Drainage Service Department

Monthly Environmental Monitoring & Auditing report for

Contract No.DC/2006/11
Drainage Improvement in Southern Lantau

July 2009

2nd Revision

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EXECUTIVE SUMMARY

This is the twelfth monthly Environmental Monitoring and Audit (EM&A) report for "Drainage Improvement in Southern Lantau Investigation". The environmental permit number is "EP-237/2005/A". The report concludes the impact monitoring for the activities undertaken during the period of 1st July 2009 to 31st July 2009. The major activities in this reporting month include excavation for pipe trench at Ling Tsui Tau, construction of box culverts at Pak Ngan Heung (PNH), formation of haul access between bottleneck A and B at Tai Tei Tong (TTT) River, construction of gabion walls at Luk Tei Tong (LTT) bypass channel and River.

Noise, water quality and ecological monitoring were performed. Results obtained were checked against the previously established Action / Limit (A/L) levels. Additionally, the implementation status of environmental mitigation measures, event/ action plan and environmental complaint handling procedures were inspected during weekly site environmental audit.

In general, waste management was satisfactory during the reporting month.

Impact monitoring for construction noise was conducted in the reporting period. No exceedance of A/L level was reported.

Furthermore, impact monitoring for water quality was conducted. Total 80 non-compliance events of water quality criteria were recorded in this reporting month. Except natural fluctuation and influence of adverse weather exceedances were mainly caused by site water discharge due to poor site conditions.

During ecological monitoring survey, no White-shouldered Starling was recorded breeding in the watch tower. And there was no sign of disturbance from the Project to the watch tower, though the breeding season of White-shouldered Starling in this year has begun. The watch tower may not be suitable for birds as nesting habitat. In addition, no disturbance on the flora and fauna in the river channels were observed during the ecological monitoring.

There was no complaint, notification of any summons and successful prosecutions against the project received during the reporting period. A yellow form regarding improper site practices and direct discharge of site wastewater was issued by EPD to the contractor on 15 July 2009. ET has been informed by the contractor on 23 July 2009 for the incident and carried out investigation for the corrective actions taken.

Key construction activity in the coming month will be construction of box culvert at PNH, haul access and gabion walls at TTT River and retaining walls, gabion blocks as well as box culvert at LTT River. It is expected that noise, air and water quality impacts will be resulted from the works. With reference to the EM&A manual and mitigation measure report, mitigation measures are proposed to be taken, if necessary.

The ET will continue to implement the environmental monitoring & audit programme in accordance with the EM&A Manual and Environmental Permit requirement.

1. Introduction

This is the eleventh monthly Environmental Monitoring and Audit (EM&A) Report for "Drainage Improvement in Southern Lantau Investigation" project (Environmental Permit No. EP-237/2005/A)

2. Project Information

2.1 Construction program

The "Drainage Improvement in Southern Lantau Investigation" project will be completed by January 2011. The project comprises the following:

- Construction of approximately 80m long gabion with natural bed in Pak Ngan Heung River, approximately 180m of three cells 3m x 2m box culvert and approximately 100m of rectangular channel at Pak Ngan Heung River;
- Construction of approximately 250m of 0.75m wide U-Channel at Ling Tsui Tau Village in Mui Wo;
- Construction of bypass channel of about 350m and 240m long of gabion channels at Luk Tei Tong River respectively; and
- Widening three existing bottlenecks with gabion lined at Tai Tei Tong River

Appendix A shows the construction program and location plan of the project.

2.2 Project Organization

The Main Contractor, Yick Hing Construction Company Limited, has commissioned Environmental Pioneers & Solutions Limited and Ecosystems Limited as the Environmental Team, which comprises the environmental team leader, the ecologists and the environmental technicians to undertake the environmental monitoring and audit work for this project.

The environmental management structure and is shown in Fig 2.2.1.

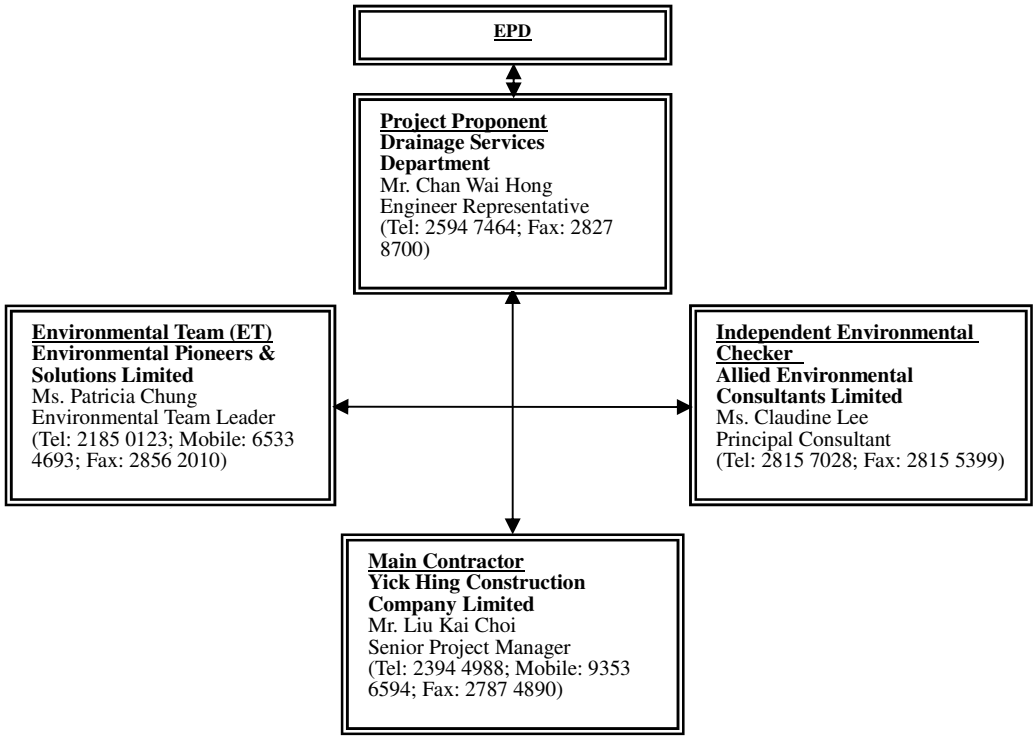


Figure. 2.2.1 Environmental Management structure for the project

2.3 Key Personal Contact information chart

Detailed contact of key persons involved in environmental aspect of the project is shown in Appendix B.

3. Construction Stage

3.1 Construction Activities in the reporting month

Major activities in the reporting month included the followings:

1. Construction of box culverts BC5 to 8 at PNH;
2. Construction of retaining wall D at PNH River;
3. Construction of box culvert A at LTT
4. Construction of gabion blocks at bottleneck B of TTT River;
5. Construction of footpath and manhole along Ling Tsui Tau; and
6. Construction of retaining wall J (near Yuen's Compound) at LTT River.

3.2 Construction Activities for the coming month

Key Construction works in the coming month will include:

1. Finishing works for box culverts BC5 to 8 at PNH;
2. Construction of retaining wall D at PNH River;
3. Construction of box culvert A at LTT;
4. Construction of gabion blocks at bottleneck B of TTT River;
5. Construction of gabion wall (near mangrove area) along LTT River; and
6. Construction of retaining wall J (near Yuen's Compound) at LTT River.

3.3 Environmental Status

Appendix A shows the drawing of the project area.

Locations of the monitoring and control stations with environmental sensitive receivers are presented in Section 4.3, 5.3 and 6.3 for noise, water and ecological monitoring respectively.

4. Noise Monitoring

4.1 Monitoring Parameters and Methodology

The construction noise level was measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq\ (30minutes)}$ was used as the monitoring parameter for the impact monitoring in the time period between 0700 to 1900 hours on normal weekdays. For all other time period, $L_{eq\ (5minutes)}$ was employed for comparison with the Noise Control Ordinance (NCO) criteria.

Noise measurement results obtained from each monitoring location were recorded in the Construction Noise Monitoring Data Sheet (Appendix E) immediately after the measurement. As supplementary information for data auditing, statistical results L_{10} and L_{90} were also be recorded for reference.

In case of non-compliance with the construction noise criteria, more frequent monitoring, as specified in the Action plan in table 4.5.2, shall be carried out. This additional monitoring shall be carried out until the recorded noise levels are rectified or proved to be irrelevant to the construction activities.

4.2 Monitoring Equipment

The sound level meters and calibrators comply with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications as referred to in the Technical Memorandum (TM) to the Noise Control Ordinance was deployed as monitoring equipment for noise measurement.

Noise measurement was not be made in the presence of fog, rain, wind with a steady speed exceeding $5ms^{-1}$ or wind with gust exceeding $10ms^{-1}$. Thus wind speed was checked by the portable wind speed indicator capable of measuring the wind speed in m/s. Table 4.2.1 summarizes the equipment list for noise monitoring

Table 4.2.1 Equipment List for Noise Monitoring

Equipment	Manufacturer & Model No.	Precision Grade	Qty
Integrated sound level meter	ACO Japan, model 6224	IEC 651 Type 1 IEC 804 Type 1	1
Windscreen	Microtech gefell model W2	N/A	1
Acoustical calibrator	Castle GA 607	IEC 942 Type 1	1
Wind speed indicator	Kestrel K1000	N/A	1
Remarks: Calibration details for the sound level meter is given in Appendix C for reference			

4.3 Monitoring Locations

According to the Baseline Monitoring Report issued in May 2008 for the captioned project, four locations where are alternative from the locations proposed in EM&A manual, were designated for baseline noise monitoring. For the data validation, impact noise monitoring was undertaken in the same locations during the construction phase of the project. The proposed monitoring locations are summarized in Table 4.3.1. Figure 4.3.1 shows the Noise Monitoring Locations

Noise measurement in each monitoring locations were taken at a point 1m from the exterior of the selected premises and at a height with no disturbance to the dweller and least obstructed view.

Table 4.3.1 Noise Monitoring Locations during Construction Phase

Identification No.	Noise Monitoring Locations
N1	No. 73, Village House, Ling Tsui Tau Tsuen (ground level)
N2	No. 31, Village House, Ling Tsui Tau Tsuen (ground level)
N3	Fence wall outside No. 5 village house adjacent to Luk Tei Tong River Outlet (ground level)
N4	No. 23, Village House, Tai Tei Tong River (ground level)

In accordance with the requirements in the EM&A manual, weekly impact monitoring was conducted. For the time period between 0700 and 1900 hours on normal weekdays, and noise parameter of $L_{eq\ (30minutes)}$ was measured. As if the construction works were carried out during restricted period (ie. 1900-2300, 2300-0700 of next day and Sundays / general holiday), impact monitoring that comprises 3 consecutive $L_{eq\ (5minutes)}$ would be carried out.

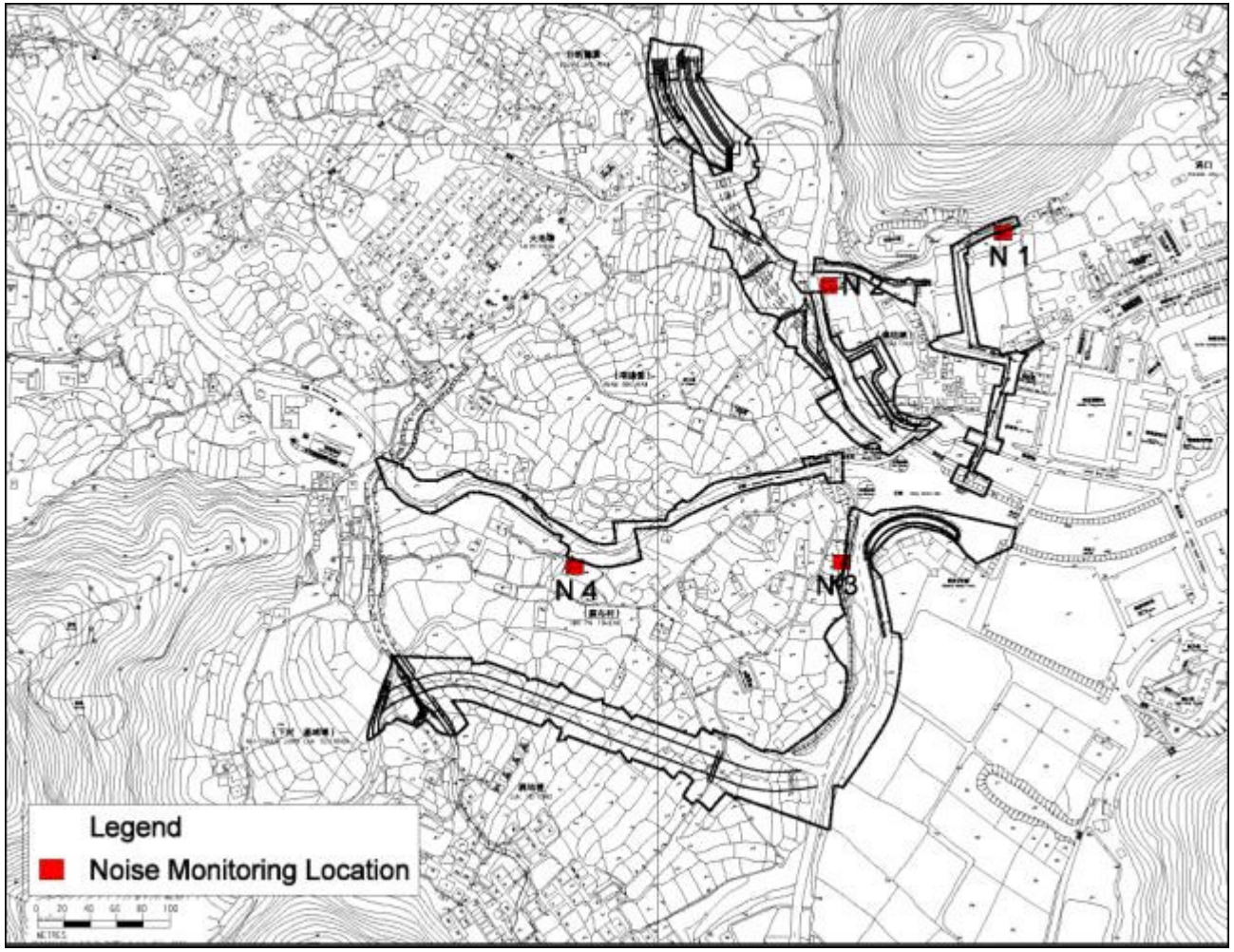


Figure 4.3.1 Impact noise monitoring locations

4.4 Monitoring Results and Interpretation

Relevant details of the noise monitoring results are presented in Table 4.4.1. The results, ranged between 48.8 dB (A) and 63.7 dB (A), were within the limit levels and therefore, no exceedance was found.

Table 4.4.1 Noise monitoring results

Table 4.4.1 Noise Monitoring Results for the reporting month

Location	Parameter	Date	Time	L_{Aeq} dB(A)	Limit dB(A)	Exceedance	Weather
N1	$L_{eq\ 30mins}$	6/07/09	15:08	48.8	75	N	Sunny
N1	$L_{eq\ 30mins}$	13/07/09	14:45	49.6	75	N	Sunny
N1	$L_{eq\ 30mins}$	20/07/09	15:03	50.4	75	N	Sunny
N1	$L_{eq\ 30mins}$	27/07/09	14:45	50.4	75	N	Cloudy
N2	$L_{eq\ 30mins}$	6/07/09	13:20	53.9	75	N	Sunny
N2	$L_{eq\ 30mins}$	13/07/09	14:10	53.7	75	N	Sunny
N2	$L_{eq\ 30mins}$	20/07/09	14:25	60.2	75	N	Sunny
N2	$L_{eq\ 30mins}$	27/07/09	14:10	60.0	75	N	Cloudy
N3*	$L_{eq\ 30mins}$	6/07/09	13:55	62.8	75	N	Sunny
N3*	$L_{eq\ 30mins}$	13/07/09	13:35	55.5	75	N	Sunny
N3*	$L_{eq\ 30mins}$	20/07/09	13:15	63.7	75	N	Sunny
N3*	$L_{eq\ 30mins}$	27/07/09	13:00	57.8	75	N	Cloudy
N4	$L_{eq\ 30mins}$	6/07/09	14:30	57.5	75	N	Sunny
N4	$L_{eq\ 30mins}$	13/07/09	13:00	60.1	75	N	Sunny
N4	$L_{eq\ 30mins}$	20/07/09	13:50	58.6	75	N	Sunny
N4	$L_{eq\ 30mins}$	27/07/09	13:35	62.2	75	N	Cloudy

Remarks: Raw datasheet for noise monitoring are attached in Appendix E for reference.
Remark*: The equivalent noise level of N3 is corrected by +3 dB from the raw data result due to the fact that free field measurement was carried out in the location.

4.5 Action and Limit level for Construction noise

The Action and Limit (A/L) levels for construction noise are defined in Table 4.5.1. Should non-compliance of the criteria occur, action in accordance with the Action Plan in Table 4.5.2 should be carried out.

There was no recorded exceedance in the reporting month.

Table 4.5.1 Action and Limit Levels for Construction noise		
Time Period	**Action Level**	**Limit Level**
0700 – 1900 hours on normal weekdays	When one documented complaint is received	75dB(A)
Remarks: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.		

Table 4.5.2 Event / Action Plan for Construction Noise

EVENT	**ACTION**			
	ET	**IC(E)**	**ER**	**Contractor**
Action Level	1. Notify IC(E) and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IC(E), ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IC(E); 2. Implement Noise mitigation proposals.
Limit Level	1. Identify source; 2. Inform IC(E), ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IC(E), ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results 8. If exceedance stops, cease additional monitoring	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

4.6 Noise Mitigation Measures

The following mitigation measures were observed from the weekly site inspection in the reporting month:

- Use of quiet powered mechanical equipment (PME)
- Implementation of the following good site practices:
  - Only well-maintained and regularly serviced plant should be operated on site;
  - Silencers or mufflers on construction equipment;
  - Mobile plant, if any, should be sited as far from noise sensitive receivers as possible; and
  - Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.

5. Water Monitoring

5.1 Water Quality Monitoring Parameters and methodology

Turbidity in Nephelometric Turbidity Unit (NTU), Dissolved Oxygen (DO) in mg/L and Suspended Solids (SS) in mg/L are required to measure in this project. Turbidity, DO was measured in-situ while water samples were delivered to Accredited HOKLAS Laboratory for analysis of SS.

Other relevant data such as monitoring location, time, water depth, temperature, salinity, weather conditions and any other special phenomena and work underway at the construction site were recorded during sampling.

According to the requirement of the EM&A manual, two consecutive measurements for parameters of DO concentration, DO saturation and Turbidity are required to be taken at each monitoring location. When the difference in value between the first and second reading of DO or Turbidity is more than 25%, the reading would be discarded and further reading would be taken.

5.2 Monitoring Equipment

Turbidity, DO, Salinity, pH and temperature was measured by an instrument complied with the following requirements:

The instrument is a portable as well as weatherproof multimeter complete with cable and uses a DC power source. It is capable of measuring:

- A turbidity between 0-800NTU;
- A dissolved Oxygen level in the range of 0-20mg/L and 0-200% saturation;
- A temperature of 0-50^{o}C;
- Salinity in the range of 0-40ppt;
- pH in the range of 0-14.

Suspended solid was determined by the water samples collected from the monitoring locations for further analysis in accredited HOKLAS laboratory. Water samples were contained by polythene bottles, packed in ice (cooled in 4^{o}C without frozen) and delivered to the laboratory for analysis as soon as possible after collection. Duplicate samples from each independent sampling event were undertaken during impact monitoring.

Detailed calibration records of the multimeter were shown in Appendix C for reference.

5.3 Monitoring Locations

Seven locations included a control station in upstream of each stream/ river, a monitoring station at the end of each stream/ river of the works area and a monitoring station at Silver River were proposed for the impact water quality monitoring. Water samples were collected at mid-depth of each proposed monitoring stations for measurements and sample collection. The Location Plan is shown in Figure 5.3.1 for reference.

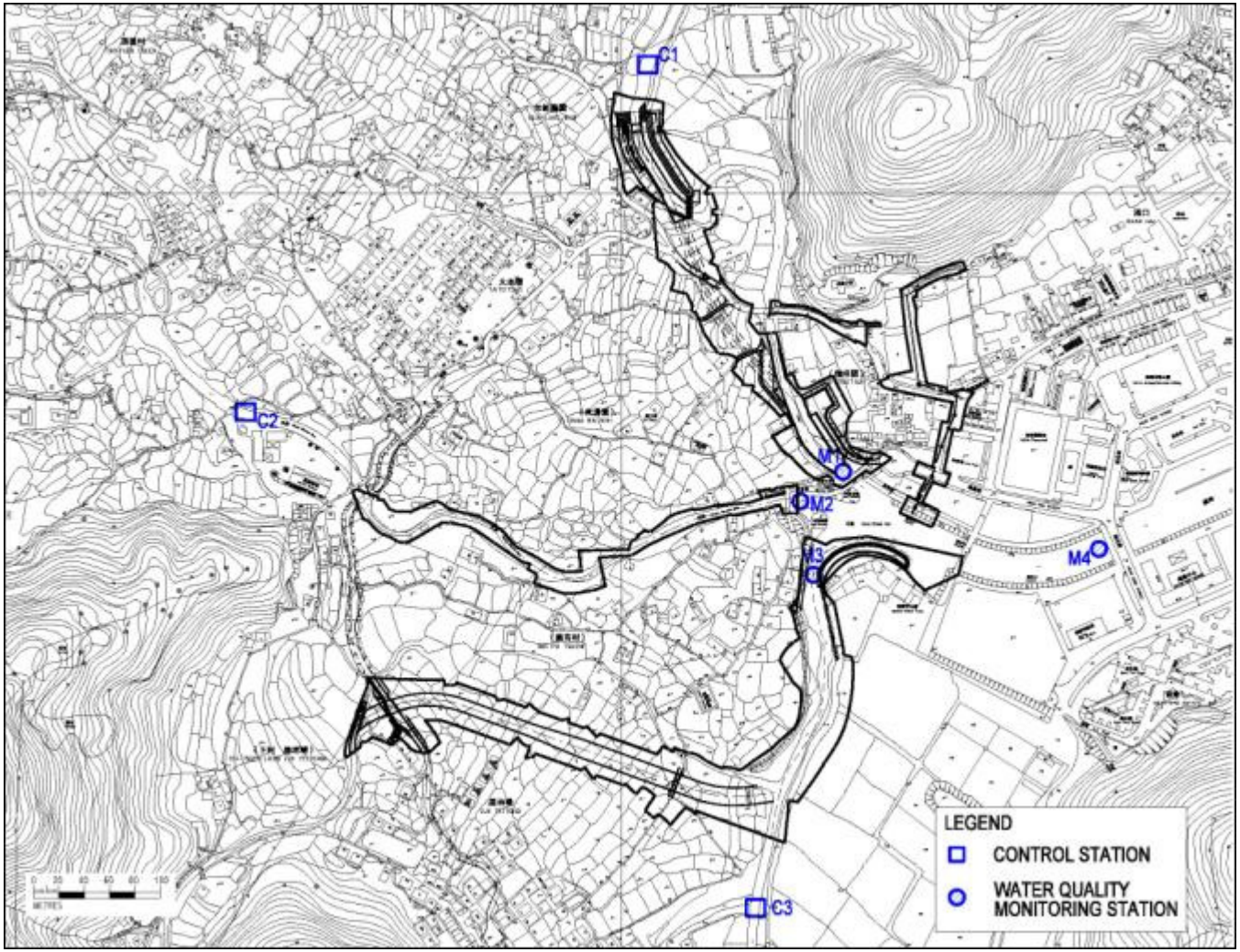


Figure 5.3.1 Water Quality Monitoring Locations

5.4 Monitoring Frequency

Impact water quality monitoring was undertaken three days per week and at ebb tides during the course of the construction river works. Upon the completion of the construction works, the monitoring exercises at the designated monitoring stations will be continued for four weeks in the same manner as the impact monitoring.

5.5 Monitoring Results and Interpretation

Water quality monitoring was carried out nineteen times during July. Detailed on-site measurements and laboratory analysis reports including QA/QC results are shown in Appendix F1 and F2 respectively, while Table 5.5.1 presents consolidated results throughout the reporting month.

Exceedance events on parameters of turbidity and suspended solids were recorded in this reporting period according to the established level. Findings from the investigations showed that the total 80 exceedance events were mainly caused by:

1.) Channel clearance activities carried out at the upper stream area of TTT River by the other project;
2.) Surface run-off due to defective site practices and/or mitigation measures for the formation of haul access between bottleneck A and B at TTT River;
3.) Surface run-off and leakage of site water due to defective site practices and/or mitigation measures for the construction activities along 3 rivers;
4.) Discharge of silty water to PNH River channel due to accumulation as well as overflow of site water from BC13; and
5.) Soil run-off and disturbance of sediment due to heavy rainstorm.

Detailed information of the exceedance events and action taken were presented in Section 7.

Table 5.5.1 Water quality monitoring results in July 2009

	M1			M2			M3			M4		
	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave
Turbidity (NTU)	1.1	35.7	8.0	0.0	186.5	13.1	3.7	66.0	12.7	0.0	14.2	5.8
DO (mg/l)	7.3	8.2	7.8	7.0	9.5	7.7	4.8	8.3	7.0	6.8	8.8	7.7
Suspended Solid (mg/l)	2.5	16.0	5.5	1.2	125.6	10.4	9.4	44.8	13.4	5.2	11.3	7.0

	C1			C2			C3		
	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave
Turbidity (NTU)	0.0	0.9	0.1	0.0	45.1	4.9	0.0	7.8	3.3
DO (mg/l)	7.2	7.9	7.5	7.1	8.5	7.6	5.1	7.3	5.9
Suspended Solid (mg/l)	1.0	5.4	1.6	1.0	31.8	4.2	3.1	9.8	5.2

* Remarks: Detection limit for Turbidity, DO and SS are 1 NTU, 0.1 mg/L and 1 mg/L respectively.

