earthwork for Outfall O-1	60	60	14DEC07A	05JUN08A	14DEC07A	05JUN08A	2	
01R0001910	Re-bar Supply	90	90	14DEC07A	30MAY08A	14DEC07A	30MAY08A	2	
01R0001912	Soil Nailing	60	60	28DEC07A	02APR08A	28DEC07A	02APR08A	2	
01R0001914	H-piling Works	90	90	14DEC07A	09MAY08A	14DEC07A	09MAY08A	2	
01R0001916	Fabrication of Pre-cast Lining	80	80	02JUN08A	05JAN09A	02JUN08A	05JAN09A	2	
01R0001920	Drainage/Road Works for Access Road at I-3	60	60	08AUG08A	03NOV08A	08AUG08A	03NOV08A	2	
01R0001922	Temp. steel decking over Shing Mun Nullah at I-1	90	90	14DEC07A	25APR08A	14DEC07A	25APR08A	2	
01R0001924	Design/Install Communication System	344	344	28JUN08A	26JUN09	28JUN08A	26JUN09	2	356
01R0001925	Design/install Flow Monitoring Devices	78	78	14JUL08A	01AUG08A	14JUL08A	01AUG08A	2	
01R0001936	Procurement & delivery of Communication System	180	180	06DEC09	03JUN10	06DEC09	03JUN10	2	356
01R0001938	Procurement/delivery of Flow Measurement Devices	120	120	11OCT09	07FEB10	11OCT09	07FEB10	2	501
01R0018A02	Supply TBM/Main Tunnel Construction	7	7	14DEC07A	21DEC07A	14DEC07A	21DEC07A	2	
01R0018A04	Security	17	17	17DEC07A	02JAN08A	17DEC07A	02JAN08A	2	
01R0018A06	Progress Photo/Vedio	25	25	29DEC07A	22JAN08A	29DEC07A	22JAN08A	2	
01R0018A08	Webpage/Physical Model/3D Animation	48	48	14DEC07A	14FEB08A	14DEC07A	14FEB08A	2	
01R0018A10	Hoarding/Fencing Erection	60	60	04JAN08A	03MAR08A	04JAN08A	03MAR08A	2	
01R0018A12	Erection of Contractor's Office	67	67	28DEC07A	03MAR08A	28DEC07A	03MAR08A	2	
01R0018A14	Remote Control CCTV	60	60	04JAN08A	03MAR08A	04JAN08A	03MAR08A	2	
01R0018A16	Concrete Supply	45	45	14DEC07A	11MAR08A	14DEC07A	11MAR08A	2	
01R0018A18	Geotechnical Instrumentation	60	60	15JAN08A	14MAR08A	15JAN08A	14MAR08A	2	
01R0018A20	Drilling/Grouting for Geotchnical Instrumentat.	60	60	16JAN08A	15MAR08A	16JAN08A	15MAR08A	2	



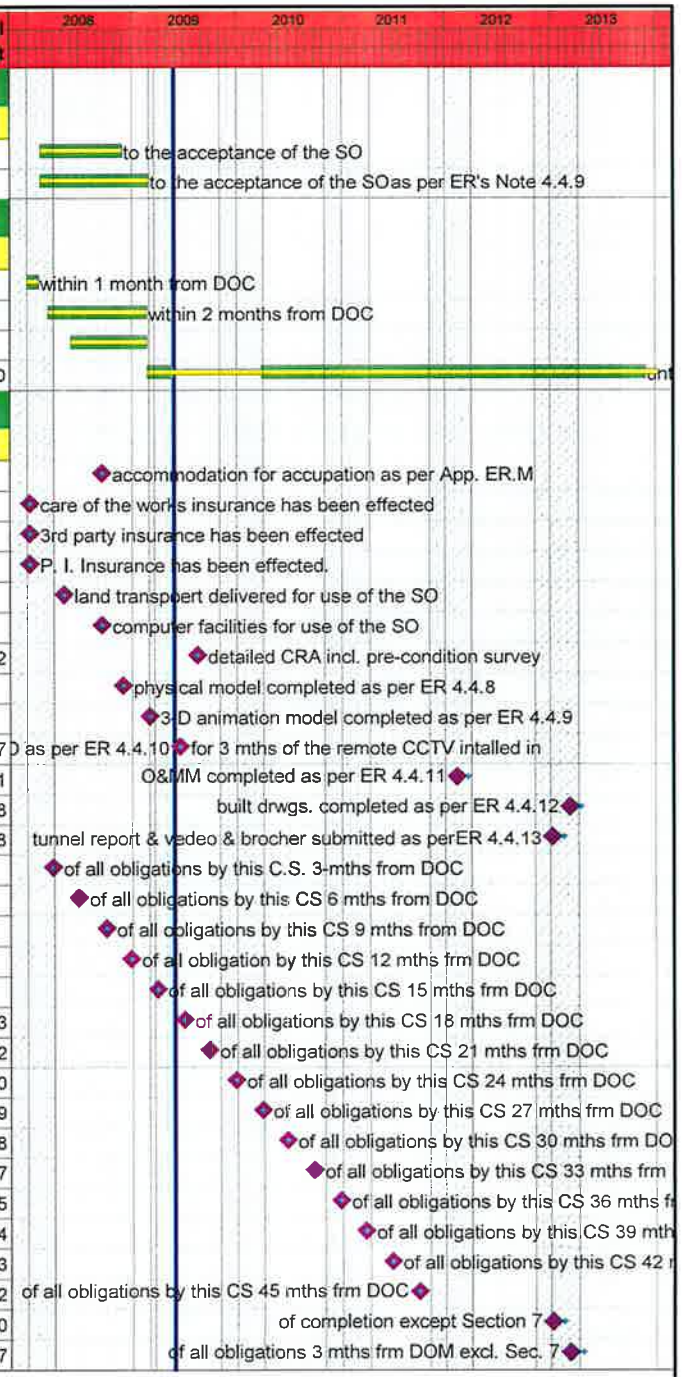
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
01R0018A22	Site Clearance	60	60	26JAN08A	25MAR08A	26JAN08A	25MAR08A	2	
01R0018A24	Erection of SOR's Office	95	95	02JAN08A	05APR08A	02JAN08A	05APR08A	2	
01R0018A26	Carry out Grout Trial at Fault F1	90	90	02APR08A	30JUN08A	02APR08A	30JUN08A	2	
01R0018A28	Design/Fabricate Segmental Lining Mould	90	90	23APR08A	21JUL08A	23APR08A	21JUL08A	2	
01R0018A30	Construction of Skin Walls	90	90	21JUL08A	03JAN09A	21JUL08A	03JAN09A	2	
01R0018A32	Design/Fabricate/Supply/Install Conveyor Belt	90	90	14JUL08A	05JAN09A	14JUL08A	05JAN09A	2	
01R0018A34	Supply of Locomotive	90	90	14JUL08A	10OCT08A	14JUL08A	10OCT08A	2	
01R0018A36	Excavation Works at I-1	60	60	28AUG08A	21JAN09A	28AUG08A	21JAN09A	2	
01R0018A38	Construction of Steel Platform at O-1	50	50	28AUG08A	14MAR09A	28AUG08A	14MAR09A	2	
01R0018A40	Construction of Steel Platform at I-2	50	50	28AUG08A	27DEC08A	28AUG08A	27DEC08A	2	
01R0018A42	Pre-excavation Grouting for Shaft Excavation	60	60	28AUG08A	11MAR09A	28AUG08A	11MAR09A	2	
01R0018A46	Excavation/Construction of TBM Launching Chamber	70	70	28AUG08A	18DEC08A	28AUG08A	18DEC08A	2	
01R0018A48	Construction of Subgrade Structure at I-1	333	333	28AUG08A	26JUL09	28AUG08A	26JUL09	2	186
01R0018A50	Shaft Excavation by RCD at I-2	90	90	28AUG08A	26NOV08A	28AUG08A	26NOV08A	2	
01R0018A52	Excavation/Construction of Shafts/Adits/Chambers	90	90	28AUG08A	26MAR09A	28AUG08A	26MAR09A	2	
01R0018A54	Construction of Hopper at O-1	90	90	28AUG08A	31JAN09A	28AUG08A	31JAN09A	2	
01R0018A56	Suttering of Spiral Ramp	233	233	28AUG08A	26JUL09	28AUG08A	26JUL09	2	200
01R0018A58	Open Cut Excavation & Construction at I-3	90	90	28AUG08A	02MAY09A	28AUG08A	02MAY09A	2	
01R0018A60	Lining Formworks for Underground Structures	233	233	28AUG08A	05AUG09	28AUG08A	05AUG09	2	137
01R0018A61	Tunnel Data Management System (TDMS)	90	90	28AUG08A	03APR09A	28AUG08A	03APR09A	2	
01R0018A62	Supply of Rail Track	90	90	28AUG08A	26MAR09A	28AUG08A	26MAR09A	2	
01R0018A64	Supply of Aggregate	120	120	28FEB09A	28JUL09	28FEB09A	28JUL09	2	-64
01R0018A68	Construct Box Culvert/Cascade/Spiral Ramp at O-1	200	200	28FEB09A	16SEP09	28FEB09A	16SEP09	2	1,566
01R0018A70	Metal Works	200	200	28FEB09A	16OCT09	28FEB09A	16OCT09	2	593
01R0018A72	Pipe Jacking Works at Lo Wai	250	250	28FEB09A	16OCT09	28FEB09A	16OCT09	2	301
01R0018A74	Finishing Works	250	250	28FEB09A	05DEC09	28FEB09A	05DEC09	2	549
Others									
01R0001928	Submit Contractor's Management Team	0	0		10JAN08A		10JAN08A	2	
01R0001930	Submit Photographer for Monthly Progress Photo	0	0	28JAN08A		28JAN08A		2	
01R0001932	Install Project Signboards at Potions A,B,C & D	30	30	28FEB09A	29MAY09	28FEB09A	29MAY09	2	0
01R0001934	Presentation of TDMS to SOR/ Employer; ER 4.4.6	6	6	27MAR09A	06MAY09A	27MAR09A	06MAY09A	2	
01R0001940	Prepare/submit Operation & Maintenance Manual	90	90	11NOV11	08FEB12	23DEC11	21MAR12	2	691
01R0001942	Prepare/submit As-built Drawings	90	90	08DEC12	07MAR13	19JAN13	18APR13	2	298
01R0001944	Produce 2 documentary video for tunnel	30	30	08DEC12	06JAN13	19JAN13	17FEB13	2	358
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	21	21	07APR08A	20AUG08A	07APR08A	20AUG08A	2	
01R00PCRA4	DC review & certify PCRA for works at I-1	60	60	22MAY08A	13OCT08A	22MAY08A	13OCT08A	2	
01R00PCRA6	SOR review & accept PCRA at works at I-1	60	60	12MAY08A	25SEP08A	12MAY08A	25SEP08A	2	
01R00PCRA8	GEO review/agree PCRA	28	28	31OCT08A	09DEC08A	31OCT08A	09DEC08A	2	
PCRA for Works at Portion B (I-2)									
01R00PCRB2	Prepare/submit PCRA for works at I-2	21	21	14APR08A	20AUG08A	14APR08A	20AUG08A	2	



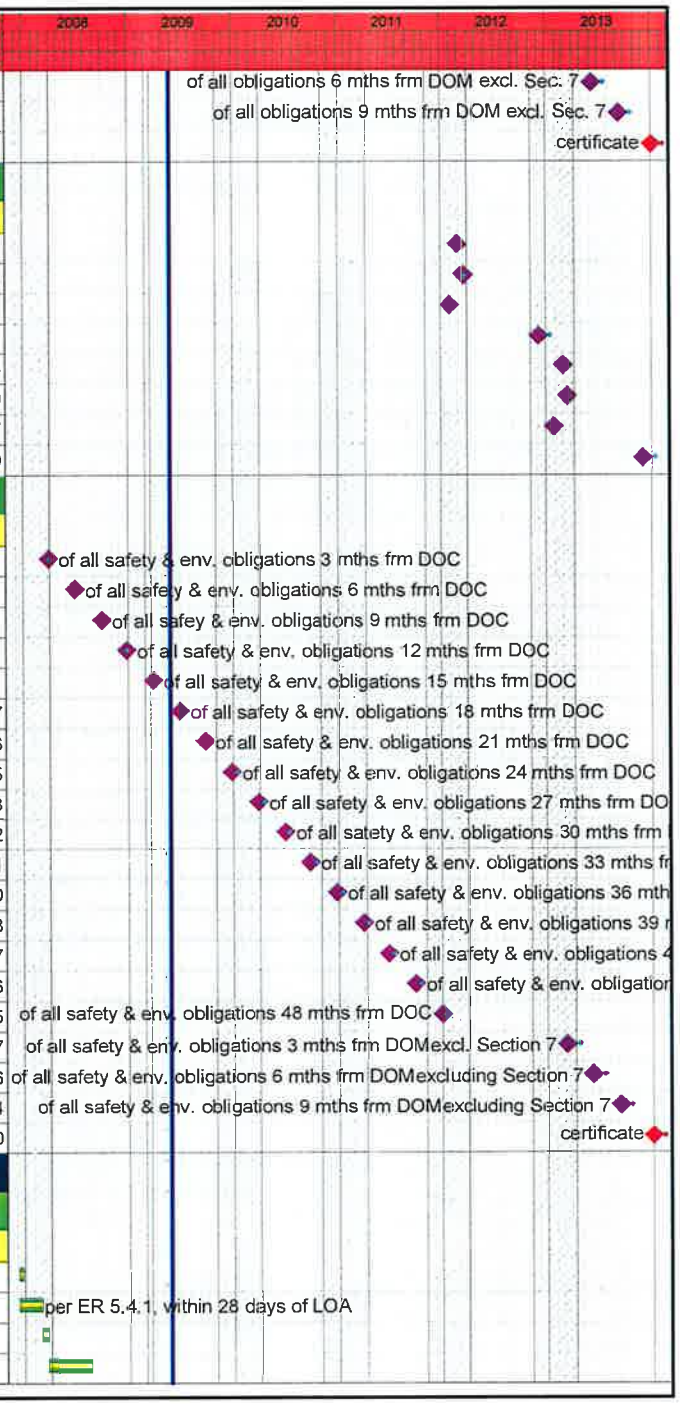
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
01R00PCRB4	DC review & certify PCRA for works at I-2	60	60	22MAY08A	13OCT08A	22MAY08A	13OCT08A	2	
01R00PCRB6	SOR review & accept PCRA at works at I-2	60	60	22MAY08A	25SEP08A	22MAY08A	25SEP08A	2	
01R00PCRB8	GEO review/agree PCRA	28	28	31OCT08A	09DEC08A	31OCT08A	09DEC08A	2	
PCRA for Works at Portion C (I-3)									
01R00PCRC2	Prepare/submit PCRA for works at I-3	21	21	01APR08A	20AUG08A	01APR08A	20AUG08A	2	
01R00PCRC4	DC review & certify PCRA for works at I-3	60	60	21MAY08A	13OCT08A	21MAY08A	13OCT08A	2	
01R00PCRC6	SOR review & accept PCRA at works at I-3	60	60	21MAY08A	25SEP08A	21MAY08A	25SEP08A	2	
01R00PCRC8	GEO review/agree PCRA	28	28	31OCT08A	09DEC08A	31OCT08A	09DEC08A	2	
PCRA for Works at Portion D/E (O-1)									
01R00PCRD2	Prepare/submit PCRA for works at O-1	21	21	01APR08A	20AUG08A	01APR08A	20AUG08A	2	
01R00PCRD4	DC review & certify PCRA for works at O-1	60	60	21MAY08A	13OCT08A	21MAY08A	13OCT08A	2	
01R00PCRD6	SOR review & accept PCRA at works at O-1	60	60	12MAY08A	25SEP08A	12MAY08A	25SEP08A	2	
01R00PCRD8	GEO review/agree PCRA	28	28	31OCT08A	09DEC08A	31OCT08A	09DEC08A	2	
PCRA for Works at Portion F/J (Main Tunnel)									
01R00PCRF2	Prepare/submit PCRA for main tunnel works	21	21	09JUN08A	23APR09A	09JUN08A	23APR09A	2	
01R00PCRF4	DC review & certify PCRA for main tunnel works	60	60	14JUL08A	08JUN09	14JUL08A	08JUN09	2	-77
01R00PCRF6	SOR review & accept PCRA for main tunnel works	60	60	16JUL08A	16JUN09	16JUL08A	16JUN09	2	-78
01R00PCRF8	GEO review/agree PCRA	28	28	28FEB09A	09JUN09	28FEB09A	09JUN09	2	0
DCRA for Works at Portion A (I-1)									
01R00DCRA2	Prepare/submit DCRA for works at I-1	14	14	02OCT08A	27OCT08A	02OCT08A	27OCT08A	2	
01R00DCRA4	DC review & certify DCRA for works at I-1	21	21	28OCT08A	17FEB09A	28OCT08A	17FEB09A	2	
01R00DCRA6	SOR review & accept DCRA at works at I-1	49	49	05NOV08A	26MAR09A	05NOV08A	26MAR09A	2	
01R00DCRA8	GEO review/agree DCRA	28	28	28FEB09A	27MAR09A	28FEB09A	27MAR09A	2	
DCRA for Works at Portion B (I-2)									
01R00DCRB2	Prepare/submit DCRA for works at I-2	14	14	14OCT08A	02JUN09	14OCT08A	02JUN09	2	0
01R00DCRB4	DC review & certify DCRA for works at I-2	21	21	05DEC08A	09JUN09	05DEC08A	09JUN09	2	0
01R00DCRB6	SOR review & accept DCRA at works at I-2	49	49	10DEC08A	16JUN09	10DEC08A	16JUN09	2	7
01R00DCRB8	GEO review/agree DCRA	28	28	10JUN09	07JUL09	10JUN09	07JUL09	2	0
DCRA for Works at Portion C (I-3)									
01R00DCRC2	Prepare/submit DCRA for works at I-3	14	14	14OCT08A	03JUN09	14OCT08A	03JUN09	2	-59
01R00DCRC4	DC review & certify DCRA for works at I-3	21	21	31OCT08A	10JUN09	31OCT08A	10JUN09	2	-59
01R00DCRC6	SOR review & accept DCRA at works at I-3	49	49	07NOV08A	17JUN09	07NOV08A	17JUN09	2	-59
01R00DCRC8	GEO review/agree DCRA	28	28	11JUN09	08JUL09	11JUN09	08JUL09	2	0
DCRA for Works at Portion D/E (O-1)									
01R00DCRD2	Prepare/submit DCRA for works at O-1	14	14	03NOV08A	03JUN09	03NOV08A	03JUN09	2	-157
01R00DCRD4	DC review & certify DCRA for works at O-1	21	21	15NOV08A	10JUN09	15NOV08A	10JUN09	2	-157
01R00DCRD6	SOR review & accept DCRA at works at O-1	49	49	15NOV08A	17JUN09	15NOV08A	17JUN09	2	-157
01R00DCRD8	GEO review/agree DCRA	28	28	11JUN09	08JUL09	11JUN09	08JUL09	2	0
DCRA for Works at Portion F/J (Main Tunnel)									
01R00DCRF2	Prepare/submit DCRA for main tunnel works	21	21	14MAR09A	23JUN09	14MAR09A	23JUN09	2	-78
01R00DCRF4	DC review & certify DCRA for main tunnel works	21	21	24JUN09	14JUL09	24JUN09	14JUL09	2	-78
01R00DCRF6	SOR review & accept DCRA for main tunnel works	49	49	24JUN09	11AUG09	24JUN09	11AUG09	2	-78
01R00DCRF8	GEO review/agree DCRA	28	28	15JUL09	11AUG09	15JUL09	11AUG09	2	0



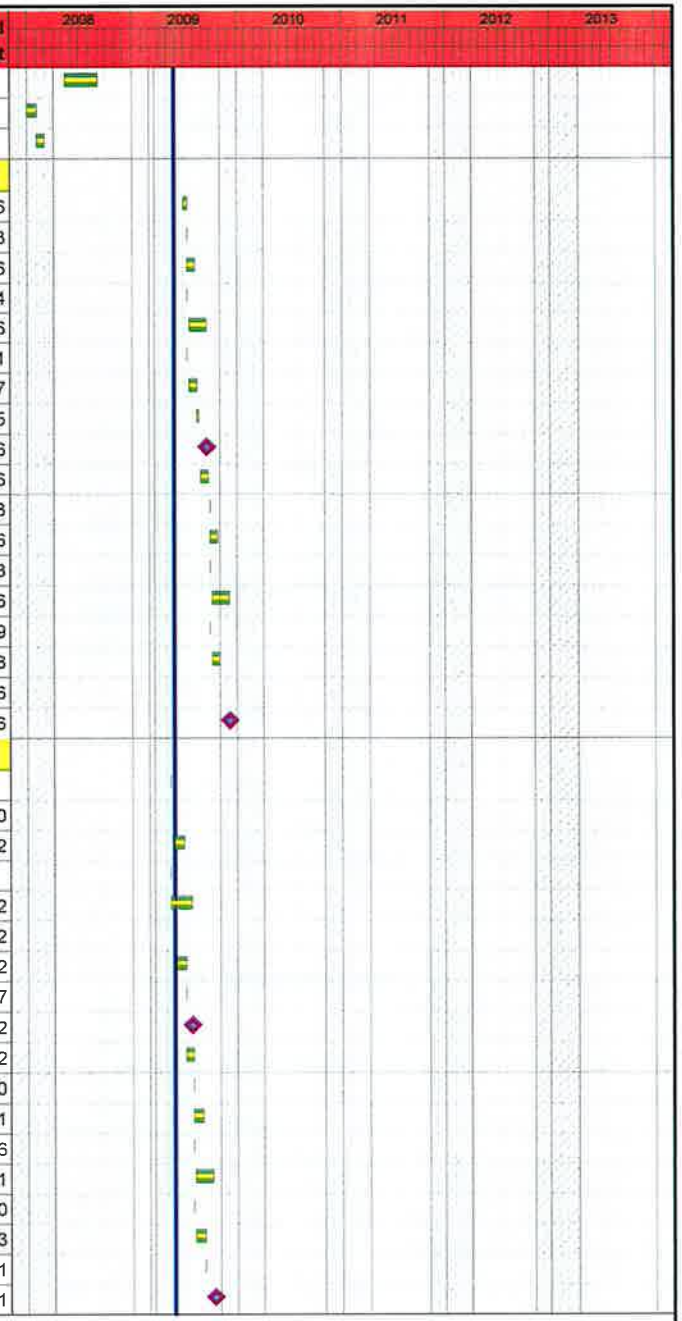
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
Physical Models & Other Material Display									
01R0002302	Prepare/submit a physical models	255	255	15FEB08A	27NOV08A	15FEB08A	27NOV08A	2	
01R0002304	Prepare/submit a 3-D animation model	308	308	15FEB08A	27FEB09A	15FEB08A	27FEB09A	2	
Internet Website as per ER 4.4.7									
01R0002402	Propose the design of web page	30	30	28DEC07A	09FEB08A	28DEC07A	09FEB08A	2	
01R0002404	Produce the web page for approval of SO	211	211	10MAR08A	19FEB09A	10MAR08A	19FEB09A	2	
01R0002406	SO's approval of web page	30	30	02JUN08A	24FEB09A	02JUN08A	24FEB09A	2	
01R0002408	Submit updated web pages monthly	1,433	1,433	25FEB09A	30NOV13	25FEB09A	11JAN14	2	30
Schedule of Milestones for Cost Centre No. 1R									
01R0002501	1R 1; On provision of SO's Accommodation	0	0		13SEP08A		13SEP08A	2	
01R0002502	1R 2; On providing documents of effected CWI	0	0		03JAN08A		03JAN08A	2	
01R0002503	1R 3; On providing documents of effected TPI	0	0		03JAN08A		03JAN08A	2	
01R0002504	1R 4; On Pproviding documents of effected PII	0	0		03JAN08A		03JAN08A	2	
01R0002505	1R 5; On delivery of all Land Transport for SO	0	0		02MAY08A		02MAY08A	2	
01R0002506	1R 6; On install. of computer facilities for SO	0	0		13SEP08A		13SEP08A	2	
01R0002507	1R 7; On accept. of detailed CRA incl. PCS	0	0		11AUG09		11AUG09	2	1,602
01R0002508	1R 8; On acceptance of Physical Model by the SO	0	0		27NOV08A		27NOV08A	2	
01R0002509	1R 9; On acceptance of 3-D Animation Model	0	0		27FEB09A		27FEB09A	2	
01R0002510	1R 10; On satisf. operation of CCTV for 3 mth	0	0		17JUN09		17JUN09	2	1,657
01R0002511	1R 11; On acceptance of O&MM	0	0		08FEB12		21MAR12	2	691
01R0002512	1R 12; On acceptance of as-built drwgs.	0	0		07MAR13		18APR13	2	298
01R0002513	1R 13; On acceptance of T.R/Video/Brouchure	0	0		06JAN13		17FEB13	2	358
01R0002514	1R 14; On complete all wks for 3 mth frm DOC	0	0		27MAR08A		27MAR08A	2	
01R0002515	1R 15; On complete all wks for 6 mth frm DOC	0	0		27JUN08A		27JUN08A	2	
01R0002516	1R 16; On complete all wks for 9 mth frm DOC	0	0		25SEP08A		25SEP08A	2	
01R0002517	1R 17; On complete all wks for 12 mth frm DOC	0	0		27DEC08A		27DEC08A	2	
01R0002518	1R 18; On complete all wks for 15 mth frm DOC	0	0		27MAR09A		27MAR09A	2	
01R0002519	1R 19; On complete all wks for 18 mth frm DOC	0	0		26JUN09		26JUN09	2	1,163
01R0002520	1R 20; On complete all wks for 21 mth frm DOC	0	0		25SEP09		25SEP09	2	1,072
01R0002521	1R 21; On complete all wks for 24 mth frm DOC	0	0		26DEC09		26DEC09	2	980
01R0002522	1R 22; On complete all wks for 27 mth frm DOC	0	0		27MAR10		27MAR10	2	889
01R0002523	1R 23; On complete all wks for 30 mth frm DOC	0	0		26JUN10		26JUN10	2	798
01R0002524	1R 24; On complete all wks for 33 mth frm DOC	0	0		25SEP10		25SEP10	2	707
01R0002525	1R 25; On complete all wks for 36 mth frm DOC	0	0		26DEC10		26DEC10	2	615
01R0002526	1R 26; On complete all wks for 39 mth frm DOC	0	0		27MAR11		27MAR11	2	524
01R0002527	1R 27; On complete all wks for 42 mth frm DOC	0	0		26JUN11		26JUN11	2	433
01R0002528	1R 28; On complete all wks for 45 mth frm DOC	0	0		25SEP11		25SEP11	2	342
01R0002529	1R 29; On issuance of completion certificates	0	0		04JAN13		15FEB13	2	360
01R0002530	1R 30; On complete all wks for 3 mth frm CMP	0	0		08MAR13		19APR13	2	297



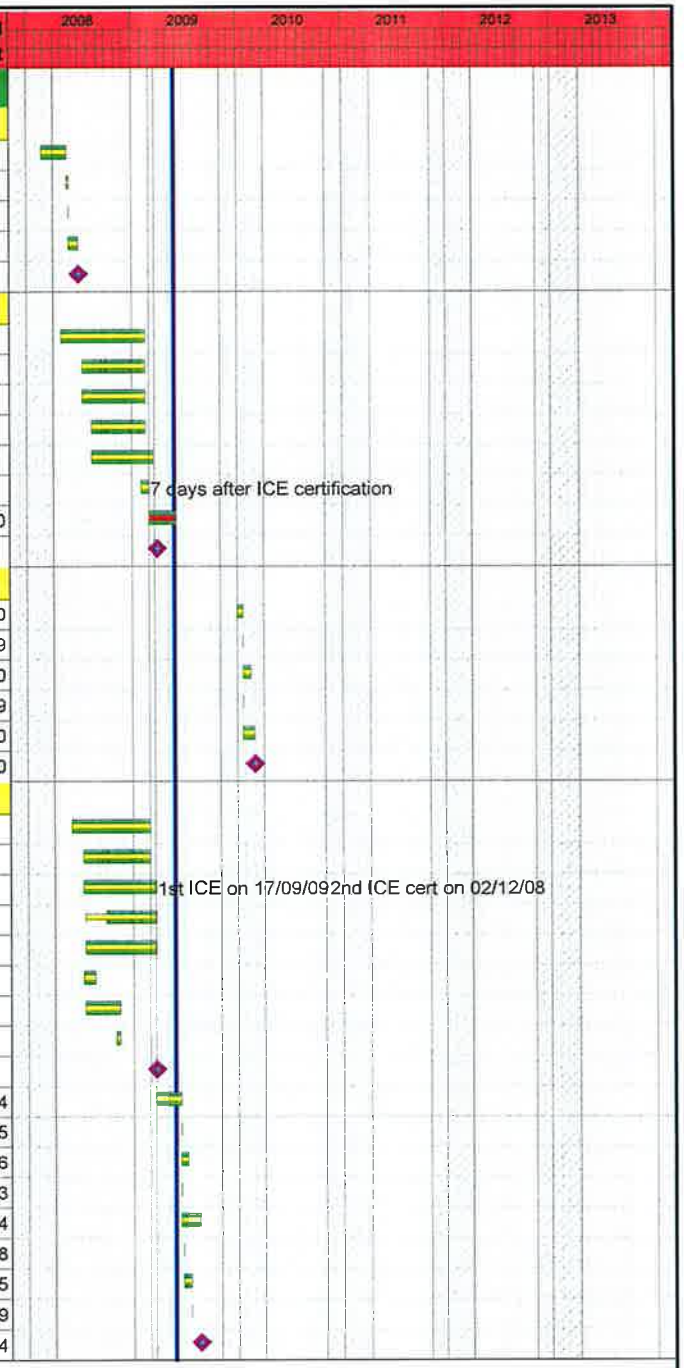
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
01R0002531	1R 31; On complete all wks for 6 mth frm CMP	0	0		07JUN13		19JUL13	2	206
01R0002532	1R 32; On complete all wks for 9 mth frm CMP	0	0		06SEP13		18OCT13	2	115
01R0002533	1R 33; On issuance of maintenance certificate	0	0		30DEC13		10FEB14	2	0
Schedule of Milestones for Cost Centre No. 16R									
16R7003001	16R 1; On completion of landscape wks; Portion A	0	0		01MAR12		01MAR12	2	669
16R7003002	16R 2; On completion of landscape wks; Portion B	0	0		16MAR12		16MAR12	2	654
16R7003003	16R 3; On completion of landscape wks; Portion C	0	0		28JAN12		28JAN12	2	702
16R7003004	16R 4; On completion of landscape wks; Portion D	0	0		30NOV12		11JAN13	2	395
16R7003005	16R 5; On completion of establish wks; Portion A	0	0		01MAR13		01MAR13	2	304
16R7003006	16R 6; On completion of establish wks; Portion B	0	0		16MAR13		16MAR13	2	289
16R7003007	16R 7; On completion of establish wks; Portion C	0	0		27JAN13		27JAN13	2	337
16R7003008	16R 8; On completion of establish wks; Portion D	0	0		30NOV13		11JAN14	2	30
Schedule of Milestones for Cost Centre No. 17R									
17R0003101	17R 1; On complet of all wks for 3 mth frm DOC	0	0		27MAR08A		27MAR08A	2	
17R0003102	17R 2; On complet of all wks for 6 mth frm DOC	0	0		27JUN08A		27JUN08A	2	
17R0003103	17R 3; On complet of all wks for 9 mth frm DOC	0	0		26SEP08A		26SEP08A	2	
17R0003104	17R 4; On complet of all wks for 12 mth frm DOC	0	0		27DEC08A		27DEC08A	2	
17R0003105	17R 5; On complet of all wks for 15 mth frm DOC	0	0		27MAR09A		27MAR09A	2	
17R0003106	17R 6; On complet of all wks for 18 mth frm DOC	0	0		27JUN09		15JUL09	2	1,647
17R0003107	17R 7; On complet of all wks for 21 mth frm DOC	0	0		26SEP09		14OCT09	2	1,556
17R0003108	17R 8; On complet of all wks for 24 mth frm DOC	0	0		26DEC09		13JAN10	2	1,465
17R0003109	17R 9; On complet of all wks for 27 mth frm DOC	0	0		28MAR10		15APR10	2	1,373
17R0003110	17R 10; On complet all wks for 30 mth frm DOC	0	0		27JUN10		15JUL10	2	1,282
17R0003111	17R 11; On complet all wks for 33 mth frm DOC	0	0		26SEP10		14OCT10	2	1,191
17R0003112	17R 12; On complet all wks for 36 mth frm DOC	0	0		26DEC10		13JAN11	2	1,100
17R0003113	17R 13; On complet all wks for 39 mth frm DOC	0	0		28MAR11		15APR11	2	1,008
17R0003114	17R 14; On complet all wks for 42 mth frm DOC	0	0		27JUN11		15JUL11	2	917
17R0003115	17R 15; On complet all wks for 45 mth frm DOC	0	0		26SEP11		14OCT11	2	826
17R0003116	17R 16; On complet all wks for 48 mth frm DOC	0	0		26DEC11		13JAN12	2	735
17R0003117	17R 17; On complet of all wks for 3 mth frm CMP	0	0		08MAR13		19APR13	2	297
17R0003118	17R 18; On complet of all wks for 6 mth frm CMP	0	0		07JUN13		19JUL13	2	206
17R0003119	17R 19; On complet of all wks for 9 mth frm CMP	0	0		07SEP13		19OCT13	2	114
17R0003120	17R 20; On issuance of maintenance certificate	0	0		30DEC13		10FEB14	2	0
Design/Design Check for Permanent Works									
Project -wide Packages									
Project Design Plan (PDP)									
02L10D0102	Employ Independent Designer	7	7	14DEC07A	20DEC07A	14DEC07A	20DEC07A	2	
02L10D0104	Prepare & submit Project Design Plan (PDP)	28	28	14DEC07A	26FEB08A	14DEC07A	26FEB08A	2	
02L10D0106	SO's review & comment on PDP	28	28	27FEB08A	18MAR08A	27FEB08A	18MAR08A	2	
02L10D0108	Provide further information of (PDP)	28	28	19MAR08A	21AUG08A	19MAR08A	21AUG08A	2	



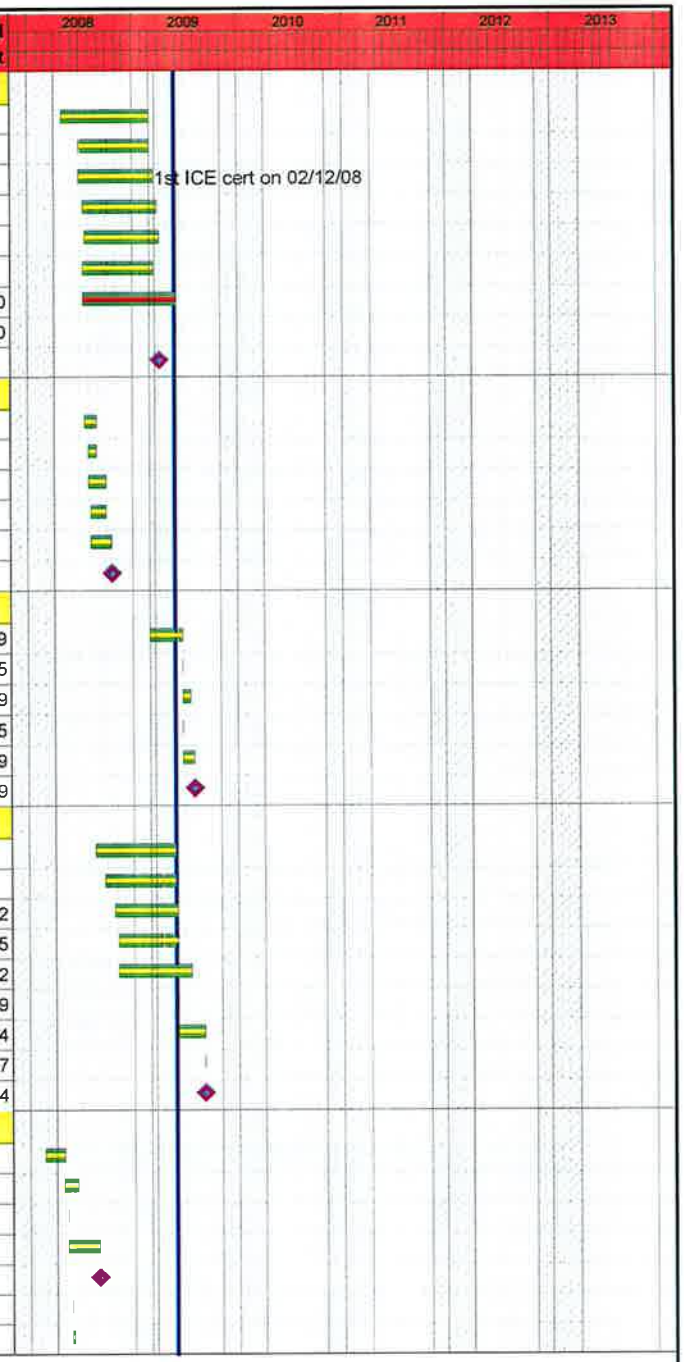
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
02L10D0110	SO approves PDP	14	14	14MAY08A	04SEP08A	14MAY08A	04SEP08A	2	
02L10D0112	Employ Independent Design Checker	14	14	28DEC07A	01FEB08A	28DEC07A	01FEB08A	2	
02L10D0114	Approval of Design Checker by the SO	28	28	02FEB08A	28FEB08A	02FEB08A	28FEB08A	2	
Design for Communication System									
02L1FE0102	Design preparation for the AIP submission	15	15	27JUN09	11JUL09	27JUN09	11JUL09	2	356
02L1FE0103	Design (AIP) submission for the DC's approval	1	1	13JUL09	13JUL09	13JUL09	13JUL09	1	288
02L1FE0104	Design (AIP) certification by the Design Checker	28	28	14JUL09	10AUG09	14JUL09	10AUG09	2	356
02L1FE0106	Design (AIP) submission for the SO's approval	1	1	13JUL09	13JUL09	13JUL09	13JUL09	1	294
02L1FE0108	Design (AIP) review by the SO	60	60	21JUL09	18SEP09	21JUL09	18SEP09	2	356
02L1FE0110	AIP submission for rel. authorities' approval	1	1	13JUL09	13JUL09	13JUL09	13JUL09	1	321
02L1FE0112	Design (AIP) review by the rel. authorities	28	28	21JUL09	17AUG09	21JUL09	17AUG09	2	387
02L1FE0114	Obtain rel. authorities's approval for AIP	1	1	18AUG09	18AUG09	18AUG09	18AUG09	1	315
02L1FE0116	Obtain SO's consent for design (AIP)	0	0		19SEP09		19SEP09	2	356
02L1FE0118	Design preparation for the DDA submission	30	30	28AUG09	26SEP09	28AUG09	26SEP09	2	356
02L1FE0119	Design (DDA) submission for the DC's approval	1	1	28SEP09	28SEP09	28SEP09	28SEP09	1	288
02L1FE0120	Design (DDA) certification by the Design Checker	28	28	29SEP09	26OCT09	29SEP09	26OCT09	2	356
02L1FE0122	Design (DDA) submission for the SO's approval	1	1	28SEP09	28SEP09	28SEP09	28SEP09	1	293
02L1FE0124	Design (DDA) review by the SO	60	60	06OCT09	04DEC09	06OCT09	04DEC09	2	356
02L1FE0126	DDA submission for rel. authorities' approval	1	1	28SEP09	28SEP09	28SEP09	28SEP09	1	319
02L1FE0128	Design (DDA) review by the rel. authorities	28	28	06OCT09	02NOV09	06OCT09	02NOV09	2	388
02L1FE0130	Obtain rel. authorities's approval for DDA	1	1	03NOV09	03NOV09	03NOV09	03NOV09	1	316
02L1FE0132	Obtain SO's consent for design (DDA)	0	0		05DEC09		05DEC09	2	356
Design for Flow Measurement System									
02L1FE0202	Design preparation for the AIP submission	0	0		11MAY09A		11MAY09A	2	
02L1FE0203	Design (AIP) submission for the DC's approval	1	1	29MAY09	29MAY09	29MAY09	29MAY09	1	410
02L1FE0204	Design (AIP) certification by the Design Checker	28	28	30MAY09	26JUN09	30MAY09	26JUN09	2	502
02L1FE0206	Design (AIP) submission for the SO's approval	1	1	12MAY09A	12MAY09A	12MAY09A	12MAY09A	1	
02L1FE0208	Design (AIP) review by the SO	60	60	13MAY09A	24JUL09	13MAY09A	24JUL09	2	502
02L1FE0210	AIP submission for rel. authorities' approval	1	1	29MAY09	29MAY09	29MAY09	29MAY09	1	432
02L1FE0212	Design (AIP) review by the rel. authorities	28	28	06JUN09	03JUL09	06JUN09	03JUL09	2	522
02L1FE0214	Obtain rel. authorities's approval for AIP	1	1	04JUL09	04JUL09	04JUL09	04JUL09	1	427
02L1FE0216	Obtain SO's consent for design (AIP)	0	0		25JUL09		25JUL09	2	502
02L1FE0218	Design preparation for the DDA submission	30	30	03JUL09	01AUG09	03JUL09	01AUG09	2	502
02L1FE0219	Design (DDA) submission for the DC's approval	1	1	03AUG09	03AUG09	03AUG09	03AUG09	1	410
02L1FE0220	Design (DDA) certification by the Design Checker	28	28	04AUG09	31AUG09	04AUG09	31AUG09	2	501
02L1FE0222	Design (DDA) submission for the SO's approval	1	1	03AUG09	03AUG09	03AUG09	03AUG09	1	416
02L1FE0224	Design (DDA) review by the SO	60	60	11AUG09	09OCT09	11AUG09	09OCT09	2	501
02L1FE0226	DDA submission for rel. authorities' approval	1	1	03AUG09	03AUG09	03AUG09	03AUG09	1	440
02L1FE0228	Design (DDA) review by the rel. authorities	28	28	11AUG09	07SEP09	11AUG09	07SEP09	2	533
02L1FE0230	Obtain rel. authorities's approval for DDA	1	1	08SEP09	08SEP09	08SEP09	08SEP09	1	431
02L1FE0232	Obtain design (DDA) approval from the SO	0	0		10OCT09		10OCT09	2	501



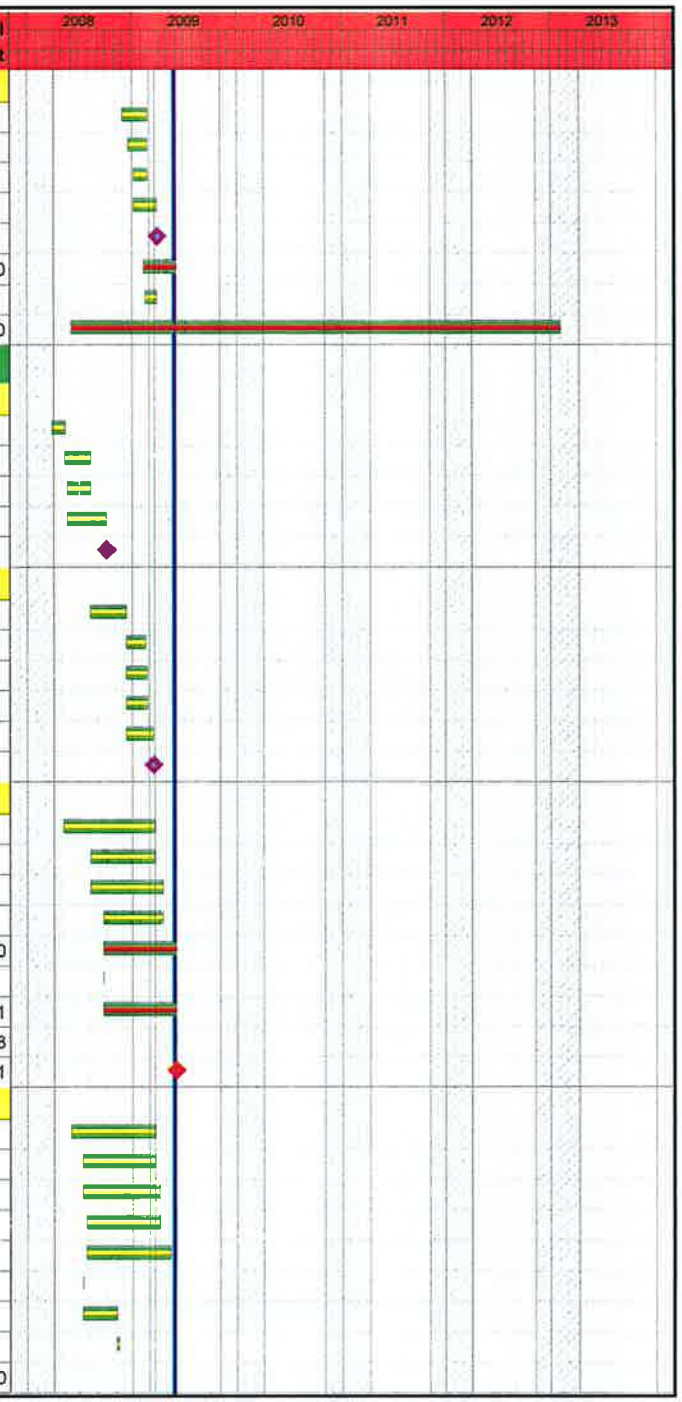
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
Design Packages for Works in Portion A									
Temp. Steel Decking Design Over Shing Mun Nullah									
02L1AA0102	Design preparation by the Designer	14	14	22FEB08A	15MAY08A	22FEB08A	15MAY08A	2	
02L1AA0104	Design certification by the Design Checker	14	14	16MAY08A	26MAY08A	16MAY08A	26MAY08A	2	
02L1AA0106	Design submission for the SO's approval	1	1	26MAY08A	26MAY08A	26MAY08A	26MAY08A	1	
02L1AA0108	Design review by the SO	21	21	27MAY08A	30JUN08A	27MAY08A	30JUN08A	2	
02L1AA0110	Obtain design approval from the SO	0	0		30JUN08A		30JUN08A	2	
ELS Design for Spiral Ramp/Cascade/Box Culvert									
02L1AA0202	Design preparation for the DDA submission	158	158	02MAY08A	16FEB09A	02MAY08A	16FEB09A	2	
02L1AA0203	Design submission for the DC's approval	2	2	10JUL08A	17FEB09A	10JUL08A	17FEB09A	1	
02L1AA0204	Design (DDA) certification by the Design Checker	30	30	11JUL08A	17FEB09A	11JUL08A	17FEB09A	2	
02L1AA0206	Design (DDA) submission for the SO's approval	2	2	12AUG08A	17FEB09A	12AUG08A	17FEB09A	1	
02L1AA0208	Design (DDA) review by the SO	68	68	13AUG08A	14MAR09A	13AUG08A	14MAR09A	2	
02L1AA0216	SO submit design (DDA) for approval of GEO	1	1	03FEB09A	03MAR09A	03FEB09A	03MAR09A	1	
02L1AA0218	Design (DDA) review/approval by the GEO	28	28	04MAR09A	31MAY09	04MAR09A	31MAY09	2	0
02L1AA0238	Obtain SO's consent for design (DDA)	0	0		24MAR09A		24MAR09A	2	
Temp. Platform Design for H-Piling									
02L1AA0302	Design preparation by the Designer	15	15	04JAN10*	18JAN10	04JAN10*	18JAN10	2	330
02L1AA0303	Design submission for the DC's approval	1	1	19JAN10	19JAN10	19JAN10	19JAN10	1	269
02L1AA0304	Design certification by the Design Checker	28	28	20JAN10	16FEB10	20JAN10	16FEB10	2	330
02L1AA0306	Design submission for the SO's approval	1	1	19JAN10	19JAN10	19JAN10	19JAN10	1	269
02L1AA0308	Design review by the SO	42	42	20JAN10	02MAR10	20JAN10	02MAR10	2	330
02L1AA0310	Obtain design approval from the SO	0	0		02MAR10		02MAR10	2	330
Cascade & Box Culver Design for Portion A									
02L1AA0402	Design preparation for the AIP submission	30	30	02JUN08A	28FEB09A	02JUN08A	28FEB09A	2	
02L1AA0403	Design (AIP) submission for the DC's approval	3	3	12JUL08A	02MAR09A	12JUL08A	02MAR09A	1	
02L1AA0404	Design (AIP) certification by the Design Checker	243	243	14JUL08A	18MAR09A	14JUL08A	18MAR09A	2	
02L1AA0406	Design (AIP) submission for the SO's approval	2	2	15JUL08A	19MAR09A	15JUL08A	19MAR09A	1	
02L1AA0408	Design (AIP) review by the SO	66	66	16JUL08A	20MAR09A	16JUL08A	20MAR09A	2	
02L1AA0410	AIP submission for rel. authorities' approval	1	1	14JUL08A	19AUG08A	14JUL08A	19AUG08A	1	
02L1AA0412	Design (AIP) review by the rel. authorities	28	28	15JUL08A	12NOV08A	15JUL08A	12NOV08A	2	
02L1AA0414	Obtain rel. authorities's approval for AIP	1	1	03NOV08A	12NOV08A	03NOV08A	12NOV08A	1	
02L1AA0420	Obtain SO's consent for design (AIP)	0	0		20MAR09A		20MAR09A	2	
02L1AA0422	Design preparation for the DDA submission	30	30	21MAR09A	12JUN09	21MAR09A	12JUN09	2	124
02L1AA0423	Design (DDA) submission for the DC's approval	1	1	13JUN09	13JUN09	13JUN09	13JUN09	1	105
02L1AA0424	Design (DDA) certification by the Design Checker	28	28	14JUN09	11JUL09	14JUN09	11JUL09	2	126
02L1AA0426	Design (DDA) submission for the SO's approval	1	1	13JUN09	13JUN09	13JUN09	13JUN09	1	103
02L1AA0428	Design (DDA) review by the SO	66	66	14JUN09	18AUG09	14JUN09	18AUG09	2	124
02L1AA0430	DDA submission for rel. authorities' approval	1	1	20JUN09	20JUN09	20JUN09	20JUN09	1	128
02L1AA0432	Design (DDA) review by the rel. authorities	28	28	21JUN09	18JUL09	21JUN09	18JUL09	2	155
02L1AA0434	Obtain rel. authorities's approval for DDA	1	1	20JUL09	20JUL09	20JUL09	20JUL09	1	129
02L1AA0440	Obtain SO's consent for design (DDA)	0	0		19AUG09		19AUG09	2	124



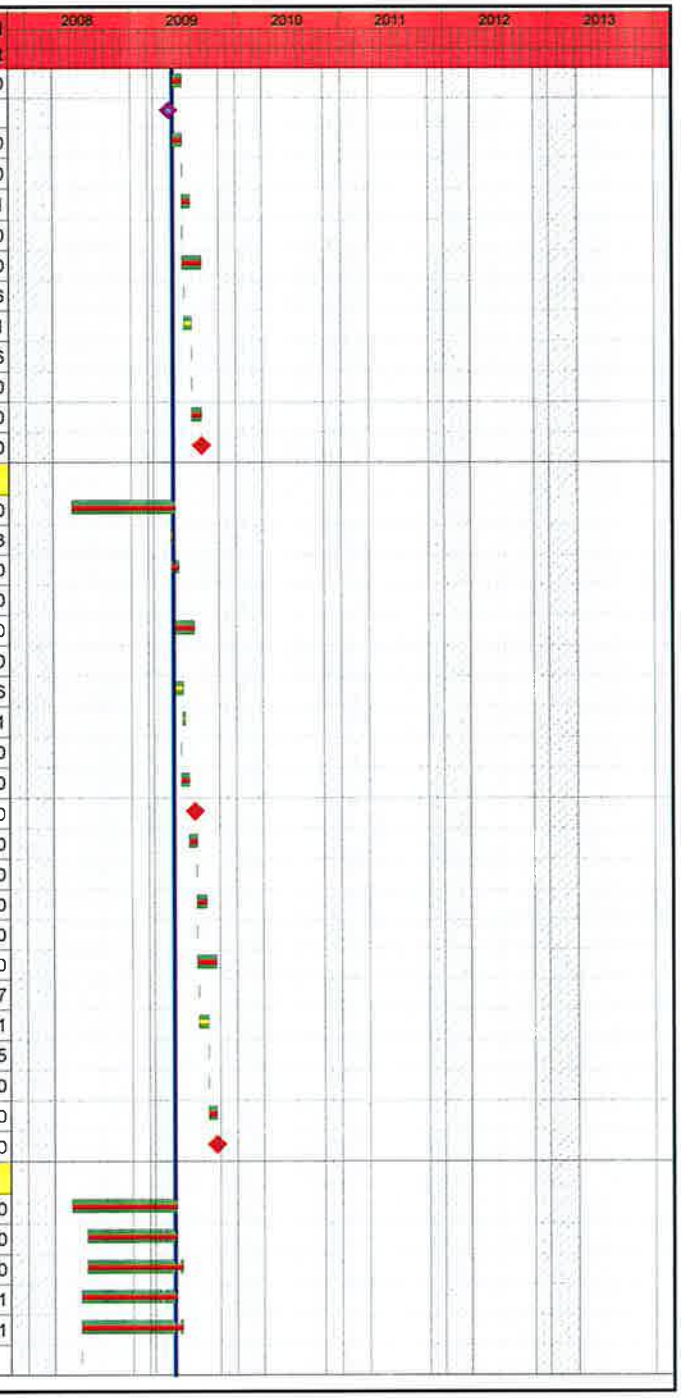
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
Impact Assessment on WSD Wo Yip Hop V. S. P. H.									
02L1AA0502	Design preparation for the DDA submission	30	30	02MAY08A	26FEB09A	02MAY08A	26FEB09A	2	
02L1AA0503	Design (DDA) submission for the DC's approval	1	1	26JUN08A	27FEB09A	26JUN08A	27FEB09A	1	
02L1AA0504	Design (DDA) certification by the Design Checker	60	60	27JUN08A	11MAR09A	27JUN08A	11MAR09A	2	
02L1AA0506	Design (DDA) submission for the SO's approval	2	2	14JUL08A	24MAR09A	14JUL08A	24MAR09A	1	
02L1AA0508	Design (DDA) review by the SO	66	66	15JUL08A	31MAR09A	15JUL08A	31MAR09A	2	
02L1AA0510	DDA submission for rel. authorities' approval	2	2	10JUL08A	14MAR09A	10JUL08A	14MAR09A	1	
02L1AA0512	Design (DDA) review by the rel. authorities	28	28	14JUL08A	31MAY09	14JUL08A	31MAY09	2	0
02L1AA0514	Obtain rel. authorities's approval for DDA	1	1	01JUN09	01JUN09	01JUN09	01JUN09	1	0
02L1AA0520	Obtain SO's consent for design (DDA)	0	0		31MAR09A		31MAR09A	2	
Temporary Platform for Pipe Piling									
02L1AA0602	Design preparation by the Designer	11	11	21JUL08A	23AUG08A	21JUL08A	23AUG08A	2	
02L1AA0603	Design submission for the DC's approval	1	1	01AUG08A	25AUG08A	01AUG08A	25AUG08A	1	
02L1AA0604	Design certification by the Design Checker	21	21	02AUG08A	26SEP08A	02AUG08A	26SEP08A	2	
02L1AA0606	Design submission for the SO's approval	1	1	08AUG08A	27SEP08A	08AUG08A	27SEP08A	1	
02L1AA0608	Design review by the SO	28	28	09AUG08A	17OCT08A	09AUG08A	17OCT08A	2	
02L1AA0610	Obtain design approval from the SO	0	0		17OCT08A		17OCT08A	2	
Temporary Works Design for Retrieval of TBM									
02L1AA0702	Design preparation by the Designer	30	30	28FEB09A	22JUN09	28FEB09A	22JUN09	2	139
02L1AA0703	Design submission for the DC's approval	1	1	23JUN09	23JUN09	23JUN09	23JUN09	1	115
02L1AA0704	Design certification by the Design Checker	28	28	24JUN09	21JUL09	24JUN09	21JUL09	2	139
02L1AA0706	Design submission for the SO's approval	1	1	23JUN09	23JUN09	23JUN09	23JUN09	1	115
02L1AA0708	Design review by the SO	42	42	24JUN09	04AUG09	24JUN09	04AUG09	2	139
02L1AA0710	Obtain design approval from the SO	0	0		04AUG09		04AUG09	2	139
Temporary Drainage Management Plan for Portion A									
02L1AA0802	TDMP preparation by the Designer	208	208	18AUG08A	23MAY09A	18AUG08A	23MAY09A	2	
02L1AA0804	TDMP submission for the DC's approval	2	2	24SEP08A	25MAY09A	24SEP08A	25MAY09A	1	
02L1AA0806	TDMP certification by the Design Checker	28	28	24OCT08A	03JUN09	24OCT08A	03JUN09	2	142
02L1AA0808	TDMP submission for the SO's approval	2	2	05NOV08A	04JUN09	05NOV08A	04JUN09	1	165
02L1AA0810	TDMP review by the SO	90	90	05NOV08A	16JUL09	05NOV08A	16JUL09	2	192
02L1AA0812	TDMP submission for DSD's approval	1	1	04JUN09	04JUN09	04JUN09	04JUN09	1	119
02L1AA0814	TDMP review by the DSD	90	90	05JUN09	02SEP09	05JUN09	02SEP09	2	144
02L1AA0816	Obtain DSD's approval for DDA	1	1	03SEP09	03SEP09	03SEP09	03SEP09	1	117
02L1AA0818	Obtain SO's consent for TDMP	0	0		03SEP09		03SEP09	2	144
Geotechnical Instrumentation Stg 1 for GL Works									
3DL1AAG102	Design preparation by the Designer	14	14	22FEB08A	28APR08A	22FEB08A	28APR08A	2	
3DL1AAG104	Design certification by the Design Checker	7	7	29APR08A	16JUN08A	29APR08A	16JUN08A	2	
3DL1AAG106	Design submission for the SO's approval	1	1	10MAY08A	10MAY08A	10MAY08A	10MAY08A	1	
3DL1AAG108	Design review by the SO	14	14	12MAY08A	28AUG08A	12MAY08A	28AUG08A	2	
3DL1AAG110	Obtain design approval from the SO	0	0		28AUG08A		28AUG08A	2	
3DL1AAG112	Install Geotechnical Instruments	6	6	26MAY08A	26MAY08A	26MAY08A	26MAY08A	1	
3DL1AAG114	Baseline Monitoring	14	14	27MAY08A	31MAY08A	27MAY08A	31MAY08A	2	



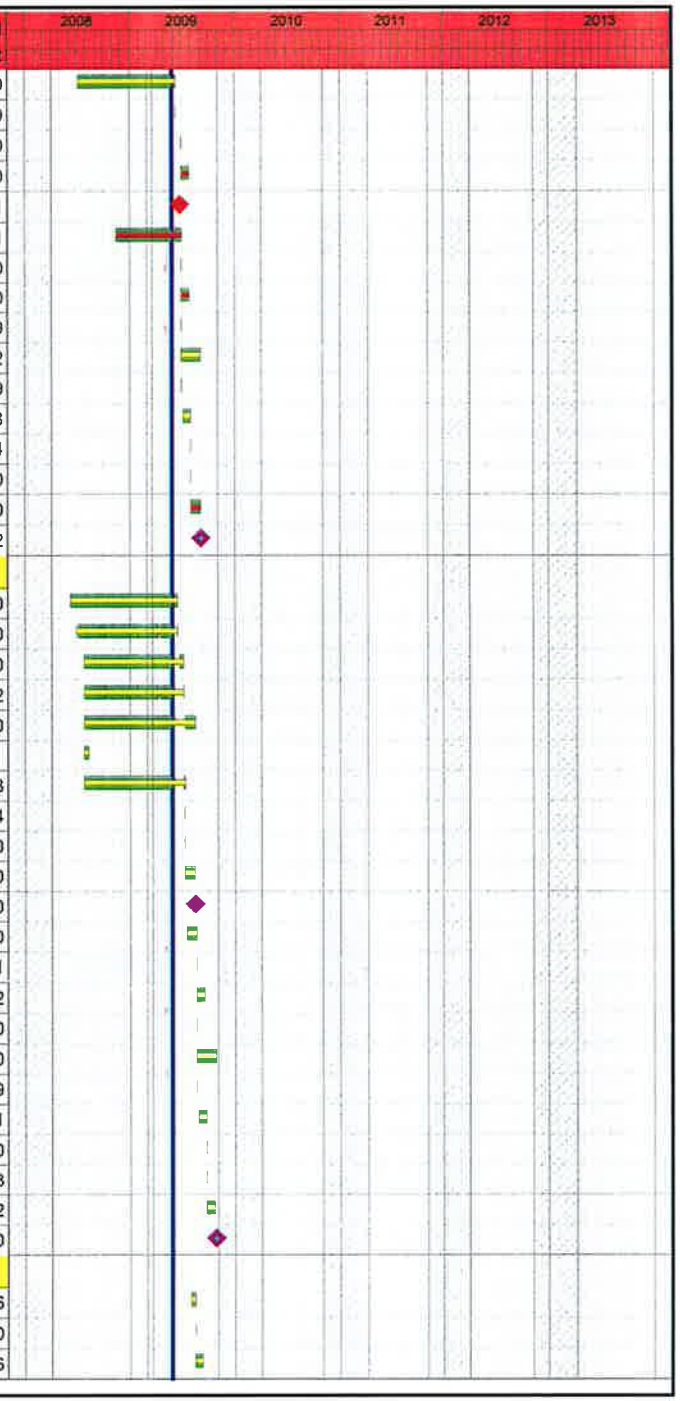
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
Geotechnical Instrumentation Stg 2 for Deep Exc.									
3DL1AAG202	Design preparation by the Designer	14	14	01DEC08A	24FEB09A	01DEC08A	24FEB09A	2	
3DL1AAG204	Design certification by the Design Checker	7	7	15DEC08A	25FEB09A	15DEC08A	25FEB09A	2	
3DL1AAG206	Design submission for the SO's approval	1	1	07JAN09A	25FEB09A	07JAN09A	25FEB09A	1	
3DL1AAG208	Design review by the SO	28	28	08JAN09A	24MAR09A	08JAN09A	24MAR09A	2	
3DL1AAG210	Obtain design approval from the SO	0	0		24MAR09A		24MAR09A	2	
3DL1AAG212	Install Geotechnical Instruments	28	28	09FEB09A	04JUN09	09FEB09A	04JUN09	1	0
3DL1AAG214	Baseline Monitoring	6	6	18FEB09A	25MAR09A	18FEB09A	25MAR09A	2	
3DL1AAG216	Monitor/report Geotechnical Instrumentation	1,643	1,643	02JUN08A	04FEB13	02JUN08A	04FEB13	2	0
Design Packages for Works in Portion B									
Piling Platform to Construct H-pile Wall									
02L1BB0202	Design preparation by the Designer	15	15	24MAR08A	09MAY08A	24MAR08A	09MAY08A	2	
02L1BB0204	Design certification by the Design Checker	14	14	10MAY08A	08AUG08A	10MAY08A	08AUG08A	2	
02L1BB0206	Design submission for the SO's approval	1	1	21MAY08A	08AUG08A	21MAY08A	08AUG08A	1	
02L1BB0208	Design review by the SO	21	21	22MAY08A	25SEP08A	22MAY08A	25SEP08A	2	
02L1BB0210	Obtain design approval from the SO	0	0		25SEP08A		25SEP08A	2	
Temp. Platform to Construct Drop Shafts									
02L1BB0302	Design preparation by the Designer	22	22	04AUG08A	11DEC08A	04AUG08A	11DEC08A	2	
02L1BB0303	Design submission for the DC's approval	2	2	11DEC08A	12FEB09A	11DEC08A	12FEB09A	1	
02L1BB0304	Design certification by the Design Checker	14	14	12DEC08A	25FEB09A	12DEC08A	25FEB09A	2	
02L1BB0306	Design submission for the SO's approval	2	2	12DEC08A	25FEB09A	12DEC08A	25FEB09A	1	
02L1BB0308	Design review by the SO	21	21	13DEC08A	11MAR09A	13DEC08A	11MAR09A	2	
02L1BB0310	Obtain design approval from the SO	0	0		11MAR09A		11MAR09A	2	
Temporary Drainage Management Plan									
02L1BB0402	TDMP preparation by the Designer	313	313	05MAY08A	21MAR09A	05MAY08A	21MAR09A	2	
02L1BB0403	TDMP submission for the DC's approval	2	2	05AUG08A	23MAR09A	05AUG08A	23MAR09A	1	
02L1BB0404	TDMP certification by the Design Checker	213	213	06AUG08A	13APR09A	06AUG08A	13APR09A	2	
02L1BB0406	TDMP submission for the SO's approval	2	2	24SEP08A	14APR09A	24SEP08A	14APR09A	1	
02L1BB0408	TDMP review by the SO	90	90	25SEP08A	03JUN09	25SEP08A	03JUN09	2	-210
02L1BB0410	TDMP submission for DSD's approval	1	1	23SEP08A	23SEP08A	23SEP08A	23SEP08A	1	
02L1BB0412	TDMP review by the DSD	90	90	24SEP08A	04JUN09	24SEP08A	04JUN09	2	-211
02L1BB0414	Obtain DSD's approval for DDA	1	1	05JUN09	05JUN09	05JUN09	05JUN09	1	-168
02L1BB0416	Obtain SO's consent for TDMP	0	0		05JUN09		05JUN09	2	-211
Temp. Support Design for MAA/MAS/VDS/DC									
02L1BB0502	Design preparation for the AIP submission	272	272	02JUN08A	19MAR09A	02JUN08A	19MAR09A	2	
02L1BB0503	Design (AIP) submission for the DC's approval	2	2	11JUL08A	20MAR09A	11JUL08A	20MAR09A	1	
02L1BB0504	Design (AIP) certification by the Design Checker	60	60	12JUL08A	04APR09A	12JUL08A	04APR09A	2	
02L1BB0506	Design (AIP) submission for the SO's approval	2	2	24JUL08A	06APR09A	24JUL08A	06APR09A	1	
02L1BB0508	Design (AIP) review by the SO	66	66	25JUL08A	11MAY09A	25JUL08A	11MAY09A	2	
02L1BB0510	AIP submission for rel. authorities' approval	1	1	12JUL08A	12JUL08A	12JUL08A	12JUL08A	1	
02L1BB0512	Design (AIP) review by the rel. authorities	28	28	14JUL08A	10NOV08A	14JUL08A	10NOV08A	2	
02L1BB0514	Obtain rel. authorities's approval for AIP	1	1	11NOV08A	11NOV08A	11NOV08A	11NOV08A	1	
02L1BB0516	SO submit design (AIP) for approval of GEO	1	1	29MAY09	29MAY09	29MAY09	29MAY09	1	0



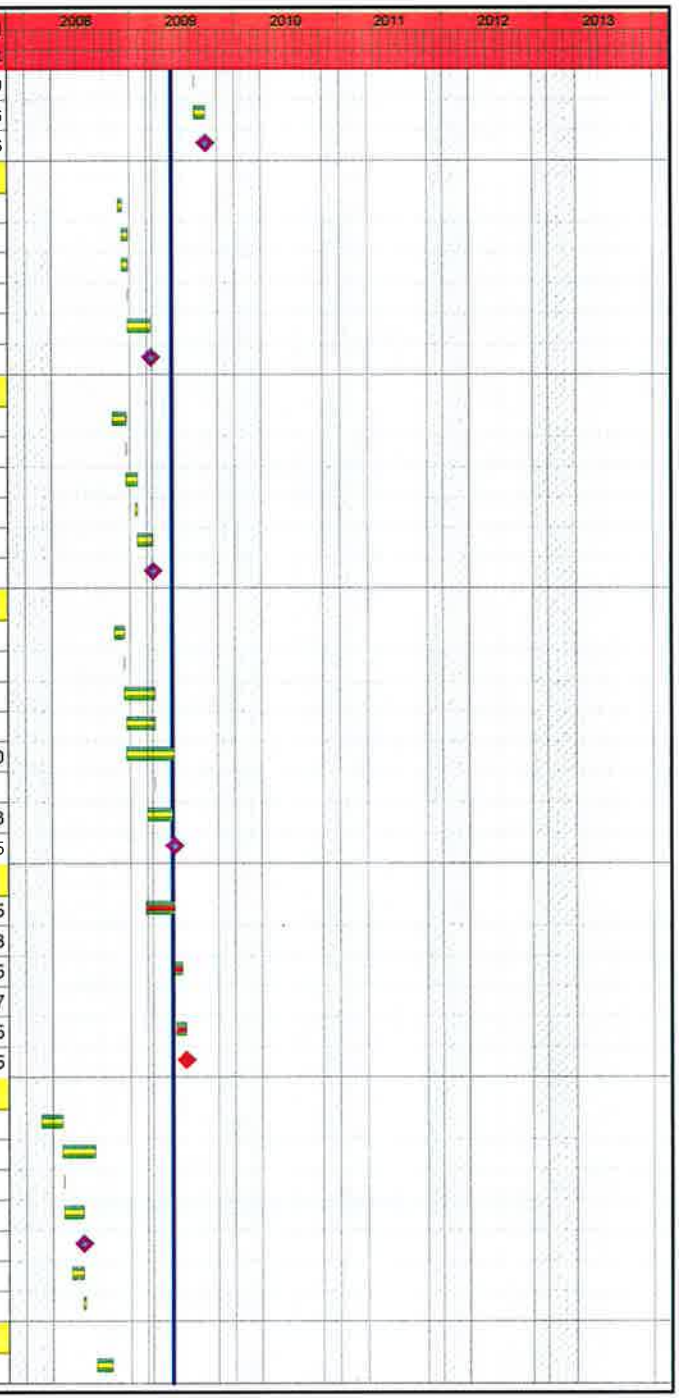
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
02L1BB0518	Design (AIP) review/approval by the GEO	28	28	30MAY09	26JUN09	30MAY09	26JUN09	2	0
02L1BB0520	Obtain SO's consent for design (AIP)	0	0		11MAY09A		11MAY09A	2	
02L1BB0522	Design preparation for the DDA submission	30	30	28MAY09	26JUN09	28MAY09	26JUN09	2	0
02L1BB0523	Design (DDA) submission for the DC's approval	1	1	27JUN09	27JUN09	27JUN09	27JUN09	1	0
02L1BB0524	Design (DDA) certification by the Design Checker	28	28	28JUN09	25JUL09	28JUN09	25JUL09	2	1
02L1BB0526	Design (DDA) submission for the SO's approval	1	1	27JUN09	27JUN09	27JUN09	27JUN09	1	0
02L1BB0528	Design (DDA) review by the SO	66	66	28JUN09	01SEP09	28JUN09	01SEP09	2	0
02L1BB0530	DDA submission for rel. authorities' approval	1	1	04JUL09	04JUL09	04JUL09	04JUL09	1	26
02L1BB0532	Design (DDA) review by the rel. authorities	28	28	05JUL09	01AUG09	05JUL09	01AUG09	2	31
02L1BB0534	Obtain rel. authorities's approval for DDA	1	1	03AUG09	03AUG09	03AUG09	03AUG09	1	26
02L1BB0536	SO submit design (DDA) for approval of GEO	1	1	03AUG09	03AUG09	03AUG09	03AUG09	1	0
02L1BB0538	Design (DDA) review/approval by the GEO	28	28	04AUG09	31AUG09	04AUG09	31AUG09	2	0
02L1BB0540	Obtain SO's consent for design (DDA)	0	0		02SEP09		02SEP09	2	0
Temp. Support Design for MA and MA/MT Connection									
02L1BB0602	Design preparation for the AIP submission	110	110	09JUN08A	02JUN09	09JUN08A	02JUN09	2	0
02L1BB0603	Design (AIP) submission for the DC's approval	1	1	18MAY09A	29MAY09	18MAY09A	29MAY09	1	3
02L1BB0604	Design (AIP) certification by the Design Checker	28	28	19MAY09A	14JUN09	19MAY09A	14JUN09	2	0
02L1BB0606	Design (AIP) submission for the SO's approval	1	1	03JUN09	03JUN09	03JUN09	03JUN09	1	0
02L1BB0608	Design (AIP) review by the SO	66	66	04JUN09	08AUG09	04JUN09	08AUG09	2	0
02L1BB0610	AIP submission for rel. authorities' approval	1	1	03JUN09	03JUN09	03JUN09	03JUN09	1	30
02L1BB0612	Design (AIP) review by the rel. authorities	28	28	04JUN09	01JUL09	04JUN09	01JUL09	2	36
02L1BB0614	Obtain rel. authorities's approval for AIP	1	1	02JUL09	02JUL09	02JUL09	02JUL09	1	31
02L1BB0616	SO submit design (AIP) for approval of GEO	1	1	22JUN09	22JUN09	22JUN09	22JUN09	1	0
02L1BB0618	Design (AIP) review/approval by the GEO	28	28	23JUN09	20JUL09	23JUN09	20JUL09	2	0
02L1BB0620	Obtain SO's consent for design (AIP)	0	0		09AUG09		09AUG09	2	0
02L1BB0622	Design preparation for the DDA submission	30	30	18JUL09	16AUG09	18JUL09	16AUG09	2	0
02L1BB0623	Design (DDA) submission for the DC's approval	1	1	17AUG09	17AUG09	17AUG09	17AUG09	1	0
02L1BB0624	Design (DDA) certification by the Design Checker	28	28	18AUG09	14SEP09	18AUG09	14SEP09	2	0
02L1BB0626	Design (DDA) submission for the SO's approval	1	1	17AUG09	17AUG09	17AUG09	17AUG09	1	0
02L1BB0628	Design (DDA) review by the SO	66	66	18AUG09	22OCT09	18AUG09	22OCT09	2	0
02L1BB0630	DDA submission for rel. authorities' approval	1	1	24AUG09	24AUG09	24AUG09	24AUG09	1	27
02L1BB0632	Design (DDA) review by the rel. authorities	28	28	25AUG09	21SEP09	25AUG09	21SEP09	2	31
02L1BB0634	Obtain rel. authorities's approval for DDA	1	1	22SEP09	22SEP09	22SEP09	22SEP09	1	25
02L1BB0636	SO submit design (DDA) for approval of GEO	1	1	22SEP09	22SEP09	22SEP09	22SEP09	1	0
02L1BB0638	Design (DDA) review/approval by the GEO	28	28	23SEP09	20OCT09	23SEP09	20OCT09	2	0
02L1BB0640	Obtain SO's consent for design (DDA)	0	0		23OCT09		23OCT09	2	0
Permanent Design for MAA/MAS/VDS/DC									
02L1BB0702	Design preparation for the AIP submission	285	285	02JUN08A	02JUN09	02JUN08A	02JUN09	2	0
02L1BB0703	Design submission for the DC's approval	2	2	23JUL08A	03JUN09	23JUL08A	03JUN09	1	0
02L1BB0704	Design (AIP) certification by the Design Checker	60	60	24JUL08A	19JUN09	24JUL08A	19JUN09	2	0
02L1BB0706	Design (AIP) submission for the SO's approval	2	2	04JUL08A	03JUN09	04JUL08A	03JUN09	1	1
02L1BB0708	Design (AIP) review by the SO	66	66	05JUL08A	19JUN09	05JUL08A	19JUN09	2	1
02L1BB0710	AIP submission for rel. authorities' approval	1	1	03JUL08A	03JUL08A	03JUL08A	03JUL08A	1	



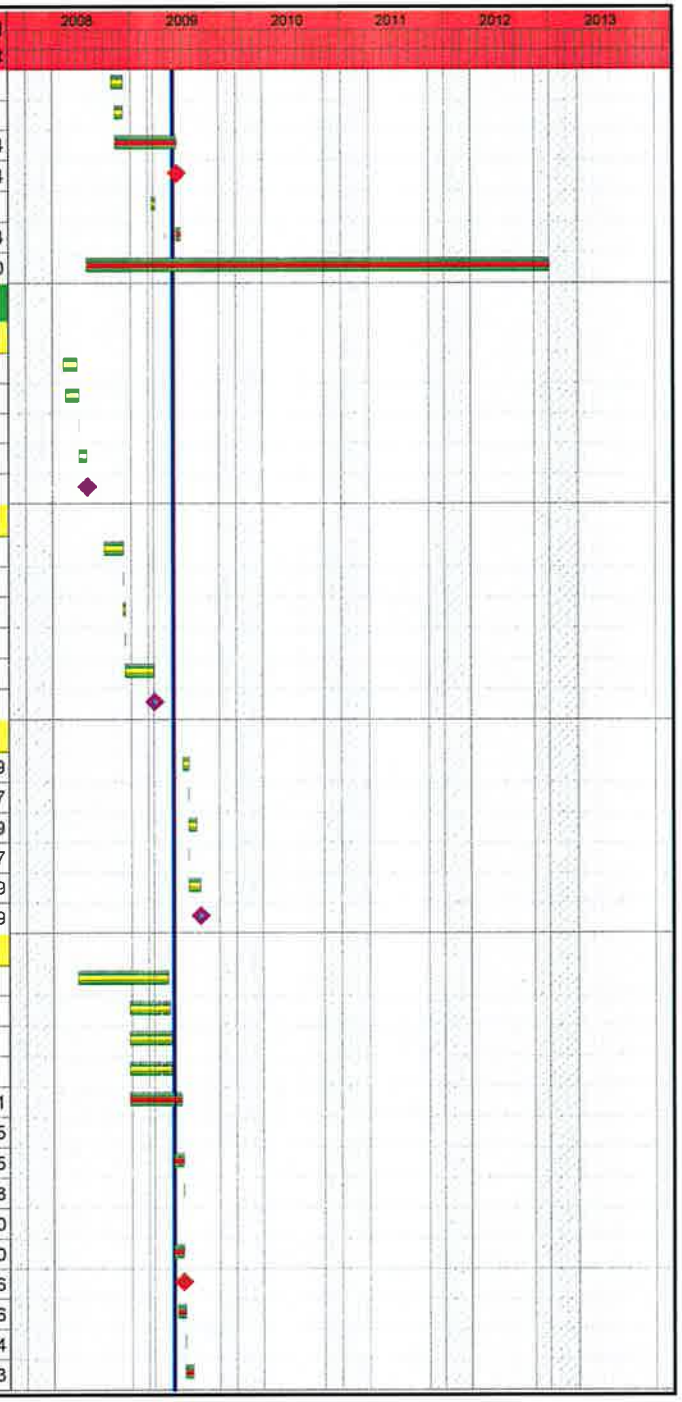
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
02L1BB0712	Design (AIP) review by the rel. authorities	28	28	04JUL08A	08JUN09	04JUL08A	08JUN09	2	10
02L1BB0714	Obtain rel. authorities's approval for AIP	1	1	09JUN09	09JUN09	09JUN09	09JUN09	1	9
02L1BB0716	SO submit design (AIP) for approval of GEO	1	1	27JUN09	27JUN09	27JUN09	27JUN09	1	0
02L1BB0718	Design (AIP) review/approval by the GEO	28	28	28JUN09	25JUL09	28JUN09	25JUL09	2	0
02L1BB0720	Obtain SO's consent for design (AIP)	0	0		20JUN09		20JUN09	2	1
02L1BB0722	Design preparation for the DDA submission	30	30	17NOV08A	27JUN09	17NOV08A	27JUN09	2	1
02L1BB0723	Design submission for the DC's approval	1	1	29JUN09	29JUN09	29JUN09	29JUN09	1	0
02L1BB0724	Design (DDA) certification by the Design Checker	28	28	30JUN09	27JUL09	30JUN09	27JUL09	2	0
02L1BB0726	Design (DDA) submission for the SO's approval	1	1	29JUN09	29JUN09	29JUN09	29JUN09	1	269
02L1BB0728	Design (DDA) review by the SO	66	66	30JUN09	03SEP09	30JUN09	03SEP09	2	332
02L1BB0730	DDA submission for rel. authorities' approval	1	1	29JUN09	29JUN09	29JUN09	29JUN09	1	299
02L1BB0732	Design (DDA) review by the rel. authorities	28	28	07JUL09	03AUG09	07JUL09	03AUG09	2	363
02L1BB0734	Obtain rel. authorities's approval for DDA	1	1	04AUG09	04AUG09	04AUG09	04AUG09	1	294
02L1BB0736	SO submit design (DDA) for approval of GEO	1	1	04AUG09	04AUG09	04AUG09	04AUG09	1	0
02L1BB0738	Design (DDA) review/approval by the GEO	28	28	05AUG09	01SEP09	05AUG09	01SEP09	2	0
02L1BB0740	Obtain SO's consent for design (DDA)	0	0		04SEP09		04SEP09	2	332
Permanent Design for MA and MA/MT Connection									
02L1BB0802	Design preparation for AIP submission	90	90	09JUN08A	17JUN09	09JUN08A	17JUN09	2	120
02L1BB0803	Design (AIP) submission for the DC's approval	2	2	30JUN08A	18JUN09	30JUN08A	18JUN09	1	100
02L1BB0804	Design (AIP) certification by the Design Checker	28	28	24JUL08A	06JUL09	24JUL08A	06JUL09	2	120
02L1BB0806	Design (AIP) submission for the SO's approval	2	2	25JUL08A	07JUL09	25JUL08A	07JUL09	1	102
02L1BB0808	Design (AIP) review by the SO	66	66	26JUL08A	11AUG09	26JUL08A	11AUG09	2	120
02L1BB0810	AIP submission for rel. authorities' approval	1	1	25JUL08A	07AUG08A	25JUL08A	07AUG08A	1	
02L1BB0812	Design (AIP) review by the rel. authorities	28	28	26JUL08A	13JUL09	26JUL08A	13JUL09	2	148
02L1BB0814	Obtain rel. authorities's approval for AIP	1	1	14JUL09	14JUL09	14JUL09	14JUL09	1	124
02L1BB0816	SO submit design (AIP) for approval of GEO	1	1	14JUL09	14JUL09	14JUL09	14JUL09	1	100
02L1BB0818	Design (AIP) review/approval by the GEO	28	28	15JUL09	11AUG09	15JUL09	11AUG09	2	120
02L1BB0820	Obtain SO's consent for design (AIP)	0	0		12AUG09		12AUG09	2	120
02L1BB0822	Design preparation for the DDA submission	30	30	21JUL09	19AUG09	21JUL09	19AUG09	2	120
02L1BB0823	Design (DDA) submission for the DC's approval	1	1	20AUG09	20AUG09	20AUG09	20AUG09	1	101
02L1BB0824	Design (DDA) certification by the Design Checker	28	28	21AUG09	17SEP09	21AUG09	17SEP09	2	122
02L1BB0826	Design (DDA) submission for the SO's approval	1	1	20AUG09	20AUG09	20AUG09	20AUG09	1	100
02L1BB0828	Design (DDA) review by the SO	66	66	21AUG09	25OCT09	21AUG09	25OCT09	2	120
02L1BB0830	DDA submission for rel. authorities' approval	1	1	20AUG09	20AUG09	20AUG09	20AUG09	1	129
02L1BB0832	Design (DDA) review by the rel. authorities	28	28	28AUG09	24SEP09	28AUG09	24SEP09	2	151
02L1BB0834	Obtain rel. authorities's approval for DDA	1	1	25SEP09	25SEP09	25SEP09	25SEP09	1	120
02L1BB0836	SO submit design (DDA) for approval of GEO	1	1	25SEP09	25SEP09	25SEP09	25SEP09	1	98
02L1BB0838	Design (DDA) review/approval by the GEO	28	28	26SEP09	23OCT09	26SEP09	23OCT09	2	122
02L1BB0840	Obtain SO's consent for design (DDA)	0	0		26OCT09		26OCT09	2	120
ELS for Perm. Approach Channel Construction									
02L1BB0902	Design preparation by the Designer	14	14	01AUG09*	14AUG09	01AUG09*	14AUG09	2	86
02L1BB0903	Design submission for the DC's approval	1	1	15AUG09	15AUG09	15AUG09	15AUG09	1	70
02L1BB0904	Design certification by the Design Checker	28	28	16AUG09	12SEP09	16AUG09	12SEP09	2	86



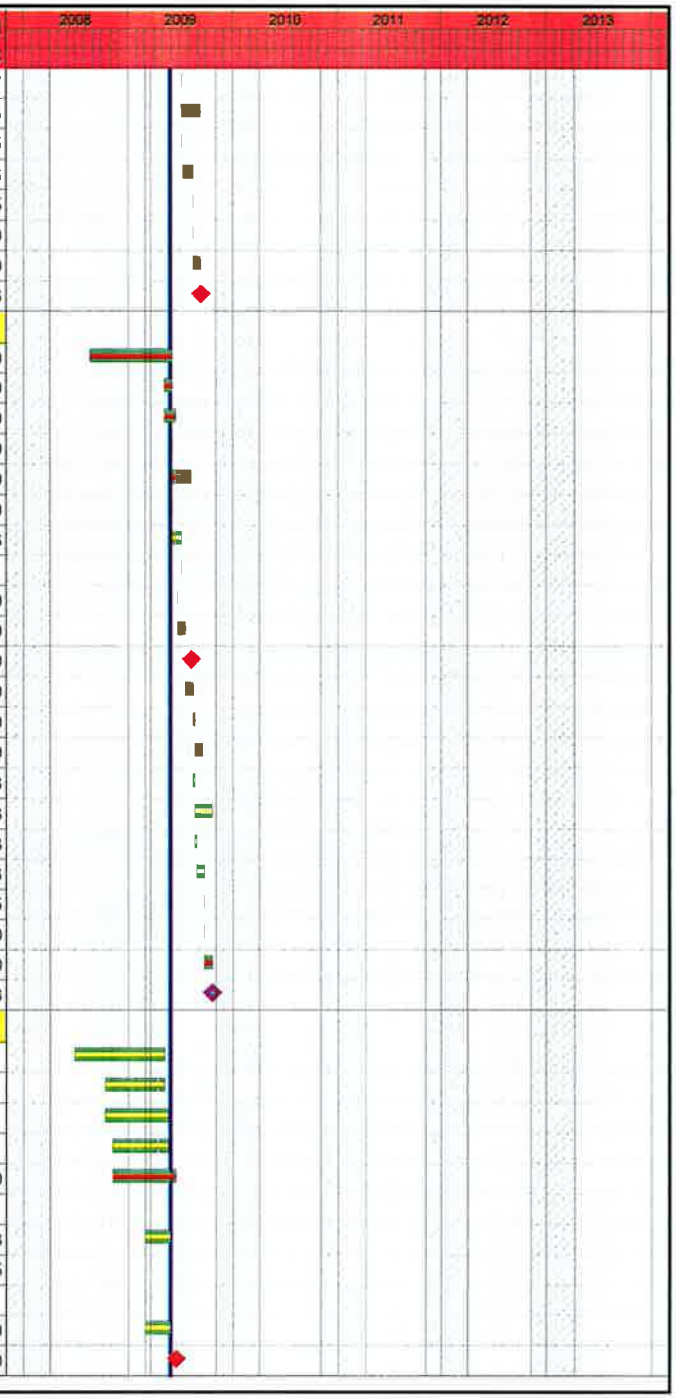
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
02L1BB0906	Design submission for the SO's approval	1	1	15AUG09	15AUG09	15AUG09	15AUG09	1	70
02L1BB0908	Design review by the SO	42	42	16AUG09	26SEP09	16AUG09	26SEP09	2	86
02L1BB0910	Obtain design approval from the SO	0	0		26SEP09		26SEP09	2	86
Platform for RCD Operation (Air Vent Shaft)									
02L1BB1602	Prepare design/method statement	6	6	22NOV08A	01DEC08A	22NOV08A	01DEC08A	1	
02L1BB1604	Submit design/method statement to Design Checker	1	1	02DEC08A	23DEC08A	02DEC08A	23DEC08A	1	
02L1BB1606	Certify design/m.s. by Design Checker	7	7	03DEC08A	24DEC08A	03DEC08A	24DEC08A	2	
02L1BB1608	Submit design/m.s. to SO	1	1	24DEC08A	24DEC08A	24DEC08A	24DEC08A	1	
02L1BB1610	Design/m.s. review by SO	14	14	25DEC08A	11MAR09A	25DEC08A	11MAR09A	2	
02L1BB1612	Obtain design/m.s. approval from the SO	0	0		11MAR09A		11MAR09A	1	
Temporary Works for Air Vent Shaft Construction									
02L1BB1702	Prepare design/method statement	21	21	03NOV08A	16DEC08A	03NOV08A	16DEC08A	1	
02L1BB1704	Submit design/method statement to Design Checker	1	1	17DEC08A	17DEC08A	17DEC08A	17DEC08A	1	
02L1BB1706	Certify design/m.s. by Design Checker	14	14	18DEC08A	23JAN09A	18DEC08A	23JAN09A	2	
02L1BB1708	Submit design/m.s. to SO	1	1	23JAN09A	23JAN09A	23JAN09A	23JAN09A	1	
02L1BB1710	Design/m.s. review by SO	7	7	24JAN09A	23MAR09A	24JAN09A	23MAR09A	2	
02L1BB1712	Obtain design/m.s. approval from the SO	0	0		23MAR09A		23MAR09A	1	
Permanet Design for Air Vent Shaft									
02L1BB1802	Prepare design/method statement	26	26	05NOV08A	11DEC08A	05NOV08A	11DEC08A	1	
02L1BB1804	Submit design/method statement to Design Checker	1	1	12DEC08A	12DEC08A	12DEC08A	12DEC08A	1	
02L1BB1806	Certify design/m.s. by Design Checker	21	21	13DEC08A	24MAR09A	13DEC08A	24MAR09A	2	
02L1BB1808	Submit design/m.s. to SO	1	1	17DEC08A	24MAR09A	17DEC08A	24MAR09A	1	
02L1BB1810	Design/m.s. review by SO	42	42	18DEC08A	31MAY09	18DEC08A	31MAY09	2	150
02L1BB1812	Submit design to rel. authorities	1	1	25MAR09A	25MAR09A	25MAR09A	25MAR09A	1	
02L1BB1814	Obtain design approval from rel. authorities	28	28	01MAR09A	28MAY09	01MAR09A	28MAY09	2	153
02L1BB1816	Obtain design/m.s. approval from the SO	0	0		30MAY09		30MAY09	1	125
ELS Design for Construction of Vortex Shaft									
02L1BB1902	Design preparation by the Designer	25	25	23FEB09A	02JUN09	23FEB09A	02JUN09	2	-205
02L1BB1904	Design submission for the DC's approval	1	1	03JUN09	03JUN09	03JUN09	03JUN09	1	-163
02L1BB1906	Design certification by the Design Checker	28	28	04JUN09	01JUL09	04JUN09	01JUL09	2	-205
02L1BB1908	Design submission for the SO's approval	1	1	03JUN09	03JUN09	03JUN09	03JUN09	1	-157
02L1BB1910	Design review by the SO	42	42	11JUN09	15JUL09	11JUN09	15JUL09	2	-205
02L1BB1912	Obtain design approval from the SO	0	0		15JUL09		15JUL09	2	-205
Geotechnical Instrumentation Stg 1 for GL Works									
3DL1BBG102	Design preparation by the Designer	14	14	22FEB08A	05MAY08A	22FEB08A	05MAY08A	2	
3DL1BBG104	Design certification by the Design Checker	7	7	06MAY08A	29AUG08A	06MAY08A	29AUG08A	2	
3DL1BBG106	Design submission for the SO's approval	1	1	10MAY08A	10MAY08A	10MAY08A	10MAY08A	1	
3DL1BBG108	Design review by the SO	14	14	12MAY08A	14JUL08A	12MAY08A	14JUL08A	2	
3DL1BBG110	Obtain design approval from the SO	0	0		14JUL08A		14JUL08A	2	
3DL1BBG112	Install Geotechnical Instruments	6	6	11JUN08A	19JUL08A	11JUN08A	19JUL08A	1	
3DL1BBG114	Baseline Monitoring	14	14	21JUL08A	26JUL08A	21JUL08A	26JUL08A	2	
Geotechnical Instrumentation Stg 2 for Deep Exc.									
3DL1BBG202	Design preparation by the Designer	40	40	31AUG08A	24OCT08A	31AUG08A	24OCT08A	2	



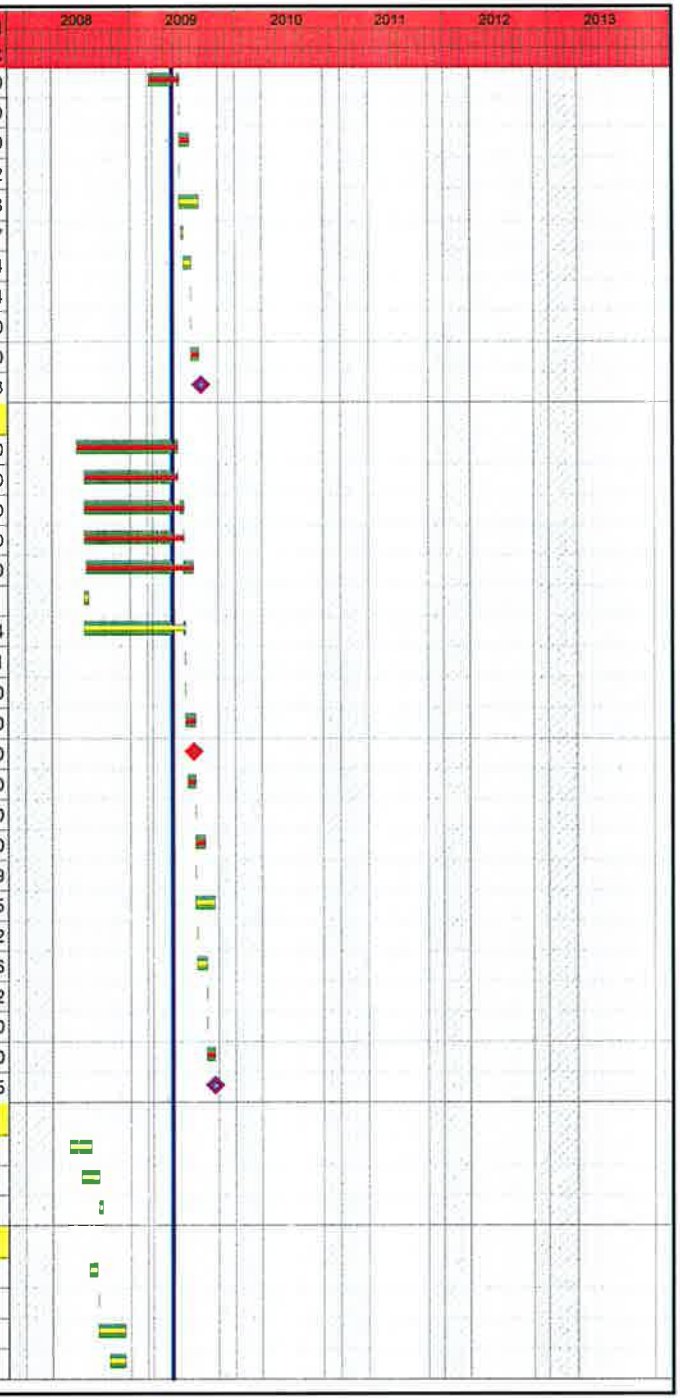
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
3DL1BBG204	Design certification by the Design Checker	14	14	24OCT08A	02DEC08A	24OCT08A	02DEC08A	2	
3DL1BBG206	Design submission for the SO's approval	1	1	05NOV08A	02DEC08A	05NOV08A	02DEC08A	1	
3DL1BBG208	Design review by the SO	28	28	06NOV08A	10JUN09	06NOV08A	10JUN09	2	-114
3DL1BBG210	Obtain design approval from the SO	0	0		10JUN09		10JUN09	2	-114
3DL1BBG212	Install Geotechnical Instruments	12	12	14MAR09A	27MAR09A	14MAR09A	27MAR09A	1	
3DL1BBG214	Baseline Monitoring	14	14	11JUN09	24JUN09	11JUN09	24JUN09	2	-114
3DL1BBG216	Monitor/report Geotechnical Instrumentation	1,587	1,587	28JUL08A	31DEC12	28JUL08A	31DEC12	2	0
Design Packages for Works in Portion C									
Piling Platform for H-pile Wall A									
02L1CC0002	Design preparation by the Designer	15	15	12MAY08A	27JUN08A	12MAY08A	27JUN08A	2	
02L1CC0004	Design certification by the Design Checker	14	14	22MAY08A	03JUL08A	22MAY08A	03JUL08A	2	
02L1CC0006	Design submission for the SO's approval	1	1	04JUL08A	04JUL08A	04JUL08A	04JUL08A	1	
02L1CC0008	Design review by the SO	14	14	05JUL08A	29JUL08A	05JUL08A	29JUL08A	2	
02L1CC0010	Obtain design approval from the SO	0	0		29JUL08A		29JUL08A	2	
Temporary Works for Formation of Access Road									
02L1CC0102	Design preparation by the Designer	40	40	29SEP08A	01DEC08A	29SEP08A	01DEC08A	2	
02L1CC0103	Design submission for the DC's approval	1	1	02DEC08A	02DEC08A	02DEC08A	02DEC08A	1	
02L1CC0104	Design certification by the Design Checker	14	14	03DEC08A	08DEC08A	03DEC08A	08DEC08A	2	
02L1CC0106	Design submission for the SO's approval	1	1	09DEC08A	09DEC08A	09DEC08A	09DEC08A	1	
02L1CC0108	Design review by the SO	28	28	10DEC08A	23MAR09A	10DEC08A	23MAR09A	2	
02L1CC0110	Obtain design approval from the SO	0	0		23MAR09A		23MAR09A	2	
Piling Platform for H-pile Wall B									
02L1CC0202	Design preparation by the Designer	15	15	02JUL09*	16JUL09	02JUL09*	16JUL09	2	179
02L1CC0203	Design submission for the DC's approval	1	1	17JUL09	17JUL09	17JUL09	17JUL09	1	147
02L1CC0204	Design certification by the Design Checker	28	28	18JUL09	14AUG09	18JUL09	14AUG09	2	179
02L1CC0206	Design submission for the SO's approval	1	1	17JUL09	17JUL09	17JUL09	17JUL09	1	147
02L1CC0208	Design review by the SO	42	42	18JUL09	28AUG09	18JUL09	28AUG09	2	179
02L1CC0210	Obtain design approval from the SO	0	0		28AUG09		28AUG09	2	179
Temp. Support Design for MAA/MAS/VDS/DC/AVS									
02L1CC0302	Design preparation for the AIP submission	103	103	26JUN08A	09MAY09A	26JUN08A	09MAY09A	2	
02L1CC0303	Design (AIP) submission for the DC's approval	2	2	23DEC08A	15MAY09A	23DEC08A	15MAY09A	1	
02L1CC0304	Design (AIP) certification by the Design Checker	28	28	24DEC08A	19MAY09A	24DEC08A	19MAY09A	2	
02L1CC0306	Design (AIP) submission for the SO's approval	2	2	23DEC08A	19MAY09A	23DEC08A	19MAY09A	1	
02L1CC0308	Design (AIP) review by the SO	66	66	24DEC08A	23JUN09	24DEC08A	23JUN09	2	-141
02L1CC0310	AIP submission for rel. authorities' approval	1	1	29MAY09	29MAY09	29MAY09	29MAY09	1	-115
02L1CC0312	Design (AIP) review by the rel. authorities	28	28	30MAY09	26JUN09	30MAY09	26JUN09	2	-145
02L1CC0314	Obtain rel. authorities's approval for AIP	1	1	27JUN09	27JUN09	27JUN09	27JUN09	1	-118
02L1CC0316	SO submit design (AIP) for approval of GEO	1	1	29MAY09	29MAY09	29MAY09	29MAY09	1	0
02L1CC0318	Design (AIP) review/approval by the GEO	28	28	30MAY09	26JUN09	30MAY09	26JUN09	2	0
02L1CC0320	Obtain SO's consent for design (AIP)	0	0		29JUN09		29JUN09	2	-146
02L1CC0322	Design preparation for the DDA submission	30	30	07JUN09	06JUL09	07JUN09	06JUL09	2	-146
02L1CC0323	Design (DDA) submission for the DC's approval	1	1	07JUL09	07JUL09	07JUL09	07JUL09	1	-114
02L1CC0324	Design (DDA) certification by the Design Checker	28	28	08JUL09	04AUG09	08JUL09	04AUG09	2	-143