5.6 Action and limit level for Water Quality

Based on the criteria stipulated in EM&A manual Section 4.8 and baseline water quality monitoring data obtained, the A/L levels are shown in Table 5.6.1 and Table 5.6.2. If the water quality monitoring results at any impact stations exceeded the criteria, the actions in accordance with the Event and Action Plan in Table 5.6.3 should be taken.

Table 5.6.1 Water quality criteria for monitoring

Parameters	Action	Limit
DO in mg/L (mid-depth)	- 5%-ile of baseline data	- 4mg/L
SS in mg/L (mid-depth)	- 95%-ile of baseline data; or - 120% of control station's SS on the same day of measurement	- 99%-ile of baseline; or - 130% of control station's SS on the same day of measurement
Turbidity in NTU (mid-depth)	- 95%-ile of baseline data; or - 120% of control station's turbidity on the same day of measurement	- 99%-ile of baseline; or - 130% of control station's turbidity on the same day of measurement

Table 5.6.2 Action and Limit Levels established according to baseline data

Parameters	Monitoring locations							
	M1		M2		M3		M4	
	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
Turbidity (NTU)	15.2	16.9	5.3	6.5	16.8	26.0	16.2	18.0
DO (mg/L)	5.7	4.0	6.2	4.0	5.9	4.0	5.9	4.0
SS (mg/L)	12.2	12.8	3.1	4.2	12.4	17.7	13.9	15.2

Remarks:
For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits
For SS and turbidity, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

Table 5.6.3 Event and action Plan for Water Quality

EVENT	ACTION			
	ET	**IC(E)**	**ER**	**Contractor**
Action Level being exceed by one sampling day	1. Repeat in *situ* measurement to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IC(E) and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IC(E) and Contractor; 6. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IC(E) on the proposed mitigation measures; 2. make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IC(E) and propose mitigation measures to IC(E) and ER; 6. Implement the agreed mitigation measures.
Action level being exceed by more than two consecutive sampling days	1. Repeat in *situ* measurement to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IC(E) and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IC(E) and Contractor; 6. Ensure mitigation measures are implemented; prepare to increase the monitoring frequency to daily 7. Repeat measurement on next day of exceedance	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IC(E) on the proposed mitigation measures; 2. make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IC(E) and propose mitigation measures to IC(E) and ER within three working days; 6. Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day	1. Repeat in *situ* measurement to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IC(E) and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IC(E) and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IC(E) on the proposed mitigation measures; 2. make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IC(E) and propose mitigation measures to IC(E) and ER; 6. Implement the agreed mitigation measures.

5.7 Water Quality Mitigation Measures

Construction Run-off and Drainage

The site practices outlined in ProPECC PN 1/94 'Construction Site Drainage" should be followed as far as practicable during both construction and operation phase of the drainage improvement works in order to minimize surface runoff and the chance of erosion, and also to retain and reduce any suspended solids prior to discharge.

As recommended in the final EM&A manual, attention would be paid especially construction run-off and drainage, general construction activities, sewage discharged from construction workforce and river channel excavation works.

Contractor was recommended to provide sufficient water treatment facilities for accumulated site water and excavation activities carried out nearby river channel. Earth bunds should be provided to the construction site in / next to the river channel to form an enclosed, dry environment to minimize water quality impact.

5.8 Water Monitoring Schedule for the Next reporting period

Water monitoring in the next reporting period is scheduled for 3, 5, 7, 10, 12, 13, 17, 19, 21, 24, 25, 26, 31 August.

6. Ecology Monitoring

6.1 Ecological Monitoring Parameters

According to the Final EM&A Manual, a specific ecological monitoring programme of the improved section of PNH and LTT Rivers is recommended. The monitoring parameters required to measure in this project and survey methodology are described below:

(1) Avifauna species and abundance: Birds will be surveyed quantitatively using transect count method. Birds within the river channel and on the riverbank will be identified and their abundance will be recorded.

(2) Aquatic macroinvertebrate community species composition and abundance: Survey on aquatic fauna will focus on determination of the diversity and abundance of stream aquatic communities. Sampling methods, such as active searching, direct observation, netting, and kick sampling, will be determined according to the site conditions during field survey.

(3) Fish community species composition and abundance: Sampling methods, such as active searching, direct observation, and hand netting, will be determined according to the site conditions during field survey.

(4) Adult odonate community species composition and abundance: Adult dragonfly will be surveyed quantitatively using transect count method. Adult dragonflies within the river channel and on the riverbank will be identified and their abundance will be recorded. Species requiring close examination will be netted.

(5) Aquatic, emergent and riparian vegetation community species composition and abundance: The area will be walked through. Plant species composition and their relative abundance will be recorded.

(6) Surveys of White-shouldered Starling Sturnus sinensis will be conducted at the disused watchtowers next to LTT river. Breeding of the White-shouldered Starlings will be determined by checking signs of attempt to breed or sign of breeding which include carrying nesting materials, to-and-fro movement of adults carrying food, presence of recently fledged juveniles, etc. The number of breeding pairs and the site observation will be recorded whenever possible.

Water Quality Monitoring along LTT and PNH River as well as LTT bypass channel was carried out. Water quality monitoring will include Turbidity in Nephelometric Turbidity Unit (NTU), Dissolved Oxygen (DO) in mg/L and Suspended Solids (SS) in mg/L are required to measure in this project. Moreover, additional water monitoring parameters will be taken for the purposes of ecological monitoring of water quality in this project. The added information will include: BOD, Ammonia, Nitrate and Phosphate concentrations. Turbidity, DO, pH and water flow will be measured in-situ while water samples will be delivered to Accredited HOKLAS Laboratory accredited laboratory and the analyses followed the standard methods according to APHA Standard Methods for the Examination of Water and Wastewater, 20th Edition, or equivalent for analysis of SS, BOD, Ammonia, Nitrate and Phosphate concentrations.

Other relevant data such as monitoring location, time, water depth, temperature, salinity, weather conditions and any other special phenomena and work underway at the construction site will be recorded during sampling.

According to the requirement of the EM&A manual, two consecutive measurements for parameters of DO concentration, DO saturation and Turbidity are required to be taken at each monitoring. When the difference in value between the first and second reading of DO or Turbidity is more than 25%, the reading will be discarded and further reading will be taken.

6.2 Monitoring Equipment and Methodology

Turbidity, DO, Salinity, pH and Temperature will be measured by a instrument complied with the following requirements:

The instrument is a portable as well as weatherproof multimeter complete with cable and uses a DC power source. It is capable of measuring:

- A turbidity between 0-800NTU;
- A dissolved Oxygen level in the range of 0-20mg/L and 0-200% saturation;
- A temperature of 0-50^{o}C;
- Salinity in the range of 0-40ppt;
- pH in the range of 0-14.

Suspended solid was determined by the water samples collected from the

monitoring locations for further analysis in accredited HOKLAS laboratory. Water samples were contained by polythene bottles, packed in ice (cooled in 4°C without frozen) and delivered to the laboratory for analysis as soon as possible after collection. Duplicate samples from each independent sampling event were undertaken during impact monitoring.

6.3 Monitoring Locations

According to the Final EM&A Manual, the improved section of the river channels will be divided into 50m long sections, and ecological survey will be carried out in each of the 50m sections. A total of nine sections will be divided for the two rivers which include:

- Two sections for existing upstream of PNH river (i.e. the proposed 80m long trapezoidal channel)
- Two sections for existing downstream of PNH river (i.e. the proposed 100m long rectangular channel)
- Five sections for existing Luk Tei Tong River (i.e. the proposed 240m long trapezoidal channel)

The disused watchtowers are located at the confluence of the three rivers and next to LTT river.

The Location Plan for ecological is shown in Figure 6.1 for reference.

The improved sections of the river channels require to carrying out water quality monitoring for the ecological purpose. The sampling points for impact monitoring was undertaken in the same place as the baseline monitoring proposed, where include:

- Three points for existing of PNH river
- Three points for existing of Luk Tei Tong River

The Location Plan for ecological water monitoring is shown in Figure 6.2 for reference.

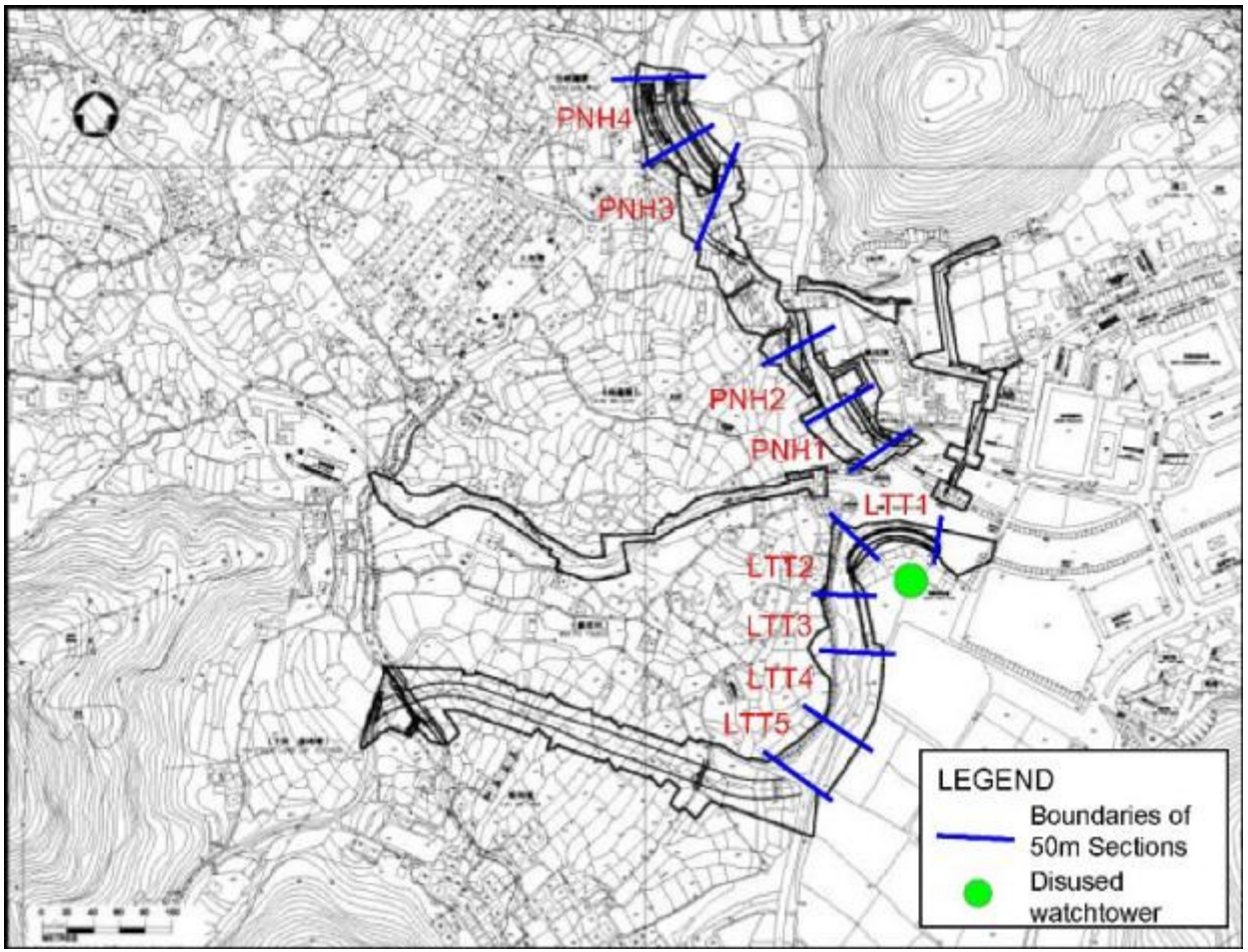


Figure 6.1 Ecological Monitoring Locations

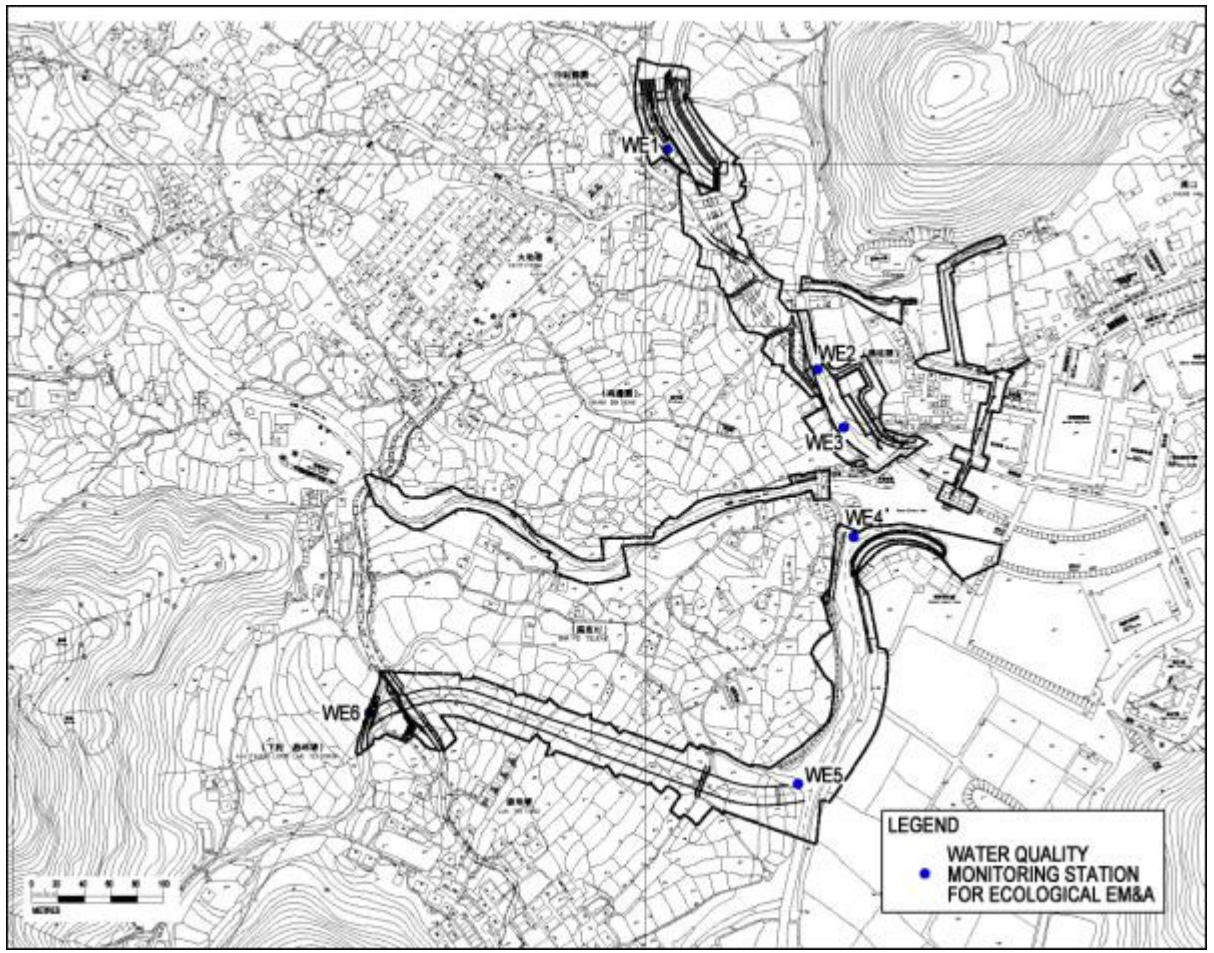


Figure 6.2 Ecological Water Quality monitoring locations

6.4 Monitoring Frequency

As proposed, ecological impact monitoring was carried out once for each monitoring location in the reporting month.

6.5 Monitoring results

Pak Ngan Heung Stream N and S sections

Surveys were conducted on 24 July 2009. The north section of Pak Ngan Heung Stream was fairly modified. Part of the west bank was lined with rock gabion bank and occupied by village houses and abandoned agricultural field. The stream channel was wider than the downstream section, but the stream bank was still fairly narrow and steep in gradient. Compared to the south section, the north section was relatively shaded due to presence of more trees with larger canopy.

The walk through survey recorded a total of 63 species, including 17 trees, 10 shrub, 19 herb and 7 grass species (Appendix D1). 48 of the species recorded are natives, while 15 were exotics. The quantitative sampling recorded 27 species at the north section. Large native (e.g. *Celtis sinensis, Cleistocalyx operculata, Ficus hispida*) and exotic trees (*Acacia confusa*) dominated the transects. Other species recorded include common and typical native pioneer forest and streamside tree species and ruderal species. No species of conservation interest was recorded.

Table 6.5.1 Relative percentage cover of vegetation recorded at Pak Ngan Heung (N) Section

	Relative % cover	
Species	**PNH3**	**PNH4**
Acacia confusa		11.64
Acorus graminifolia		0.14
Alocasia macrorrhiza		0.27
Aporosa dioica		0.75
Bamboo	14.72	
Celtis sinensis		0.41
Christella parasitica	0.88	1.34
Cleistocalyx operculata	8.83	
Dalbergia hancei	7.36	
Embelia ribes		2.17
Ficus hispida	3.19	1.22
Litsea glutinosa		1.36
Macaranga tanarius		1.43
Mallotus paniculatus	19.63	
Microstegium ciliatum		0.84
Mikania micrantha	1.23	3.53
Neyraudia reynaudiana		0.14
Panicum maximum		6.13
Phyllanthus urinaria		1.89
Pilea microphylla		10.88
Psychotria asiatica	0.98	1.62
Pueraria phaseoloides		53.60
Sageretia thea		0.58
Sporobolus fertilis		0.07
Sterculia lanceolata	8.83	
Syzygium jambos	31.90	
Wedelia triloba	2.45	
Total Relative % Cover	100.0	100.0
Total Transect Length (m)	13	34

*Total Cover rounded up to one decimal place to avoid round-off error.

The south section of Pak Ngan Heung Stream was highly modified. Both banks were lined with rock gabions and were occupied by village houses immediately beyond the channel. The stream channel was lack of riparian zone and vegetation. A total of 17 species recorded, 13 of which were native and 4 were exotic. It was composed of isolated individuals of mangrove (*Kandelia obovata*), backshore species (*Clerodendrum inerme*), native (*Celtis sinensis*) and planted trees (*Acacia confusa*) (Appendix D2). No species of conservation interest was recorded.

Terrestrial Fauna

Surveys were conducted on 3 July 2009.

A total of five species of birds were recorded in the proposed work area of the Pak Ngan Heung River (Table 6.5.2). All are common in Hong Kong.

Table 6.5.2 Avifauna in Pak Ngan Heung

Common names	**Latin names**	**PNH 1**	**PNH 2**	**PNH 3**	**PNH 4**	**Commonness & distribution**
Chinese Bulbul	*Pycnonotus sinensis*	4				CW
Red-whiskered Bulbul	*Pycnonotus jocosus*			3		CW
Magpie Robin	*Copsychus saularis*	2		1		CW
Common Tailorbird	*Orthotomus sutorius*	2				CW
Masked Laughingthrush	*Garrulax perspicillatus*	1				CW

CW = common and widespread, CL = common/uncommon and localized

Eight species of dragonfly was recorded in the proposed work area of the Pak Ngan Heung River (Table 6.5.3). All are common and widespread in Hong Kong.

Table 6.5.3 Dragonfly in Pak Ngan Heung River

Common names	***Latin names***	**PNH 1**	**PNH 2**	**PNH 3**	**PNH 4**	**Commonness & distribution**
Black-banded Gossamerwing	*Euphaea decorata*	2	1		6	A
Orange-tailed Sprite	*Ceriagrion auranticum*		2	1	1	A
Orange-tailed Midget	*Agriocnemis femina*			6	2	A
Wandering Midget	*Agriocnemis pygmaea*			12	15	C
Common Bluetail	*Ischnura senegalensis*			3	2	A
Black Threadtail	*Prodasineura autumnalis*				3	A
Yellow Featherlegs	*Copera marginipes*		2			A
Crimson Dropwing	*Trithemis aurora*				2	A

A = abundant, UC = uncommon

Aquatic fauna and fish

9 species of fish and 3 crustacean were recorded in the 4 sections at PNH. All are common and widespread in Hong Kong. Though Predaceous Chub was observed, the another one fish species of conservation concern reported in the EIA report, i.e. Flagtail *Kuhlia marginata*, was not recorded in PNH during the present monthly monitoring survey.

Table 6.5.4 Aquatic Invertebrates and fish in Pak Ngan Heung

Common names	Scientific names	PNH 1	PNH 2	PNH3	PNH4
Invertebrates					
Atyid shrimp	*Caridina elongata*				+
Palaemond shrimp	*Macrobrachium hainanensis*			+	
Crab	*Varuna litterata*				
Mitten Crab	*Eriocheir japonica*			+	
Fish					
Mosquito fish	*Gamusia affinis*				+
Barcheek Goby	*Rhinogobius giurinus*				++
Goby	*Rhinogobius duospilus*		+		
Swordtail	*Xiphophorus hellerii*				+
Six-banded Barb	*Puntius semifasciolatus*				+
Unidentified Cichlid fish					
Tilapia		+	++	+	
Predaceous Chub	*Parazacco spilurus*			+	
Jarbua Terapon	*Terapon jarbua*	++	+		
Common Silver-biddy	*Gerres oyena*				
Mullet	*Mugil cephalus*	++	+++		
Broken-band Hillstream Loach	*Liniparhomaloptera disparis*				

+ = Occasional, less than 5 individuals were found; ++ = Common, 5 – 20 individuals were found; +++ = Abundant, more than 20 individuals were found.

Luk Tei Tong Stream Section

Vegetation

Surveys were conducted on 24 July 2009. The Luk Tei Tong Stream Section was highly modified. Vegetation only established on isolated muddy patches at the estuary and remaining semi-natural banks of Section 1 and Section 2. Vegetation on the eastern stream bank from the second half of Section 3 to Section 5 were largely cleared while the western bank was still lined with rock gabions or concrete. The whole section appeared to be subject to tidal influence, as mangrove associated or backshore species were recorded along the whole channel.

The walk through survey recorded a total of 28 species, including 10 tree, 6 shrub, 4 grass species (Appendix D3). 22 of the species recorded are natives, while 5 were exotics. The quantitative sampling recorded 8 species at Sections 2. Section 2 was dominated by *Terminalia catappa* and *Wollastonia biflora*. No quantitative survey was carried out on Section 3 and 4 due to vegetation clearance on stream banks as part of the site clearance works under the project.

Due to the patchiness of streamside vegetation, the quantitative data should be interpreted with cautions and used as a reference only.

Table 6.5.5 Relative percentage cover of vegetation recorded at Luk Tei Tong Stream Section

	Relative % cover
Species	**LLT2**
Acanthus ilicifoius	2.43
Celtis sinensis	9.33
Execoecaria agallocha	7.20
Fimbristylis sp.	8.64
Kandelia obovata	7.58
Premna serratifolia	4.55
Terminalia catappa	35.63
Wollastonia biflora	24.64
	100.0

*Total Cover rounded up to one decimal place to avoid round-off error.

Terrestrial Fauna

The proposed work area of Luk Tei Tong River was divided into 5 sections. All recorded avifauna and dragonfly species are common in Hong Kong

Surveys were conducted on 3 July 2009.

A total of 13 species of birds were recorded in these sections (Table 6.5.6). All these species are common and widely distributed in Hong Kong.

Table 6.5.6 Avifauna in Luk Tei Tong River

Common names	**Latin names**	**LTT 1**	**LTT 2**	**LTT 3**	**LTT 4**	**LTT 5**	**Commonness & distribution**
Grey Heron	*Ardea cinerea*		1				CL
Spotted Dove	*Streptopelia chinensis*	2	5				CW
White Wagtail	*Motacilla alba*				2		CW
Barn Swallow	*Hirundo rustica*					3	CW

Chinese Bulbul	*Pycnonotus sinensis*			2			CW
Red-whiskered Bulbul	*Pycnonotus jocosus*	3	4				CW
Masked Laughingthrush	*Garrulax perspicillatus*		6				CW
Japanese White-eye	*Zosterops japonica*	2					CW
Great Tit	*Parus major*	1					CW
Crested Myna	*Acridotheres cristatellus*	2			6		CW
Black-necked Starling	*Sturnus nigricollis*			4		3	CW
Common Magpie	*Pica pica*	2					CW
Eurasian Tree Sparrow	*Passer montanus*				4		CW

CW = common and widespread, CL = common/uncommon and localized, R = uncommon/rare and localised

Three species of dragonfly were recorded in the Luk Tei Tong River (Table 6.5.7). All are common and widespread in Hong Kong.

Table 6.5.7 Dragonfly in Luk Tei Tong River

Common names	**Latin names**	**LTT 1**	**LTT 2**	**LTT 3**	**LTT 4**	**LTT 5**	**Commonness & distribution**
Green Skimmer	*Orthetrum sabina*			1		2	C
Variegated Flutterer	*Rhyothemis variegata*					6	C
Crimson Dropwing	*Trithemis aurora*	2				1	A

A = abundant, C = common

Aquatic invertebrates and fish

5 species of fish, 2 species of crustacean and 3 species of mollusks were recorded in the 5 sections at LTT. All are common and widespread in Hong Kong. The two fish species of conservation concern reported in the EIA report, i.e. Flagtail *Kuhlia marginata* and Predaceous Chub *Parazacco spilurus* were not recorded in LTT during the present monitoring as well as the baseline

monitoring survey. As some parts of the original stream banks have been being modified for the new gabion walls, the species number and abundance of aquatic fauna in these parts were lower than that recorded in previous monitoring, such as Section LLT3 due to the temporarily loss of stream banks and the disturbance.

Table 6.5.8 Aquatic invertebrates and fish in Luk Tei Tong River

Common names	Scientific names	LTT1	LTT2	LTT3	LTT4	LTT5
Invertebrates						
Mangrove clam	*Geloina erosa*					
Rock oyster	*Saccostrea cuculata*		++			
Snail	*Melanoides tuberculata*					
Snail	*Terebralia* sp.					
Snail	*Nerita* sp.		+			
Snail	*Littoraria articulata*		+			
Crab	*Varuna litterata*					
Fiddler crab	*Uca lactea*					
Fiddler crab	*Uca arcuata*					
Fiddler crab	*Uca crassipes*					
Crab	*Perisesarma bidens*		++			
Mangrove mud crab	*Scylla paramamosain*		+			
Mitten crab	*Eriocheir japonica*					
Fish						
Common mudskipper	*Periophthalmus cantonensis*					
Tilapia		++				
Jarbua terapon	*Terapon jarbua*		+	+		
Mullet	*Mugil cephalus*	+++	++	+		
Common Silver-biddy	*Gerres oyena*		+			
Barcheek Goby	*Rhinogobius giurinus*				+	

+ = Occasional, less than 5 individuals were found; ++ = Common, 5 – 20 individuals were found; +++ = Abundant, more than 20 individuals were found.

Disused Watchtowers

Surveys were conducted on 3 July 2009.

There was no sign (e.g., adults carrying food or nesting materials) of use of the watchtower as nesting habitat by White-shouldered Starling. This species was not observed during the July 2009 monitoring. No bird of other species was observed entering the watchtower.

Most birds in Hong Kong breed between March and July. No sign of nesting of White-shouldered Starling in the disused watchtower was observed during this period.

Since the monitoring surveys commenced in August 2008, no bird was observed entering the watchtower. It seems the birds do not prefer the watchtower as roosting or nesting habitat.

Ecological Water Quality Monitoring (EWQM)

EWQM was conducted on 03 July 2009. Monitoring results are summarized in Table 6.9. Detailed on-site measurements and laboratory report are presented in Appendix D4 and D5.

Table 6.10 shows the baseline results of Ecological Water Quality Monitoring, from the information given in Baseline Monitoring Report.

To review the results in Table 6.9 in general, the measured results were found similar with past months.

Table 6.9 Summarized Ecological water quality monitoring results (03 July 2009)

Parameters	Limit of detection	WE1	WE2	WE3	WE4	WE5	WE6
Suspended Solid (mg/l)	1	1.25	2.20	8.35	16.70	7.30	1.00
Nitrogen (Ammonia) (mg/l)	0.01	0.03	0.15	0.17	0.27	0.87	0.03
Nitrogen (Nitrate) (mg/l)	0.01	0.09	0.14	0.14	0.36	0.07	0.10
Phosphorous (mg/l)	0.01	0.04	0.07	0.10	0.15	0.30	0.02
BOD_5 (mg/l)	1	2.00	2.00	2.00	2.00	3.00	2.00
DO (mg/l)	0.01	7.58	8.04	7.93	7.01	7.38	7.12
Turbidity (NTU)	0.1	0.00	0.00	17.20	17.90	3.50	0.00
Temperature (oC)	0.1	27.6	27.8	27.5	28.6	29.1	27.5
pH	0.01	6.74	7.79	7.47	6.75	6.63	6.30
Salinity (ppt)	0.1	0	0.1	0.1	4.2	0.2	0
Conductivity (ms/m)	0.1	7.4	24.1	29.0	742.0	58.5	5.2
Water Flow (m/s)	N/A	0.02	0.05	0.1	0.04	0.04	0.02

Table 6.10 Baseline Results of Ecological water quality monitoring

Parameters	WE1	WE2	WE3	WE4	WE5	WE6
Suspended Solid (mg/l)	1.0	2.0	3.0	3.0	<1	<1
Nitrogen (Ammonia) (mg/l)	0.07	0.12	0.11	0.23	0.03	0.02
Nitrogen (Nitrate) (mg/l)	0.12	0.13	0.13	0.31	0.04	0.05
Phosphorous (mg/l)	0.04	0.06	0.06	0.09	0.06	0.05
BOD_5 (mg/l)	<2	<2	<2	<2	<2	<2
DO (mg/l)	6.58	6.82	6.37	7.61	6.87	5.70
Turbidity (NTU)	4.44	5.12	5.93	6.96	4.65	2.73
PH	6.4	7.1	7.0	6.8	6.6	6.1
Salinity (ppt)	<0.1	0.1	0.3	7.6	0.1	<0.1

6.6 Action and Limit level for Monitoring of White-shouldered Starlings

A simple Event and Action Plan is shown in Table 6.6.1. Should the Event occur, action in accordance with the Action Plan should be carried out.

There was no recorded event in the reporting month.

Table 6.6.1 Event / Action Plan for Monitoring of White-shouldered Starlings

EVENT	ACTION	
	ET Leader	**Contractor**
Identification of disturbance to breeding White-shouldered Starlings	1. Increase frequency of monitoring to twice weekly	1. Check all construction actions and working methods
	2. Notify Site Engineer	2. Submit proposals for remedial action to prevent abandonment of the breeding site.
	3. Review construction activities of previous week.	3. Implement remedial action.
	4. Identify any changes in construction activities in previous week	4. Liaise with ET regarding effectiveness of remedial actions.
	5. Discuss remedial actions with Site Engineer	

6.7 Ecological monitoring Schedule

The next ecological surveys are scheduled on 11th, 14th and 26th August, while ecological water quality monitoring is scheduled on 5th August.

7. Action taken in Event of Exceedence

If the measurements (Noise, Water, Ecology) exceed the action / limit level, exceedance details will be reported and follow-up actions will be taken by relevant parties involved.

During the reporting period there was no exceedance for noise, ecological measurements recorded; therefore no actions were taken.

Total 80 non-compliance events of water quality limits (Dissolved Oxygen, Turbidity and Suspended Solids) were recorded in this reporting period according to the established level. ET has arranged site investigations for the exceedance events. Findings from the inspection showed causes were substantially attributable to:

- Channel clearance activities carried out at the upper stream area of TTT River by the other project;
- Surface run-off due to defective site practices and/or mitigation measures for the formation of haul access between bottleneck A and B at TTT River;
- Surface run-off and leakage of site water due to defective site practices and/or mitigation measures for the construction of gabion wall along LTT River;
- Discharge of silty water to PNH River channel due to accumulation as well as overflow of site water from BC13; and
- Soil run-off and disturbance of sediment due to natural fluctuation and adverse weather.

The summary of non-compliance is listed in Table 7.1 for reference.

Among the 80 events of non-compliance recorded in this reporting month, 18 of them were believed to be caused by improper site practice carried out by the contractor. Additional monitoring was carried out in the next day (unless cancelled due to heavy rainstorm) if exceedance of limit level was occurred.

Base on the nature of deficiencies observed, contractor was urged to carry out necessary mitigation measures so as to minimize the disturbance of water quality to minimal level. Site water seepage to the river channel due to overflow and ineffective protection measures were the major cause of exceedance observed. Contractor was advised to rectify bunds and barriers provided to prevent site water directly entering the stream courses. Contractor took the advice and implement corrective actions however, follow up actions provided were found not effective and further improvement was recommended. As reported by contractor, de-silting tanks are under preparation. Contractor was advised to provide effective de-silting facilities as soon as possible and soak-away on site ground should be prevented.

In accordance with the relevant contractual documents and environmental permits, Contractor was reminded to implement necessary mitigation measures before commencement of construction activities. Contractor was also advised again to be cautious on the conditions of sites as well as mitigation measures provided. Site practices should be reviewed and mitigation measures should be enhanced if water quality was still affected by works. Follow up actions should be taken immediately as to minimize deterioration of water quality as far as practicable.

Table 7.1 Summary of Non-compliance for Water Quality

Date	Location	Parameter	Level of exceedance	Main cause of exceedance
02/07/09	M1	Turbidity, S.S	Limit Level	M1, M2 & M3 – No particular observations
	M2	S.S.		
	M3	Turbidity, S.S		
03/07/09	M1	Turbidity, S.S.	Limit Level	M1 - Site water leakage from BC13 at PNH
	M2	S.S.	Limit Level	M2 – No particular observation
	M3	Turbidity, S.S	Action Level	M3 - Surface run-off generate from the construction of retaining wall and/or gabion wall
04/07/09	M1	Turbidity, S.S.	Action Level	M1 – No particular observation
	M3	Turbidity, S.S. & D.O	Limit Level, Action Level for D.O.	M3 - Disturbance due to adverse rainy weather
06/07/09	M1	Turbidity, S.S.	Limit Level	M1 - Site water leakage from BC13 at PNH
	M3	Turbidity, S.S.	Limit Level	M3 – No particular observation
07/07/09	M1	Turbidity, S.S.	Limit Level	Site water leakage from BC13 at PNH
08/07/09	M1	Turbidity, S.S.	Limit Level	M1 & M3 – No particular observations

	M3	Turbidity, S.S.		
10/07/09	M1	Turbidity, S.S.	Limit Level	M1 & M3 – No particular observations
	M3	Turbidity, S.S.	Action Level, Limit Level	
13/07/09	M1	Turbidity	Limit Level	M1, M2 & M3 – No particular observations
	M2	S.S.		
	M3	Turbidity, S.S.		
14/07/09	M1	Turbidity, S.S.	Limit level	M1, M2 & M3 – No particular observations
	M2	Turbidity, S.S.		
	M3	Turbidity, S.S.		
15/07/09	M1	Turbidity, S.S.	Limit Level	M1 & M3 – No particular observations M2 - Channel clearance activities carried out by the other project at upper stream area, and site water discharge from retaining wall H
	M2	Turbidity, S.S.		
	M3	Turbidity		
16/07/09	M2	Turbidity, S.S.	Limit Level, Action Level	Channel clearance activities carried out by the other project at upper stream area
20/07/09	M1	Turbidity, S.S	Limit Level	M1 – No particular observations
	M2	S.S.	Action Level	M2 – No particular observation
	M3	Turbidity, S.S	Limit Level	M3 - Disturbance due to adverse rainy weather
22/07/09	M1	Turbidity, S.S.	Limit Level	M1 & M3 – No particular observations M2 - Haul access formation between Bottleneck A and B of TTT River
	M2	Turbidity, S.S.		
	M3	Turbidity, S.S.		
23/07/09	M2	Turbidity, S.S.	Limit Level	Haul access formation between Bottleneck A and B of TTT River
24/07/09	M1	Turbidity, S.S.	Limit level	M1, M2 & M3 – No particular observations
	M2	S.S.		
	M3	Turbidity, S.S.		
27/07/09	M1	Turbidity, S.S.	Limit Level	M1, M2 & M3 – No particular observations
	M2	Turbidity, S.S.		
	M3	Turbidity, S.S.		
28/07/09	M1	Turbidity, S.S.	Limit Level	M1 & M3 – No particular observations M2 - Haul access formation between Bottleneck A and B of TTT River
	M2	Turbidity, S.S.		
	M3	Turbidity, S.S.		
29/07/09	M2	S.S.	Limit Level	M2 – No particular observations
31/07/09	M1	Turbidity, S.S.	Limit Level	M1 & M3 – No particular observations
	M3	S.S.		

8. Construction waste disposal

It is the contractor's responsibility to ensure that all wastes produced during the construction phase for the drainage improvement works are handled, stored and disposed of in accordance with good waste management practices and EPD's regulation and requirement. Waste materials generated during construction activities, such as construction and demolition (C&D) material, chemical wastes and general refuse, are recommended to be audited at regular intervals to ensure that proper storage, transportation and disposal practices are being implemented.

Contractor has completed the registration of Waste Producer under the Waste Disposal (Chemical Waste)(General) Regulation. The Waste Producer Number, WPN 5213-950-Y2443-03 was assigned by EPD on 12 Aug 2008. The Contractor would be responsible for the implementation of any mitigation measure to minimize waste or redress problems arising from the waste materials.

Table 8.1 is a summary of updated figures of the construction wastes disposal provided by the Contractor.

Table 8.1 Summary of Construction Waste Disposal

	Amount of Construction Waste disposed		
Month	**Inert Waste (to Public Fill)**	**Non-inert Waste (to Landfill)**	**Chemical Waste (to treatment plant)**
1st July 09 to 31st July 09	4191.30 (ton)	Nil	Nil
Total (from June 08 to July 09)	17589.96 (ton)	65.23 (ton)	0

9. Status of Permits and Licenses obtained

Table 9.1 is the updated status of environmental related permits/ license obtained for the construction activities

Table 9 .1 Status of Permits and Licenses Obtained

Description	License / Permit No.#	Date of Issue	Date of Expiry	Remarks
Environmental Permit	EP-237/2005/A	05 Mar 2008	--	Issued
Registration of C&D Waste Producer	7006521	--	--	Issued
Chemical Waste Producer	5213-950-Y2443-03	12 Aug 2008	--	Issued
Construction Noise Permit	N/A	N/A	N/A	N/A
Effluent Discharge License	EP890/W2/XG032 EP890/W2/XG033 EP890/W2/XG034 EP890/W2/XG035 EP890/W2/XG036 EP890/W2/XG037 EP890/W2/XG038 EP890/W2/XG039 EP890/W2/XG040 EP890/W2/XG041	23 Oct 2008	31 Oct 2013	Issued

The contractor implemented various environmental mitigation measures as recommended in the Environmental Permit and Final Mitigation Measures Report. The implemented schedule is presented in Appendix H.

10. Complaint Log

There was no formal complaint received during the reporting month.

Table 10.1 Summary of Formal Complaints received

	Noise	Water	Ecology	Cultural	Others
July 2009	0	0	0	0	0
Total	0	0	0	0	0

11. Site Environmental Audits

11.1 Site Inspection

With an intention to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented, regular environmental site inspections have been scheduled.

Within the reporting month, site inspections were conducted on 2, 10, 16, 22 and 27 July 2009.

A detailed checklist of each site inspection together with comments, relevant photos and maps have been filed and kept. A summary of observation and follow-up action is shown in Table 11.1

Table 11.1 Summary of site inspection

Date	Observations	Advice from ET	Action taken	Closing Date
21 May 09	Vehicle was found washing at the entrance of temporary access at behind of Yuen's compound, where without proper water collection facility.	Contractor was advised to assign a proper wheel washing area with proper water collection facilities, to avoid site runoff entering the mangrove area.	Still outstanding until the end of the reporting month. To be follow up	Ongoing
04, 11, 19 & 26 June 09	U-channel next to the site area BC5 at PNH was not covered. Soil and construction debris was found entered the U-channel.	Contractor was advised to provide proper coverings to protect the U-channel from the contamination of construction materials	U-channel was poorly covered with geo-textile materials and plastic board prior to the inspection on 19 June. Further improvement was required and to be follow up	Ongoing
26 June 09	Pit poorly laid with geo-textile as a soak-away pond for site water treatment was provided next to the gabion wall of the existing LTT River	Contractor was advised to rectify the laid geo-textile to prevent erosion of the pit itself. They should also ensure no site water can be seeped through the gabion wall with filtration and cause water quality impact to the river	Soil surface of the pit was covered by cement and the defective geo-textile was rectified as advised	10 July 2009
02 July 09	Stagnant water was found in the drip pan of the power generator located at PNH construction site	Contractor was recommended to regularly provide stagnant water removal and mosquito control measures on sites as part of site cleaning practices	Ongoing practices are required due to wet season	Ongoing
02 July 09	Accumulated site water in the box culvert construction site at PNH, was found seeped into the nearby PNH River and hence caused water pollution	Although actions were taken previously to block the seepage from the outlet connected with the site. Contractor was advised to review the condition of the outlet and make sure those was properly sealed	Still outstanding until the end of the reporting month. To be follow up	Ongoing
02, 10, 22, July 09	Site water from the box culvert construction site at PNH was found diverted to a brushwood	Contractor was recommended again to provide effective de-silting facilities for site water	Although water diverted was found clear as no site activities in the concerned area during the	Ongoing

Table 11.1 Summary of site inspection

Date	Observations	Advice from ET	Action taken	Closing Date
	area nearby	treatment prior to discharging in accordance with the applied water discharge license	follow up inspections. No action was observed to be taken by contractor	
02 July 09	A chemical drum without drip tray was observed at the PNH construction site	Contractor was recommended to provide drip tray for all chemical drums on site. Idling drums should be re-located into designated chemical storage cabin	Still outstanding until the end of the reporting month. To be follow up	Ongoing
10 July 09	Open stockpiles of earth materials were observed tipped at LTT River site haul access	Contractor was advised to control size of the stockpiles and provide tarpaulin coverings to prevent erosion	Stockpiles were used and removed from site prior to the inspection on 16 July	16 July 09
10, 16 & 22 July 09	Earth bunds for the gabion wall sites were found severely eroded during inspection	Contractor was recommended to repair the eroded bunds and provide geo-textile coverings to the exposed earth surface of bunds to prevent water quality impact	Eroded earth bunds were repaired by providing sand bags and geo-textile coverings as reported by contractor	27 July 09
10, 16, 22, 27 July 09	Damaged water hoses were observed used for diverting site water from retaining wall J	Contractor was advised to replace the damaged hose and re-locate the hoses away from the river channel in case of site water leakage	Still outstanding until the end of the reporting month. To be follow up	Ongoing
10, 16 & 22 July 09	Bunds formed by concrete blocks for retaining wall H at TTT River were found defective during inspection. Gaps were observed between concrete blocks and loosing geo-textile coverings were found clogging in the river channel	Contractor was advised to rectify the observed deficiencies as soon as possible even no site activities were being carried out in the concerned site	Contractor took the advice by filling the gaps between concrete blocks with sandbags. Loosing geo-textile was removed from the channel and new coverings were provided	27 July 09
16, 22 & 27 July 09	Open stockpiles of earth materials were observed tipped at PNH BC2 site	Contractor was advised to control size of the stockpiles and provide tarpaulin coverings to prevent	Still outstanding until the end of reporting month. To be follow up	Ongoing

Table 11.1 Summary of site inspection				
Date	Observations	Advice from ET	Action taken	Closing Date
		erosion		
22 July 09	Soil run-off and erosion due to excavation activities at Bottleneck B at TTT River was observed	Contractor was advised to provide geo-textile coverings to the bare soil surface of the bunds and haul access. Contractor was also recommended to review and rectify the site condition, bunds as well as barriers provided as to minimize water quality impact due to site works	Geo-textile coverings were provided to the soil surface of bunds and haul access that exposed to the river water. However, improvement were still required to the site condition at the concerned area	Ongoing
27 July 09	Surface washing to the EVA at PNH section was being carried out that grey water was found seeped into the public drain	Contractor was advised to direct the grey water to the effective site water treatment facility for further discharge. Public drain connected with project sites should be sealed to prevent soil and construction debris entering the public drainage	To be follow up	Ongoing

11.2 Compliance with legal and Contractual requirement

ET leader has reviewed the progress and programme of the works to check any relevant environmental laws has not violated.

During this reporting month, a yellow form regarding improper site practices and direct discharge of site wastewater was issued by EPD to the contractor on 15 July 2009. ET has been informed by the contractor on 23 July 2009 for the incident and carried out investigation for the corrective actions taken.

According to the details of the inspection carried out by EPD, the following aspects were the major concerns raised:

- Poor condition of earth bunds at retaining H of TTT River, causing site water seepage into the river channel;
- Inadequate treatment was provided that effluent quality unlikely to meet the limit of discharge license; and
- Suspected no wastewater treatment provided and site water directly discharged outside site boundaries.

Contractor was urged to implement corrective actions include rectification of bunds formed by concrete blocks at retaining wall H, as to prevent further seepage of site water. However, follow up actions were not effective that site water seepage was still observed. Contractor was advised to further enhance the environmental mitigation measures to prevent muddy water entering the river channel from sites.

Muddy water generated on sites was mostly treated by soak-away in site ground. Site water was not effectively treated and overflowed to the river channel and area outside site boundaries. As reported by contractor, de-silting tanks will be provided for site water treatment and natural soak-away will be prevented in their sites. As the de-silting tanks are still under installation, the condition and effectiveness of the de-silting facilities will be checked in the next reporting period.

11.3 Environmental Complaint and follow up actions

During this reporting period, there was no documented complaint received. Therefore, follow up actions for the environmental complaint is not required.

Further to the environmental concerns raised by green group during May 2009, Ecologist of ET has conducted a monthly survey to mangrove area at the east of Luk Tei Tong River. Details of findings refer to Appendix K.

Bottleneck at Tai Tei Tong River (located at the downstream of Mui Wo School) was remained half-done that follow up actions were ceased due to adverse weather in the reporting month.

12. Future key issues

Key construction activity in the coming month will include construction of retaining walls at PNH River and TTT River, gabion wall at LTT River, as well as box culvert at PNH River and LTT. It is expected that several impacts on environmental aspects will be generated on-site. With reference to the EM&A manual, mitigation measure report as well as the environmental permit, proper mitigation measures are proposed to be taken, if necessary.

Contractor was seriously advised to provide proper measures to mitigate water quality impacts to the river channels due to construction works. River based construction activities should be carried out in enclosed as well as dry condition to prevent discharge of site water to the stream; containment measures such as bunds and barriers should be provided as to restrict the carrying out of construction works within enclosed dry area of the river. Surface or earth bunds should be covered with tarpaulin to prevent soil erosion.

Underground water and site water may be accumulated on site. Contractor is recommended to treat the accumulated site water by proper silt removal facilities before discharging to the designated discharge point; also reuse of site water should be considered. Channel, trench and manholes should be sealed to prevent site water entering public drainage and causing water quality impact.

Contractor was reminded that all vehicles should be washed before leaving

sites. Site entrances should be regularly cleaned to prevent soil and construction debris deposited to the public access. Grey water generated from vehicles and/or site washing should be collected and treated before discharge.

Contractor was reminded to be cautious on erosion and surface run-off from the stockpiles of earth materials and exposed earth surfaces. Coverings with tarpaulin and/or geo-textile materials should be provided to minimize the concerned impacts.

Dust impact may be resulted by boulder movement, breaking and installation works of gabion blocks, contractor is reminded to provide regular watering to the dusty static site area and stockpile. Meanwhile, size and height of stockpiles should be controlled as such erosion issue could be minimized.

13. Conclusions

In this reporting month, construction of retaining walls at PNH River and LTT River, box culvert at PNH and LTT, as well as gabion wall at TTT River were being carried out.

Regular site meetings and inspection audits led by the seniors for discussing site environmental matters were held among Project Proponent, Contractor and the ET on weekly basis. Also monthly site meeting and inspection audits with the above parties and IEC were carried out at the mid of the reporting month.

For noise level monitoring, all results were within the established A/L limits.

For water quality monitoring, total 80 non-compliance events of water quality criteria were recorded in this reporting month. Except natural fluctuation and influence of adverse weather exceedances were mainly caused by site water discharge due to poor site conditions. As such contractor was urged to review their site condition, working method and implementation status of mitigation measures as to prevent further water quality impact. Although follow up actions has been taken as reported by the Contractor, ongoing improvement works were required further to the outcome of the inspections and follow up investigations.

During ecological monitoring survey, no White-shouldered Starling was recorded breeding in the watch tower. There was no sign of disturbance from the Project to the watch tower. The breeding season of White-shouldered Starling in this year has begun. However, the absence of nesting of White-shouldered Starling in the watch tower did not seem to be related to construction works in Luk Tei Tong River. A bird species nests in village house should be to certain extent disturbance tolerant.

No bird was observed entering the watchtower since the monitoring surveys commenced in August 2008. Also, no breeding was recorded in the baseline survey in September 2007. It appears that the birds do not prefer to roost or nest in the watch tower.

Also, there were not any notifications of summons recorded during the reporting period. Furthermore, there were not any formal prosecution and complaints recorded. However, a yellow form regarding improper site practices and direct discharge of site wastewater was issued by EPD to the contractor on 15 July 2009. ET has been informed by the contractor on 23 July 2009 for the incident and carried out investigation for the corrective actions taken.

Site water control was the major concern in this reporting month. Contractor was recommended to provide proper de-silting facilities for site water treatment; conditions of the earth bunds provided should be rectified to prevent surface run-off and soil erosion due to site works. Corrective actions to the identified defects should be implemented as soon as possible to minimize deterioration of water quality.