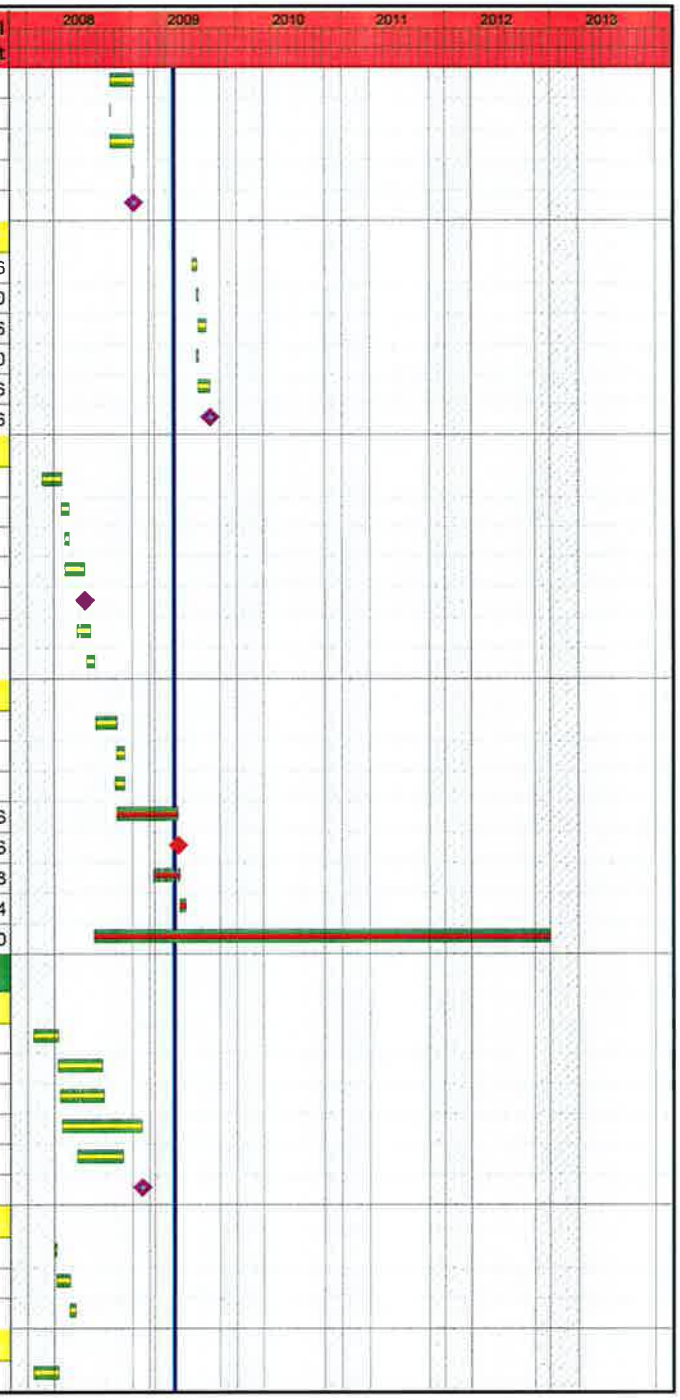
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
02L1CC0326	Design (DDA) submission for the SO's approval	1	1	07JUL09	07JUL09	07JUL09	07JUL09	1	-117
02L1CC0328	Design (DDA) review by the SO	66	66	08JUL09	11SEP09	08JUL09	11SEP09	2	-146
02L1CC0330	DDA submission for rel. authorities' approval	1	1	07JUL09	07JUL09	07JUL09	07JUL09	1	-85
02L1CC0332	Design (DDA) review by the rel. authorities	28	28	15JUL09	11AUG09	15JUL09	11AUG09	2	-116
02L1CC0334	Obtain rel. authorities's approval for DDA	1	1	12AUG09	12AUG09	12AUG09	12AUG09	1	-95
02L1CC0336	SO submit design (DDA) for approval of GEO	1	1	12AUG09	12AUG09	12AUG09	12AUG09	1	0
02L1CC0338	Design (DDA) review/approval by the GEO	28	28	13AUG09	09SEP09	13AUG09	09SEP09	2	0
02L1CC0340	Obtain SO's consent for design (DDA)	0	0		12SEP09		12SEP09	2	-146
Temp. Support Design for MA and MA/MT Connection									
02L1CC0402	Design preparation for the AIP submission	110	110	18AUG08A	03JUN09	18AUG08A	03JUN09	2	0
02L1CC0403	Design (AIP) submission for the DC's approval	2	2	05MAY09A	30MAY09	05MAY09A	30MAY09	1	0
02L1CC0404	Design (AIP) certification by the Design Checker	28	28	06MAY09A	15JUN09	06MAY09A	15JUN09	2	0
02L1CC0406	Design (AIP) submission for the SO's approval	1	1	04JUN09	04JUN09	04JUN09	04JUN09	1	0
02L1CC0408	Design (AIP) review by the SO	66	66	05JUN09	09AUG09	05JUN09	09AUG09	2	0
02L1CC0410	AIP submission for rel. authorities' approval	1	1	04JUN09	04JUN09	04JUN09	04JUN09	1	30
02L1CC0412	Design (AIP) review by the rel. authorities	28	28	05JUN09	02JUL09	05JUN09	02JUL09	2	36
02L1CC0414	Obtain rel. authorities's approval for AIP	1	1	03JUL09	03JUL09	03JUL09	03JUL09	1	31
02L1CC0416	SO submit design (AIP) for approval of GEO	1	1	23JUN09	23JUN09	23JUN09	23JUN09	1	0
02L1CC0418	Design (AIP) review/approval by the GEO	28	28	24JUN09	21JUL09	24JUN09	21JUL09	2	0
02L1CC0420	Obtain SO's consent for design (AIP)	0	0		10AUG09		10AUG09	2	0
02L1CC0422	Design preparation for the DDA submission	30	30	19JUL09	17AUG09	19JUL09	17AUG09	2	0
02L1CC0423	Design submission for the DC's approval	1	1	18AUG09	18AUG09	18AUG09	18AUG09	1	0
02L1CC0424	Design (DDA) certification by the Design Checker	28	28	19AUG09	15SEP09	19AUG09	15SEP09	2	0
02L1CC0426	Design (DDA) submission for the SO's approval	1	1	18AUG09	18AUG09	18AUG09	18AUG09	1	73
02L1CC0428	Design (DDA) review by the SO	66	66	19AUG09	23OCT09	19AUG09	23OCT09	2	88
02L1CC0430	DDA submission for rel. authorities' approval	1	1	25AUG09	25AUG09	25AUG09	25AUG09	1	98
02L1CC0432	Design (DDA) review by the rel. authorities	28	28	26AUG09	22SEP09	26AUG09	22SEP09	2	118
02L1CC0434	Obtain rel. authorities's approval for DDA	1	1	23SEP09	23SEP09	23SEP09	23SEP09	1	95
02L1CC0436	SO submit design (DDA) for approval of GEO	1	1	23SEP09	23SEP09	23SEP09	23SEP09	1	0
02L1CC0438	Design (DDA) review/approval by the GEO	28	28	24SEP09	21OCT09	24SEP09	21OCT09	2	0
02L1CC0440	Obtain SO's consent for design (DDA)	0	0		23OCT09		23OCT09	2	88
Permanent Design for MAA/MAS/VDS/DC/AVS									
02L1CC0502	Design preparation for the AIP submission	103	103	26JUN08A	04MAY09A	26JUN08A	04MAY09A	2	
02L1CC0503	Design submission for the DC's approval	2	2	11OCT08A	05MAY09A	11OCT08A	05MAY09A	1	
02L1CC0504	Design (AIP) certification by the Design Checker	28	28	13OCT08A	19MAY09A	13OCT08A	19MAY09A	2	
02L1CC0506	Design (AIP) submission for the SO's approval	4	4	05NOV08A	19MAY09A	05NOV08A	19MAY09A	1	
02L1CC0508	Design (AIP) review by the SO	66	66	06NOV08A	16JUN09	06NOV08A	16JUN09	2	0
02L1CC0510	AIP submission for rel. authorities' approval	1	1	28FEB09A	28FEB09A	28FEB09A	28FEB09A	1	
02L1CC0512	Design (AIP) review by the rel. authorities	28	28	01MAR09A	28MAY09	01MAR09A	28MAY09	2	18
02L1CC0514	Obtain rel. authorities's approval for AIP	1	1	29MAY09	29MAY09	29MAY09	29MAY09	1	15
02L1CC0516	SO submit design (AIP) for approval of GEO	1	1	28FEB09A	28FEB09A	28FEB09A	28FEB09A	1	
02L1CC0518	Design (AIP) review/approval by the GEO	28	28	01MAR09A	28MAY09	01MAR09A	28MAY09	2	19
02L1CC0520	Obtain SO's consent for design (AIP)	0	0		17JUN09		17JUN09	2	0



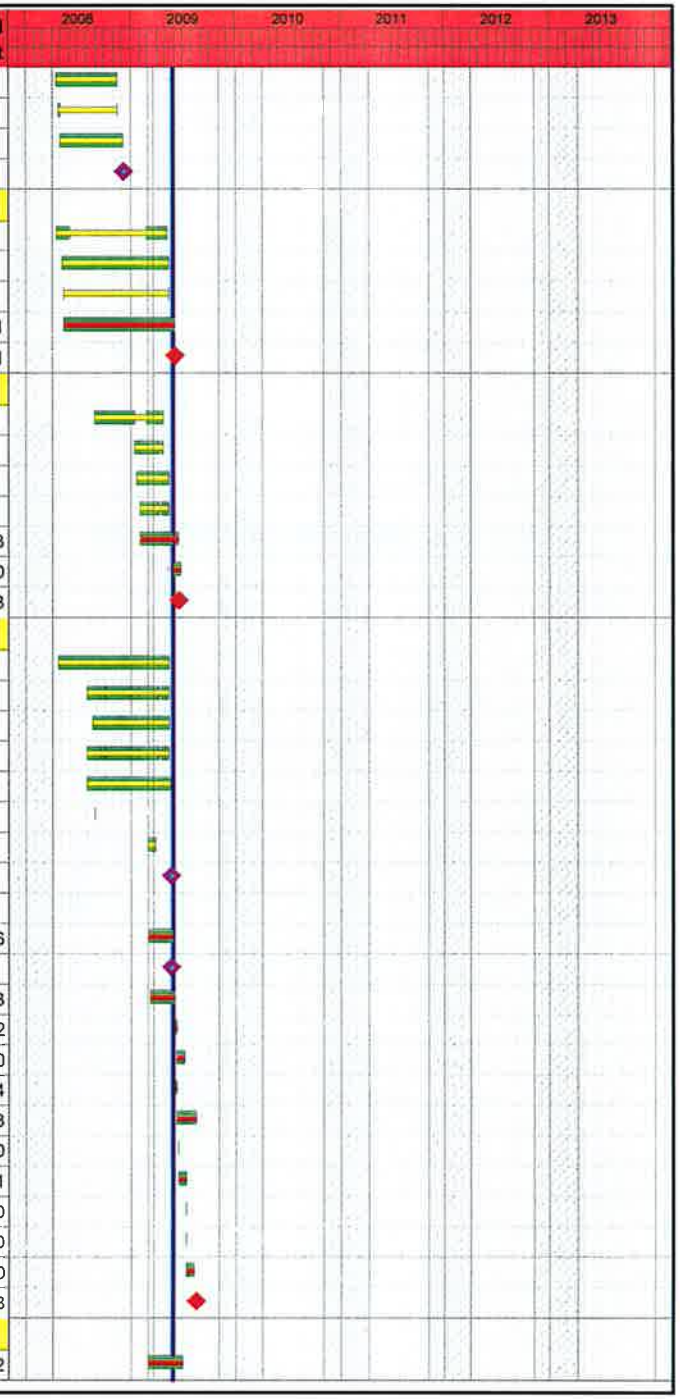
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
02L1CC0522	Design preparation for the DDA submission	30	30	09MAR09A	24JUN09	09MAR09A	24JUN09	2	0
02L1CC0523	Design submission for the DC's approval	1	1	25JUN09	25JUN09	25JUN09	25JUN09	1	0
02L1CC0524	Design (DDA) certification by the Design Checker	28	28	26JUN09	23JUL09	26JUN09	23JUL09	2	0
02L1CC0526	Design (DDA) submission for the SO's approval	1	1	25JUN09	25JUN09	25JUN09	25JUN09	1	152
02L1CC0528	Design (DDA) review by the SO	66	66	26JUN09	30AUG09	26JUN09	30AUG09	2	183
02L1CC0530	DDA submission for rel. authorities' approval	1	1	02JUL09	02JUL09	02JUL09	02JUL09	1	177
02L1CC0532	Design (DDA) review by the rel. authorities	28	28	03JUL09	30JUL09	03JUL09	30JUL09	2	214
02L1CC0534	Obtain rel. authorities's approval for DDA	1	1	31JUL09	31JUL09	31JUL09	31JUL09	1	174
02L1CC0536	SO submit design (DDA) for approval of GEO	1	1	31JUL09	31JUL09	31JUL09	31JUL09	1	0
02L1CC0538	Design (DDA) review/approval by the GEO	28	28	01AUG09	28AUG09	01AUG09	28AUG09	2	0
02L1CC0540	Obtain SO's consent for design (DDA)	0	0		31AUG09		31AUG09	2	183
Permanent Design for MA and MA/MT Connection									
02L1CC0602	Design preparation for the AIP submission	84	84	01JUL08A	17JUN09	01JUL08A	17JUN09	2	0
02L1CC0603	Design (AIP) submission for the DC's approval	2	2	25JUL08A	18JUN09	25JUL08A	18JUN09	1	0
02L1CC0604	Design (AIP) certification by the Design Checker	28	28	26JUL08A	06JUL09	26JUL08A	06JUL09	2	0
02L1CC0606	Design (AIP) submission for the SO's approval	2	2	26JUL08A	07JUL09	26JUL08A	07JUL09	1	0
02L1CC0608	Design (AIP) review by the SO	66	66	28JUL08A	08AUG09	28JUL08A	08AUG09	2	0
02L1CC0610	AIP submission for rel. authorities' approval	1	1	25JUL08A	08AUG08A	25JUL08A	08AUG08A	1	
02L1CC0612	Design (AIP) review by the rel. authorities	28	28	26JUL08A	13JUL09	26JUL08A	13JUL09	2	24
02L1CC0614	Obtain rel. authorities's approval for AIP	1	1	14JUL09	14JUL09	14JUL09	14JUL09	1	21
02L1CC0616	SO submit design (AIP) for approval of GEO	1	1	14JUL09	14JUL09	14JUL09	14JUL09	1	0
02L1CC0618	Design (AIP) review/approval by the GEO	28	28	15JUL09	11AUG09	15JUL09	11AUG09	2	0
02L1CC0620	Obtain SO's consent for design (AIP)	0	0		09AUG09		09AUG09	2	0
02L1CC0622	Design preparation for the DDA submission	30	30	18JUL09	16AUG09	18JUL09	16AUG09	2	0
02L1CC0623	Design (DDA) submission for the DC's approval	1	1	17AUG09	17AUG09	17AUG09	17AUG09	1	0
02L1CC0624	Design (DDA) certification by the Design Checker	28	28	18AUG09	14SEP09	18AUG09	14SEP09	2	0
02L1CC0626	Design (DDA) submission for the SO's approval	1	1	17AUG09	17AUG09	17AUG09	17AUG09	1	419
02L1CC0628	Design (DDA) review by the SO	66	66	18AUG09	22OCT09	18AUG09	22OCT09	2	515
02L1CC0630	DDA submission for rel. authorities' approval	1	1	24AUG09	24AUG09	24AUG09	24AUG09	1	442
02L1CC0632	Design (DDA) review by the rel. authorities	28	28	25AUG09	21SEP09	25AUG09	21SEP09	2	546
02L1CC0634	Obtain rel. authorities's approval for DDA	1	1	22SEP09	22SEP09	22SEP09	22SEP09	1	442
02L1CC0636	SO submit design (DDA) for approval of GEO	1	1	22SEP09	22SEP09	22SEP09	22SEP09	1	0
02L1CC0638	Design (DDA) review/approval by the GEO	28	28	23SEP09	20OCT09	23SEP09	20OCT09	2	0
02L1CC0640	Obtain SO's consent for design (DDA)	0	0		23OCT09		23OCT09	2	515
Boulder Assessment & Design for Stabili. Measure									
02L1CC0702	Boulder Surevey	30	30	02JUN08A	15AUG08A	02JUN08A	15AUG08A	1	
02L1CC0704	Prepare/submit boulder surevey report	25	25	14JUL08A	05SEP08A	14JUL08A	05SEP08A	1	
02L1CC0706	SO review boulder survey report	14	14	06SEP08A	19SEP08A	06SEP08A	19SEP08A	2	
Temporary Drainage Management Plan									
02L1CC0802	TDMP preparation by the Designer	14	14	04AUG08A	03SEP08A	04AUG08A	03SEP08A	2	
02L1CC0803	TDMP submission for the DC's approval	1	1	08SEP08A	08SEP08A	08SEP08A	08SEP08A	1	
02L1CC0804	TDMP certification by the Design Checker	28	28	09SEP08A	10DEC08A	09SEP08A	10DEC08A	2	
02L1CC0806	TDMP submission for the SO's approval	2	2	20OCT08A	11DEC08A	20OCT08A	11DEC08A	1	



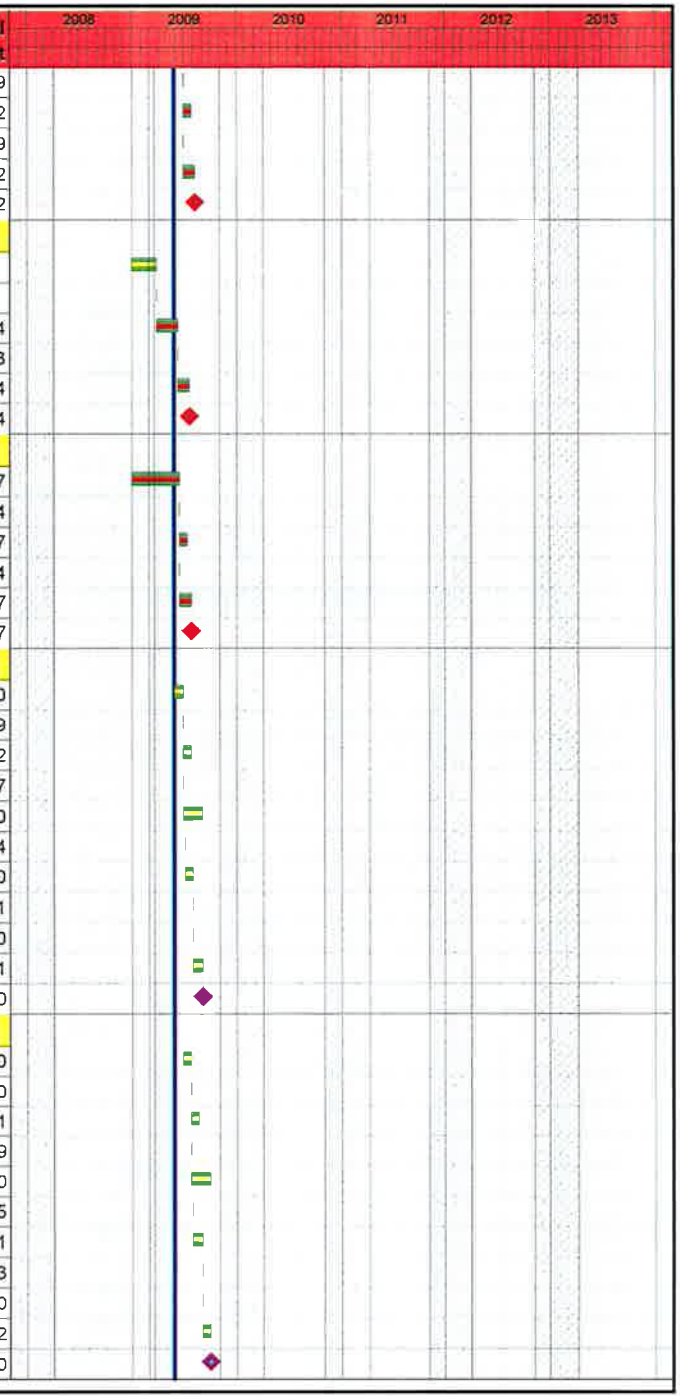
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
02L1CC0808	TDMP review by the SO	90	90	21OCT08A	08JAN09A	21OCT08A	08JAN09A	2	
02L1CC0810	TDMP submission for DSD's approval	1	1	21OCT08A	21OCT08A	21OCT08A	21OCT08A	1	
02L1CC0812	TDMP review by the DSD	90	90	22OCT08A	08JAN09A	22OCT08A	08JAN09A	2	
02L1CC0814	Obtain DSD's approval for DDA	1	1	08JAN09A	08JAN09A	08JAN09A	08JAN09A	1	
02L1CC0816	Obtain SO's consent for TDMP	0	0		08JAN09A		08JAN09A	2	
ELS for Permanent Approach Channel Construction									
02L1CC0902	Design preparation by the Designer	15	15	03AUG09*	17AUG09	03AUG09*	17AUG09	2	406
02L1CC0903	Design submission for the DC's approval	1	1	18AUG09	18AUG09	18AUG09	18AUG09	1	330
02L1CC0904	Design certification by the Design Checker	28	28	19AUG09	15SEP09	19AUG09	15SEP09	2	406
02L1CC0906	Design submission for the SO's approval	1	1	18AUG09	18AUG09	18AUG09	18AUG09	1	330
02L1CC0908	Design review by the SO	42	42	19AUG09	29SEP09	19AUG09	29SEP09	2	406
02L1CC0910	Obtain design approval from the SO	0	0		29SEP09		29SEP09	2	406
Geotechnical Instrumentation Stg 1 for GL Works									
3DL1CCG102	Design preparation by the Designer	14	14	22FEB08A	29APR08A	22FEB08A	29APR08A	2	
3DL1CCG104	Design certification by the Design Checker	7	7	30APR08A	26MAY08A	30APR08A	26MAY08A	2	
3DL1CCG106	Design submission for the SO's approval	1	1	10MAY08A	26MAY08A	10MAY08A	26MAY08A	1	
3DL1CCG108	Design review by the SO	14	14	12MAY08A	14JUL08A	12MAY08A	14JUL08A	2	
3DL1CCG110	Obtain design approval from the SO	0	0		14JUL08A		14JUL08A	2	
3DL1CCG112	Install Geotechnical Instruments	19	19	24JUN08A	09AUG08A	24JUN08A	09AUG08A	1	
3DL1CCG114	Baseline Monitoring	14	14	26JUL08A	16AUG08A	26JUL08A	16AUG08A	2	
Geotechnical Instrumentation Stg 2 for Deep Exc.									
3DL1CCG202	Design preparation by the Designer	60	60	28AUG08A	04NOV08A	28AUG08A	04NOV08A	2	
3DL1CCG204	Design certification by the Design Checker	14	14	11NOV08A	01DEC08A	11NOV08A	01DEC08A	2	
3DL1CCG206	Design submission for the SO's approval	2	2	04NOV08A	02DEC08A	04NOV08A	02DEC08A	1	
3DL1CCG210	Design review by the SO	28	28	05NOV08A	11JUN09	05NOV08A	11JUN09	2	-76
3DL1CCG212	Obtain design approval from the SO	0	0		11JUN09		11JUN09	2	-76
3DL1CCG214	Install Geotechnical Instruments	18	18	14MAR09A	18JUN09	14MAR09A	18JUN09	1	-58
3DL1CCG216	Baseline Monitoring	14	14	19JUN09	02JUL09	19JUN09	02JUL09	2	-74
3DL1CCG218	Monitor/report Geotechnical Instrumentation	1,566	1,566	18AUG08A	31DEC12	18AUG08A	31DEC12	2	0
Design Packages for Works in Portion D									
Temp. Access Rd Design at P. D; +14mPD to +69mPD									
02L1DD0102	Design preparation by the Designer	14	14	17JAN08A	16APR08A	17JAN08A	16APR08A	2	
02L1DD0104	Design certification by the Design Checker	150	150	17APR08A	13SEP08A	17APR08A	13SEP08A	2	
02L1DD0106	Design submission for the SO's approval	2	2	25APR08A	24SEP08A	25APR08A	24SEP08A	1	
02L1DD0108	Design review by the SO	90	90	26APR08A	04FEB09A	26APR08A	04FEB09A	2	
02L1DD0110	Design review by GEO	28	28	23JUN08A	29NOV08A	23JUN08A	29NOV08A	2	
02L1DD0112	Obtain design approval from the SO	0	0		04FEB09A		04FEB09A	2	
Boulder Assessment & Design for Stabili. Measure									
02L1DD0302	Boulder Surevey	14	14	03APR08A	11APR08A	03APR08A	11APR08A	1	
02L1DD0304	Prepare/submit boulder surevey report	25	25	12APR08A	26MAY08A	12APR08A	26MAY08A	1	
02L1DD0306	SO review boulder survey report	14	14	27MAY08A	16JUN08A	27MAY08A	16JUN08A	2	
Site Formation Design; +69mPD to +40mPD									
02L1DD0402	Design preparation by the Designer	14	14	17JAN08A	16APR08A	17JAN08A	16APR08A	2	



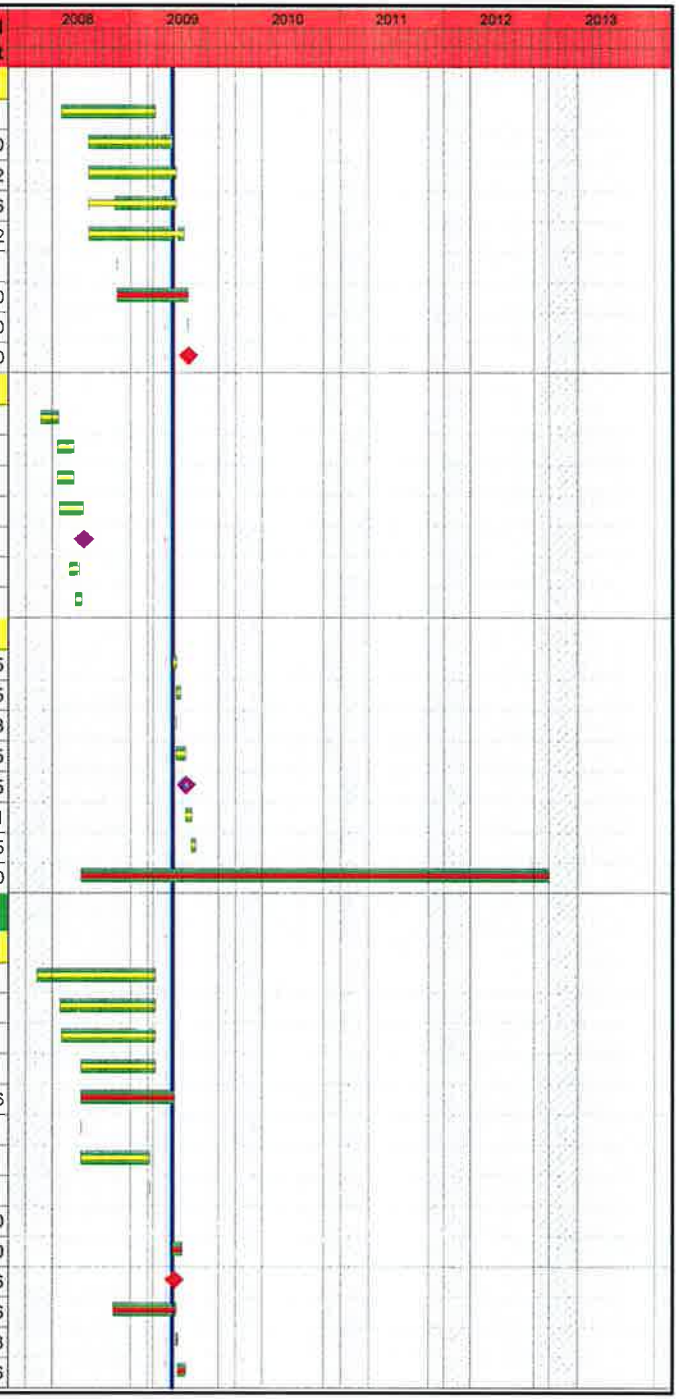
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
02L1DD0404	Design certification by the Design Checker	150	150	17APR08A	14NOV08A	17APR08A	14NOV08A	2	
02L1DD0406	Design submission for the SO's approval	2	2	25APR08A	14NOV08A	25APR08A	14NOV08A	1	
02L1DD0408	Design review by the SO	90	90	26APR08A	04DEC08A	26APR08A	04DEC08A	2	
02L1DD0412	Obtain design approval from the SO	0	0		04DEC08A		04DEC08A	2	
Site Formation Design; +40mPD to +24mPD									
02L1DD0502	Design preparation by the Designer	120	120	14APR08A	09MAY09A	14APR08A	09MAY09A	2	
02L1DD0504	Design certification by the Design Checker	145	145	05MAY08A	15MAY09A	05MAY08A	15MAY09A	2	
02L1DD0506	Design submission for the SO's approval	2	2	10MAY08A	16MAY09A	10MAY08A	16MAY09A	1	
02L1DD0508	Design review by the SO	90	90	12MAY08A	03JUN09	12MAY08A	03JUN09	2	-201
02L1DD0512	Obtain design approval from the SO	0	0		03JUN09		03JUN09	2	-201
Site Formation Design; +24mPD to 14mPD									
02L1DD0602	Design preparation by the Designer	60	60	28AUG08A	23APR09A	28AUG08A	23APR09A	2	
02L1DD0603	Design submission for the DC's approval	2	2	16JAN09A	24APR09A	16JAN09A	24APR09A	1	
02L1DD0604	Design certification by the Design Checker	28	28	19JAN09A	15MAY09A	19JAN09A	15MAY09A	2	
02L1DD0606	Design submission for the SO's approval	2	2	02FEB09A	15MAY09A	02FEB09A	15MAY09A	1	
02L1DD0608	Design review by the SO	63	63	03FEB09A	18JUN09	03FEB09A	18JUN09	2	-213
02L1DD0610	Design review by GEO	28	28	28MAY09	24JUN09	28MAY09	24JUN09	2	0
02L1DD0612	Obtain design approval from the SO	0	0		18JUN09		18JUN09	2	-213
TBM Launching Chamber Design									
02L1DD0702	Design (AIP) preparation by the Designer	381	381	21APR08A	11MAY09A	21APR08A	11MAY09A	2	
02L1DD0703	Design (AIP) submission for the DC's approval	3	3	28JUL08A	12MAY09A	28JUL08A	12MAY09A	1	
02L1DD0704	Design (AIP) certification by the Design Checker	37	37	21AUG08A	13MAY09A	21AUG08A	13MAY09A	2	
02L1DD0706	Design (AIP) submission for the SO's approval	3	3	28JUL08A	13MAY09A	28JUL08A	13MAY09A	1	
02L1DD0708	Design (AIP) review by the SO	280	280	29JUL08A	19MAY09A	29JUL08A	19MAY09A	2	
02L1DD0710	AIP submission for rel. authorities' approval	1	1	28AUG08A	28AUG08A	28AUG08A	28AUG08A	1	
02L1DD0712	Design (AIP) review by the rel. authorities	28	28	28FEB09A	27MAR09A	28FEB09A	27MAR09A	2	
02L1DD0714	Obtain rel. authorities's approval for AIP	0	0		19MAY09A		19MAY09A	1	
02L1DD0716	SO submit Design (AIP) for approval of GEO	1	1	28FEB09A	28FEB09A	28FEB09A	28FEB09A	1	
02L1DD0718	Design (AIP) review/approval by the GEO	28	28	01MAR09A	28MAY09	01MAR09A	28MAY09	2	-176
02L1DD0720	Obtain SO's consent for design (AIP)	0	0		19MAY09A		19MAY09A	2	
02L1DD0722	Design preparation for the DDA submission	30	30	07MAR09A	05JUN09	07MAR09A	05JUN09	2	-183
02L1DD0723	Design (DDA) submission for the DC's approval	1	1	06JUN09	06JUN09	06JUN09	06JUN09	1	-142
02L1DD0724	Design (DDA) certification by the Design Checker	28	28	07JUN09	04JUL09	07JUN09	04JUL09	2	-180
02L1DD0726	Design (DDA) submission for the SO's approval	1	1	06JUN09	06JUN09	06JUN09	06JUN09	1	-144
02L1DD0728	Design (DDA) review by the SO	66	66	07JUN09	11AUG09	07JUN09	11AUG09	2	-183
02L1DD0730	DDA submission for rel. authorities' approval	1	1	13JUN09	13JUN09	13JUN09	13JUN09	1	0
02L1DD0732	Design (DDA) review by the rel. authorities	28	28	14JUN09	11JUL09	14JUN09	11JUL09	2	1
02L1DD0734	Obtain rel. authorities's approval for DDA	1	1	13JUL09	13JUL09	13JUL09	13JUL09	1	0
02L1DD0736	SO submit design (DDA) for approval of GEO	1	1	13JUL09	13JUL09	13JUL09	13JUL09	1	0
02L1DD0738	Design (DDA) review/approval by the GEO	28	28	14JUL09	10AUG09	14JUL09	10AUG09	2	0
02L1DD0740	Obtain SO's consent for design (DDA)	0	0		12AUG09		12AUG09	2	-183
Hopper Design									
02L1DD0802	Design preparation by the Designer	119	119	28FEB09A	26JUN09	28FEB09A	26JUN09	2	-212



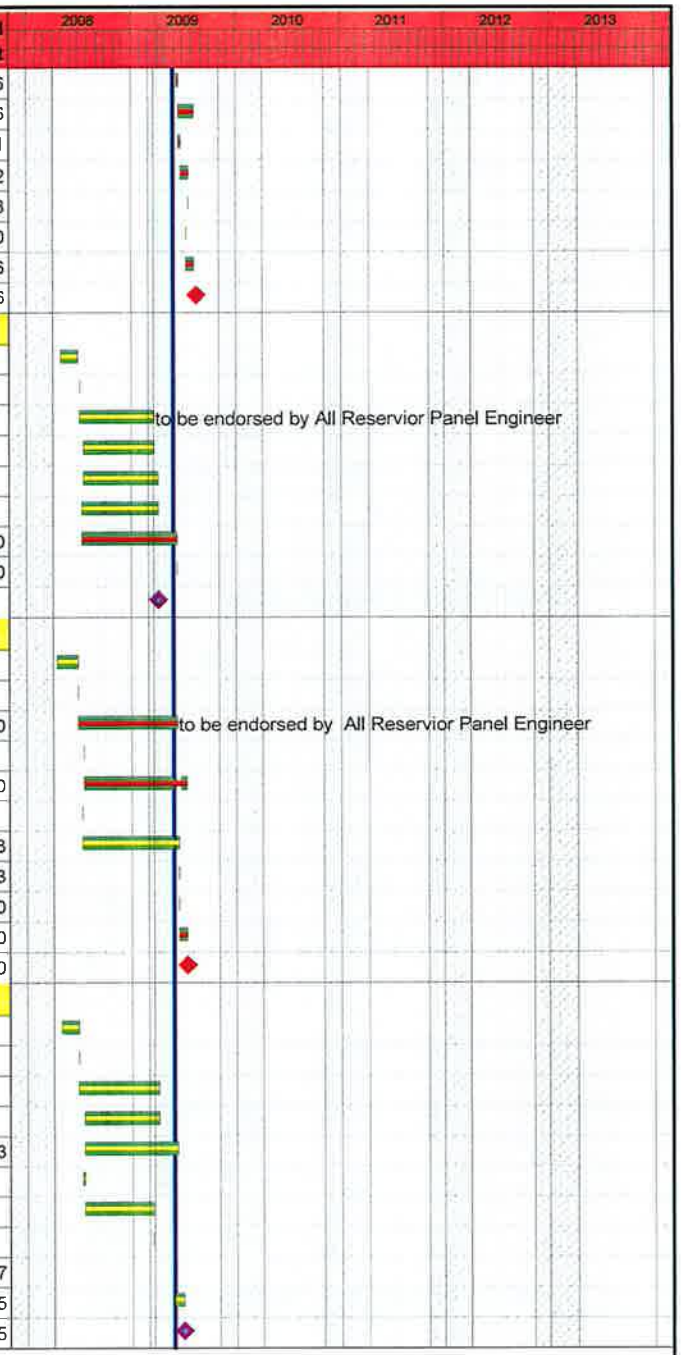
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
02L1DD0803	Design submission for the DC's approval	1	1	27JUN09	27JUN09	27JUN09	27JUN09	1	-169
02L1DD0804	Design certification by the Design Checker	28	28	28JUN09	25JUL09	28JUN09	25JUL09	2	-212
02L1DD0806	Design submission for the SO's approval	1	1	27JUN09	27JUN09	27JUN09	27JUN09	1	-169
02L1DD0808	Design review by the SO	42	42	28JUN09	08AUG09	28JUN09	08AUG09	2	-212
02L1DD0810	Obtain design approval from the SO	0	0		08AUG09		08AUG09	2	-212
Steel Platform Design									
02L1DD0902	Design preparation by the Designer	82	82	02JAN09A	24MAR09A	02JAN09A	24MAR09A	2	
02L1DD0903	Design submission for the DC's approval	1	1	25MAR09A	25MAR09A	25MAR09A	25MAR09A	1	
02L1DD0904	Design certification by the Design Checker	28	28	26MAR09A	08JUN09	26MAR09A	08JUN09	2	-194
02L1DD0906	Design submission for the SO's approval	1	1	09JUN09	09JUN09	09JUN09	09JUN09	1	-153
02L1DD0908	Design review by the SO	42	42	10JUN09	21JUL09	10JUN09	21JUL09	2	-194
02L1DD0910	Obtain design approval from the SO	0	0		21JUL09		21JUL09	2	-194
Overhead Gantry Support & Noise Enclosure Design									
02L1DD1002	Design preparation by the Designer	82	82	02JAN09A	14JUN09	02JAN09A	14JUN09	2	-157
02L1DD1003	Design submission for the DC's approval	1	1	15JUN09	15JUN09	15JUN09	15JUN09	1	-124
02L1DD1004	Design certification by the Design Checker	28	28	16JUN09	13JUL09	16JUN09	13JUL09	2	-157
02L1DD1006	Design submission for the SO's approval	1	1	15JUN09	15JUN09	15JUN09	15JUN09	1	-124
02L1DD1008	Design review by the SO	42	42	16JUN09	27JUL09	16JUN09	27JUL09	2	-157
02L1DD1010	Obtain design approval from the SO	0	0		27JUL09		27JUL09	2	-157
ELS Design for Spiral Ramp & Vehicular Access									
02L1DD1102	Design preparation for the AIP submission	30	30	28MAY09	26JUN09	28MAY09	26JUN09	2	130
02L1DD1103	Design (DDA) submission for the DC's approval	1	1	27JUN09	27JUN09	27JUN09	27JUN09	1	109
02L1DD1104	Design (DDA) certification by the Design Checker	28	28	28JUN09	25JUL09	28JUN09	25JUL09	2	132
02L1DD1106	Design (DDA) submission for the SO's approval	1	1	27JUN09	27JUN09	27JUN09	27JUN09	1	107
02L1DD1108	Design (DDA) review by the SO	66	66	28JUN09	01SEP09	28JUN09	01SEP09	2	130
02L1DD1110	DDA submission for rel. authorities' approval	1	1	04JUL09	04JUL09	04JUL09	04JUL09	1	134
02L1DD1112	Design (DDA) review by the rel. authorities	28	28	05JUL09	01AUG09	05JUL09	01AUG09	2	160
02L1DD1114	Obtain rel. authorities's approval for DDA	1	1	03AUG09	03AUG09	03AUG09	03AUG09	1	131
02L1DD1116	SO submit design (DDA) for approval of GEO	1	1	03AUG09	03AUG09	03AUG09	03AUG09	1	110
02L1DD1118	Design (DDA) review/approval by the GEO	28	28	04AUG09	31AUG09	04AUG09	31AUG09	2	131
02L1DD1120	Obtain SO's consent for design (DDA)	0	0		02SEP09		02SEP09	2	130
ELS Design for Box Culvert & Open Channel									
02L1DD1202	Design preparation for the AIP submission	30	30	27JUN09	26JUL09	27JUN09	26JUL09	2	1,550
02L1DD1203	Design (DDA) submission for the DC's approval	1	1	27JUL09	27JUL09	27JUL09	27JUL09	1	1,260
02L1DD1204	Design (DDA) certification by the Design Checker	28	28	28JUL09	24AUG09	28JUL09	24AUG09	2	1,551
02L1DD1206	Design (DDA) submission for the SO's approval	1	1	27JUL09	27JUL09	27JUL09	27JUL09	1	1,259
02L1DD1208	Design (DDA) review by the SO	66	66	28JUL09	01OCT09	28JUL09	01OCT09	2	1,550
02L1DD1210	DDA submission for rel. authorities' approval	1	1	03AUG09	03AUG09	03AUG09	03AUG09	1	1,285
02L1DD1212	Design (DDA) review by the rel. authorities	28	28	04AUG09	31AUG09	04AUG09	31AUG09	2	1,581
02L1DD1214	Obtain rel. authorities's approval for DDA	1	1	01SEP09	01SEP09	01SEP09	01SEP09	1	1,283
02L1DD1216	SO submit design (DDA) for approval of GEO	1	1	01SEP09	01SEP09	01SEP09	01SEP09	1	1,260
02L1DD1218	Design (DDA) review/approval by the GEO	28	28	02SEP09	29SEP09	02SEP09	29SEP09	2	1,552
02L1DD1220	Obtain SO's consent for design (DDA)	0	0		02OCT09		02OCT09	2	1,550



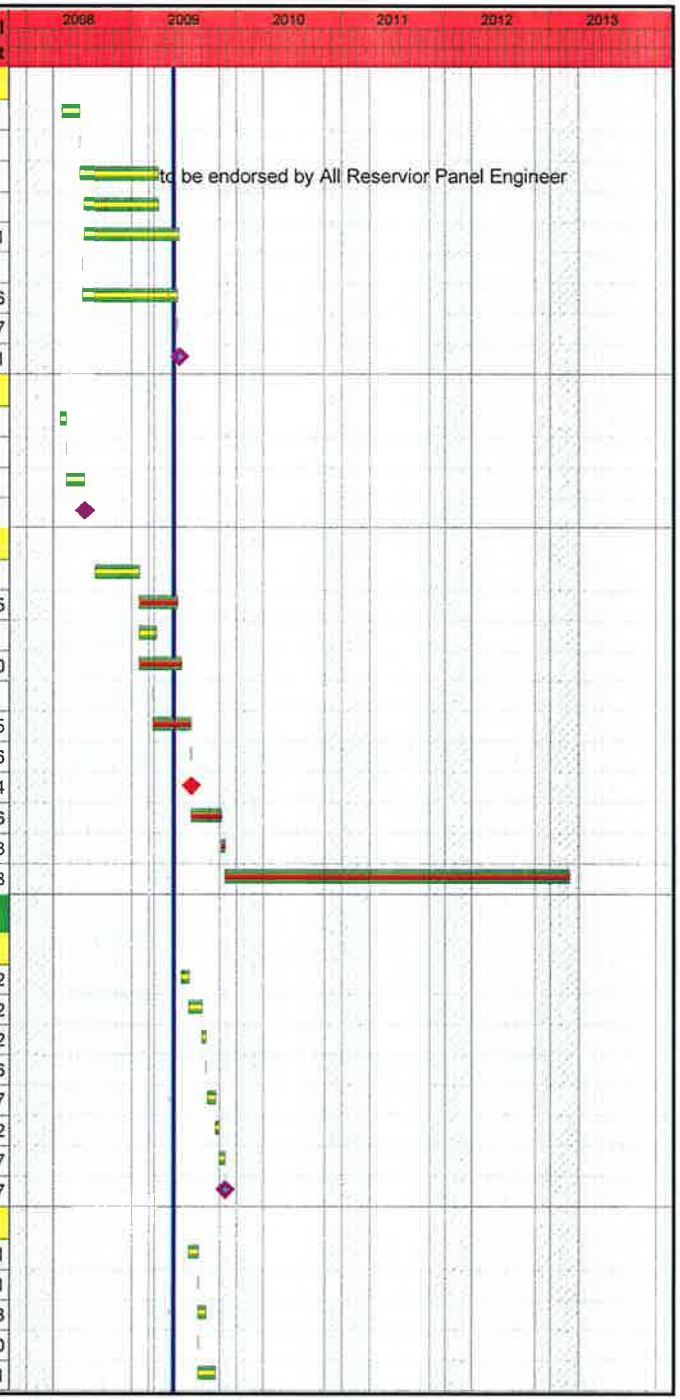
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
Temporary Drainage Management Plan									
02L1DD1302	TDMP preparation by the Designer	225	225	05MAY08A	27MAR09A	05MAY08A	27MAR09A	2	
02L1DD1303	TDMP submission for the DC's approval	2	2	08AUG08A	29MAY09	08AUG08A	29MAY09	1	10
02L1DD1304	TDMP certification by the Design Checker	28	28	09AUG08A	06JUN09	09AUG08A	06JUN09	2	12
02L1DD1306	TDMP submission for the SO's approval	2	2	08AUG08A	08JUN09	08AUG08A	08JUN09	1	16
02L1DD1308	TDMP review by the SO	90	90	08AUG08A	04JUL09	08AUG08A	04JUL09	2	12
02L1DD1310	TDMP submission for DSD's approval	1	1	17NOV08A	17NOV08A	17NOV08A	17NOV08A	1	
02L1DD1312	TDMP review by the DSD	90	90	18NOV08A	16JUL09	18NOV08A	16JUL09	2	0
02L1DD1314	Obtain DSD's approval for DDA	1	1	17JUL09	17JUL09	17JUL09	17JUL09	1	0
02L1DD1316	Obtain SO's consent for TDMP	0	0		17JUL09		17JUL09	2	0
Geotechnical Instrumentation Stg 1 for GL Works									
3DL1DDG102	Design preparation by the Designer	14	14	22FEB08A	24APR08A	22FEB08A	24APR08A	2	
3DL1DDG104	Design certification by the Design Checker	7	7	25APR08A	16JUN08A	25APR08A	16JUN08A	2	
3DL1DDG106	Design submission for the SO's approval	1	1	25APR08A	16JUN08A	25APR08A	16JUN08A	1	
3DL1DDG108	Design review by the SO	14	14	26APR08A	14JUL08A	26APR08A	14JUL08A	2	
3DL1DDG110	Obtain design approval from the SO	0	0		14JUL08A		14JUL08A	2	
3DL1DDG112	Install Geotechnical Instruments	10	10	04JUN08A	05JUL08A	04JUN08A	05JUL08A	1	
3DL1DDG114	Initial reading	14	14	18JUN08A	09JUL08A	18JUN08A	09JUL08A	2	
Geotechnical Instrumentation Stg 2 for Deep Exc.									
3DL1DDG202	Design preparation by the Designer	14	14	28MAY09*	10JUN09	28MAY09*	10JUN09	2	195
3DL1DDG204	Design certification by the Design Checker	14	14	11JUN09	24JUN09	11JUN09	24JUN09	2	195
3DL1DDG206	Design submission for the SO's approval	1	1	11JUN09	11JUN09	11JUN09	11JUN09	1	163
3DL1DDG208	Design review by the SO	28	28	12JUN09	09JUL09	12JUN09	09JUL09	2	195
3DL1DDG210	Obtain design approval from the SO	0	0		09JUL09		09JUL09	2	195
3DL1DDG212	Install Geotechnical Instruments	18	18	10JUL09	30JUL09	10JUL09	30JUL09	1	161
3DL1DDG214	Baseline Monitoring	14	14	31JUL09	13AUG09	31JUL09	13AUG09	2	195
3DL1DDG216	Monitor/report Geotechnical Insturmentatation	1,605	1,605	10JUL08A	31DEC12	10JUL08A	31DEC12	2	0
Design Packages for Works in Portion F									
Main Tunnel Design									
02L1FF0102	Design preparation for the AIP submission	414	414	08FEB08A	27MAR09A	08FEB08A	27MAR09A	2	
02L1FF0103	Design (AIP) submission for the DC's approval	2	2	02MAY08A	27MAR09A	02MAY08A	27MAR09A	1	
02L1FF0104	Design (AIP) certification by the Design Checker	28	28	03MAY08A	27MAR09A	03MAY08A	27MAR09A	2	
02L1FF0106	Design (AIP) submission for the SO's approval	1	1	10JUL08A	27MAR09A	10JUL08A	27MAR09A	1	
02L1FF0108	Design (AIP) review by the SO	66	66	11JUL08A	03JUN09	11JUL08A	03JUN09	2	-176
02L1FF0110	AIP submission for rel. authorities' approval	1	1	08JUL08A	08JUL08A	08JUL08A	08JUL08A	1	
02L1FF0112	Design (AIP) review by the rel. authorities	28	28	09JUL08A	05MAR09A	09JUL08A	05MAR09A	2	
02L1FF0114	Obtain rel. authorities's approval for AIP	1	1	06MAR09A	06MAR09A	06MAR09A	06MAR09A	1	
02L1FF0116	SO submit design (AIP) for approval of GEO	1	1	29MAY09	29MAY09	29MAY09	29MAY09	1	0
02L1FF0118	Design (AIP) review/approval by the GEO	28	28	30MAY09	26JUN09	30MAY09	26JUN09	2	0
02L1FF0120	Obtain SO's consent for design (AIP)	0	0		04JUN09		04JUN09	2	-176
02L1FF0122	Design preparation for the DDA submission	30	30	04NOV08A	11JUN09	04NOV08A	11JUN09	2	-176
02L1FF0123	Design (DDA) submission for the DC's approval	1	1	12JUN09	12JUN09	12JUN09	12JUN09	1	-138
02L1FF0124	Design (DDA) certification by the Design Checker	28	28	13JUN09	10JUL09	13JUN09	10JUL09	2	-176



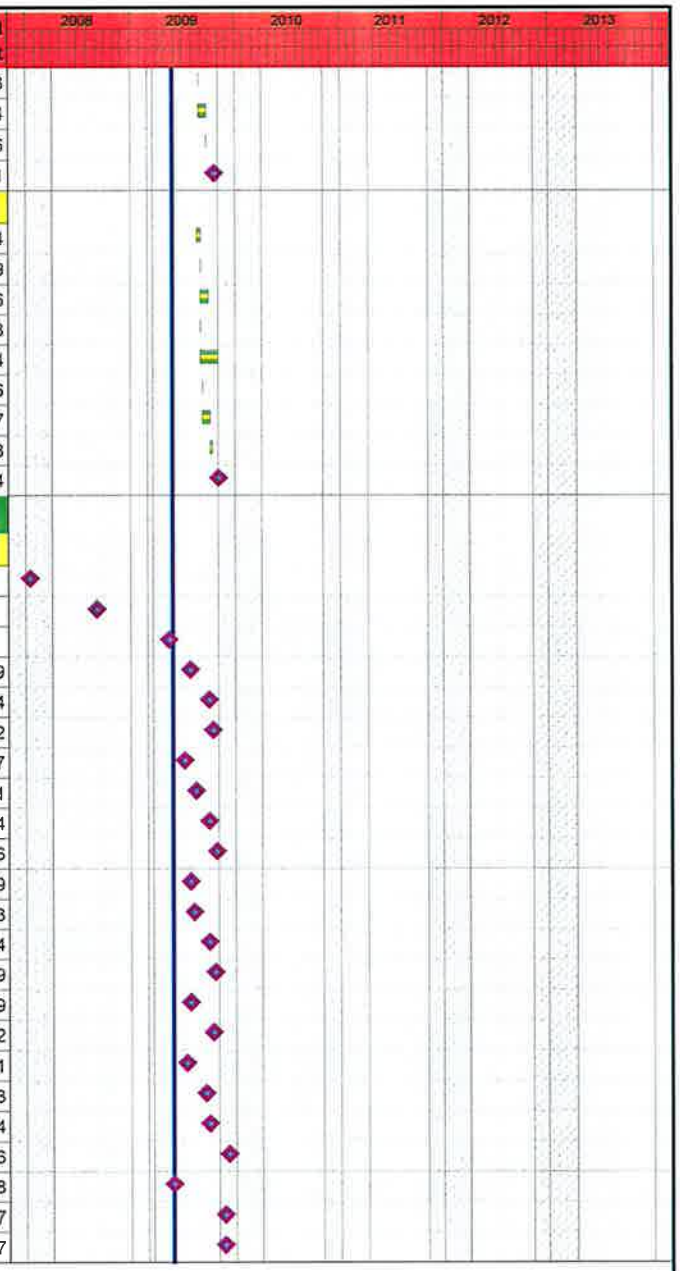
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
02L1FF0126	Design (DDA) submission for the SO's approval	1	1	12JUN09	12JUN09	12JUN09	12JUN09	1	-136
02L1FF0128	Design (DDA) review by the SO	56	56	16JUN09	10AUG09	16JUN09	10AUG09	2	-176
02L1FF0130	DDA submission for rel. authorities' approval	1	1	19JUN09	19JUN09	19JUN09	19JUN09	1	-121
02L1FF0132	Design (DDA) review by the rel. authorities	28	28	20JUN09	17JUL09	20JUN09	17JUL09	2	-152
02L1FF0134	Obtain rel. authorities's approval for DDA	1	1	18JUL09	18JUL09	18JUL09	18JUL09	1	-123
02L1FF0136	SO submit design (DDA) for approval of GEO	1	1	13JUL09	13JUL09	13JUL09	13JUL09	1	-140
02L1FF0138	Design (DDA) review/approval by the GEO	28	28	14JUL09	10AUG09	14JUL09	10AUG09	2	-176
02L1FF0140	Obtain SO's consent for design (DDA)	0	0		11AUG09		11AUG09	2	-176
Impact Assessment on WSD Yau Kam Tau WTW									
02L1FF0202	Design preparation for the DDA submission	60	60	29APR08A	30JUN08A	29APR08A	30JUN08A	2	
02L1FF0203	Design (DDA) submission for the DC's approval	1	1	03JUL08A	03JUL08A	03JUL08A	03JUL08A	1	
02L1FF0204	Design (DDA) certification by the Design Checker	260	260	04JUL08A	18MAR09A	04JUL08A	18MAR09A	2	
02L1FF0206	Design (DDA) submission for the SO's approval	1	1	15JUL08A	18MAR09A	15JUL08A	18MAR09A	1	
02L1FF0208	Design (DDA) review by the SO	66	66	16JUL08A	31MAR09A	16JUL08A	31MAR09A	2	
02L1FF0210	DDA submission for rel. authorities' approval	1	1	10JUL08A	02APR09A	10JUL08A	02APR09A	1	
02L1FF0212	Design (DDA) review by the rel. authorities	28	28	11JUL08A	10JUN09	11JUL08A	10JUN09	2	0
02L1FF0214	Obtain rel. authorities's approval for DDA	1	1	11JUN09	11JUN09	11JUN09	11JUN09	1	0
02L1FF0220	Obtain SO's consent for design (DDA)	0	0		31MAR09A		31MAR09A	2	
Impact Assessment on WSD Tai Lam Chung WT No. 3									
02L1FF0302	Design preparation for the DDA submission	32	32	14APR08A	27JUN08A	14APR08A	27JUN08A	2	
02L1FF0303	Design submission for the DC's approval	1	1	27JUN08A	27JUN08A	27JUN08A	27JUN08A	1	
02L1FF0304	Design (DDA) certification by the Design Checker	285	285	28JUN08A	08JUN09	28JUN08A	08JUN09	2	0
02L1FF0306	Design (DDA) submission for the SO's approval	1	1	15JUL08A	15JUL08A	15JUL08A	15JUL08A	1	
02L1FF0308	Design (DDA) review by the SO	66	66	16JUL08A	13JUL09	16JUL08A	13JUL09	2	0
02L1FF0310	DDA submission for rel. authorities' approval	1	1	10JUL08A	10JUL08A	10JUL08A	10JUL08A	1	
02L1FF0312	Design (DDA) review by the rel. authorities	28	28	11JUL08A	15JUN09	11JUL08A	15JUN09	2	28
02L1FF0314	Obtain rel. authorities's approval for DDA	1	1	16JUN09	16JUN09	16JUN09	16JUN09	1	23
02L1FF0316	SO submit design (DDA) for approval of GEO	1	1	16JUN09	16JUN09	16JUN09	16JUN09	1	0
02L1FF0318	Design (DDA) review/approval by the GEO	28	28	17JUN09	14JUL09	17JUN09	14JUL09	2	0
02L1FF0320	Obtain SO's consent for design (DDA)	0	0		14JUL09		14JUL09	2	0
Impact Assessment on KCRC West Rail Tunnel									
02L1FF0402	Design preparation for the DDA submission	30	30	28APR08A	26JUN08A	28APR08A	26JUN08A	2	
02L1FF0403	Design submission for the DC's approval	1	1	26JUN08A	26JUN08A	26JUN08A	26JUN08A	1	
02L1FF0404	Design (DDA) certification by the Design Checker	90	90	27JUN08A	02APR09A	27JUN08A	02APR09A	2	
02L1FF0406	Design (DDA) submission for the SO's approval	2	2	15JUL08A	03APR09A	15JUL08A	03APR09A	1	
02L1FF0408	Design (DDA) review by the SO	267	267	16JUL08A	08JUN09	16JUL08A	08JUN09	2	133
02L1FF0410	DDA submission for rel. authorities' approval	1	1	14JUL08A	14JUL08A	14JUL08A	14JUL08A	1	
02L1FF0412	Design (DDA) review by the rel. authorities	28	28	15JUL08A	11MAR09A	15JUL08A	11MAR09A	2	
02L1FF0414	Obtain rel. authorities's approval for DDA	1	1	12MAR09A	11MAR09A	12MAR09A	11MAR09A	1	
02L1FF0416	SO submit design (DDA) for approval of GEO	1	1	29MAY09	29MAY09	29MAY09	29MAY09	1	97
02L1FF0418	Design (DDA) review/approval by the GEO	28	28	30MAY09	26JUN09	30MAY09	26JUN09	2	115
02L1FF0420	Obtain SO's consent for design (DDA)	0	0		27JUN09		27JUN09	2	115



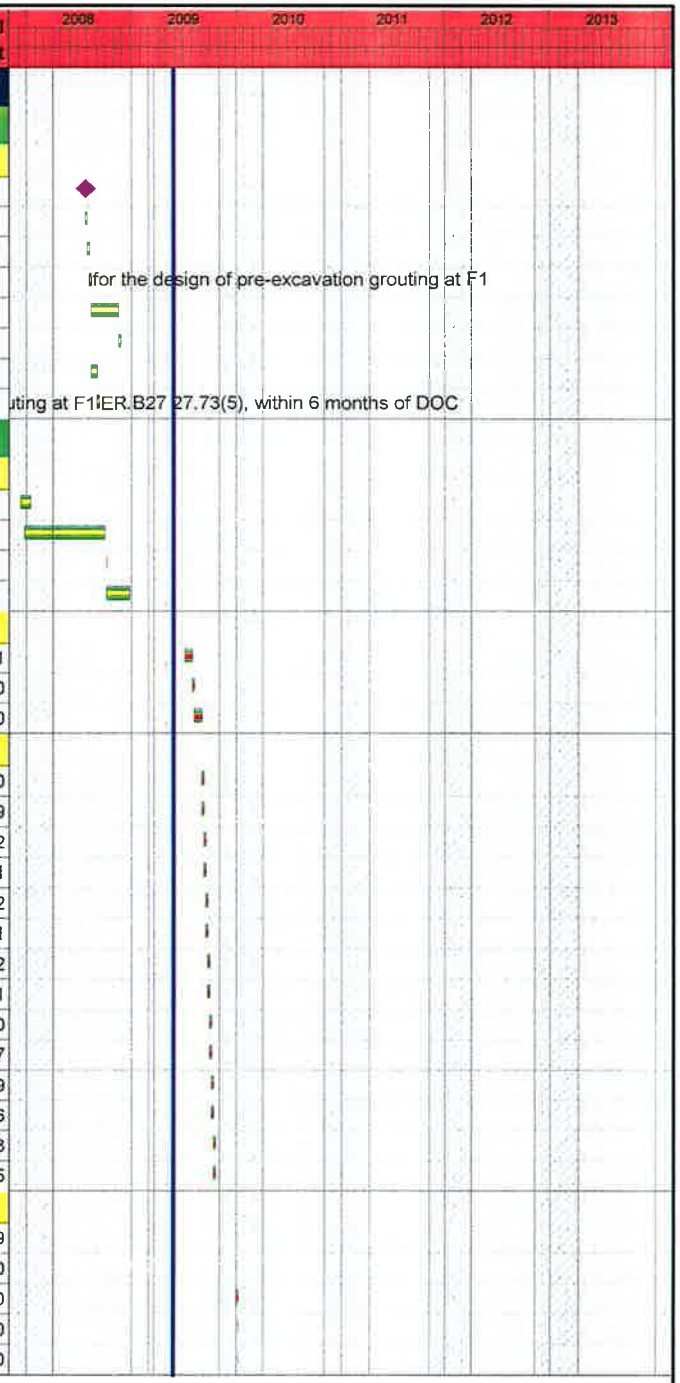
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
Impact Assessment on WSD Tsuen Wan Reservoir G.									
02L1FF0502	Design preparation for the DDA submission	30	30	05MAY08A	02JUL08A	05MAY08A	02JUL08A	2	
02L1FF0503	Design submission for the DC's approval	1	1	03JUL08A	03JUL08A	03JUL08A	03JUL08A	1	
02L1FF0504	Design (DDA) certification by the Design Checker	260	260	04JUL08A	01APR09A	04JUL08A	01APR09A	2	
02L1FF0506	Design (DDA) submission for the SO's approval	2	2	15JUL08A	01APR09A	15JUL08A	01APR09A	1	
02L1FF0508	Design (DDA) review by the SO	60	60	16JUL08A	16JUN09	16JUL08A	16JUN09	2	221
02L1FF0510	DDA submission for rel. authorities' approval	1	1	10JUL08A	10JUL08A	10JUL08A	10JUL08A	1	
02L1FF0512	Design (DDA) review by the rel. authorities	28	28	11JUL08A	10JUN09	11JUL08A	10JUN09	2	226
02L1FF0514	Obtain rel. authorities's approval for DDA	1	1	11JUN09	11JUN09	11JUN09	11JUN09	1	187
02L1FF0520	Obtain SO's consent for design (DDA)	0	0		17JUN09		17JUN09	2	221
Grout Trial at Foult Zone F1									
02L1FF0602	MS preparation for the DDA submission	12	12	02MAY08A	20MAY08A	02MAY08A	20MAY08A	2	
02L1FF0606	Ms (DDA) submission for the SO's approval	1	1	21MAY08A	21MAY08A	21MAY08A	21MAY08A	1	
02L1FF0608	MS (DDA) review by the SO	24	24	22MAY08A	17JUL08A	22MAY08A	17JUL08A	2	
02L1FF0620	Obtain SO's consent for MS (DDA)	0	0		17JUL08A		17JUL08A	2	
Geotechniucal Instrumentation									
3DL1FFGI02	Design preparation by the Designer	60	60	28AUG08A	23JAN09A	28AUG08A	23JAN09A	2	
3DL1FFGI04	Design certification by the Design Checker	14	14	24JAN09A	10JUN09	24JAN09A	10JUN09	2	-195
3DL1FFGI06	Design submission for the SO's approval	2	2	24JAN09A	26MAR09A	24JAN09A	26MAR09A	1	
3DL1FFGI08	Design review by the SO	56	56	24JAN09A	20JUN09	24JAN09A	20JUN09	2	-160
3DL1FFGI10	DDA submission for rel. authorities' approval	1	1	14MAR09A	14MAR09A	14MAR09A	14MAR09A	1	
3DL1FFGI12	Design (DDA) review by the rel. authorities	56	56	15MAR09A	23JUL09	15MAR09A	23JUL09	2	-195
3DL1FFGI14	Obtain rel. authorities's approval for DDA	1	1	24JUL09	24JUL09	24JUL09	24JUL09	1	-156
3DL1FFGI16	Obtain design approval from the SO	0	0		24JUL09		24JUL09	2	-194
3DL1FFGI18	Install geotechnical instrumentsation	90	90	25JUL09	10NOV09	25JUL09	10NOV09	1	-156
3DL1FFGI20	Baseline Monitoring	14	14	11NOV09	24NOV09	11NOV09	24NOV09	2	-188
3DL1FT0208	Maintain/monitor geotechnical instrumentation	1,200	1,200	25NOV09	08MAR13	25NOV09	08MAR13	2	-188
Design Packages for Works in Portion G									
Drainage Impact Assessment									
02L1GG0105	Quatation and award consultant	24	24	22JUN09*	20JUL09	22JUN09*	20JUL09	1	182
02L1GG0115	Prepare preliminary DIA report	36	36	21JUL09	31AUG09	21JUL09	31AUG09	1	182
02L1GG0125	Prepare final DIA report	12	12	01SEP09	14SEP09	01SEP09	14SEP09	1	182
02L1GG0135	Submission of DIA report to SOR/DSD	1	1	15SEP09	15SEP09	15SEP09	15SEP09	1	186
02L1GG0145	SOR/DSD review/comment DIA report	28	28	22SEP09	19OCT09	22SEP09	19OCT09	2	227
02L1GG0155	Revise DIA incorporating comments	12	12	20OCT09	03NOV09	20OCT09	03NOV09	1	182
02L1GG0165	SOR/DSD review/approve DIA report	21	21	04NOV09	24NOV09	04NOV09	24NOV09	2	227
02L1GG0175	Obtain consent from SOR and DSD	0	0		24NOV09		24NOV09	2	227
Temp. Platform Design for H-Piling at Portion G									
02L1GG0202	Design preparation for the DDA submission	30	30	21JUL09	19AUG09	21JUL09	19AUG09	2	261
02L1GG0203	Design (DDA) submission for the DC's approval	1	1	20AUG09	20AUG09	20AUG09	20AUG09	1	211
02L1GG0204	Design (DDA) certification by the Design Checker	28	28	21AUG09	17SEP09	21AUG09	17SEP09	2	263
02L1GG0206	Design (DDA) submission for the SO's approval	1	1	20AUG09	20AUG09	20AUG09	20AUG09	1	210
02L1GG0208	Design (DDA) review by the SO	58	58	21AUG09	17OCT09	21AUG09	17OCT09	2	261



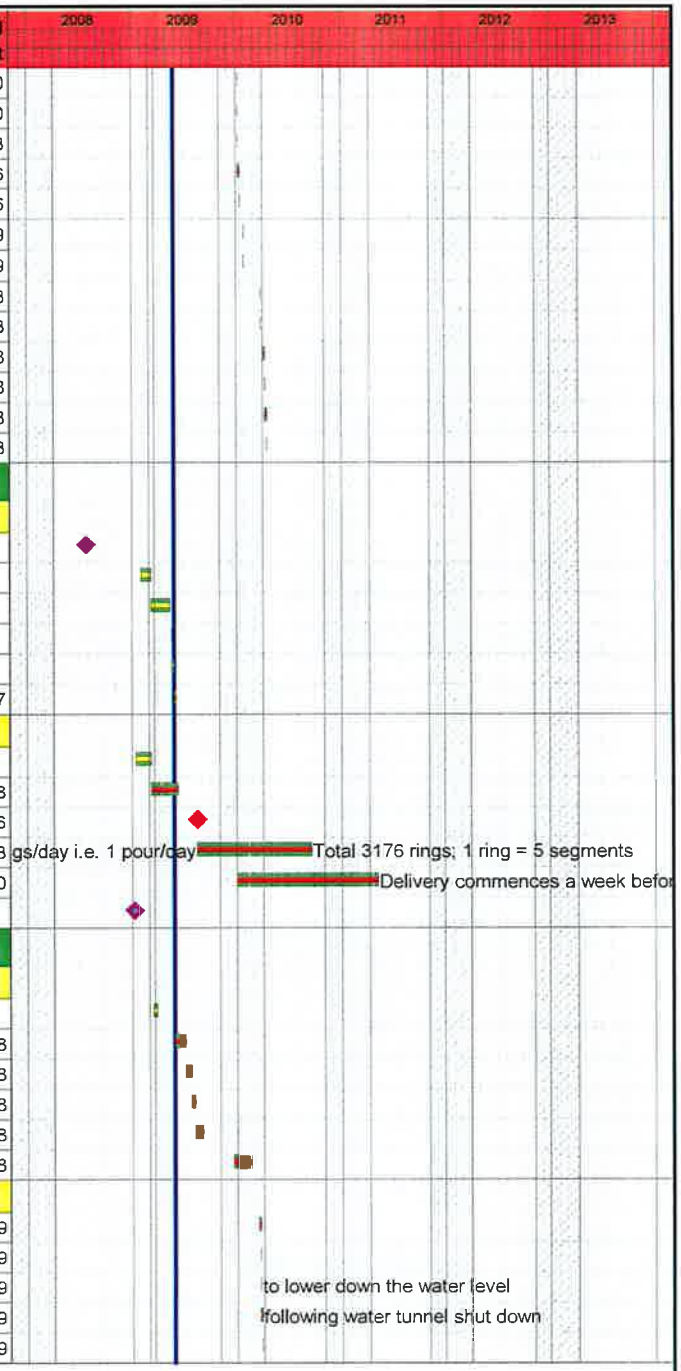
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
02L1GG0210	DDA submission for rel. authorities' approval	1	1	27AUG09	27AUG09	27AUG09	27AUG09	1	228
02L1GG0212	Design (DDA) review by the rel. authorities	28	28	28AUG09	24SEP09	28AUG09	24SEP09	2	284
02L1GG0214	Obtain rel. authorities's approval for DDA	1	1	25SEP09	25SEP09	25SEP09	25SEP09	1	226
02L1GG0228	Obtain design (DDA) approval from the SO	0	0		18OCT09		18OCT09	2	261
ELS Design for Pipe Jacking at Portion G									
02L1GG0302	Design preparation for the DDA submission	15	15	20AUG09	03SEP09	20AUG09	03SEP09	2	284
02L1GG0303	Design (DDA) submission for the DC's approval	1	1	04SEP09	04SEP09	04SEP09	04SEP09	1	229
02L1GG0304	Design (DDA) certification by the Design Checker	28	28	05SEP09	02OCT09	05SEP09	02OCT09	2	286
02L1GG0306	Design (DDA) submission for the SO's approval	1	1	04SEP09	04SEP09	04SEP09	04SEP09	1	228
02L1GG0308	Design (DDA) review by the SO	58	58	05SEP09	01NOV09	05SEP09	01NOV09	2	284
02L1GG0310	DDA submission for rel. authorities' approval	1	1	11SEP09	11SEP09	11SEP09	11SEP09	1	246
02L1GG0314	Design (DDA) review by the rel. authorities	28	28	12SEP09	09OCT09	12SEP09	09OCT09	2	307
02L1GG0316	Obtain rel. authorities's approval for DDA	1	1	10OCT09	10OCT09	10OCT09	10OCT09	1	248
02L1GG0318	Obtain design (DDA) approval from the SO	0	0		02NOV09		02NOV09	2	284
Schedule of Milestones for Cost Centre No. 2L									
02L10D1002	2L 1; On submission of PDP to the SO	0	0		10JAN08A		10JAN08A	2	
02L10D1004	2L 2; On acception of PDP by the SO	0	0		04SEP08A		04SEP08A	2	
02L10D1006	2L 3; On submission of AIP to the SO; Portion A	0	0		12MAY09A		12MAY09A	2	
02L10D1008	2L 4; On acceptance of AIP by the SO; Portion A	0	0		25JUL09		25JUL09	2	1,619
02L10D1010	2L 5; On subumission of DDA to the SO; Portion A	0	0		28SEP09		28SEP09	2	1,554
02L10D1012	2L 6; On acceptance of DDA by the SO; Portion A	0	0		10OCT09		10OCT09	2	1,542
02L10D1014	2L 7; On submission of AIP to the SO; Portion B	0	0		07JUL09		07JUL09	2	1,637
02L10D1016	2L 8; On acceptance of AIP by the SO; Portion B	0	0		12AUG09		12AUG09	2	1,601
02L10D1018	2L 9; On submission of DDA to the SO; Portion B	0	0		28SEP09		28SEP09	2	1,554
02L10D1020	2L 10; On acceptance of DDA by the SO; Portion B	0	0		26OCT09		26OCT09	2	1,526
02L10D1022	2L 11; On submission of AIP to the SO; Portion C	0	0		25JUL09		25JUL09	2	1,619
02L10D1024	2L 12; On acceptance of AIP by the SO; Portion C	0	0		10AUG09		10AUG09	2	1,603
02L10D1026	2L 13; On submission of DDA to the SO; Portion C	0	0		28SEP09		28SEP09	2	1,554
02L10D1028	2L 14; On acceptance of DDA by the SO; Portion C	0	0		23OCT09		23OCT09	2	1,529
02L10D1030	2L 15; On acceptance of AIP by the SO; Portion D	0	0		25JUL09		25JUL09	2	1,619
02L10D1032	2L 16; On acceptance of DDA by the SO; Portion D	0	0		10OCT09		10OCT09	2	1,542
02L10D1034	2L 17; On submission of AIP to the SO; Portion F	0	0		13JUL09		13JUL09	2	1,631
02L10D1036	2L 18; On acceptance of AIP by the SO; Portion F	0	0		19SEP09		19SEP09	2	1,563
02L10D1038	2L 19; On submission of DDA to the SO; Portion F	0	0		28SEP09		28SEP09	2	1,554
02L10D1040	2L 20; On acceptance of DDA by the SO; Portion F	0	0		05DEC09		05DEC09	2	1,486
02L10D1042	2L 21; On acceptance of AIP by the SO; Portion G	0	0		27MAY09		27MAY09	2	1,678
02L10D1044	2L 22; On acceptance of DDA by the SO; Portion G	0	0		24NOV09		24NOV09	2	1,497
02L10D1046	2L 23; On completion of all works under this CC	0	0		24NOV09		24NOV09	2	1,497



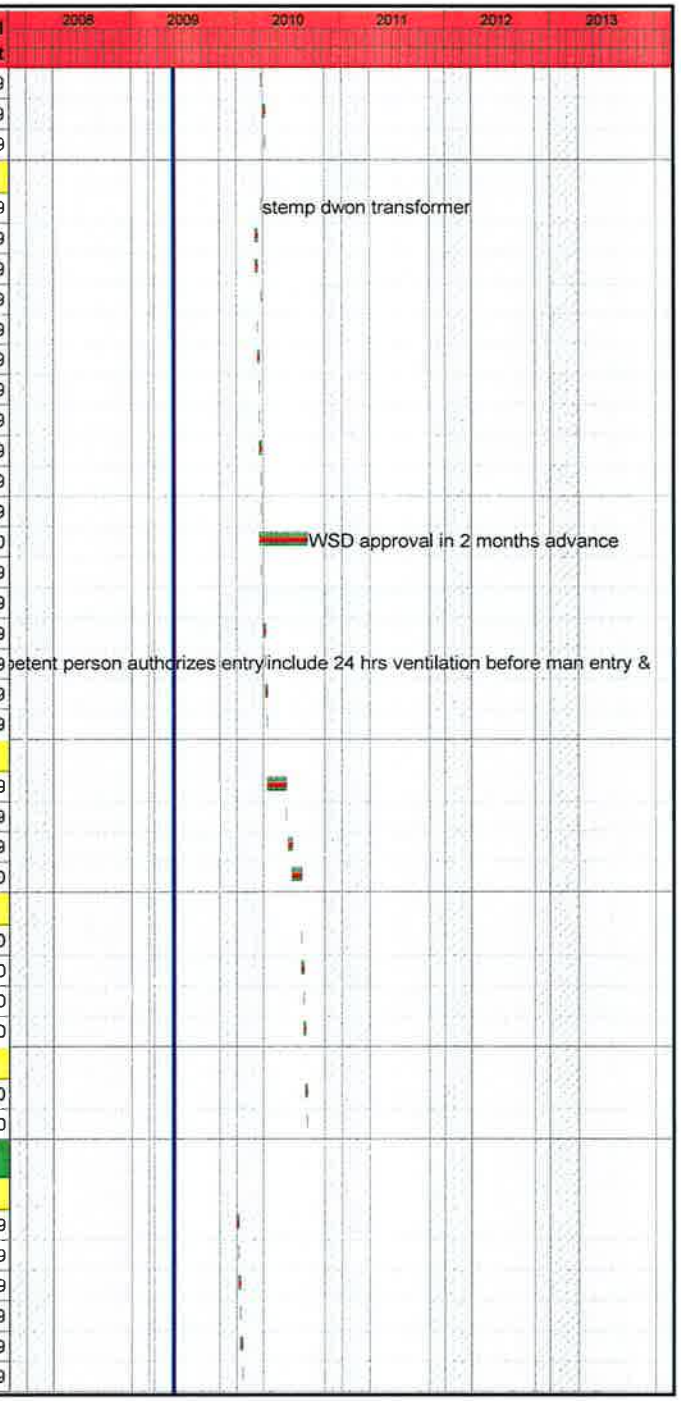
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
Construction of Main Tunnel									
Trial Grout at Fault Zone F1									
3AL1FT0002	HyD issue XP	0	0		23JUL08A		23JUL08A	2	
3AL1FT0004	Adavance notice to HyD/Road advice	6	6	24JUL08A	30JUL08A	24JUL08A	30JUL08A	1	
3AL1FT0006	Trial pit excavation	4	4	31JUL08A	04AUG08A	31JUL08A	04AUG08A	1	
3AL1FT0010	Scaffolding, mobilize & set up	7	7	05AUG08A	13AUG08A	05AUG08A	13AUG08A	1	
3AL1FT0012	Drill & test for 2m Arrangement Test	45	45	14AUG08A	15NOV08A	14AUG08A	15NOV08A	1	
3AL1FT0014	Backfill drilled holes, demobilization & Tidy up	6	6	17NOV08A	22NOV08A	17NOV08A	22NOV08A	1	
3AL1FT0016	Drill & test for single hole arrangement test	17	17	11AUG08A	04SEP08A	11AUG08A	04SEP08A	1	
3AL1FT0018	Backfill drilled hole, demobilization & tidy up	1	1	05SEP08A	05SEP08A	05SEP08A	05SEP08A	1	
TBM Manufacture/Testing/Delivery									
Manufacture of TBM & Back-ups									
3AL1FT0302	TBM & Excavation Sys Procurement	30	30	14DEC07A	12JAN08A	14DEC07A	12JAN08A	2	
3AL1FT0304	TBM design & manufacturing	252	252	21DEC07A	28SEP08A	21DEC07A	28SEP08A	2	
3AL1FT0306	TBM workshop tests	7	7	04OCT08A	08OCT08A	04OCT08A	08OCT08A	2	
3AL1FT0308	TBM dismounting & packing	21	21	09OCT08A	24DEC08A	09OCT08A	24DEC08A	2	
Delivery of TBM									
3AL1FT0105	TBM shipment to Hong Kong	30	30	06JUL09*	04AUG09	06JUL09*	04AUG09	2	-161
3AL1FT0110	TBM arriving Portion I	3	3	05AUG09	07AUG09	05AUG09	07AUG09	1	-130
3AL1FT0115	Destuffing Containers/Cleaning & lubrication	24	24	08AUG09	04SEP09	08AUG09	04SEP09	1	-130
TBM Pre-assembly/Test & Commis. at Portion I									
3AL1FT0205	Cutterhead	7	7	05SEP09	12SEP09	05SEP09	12SEP09	1	-130
3AL1FT0210	Bearing	6	6	05SEP09	11SEP09	05SEP09	11SEP09	1	-129
3AL1FT0215	Backup # 1	6	6	12SEP09	18SEP09	12SEP09	18SEP09	1	-122
3AL1FT0220	Backup # 2	5	5	14SEP09	18SEP09	14SEP09	18SEP09	1	-121
3AL1FT0225	Backup # 3	5	5	19SEP09	24SEP09	19SEP09	24SEP09	1	-122
3AL1FT0230	Backup # 4	5	5	19SEP09	24SEP09	19SEP09	24SEP09	1	-121
3AL1FT0240	Baackup # 5	5	5	25SEP09	30SEP09	25SEP09	30SEP09	1	-122
3AL1FT0245	Backup # 6	5	5	25SEP09	30SEP09	25SEP09	30SEP09	1	-121
3AL1FT0250	Backup # 7	5	5	02OCT09	08OCT09	02OCT09	08OCT09	1	-80
3AL1FT0255	Backup # 8	5	5	02OCT09	08OCT09	02OCT09	08OCT09	1	-77
3AL1FT0260	Backup # 9	5	5	09OCT09	14OCT09	09OCT09	14OCT09	1	-79
3AL1FT0365	Backup # 10	5	5	09OCT09	14OCT09	09OCT09	14OCT09	1	-76
3AL1FT0370	Backup # 11	5	5	15OCT09	20OCT09	15OCT09	20OCT09	1	-78
3AL1FT0375	Backup # 12	5	5	15OCT09	20OCT09	15OCT09	20OCT09	1	-75
TBM Transport from Portion I to Outfall									
3AL1FT0405	Cutterhead	1	1	02JAN10	02JAN10	02JAN10	02JAN10	1	-219
3AL1FT0415	Shield # 1	1	1	04JAN10	04JAN10	04JAN10	04JAN10	1	-210
3AL1FT0425	Shield # 2	1	1	05JAN10	05JAN10	05JAN10	05JAN10	1	-210
3AL1FT0435	Bearing	1	1	06JAN10	06JAN10	06JAN10	06JAN10	1	-210
3AL1FT0445	Erector	1	1	07JAN10	07JAN10	07JAN10	07JAN10	1	-210



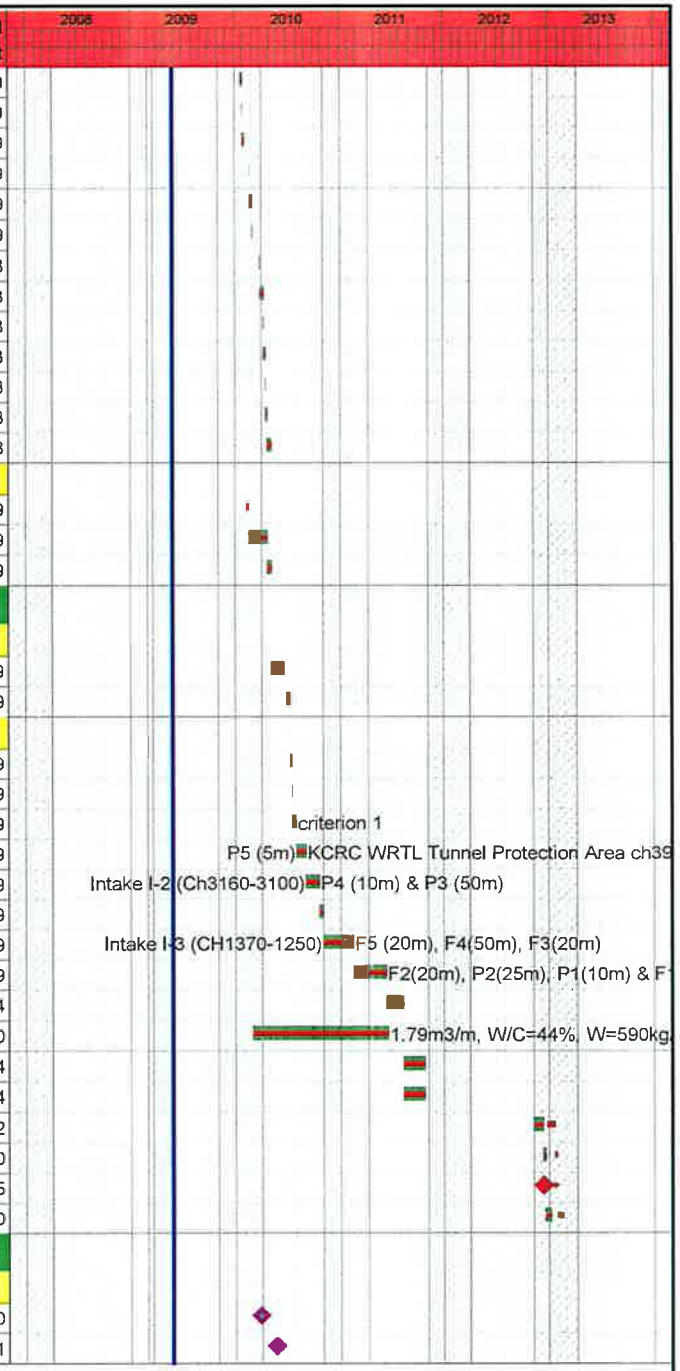
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
3AL1FT0455	Conveyor	1	1	08JAN10	08JAN10	08JAN10	08JAN10	1	-210
3AL1FT0465	Backup # 1	1	1	09JAN10	09JAN10	09JAN10	09JAN10	1	-210
3AL1FT0475	Backup # 2	1	1	11JAN10	11JAN10	11JAN10	11JAN10	1	-208
3AL1FT0485	Backup # 3	1	1	12JAN10	12JAN10	12JAN10	12JAN10	1	-206
3AL1FT0495	Backup # 4	1	1	13JAN10	13JAN10	13JAN10	13JAN10	1	-206
3AL1FT0505	Backup # 5	1	1	29JAN10	29JAN10	29JAN10	29JAN10	1	-219
3AL1FT0515	Backup # 6	1	1	30JAN10	30JAN10	30JAN10	30JAN10	1	-219
3AL1FT0525	Backup # 7	1	1	27MAR10	27MAR10	27MAR10	27MAR10	1	-218
3AL1FT0535	Backup # 8	1	1	31MAR10	31MAR10	31MAR10	31MAR10	1	-218
3AL1FT0545	Backup # 9	1	1	08APR10	08APR10	08APR10	08APR10	1	-218
3AL1FT0555	Backup # 10	1	1	12APR10	12APR10	12APR10	12APR10	1	-218
3AL1FT0565	Backup # 11	1	1	15APR10	15APR10	15APR10	15APR10	1	-218
3AL1FT0575	Backup # 12	1	1	19APR10	19APR10	19APR10	19APR10	1	-218
Manufacture Pre-cast Lining/Delivery									
Segmental Lining Mould									
3AL1FTSM02	Procure sub-contract for segmental mould	0	0		21JUL08A		21JUL08A	2	
3AL1FTSM04	Prepare shop drwgs for segmental mould	60	60	02FEB09A	05MAR09A	02FEB09A	05MAR09A	2	
3AL1FTSM06	Fabrication of segmental mould	90	90	06MAR09A	16MAY09A	06MAR09A	16MAY09A	2	
3AL1FTSM08	Inspection in Korea	7	7	18MAY09A	20MAY09A	18MAY09A	20MAY09A	2	
3AL1FTSM10	Painting & packing	7	7	21MAY09A	27MAY09A	21MAY09A	27MAY09A	2	
3AL1FTSM12	Delivery of segmental moulds to HKG	7	7	28MAY09	03JUN09	28MAY09	03JUN09	2	-107
Pre-cast Segmental Lining									
3AL1FT0404	Prepare/submit QA/QC System	30	30	12JAN09A	04MAR09A	12JAN09A	04MAR09A	2	
3AL1FT0410	SO approve QA/QC system	28	28	05MAR09A	06JUN09	05MAR09A	06JUN09	1	-88
3AL1FT0412	Approval of Tunnel Linig Design	0	0		11AUG09		11AUG09	2	-176
3AL1FT0416	Manufactur of segments	330	330	12AUG09	20SEP10	12AUG09	20SEP10	1	-143
3AL1FT0418	Delivery of Segments	400	400	02JAN10	12MAY11	02JAN10	12MAY11	1	-200
3AL1FTSL02	Procure sub-contract for segment lining	0	0		05JAN09A		05JAN09A	1	
Geotech Instrumetation at WSD Tunnel Using PPE									
Method Statement to Install G.I. Works									
3AL1FTMS02	Prepare method statement	69	69	12MAR09A	26MAR09A	12MAR09A	26MAR09A	1	
3AL1FTMS04	Method statement endorsement by ICE & APRE	30	30	29MAY09A	03JUL09	29MAY09A	03JUL09	1	-68
3AL1FTMS08	Method statement endorsement by LD	18	18	04JUL09	24JUL09	04JUL09	24JUL09	1	-68
3AL1FTMS12	Method statement endorsement by SOR	12	12	25JUL09	07AUG09	25JUL09	07AUG09	1	-68
3AL1FTMS14	Method statement endorsement by WSD	24	24	08AUG09	04SEP09	08AUG09	04SEP09	1	-68
3AL1FTMS24	Application for electrical power	45	45	22DEC09*	18FEB10	22DEC09*	18FEB10	1	-188
At Ting Kau Air Valve House									
3AL1WT3B02	Arrange WSD to open the valve house	1	1	19MAR10	19MAR10	19MAR10	19MAR10	1	-219
3AL1WT3B12	Set up exhoust fans & arrange temp. electricity	3	3	20MAR10	23MAR10	20MAR10	23MAR10	1	-219
3AL1WT3B22	Arrange 2 nrs. set of water pumps	2	2	24MAR10	25MAR10	24MAR10	25MAR10	1	-219
3AL1WT3B32	Remove the air vent pipe (DN250)	2	2	26MAR10	27MAR10	26MAR10	27MAR10	1	-219
3AL1WT3B42	Remove connection flange (DN900)	1	1	29MAR10	29MAR10	29MAR10	29MAR10	1	-219



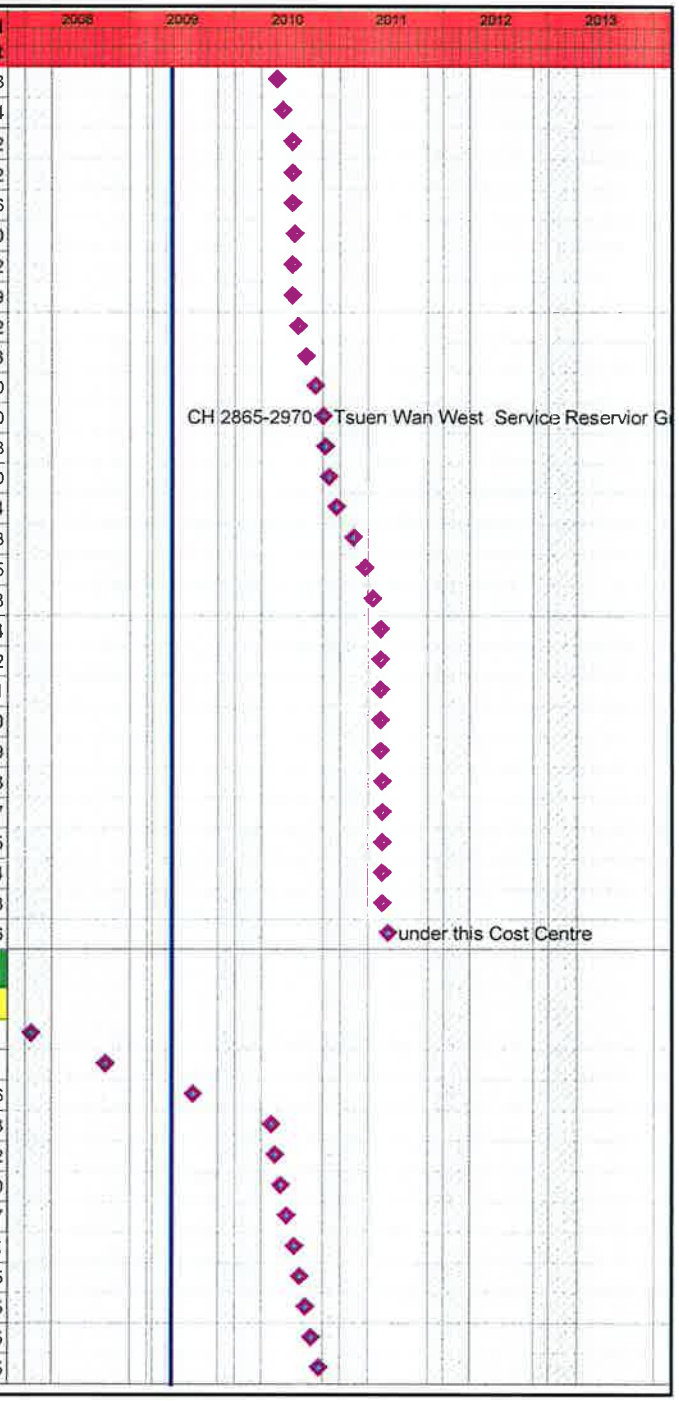
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
3AL1WT3B52	Connect exhaust fan to valve shaft	3	3	30MAR10	01APR10	30MAR10	01APR10	1	-219
3AL1WT3B62	Connect new vent pipe to exhaust fan(s)	2	2	07APR10	08APR10	07APR10	08APR10	1	-219
3AL1WT3B72	Test and commission exhaust fan(s)	3	3	09APR10	12APR10	09APR10	12APR10	1	-219
Preparation Works at Chai Wan Kok Shaft									
3AL1FTCT02	Install electricity take off, switch board &	4	4	27MAR10	31MAR10	27MAR10	31MAR10	1	-219
3AL1FTCT12	Install waste reception/disposal area	1	1	13MAR10	13MAR10	13MAR10	13MAR10	1	-219
3AL1FTCT22	Install toilet and shower	3	3	11MAR10	13MAR10	11MAR10	13MAR10	1	-219
3AL1FTCT32	Set up generatior, two 2" water pumps	2	2	30MAR10	31MAR10	30MAR10	31MAR10	1	-219
3AL1FTCW02	UU detection	3	3	15MAR10	17MAR10	15MAR10	17MAR10	1	-219
3AL1FTCW04	Excavate to lower platform apprx. 0.5m-1m	2	2	18MAR10	19MAR10	18MAR10	19MAR10	1	-219
3AL1FTCW06	Set out & align sheet piling	1	1	20MAR10	20MAR10	20MAR10	20MAR10	1	-219
3AL1FTCW08	Install sheet piles & excavate to install rails	4	4	22MAR10	25MAR10	22MAR10	25MAR10	1	-219
3AL1FTCW10	Excavate to the bottom of DN1200 pipe	3	3	26MAR10	29MAR10	26MAR10	29MAR10	1	-219
3AL1FTCW12	Lay conrete blinding to pit	2	2	30MAR10	31MAR10	30MAR10	31MAR10	1	-219
3AL1FTCW14	ICE checking	1	1	01APR10	01APR10	01APR10	01APR10	1	-219
3AL1FTCW16	WSD Tunnel Shut Down Period	131*	131*	26MAR10	03SEP10	26MAR10	03SEP10	1	0
3AL1FTCW18	WSD Tunnel #3 commences shut down	1	1	01APR10	01APR10	01APR10	01APR10	1	-219
3AL1FTCW20	Cut & clean invert and inner face of DN1200	1	1	07APR10	07APR10	07APR10	07APR10	1	-219
3AL1FTCW22	Plug DN1200 pipe at the face near valve house	1	1	08APR10	08APR10	08APR10	08APR10	1	-219
3AL1FTCW24	Fabricate trolly & trial	4	4	09APR10	13APR10	09APR10	13APR10	1	-219
3AL1FTCW26	Install longituditual tensioned wire	2	2	14APR10	15APR10	14APR10	15APR10	1	-219
3AL1FTCW36	Temporary plug main tunnel to form air seal	2	2	16APR10	17APR10	16APR10	17APR10	1	-219
Works In Aqueduct									
3AL1FTAD04	Install instruments	56	56	19APR10	25JUN10	19APR10	25JUN10	1	-219
3AL1FTAD06	Inspection	1	1	26JUN10	26JUN10	26JUN10	26JUN10	1	-219
3AL1FTAD08	TBM crossing affected 120m section	12	12	28JUN10	12JUL10	28JUN10	12JUL10	1	-219
3AL1FTAD10	De-install instruments	32	32	13JUL10	18AUG10	13JUL10	18AUG10	1	0
Demobilisation									
3AL1FTAE04	Remove trolley system	1	1	19AUG10	19AUG10	19AUG10	19AUG10	1	0
3AL1FTAE14	Remove the plug at Ting Kau	2	2	20AUG10	21AUG10	20AUG10	21AUG10	1	0
3AL1FTAE24	Remove ventilation system, reinstate T.K. valve	3	3	23AUG10	25AUG10	23AUG10	25AUG10	1	0
3AL1FTAE34	Remove temporary portal at junction	1	1	26AUG10	26AUG10	26AUG10	26AUG10	1	0
Reinstatement Works									
3AL1FTRS02	Reinstate opening at Chai Wan Kok	7	7	27AUG10	03SEP10	27AUG10	03SEP10	1	0
3AL1FTRS04	WSD Tunnel #3 re-operates	1	1	03SEP10	03SEP10	03SEP10	03SEP10	1	0
TBM Assembly & Initial Driving; Day Time Work									
TBM Assembly/Test & Commiss. at Outfall									
3AL1FT0605	Cutterhead	3	3	04JAN10	06JAN10	04JAN10	06JAN10	1	-219
3AL1FT0615	Shield (bottom)	4	4	07JAN10	11JAN10	07JAN10	11JAN10	1	-219
3AL1FT0625	Bearing	1	1	12JAN10	12JAN10	12JAN10	12JAN10	1	-219
3AL1FT0635	Erector & Conveyor Belt	3	3	13JAN10	15JAN10	13JAN10	15JAN10	1	-219
3AL1FT0645	Shield (top)	4	4	16JAN10	20JAN10	16JAN10	20JAN10	1	-219
3AL1FT0655	Backup # 1	3	3	21JAN10	23JAN10	21JAN10	23JAN10	1	-219