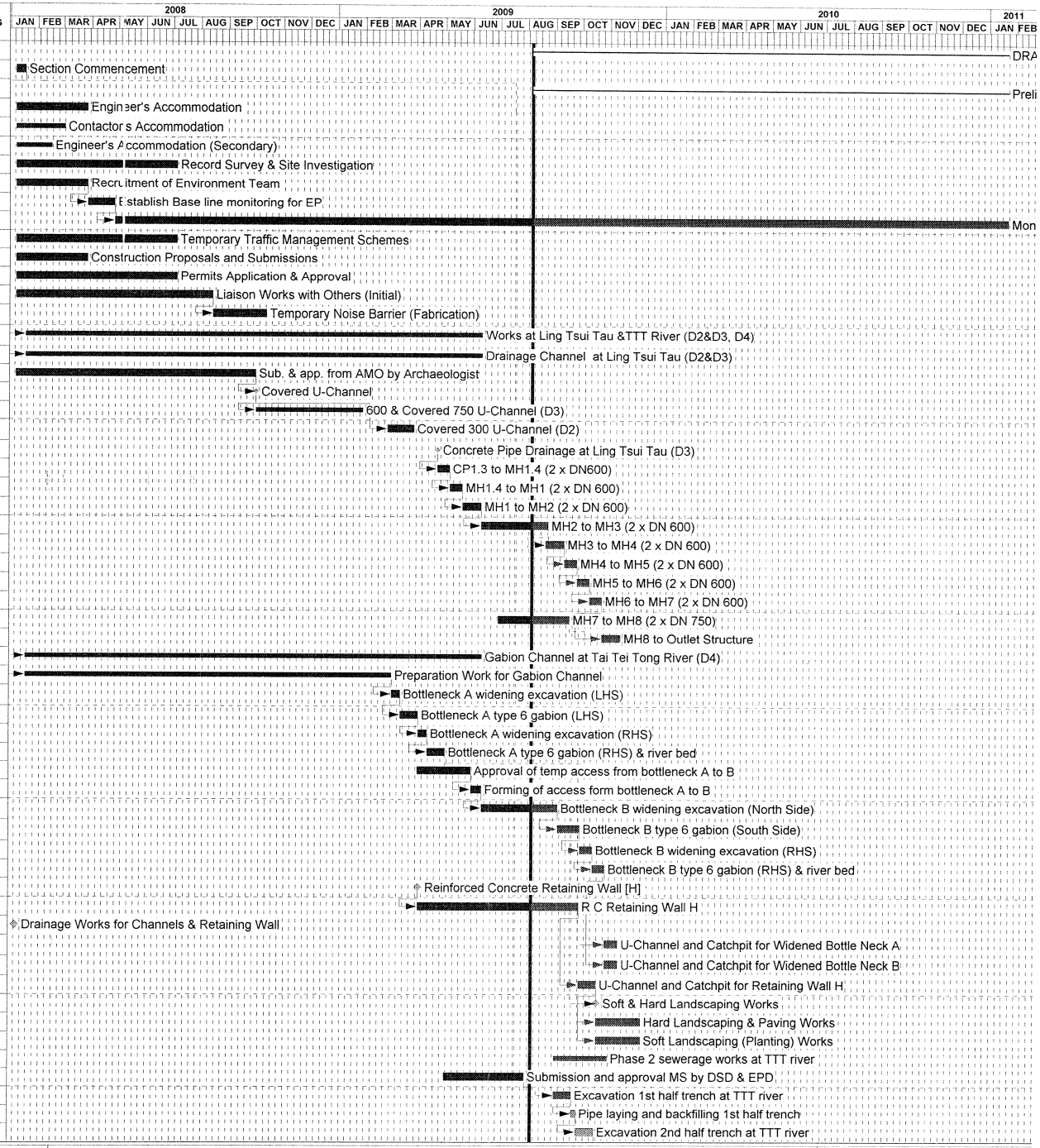
ET has reminded the contractor to provide environmental pollution control measures wherever necessary; and to keep a good environmental management at site practice.

The ET will continue to implement the environmental monitoring & audit programme in accordance with the EM&A Manual and Environmental Permit requirement.

Appendix A

Construction Programmer and Location plan

Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	%	Predecessors
0000	DRAINAGE IMPROVEMENT WORK IN S LANTAU	534 *	534 *	06AUG2009	21JAN2011	0	
0001	Section Commencement	11	0	07JAN2008 A	17JAN2008 A	100	
0010	Preliminaries	534 *	534 *	06AUG2009	21JAN2011	0	
0020	Engineer's Accommodation	80	0	07JAN2008 A	26MAR2008 A	100	
0030	Contactor's Accommodation	55	0	07JAN2008 A	01MAR2008 A	100	
0040	Engineer's Accommodation (Secondary)	40	0	07JAN2008 A	15FEB2008 A	100	
0050	Record Survey & Site Investigation	180	0	07JAN2008 A	04JUL2008 A	100	
0060	Recruitment of Environment Team	80	0	07JAN2008 A	26MAR2008 A	100	
0070	Establish Base line monitoring for EP	30	0	27MAR2008 A	25APR2008 A	100	**0060**
0080	Monitoring for Environmental Permit	1001	534	26APR2008 A	21JAN2011	47	**0070**
0100	Temporary Traffic Management Schemes	180	0	07JAN2008 A	04JUL2008 A	100	
0110	Construction Proposals and Submissions	80	0	07JAN2008 A	26MAR2008 A	100	
0120	Permits Application & Approval	180	0	07JAN2008 A	04JUL2008 A	100	
0130	Liaison Works with Others (Initial)	220	0	07JAN2008 A	13AUG2008 A	100	
0140	Temporary Noise Barrier (Fabrication)	60	0	14AUG2008 A	12OCT2008 A	100	**0130**
1000	Works at Ling Tsui Tau &TTT River (D2&D3, D4)	510	0	18JAN2008 A	10JUN2009 A	100	**0001**
1010	Drainage Channel at Ling Tsui Tau (D2&D3)	510	0	18JAN2008 A	10JUN2009 A	100	**0001**
1020	Sub. & app. from AMO by Archaeologist	268	0	07JAN2008 A	30SEP2008 A	100	
1030	Covered U-Channel	0	0	01OCT2008 A		100	**1020**
1031	600 & Covered 750 U-Channel (D3)	120	0	01OCT2008 A	28JAN2009 A	100	**1030**
1032	Covered 300 U-Channel (D2)	30	0	25FEB2009 A	26MAR2009 A	100	**1030**
1040	Concrete Pipe Drainage at Ling Tsui Tau (D3)	0	0	22APR2009 A		100	
1041	CP1.3 to MH1.4 (2 x DN600)	14	0	22APR2009 A	05MAY2009 A	100	**1040**
1042	MH1.4 to MH1 (2 x DN 600)	14	0	06MAY2009 A	19MAY2009 A	100	**1041**
1043	MH1 to MH2 (2 x DN 600)	21	0	20MAY2009 A	09JUN2009 A	100	**1042**
1044	MH2 to MH3 (2 x DN 600)	75	18	10JUN2009 A	23AUG2009	76	**1043**
1045	MH3 to MH4 (2 x DN 600)	21	21	21AUG2009 *	10SEP2009	0	**1044**
1046	MH4 to MH5 (2 x DN 600)	14	14	11SEP2009	24SEP2009	0	**1045**
1047	MH5 to MH6 (2 x DN 600)	14	14	25SEP2009	08OCT2009	0	**1046**
1048	MH6 to MH7 (2 x DN 600)	14	14	09OCT2009	22OCT2009	0	**1047**
1049	MH7 to MH8 (2 x DN 750)	80	42	29JUN2009 A	16SEP2009	48	
1050	MH8 to Outlet Structure	21	21	23OCT2009	12NOV2009	0	**1048, 1049**
1100	Gabion Channel at Tai Tei Tong River (D4)	510	0	18JAN2008 A	10JUN2009 A	100	**0001**
1110	Preparation Work for Gabion Channel	409	0	18JAN2008 A	01MAR2009 A	100	**0001**
1120	Bottleneck A widening excavation (LHS)	10	0	02MAR2009 A	11MAR2009 A	100	**1110**
1121	Bottleneck A type 6 gabion (LHS)	20	0	12MAR2009 A	31MAR2009 A	100	**1120**
1122	Bottleneck A widening excavation (RHS)	10	0	01APR2009 A	10APR2009 A	100	**1121**
1123	Bottleneck A type 6 gabion (RHS) & river bed	20	0	11APR2009 A	30APR2009 A	100	**1122**
1130	Approval of temp access from bottleneck A to B	60	0	31MAR2009 A	29MAY2009 A	100	
1131	Forming of access form bottleneck A to B	12	0	30MAY2009 A	10JUN2009 A	100	**1130**
1132	Bottleneck B widening excavation (North Side)	85	29	11JUN2009 A	03SEP2009	66	**1131**
1133	Bottleneck B type 6 gabion (South Side)	25	25	04SEP2009	28SEP2009	0	**1132**
1134	Bottleneck B widening excavation (RHS)	14	14	29SEP2009	12OCT2009	0	**1133**
1135	Bottleneck B type 6 gabion (RHS) & river bed	14	14	13OCT2009	26OCT2009	0	**1134**
1140	Reinforced Concrete Retaining Wall [H]	0	0	01APR2009 A		100	
1141	R C Retaining Wall H	180	53	01APR2009 A	27SEP2009	71	**1140**
1150	Drainage Works for Channels & Retaining Wall	0	0	07JAN2008 A		100	
1151	U-Channel and Catchpit for Widened Bottle Neck A	15	15	27OCT2009	10NOV2009	0	**1123, 1135**
1152	U-Channel and Catchpit for Widened Bottle Neck B	15	15	27OCT2009	10NOV2009	0	**1135**
1153	U-Channel and Catchpit for Retaining Wall H	20	20	28SEP2009	17OCT2009	0	**1141**
1160	Soft & Hard Landscaping Works	0	0	18OCT2009		0	**1123, 1153**
1170	Hard Landscaping & Paving Works	50	50	18OCT2009	06DEC2009	0	**1153**
1180	Soft Landscaping (Planting) Works	50	50	18OCT2009	06DEC2009	0	**1153**
1200	Phase 2 sewerage works at TTT river	60	60	01SEP2009 *	30OCT2009	0	
1210	Submission and approval MS by DSD & EPD	90	0	01MAY2009 A	29JUL2009 A	100	
1220	Excavation 1st half trench at TTT river	20	20	01SEP2009 *	20SEP2009	0	**1210**
1230	Pipe laying and backfilling 1st half trench	5	5	21SEP2009	25SEP2009	0	**1220**
1240	Excavation 2nd half trench at TTT river	20	20	26SEP2009	15OCT2009	0	**1230**



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c Primavera Systems, Inc.	

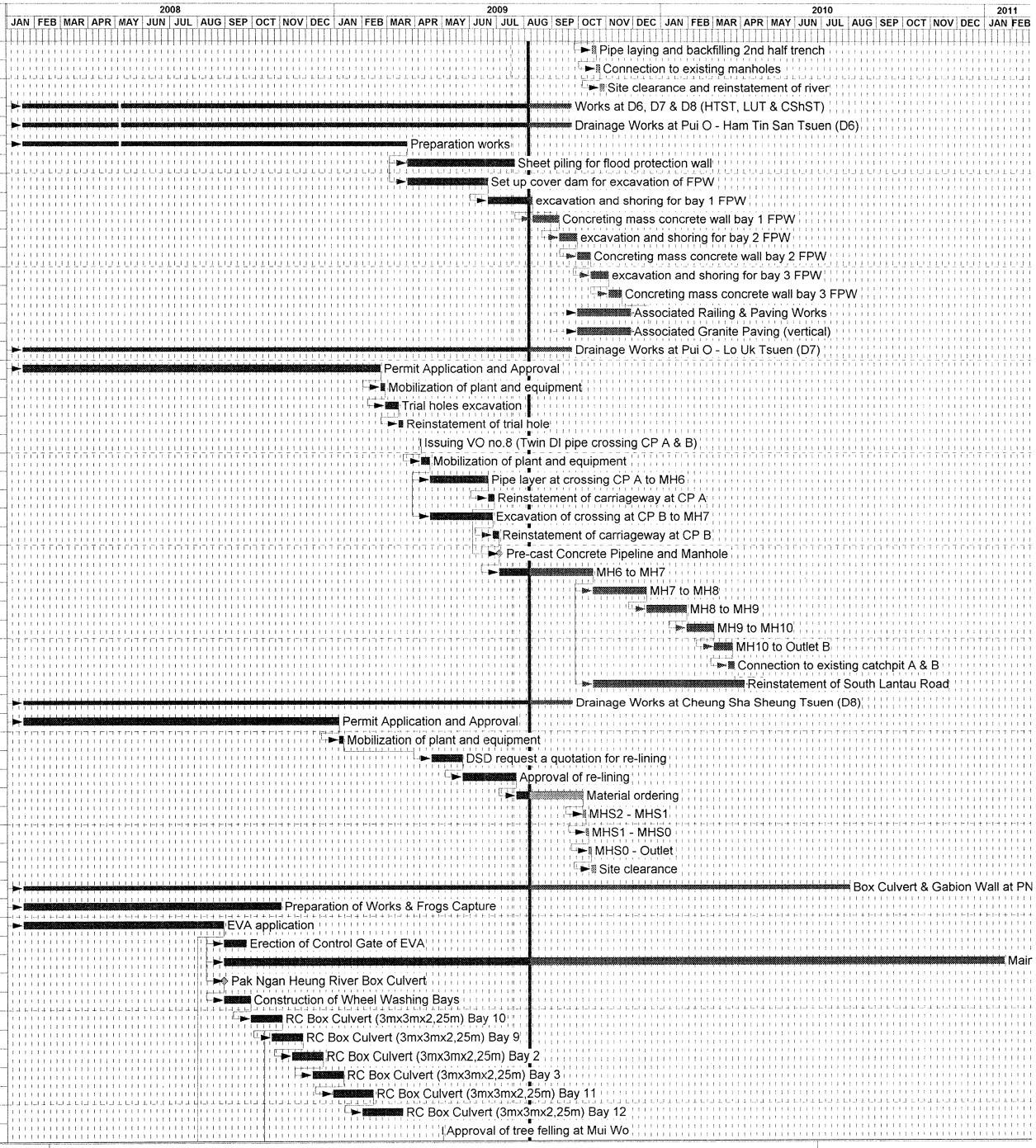
Yick Hing Construction Co. Ltd.

Drainage Improvement Work in South Lantau
and Construction of Mui Wo Village Sewerage Phase 1

Master Programme (Rev.9b)

Early bar
Progress bar
Critical bar
Summary bar
Start milestone point
Finish milestone point

Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	%	Predecessors
1250	Pipe laying and backfilling 2nd half trench	5	5	16OCT2009	20OCT2009	0	**1240**
1260	Connection to existing manholes	4	4	21OCT2009	24OCT2009	0	**1250**
1270	Site clearance and reinstatement of river	5	5	25OCT2009	29OCT2009	0	**1260**
2000	Works at D6, D7 & D8 (HTST, LUT & CShST)	614	48	18JAN2008 A	22SEP2009	92	**0001**
2100	Drainage Works at Pui O - Ham Tin San Tsuen (D6)	614	48	18JAN2008 A	22SEP2009	92	**0001**
2110	Preparation works	430	0	18JAN2008 A	22MAR2009 A	100	**0001**
2111	Sheet piling for flood protection wall	120	0	23MAR2009 A	20JUL2009 A	100	**2110**
2112	Set up cover dam for excavation of FPW	90	0	23MAR2009 A	20JUN2009 A	100	**2110**
2113	excavation and shoring for bay 1 FPW	50	4	21JUN2009 A	09AUG2009	92	**2112**
2114	Concreting mass concrete wall bay 1 FPW	30	30	10AUG2009	08SEP2009	0	**2113**
2115	excavation and shoring for bay 2 FPW	20	20	09SEP2009	28SEP2009	0	**2114**
2116	Concreting mass concrete wall bay 2 FPW	15	15	29SEP2009	13OCT2009	0	**2115**
2117	excavation and shoring for bay 3 FPW	20	20	14OCT2009	02NOV2009	0	**2116**
2118	Concreting mass concrete wall bay 3 FPW	15	15	03NOV2009	17NOV2009	0	**2117**
2120	Associated Railing & Paving Works	60	60	29SEP2009 *	27NOV2009	0	**2113, 2118**
2130	Associated Granite Paving (vertical)	60	60	29SEP2009	27NOV2009	0	**2113, 2118**
2200	Drainage Works at Pui O - Lo Uk Tsuen (D7)	614	48	18JAN2008 A	22SEP2009	92	**0001**
2210	Permit Application and Approval	400	0	18JAN2008 A	20FEB2009 A	100	**0001**
2211	Mobilization of plant and equipment	5	0	21FEB2009 A	25FEB2009 A	100	**2210**
2212	Trial holes excavation	15	0	26FEB2009 A	12MAR2009 A	100	**2211**
2213	Reinstatement of trial hole	5	0	13MAR2009 A	17MAR2009 A	100	**2212**
2220	Issuing VO no.8 (Twin DI pipe crossing CP A & B)	1	0	06APR2009 A	06APR2009 A	100	
2223	Mobilization of plant and equipment	10	0	07APR2009 A	16APR2009 A	100	**2220**
2224	Pipe layer at crossing CP A to MH6	65	0	17APR2009 A	20JUN2009 A	100	**2223**
2225	Reinstatement of carriageway at CP A	7	0	21JUN2009 A	27JUN2009 A	100	**2224**
2226	Excavation of crossing at CP B to MH7	70	0	17APR2009 A	25JUN2009 A	100	**2223**
2227	Reinstatement of carriageway at CP B	7	0	26JUN2009 A	02JUL2009 A	100	**2226**
2230	Pre-cast Concrete Pipeline and Manhole	0	0	03JUL2009 A		100	**2225, 2227**
2231	MH6 to MH7	105	71	03JUL2009 A	15OCT2009	32	**2230**
2232	MH7 to MH8	60	60	16OCT2009	14DEC2009	0	**2231**
2233	MH8 to MH9	45	45	15DEC2009	28JAN2010	0	**2232**
2234	MH9 to MH10	31	31	29JAN2010	28FEB2010	0	**2233**
2235	MH10 to Outlet B	21	21	01MAR2010	21MAR2010	0	**2234**
2236	Connection to existing catchpit A & B	7	7	17MAR2010	23MAR2010	0	**2235**
2240	Reinstatement of South Lantau Road	170	170	16OCT2009	03APR2010	0	**2231, 2236**
2300	Drainage Works at Cheung Sha Sheung Tsuen (D8)	614	48	18JAN2008 A	22SEP2009	92	**0001**
2310	Permit Application and Approval	353	0	18JAN2008 A	04JAN2009 A	100	**0001**
2311	Mobilization of plant and equipment	5	0	05JAN2009 A	09JAN2009 A	100	**2310**
2312	DSD request a quotation for re-lining	35	0	18APR2009 A	22MAY2009 A	100	**2311**
2313	Approval of re-lining	60	0	23MAY2009 A	21JUL2009 A	100	**2312**
2314	Material ordering	75	60	22JUL2009 A	04OCT2009	20	**2313**
2315	MHS2 - MHS1	3	3	05OCT2009	07OCT2009	0	**2314**
2316	MHS1 - MHS0	3	3	08OCT2009	10OCT2009	0	**2315**
2317	MHS0 - Outlet	3	3	11OCT2009	13OCT2009	0	**2316**
2340	Site clearance	5	5	14OCT2009	18OCT2009	0	**2317**
3000	Box Culvert & Gabion Wall at PNH River (D1)	926	360	18JAN2008 A	31JUL2010	61	**0001**
3010	Preparation of Works & Frogs Capture	288	0	18JAN2008 A	31OCT2008 A	100	**0001**
3020	EVA application	224	0	18JAN2008 A	28AUG2008 A	100	**0001**
3030	Erection of Control Gate of EVA	25	0	29AUG2008 A	22SEP2008 A	100	**3020**
3040	Maintenance of EVA	876	534	29AUG2008 A	21JAN2011	39	**3020**
3100	Pak Ngan Heung River Box Culvert	0	0	29AUG2008 A		100	**3020**
3110	Construction of Wheel Washing Bays	30	0	29AUG2008 A	27SEP2008 A	100	**3100**
3111	RC Box Culvert (3mx3mx2,25m) Bay 10	35	0	28SEP2008 A	01NOV2008 A	100	**3110**
3112	RC Box Culvert (3mx3mx2,25m) Bay 9	35	0	21OCT2008 A	24NOV2008 A	100	**3111**
3113	RC Box Culvert (3mx3mx2,25m) Bay 2	35	0	13NOV2008 A	17DEC2008 A	100	**3112**
3114	RC Box Culvert (3mx3mx2,25m) Bay 3	35	0	06DEC2008 A	09JAN2009 A	100	**3113**
3115	RC Box Culvert (3mx3mx2,25m) Bay 11	45	0	29DEC2008 A	11FEB2009 A	100	**3114**
3116	RC Box Culvert (3mx3mx2,25m) Bay 12	45	0	31JAN2009 A	16MAR2009 A	100	**3115**
3117	Approval of tree felling at Mui Wo	1	0	30APR2009 A	30APR2009 A	100	



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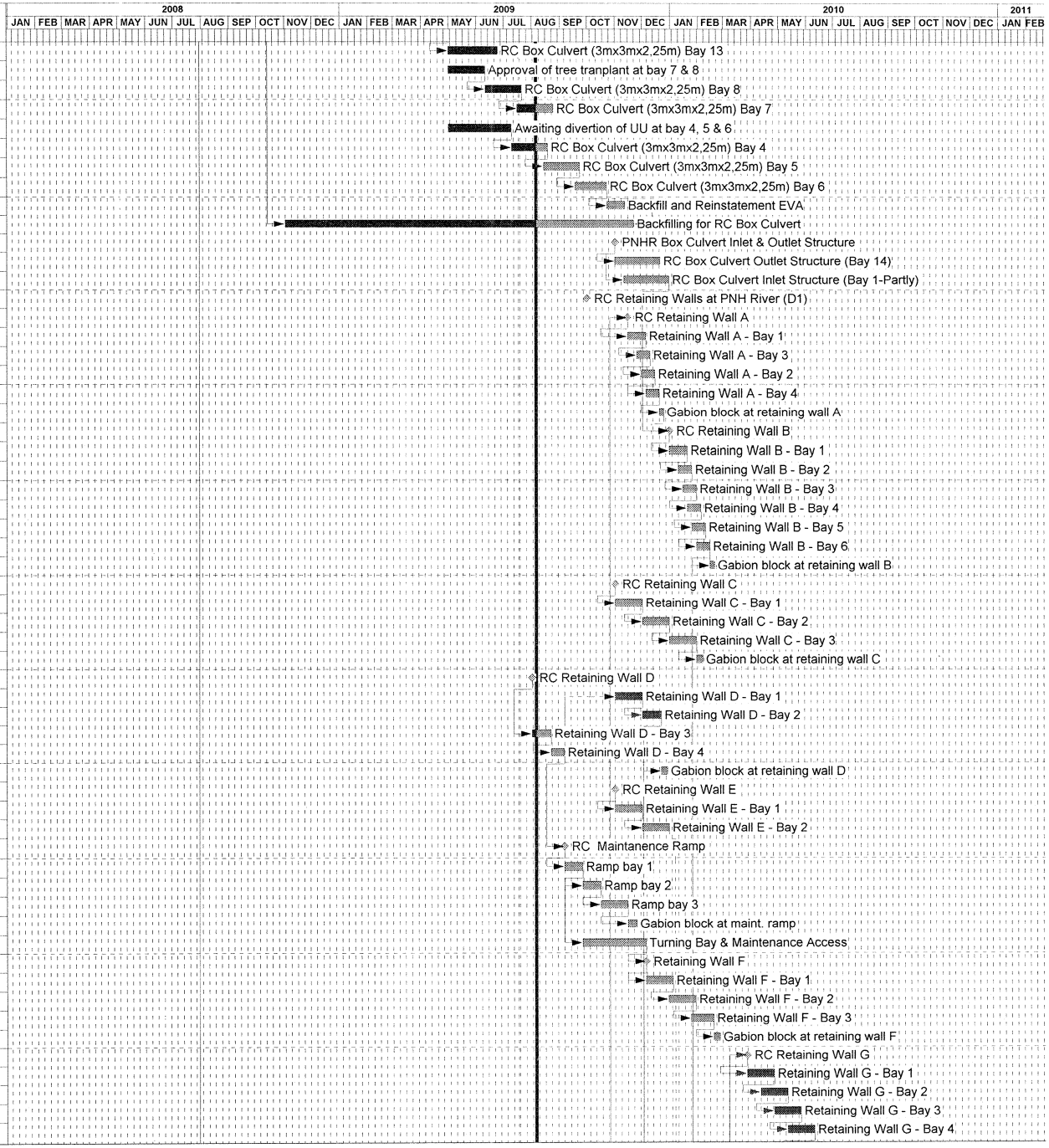
Drainage Improvement Work in South Lantau
and Construction of Mui Wo Village Sewerage Phase 1

Master Programme (Rev.9b)

Early bar
Progress bar
Critical bar
Summary bar
Start milestone point
Finish milestone point

Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	%	Predecessors
3118	RC Box Culvert (3mx3mx2,25m) Bay 13	55	0	01MAY2009 A	24JUN2009 A	100	3117
3119	Approval of tree tranplant at bay 7 & 8	41	0	01MAY2009 A	10JUN2009 A	100	
3120	RC Box Culvert (3mx3mx2,25m) Bay 8	40	0	11JUN2009 A	20JUL2009 A	100	3119
3121	RC Box Culvert (3mx3mx2,25m) Bay 7	40	19	16JUL2009 A	24AUG2009	53	3120
3122	Awaiting divertion of UU at bay 4, 5 & 6	70	0	01MAY2009 A	09JUL2009 A	100	
3123	RC Box Culvert (3mx3mx2,25m) Bay 4	40	13	10JUL2009 A	18AUG2009	68	3122
3124	RC Box Culvert (3mx3mx2,25m) Bay 5	40	40	14AUG2009	22SEP2009	0	3123
3125	RC Box Culvert (3mx3mx2,25m) Bay 6	35	35	18SEP2009	22OCT2009	0	3124
3130	Backfill and Reinstatement EVA	20	20	23OCT2009	11NOV2009	0	3125
3140	Backfilling for RC Box Culvert	385	108	02NOV2008 A	21NOV2009	72	3111, 3125
3150	PNHR Box Culvert Inlet & Outlet Structure	0	0	01NOV2009 *		0	
3160	RC Box Culvert Outlet Structure (Bay 14)	50	50	01NOV2009	20DEC2009	0	3150
3170	RC Box Culvert Inlet Structure (Bay 1-Partly)	50	50	11NOV2009	30DEC2009	0	3150
3300	RC Retaining Walls at PNH River (D1)	0	0	01OCT2009 *		0	
3310	RC Retaining Wall A	0	0	15NOV2009		0	3510
3311	Retaining Wall A - Bay 1	20	20	15NOV2009	04DEC2009	0	3310
3312	Retaining Wall A - Bay 3	15	15	25NOV2009	09DEC2009	0	3311
3313	Retaining Wall A - Bay 2	15	15	30NOV2009	14DEC2009	0	3312
3314	Retaining Wall A - Bay 4	15	15	05DEC2009	19DEC2009	0	3313
3315	Gabion block at retaining wall A	5	5	20DEC2009	24DEC2009	0	3314
3320	RC Retaining Wall B	0	0	31DEC2009		0	3170, 3315
3321	Retaining Wall B - Bay 1	20	20	31DEC2009	19JAN2010	0	3320
3322	Retaining Wall B - Bay 2	15	15	10JAN2010	24JAN2010	0	3321
3323	Retaining Wall B - Bay 3	15	15	15JAN2010	29JAN2010	0	3322
3324	Retaining Wall B - Bay 4	15	15	20JAN2010	03FEB2010	0	3323
3325	Retaining Wall B - Bay 5	15	15	25JAN2010	08FEB2010	0	3324
3326	Retaining Wall B - Bay 6	15	15	30JAN2010	13FEB2010	0	3325
3327	Gabion block at retaining wall B	5	5	14FEB2010	18FEB2010	0	3326
3330	RC Retaining Wall C	0	0	01NOV2009 *		0	
3331	Retaining Wall C - Bay 1	30	30	01NOV2009	30NOV2009	0	3330
3332	Retaining Wall C - Bay 2	30	30	01DEC2009	30DEC2009	0	3331
3333	Retaining Wall C - Bay 3	30	30	31DEC2009	29JAN2010	0	3332
3334	Gabion block at retaining wall C	7	7	30JAN2010	05FEB2010	0	3333
3340	RC Retaining Wall D	0	0	01AUG2009 A		100	
3341	Retaining Wall D - Bay 1	30	30	01NOV2009 *	30NOV2009	0	3344
3342	Retaining Wall D - Bay 2	21	21	01DEC2009	21DEC2009	0	3341
3343	Retaining Wall D - Bay 3	21	16	01AUG2009 A	21AUG2009	24	3340
3344	Retaining Wall D - Bay 4	15	15	22AUG2009	05SEP2009	0	3343
3345	Gabion block at retaining wall D	7	7	22DEC2009	28DEC2009	0	3342
3350	RC Retaining Wall E	0	0	01NOV2009 *		0	
3351	Retaining Wall E - Bay 1	30	30	01NOV2009	30NOV2009	0	3350
3352	Retaining Wall E - Bay 2	30	30	01DEC2009	30DEC2009	0	3351
3360	RC Maintanence Ramp	0	0	06SEP2009		0	3344
3361	Ramp bay 1	20	20	06SEP2009	25SEP2009	0	3360
3362	Ramp bay 2	20	20	26SEP2009	15OCT2009	0	3361
3363	Ramp bay 3	30	30	16OCT2009	14NOV2009	0	3362
3368	Gabion block at maint. ramp	10	10	15NOV2009	24NOV2009	0	3363
3369	Turning Bay & Maintenance Access	70	70	26SEP2009	04DEC2009	0	3361
3370	Retaining Wall F	0	0	05DEC2009		0	3369
3371	Retaining Wall F - Bay 1	30	30	05DEC2009	03JAN2010	0	3370
3372	Retaining Wall F - Bay 2	30	30	30DEC2009	28JAN2010	0	3371
3373	Retaining Wall F - Bay 3	25	25	24JAN2010	17FEB2010	0	3372
3374	Gabion block at retaining wall F	7	7	18FEB2010	24FEB2010	0	3373
3380	RC Retaining Wall G	0	0	27MAR2010		0	3421
3381	Retaining Wall G - Bay 1	30	30	27MAR2010	25APR2010	0	3380
3382	Retaining Wall G - Bay 2	30	30	11APR2010	10MAY2010	0	3381
3383	Retaining Wall G - Bay 3	30	30	26APR2010	25MAY2010	0	3382
3384	Retaining Wall G - Bay 4	30	30	11MAY2010	09JUN2010	0	3383



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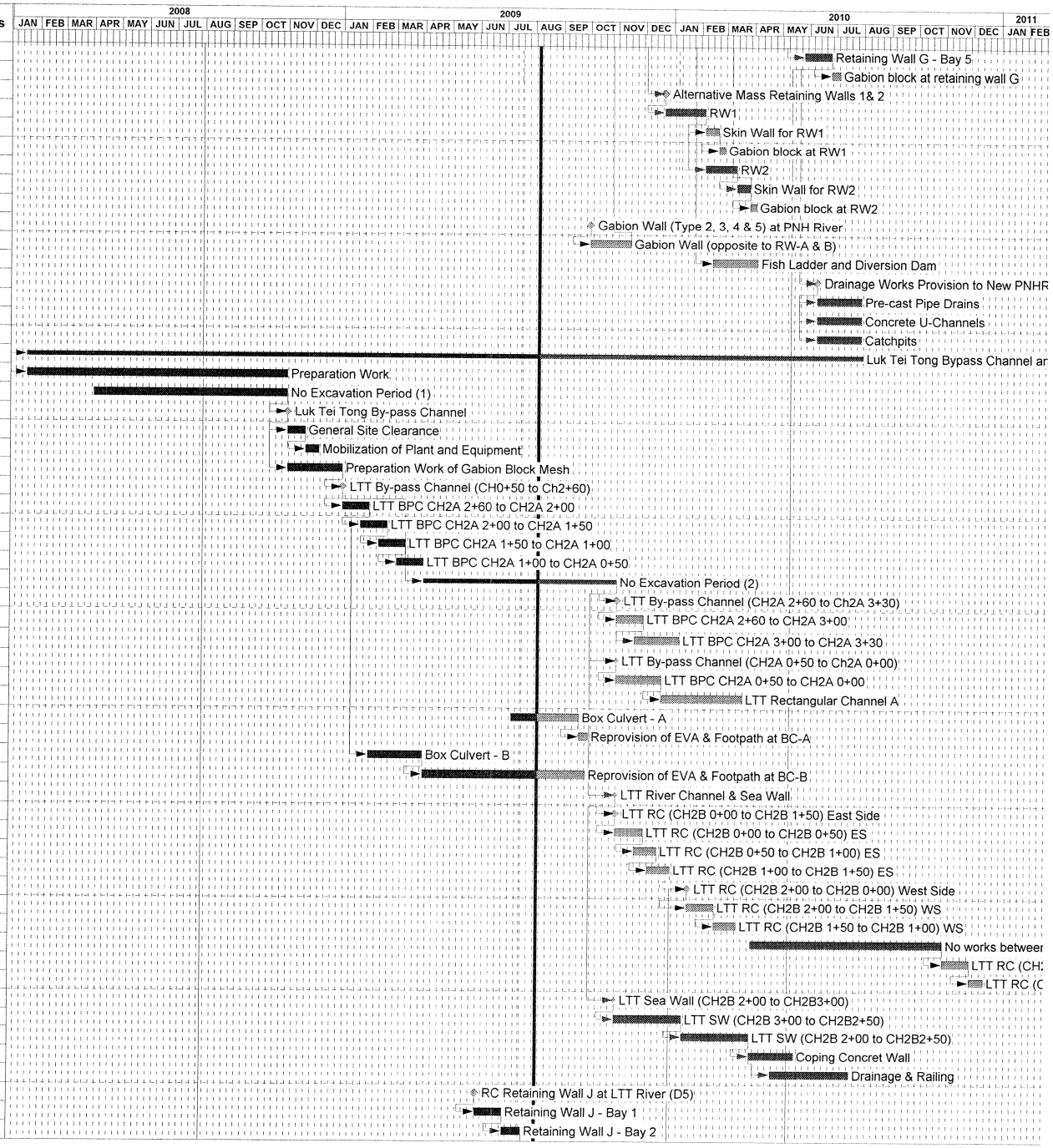
Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	%	Predecessors
3385	Retaining Wall G - Bay 5	30	30	26MAY2010	24JUN2010	0	**3384**
3386	Gabion block at retaining wall G	10	10	25JUN2010	04JUL2010	0	**3385**
3400	Alternative Mass Retaining Walls 1& 2	0	0	22DEC2009		0	**3342**
3410	RW1	45	45	22DEC2009	04FEB2010	0	**3400**
3411	Skin Wall for RW1	15	15	05FEB2010	19FEB2010	0	**3410**
3412	Gabion block at RW1	7	7	20FEB2010	26FEB2010	0	**3411**
3420	RW2	35	35	05FEB2010	11MAR2010	0	**3352, 3410**
3421	Skin Wall for RW2	15	15	12MAR2010	26MAR2010	0	**3420**
3422	Gabion block at RW2	7	7	27MAR2010	02APR2010	0	**3421**
3500	Gabion Wall (Type 2, 3, 4 & 5) at PNH River	0	0	01OCT2009 *		0	
3510	Gabion Wall (opposite to RW-A & B)	45	45	01OCT2009	14NOV2009	0	**3500**
3530	Fish Ladder and Diversion Dam	50	50	14FEB2010	04APR2010	0	**3326**
3600	Drainage Works Provision to New PNHR Channel	0	0	10JUN2010		0	**3385**
3610	Pre-cast Pipe Drains	50	50	10JUN2010	29JUL2010	0	**3600**
3620	Concrete U-Channels	50	50	10JUN2010	29JUL2010	0	**3600**
3630	Catchpits	50	50	10JUN2010	29JUL2010	0	**3600**
4000	Luk Tei Tong Bypass Channel and River (D5)	926	360	18JAN2008 A	31JUL2010	61	**0001**
4010	Preparation Work	288	0	18JAN2008 A	31OCT2008 A	100	**0001**
4020	No Excavation Period (1)	214	0 *	01APR2008 A	31OCT2008 A	100	
4100	Luk Tei Tong By-pass Channel	0	0	01NOV2008 A		100	**4020**
4101	General Site Clearance	20	0	01NOV2008 A	20NOV2008 A	100	**4100**
4102	Mobilization of Plant and Equipment	15	0	21NOV2008 A	05DEC2008 A	100	**4101**
4103	Preparation Work of Gabion Block Mesh	61	0	01NOV2008 A	31DEC2008 A	100	**4100**
4110	LTT By-pass Channel (CH0+50 to Ch2+60)	0	0	01JAN2009 A		100	**4103**
4111	LTT BPC CH2A 2+60 to CH2A 2+00	30	0	01JAN2009 A	30JAN2009 A	100	**4110**
4112	LTT BPC CH2A 2+00 to CH2A 1+50	30	0	21JAN2009 A	19FEB2009 A	100	**4111**
4113	LTT BPC CH2A 1+50 to CH2A 1+00	30	0	10FEB2009 A	11MAR2009 A	100	**4112**
4114	LTT BPC CH2A 1+00 to CH2A 0+50	30	0	02MAR2009 A	31MAR2009 A	100	**4113**
4200	No Excavation Period (2)	214	87 *	01APR2009 A	31OCT2009	59	**4110**
4210	LTT By-pass Channel (CH2A 2+60 to Ch2A 3+30)	0	0	01NOV2009		0	**4200**
4211	LTT BPC CH2A 2+60 to CH2A 3+00	30	30	01NOV2009	30NOV2009	0	**4210**
4212	LTT BPC CH2A 3+00 to CH2A 3+30	50	50	21NOV2009	09JAN2010	0	**4211**
4220	LTT By-pass Channel (CH2A 0+50 to Ch2A 0+00)	0	0	01NOV2009		0	**4200**
4221	LTT BPC CH2A 0+50 to CH2A 0+00	50	50	01NOV2009	20DEC2009	0	**4220**
4230	LTT Rectangular Channel A	90	90	21DEC2009	20MAR2010	0	**4221**
4240	Box Culvert - A	75	46	08JUL2009 A	20SEP2009	39	
4241	Reprovision of EVA & Footpath at BC-A	10	10	21SEP2009	30SEP2009	0	**4240**
4250	Box Culvert - B	60	0	31JAN2009 A	31MAR2009 A	100	**4111**
4260	Reprovision of EVA & Footpath at BC-B	180	53	01APR2009 A	27SEP2009	71	**4250**
4300	LTT River Channel & Sea Wall	0	0	01NOV2009		0	**4200**
4310	LTT RC (CH2B 0+00 to CH2B 1+50) East Side	0	0	01NOV2009		0	**4300**
4311	LTT RC (CH2B 0+00 to CH2B 0+50) ES	31	31	01NOV2009	01DEC2009	0	**4310**
4312	LTT RC (CH2B 0+50 to CH2B 1+00) ES	25	25	22NOV2009	16DEC2009	0	**4311**
4313	LTT RC (CH2B 1+00 to CH2B 1+50) ES	25	25	07DEC2009	31DEC2009	0	**4312**
4314	LTT RC (CH2B 2+00 to CH2B 0+00) West Side	0	0	20JAN2010		0	**4313, 4428**
4315	LTT RC (CH2B 2+00 to CH2B 1+50) WS	30	30	20JAN2010	18FEB2010	0	**4314**
4316	LTT RC (CH2B 1+50 to CH2B 1+00) WS	25	25	19FEB2010	15MAR2010	0	**4315**
4317	No works between Apr & Oct 2010	214	214	01APR2010 *	31OCT2010	0	
4318	LTT RC (CH2B 1+00 to CH2B 0+50) WS	30	30	01NOV2010	30NOV2010	0	**4317**
4319	LTT RC (CH2B 0+50 to CH2B 0+00) WS	16	16	01DEC2010	16DEC2010	0	**4318**
4320	LTT Sea Wall (CH2B 2+00 to CH2B3+00)	0	0	01NOV2009		0	**4300**
4321	LTT SW (CH2B 3+00 to CH2B2+50)	75	75	01NOV2009	14JAN2010	0	**4320**
4322	LTT SW (CH2B 2+00 to CH2B2+50)	75	75	15JAN2010	30MAR2010	0	**4321**
4323	Coping Concret Wall	50	50	31MAR2010	19MAY2010	0	**4322**
4324	Drainage & Railing	88	88	24APR2010	20JUL2010	0	**4323**
4340	RC Retaining Wall J at LTT River (D5)	0	0	01JUN2009 A		100	
4341	Retaining Wall J - Bay 1	30	0	01JUN2009 A	30JUN2009 A	100	**4340**
4342	Retaining Wall J - Bay 2	21	0	01JUL2009 A	21JUL2009 A	100	**4341**



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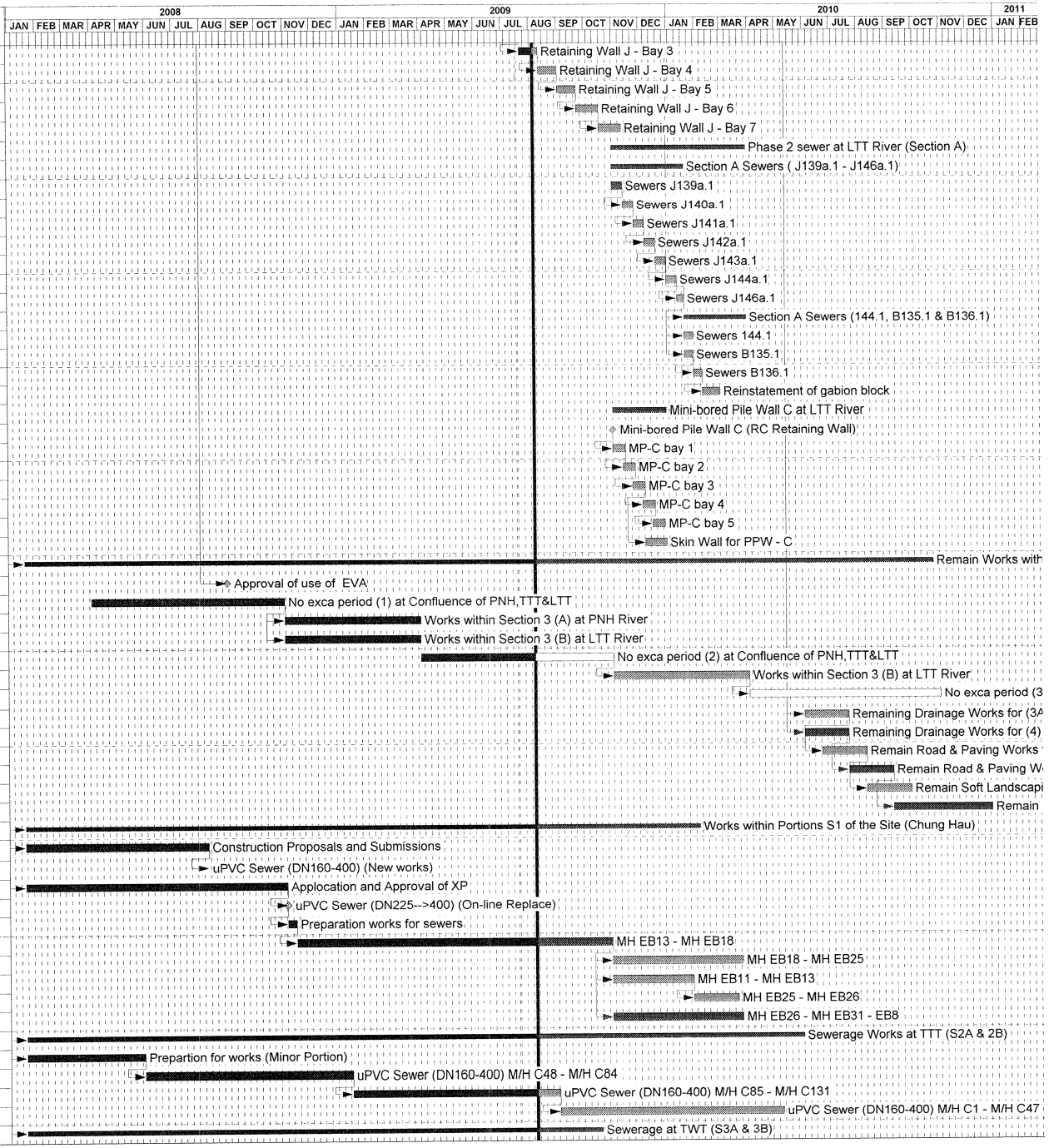
4343	Retaining Wall J - Bay 3	21	6	22JUL2009 A	11AUG2009	71	4342
4344	Retaining Wall J - Bay 4	21	21	12AUG2009	01SEP2009	0	4343
4345	Retaining Wall J - Bay 5	21	21	02SEP2009	22SEP2009	0	4344
4346	Retaining Wall J - Bay 6	25	25	23SEP2009	17OCT2009	0	4345
4347	Retaining Wall J - Bay 7	25	25	18OCT2009	11NOV2009	0	4346
4400	Phase 2 sewer at LTT River (Section A)	149	149	01NOV2009 *	29MAR2010	0	
4420	Section A Sewers (J139a.1 - J146a.1)	80	80	01NOV2009 *	19JAN2010	0	
4421	Sewers J139a.1	12	12	01NOV2009 *	12NOV2009	0	
4422	Sewers J140a.1	12	12	13NOV2009	24NOV2009	0	4421
4423	Sewers J141a.1	12	12	25NOV2009	06DEC2009	0	4422
4424	Sewers J142a.1	12	12	07DEC2009	18DEC2009	0	4423
4425	Sewers J143a.1	12	12	19DEC2009	30DEC2009	0	4424
4427	Sewers J144a.1	12	12	31DEC2009	11JAN2010	0	4425
4428	Sewers J146a.1	8	8	12JAN2010	19JAN2010	0	4427
4430	Section A Sewers (144.1, B135.1 & B136.1)	69	69	20JAN2010	29MAR2010	0	4428
4431	Sewers 144.1	10	10	20JAN2010	29JAN2010	0	4428
4433	Sewers B135.1	10	10	20JAN2010	29JAN2010	0	4428
4434	Sewers B136.1	10	10	30JAN2010	08FEB2010	0	4433
4435	Reinstatement of gabion block	20	20	09FEB2010	28FEB2010	0	4434
4500	Mini-bored Pile Wall C at LTT River	60	60	01NOV2009 *	30DEC2009	0	
4510	Mini-bored Pile Wall C (RC Retaining Wall)	0	0	01NOV2009 *		0	
4511	MP-C bay 1	14	14	01NOV2009	14NOV2009	0	4510
4512	MP-C bay 2	14	14	12NOV2009	25NOV2009	0	4511
4513	MP-C bay 3	14	14	23NOV2009	06DEC2009	0	4512
4514	MP-C bay 4	14	14	04DEC2009	17DEC2009	0	4513
4515	MP-C bay 5	14	14	15DEC2009	28DEC2009	0	4514
4520	Skin Wall for PPW - C	24	24	07DEC2009	30DEC2009	0	4513
4800	Remain Works within PNH & LTT River (D1&D5)	1010	444	18JAN2008 A	23OCT2010	56	0001
4810	Approval of use of EVA	0	0	29AUG2008 A		100	3020
4820	No exca period (1) at Confluence of PNH,TTT&LTT	214	0	01APR2008 A	31OCT2008 A	100	
4830	Works within Section 3 (A) at PNH River	151	0	01NOV2008 A	31MAR2009 A	100	4820
4840	Works within Section 3 (B) at LTT River	151	0	01NOV2008 A	31MAR2009 A	100	4820
4850	No exca period (2) at Confluence of PNH,TTT&LTT	214	87	01APR2009 A	31OCT2009	59	
4860	Works within Section 3 (B) at LTT River	151	151	01NOV2009	31MAR2010	0	4850
4900	No exca period (3) at Confluence of PNH,TTT&LTT	214	214	01APR2010	31OCT2010	0	4860
4910	Remaining Drainage Works for (3A) Embankment	50	50	01JUN2010	20JUL2010	0	3385
4920	Remaining Drainage Works for (4) Embankment	50	50	01JUN2010	20JUL2010	0	3385
4930	Remain Road & Paving Works for (3A) Embankment	50	50	21JUN2010	09AUG2010	0	4910
4940	Remain Road & Paving Works for (4) Embankment	50	50	21JUL2010	08SEP2010	0	4920
4950	Remain Soft Landscaping Planting(3A) Works	50	50	10AUG2010	28SEP2010	0	4930
4960	Remain Soft Landscaping Planting (4) Works	110	110	09SEP2010	27DEC2010	0	4940
5000	Works within Portions S1 of the Site (Chung Hau)	748	182	18JAN2008 A	03FEB2010	76	0001
5010	Construction Proposals and Submissions	203	0	18JAN2008 A	07AUG2008 A	100	0001
5020	uPVC Sewer (DN160-400) (New works)	0	0	08AUG2008 A	07AUG2008 A	100	5010
5030	Applocation and Approval of XP	290	0	18JAN2008 A	02NOV2008 A	100	0001
5040	uPVC Sewer (DN225-->400) (On-line Replace)	0	0	03NOV2008 A		100	5030
5041	Preparation works for sewers	10	0	03NOV2008 A	12NOV2008 A	100	5040
5042	MH EB13 - MH EB18	350	84	13NOV2008 A	28OCT2009	76	5041
5043	MH EB18 - MH EB25	145	145	29OCT2009	22MAR2010	0	5042
5044	MH EB11 - MH EB13	90	90	29OCT2009	26JAN2010	0	5042
5045	MH EB25 - MH EB26	50	50	27JAN2010	17MAR2010	0	5044
5046	MH EB26 - MH EB31 - EB8	145	145	29OCT2009	22MAR2010	0	5042
6000	Sewerage Works at TTT (S2A & 2B)	863	297	18JAN2008 A	29MAY2010	66	0001
6010	Prepartion for works (Minor Portion)	131	0	18JAN2008 A	27MAY2008 A	100	0001
6020	uPVC Sewer (DN160-400) M/H C48 - M/H C84	230	0	28MAY2008 A	12JAN2009 A	100	6010
6030	uPVC Sewer (DN160-400) M/H C85 - M/H C131	230	25	13JAN2009 A	30AUG2009	89	6020
6040	uPVC Sewer (DN160-400) M/H C1 - M/H C47	249	249	31AUG2009	06MAY2010	0	6030
7000	Sewerage at TWT (S3A & 3B)	638	72	18JAN2008 A	16OCT2009	89	0001



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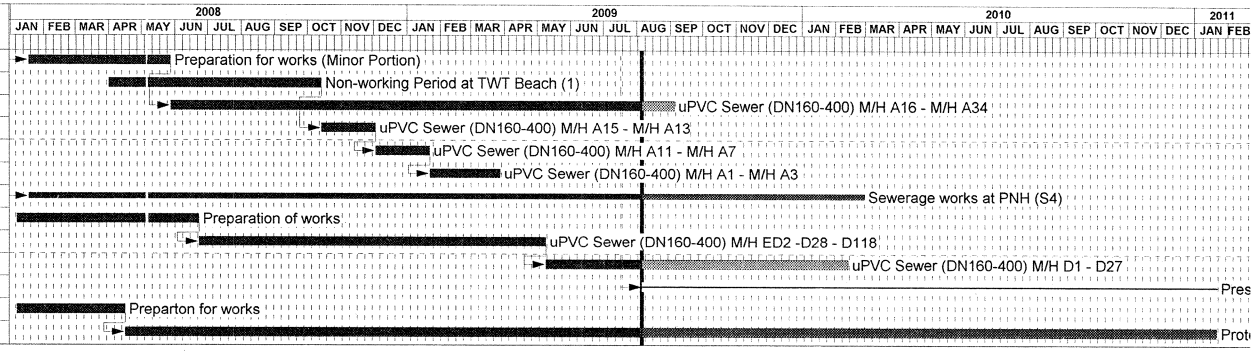
7010	Preparation for works (Minor Portion)	131	0	18JAN2008 A	27MAY2008 A	100	**0001**
7020	Non-working Period at TWT Beach (1)	196	0 *	01APR2008 A	13OCT2008 A	100	
7030	uPVC Sewer (DN160-400) M/H A16 - M/H A34	465	30	28MAY2008 A	04SEP2009	94	**7010**
7040	uPVC Sewer (DN160-400) M/H A15 - M/H A13	50	0	14OCT2008 A	02DEC2008 A	100	**7020**
7050	uPVC Sewer (DN160-400) M/H A11 - M/H A7	50	0	03DEC2008 A	21JAN2009 A	100	**7040**
7060	uPVC Sewer (DN160-400) M/H A1 - M/H A3	65	0	22JAN2009 A	27MAR2009 A	100	**7050**
8000	Sewerage works at PNH (S4)	772	206	18JAN2008 A	27FEB2010	73	**0001**
8010	Preparation of works	168	0	07JAN2008 A	22JUN2008 A	100	
8020	uPVC Sewer (DN160-400) M/H ED2 -D28 - D118	320	0	23JUN2008 A	08MAY2009 A	100	**8010**
8030	uPVC Sewer (DN160-400) M/H D1 - D27	280	191	09MAY2009 A	12FEB2010	32	**8020**
9000	Preservation & Protection of Exist Trees	534 *	534 *	06AUG2009	21JAN2011	0	**0001**
9010	Preparton for works	100	0	07JAN2008 A	15APR2008 A	100	
9020	Protection & Transplanting Works	1011	534	16APR2008 A	21JAN2011	47	**9010**