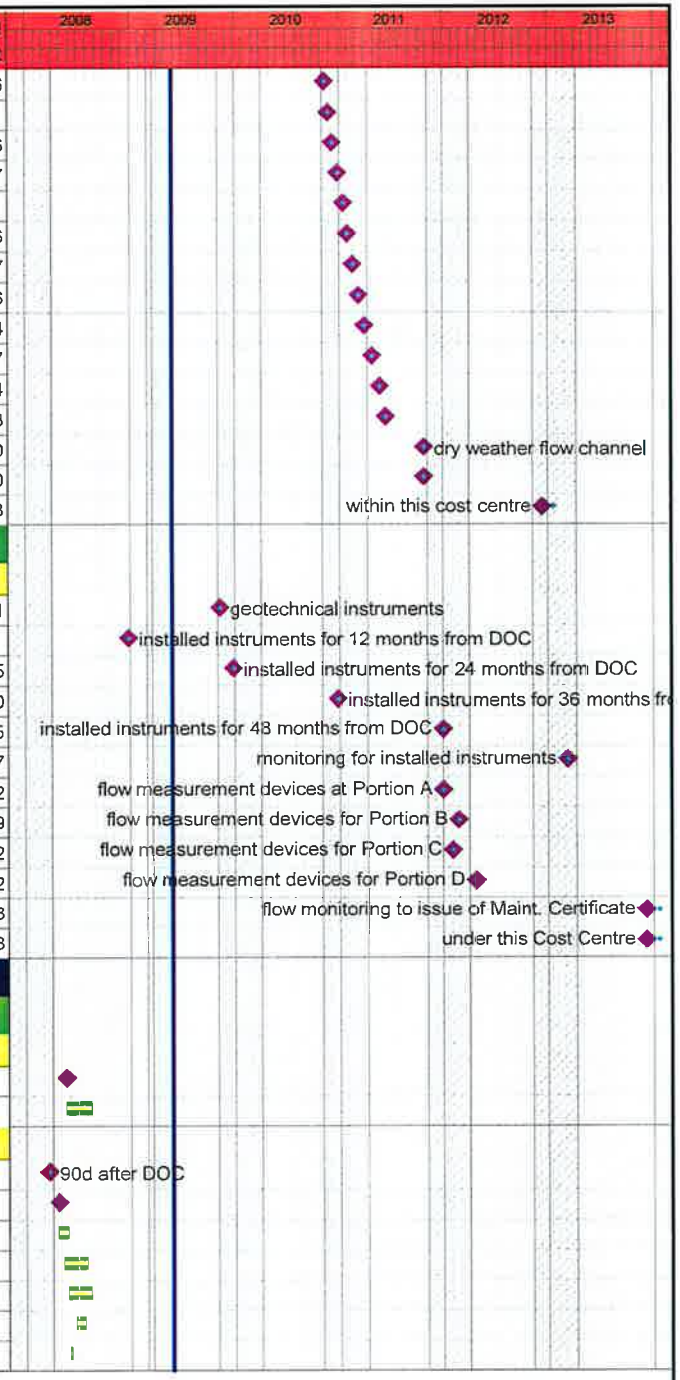
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
3AL1FT0665	Backup # 2	3	3	25JAN10	27JAN10	25JAN10	27JAN10	1	-219
3AL1FT0675	Backup # 3	3	3	28JAN10	30JAN10	28JAN10	30JAN10	1	-219
3AL1FT0685	Test & commission stage 1	6	6	01FEB10	06FEB10	01FEB10	06FEB10	1	-219
3AL1FT0695	Backup # 4	3	3	24FEB10	26FEB10	24FEB10	26FEB10	1	-199
3AL1FT0705	Backup # 5	3	3	27FEB10	02MAR10	27FEB10	02MAR10	1	-199
3AL1FT0715	Backup # 6	3	3	03MAR10	05MAR10	03MAR10	05MAR10	1	-199
3AL1FT0725	Backup # 7	3	3	29MAR10	31MAR10	29MAR10	31MAR10	1	-218
3AL1FT0735	Backup # 8	3	3	01APR10	08APR10	01APR10	08APR10	1	-218
3AL1FT0745	Backup # 9	3	3	09APR10	12APR10	09APR10	12APR10	1	-218
3AL1FT0755	Backup # 10	3	3	13APR10	15APR10	13APR10	15APR10	1	-218
3AL1FT0765	Backup # 11	3	3	16APR10	19APR10	16APR10	19APR10	1	-218
3AL1FT0775	Backup # 12	3	3	20APR10	22APR10	20APR10	22APR10	1	-218
3AL1FT0785	Test & commission stage 2	12	12	23APR10	07MAY10	23APR10	07MAY10	1	-218
TBM Initial Advacing; Day Time Work									
3AL1FT0704	TBM advancing; Ch. 5098 to Ch. 5084	6	6	08FEB10	17FEB10	08FEB10	17FEB10	1	-219
3AL1FT0708	TBM advances; CH5084-4963	54	54	18FEB10	26APR10	18FEB10	26APR10	1	-219
3AL1FT0720	TBM stop to install rem. items	10	10	27APR10	08MAY10	27APR10	08MAY10	1	-219
Main Tunnel Works; Day & Night Work									
TBM Advancing upto Crossing WSD Tunnel # 3									
3AL1FT0816	TBM advances; CH4963-4415 (to WSD Tunnel # 3)	40	40	10MAY10	26JUN10	10MAY10	26JUN10	1	-219
3AL1FT0818	TBM crossing WSD Tunnel # 3; CH4415- 4295	12	12	28JUN10	12JUL10	28JUN10	12JUL10	1	-219
TBM Advancing upto Breakthrough									
3AL1FT0819	TBM advances; CH4295-4250	5	5	13JUL10	17JUL10	13JUL10	17JUL10	1	-219
3AL1FT0820	TBM advances; P6 CH4250-4220	2	2	19JUL10	20JUL10	19JUL10	20JUL10	1	-219
3AL1FT0822	TBM advances; CH4220-3940	14	14	21JUL10	05AUG10	21JUL10	05AUG10	1	-219
3AL1FT0824	TBM advances; CH3940-3560	24	24	06AUG10	02SEP10	06AUG10	02SEP10	1	-219
3AL1FT0826	TBM advances CH3560-2970	40	40	03SEP10	22OCT10	03SEP10	22OCT10	1	-219
3AL1FT0828	TBM advances; WSD WS Reservior CH2970-2860	13	13	23OCT10	06NOV10	23OCT10	06NOV10	1	-219
3AL1FT0830	TBM advances; CH2860-1250	83	83	08NOV10	18FEB11	08NOV10	18FEB11	1	-219
3AL1FT0832	TBM advances; CH1250-0	91	91	19FEB11	11JUN11	19FEB11	11JUN11	1	-219
3AL1FT0890	Desembly & demobilization of TBM	50	50	13JUN11	10AUG11	13JUN11	10AUG11	1	-114
3AL1FT0892	Back grouting (daytime); CH5100-00	382	382	04MAR10	18JUN11	04MAR10	18JUN11	1	-20
3AL1FT0894	Complete maintennce access & dry weather channel	60	60	11AUG11	22OCT11	11AUG11	22OCT11	1	-64
3AL1FT0896	Installation of communication system (Daytime)	60	60	11AUG11	22OCT11	11AUG11	22OCT11	1	-64
3AL1FT0898	Testing & Commissioning; daytime	28	28	10NOV12	07DEC12	22DEC12	18JAN13	2	-462
3AL1FT0902	Contractor serve notice for Works completion	7	7	08DEC12	14DEC12	19JAN13	25JAN13	2	0
3AL1FT0904	Handover of Portion F	0	0		07DEC12		18JAN13	1	-375
3AL1FT0906	SO issues completion certificate	21	21	15DEC12	04JAN13	26JAN13	15FEB13	2	0
Schedule of Milestones for Cost Centre No. 6aR									
6AR1FT0902	6aR 1; On completion of grouting at P7	0	0		31MAR10		31MAR10	2	1,370
6AR1FT0904	6aR 2; On completion of grouting at F6c	0	0		19MAY10		19MAY10	2	1,321



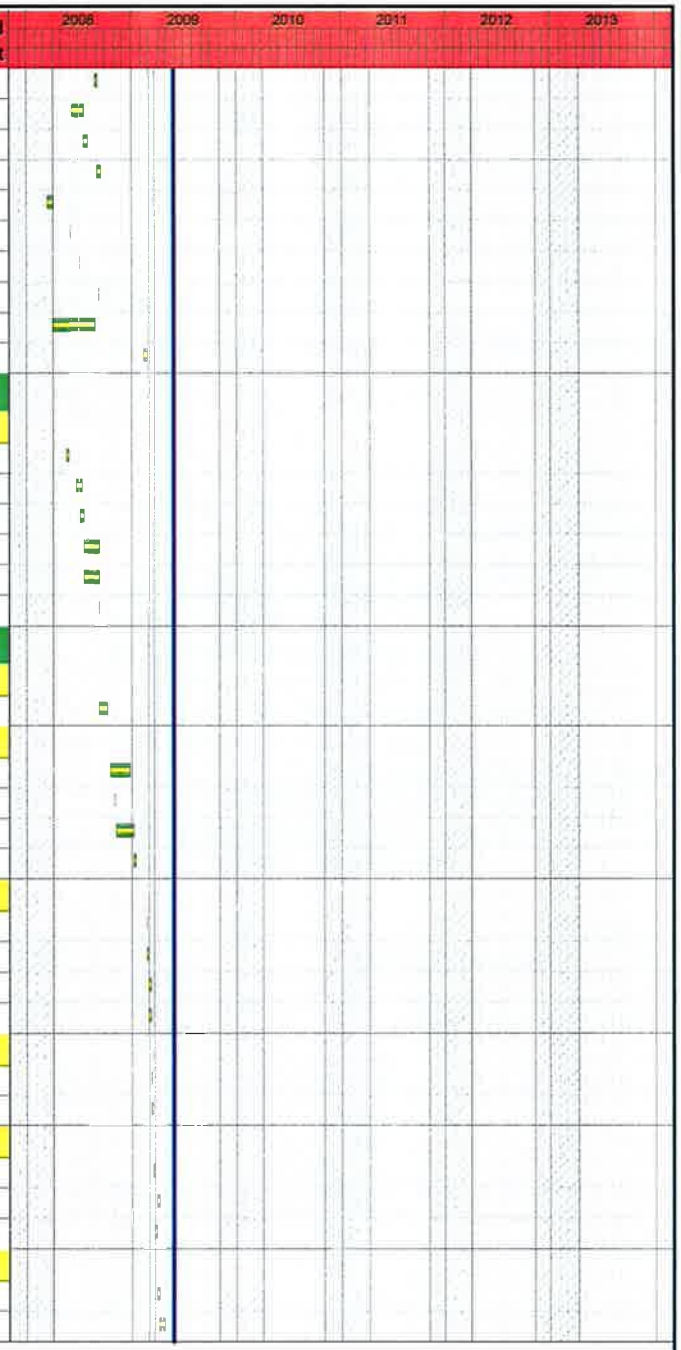
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
6AR1FT0906	6aR 3; On completion of grouting at F6b	0	0		27MAY10		27MAY10	2	1,313
6AR1FT0908	6aR 4; On completion of grouting at F6a	0	0		15JUN10		15JUN10	2	1,294
6AR1FT0910	6aR 5; On completion of grouting at WSD T. 3	0	0		17JUL10		17JUL10	2	1,262
6AR1FT0912	6aR 6; On completion of 20% grout by Ith at P6	0	0		17JUL10		17JUL10	2	1,262
6AR1FT0914	6aR 7; On completion of 40% grout by Ith at P6	0	0		23JUL10		23JUL10	2	1,256
6AR1FT0916	6aR 8; On completion of 60% grout by Ith at P6	0	0		29JUL10		29JUL10	2	1,250
6AR1FT0918	6aR 9; On completion of 80% grout by Ith at P6	0	0		17JUL10		17JUL10	2	1,262
6AR1FT0920	6aR 10; On completion of grouting works at P6	0	0		20JUL10		20JUL10	2	1,259
6AR1FT0922	6aR 11; On completion of grouting wks at P5	0	0		06AUG10		06AUG10	2	1,242
6AR1FT0924	6aR 12; On completion of grouting wks at P4	0	0		04SEP10		04SEP10	2	1,213
6AR1FT0926	6aR 13; On completion of grouting wks at P3	0	0		07OCT10		07OCT10	2	1,180
6AR1FT0928	6aR 14; On completion of grouting wks at WSD's	0	0		06NOV10		06NOV10	2	1,150
6AR1FT0930	6aR 15; On completion of grouting wks at F5	0	0		13NOV10		13NOV10	2	1,143
6AR1FT0932	6aR 16; On completion of grouting wks at F4	0	0		26NOV10		26NOV10	2	1,130
6AR1FT0934	6aR 17; On completion of grouting wks at F3	0	0		22DEC10		22DEC10	2	1,104
6AR1FT0936	6aR 18; On completion of grouting wks at F2	0	0		21FEB11		21FEB11	2	1,043
6AR1FT0938	6aR 19; On completion of grouting wks at P2	0	0		31MAR11		31MAR11	2	1,005
6AR1FT0940	6aR 20; On completion of grouting wks at P1	0	0		27APR11		27APR11	2	978
6AR1FT0942	6aR 21; On completion of 10% grout by Ith at F1	0	0		21MAY11		21MAY11	2	954
6AR1FT0944	6aR 22; On completion of 20% grout by Ith at F1	0	0		23MAY11		23MAY11	2	952
6AR1FT0946	6aR 23; On completion of 30% grout by Ith at F1	0	0		24MAY11		24MAY11	2	951
6AR1FT0948	6aR 24; On completion of 40% grout by Ith at F1	0	0		25MAY11		25MAY11	2	950
6AR1FT0950	6aR 25; On completion of 50% grout by Ith at F1	0	0		26MAY11		26MAY11	2	949
6AR1FT0952	6aR 26; On completion of 60% grout by Ith at F1	0	0		27MAY11		27MAY11	2	948
6AR1FT0954	6aR 27; On completion of 70% grout by Ith at F1	0	0		28MAY11		28MAY11	2	947
6AR1FT0956	6aR 28; On completion of 80% grout by Ith at F1	0	0		30MAY11		30MAY11	2	945
6AR1FT0958	6aR 29; On completion of 90% grout by Ith at F1	0	0		31MAY11		31MAY11	2	944
6AR1FT0960	6aR 30; On completion of grouting works at F1	0	0		01JUN11		01JUN11	2	943
6AR1FT0970	6aR 31; On completion of all works under this CC	0	0		18JUN11		18JUN11	2	926
Schedule of Milestones for Cost Centre No. 3aL									
3AL1FT1002	3aL 1; On providing evidence of procuring TBM	0	0		19JAN08A		19JAN08A	2	
3AL1FT1004	3aL 2; On providing evidence of TBM Factory Test	0	0		08OCT08A		08OCT08A	2	
3AL1FT1006	3aL 3; On delivery of all parts of TBM to the Si	0	0		07AUG09		07AUG09	2	1,606
3AL1FT1008	3aL 4; On completion of site comm. & test. of TB	0	0		07MAY10		07MAY10	2	1,333
3AL1FT1010	3aL 5; On completion of 5% perm. tunnel lining	0	0		18MAY10		18MAY10	2	1,322
3AL1FT1012	3aL 6; On completion of 10% perm. tunnel lining	0	0		09JUN10		09JUN10	2	1,300
3AL1FT1014	3aL 7; On completion of 15% perm. tunnel lining	0	0		02JUL10		02JUL10	2	1,277
3AL1FT1016	3aL 8; On completion of 20% perm. tunnel lining	0	0		28JUL10		28JUL10	2	1,251
3AL1FT1018	3aL 9; On completion of 25% perm. tunnel lining	0	0		13AUG10		13AUG10	2	1,235
3AL1FT1020	3aL 10; On completion of 30% perm. tunnel lining	0	0		02SEP10		02SEP10	2	1,215
3AL1FT1022	3aL 11; On completion of 35% perm. tunnel lining	0	0		22SEP10		22SEP10	2	1,195
3AL1FT1024	3aL 12; On completion of 40% perm. tunnel lining	0	0		22OCT10		22OCT10	2	1,165



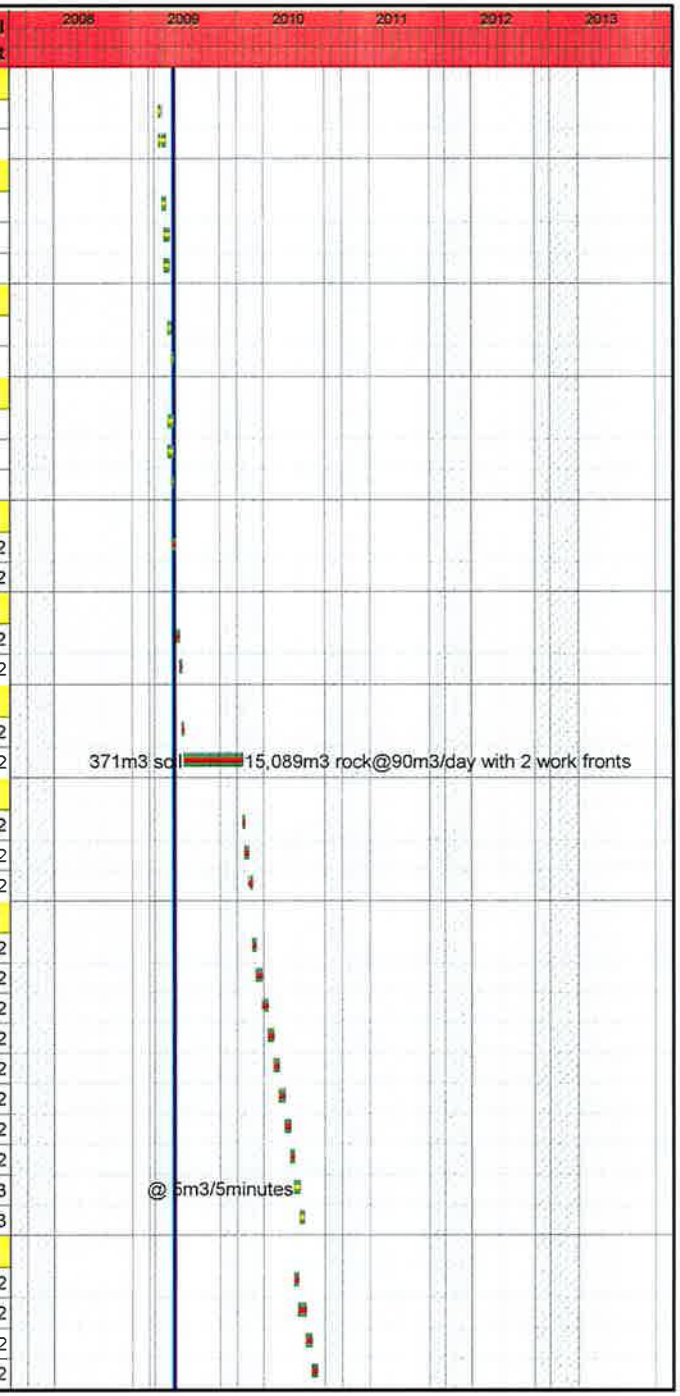
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
3AL1FT1026	3aL 13; On completion of 45% perm. tunnel lining	0	0		10NOV10		10NOV10	2	1,146
3AL1FT1028	3aL 14; On completion of 50% perm. tunnel lining	0	0		25NOV10		25NOV10	2	1,131
3AL1FT1030	3aL 15; On completion of 55% perm. tunnel lining	0	0		10DEC10		10DEC10	2	1,116
3AL1FT1032	3aL 16; On completion of 60% perm. tunnel lining	0	0		29DEC10		29DEC10	2	1,097
3AL1FT1034	3aL 17; On completion of 65% perm. tunnel lining	0	0		14JAN11		14JAN11	2	1,081
3AL1FT1036	3aL 18; On completion of 70% perm. tunnel lining	0	0		29JAN11		29JAN11	2	1,066
3AL1FT1038	3aL 19; On completion of 75% perm. tunnel lining	0	0		17FEB11		17FEB11	2	1,047
3AL1FT1040	3aL 20; On completion of 80% perm. tunnel lining	0	0		10MAR11		10MAR11	2	1,026
3AL1FT1042	3aL 21; On completion of 85% perm. tunnel lining	0	0		01APR11		01APR11	2	1,004
3AL1FT1044	3aL 22; On completion of 90% perm. tunnel lining	0	0		28APR11		28APR11	2	977
3AL1FT1046	3aL 23; On completion of 95% perm. tunnel lining	0	0		21MAY11		21MAY11	2	954
3AL1FT1048	3aL 24; On completion of perm. tunnel lining	0	0		11JUN11		11JUN11	2	933
3AL1FT1050	3aL 25; On completion of maint. access/flow chan	0	0		22OCT11		22OCT11	2	800
3AL1FT1052	3aL 26; On completion of provision of communic.	0	0		22OCT11		22OCT11	2	800
3AL1FT1054	3aL 27; On completion of all works under this CC	0	0		07DEC12		18JAN13	2	388
Schedule of Milestones for Cost Centre No. 3dL									
3DL10T1202	3dL 1; On complet. of install geo instrrument.	0	0		10NOV09		10NOV09	2	1,511
3DL10T1204	3dL 2; Maint./monit. geo. inst. for 12 mth	0	0		27DEC08A		27DEC08A	2	
3DL10T1206	3dL 3; Maint./monitor geo. inst. for 24	0	0		26DEC09		26DEC09	2	1,465
3DL10T1208	3dL 4; Maint./monitor geo. inst. for 36	0	0		26DEC10		26DEC10	2	1,100
3DL10T1210	3dL 5; Maint./monitor geo. inst. for 48	0	0		26DEC11		26DEC11	2	735
3DL10T1212	3dL 6; On completion of maint. & monit. of geo.	0	0		08MAR13		08MAR13	2	297
3DL10T1214	3dL 7; On installation of FMD at Portion A	0	0		29DEC11		29DEC11	2	732
3DL10T1216	3dL 8; On installation of FMD at Portion B	0	0		20FEB12		20FEB12	2	679
3DL10T1218	3dL 9; On installation of FMD at Portion C	0	0		28JAN12		28JAN12	2	702
3DL10T1220	3dL 10; On installation of FMD at Portion D	0	0		17APR12		17APR12	2	622
3DL10T1222	3dL 11; On completion of maint. & monit. of FMD	0	0		07DEC13		18JAN14	2	23
3DL10T1224	3dL 12; On completion of all works under this CC	0	0		07DEC13		18JAN14	2	23
Construction of Intake I-1									
Preliminary Works									
VO#07; Transperant Hoarding at I-1									
VO007-02	Receive VO7 for transparent hoarding	0	0		19MAY08A		19MAY08A	1	
VO007-04	Procure/prepare/install transparent hoarding	70	70	20MAY08A	11AUG08A	20MAY08A	11AUG08A	1	
01R1AI1102	Possession of site	0	0	19MAR08A		19MAR08A		1	
01R1AI1104	Obtain TTA (ingress & egress) approval	0	0	19APR08A		19APR08A		2	
01R1AI1106	Site clearance	30	30	21APR08A	26MAY08A	21APR08A	26MAY08A	1	
01R1AI1108	Obtain tree	6	6	13MAY08A	31JUL08A	13MAY08A	31JUL08A	1	
01R1AI1110	Hoarding erection enclosing the Site	18	18	23MAY08A	11AUG08A	23MAY08A	11AUG08A	1	
01R1AI1112	Site entrance construction	6	6	23JUN08A	25JUL08A	23JUN08A	25JUL08A	1	
01R1AI1114	Install wheel wahing facilities	7	7	03JUN08A	07JUN08A	03JUN08A	07JUN08A	1	



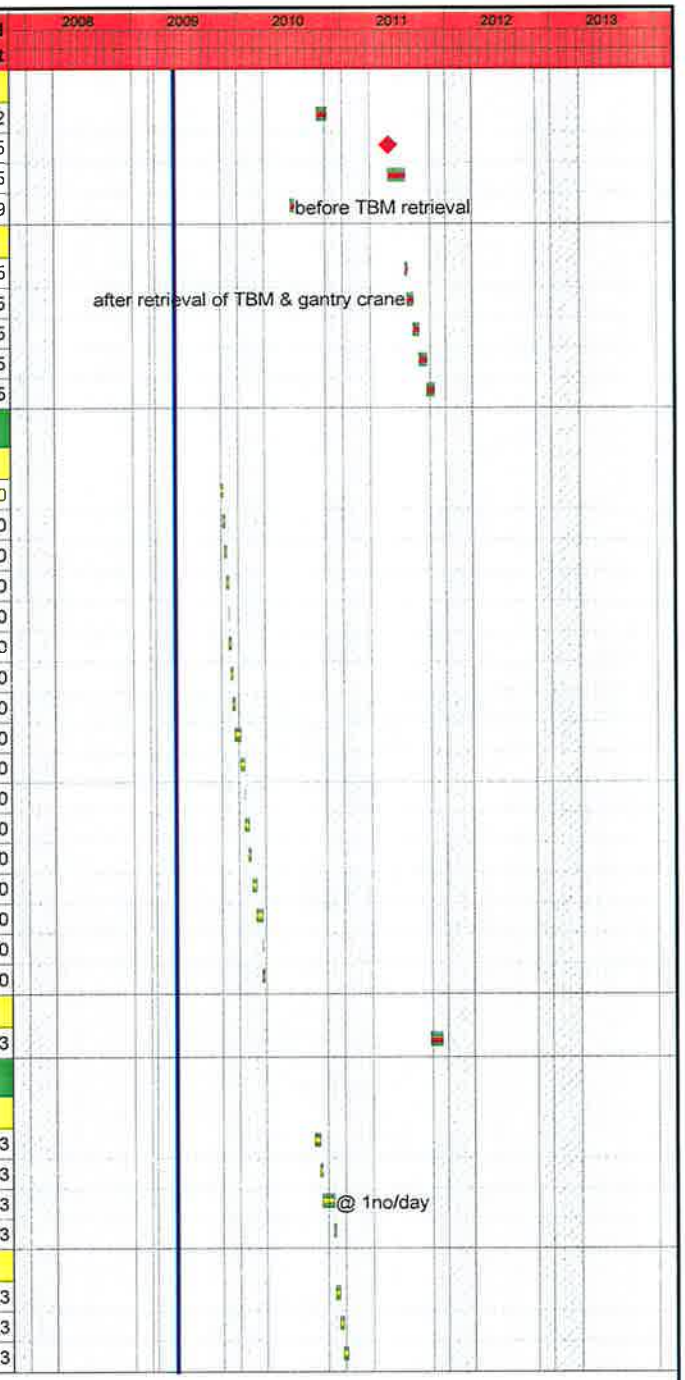
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
01R1AI1116	Erect SOR's secondary site office	6	6	28AUG08A	03SEP08A	28AUG08A	03SEP08A	1	
01R1AI1118	Footing for temp. bridge span over Shing M. Nul.	26	26	10JUN08A	16JUL08A	10JUN08A	16JUL08A	1	
01R1AI1120	Decking for temp. bridge span over Shing M. Nul.	13	13	17JUL08A	01AUG08A	17JUL08A	01AUG08A	1	
01R1AI1122	Install remote control CCTV as per ER 4.4.10	12	12	04SEP08A	18SEP08A	04SEP08A	18SEP08A	1	
16R1AI1101	Tree Identification & Report	14	14	14MAR08A	01APR08A	14MAR08A	01APR08A	2	
16R7AI1102	1st tree pruning for small 3 nos. trees	1	1	03JUN08A	03JUN08A	03JUN08A	03JUN08A	1	
16R7AI1104	2nd tree pruning for small 3 nos. trees	1	1	04JUL08A	04JUL08A	04JUL08A	04JUL08A	1	
16R7AI1106	Final pruning & uplifting of 3 nos. small trees	2	2	08SEP08A	09SEP08A	08SEP08A	09SEP08A	1	
16R7AI1108	Confirm location for trees to be transplanted	51	51	02APR08A	27AUG08A	02APR08A	27AUG08A	1	
16R7AI1114	One stg transplant for big 4 nos. big trees	9	9	11FEB09A	19FEB09A	11FEB09A	19FEB09A	1	
Permanent Soil Nailing Works									
11R2AI1302	Erect working platform & mobilization	8	8	17MAY08A	24MAY08A	17MAY08A	24MAY08A	1	
11R2AI1304	Install test nails & proof loading test; 2 nos.	8	8	24JUN08A	08JUL08A	24JUN08A	08JUL08A	1	
11R2AI1306	Soil nailing for A to C rows; 69 nos.	16	16	02JUL08A	14JUL08A	02JUL08A	14JUL08A	1	
11R2AI1308	Soil nailing for D to F rows; 71 nos.	29	29	15JUL08A	05SEP08A	15JUL08A	05SEP08A	1	
11R2AI1310	Constrcut soil nail heads; 140 nos.	22	22	19JUL08A	06SEP08A	19JUL08A	06SEP08A	1	
11R2AI1312	Demobilization	3	3	08SEP08A	10SEP08A	08SEP08A	10SEP08A	1	
Construction of Spiral Ramp & Cascade									
Additional GI Woks to Fnalize Design									
AGIA-02	Drill for 5 nos. additional GI works	21	21	09SEP08A	04OCT08A	09SEP08A	04OCT08A	1	
Temp. Pipe-pile cofferdam									
04L1AI1202	Erect piling platform	43	43	22OCT08A	24DEC08A	22OCT08A	24DEC08A	1	
04L1AI1203	Mobilization & set up piling rig	3	3	30OCT08A	01NOV08A	30OCT08A	01NOV08A	1	
04L1AI1204	Install 273 mm dia. temp. pipe piles; 144 nos.	43	43	08NOV08A	05JAN09A	08NOV08A	05JAN09A	1	
04L1AI1226	Demobilize all plant and materials	6	6	06JAN09A	13JAN09A	06JAN09A	13JAN09A	1	
Excavate +104.0 to +100.5mPD; Row 7									
04L1AI1402	Mobilization	1	1	23FEB09A	23FEB09A	23FEB09A	23FEB09A	1	
04L1AI1404	Bulk excavation; soil (155m3)	4	4	24FEB09A	27FEB09A	24FEB09A	27FEB09A	1	
04L1AI1406	Install test tie-back & proof load test	4	4	28FEB09A	04MAR09A	28FEB09A	04MAR09A	1	
04L1AI1408	Install tie backs/wailing & shortcrete	4	4	03MAR09A	06MAR09A	03MAR09A	06MAR09A	1	
Excavate +100.5 to +99.0mPD; Rows 1 & 8									
04L1AI1410	Bulk excavation; soil (219m3)	2	2	07MAR09A	09MAR09A	07MAR09A	09MAR09A	1	
04L1AI1412	Install tie backs/wailing & shorcrete	6	6	10MAR09A	16MAR09A	10MAR09A	16MAR09A	1	
Excavate +99.0 to +96.5mPD; Rows 2, 9 & 18									
04L1AI1414	Bulk excavation; soil (710m3)	3	3	17MAR09A	19MAR09A	17MAR09A	19MAR09A	1	
04L1AI1416	Install test tie-back & proof load test	4	4	26MAR09A	01APR09A	26MAR09A	01APR09A	1	
04L1AI1418	Install tie backs/wailing & shortcrete	6	6	23MAR09A	28MAR09A	23MAR09A	28MAR09A	1	
Excavate +96.5 to +95.0mPD; Rows3, 10 & 19									
04L1AI1420	Bulk excavation; soil (721m3)	3	3	30MAR09A	04APR09A	30MAR09A	04APR09A	1	
04L1AI1422	Install tie backs/wailing & shortcrete	4	4	02APR09A	20APR09A	02APR09A	20APR09A	1	



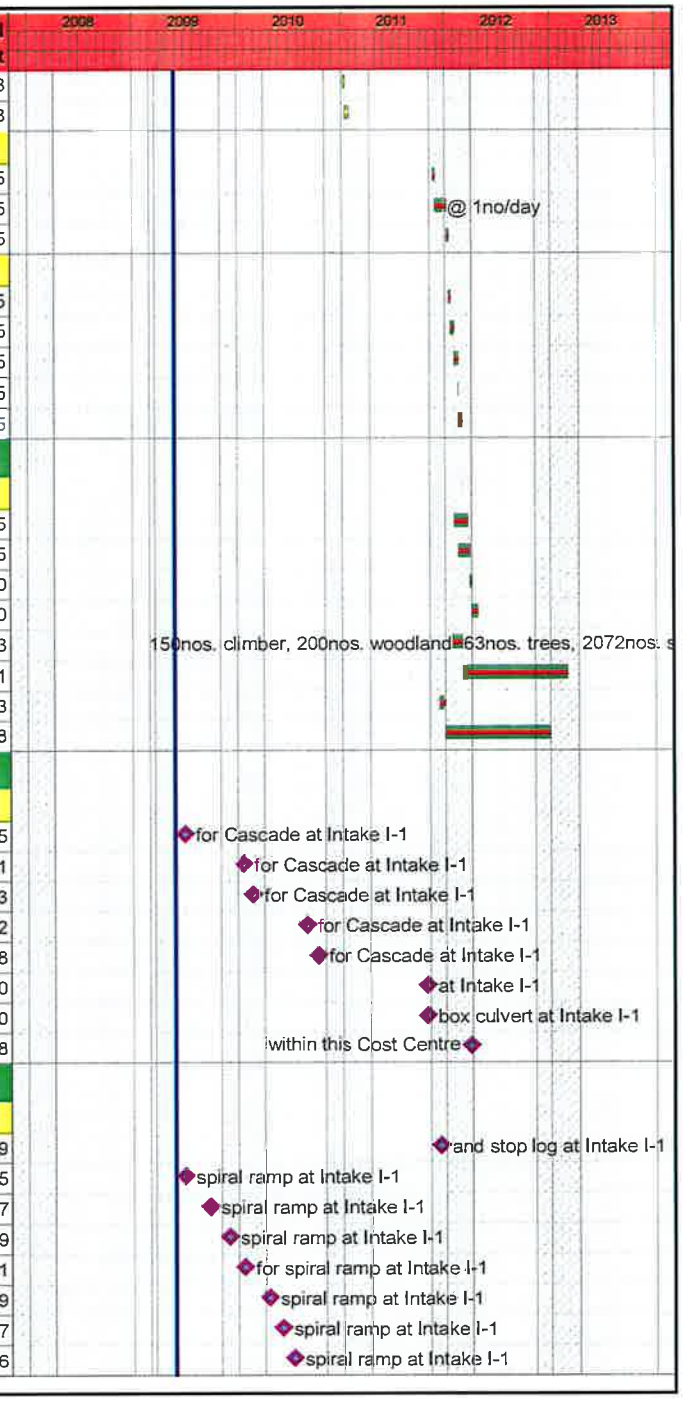
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
Excavate +95.0 to +94.0 mPD; Rows 4, 11 & 20									
04L1AI1424	Bulk excavation; soil (701m3)	3	3	06APR09A	18APR09A	06APR09A	18APR09A	1	
04L1AI1426	Install tie backs/wailing & shorcrete	5	5	03APR09A	30APR09A	03APR09A	30APR09A	1	
Excavate +94.0 to + 93.0mPD; Rows 5,12,16,21&24									
04L1AI1428	Bulk excavation; soil (818m3)	4	4	20APR09A	27APR09A	20APR09A	27APR09A	1	
04L1AI1430	Install test tie-back & proof load test	4	4	21APR09A	16MAY09A	21APR09A	16MAY09A	1	
04L1AI1432	Install tie backs/wailing & shorcrete	5	5	21APR09A	16MAY09A	21APR09A	16MAY09A	1	
Excavate +93.0 to +92.5mPD; Row 22									
04L1AI1434	Bulk excavation; soil (423m3) & rock (52m3)	3	3	04MAY09A	18MAY09A	04MAY09A	18MAY09A	1	
04L1AI1436	Install tie backs/wailing & shorcrete	2	2	19MAY09A	27MAY09A	19MAY09A	27MAY09A	1	
Excavate +92.5 to 91.1mPD; Rows 6,13,16,17&23									
04L1AI1438	Bulk excavation; soil (1002m3) & rock (342m3)	8	8	06MAY09A	23MAY09A	06MAY09A	23MAY09A	1	
04L1AI1440	Install test tie-back & proof load test	4	4	08MAY09A	25MAY09A	08MAY09A	25MAY09A	1	
04L1AI1442	Install tie backs/wailing & shorcrete	4	4	18MAY09A	27MAY09A	18MAY09A	27MAY09A	1	
Excavate +91.1 to 89.5mPD; Rows 14, 17 & 25									
04L1AI1444	Bulk excavation; soil (724m3) & rock (811m3)	12	12	18MAY09A	01JUN09	18MAY09A	01JUN09	1	-22
04L1AI1446	Install tie backs/wailing & shorcrete	4	4	02JUN09	05JUN09	02JUN09	05JUN09	1	-22
Excavate +89.5 to 88.5mPD; Rows 15 & 26									
04L1AI1448	Bulk excavation; soil (269m3) & rock (690m3)	9	9	06JUN09	16JUN09	06JUN09	16JUN09	1	-22
04L1AI1450	Install tie backs/wailing & shorcrete	3	3	17JUN09	19JUN09	17JUN09	19JUN09	1	-22
Excavate +88.5 to 71.5mPD; Rows 27 to 31									
07R1AI1442	Set up for dewatering	8	8	20JUN09	29JUN09	20JUN09	29JUN09	1	-22
07R1AI1444	Rock excavation/mucking out/temp. support	168	168	30JUN09	19JAN10	30JUN09	19JAN10	1	-22
Construcion of Vehiucular Access									
04L1AI1452	Cast base slab	6	6	20JAN10	26JAN10	20JAN10	26JAN10	1	-22
04L1AI1454	Cast walls	12	12	27JAN10	09FEB10	27JAN10	09FEB10	1	-22
04L1AI1456	Cast roof slab	12	12	10FEB10	26FEB10	10FEB10	26FEB10	1	-22
Construction of Spiral Ramp Structure									
07R1AI1402	Cast base slab	12	12	27FEB10	12MAR10	27FEB10	12MAR10	1	-22
07R1AI1404	Cast ramp up to +76.51mPD	15	15	13MAR10	30MAR10	13MAR10	30MAR10	1	-22
07R1AI1406	Cast ramp up to +80.81mPD	15	15	31MAR10	21APR10	31MAR10	21APR10	1	-22
07R1AI1408	Cast ramp up to +85.10mPD	15	15	22APR10	10MAY10	22APR10	10MAY10	1	-22
07R1AI1410	Cast ramp up to 89.41mPD	15	15	11MAY10	28MAY10	11MAY10	28MAY10	1	-22
07R1AI1412	Cast ramp up to 93.71mPD	15	15	29MAY10	15JUN10	29MAY10	15JUN10	1	-22
07R1AI1414	Cast ramp up to 98.01mPD	15	15	17JUN10	05JUL10	17JUN10	05JUL10	1	-22
07R1AI1416	Cast ramp up to +102.31mPD	15	15	06JUL10	22JUL10	06JUL10	22JUL10	1	-22
07R1AI1418	Backfill spiral ramp; 2496m3 @ 200m3/day	13	13	23JUL10	06AUG10	23JUL10	06AUG10	1	103
07R1AI1420	Construct RC spiral ramp top	15	15	07AUG10	24AUG10	07AUG10	24AUG10	1	103
Construction of Cascade Structure									
04L1AI1472	Cast base slabs	12	12	23JUL10	05AUG10	23JUL10	05AUG10	1	-22
04L1AI1474	Cast walls 1st lift	18	18	06AUG10	26AUG10	06AUG10	26AUG10	1	-22
04L1AI1476	Cast walls 2nd lift, 200mm down from soffit	18	18	27AUG10	16SEP10	27AUG10	16SEP10	1	-22
04L1AI1478	Cast roof slabs	18	18	17SEP10	09OCT10	17SEP10	09OCT10	1	-22



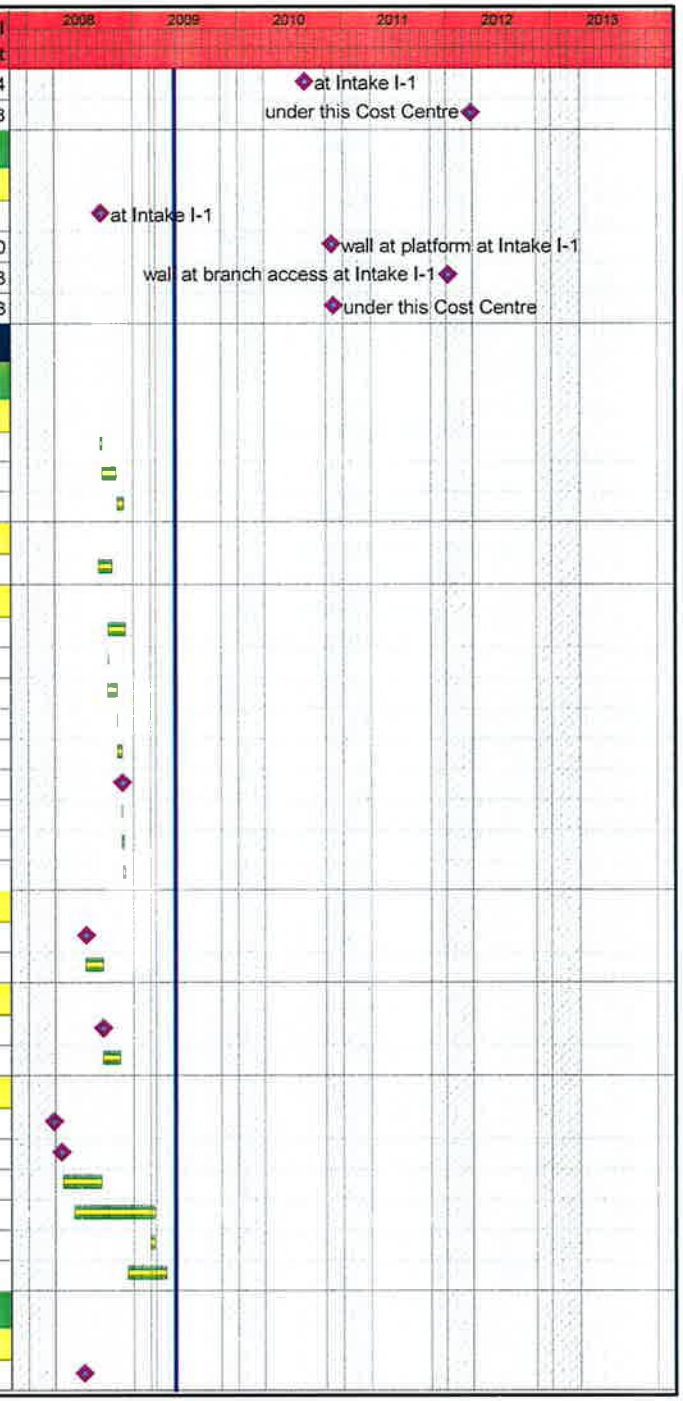
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
Dismantle & Removal of TBM									
04L1AI1458	Backfill & form cranage platform	24	24	11OCT10	08NOV10	11OCT10	08NOV10	1	-22
04L1AI1460	TBM break through	0	0		11JUN11*		11JUN11*	1	-195
04L1AI1461	Dissembly & demobilization of TBM	50	50	13JUN11	10AUG11	13JUN11	10AUG11	1	-195
04L1AI1462	Cast lower base slab	12	12	06JUL10	19JUL10	06JUL10	19JUL10	1	-19
Construction of Box Culvert Structure									
04L1AI1463	Cast upper base	6	6	11AUG11	17AUG11	11AUG11	17AUG11	1	-195
04L1AI1464	Cast walls 1st lift	18	18	18AUG11	07SEP11	18AUG11	07SEP11	1	-195
04L1AI1466	Cast walls 2nd lift, 200mm down from soffit	18	18	08SEP11	29SEP11	08SEP11	29SEP11	1	-195
04L1AI1468	Cast roof slabs	18	18	30SEP11	22OCT11	30SEP11	22OCT11	1	-195
04L1AI1470	Backfill & compaction above box culvert; ~13m	22	22	24OCT11	17NOV11	24OCT11	17NOV11	1	-195
Modification of Existing Channel in Dry Season									
Channel Modification (Varied)Works (Civil Works)									
07R1AI1502	Break wall & slab at pipe pile location	8	8	02NOV09*	10NOV09	02NOV09*	10NOV09	1	70
07R1AI1504	Set up pipe pile rig	3	3	11NOV09	13NOV09	11NOV09	13NOV09	1	70
07R1AI1506	Install pipe piles (30n*12m)	10	10	14NOV09	25NOV09	14NOV09	25NOV09	1	70
07R1AI1508	Break existing masonry wall	4	4	26NOV09	30NOV09	26NOV09	30NOV09	1	70
07R1AI1510	PC blcok/sand back bund wall for water diversion	2	2	01DEC09	02DEC09	01DEC09	02DEC09	1	70
07R1AI1512	Cut existing slab	1	1	03DEC09	03DEC09	03DEC09	03DEC09	1	70
07R1AI1514	Demolish Wo Yi Hop Nullah wall & slab	6	6	04DEC09	10DEC09	04DEC09	10DEC09	1	70
07R1AI1518	Construct WYH Nullah wall below slab	6	6	11DEC09	17DEC09	11DEC09	17DEC09	1	70
07R1AI1520	Backfill & SRT behind wall below slab	18	18	18DEC09	11JAN10	18DEC09	11JAN10	1	70
07R1AI1522	Demolish Shing Mun Nullah wall with struts	6	6	12JAN10	18JAN10	12JAN10	18JAN10	1	70
07R1AI1524	Demolish Shing Mun Nullah slab	4	4	19JAN10	22JAN10	19JAN10	22JAN10	1	70
07R1AI1626	Construct slab	8	8	23JAN10	01FEB10	23JAN10	01FEB10	1	70
07R1AI1628	Construct wall for WYH Nullah	10	10	02FEB10	12FEB10	02FEB10	12FEB10	1	70
07R1AI1630	Constrtuct wall for SM Nullah	10	10	17FEB10	27FEB10	17FEB10	27FEB10	1	70
07R1AI1632	Assoc. RC works for trash grill & stop slogs	18	18	01MAR10	20MAR10	01MAR10	20MAR10	1	70
07R1AI1634	Mass concrete infill	3	3	22MAR10	24MAR10	22MAR10	24MAR10	1	70
07R1AI1636	PC block & san bag bund wall	3	3	25MAR10	27MAR10	25MAR10	27MAR10	1	70
Channel Modification Works (Steel Works)									
07R1AI150T	Install steelworks; Phase 3	36	36	01NOV11*	12DEC11	01NOV11*	12DEC11	1	-143
Piling Works									
Piing Works Along Crest Plarform									
11R2AI1202	Erect piling platform for upper piles	12	12	22SEP10	07OCT10	22SEP10	07OCT10	1	103
11R2AI1204	Mobilize piling rig & set up	6	6	08OCT10	14OCT10	08OCT10	14OCT10	1	103
11R2AI1206	350mm dia. pre-bored H-piles (upper); 36 nos.	36	36	15OCT10	26NOV10	15OCT10	26NOV10	1	103
11R2AI1208	Demobilize piling rig	6	6	27NOV10	03DEC10	27NOV10	03DEC10	1	103
Skin Wall & Crest Platform									
11R2AI1210	Excavate & hack off grout	8	8	04DEC10	13DEC10	04DEC10	13DEC10	1	103
11R2AI1212	Construct skin wall	12	12	14DEC10	29DEC10	14DEC10	29DEC10	1	103
11R2AI1214	Construct capping beam	8	8	30DEC10	08JAN11	30DEC10	08JAN11	1	103



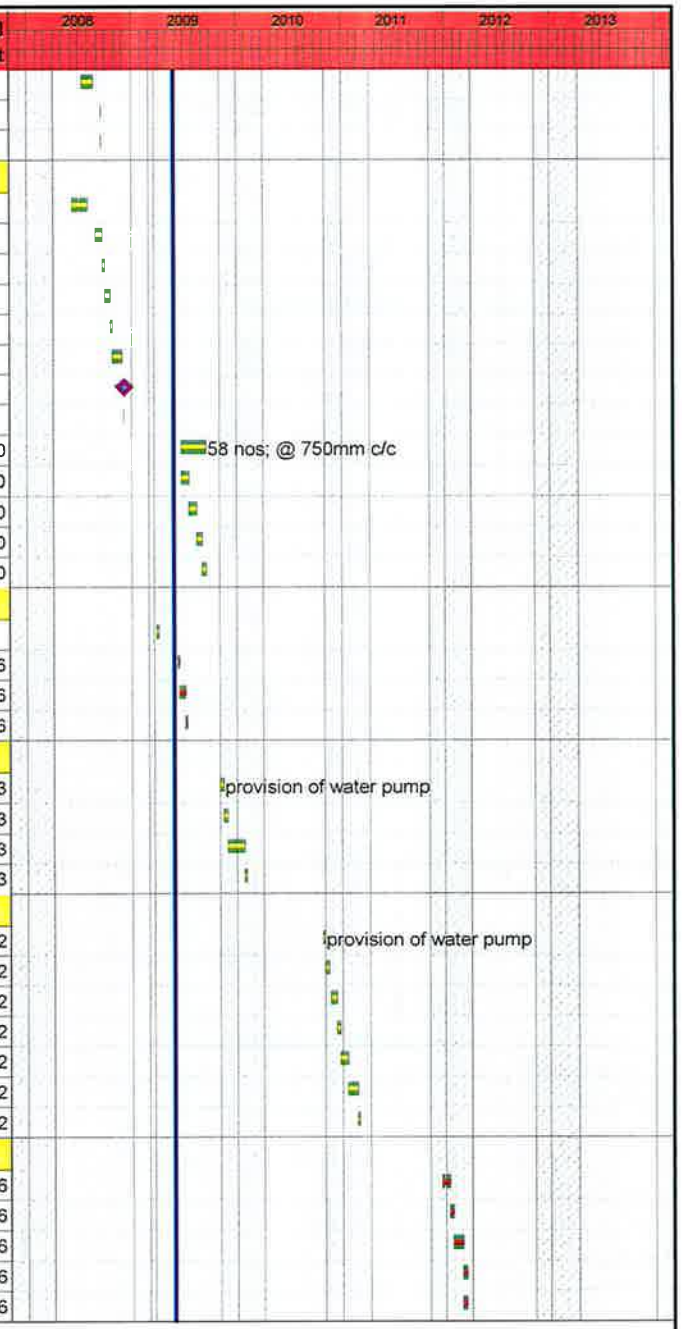
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
11R2AI1216	Backfill & construct U-channel	4	4	10JAN11	13JAN11	10JAN11	13JAN11	1	103
11R2AI1218	Fix rebar/ erect fwk/concrete ramp	12	12	14JAN11	27JAN11	14JAN11	27JAN11	1	103
Piling Works Above Inclined Access Ramp									
11R2AI1220	Mobilize piling rig & set up	6	6	18NOV11	24NOV11	18NOV11	24NOV11	1	-195
11R2AI1222	350mm dia. pre-bored H-piles (lower); 29 nos.	29	29	25NOV11	02JAN12	25NOV11	02JAN12	1	-195
11R2AI1224	Demobilize piling rig	6	6	03JAN12	09JAN12	03JAN12	09JAN12	1	-195
Skin Wall & Inclined Access Ramp									
11R2AI1226	Excavate & hack off grout	6	6	10JAN12	16JAN12	10JAN12	16JAN12	1	-195
11R2AI1228	Construct skin wall	12	12	17JAN12	02FEB12	17JAN12	02FEB12	1	-195
11R2AI1230	Construct capping beam	8	8	03FEB12	11FEB12	03FEB12	11FEB12	1	-195
11R2AI1232	Backfill & construct U-channel	4	4	13FEB12	16FEB12	13FEB12	16FEB12	1	-195
11R2AI1234	Fix rebar/erect fwk/concrete ramp	12	12	17FEB12	01MAR12	17FEB12	01MAR12	1	-195
Remaining Works Prior to Handover									
07R1AI1606	Finishing & reinstatement works; Portion A	36	36	03FEB12	15MAR12	03FEB12	15MAR12	1	-195
07R1AI1608	Pre-handover inspections and remedial works	30	30	17FEB12	22MAR12	17FEB12	22MAR12	1	-195
07R1AI1610	Contractor serve notice for Works completion	7	7	23MAR12	29MAR12	23MAR12	29MAR12	2	0
07R1AI1612	SO issues completion certificate	21	21	30MAR12	19APR12	30MAR12	19APR12	2	0
16R7AI1602	Landscaping works at Portion A	30	30	27JAN12	01MAR12	27JAN12	01MAR12	1	-183
16R7AI1604	Establishment Works at Portion A	365	365	02MAR12	01MAR13	02MAR12	01MAR13	2	-181
3DL1AI1602	Install flow measurement devices at Intake I-1	12	12	13DEC11	29DEC11	13DEC11	29DEC11	1	-143
3DL1AI1604	Maintain & monitor flow monitoring	365	365	30DEC11	28DEC12	30DEC11	28DEC12	2	-118
Schedule of Milestones for Cost Center No. 4L									
04L1AI1802	4L 1; On completion of 50% excavation	0	0		29JUN09		29JUN09	2	1,645
04L1AI1804	4L 2; On completion of excavation	0	0		19JAN10		19JAN10	2	1,441
04L1AI1806	4L 3; On completion of 25% concreting	0	0		26FEB10		26FEB10	2	1,403
04L1AI1808	4L 4; On completion of 50% concreting	0	0		26AUG10		26AUG10	2	1,222
04L1AI1810	4L 5; On completion of 75% concreting	0	0		09OCT10		09OCT10	2	1,178
04L1AI1812	4L 6; On completion of Cascade	0	0		22OCT11		22OCT11	2	800
04L1AI1814	4L 7; On completion of connecting BC	0	0		22OCT11		22OCT11	2	800
04L1AI1816	4L 8; On completion of all works under this CC	0	0		22MAR12		22MAR12	2	648
Schedule of Milestones for Cost Centre No. 7R									
07R1AI1902	7R 1; On completion of trash grills	0	0		12DEC11		12DEC11	2	749
07R1AI1904	7R 2; On completion of 25% excavation	0	0		29JUN09		29JUN09	2	1,645
07R1AI1906	7R 3; On completion of 50% excavation	0	0		25SEP09		25SEP09	2	1,557
07R1AI1908	7R 4; On completion of 75% excavation	0	0		02DEC09		02DEC09	2	1,489
07R1AI1910	7R 5; On completion of all excavation	0	0		19JAN10		19JAN10	2	1,441
07R1AI1912	7R 6; On completion of spiral ramp to +80mPD	0	0		21APR10		21APR10	2	1,349
07R1AI1914	7R 7; On completion of spiral ramp to +90mPD	0	0		02JUN10		02JUN10	2	1,307
07R1AI1916	7R 8; On completion of spiral ramp to +100mPD	0	0		13JUL10		13JUL10	2	1,266



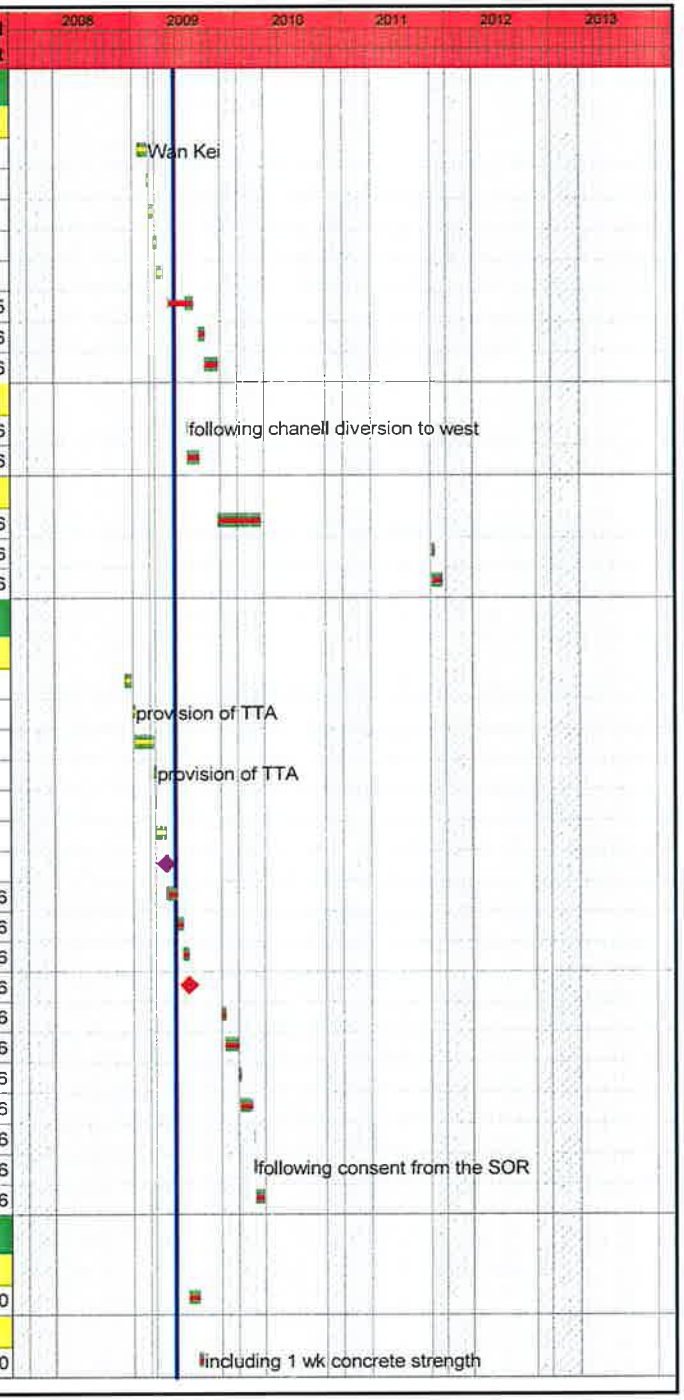
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
07R1AI1918	7R 9; On completion of spiral access ramp	0	0		24AUG10		24AUG10	2	1,224
07R1AI1920	7R 10; On completion of all works under this CC	0	0		22MAR12		22MAR12	2	648
Schedule of Milestones for Cost Centre No. 11R									
11R2AI1R02	11R 1; On completion of soil nailing works	0	0		06SEP08A		06SEP08A	2	
11R2AI1R04	11R 2; On completion of piling at platform	0	0		26NOV10		26NOV10	2	1,130
11R2AI1R06	11R 3; On completion of piling at branch access	0	0		02JAN12		02JAN12	2	728
11R2AI1R08	11R 4; On completion of all works under this CC	0	0		03DEC10		03DEC10	2	1,123
Construction of Intake I-2									
Preliminary Works									
Additional GI Works to Finalize Design									
AGIB-02	Erect platform/mibilization & set up GI rig	3	3	12SEP08A	16SEP08A	12SEP08A	16SEP08A	1	
AGIB-04	Drill 3 nos. GI holes for Intake Structures	22	22	17SEP08A	03NOV08A	17SEP08A	03NOV08A	1	
AGIB-06	Drill 1 hole for Intersection with Main Tunnel	12	12	11NOV08A	24NOV08A	11NOV08A	24NOV08A	1	
Diversion of CLP Overhead Cable									
01R1BU0102	Temporary diversion of CLP overhead cable	30	30	02SEP08A	17OCT08A	02SEP08A	17OCT08A	2	
Dievrsion of 100mm Watermain									
01R1BU0202	Temporary Diversion of 100mm dia. Watermain	64*	64*	03OCT08A	05DEC08A	03OCT08A	05DEC08A	2	
01R1BU0204	Issue VO35 for temp. diversion	1	1	03OCT08A	03OCT08A	03OCT08A	03OCT08A	1	
01R1BU0206	Preparation works	26	26	04OCT08A	04NOV08A	04OCT08A	04NOV08A	1	
01R1BU0208	Install steel support	3	3	05NOV08A	07NOV08A	05NOV08A	07NOV08A	1	
01R1BU0210	Lay new watermain	2	2	08NOV08A	18NOV08A	08NOV08A	18NOV08A	1	
01R1BU0212	Obtain ICE certificate for temp. support	0	0		19NOV08A		19NOV08A	1	
01R1BU0214	Pressure test	2	2	20NOV08A	21NOV08A	20NOV08A	21NOV08A	1	
01R1BU0216	Sterilise new pipe & take water sample	3	3	22NOV08A	25NOV08A	22NOV08A	25NOV08A	1	
01R1BU0218	Watermain connection by WSD	10	10	26NOV08A	05DEC08A	26NOV08A	05DEC08A	2	
VO #11; Transperant Hoarding at I-2									
VO011-02	Receive VO11 for transparent hoarding	0	0		14JUL08A		14JUL08A	1	
VO011-04	Procure/prepare/install transparent hoarding	51	51	15JUL08A	13SEP08A	15JUL08A	13SEP08A	1	
VO#32; Replace Hoarding by Chain Link Fence									
VO032-I202	Receive VO-32 for replacing hoarding by CLF	0	0		16SEP08A		16SEP08A	1	
VO032-I204	Procure/prepare/install transparent hoarding	51	51	17SEP08A	17NOV08A	17SEP08A	17NOV08A	1	
01R1BI2102	Possession of Portion B -90d of DOC	0	0	26MAR08A		26MAR08A		2	
01R1BI2104	Obtain TTA (ingress & egress) approval	0	0		19APR08A		19APR08A	2	
01R1BI2108	Site clearance	30	30	02MAY08A	05SEP08A	02MAY08A	05SEP08A	1	
01R1BI2112	Erect hoarding	30	30	05JUN08A	16MAR09A	05JUN08A	16MAR09A	1	
01R1BI2116	Install remote contorl CCTV as per ER 4.4.10	12	12	28FEB09A	13MAR09A	28FEB09A	13MAR09A	1	
16R7BI2002	Tree transplanting; 1 no.	72	72	10DEC08A	23APR09A	10DEC08A	23APR09A	1	
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	0	0		10JUL08A		10JUL08A	1	



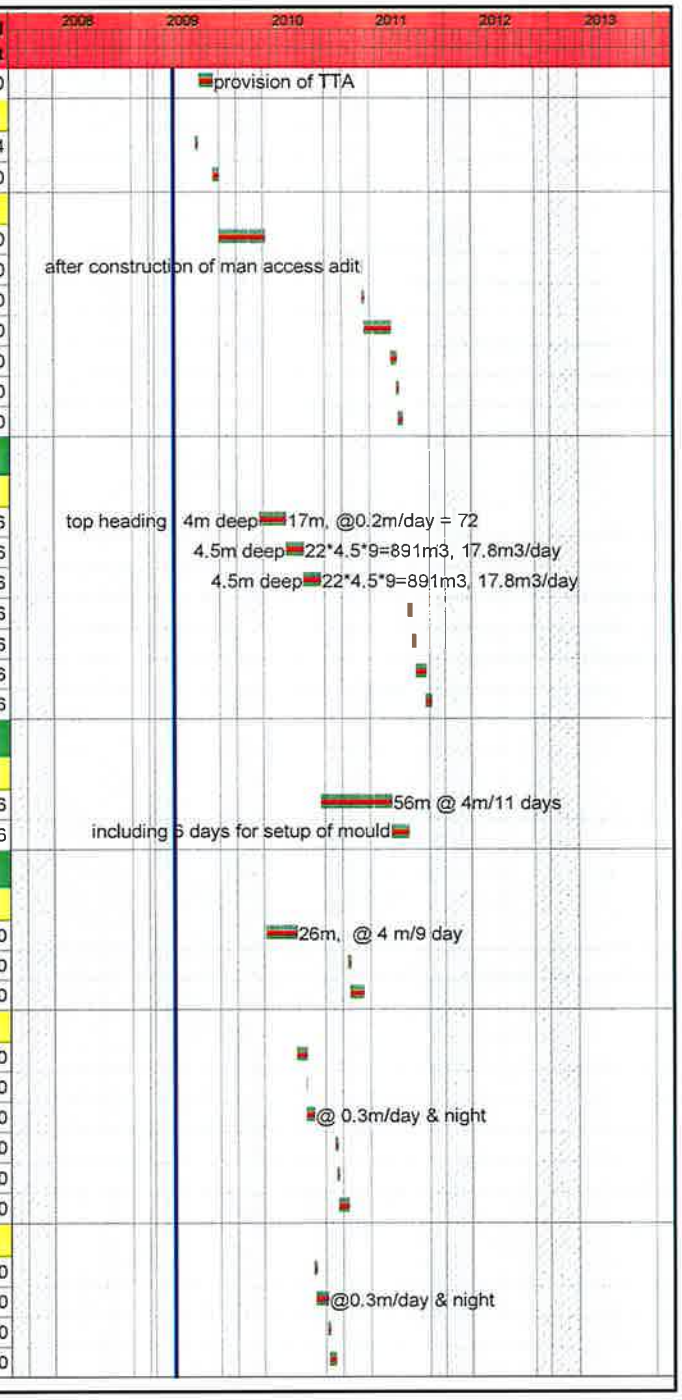
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
VO022-04	SOR confirmed to demolish exit. ret. wall	38	38	11JUL08A	21AUG08A	11JUL08A	21AUG08A	1	
VO022-06	Demolish existing retaining wall	1	1	13SEP08A	13SEP08A	13SEP08A	13SEP08A	1	
VO022-16	Reinstate piling platform	2	2	16SEP08A	17SEP08A	16SEP08A	17SEP08A	1	
Phase 1; Construct 550 dia. H-pile Wall									
12R3BI2202	Form temp. access ramp along west side of stream	44	44	10JUN08A	31JUL08A	10JUN08A	31JUL08A	1	
12R3BI2204	Additional SI & engineering works	26	26	25AUG08A	24SEP08A	25AUG08A	24SEP08A	1	
12R3BI2206	Mobilize piling rig & set up	5	5	25SEP08A	30SEP08A	25SEP08A	30SEP08A	1	
12R3BI2208	Construct piles 1 to 18	13	13	02OCT08A	17OCT08A	02OCT08A	17OCT08A	1	
12R3BI2210	Piling works stopped by the SOR	8	8	18OCT08A	27OCT08A	18OCT08A	27OCT08A	1	
12R3BI2212	Construct piles 19-58	28	28	28OCT08A	26NOV08A	28OCT08A	26NOV08A	1	
12R3BI2214	SOR's instruction to delet pile 59	0	0		02DEC08A		02DEC08A	1	
12R3BI2216	Demobilize piling rig	4	4	03DEC08A	06DEC08A	03DEC08A	06DEC08A	1	
12R3BI2218	Construct skin wall/caping beam/u-channel	70*	70*	25JUN09	15SEP09	25JUN09	15SEP09	1	80
12R3BI2220	Excavate for skin wall; 4 bays	18	18	25JUN09	16JUL09	25JUN09	16JUL09	1	80
12R3BI2222	Construct for skin wall; 4 bays	24	24	17JUL09	13AUG09	17JUL09	13AUG09	1	80
12R3BI2224	Construct capping beam; 4 bays	16	16	14AUG09	01SEP09	14AUG09	01SEP09	1	80
12R3BI2226	Construct drainage; 4 bays	12	12	02SEP09	15SEP09	02SEP09	15SEP09	1	80
Phase 1; Construct Dry Weather Flow Channel									
08R1BI2202	Excavate for new low flow channel	6	6	27MAR09A	03APR09A	27MAR09A	03APR09A	1	
08R1BI2204	Construct new low flow channel	6	6	11JUN09	17JUN09	11JUN09	17JUN09	1	-196
08R3BI2208	Remove blcock wall/excavate for gantry footing	12	12	18JUN09	02JUL09	18JUN09	02JUL09	1	-196
08R3BI2212	Construct PC bund wall to protect gantry footing	6	6	03JUL09	09JUL09	03JUL09	09JUL09	1	-196
Phase 2; Construct Approach Channel West									
08R1BI2218	Construct temp. concrete block bund	12	12	02NOV09*	14NOV09	02NOV09*	14NOV09	1	43
08R1BI2220	Excavate for western portion guide wall & slab	12	12	16NOV09	28NOV09	16NOV09	28NOV09	1	43
08R1BI2222	Construct western portion of guide wall & slab	50	50	30NOV09	29JAN10	30NOV09	29JAN10	1	43
08R1BI2224	Remove concrete block bund	6	6	30JAN10	05FEB10	30JAN10	05FEB10	1	43
Phase 3; Construct Approach Channel North									
08R1BI2226	Construct temp. concrete block bund	6	6	01NOV10*	06NOV10	01NOV10*	06NOV10	1	22
08R1BI2228	Excavate for L-shaped retaining wall	12	12	08NOV10	20NOV10	08NOV10	20NOV10	1	22
08R1BI2230	Construct L-shaped retaining wall	18	18	22NOV10	11DEC10	22NOV10	11DEC10	1	22
08R1BI2232	Excavate eastern portion of guide wall & slab	12	12	13DEC10	28DEC10	13DEC10	28DEC10	1	22
08R1BI2234	Construction of boulder traps; 7nos.	24	24	29DEC10	26JAN11	29DEC10	26JAN11	1	22
08R1BI2236	Construct eastern portion of guide wall & slab	24	24	27JAN11	26FEB11	27JAN11	26FEB11	1	22
08R1BI2240	Remove temp. concrete blcok bund	6	6	28FEB11	05MAR11	28FEB11	05MAR11	1	22
Phase 4 - Construct Remaining Appr. Channel									
08R1BI2242	Remove gantry crane & steel deck	18	18	16DEC11	10JAN12	16DEC11	10JAN12	1	-196
08R1BI2244	Excavation for remaining approach channel	12	12	11JAN12	27JAN12	11JAN12	27JAN12	1	-196
08R1BI2246	Construct remaining approach channel	24	24	28JAN12	24FEB12	28JAN12	24FEB12	1	-196
08R1BI2248	Close out last section of guide wall	12	12	25FEB12	09MAR12	25FEB12	09MAR12	1	-196
08R1BI2250	Construct trash grill	12	12	25FEB12	09MAR12	25FEB12	09MAR12	1	-196



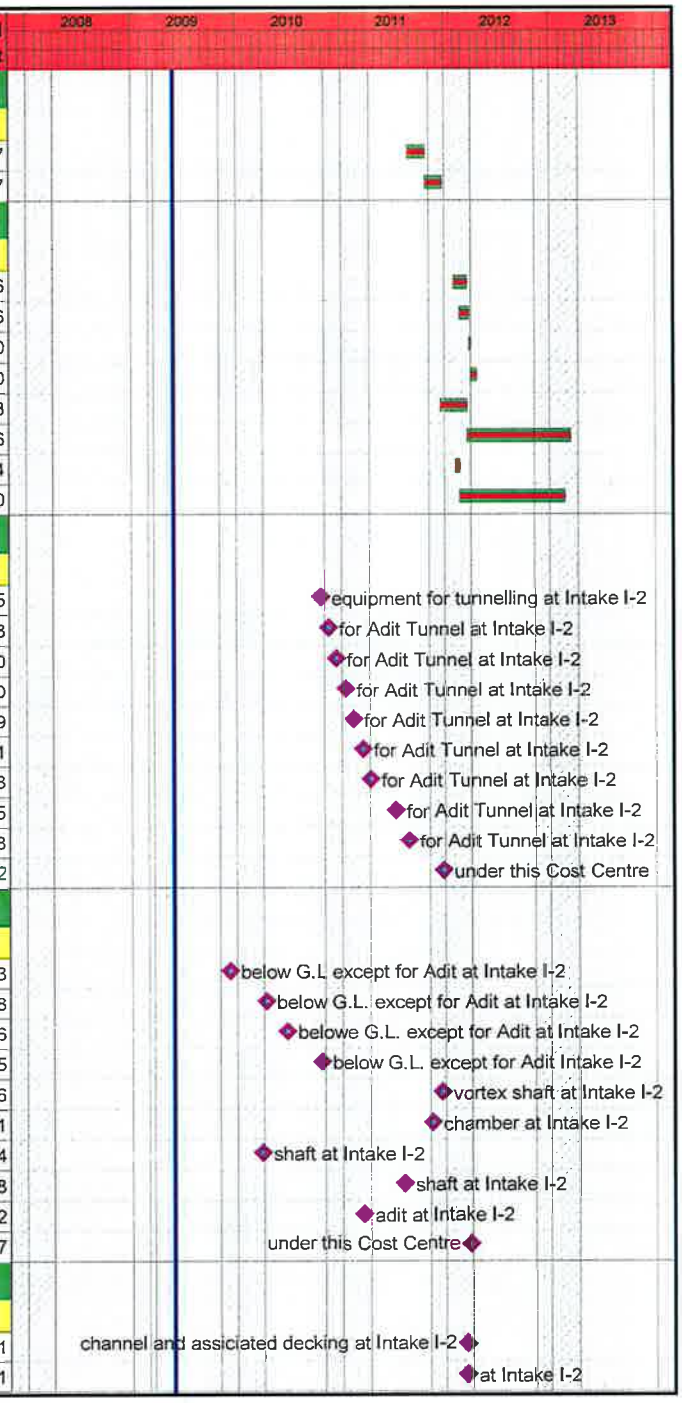
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
Excavate & Construct Vortex/Drop Shaft									
Steel Deck & Gantry Crane/Noise Enclosure									
05L1BI2300	Construct 8 nos. mini piles	24	24	20JAN09A	21FEB09A	20JAN09A	21FEB09A	1	
05L1BI2301	Erect timber platform for mini piling	4	4	23FEB09A	26FEB09A	23FEB09A	26FEB09A	1	
05L1BI2302	Construct 6 nos. mini piles	12	12	27FEB09A	12MAR09A	27FEB09A	12MAR09A	1	
05L1BI2303	Excavation for footing/pile caps	12	12	13MAR09A	26MAR09A	13MAR09A	26MAR09A	1	
05L1BI2304	Construction of footing/pile caps	12	12	27MAR09A	18APR09A	27MAR09A	18APR09A	1	
05L1BI2305	Install steel deck	25	25	04MAY09A	30JUL09	04MAY09A	30JUL09	1	-175
05L1BI2316	Construct footing for gantry crane	12	12	25AUG09	07SEP09	25AUG09	07SEP09	1	-196
05L1BI2318	Install gantry crane & noise enclosure	42	42	08SEP09	29OCT09	08SEP09	29OCT09	1	-196
Ground Treatment Works for Vortex Shaft									
05L1BI2306	Setting up	2	2	10JUL09	11JUL09	10JUL09	11JUL09	1	-196
05L1BI2308	Probing & curtain grouting around shaft	37	37	13JUL09	24AUG09	13JUL09	24AUG09	1	-196
Excavation and Construction of Vortex Shaft									
05L1BI2320	Excavate shaft; +99mPD to +65mPD (30m)	118	118	30OCT09	23MAR10	30OCT09	23MAR10	1	-196
05L1BI2321	Set up for lining construction	6	6	11NOV11	17NOV11	11NOV11	17NOV11	1	-196
05L1BI2322	Construct permanent lining; 30m @ 4m/ 4days	30	30	11NOV11	15DEC11	11NOV11	15DEC11	1	-196
Excavate & Construct Air Vent Shaft									
05L1BI2418	Enlarge the platform for RCD operation	15	15	08DEC08A	27DEC08A	08DEC08A	27DEC08A	1	
05L1BI2420	Mobilize & set up RCD for excavation	6	6	29DEC08A	06JAN09A	29DEC08A	06JAN09A	1	
05L1BI2422	Bore shaft with RCD; 37.5m @1m/day	54	54	07JAN09A	13MAR09A	07JAN09A	13MAR09A	1	
05L1BI2424	Demobilize RCD rig	5	5	14MAR09A	19MAR09A	14MAR09A	19MAR09A	1	
05L1BI2426	Install permanent steel liner	3	3	20MAR09A	23MAR09A	20MAR09A	23MAR09A	1	
05L1BI2427	Preparation works for casting concrete	1	1	21MAR09A	25APR09A	21MAR09A	25APR09A	1	
05L1BI2428	Damage found on installed steel liner	0	0		25APR09A		25APR09A	1	
05L1BI2429	Removal of steel liner	31	31	27APR09A	04JUN09	27APR09A	04JUN09	1	-196
05L1BI2430	Remove RCD platform	17	17	05JUN09	24JUN09	05JUN09	24JUN09	1	-196
05L1BI2432	Construct PC bund wall	12	12	25JUN09	09JUL09	25JUN09	09JUL09	1	-196
05L1BI2434	Divert channel to West	0	0		09JUL09		09JUL09	1	-196
05L1BI2436	Footing for gantry crane	12	12	02NOV09*	14NOV09	02NOV09*	14NOV09	1	-96
05L1BI2438	Erection of gantry crane	36	36	16NOV09	29DEC09	16NOV09	29DEC09	1	-96
05L1BI2440	Set up sliding system	6	6	30DEC09	06JAN10	30DEC09	06JAN10	1	-96
05L1BI2446	Install steel casing	36	36	07JAN10	20FEB10	07JAN10	20FEB10	1	-96
05L1BI2448	Survey checking & capping concrete	3	3	22FEB10	24FEB10	22FEB10	24FEB10	1	-96
05L1BI2450	Preparation & concreting	3	3	25FEB10	27FEB10	25FEB10	27FEB10	1	-96
05L1BI2452	Construct upstand wall	24	24	01MAR10*	27MAR10	01MAR10*	27MAR10	1	-96
Excavate & Construct Man Access Shaft									
Ground Treatment for Man Access Shaft									
05L1BI2502	Probing & curtain grouting around shaft	31	31	10JUL09	14AUG09	10JUL09	14AUG09	1	-50
Gantry Crane & Noise Enclosure at M. A. Shaft									
05L1BI2504	Excavate & construct 4 nos. gantry footings	12	12	15AUG09	28AUG09	15AUG09	28AUG09	1	-50



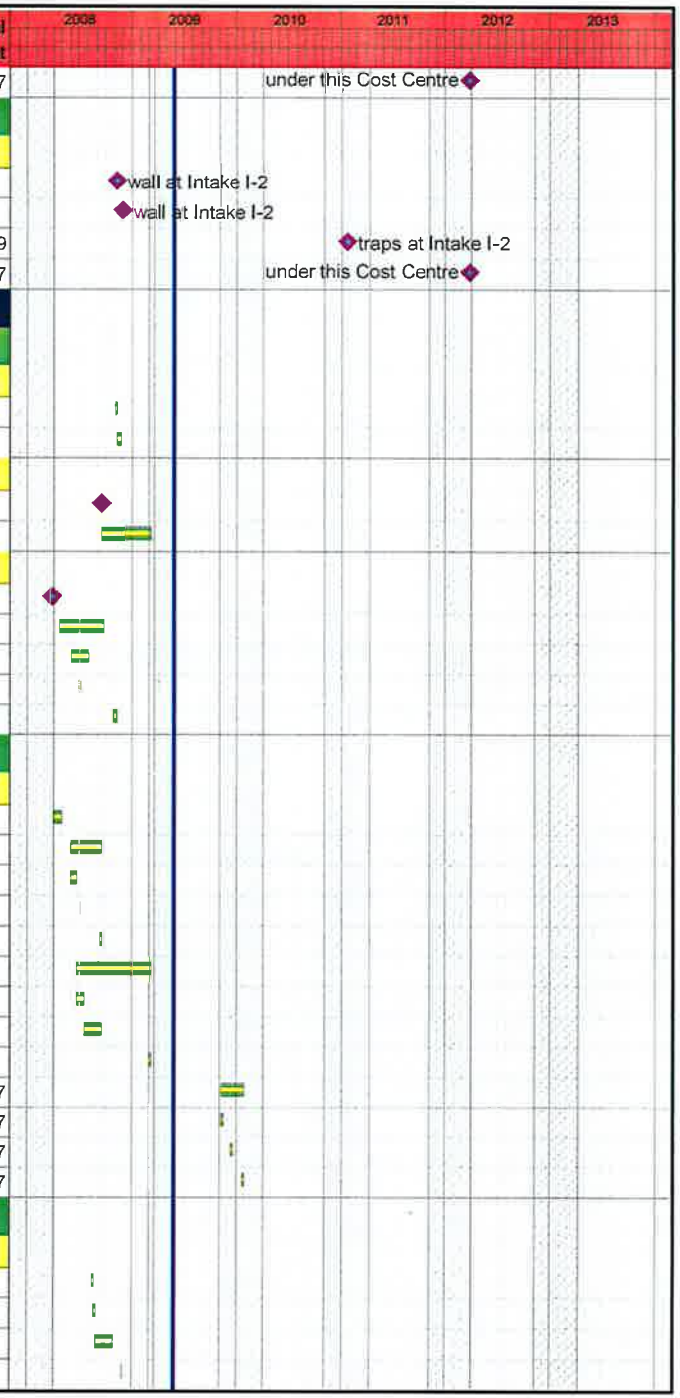
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
05L1BI2505	Install gantry crane & noise enclosure	36	36	29AUG09	12OCT09	29AUG09	12OCT09	1	-50
ELS and Excavation upto Rock Head Level at M.A.									
05L1BI2503	Install sheet piles	6	6	15AUG09	21AUG09	15AUG09	21AUG09	1	-44
05L1BI2506	Excavation to rock head level	18	18	13OCT09	03NOV09	13OCT09	03NOV09	1	-50
Excavation & Construction of Man Access Shaft									
05L1BI2508	Excavation/muck out/temporoary support	127	127	04NOV09	12APR10	04NOV09	12APR10	1	-50
05L1BI2522	Construct base	4	4	15MAR11	18MAR11	15MAR11	18MAR11	1	-50
05L1BI2524	Set up for 37m shaft construction (wall only)	6	6	19MAR11	25MAR11	19MAR11	25MAR11	1	-50
05L1BI2526	Construct wall/stair; 25 landings @ 3 days/land	75	75	26MAR11	28JUN11	26MAR11	28JUN11	1	-50
05L1BI2528	Removal of gantry crane	12	12	29JUN11	13JUL11	29JUN11	13JUL11	1	-50
05L1BI2530	Construct wall above ground level	8	8	14JUL11	22JUL11	14JUL11	22JUL11	1	-50
05L1BI2532	Construct shaft roof	12	12	23JUL11	05AUG11	23JUL11	05AUG11	1	-50
Excavate & Construct Deaeration Chamber									
05L1BI2602	Probing/grout/excavate/muckout/temp.support	72	72	24MAR10	23JUN10	24MAR10	23JUN10	1	-196
05L1BI2604	Drill/excavate/muckout/temp. support for bench	50	50	24JUN10	21AUG10	24JUN10	21AUG10	1	-196
05L1BI2607	Drill/excavate/muckout/temp. support for bottom	50	50	23AUG10	22OCT10	23AUG10	22OCT10	1	-196
05L1BI2608	Set up for lining construction	12	12	26AUG11	08SEP11	26AUG11	08SEP11	1	-196
05L1BI2610	Construct base; 3 bays	9	9	09SEP11	20SEP11	09SEP11	20SEP11	1	-196
05L1BI2612	Construct walls 2 lifts; 3 bays	24	24	21SEP11	20OCT11	21SEP11	20OCT11	1	-196
05L1BI2614	Const. crown/underpin. of air vent & drop shafts	18	18	21OCT11	10NOV11	21OCT11	10NOV11	1	-196
Excavate & Construct Main Adit Tunnel									
3BL1BI2102	Probing/grout/temp. support/excavation/muck out	200	200	23OCT10	27JUN11	23OCT10	27JUN11	1	-196
3BL1BI2104	Construct permanent lining	50	50	28JUN11	25AUG11	28JUN11	25AUG11	1	-196
Excavate & Construct Man Access Adit									
Upper Horizontal Section									
05L1BI2806	Probing/gorut/excavate/muckout/temporary support	90	90	13APR10	30JUL10	13APR10	30JUL10	1	-50
05L1BI2830	Set up for 23m upper adit construction	6	6	26JAN11	01FEB11	26JAN11	01FEB11	1	-50
05L1BI2834	Construction of permanent lining	32	32	02FEB11	14MAR11	02FEB11	14MAR11	1	-50
Vertical Section									
05L1BI2807	Probing & curtain grouting around shaft	24	24	31JUL10	27AUG10	31JUL10	27AUG10	1	-50
05L1BI2808	Set up for 7.2m raise (shaft) excavation	2	2	28AUG10	30AUG10	28AUG10	30AUG10	1	-50
05L1BI2810	Excavate/removal of rock/temporary support	24	24	31AUG10	28SEP10	31AUG10	28SEP10	1	-50
05L1BI2822	Construct base of raise shaft	4	4	09DEC10	13DEC10	09DEC10	13DEC10	1	-50
05L1BI2824	Set up for 9m raise stairway const. (wall only)	6	6	14DEC10	20DEC10	14DEC10	20DEC10	1	-50
05L1BI2826	Construct wall & stair; 7 landings @4days/landin	28	28	21DEC10	25JAN11	21DEC10	25JAN11	1	-50
Lower Horizontal Section									
05L1BI2812	Set up for 9.3m lower adit excavation	2	2	29SEP10	30SEP10	29SEP10	30SEP10	1	-50
05L1BI2814	Excavate/removal of rock/temporary support	31	31	02OCT10	08NOV10	02OCT10	08NOV10	1	-50
05L1BI2816	Set up for 7m lower adit construction	6	6	09NOV10	15NOV10	09NOV10	15NOV10	1	-50
05L1BI2818	Construction of permanent lining for lower adit	20	20	16NOV10	08DEC10	16NOV10	08DEC10	1	-50



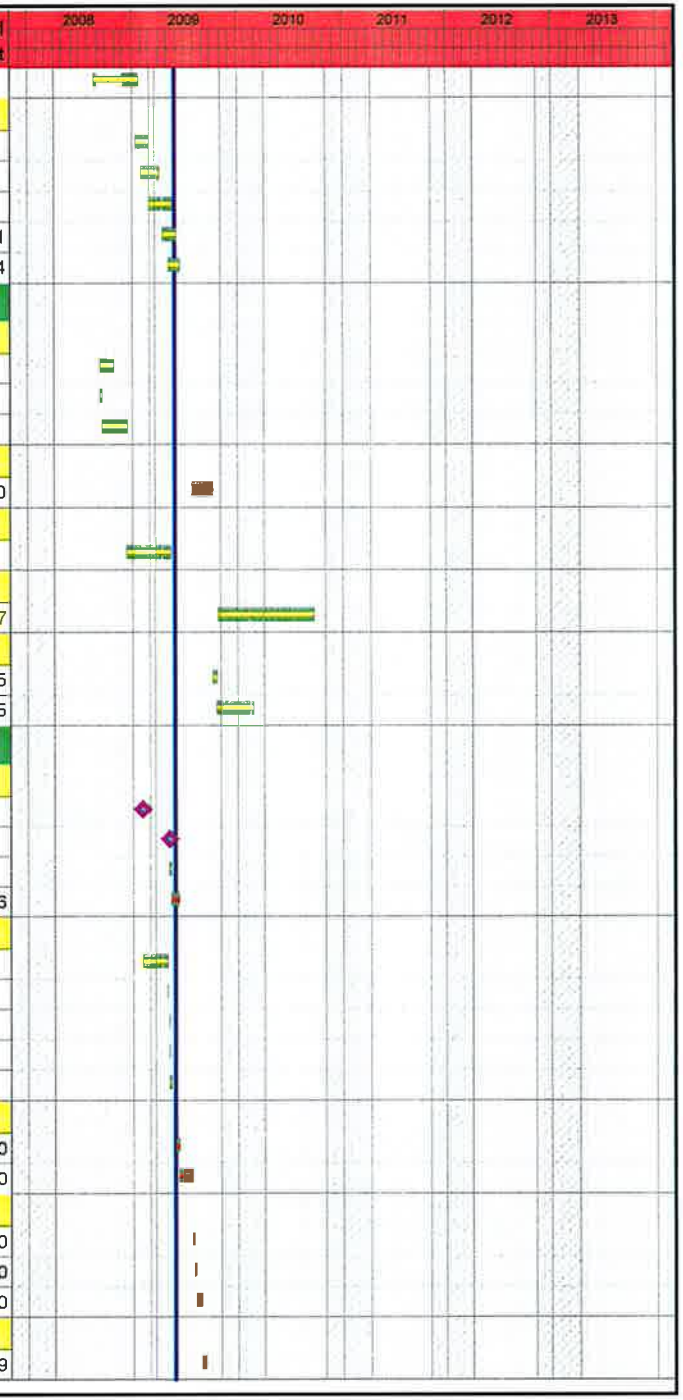
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
Junction Between Main Tunnel & Adit Tunnel									
3BL1BI2106	Temp. support & excavation breakthrough	48	48	26AUG11	24OCT11	26AUG11	24OCT11	1	-127
3BL1BI2108	Construct collar between MT & AT	48	48	25OCT11	19DEC11	25OCT11	19DEC11	1	-127
Remaining Works Prior to Handover									
08R1BI2102	Finishing & reinstatement works; Portion B	36	36	04FEB12	16MAR12	04FEB12	16MAR12	1	-196
08R1BI2103	Pre-handover inspections and remedial works	30	30	18FEB12	23MAR12	18FEB12	23MAR12	1	-196
08R1BI2104	Contractor serve notice for Works completion	7	7	24MAR12	30MAR12	24MAR12	30MAR12	2	0
08R1BI2105	SO issues completion certificate	21	21	31MAR12	20APR12	31MAR12	20APR12	2	0
16R7BI2102	Landscaping works at Portion B	72	72	16DEC11	16MAR12	16DEC11	16MAR12	1	-158
16R7BI2104	Establishment Works at Portion B	365	365	17MAR12	16MAR13	17MAR12	16MAR13	2	-196
3DL1BI2101	Install flow measurement devices at Intake I-2	12	12	07FEB12	20FEB12	07FEB12	20FEB12	1	-184
3DL1BI2105	Maintain & monitor flow monitoring	365	365	21FEB12	19FEB13	21FEB12	19FEB13	2	0
Schedule of Milestones for Cost Centre No. 3bL									
3BL1BI2A02	3bL 1; On establishing tunnelling equipments	0	0		22OCT10		22OCT10	2	1,165
3BL1BI2A04	3bL 2; On completion of 12.5% perm. tunnel linin	0	0		18NOV10		18NOV10	2	1,138
3BL1BI2A06	3bL 3; On completion of 25% perm. tunnel lining	0	0		16DEC10		16DEC10	2	1,110
3BL1BI2A08	3bL 4; On completion of 37.5% perm. tunnel linin	0	0		15JAN11		15JAN11	2	1,080
3BL1BI2A10	3bL 5; On completion of 50% perm. tunnel lining	0	0		15FEB11		15FEB11	2	1,049
3BL1BI2A12	3bL 6; On completion of 62.5% perm. tunnel linin	0	0		15MAR11		15MAR11	2	1,021
3BL1BI2A14	3bL 7; On completion of 75% perm. tunnel lining	0	0		12APR11		12APR11	2	993
3BL1BI2A16	3bL 8; On completion of 87.5% perm. tunnel linin	0	0		09JUL11		09JUL11	2	905
3BL1BI2A18	3bL 9; On completion of perm. tunnel lining	0	0		25AUG11		25AUG11	2	858
3BL1BI2A20	3bL 10; On completion of all works under this CC	0	0		19DEC11		19DEC11	2	742
Schedule of Milestones for Cost Centre No. 5L									
05L1BI2M02	5L 1; On completion of 25% of excavation	0	0		08DEC09		08DEC09	2	1,483
05L1BI2M04	5L 2; On completion of 50% of excavation	0	0		12APR10		12APR10	2	1,358
05L1BI2M06	5L 3; On completion of 75% of excavation	0	0		23JUN10		23JUN10	2	1,286
05L1BI2M08	5L 4; On completion of all excavation	0	0		22OCT10		22OCT10	2	1,165
05L1BI2M10	5L 5; On completion of drop shaft & vortex shaft	0	0		15DEC11		15DEC11	2	746
05L1BI2M12	5L 6; On completion of de-aeration chamber	0	0		10NOV11		10NOV11	2	781
05L1BI2M14	5L 7; On completion of air vent shaft	0	0		27MAR10		27MAR10	2	1,374
05L1BI2M16	5L 8; On completion of man access shaft	0	0		05AUG11		05AUG11	2	878
05L1BI2M18	5L 9; On completion of man access adit	0	0		14MAR11		14MAR11	2	1,022
05L1BI2M20	5L 10; On completion of all works under this CC	0	0		23MAR12		23MAR12	2	647
Schedule of Milestones for Cost Centre No. 8R									
08R1BI2R02	8R 1; On completion of approach channel	0	0		09MAR12		09MAR12	2	661
08R1BI2R04	8R 2; On completion of trash grill	0	0		09MAR12		09MAR12	2	661



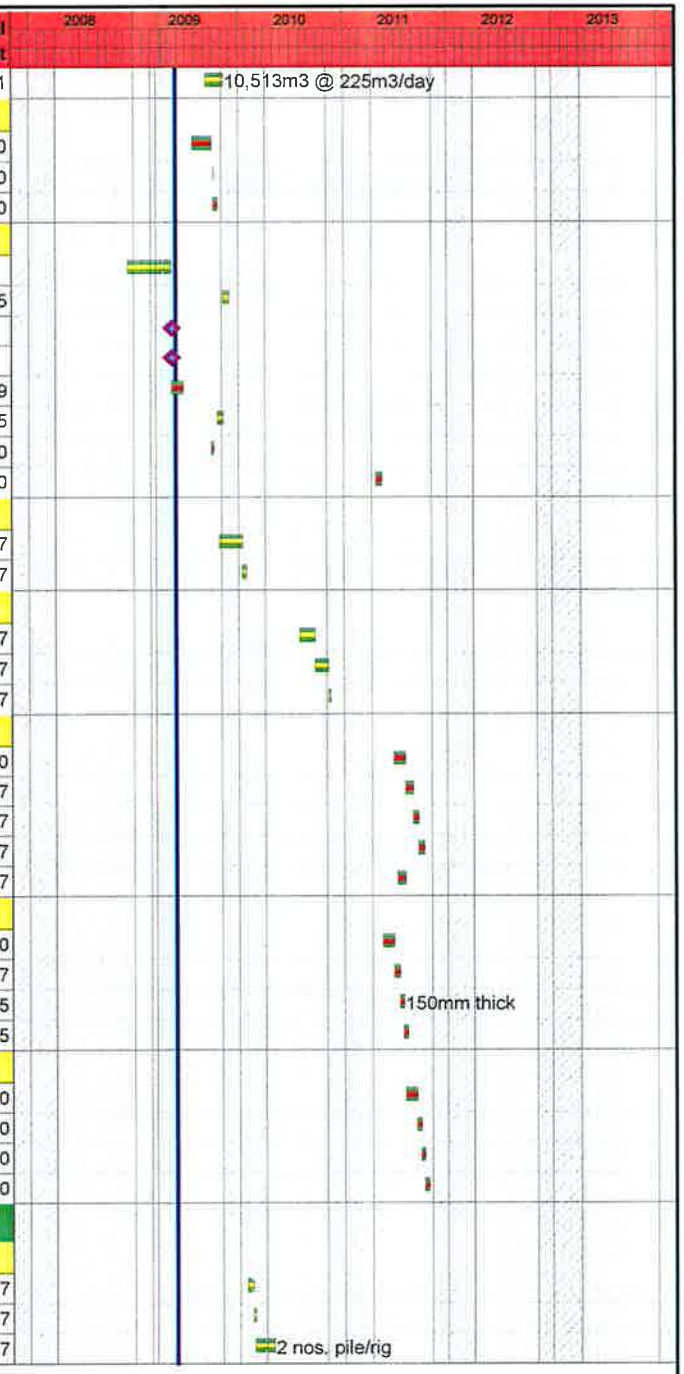
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
08R1BI2R06	8R 3; On completion of all works under this CC	0	0		23MAR12		23MAR12	2	647
Schedule of Milestones for Cost Centre No. 12R									
12R3BI2S02	12R 1; On completion of 50% pile retain. wall	0	0		06NOV08A		06NOV08A	2	
12R3BI2S04	12R 2; On completion of pile retain. wall	0	0		26NOV08A		26NOV08A	2	
12R3BI2S06	12R 3; On completion of boulder traps	0	0		26JAN11		26JAN11	2	1,069
12R3BI2S08	12R 4; On completion of all works under this CC	0	0		23MAR12		23MAR12	2	647
Construction of Intake I-3									
Preliminary Works									
Additional GI Works To Finalize Design									
AGIC-02	Erect platform/mibilization & set up GI rig	3	3	03NOV08A	05NOV08A	03NOV08A	05NOV08A	1	
AGIC-04	Drill 3 nos. GI holes for Intake Structures	12	12	06NOV08A	19NOV08A	06NOV08A	19NOV08A	1	
VO#32; Replace Hoarding by Chain Link Fence									
VO032-I302	Received VO-32 for replacing hoarding by CLF	0	0		16SEP08A		16SEP08A	1	
VO032-I304	Procure/prepare/install transparent hoarding	80	80	17SEP08A	06MAR09A	17SEP08A	06MAR09A	1	
01R1CI3102	Possession of Portion C -90d of DOC	0	0	26MAR08A		26MAR08A		2	
01R1CI3104	Site clearance	40	40	22APR08A	20SEP08A	22APR08A	20SEP08A	1	
01R1CI3106	Haording at slope crest	48	48	03JUN08A	30JUL08A	03JUN08A	30JUL08A	1	
01R1CI3110	Set-up wheel washing facilities	6	6	30JUN08A	03JUL08A	30JUN08A	03JUL08A	1	
01R1CI3118	Install remote contorl CCTV as per ER 4.4.10	12	12	28OCT08A	10NOV08A	28OCT08A	10NOV08A	1	
Tree Transplanting Works									
16R7CI3202	Tree inspection & report	7	7	01APR08A	26APR08A	01APR08A	26APR08A	2	
16R7CI3204	Tree transplant for upper parts; 8 nos.	86*	86*	04JUN08A	13SEP08A	04JUN08A	13SEP08A	1	
16R7CI3206	1st stg tree pruning	2	2	04JUN08A	21JUN08A	04JUN08A	21JUN08A	1	
16R7CI3208	2nd stg tree pruning	2	2	04JUL08A	04JUL08A	04JUL08A	04JUL08A	1	
16R7CI3210	Final stg. tree pruning & tree uplifting	6	6	08SEP08A	13SEP08A	08SEP08A	13SEP08A	1	
16R7CI3212	Tree transplanting at Ch250-Ch200); 20 nos.	214*	214*	21JUN08A	09MAR09A	21JUN08A	09MAR09A	1	
16R7CI3214	1st stg tree pruning	3	3	21JUN08A	15JUL08A	21JUN08A	15JUL08A	1	
16R7CI3216	2nd stg tree pruning	3	3	15JUL08A	12SEP08A	15JUL08A	12SEP08A	1	
16R7CI3218	Final stg tree pruning & tree uplifting	8	8	28FEB09A	09MAR09A	28FEB09A	09MAR09A	1	
16R7CI3220	Tree transplanting at Ch100-Ch0	66*	66*	12NOV09	30JAN10	12NOV09	30JAN10	1	17
16R7CI3222	1st stg tree pruning	4	4	12NOV09	16NOV09	12NOV09	16NOV09	1	17
16R7CI3224	2nd stg tree pruning	4	4	15DEC09	18DEC09	15DEC09	18DEC09	1	17
16R7CI3226	Final stg tree pruning & tree uplifting	10	10	20JAN10	30JAN10	20JAN10	30JAN10	1	17
H-Pile Retaining Wall for Wall A									
Piling Works									
13R4CI3400	Mobilize & set up piling rig	6	6	11AUG08A	16AUG08A	11AUG08A	16AUG08A	1	
13R4CI3401	Drill 28 nos. grout (partially) 11 nos. piles	1	1	18AUG08A	28AUG08A	18AUG08A	28AUG08A	1	
13R4CI3402	Piling stopped due to accessive grout loss	1	1	29AUG08A	22OCT08A	29AUG08A	22OCT08A	1	
13R4CI3403	Piling resumed date	1	1	26NOV08A	26NOV08A	26NOV08A	26NOV08A	1	



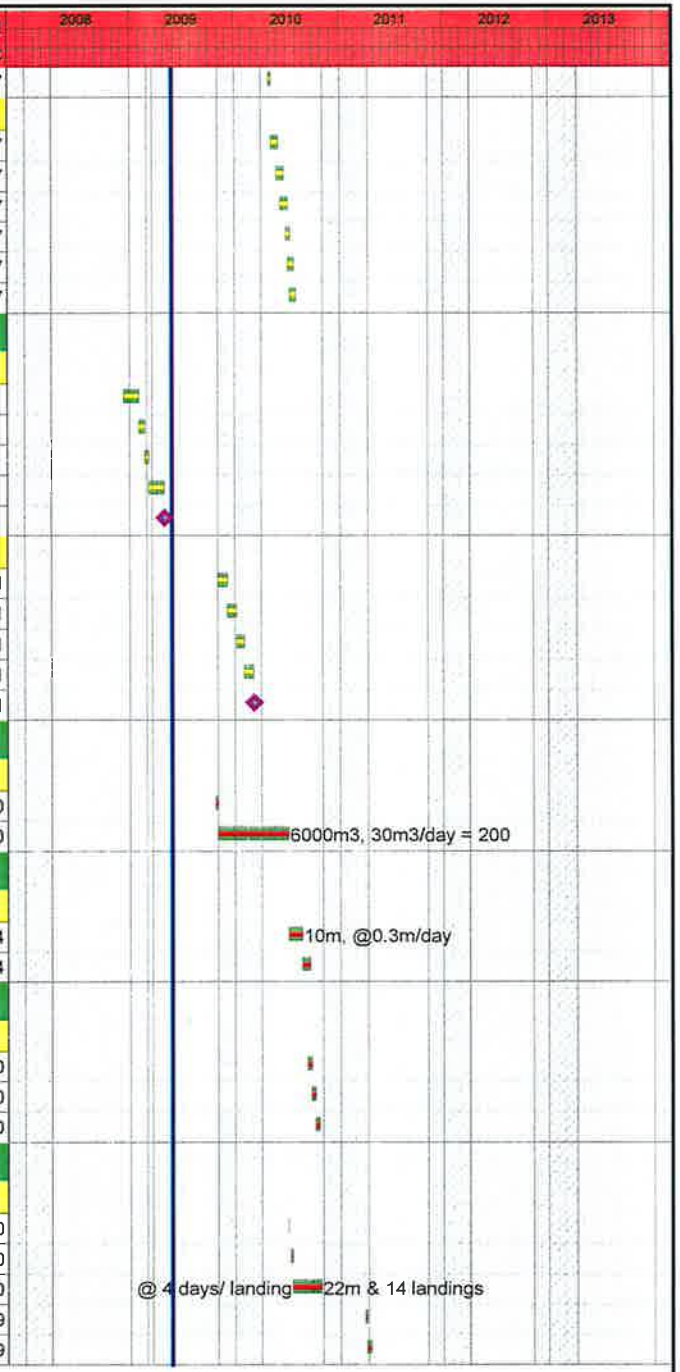
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
13R4CI3405	Complete all H-piles, Wall A; 347nos.	70	70	18AUG08A	21JAN09A	18AUG08A	21JAN09A	1	
Skin Wall									
13R4CI3406	Excavate for skin wall construction; 2130m3	60	60	14JAN09A	02MAR09A	14JAN09A	02MAR09A	1	
13R4CI3408	Hack off piles; piles 1 to 347	48	48	04FEB09A	02APR09A	04FEB09A	02APR09A	1	
13R4CI3410	Construct skin wall;	60	60	28FEB09A	19MAY09A	28FEB09A	19MAY09A	1	
13R4CI3414	Construct for capping beams;	24	24	14APR09A	04JUN09	14APR09A	04JUN09	1	401
13R4CI3416	Construct U-channels	37	37	06MAY09A	18JUN09	06MAY09A	18JUN09	1	394
Soil Nailing Works									
Soil Nailing Outside Excavation Area									
13R1CI3502	Scaffolding platform for soil nailing	18	18	08SEP08A	28OCT08A	08SEP08A	28OCT08A	1	
13R1CI3504	Mobilize & set up drilling & grouting plants	4	4	12SEP08A	17SEP08A	12SEP08A	17SEP08A	1	
13R1CI3506	Install & grout soil nails; 193 nos. + 8 Test N.	69	69	18SEP08A	09DEC08A	18SEP08A	09DEC08A	1	
Soil Nailing Within Excavation; Ch. 270-210									
13R1CI3508	Install & grout soil nails	58*	58*	29JUL09	06OCT09	29JUL09	06OCT09	1	-160
Soil Nailing Within Excavation; Ch. 210-130									
13R1CI3510	Install & grout soil nails	117*	117*	12DEC08A	11MAY09A	12DEC08A	11MAY09A	1	
Soil Nailing Within Excavation; Ch.130-0									
13R1CI3512	Install & grout soil nails	267*	267*	30OCT09	22SEP10	30OCT09	22SEP10	1	17
Rem. Soil Nailing Outside Excavation									
13R1CI3522	Scoffolding platform for soil nailing	12	12	10OCT09	23OCT09	10OCT09	23OCT09	1	235
13R1CI3532	Install & grout soil nails; 261 no.s + 3 Test N.	100	100	24OCT09	25FEB10	24OCT09	25FEB10	1	235
Access Road Construction									
Preliminary Works for Works Included VO#043									
VO043-010	Receive VO for revising design	0	0		02FEB09A		02FEB09A	1	
VO043-020	Recieve amendment to VO#043	0	0		05MAY09A		05MAY09A	2	
VO043-030	Procurement of lean mix concrete	12	12	06MAY09A	14MAY09A	06MAY09A	14MAY09A	1	
VO043-040	Testing & approval of lean mix concrete	18	18	15MAY09A	06JUN09	15MAY09A	06JUN09	1	-156
Mass Wall to Protect Retained Trees; VO #043									
VO043-120	Setting out at site	69	69	03FEB09A	28APR09A	03FEB09A	28APR09A	1	
VO043-130	Excavate & muck out manually; 50m @ 4m/day	2	2	29APR09A	30APR09A	29APR09A	30APR09A	1	
VO043-140	Erect formwork; 70m2 @ 14m2/day	5	5	04MAY09A	08MAY09A	04MAY09A	08MAY09A	1	
VO043-150	Set up for conreting	2	2	08MAY09A	09MAY09A	08MAY09A	09MAY09A	1	
VO043-160	Pour concrete & removal of formwork	2	2	09MAY09A	11MAY09A	09MAY09A	11MAY09A	1	
Ch.460 to 370; VO# 043									
VO043-060	Bulk excavation for benching;1061 @ 45m3/day	12	12	29MAY09	11JUN09	29MAY09	11JUN09	1	-160
VO043-070	Fill & compaction; 39 layers @ 1 day/layer	39	39	12JUN09	28JUL09	12JUN09	28JUL09	1	-160
Ch. 370 to Ch. 270; VO #043									
VO043-090	Excavation for access road Ch. 370 to 310	4	4	29JUL09	01AUG09	29JUL09	01AUG09	1	-160
VO043-100	Bulk excavation for benching; Ch. 310 to 270	5	5	03AUG09	07AUG09	03AUG09	07AUG09	1	-160
VO043-110	Fill & compaction lean mix concerete; 15 layers	15	15	08AUG09	25AUG09	08AUG09	25AUG09	1	-160
Works On & Above Access Road; Ch. 460-270									
09R1CI3610	Temporary concrete paving & curing	16	16	26AUG09	12SEP09	26AUG09	12SEP09	1	-139



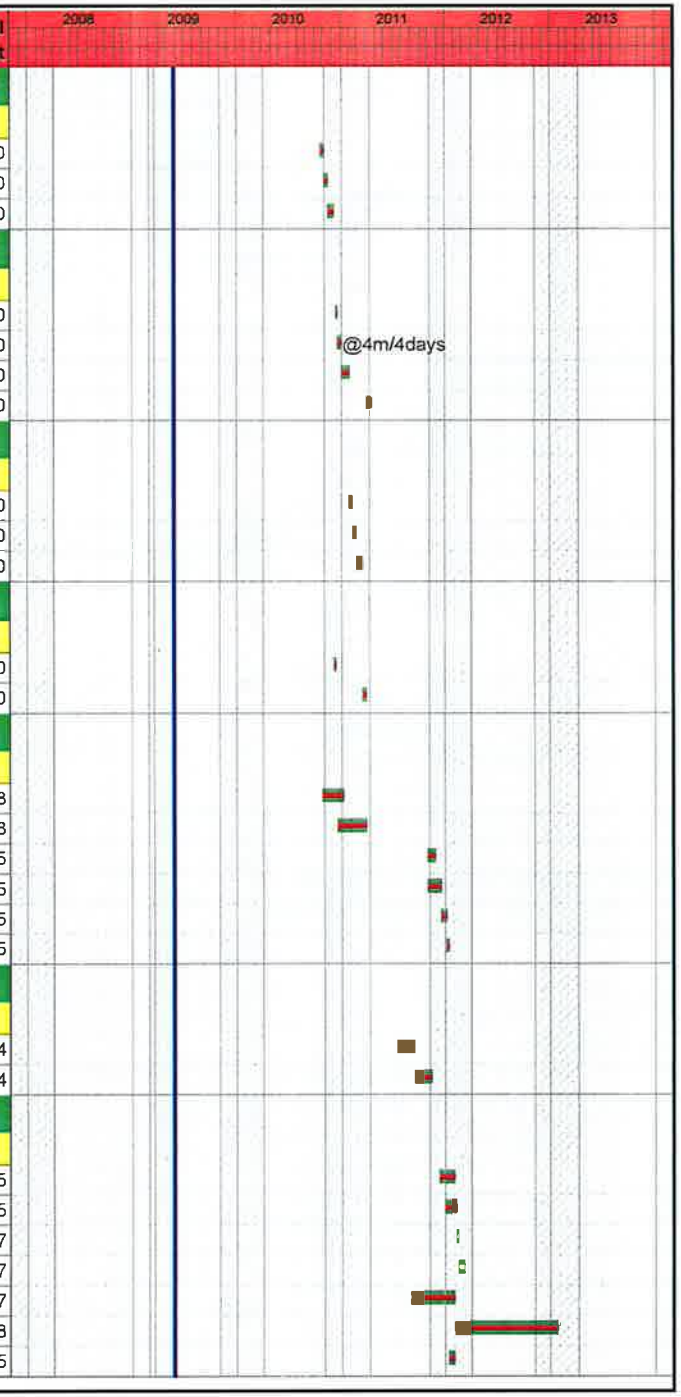
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
09R1CI3620	Excavation of slope batter above access road	47	47	14SEP09	10NOV09	14SEP09	10NOV09	1	321
Ch. 270 to Ch. 210									
09R1CI3624	Excavation & soil nailing	54	54	29JUL09	29SEP09	29JUL09	29SEP09	1	-160
09R1CI3626	Backfill (grade 200) & compaction	3	3	07OCT09	09OCT09	07OCT09	09OCT09	1	-160
09R1CI3628	Temporary concrete paving & curing	10	10	10OCT09	21OCT09	10OCT09	21OCT09	1	-160
Ch. 210 to Ch. 130									
09R1CI3630	Excavation as per conforming design	48	48	12DEC08A	11MAY09A	12DEC08A	11MAY09A	1	
09R1CI3632	Temporary concrete paving & curing	12	12	13NOV09	26NOV09	13NOV09	26NOV09	1	55
VO-084-02	VO#084 revising the design received	0	0	12MAY09A		12MAY09A		1	
VO-084-12	Works resumed as per VO #084	0	0	16MAY09A		16MAY09A		1	
VO-084-22	Excavate slope profile as per VO#084	34	34	16MAY09A	25JUN09	16MAY09A	25JUN09	1	-79
VO-084-26	Remove excavated material off site; 6000m3	18	18	22OCT09	12NOV09	22OCT09	12NOV09	1	55
VO-084-32	Soil nailing at Ch. 198 to 210	4	4	30SEP09	06OCT09	30SEP09	06OCT09	1	-160
VO-084-42	Excavate to access road formation	18	18	26APR11	17MAY11	26APR11	17MAY11	1	-160
Ch. 130 to Ch. 0; up to +74.5mPD									
09R1CI3634	Excavation & soil nailing	62	62	30OCT09	13JAN10	30OCT09	13JAN10	1	17
09R1CI3636	Temporary concrete paving & curing	15	15	14JAN10	30JAN10	14JAN10	30JAN10	1	17
Ch. 130 to Ch. 0; below +74.5mPD									
09R1CI3638	Excavate & soil nailing (+74.5 to 88.5mPD)	41	41	06AUG10	22SEP10	06AUG10	22SEP10	1	17
09R1CI3640	Excavate rock (88.5 to 63mPD; 3239m3 @ 80m3/day	40	40	24SEP10	11NOV10	24SEP10	11NOV10	1	17
09R1CI3642	Backfill (grade 200) & compaction	7	7	12NOV10	19NOV10	12NOV10	19NOV10	1	17
Drainage & Road Paving; Ch. 460 to Ch. 270									
09R1CI3664	Construct drainage as per VO#090; 190m @ 5m/day	32	32	29JUN11	05AUG11	29JUN11	05AUG11	1	-160
09R1CI3674	Road formation; 190m @ 12m/day	20	20	06AUG11	29AUG11	06AUG11	29AUG11	1	-157
09R1CI3684	Lay sub-bse and kerb; 190m @ 12m/day	16	16	30AUG11	17SEP11	30AUG11	17SEP11	1	-157
09R1CI3694	Concrete paving; 190m @ 12m/day	16	16	19SEP11	08OCT11	19SEP11	08OCT11	1	-157
VO-095-02	Green slope arrangement as per VO# 095	24	24	09JUL11	05AUG11	09JUL11	05AUG11	1	-157
Drainage & Road Paving; Ch. 270 to Ch. 130									
09R1CI3644	Construct drainage; 140m @ 4m/day	35	35	18MAY11	28JUN11	18MAY11	28JUN11	1	-160
09R1CI3646	Backfill trench & road formation; 140m @ 12m/day	12	12	29JUN11	13JUL11	29JUN11	13JUL11	1	-137
09R1CI3648	Lay sub-base and kerb; 140m @12m/day	12	12	14JUL11	27JUL11	14JUL11	27JUL11	1	-125
09R1CI3654	Concrete paving; 140m @ 12m/day	12	12	28JUL11	10AUG11	28JUL11	10AUG11	1	-125
Drainage & Road paving: Ch. 130 to Ch. 0									
09R1CI3704	Construct drainage; 130m @ 4m/day	33	33	06AUG11	14SEP11	06AUG11	14SEP11	1	-160
09R1CI3714	Backfill trench & road formation; 130m @ 12m/day	11	11	15SEP11	27SEP11	15SEP11	27SEP11	1	-160
09R1CI3724	Lay sub-base & kerb; 130m @12m/day	11	11	28SEP11	12OCT11	28SEP11	12OCT11	1	-160
09R1CI3734	Concrete paving; 130m @ 12m/day	11	11	13OCT11	25OCT11	13OCT11	25OCT11	1	-160
H-Pile Retaining Wall for Wall B									
Piling Works									
13R4CI3701	Form piling platform for Wall B	12	12	01FEB10	17FEB10	01FEB10	17FEB10	1	17
13R4CI3702	Mobilize & set up piling rig	6	6	18FEB10	24FEB10	18FEB10	24FEB10	1	17
13R4CI3704	350mm dia. pre-bored H-piles, Wall B; 98 nos.	53	53	25FEB10	03MAY10	25FEB10	03MAY10	1	17



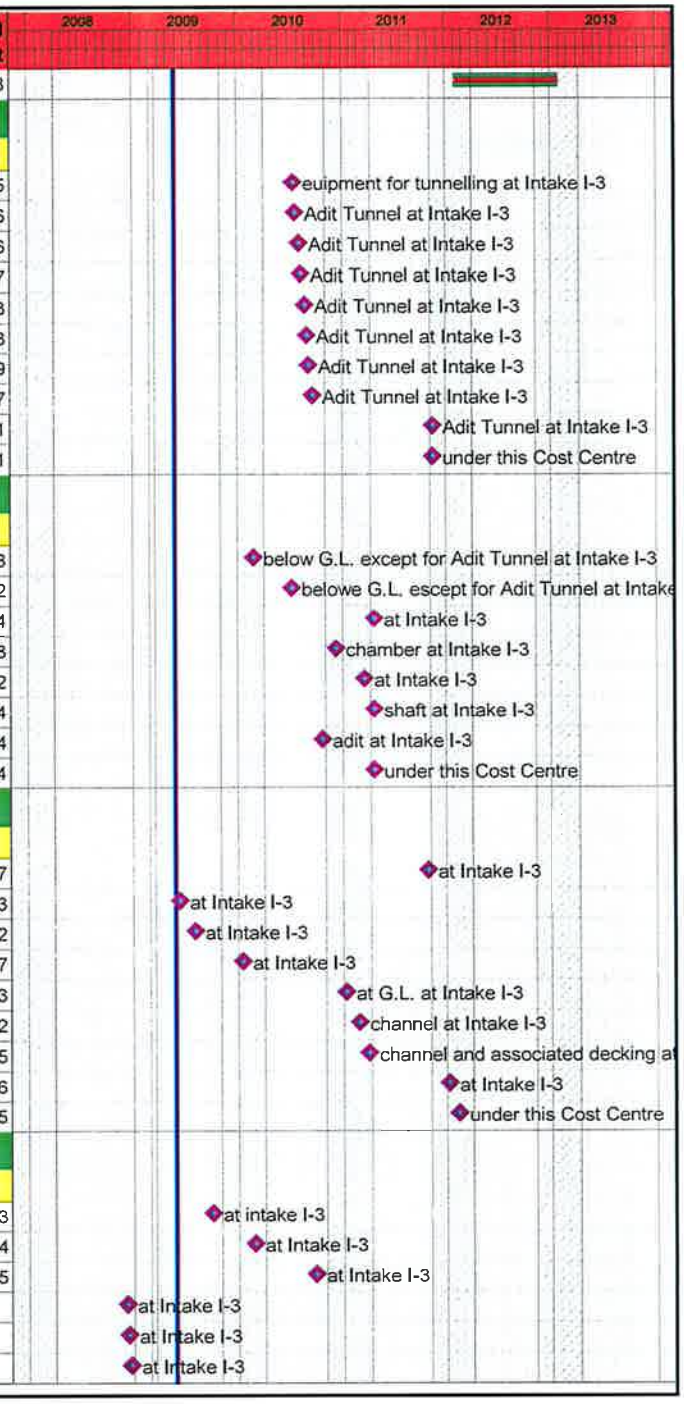
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
13R4CI3705	Demobilize piling rig	6	6	04MAY10	10MAY10	04MAY10	10MAY10	1	17
Skin Wall									
13R4CI3706	Excavate for skin wall; 48m3	18	18	11MAY10	01JUN10	11MAY10	01JUN10	1	17
13R4CI3708	Hack off piles; piles 1 to 98	24	24	26MAY10	23JUN10	26MAY10	23JUN10	1	17
13R4CI3710	Construct skin wall; 6 bays	24	24	09JUN10	08JUL10	09JUN10	08JUL10	1	17
13R4CI3712	Excavate for capping beams;	12	12	02JUL10	15JUL10	02JUL10	15JUL10	1	17
13R4CI3714	Construct for capping beams;	18	18	09JUL10	29JUL10	09JUL10	29JUL10	1	17
13R4CI3716	Construct U-channels	18	18	16JUL10	05AUG10	16JUL10	05AUG10	1	17
Channel Modification Works (Dry Season)									
River Diversion for Underground Works									
09R1CI3802	Form a temporay plant access to stream	60	60	12DEC08A	04FEB09A	12DEC08A	04FEB09A	1	
09R1CI3804	Break boulders	32	32	05FEB09A	24FEB09A	05FEB09A	24FEB09A	1	
09R1CI3806	Concrete bedding for bund wall (gabion)	11	11	25FEB09A	09MAR09A	25FEB09A	09MAR09A	1	
09R1CI3808	Construct bund wall (gabion)	22	22	10MAR09A	30APR09A	10MAR09A	30APR09A	1	
09R1CI3810	Divert channel to south west	0	0		30APR09A		30APR09A	1	
Channel Modification Works									
09R1CI3812	Breaking of large boulders	30	30	02NOV09*	05DEC09	02NOV09*	05DEC09	1	21
09R1CI3814	Excavation of the stream bed & make good	24	24	07DEC09	06JAN10	07DEC09	06JAN10	1	21
09R1CI3816	Laying of rock armour	24	24	07JAN10	03FEB10	07JAN10	03FEB10	1	21
09R1CI3818	Construct bund wall for approch channel const.	24	24	04FEB10	06MAR10	04FEB10	06MAR10	1	21
09R1CI3820	Divert channel to south west	0	0		06MAR10		06MAR10	1	21
Excavation for AVS/VS/DC/MAS/MAA									
Open Excavation for Underground Structures									
06L1CI3906	Mobilize drilling rig, backhoes	1	1	30OCT09	30OCT09	30OCT09	30OCT09	1	-160
06L1CI3908	Excavate/mucking out/temporary support	200	200	31OCT09	07JUL10	31OCT09	07JUL10	1	-160
Excavation & Construction of Main Adit									
3CL1CI3102	Excavation/mucking out/temporary support	40	40	08JUL10	23AUG10	08JUL10	23AUG10	1	-134
3CL1CI3104	Construction of permanent lining	24	24	24AUG10	20SEP10	24AUG10	20SEP10	1	-134
Construction of Man Access Adit (MAA)									
06L1CI3112	Cast invert; 1 bay	7	7	15SEP10	22SEP10	15SEP10	22SEP10	1	-160
06L1CI3114	Cast walls	12	12	24SEP10	08OCT10	24SEP10	08OCT10	1	-160
06L1CI3116	Cast crown	12	12	09OCT10	23OCT10	09OCT10	23OCT10	1	-160
Construction of Man Access Shaft (MAS)									
06L1CI3122	Cast base	3	3	08JUL10	10JUL10	08JUL10	10JUL10	1	-160
06L1CI3124	Set up formworks	6	6	12JUL10	17JUL10	12JUL10	17JUL10	1	-160
06L1CI3126	Construct wall/stair; 14 landings @ 6 days/land.	84	84	19JUL10	27OCT10	19JUL10	27OCT10	1	-160
06L1CI3128	Construct wall above ground level	6	6	31MAR11	07APR11	31MAR11	07APR11	1	-9
06L1CI3129	Construct shaft roof	12	12	08APR11	21APR11	08APR11	21APR11	1	-9



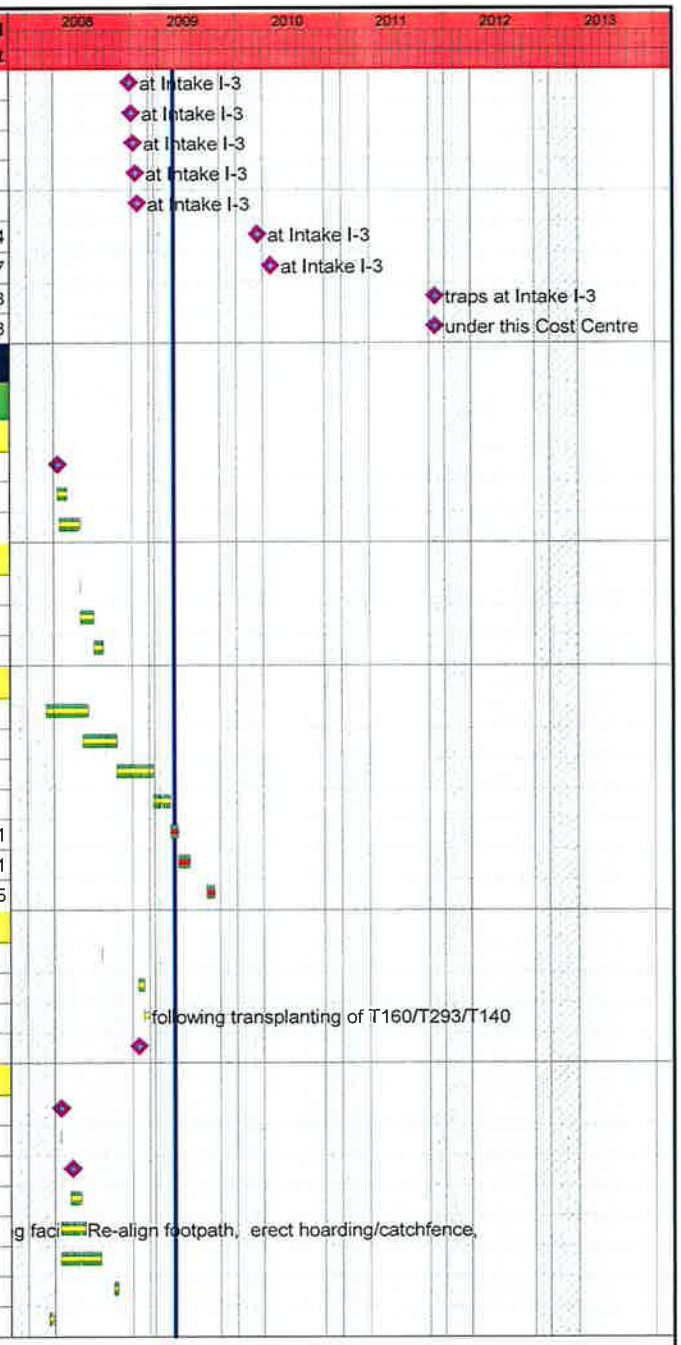
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
Construction of Deaerarion Chamber (DC)									
06L1CI3132	Construct base	9	9	25OCT10	03NOV10	25OCT10	03NOV10	1	-160
06L1CI3134	Construct walls 2 lifts	12	12	04NOV10	17NOV10	04NOV10	17NOV10	1	-160
06L1CI3136	Const. crown/underpin of air vent & drop shafts	18	18	18NOV10	08DEC10	18NOV10	08DEC10	1	-160
Construction of Vortex Shaft (VS)									
06L1CI3142	Set up formworks	6	6	17DEC10	23DEC10	17DEC10	23DEC10	1	-160
06L1CI3144	Construction of drop shaft; 4m high	6	6	24DEC10	03JAN11	24DEC10	03JAN11	1	-160
06L1CI3146	Construction of vortex structure	24	24	04JAN11	31JAN11	04JAN11	31JAN11	1	-160
06L1CI3148	Construct remaining of the vortex	18	18	31MAR11	21APR11	31MAR11	21APR11	1	-160
Construction of Air Vent Shaft Shaft (AVS)									
06L1CI3152	Set up formworks	6	6	01FEB11	10FEB11	01FEB11	10FEB11	1	-160
06L1CI3514	Cast 15m high circular wall	15	15	11FEB11	28FEB11	11FEB11	28FEB11	1	-160
06L1CI3516	Construct upstand wall	12	12	01MAR11	14MAR11	01MAR11	14MAR11	1	-160
Backfill Around Structure									
06L1CI3162	Granular fill up to +54mPD; 623m3	7	7	09DEC10	16DEC10	09DEC10	16DEC10	1	-160
06L1CI3164	Granular fill above +54mPD; 1400m3	14	14	15MAR11	30MAR11	15MAR11	30MAR11	1	-160
Construction of Approach Channel									
09R1CI3172	Excavation for Approach Channel	60	60	01NOV10*	12JAN11	01NOV10*	12JAN11	1	8
09R1CI3174	Construction of Approach Channel; upstream	82	82	20DEC10	31MAR11	20DEC10	31MAR11	1	8
09R1CI3176	Construction of boulder trap; 7 nos.	24	24	01NOV11*	28NOV11	01NOV11*	28NOV11	1	-165
09R1CI3177	Construction of Approach Channel; downstream	40	40	01NOV11	16DEC11	01NOV11	16DEC11	1	-165
09R1CI3178	Construction of trash grill	12	12	17DEC11	04JAN12	17DEC11	04JAN12	1	-165
09R1CI3179	Removal of concrete bolck bund	6	6	05JAN12	11JAN12	05JAN12	11JAN12	1	-165
Junction Between Main Tunnel & Adit Tunnel									
3CL1CI3106	Temp. support & excavation breakthrough	48	48	19JUL11	12SEP11	19JUL11	12SEP11	1	-94
3CL1CI3108	Construct collar between MT & AT	48	48	14SEP11	10NOV11	14SEP11	10NOV11	1	-94
Remaining Works Prior to Handover to Client									
09R1CI3142	Finishing & reinstatement works; Portion C	36	36	10DEC11	28JAN12	10DEC11	28JAN12	1	-155
09R1CI3143	Pre-handover inspections and remedial works	30	30	28DEC11	04FEB12	28DEC11	04FEB12	1	-155
09R1CI3144	Contractor serve notice for Works completion	7	7	05FEB12	11FEB12	05FEB12	11FEB12	2	667
09R1CI3146	SO issues completion certificate	21	21	12FEB12	03MAR12	12FEB12	03MAR12	2	667
16R7CI3142	Landscaping works at Portion C	120	120	31AUG11	28JAN12	31AUG11	28JAN12	1	-117
16R7CI3144	Establishment Works at Portion C	365	365	29JAN12	27JAN13	29JAN12	27JAN13	2	-148
3DL1CI3141	Install flow measurement devices at Intake I-3	12	12	12JAN12	28JAN12	12JAN12	28JAN12	1	-165



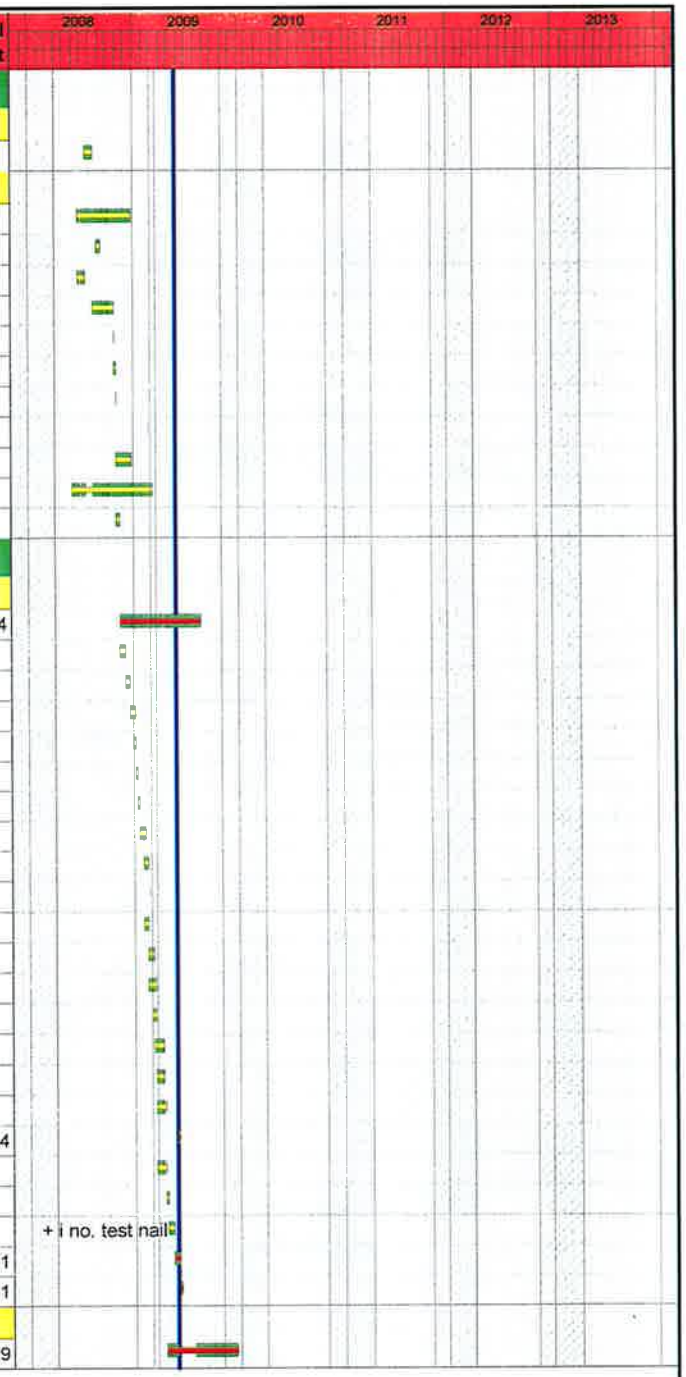
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
3DL1CI3143	Maintain & monitor flow monitoring	365	365	29JAN12	27JAN13	29JAN12	27JAN13	2	-148
Schedule of Milestones for Cost Centre No. 3cL									
3CL1CI3A02	3cL 1; On establishing tunnelling equipments	0	0		14JUL10		14JUL10	2	1,265
3CL1CI3A04	3cL 2; On completion of 12.5% perm. tunnel linin	0	0		23JUL10		23JUL10	2	1,256
3CL1CI3A06	3cL 3; On completion of 25% perm. tunnel lining	0	0		02AUG10		02AUG10	2	1,246
3CL1CI3A08	3cL 4; On completion of 37.5 perm. tunnel lining	0	0		11AUG10		11AUG10	2	1,237
3CL1CI3A10	3cL 5; On completion of 50% perm. tunnel lining	0	0		20AUG10		20AUG10	2	1,228
3CL1CI3A12	3cL 6; On completion of 62.5% perm. tunnel linin	0	0		30AUG10		30AUG10	2	1,218
3CL1CI3A14	3cL 7; On completion of 75% perm. tunnel lining	0	0		08SEP10		08SEP10	2	1,209
3CL1CI3A16	3cL 8; On completion of 87.5% perm. tunnel linin	0	0		20SEP10		20SEP10	2	1,197
3CL1CI3A18	3cL 9; On completion of perm. tunnel lining	0	0		10NOV11		10NOV11	2	781
3CL1CI3A20	3cL 10; On completion of all works under this CC	0	0		10NOV11		10NOV11	2	781
Schedule of Milestones for Cost Centre No. 6L									
06L1CI3M02	6L 1; On completion of 50% of excavation	0	0		26FEB10		26FEB10	2	1,403
06L1CI3M04	6L 2; On completion of excavation works	0	0		07JUL10		07JUL10	2	1,272
06L1CI3M08	6L 3; On completion of vortex shaft	0	0		21APR11		21APR11	2	984
06L1CI3M10	6L 4; On completion of de-aeration chamber	0	0		08DEC10		08DEC10	2	1,118
06L1CI3M12	6L 5; On completion of vent shaft	0	0		14MAR11		14MAR11	2	1,022
06L1CI3M14	6L 6; On completion of man access shaft	0	0		21APR11		21APR11	2	984
06L1CI3M16	6L 7; On completion of man access adit	0	0		23OCT10		23OCT10	2	1,164
06L1CI3M18	6L 8; On completion of all works under this CC	0	0		21APR11		21APR11	2	984
Schedule of Milestone for Cost Centre No. 9R									
09R1CI3R02	9R 1; On completion of access road	0	0		25OCT11		25OCT11	2	797
09R1CI3R04	9R 2; On completion of 25% of excavation at G.L	0	0		11JUN09		11JUN09	2	1,663
09R1CI3R06	9R 3; On completion of 50% of excavation at G.L	0	0		01AUG09		01AUG09	2	1,612
09R1CI3R08	9R 4; On completion of 75% of excavation at G.L	0	0		13JAN10		13JAN10	2	1,447
09R1CI3R10	9R 5; On completion of excavation at G.L.	0	0		12JAN11		12JAN11	2	1,083
09R1CI3R12	9R 6; On completion of 50% of approach channel	0	0		22FEB11		22FEB11	2	1,042
09R1CI3R14	9R 7; On completion of approach channel	0	0		31MAR11		31MAR11	2	1,005
09R1CI3R16	9R 8; On completion of trash grill	0	0		04JAN12		04JAN12	2	726
09R1CI3R18	9R 9; On completion of all works under this CC	0	0		04FEB12		04FEB12	2	695
Schedule of Milestones for Cost Centre No. 13R									
13R4CI3S01	13R 1; On completion of 30% soil nailing	0	0		29SEP09		29SEP09	2	1,553
13R4CI3S02	13R 2; On completion of 60% soil nailing	0	0		25FEB10		25FEB10	2	1,404
13R4CI3S03	13R 3; On completion of all soil naing works	0	0		22SEP10		22SEP10	2	1,195
13R4CI3S04	13R 4; On completion of 10% piles by number	0	0		05DEC08A		05DEC08A	2	
13R4CI3S05	13R 5; On completion of 20% piles by number	0	0		13DEC08A		13DEC08A	2	
13R4CI3S06	13R 6; On completion of 30% piles by number	0	0		18DEC08A		18DEC08A	2	



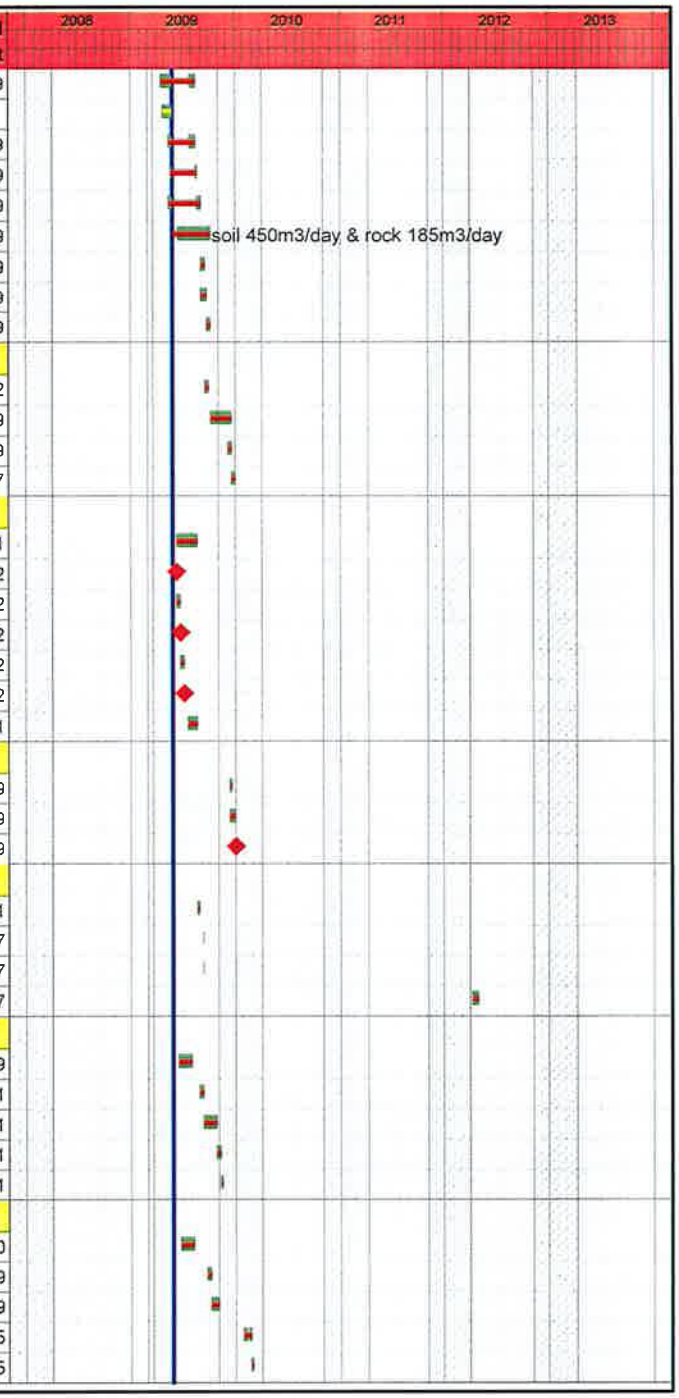
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
13R4CI3S07	13R 7; On completion of 40% piles by number	0	0		23DEC08A		23DEC08A	2	
13R4CI3S08	13R 8; On completion of 50% piles by number	0	0		02JAN09A		02JAN09A	2	
13R4CI3S09	13R 9; On completion of 60% piles by number	0	0		09JAN09A		09JAN09A	2	
13R4CI3S10	13R 10; On completion of 70% piles by number	0	0		16JAN09A		16JAN09A	2	
13R4CI3S11	13R 11; On completion of 80% piles by number	0	0		21JAN09A		21JAN09A	2	
13R4CI3S12	13R 12; On completion of 90% piles by number	0	0		17MAR10		17MAR10	2	1,384
13R4CI3S13	13R 13; On completion of all piling works	0	0		03MAY10		03MAY10	2	1,337
13R4CI3S14	13R 14; On completion of boulder traps	0	0		28NOV11		28NOV11	2	763
13R4CI3S15	13R 15; On completion of all work under this CC	0	0		28NOV11		28NOV11	2	763
Construction of Outfall O-1									
Preliminary Works									
VO # 06; Transperant Hoarding at Outfall									
01R1DO0106	Receive VO6 for transperant hoarding	0	0		16APR08A		16APR08A	1	
01R1DO0108	Procurement for transperent hoarding	21	21	17APR08A	20MAY08A	17APR08A	20MAY08A	1	
01R1DO0110	Erect hoarding	18	18	21APR08A	02JUL08A	21APR08A	02JUL08A	1	
VO #16; Chain Link Fence at O-1									
V01602	Issue VO16 for chain link fence	0	0		02JUL08A		02JUL08A	1	
V01612	Preparation works for chain link fence	1	1	03JUL08A	18AUG08A	03JUL08A	18AUG08A	1	
V01622	Erect chain link fence; 460m	38	38	19AUG08A	19SEP08A	19AUG08A	19SEP08A	1	
Temporary CLP Power Supply for TBM Operation									
01R1DCLP02	Application/approval for temp. CLP Power Supply	200	200	07MAR08A	01AUG08A	07MAR08A	01AUG08A	2	
01R1DCLP14	Appoint sub-contractor for design & build TX Rm	67	67	14JUL08A	07NOV08A	14JUL08A	07NOV08A	1	
01R1DCLP24	Design for transformer room	24	24	08NOV08A	11MAR09A	08NOV08A	11MAR09A	1	
01R1DCLP34	Constuct transformer room	60	60	12MAR09A	14MAY09A	12MAR09A	14MAY09A	1	
01R1DCLP44	CLP inspection & defect rectification	14	14	15MAY09A	10JUN09	15MAY09A	10JUN09	1	-181
01R1DCLP54	CLP cabling to TX room & commissioning	32	32	11JUN09	18JUL09	11JUN09	18JUL09	1	-181
01R1DCLP74	CLPE cabling from TX room to 24mPD platform	18	18	19SEP09	12OCT09	19SEP09	12OCT09	1	-165
VO#25; Revised Fencig Details at O-1 Next to GVT									
V025-02	Receive VO16 for revised details next to GVT	0	0		17SEP08A		17SEP08A	1	
V025-12	Preparation works	24	24	22JAN09A	07FEB09A	22JAN09A	07FEB09A	1	
V025-22	Erect proposed transparent hoarding	4	4	09FEB09A	02MAR09A	09FEB09A	02MAR09A	1	
V055-02	Receive VO#55 in lieu of VO#25	0	0		21JAN09A		21JAN09A	1	
01R1DO0102	Obtain TTA (ingress & egress) approval	0	0		18APR08A		18APR08A	2	
01R1DO0103	Implment TTA for diverting footpath	1	1	19APR08A	19APR08A	19APR08A	19APR08A	1	
01R1DO0104	Obtain excavation permit	0	0		29MAY08A		29MAY08A	2	
01R1DO0112	Erect catch fencing	10	10	26MAY08A	02JUL08A	26MAY08A	02JUL08A	1	
01R1DO0114	Site establishment	30	30	21APR08A	15JUL08A	21APR08A	15JUL08A	1	
01R1DO0116	Site clearance	30	30	21APR08A	05SEP08A	21APR08A	05SEP08A	1	
01R1DO0118	Install remote contorl CCTV as per ER 4.4.10	12	12	28OCT08A	10NOV08A	28OCT08A	10NOV08A	1	
16R1DO0110	Tree inspection & report	7	7	13MAR08A	28MAR08A	13MAR08A	28MAR08A	1	



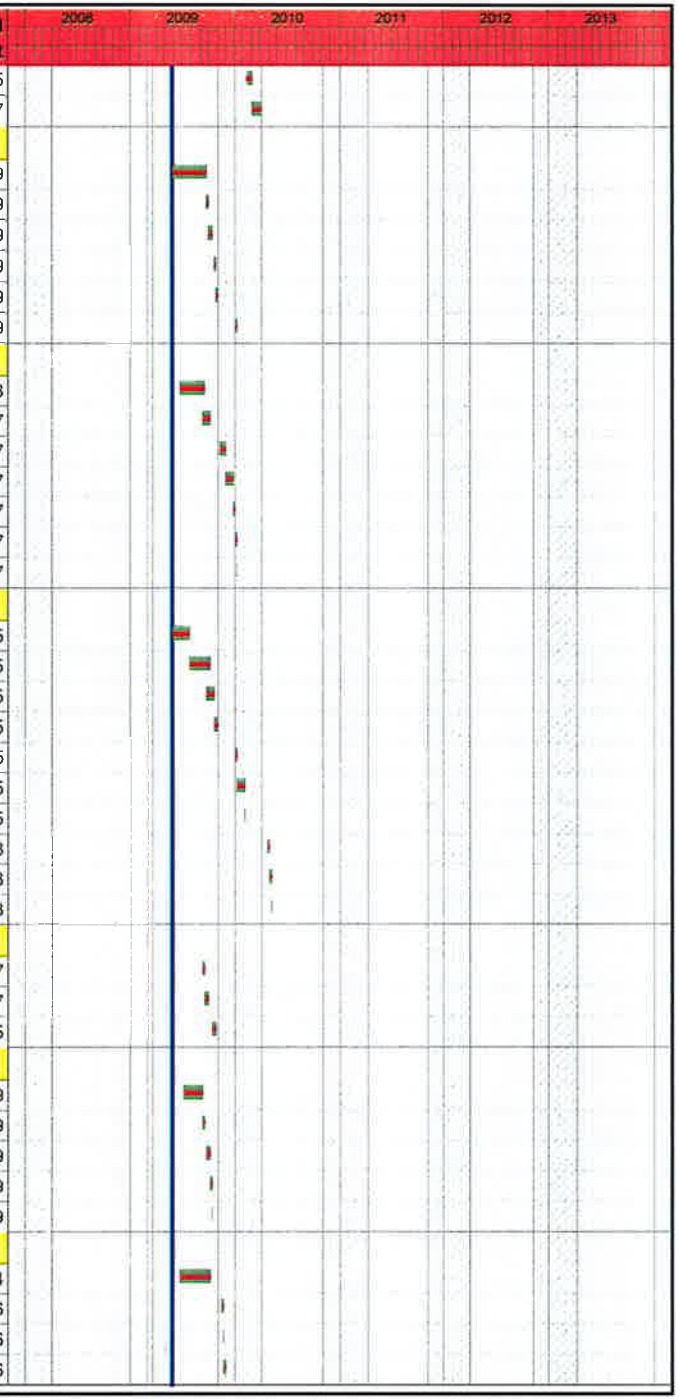
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
Form Temporary Access/Tree Felling									
Works Suspension Due to Obstruct. from Villagers									
WSO02	Works suspension due to obstruct. frm villagers	24	24	19JUL08A	10AUG08A	19JUL08A	10AUG08A	2	
10R1DO0202	Form temp. access road from +14mPD to +69mPD	158*	158*	19JUN08A	24DEC08A	19JUN08A	24DEC08A	1	
10R1DOAR04	Const. temp. steel decking over exist Outfall W	11	11	26AUG08A	06SEP08A	26AUG08A	06SEP08A	1	
10R1DOAR08	Form temp. access road from 14mPD to 28mPD	12	12	19JUN08A	18JUL08A	19JUN08A	18JUL08A	1	
10R1DOAR12	Preparation works for transplanting T160	53	53	11AUG08A	25OCT08A	11AUG08A	25OCT08A	1	
10R1DOAR42	Mobilze & set up crane for tree transplant	1	1	27OCT08A	27OCT08A	27OCT08A	27OCT08A	1	
10R1DOAR44	Crown pruning for T160	2	2	28OCT08A	29OCT08A	28OCT08A	29OCT08A	1	
10R1DOAR46	Cut root & uplift T160	1	1	30OCT08A	30OCT08A	30OCT08A	30OCT08A	1	
10R1DOAR54	Crown pruning/Cut root & uplift T142	10	10	21FEB09A	21FEB09A	21FEB09A	21FEB09A	1	
10R1DOAR56	Construct access road from +43 to +55mPD	30	30	31OCT08A	24DEC08A	31OCT08A	24DEC08A	1	
16R7DO0202	Tree transplant at Outfall O-1	105	105	02JUN08A	06MAR09A	02JUN08A	06MAR09A	1	
16R7DO0204	Tree transplant above +62mPD	11	11	31OCT08A	12NOV08A	31OCT08A	12NOV08A	1	
Form Temporary Launching Platform									
Slope Cut & Soil Nailing; +71mPD to +40mPD									
10R1DO030	+71 to +40mPD (rows to A to P)	229*	229*	13NOV08A	22AUG09	13NOV08A	22AUG09	1	-184
10R1DO031	Remove boulder/Cut slope for rows A to D	9	9	13NOV08A	06DEC08A	13NOV08A	06DEC08A	1	
10R1DO032	Erect scaffold & Drill/install/grout/P1at row C	12	12	02DEC08A	16DEC08A	02DEC08A	16DEC08A	1	
10R1DO033	Drill/install/grout rows B to C; 18 nos.	14	14	17DEC08A	06JAN09A	17DEC08A	06JAN09A	1	
10R1DO034	Drill/install/grout/testing for P2 at row D	8	8	30DEC08A	06JAN09A	30DEC08A	06JAN09A	2	
10R1DO035	Drill/install/grout D1 to D11	7	7	07JAN09A	16JAN09A	07JAN09A	16JAN09A	1	
10R1DO036	Cut slope for E1 to G20; soil 620m3	2	2	15JAN09A	20JAN09A	15JAN09A	20JAN09A	1	
10R1DO037	Drill/install/grout E1 to G20: 51 nos.	19	19	20JAN09A	11FEB09A	20JAN09A	11FEB09A	1	
10R1DO038	Construct nail heads/remove platform; rows B-G	10	10	02FEB09A	17FEB09A	02FEB09A	17FEB09A	1	
10R1DO039	Erosion mat, wire mesh & hydroseed; rows B-G	10	10	21FEB09A	24FEB09A	21FEB09A	24FEB09A	1	
10R1DO040	Cut slope for H1 to I25; soil 1819m3	12	12	02FEB09A	17FEB09A	02FEB09A	17FEB09A	1	
10R1DO041	Drill/install/grout H1 to I25; 47 nos.	13	13	18FEB09A	04MAR09A	18FEB09A	04MAR09A	1	
10R1DO042	Cut slope for J1 to M37; soil 5834m3	20	20	19FEB09A	13MAR09A	19FEB09A	13MAR09A	1	
10R1DO043	Erect working platform for rows J to M	14	14	28FEB09A	16MAR09A	28FEB09A	16MAR09A	1	
10R1DO044	Test nails for P3, P4, P5 & P10	12	12	05MAR09A	07APR09A	05MAR09A	07APR09A	1	
10R1DO045	Drill/install/grout J1 to M37; 134 nos.	20	20	12MAR09A	07APR09A	12MAR09A	07APR09A	1	
10R1DO047	Construct nail heads/remove platform; rows H-M	20	20	14MAR09A	18APR09A	14MAR09A	18APR09A	1	
10R1DO048	Erosion mat, wire mesh & hydroseed; rows H-M	6	6	29MAY09	04JUN09	29MAY09	04JUN09	1	-184
10R1DO049	Excavate soil 5600m3 & boulde 229m3; Rows N to P	22	22	14MAR09A	18APR09A	14MAR09A	18APR09A	1	
10R1DO050	Erect working platform for rows N to P	10	10	20APR09A	24APR09A	20APR09A	24APR09A	1	
10R1DO051	Drill/install/grout N1 to P31; 111 nos.	20	20	23APR09A	13MAY09A	23APR09A	13MAY09A	1	
10R1DO053	Construct nail heads/remove platform; row N to P	14	14	14MAY09A	02JUN09	14MAY09A	02JUN09	1	-161
10R1DO054	Erosion mat, wire mesh & hydroseed; rows N to P	6	6	03JUN09	09JUN09	03JUN09	09JUN09	1	-161
Slope Cut & Soil Nailing; +40mPD to +24mPD									
10R1DO130	+40 to +24mPD (rows Q to X)	205*	205*	20APR09A	22DEC09	20APR09A	22DEC09	1	-219



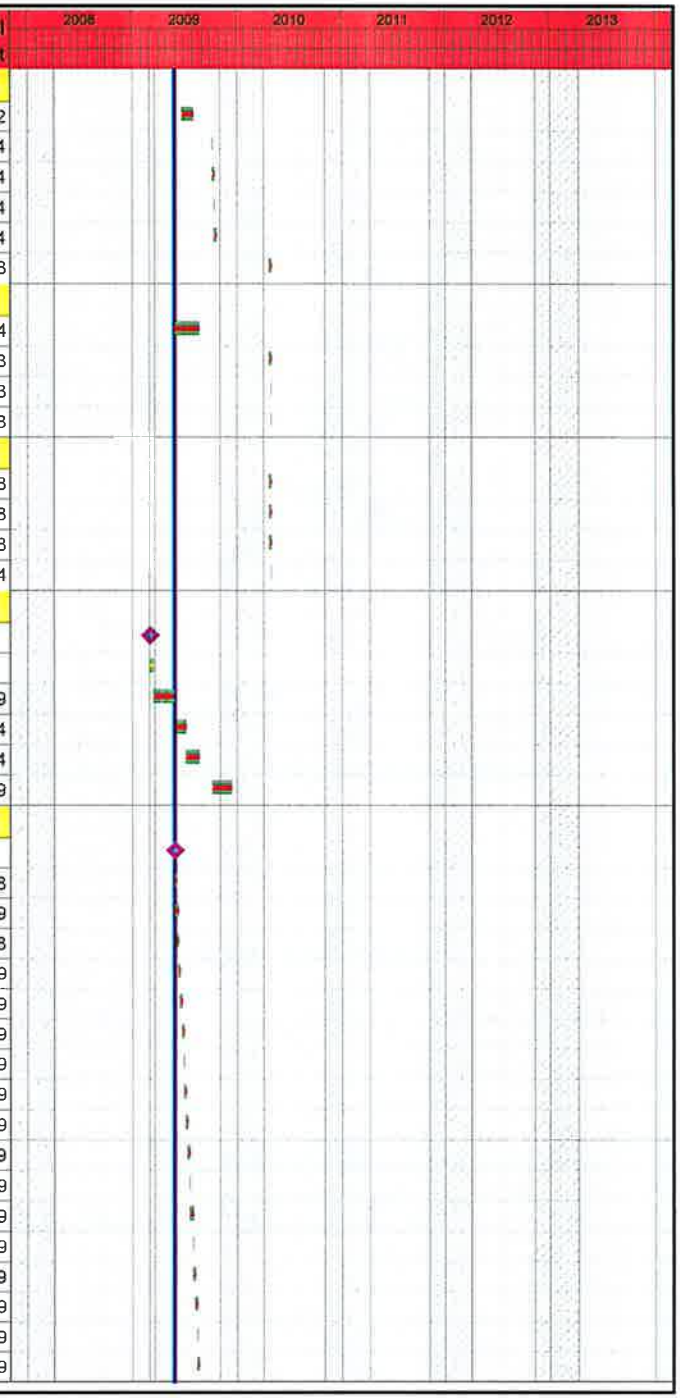
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
10R1DO131	Excavation; 40 to 30mPD; soil 8291m3/rock 2778m3	43	43	20APR09A	13AUG09	20APR09A	13AUG09	1	-219
10R1DO132	Reinstate temp. access	30	30	21APR09A	27MAY09A	21APR09A	27MAY09A	1	
10R1DO133	Erect working platfrom for rows Q to U	22	22	11MAY09A	17AUG09	11MAY09A	17AUG09	1	-219
10R1DO134	Test nails for P6, P7, P8 & P11	12	12	21MAY09A	24AUG09	21MAY09A	24AUG09	1	-219
10R1DO135	Drill/install/grout Q1 to U10; 99 nos.	13	13	12MAY09A	04SEP09	12MAY09A	04SEP09	1	-219
10R1DO136	Excavation; 30 to 24mPD; soil 4197m3/rock 7592m3	95	95	27MAY09A	08OCT09	27MAY09A	08OCT09	1	-219
10R1DO137	Drill/install/grout V1 to X14; 37 nos.	10	10	05SEP09	16SEP09	05SEP09	16SEP09	1	-219
10R1DO138	Construct nail heads/remove platform; row V to X	17	17	02SEP09	21SEP09	02SEP09	21SEP09	1	-219
10R1DO139	Erosion mat, wire mesh & hydroseed; rows V to X	10	10	22SEP09	05OCT09	22SEP09	05OCT09	1	-219
TBM Launching Chamber									
10R1DO1305	Pipe pile roof support	9	9	18SEP09	28SEP09	18SEP09	28SEP09	1	-212
10R1DO1310	Excavate/construct TBM launching chamber	63	63	09OCT09	22DEC09	09OCT09	22DEC09	1	-219
10R1DO1315	Form launching chamber cradle	12	12	09DEC09	22DEC09	09DEC09	22DEC09	1	-219
10R1DO1325	Ground treatment prior to TBM commence boring	4	4	23DEC09	29DEC09	23DEC09	29DEC09	1	-217
Slope Cut & TBM Access Road; +24 to +14mPD									
10R1DO230	+24 to +14mPD	63*	63*	08JUN09	20AUG09	08JUN09	20AUG09	1	-181
10R1DO240	Relocate sedimentation tank	0	0		06JUN09*		06JUN09*	1	-172
10R1DO250	Form access for big breaker	12	12	08JUN09	20JUN09	08JUN09	20JUN09	1	-172
10R1DO260	Mobilization of big breaker	0	0		20JUN09		20JUN09	1	-172
10R1DO270	Form new TBM access +14mPD to +24mPD	14	14	22JUN09	08JUL09	22JUN09	08JUL09	1	-172
10R1DO280	Divert access to new TBM access	0	0		08JUL09		08JUL09	1	-172
10R1DO290	Demolish masonry & ret. wall at +14mPD	28	28	20JUL09	20AUG09	20JUL09	20AUG09	1	-181
TBM Assembly Area at +24mPD									
10R1DO185	Construct temporary draiange	6	6	16DEC09	22DEC09	16DEC09	22DEC09	1	-219
10R1DO195	Concrete slab	12	12	16DEC09	31DEC09	16DEC09	31DEC09	1	-219
3AL1DO0314	Commence TBM initial assembly	0	0	02JAN10		02JAN10		1	-219
Tower Crane									
3AL1DO2005	Foundation	8	8	21AUG09	29AUG09	21AUG09	29AUG09	1	-181
3AL1DO2010	Erection	3	3	08SEP09	10SEP09	08SEP09	10SEP09	1	-157
3AL1DO2015	Test & commissioning	1	1	11SEP09	11SEP09	11SEP09	11SEP09	1	-157
3AL1DO2025	Removal of tower crane & reinstatement	12	12	11APR12	24APR12	11APR12	24APR12	1	-207
TBM Platform									
3AL1DO2505	Pre-fabrication	40	40	18JUN09*	04AUG09	18JUN09*	04AUG09	1	-159
3AL1DO2515	Foundation	12	12	31AUG09	12SEP09	31AUG09	12SEP09	1	-181
3AL1DO2525	Erect steel framework	36	36	14SEP09	28OCT09	14SEP09	28OCT09	1	-181
3AL1DO2535	Install platform	12	12	29OCT09	11NOV09	29OCT09	11NOV09	1	-181
3AL1DO2545	ICE certification	3	3	12NOV09	14NOV09	12NOV09	14NOV09	1	-181
Noise Enclosure									
3AL1DO3005	Pre-fabrication	42	42	22JUN09*	10AUG09	22JUN09*	10AUG09	1	-120
3AL1DO3015	Foundation	12	12	23SEP09	08OCT09	23SEP09	08OCT09	1	-169
3AL1DO3025	Erect steel framework	18	18	09OCT09	30OCT09	09OCT09	30OCT09	1	-169
3AL1DO3035	Cladding	22	22	27JAN10	24FEB10	27JAN10	24FEB10	1	-195
3AL1DO3045	ICE certification	3	3	25FEB10	27FEB10	25FEB10	27FEB10	1	-195



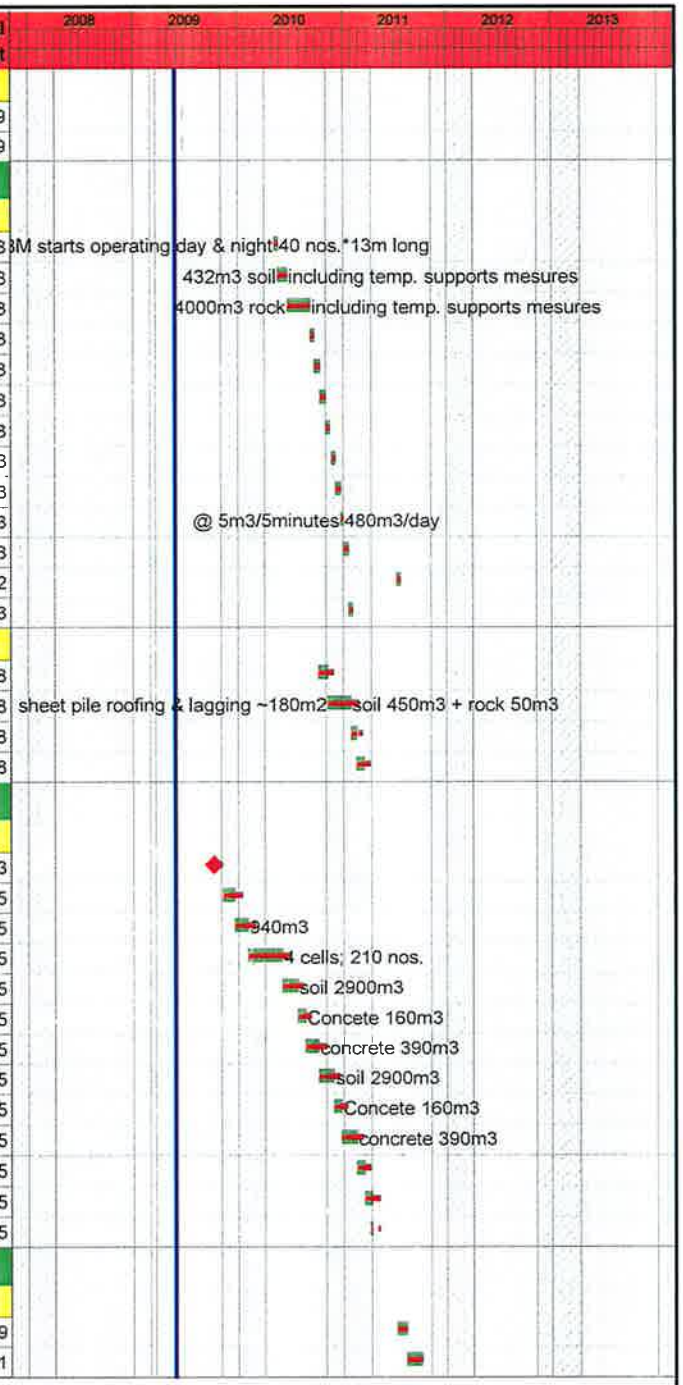
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
3AL1FT0802	Apply to EPD for CNP for 24 hrs. tunnel work	12	12	11FEB10	27FEB10	11FEB10	27FEB10	1	-195
3AL1FT0804	EPD process/approve CNP application	36	36	28FEB10	04APR10	28FEB10	04APR10	2	-237
105 Ton Gantry Crane									
3AL1DO3505	Manufacture	99	99	29MAY09	22SEP09	29MAY09	22SEP09	1	-159
3AL1DO3515	Shipping to Hong Kong	6	6	23SEP09	29SEP09	23SEP09	29SEP09	1	-159
3AL1DO3525	Assembly	8	8	30SEP09	10OCT09	30SEP09	10OCT09	1	-159
3AL1DO3535	Install rails	4	4	23OCT09	28OCT09	23OCT09	28OCT09	1	-169
3AL1DO3545	Test & commission	3	3	29OCT09	31OCT09	29OCT09	31OCT09	1	-169
3AL1DO3555	Receive initial segments and stock	6	6	02JAN10	08JAN10	02JAN10	08JAN10	1	-209
Muck Hopper									
3AL1DO4005	Pre-fabrication	75	75	22JUN09*	17SEP09	22JUN09*	17SEP09	1	-83
3AL1DO4015	Foundation	18	18	14SEP09	06OCT09	14SEP09	06OCT09	1	-97
3AL1DO4025	Erect steelwork	18	18	12NOV09	02DEC09	12NOV09	02DEC09	1	-127
3AL1DO4035	Erect hopper	18	18	03DEC09	23DEC09	03DEC09	23DEC09	1	-127
3AL1DO4045	Install transfer conveyor	4	4	24DEC09	30DEC09	24DEC09	30DEC09	1	-127
3AL1DO4055	M&E works	6	6	31DEC09	07JAN10	31DEC09	07JAN10	1	-127
3AL1DO4065	Test & commissioning	3	3	08JAN10	11JAN10	08JAN10	11JAN10	1	-127
Marti Conveyor									
3AL1DO4505	Engineering	50	50	29MAY09	27JUL09	29MAY09	27JUL09	1	-105
3AL1DO4515	Pre-fabrication	60	60	28JUL09	07OCT09	28JUL09	07OCT09	1	-105
3AL1DO4525	Delivery to Hong Kong	25	25	23SEP09	23OCT09	23SEP09	23OCT09	1	-105
3AL1DO4535	Pre-assembly at Portion I	6	6	24OCT09	31OCT09	24OCT09	31OCT09	1	-105
3AL1DO4545	Foundation	3	3	02JAN10	05JAN10	02JAN10	05JAN10	1	-155
3AL1DO4555	Install belt conveyor stage 1	24	24	06JAN10	02FEB10	06JAN10	02FEB10	1	-155
3AL1DO4565	Install transfer conveyor	1	1	03FEB10	03FEB10	03FEB10	03FEB10	1	-155
3AL1DO4575	Install belt conveyor stage 2	6	6	27APR10	04MAY10	27APR10	04MAY10	1	-218
3AL1DO4585	M&E works	2	2	05MAY10	06MAY10	05MAY10	06MAY10	1	-218
3AL1DO4595	Test & commission	1	1	07MAY10	07MAY10	07MAY10	07MAY10	1	-218
LV Station									
3AL1DO5005	Delivery & install containers 1/2/3	4	4	12SEP09	16SEP09	12SEP09	16SEP09	1	-157
3AL1DO5015	M&E works	12	12	17SEP09	30SEP09	17SEP09	30SEP09	1	-157
3AL1DO5025	Test & commision	12	12	13OCT09	27OCT09	13OCT09	27OCT09	1	-165
Cooling Water System									
3AL1DO5505	Pre-fabrication	53	53	09JUL09	08SEP09	09JUL09	08SEP09	1	-129
3AL1DO5515	Foundation	10	10	09SEP09	19SEP09	09SEP09	19SEP09	1	-129
3AL1DO5525	Erect cooling system	12	12	21SEP09	06OCT09	21SEP09	06OCT09	1	-129
3AL1DO5535	M&E works	4	4	07OCT09	10OCT09	07OCT09	10OCT09	1	-129
3AL1DO5545	Test & commission	2	2	12OCT09	13OCT09	12OCT09	13OCT09	1	-129
Grout System									
3AL1DO6005	Pre-fabrication	90	90	22JUN09*	07OCT09	22JUN09*	07OCT09	1	-134
3AL1DO6015	Erect system	6	6	16NOV09	21NOV09	16NOV09	21NOV09	1	-166
3AL1DO6025	M&E works	3	3	23NOV09	25NOV09	23NOV09	25NOV09	1	-166
3AL1DO6035	Test & commission	1	1	26NOV09	26NOV09	26NOV09	26NOV09	1	-166



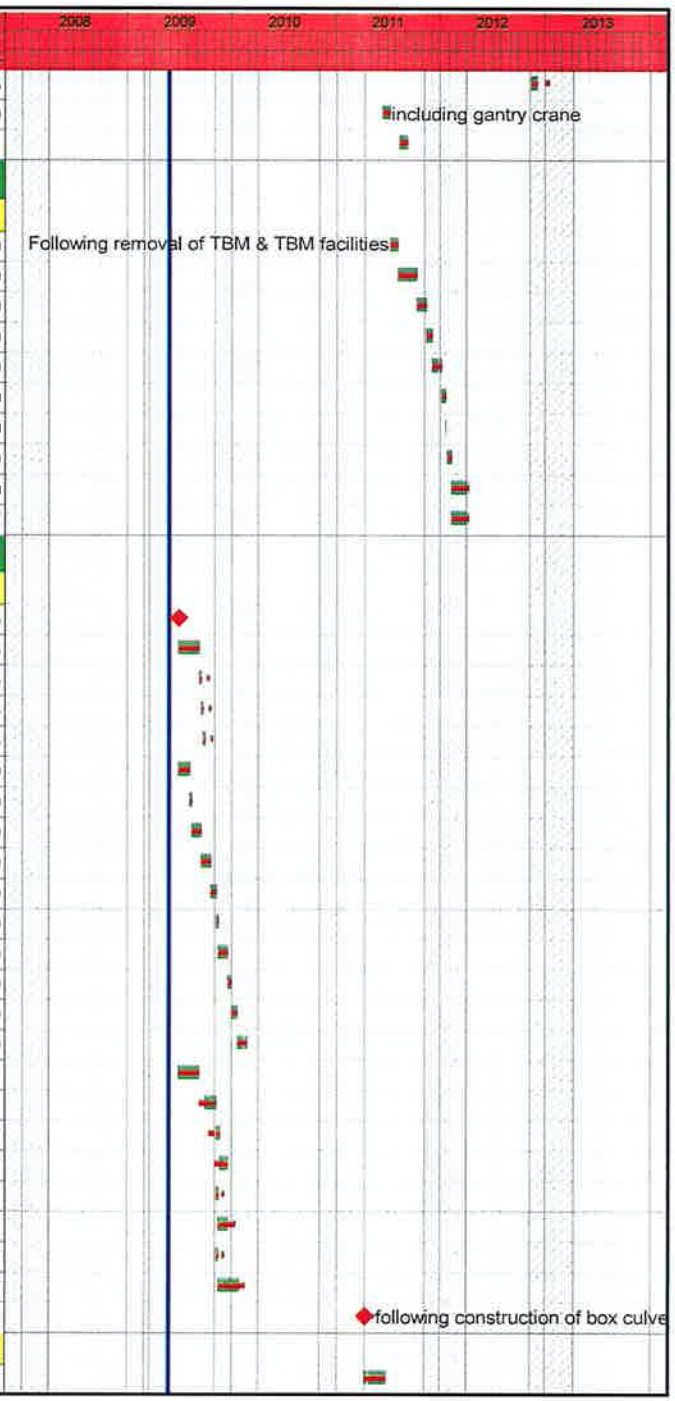
ID	Activity Description	004 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
Pea Gravel Plant									
3AL1DO7505	Pre-fabrication	36	36	22JUN09	03AUG09	22JUN09	03AUG09	1	-82
3AL1DO7515	Install hopper	4	4	06OCT09	09OCT09	06OCT09	09OCT09	1	-134
3AL1DO7525	Erect conveyor	2	2	10OCT09	12OCT09	10OCT09	12OCT09	1	-134
3AL1DO7535	M&E works	4	4	13OCT09	16OCT09	13OCT09	16OCT09	1	-134
3AL1DO7545	Test & commission	2	2	17OCT09	19OCT09	17OCT09	19OCT09	1	-134
3AL1DO7555	Install conveyor connecting to TBM	4	4	27APR10	30APR10	27APR10	30APR10	1	-213
Ventilation System									
3AL1DO8005	Pre-fabrication	72	72	29MAY09	21AUG09	29MAY09	21AUG09	1	-14
3AL1DO8015	Erect system	2	2	27APR10	28APR10	27APR10	28APR10	1	-213
3AL1DO8025	M&E works	1	1	29APR10	29APR10	29APR10	29APR10	1	-213
3AL1DO8035	Test & commission	1	1	30APR10	30APR10	30APR10	30APR10	1	-213
Micsellaneous									
3AL1DO8502	Install transformer & hormonic filter	2	2	27APR10	28APR10	27APR10	28APR10	1	-218
3AL1DO8512	Remove invert segments; 19 nos.	2	2	27APR10	28APR10	27APR10	28APR10	1	-218
3AL1DO8522	Make good slab	3	3	28APR10	30APR10	28APR10	30APR10	1	-218
3AL1DO8532	Install rail switch	1	1	03MAY10	03MAY10	03MAY10	03MAY10	1	-214
VO # 49 & 53; Additional Drainage & Stairway									
VO-04910	Received Variation orders	0	0		26FEB09A		26FEB09A	1	
VO-04920	Preparation works for varied works	14	14	27FEB09A	14MAR09A	27FEB09A	14MAR09A	1	
VO-04930	Construct u-channel & stairway; +71mPD to +55mPD	60	60	16MAR09A	29MAY09	16MAR09A	29MAY09	1	-179
VO-04940	Construct u-channel & stairway;+55mPD to +47mPD	27	27	05JUN09	07JUL09	05JUN09	07JUL09	1	-184
VO-04950	Construct u-channel & stairway; +47mPD to +41mPD	40	40	08JUL09	22AUG09	08JUL09	22AUG09	1	-184
VO-04960	Construct u-channel & stairway; +41 to +24 mPD	60	60	06OCT09	15DEC09	06OCT09	15DEC09	1	-219
VO #88; Revised Slope Profile with Add. Supports									
VO-088000	Received VO #088	0	0		27MAY09A		27MAY09A	1	
VO-088005	Excavate from 38.5mPD to 36.5mPD	6	6	29MAY09	04JUN09	29MAY09	04JUN09	1	-218
VO-088010	Procure and prepare materials	9	9	29MAY09	08JUN09	29MAY09	08JUN09	1	-219
VO-088015	SOR confirm soil nails location	2	2	05JUN09	06JUN09	05JUN09	06JUN09	1	-218
VO-088020	Drill/install/grout soil nails; rows AA-AB	7	7	09JUN09	16JUN09	09JUN09	16JUN09	1	-219
VO-088025	Install wire mesh & shorcrete 150mm	3	3	17JUN09	19JUN09	17JUN09	19JUN09	1	-219
VO-088030	Excavate from +36.5 mPD to 34.5mPD	6	6	20JUN09	26JUN09	20JUN09	26JUN09	1	-219
VO-088035	SOR confirm soil nails location	2	2	27JUN09	29JUN09	27JUN09	29JUN09	1	-219
VO-088040	Drill/install/grout soil nails; rows AC-AD	7	7	30JUN09	08JUL09	30JUN09	08JUL09	1	-219
VO-088045	Install wire mesh & shorcrete 150mm	3	3	09JUL09	11JUL09	09JUL09	11JUL09	1	-219
VO-088050	Excavate from +34.5 mPD to 32.5mPD	6	6	13JUL09	18JUL09	13JUL09	18JUL09	1	-219
VO-088055	SOR confirm soil nails location	2	2	20JUL09	21JUL09	20JUL09	21JUL09	1	-219
VO-088060	Drill/install/grout soil nails; rows AE-AF	7	7	22JUL09	29JUL09	22JUL09	29JUL09	1	-219
VO-088065	Install wire mesh & shorcrete 150mm	3	3	30JUL09	01AUG09	30JUL09	01AUG09	1	-219
VO-088070	Excavate from +34.5 mPD to 32.5mPD	6	6	03AUG09	08AUG09	03AUG09	08AUG09	1	-219
VO-088075	SOR confirm soil nails location	2	2	10AUG09	11AUG09	10AUG09	11AUG09	1	-219
VO-088080	Drill/install/grout soil nails; row AG	5	5	12AUG09	17AUG09	12AUG09	17AUG09	1	-219
VO-088085	Install wire mesh & shorcrete 150mm	3	3	18AUG09	20AUG09	18AUG09	20AUG09	1	-219



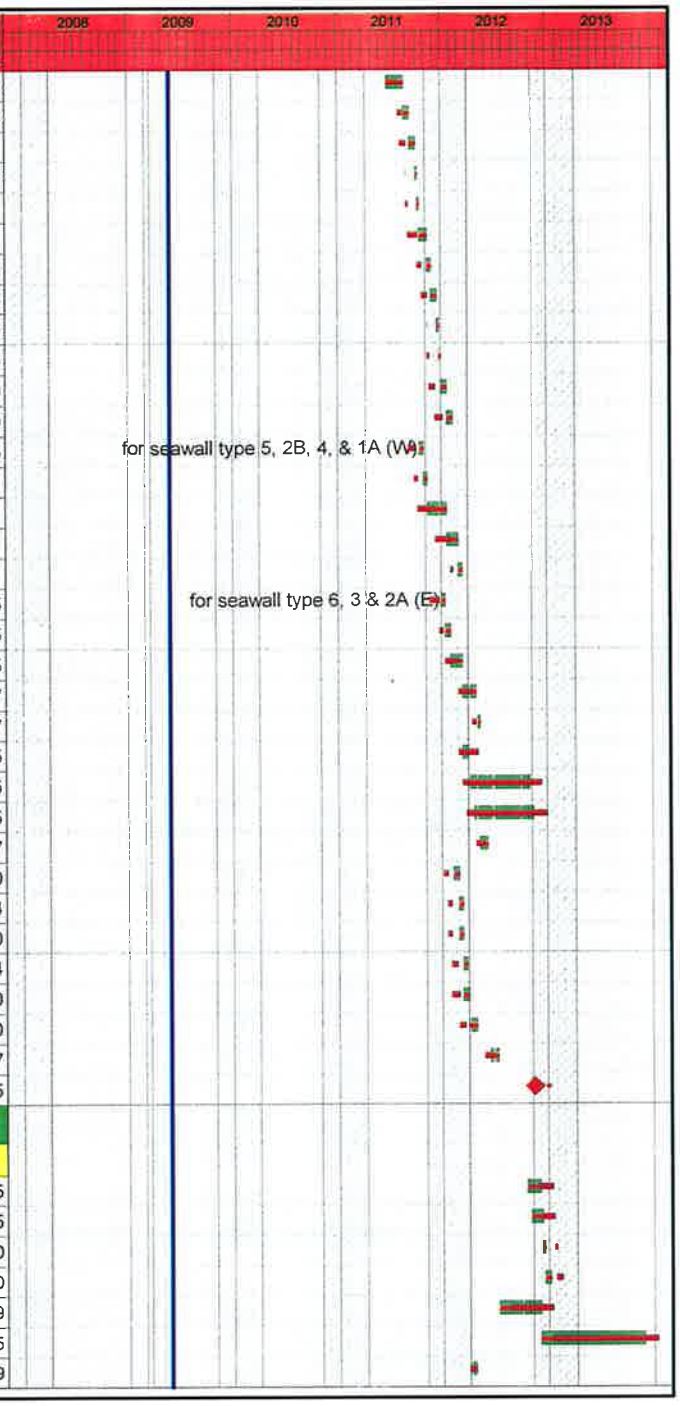
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
Instruction from SOR									
SORI-10	Suspension of rock drilling & breaking	1	1	20JUN09*	20JUN09	20JUN09*	20JUN09	1	-219
SORI-20	Erection of noise bearriers	3	3	22JUN09	24JUN09	22JUN09	24JUN09	1	-219
Construct Spiral Ramp & Associ. Vehicular Access									
Spiral Ramp									
10R1DO0402	Install 273mm dia. temp. pipe piles; 40 nos.	12	12	08MAY10	22MAY10	08MAY10	22MAY10	1	-93
10R1DO0404	Soil excavation & install wailing & tie backs	24	24	24MAY10	21JUN10	24MAY10	21JUN10	1	-93
10R1DO0406	Rock excavation for spiral ramp; 4629m3	70	70	22JUN10	11SEP10	22JUN10	11SEP10	1	-93
10R1DO0414	Construct base of spiral ramp; Outfall O-1	12	12	13SEP10	27SEP10	13SEP10	27SEP10	1	-93
10R1DO0416	Cast sprial ramp up to +6.73mPD	15	15	28SEP10	15OCT10	28SEP10	15OCT10	1	-93
10R1DO0418	Cast sprial ramp up to +11.58mPD	15	15	18OCT10	03NOV10	18OCT10	03NOV10	1	-93
10R1DO0420	Cast sprial ramp up to +16.00mPD	15	15	04NOV10	20NOV10	04NOV10	20NOV10	1	-93
10R1DO0422	Cast sprial ramp up to +20.00mPD	15	15	22NOV10	08DEC10	22NOV10	08DEC10	1	-93
10R1DO0424	Cast sprial ramp up to +24.23mPD	15	15	09DEC10	28DEC10	09DEC10	28DEC10	1	-93
10R1DO0425	Backfill spiral ramp; 1700m3	4	4	29DEC10	03JAN11	29DEC10	03JAN11	1	-93
10R1DO0426	Construct spiral ramp top; Outfall O-1	20	20	04JAN11	26JAN11	04JAN11	26JAN11	1	-93
10R1DO0428	Construct vehicular access bet. tunnel & s. ramp	10	10	12JUL11	22JUL11	12JUL11	22JUL11	1	-2
10R1DO0430	Commission of Spiral Ramp	6	6	27JAN11	02FEB11	27JAN11	02FEB11	1	-93
Vehicular Access									
10R1DO0407	Install 40 nos. roof piles # 375mm c/c	24	24	11OCT10	08NOV10	02NOV10	29NOV10	1	-128
10R1DO0408	Excavation for vehicular access underneath CPR	70	70	09NOV10	01FEB11	30NOV10	25FEB11	1	-128
10R1DO0410	Construct base for vehicular access	12	12	02FEB11	18FEB11	26FEB11	11MAR11	1	-128
10R1DO0412	Construct wall & roof for vehicular access	24	24	19FEB11	18MAR11	12MAR11	09APR11	1	-128
Lower Part Box Culvert/Open Channel By Mining									
10R1DO0502	Site possession of Portion E-650d of DOC	0	0	08OCT09		08OCT09		2	-453
10R1DO0504	Divert exist. outfall "W" under CPR arch bridge	36	36	09NOV09	19DEC09	30NOV09	13JAN10	1	-395
10R1DO0506	Remove rock armour & form platform @+2.3mPD	36	36	21DEC09	03FEB10	14JAN10	27FEB10	1	-395
10R1DO0508	Install temp. pile for pipe roofing	96	96	04FEB10	05JUN10	01MAR10	28JUN10	1	-395
10R1DO0510	Excavate for box-culvert; 2 cells	44	44	07JUN10	29JUL10	29JUN10	19AUG10	1	-395
10R1DO0512	Construct base slabs of box culvert; 2 cells	20	20	30JUL10	21AUG10	20AUG10	11SEP10	1	-395
10R1DO0514	Construt wall & roof of box culvert; 2 cells	40	40	23AUG10	09OCT10	13SEP10	01NOV10	1	-395
10R1DO0516	Excavate for box-culvert; 2 cells	44	44	11OCT10	01DEC10	02NOV10	22DEC10	1	-395
10R1DO0518	Construct base slabs of box culvert; 2 cells	20	20	02DEC10	24DEC10	23DEC10	18JAN11	1	-395
10R1DO0520	Construt wall & roof of box culvert; 2 cells	40	40	28DEC10	16FEB11	19JAN11	09MAR11	1	-395
10R1DO0522	Excavate for open channel	24	24	17FEB11	16MAR11	10MAR11	07APR11	1	-395
10R1DO0526	Construct open channel at 2.3 mPD	24	24	17MAR11	14APR11	08APR11	09MAY11	1	-395
10R1DO0528	Reinstate existing outfall "W"	6	6	08APR11	14APR11	03MAY11	09MAY11	1	-395
Construct Portal Head & Associated Strutures									
10R1DO0602	Excavate tapered open channel/ upper cascade	24	24	12JUL11	08AUG11	12JUL11	08AUG11	1	-219
10R1DO0604	Construct tapered open channel & upper cascade	48	48	09AUG11	06OCT11	09AUG11	06OCT11	1	-131



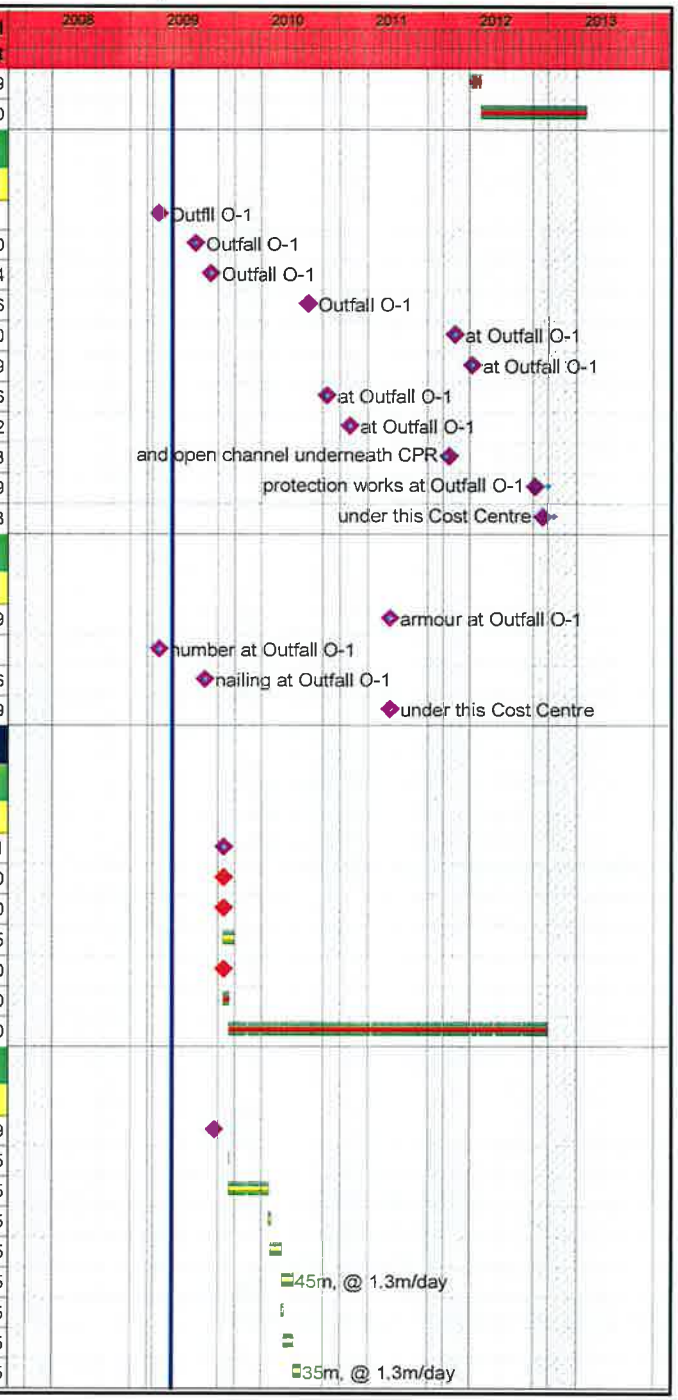
ID	Activity Description	D04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
10R1DO0606	Dismantle & removal of tower crane	12	12	17NOV12	30NOV12	28DEC12	11JAN13	1	-395
3AL1DO0602	Dismantle/remove TBM backup system	24	24	13JUN11	11JUL11	13JUN11	11JUL11	1	-219
3AL1DO0606	Construct portal head wall	24	24	09AUG11	05SEP11	09AUG11	05SEP11	1	-131
Cascade & Upper Part Box Culvert by Mining									
Upper Cascade									
10R1DO0704	Drive sheet piles	18	18	12JUL11	01AUG11	12JUL11	01AUG11	1	-219
10R1DO0706	Excavate & temp. support to services	60	60	02AUG11	13OCT11	02AUG11	13OCT11	1	-219
10R1DO0708	Construct base slab	24	24	14OCT11	10NOV11	14OCT11	10NOV11	1	-219
10R1DO0710	Construct side walls	18	18	11NOV11	01DEC11	11NOV11	01DEC11	1	-219
10R1DO0712	Construct roof	24	24	02DEC11	03JAN12	02DEC11	03JAN12	1	-219
10R1DO0714	Construct upstand	12	12	04JAN12	17JAN12	04JAN12	17JAN12	1	-219
10R1DO0716	Backfill	6	6	16JAN12	21JAN12	16JAN12	21JAN12	1	-219
10R1DO0730	Excavate for lower cascade construction	13	13	26JAN12	09FEB12	26JAN12	09FEB12	1	-219
10R1DO0732	Construct lower cascade	48	48	10FEB12	10APR12	10FEB12	10APR12	1	-219
10R1DO0734	Construct, baffle, railing etc.	48	48	10FEB12	10APR12	10FEB12	10APR12	1	-207
Seabed Protection Works									
Preliminary Works for Outfall Basin Construction									
VO061-002	Receive VO # 061	0	0		30JUN09*		30JUN09*	1	-395
VO061-004	Appoint Independent Hydrographic Surveyor	60	60	02JUL09	09SEP09	02JUL09	09SEP09	1	-395
VO061-006	Carry out sounding survey	6	6	10SEP09	16SEP09	08OCT09	14OCT09	1	-395
VO061-008	Prepare/submit drwgs./report of sounding survey	6	6	17SEP09	23SEP09	15OCT09	21OCT09	1	-395
VO061-010	SOR approves drwgs./report of sounding survey	6	6	24SEP09	30SEP09	22OCT09	29OCT09	1	-395
VO061-012	SOR issue Supplm. Environmental Review Report	30	30	02JUL09	05AUG09	02JUL09	05AUG09	1	-59
VO061-014	Apply for Variation Environmental Permit (VEP)	6	6	06AUG09	12AUG09	06AUG09	12AUG09	1	-59
VO061-016	EPD review/issue VEP	30	30	13AUG09	16SEP09	13AUG09	16SEP09	1	-59
VO061-018	Prepare/submit Revised EM&A Manual by ET	30	30	17SEP09	23OCT09	17SEP09	23OCT09	1	-59
VO061-020	IEC endorse Revised EM&A Manual	12	12	24OCT09	07NOV09	24OCT09	07NOV09	1	-59
VO061-022	EPD acknowledge Revised EM&A Manual	6	6	09NOV09	14NOV09	09NOV09	14NOV09	1	-59
VO061-024	Carry out baseline monitoring	28	28	16NOV09	17DEC09	16NOV09	17DEC09	1	-59
VO061-026	Prepare/submit baseline report by ET	12	12	18DEC09	04JAN10	18DEC09	04JAN10	1	-59
VO061-028	IEC endorse baseline report	12	12	05JAN10	18JAN10	05JAN10	18JAN10	1	-59
VO061-030	EPD approve baseline report	30	30	19JAN10	25FEB10	19JAN10	25FEB10	1	-59
VO061-032	Appoint sub-contractor for varied works	60	60	02JUL09	09SEP09	02JUL09	09SEP09	1	-377
VO061-034	Prepare/submit method statement	30	30	02OCT09	07NOV09	10SEP09	16OCT09	1	-395
VO061-036	IEC endorse method statement	12	12	09NOV09	21NOV09	17OCT09	31OCT09	1	-7
VO061-038	SOR approve method statement	24	24	23NOV09	19DEC09	02NOV09	28NOV09	1	-7
VO061-040	Apply for marine notice	6	6	09NOV09	14NOV09	30NOV09	05DEC09	1	-395
VO061-042	Revew/issue marine notice by Marine Department	30	30	16NOV09	19DEC09	07DEC09	13JAN10	1	-395
VO061-044	Apply for dumping permit	6	6	09NOV09	14NOV09	30NOV09	05DEC09	1	-37
VO061-046	Review/issue dumping permit by EPD	60	60	16NOV09	27JAN10	07DEC09	20FEB10	1	-37
VO061-048	Commence works for basin construction	0	0	15APR11		11MAY11		1	-395
VO #061; Outfall Basin Construction									
VO61-050	Excavation in rock armour to +2.3mPD	57	36	15APR11	25JUN11	11MAY11	22JUN11	1	-395