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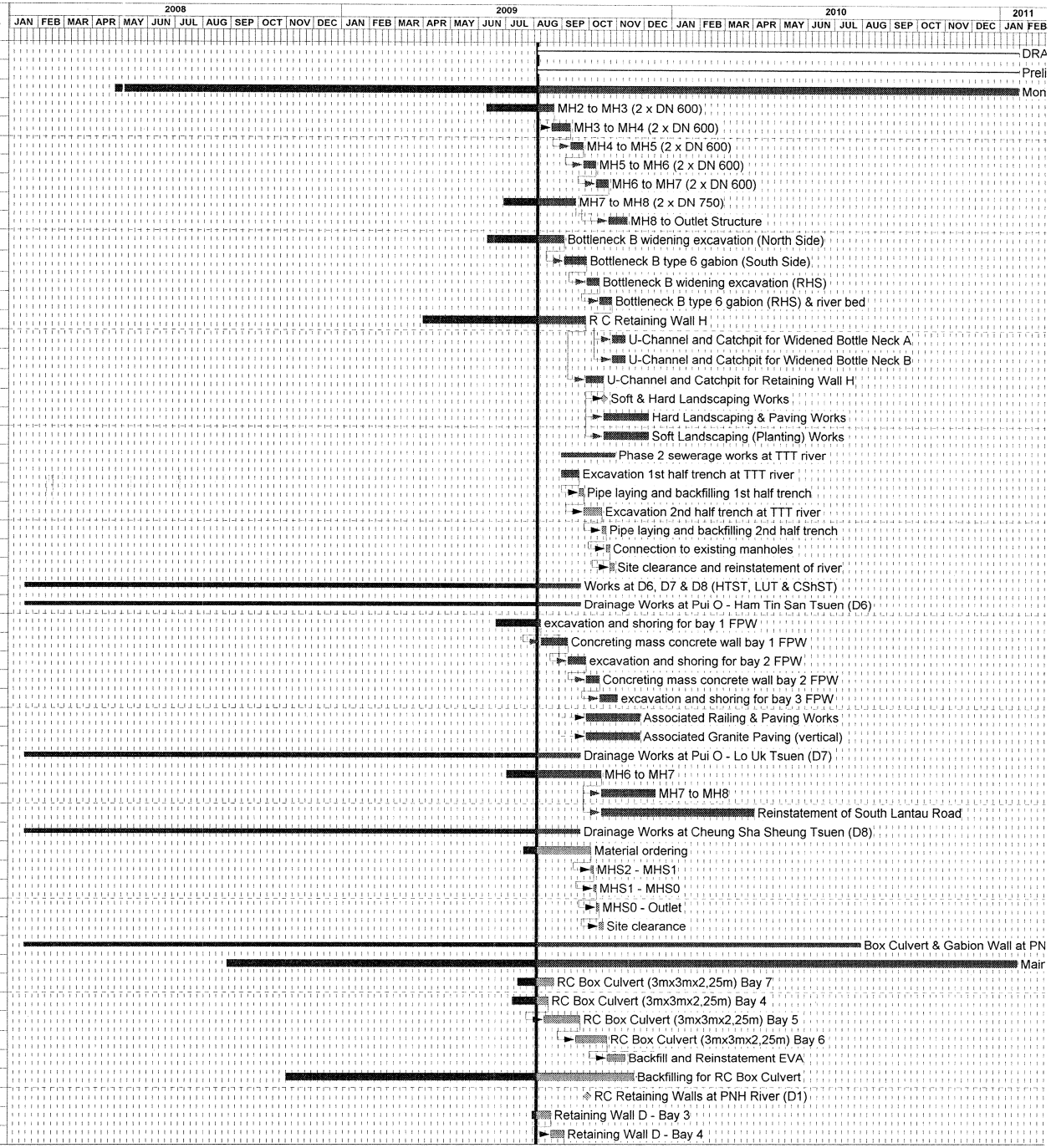
Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	%	Predecessors
0000	DRAINAGE IMPROVEMENT WORK IN S LANTAU	534 *	534 *	06AUG2009	21JAN2011	0	
0010	Preliminaries	534 *	534 *	06AUG2009	21JAN2011	0	
0080	Monitoring for Environmental Permit	1001	534	26APR2008 A	21JAN2011	47	0070
1044	MH2 to MH3 (2 x DN 600)	75	18	10JUN2009 A	23AUG2009	76	1043
1045	MH3 to MH4 (2 x DN 600)	21	21	21AUG2009 *	10SEP2009	0	1044
1046	MH4 to MH5 (2 x DN 600)	14	14	11SEP2009	24SEP2009	0	1045
1047	MH5 to MH6 (2 x DN 600)	14	14	25SEP2009	08OCT2009	0	1046
1048	MH6 to MH7 (2 x DN 600)	14	14	09OCT2009	22OCT2009	0	1047
1049	MH7 to MH8 (2 x DN 750)	80	42	29JUN2009 A	16SEP2009	48	
1050	MH8 to Outlet Structure	21	21	23OCT2009	12NOV2009	0	1048, 1049
1132	Bottleneck B widening excavation (North Side)	85	29	11JUN2009 A	03SEP2009	66	1131
1133	Bottleneck B type 6 gabion (South Side)	25	25	04SEP2009	28SEP2009	0	1132
1134	Bottleneck B widening excavation (RHS)	14	14	29SEP2009	12OCT2009	0	1133
1135	Bottleneck B type 6 gabion (RHS) & river bed	14	14	13OCT2009	26OCT2009	0	1134
1141	R C Retaining Wall H	180	53	01APR2009 A	27SEP2009	71	1140
1151	U-Channel and Catchpit for Widened Bottle Neck A	15	15	27OCT2009	10NOV2009	0	1123, 1135
1152	U-Channel and Catchpit for Widened Bottle Neck B	15	15	27OCT2009	10NOV2009	0	1135
1153	U-Channel and Catchpit for Retaining Wall H	20	20	28SEP2009	17OCT2009	0	1141
1160	Soft & Hard Landscaping Works	0	0	18OCT2009		0	1123, 1153
1170	Hard Landscaping & Paving Works	50	50	18OCT2009	06DEC2009	0	1153
1180	Soft Landscaping (Planting) Works	50	50	18OCT2009	06DEC2009	0	1153
1200	Phase 2 sewerage works at TTT river	60	60	01SEP2009 *	30OCT2009	0	
1220	Excavation 1st half trench at TTT river	20	20	01SEP2009 *	20SEP2009	0	1210
1230	Pipe laying and backfilling 1st half trench	5	5	21SEP2009	25SEP2009	0	1220
1240	Excavation 2nd half trench at TTT river	20	20	26SEP2009	15OCT2009	0	1230
1250	Pipe laying and backfilling 2nd half trench	5	5	16OCT2009	20OCT2009	0	1240
1260	Connection to existing manholes	4	4	21OCT2009	24OCT2009	0	1250
1270	Site clearance and reinstatement of river	5	5	25OCT2009	29OCT2009	0	1260
2000	Works at D6, D7 & D8 (HTST, LUT & CShST)	614	48	18JAN2008 A	22SEP2009	92	0001
2100	Drainage Works at Pui O - Ham Tin San Tsuen (D6)	614	48	18JAN2008 A	22SEP2009	92	0001
2113	excavation and shoring for bay 1 FPW	50	4	21JUN2009 A	09AUG2009	92	2112
2114	Concreting mass concrete wall bay 1 FPW	30	30	10AUG2009	08SEP2009	0	2113
2115	excavation and shoring for bay 2 FPW	20	20	09SEP2009	28SEP2009	0	2114
2116	Concreting mass concrete wall bay 2 FPW	15	15	29SEP2009	13OCT2009	0	2115
2117	excavation and shoring for bay 3 FPW	20	20	14OCT2009	02NOV2009	0	2116
2120	Associated Railing & Paving Works	60	60	29SEP2009 *	27NOV2009	0	2113, 2118
2130	Associated Granite Paving (vertical)	60	60	29SEP2009	27NOV2009	0	2113, 2118
2200	Drainage Works at Pui O - Lo Uk Tsuen (D7)	614	48	18JAN2008 A	22SEP2009	92	0001
2231	MH6 to MH7	105	71	03JUL2009 A	15OCT2009	32	2230
2232	MH7 to MH8	60	60	16OCT2009	14DEC2009	0	2231
2240	Reinstatement of South Lantau Road	170	170	16OCT2009	03APR2010	0	2231, 2236
2300	Drainage Works at Cheung Sha Sheung Tsuen (D8)	614	48	18JAN2008 A	22SEP2009	92	0001
2314	Material ordering	75	60	22JUL2009 A	04OCT2009	20	2313
2315	MHS2 - MHS1	3	3	05OCT2009	07OCT2009	0	2314
2316	MHS1 - MHS0	3	3	08OCT2009	10OCT2009	0	2315
2317	MHS0 - Outlet	3	3	11OCT2009	13OCT2009	0	2316
2340	Site clearance	5	5	14OCT2009	18OCT2009	0	2317
3000	Box Culvert & Gabion Wall at PNH River (D1)	926	360	18JAN2008 A	31JUL2010	61	0001
3040	Maintenance of EVA	876	534	29AUG2008 A	21JAN2011	39	3020
3121	RC Box Culvert (3mx3mx2,25m) Bay 7	40	19	16JUL2009 A	24AUG2009	53	3120
3123	RC Box Culvert (3mx3mx2,25m) Bay 4	40	13	10JUL2009 A	18AUG2009	68	3122
3124	RC Box Culvert (3mx3mx2,25m) Bay 5	40	40	14AUG2009	22SEP2009	0	3123
3125	RC Box Culvert (3mx3mx2,25m) Bay 6	35	35	18SEP2009	22OCT2009	0	3124
3130	Backfill and Reinstatement EVA	20	20	23OCT2009	11NOV2009	0	3125
3140	Backfilling for RC Box Culvert	385	108	02NOV2008 A	21NOV2009	72	3111, 3125
3300	RC Retaining Walls at PNH River (D1)	0	0	01OCT2009 *		0	
3343	Retaining Wall D - Bay 3	21	16	01AUG2009 A	21AUG2009	24	3340
3344	Retaining Wall D - Bay 4	15	15	22AUG2009	05SEP2009	0	3343



Start date	07JAN2008
Finish date	21JAN2011
Data date	06AUG2009
Run date	15AUG2009
Page number	1A
c Primavera Systems, Inc.	

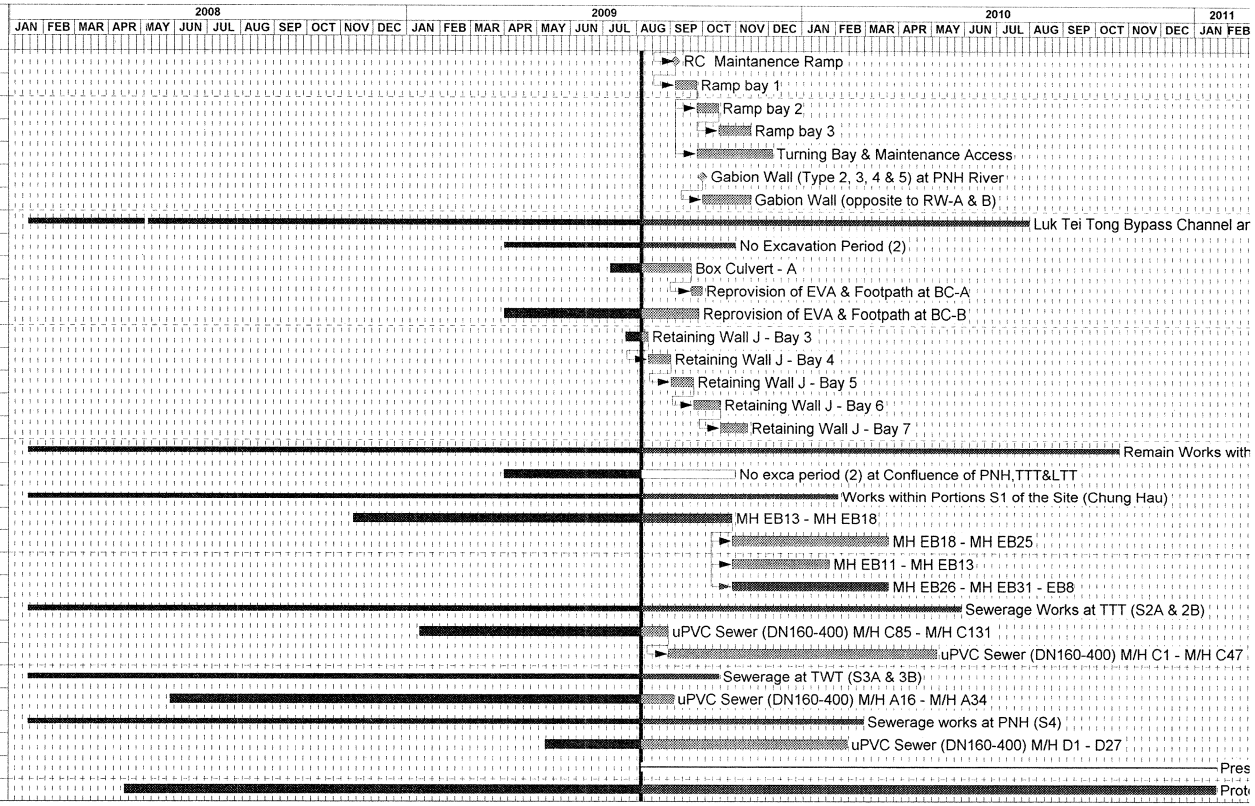
Yick Hing Construction Co. Ltd.

Drainage Improvement Work in South Lantau
and Construction of Mui Wo Village Sewerage Phase 1

3-Month Rolling Programme (Rev.9b)

- Early bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point

Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	%	Predecessors
3360	RC Maintanence Ramp	0	0	06SEP2009		0	**3344**
3361	Ramp bay 1	20	20	06SEP2009	25SEP2009	0	**3360**
3362	Ramp bay 2	20	20	26SEP2009	15OCT2009	0	**3361**
3363	Ramp bay 3	30	30	16OCT2009	14NOV2009	0	**3362**
3369	Turning Bay & Maintenance Access	70	70	26SEP2009	04DEC2009	0	**3361**
3500	Gabion Wall (Type 2, 3, 4 & 5) at PNH River	0	0	01OCT2009 *		0	
3510	Gabion Wall (opposite to RW-A & B)	45	45	01OCT2009	14NOV2009	0	**3500**
4000	Luk Tei Tong Bypass Channel and River (D5)	926	360	18JAN2008 A	31JUL2010	61	**0001**
4200	No Excavation Period (2)	214	87 *	01APR2009 A	31OCT2009	59	**4110**
4240	Box Culvert - A	75	46	08JUL2009 A	20SEP2009	39	
4241	Reprovision of EVA & Footpath at BC-A	10	10	21SEP2009	30SEP2009	0	**4240**
4260	Reprovision of EVA & Footpath at BC-B	180	53	01APR2009 A	27SEP2009	71	**4250**
4343	Retaining Wall J - Bay 3	21	6	22JUL2009 A	11AUG2009	71	**4342**
4344	Retaining Wall J - Bay 4	21	21	12AUG2009	01SEP2009	0	**4343**
4345	Retaining Wall J - Bay 5	21	21	02SEP2009	22SEP2009	0	**4344**
4346	Retaining Wall J - Bay 6	25	25	23SEP2009	17OCT2009	0	**4345**
4347	Retaining Wall J - Bay 7	25	25	18OCT2009	11NOV2009	0	**4346**
4800	Remain Works within PNH & LTT River (D1&D5)	1010	444	18JAN2008 A	23OCT2010	56	**0001**
4850	No exca period (2) at Confluence of PNH,TTT&LTT	214	87	01APR2009 A	31OCT2009	59	
5000	Works within Portions S1 of the Site (Chung Hau)	748	182	18JAN2008 A	03FEB2010	76	**0001**
5042	MH EB13 - MH EB18	350	84	13NOV2008 A	28OCT2009	76	**5041**
5043	MH EB18 - MH EB25	145	145	29OCT2009	22MAR2010	0	**5042**
5044	MH EB11 - MH EB13	90	90	29OCT2009	26JAN2010	0	**5042**
5046	MH EB26 - MH EB31 - EB8	145	145	29OCT2009	22MAR2010	0	**5042**
6000	Sewerage Works at TTT (S2A & 2B)	863	297	18JAN2008 A	29MAY2010	66	**0001**
6030	uPVC Sewer (DN160-400) M/H C85 - M/H C131	230	25	13JAN2009 A	30AUG2009	89	**6020**
6040	uPVC Sewer (DN160-400) M/H C1 - M/H C47	249	249	31AUG2009	06MAY2010	0	**6030**
7000	Sewerage at TWT (S3A & 3B)	638	72	18JAN2008 A	16OCT2009	89	**0001**
7030	uPVC Sewer (DN160-400) M/H A16 - M/H A34	465	30	28MAY2008 A	04SEP2009	94	**7010**
8000	Sewerage works at PNH (S4)	772	206	18JAN2008 A	27FEB2010	73	**0001**
8030	uPVC Sewer (DN160-400) M/H D1 - D27	280	191	09MAY2009 A	12FEB2010	32	**8020**
9000	Preservation & Protection of Exist Trees	534 *	534 *	06AUG2009	21JAN2011	0	**0001**
9020	Protection & Transplanting Works	1011	534	16APR2008 A	21JAN2011	47	**9010**



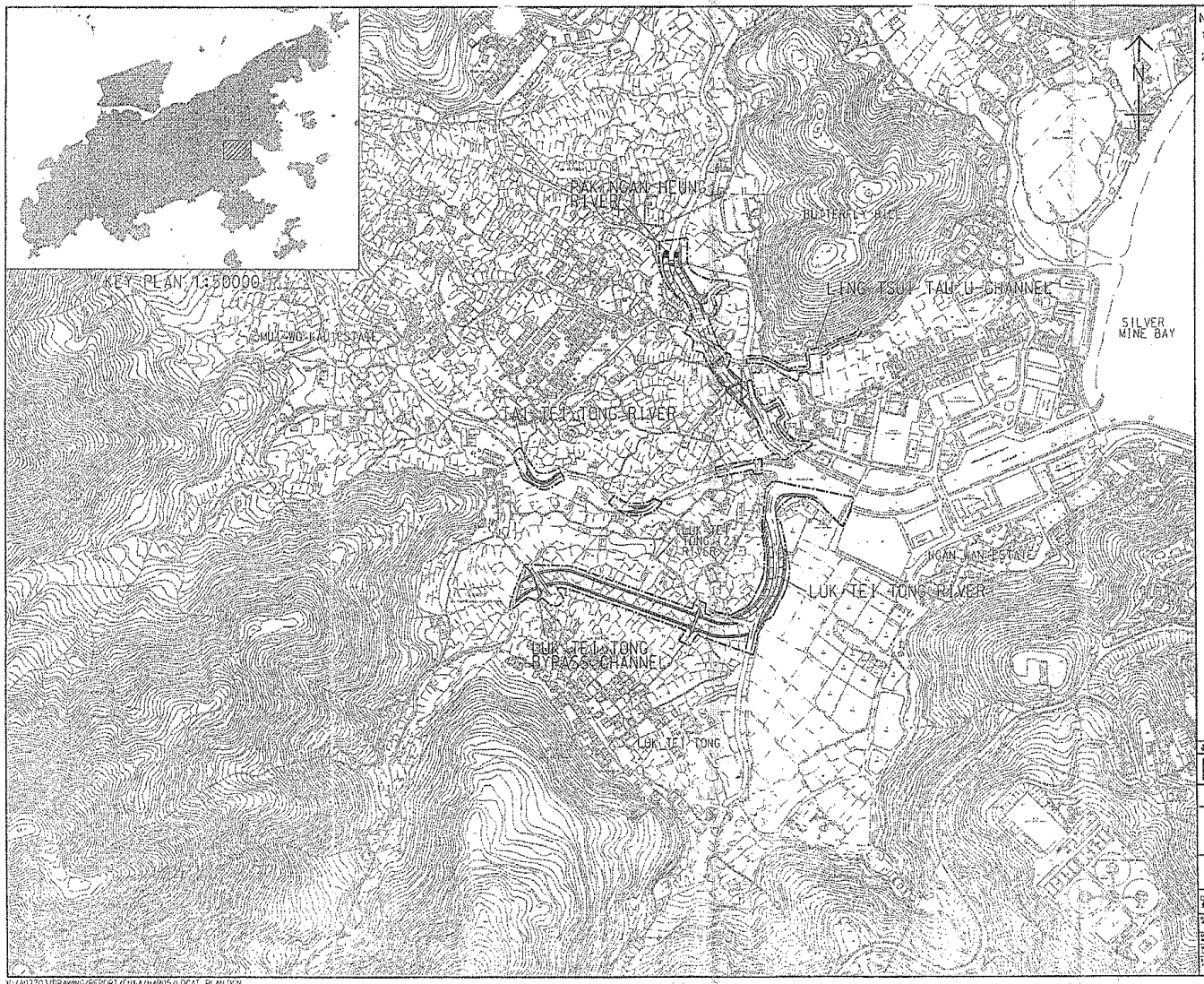
Start date	07JAN2008
Finish date	21JAN2011
Data date	06AUG2009
Run date	15AUG2009
Page number	2A

Yick Hing Construction Co. Ltd.