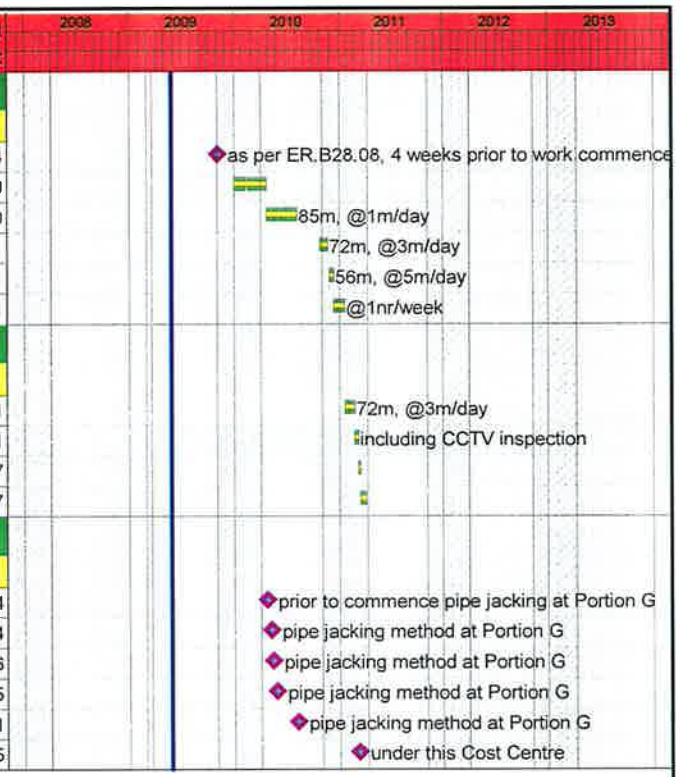
ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
VO61-055	Dredge in rock armour to -3.75mPD	51	36	27JUN11	25AUG11	23JUN11	04AUG11	1	-395
VO61-060	Place grade 400 rockfill & levelling layer	18	12	26AUG11	16SEP11	05AUG11	18AUG11	1	-395
VO61-065	Form seawall type 2(W)	15	15	17SEP11	06OCT11	12AUG11	29AUG11	1	-395
VO61-070	Construct detail Y	4	4	07OCT11	11OCT11	30AUG11	02SEP11	1	-395
VO61-075	Construct mass concrete	6	6	12OCT11	18OCT11	03SEP11	09SEP11	1	-395
VO61-080	Form seawall type 1	23	23	19OCT11	14NOV11	10SEP11	10OCT11	1	-395
VO61-085	Construct mass concrete	12	12	15NOV11	28NOV11	11OCT11	24OCT11	1	-395
VO61-090	Form seawall type 2 (E)	15	15	29NOV11	15DEC11	25OCT11	10NOV11	1	-395
VO61-095	Construct detail X	4	4	16DEC11	20DEC11	11NOV11	15NOV11	1	-395
VO61-100	Construct mass concrete	6	6	21DEC11	30DEC11	16NOV11	22NOV11	1	-395
VO61-105	Construct coping	14	14	02JAN12	17JAN12	23NOV11	08DEC11	1	-250
VO61-110	Place infill blocks M1 & M4	18	18	18JAN12	10FEB12	09DEC11	03JAN12	1	-250
VO61-115	Dredge in sea bed to -3.75mPD for seawall (W)	10	12	19OCT11	29OCT11	10SEP11	24SEP11	1	-345
VO61-120	Place grade 400 rockfill & levelling layer	12	12	31OCT11	12NOV11	26SEP11	11OCT11	1	-251
VO61-125	Form seawall type 5, 2B, 4 & 1A (W)	51	51	14NOV11	16JAN12	12OCT11	09DEC11	1	-251
VO61-130	Backfill sea walls west & north (half)	36	36	17JAN12	01MAR12	10DEC11	28JAN12	1	-251
VO61-135	Place type 2 armour	10	10	02MAR12	13MAR12	30JAN12	09FEB12	1	-251
VO61-140	Dredge in sea bed to -3.75mPD for seawall (E)	9	24	02JAN12	11JAN12	23NOV11	20DEC11	1	-395
VO61-145	Place grade 400 rockfill & levelling layer	12	12	12JAN12	28JAN12	21DEC11	07JAN12	1	-395
VO61-150	Form seawall type 6, 3 & 2A (E)	38	40	30JAN12	13MAR12	09JAN12	27FEB12	1	-395
VO61-155	Backfill sea walls east & north (half)	36	36	14MAR12	30APR12	28FEB12	13APR12	1	-287
VO61-160	Place type 2 armour	10	10	02MAY12	12MAY12	14APR12	25APR12	1	-287
VO61-165	Dredge in sea bed for stepped blocks	15	50	14MAR12	30MAR12	28FEB12	02MAY12	1	-395
VO61-170	Place levelling layer	175	224	31MAR12	02NOV12	13MAR12	11DEC12	1	-395
VO61-175	Place stepped blocks	175	224	19APR12	16NOV12	27MAR12	27DEC12	1	-395
VO61-180	Place type 2 armour to reinstate exist. seawall	24	24	14MAY12	09JUN12	26APR12	25MAY12	1	-287
VO61-185	Form ground beam (W)	12	12	11FEB12	24FEB12	04JAN12	17JAN12	1	-250
VO61-190	Form ground beam (E)	12	12	25FEB12	09MAR12	18JAN12	03FEB12	1	-244
VO61-195	Form invert slab (W)	12	12	25FEB12	09MAR12	18JAN12	03FEB12	1	-250
VO61-200	Form invert slab (E)	12	12	10MAR12	23MAR12	04FEB12	17FEB12	1	-244
VO61-205	Form end wall (W)	18	18	10MAR12	30MAR12	04FEB12	24FEB12	1	-250
VO61-210	Form end wall (E)	18	18	31MAR12	25APR12	25FEB12	16MAR12	1	-250
VO61-215	Reinstate rock armour	24	24	11JUN12	10JUL12	26MAY12	22JUN12	1	-287
VO61-220	Complete basin	0	0		16NOV12		27DEC12	1	-395
Remaining Works Prior to Handover									
10R1DO0904	Finishing & reinstatement works; Portion D	36	36	19OCT12	30NOV12	28NOV12	11JAN13	1	-395
10R1DO0906	Pre-handover inspections and remedial works	30	30	03NOV12	07DEC12	12DEC12	18JAN13	1	-395
10R1DO0908	Contractor serve notice for Works completion	7	7	08DEC12	14DEC12	19JAN13	25JAN13	2	0
10R1DO0910	SO issues completion certificate	21	21	15DEC12	04JAN13	26JAN13	15FEB13	2	0
16R7DO0902	Landscaping works at Portion D	120	120	11JUL12	30NOV12	18AUG12	11JAN13	1	-369
16R7DO0904	Establishment Works at Portion D	365	365	01DEC12	30NOV13	12JAN13	11JAN14	2	-455
3DL1DO0902	Install flow measurement devices at Outfall O-1	12	12	30MAR12	17APR12	30MAR12	17APR12	1	-219



ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish		Total Float
3DL1DO0903	T & C for flow measurement system	28	28	02APR12	10MAY12	02APR12	10MAY12	1	-219
3DL1DO0904	Maintain & monitor flow monitoring	365	365	11MAY12	10MAY13	11MAY12	10MAY13	2	0
Schedule of Milestones for Cost Centre No. 10R									
10R1DO1002	10R 1; On completion of 20% excavation works	0	0		09APR09A		09APR09A	2	
10R1DO1004	10R 2; On completion of 40% excavation works	0	0		13AUG09		13AUG09	2	1,600
10R1DO1006	10R 3; On completion of 60% excavation works	0	0		08OCT09		08OCT09	2	1,544
10R1DO1008	10R 4; On completion of 80% excavation works	0	0		11SEP10		11SEP10	2	1,206
10R1DO1010	10R 5; On completion all excavation works	0	0		09FEB12		09FEB12	2	690
10R1DO1012	10R 6; On completion of cascade structure	0	0		10APR12		10APR12	2	629
10R1DO1014	10R 7; On completion of spiral ramp to +16mPD	0	0		20NOV10		20NOV10	2	1,136
10R1DO1016	10R 8; On completion of spiral access ramp	0	0		02FEB11		02FEB11	2	1,062
10R1DO1018	10R 9; On completion box-culvert & open channel	0	0		17JAN12		03JAN12	2	713
10R1DO1020	10R 10; On completion of seabed protection wks	0	0		16NOV12		27DEC12	2	409
10R1DO1022	10R 11; On completion of all works under this CC	0	0		07DEC12		18JAN13	2	388
Schedule of Milestones for Cost Centre No. 14R									
14R5DO1102	14R 1; On complet. of remove exist. rock armour	0	0		25JUN11		22JUN11	2	919
14R5DO1104	14R 2; On complet. of 50% soil nailing by number	0	0		07APR09A		07APR09A	2	
14R5DO1106	14R 3; On completion all soiling works	0	0		16SEP09		16SEP09	2	1,566
14R5DO1108	14R 4; On completion of all works under this CC	0	0		25JUN11		22JUN11	2	919
Drainage Improvement Works at Portion G									
Preliminary Works									
01R6GG0102	SO consent Drainage Impact Assessment Report.	0	0		24NOV09		24NOV09	1	181
01R6GG0112	Obtain TTA (ingress & egress) approval	0	0		25NOV09		25NOV09	2	0
01R6GG0114	Possession of Portion G -700d of DOC	0	0	26NOV09		26NOV09		2	0
01R6GG0116	Site clearance/Site Establishment	30	30	26NOV09	02JAN10	26NOV09	02JAN10	1	165
3DL6GG0104	Obtain approval for Geotechnical Instrumentation	0	0		25NOV09		25NOV09	2	0
3DL6GG0106	Installation of Geotechnical Instrumentation	12	12	26NOV09	09DEC09	26NOV09	09DEC09	1	0
3DL6GG0108	Monitor/report Geotechnical Instrumentation	904	904	10DEC09	29DEC12	10DEC09	29DEC12	1	0
Piling Works									
15R6GG0200	Obtain SO's consent for temp. works design	0	0		17OCT09		17OCT09	1	209
15R6GG0202	Mibilization & set up for temp. platform	3	3	10DEC09	12DEC09	10DEC09	12DEC09	1	165
15R6GG0204	Construct steel working platform for H-piling	110	110	14DEC09	03MAY10	14DEC09	03MAY10	1	165
15R6GG0206	Mibilization & set up for H-piling; Wall 1	3	3	04MAY10	06MAY10	04MAY10	06MAY10	1	165
15R6GG0208	52 nos. 600mm dia. H-piles; Wall 1 @1.5 nr/day	35	35	07MAY10	18JUN10	07MAY10	18JUN10	1	165
15R6GG0210	Excavate & construct skin wall 1 at Portion G	35	35	19JUN10	30JUL10	19JUN10	30JUL10	1	165
15R6GG0212	Mibilization & set up for H-piling; Wall 2	3	3	19JUN10	22JUN10	19JUN10	22JUN10	1	165
15R6GG0214	40 nos. 600mm dia. H-piles; Wall 2 @1.5 nr/day	27	27	23JUN10	24JUL10	23JUN10	24JUL10	1	165
15R6GG0216	Excavate & construct skin wall 2 at Portion G	27	27	26JUL10	25AUG10	26JUL10	25AUG10	1	165



ID	Activity Description	AD04 Dur	WP3D Dur	AD04 Start	AD04 Finish	WP3D Start	WP3D Finish	Cal ID	Total Float
Drainage Improvement Works									
15R6GG0301	Obtain approval of ELS design package incl MS	0	0		02NOV09		02NOV09	2	284
15R6GG0302	Install ELS & construct shaft for pipe jacking	90	90	04JAN10	26APR10	04JAN10	26APR10	1	180
15R6GG0304	Construct 1.5m dia. drainage by pipe jacking	85	85	27APR10	07AUG10	27APR10	07AUG10	1	180
15R6GG0306	Construct 1.5m dia. drainage by open trenching	24	24	01NOV10*	27NOV10	01NOV10*	27NOV10	1	111
15R6GG0308	Construct .75m & 1.5m U and Stepped Channel	12	12	29NOV10	11DEC10	29NOV10	11DEC10	1	111
15R6GG0310	Construct 3 nos. manhole & 2 nos. catchpit	35	35	13DEC10	25JAN11	13DEC10	25JAN11	1	111
Remaining Works Prior to Handover to Client									
15R6GG0312	Reinstate carriageway & footway	24	24	26JAN11	25FEB11	26JAN11	25FEB11	1	111
15R6GG0402	Pre-handover inspections and remedial works	12	12	26FEB11	11MAR11	26FEB11	11MAR11	1	111
15R6GG0404	Contractor serve notice for Works completion	7	7	12MAR11	18MAR11	12MAR11	18MAR11	2	997
15R6GG0408	SO issues completion certificate	21	21	19MAR11	08APR11	19MAR11	08APR11	2	997
Schedule of Milestones for Cost Centre No. 15R									
15R6GG0502	15R 1; On completion of all temp. works	0	0		26APR10		26APR10	2	1,344
15R6GG0504	15R 2; On completion of 25% of pipejacking	0	0		06MAY10		06MAY10	2	1,334
15R6GG0506	15R 3; On completion of 50% of pipejacking	0	0		14MAY10		14MAY10	2	1,326
15R6GG0508	15R 4; On completion of 75% of pipejacking	0	0		25MAY10		25MAY10	2	1,315
15R6GG0510	15R 5; On completion of all pipejacking	0	0		07AUG10		07AUG10	2	1,241
15R6GG0512	15R 6; On completion of all wks under this CC	0	0		11MAR11		11MAR11	2	1,025



Appendix D

Implementation Status of Environmental Mitigation Measures

IMPLEMENTATION SCHEDULE April 2011

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	**Specific** 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.	DSD's Contractor	Construction Work Sites	Air Pollution Control (Construction Dust) Regulation	✓
	The dust suppression measures set out in the *Air Pollution Control (Construction Dust) Regulation*, 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 *Air Pollution Control (Construction Dust) Regulation*, the dust level is expected to be reduced by over 75%.				✓
	General To further ensure compliance with the guideline and AQO limit at the ASRs at all time, it is recommended to implement the *Air Pollution Control (Construction Dust) Regulation* 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.				
	• 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;				N/A
	• 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;				✓

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	• 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;	DSD's Contractor	Construction Work Sites	Air Pollution Control (Construction Dust) Regulation	✓
	• 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 scaled 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.				✓
Noise					
4.6.1	**During Construction** 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	DSD's Contractor	Construction Work Sites	PN 2/93 Noise from Construction Activities & EIAO	✓
	Good Site Practice 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:				
	• 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;				✓

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	• 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	✓
	• mobile plant should be sited as far away from NSRs as possible; and				✓
	• material stockpiles and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.				✓
	For Drill and Blast Works • Charge mass per delay should be decreased by minimising the number of blastholes firing on each delay.				N/A
	• Smaller blasthole patterns and longer delays should be used between dependent charges.				N/A
	• 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
	For TBM Tunnelling • 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	**During Operation** 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	DSD's Contractor	Project Area	NCO & EIAO	
	• only well-maintained plant should be operated on-site;				N/A
	• 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				N/A
	• plant known to emit noise strongly in one direction should, where possible, be orientated to direct noise away from the NSRs.				N/A
Water Quality					
5.9.1	**During Construction** Mitigation measures and a spill control and response plan have been prepared for works at the intakes and work sites.	DSD's Contractor	Construction Work Sites	Practice Note for Professional Persons with regard to site drainage (ProPECC PN 1/94) and WQO	✓
	Precautions to be taken at any time of year when rainstorms are likely: • 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.				✓
	Actions to be taken when a rainstorm is imminent or forecast: • Silt removal facilities, should be checked to ensure that they can function properly.				✓

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	• Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric.	DSD's Contractor	Construction Work Sites	WQO	✓
	• All temporary covers to slopes and stockpiles should be secured.				✓
	Actions to be taken during or after rainstorms: • Silt removal facilities should be checked and maintained to ensure satisfactory working conditions.				✓
	<u>Spill Control and Response Plan</u>				
	1 Prevention and Precaution Measures				
	General Precautions • No discharge of silty water into watercourses.				✓
	• All materials to be used during construction and operation shall be identified and their hazard potential evaluated.				✓
	• 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.				✓
	• Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials.				✓
	• 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.				✓
	• Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport				✓
	• Chemical waste containers shall be suitably labelled to notify and warn the personnel who are handling the wastes to avoid accidents.				✓
	• Storage areas shall be selected at safe locations on site and adequate space shall be allocated to the storage area.				✓
	• Prevent obstructions and tripping hazards.				✓
	Storage Precautions • All chemical storage containers shall be correctly labelled.				✓
	• Solid and impermeable enclosure walls or storage shelves shall be used.				✓
	• Only compatible chemical wastes shall be stored in the same storage area.				✓
	• The storage areas shall be inspected to detect any leakages or defective containers on a regular basis.				✓
	• Suitable notices warning of hazards, emergency response plans, telephone numbers etc shall be posted around the site, including storage areas.				✓
	• 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
	• Chemical waste containers shall be stored below eye level.				✓
5.9.1	• Adequate space for handling of the containers shall be provided	DSD's Contractor	Construction Work Sites	WQO	✓
	• 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.				✓
	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:				✓
	• Only trained personnel who are equipped with protective clothing and equipment shall be allowed to enter the spillage area for clean up.				✓
	• Spills shall be transferred appropriate back into containers using suitable equipment.				✓
	• Absorbent materials shall be used to clean up the spills and shall be disposed of as chemical wastes.				✓
	• Where appropriate suitable solvents may be used to clean the contaminated area after removal of all contaminated materials.				✓
	• 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.				✓
	Safety equipment includes but is not limited to: • Fire extinguishers.				✓
	• Spades, brushes, dustpan, mop and bucket (or similar readily available on site).				✓
	• Absorbent material such as dry sand, tissues and toweling (all materials readily available on-site).				✓
	• Containers including plaster bags, drums, etc.				✓
	• Absorbing materials.				✓
	• Pumps.				✓
	Personal protective equipment includes as appropriate: • First-aid kits.				✓
	• Safety helmet and goggles.				✓
	• 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
	• Protective boot and clothing.	DSD's Contractor	Construction Work Sites	WQO	✓
5.9.1	• Respirators and gas masks.				✓
	• Face visor and masks.				✓
5.9.2	**Emergency Responses to Spillages** 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.				
	The emergency plans should include the procedures for: • spill prevention and precaution;				✓
	• response actions; and				✓
	• spill clean up and disposal.				✓
	Spill prevention and precaution embraces good site practice and covers: • good housekeeping practices;				✓
	• chemical storage requirements; and				✓
	• chemical transfer and transport.				✓
5.9.3	**During Operation** 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.	DSD's Contractor	Project Area		N/A
Waste Management					
6.5.1	**During Construction** *Vegetation Removed from Site Clearance* 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.	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	✓
	Construction and Demolition Materials 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.				✓

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 317,936m3 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	✓
	Excavated Materials 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	✓
	Municipal Waste 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	*Waste Management Plan* 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	**Avoidance** 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.	DSD's Contractor	Construction Work Sites	EIAO	✓
	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.				✓
7.7.2	**Minimisation** 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.				
	Measures for Construction Runoff 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.				✓
	Good Construction Practice				✓
	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.	DSD's Contractor	Construction Work Sites	EIAO	✓
	Avoid any damage and disturbance, particularly those caused by filling and illegal dumping, to the remaining and surrounding natural stream habitats.				✓
	Regularly check the work site boundaries to ensure that they are not breached and that no damage occurs to surrounding areas.				✓
	Prohibit and prevent open fires within the site boundary during construction and provide temporary fire fighting equipment in the work areas.				✓
	Treat any damage that may have occurred to individual major trees in the adjacent area with surgery.				✓

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	**Compensation** 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.				N/A
	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.				N/A
	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.				N/A
	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.				N/A
	Provide armour rocks for the affected intertidal habitat in order to allow natural colonisation of intertidal organisms.				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 *EIAO-TM* 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	----	----	----	Valid
2 Jan 2008	Waste Disposal (Chemical Waste) (General) - Chemical Waste Producer	26 Feb 2008	----	5111-324-M2703-01	----	----	Valid
2 Jan 2008	Waste Disposal (Charges for Disposal of Construction Waste) Regulation - Billing Account	17 Jan 2008	----	7006574	----	----	Valid
10 Jan 2008	Notification Pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation	10 Jan 2008	001026901	----	----	----	Valid
25 Feb 2008	Water Discharge Licence – Outfall O-1	7 Aug 2008	001028154	----	EP760/323/012997I	7 Aug 2008 - 31 Aug 2013	Valid
18 Apr 2008	Water Discharge Licence – Intake I-1	19 Jun 2008	001029978	----	EP760/327/013315I	19 Jun 2008 - 30 Jun 2013	Valid
18 Apr 2008	Water Discharge Licence – Intake I-2	2 Jul 2008	001029959	----	EP760/321/013020I	2 Jul 2008 - 31 Jul 2013	Valid
18 Apr 2008	Water Discharge Licence – Intake I-3	5 Aug 2008	001029960	----	EP760/323/013324I	5 Aug 2008 - 31 Aug 2013	Valid
18 Apr 2008	Water Discharge Licence – Portion I	26 Jun 2008	001029974	----	EP760/350/013334I	26 Jun 2008 - 30 Jun 2013	Valid
23 Jul 2008	Water Discharge Licence – 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	Valid
2 Sep 2008	Variation of Environmental Permit	25 Sep 2008	VEP-271/2008	----	EP-275/2007/B	----	Valid
29 Apr 2009	Water Discharge Licence – Intake I-3 (Additional Discharge Point)	25 Mar 2010	305058	----	WT00005917-2010	25 Mar 2010 - 31 Mar 2015	Valid
5 Oct 2009	Further Environmental Permit	27 Oct 2009	FEP-096/2009	----	FEP-01/275/2007/B	----	Valid

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
13 Jul 2010	Application for Vessel Chits for Disposal of Construction Waste for Existing Account Holder (Billing Account)	23 Jul 2010	----	7011131	----	02 Oct 2010 - 30 Apr 2011	Expired
22 Jul 2010	Application for a Permit to Dump Material at Sea - Dredged / Excavated Sediment Requiring Type 1 - Open Sea Disposal	20 Sep 2010	319729	----	EP/MD/11-049	02 Oct 2010 - 01 Apr 2011	Expired
4 Sep 2010	Water Discharge Licence – Portion G	28 Oct 2010	321337	----	WT00007685-2010	28 Oct 2010 - 31 Oct 2015	Valid
8 Nov 2010	Construction Noise Permit - Intake 2	24 Nov 2010	323325	----	GW-RW0629-10	24 Nov 2010 - 14 May 2011	Valid
12 Nov 2010	Construction Noise Permit - Outfall (For Mining Works and Probe Drilling to 24hrs)	29 Nov 2010	323497	----	GW-RW0656-10	04 Dec 2010 - 03 Jun 2011	Canceled and Superseded by GW-RW0212-11
23 Nov 2010	Construction Noise Permit - Valve House (Near the Wonderland at Castle Peak Road, Ting Kau - Ventailation Fan)	23 Nov 2010	323886	----	GW-RW0652-10	26 Nov 2010 - 25 May 2011	Valid
1 Dec 2010	Construction Noise Permit - Chai Wan Kok - Valve House (Group A + B)	9 Dec 2010	324176	----	GW-RW0680-10	27 Dec 2010 - 26 Jun 2011	Valid
1 Dec 2010	Construction Noise Permit - Intake I-1	13 Dec 2010	234178	----	GW-RW0701-10	13 Dec 2010 - 03 Jun 2011	Valid
1 Dec 2010	Construction Noise Permit - Intake I-3	9 Dec 2010	234179	----	GW-RW0682-10	09 Dec 2010 - 02 Jun 2011	Canceled and Superseded by GW-RW0254-11
15 Dec 2010	Water Discharge Licence – Outfall O-1 (Additional Discharge Point)	----	----	----	----	----	Submission made on 15 Dec 2010 and acknowledge received by EPD on 15 Dec 2010.
12 Jan 2011	Construction Noise Permit - Portion G - (Water Pump)	27 Jan 2011	325763	----	GW-RW0049-11	09 Feb 2011 - 08 Aug 2011	Valid
1 Mar 2011	Application for a Permit to Dump Material at Sea - Dredged / Excavated Sediment Requiring Type 1 - Open Sea Disposal	16 Mar 2011	----	----	EP/MD/11-156	02 Apr 2011 - 01 Oct 2011	Valid

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
15 Mar 2011	Construction Noise Permit - Intake 2	29 Mar 2011	327938	----	GW-RW0219-11	15 May 2011 - 14 Nov 2011	To be effective on 15 May 2011
18 Mar 2011	Construction Noise Permit - Outfall (For Mining Works and Probe Drilling to 24hrs, Additional AquaSeq added)	29 Mar 2011	328153	----	GW-RW0212-11	30 Apr 2011 - 29 Oct 2011	Valid
30 Mar 2011	Application for Vessel Chits for Disposal of Construction Waste for Existing Account Holder (Billing Account)	21 Apr 2011	----	7011131	----	21 Apr 2011 - 30 Sep 2011	Valid
31 Mar 2011	Construction Noise Permit - Intake I-3	15 Apr 2011	328636	----	GW-RW0254-11	18 Apr 2011 - 07 Oct 2011	Valid
8 Apr 2011	Construction Noise Permit - Intake I-1	20 Apr 2011	328892	----	GW-RW0279-11	04 Jun 2011 - 02 Dec 2011	To be effective on 04 Jun 2011

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 (ASR 1)
Calibration Date: 17-Mar-11
Calibration Due Date 16-May-11
Time: 08:00

Sampler Model:	BM2000HX
Serial No.:	4994
Calibrator Orifice no.:	1785
Slope (m):	2.01637
Intercept (b):	-0.02316
Correction coeff. (r)	0.99996

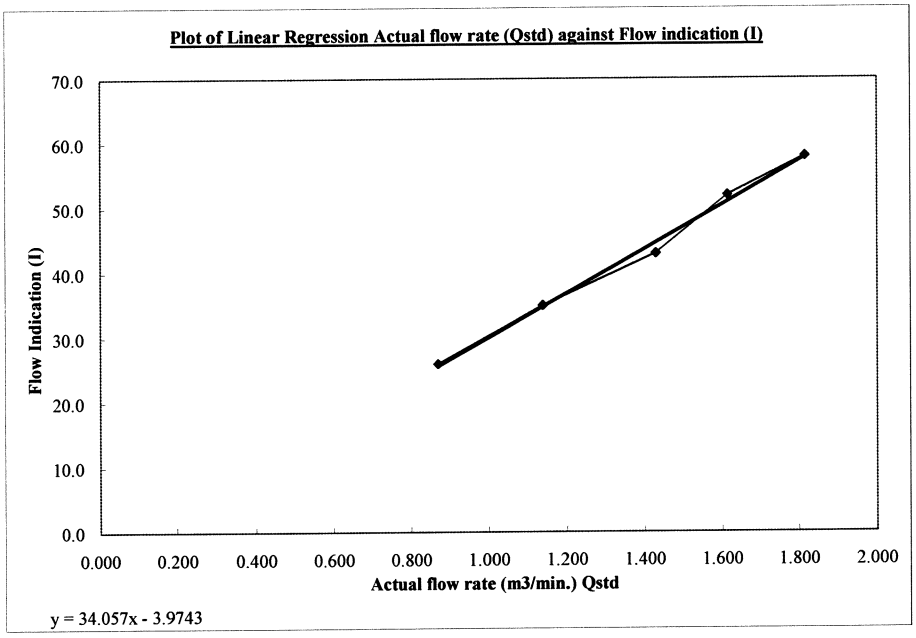
$$Flow(corrected) = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

Standard pressure (mmHg) Pstd:	763.9
Standard temp. (K) Tstd:	290.8
Calibration pressure (mmHg) Pa:	766.3
Calibration temp. (K) Ta:	289.2

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

Sample no.	Pressure Drop (H), inch	Flow (corrcted), m^3/min	Actual flow rate (Qstd), m^3/min	Flow indication (I), arbitrary
1	12.8	3.637	1.815	58.0
2	10.1	3.231	1.614	52.0
3	7.9	2.858	1.429	43.0
4	5.0	2.273	1.139	35.0
5	2.9	1.731	0.870	26.0

Correlation Coefficient : 0.9969



Remark
1HPa = 0.750062 mmHg

Calibrated by: Arthur Chiu ( ) **Date:** 17/3/2011

Checked by: F.C. Tsang ( ) **Date:** 17/3/2011

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Heng Hoi Chi Hong Ship Temple (ASR 3)
Calibration Date: 17-Mar-11
Calibration Due Date 16-May-11
Time: 08:15

Sampler Model:	BM2000HX
Serial No.:	5875
Calibrator Orifice no.:	1785
Slope (m):	2.01637
Intercept (b):	-0.02316
Correction coeff. (r)	0.99996

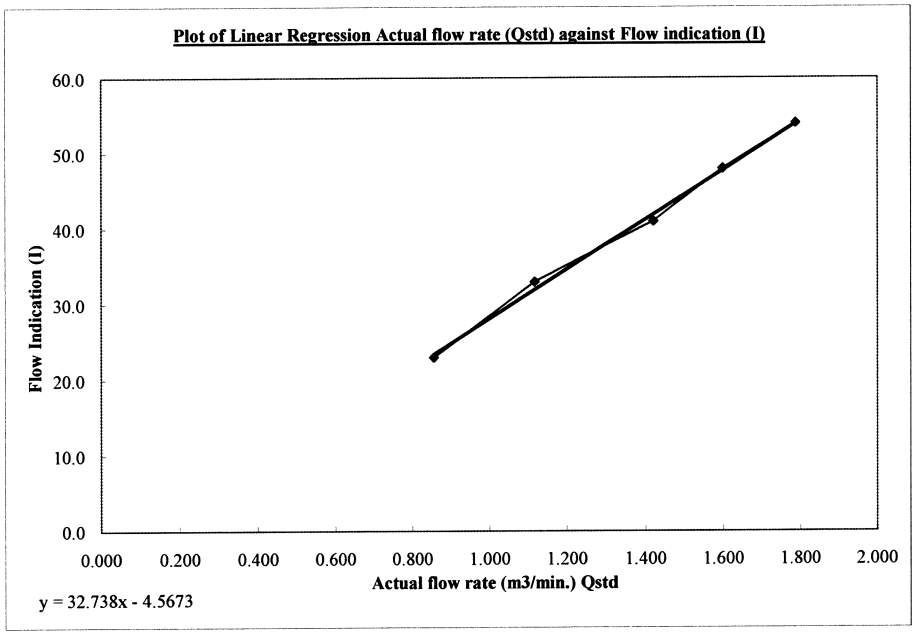
$$Flow(corrected) = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

Standard pressure (mmHg) Pstd:	763.9
Standard temp. (K) Tstd:	290.8
Calibration pressure (mmHg) Pa:	766.3
Calibration temp. (K) Ta:	289.2

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

Sample no.	Pressure Drop (H), inch	Flow (corrcted), m^3/min	Actual flow rate (Qstd), m^3/min	Flow indication (I), arbitrary
1	12.4	3.580	1.787	54.0
2	9.9	3.199	1.598	48.0
3	7.8	2.839	1.420	41.0
4	4.8	2.227	1.116	33.0
5	2.8	1.701	0.855	23.0

Correlation Coefficient : 0.9982



Remark
1HPa = 0.750062 mmHg

Calibrated by: **Arthur Chiu** ( ) **Date:** 17/3/2011

Checked by: **F.C. Tsang** ( ) **Date:** 17/3/2011

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Long Beach Gardan (ASR 8)
Calibration Date: 17-Mar-11
Calibration Due Date 16-May-11
Time: 08:30

Sampler Model:	TE5005X
Serial No.:	1059
Calibrator Orifice no.:	1785
Slope (m):	2.01637
Intercept (b):	-0.02316
Correction coeff. (r)	0.99996

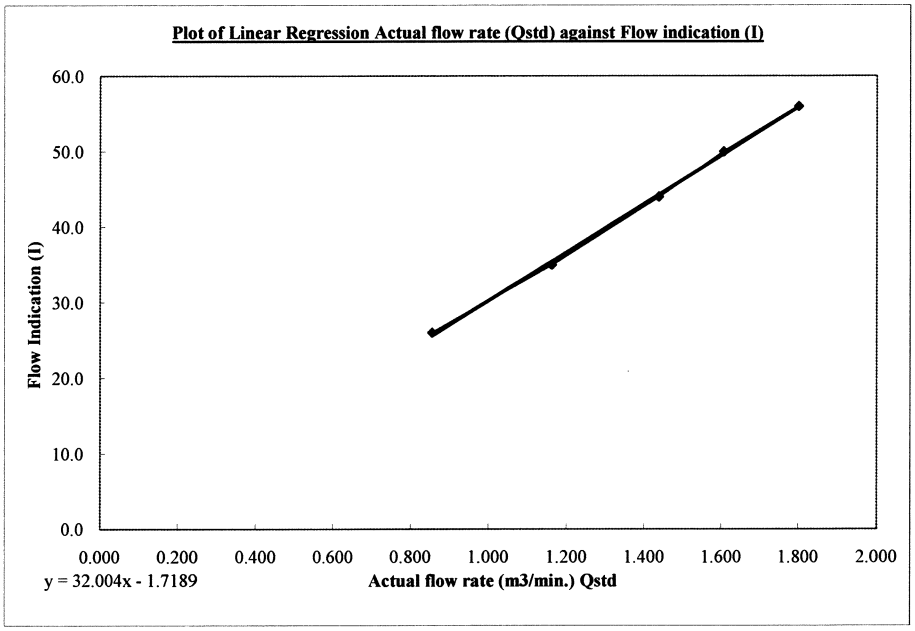
$$Flow(corrected) = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

Standard pressure (mmHg) Pstd:	763.9
Standard temp. (K) Tstd:	290.8
Calibration pressure (mmHg) Pa:	766.3
Calibration temp. (K) Ta:	289.2

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

Sample no.	Pressure Drop (H), inch	Flow (corrcted), m^3/min	Actual flow rate (Qstd), m^3/min	Flow indication (I), arbitrary
1	12.6	3.609	1.801	56.0
2	10.0	3.215	1.606	50.0
3	8.0	2.876	1.438	44.0
4	5.2	2.318	1.161	35.0
5	2.8	1.701	0.855	26.0

Correlation Coefficient : 0.9995



Remark
1HPa = 0.750062 mmHg

Calibrated by: **Arthur Chiu** ( ) **Date:** 17/3/2011

Checked by: **F.C. Tsang** ( ) **Date:** 17/3/2011

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Greenview Terrance (ASR 9)
Calibration Date: 17-Mar-11
Calibration Due Date 16-May-11
Time: 08:45

Sampler Model:	TE5005X
Serial No.:	1713
Calibrator Orifice no.:	1785
Slope (m):	2.01637
Intercept (b):	-0.02316
Correction coeff. (r)	0.99996

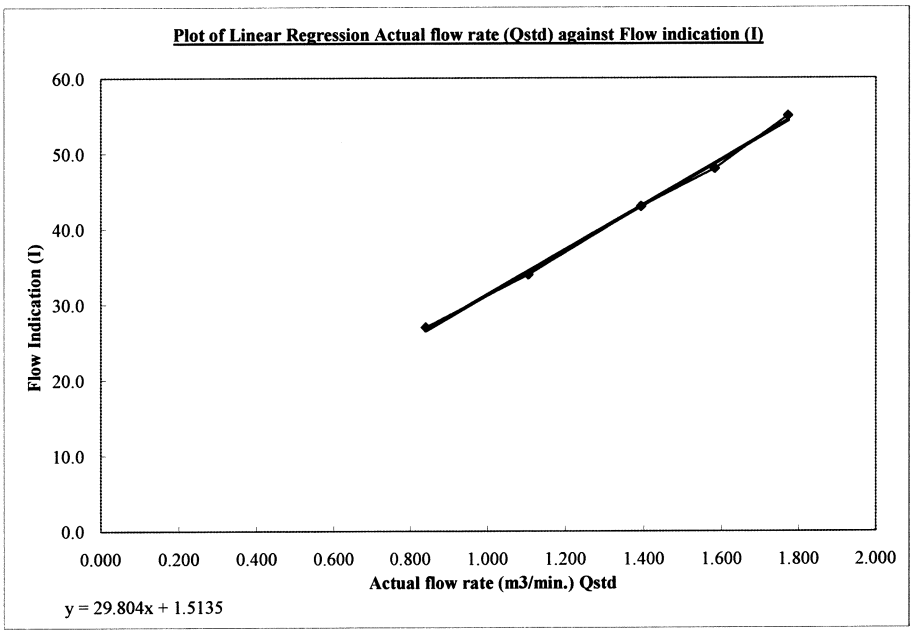
$$Flow(corrected) = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

Standard pressure (mmHg) Pstd:	763.9
Standard temp. (K) Tstd:	290.8
Calibration pressure (mmHg) Pa:	766.3
Calibration temp. (K) Ta:	289.2

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

Sample no.	Pressure Drop (H), inch	Flow (corrcted), m^3/min	Actual flow rate (Qstd), m^3/min	Flow indication (I), arbitrary
1	12.2	3.551	1.773	55.0
2	9.7	3.166	1.582	48.0
3	7.5	2.784	1.392	43.0
4	4.7	2.204	1.105	34.0
5	2.7	1.671	0.840	27.0

Correlation Coefficient : 0.9987



Remark
1HPa = 0.750062 mmHg

Calibrated by: **Arthur Chiu** ( ) **Date:** 17/3/2011

Checked by: **F.C. Tsang** ( ) **Date:** 17/3/2011

TISCH ENVIROMENTAL, INC.
145 SOUTH MIAMI AVE.
VILLAGE OF CLEVES, OH 45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 10, 2010 Rootsmeter S/N 9833620 Ta (K) - 296
Operator Tisch Orifice I.D. - 1785 Pa (mm) - 750.57

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3960	3.2	2.00
2	NA	NA	1.00	0.9840	6.4	4.00
3	NA	NA	1.00	0.8790	7.9	5.00
4	NA	NA	1.00	0.8390	8.7	5.50
5	NA	NA	1.00	0.6940	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9900	0.7092	1.4102	0.9957	0.7133	0.8881
0.9858	1.0018	1.9943	0.9915	1.0076	1.2560
0.9837	1.1191	2.2296	0.9894	1.1256	1.4042
0.9827	1.1713	2.3385	0.9884	1.1781	1.4728
0.9774	1.4084	2.8203	0.9830	1.4165	1.7762

Qstd slope (m) =	2.01637	Qa slope (m) =	1.26262
intercept (b) =	-0.02316	intercept (b) =	-0.01458
coefficient (r) =	0.99996	coefficient (r) =	0.99996

y axis = SQRT[H2O(Pa/760)(298/Ta)] y axis = SQRT[H2O(Ta/Pa)]

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

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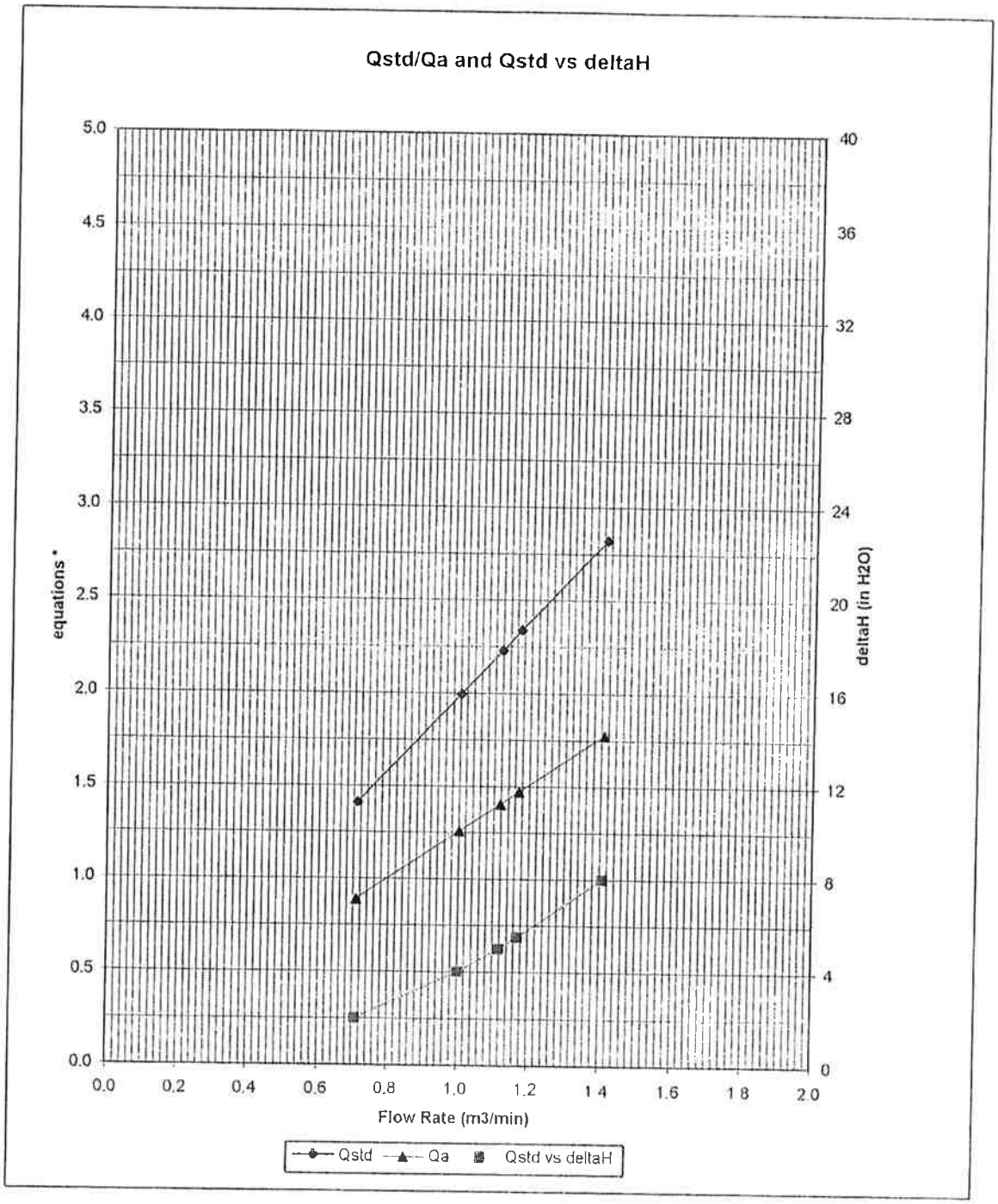
AIR POLLUTION MONITORING EQUIPMENT



*** y-axis equations:**

Qstd series: $\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$

Qa series: $\sqrt{(\Delta H\ (Ta\ /\ Pa))}$

#1785

輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C102904

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00410224

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C102904.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road,
Hong Kong

Date of Issue : 31 May 2010

Certified by : K C Lee

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 8956 E-mail: call@sun-creation.com Website: www.sun-creation.com

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C106297

Certificate of Calibration

This is to certify that the equipment

Description : Integrating Sound Level Meter

Manufacturer : Bruel & Kjaer

Model No. : 2238

Serial No. : 2448529

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C106297.

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 : 16 November 2010

Certified by : K C Lee

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

Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. **07436**

Customer : Hyder Consulting Limited

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

Order No. : Q02884 **Date of receipt :** 28-Dec-10

Item Tested

Description : Sound Level Meter

Manufacturer : B&K

Model : 2238 **Serial No. :** 2562782

Test Conditions

Date of Test : 29-Dec-10 **Supply Voltage :** --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: Z01.

Test Results

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

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

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S017A	Multi-Function Generator	07279	SCL-HKSAR
S024	Sound Level Calibrator	04062	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 : Dorothy Cheuk

Date: 30-Dec-10

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

Results :

1. SPL Accuracy

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Range	Freq. Wgt.	Bandwith	Center Freq.		
20 ~ 100	A	BB/F	--	94.0	94.1
	A	BB/S	--		94.1
	C	BB/F	--		94.0
40 ~ 120	A	BB/F	--	94.0	94.1
	A	BB/F	--	114.0	113.9

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)
140	114.0	114.3	+0.2	± 0.7 dB
130	104.0	104.3	+0.2	
120	94.0	94.1 (Ref.)	- -	
110	84.0	83.9	-0.2	
100	74.0	73.9	-0.2	
90	64.0	63.9	-0.2	
80	54.0	54.2	+0.1	

Uncertainty : ± 0.1 dB

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Calibration Certificate

3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	83.9	-0.2	± 0.4 dB
	94.0	94.1 (Ref.)	- -	
	95.0	95.1	0.0	± 0.2 dB

Uncertainty : ± 0.1 dB

4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	-40.0	- 39.4 dB, ± 1.5 dB
63 Hz	-26.7	- 26.2 dB, ± 1.5 dB
125 Hz	-16.6	- 16.1 dB, ± 1 dB
250 Hz	-9.1	- 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	+1.5	+ 1.2 dB, ± 1 dB
4 kHz	+1.3	+ 1.0 dB, ± 1 dB
8 kHz	-0.7	- 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	--
1/10	40.0	39.9	± 0.5 dB
$1/10^2$	40.0	40.0	
$1/10^3$	40.0	40.5	± 1.0 dB
$1/10^4$	40.0	41.0	

Uncertainty : ± 0.1 dB

Remarks : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric pressure : 1 012 hPa.

---------- END ----------

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Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. **07437**

Customer : Hyder Consulting Limited

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

Order No. : Q02884 **Date of receipt :** 28-Dec-10

Item Tested

Description : Sound Level Calibrator

Manufacturer : B&K

Model : Type 4231 **Serial No. :** 2699361

Test Conditions

Date of Test : 29-Dec-10 **Supply Voltage :** --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : F21, Z02.

Test Results

All results were within the IEC 942 Class 1 specification.

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

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S014	Spectrum Analyzer	03926	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	04062	NIM-PRC & SCL-HKSAR
S041	Universal Counter	04461	SCL-HKSAR
S206	Sound Level Meter	04462	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 : Dorothy Cheuk

Date: 30-Dec-10

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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Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. 07437

Results :

1. Level Accuracy

UUT Nominal Value (dB)	Measured Value (dB)	IEC 942 Class 1 Spec.
94	94.02	± 0.3 dB
114	114.10	

Uncertainty : ± 0.1 dB

2. Frequency

UUT Nominal Value	Measured Value	IEC 942 Class 1 Spec.
1 kHz	1.000 kHz	± 2 %

Uncertainty : $\pm 3.6 \times 10^{-6}$

3. Level Stability : 0.0 dB
IEC 942 Class 1 Spec. : ± 0.1 dB
Uncertainty : ± 0.01 dB

4. Total Harmonic Distortion : < 0.5 %
IEC 942 Class 1 Spec. : < 3 %
Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test
2. The above measured values are the mean of 3 measurement.
3. The uncertainty claimed is for a confidence probability of not less than 95%.
4. Atmospheric Pressure : 1012 hPa.

---------- END ----------

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CERTIFICATE OF ANALYSIS

Work Order: HK1104774
Date of Issue: 02/03/2011
Client: HYDER CONSULTING LIMITED
Client Reference:

Calibration of Mulitimeter

Item : Mulitimeter
ALS Lab ID: HK1104774 -001
Date of Calibration: 01 March 2011

Model No.: WTW pH/Oxi 340i
Serial No.: 08101283

Testing Results :

pH

Expected Reading	Recording Reading
4.00	4.10
7.00	7.10
10.0	10.18
Allowing Deviation	± 0.2 unit

Testing Method:

APHA (20th edition), 4500-H^+B

Temperature

Expected Reading	Recording Reading
17.0 °C	16.5 °C
21.0 °C	20.5 °C
34.5 °C	34.3 °C
Allowing Deviation	±2.0°C

Testing Method:

In-House Method

Dissolved Oxygen

Expected Reading	Recording Reading
7.92 mg/L	8.08 mg/L
8.62 mg/L	8.71 mg/L
9.26 mg/L	9.36 mg/L
Allowing Deviation	± 0.2 mg/L

Testing Method:

APHA (20th edition), 4500-OC & G

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd
ALS Environmental

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1106728
Date of Issue: 22/03/2011
Client: HYDER CONSULTING LIMITED

Description: Turbidimeter
Brand Name: Eutech Instruments
Model No.: TN-100
Serial No.: 215619
Equipment No.: N/A
Date of Calibration: 22 March, 2011 Date of next Calibration: 22 June, 2011

Parameters:

Turbidity

Method Ref: ALPHA 21st Ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.19	--
4	3.99	-0.2%
40	37.8	-5.5%
80	74.2	-7.3%
400	419	4.8%
800	744	-7.0%
	Tolerance Limit (±%)	10.0

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

Appendix G

Monitoring Locations

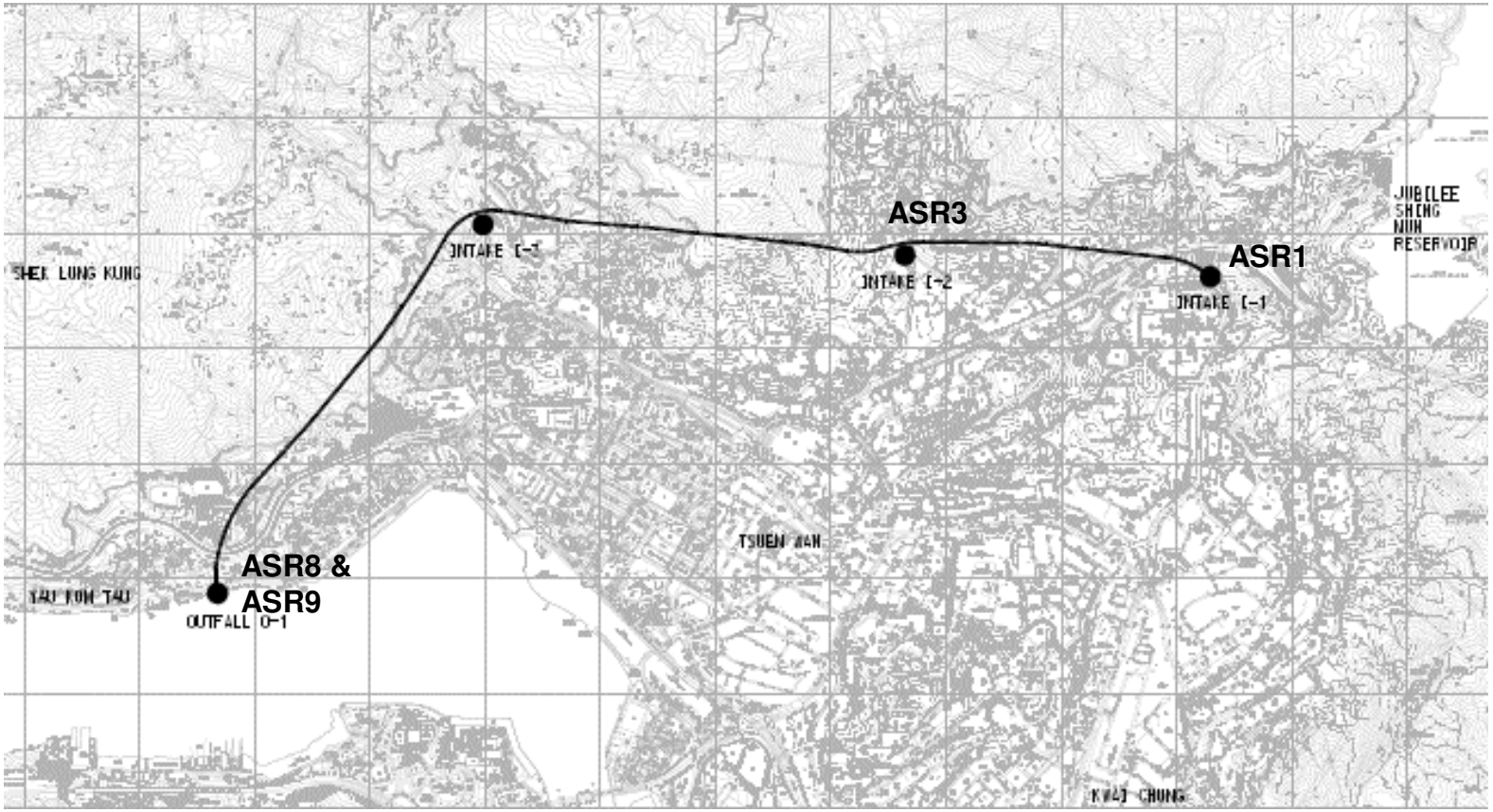


Figure 1 **Air Quality Monitoring Stations**

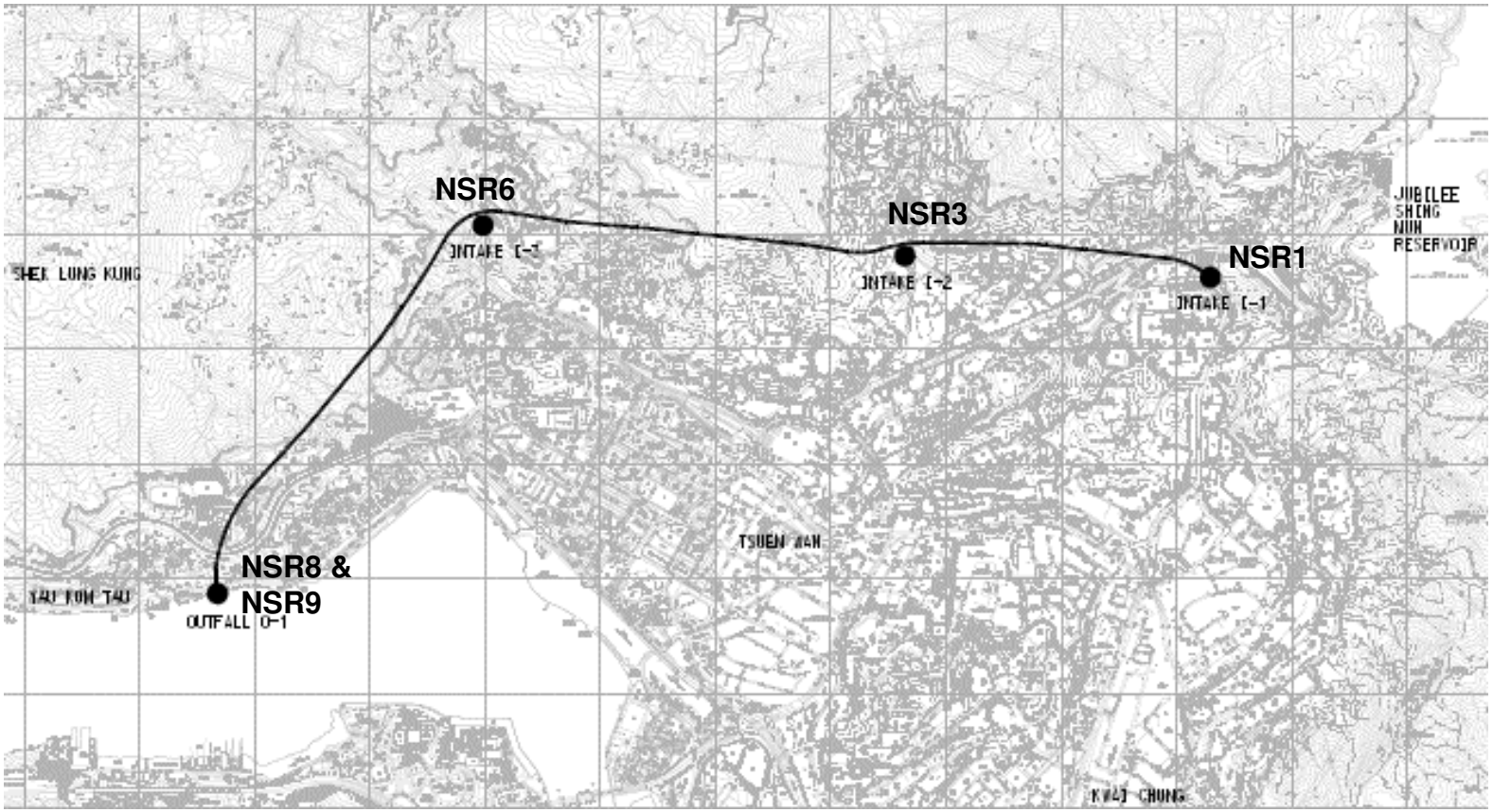


Figure 2 Noise Monitoring Stations

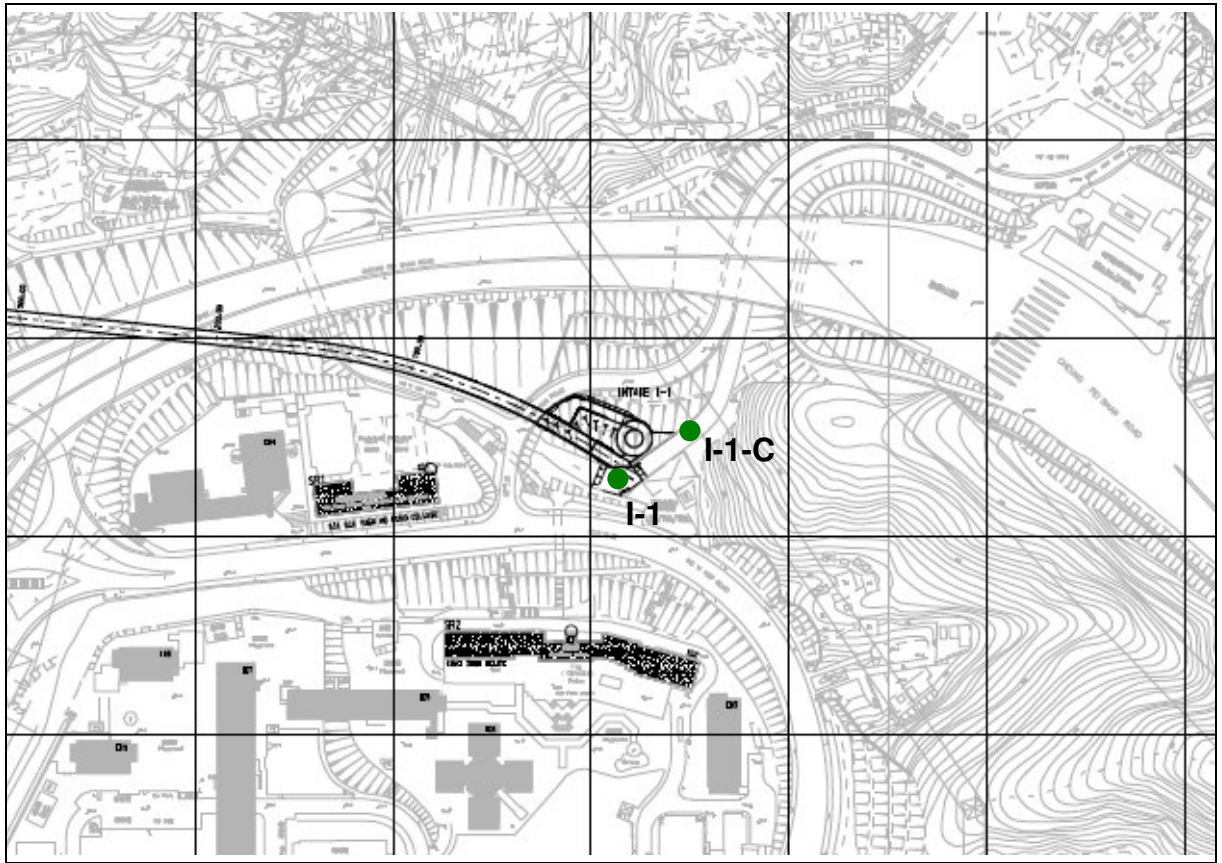


Figure 3 **Water Quality Monitoring Stations: I-1 & I-1-C at Intake I-1**

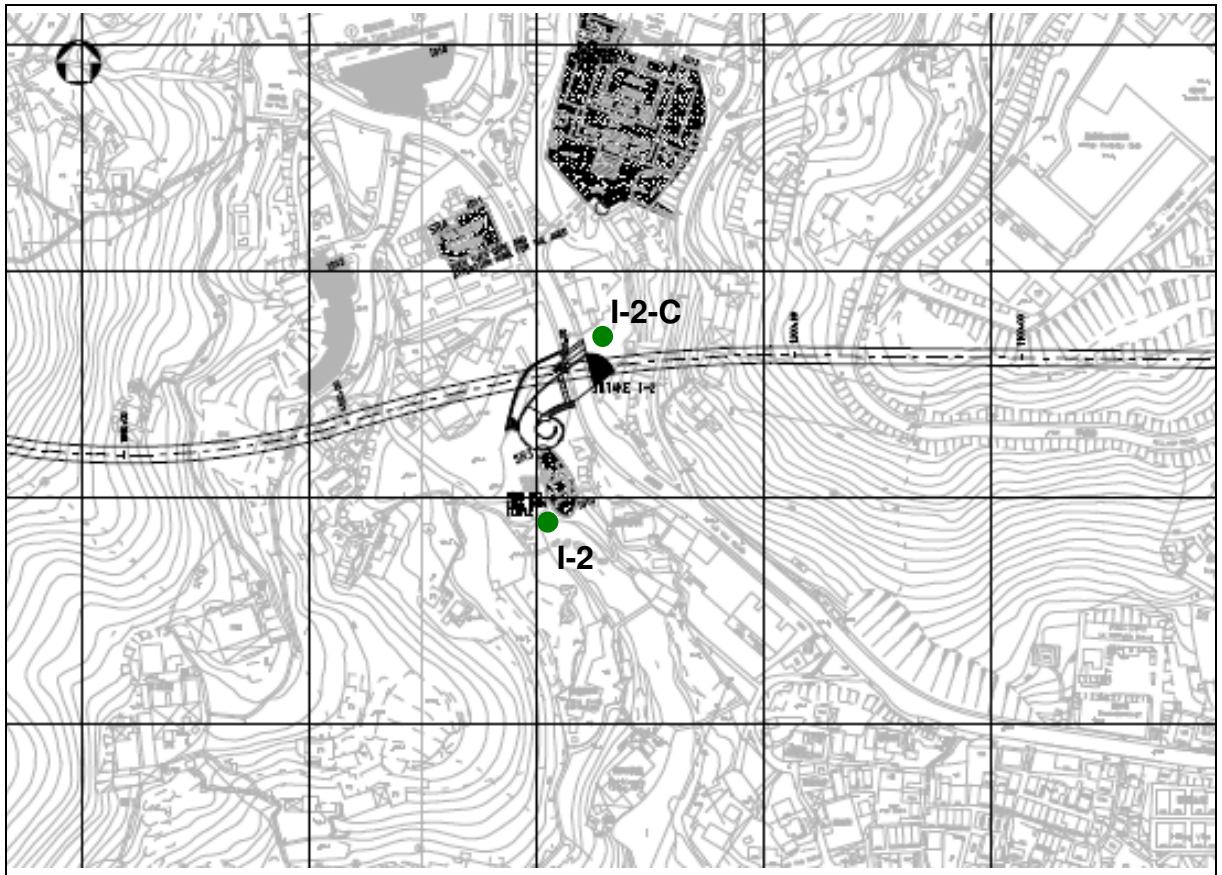


Figure 4 Water Quality Monitoring Stations: I-2 & I-2-C at Intake I-2

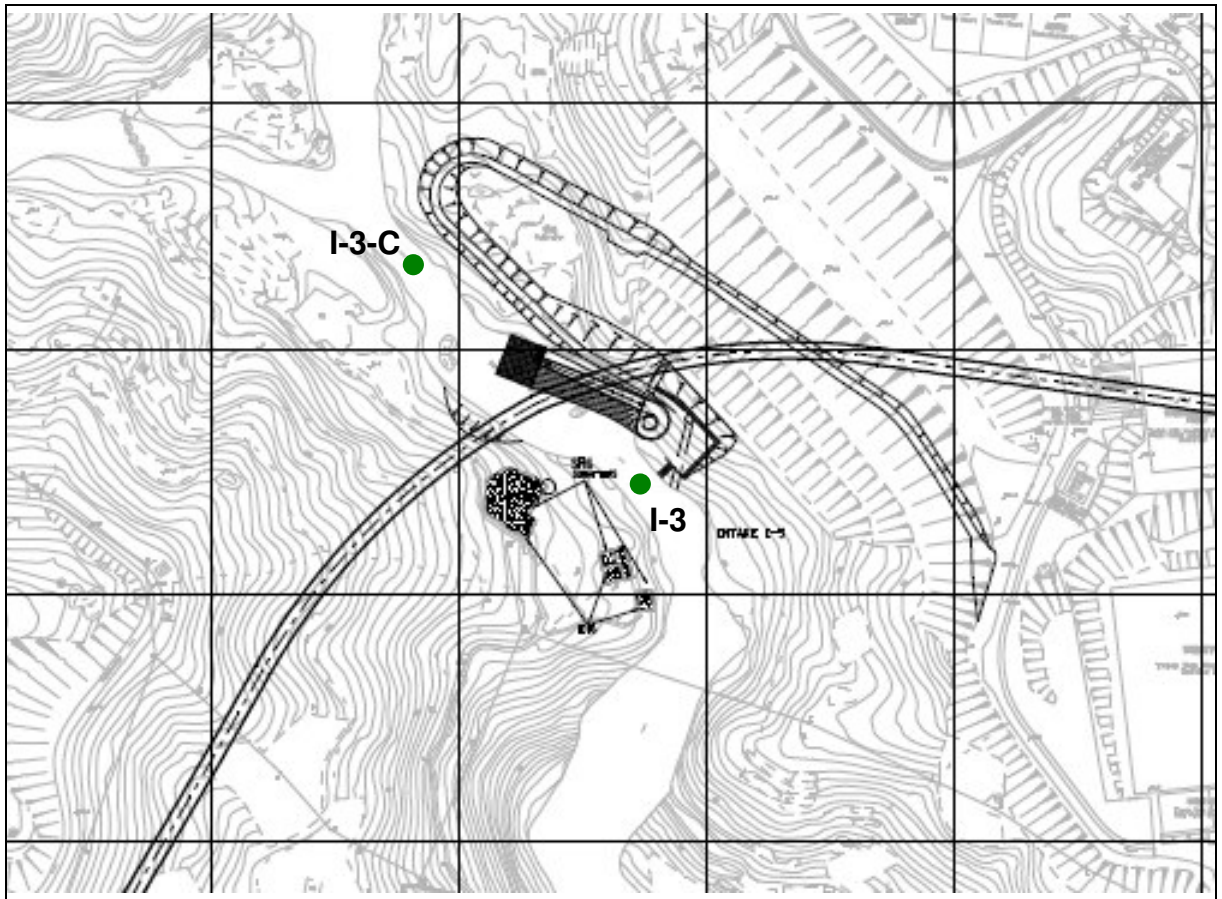


Figure 5 Water Quality Monitoring Stations: I-3 & I-3-C at Intake I-3

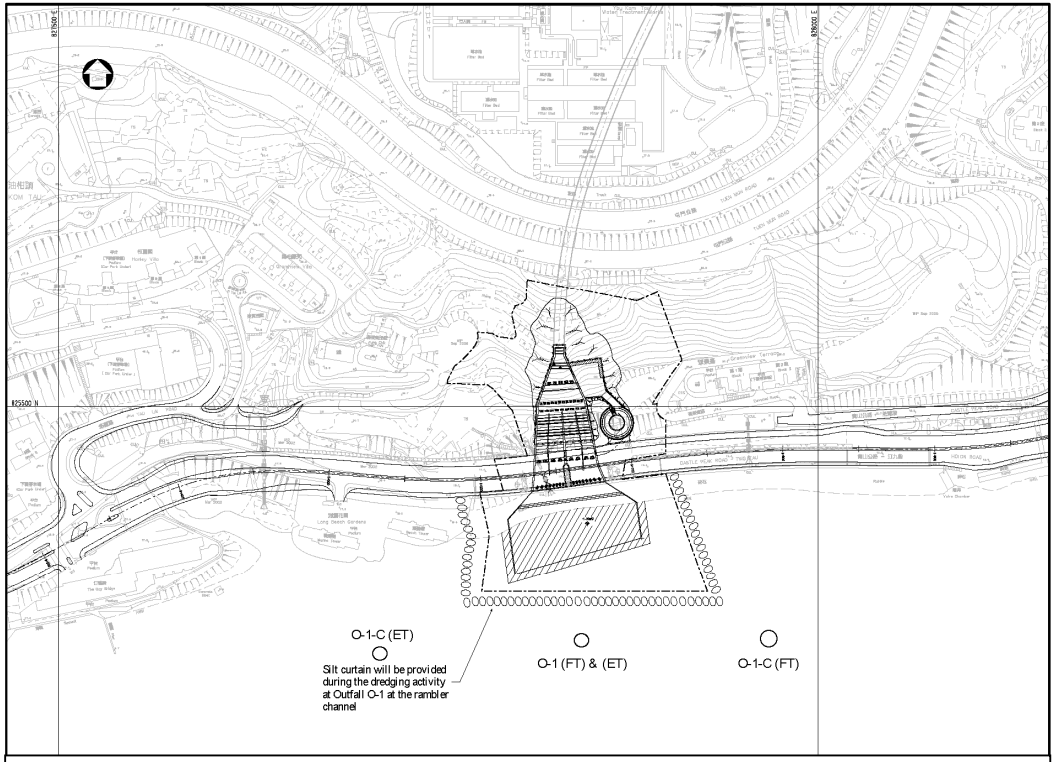


Figure 6 Water Quality Monitoring Stations: O-1 (FT) & (ET), O-1-C(FT) & O-1-C(FT) at Outfall O-1

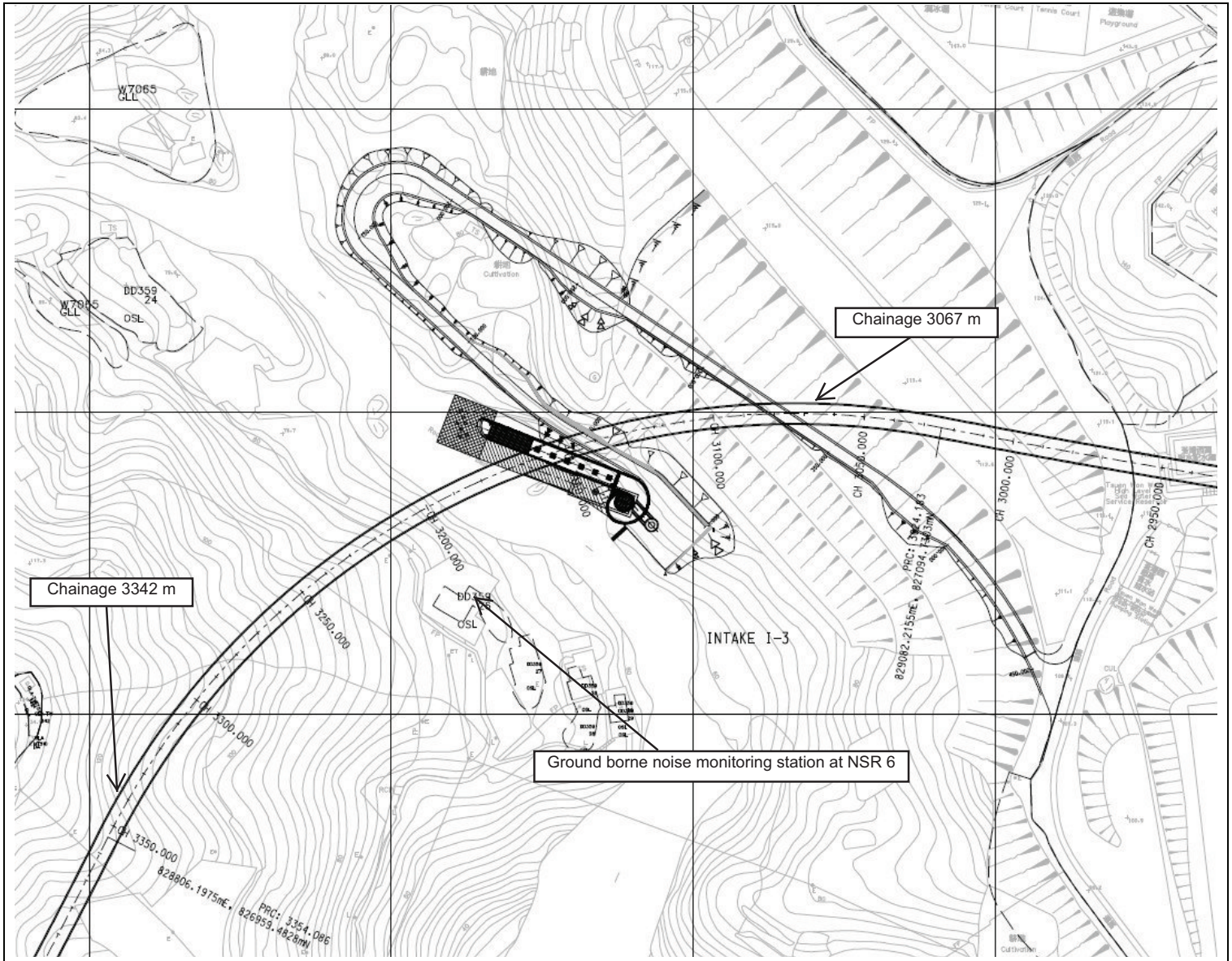


Figure 7 Ground borne noise monitoring station at NSR 6

Appendix H

EM&A Schedule

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

Impact Monitoring Programme – April 11

Date		Air	Noise	Water	Ground Borne Noise
01-Apr-11	Fri			✓	
02-Apr-11	Sat				
03-Apr-11	Sun				
04-Apr-11	Mon	✓	✓	✓	✓ **(NSR 6)**
05-Apr-11	Tue				
06-Apr-11	Wed			✓	
07-Apr-11	Thu				
08-Apr-11	Fri	✓		✓	
09-Apr-11	Sat				
10-Apr-11	Sun				
11-Apr-11	Mon			✓	
12-Apr-11	Tue				
13-Apr-11	Wed			✓	
14-Apr-11	Thu	✓	✓		✓ **(NSR 6)**
15-Apr-11	Fri			✓	
16-Apr-11	Sat				
17-Apr-11	Sun				
18-Apr-11	Mon			✓	
19-Apr-11	Tue				
20-Apr-11	Wed	✓	✓	✓	
21-Apr-11	Thu				
22-Apr-11	Fri				
23-Apr-11	Sat				
24-Apr-11	Sun				
25-Apr-11	Mon				
26-Apr-11	Tue	✓	✓	✓	
27-Apr-11	Wed				
28-Apr-11	Thu			✓	
29-Apr-11	Fri	✓			
30-Apr-11	Sat			✓	

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)
Ground borne Nose – Ground borne noise measurements is undertaken once every week at (0700-1900 Monday to Saturday) from chainage 3067m to 3042 m at NSR 6 and from 1224m to 1477m at NSR 3
Water –Water quality monitoring is undertaken three times per week

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

Impact Monitoring Programme – May 11 (Tentative)

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

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

Impact Monitoring Programme – June 11 (Tentative)

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

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 quality monitoring is undertaken three times per week

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

Impact Monitoring Programme – July 11 (Tentative)

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

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 quality monitoring 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)

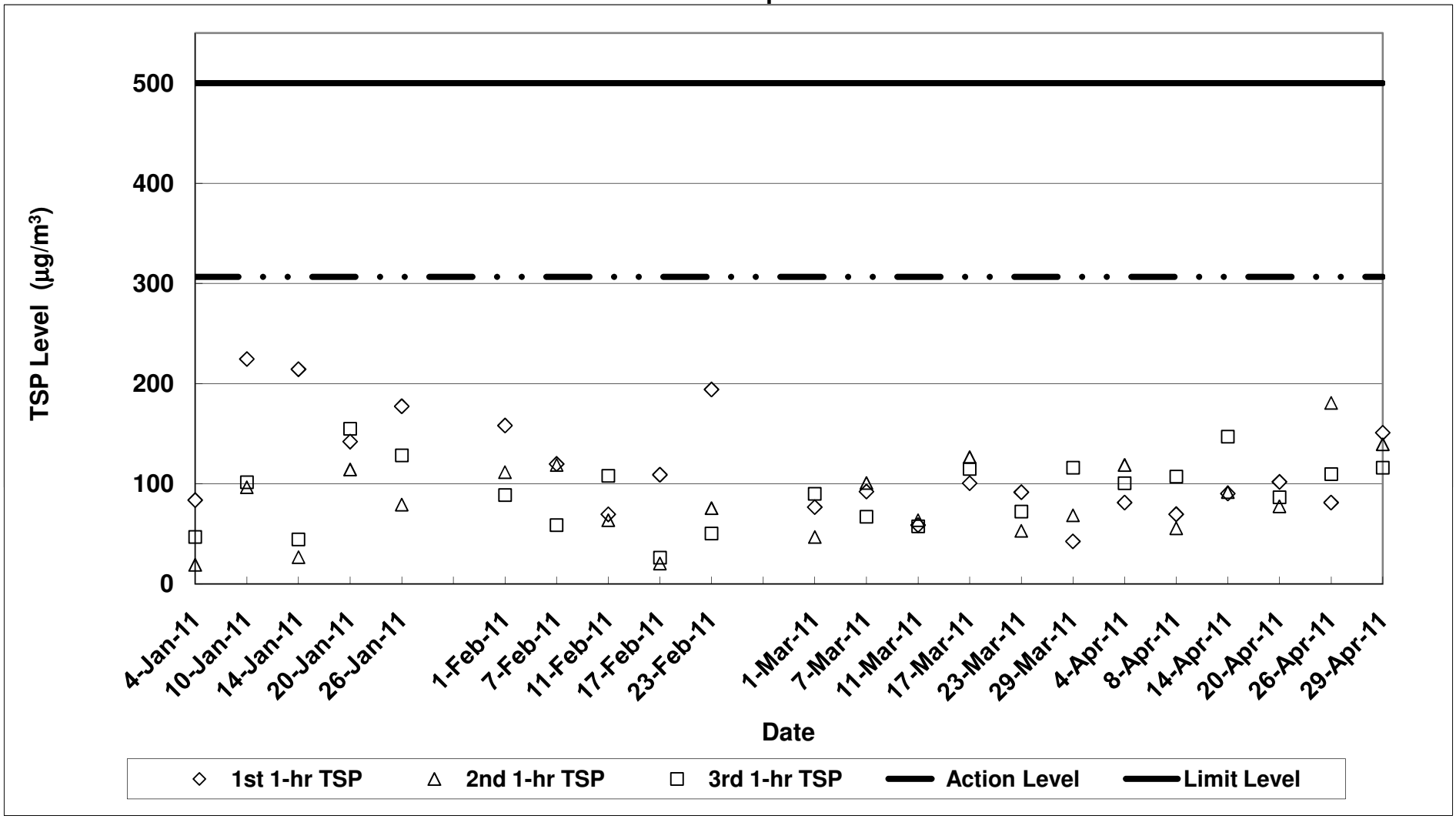
Location	Monitoring Date	Weather Conditions	Wind Speed with Direction (m/s)	Temp (ºC)	Timer-I	Timer-F	Time (mins)	Flow-I (CFM)	Flow-F (CFM)	Flow-I (m^3/min)	Flow-F (m^3/min)	Flow-avg (m^3/min)	Volume (m^3)	Weight-I (g)	Weight-f (g)	Weight-diff. (g)	1-hr TSP (μg/m^3)	Average 1-Hr TSP (μg/m^3)	Action/Limit Levels (μg/m^3)	Observation / Site Condition	Remark
Sik Sik Yuen Ho Fung College - Intake (ASR1)	04-Apr-11	Cloudy	0.3E	19	611542	611642	60.0	40	40	1.29	1.29	1.29	77.47	2.8460	2.8523	0.0063	81.3	100.3	306.6/500	Concrete works	Traffic
		Cloudy	0.3E	19	611642	611742	60.0	40	40	1.29	1.29	1.29	77.47	2.8488	2.8580	0.0092	118.8				
		Cloudy	0.3E	19	611742	611842	60.0	40	40	1.29	1.29	1.29	77.47	2.8612	2.8690	0.0078	100.7				
	08-Apr-11	Sunny	0.3E	21	611842	611942	60.0	40	40	1.29	1.29	1.29	77.47	2.8497	2.8551	0.0054	69.7	77.4		Steel bending and crane operation	Traffic
		Sunny	0.3E	21	611942	612042	60.0	40	40	1.29	1.29	1.29	77.47	2.8498	2.8541	0.0043	55.5				
		Sunny	0.3E	21	612042	612142	60.0	40	40	1.29	1.29	1.29	77.47	2.8330	2.8413	0.0083	107.1				
	14-Apr-11	Sunny	0.4E	23	612142	612242	60.0	40	40	1.29	1.29	1.29	77.47	2.8889	2.8959	0.0070	90.4	109.7		Crane operation and steel bending	Traffic
		Sunny	0.4E	23	612242	612342	60.0	40	40	1.29	1.29	1.29	77.47	2.8820	2.8891	0.0071	91.6				
		Sunny	0.4E	23	612342	612442	60.0	40	40	1.29	1.29	1.29	77.47	2.8851	2.8965	0.0114	147.2				
	20-Apr-11	Sunny	0.3E	22	612442	612542	60.0	40	40	1.29	1.29	1.29	77.47	2.8979	2.9058	0.0079	102.0	88.6		Crane operation and concrete works	Traffic
		Sunny	0.3E	22	612542	612642	60.0	40	40	1.29	1.29	1.29	77.47	2.9078	2.9138	0.0060	77.4				
		Sunny	0.3E	22	612642	612742	60.0	40	40	1.29	1.29	1.29	77.47	2.8953	2.9020	0.0067	86.5				
	26-Apr-11	Sunny	0.3E	27	612742	612842	60.0	40	40	1.29	1.29	1.29	77.47	2.8912	2.8975	0.0063	81.3	123.9		Crane operation	Traffic
		Sunny	0.3E	27	612842	612942	60.0	40	40	1.29	1.29	1.29	77.47	2.8816	2.8956	0.0140	180.7				
		Sunny	03E	27	612942	613042	60.0	40	40	1.29	1.29	1.29	77.47	2.9014	2.9099	0.0085	109.7				
	29-Apr-11	Rainy	0.5E	23	613042	613142	60.0	40	40	1.29	1.29	1.29	77.47	2.8906	2.9023	0.0117	151.0	135.5		Crane operation	Traffic
		Rainy	0.5E	23	613142	613242	60.0	40	40	1.29	1.29	1.29	77.47	2.8843	2.8951	0.0108	139.4				
		Rainy	0.5E	23	613242	613342	60.0	40	40	1.29	1.29	1.29	77.47	2.8736	2.8826	0.0090	116.2				
Hong Hoi Chee Hong Temple - Intake (ASR3)	04-Apr-11	Cloudy	0.3E	19	580090	580190	60.0	40	40	1.36	1.36	1.36	81.68	2.8860	2.8932	0.0072	88.1	140.0	327.4/500	Drilling and cutting	Traffic
		Cloudy	0.3E	19	580190	580290	60.0	40	40	1.36	1.36	1.36	81.68	2.8394	2.8494	0.0100	122.4				
		Cloudy	0.3E	19	580290	580390	60.0	40	40	1.36	1.36	1.36	81.68	2.8942	2.9113	0.0171	209.4				
	08-Apr-11	Sunny	0.3E	21	580390	580490	60.0	40	40	1.36	1.36	1.36	81.68	2.8338	2.8391	0.0053	64.9	84.9		Drilling	Traffic
		Sunny	0.3E	21	580490	580590	60.0	40	40	1.36	1.36	1.36	81.68	2.8443	2.8498	0.0055	67.3				
		Sunny	0.3E	21	580590	580690	60.0	40	40	1.36	1.36	1.36	81.68	2.8511	2.8611	0.0100	122.4				
	14-Apr-11	Sunny	0.2E	23	580690	580790	60.0	40	40	1.36	1.36	1.36	81.68	2.8891	2.8958	0.0067	82.0	90.6		Drilling	Traffic
		Sunny	0.2E	23	580790	580890	60.0	40	40	1.36	1.36	1.36	81.68	2.8850	2.8913	0.0063	77.1				
		Sunny	0.2E	23	580890	580990	60.0	40	40	1.36	1.36	1.36	81.68	2.8862	2.8954	0.0092	112.6				
	20-Apr-11	Sunny	0.2E	22	580990	581090	60.0	40	40	1.36	1.36	1.36	81.68	2.8959	2.9040	0.0081	99.2	89.4		Drilling	Traffic
		Sunny	0.2E	22	581090	581190	60.0	40	40	1.36	1.36	1.36	81.68	2.8907	2.8971	0.0064	78.4				
		Sunny	0.2E	22	581190	581290	60.0	40	40	1.36	1.36	1.36	81.68	2.9039	2.9113	0.0074	90.6				
	26-Apr-11	Sunny	0.3E	27	581290	581390	60.0	40	40	1.36	1.36	1.36	81.68	2.8965	2.9086	0.0121	148.1	114.7		Drilling	Traffic
		Sunny	0.3E	27	581390	581490	60.0	40	40	1.36	1.36	1.36	81.68	2.8994	2.9087	0.0093	113.9				
		Sunny	0.3E	27	581490	581590	60.0	40	40	1.36	1.36	1.36	81.68	2.8911	2.8978	0.0067	82.0				
	29-Apr-11	Rainy	0.5E	23	581590	581690	60.0	40	40	1.36	1.36	1.36	81.68	2.8695	2.8817	0.0122	149.4	135.5		Drilling	Traffic
		Rainy	0.5E	23	581690	581790	60.0	40	40	1.36	1.36	1.36	81.68	2.8715	2.8820	0.0105	128.6				
		Rainy	0.5E	23	581790	581890	60.0	40	40	1.36	1.36	1.36	81.68	2.8718	2.8823	0.0105	128.6				
Long Beach Gardens - Outfall (ASR8)	04-Apr-11	Cloudy	0.5E	19	574234	574334	60.0	40	40	1.30	1.30	1.30	78.21	2.8624	2.8692	0.0068	86.9	91.6	336.6/500	Crane operation and excavator	Traffic.
		Cloudy	0.5E	19	574334	574434	60.0	40	40	1.30	1.30	1.30	78.21	2.8486	2.8563	0.0077	98.4				
		Cloudy	0.5E	19	574434	574534	60.0	40	40	1.30	1.30	1.30	78.21	2.8405	2.8475	0.0070	89.5				
	08-Apr-11	Sunny	0.5E	21	574534	574634	60.0	40	40	1.30	1.30	1.30	78.21	2.9047	2.9083	0.0036	46.0	63.5		Crane operation and excavator	Traffic
		Sunny	0.5E	21	574634	574734	60.0	40	40	1.30	1.30	1.30	78.21	2.9009	2.9056	0.0047	60.1				
		Sunny	0.5E	21	574734	574834	60.0	40	40	1.30	1.30	1.30	78.21	2.8873	2.8939	0.0066	84.4				
	14-Apr-11	Sunny	0.3E	23	574834	574934	60.0	40	40	1.30	1.30	1.30	78.21	2.8870	2.8971	0.0101	129.1	119.3		Crane operation and excavator	Traffic
		Sunny	0.3E	23	574934	575034	60.0	40	40	1.30	1.30	1.30	78.21	2.8851	2.8950	0.0099	126.6				
		Sunny	0.3E	23	575034	575134	60.0	40	40	1.30	1.30	1.30	78.21	2.8968	2.9048	0.0080	102.3				
	20-Apr-11	Sunny	0.5E	22	575134	575234	60.0	40	40	1.30	1.30	1.30	78.21	2.9001	2.9130	0.0129	164.9	127.9		Crane operation and excavator	Traffic
		Sunny	0.5E	22	575234	575334	60.0	40	40	1.30	1.30	1.30	78.21	2.8811	2.8890	0.0079	101.0				
		Sunny	0.5E	22	575334	575434	60.0	40	40	1.30	1.30	1.30	78.21	2.8859	2.8951	0.0092	117.6				
	26-Apr-11	Sunny	0.5E	27	575434	575534	60.0	40	40	1.30	1.30	1.30	78.21	2.8859	2.9008	0.0149	190.5	123.6		Crane operation and breaker	Traffic
		Sunny	0.5E	27	575534	575634	60.0	40	40	1.30	1.30	1.30	78.21	2.8952	2.9018	0.0066	84.4				
		Sunny	0.5E	27	575634	575734	60.0	40	40	1.30	1.30	1.30	78.21	2.9014	2.9089	0.0075	95.9				
	29-Apr-11	Rainy	0.8E	23	575734	575834	60.0	40	40	1.30	1.30	1.30	78.21	2.8606	2.8721	0.0115	147.0	140.6		Crane operation and breaker	Traffic
		Rainy	0.8E	23	575834	575934	60.0	40	40	1.30	1.30	1.30	78.21	2.9063	2.9162	0.0099	126.6				
		Rainy	0.8E	23	575934	576034	60.0	40	40	1.30	1.30	1.30	78.21	2.8921	2.9037	0.0116	148.3				
Greenview Terrace - Outfall (ASR9)	04-Apr-11	Cloudy	0.8E	19	567080	567180	60.0	40	40	1.29	1.29	1.29	77.48	2.8319	2.8402	0.0083	107.1	114.0	329.2/500	Crane operation and breaker	Traffic.
		Cloudy	0.8E	19	567180	567280	60.0	40	40	1.29	1.29	1.29	77.48	2.8457	2.8569	0.0112	144.6				
		Cloudy	0.8E	19	567280	567380	60.0	40	40	1.29	1.29	1.29	77.48	2.8579	2.8649	0.0070	90.3				
	08-Apr-11	Sunny	0.5E	21	567380	567480	60.0	40	40	1.29	1.29	1.29	77.48	2.8709	2.8742	0.0033	42.6	66.3		Crane operation and breaker	Traffic
		Sunny	0.5E	21	567480	567580	60.0	40	40	1.29	1.29	1.29	77.48	2.8492	2.8537	0.0045	58.1				
		Sunny	0.5E	21	567580	567680	60.0	40	40	1.29	1.29	1.29	77.48	2.8516	2.8592	0.0076	98.1				
	14-Apr-11	Sunny	0.5E	23	567680	567780	60.0	40	40	1.29	1.29	1.29	77.48	2.9065	2.9158	0.0093	120.0	151.4		Crane operation and excavator	Traffic
		Sunny	0.5E	23	567780	567880	60.0	40	40	1.29	1.29	1.29	77.48	2.8982	2.9150	0.0168	216.8				
		Sunny	0.5E	23	567880	567980	60.0	40	40	1.29	1.29	1.29	77.48	2.9087	2.9178	0.0091	117.5				
	20-Apr-11	Sunny	0.5E	22	567980	568080	60.0	40	40	1.29	1.29	1.29	77.48	2.8950	2.9110	0.0160	206.5	152.7		Crane operation and excavator	Traffic
		Sunny	0.5E	22	568080	568180	60.0	40	40	1.29	1.29	1.29	77.48	2.8881	2.8984	0.0103	132.9				
		Sunny	0.5E	22	568180	568280	60.0	40	40	1.29	1.29	1.29	77.48	2.8853	2.8945	0.0092	118.7				
	26-Apr-11	Sunny	0.5E	27	568280	568380	60.0	40	40	1.29	1.29	1.29	77.48	2.9002	2.9217	0.0215	277.5	215.1		Crane operation and breaker	Traffic
		Sunny	0.5E	27	568380	568480	60.0	40	40	1.29	1.29	1.29	77.48	2.9017	2.9178	0.0161	207.8				
		Sunny	0.5E	27	568480	568580	60.0	40	40	1.29	1.29	1.29	77.48	2.8927	2.9051	0.0124	160.0				
	29-Apr-11	Rainy	0.5E	23	568580	568680	60.0	40	40	1.29	1.29	1.29	77.48	2.8810	2.8921	0.0111	143.3	154.9		Crane operation and breaker	Traffic
		Rainy	0.5E	23	568680	568780	60.0	40	40	1.29	1.29	1.29	77.48	2.8922	2.9062	0.0140	180.7				
		Rainy	0.5E	23	568780	568880	60.0	40	40	1.29	1.29	1.29	77.48	2.8802	2.8911	0.0109	140.7				

Note:

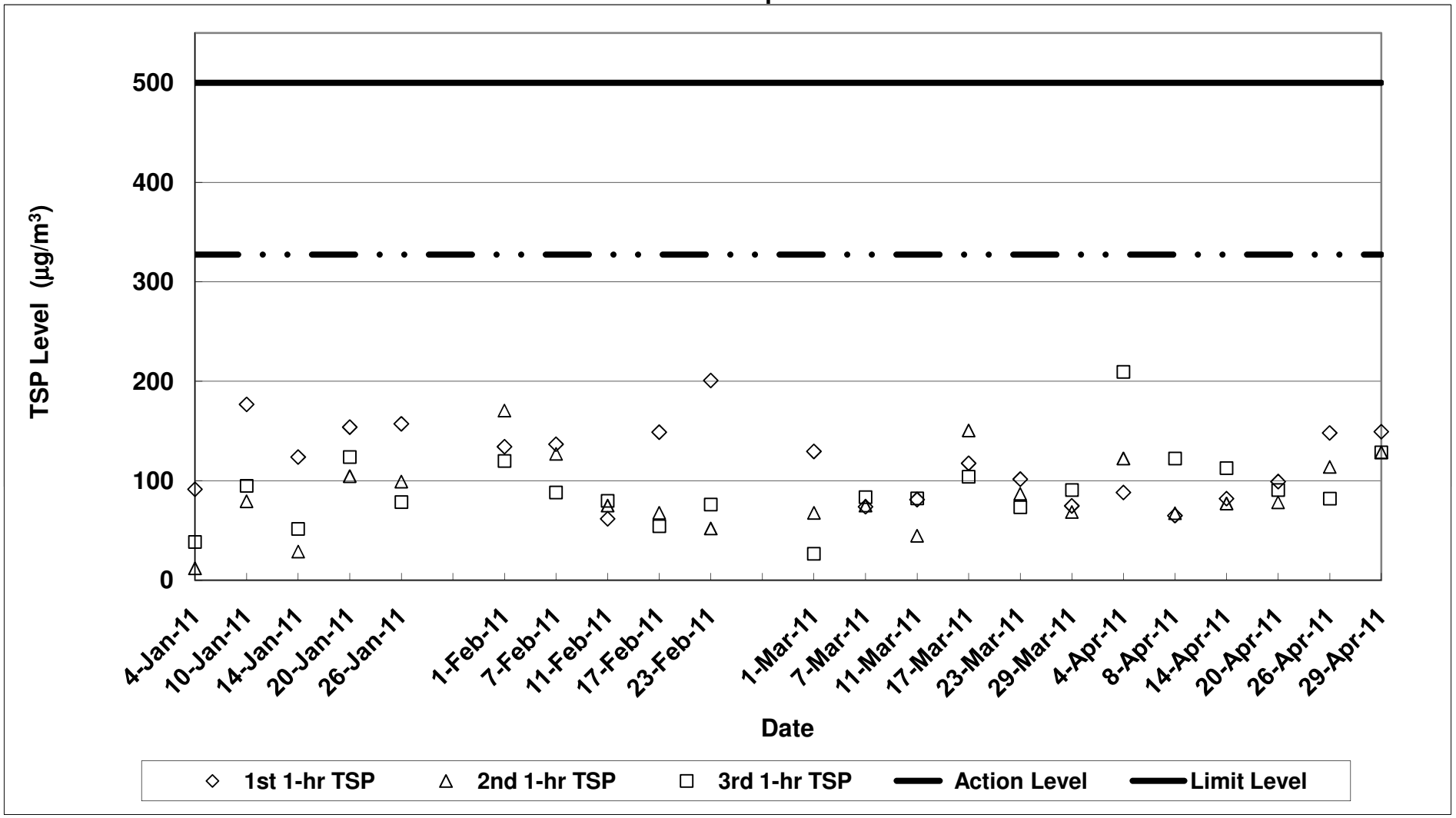
Italic font and yellow shaded indicates an exceedance of Action Level