Drainage Improvement Work in South Lantau
and Construction of Mui Wo Village Sewerage Phase 1

3-Month Rolling Programme (Rev.9b)

Early bar
Progress bar
Critical bar
Summary bar
Start milestone point
Finish milestone point



NOTES:

1. GRID LINES ARE HONG KONG GRID 1980
2. ALL LEVELS ARE IN METERS AND REFERRED TO H.K.P.D.

DRAINAGE SERVICES DEPARTMENT, THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

STORMWATER IMPROVEMENT IN SOUTHERN KOWLOON INVESTIGATION

LOCATION PLAN OF THE PROJECT

Metcalf & Eddy Ltd 美地工程顧問有限公司

ORIGINAL SIZE: A3

1.1

SEP 2004

PREPARED BY: JLFL

SCALE: 1:50000

PRELIMINARY

DRAWING NO. IN METRES

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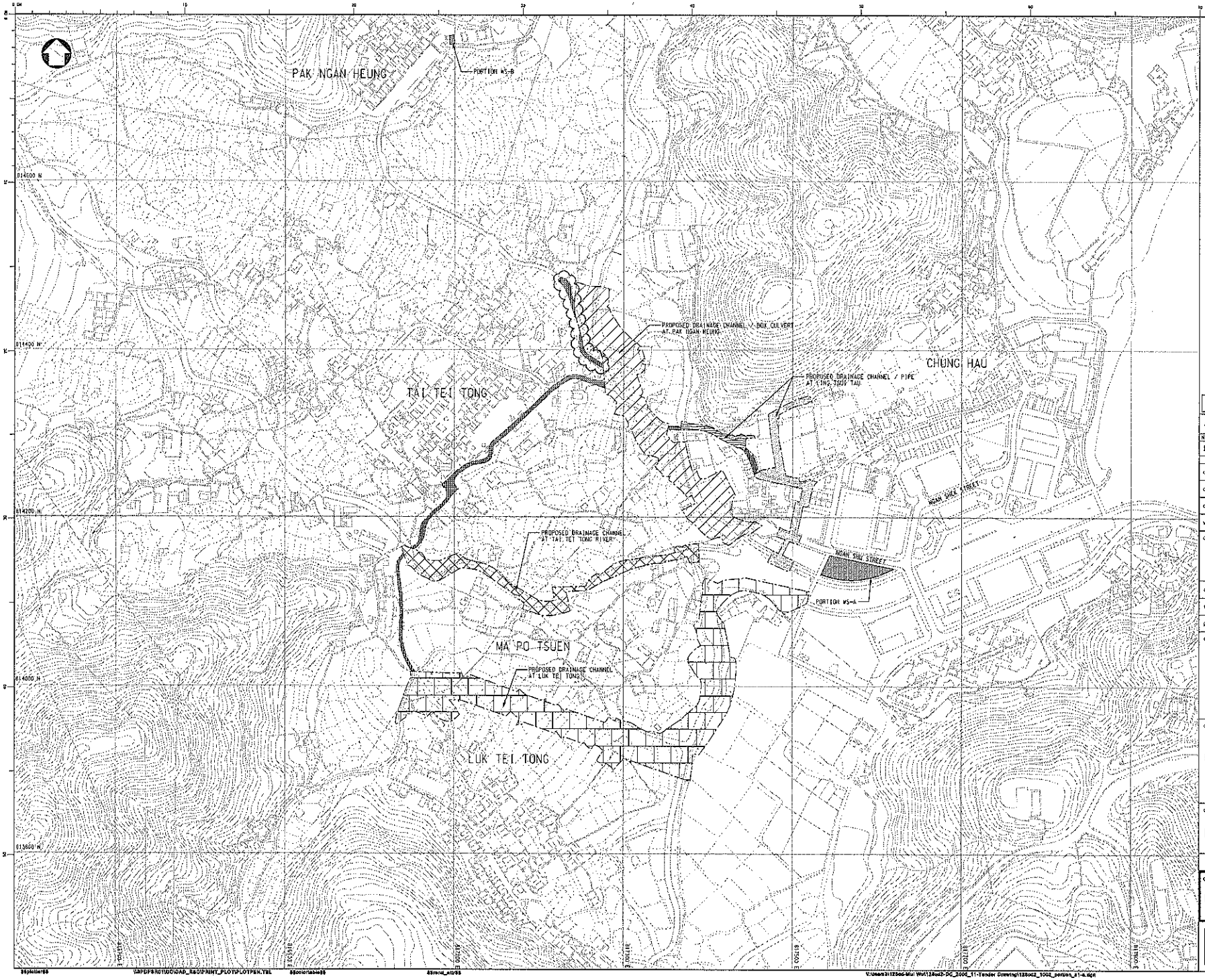

NOTES :

1. ALL LEVELS ARE IN METRES ABOVE P.D.H.K..
2. ALL GRIDS REFER TO HONG KONG 1980 GRID.

LEGENDS :

- SITE BOUNDARIES
- PORTION D1 - PAK NGAN HEUNG
- PORTION D2 - LING TSUI TAU (A)
- PORTION D3 - LING TSUI TAU (B)
- PORTION D4 - TAI TEI TONG RIVER
- PORTION D5 - LUK TEI TONG
- PORTION D6 - PUI O
- PORTION D7 - LO UK TSUEN
- PORTION D8 - CHEUNG SHA SHEUNG TSUEN
- PORTION D9 - EMERGENCY VEHICULAR ACCESS (EVA) AT HUI WO

FOR TENDER PURPOSES ONLY

No.	date	description	initial
A	16 MAY 2007	GENERAL REVISION	SIGNED H. Y. CHOW for

REVISION

	name		date
designed	SIGNED	H. Y. CHOW	12 FEB 2006
drawn	SIGNED	B. D. CHAN	23 MAR 2007
checked	SIGNED	W. H. CHAN	10 MAY 2007
vetted	SIGNED	T. Y. CHAN	11 MAY 2007

approved

SIGNED K. K. CHAN, Chief Engineer, 14 MAY 2007 Date

contract no. DC/2006/11

file no. DP/6/4128CD

project no. 128CD

contract

DRAINAGE IMPROVEMENT IN SOUTHERN LANTAU

drawing title

PORTIONS OF SITE - SOUTHERN LANTAU

(SHEET 1 OF 2)

drawing no.	scale
DDN/128CD2/1002A	1 : 2000

office

DRAINAGE PROJECTS DIVISION

DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

A1 841x594

Appendix B Key Personal Contact information chart

Organization Name	Role	Title	Name	Telephone	Fax Number
Drainage Service Department	Project Proponent	Engineering Representative	Mr. Chan Wai Hong	2594 7464	2827 8700
Allied Environmental Consultants Limited	Independent Environmental Checker (IEC)	Principal Consultant	Ms. Claudine Lee	2815 7028	2815 5399
Yick-Hing Construction Company Limited	Main Contractor	Senior Project Manager	Mr. Liu Kai Choi	2394 4988	2787 4890
Environmental Pioneers & Solutions Limited	Environmental Team (ET)	Environmental Team Leader	Ms. Patricia Chung	2185 0123	2856 2010

Appendix C

Calibration Certificates for Measuring Equipments

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

Report for Calibration of Hand-held Water Quality Meter WQC-24

Calibration Reference No. : GCE/CAL/2009/MW/WQM/C2

Client : ENVIRONMENTAL PIONEER AND SOLUTION LIMITED

Equipment No. : WQC-24 Location : Mui Wo Site

Manufacturer : DKK-TOA Serial No.: 617892

Calibration Date : 07 to 09-05-2009 Due Date : 06-08-2009

Criterion: (Repeatabilty, Linearity)

pH	:	Both within ±0.05pH
Dissolved oxygen	:	Both within ±0.1mg/L
Electric conductivity	:	Both within ±1%FS
Turbidity	:	Repeatability : within ±3%FS
Temperature	:	Repeatability ±0.25°C; Linearity ±0.5°C; (Ambient 5~45°C)

Electric Conductivity (Salinity converted from EC):

(Reference : APHA 20ed 2510 B, ISO 7888 - 1985 (E) and DKK-TOA Hand-held Water Quality Meter WQC-24 Instruction Manual)

Concentration of KCl Standard Solution (M)	Reference conductivity value at 25.0 °C	Indicated value by meter	Linearity (R^2)
0	0.0 mS/m*	0.0 mS/m	1.0000
0.001	14.7 mS/m	15.5 mS/m	
0.005	71.8 mS/m	72.8 mS/m	
0.01	0.141 S/m	0.148 S/m	
0.05	0.667 S/m	0.675 S/m	
0.1	1.29 S/m	1.30 S/m	Acceptance Criterion
0.5	5.87 S/m	5.88 S/m	$R^2 > 0.995$
Repeatability	1st time	0.00 , 5.88 S/m	-
	2nd time	0.00 , 5.88 S/m	
	3rd time	0.00 , 5.88 S/m	
	0.00 , 5.88 S/m	0.00 , 0.00	

* 1 S/m = 10^4 µmhos/cm = 10^3 mS/m

Remark: For repeatability, the maximum difference from the average value of 3 measurements was taken.

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

Dissolved Oxygen:

(Reference : APHA 20ed 4500-O B&C, ISO 5814:1990(E) and DKK-TOA Hand-held Water Quality Meter WQC-24 Instruction Manual)

DO value evaluated by Iodometric Method (mg/L)		Indicated value by meter (mg/L)	Linearity (R^2)
0.00		0.00	0.9990
3.72		3.85	
6.28		6.47	
8.56		8.81	
10.69		10.58	Acceptance Criterion
13.77		13.58	$R^2 > 0.995$
Repeatability	1st time	0.00 , 8.83	-
	2nd time	0.00 , 8.80	
	3rd time	0.00 , 8.81	
	0.00 , 8.56	0.00 , 0.03	

Remark: For repeatability, the maximum difference from the average value of 3 measurements was taken.

pH Value:

(Reference : APHA 20ed 4500-H^+ B, ISO 10523:1994(E) and DKK-TOA Hand-held Water Quality Meter WQC-24 Instruction Manual)

Calibration pH buffer (25°C)	Input value (pH buffer) (25°C)	Indicated pH value by meter (25°C)	Linearity (R^2)
pH = 1.67	1.67	1.70	1.0000
pH = 6.86	4.00	4.03	
pH = 7.42	7.00	7.03	
pH = 9.18	10.00	10.04	Acceptance Criterion
pH = 12.45	12.45	12.50	$R^2 > 0.995$
Repeatability	1st time	4.03 , 10.04	-
	2nd time	4.03 , 10.05	
	3rd time	4.02 , 10.04	
	pH 4.00 , 10.00	0.01 , 0.01	

Remark: For repeatability, the maximum difference from the average value of 3 measurements was taken.

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

Temperature:

(Reference : APHA 20ed 2550 B, In-house method and DKK-TOA Hand-held Water Quality Meter WQC-24 Instruction Manual)

Setting Temperature (°C)	Indicated value by meter (°C)		Linearity
5.0	4.9		$R^2 = 0.9999$ And SD = ± 0.15°C
15.0	15.2		
25.0	24.8		
35.0	35.4		
45.0	45.2		Acceptance Criterion
55.0	55.5		$R^2 > 0.995$ and within ± 5°C
Repeatability	1st time	5.2 , 55.4	-
	2nd time	5.2 , 55.5	
	3rd time	5.1 , 55.6	
	5.0 , 55.0	0.1 , 0.2	

Remark: For repeatability, the maximum difference from the average value of 3 measurements was taken.

Turbidity:

(Reference : APHA 20ed 2130 B and DKK-TOA Hand-held Water Quality Meter WQC-24 Instruction Manual)

Formazin Standards (NTU)	Indicated value by meter (NTU)		Linearity (R^2)
0.0	0.0		1.0000
20.0	21.0		
100.0	102.1		
400.0	404.2		Acceptance Criterion
800.0	805.4		$R^2 > 0.995$
Repeatability	1st time	0.3 , 805.8	-
	2nd time	0.3 , 805.4	
	3rd time	0.3 , 805.0	
	0.0 , 800.0	0.0 , 0.8	

Remark: For repeatability, the maximum difference from the average value of 3 measurements was taken.

Comments : Pass, comply with the criteria..

Tested by : Ho Tin Kau Certified by : Gu Chin
Chemist

Checked by : Gu Chin Date : 9-5-2008

Form No. : CAL/WQM/R (2-12-2008)

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong. Tel : (852) 2873 6860
香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓 Fax : (852) 2555 7533
E-mail: smec@cigismec.com Website: www.cigismec.com
HOKLAS 028

CERTIFICATE OF CALIBRATION

D094

Certificate No.: 09CA0102 01-01

Item tested

Description:	Sound Level Meter (Type I)	,	Microphone
Manufacturer:	ACO, Japan	,	ACO, Japan
Type/Model No.:	6224	,	7146
Serial/Equipment No.:	060166	,	34733
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Geotechnics & Concrete Engineering (H.K.) Ltd.
Address of Customer:	G/F., 6 Ko Shan Road, Hung Hom, Kowloon, Hong Kong
Request No.:	-
Date of request:	30-12-2008

Date of test: 02-01-2009

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	11-01-2009	CIGISMEC
Signal generator	DS 360	33873	12-06-2009	CEPREI
Signal generator	DS 360	61227	18-07-2009	CEPREI

Ambient conditions

Temperature:	23 ± 2 °C
Relative humidity:	55 ± 15 %
Air pressure:	1010 ± 15 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 02-01-2009 **Company Chop:** 綜合試驗有限公司 SOILS & MATERIALS ENGINEERING COMPANY LTD.

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong. Tel : (852) 2873 6860
香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓 Fax : (852) 2555 7533
E-mail: smec@cigismec.com Website: www.cigismec.com
HOKLAS 028

CERTIFICATE OF CALIBRATION

0094

(Continuation Page)

1, Electrical Tests

The electrical tests were perfomed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Uncertainty (dB) / Coverage Factor	
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	1.5	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	N/A	N/A	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Uncertainty (dB) / Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3
	Weighting A at 8000 Hz	Pass	0.5

3, Response to associated sound calibrator

N/A

The uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95 %. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: C.Y. Fung Checked by:
Date: 02-01-2009 Date: 02-01-2009

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel : (852) 2873 6860
Fax : (852) 2555 7533
HOKLAS 028

CERTIFICATE OF CALIBRATION

D095

Certificate No.: 09CA0102 01-02 **Page:** 1 of 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	Castle Group Ltd.
Type/Model No.:	GA607
Serial/Equipment No.:	039543
Adaptors used:	-

Item submitted by

Curstomer:	Geotechnics & Concrete Engineering (H.K.) Ltd.
Address of Customer:	G/F., 6 Ko Shan Road, Hung Hom, Kowloon, Hong Kong
Request No.:	-
Date of request:	30-12-2008

Date of test: 02-01-2009

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	29-06-2009	SCL
Preamplifier	B&K 2673	2239857	02-12-2009	CEPREI
Measuring amplifier	B&K 2610	2346941	03-12-2009	CEPREI
Signal generator	DS 360	61227	18-07-2009	CEPREI
Digital multi-meter	34401A	US36087050	03-12-2009	CIGISMEC
Audio analyzer	8903B	GB41300350	27-11-2009	CEPREI
Universal counter	53132A	MY40003662	11-07-2009	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1010 ± 15 hPa

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 02-01-2009 **Company Chop:**

SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong. Tel : (852) 2873 6860
香港黃竹坑道37號利達中心地下，9樓，12樓，13樓及20樓 Fax : (852) 2555 7533
E-mail: smec@cigismec.com Website: www.cigismec.com

HOKLAS 028

CERTIFICATE OF CALIBRATION

D095

(Continuation Page)

Certificate No.: 09CA0102 01-02 **Page:** 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Uncertainty dB
1000	94.00	94.30	0.1

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.002 dB**

Estimated uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 1000.0 Hz**

Estimated uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 2.1%**

Estimated uncertainty 0.7%

The uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95 %. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by: C.Y. Fung **Checked by:**
Date: 02-01-2009 **Date:** 02-01-2009

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

Appendix D1 Plant species recorded at Pak Ngan Heung River (N)

			Relative	Occurrence	
Species	Habit	Native	Abundance	PNH3	PNH4
Acacia confusa	tree	no	occasional		+
Achyranthes aspera	herb	yes	scarce		+
Acorus gramineus	herb	yes	scarce		+
Alangium chinensis	tree	yes	scarce		+
Alocasia macrorrhiza	herb	yes	occasional	+	+
Aporosa dioica	tree	yes	occasional	+	+
Ardisia crenata	shrub	yes	occasional	+	+
Bamboo	herb	-	scarce	+	
Bidens pilosa	herb	yes	occasional		+
Bischofia javanica	herb	yes	scarce	+	
Bridelia tomentosa	tree	yes	scarce	+	+
Celtis sinensis	tree	yes	occasional	+	+
Centotheca lappacea	grass	yes	scarce	+	+
Christella parasitica	fern	yes	occasional	+	+
Cleistocalyx operculata	tree	yes	occasional	+	+
Colocasia esculenta	herb	no	scarce	+	
Commelina sp.	herb	yes	scarce	+	+
Conyza canadensis	herb	no	scarce	+	+
Desmos chinensis	shrub	yes	occasional	+	
Dimocarpus longan	tree	no	occasional		+
Embelia ribes	climber	yes	scarce		+
Ficus hispida	tree	yes	common	+	+
Ficus superba	tree	yes	occasional		+
Garcinia oblongifolia	tree	yes	occasional		+
Glochidion puberum	shrub	yes	scarce	+	
Hedychium coronarium	herb	no	scarce		+
Hedyotis hedyotidea	climber	yes	scarce		+
Hibiscus rosa-sinensis	shrub	no	occasional		+
Liriope spicata	herb	yes	scarce		+
Litsea glutinosa	tree	yes	occasional	+	+
Litsea rotundifolia	shrub	yes	scarce	+	
Lophatherum gracile	grass	yes	scarce	+	
Lygodium japonicum	fern	yes	scarce	+	

			Relative	Occurrence	
Species	Habit	Native	Abundance	PNH3	PNH4
Macaranga tanarius	tree	yes	occasional	+	+
Mallotus paniculatus	tree	yes	scarce	+	
Microcos paniculata	tree	yes	scarce	+	+
Microstegium ciliatum	grass	yes	common	+	+
Mikania micrantha	climber	no	common	+	+
Mimosa pudica	herb	yes	scarce	+	
Murraya paniculata	shrub	no	scarce	+	
Musa paradisiaca	tree	no	scarce	+	
Mussaenda erosa	shrub	yes	scarce	+	
Neyraudia reynaudiana	grass	yes	occasional	+	+
Panicum maximum	grass	no	common	+	+
Phyllanthus urinaria	herb	yes	scarce	+	+
Pilea microphylla	herb	no	occasional		+
Plantago major	herb	yes	scarce		+
Pogonatherum crinitum	grass	yes	scarce		+
Polygonum chinense	herb	yes	occasional	+	
Polygonum sp.	herb	yes	scarce	+	
Psychotria asiatica	shrub	yes	common	+	+
Pteris ensiformis	fern	yes	scarce		+
Pueraria phaseoloides	climber	yes	occasional	+	+
Sageretia thea	climber	yes	occasional		+
Scoparia dulcis	herb	yes	scarce		+
Severinia buxifolia	shrub	yes	scarce		+
Sporobolus fertilis	grass	yes	scarce		+
Sterculia lanceolata	tree	yes	common	+	+
Syngonium podophyllum	climber	no	occasional	+	
Syzygium jambos	tree	no	common	+	+
Urena lobata	herb	yes	scarce		+
Uvaria microcarpa	shrub	yes	occasional	+	+
Wedelia trilobata	climber	no	scarce	+	

Appendix D2 Plant species recorded at Pak Ngan Heung River (S)

			Relative	Occurrence	
Species	Habit	Native	Abundance	PNH1	PNH2
Acacia confusa	tree	no	occasional	+	
Acanthus ilicifolius	shrub	yes	scarce	+	
Acrostichum aureum	fern	yes	scarce	+	
Celtis sinensis	tree	yes	occasional	+	
Clerodendrum inerme	shrub	yes	occasional	+	
Dendrotrophe frutescens	climber	yes	scarce	+	
Ficus microcarpa	tree	yes	scarce		+
Ficus superba	tree	yes	occasional		+
Ipomoea cairica	climber	yes	occasional		+
Kandelia obovata	shrub	yes	scarce	+	
Melaleuca quinquenervia	tree	no	common	+	
Neyraudia reynaudiana	grass	yes	occasional	+	
Panicum maximum	grass	no	common	+	+
Phyllanthus urinaria	shrub	yes	common		+
Sapium sebiferum	tree	yes	occasional		+
Wedelia triloba	climber	no	occasional	+	+
Wollastonia biflora	climber	yes	occasional	+	

Appendix D3 Plant species recorded at Luk Tei Tong River

			Relative	Occurrence				
Species	Habit	Native	Abundance	LLT1	LLT2	LLT3	LLT4	LLT5
Acanthus ilicifolius	shrub	yes	common	+	+			
Acrostichum aureum	fern	yes	scarce					+
Aegiceras corniculatum	shrub	yes	scarce	+				
Bougainvillea spectabilis	climber	no	scarce	+				
Bridelia tomentosa	tree	yes	occasional	+				
Celtis sinensis	tree	yes	scarce	+	+			
Clerodendrum inerme	shrub	yes	abundant	+	+		+	
Cyperus malaccensis	sedge	yes	occasional		+			
Derris trilfoliata	climber	yes	occasional		+			
Excoecaria agallocha	shrub	yes	common	+	+			
Ficus superba	tree	yes	occasional	+				
Fimbristylis ferruginea	sedge	yes	occasional		+		+	
Hibiscus tiliaceus	tree	yes	abundant	+			+	
Kandelia obovata	tree	yes	common	+	+			
Lantana camara	shrub	no	scarce		+			
Leucaena leucocephala	tree	no	occasional	+				
Litsea glutinosa	tree	yes	scarce		+			
Neyraudia reynaudiana	grass	yes	occasional	+				+
Panicum maximum	grass	no	common	+				
Paspalum paspaloides	grass	no	occasional		+			
Premna serratifolia	tree	yes	scarce		+			
Saccharum arundinaceum	grass	yes	scarce	+				
Sageretia thea	climber	yes	scarce		+			
Scolopia chinensis	tree	yes	scarce				+	
Terminalia catappa	tree	no	scarce		+			
Toxocarpus wightianus	climber	yes	scarce		+		+	
Wikstroemia indica	shrub	yes	scarce				+	
Wollastonia biflora	climber	yes	occasional		+			

Appendix D4

Ecological Water Monitoring Results (on-site measurements)

Environmental Pioneers & Solutions Limited

Ecological Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 3/7/09 **Weather Condition: Sunny**

Monitoring Location	**WE1**			**WE2**			**WE3**			**WE4**			**WE5**			**WE6**		
Time (hhmm)	1135			1125			1045			1110			1205			1150		
Tide Mode	ebb			ebb			ebb			ebb			ebb			ebb		
River Condition	Normal			Normal			Muddy			Muddy			Normal			Normal		
Water Depth (m)	< 1.0			< 1.0			< 1.0			< 1.0			< 1.0			< 1.0		
pH value	6.74			7.79			7.47			6.75			6.63			6.30		
Temperature (oC)	27.6			27.8			27.5			28.6			29.1			27.5		
Salinity (ppt)	0.0			0.1			0.1			4.2			0.2			0.0		
Conductivity (ms/m)	7.4			24.1			29.0			742.0			58.5			5.2		
Water flow (m/s)	0.020			0.050			0.100			0.040			0.040			0.020		
Turbidity (NTU)	0.0	0.0	Average 0.00	0.0	0.0	Average 0.00	17.2	17.2	Average 17.20	17.9	17.9	Average 17.9	3.5	3.5	Average 3.50	0.0	0.0	Average 0.0
DO (mg/l)	7.58	7.58	Average 7.58	8.04	8.04	Average 8.04	7.93	7.93	Average 7.93	7.01	7.01	Average 7.01	7.38	7.38	Average 7.38	7.12	7.12	Average 7.12
DO Saturation (%)	97	97	Average 97	103	103	Average 103	102	102	Average 102	93	93	Average 93	96	96	Average 96	90	90	Average 90

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		3/7/09

remark or observation: Muddy water is observed at WE3 due to water without desilting properly discharged to the public drain of box culvert. Muddy water is observed at location WE4 due to the silted water leakage at Luk Tei Tong river.

Appendix D5

Ecological Water Monitoring Results (lab report)

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST SUMMARY ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700022 Date of Issue : 09-07-2009

Client* : Environmental Pioneers & Solutions Limited Date Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 04-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	499	494	1.0	25.3
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		WE1	WE1 Duplicate	WE2	WE2 Duplicate	WE3	WE3 Duplicate		
	Sampling Date/Time		03 July 2009 / 11:35		03 July 2009 / 11:25		03 July 2009 / 10:45			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.1	1.4	2.1	2.3	8.4	8.3		

TEST RESULTS	Sample ID		WE4	WE4 Duplicate	WE5	WE5 Duplicate	WE6	WE6 Duplicate		
	Sampling Date/Time		03 July 2009 / 11:10		03 July 2009 / 12:05		03 July 2009 / 11:50			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	16.2	17.2	7.1	7.5	< 1.0	< 1.0		

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : Location M1 & WE3 and Location M3 & WE4 are the same location.

----- End -----

Tested By : K.L. Fong

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090700242 Date of Issue : 29-07-2009

Client* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 10-07-2009

GCE Serial No. : WQM072009 Sampling Date* : 03-07-2009 / 11:35 Sample Type* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.* : WE1

Descripption : River Water

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	--
Odour		APHA 20ed 2150 B	Odour Characteristics : --
			Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C		APHA 20ed 4500-H^+ B	--
Colour	TCU	APHA 20ed 2120 B	--
Turbidity	NTU	APHA 20ed 2130 B	--
Conductivity at 25°C	µS/cm	APHA 20ed 2510 B	--
Salinity	g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH_3 D	0.03
		APHA 20ed 4500-NH_3 E	--
		APHA 18ed 4500-NH_3 C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO_3^- E	0.09
Phosphorus	mg/L	APHA 20ed 4500-P D	0.04
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	2
Chemical Oxygen Demand (COD)	mg/L	APHA 20ed 5220 D	--
Total Suspended Solid	mg/L	APHA 20ed 2540 D	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 July 2009.

REMARKS : Sample Location WE1.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090700250 Date of Issue : 29-07-2009

Client* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 10-07-2009

GCE Serial No. : WQM072009 Sampling Date* : 03-07-2009 / 11:35 Sample Type* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.* : WE1 Duplicate

Descripption : River Water

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	--
Odour		APHA 20ed 2150 B	Odour Characteristics : --
			Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C		APHA 20ed 4500-H^+ B	--
Colour	TCU	APHA 20ed 2120 B	--
Turbidity	NTU	APHA 20ed 2130 B	--
Conductivity at 25°C	µS/cm	APHA 20ed 2510 B	--
Salinity	g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH_3 D	0.02
		APHA 20ed 4500-NH_3 E	--
		APHA 18ed 4500-NH_3 C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO_3^- E	0.09
Phosphorus	mg/L	APHA 20ed 4500-P D	0.04
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	2
Chemical Oxygen Demand (COD)	mg/L	APHA 20ed 5220 D	--
Total Suspended Solid	mg/L	APHA 20ed 2540 D	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 July 2009.

REMARKS : Sample Location WE1.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090700268 Date of Issue : 29-07-2009

Client* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 10-07-2009

GCE Serial No. : WQM072009 Sampling Date* : 03-07-2009 / 11:25 Sample Type* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.* : WE2

Descripption : River Water

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	--
Odour		APHA 20ed 2150 B	Odour Characteristics : --
			Threshold Odour Number (TON) : --
pH Value at temperature [	] °C	APHA 20ed 4500-H^+ B	--
Colour	TCU	APHA 20ed 2120 B	--
Turbidity	NTU	APHA 20ed 2130 B	--
Conductivity at 25°C	µS/cm	APHA 20ed 2510 B	--
Salinity	g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH_3 D	0.14
		APHA 20ed 4500-NH_3 E	--
		APHA 18ed 4500-NH_3 C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO_3^- E	0.14
Phosphorus	mg/L	APHA 20ed 4500-P D	0.06
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	2
Chemical Oxygen Demand (COD)	mg/L	APHA 20ed 5220 D	--
Total Suspended Solid	mg/L	APHA 20ed 2540 D	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 July 2009.

REMARKS : Sample Location WE2.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090700276 Date of Issue : 29-07-2009

Client* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 10-07-2009

GCE Serial No. : WQM072009 Sampling Date* : 03-07-2009 / 11:25 Sample Type* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.* : WE2 Duplicate

Descripption : River Water

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	--
Odour		APHA 20ed 2150 B	Odour Characteristics : --
			Threshold Odour Number (TON) : --
pH Value at temperature [	] °C	APHA 20ed 4500-H^+ B	--
Colour	TCU	APHA 20ed 2120 B	--
Turbidity	NTU	APHA 20ed 2130 B	--
Conductivity at 25°C	µS/cm	APHA 20ed 2510 B	--
Salinity	g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH_3 D	0.15
		APHA 20ed 4500-NH_3 E	--
		APHA 18ed 4500-NH_3 C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO_3^- E	0.14
Phosphorus	mg/L	APHA 20ed 4500-P D	0.07
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	2
Chemical Oxygen Demand (COD)	mg/L	APHA 20ed 5220 D	--
Total Suspended Solid	mg/L	APHA 20ed 2540 D	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 July 2009.