Bolid font and red shaded area indicates an exceedance of Limit Level

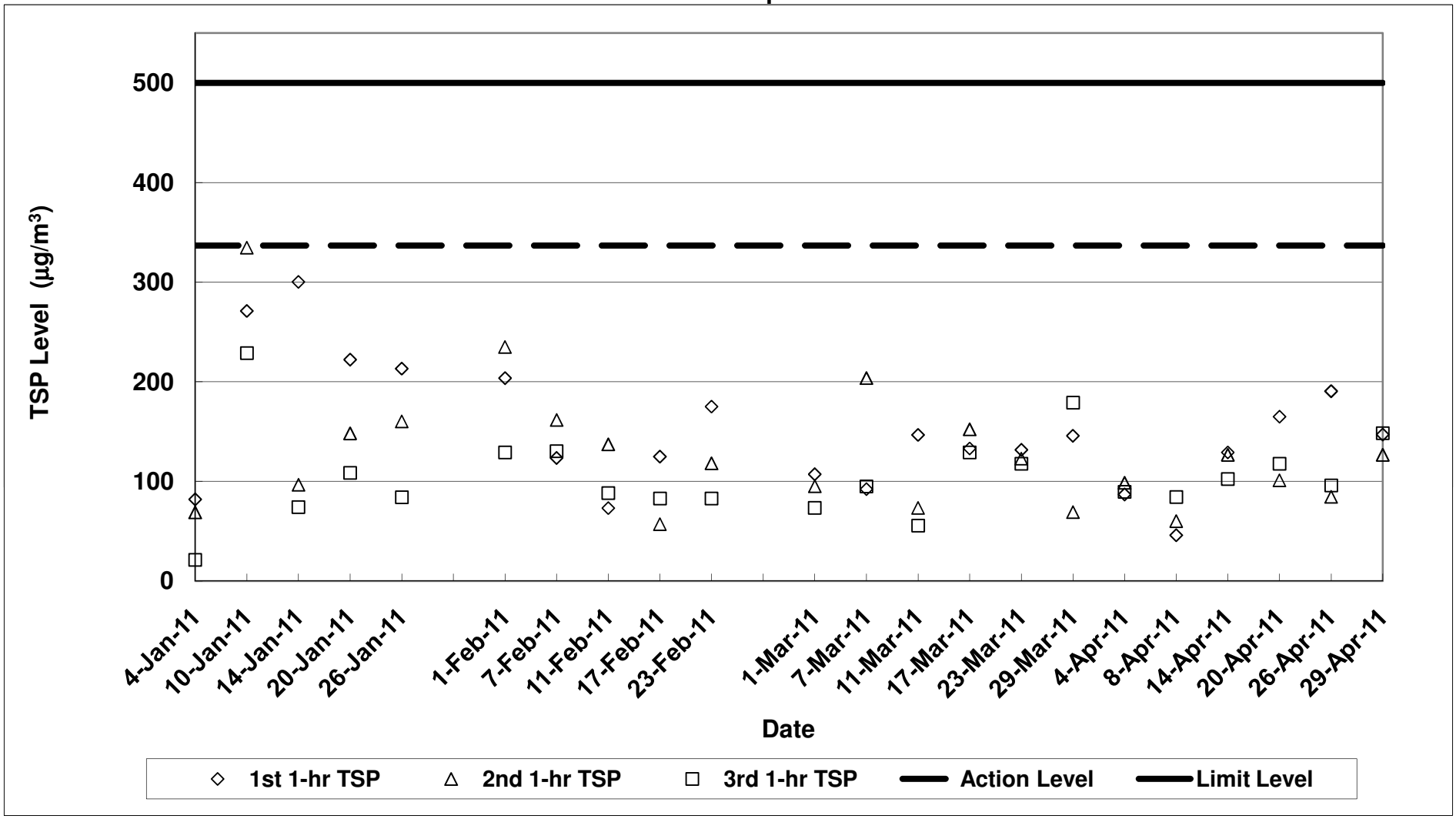
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Air Quality Monitoring (1-hr TSP) Results at Sik Sik Yuen Ho Fung College - Intake (ASR1)
Jan-11 to Apr-11



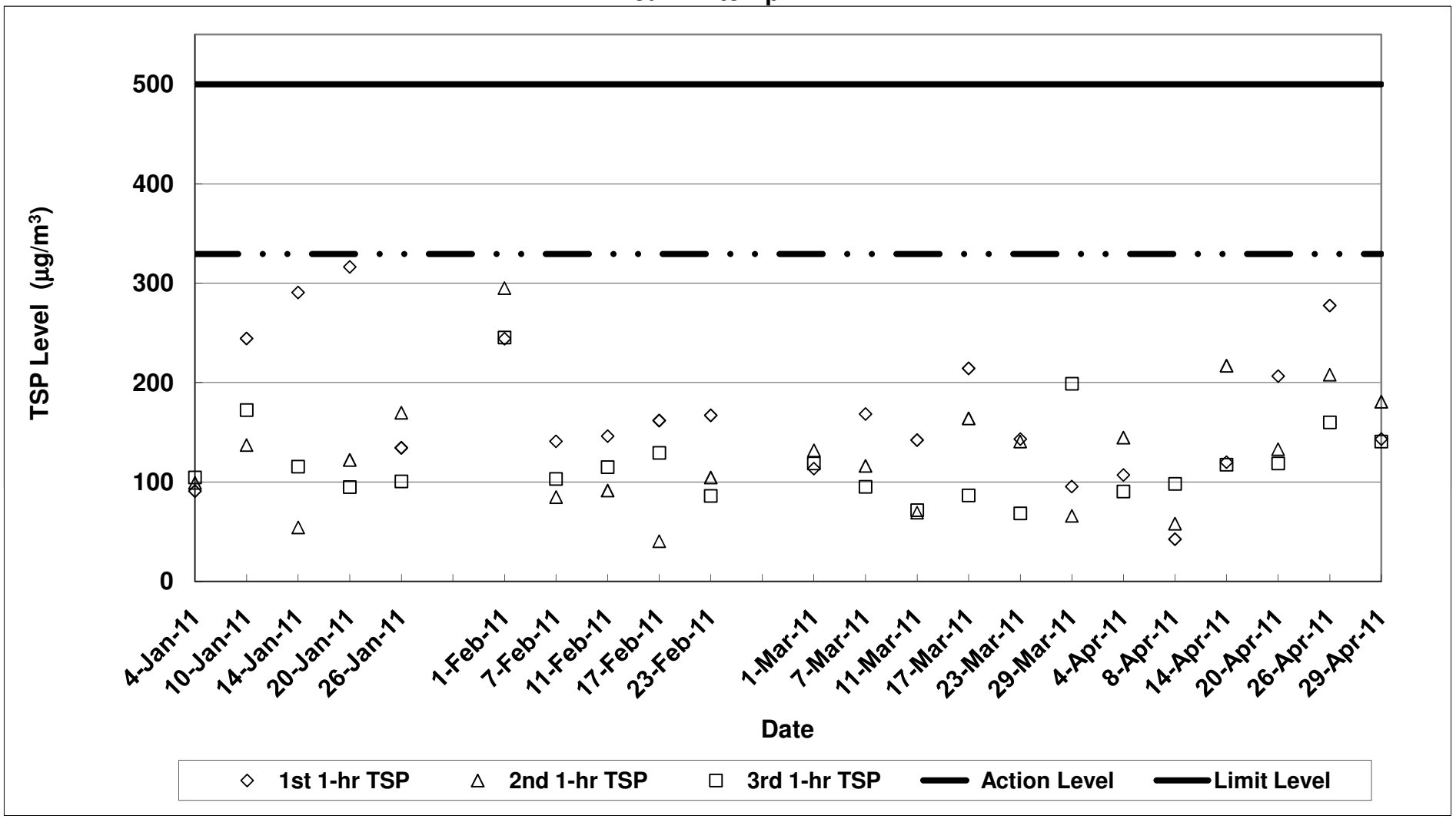
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Air Quality Monitoring (1-hr TSP) Results at Hong Hoi Chee Hong Temple - Intake (ASR3)
Jan-11 to Apr-11



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)
Jan-11 to Apr-11



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Air Quality Monitoring (1-hr TSP) Results at Greenview Terrace - Outfall (ASR9)
Jan-11 to Apr-11



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

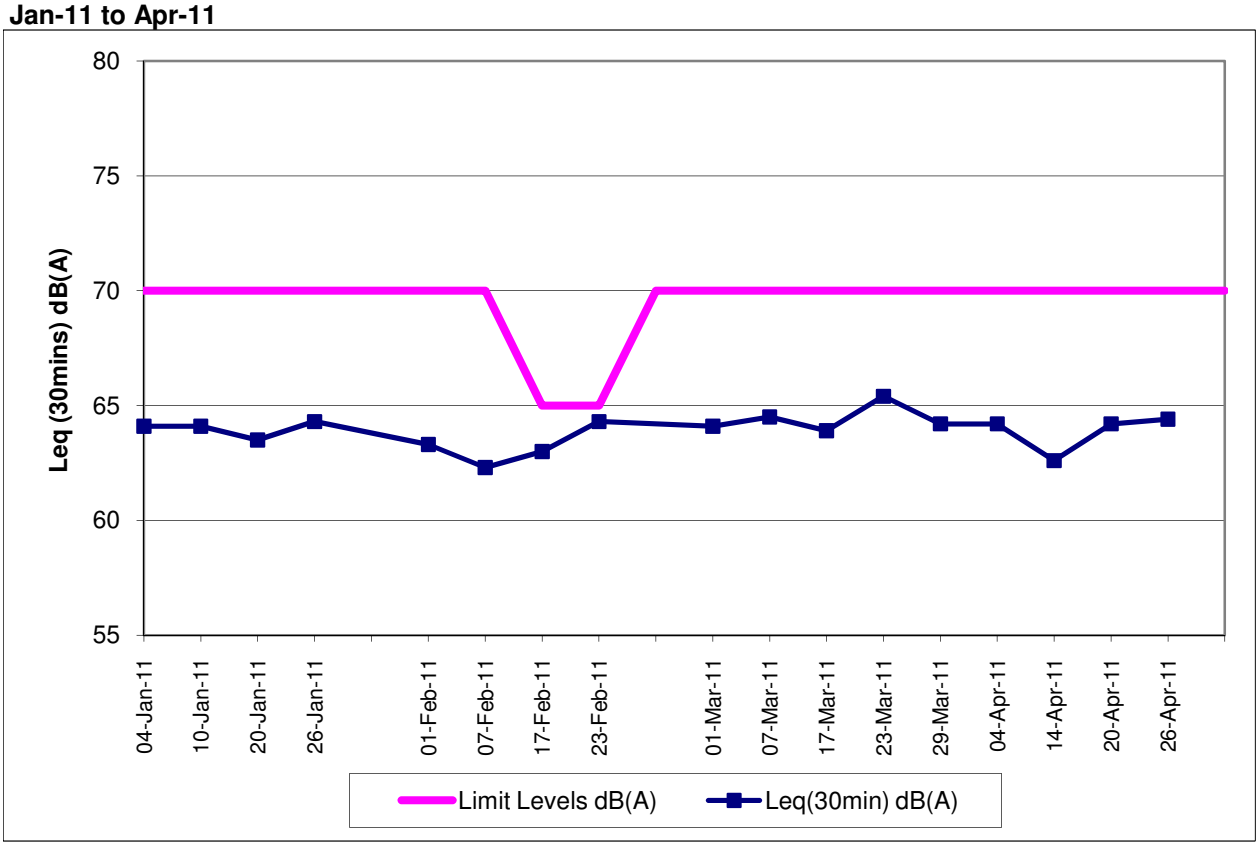
Noise Impact Monitoring Results

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	04-Apr-11	Cloudy	19	0.3	E	17:07	17:37		70	64.2	65.8	61.6	-	Concrete works	Traffic noise
NSR 1	14-Apr-11	Sunny	23	0.4	E	15:45	16:15		70	62.6	65.4	58.4	-	Crane operation and steel bending	Traffic noise and aircraft noise
	20-Apr-11	Fine	22	0.3	E	16:25	16:55	66.1	70	64.2	66.4	60.2	-	Crane operation and concrete works	Traffic noise and aircraft noise
	26-Apr-11	Sunny	27	0.3	E	15:50	16:20		70	64.4	66.9	60.6	-	Crane operation	Traffic noise and aircraft noise
									70				-		
Hong Hoi Chee Hong Temple	04-Apr-11	Cloudy	19	0.3	E	16:29	16:59		75	67.3	69.8	59.4	-	Drilling and cutting	Traffic noise
NSR 3	14-Apr-11	Sunny	23	0.2	E	15:07	15:37		75	68.4	70.3	62.1	-	Drilling	Traffic noise and aircraft noise
	20-Apr-11	Fine	22	0.2	E	15:40	16:10	57.9	75	60.9	62.2	58.2	-	Drilling	Traffic noise and aircraft noise
	26-Apr-11	Sunny	27	0.3	E	15:00	15:30		75	62.6	64.7	59.2	-	Drilling	Traffic noise and aircraft noise
									75				-		
Squatters	04-Apr-11	Cloudy	19	0.3	E	10:50	11:20		75	63.7	64.9	60.1	-	Crane operation and drilling	Birds
NSR 6	14-Apr-11	Sunny	23	0.3	E	10:20	10:50		75	66.2	68.9	61.1	-	Crane operation and drilling	Aircraft noise and insect noise
	20-Apr-11	Sunny	22	0.2	E	11:16	11:46	61.2	75	58.2	60.0	55.5	-	Crane operation and drilling	Aircraft noise and birds
	26-Apr-11	Sunny	27	0.2	E	14:00	14:30		75	63.3	65.8	59.6	-	Crane operation and drilling	Aircraft noise
									75				-		
Long Beach Gardens	04-Apr-11	Cloudy	19	0.5	E	09:54	10:24		75	65.5	67.2	62.7	-	Crane operation and excavator	Traffic noise
NSR 8	14-Apr-11	Sunny	23	0.3	E	14:20	14:50		75	63.7	66.0	60.8	-	Crane operation and excavator	Traffic noise and aircraft noise
	20-Apr-11	Sunny	22	0.5	E	09:50	10:20	60.9	75	68.8	71.6	63.1	-	Crane operation and excavator	Traffic noise and aircraft noise
	26-Apr-11	Sunny	27	0.5	E	10:05	10:35		75	65.1	67.2	61.9	-	Crane operation and breaker	Traffic noise and aircraft noise
									75				-		
Greenview Terrace	04-Apr-11	Cloudy	19	0.8	E	09:15	09:45		75	74.1	76.6	69.9	-	Crane operation and breaker	Traffic nosie
NSR 9	14-Apr-11	Sunny	23	0.5	E	13:40	14:10		75	68.3	70.0	66.2	-	Crane operation and excavator	Traffic noise and aircraft noise
	20-Apr-11	Sunny	22	0.5	E	10:28	10:58	59.7	75	68.8	70.6	65.4	-	Crane operation and excavator	Traffic noise and aircraft noise
	26-Apr-11	Sunny	27	0.5	E	10:45	11:15		75	73.4	76.6	67.9	-	Crane operation and breaker	Traffic noise and aircraft noise
									75				-		

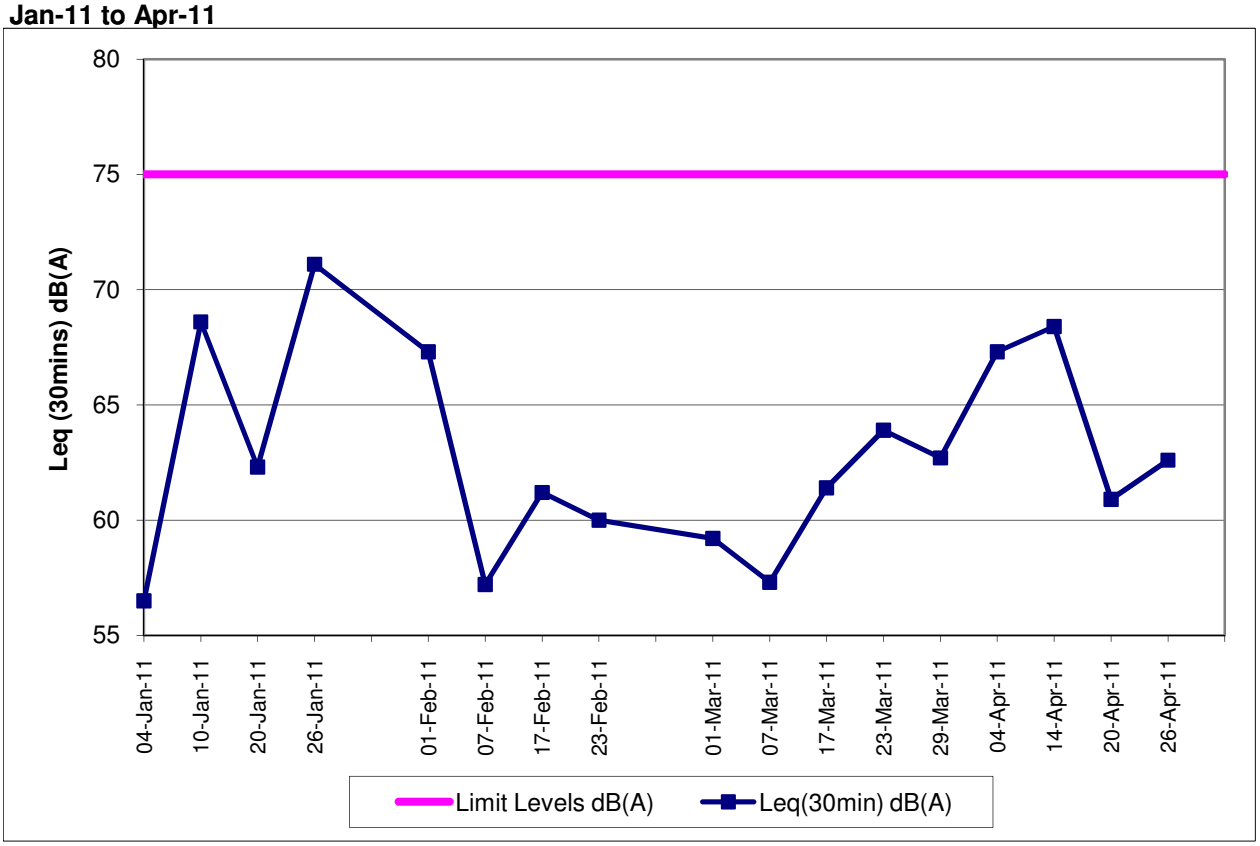
1: Baseline Noise Level
2: Limit Level
3: Corrected Noise Level

Note:
The limit level of NSR1 is 65dB(A) during school examination period.
Red Bold indicates an exceedance of Limit Level
* means additional noise monitoring

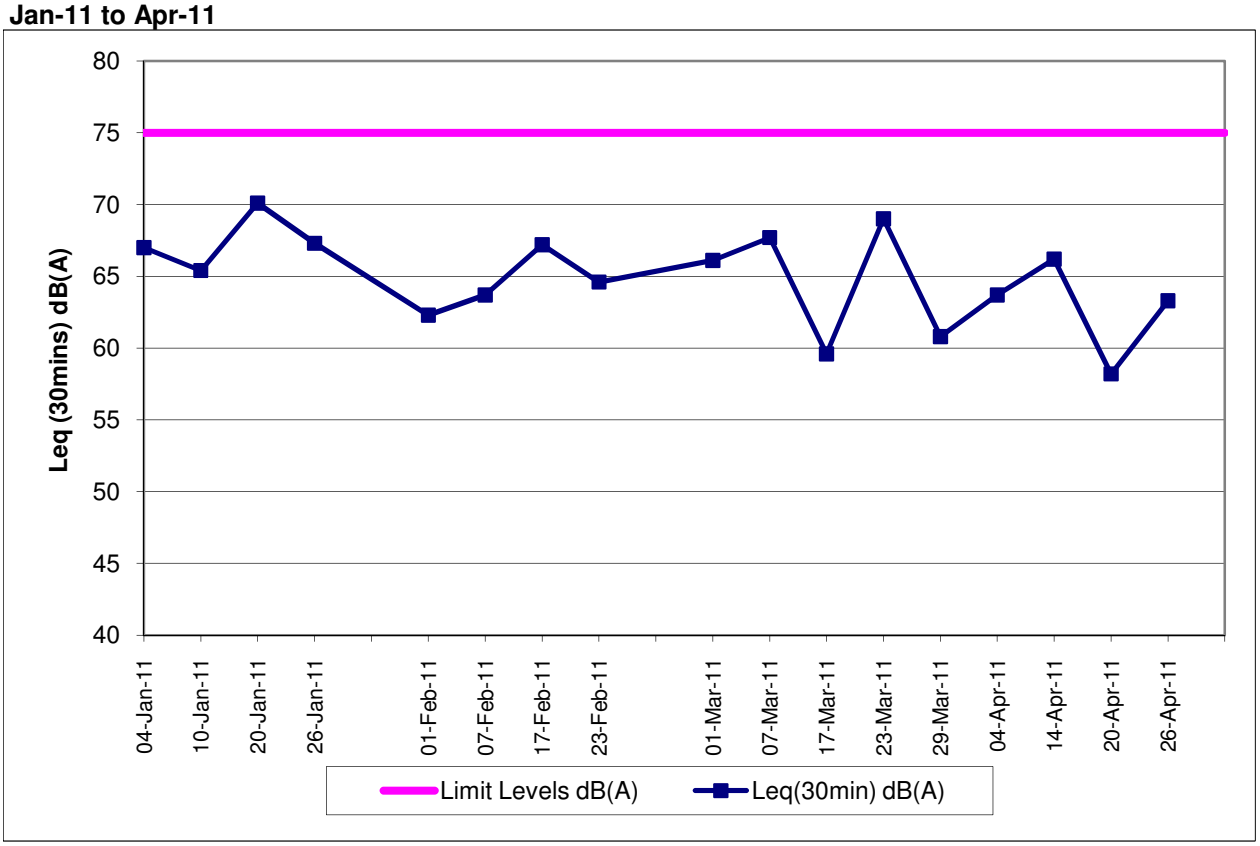
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Sik Sik Yuen Ho Fung College (NSR 1)
Jan-11 to Apr-11



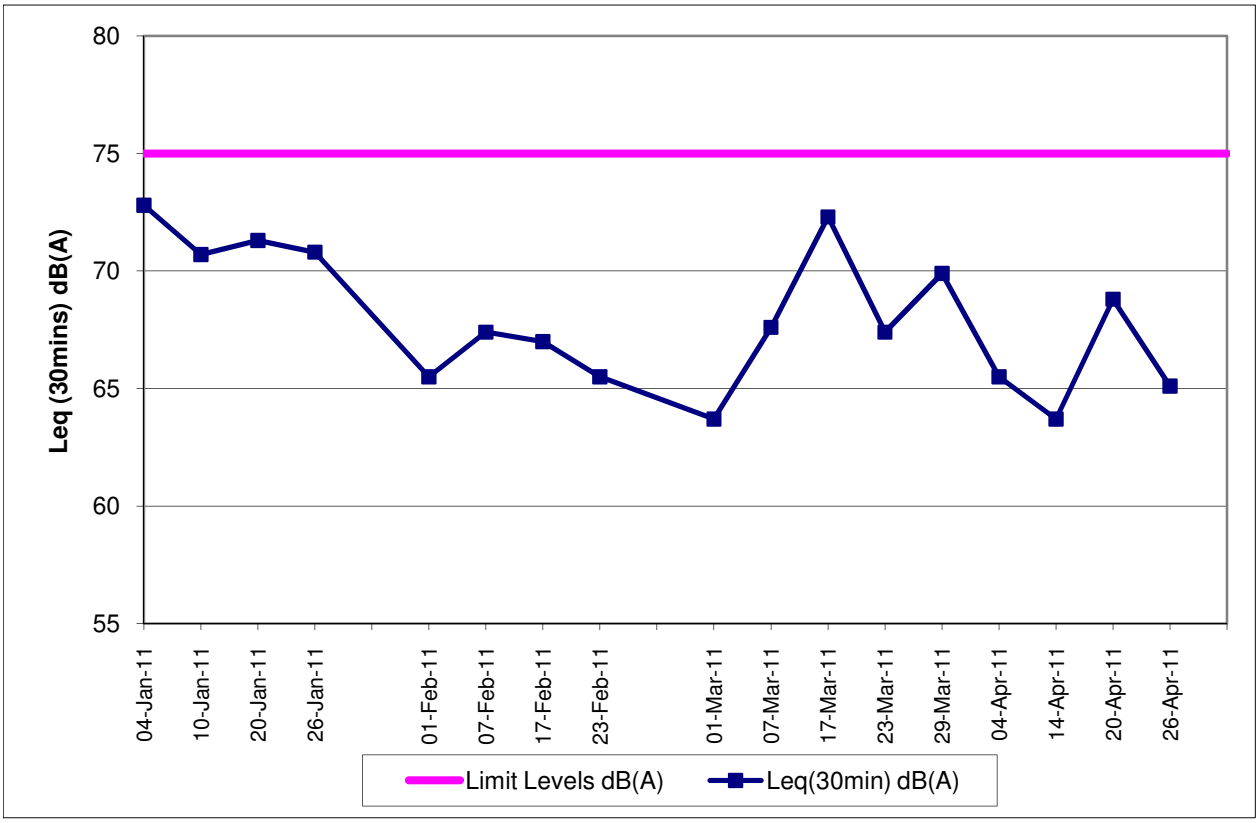
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Hong Hoi Chee Hong Temple (NSR 3)
Jan-11 to Apr-11



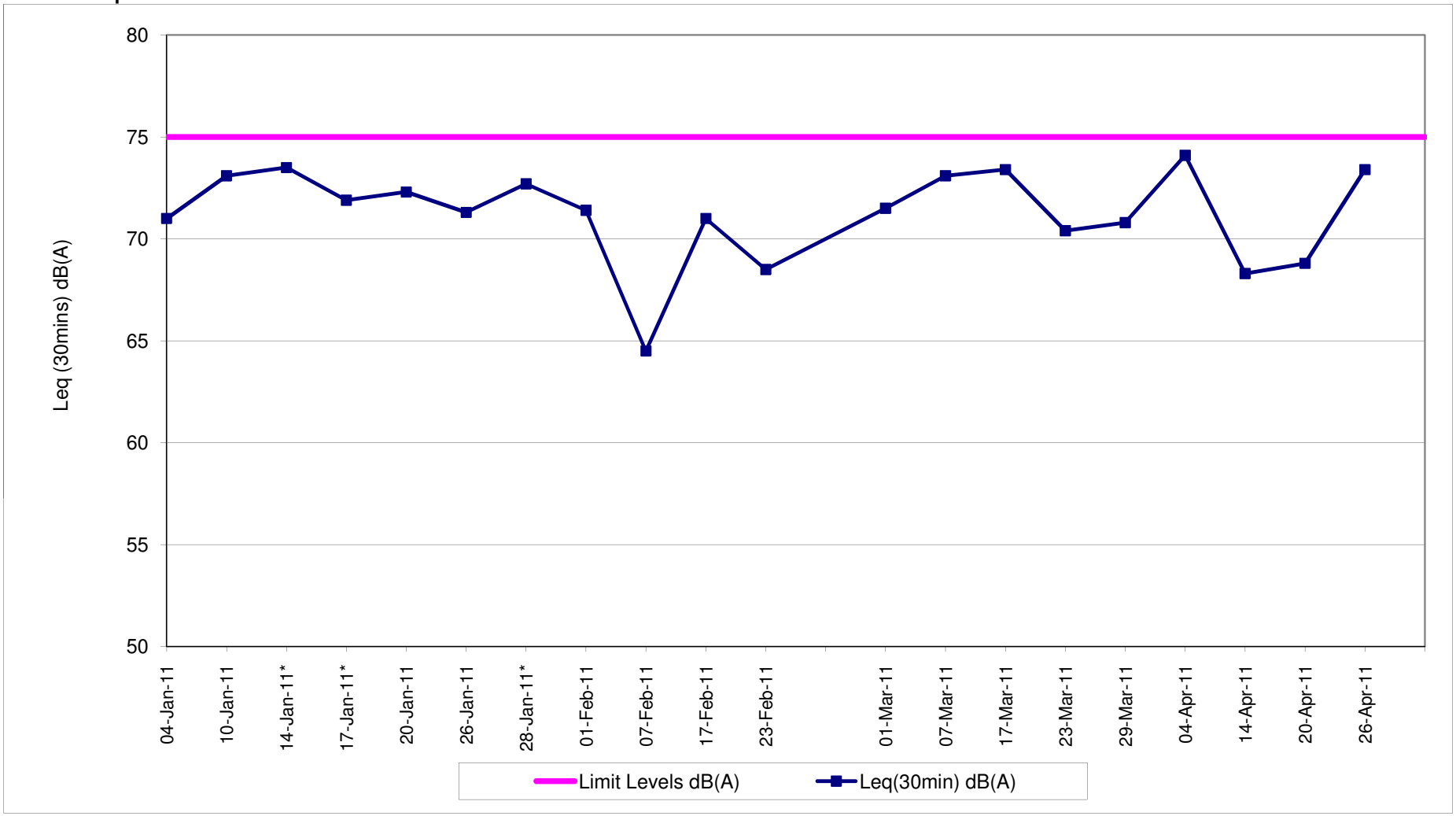
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Squatters (NSR 6)
Jan-11 to Apr-11



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Long Beach Gardens (NSR 8)
Jan-11 to Apr-11



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Greenview Terrace (NSR 9)
Jan-11 to Apr-11



* Additional Noise Monitoring

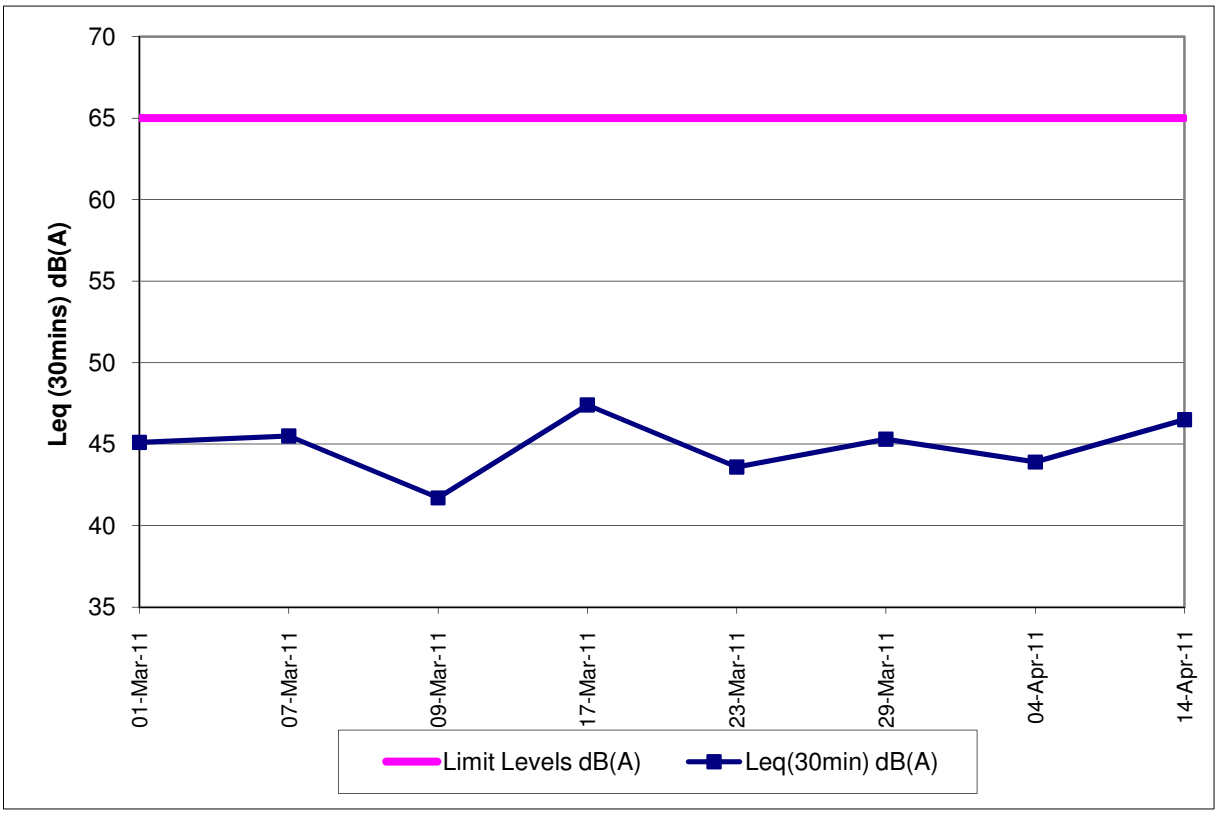
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel

Groundborne Noise Impact Monitoring Results

Monitoring Locations	Date	TBM Location Chainage (m)	Weather Conditions	Temperature (°C)	Start Time	End Time	Limit Level dB(A)	$L_{eq(30min)}$ dB(A)	$L_{10(30min)}$ dB(A)	$L_{90(30min)}$ dB(A)	Observation / Site Condition	Remark
Squatters	04-Apr-11	3121	Cloudy	19	11:05	11:35	65	43.9	45.2	39.4	Drilling	Nil
NSR 6	14-Apr-11	2991	Sunny	23	10:53	11:23	65	46.5	49.1	40.7	Drilling	Nil

Note:
Red Bold indicates an exceedance of Limit Level
* means additional noise monitoring

Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Groundborne Noise Monitoring Results at NSR 6
Mar 11 to Apr 11



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 1	Temp 2	Temp Avg	DO(mg/L) 1	DO(mg/L) 2	DO(mg/L) Avg	Action/Limit Level of DO(mg/L)	pH 1	pH 2	pH Avg	Turbidity(NTU) 1	Turbidity(NTU) 2	Turbidity(NTU) Avg	Action/Limit Level of Tby	SS (mg/L) 1	SS (mg/L) 2	SS (mg/L) Avg	Action/Limit Level of SS(mg/L)	Remarks:	Action to be taken
Sik Sik Yuen Ho Fung College I-1	01-Apr-11	14:30	Sunny	<1	23.90	23.90	23.90	6.86	6.94	6.90	3.42 / 3.34	8.06	8.05	8.06	3.86	3.92	3.89	9.75 / 12.47	4.50	4.10	4.30	8.85 / 10.17	Steel bending and crane operation	Nil
	04-Apr-11	13:50	Cloudy	<1	19.50	19.50	19.50	7.54	7.51	7.53		8.05	8.05	8.05	5.06	5.14	5.10		4.40	4.50	4.45		Concrete works	Nil
	06-Apr-11	10:25	Fine	<1	22.70	22.70	22.70	7.07	7.19	7.13		8.11	8.11	8.11	9.37	9.46	9.42		10.80	11.10	**10.95**		Steel bending and crane operation	Nil
	08-Apr-11	14:37	Sunny	<1	21.90	21.90	21.90	6.94	6.99	6.97		8.10	8.11	8.11	5.18	5.14	5.16		9.60	9.30	*9.45*		Steel bending and crane operation	Nil
	11-Apr-11	11:10	Sunny	<1	28.50	28.50	28.50	6.74	6.77	6.76		8.02	8.02	8.02	7.62	7.55	7.59		8.20	8.20	8.20		Steel bending and crane operation	Nil
	13-Apr-11	11:20	Sunny	<1	23.70	23.70	23.70	7.28	7.25	7.27		8.17	8.18	8.18	4.55	4.63	4.59		4.60	4.40	4.50		Steel bending and crane operation	Nil
	15-Apr-11	11:50	Sunny	<1	24.40	24.30	24.35	7.08	7.12	7.10		8.11	8.12	8.12	4.50	4.44	4.47		5.00	3.40	4.20		Steel bending and crane operation	Nil
	18-Apr-11	09:20	Fine	<1	26.00	26.00	26.00	7.20	7.25	7.23		8.06	8.06	8.06	4.77	4.79	4.78		3.20	2.20	*2.70*		Crane operation	Nil
	20-Apr-11	16:44	Fine	<1	24.10	24.00	24.05	7.15	7.18	7.17		7.96	7.95	7.96	3.66	3.74	3.70		2.50	<2.00	2.25		Crane operation and concrete works	Nil
	26-Apr-11	16:17	Sunny	<1	27.00	27.00	27.00	7.15	7.20	7.18		8.09	8.10	8.10	3.50	3.47	3.49		<2.00	<2.00	<2.00		Crane operation	Nil
	28-Apr-11	16:33	Cloudy	<1	28.10	28.10	28.10	6.96	6.92	6.94		8.06	8.07	8.07	2.62	2.60	2.61		<2.00	<2.00	<2.00		Crane operation	Nil
	30-Apr-11	09:00	Rainy	<1	24.20	24.30	24.25	7.13	7.19	7.16		8.07	8.07	8.07	2.40	2.43	2.42		<2.00	2.20	2.10		Crane operation and concrete works	Nil
	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			Nil
	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			-
Sik Sik Yuen Ho Fung College I-1-C	01-Apr-11	14:20	Sunny	<1	23.90	23.90	23.90	7.12	7.07	7.10	- /-	8.06	8.05	8.06	3.95	3.90	3.93	- /-	4.50	4.20	4.35	- /-	Nil	Nil
	04-Apr-11	13:40	Cloudy	<1	19.50	19.50	19.50	7.41	7.44	7.43		8.06	8.05	8.06	5.53	5.47	5.50		4.50	4.70	4.60		Nil	Nil
	06-Apr-11	10:15	Fine	<1	22.60	22.60	22.60	7.27	7.22	7.25		8.10	8.10	8.10	9.50	9.57	9.54		10.70	10.50	10.60		Nil	Nil
	08-Apr-11	14:38	Sunny	<1	21.90	21.90	21.90	7.05	7.10	7.08		8.10	8.10	8.10	5.05	5.12	5.09		9.90	10.10	10.00		Nil	Nil
	11-Apr-11	11:05	Sunny	<1	28.60	28.60	28.60	6.75	6.70	6.73		8.03	8.03	8.03	7.74	7.80	7.77		8.20	7.30	7.75		Nil	Nil
	13-Apr-11	11:10	Sunny	<1	23.70	23.70	23.70	7.31	7.34	7.33		8.18	8.18	8.18	4.70	4.66	4.68		4.60	5.00	4.80		Nil	Nil
	15-Apr-11	11:40	Sunny	<1	24.40	24.40	24.40	7.23	7.27	7.25		8.12	8.12	8.12	4.59	4.66	4.63		5.10	5.30	5.20		Nil	Nil
	18-Apr-11	09:10	Fine	<1	26.10	26.10	26.10	7.14	7.23	7.19		8.05	8.06	8.06	4.94	4.90	4.92		<2.00	2.20	2.10		Nil	Nil
	20-Apr-11	16:35	Fine	<1	24.00	24.00	24.00	7.00	7.05	7.03		7.95	7.95	7.95	3.76	3.82	3.79		<2.00	<2.00	<2.00		Nil	Nil
	26-Apr-11	16:05	Sunny	<1	26.90	26.90	26.90	7.08	7.13	7.11		8.10	8.11	8.11	3.49	3.60	3.55		<2.00	<2.00	<2.00		Nil	Nil
	28-Apr-11	16:25	Cloudy	<1	28.00	28.00	28.00	7.01	6.97	6.99		8.07	8.07	8.07	2.50	2.46	2.48		<2.00	<2.00	<2.00		Nil	Nil
	30-Apr-11	08:50	Rainy	<1	24.30	24.30	24.30	7.28	7.42	7.35		8.08	8.07	8.08	2.47	2.55	2.51		<2.00	<2.00	<2.00		Nil	Nil
	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-		Nil	Nil
	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			-
Hong Hoi Chee Hong Temple I-2	01-Apr-11	14:00	Sunny	<1	22.50	22.60	22.55	6.70	6.66	6.68	8.04	8.70	8.70	8.70	1.30	1.27	1.29	6.63 / 6.99	<2.00	<2.00	<2.00	7.68 / 8.34	Drilling	Nil
	04-Apr-11	14:20	Cloudy	<1	19.70	19.70	19.70	7.56	7.60	7.58		8.88	8.89	8.89	1.57	1.61	1.59		<2.00	<2.00	<2.00		Drilling	Nil
	06-Apr-11	11:10	Fine	<1	22.00	22.00	22.00	7.52	7.60	7.56		8.91	8.90	8.91	1.53	1.50	1.52		<2.00	<2.00	<2.00		Drilling	Nil
	08-Apr-11	14:10	Sunny	<1	21.80	21.90	21.85	7.31	7.42	7.37		8.01	8.01	8.01	1.88	1.93	1.91		<2.00	<2.00	<2.00		Drilling	Nil
	11-Apr-11	11:40	Sunny	<1	28.00	28.10	28.05	7.05	7.10	7.08		8.06	8.05	8.06	1.78	1.86	1.82		<2.00	<2.00	<2.00		Drilling	Nil
	13-Apr-11	10:51	Sunny	<1	23.40	23.40	23.40	7.51	7.40	7.46		8.40	8.40	8.40	1.24	1.30	1.27		<2.00	<2.00	<2.00		Drilling	Nil
	15-Apr-11	11:17	Sunny	<1	25.10	25.10	25.10	7.13	7.15	7.14		8.01	8.01	8.01	1.10	1.07	1.09		<2.00	<2.00	<2.00		Drilling	Nil
	18-Apr-11	09:44	Fine	<1	26.10	26.10	26.10	7.23	7.27	7.25		8.11	8.10	8.11	2.10	2.17	2.14		<2.00	<2.00	<2.00		Drilling	Nil
	20-Apr-11	16:10	Fine	<1	24.20	24.20	24.20	7.22	7.26	7.24		8.00	7.99	8.00	1.57	1.63	1.60		<2.00	<2.00	<2.00		Drilling	Nil
	26-Apr-11	15:25	Sunny	<1	26.70	26.70	26.70	7.11	7.09	7.10		7.99	7.99	7.99	1.72	1.65	1.69		<2.00	<2.00	<2.00		Drilling	Nil
	28-Apr-11	16:04	Cloudy	<1	28.10	28.20	28.15	7.24	7.28	7.26		8.01	8.01	8.01	1.86	1.87	1.87		<2.00	<2.00	<2.00		Drilling	Nil
	30-Apr-11	09:26	Rainy	<1	24.00	24.10	24.05	7.34	7.32	7.33		8.06	8.06	8.06	2.00	1.94	1.97		2.70	3.70	3.20		Drilling	Nil
	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			Nil
	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			-
Hong Hoi Chee Hong Temple I-2-C	01-Apr-11	13:50	Sunny	<1	23.00	23.00	23.00	6.83	6.73	6.78	- /-	8.72	8.71	8.72	1.22	1.36	1.29	- /-	<2.00	<2.00	<2.00	- /-	Nil	Nil
	04-Apr-11	14:10	Cloudy	<1	19.80	19.80	19.80	7.68	7.73	7.71		8.88	8.88	8.88	1.60	1.52	1.56		<2.00	<2.00	<2.00		Nil	Nil
	06-Apr-11	11:00	Fine	<1	21.90	21.80	21.85	7.84	7.82	7.83		8.90	8.90	8.90	1.55	1.44	1.50		<2.00	<2.00	<2.00		Nil	Nil
	08-Apr-11	14:02	Sunny	<1	22.00	22.00	22.00	7.35	7.38	7.37		8.02	8.02	8.02	1.92	1.97	1.95		<2.00	<2.00	<2.00		Nil	Nil
	11-Apr-11	11:30	Sunny	<1	28.10	28.10	28.10	6.97	7.03	7.00		8.05	8.05	8.05	1.90	1.95	1.93		<2.00	<2.00	<2.00		Nil	Nil
	13-Apr-11	10:42	Sunny	<1	23.50	23.50	23.50	7.55	7.58	7.57		8.40	8.40	8.40	1.63	1.74	1.69		<2.00	<2.00	<2.00		Nil	Nil
	15-Apr-11	11:08	Sunny	<1	25.00	25.00	25.00	7.04	7.07	7.06		8.02	8.02	8.02	1.12	1.16	1.14		<2.00	<2.00	<2.00		Nil	Nil
	18-Apr-11	09:35	Fine	<1	26.20	26.20	26.20	7.11	7.18	7.15		8.10	8.10	8.10	2.21	2.18	2.20		2.90	2.10	2.50		Nil	Nil
	20-Apr-11	15:50	Fine	<1	24.20	24.20	24.20	7.22	7.19	7.21		7.98	7.99	7.99	1.66	1.69	1.68		<2.00	<2.00	<2.00		Nil	Nil
	26-Apr-11	15:14	Sunny	<1	26.60	26.60	26.60	7.14	7.23	7.19		7.98	7.99	7.99	1.66	1.73	1.70		<2.00	<2.00	<2.00		Nil	Nil
	28-Apr-11	15:55	Cloudy	<1	28.30	28.30	28.30	7.17	7.21	7.19		8.02	8.01	8.02	1.90	1.92	1.91		<2.00	2.10	2.05		Nil	Nil
	30-Apr-11	09:17	Rainy	<1	24.20	24.20	24.20	7.46	7.40	7.43		8.07	8.06	8.07	2.02	1.95	1.99		7.00	5.30	6.15		Nil	Nil
	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-		Nil	Nil
	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			-
Squatters I-3	01-Apr-11	13:14	Sunny	<1	23.30	23.30	23.30	7.33	7.35	7.34	3.65 / 3.51	9.50	9.51	9.51	1.55	1.50	1.53	3.99 / 4.18	<2.00	<2.00	<2.00	6.13 / 7.23	Crane operation and breaker	Nil
	04-Apr-11	11:10	Cloudy	<1	20.50	20.60	20.55	7.62	7.72	7.67		9.36	9.37	9.37	1.87	1.84	1.86		<2.00	<2.00	<2.00		Drilling and crane operation	Nil
	06-Apr-11	13:26	Fine	<1	22.50	22.40	22.45	7.35	7.41	7.38		9.12	9.11	9.12	1.97	1.93	1.95		<2.00	<2.00	<2.00		Excavation works and crane operation	Nil
	08-Apr-11	13:40	Sunny	<1	22.10	22.10	22.10	7.42	7.38	7.40		9.77	9.76	9.77	1.98	1.94	1.96		<2.00	<2.00	<2.00		Excavation works and crane operation	Nil
	11-Apr-11	13:40	Sunny	<1	28.20	28.10	28.15	6.87	6.92	6.90		9.70	9.70	9.70	1.86	1.94	1.90		<2.00	<2.00	<2.00		Crane operation and drilling	Nil
	13-Apr-11	10:10	Sunny	<1	23.30	23.30	23.30	7.61	7.59	7.60		9.35	9.35	9.35	1.78	1.74	1.76		<2.00	<2.00	<2.00		Crane operation and drilling	Nil
	15-Apr-11	13:27	Sunny	<1	25.00	25.00	25.00	7.54	7.64	7.59		9.08	9.08	9.08	1.12	1.16	1.14		<2.00	<2.00	<2.00		Crane operation and drilling	Nil
	18-Apr-11	10:25	Fine	<1	26.40	26.40	26.40	7.06	7.11	7.09		9.50	9.50	9.50	1.90	1.93	1.92		<2.00	<2.00	<2.00		Crane operation and drilling	Nil
	20-Apr-11	11:35	Fine	<1	24.30	24.30	24.30	7.09	7.11	7.10		9.72	9.72	9.72	1.44	1.47	1.46		<2.00	<2.00	<2.00		Crane operation and drilling	Nil
	26-Apr-11	14:22	Sunny	<1	26.00	26.00	26.00	7.18	7.21	7.20		9.91	9.90	9.91	1.16	1.18	1.17		<2.00	<2.00	<2.00		Crane operation and drilling	Nil
	28-Apr-11	15:30	Cloudy	<1	27.90	27.90	27.90	7.22	7.12	7.17		9.90	9.90	9.90	2.20	2.22	2.21		<2.00	<2.00	<2.00		Crane operation and excavator	Nil
	30-Apr-11	11:18	Rainy	<1	24.70	24.60	24.65	7.08	7.13	7.11		8.96	8.97	8.97	1.92	1.90	1.91		<2.00	<2.00	<2.00		Crane operation and excavator	Nil
	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			Nil
	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			-
Squatters I-3-C	01-Apr-11	13:05	Sunny	<1	23.10	23.10	23.10	7.39	7.43	7.41	- /-	9.49	9.50	9.50	1.46	1.53	1.50	- /-	<2.00	<2.00	<2.00	- /-	Nil	Nil
	04-Apr-11	11:00	Cloudy	<1	20.50	20.50	20.50	7.89	7.93	7.91		9.36	9.37	9.37	1.80	1.86	1.83		<2.00	<2.00	<2.00		Nil	Nil
	06-Apr-11	13:10	Fine	<1	22.30	22.30	22.30	7.37	7.32	7.35		9.10	9.10	9.10	1.90	1.94	1.92		<2.00	<2.00	<2.00		Nil	Nil
	08-Apr-11	13:30	Sunny	<1	22.10	22.10	22.10	7.45	7.51	7.48		9.75	9.74	9.75	1.95	1.99	1.97		<2.00	<2.00	<2.00		Nil	Nil
	11-Apr-11	13:30	Sunny	<1	28.20	28.20	28.20	6.81	6.84	6.83		9.70	9.71	9.71	1.90	1.94	1.92		<2.00	<2.00	<2.00		Nil	Nil
	13-Apr-11	10:00	Sunny	<1	23.30	23.30	23.30	7.46	7.51	7.49		9.36	9.35	9.36	1.72	1.66	1.69		<2.00	<2.00	<2.00		Nil	Nil
	15-Apr-11	13:16	Sunny	<1	25.10	25.10	25.10	7.47	7.50	7.49		9.07	9.07	9.07	1.18	1.21	1.20		<2.00	<2.00	<2.00		Nil	Nil
	18-Apr-11	10:10	Fine	<1	26.50	26.50	26.50	7.03	7.13	7.08		9.49	9.50	9.50	1.96	1.99	1.98		<2.00	<2.00	<2.00		Nil	Nil
	20-Apr-11	11:25	Fine	<1	24.30	24.30	24.30	7.02	7.06	7.04		9.73	9.72	9.73	1.40	1.50	1.45		<2.00	<2.00	<2.00		Nil	Nil
	26-Apr-11	14:10	Sunny	<1	26.00	26.00	26.00	7.24	7.20	7.22		9.90	9.90	9.90	1.12	1.14	1.13		<2.00	<2.00	<2.00		Nil	Nil
	28-Apr-11	15:20	Cloudy	<1	27.70	27.80	27.75	7.18	7.24	7.21		9.90	9.91	9.91	2.27	2.31	2.29		<2.00	<2.00	<2.00		Nil	Nil
	30-Apr-11	11:08	Rainy	<1	24.70	24.70	24.70	7.18	7.22	7.20		8.90	8.89	8.90	1.98	1.94	1.96		<2.00	<2.00	<2.00		Nil	Nil
	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-		Nil	Nil
	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			-

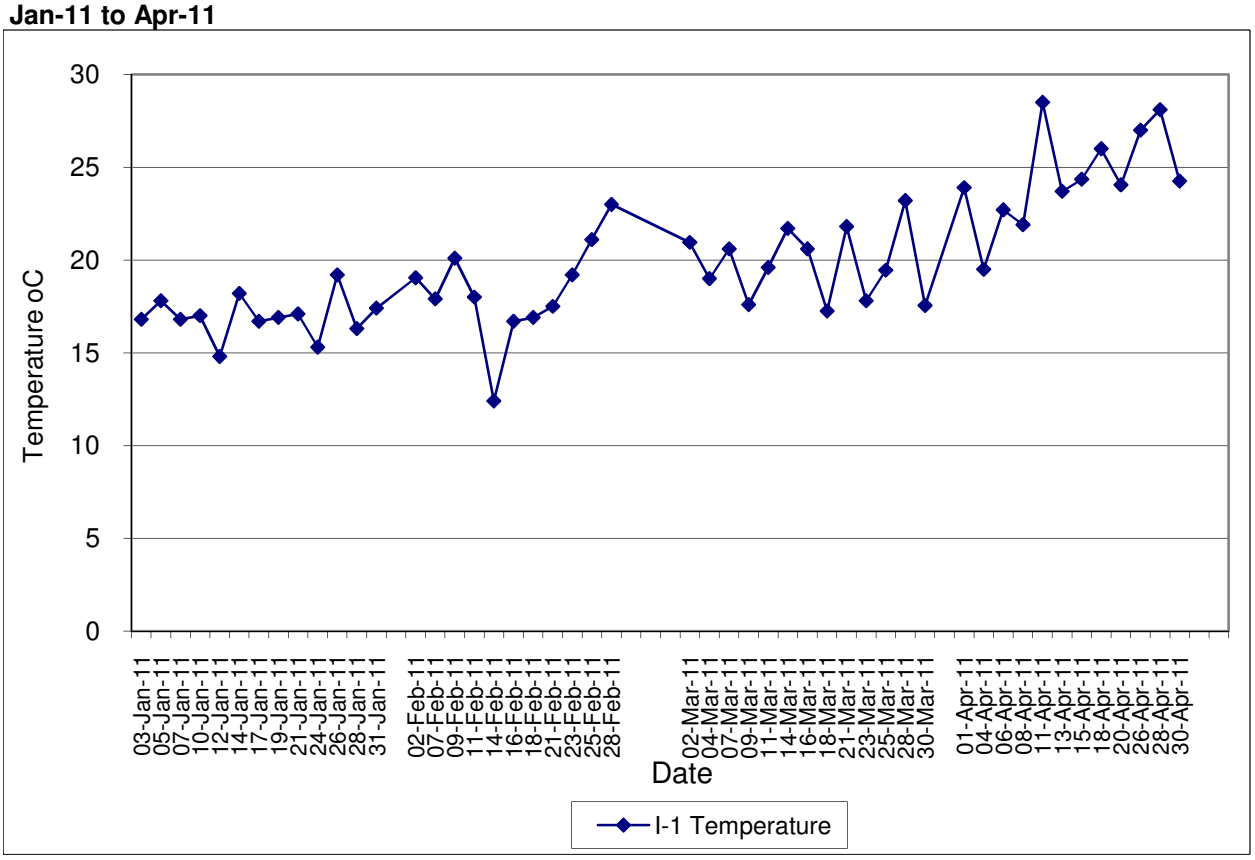
Note:

Blue Italic indicates an exceedance of Action Level

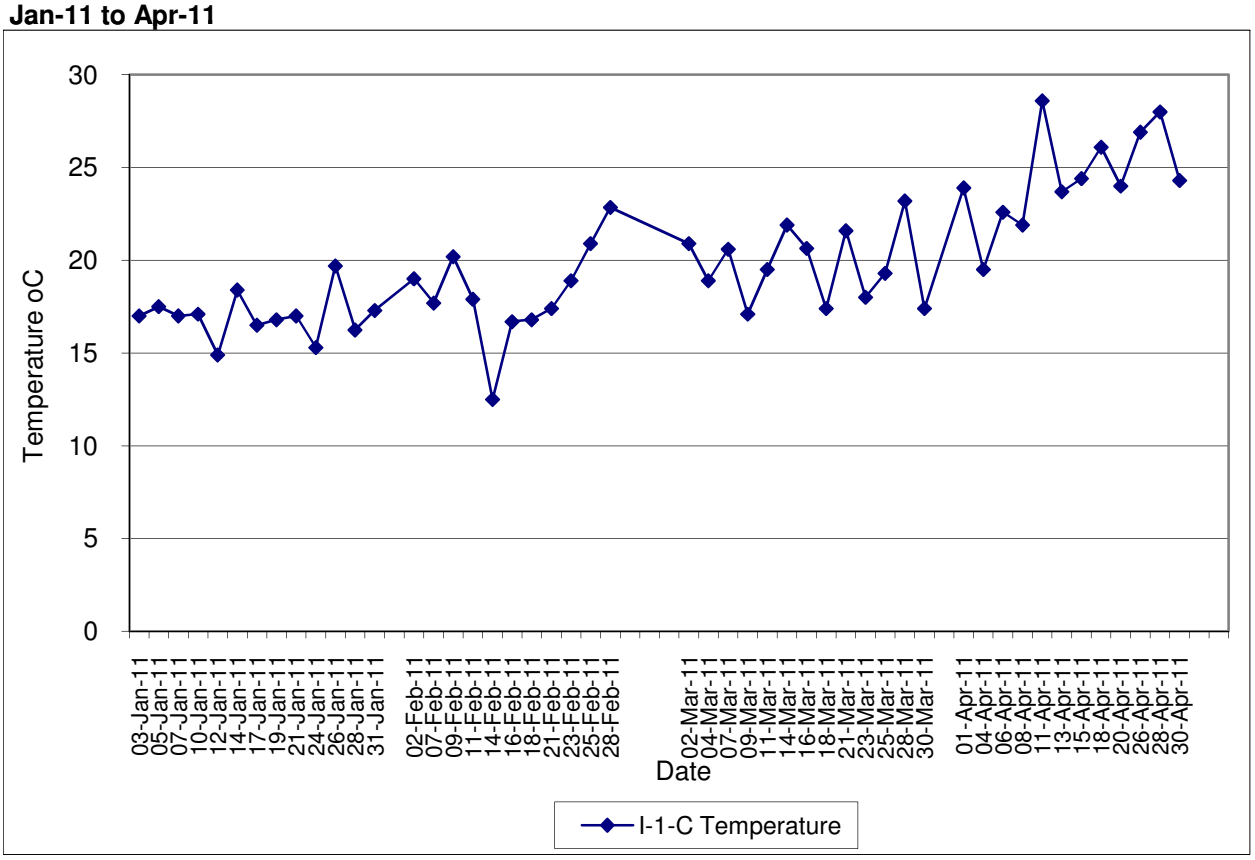
Red Bold indicates an exceedance of Limit Level

Samples with SS level smaller than 2 mg/L will be assumed as 2mg/L when calulating the average SS values under the situation that one sample is smaller than 2

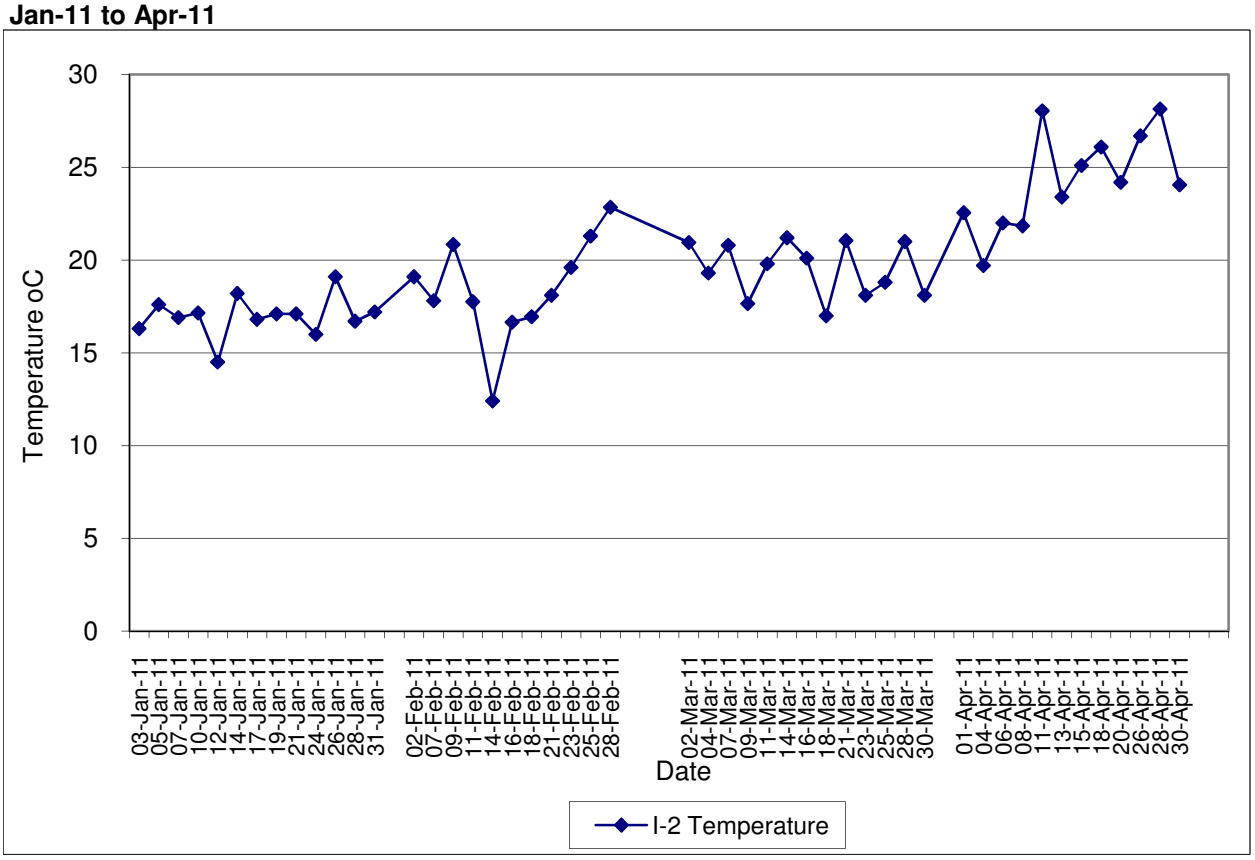
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
Jan-11 to Apr-11



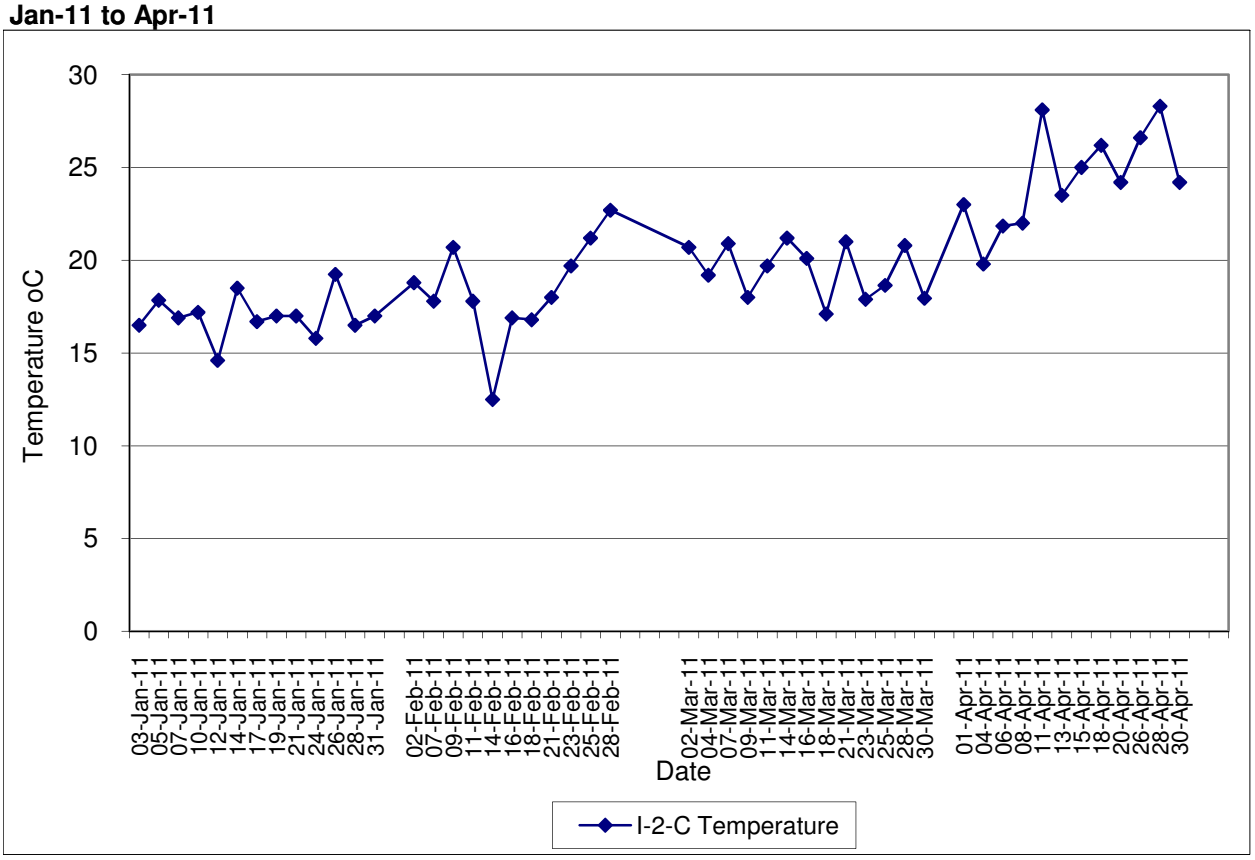
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
Jan-11 to Apr-11



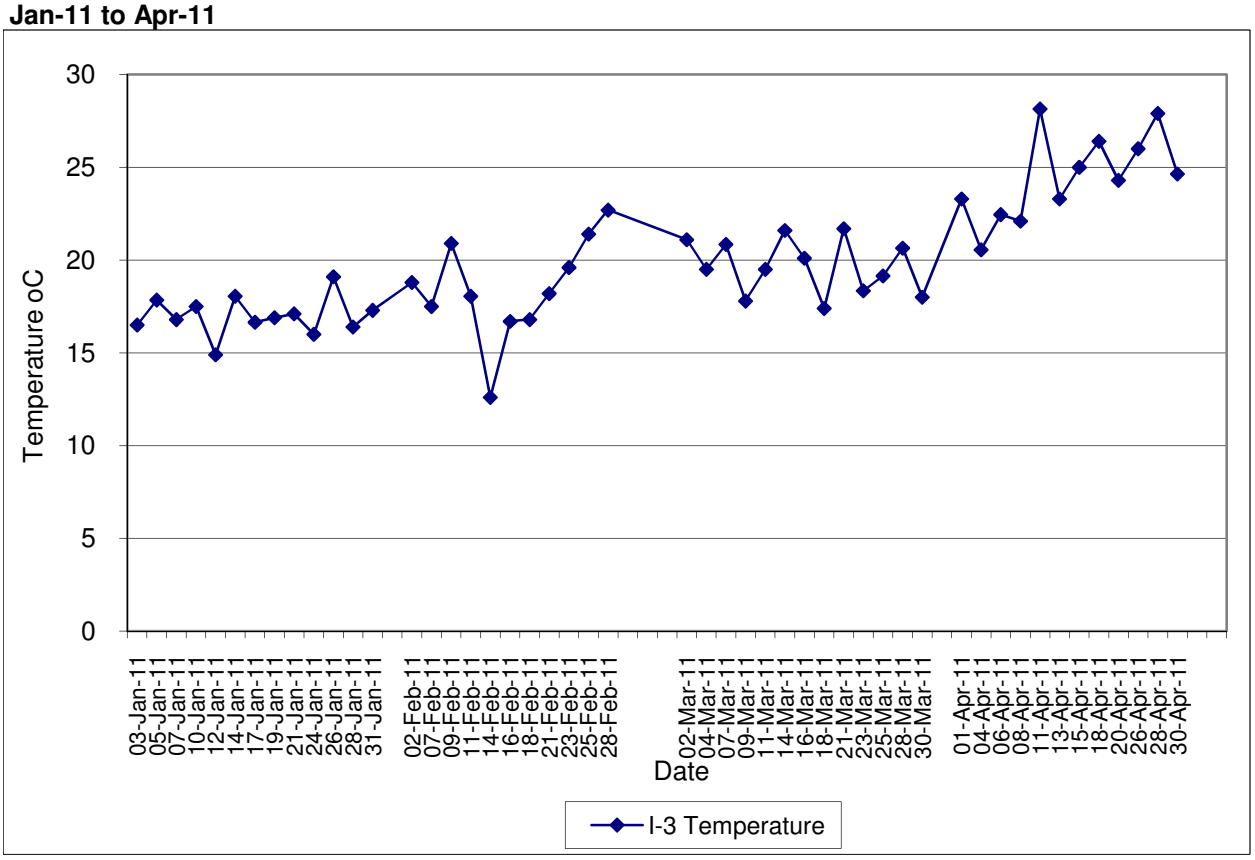
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Jan-11 to Apr-11



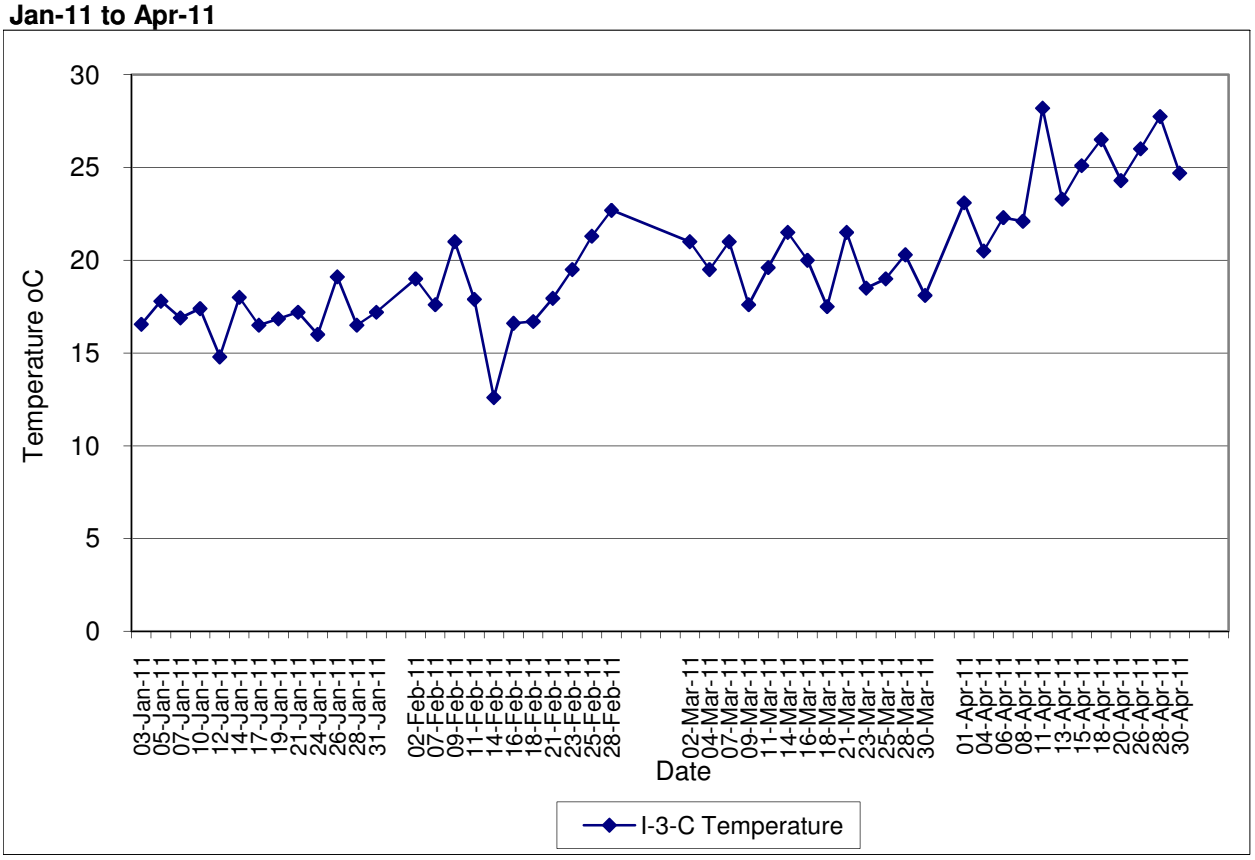
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Jan-11 to Apr-11



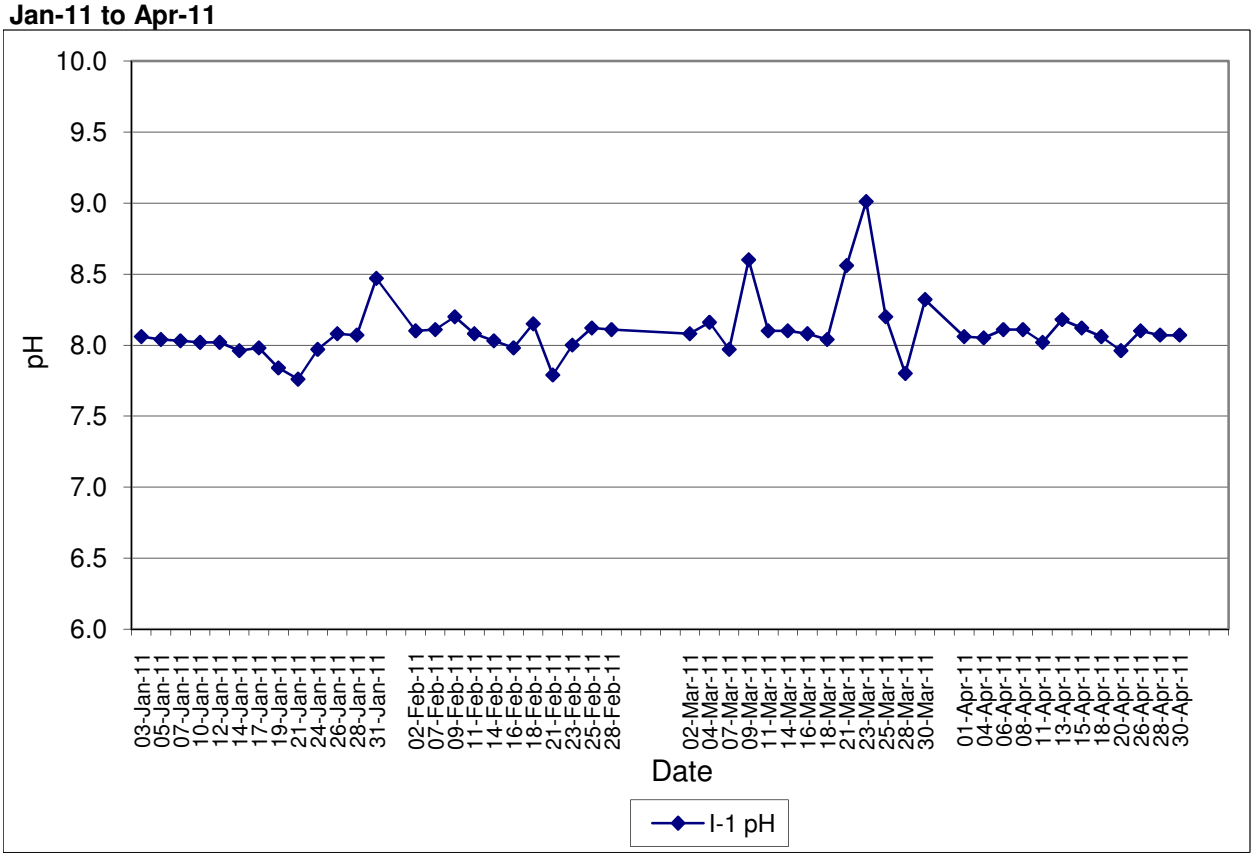
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Jan-11 to Apr-11



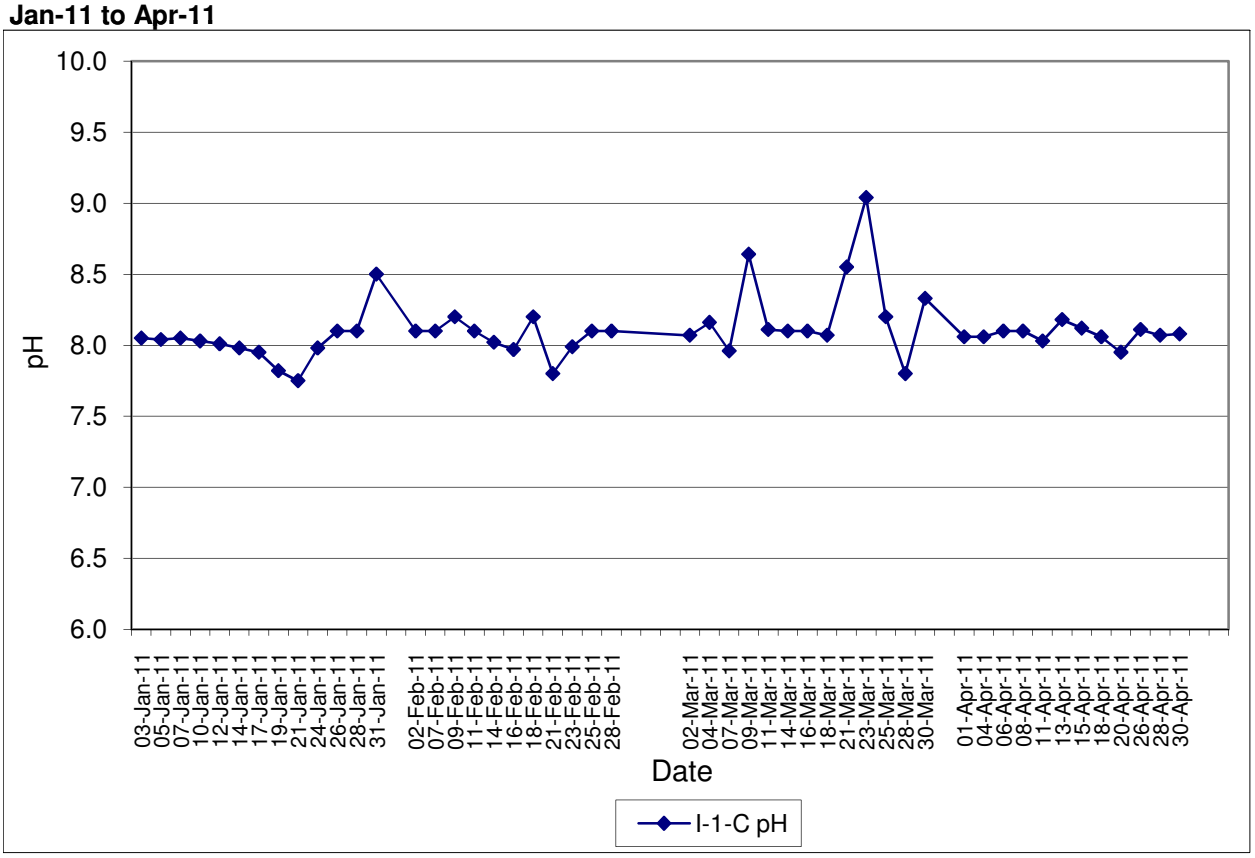
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Jan-11 to Apr-11



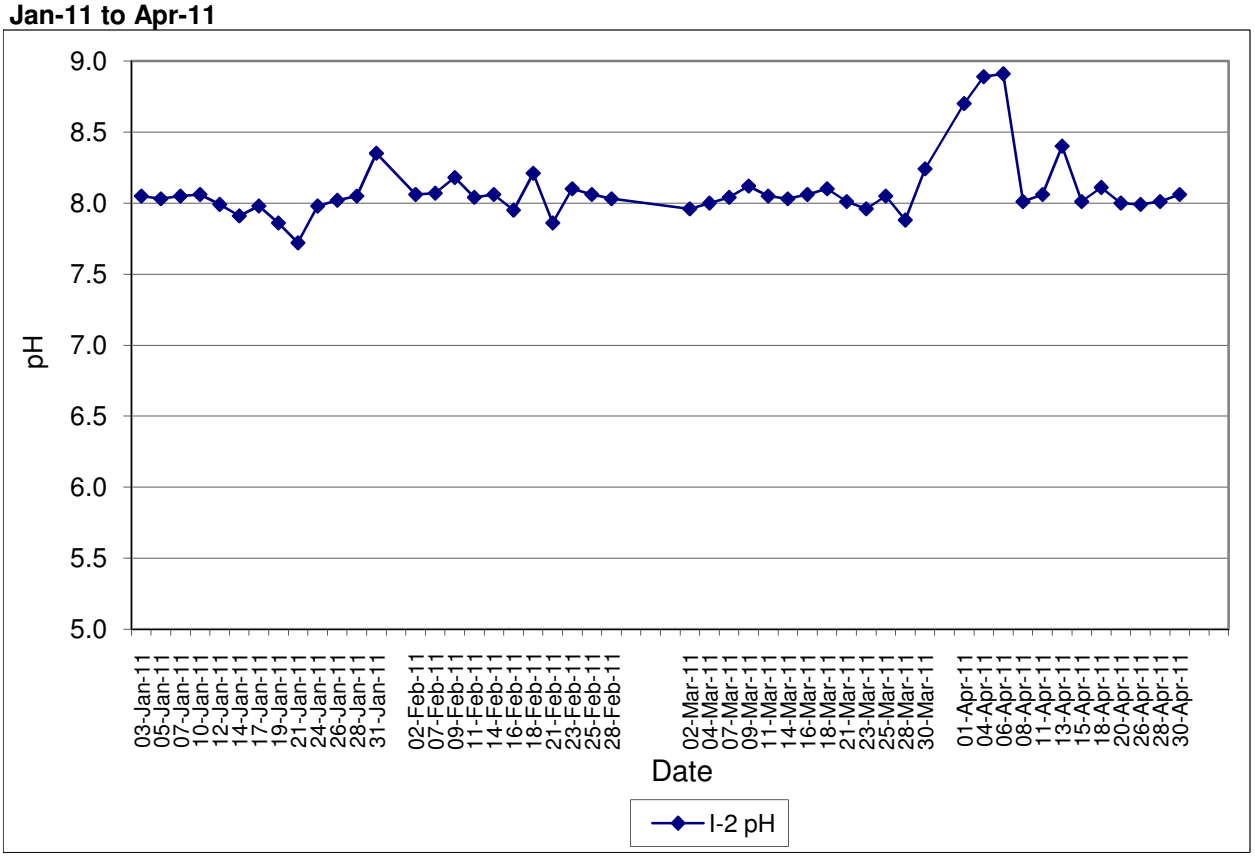
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
Jan-11 to Apr-11



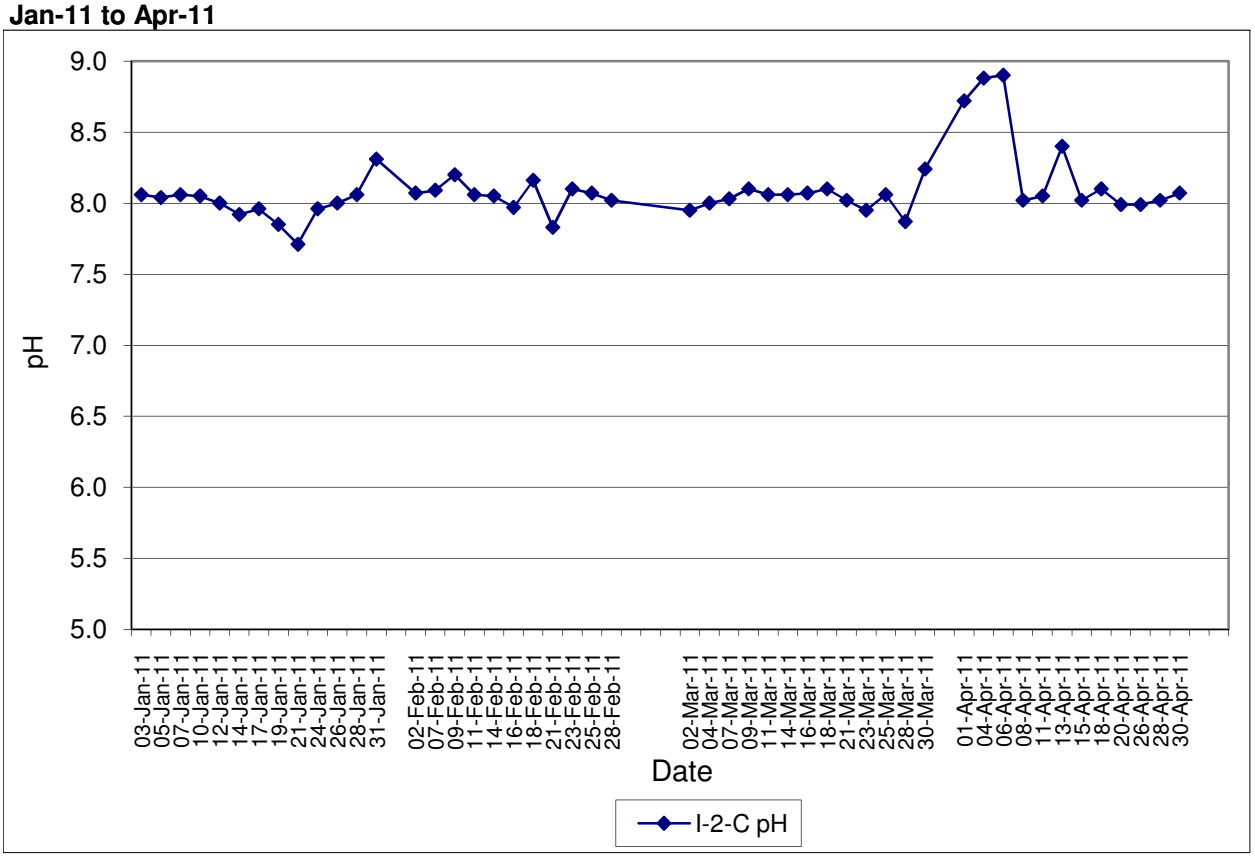
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
Jan-11 to Apr-11



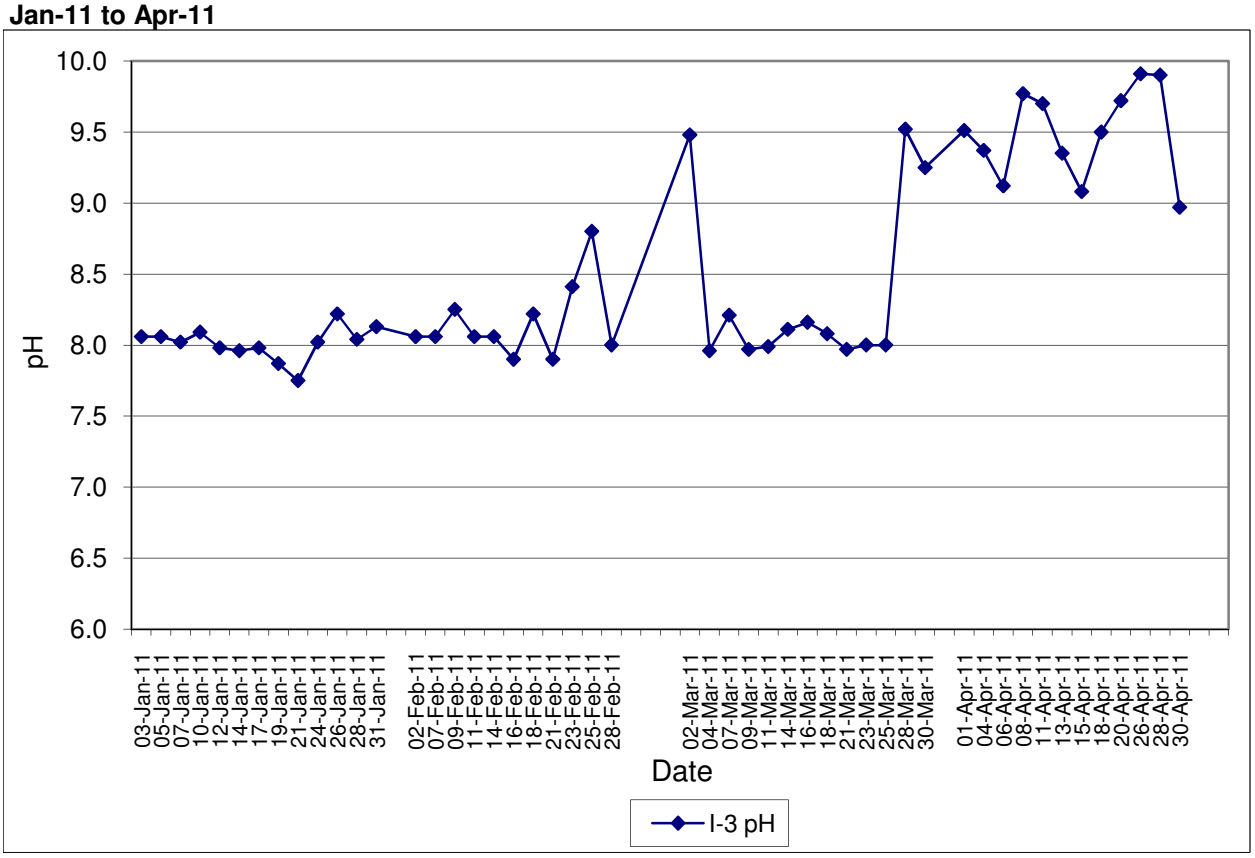
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Jan-11 to Apr-11



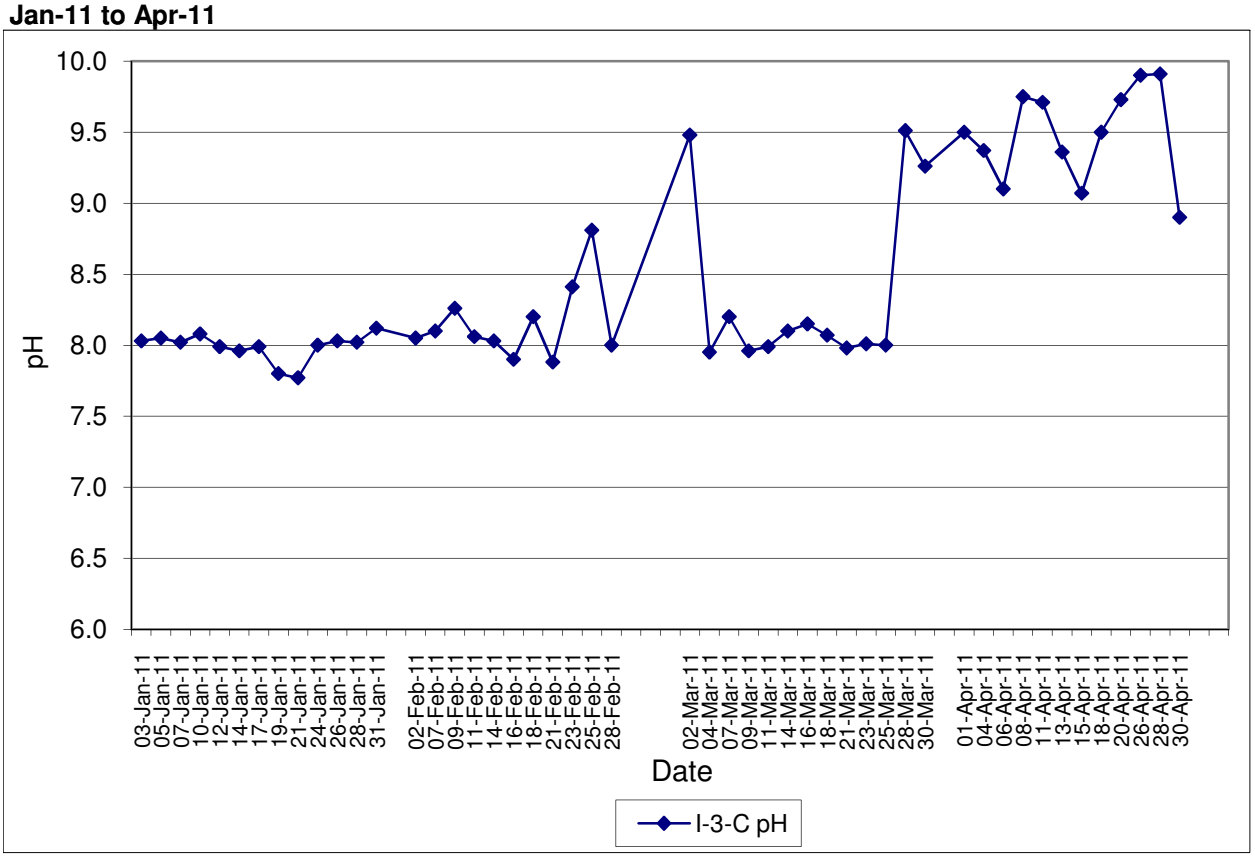
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Jan-11 to Apr-11



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Jan-11 to Apr-11

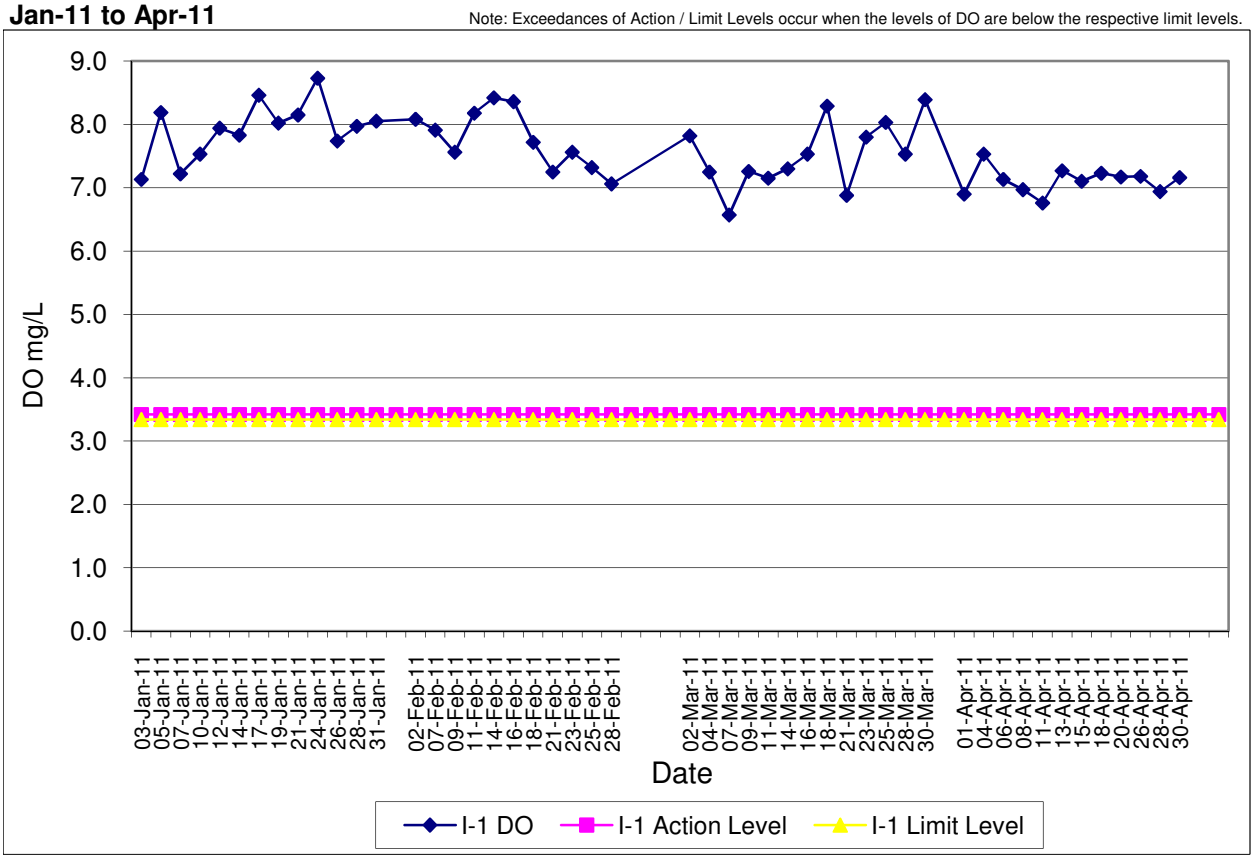


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Jan-11 to Apr-11

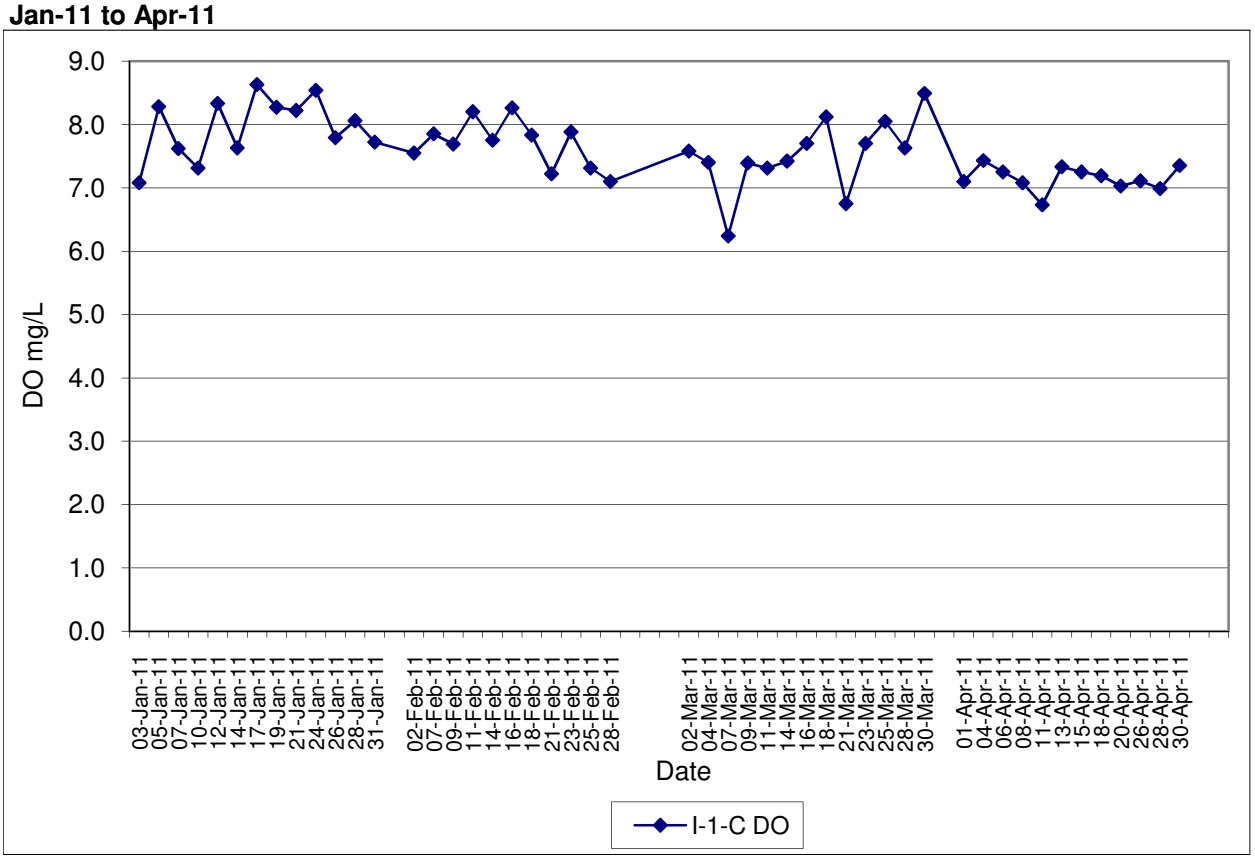


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
Jan-11 to Apr-11

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

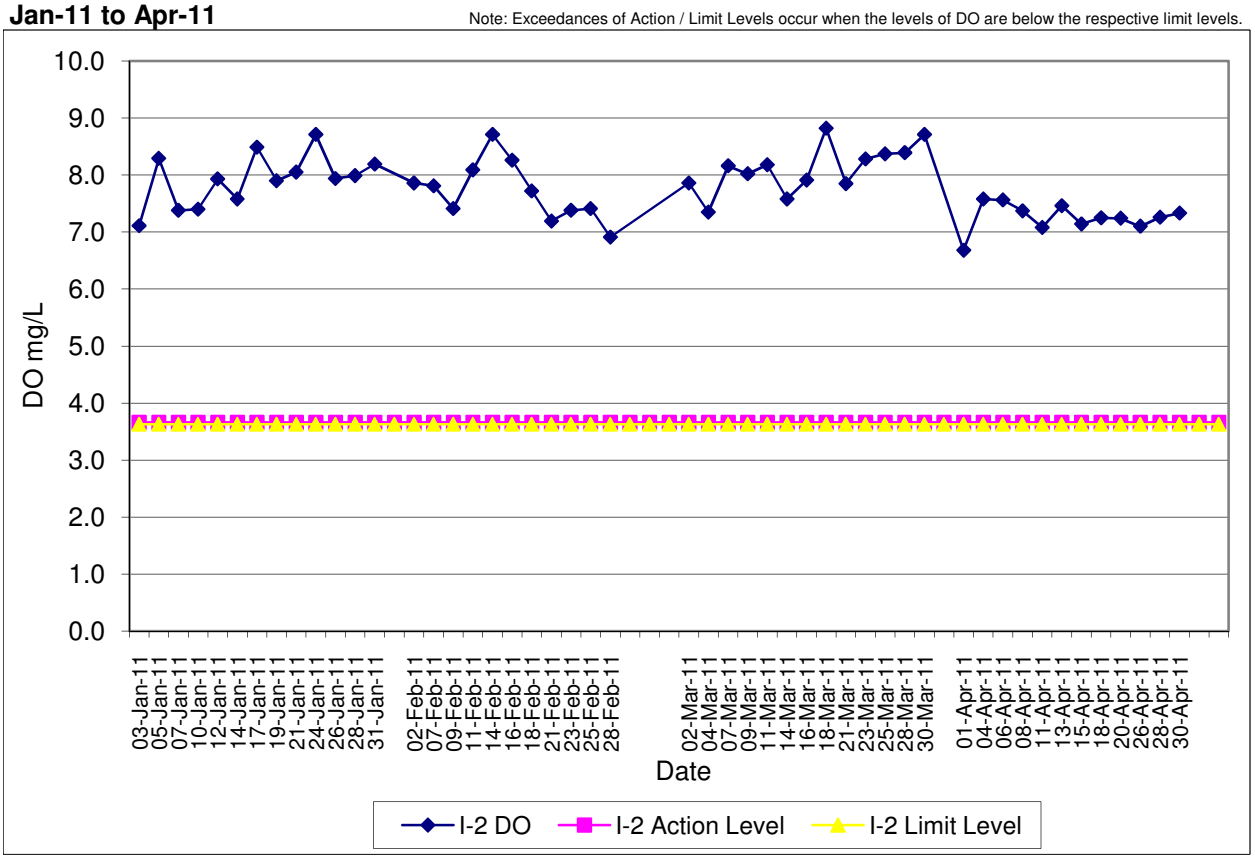


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
Jan-11 to Apr-11

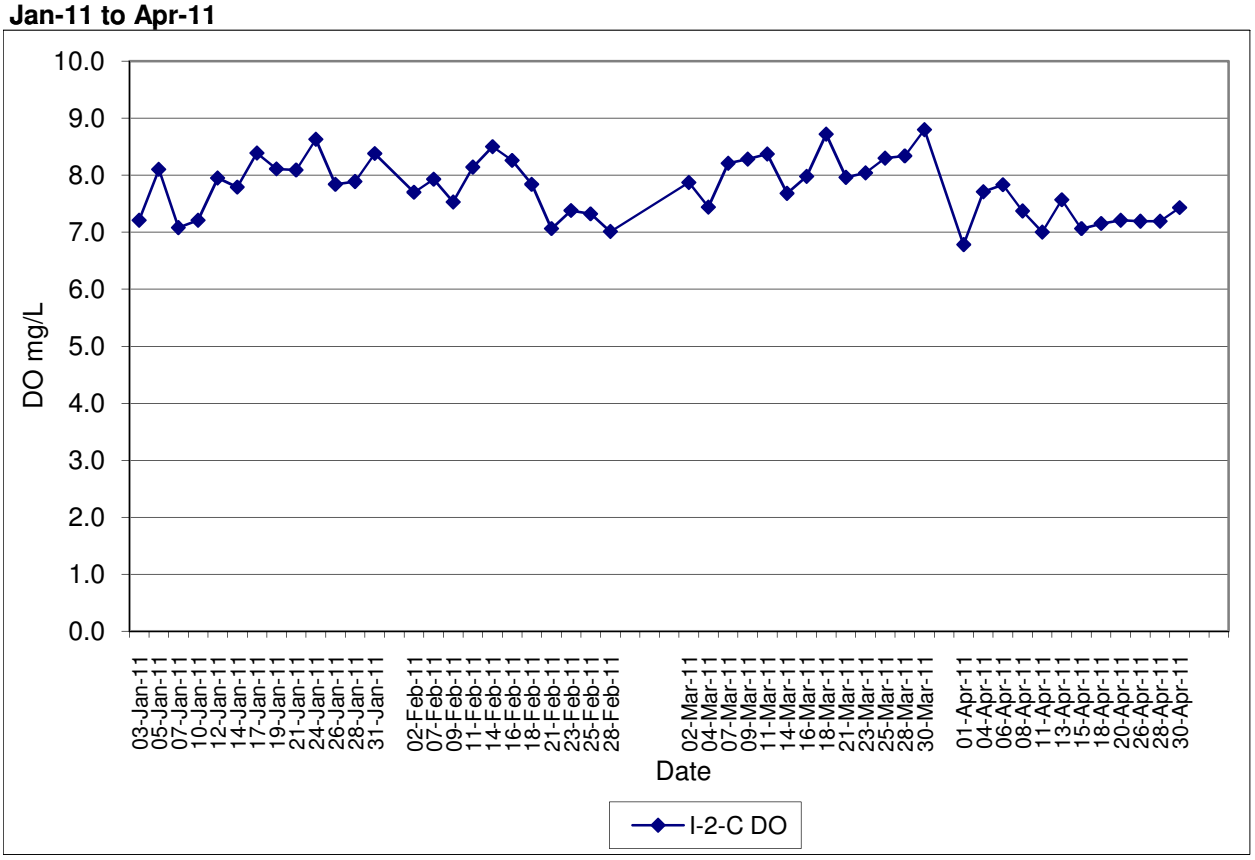


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Jan-11 to Apr-11

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

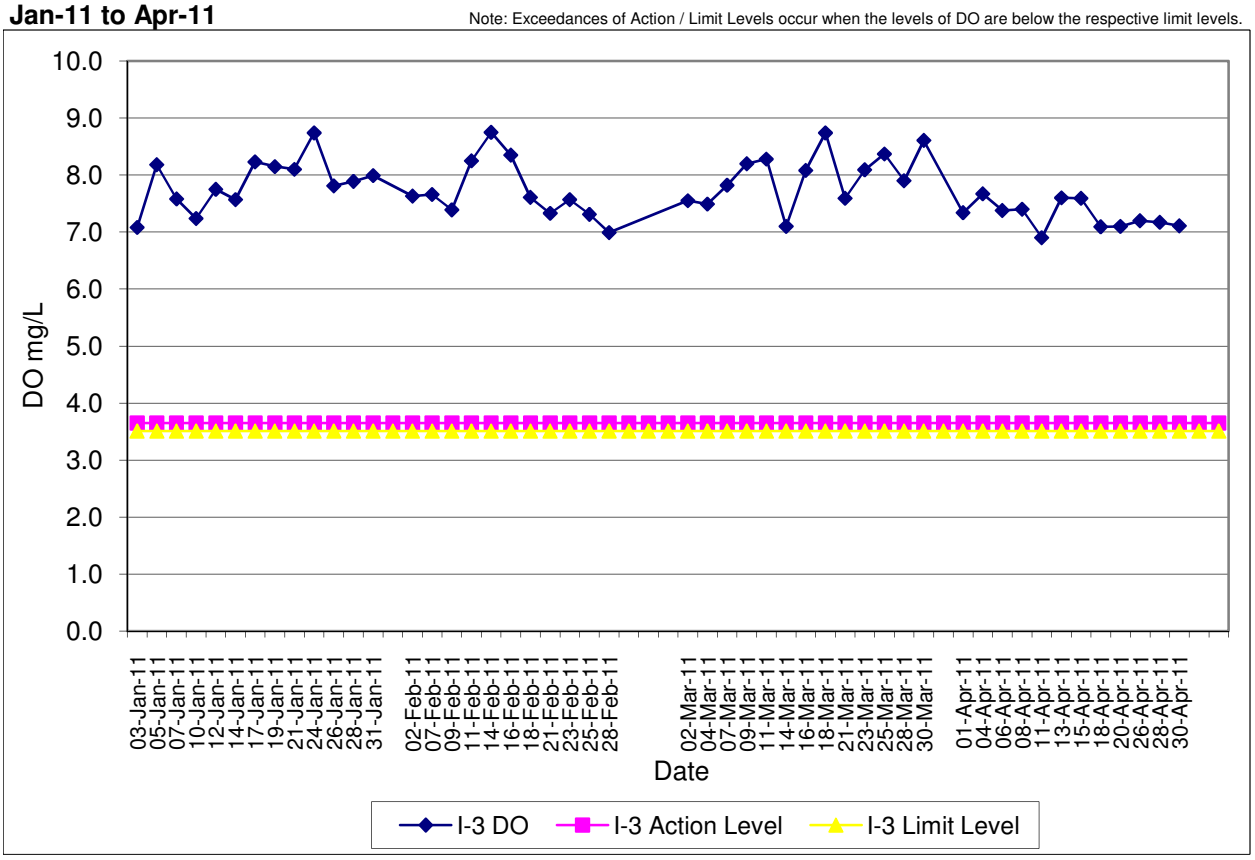


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Jan-11 to Apr-11

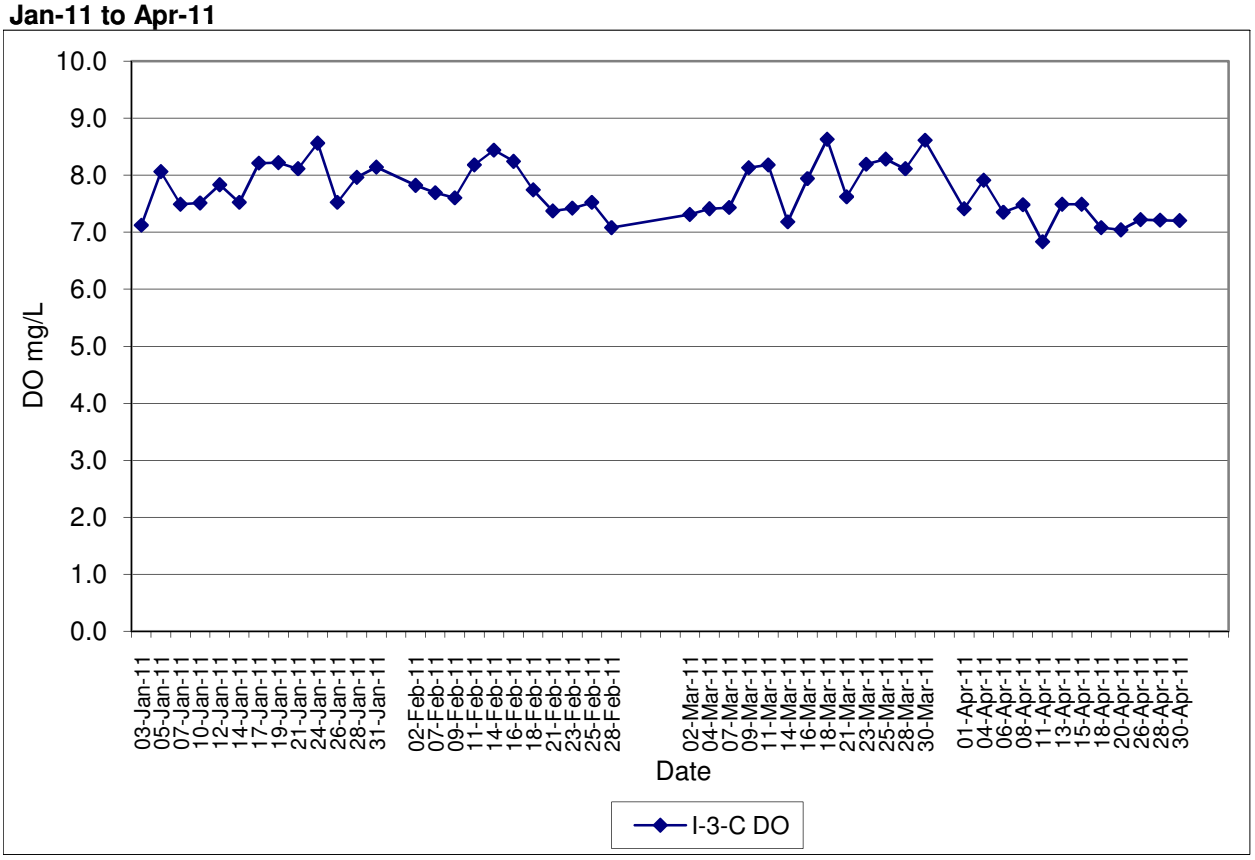


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Jan-11 to Apr-11

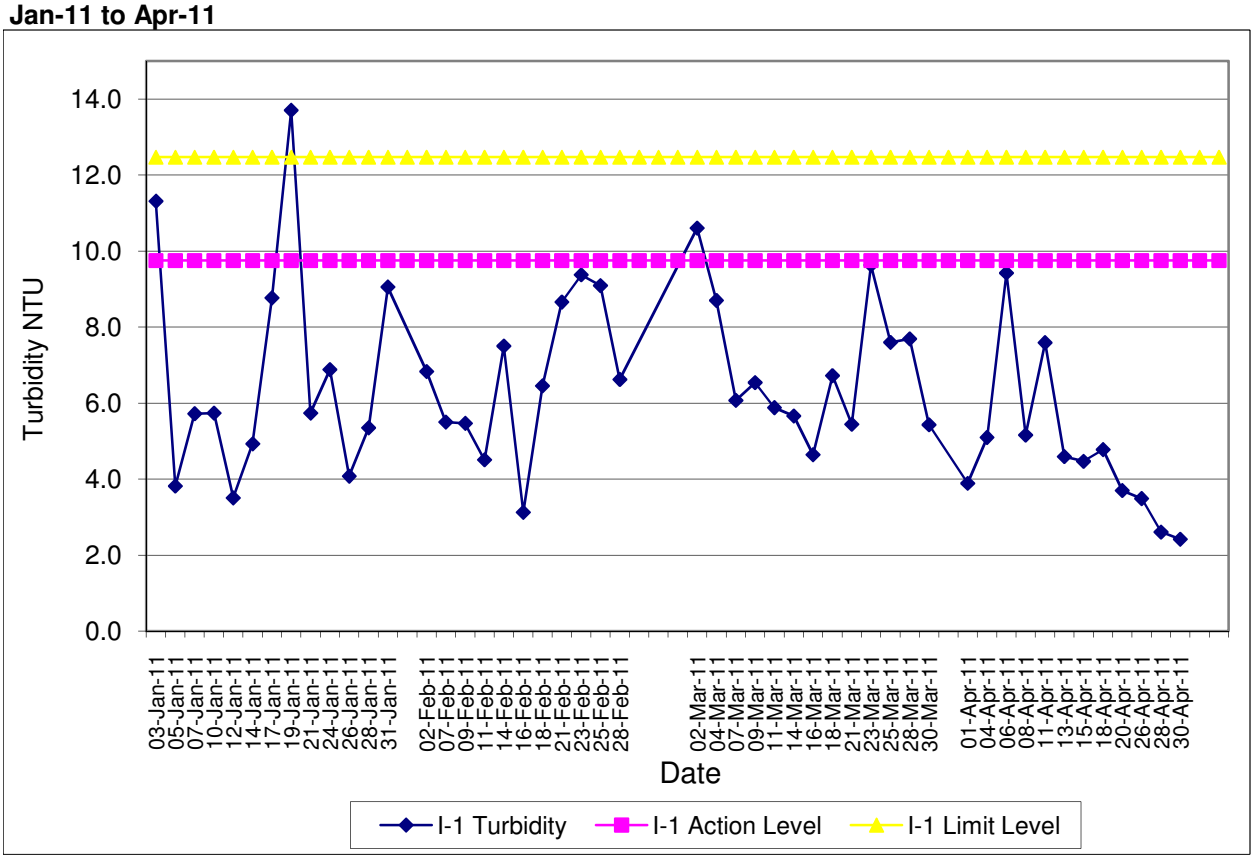
Note: Exceedances of Action / Limit Levels occur when the levels of DO are below the respective limit levels.



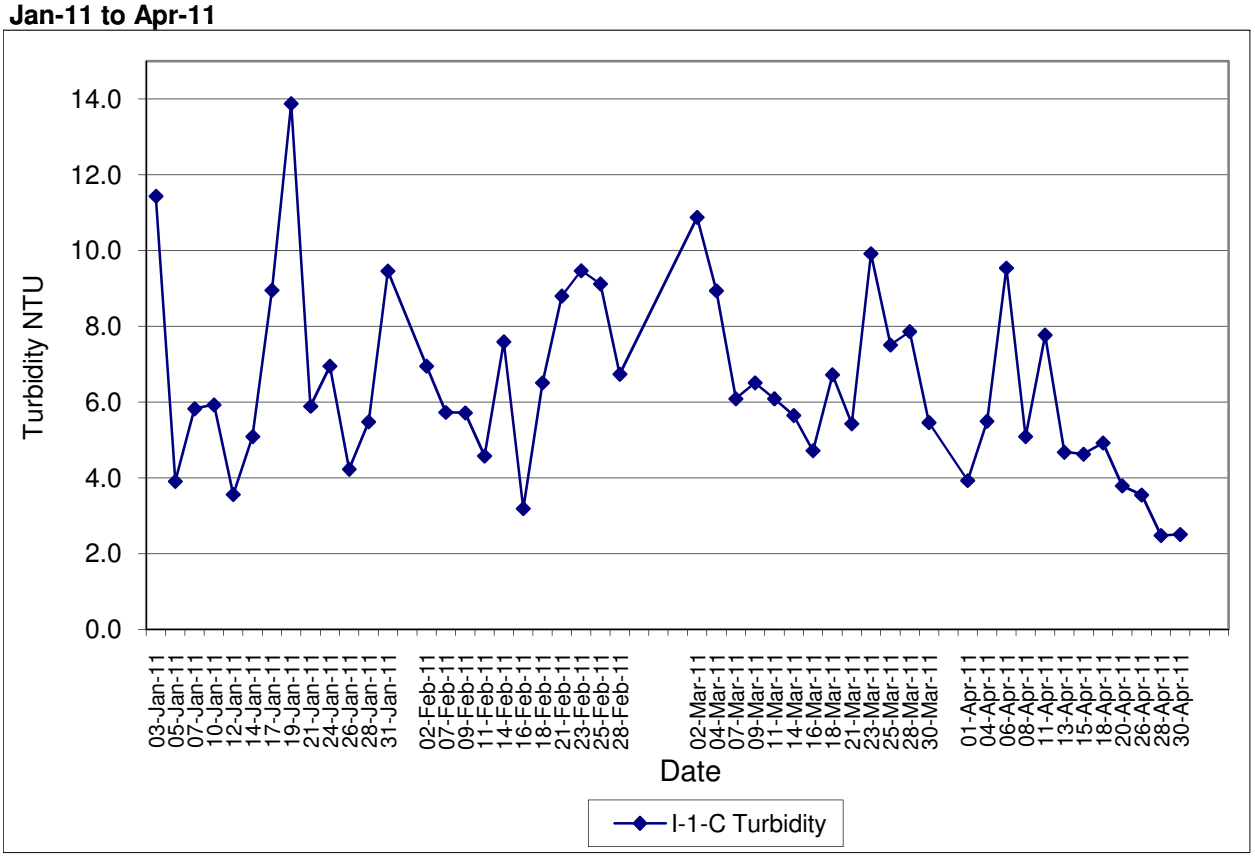
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Jan-11 to Apr-11



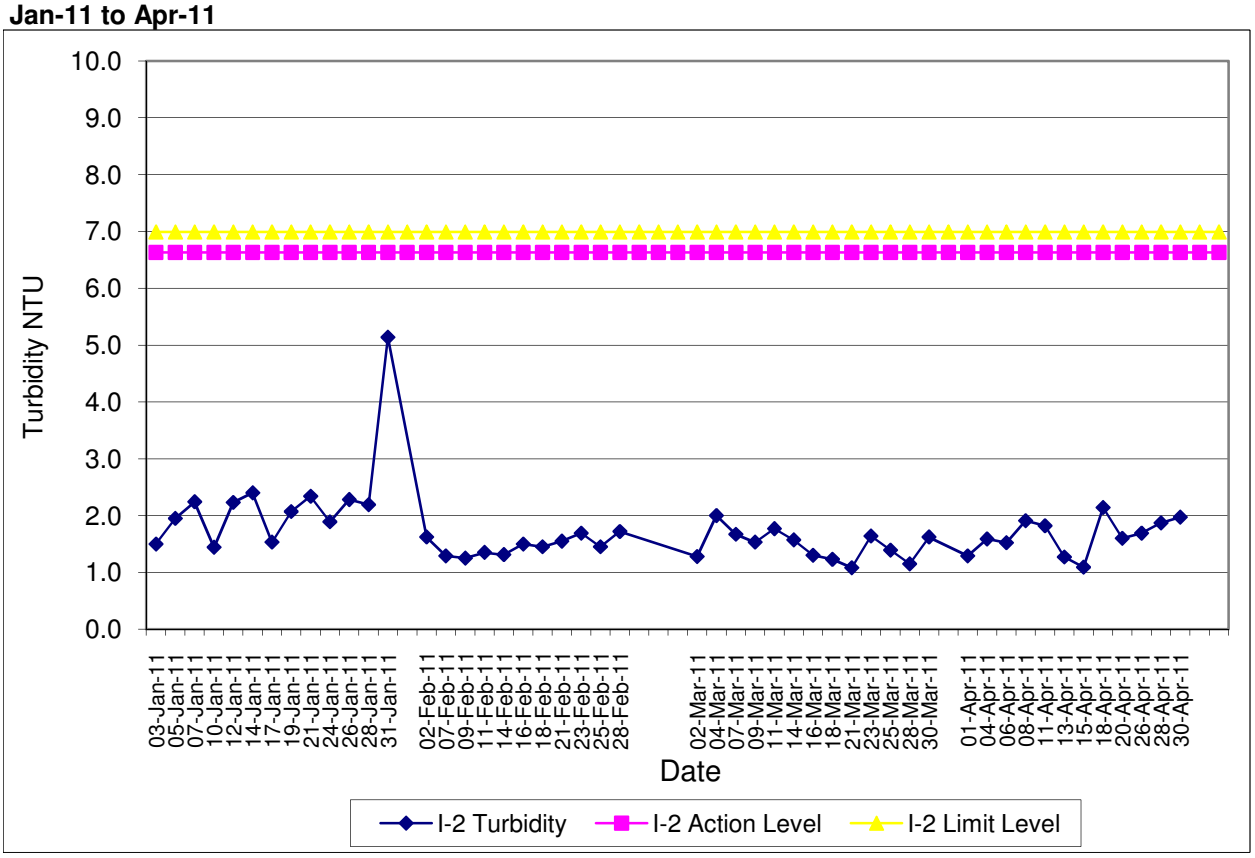
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
Jan-11 to Apr-11



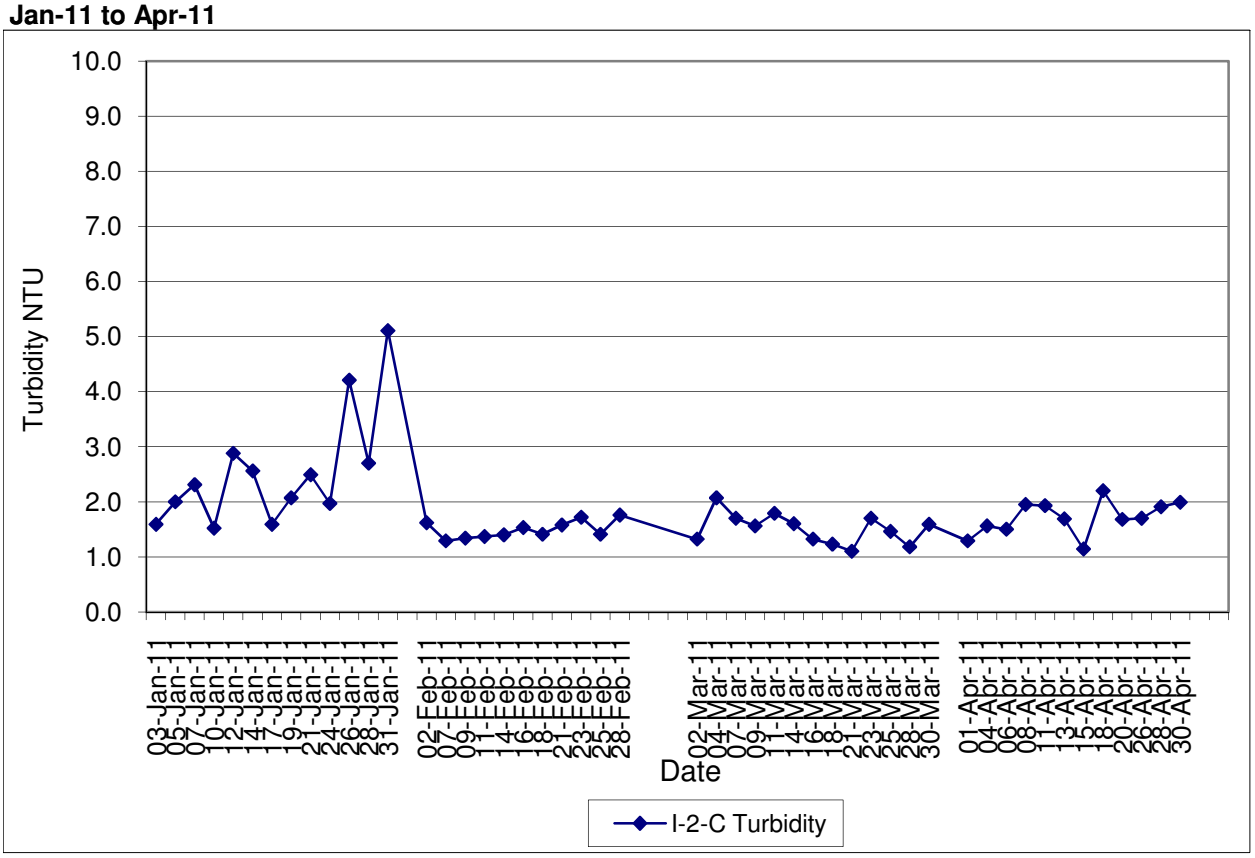
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
Jan-11 to Apr-11



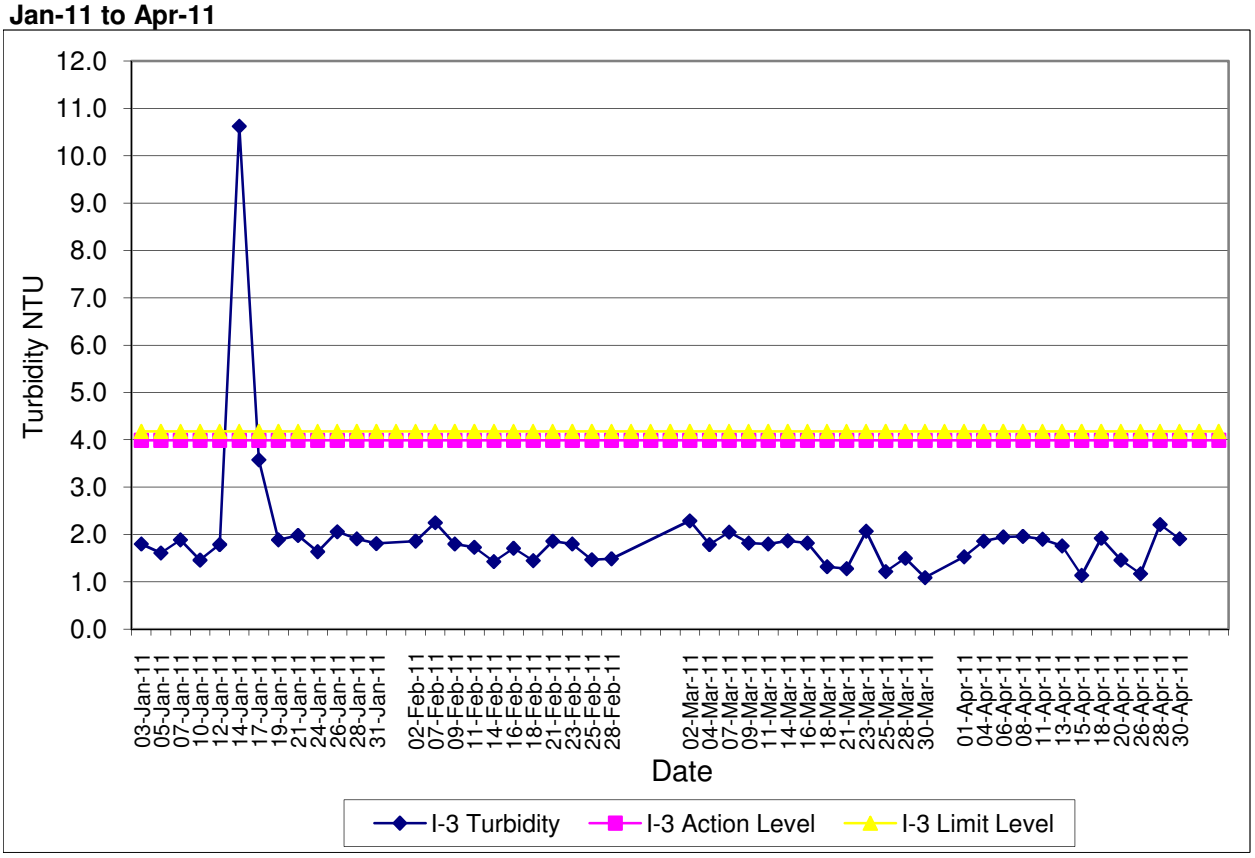
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Jan-11 to Apr-11



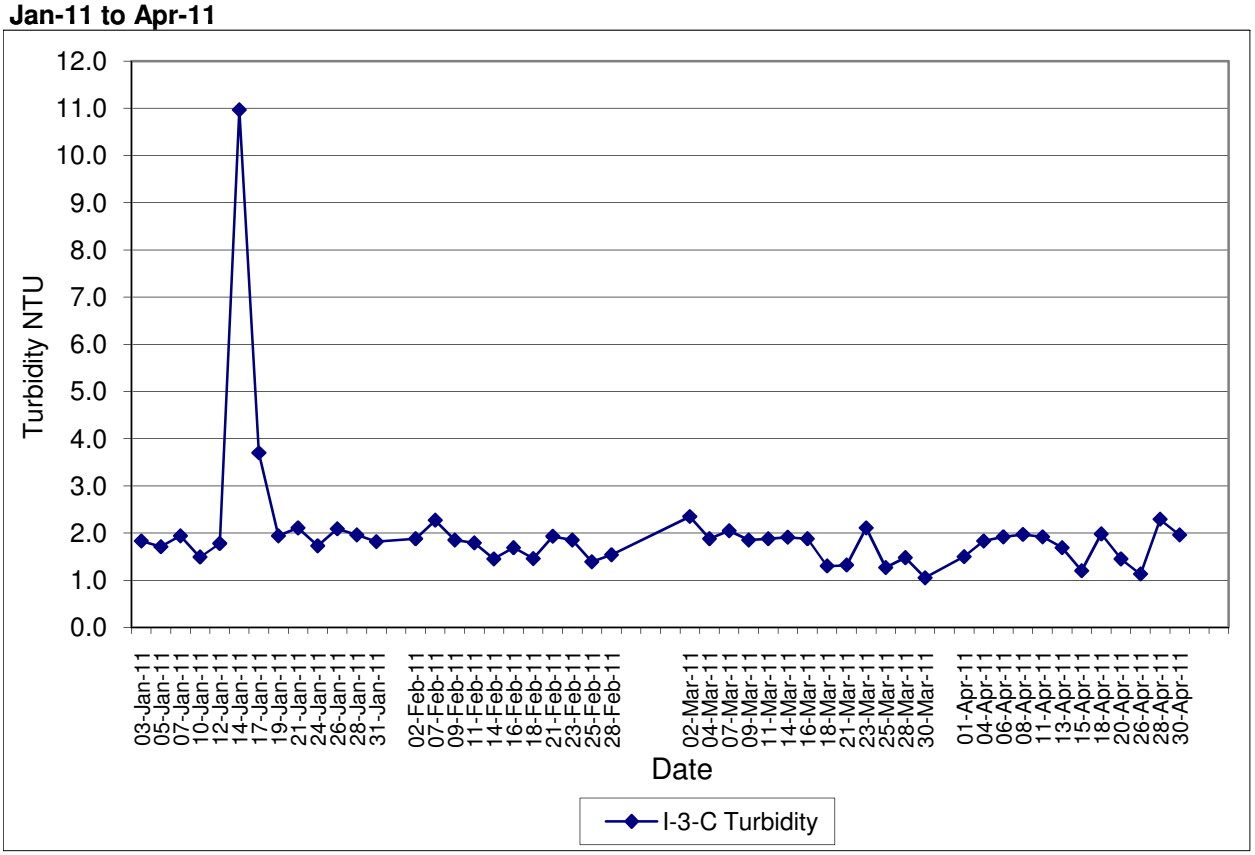
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Jan-11 to Apr-11



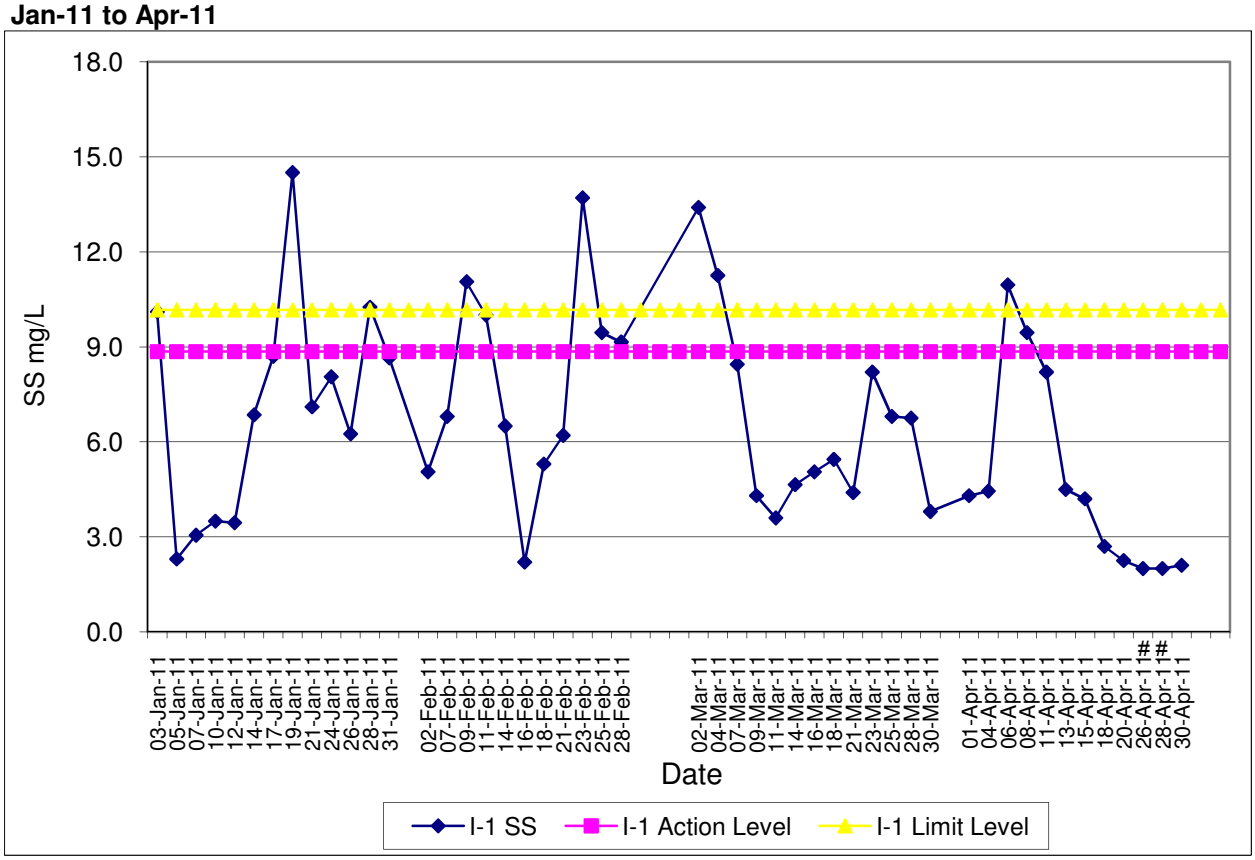
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Jan-11 to Apr-11



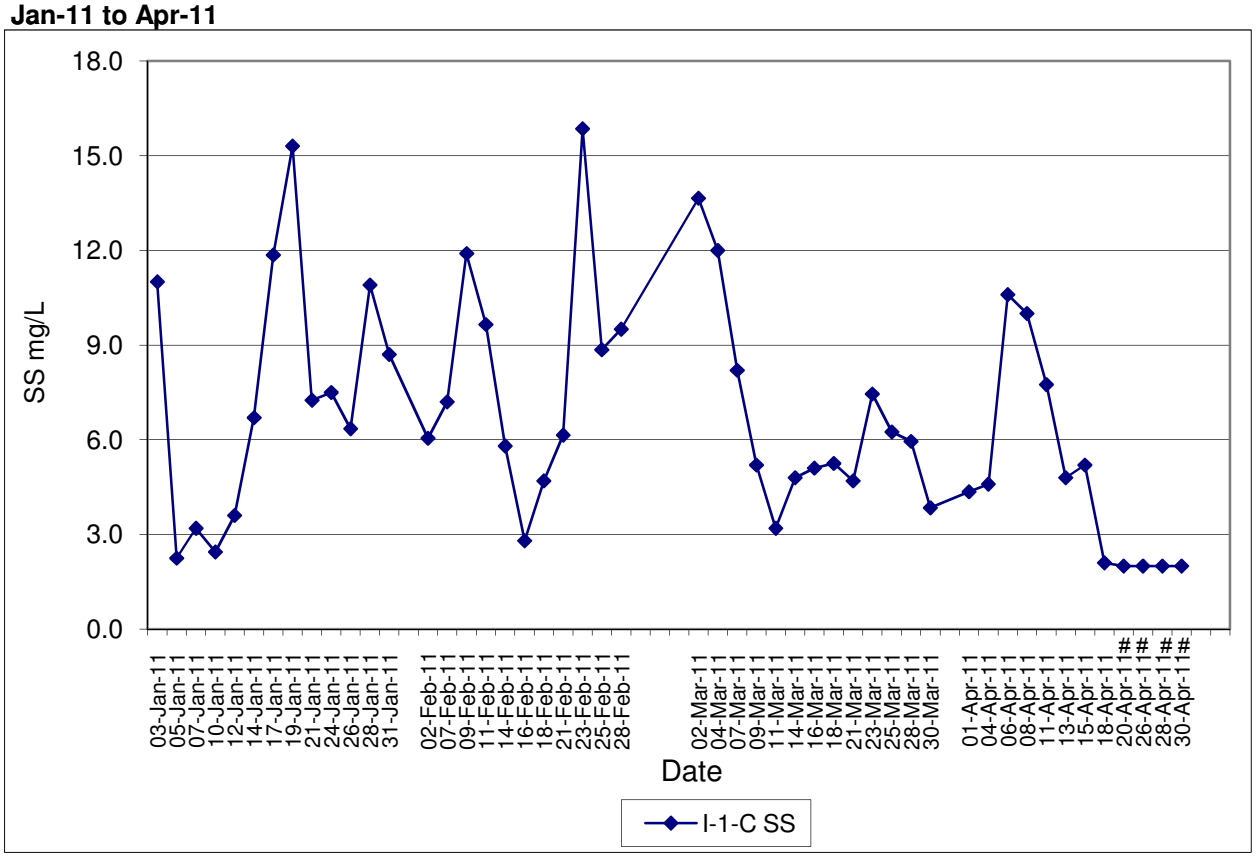
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Jan-11 to Apr-11



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)
Jan-11 to Apr-11

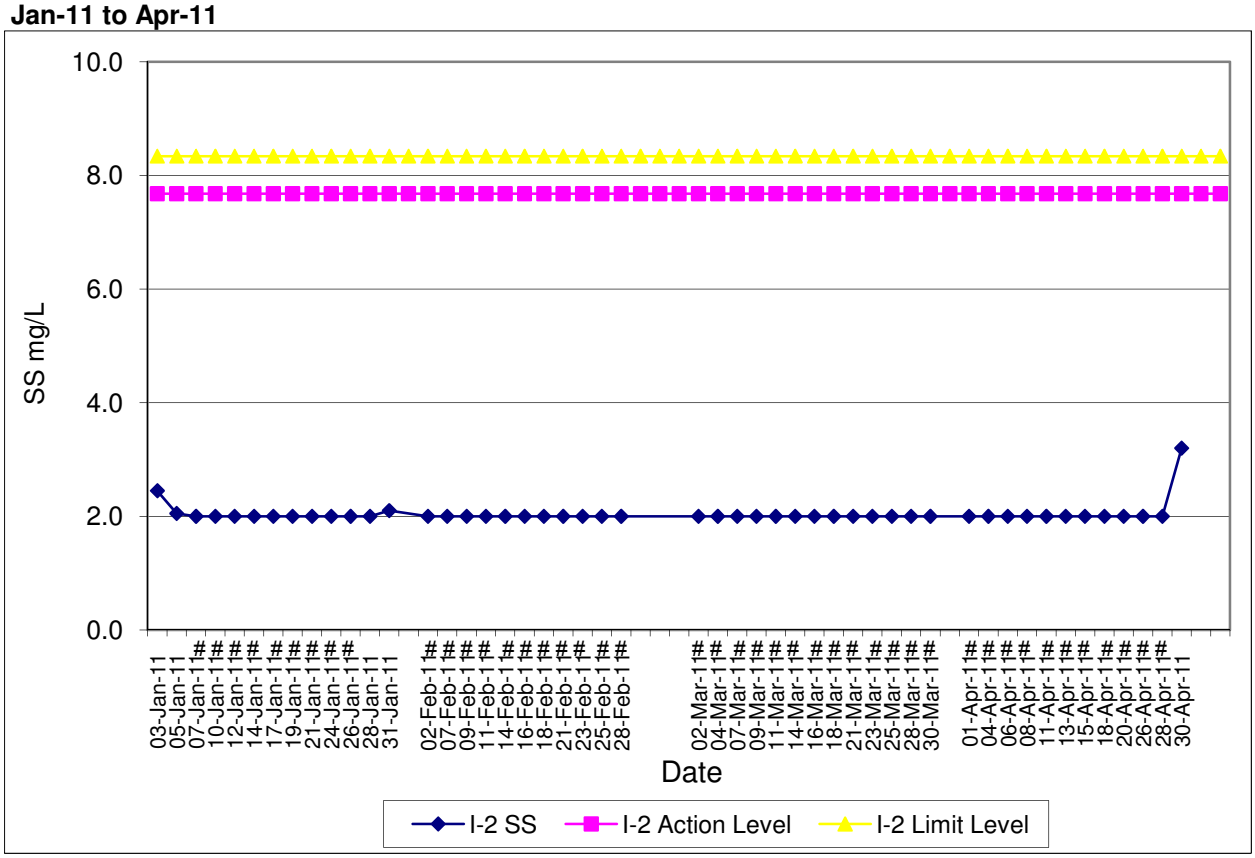


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
Jan-11 to Apr-11

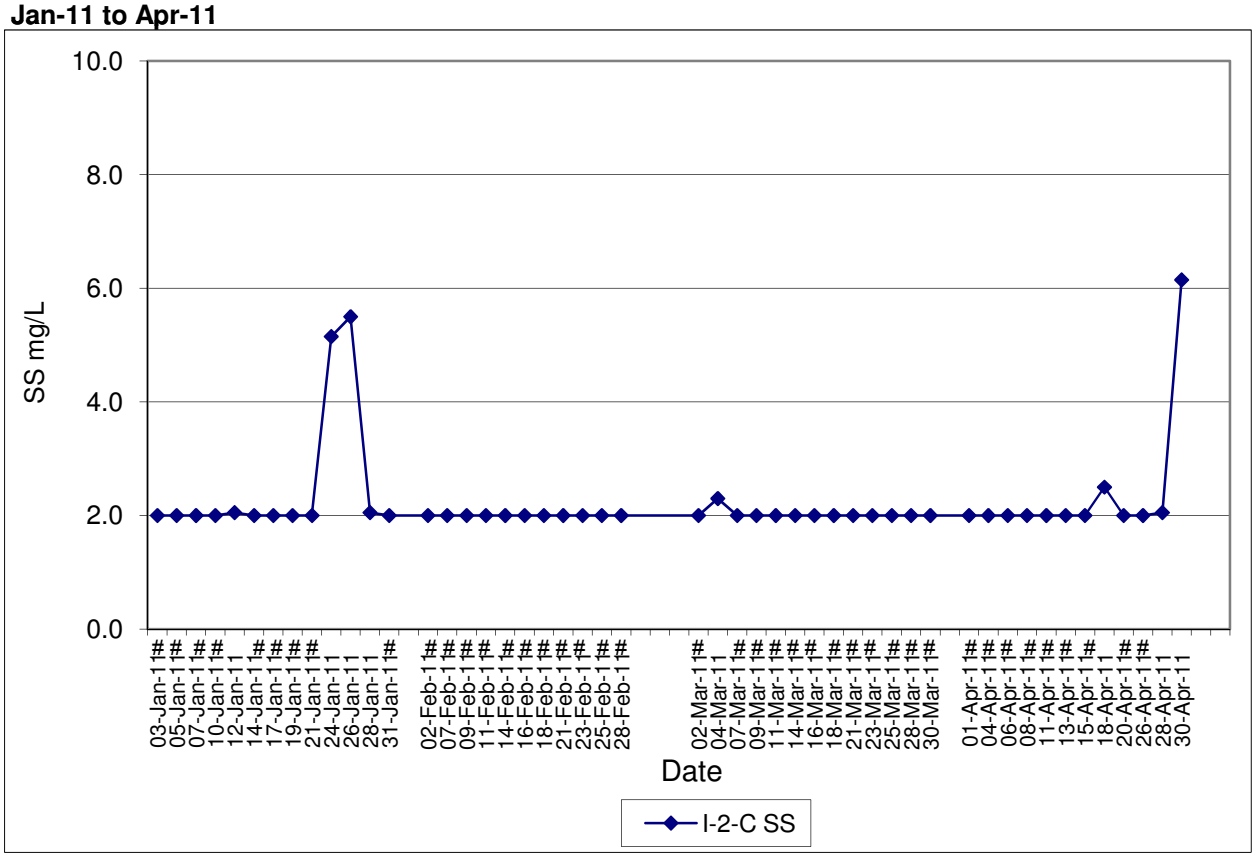


Note: # - For average SS level smaller than 2mg/L, the levels are plotted as 2mg/L in the garphs.

Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Jan-11 to Apr-11

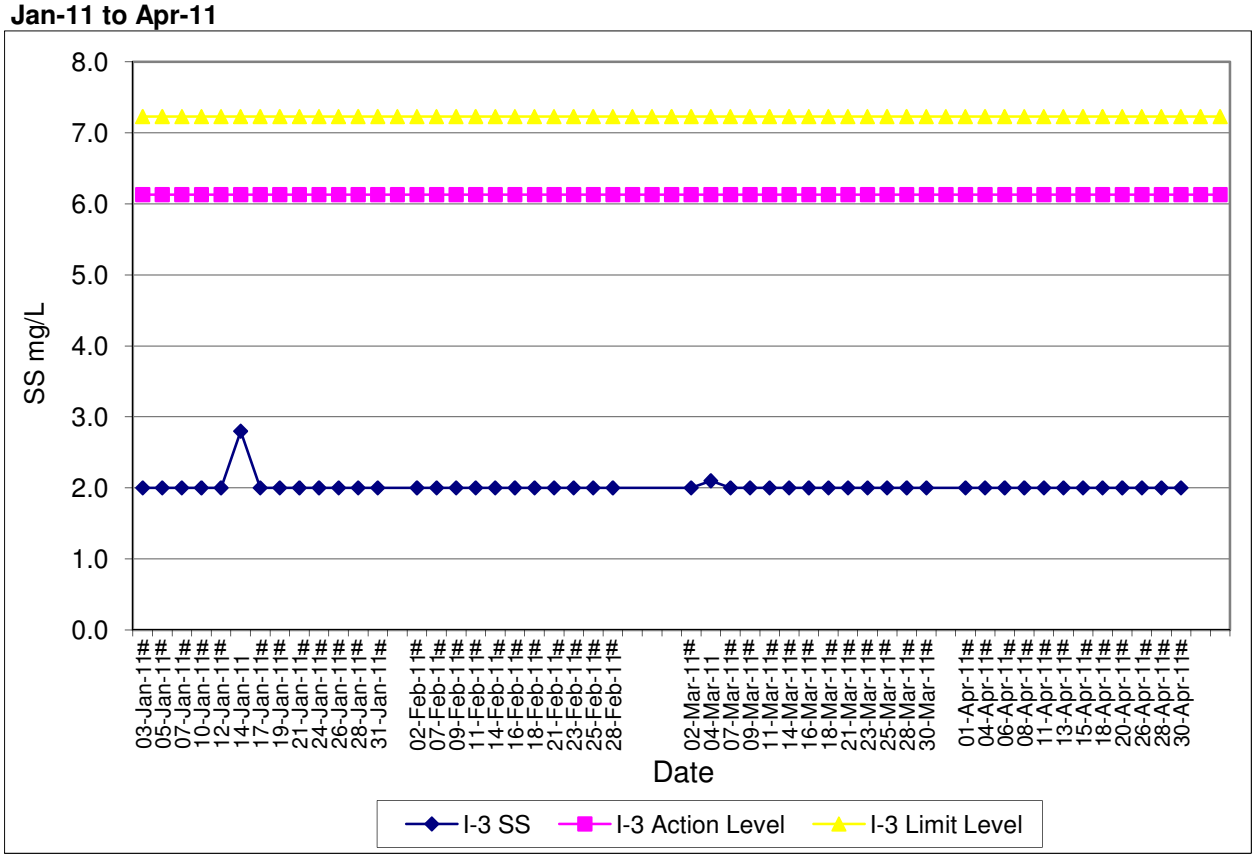


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Jan-11 to Apr-11

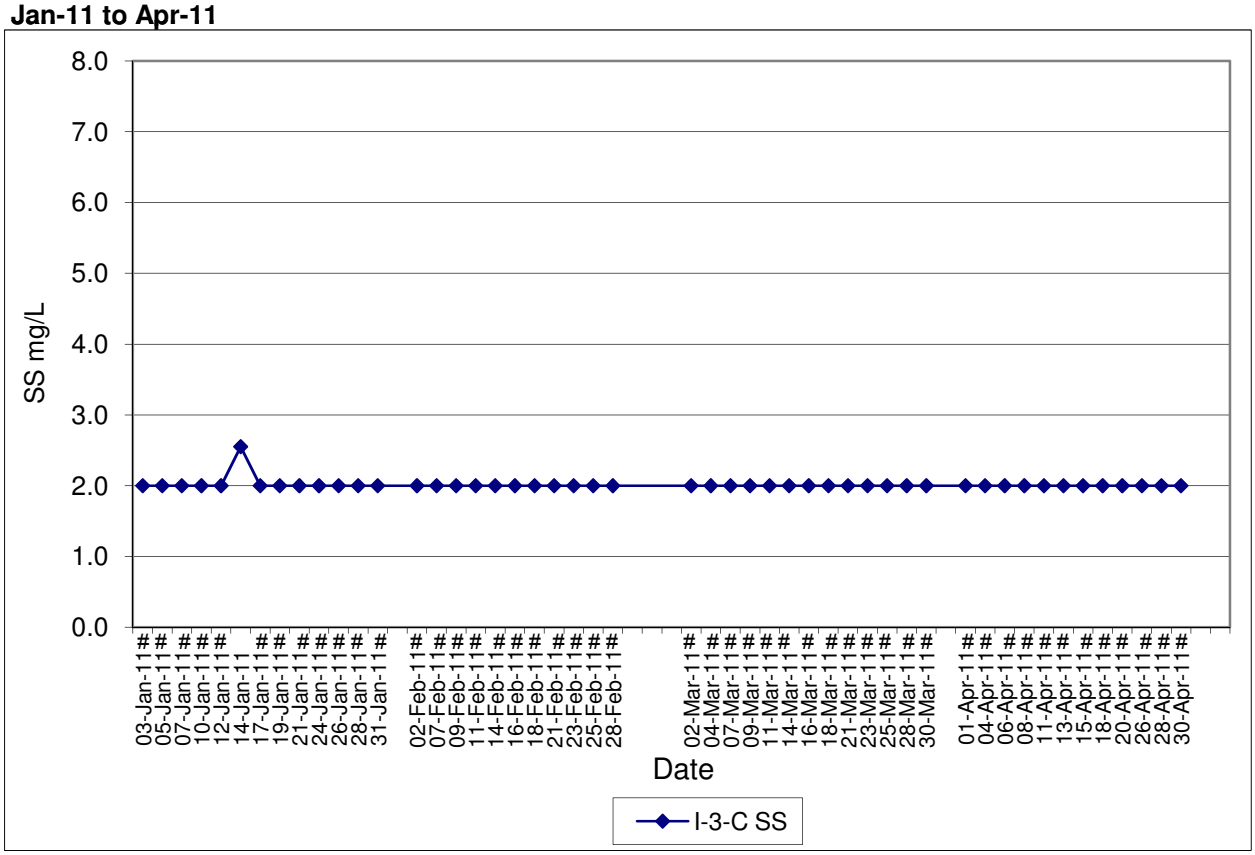


Note: # - For average SS level smaller than 2mg/L, the levels are plotted as 2mg/L in the garphs.

Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Jan-11 to Apr-11



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Jan-11 to Apr-11



Note: # - For average SS level smaller than 2mg/L, the levels are plotted as 2mg/L in the garphs.

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

Marine Water Quality Impact Monitoring Results

Monitoring Locations	Date	Depth	Start Time	Weather	Water Depth(m)	Temp 1	Temp '-	Temp Avg	DO(mg/L) 1	DO(mg/L) 2	DO(mg/L) Avg	Action/Limit Level of DO(mg/L)	pH 1	pH 2	pH Avg	Turbidity(NTU) 1	Turbidity(NTU) 2	Turbidity(NTU) Avg	Action/Limit Level of Tby	SS (mg/L) 1	SS (mg/L) 2	SS (mg/L) Avg	Action/Limit Level of SS(mg/L)	Remarks:	Action to be taken
Outfall 1 During Flood Tide O-1(FT)	01-Apr-11	Surface	16:30	Sunny	1	22.20	22.10	22.15	7.35	7.42	7.39	6.84 / 6.81	8.31	8.31	8.31	3.50	3.61	3.58	10.35 / 13.15	5.00	4.90	5.47	14.1 / 18.08	Works in Portion E	Nil
		Middle			4.25	22.10	22.20		7.25	7.29	7.27		8.31	8.31		3.43	3.58			5.10	6.40				
		Bottom			7.5	22.20	22.10		7.31	7.35	7.33	6.99 / 6.96	8.31	8.31		3.64	3.73			5.60	5.80				
	04-Apr-11	Surface	08:30	Cloudy	1	19.60	19.70	19.60	7.73	7.63	7.68	6.84 / 6.81	8.40	8.40	8.41	1.16	1.21	1.13		2.50	2.60	2.55		Works in Portion E	Nil
		Middle			4.5	19.70	19.60		7.40	7.36	7.38		8.41	8.41		1.05	1.11			3.50	2.00				
		Bottom			8	19.50	19.50		7.33	7.45	7.39	6.99 / 6.96	8.41	8.41		1.10	1.14			2.50	2.20				
	06-Apr-11	Surface	08:50	Fine	1	20.50	20.50	20.52	7.78	7.82	7.80	6.84 / 6.81	8.43	8.43	8.43	2.41	2.46	2.34		3.40	5.50	4.97		Works in Portion E	Nil
		Middle			4.75	20.50	20.50		7.77	7.80	7.79		8.43	8.43		2.30	2.26			5.00	6.40				
		Bottom			8.5	20.50	20.60		7.91	7.95	7.93	6.99 / 6.96	8.43	8.43		2.23	2.40			5.60	3.90				
	08-Apr-11	Surface	09:12	Sunny	1	22.70	22.70	22.63	7.14	7.22	7.18	6.84 / 6.81	8.39	8.39	8.39	1.70	1.72	1.81		5.70	5.20	*5.35*		Works in Portion E	Nil
		Middle			4.5	22.60	22.70		7.38	7.41	7.40		8.39	8.39		1.80	1.83			6.00	4.70				
		Bottom			8	22.60	22.50		7.33	7.39	7.36	6.99 / 6.96	8.39	8.39		1.92	1.86			5.60	4.90				
	11-Apr-11	Surface	10:20	Sunny	1	26.10	26.10	26.10	7.40	7.36	7.38	6.84 / 6.81	8.58	8.58	8.58	2.20	2.16	2.24		5.10	4.90	*5.27*		Works in Portion E	Nil
		Middle			4.5	26.10	26.10		7.19	7.23	7.21		8.59	8.58		2.30	2.34			7.00	5.00				
		Bottom			8	26.10	26.10		7.48	7.44	7.46	6.99 / 6.96	8.58	8.58		2.18	2.27			4.60	5.00				
	13-Apr-11	Surface	14:33	Sunny	1	22.70	22.60	22.62	7.62	7.59	7.61	6.84 / 6.81	8.59	8.59	8.59	1.05	1.08	1.13		4.10	3.20	*3.90*		Works in Portion E	Nil
		Middle			4.25	22.60	22.60		7.50	7.52	7.51		8.59	8.59		1.02	1.16			3.20	4.80				
		Bottom			7.5	22.60	22.60		7.54	7.61	7.58	6.99 / 6.96	8.59	8.59		1.21	1.27			5.00	3.10				
	15-Apr-11	Surface	15:33	Sunny	1	27.00	27.00	27.05	7.52	7.55	7.54	6.84 / 6.81	8.60	8.60	8.61	1.27	1.25	1.25		2.10	<2.00	2.37		Works in Portion E	Nil
		Middle			4.25	27.10	27.10		7.41	7.46	7.44		8.60	8.61		1.18	1.26			2.80	2.60				
		Bottom			7.5	27.00	27.10		7.49	7.53	7.51	6.99 / 6.96	8.61	8.61		1.25	1.29			2.40	2.30				
	18-Apr-11	Surface	17:33	Fine	1	25.40	25.40	25.38	7.16	7.19	7.18	6.84 / 6.81	8.57	8.57	8.57	3.61	3.57	3.63		6.60	4.80	5.38		Works in Portion E	Nil
		Middle			4.25	25.40	25.40		7.19	7.25	7.22		8.57	8.57		3.66	3.70			5.30	4.60				
		Bottom			7.5	25.40	25.30		7.04	7.08	7.06	6.99 / 6.96	8.57	8.57		3.62	3.60			6.40	4.60				
	20-Apr-11	Surface	08:45	Fine	1	24.30	24.30	24.30	7.03	7.07	7.05	6.84 / 6.81	8.37	8.37	8.37	3.70	3.65	3.51		4.60	5.50	4.32		Works in Portion E	Nil
		Middle			5	24.30	24.30		7.03	7.08	7.06		8.37	8.36		3.40	3.51			4.00	4.00				
		Bottom			9	24.30	24.30		7.11	7.21	7.16	6.99 / 6.96	8.37	8.37		3.40	3.37			4.40	3.40				
	26-Apr-11	Surface	12:05	Sunny	1	27.50	27.40	27.40	7.38	7.41	7.40	6.84 / 6.81	8.37	8.38	8.37	3.17	3.19	3.35		2.10	2.60	2.57		Works in Portion E	Nil
		Middle			4.5	27.40	27.40		7.28	7.33	7.31		8.37	8.37		3.40	3.56			3.40	2.70				
		Bottom			8	27.30	27.40		7.23	7.21	7.22	6.99 / 6.96	8.37	8.38		3.38	3.41			2.20	2.40				
	28-Apr-11	Surface	14:35	Cloudy	1	27.90	27.90	27.87	7.26	7.28	7.27	6.84 / 6.81	8.49	8.49	8.49	2.16	2.21	2.17		9.60	9.60	8.10		Works in Portion E	Nil
		Middle			4.25	27.90	27.90		7.09	7.11	7.10		8.49	8.49		2.09	2.11			7.60	5.80				
		Bottom			7.5	27.80	27.80		7.18	7.21	7.20	6.99 / 6.96	8.49	8.49		2.20	2.25			8.60	7.40				
	30-Apr-11	Surface	07:45	Rainy	1	24.10	24.10	24.03	7.03	7.08	7.06	6.84 / 6.81	8.39	8.39	8.38	2.05	2.02	2.11		2.30	3.90	4.07		Works in Portion E	Nil
		Middle			4.5	24.00	24.00		7.19	7.29	7.24		8.38	8.38		2.10	2.14			5.50	4.00				
		Bottom			8	24.00	24.00		7.22	7.26	7.24	6.99 / 6.96	8.38	8.38		2.18	2.19			5.30	3.40				
	-	Surface	-	-	-	-	-	-	-	-	-	6.84 / 6.81	-	-	-	-	-	-		-	-	-			
		Middle			-	-	-		-	-	-		-	-		-	-			-	-				
		Bottom			-	-	-		-	-	-	6.99 / 6.96	-	-		-	-			-	-				
	-	Surface	-	-	-	-	-	-	-	-	-	6.84 / 6.81	-	-	-	-	-	-		-	-	-			
		Middle			-	-	-		-	-	-		-	-		-	-			-	-				
		Bottom			-	-	-		-	-	-	6.99 / 6.96	-	-		-	-			-	-				
Control of Outfall 1 During Flood Tide O-1-C(FT)	01-Apr-11	Surface	16:04	Sunny	1	22.20	22.30	22.30	7.29	7.34	7.32	- /-	8.30	8.30	8.31	3.74	3.62	3.64	- /-	6.20	6.20	6.10	- /-	Nil	Nil
		Middle			6.75	22.30	22.30		7.25	7.27	7.26		8.31	8.31		3.60	3.57			7.20	6.20				
		Bottom			12.5	22.40	22.30		7.33	7.38	7.36		8.31	8.31		3.70	3.61			5.10	5.70				
	04-Apr-11	Surface	08:10	Cloudy	1	19.80	19.80	19.77	7.68	7.73	7.71		8.40	8.40	8.41	1.21	1.15	1.15		3.50	2.60	3.12		Nil	Nil
		Middle			6.75	19.80	19.70		7.47	7.55	7.51		8.41	8.41		1.17	1.08			2.20	3.30				
		Bottom			12.5	19.70	19.80		7.42	7.47	7.45		8.41	8.41		1.12	1.16			3.80	3.30				
	06-Apr-11	Surface	08:20	Fine	1	20.50	20.50	20.55	7.64	7.69	7.67		8.43	8.43	8.43	2.50	2.44	2.42		4.80	3.90	4.40		Nil	Nil
		Middle			7	20.60	20.60		7.60	7.63	7.62		8.43	8.42		2.30	2.37			4.40	4.10				
		Bottom			13	20.50	20.60		7.86	7.81	7.84		8.42	8.43		2.40	2.51			4.30	4.90				
	08-Apr-11	Surface	08:40	Sunny	1	22.80	22.70	22.73	7.54	7.59	7.57		8.38	8.39	8.39	1.66	1.72	1.82		3.70	4.00	4.20		Nil	Nil
		Middle			7	22.70	22.70		7.34	7.37	7.36		8.39	8.39		1.89	1.81			3.90	4.10				
		Bottom			13	22.80	22.70		7.48	7.43	7.46		8.40	8.39		1.94	1.90			4.50	5.00				
	11-Apr-11	Surface	09:55	Sunny	1	26.00	26.10	26.07	7.38	7.34	7.36		8.58	8.58	8.59	2.18	2.15	2.25		4.10	4.40	4.27		Nil	Nil
		Middle			7	26.10	26.10		7.25	7.27	7.26		8.59	8.59		2.40	2.37			4.50	5.00				
		Bottom			13	26.10	26.00		7.20	7.24	7.22		8.59	8.59		2.16	2.24			4.20	3.40				
	13-Apr-11	Surface	14:05	Sunny	1	22.50	22.50	22.57	7.48	7.53	7.51		8.58	8.59	8.59	1.04	1.11	1.15		2.00	3.20	3.03		Nil	Nil
		Middle			6.75	22.60	22.60		7.74	7.78	7.76		8.60	8.60		1.15	1.08			4.70	2.80				
		Bottom			12.5	22.60	22.60		7.68	7.62	7.65		8.59	8.59		1.31	1.20			2.00	3.50				
	15-Apr-11	Surface	15:06	Sunny	1	27.00	27.00	26.98	7.55	7.65	7.60		8.60	8.61	8.60	1.23	1.20	1.24		2.40	2.20	2.52		Nil	Nil
		Middle			6.5	27.00	26.90		7.29	7.33	7.31		8.61	8.60		1.14	1.20			3.00	2.60				
		Bottom			12	27.00	27.00		7.49	7.53	7.51		8.60	8.60		1.31	1.37			2.70	2.20				
	18-Apr-11	Surface	17:05	Fine	1	25.50	25.40	25.40	7.02	7.08	7.05		8.57	8.57	8.57	3.65	3.71	3.63		5.80	4.20	5.02		Nil	Nil
		Middle			6.5	25.40	25.30		7.23	7.18	7.21		8.57	8.57		3.55	3.62			5.60	4.20				
		Bottom			12	25.40	25.40		7.03	7.07	7.05		8.57	8.58		3.67	3.60			5.60	4.70				
	20-Apr-11	Surface	08:18	Fine	1	24.30	24.30	24.27	7.14	7.18	7.16		8.36	8.36	8.37	4.70	4.87	4.72		9.40	8.90	7.90		Nil	Nil
		Middle			7.25	24.30	24.20		7.02	7.06	7.04		8.37	8.37		4.56	4.63			7.60	6.60				
		Bottom			13.5	24.20	24.30		7.07	7.10	7.09		8.37	8.37		4.81	4.77			7.80	7.10				
	26-Apr-11	Surface	11:40	Sunny	1	27.50	27.50	27.43	7.30	7.26	7.28		8.38	8.38	8.38	4.09	4.05	3.94		2.60	2.50	2.42		Nil	Nil
		Middle			7	27.50	27.40		7.20	7.16	7.18		8.38	8.39		3.96	3.90			3.20	2.20				
		Bottom			13	27.30	27.40		7.22	7.30	7.26		8.37	8.38		3.77	3.86			<2.00	<2.00				
	28-Apr-11	Surface	14:05	Cloudy	1	27.80	27.80	27.80	7.26	7.28	7.27		8.49	8.49	8.49	2.20	2.18	2.20		6.80	9.00	9.22		Nil	Nil
		Middle			6.75	27.80	27.80		7.17	7.21	7.19		8.49	8.49		2.07	2.15			10.80	9.70				
		Bottom			12.5	27.80	27.80		7.05	7.08	7.07		8.49	8.49		2.30	2.27			10.50	8.50				
	30-Apr-11	Surface	07:15	Rainy	1	24.10	24.10	24.03	7.18	7.23	7.21		8.38	8.39	8.38	1.98	2.02	2.07		4.20	6.30	3.98		Nil	Nil
		Middle			6.75	24.00	24.00		7.33	7.27	7.30		8.38	8.38		2.13	2.07			3.50	3.50				
		Bottom			12.5	24.00	24.00		7.24	7.26	7.25		8.38	8.38		2.06	2.15			2.90	3.50				
	-	Surface	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			
		Middle			-	-	-		-	-	-		-	-		-	-			-	-				
		Bottom			-	-	-		-	-	-		-	-		-	-			-	-				
	-	Surface	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			
		Middle			-	-	-		-	-	-		-	-		-	-			-	-				
		Bottom			-	-	-		-	-	-		-	-		-	-			-	-				

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

Marine Water Quality Impact Monitoring Results

Monitoring Locations	Date	Depth	Start Time	Weather	Water Depth(m)	Temp 1	Temp '-	Temp Avg	DO(mg/L) 1	DO(mg/L) 2	DO(mg/L) Avg	Action/Limit Level of DO(mg/L)	pH 1	pH 2	pH Avg	Turbidity(NTU) 1	Turbidity(NTU) 2	Turbidity(NTU) Avg	Action/Limit Level of Tby	SS (mg/L) 1	SS (mg/L) 2	SS (mg/L) Avg	Action/Limit Level of SS(mg/L)	Remarks:	Action to be taken
Outfall 1 During Ebb Tide O-1(ET)	01-Apr-11	Surface	11:22	Sunny	1	23.10	23.20	23.18	7.34	7.40	7.37	7.02 / 6.94	8.30	8.29	8.29	2.96	3.04	3.01	11.87 / 13.44	4.70	5.10	5.38	13.25 / 14.39	Works in Portion E	Nil
		Middle			4.25	23.20	23.20		7.17	7.27	7.22		8.29	8.29		3.15	3.02			5.80	5.00				
		Bottom			7.5	23.20	23.20		7.31	7.34	7.33	6.7 / 6.48	8.29	8.29		2.86	3.00			6.50	5.20				
	04-Apr-11	Surface	12:31	Cloudy	1	19.60	19.60	19.55	7.66	7.70	7.68	7.02 / 6.94	8.41	8.41	8.41	1.77	1.74	1.65		5.20	5.00	4.62		Works in Portion E	Nil
		Middle			4.5	19.50	19.50		7.48	7.59	7.54		8.42	8.41		1.57	1.66			4.50	3.90				
		Bottom			8	19.60	19.50		7.64	7.79	7.72	6.7 / 6.48	8.41	8.42		1.60	1.57			5.30	3.80				
	06-Apr-11	Surface	14:33	Fine	1	20.70	20.70	20.75	7.82	7.86	7.84	7.02 / 6.94	8.45	8.45	8.45	1.35	1.38	1.42		2.70	2.00	2.62		Nil	Nil
		Middle			4.5	20.80	20.80		7.97	8.00	7.99		8.45	8.45		1.42	1.46			4.00	2.60				
		Bottom			8	20.80	20.70		7.68	7.73	7.71	6.7 / 6.48	8.45	8.45		1.44	1.45			2.40	2.00				
	08-Apr-11	Surface	15:36	Sunny	1	22.50	22.60	22.52	7.48	7.42	7.45	7.02 / 6.94	8.39	8.39	8.39	2.10	2.05	2.08		2.90	2.20	2.45		Works in Portion E	Nil
		Middle			4.5	22.50	22.50		7.46	7.49	7.48		8.39	8.39		2.06	2.11			2.10	2.30				
		Bottom			8	22.50	22.50		7.41	7.38	7.40	6.7 / 6.48	8.39	8.40		2.03	2.10			2.60	2.60				
	11-Apr-11	Surface	15:33	Sunny	1	26.60	26.20	26.53	7.49	7.52	7.51	7.02 / 6.94	8.59	8.59	8.59	2.07	2.09	2.12		5.40	3.50	3.87		Dredging	Nil
		Middle			4.25	26.60	26.60		7.53	7.58	7.56		8.58	8.58		2.15	2.04			2.70	3.00				
		Bottom			7.5	26.60	26.60		7.55	7.61	7.58	6.7 / 6.48	8.58	8.59		2.16	2.19			4.20	4.40				
	13-Apr-11	Surface	09:15	Sunny	1	22.70	22.70	22.73	7.63	7.70	7.67	7.02 / 6.94	8.58	8.58	8.58	1.42	1.50	1.48		3.70	2.60	4.73		Works in Portion E	Nil
		Middle			4.5	22.70	22.70		7.64	7.62	7.63		8.58	8.58		1.37	1.48			5.10	6.80				
		Bottom			8	22.80	22.80		7.73	7.77	7.75	6.7 / 6.48	8.57	8.57		1.51	1.57			4.10	6.10				
	15-Apr-11	Surface	10:14	Sunny	1	26.80	26.90	26.88	7.43	7.46	7.45	7.02 / 6.94	8.60	8.60	8.60	1.46	1.52	1.53		4.20	3.20	3.70		Works in Portion E	Nil
		Middle			4.25	26.80	26.90		7.60	7.53	7.57		8.60	8.59		1.49	1.57			3.60	2.90				
		Bottom			7.5	27.00	26.90		7.27	7.31	7.29	6.7 / 6.48	8.59	8.59		1.60	1.53			4.60	3.70				
	18-Apr-11	Surface	12:37	Fine	1	25.10	25.20	25.18	7.14	7.16	7.15	7.02 / 6.94	8.54	8.54	8.54	3.66	3.73	3.62		3.50	5.00	4.02		Works in Portion E	Nil
		Middle			4.5	25.20	25.20		7.07	7.17	7.12		8.54	8.54		3.54	3.63			4.00	3.60				
		Bottom			8	25.20	25.20		7.30	7.27	7.29	6.7 / 6.48	8.54	8.54		3.51	3.62			4.50	3.50				
	20-Apr-11	Surface	15:02	Fine	1	24.50	24.60	24.55	7.80	7.11	7.46	7.02 / 6.94	8.37	8.37	8.37	1.98	2.07	2.14		3.20	2.80	3.25		Works in Portion E	Nil
		Middle			4	24.60	24.60		7.07	7.11	7.09		8.37	8.37		2.18	2.13			3.60	3.60				
		Bottom			7	24.50	24.50		7.12	7.15	7.14	6.7 / 6.48	8.37	8.37		2.20	2.26			2.50	3.80				
	26-Apr-11	Surface	17:30	Sunny	1	27.00	27.00	27.07	7.21	7.24	7.23	7.02 / 6.94	8.37	8.37	8.37	2.18	2.10	2.13		2.00	<2.00	2.48		Works in Portion E	Nil
		Middle			4.5	27.00	27.10		7.27	7.35	7.31		8.37	8.37		2.07	2.17			2.10	2.70				
		Bottom			8	27.20	27.10		7.17	7.22	7.20	6.7 / 6.48	8.38	8.38		2.17	2.09			3.40	2.70				
	28-Apr-11	Surface	09:38	Cloudy	1	27.60	27.60	27.58	7.18	7.28	7.23	7.02 / 6.94	8.47	8.47	8.47	2.25	2.27	2.22		3.50	2.50	3.00		Works in Portion E	Nil
		Middle			4.5	27.60	27.60		7.17	7.26	7.22		8.47	8.47		2.18	2.12			3.50	2.50				
		Bottom			8	27.60	27.50		7.44	7.36	7.40	6.7 / 6.48	8.47	8.47		2.31	2.20			3.40	2.60				
	30-Apr-11	Surface	10:31	Rainy	1	23.70	23.70	23.70	7.19	7.16	7.18	7.02 / 6.94	8.40	8.40	8.40	2.21	2.30	2.15		3.40	4.70	3.72		Works in Portion E	Nil
		Middle			4.5	23.70	23.70		7.11	7.14	7.13		8.40	8.40		2.06	2.10			3.00	3.30				
		Bottom			8	23.70	23.70		7.25	7.28	7.27	6.7 / 6.48	8.40	8.41		2.09	2.13			3.20	4.70				
	-	Surface	-	-	-	-	-	-	-	-	-	7.02 / 6.94	-	-	-	-	-	-		-	-	-			
		Middle			-	-	-		-	-	-		-	-		-	-			-	-				
		Bottom			-	-	-		-	-	-	6.7 / 6.48	-	-		-	-			-	-				
	-	Surface	-	-	-	-	-	-	-	-	-	7.02 / 6.94	-	-	-	-	-	-		-	-	-			
		Middle			-	-	-		-	-	-		-	-		-	-			-	-				
		Bottom			-	-	-		-	-	-	6.7 / 6.48	-	-		-	-			-	-				
Control of Outfall 1 During Ebb Tide O-1-C(ET)	01-Apr-11	Surface	10:50	Sunny	1	23.70	23.70	23.67	7.42	7.44	7.43	8.22	8.29	8.29	8.29	3.39	3.46	3.24	- /-	4.80	4.10	4.68	- /-	Nil	Nil
		Middle			5.75	23.70	23.60		7.23	7.30	7.27		8.29	8.29		3.21	3.15			4.10	4.80				
		Bottom			10.5	23.60	23.70		7.24	7.28	7.26		8.30	8.29		3.07	3.14			5.70	4.60				
	04-Apr-11	Surface	12:08	Cloudy	1	19.50	19.50	19.43	7.57	7.61	7.59		8.42	8.41	8.42	1.71	1.68	1.61		7.00	5.50	6.60		Nil	Nil
		Middle			5.75	19.40	19.40		7.52	7.60	7.56		8.41	8.41		1.44	1.53			6.50	6.20				
		Bottom			10.5	19.40	19.40		7.51	7.56	7.54		8.42	8.42		1.62	1.69			7.70	6.70				
	06-Apr-11	Surface	14:05	Fine	1	20.70	20.70	20.72	7.44	7.53	7.49		8.44	8.44	8.44	1.28	1.36	1.38		2.70	2.00	2.55		Nil	Nil
		Middle			5.75	20.70	20.80		7.63	7.68	7.66		8.44	8.45		1.41	1.50			<2.00	<2.00				
		Bottom			10.5	20.70	20.70		7.53	7.55	7.54		8.44	8.44		1.42	1.31			2.60	4.00				
	08-Apr-11	Surface	15:10	Sunny	1	22.50	22.50	22.50	7.35	7.40	7.38		8.40	8.40	8.40	2.03	2.12	2.09		2.90	3.70	3.03		Nil	Nil
		Middle			6	22.50	22.60		7.48	7.51	7.50		8.40	8.40		2.04	2.07			3.60	3.10				
		Bottom			11	22.50	22.40		7.50	7.55	7.53		8.39	8.39		2.13	2.17			2.30	2.60				
	11-Apr-11	Surface	15:06	Sunny	1	26.50	26.50	26.53	7.40	7.43	7.42		8.59	8.58	8.58	2.20	2.17	2.25		4.50	3.00	3.65		Nil	Nil
		Middle			5.75	26.50	26.50		7.47	7.54	7.51		8.58	8.58		2.34	2.31			3.90	3.30				
		Bottom			10.5	26.60	26.60		7.66	7.62	7.64		8.58	8.59		2.26	2.21			3.60	3.60				
	13-Apr-11	Surface	08:50	Sunny	1	22.80	22.80	22.85	7.82	7.86	7.84		8.57	8.57	8.57	1.53	1.63	1.55		3.00	5.10	4.05		Nil	Nil
		Middle			6	22.90	22.80		7.63	7.59	7.61		8.58	8.57		1.50	1.47			5.20	2.90				
		Bottom			11	22.90	22.90		7.66	7.72	7.69		8.57	8.57		1.58	1.61			3.50	4.60				
	15-Apr-11	Surface	09:45	Sunny	1	26.90	26.80	26.87	7.40	7.44	7.42		8.60	8.61	8.61	1.40	1.51	1.53		3.50	3.50	3.92		Nil	Nil
		Middle			5.5	26.90	26.90		7.51	7.53	7.52		8.61	8.61		1.60	1.57			5.00	4.00				
		Bottom			10	26.80	26.90		7.34	7.37	7.36		8.61	8.60		1.52	1.57			3.80	3.70				
	18-Apr-11	Surface	12:10	Fine	1	25.30	25.30	25.27	7.19	7.23	7.21		8.54	8.54	8.54	3.80	3.71	3.66		6.30	4.50	4.15		Nil	Nil
		Middle			5.75	25.30	25.30		7.22	7.27	7.25		8.54	8.54		3.54	3.63			2.80	4.60				
		Bottom			10.5	25.20	25.20		7.20	7.17	7.19		8.54	8.54		3.55	3.71			2.60	4.10				
	20-Apr-11	Surface	14:35	Fine	1	24.50	24.50	24.57	7.27	7.23	7.25		8.37	8.37	8.37	2.20	2.30	2.36		2.80	2.80	3.57		Nil	Nil
		Middle			5.5	24.50	24.60		7.10	7.13	7.12		8.37	8.37		2.50	2.47			5.00	3.60				
		Bottom			10	24.70	24.60		7.09	7.11	7.10		8.37	8.38		2.35	2.31			4.20	3.00				
	26-Apr-11	Surface	17:05	Sunny	1	27.10	27.10	27.05	7.11	7.15	7.13		8.37	8.37	8.37	2.33	2.47	2.51		2.20	<2.00	2.38		Nil	Nil
		Middle			5.75	27.00	27.00		7.15	7.19	7.17		8.38	8.37		2.50	2.60			3.30	2.50				
		Bottom			10.5	27.00	27.10		7.22	7.28	7.25		8.38	8.37		2.61	2.57			<2.00	2.30				
	28-Apr-11	Surface	09:07	Cloudy	1	27.50	27.50	27.57	7.28	7.31	7.30		8.47	8.47	8.47	2.28	2.32	2.23		3.80	2.60	2.73		Nil	Nil
		Middle			5.75	27.60	27.60		7.20	7.23	7.22		8.47	8.46		2.15	2.19			3.30	2.20				
		Bottom			10.5	27.60	27.60		7.31	7.27	7.29		8.47	8.47		2.20	2.26			2.40	2.10				
	30-Apr-11	Surface	10:02	Rainy	1	23.80	23.80	23.78	7.31	7.26	7.29		8.40	8.40	8.40	2.40	2.37	2.24		2.30	2.60	3.62		Nil	Nil
		Middle			5.75	23.80	23.80		7.29	7.33	7.31		8.41	8.41		2.16	2.14			3.50	5.10				
		Bottom			10.5	23.80	23.70		7.18	7.21	7.20		8.40	8.40		2.16	2.19			4.10	4.10				
	-	Surface	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			
		Middle			-	-	-		-	-	-		-	-		-	-			-	-				
		Bottom			-	-	-		-	-	-		-	-		-	-			-	-				
	-	Surface	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-			
		Middle			-	-	-		-	-	-		-	-		-	-			-	-				
		Bottom			-	-	-		-	-	-		-	-		-	-			-	-				

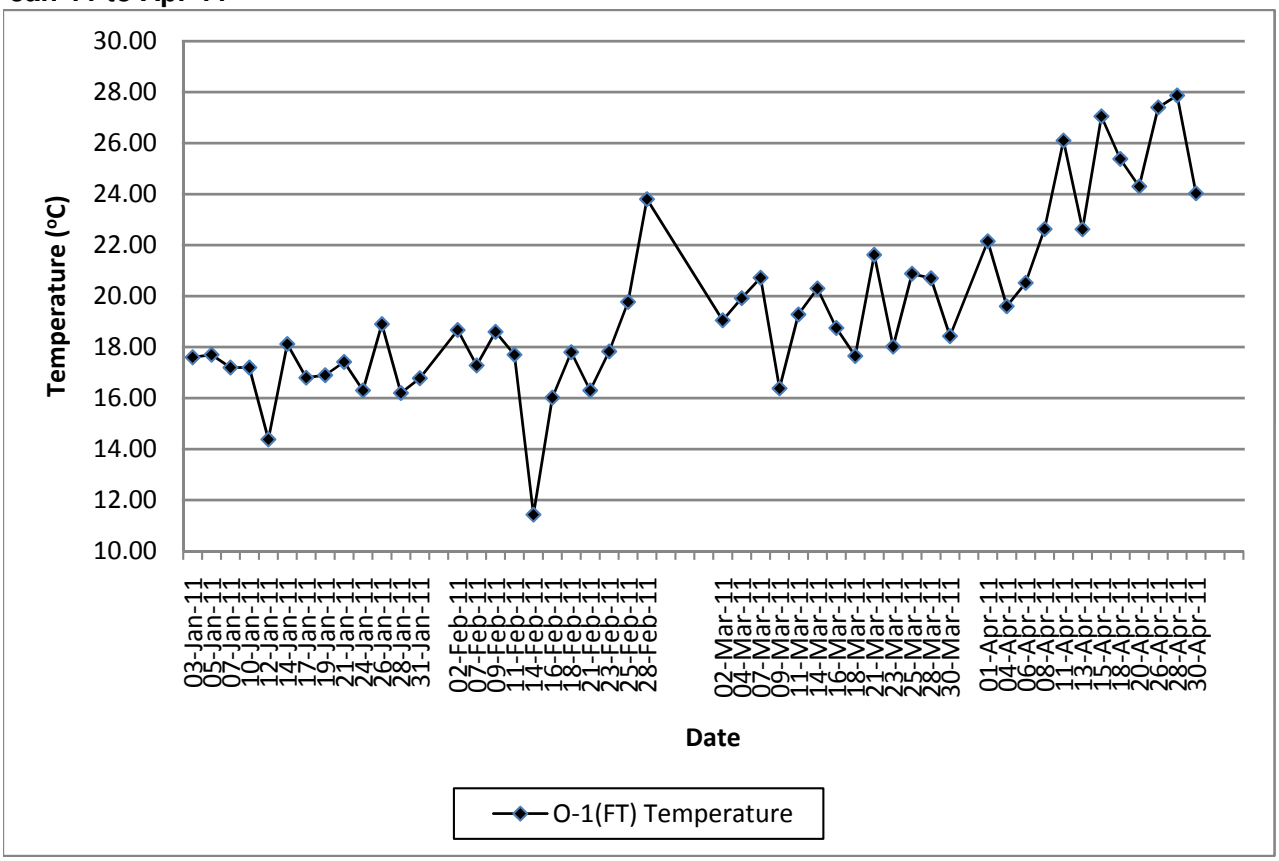
Note:

Blue Italic indicates an exceedance of Action Level

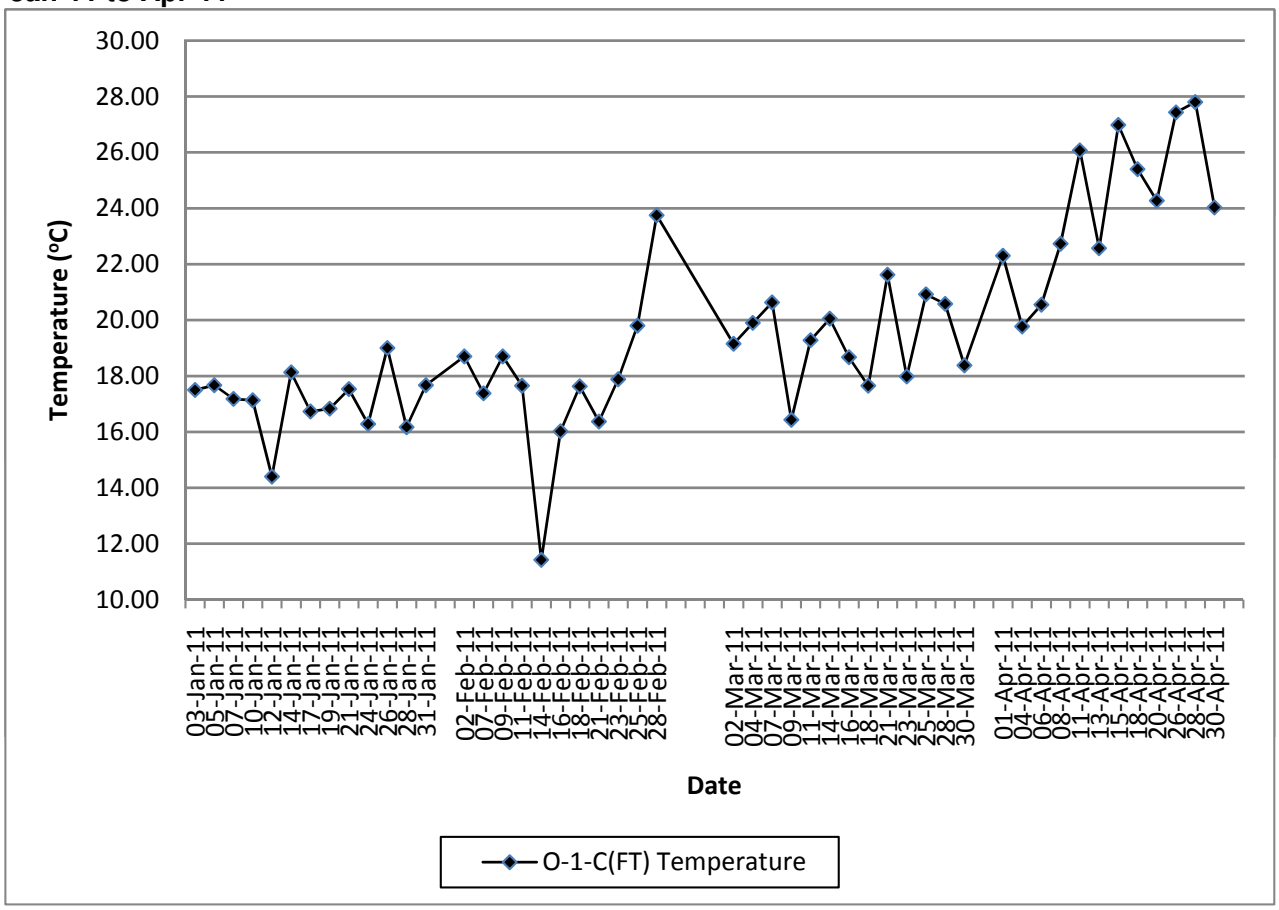
Red Bold indicates an exceedance of Limit Level

Samples with SS level smaller than 2 mg/L will be assumed as 2mg/L when calulating the average SS values under the situation that one sample is smaller than 2

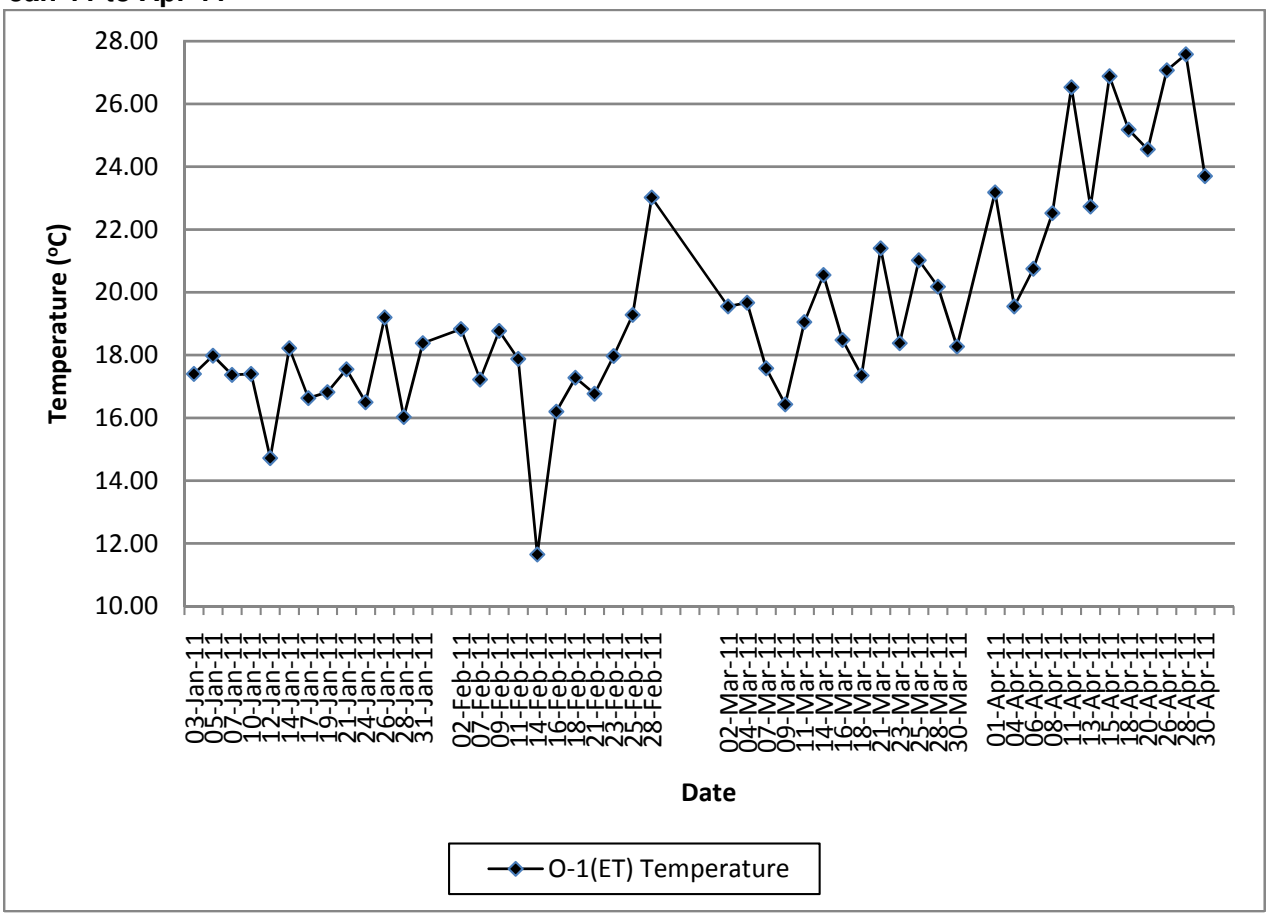
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Outfall 1 During Flood Tide (O-1(FT))
Jan-11 to Apr-11



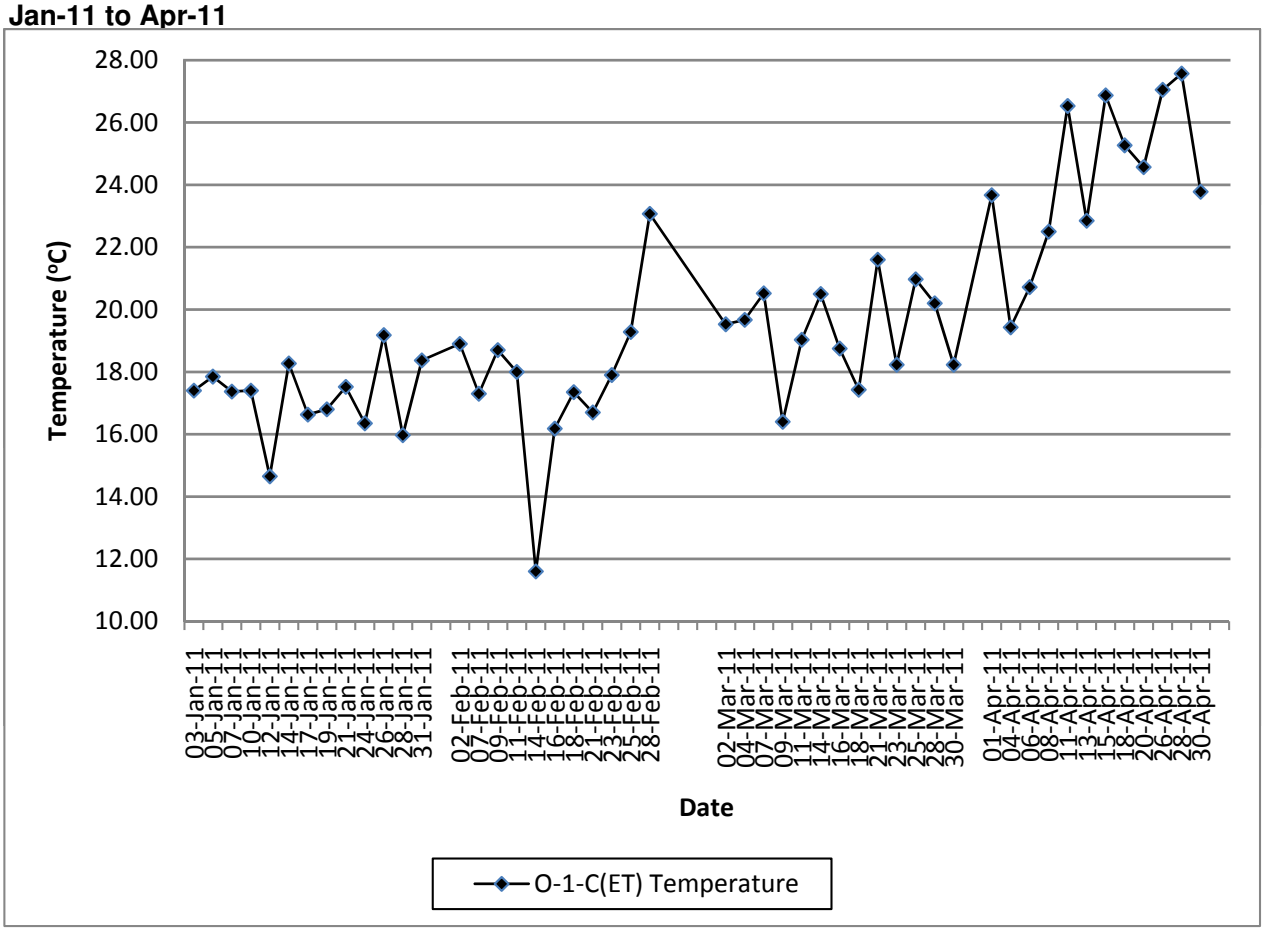
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Control of Outfall 1 During Flood Tide (O-1-C(FT))
Jan-11 to Apr-11



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Outfall 1 During Ebb Tide (O-1(ET))
Jan-11 to Apr-11



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Control of Outfall 1 During Ebb Tide (O-1-C(ET))
Jan-11 to Apr-11



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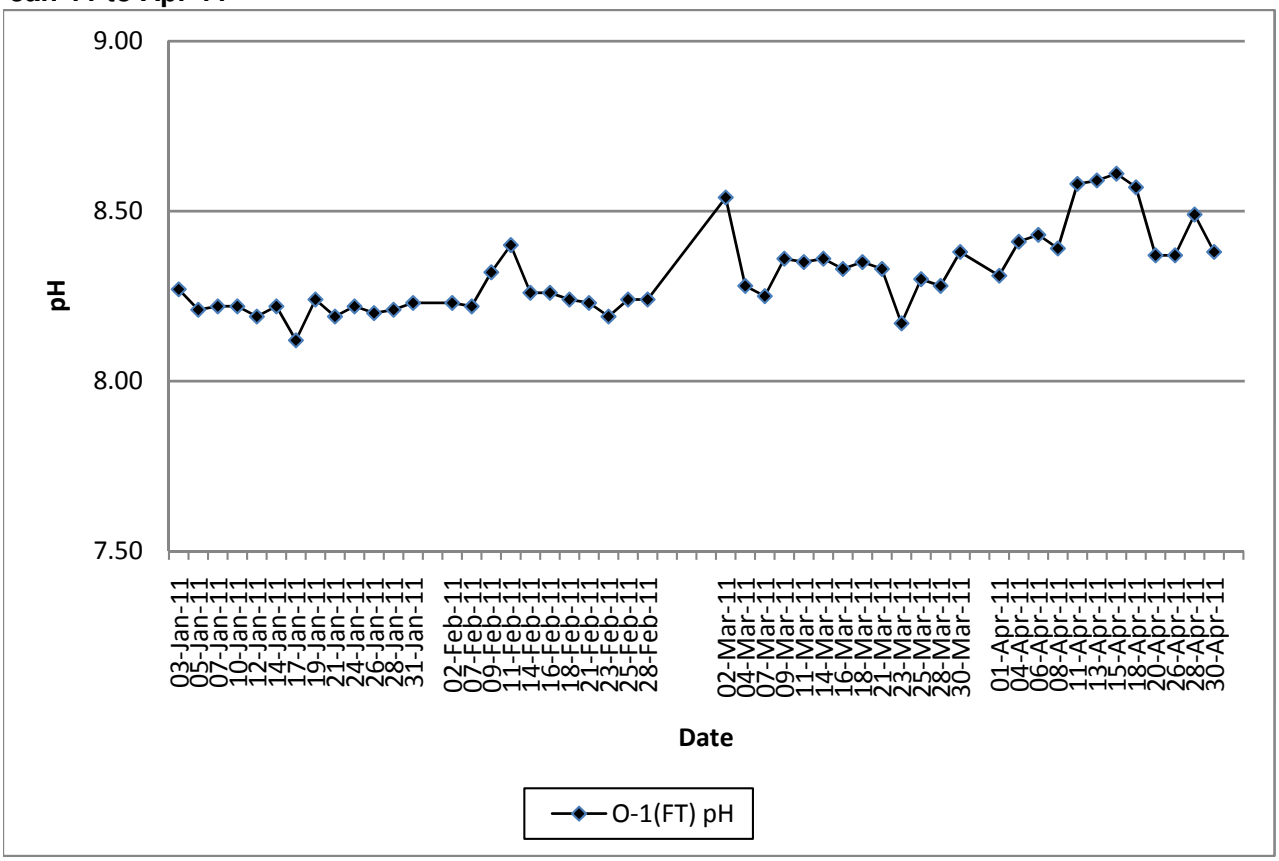
Water Quality Results at Outfall 1 During Flood Tide (O-1(FT))
Jan-11 to Apr-11



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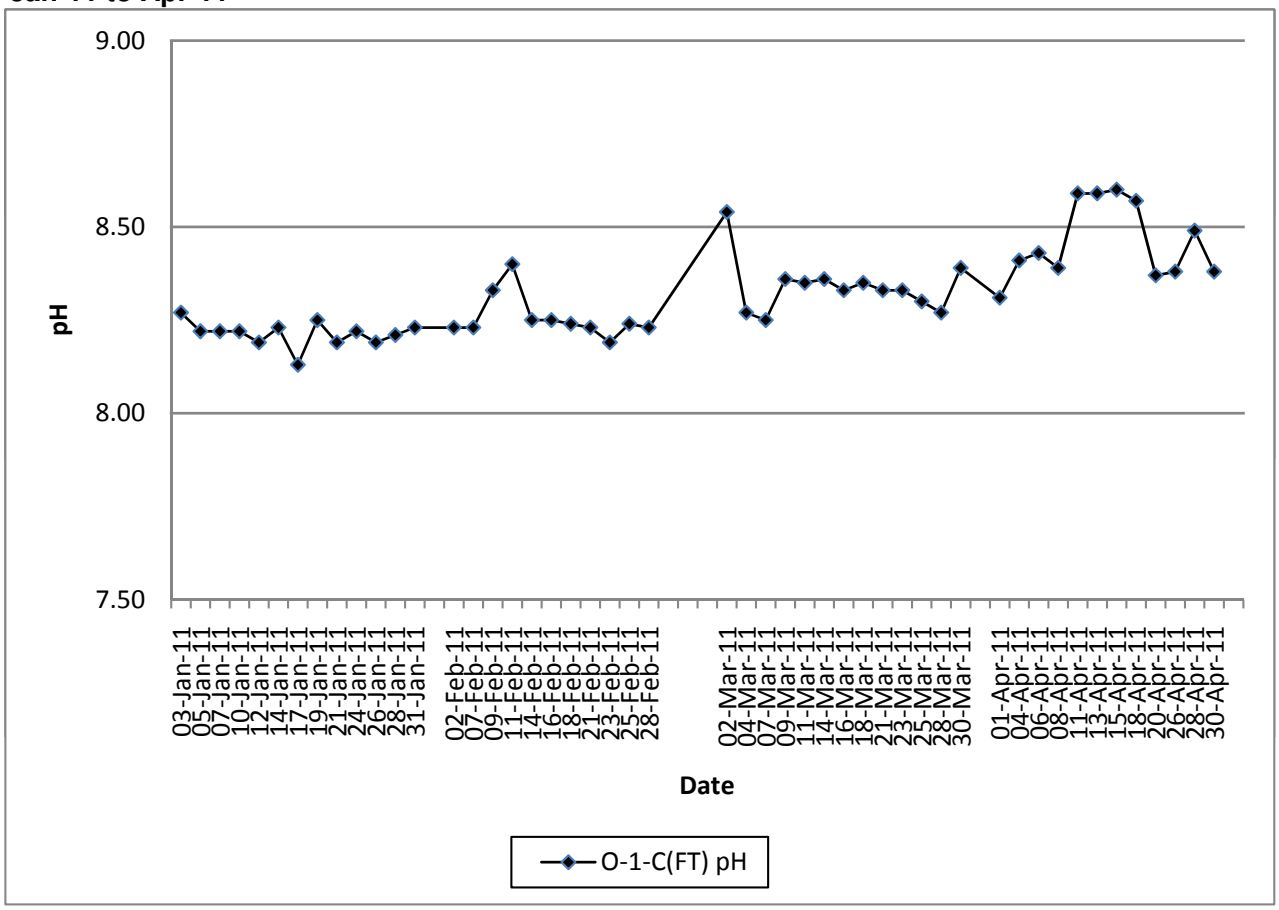
Water Quality Results at Control of Outfall 1 During Flood Tide (O-1-C(FT))
Jan-11 to Apr-11



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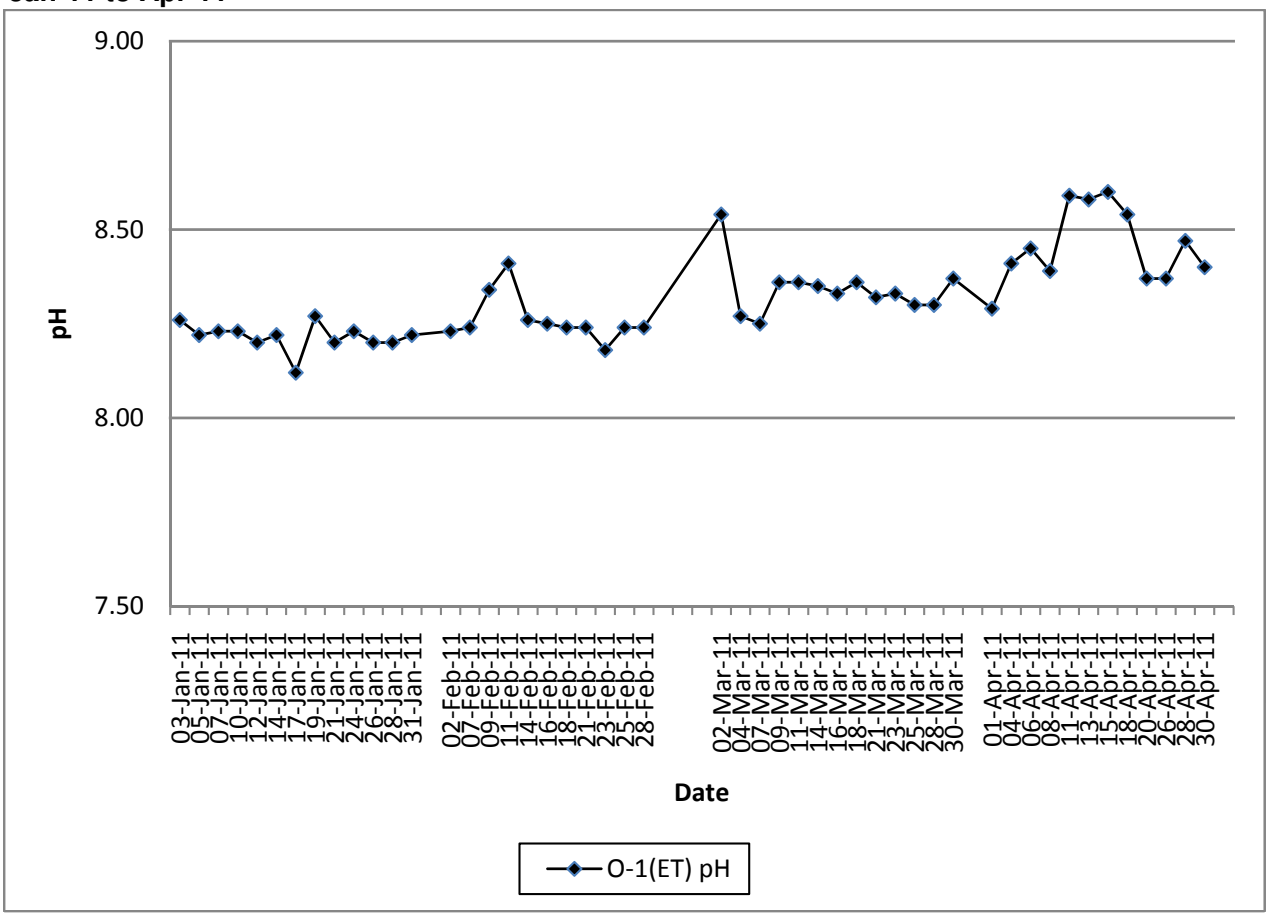
Water Quality Results at Outfall 1 During Ebb Tide (O-1(ET))
Jan-11 to Apr-11



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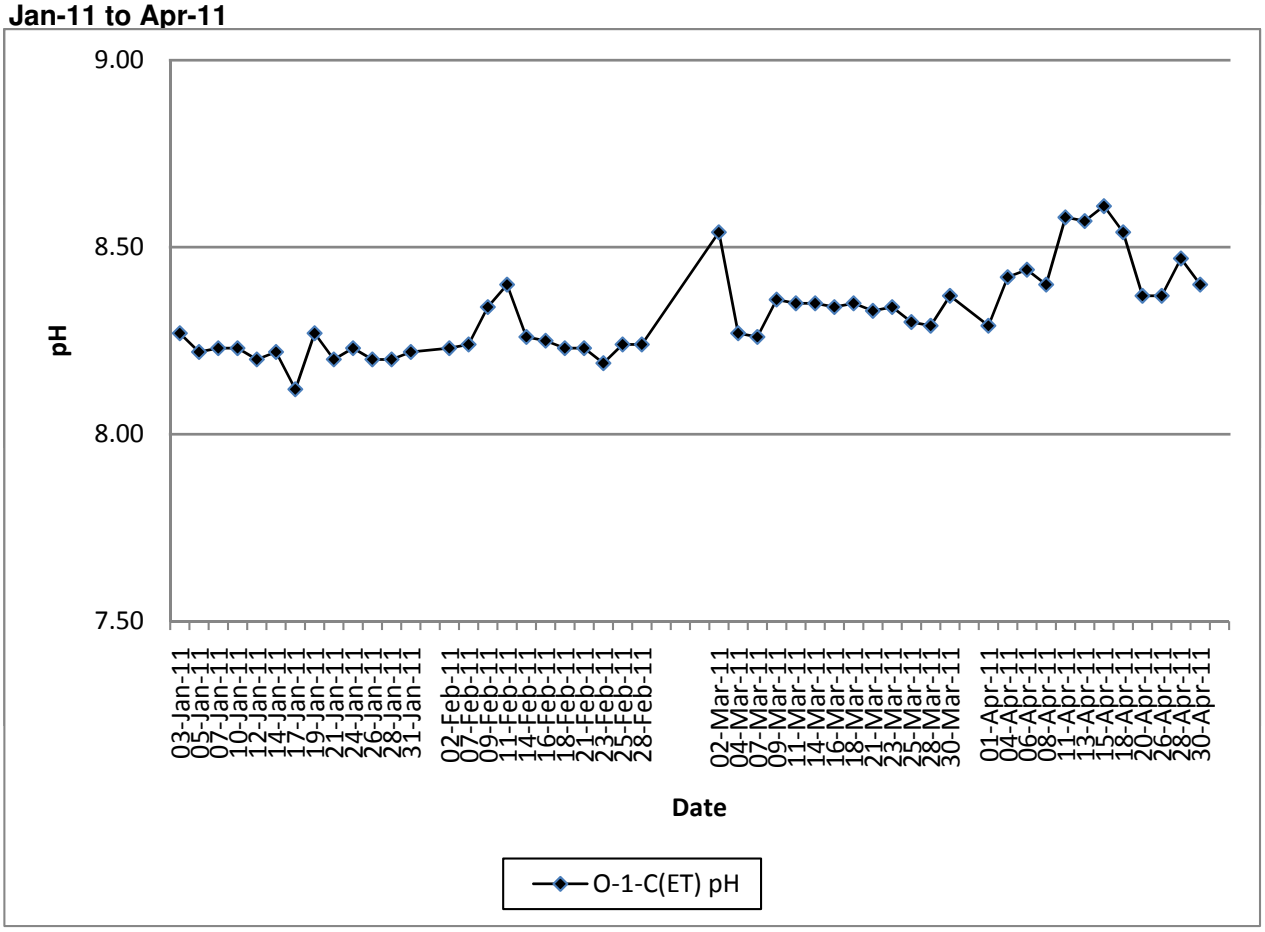
Water Quality Results at Control of Outfall 1 During Ebb Tide (O-1-C(ET))
Jan-11 to Apr-11



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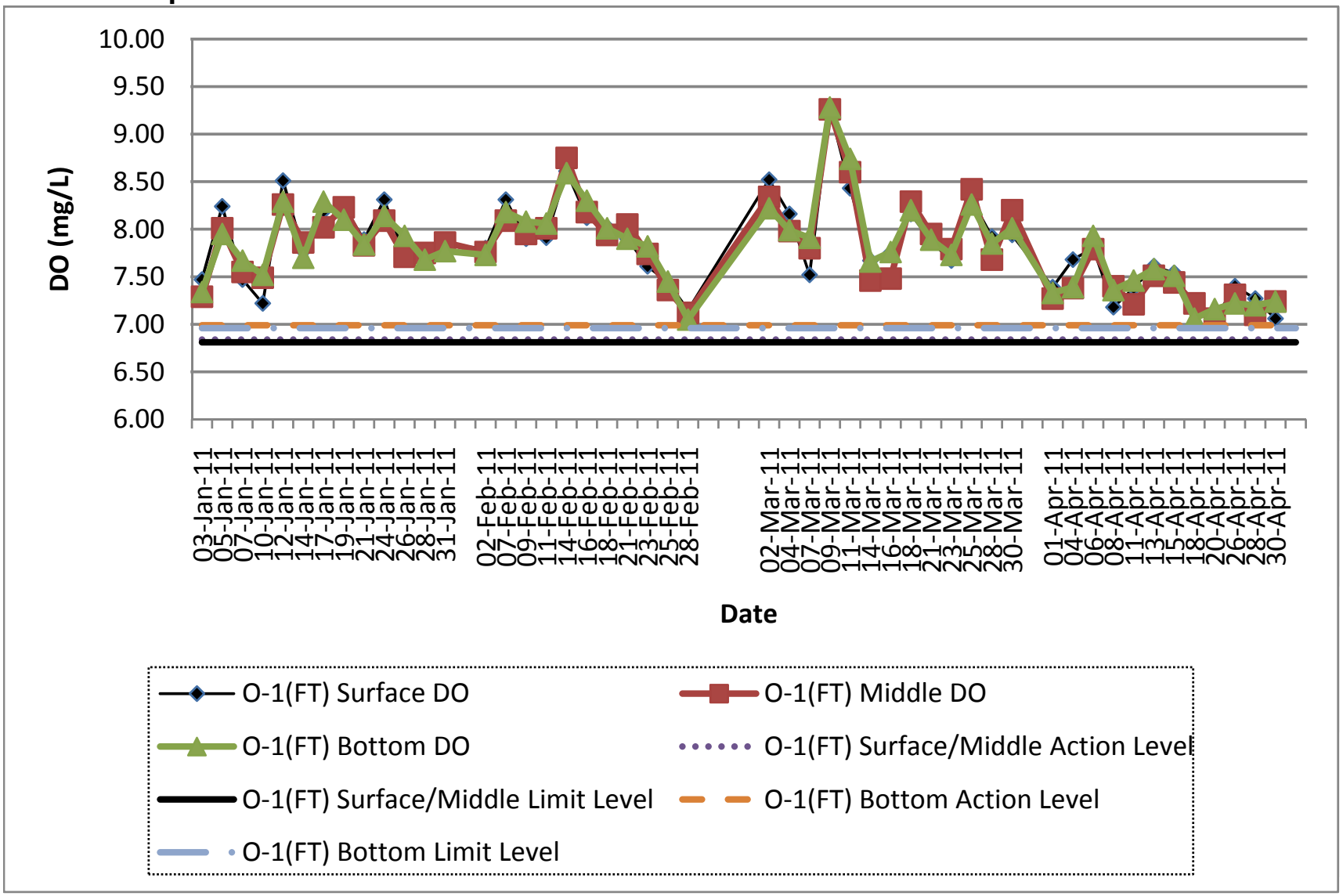
Water Quality Results at Outfall 1 During Flood Tide (O-1(FT))
Jan-11 to Apr-11



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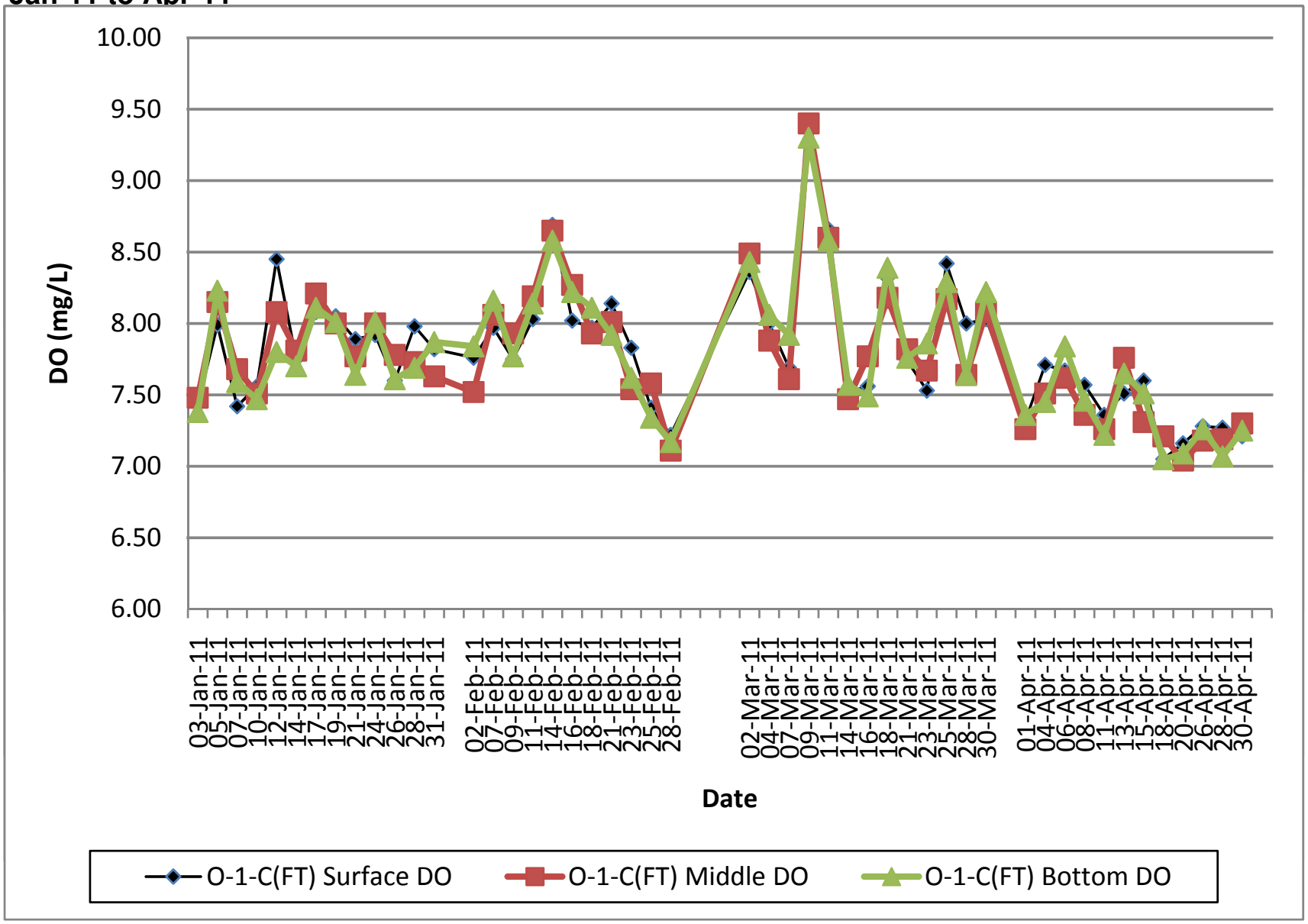
Water Quality Results at Control of Outfall 1 During Flood Tide (O-1-C(FT))
Jan-11 to Apr-11



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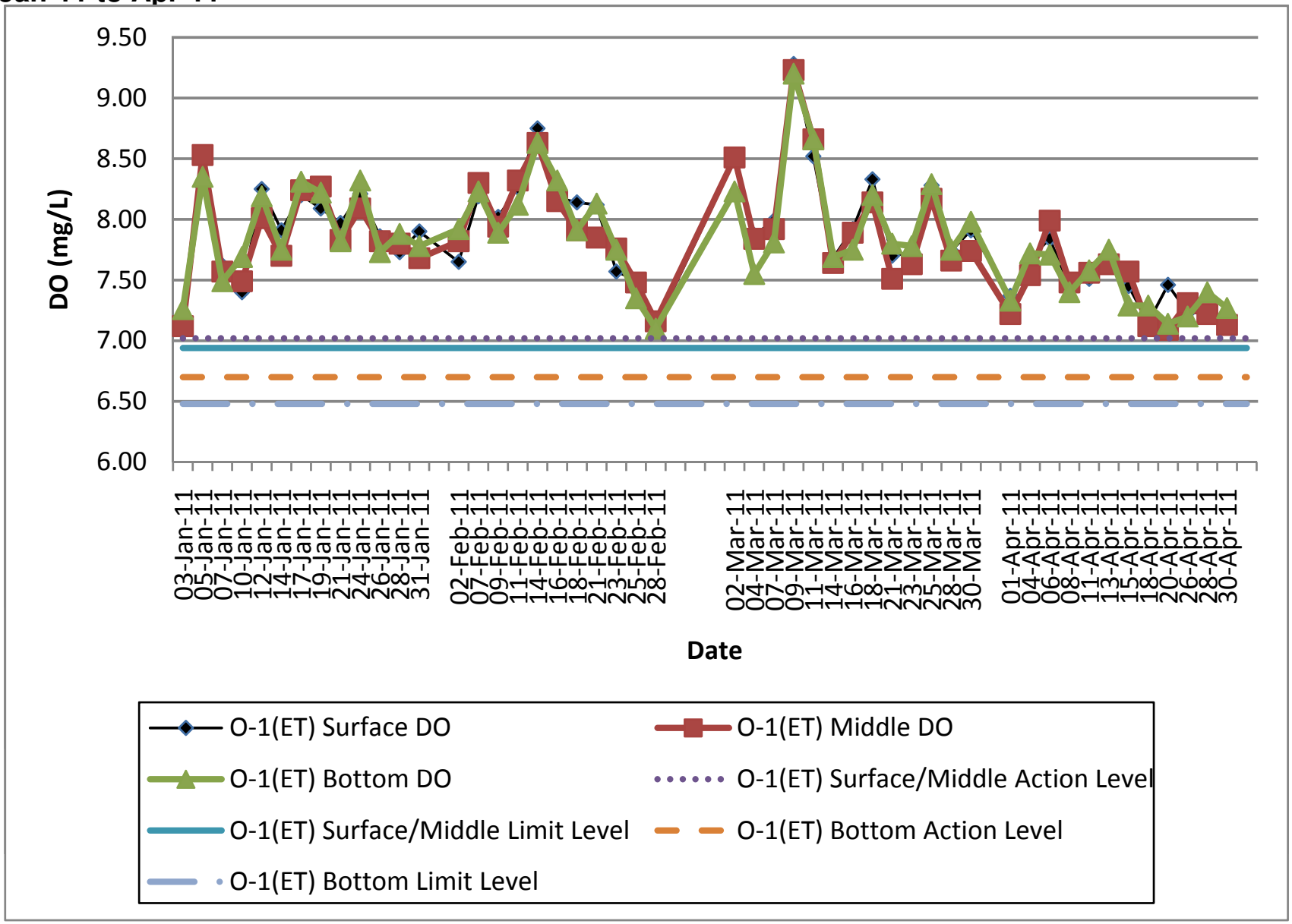
Water Quality Results at Outfall 1 During Ebb Tide (O-1(ET))
Jan-11 to Apr-11



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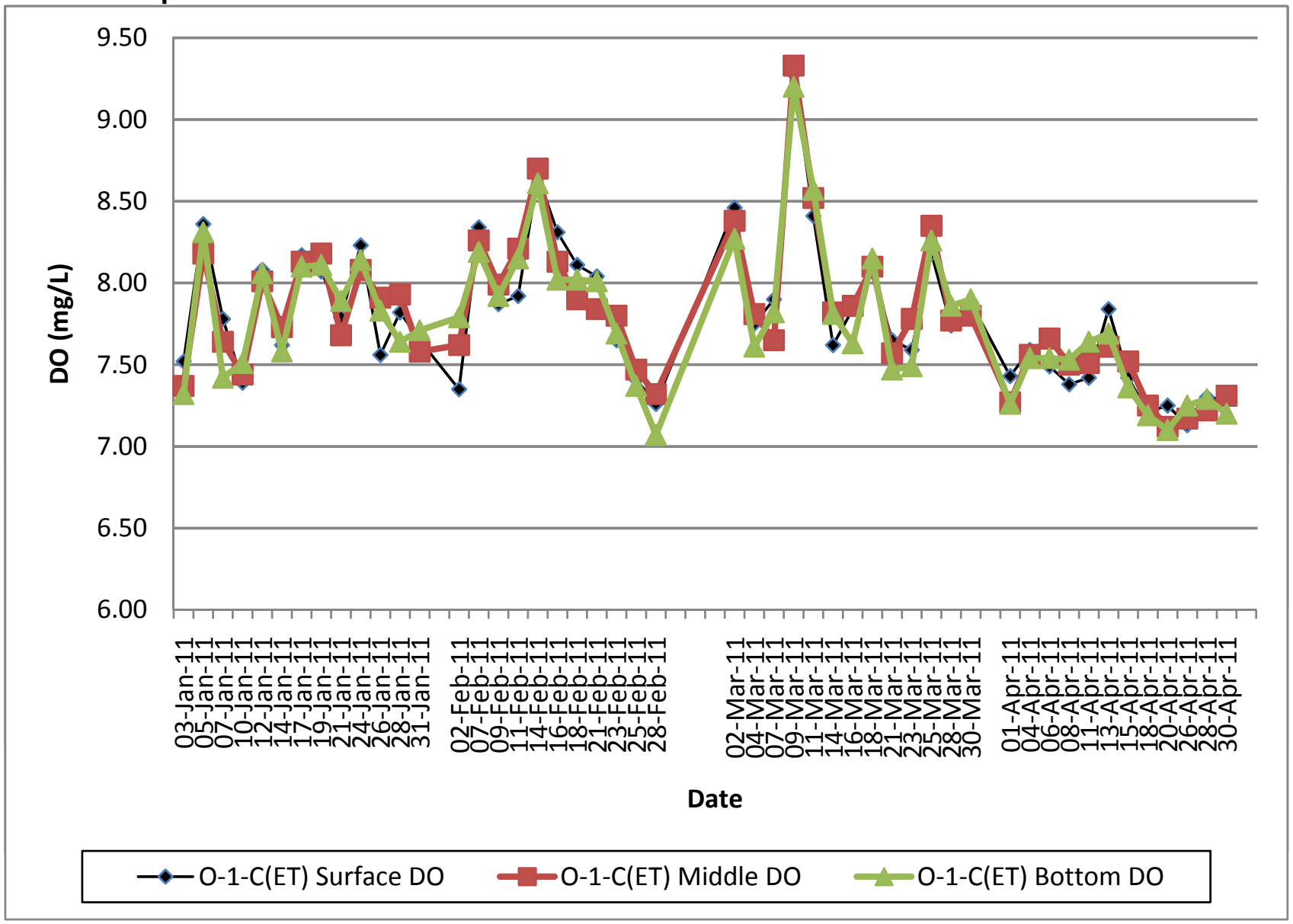
Water Quality Results at Control of Outfall 1 During Ebb Tide (O-1-C(ET))
Jan-11 to Apr-11



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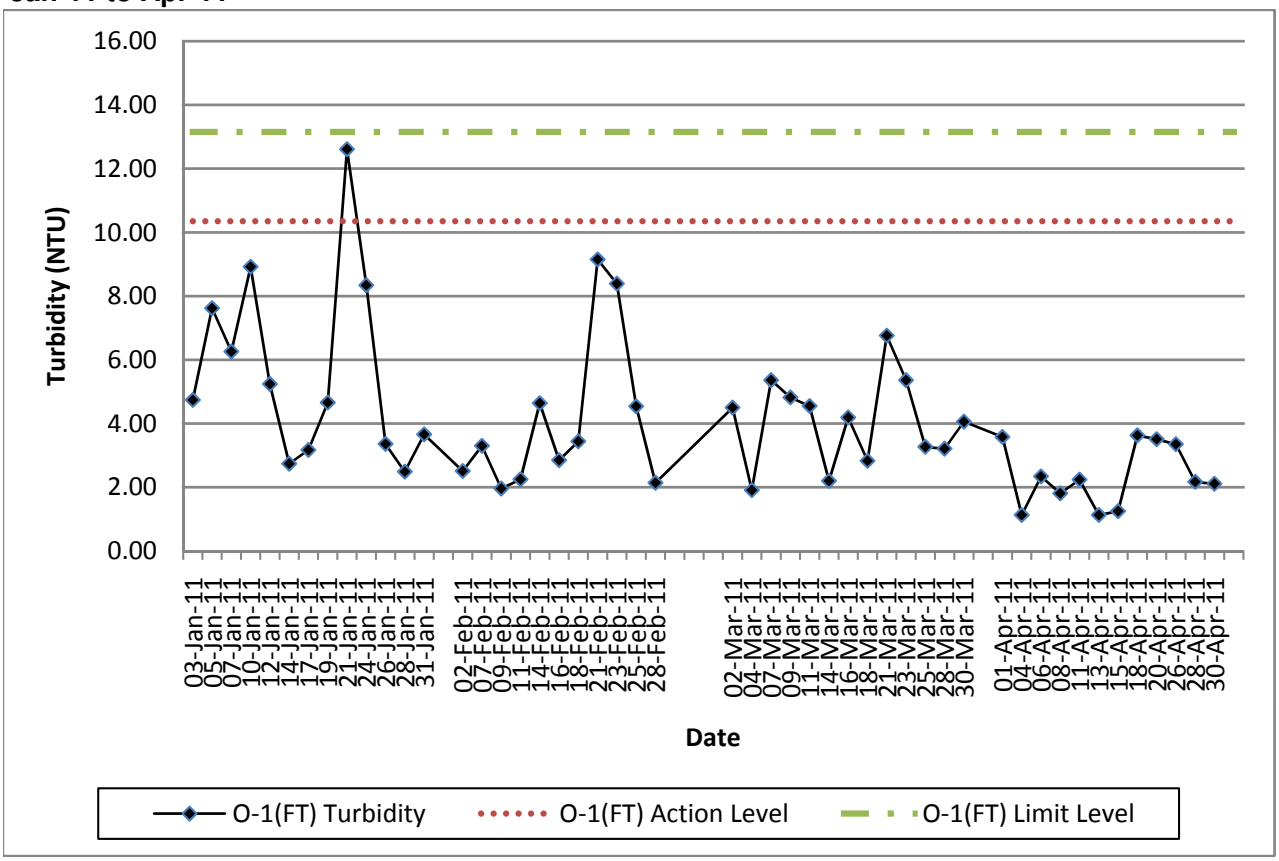
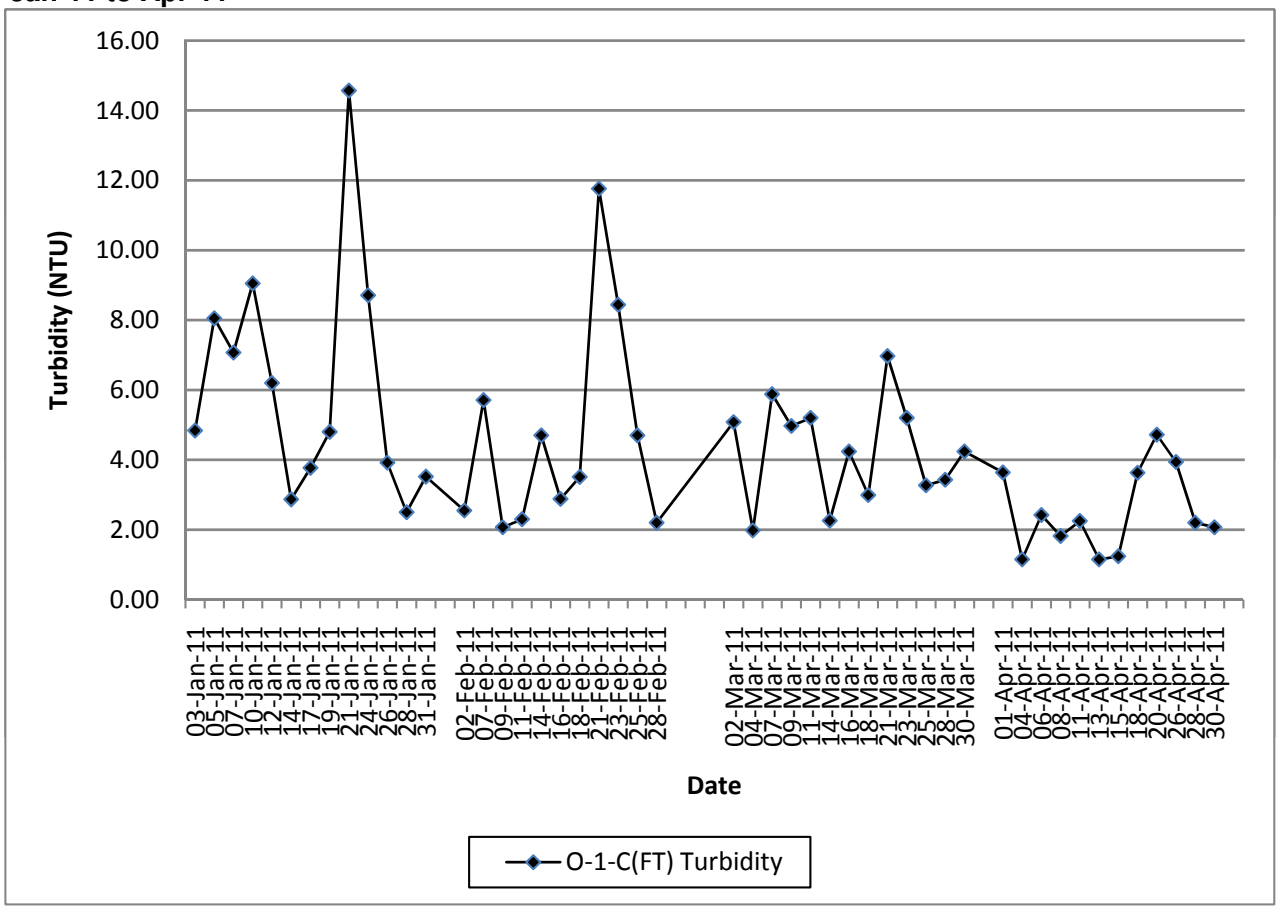
Water Quality Results at Outfall 1 During Flood Tide (O-1(FT))
Jan-11 to Apr-11



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Control of Outfall 1 During Flood Tide (O-1-C(FT))
Jan-11 to Apr-11



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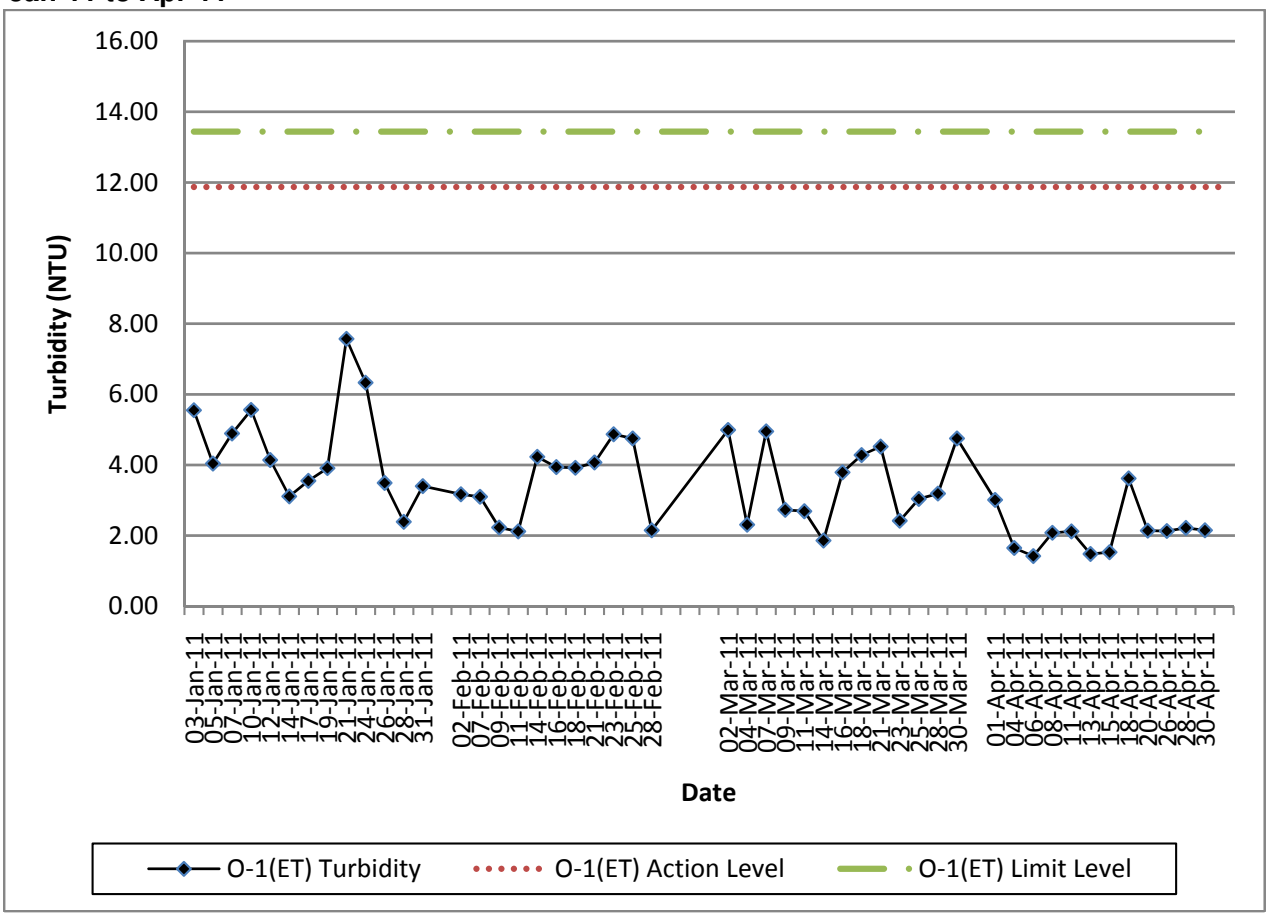
Water Quality Results at Outfall 1 During Ebb Tide (O-1(ET))
Jan-11 to Apr-11



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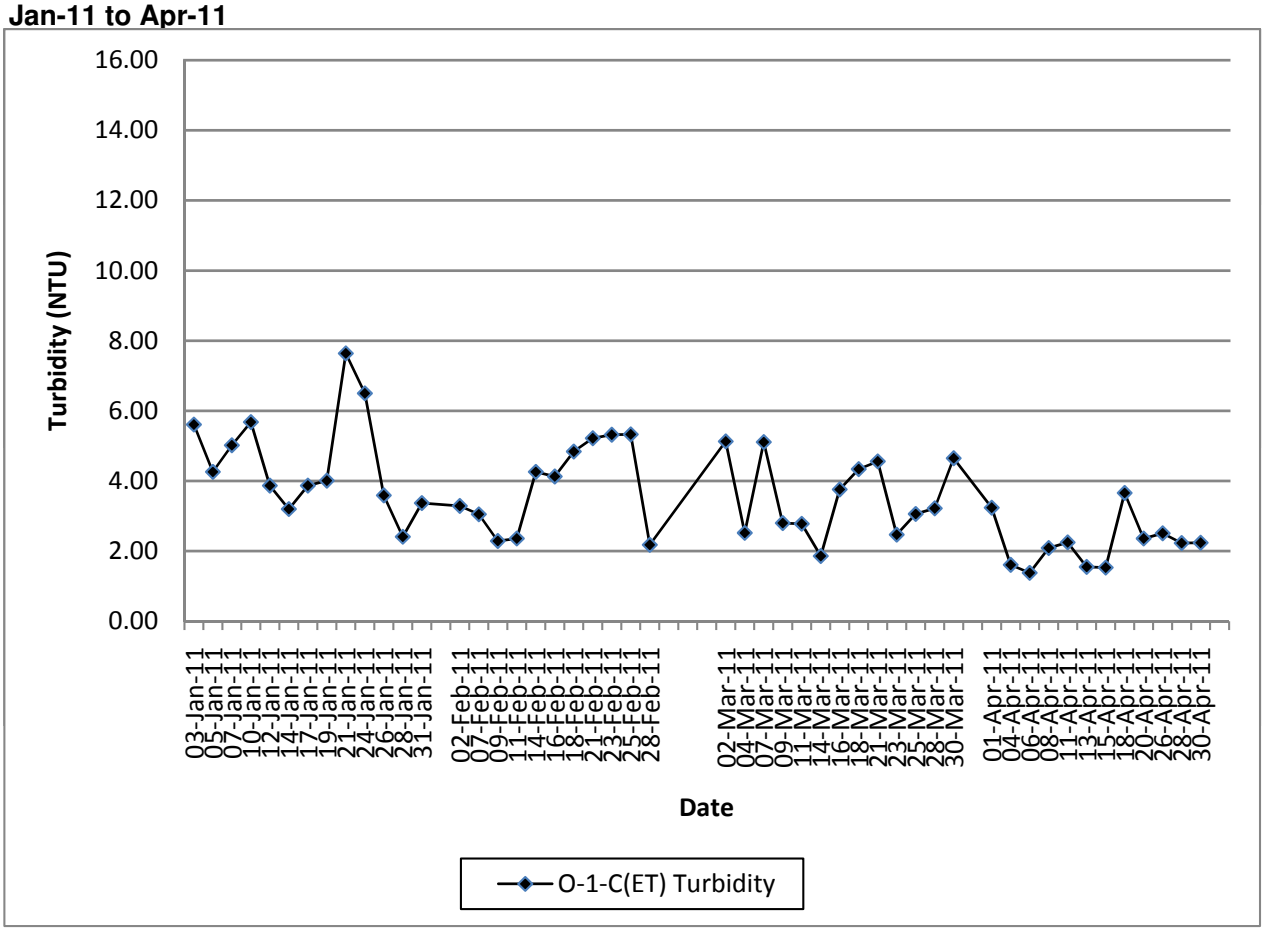
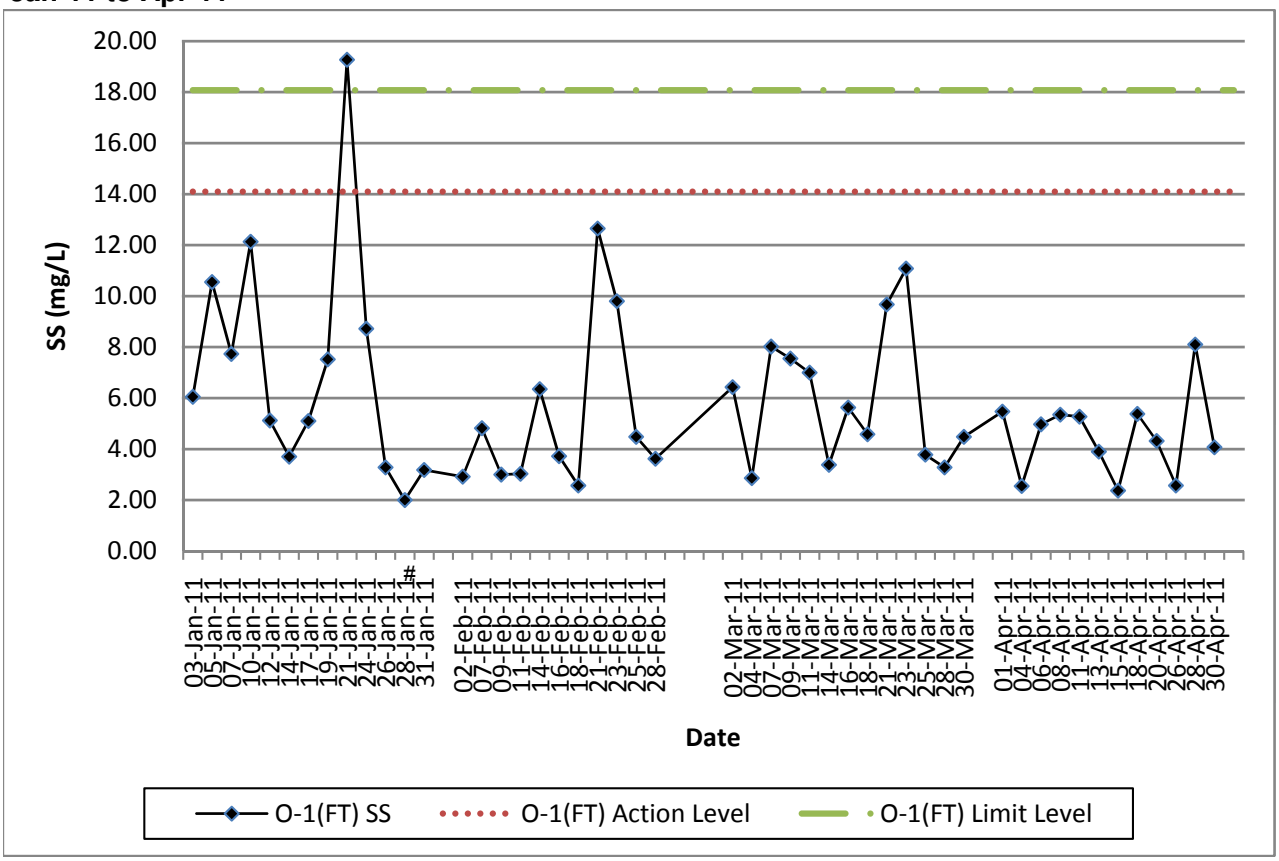
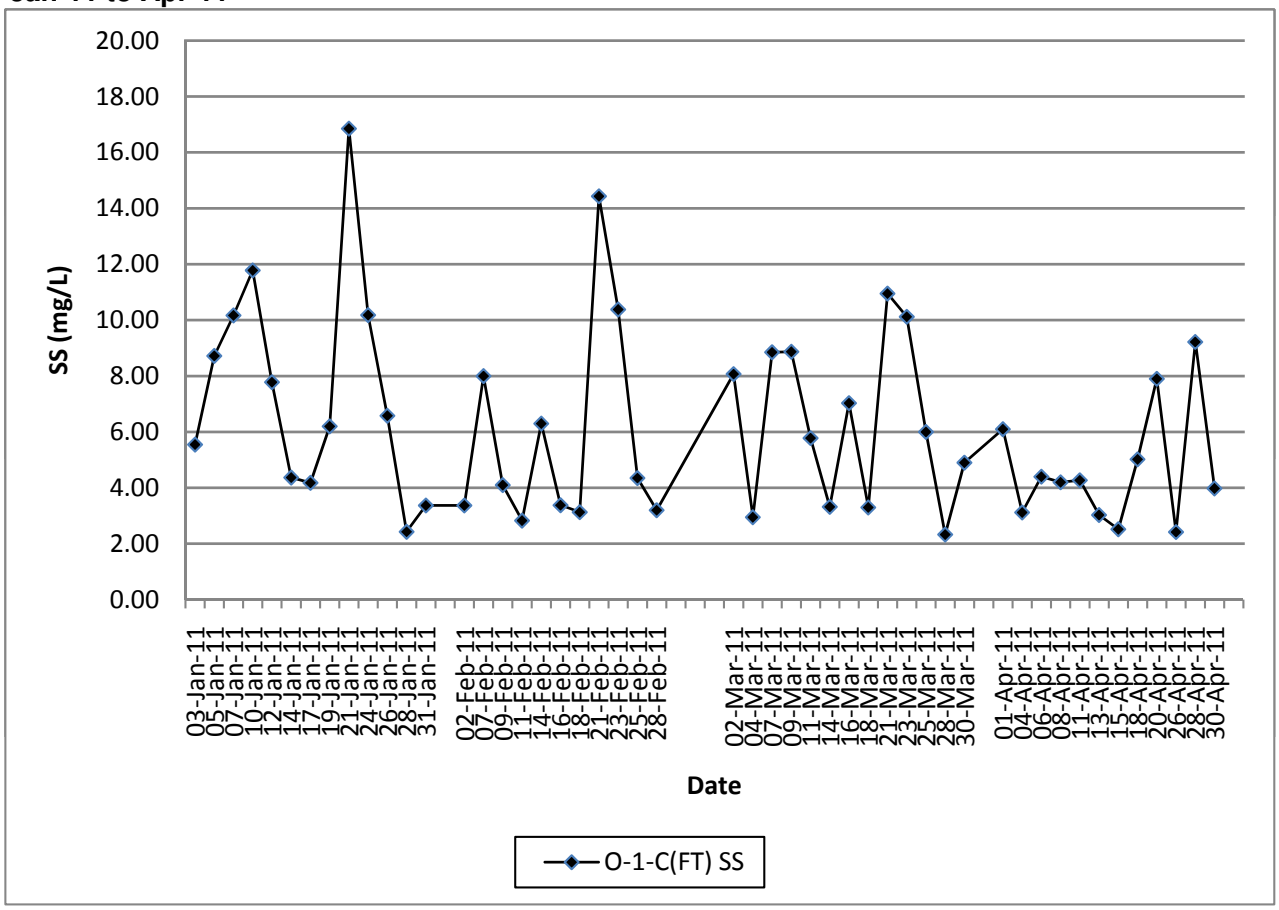
Water Quality Results at Control of Outfall 1 During Ebb Tide (O-1-C(ET))
Jan-11 to Apr-11



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Outfall 1 During Flood Tide (O-1(FT))
Jan-11 to Apr-11

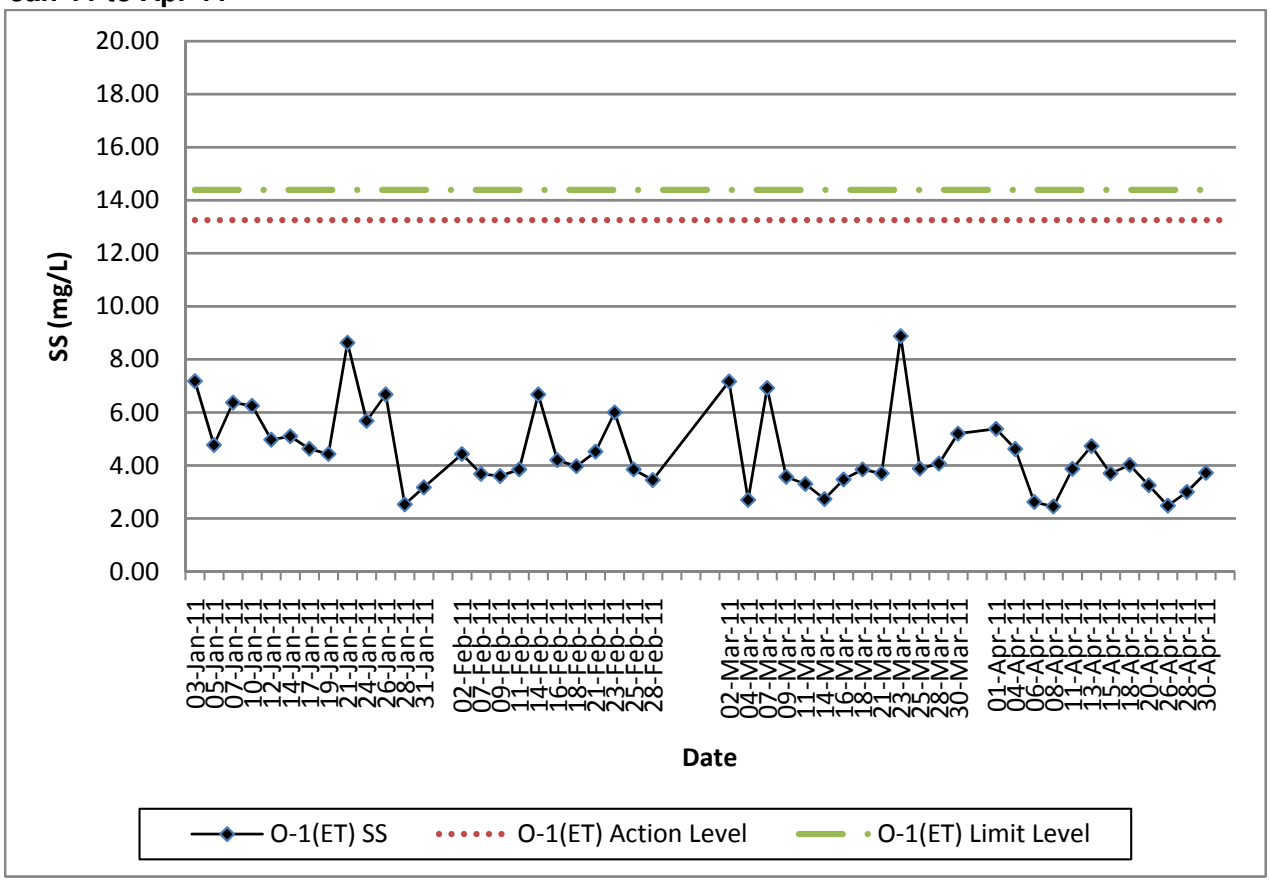


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Control of Outfall 1 During Flood Tide (O-1-C(FT))
Jan-11 to Apr-11

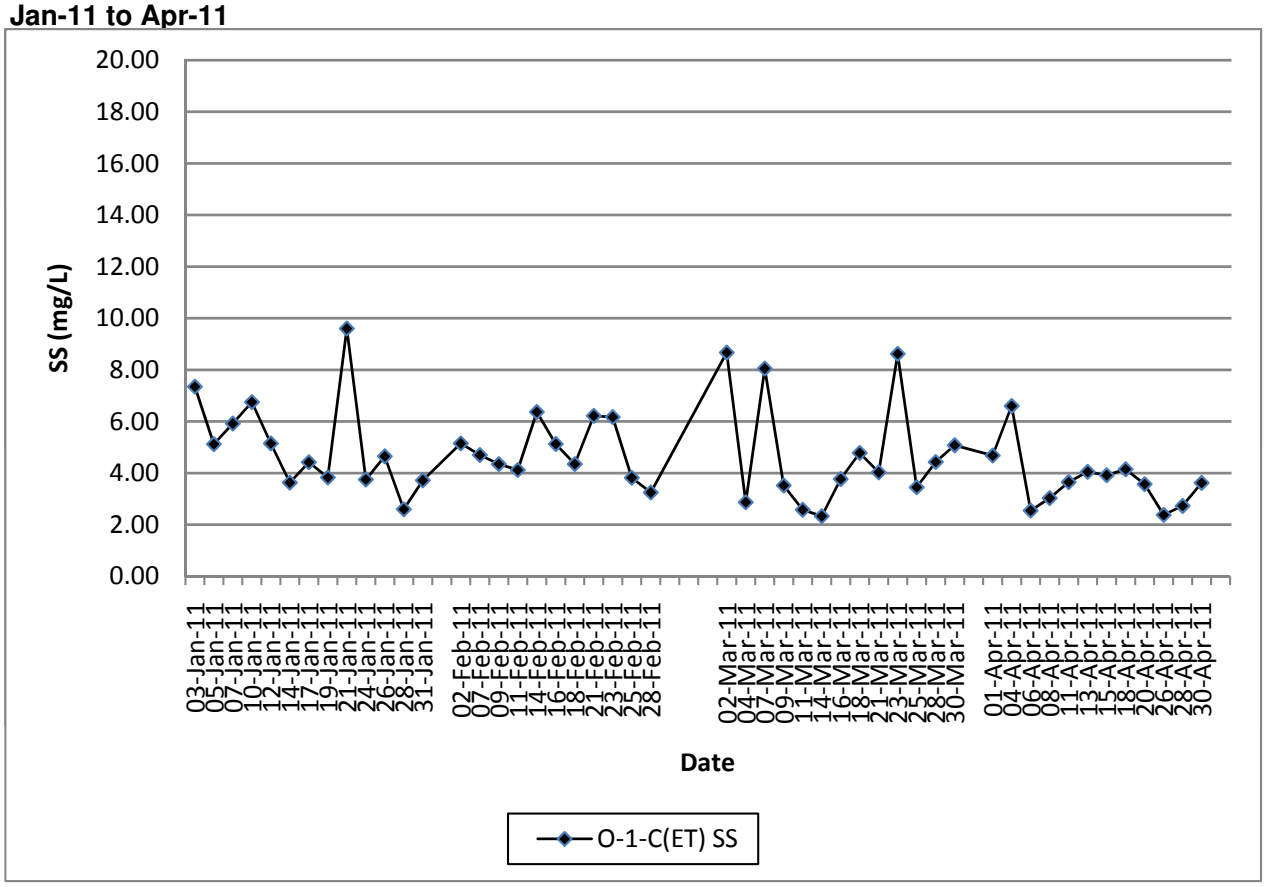


Note: # - For average SS level smaller than 2mg/L, the levels are plotted as 2mg/L in the garphs.

Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Outfall 1 During Ebb Tide (O-1(ET))
Jan-11 to Apr-11



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Control of Outfall 1 During Ebb Tide (O-1-C(ET))
Jan-11 to Apr-11



Note: # - For average SS level smaller than 2mg/L, the levels are plotted as 2mg/L in the garphs.

Appendix J

Interim Notifications of Environmental Quality Limits Exceedances

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	06-Apr-11
Time	10:25 AM
Monitoring Location	Sik Sik Yuen Ho Fung College (I-1)
Parameter	Suspended Solids
Action & Limit Levels (mg/L)	8.85 / 10.17
Measured Level (mg/L)	10.95
Possible reason for Action or Limit Level Non-compliance	A high SS level of 10.60 mg/L was recorded at Control Station (I-1-C)
Actions taken / to be taken	The measured SS level was above the baseline limit level, but lower than 120% of SS level of the control station (I-1-C). General site cleaning, rebar fixing at cascade bay 1, dismantling of formwork at vehicle access, removal of hoarding and masonry wall and geotechnical instrumentation monitoring were undertaken during the measurement. No direct disturbance was observed from the site. Thus, the exceedance was considered to be contributed by high SS level at upstream location and natural variation. Therefore, no action was required.
Remarks	Following mitigation measures were provided: (1) Waste water was collected and diverted to on-site waste water treatment plant for treatment before discharge; and (2) Nullah and site area were separated by sealed concrete block.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 12-Apr-11

Photographic record for exceedance of Suspended Solids recorded at Sik Sik Yuen Ho Fung College (I-1) on 06-Apr-11

Site photo

Photo taken at I-1

Photo taken at I-1-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Action Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	08-Apr-11
Time	2:37 PM
Monitoring Location	Sik Sik Yuen Ho Fung College (I-1)
Parameter	Suspended Solids
Action & Limit Levels (mg/L)	8.85 / 10.17
Measured Level (mg/L)	9.45
Possible reason for Action or Limit Level Non-compliance	A high SS level of 10.00 mg/L was recorded at Control Station (I-1-C)
Actions taken / to be taken	The measured SS level was above the baseline action level, but lower than the SS level of the control station (I-1-C). General site cleaning, rebar fixing at cascade bay 3, formwork prepaing, removal of masonry wall, pipe roof corning drilling and geotechnical instrumentation monitoring were undertaken during the measurement. No direct disturbance was observed from the site. Thus, the exceedance was considered to be contributed by high SS level of the upstream location and natural variation. Therefore, no action was required.
Remarks	The following mitigation measures were provided: (1) Waste water was collected and diverted to waste water treatment plant for treatment before discharge; (2) Nullah and site area were separated by sealed concrete block.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 18-Apr-11

Photographic record for exceedance of Suspended Solids recorded at Sik Sik Yuen Ho Fung College (I-1) on 08-Apr-11

Site photo

Photo taken at I-1

Photo taken at I-1-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Action Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	08-Apr-11
Time	9:12 AM
Monitoring Location	O-1(FT)
Parameter	Suspended Solids (SS)
Action & Limit Levels (mg/L)	14.10 / 18.08 (derived from the baseline monitoring data)
Measured Level (depth-averaged) at Monitoring Location	5.35
Control Station	O-1-C(FT)
Measured Level (depth averaged) at Control Station (mg/L)	4.20
Possible reason for Action or Limit Level Non-compliance	The measured SS level (depth-averaged) at O-1(FT) was below the baseline action/limit level but was higher than 120% of the control station's SS level (O-1-C(FT)) at the same tide of the same day. Only laying non-woven geo-textile and backfilling grade 200 rockfill behind installed seawall blocks were undertaken and there was no other marine works during monitoring. Silt curtain was deployed along the Portion E boundary line and extended from seawater level to seabed. Floating type silt curtain was also employed at the inner side. As such, the exceedance was considered to be contributed by natural variation and no further action was required.
Actions taken / to be taken	(1) Silt curtain had been provided along the Portion E boundary line and extended from seawater level to the bottom of seabed; (2) Floating type silt curtain had been employed at the inner side; (3) Sufficient slack of silt curtain was allowed to cope with the wave and tidal action to ensure the curtains (outer and inner) were rested on seabed; (4) condition of silt curtain was checked by the supervisor daily; (5) and seawall blocks installation was undertaken within the inner silt curtain area only.
Remarks	None

Prepared by: F. C. Tsang

Designation: Environmental Team Leader

Signature:

Date: 18-Apr-11

Photographic record for exceedance of Suspended Solids (SS) recorded at O-1(FT) on 08-Apr-11

Site photo

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Action Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	11-Apr-11
Time	10:20 AM
Monitoring Location	O-1(FT)
Parameter	Suspended Solids (SS)
Action & Limit Levels (mg/L)	14.10 / 18.08 (derived from the baseline monitoring data)
Measured Level (depth-averaged) at Monitoring Location	5.27
Control Station	O-1-C(FT)
Measured Level (depth averaged) at Control Station (mg/L)	4.27
Possible reason for Action or Limit Level Non-compliance	The measured SS level (depth-averaged) at O-1(FT) was below the baseline action/limit level but was higher than 120% of the control station's SS level (O-1-C(FT)) at the same tide of the same day. Only installation of temporary concrete blocks and placing leveling stone were undertaken and there was no other marine works during monitoring. Silt curtain was deployed along the Portion E boundary line and extended from seawater level to seabed. Floating type silt curtain was also employed at the inner side. As such, the exceedance was considered to be contributed by natural variation and no further action was required.
Actions taken / to be taken	(1) Silt curtain had been provided along the Portion E boundary line and extended from seawater level to the bottom of seabed; (2) Floating type silt curtain had been employed at the inner side; (3) Sufficient slack of silt curtain was allowed to cope with the wave and tidal action to ensure the curtains (outer and inner) were rested on seabed; (4) condition of silt curtain was checked by the supervisor daily; (5) and seawall blocks installation was undertaken within the inner silt curtain area only.
Remarks	None

Prepared by: F. C. Tsang

Designation: Environmental Team Leader

Signature:

Date: 18-Apr-11

Photographic record for exceedance of Suspended Solids (SS) recorded at O-1(FT) on 11-Apr-11

Site photo

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Action Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	13-Apr-11
Time	2:33 PM
Monitoring Location	O-1(FT)
Parameter	Suspended Solids (SS)
Action & Limit Levels (mg/L)	14.10 / 18.08 (derived from the baseline monitoring data)
Measured Level (depth-averaged) at Monitoring Location	3.90
Control Station	O-1-C(FT)
Measured Level (depth averaged) at Control Station (mg/L)	3.03
Possible reason for Action or Limit Level Non-compliance	The measured SS level (depth-averaged) at O-1(FT) was below the baseline action/limit level but was higher than 120% of the control station's SS level (O-1-C(FT)) at the same tide of the same day. Only installation of bagged concrete for seawall formation was undertaken and there was no other marine works during monitoring. Silt curtain was deployed along the Portion E boundary line and extended from seawater level to seabed. Floating type silt curtain was also employed at the inner side. As such, the exceedance was considered to be contributed by natural variation and no further action was required.
Actions taken / to be taken	(1) Silt curtain had been provided along the Portion E boundary line and extended from seawater level to the bottom of seabed; (2) floating type silt curtain had been employed at the inner side; (3) sufficient slack of silt curtain was allowed to cope with the wave and tidal action to ensure the curtains (outer and inner) were rested on seabed; (4) condition of silt curtain was checked by the supervisor daily; (5) and seawall blocks installation was undertaken within the inner silt curtain area only.
Remarks	None

Prepared by: F. C. Tsang

Designation: Environmental Team Leader

Signature:

Date: 20-Apr-11

Photographic record for exceedance of Suspended Solids (SS) recorded at O-1(FT) on 13-Apr-11

Site photo

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Action Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	18-Apr-11
Time	9:20 AM
Monitoring Location	Sik Sik Yuen Ho Fung College (I-1)
Parameter	Suspended Solids
Action & Limit Levels (mg/L)	8.85 / 10.17
Measured Level (mg/L)	2.70
Possible reason for Action or Limit Level Non-compliance	A low SS level of 2.10 mg/L was recorded at Control Station (I-1-C)
Actions taken / to be taken	The measured SS level was below the baseline action level, but higher than 120% of SS level of the control station (I-1-C). General site cleaning, formwork at Cascade Bay 3 and 4, construction of H-pile platform, pipe roof drilling and geotechnical instrumentation monitoring were undertaken during the measurement. No direct disturbance was observed from the site. Thus, the exceedance was considered to be contributed by natural variation and no action was required.
Remarks	The following mitigation measures were provided: (1) Waste water was collected and diverted to waste water treatment plant for treatment before discharge; (2) Nullah and site area were separated by sealed concrete block.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 29-Apr-11

Photographic record for exceedance of Suspended Solids recorded at Sik Sik Yuen Ho Fung College (I-1) on 18-Apr-11

Site photo

Photo taken at I-1

Photo taken at I-1-C

Appendix K

Complaint Log

APPENDIX K

COMPLAINT LOG

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
1	CIR-001	9 March 2009 at Outfall	Public through 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.	Findings/ Observations 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. Conclusion/Remedial Action 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. 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	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					wastewater treatment plant, tanker should be used.	
2	CIR-002	8 May 2009 at Outfall	Public through 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 2009. Site investigation was also carried out by EPD with the Contractor on 14 May 2009.	Findings/ Observations Regular 1-hour TSP monitoring, in accordance with EM&A Manual, is performed by Environmental Team. The monitoring station concerned is ASR9 (i.e. at the podium level of Greenview Terrace facing to the construction site). The closest date for the 1-hour TSP concentration monitoring was on 6 May 2009 and 12 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. 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: • 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). Conclusion/Remedial Action Based on the site inspection and monitoring results, the complaint is considered not justifiable since no	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					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.	
3	CIR-003	14 May 2009 at Outfall	Public through EPD	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 2009.	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. The contractor and the environmental team were also undertaken site investigation on the 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. 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	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					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. 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. • 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 ($L_{eq,\ 30\ min}$) 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.	

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
4	CIR-004	10 July 2009 at Outfall	Public through EPD	EPD has received a complaint (EPD ref: EP3/N22/RW/15137-09) regarding to construction dust from the outfall construction site on 10 July 2009.	Findings/ Observations 1-hour TSP concentration monitoring was on 10 July 2009 at Greenview Terrace, ASR9. Soil nailing works, concrete breaking, excavation and loading & unloading excavated materials were observed during monitoring. All 1-hour TSP concentrations at ASR9 were below the established Action and Limit Levels. No exceedance was recorded on 10 July 2009. 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: • Water spraying was provided to the exposed surface. • 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). • Tarpaulin was used for covering the dusty works in the Portal area. Conclusion/Remedial Action The complaint is considered not justifiable since no action & limit level exceedance on construction dust are identified	Closed
5 & 6	CIR-005	29 July 2009 & 11 August 2009 at Outfall	Public through SOR	SOR has received two complaints (SOR ref: (DC/2007/12)/M45/500/02480, 02500) from Greenview Terrace	Findings/ Observations Soil nailing, excavation, rock breaking and drilling, loading and unloading the materials were generally observed during monitoring period in July and August 2009. According to the noise monitoring results from	Same Case with Complaint No. 11

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
				regarding to daytime construction noise exceedance recorded at NSR9 on 8, 22, 23, 27 and 29 July 2009 and a large amount dust generated at the outfall construction site. The complaint dates were corresponded to 29 July and 11 August 2009.	6 July 2009 to 31 August 2009 at NSR 9, 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 from 6 July 2009 to 25 August 2009. <u>Conclusion/Remedial Action</u> The dust complaint on 22 July 2009 was due to the soil nailing works. The Contractor was reminded enhance the dust mitigation measures during soil nailing works. A designated staff was provided to spray water continuously during soil nailing. A nylon bag was placed on the drilling hole and keeping wet to suppress dust. A sprinkler was added at the hillside of the site and water spraying was provided continuously during operation of drilling to suppress dust. The documented complaint for noise is considered to trigger the action level and the Contractor was also reminded to enhance the on-site noise mitigation measures continuously. The enhanced mitigation measures are proposed as follows: • A staff from the Contractor was designated to take the reading of Leq (5mins) at the roof of Greenview Terrace. In case of the Leq (5min) exceed 73 dB(A), the Contractor would re-schedule the noisy plants to mitigate the escalation of noise level. • The designated staff was reminded to record all the weather condition including raining and wind speed. • Tools box talk for the Contractor's Team was carried out for reminding that the movable barrier should be placed to the breaking activities as much as possible. • Movable noise barriers were placed on site and the	

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					movable noise barriers were also modified. • Existing 25 ton rock breaker had been replaced by the another breaker. • The breaking tap of the 25 ton rock breaker had been replaced by another breaking tap. • A joint filler wall was installed at the vertical face of westbound to mitigate the noise rebound from the vertical face to high level of Greenview Terrace. From the additional monitoring data and monitoring data under regular EM&A requirements, noise level ($L_{eq, 30 min}$) between 6 July to 31 August 2009 was in the range of 71 to 74 dB(A) to the nearest integer. The noise monitoring frequency was maintained in twice per week to check whether the mitigation measures are effective. From the information of the Contractor, all the mitigation measures were implemented on 31 August 2009. Noise levels ($L_{eq, 30 min}$) were also re-measured after the implementation of the mitigation measures. Noise level ($L_{eq, 30 min}$) from 4 Sep to 28 Sep 2009 was in the range of 70 to 73 dB(A) to the nearest integer after the implementation of the mitigation measures. In our investigation, there was no exceedance of the measured noise level at Greenview Terrace.	
7	CIR-006	12 August 2009 at Outfall	Public through SOR	SOR has received a complaint (SOR ref: (DC/2007/12)/M45/500/02527) from Greenview Terrace, via Apple Daily regarding to daytime construction noise level ($L_{eq(30min)}$) was sometimes more than 80 dB(A) and a large amount dust	<u>Findings/ Observations</u> Soil nailing, excavation, rock breaking and drilling, loading and unloading the materials were generally observed during monitoring period in July and August 2009. According to the noise monitoring results from 6 July 2009 to 31 August 2009 at NSR 9, 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	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
				generated at the outfall construction site. The complaint date was corresponded to 12 August 2009.	Action and Limit Levels from 6 July 2009 to 25 August 2009. <u>Conclusion/Remedial Action</u> The dust complaint was considered not justifiable since no action & limit level exceedance on construction dust were identified. However, it was a recurrent case from Greenview Terrace. The Contractor was recommended to enhance water spraying continuously especially in rock breaking activities. On the other hand, there was no noise levels ($L_{eq(30min)}$) from the measurement taken from ET was more than 80 dB(A). However, it was a recurrent case from Greenview Terrace. The Contractor was reminded to enhance the on-site noise mitigation measures. The enhanced mitigation measures are proposed as follows: • A staff from the Contractor was designated to take the reading of Leq (5mins) at the roof of Greenview Terrace. In case of the Leq (5min) exceed 73 dB(A), the Contractor would re-schedule the noisy plants to mitigate the escalation of noise level. • The designated staff was reminded to record all the weather condition including raining and wind speed. • Tools box talk for the Contractor's Team was carried out for reminding that the movable barrier should be placed to the breaking activities as much as possible. • Movable noise barriers were placed on site and the movable noise barriers were also modified. • Existing 25 ton rock breaker had been replaced by the another breaker. • The breaking tap of the 25 ton rock breaker had	

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					been replaced by another breaking tap. • A joint filler wall was installed at the vertical face of westbound to mitigate the noise rebound from the vertical face to high level of Greenview Terrace. From the additional monitoring data and monitoring data under regular EM&A requirements, noise level ($L_{eq, 30 min}$) from 6 July to 31 August 2009 was in the range of 71 to 74 dB(A) to the nearest integer. The noise monitoring frequency was maintained in twice per week to check whether the mitigation measures are effective. From the information of the Contractor, all the mitigation measures were implemented on 31 August 2009. Noise levels ($L_{eq, 30 min}$) were also re-measured after the implementation of the mitigation measures. Noise level ($L_{eq, 30 min}$) from 4 Sep to 28 Sep 2009 was in the range of 70 to 73 dB(A) to the nearest integer after the implementation of the mitigation measures.	
8	CIR-007	14 August 2009 at Outfall	Public through EPD	EPD has received a complaint (EPD ref: EP3/N22/RW/17978-09) from Greenview Terrace regarding to daytime construction noise from the outfall construction site. The complaint date was corresponded to 14 August 2009.	Findings/ Observations Soil nailing, excavation, rock breaking and drilling, loading and unloading the materials were generally observed during monitoring period in July and August 2009. According to the noise monitoring results from 6 July 2009 to 31 August 2009 at NSR 9, the measured noise levels complied with the limit level in accordance with the EIAO-TM. Conclusion/Remedial Action This was a recurrent case from Greenview Terrace. The documented complaint for noise is considered to trigger the action level and the Contractor was reminded to enhance the on-site noise mitigation measures continuously. The enhanced mitigation measures are proposed as follows:	Same Case with Complaint No. 11

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					• A staff from the Contractor was designated to take the reading of Leq (5mins) at the roof of Greenview Terrace. In case of the Leq (5min) exceed 73 dB(A), the Contractor would re-schedule the noisy plants to mitigate the escalation of noise level. • The designated staff was reminded to record all the weather condition including raining and wind speed. • Tools box talk for the Contractor's Team was carried out for reminding that the movable barrier should be placed to the breaking activities as much as possible. • Movable noise barriers were placed on site and the movable noise barriers were also modified. • Existing 25 ton rock breaker had been replaced by the another breaker. • The breaking tap of the 25 ton rock breaker had been replaced by another breaking tap. • A joint filler wall was installed at the vertical face of westbound to mitigate the noise rebound from the vertical face to high level of Greenview Terrace. From the additional monitoring data and monitoring data under regular EM&A requirements, noise level ($L_{eq, 30 min}$) from 6 July to 31 August 2009 was in the range of 71 to 74 dB(A) to the nearest integer. The noise monitoring frequency would be maintained in twice per week to check whether the mitigation measures are effective. From the information of the Contractor, all the mitigation measures were implemented on 31 August 2009. Noise levels ($L_{eq, 30 min}$) were also re-measured after the implementation of the mitigation measures. Noise level ($L_{eq, 30 min}$) from 4 Sep to 28 Sep 2009 was in the range of 70 to 73	

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					dB(A) to the nearest integer after the implementation of the mitigation measures.	
9	CIR-008	17 August 2009 at Portion D of the Site	Public through SOR	SOR has received a complaint (SOR ref:(DC/2007/12)/M45/500/02546) from Long Bench Garden regarding to noise nuisance generated from the daytime construction work (rock-breaking) in Portion D of the Site. The complaint date was corresponded to 17 August 2009.	Findings/ Observations Soil nailing, excavation, rock breaking and drilling, loading and unloading the materials were generally observed during monitoring period in August 2009. The monitoring results from 3 August 2009 to 31 August 2009 at NSR 8 showed the measured noise levels complied with the limit level in accordance with the EIAO-TM. The contractor and the environmental team were also undertaken site investigation on the subject area in response to the complaint. Noise mitigation measures should be enhanced continuously due to this complaint. Conclusion/Proposed Action The documented complaint for noise is considered to trigger the action level and the Contractor was reminded to enhance the on-site noise mitigation measures continuously. The enhanced mitigation measures are recommended as follows: • Movable noise barriers had been placed towards the direction of Long Bench Garden, particular for the pipe pile works in the portal. • Tools box talk for construction team was carried out for reminding that the movable barrier should be placed to the breaking activities as much as possible. • The existing noisy 25 ton rock breaker had been replaced by the other breaker. • A joint filler wall had been fixed on the vertical face of west bound to absorb the noise generated towards Long Beach Garden. Noise monitoring frequency was increased twice per	Closed

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					week by ET due to this complaint. The measured noise levels were complied with the limit level in accordance with the EIAO-TM. No further complaint was received from Long Bench Garden within the reporting month.	
10	CIR-009	22 August 2009 at Outfall	Public through SOR	A complaint (SOR ref: (DC/2007/12)/M45/500/02628) was received from Greenview Terrace regarding to daytime construction noise level (Leq(30min)) was sometimes exceeded 75 dB(A) at the outfall construction site. The complaint date was corresponded to 22 August 2009.	Findings/ Observations Soil nailing, excavation, rock breaking and drilling, loading and unloading the materials were generally observed during monitoring period in July and August 2009. The monitoring results from 6 July 2009 to 31 August 2009 at NSR 9 showed the measured noise levels complied with the limit level in accordance with the EIAO-TM. The contractor and the environmental team were also undertaken site investigation on the subject area in response to the complaint. Noise mitigation measures should be enhanced continuously due to this complaint. Conclusion/Proposed Action The documented complaint for noise is considered to trigger the action level and the Contractor was reminded to enhance the on-site noise mitigation measures continuously. The enhanced mitigation measures are recommended as follows: • A staff from the Contractor was designated to take the reading of Leq (5mins) at the roof of Greenview Terrace. In case of the Leq (5min) exceed 73 dB(A), the Contractor would re-schedule the noisy plants to mitigate the escalation of noise level. • The designated staff was reminded to record all the weather condition including raining and wind speed. • Tools box talk for the Contractor's Team was carried out for reminding that the movable barrier	Same Case with Complaint No. 11

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					should be placed to the breaking activities as much as possible. • Movable noise barriers were placed on site and the movable noise barriers were also modified. • Existing 25 ton rock breaker had been replaced by the another breaker. • The breaking tap of the 25 ton rock breaker had been replaced by another breaking tap. • A joint filler wall was installed at the vertical face of westbound to mitigate the noise rebound from the vertical face to high level of Greenview Terrace. From the additional monitoring data and monitoring data under regular EM&A requirements, noise level ($L_{eq, 30 min}$) from 6 July to 31 August 2009 was in the range of 71 to 74 dB(A) to the nearest integer. The noise monitoring frequency was maintained in twice per week to check whether the mitigation measures are effective. From the information of the Contractor, all the mitigation measures were implemented on 31 August 2009. Noise levels ($L_{eq, 30 min}$) were also re-measured after the implementation of the mitigation measures. Noise level ($L_{eq, 30 min}$) from 4 Sep to 28 Sep 2009 was in the range of 70 to 73 dB(A) to the nearest integer after the implementation of the mitigation measures. In our investigation, there was no exceedance of the measured noise level at Greenview Terrace.	
11	CIR-010	24 September 2009 at Outfall	Public through SOR	A complaint (SOR ref: (DC/2007/12)/M45/500/02749) was received from Greenview Terrace regarding to daytime construction noise level	<u>Findings/ Observations</u> Soil nailing, excavation, rock breaking and drilling, loading and unloading the materials were generally observed during monitoring period in July and September 2009. The monitoring results from 6 July 2009 to 29 October 2009 at NSR 9 showed the	Closed

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				(Leq(30min)) was sometimes exceeded 75 dB(A) at the outfall construction site.	measured noise levels complied with the limit level in accordance with the EIAO-TM. The contractor and the environmental team were also undertaken site investigation on the subject area in response to the complaint. Noise mitigation measures have been enhanced continuously due to this complaint. <u>Conclusion/Proposed Action</u> The documented complaint for noise is considered to trigger the action level and the Contractor was reminded to enhance the on-site noise mitigation measures continuously. The enhanced mitigation measures were implemented as follows: • A staff from the Contractor was designated to take the reading of Leq (5mins) at the roof of Greenview Terrace. In case of the Leq (5min) exceed 73 dB(A), the Contractor would re-schedule the noisy plants to mitigate the escalation of noise level. • The designated staff was reminded to record all the weather condition including raining and wind speed. • Tools box talk for the Contractor's Team was carried out for reminding that the movable barrier should be placed to the breaking activities as much as possible. • Movable noise barriers were placed on site and the movable noise barriers were also modified. • Existing 25 ton rock breaker had been replaced by the another breaker. • The breaking tap of the 25 ton rock breaker had been replaced by another breaking tap. • A joint filler wall was installed at the vertical face of westbound to mitigate the noise rebound from the vertical face to high level of Greenview Terrace.	

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					From the additional monitoring data above and the regular monitoring under EM&A requirements, the measured noise levels were complied with the limit level in accordance with the EIAO-TM. From the noise level on 25 September 2009 and 2 October 2009, the trend of noise level seemed to be increased since the decoration work at 14/F Greenview Terrace was the domain noise source during the monitoring. The noise level during that time would be considered for reference only. There was no exceedance of the measured noise level at Greenview Terrace in our investigation.	
12	CIR-011	2 October 2009 at I-3	Public through EPD	EPD has received a complaint (EPD ref: EP3/N22/RW/22016-09) regarding to construction dust at the Intake-3 on 2 October 2009.	<u>Findings/ Observations</u> There is no representative air monitoring location as stated in the EM&A Manual. The contractor and the environmental team were undertaken site investigation on the subject area at 08-Oct-09 in response to the complaint. Air quality mitigation measures as recommended in EIA have been implemented by the Contractor. However, the dust impact by exposed area could be further improved. The mitigation measures during the site investigation were observed as follows: • Water spraying was provided to the exposed surface. • Wheel washing facilities for dump trucks was provided at the site exit. • Water spraying was provided during excavation and loading/unloading works <u>Conclusion/Proposed Action</u> Based on our site inspection, the complaint for dust is	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					considered justifiable as it is due to windy erosion on the exposed surface. 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 season, the haul road and the exposed area would be dry very quickly. The Contractor was recommended to provide water spraying more frequently especially in the dry season.	
13	(DC/2007/12)/ M45/500/2923 & email on 11 November 2009 from MCSJV	9 November 2009 at Outfall	Greenview Terrace through EPD	Movable noise barrier was not placed close enough to the piling machine.	Immediate Action The rig was re-orientated and the barrier was placed closed to the drilling head. Follow-up Action • Training was conducted to the operator to ensure that the workers aware that the barrier should be placed closed not the drilling head not the machine itself. • In order to prevent future occurrence, a permit to dig system was adopted. It should be checked by the Contractor and endorsed by the SOR before starting the drilling rig. The follow up action was checked and a permit to dig system has been implemented.	Closed
14	(DC/2007/12)/ M45/500/2978 & email on 19 November 2009 from MCSJV	18 November 2009 at Outfall	Greenview Terrace through EPD	Rock-breaking activity carried out in the eastern area of Portion D, closest to Greenview Terrace, was not totally screened and line of sight of the breaker was observed from the NSR.	Follow up Action • The bamboo scaffold was extended further away from stage 3 scaffold to further screen off the activities to the Greenview. The length of the extension was about 8 to 10 m. • A strong reminded was given to the relevant staff and sub-contractor and the barrier should be placed in the right orientation before breaking.	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					• The mitigation measures were strictly followed as stated in the proposal. The follow up action and relevant records was checked.	
15.	CIR-12	19 January 2010 at Intake-3 construction site	Public through EPD	EPD has received a public complaint (EPD ref: EP3/N22/RW/01270-10) regarding effluent discharge at Intake-3 construction site on 19 January 2010.	Findings/ Observations The effluent discharge on 19 January 2010 was due to the leakage of Gabion wall at I3. The water from the rock drilling work was flowing through the gap of the Gabion Wall to the watercourses at I3. Immediate Action The contractor had sealed the gap at the Gabion Wall immediately after the incident. Conclusion/Proposed Action Based on our site inspection, the complaint was due to leakage of Gabion wall. The area would be checked and maintained continuously to avoid recurrence case. The above identified mitigation measures have been implemented by the Contractor on 22 January 2010 and ET has also checked the implementation on 31 January 2010. The ET will closely inspect the watercourses during the routine site inspections and provide advice to the Contractor.	Closed.
16	CIR-13	19 January 2010 at Intake-3 construction site	Public through EPD	EPD has received a public complaint (EPD ref: EP3/N22/RW/01319-10) regarding daytime construction noise at Intake-3 construction site on 19 January 2010.	Findings/ Observations The monitoring station concerned is NSR6 (i.e. at Squatter facing to the construction site). Excavation, soil nailing, rock drilling and breaking, loading and unloading the materials were generally observed during monitoring period in mid-January 2010. The measured noise levels in January 2010 complied with the limit level in accordance with the EM&A Manual. These cases would also be treated as two action level exceedances on noise. The Contractor and the Environmental Team were also undertaken site	Closed.

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					investigation on the subject area in response to complaint. The noise mitigation measures during the site investigation were recommended as follows: • Sound insulation sheets were installed covering the working area during breaking and rock drilling in order to block the line of sight to the NSR. • Noise insulation materials were used to enclose the drilling rig tightly. Conclusion/Proposed Action Based on the site inspection and monitoring results, the complaint was due to noise generated by rock breaking work. The identified mitigation measures have been discussed with the Contractor and the Contractor has submitted the remedial proposal. The proposal was implemented by the Contractor on 25 January 2010 and ET has also checked the implementation on 31 January 2010. The Contractor was also advised to review the mitigation measures from time to time near the NSR at I3. The ET will closely inspect the area during the routine site inspections and provide advice to the Contractor.	
17	CIR-13	21 January 2010 at Intake-3 construction site	Public through EPD	EPD has received a public complaint (EPD ref: EP3/N22/RW/01444-10) regarding daytime construction noise at Intake-3 construction site on 21 January 2010.	Refers to Investigation /Mitigation Action for Complaint No. 16.	Closed
18	CIR-14	27 August 2010 near Intake-2 construction site	Public through DSD	DSD has received a public complaint regarding choked sewage manhole (MH1) at Lo Wai Road construction site on 27 August 2010.	Findings/ Observations During DSD inspection on 30 August 2010, improper discharge from the site to manhole, MH3, which is located downstream of MH1 was observed. ET had received those information from the Contractor on 09	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					September 2010. Site investigation was also carried out by SOR's representative with the Contractor on 01 September 2010. Checking with the site log, the construction activity at Lo Wai on 27 August 2010 was pipe jacking only. No site formation works was undertaken. The contractor and SOR's representative have undertaken site investigation on the subject area on 01 September 2010. On-site flow test at Portion G had conducted. ● Maeda works area is located at the lower section of Lo Wai Road and manhole MH3 is adjacent to the works area. MH1 (choked sewage manhole) is located at the upper section of Lo Wai Road. MH2 manhole is located middle section of Lo Wai Road. MH1 and MH2 are outside the works area. ● Water flow test for manhole MH2 and MH3 and no blockage was observed. ● Sewage overflow was found at MH1 during the joint site inspection on 01 September 2010 ● It was reported that there were water pipes connected between the site and the MH3. Discharge was found in MH3 during DSD inspection. ● The contractor claimed that the purpose of the water pipes was to direct the storm water and underground water inside the concrete pipe "pipe jacking". ● There was no discharge license for that portion. The Contractor had stopped on 01 September 2010 the water pumping to MH3 and apply the discharge license for the Lo Wai site. <u>Conclusion/Proposed Action</u> Based on the joint site inspection, the choked manhole MH1 was not due to works activities. The Contractor had clean up the choked manhole MH1	

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					and no sewage overflow from MH1 was observed. The Contractor was requested to divert the storm water to desilting system prior to discharge while no such discharge can be made until a valid discharge license is granted. The ET will closely inspect the vicinity area during the routine site inspections and provide advice to the Contractor as necessary.	
19&20	CIR-15	17 November 2010 at outfall construction site	Public through EPD	EPD has received a public complaint (EPD ref: EP3/N22/RW/24002-10 and EP3/N22/RW/24006-10) regarding daytime construction noise about derrick barge squeaking and rock breaking at Outfall construction site on 17 November 2010.	Findings/ Observations Drilling, excavation, marine mud dredging, rock breaking, mucking-out process and crane operation were observed during site inspections on 2 and 17 December 2010. The monitoring results measured on 15 November 2010 and 25 November at NSR 9 showed that the measured noise levels complied with the limit level (75 dB(A)) in accordance with the EIAO-TM. As part of the investigation of the noise complaints, the Contractor and the ET conducted additional site inspections and reviewed and audited the current noise mitigation practices and the Contractor's environmental performance on-site. Conclusion / Proposed Action The documented complaints for noise triggered the action level of the noise monitoring. The Contractor had implemented the following on-site noise mitigation measures: ● Erection of temporary noise insulation sheet at the rim of the spiral ramp construction site; ● Moveable barriers for rock breaker; ● Wrapping noise absorptive material at the rock breaker head; ● Tailor made noise enclosure for drilling rig; ● Semi-enclosed muck out process at muck hopper;	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					● Use of rock splitter (which is a relatively quieter method in contrast to rock breaker); and ● Noise insulation blanket enclosing the crane engine of derrick barge. Noise monitoring was increased to twice per week and the results were reported in the Complaint Investigation Report submitted on 24 December 2010. The measured noise level after implementation of the noise mitigation measures ranged from 69 to 73 dB(A) to the nearest integer and complied with the limit level in accordance with the EIAO-TM. The results showed that noise mitigation measures were effective. The contractor was advised to review the mitigation measures from time to time near the NSR 9. The ET would closely inspect the area during the routine site inspections and provide advice to the Contractor.	
21	CIR-16	10 January 2011 at outfall construction site	Public through EPD	EPD has received a public complaint (EPD ref: EP3/N22/RW/00484-11) regarding dark smoke emission from derrick barge and construction noise and dust at Outfall construction site on 10 January 2011.	Findings/ Observations 1. Dark Smoke Emission from Derrick Barge Dark smoke emitted from the derrick barge was promptly investigated after the receipt of the complaint. The issue was found specific to the mechanical operation of the barge working at the site at that moment. The derrick barge being complained was then replaced by another barge without the relevant mechanical issue. No further complaint was received since then. 2. Construction Dust Regular 1-hour TSP monitoring, in accordance with EM&A Manual, was carried out by the Environmental Team (ET). The monitoring station concerned is ASR 9, located at the podium level of Greenview Terrace facing the construction site. In January, 1 hour TSP	Closed

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					concentration monitoring had been conducted on 4, 10, 14, 20 and 26 January 2011 at Greenview Terrace (ASR). Rock breaking, drilling and excavation were observed during monitoring. No exceedance was recorded. The contractor and the environmental team were also undertaken site investigation at the subject area on 21 January 2011 in response to the complaint. It was confirmed that the air quality mitigation measures as recommended in EIA had been provided by the Contractor. The mitigation measures are as follows: ● Water spraying surrounding the spiral ramp; ● Water spraying for rock drilling and rock breaking; ● Water spraying for C&D material before loading and unloading to derrick barge; ● Water spraying for the exposed surface and the haul road; ● Water spraying for trucks and vehicles at the site exit. 3. <u>Construction Noise</u> The documented complaints for noise triggered the action level of the noise monitoring. The Contractor had implemented the following on-site noise mitigation measures: ● Extension of Temporary noise insulation barrier (made of noise blanket) at the rim of the spiral ramp construction site facing Greenview Terrace; ● Movable noise barriers to surround the rock breaking activities at the spiral ramp where it is in safe ground condition; ● Tailor made noise enclosure for rock drilling machine;	

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					● Semi-enclosed muck out process at muck hopper (with noise curtain underneath); ● Use of temporary noise enclosure for piling work at Castle Peak Road; ● Noise insulation blanket enclosing the crane engine of derrick barge; ● Additional noise blanket along the railings of the spiral ramp; and ● Use of rock splitter (which is a relatively quieter method in contrast to rock breaker). Noise monitoring has been increased to twice per week and the results will be reported in the Complaint Investigation Report to be submitted in mid-February 2011. The measured noise level after implementation of the noise mitigation measures ranged from 71 to 74 dB(A) to the nearest integer and complied with the limit level in accordance with the EIAO-TM. The results showed that noise mitigation measures were effective. The contractor was advised to review the mitigation measures from time to time near the NSR 9. The ET would closely inspect the area during the routine site inspections and provide advice to the Contractor. <u>Conclusion / Proposed Action</u> 1. <u>Dark Smoke Emission from Derrick Barge</u> Dark smoke emitted from the derrick barge was considered a stand-alone incident and was specific to the derrick barge being complained. No further complaint was received after the barge was replaced by another. 2. <u>Construction Dust</u> Based on our site inspection and monitoring results,	

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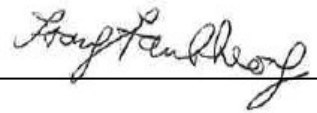
					the complaint was considered not justifiable since no action and limit level exceedance on construction dust were identified. Air quality mitigation measures as recommended in EIA were implemented in order to control and minimize the air quality impact and nuisance arising from the construction activities. Nevertheless, the Contractor was reminded to enhance the air quality mitigation measures such as increasing the water spraying frequency and ensure proper functioning of the automatic sprinklers at the Outfall construction site. 3. <u>Construction Noise</u> Noise measurement results between 10 and 28 January 2011 were below the limit level (75 dB(A)) and complied with the noise criterion. The Contractor had implemented various mitigation measures on site to alleviate the construction noise impact. The ET will remind the Contractor to enhance and maintain the normal functioning of the measures continuously to minimize the impact. The Contractor should also closely liaise with the nearby residents and inform the progress of the construction and the implementation of the environmental mitigation measures at the Outfall construction site.	

Signed by Environmental Team Leader:  Date: 1 May 2011