REMARKS : Sample Location WE2.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090700284 Date of Issue : 29-07-2009

Client* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 10-07-2009

GCE Serial No. : WQM072009 Sampling Date* : 03-07-2009 / 10:45 Sample Type* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.* : WE3

Descripption : River Water

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	--
Odour		APHA 20ed 2150 B	Odour Characteristics : --
			Threshold Odour Number (TON) : --
pH Value at temperature [	] °C	APHA 20ed 4500-H^+ B	--
Colour	TCU	APHA 20ed 2120 B	--
Turbidity	NTU	APHA 20ed 2130 B	--
Conductivity at 25°C	µS/cm	APHA 20ed 2510 B	--
Salinity	g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH_3 D	0.17
		APHA 20ed 4500-NH_3 E	--
		APHA 18ed 4500-NH_3 C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO_3^- E	0.14
Phosphorus	mg/L	APHA 20ed 4500-P D	0.1
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	2
Chemical Oxygen Demand (COD)	mg/L	APHA 20ed 5220 D	--
Total Suspended Solid	mg/L	APHA 20ed 2540 D	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 July 2009.

REMARKS : Sample Location WE3.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090700292 Date of Issue : 29-07-2009

Client* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 10-07-2009

GCE Serial No. : WQM072009 Sampling Date* : 03-07-2009 / 10:45 Sample Type* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.* : WE3 Duplicate

Descripption : River Water

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	--
Odour		APHA 20ed 2150 B	Odour Characteristics : --
			Threshold Odour Number (TON) : --
pH Value at temperature [ ]	°C	APHA 20ed 4500-H^+ B	--
Colour	TCU	APHA 20ed 2120 B	--
Turbidity	NTU	APHA 20ed 2130 B	--
Conductivity at 25°C	µS/cm	APHA 20ed 2510 B	--
Salinity	g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH_3 D	0.16
		APHA 20ed 4500-NH_3 E	--
		APHA 18ed 4500-NH_3 C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO_3^- E	0.13
Phosphorus	mg/L	APHA 20ed 4500-P D	0.10
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	2
Chemical Oxygen Demand (COD)	mg/L	APHA 20ed 5220 D	--
Total Suspended Solid	mg/L	APHA 20ed 2540 D	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 July 2009.

REMARKS : Sample Location WE3.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090700307 Date of Issue : 29-07-2009

Client* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 10-07-2009

GCE Serial No. : WQM072009 Sampling Date* : 03-07-2009 / 11:10 Sample Type* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.* : WE4

Descripption : River Water

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	--
Odour		APHA 20ed 2150 B	Odour Characteristics : --
			Threshold Odour Number (TON) : --
pH Value at temperature [	] °C	APHA 20ed 4500-H^+ B	--
Colour	TCU	APHA 20ed 2120 B	--
Turbidity	NTU	APHA 20ed 2130 B	--
Conductivity at 25°C	µS/cm	APHA 20ed 2510 B	--
Salinity	g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH_3 D	0.27
		APHA 20ed 4500-NH_3 E	--
		APHA 18ed 4500-NH_3 C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO_3^- E	0.36
Phosphorus	mg/L	APHA 20ed 4500-P D	0.15
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	2
Chemical Oxygen Demand (COD)	mg/L	APHA 20ed 5220 D	--
Total Suspended Solid	mg/L	APHA 20ed 2540 D	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 July 2009.

REMARKS : Sample Location WE4.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090700315 Date of Issue : 29-07-2009

Client* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 10-07-2009

GCE Serial No. : WQM072009 Sampling Date* : 03-07-2009 / 11:10 Sample Type* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.* : WE4 Duplicate

Descripption : River Water

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	--
Odour		APHA 20ed 2150 B	Odour Characteristics : --
			Threshold Odour Number (TON) : --
pH Value at temperature [	] °C	APHA 20ed 4500-H^+ B	--
Colour	TCU	APHA 20ed 2120 B	--
Turbidity	NTU	APHA 20ed 2130 B	--
Conductivity at 25°C	µS/cm	APHA 20ed 2510 B	--
Salinity	g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH_3 D	0.26
		APHA 20ed 4500-NH_3 E	--
		APHA 18ed 4500-NH_3 C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO_3^- E	0.35
Phosphorus	mg/L	APHA 20ed 4500-P D	0.14
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	2
Chemical Oxygen Demand (COD)	mg/L	APHA 20ed 5220 D	--
Total Suspended Solid	mg/L	APHA 20ed 2540 D	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 July 2009.

REMARKS : Sample Location WE4.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090700323 Date of Issue : 29-07-2009

Client* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 10-07-2009

GCE Serial No. : WQM072009 Sampling Date* : 03-07-2009 / 12:05 Sample Type* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.* : WE5

Descripption : River Water

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	--
Odour		APHA 20ed 2150 B	Odour Characteristics : --
			Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C		APHA 20ed 4500-H^+ B	--
Colour	TCU	APHA 20ed 2120 B	--
Turbidity	NTU	APHA 20ed 2130 B	--
Conductivity at 25°C	µS/cm	APHA 20ed 2510 B	--
Salinity	g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH_3 D	0.86
		APHA 20ed 4500-NH_3 E	--
		APHA 18ed 4500-NH_3 C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO_3^- E	0.06
Phosphorus	mg/L	APHA 20ed 4500-P D	0.29
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	3
Chemical Oxygen Demand (COD)	mg/L	APHA 20ed 5220 D	--
Total Suspended Solid	mg/L	APHA 20ed 2540 D	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 July 2009.

REMARKS : Sample Location WE5.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

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TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090700331 Date of Issue : 29-07-2009

Client* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 10-07-2009

GCE Serial No. : WQM072009 Sampling Date* : 03-07-2009 / 12:05 Sample Type* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.* : WE5 Duplicate

Descripption : River Water

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	--
Odour		APHA 20ed 2150 B	Odour Characteristics : --
			Threshold Odour Number (TON) : --
pH Value at temperature [	] °C	APHA 20ed 4500-H^+ B	--
Colour	TCU	APHA 20ed 2120 B	--
Turbidity	NTU	APHA 20ed 2130 B	--
Conductivity at 25°C	µS/cm	APHA 20ed 2510 B	--
Salinity	g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH_3 D	0.87
		APHA 20ed 4500-NH_3 E	--
		APHA 18ed 4500-NH_3 C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO_3^- E	0.07
Phosphorus	mg/L	APHA 20ed 4500-P D	0.30
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	3
Chemical Oxygen Demand (COD)	mg/L	APHA 20ed 5220 D	--
Total Suspended Solid	mg/L	APHA 20ed 2540 D	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 July 2009.

REMARKS : Sample Location WE5.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
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TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090700349 Date of Issue : 29-07-2009

Client* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 10-07-2009

GCE Serial No. : WQM072009 Sampling Date* : 03-07-2009 / 11:50 Sample Type* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.* : WE6

Descripption : River Water

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	--
Odour		APHA 20ed 2150 B	Odour Characteristics : --
			Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C		APHA 20ed 4500-H^+ B	--
Colour	TCU	APHA 20ed 2120 B	--
Turbidity	NTU	APHA 20ed 2130 B	--
Conductivity at 25°C	µS/cm	APHA 20ed 2510 B	--
Salinity	g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH_3 D	0.03
		APHA 20ed 4500-NH_3 E	--
		APHA 18ed 4500-NH_3 C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO_3^- E	0.10
Phosphorus	mg/L	APHA 20ed 4500-P D	0.02
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	2
Chemical Oxygen Demand (COD)	mg/L	APHA 20ed 5220 D	--
Total Suspended Solid	mg/L	APHA 20ed 2540 D	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 July 2009.

REMARKS : Sample Location WE6.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
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TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090700357 Date of Issue : 29-07-2009

Client* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 10-07-2009

GCE Serial No. : WQM072009 Sampling Date* : 03-07-2009 / 11:50 Sample Type* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.* : WE6 Duplicate

Descripption : River Water

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	--
Odour		APHA 20ed 2150 B	Odour Characteristics : --
			Threshold Odour Number (TON) : --
pH Value at temperature [	] °C	APHA 20ed 4500-H^+ B	--
Colour	TCU	APHA 20ed 2120 B	--
Turbidity	NTU	APHA 20ed 2130 B	--
Conductivity at 25°C	µS/cm	APHA 20ed 2510 B	--
Salinity	g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH_3 D	0.03
		APHA 20ed 4500-NH_3 E	--
		APHA 18ed 4500-NH_3 C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO_3^- E	0.10
Phosphorus	mg/L	APHA 20ed 4500-P D	0.02
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	2
Chemical Oxygen Demand (COD)	mg/L	APHA 20ed 5220 D	--
Total Suspended Solid	mg/L	APHA 20ed 2540 D	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 July 2009.

REMARKS : Sample Location WE6.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

Appendix E

Construction Noise Monitoring Data Sheet

大成環境科技拓展有限公司
Environmental Pioneers and Solutions Limited

Construction Noise Monitoring Data Sheet

Monitoring Location		N1	N2
Description of Location		Façade	Façade
Date of Monitoring		6/7/2009	
Measurement Start Time (hhmm)		15:08	13:20
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.7	1.3
Measurement Results	L_{90} (dB(A))	44.7	50.2
	L_{10} (dB(A))	50.6	55.5
	Leq (dB(A))	48.8	53.9
Weather condition:		Sunny	
Major Construction Noise Sourse(s) During Monitoring		no construction works are being carried out during measurement.	1. Excavator noise 2. Construction trucks noise 3. Power generator noise
Other Noise Source(s) During Monitoring			1. Public noise
Remarks			

	Name & Designation	Signature	Date:
Prepared by:	Jimmy Cheng		6/7/2009

大成環境科技拓展有限公司
Environmental Pioneers and Solutions Limited

Construction Noise Monitoring Data Sheet

Monitoring Location		N3	N4
Description of Location		Freefield	Facede
Date of Monitoring		6/7/2009	
Measurement Start Time (hhmm)		13:55	14:30
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		1.4	1.3
Measurement Results	L_{90} (dB(A))	48.8	53.3
	L_{10} (dB(A))	62.4	61.7
	Leq (dB(A))	59.8	57.5
Weather condition:		Sunny	
Major Construction Noise Sourse(s) During Monitoring		1. Excavator noise	no construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise (Bicycles)	1. Public noise
Remarks			

	Name & Designation	Signature	Date:
Prepared by:	Jimmy Cheng		6/7/2009

大成環境科技拓展有限公司
Environmental Pioneers and Solutions Limited

Construction Noise Monitoring Data Sheet

Monitoring Location		N1	N2
Description of Location		Façade	Façade
Date of Monitoring		13/7/2009	
Measurement Start Time (hhmm)		14:45	14:10
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.5	0.7
Measurement Results	L_{90} (dB(A))	45.7	50.7
	L_{10} (dB(A))	51.3	55.0
	Leq (dB(A))	49.6	53.7
Weather condition:		Sunny	
Major Construction Noise Sourse(s) During Monitoring		no construction works are being carried out during measurement.	1. Excavator noise 2. Power generator noise
Other Noise Source(s) During Monitoring			1. Public noise
Remarks			

	Name & Designation	Signature	Date:
Prepared by:	Jimmy Cheng		13/7/2009

大成環境科技拓展有限公司
Environmental Pioneers and Solutions Limited

Construction Noise Monitoring Data Sheet

Monitoring Location		N3	N4
Description of Location		Freefield	Facede
Date of Monitoring		13/7/2009	
Measurement Start Time (hhmm)		13:35	13:00
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		1.1	0.9
Measurement Results	L_{90} (dB(A))	42.5	47.6
	L_{10} (dB(A))	54.9	64.9
	Leq (dB(A))	52.5	60.1
Weather condition:		Sunny	
Major Construction Noise Sourse(s) During Monitoring		no construction works are being carried out during measurement.	no construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise (Bicycles)	1. Public noise
Remarks			

	Name & Designation	Signature	Date:
Prepared by:	Jimmy Cheng		13/7/2009

大成環境科技拓展有限公司
Environmental Pioneers and Solutions Limited

Construction Noise Monitoring Data Sheet

Monitoring Location		N1	N2
Description of Location		Façade	Façade
Date of Monitoring		20/7/2009	
Measurement Start Time (hhmm)		15:03	14:25
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.4	1.3
Measurement Results	L_{90} (dB(A))	46.8	56.4
	L_{10} (dB(A))	52.7	61.4
	Leq (dB(A))	50.4	60.2
Weather condition:		Sunny	
Major Construction Noise Sourse(s) During Monitoring		No construction works are being carried out during measurement.	1. Excavtor noise 2. Power generator noise
Other Noise Source(s) During Monitoring			1. Public noise
Remarks			

	Name & Designation	Signature	Date:
Prepared by:	Jimmy Cheng		20/7/2009

大成環境科技拓展有限公司
Environmental Pioneers and Solutions Limited

Construction Noise Monitoring Data Sheet

Monitoring Location		N3	N4
Description of Location		Freefield	Facede
Date of Monitoring		20/7/2009	
Measurement Start Time (hhmm)		13:15	13:50
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.8	1.1
Measurement Results	L_{90} (dB(A))	49.8	51.7
	L_{10} (dB(A))	62.8	62.3
	Leq (dB(A))	60.7	58.6
Weather condition:		Sunny	
Major Construction Noise Sourse(s) During Monitoring		No construction works are being carried out during measurement.	No construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise (Bicycle) 3. Dog barking noise	1. Public noise
Remarks			

	Name & Designation	Signature	Date:
Prepared by:	Jimmy Cheng		20/7/2009

大成環境科技拓展有限公司
Environmental Pioneers and Solutions Limited

Construction Noise Monitoring Data Sheet

Monitoring Location		N1	N2
Description of Location		Façade	Façade
Date of Monitoring		27/072009	
Measurement Start Time (hhmm)		14:45	14:10
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.3	1.1
Measurement Results	L_{90} (dB(A))	46.8	58.2
	L_{10} (dB(A))	52.7	61.0
	Leq (dB(A))	50.4	60.0
Weather condition:		Cloudy	
Major Construction Noise Sourse(s) During Monitoring		No construction works are being carried out during measurement.	1. Excavator noise 2. Power generator noise 3. Concrete curing noise
Other Noise Source(s) During Monitoring			1. Public noise
Remarks			

	Name & Designation	Signature	Date:
Prepared by:	Jimmy Cheng		27/7/2009

大成環境科技拓展有限公司
Environmental Pioneers and Solutions Limited

Construction Noise Monitoring Data Sheet

Monitoring Location		N3	N4
Description of Location		Freefield	Facede
Date of Monitoring		27/7/2009	
Measurement Start Time (hhmm)		13:00	13:35
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.4	0.8
Measurement Results	L_{90} (dB(A))	42.5	49.1
	L_{10} (dB(A))	56.7	66.7
	Leq (dB(A))	54.8	62.2
Weather condition:		Cloudy	
Major Construction Noise Sourse(s) During Monitoring		No construction works are being carried out during measurement.	No construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise (Bicycle)	1. Public noise 2. Dog barking noise
Remarks			

	Name & Designation	Signature	Date:
Prepared by:	Jimmy Cheng		27/7/2009

Appendix F1

Water Quality
Monitoring Data Sheet

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 2/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1110			1115			1123			1130			1140			1150			1205		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			< 1			< 1			< 1			< 1		
pH value	5.97			6.19			6.67			7.24			7.29			6.51			6.67		
Temperature (oC)	28.2			29.0			30.2			30.4			28.2			29.1			30.1		
Salinity (ppt)	0.0			0.0			2.9			3.8			0.0			0.0			0.2		
Turbidity (NTU)	1.3	1.4	Average 1.4	0.0	0.0	Average 0.0	11.8	12.0	Average 11.9	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	2.4	2.5	Average 2.5
DO (mg/l)	8.23	8.21	Average 8.22	7.52	7.51	Average 7.52	6.25	6.26	Average 6.26	7.48	7.46	Average 7.47	7.37	7.37	Average 7.37	7.47	7.45	Average 7.46	5.08	5.06	Average 5.07
DO Saturation (%)	106	106	Average 106	99	99	Average 99	84	84	Average 84	102	102	Average 102	95	95	Average 95	98	98	Average 98	67	67	Average 67

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		2/7/2009

remark or observation:

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 3/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1045			1055			1110			1035			1135			1140			1158		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	Muddy			normal			Muddy			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			< 1			< 1			< 1			< 1		
pH value	7.47			6.79			6.75			7.32			6.74			6.46			6.43		
Temperature (oC)	27.5			27.9			28.6			28.5			27.6			27.6			28.2		
Salinity (ppt)	0.1			0.0			4.2			3.6			0.0			0.0			0.1		
Turbidity (NTU)	17.2	17.2	Average 17.2	0.0	0.0	Average 0.0	17.9	17.9	Average 17.9	0.4	0.4	Average 0.4	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0
DO (mg/l)	7.93	7.93	Average 7.93	7.64	7.64	Average 7.64	7.01	7.01	Average 7.01	7.90	7.89	Average 7.90	7.58	7.58	Average 7.58	7.87	7.87	Average 7.87	6.72	6.72	Average 6.72
DO Saturation (%)	102	102	Average 102	99	99	Average 99	93	93	Average 93	105	105	Average 105	97	97	Average 97	101	101	Average 101	87	87	Average 87

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		3/7/2009

remark or observation: M1 - Direct discharge of site water from site retaining wall D without proper treatment. M3- Site run-off from gabion wall site nearby mangrove area

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 4/7/2009 Cloudy

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1110						1120						1140						1130		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.1			< 1			< 1			< 1		
pH value	7.05						6.73						6.83						6.80		
Temperature (oC)	26.4						26.9						26.6						26.8		
Salinity (ppt)	0.4						4.5						0.0						0.3		
Turbidity (NTU)	7.8	7.8	Average 7.8			Average #DIV/0!	12.3	12.3	Average 12.3			Average #DIV/0!	0.0	0.0	Average 0.0			Average #DIV/0!	1.0	1.0	Average 1.0
DO (mg/l)	7.28	7.28	Average 7.28			Average #DIV/0!	4.79	4.79	Average 4.79			Average #DIV/0!	7.24	7.24	Average 7.24			Average #DIV/0!	5.76	5.76	Average 5.76
DO Saturation (%)	91	91	Average 91			Average #DIV/0!	62	62	Average 62			Average #DIV/0!	90	90	Average 90			Average #DIV/0!	71	71	Average 71

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		4/7/2009

remark or observation: The reading of DO of location M3 is lower than the DO action level due to the raining before taking water sample.

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 6/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1215			1205			1200			1225			1305			1315			1150		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	Muddy			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.1			< 1			< 1			< 1		
pH value	6.76			7.21			6.85			6.83			6.79			6.93			6.59		
Temperature (oC)	27.2			26.9			27.5			27.6			26.4			27.2			27.5		
Salinity (ppt)	0.0			0.0			1.2			0.3			0.0			0.0			0.1		
Turbidity (NTU)	35.7	35.7	Average 35.7	0.0	0.0	Average 0.0	15.1	15.1	Average 15.1	14.2	14.2	Average 14.2	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	2.3	2.3	Average 2.3
DO (mg/l)	7.61	7.61	Average 7.61	7.97	7.97	Average 7.97	6.89	6.89	Average 6.89	7.54	7.54	Average 7.54	7.37	7.37	Average 7.37	7.12	7.12	Average 7.12	5.42	5.42	Average 5.42
DO Saturation (%)	96	96	Average 96	99	99	Average 99	87	87	Average 87	96	96	Average 96	94	94	Average 94	91	91	Average 91	69	69	Average 69

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		6/7/2009

remark or observation: Muddy water is observed at location M1 due to the silted water leakage at box culvert.

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: **7/7/2009** Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1255												1245								
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.1			< 1			< 1			< 1		
pH value	6.61												6.87								
Temperature (oC)	28.6												29.1								
Salinity (ppt)	0.2												0.0								
Turbidity (NTU)	17.5	17.5	Average 17.5			Average #DIV/0!			Average #DIV/0!			Average #DIV/0!	0.0	0.0	Average 0.0			Average #DIV/0!			Average #DIV/0!
DO (mg/l)	8.11	8.11	Average 8.11			Average #DIV/0!			Average #DIV/0!			Average #DIV/0!	7.65	7.65	Average 7.65			Average #DIV/0!			Average #DIV/0!
DO Saturation (%)	105	105	Average 105			Average #DIV/0!			Average #DIV/0!			Average #DIV/0!	100	100	Average 100			Average #DIV/0!			Average #DIV/0!

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		7/7/2009

remark or observation: Muddy water is observed at location M1 due to water without desitling properly discharge to the public drain at box culvert.

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 8/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1320			1325			1330			1310			1400			1350			1340		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			< 1			< 1			< 1			< 1		
pH value	7.20			7.03			6.87			6.97			7.12			6.87			7.28		
Temperature (oC)	28.9			29.5			30.7			29.7			29.3			29.6			30.5		
Salinity (ppt)	1.0			0.3			3.3			3.2			0.0			0.0			0.5		
Turbidity (NTU)	1.1	1.1	Average 1.1	0.0	0.0	Average 0.0	3.8	3.8	Average 3.8	2.3	2.3	Average 2.3	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	2.7	2.7	Average 2.7
DO (mg/l)	7.94	7.94	Average 7.94	7.48	7.48	Average 7.48	6.90	6.90	Average 6.90	7.52	7.52	Average 7.52	7.43	7.43	Average 7.43	7.15	7.15	Average 7.15	6.71	6.71	Average 6.71
DO Saturation (%)	104	104	Average 104	98	98	Average 98	94	94	Average 94	101	101	Average 101	98	98	Average 98	96	96	Average 96	91	91	Average 91

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		8/7/2009

remark or observation: _____

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 10/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1425			1430			1440			1415			1445			1455			1505		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			< 1			< 1			< 1			< 1		
pH value	7.35			7.18			6.97			7.08			7.24			6.72			6.96		
Temperature (oC)	30.4			31.0			31.1			31.3			30.3			30.0			31.5		
Salinity (ppt)	1.9			0.5			5.3			6.4			0.0			0.0			1.1		
Turbidity (NTU)	2.3	2.3	Average 2.3	1.3	1.3	Average 1.3	7.2	7.2	Average 7.2	3.3	3.3	Average 3.3	0.0	0.0	Average 0.0	4.3	4.3	Average 4.3	5.7	5.7	Average 5.7
DO (mg/l)	8.08	8.08	Average 8.08	7.41	7.41	Average 7.41	7.42	7.42	Average 7.42	7.65	7.65	Average 7.65	7.35	7.35	Average 7.35	7.37	7.37	Average 7.37	6.37	6.37	Average 6.37
DO Saturation (%)	109	109	Average 109	100	100	Average 100	103	103	Average 103	108	108	Average 108	98	98	Average 98	98	98	Average 98	80	80	Average 80

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		10/7/2009

remark or observation: _____

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 13/7/2009 Suuny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1540			1550			1555			1530			1625			1615			1605		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.1			< 1			< 1			< 1		
pH value	7.09			6.81			6.90			7.13			6.96			6.93			7.27		
Temperature (oC)	30.5			31.1			31.1			31.7			30.7			29.8			29.5		
Salinity (ppt)	0.2			0.0			3.8			5.0			0.0			0.0			0.4		
Turbidity (NTU)	11.8	11.8	Average 11.8	0.0	0.0	Average 0.0	3.7	3.7	Average 3.7	4.7	4.7	Average 4.7	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	2.1	2.1	Average 2.1
DO (mg/l)	7.72	7.72	Average 7.72	7.42	7.42	Average 7.42	7.51	7.51	Average 7.51	7.71	7.71	Average 7.71	7.52	7.52	Average 7.52	7.41	7.41	Average 7.41	6.09	6.09	Average 6.09
DO Saturation (%)	103	103	Average 103	101	101	Average 101	103	103	Average 103	109	109	Average 109	99	99	Average 99	98	98	Average 98	80	80	Average 80

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		13/7/2009

remark or observation:

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 14/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1610			1620			1555			1630			1510			1525			1540		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.2			< 1			< 1			< 1		
pH value	7.31			7.54			7.12			7.28			6.51			6.21			6.51		
Temperature (oC)	30.2			29.4			30.0			30.0			28.0			28.6			28.7		
Salinity (ppt)	1.1			0.2			5.0			4.2			0.0			0.0			0.1		
Turbidity (NTU)	5.3	5.3	Average 5.3	4.4	4.4	Average 4.4	13.7	13.7	Average 13.7	5.4	5.4	Average 5.4	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	7.8	7.8	Average 7.8
DO (mg/l)	7.71	7.71	Average 7.71	7.81	7.81	Average 7.81	7.68	7.68	Average 7.68	8.27	8.27	Average 8.27	7.61	7.61	Average 7.61	8.50	8.50	Average 8.50	5.67	5.67	Average 5.67
DO Saturation (%)	102	102	Average 102	103	103	Average 103	104	104	Average 104	112	112	Average 112	98	98	Average 98	110	110	Average 110	73	73	Average 73

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		14/7/2009

remark or observation: _____

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 15/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1650			1645			1640			1700			1610			1620			1630		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			Muudy			normal			normal			normal			Muddy			normal		
Water Depth (m)	<1			< 1			< 1			1.1			< 1			< 1			< 1		
pH value	6.91			7.45			7.09			7.12			7.01			6.83			6.39		
Temperature (oC)	29.2			30.8			31.4			31.6			29.3			29.3			30.2		
Salinity (ppt)	0.0			0.1			3.4			1.8			0.0			0.0			0.8		
Turbidity (NTU)	2.3	2.3	Average 2.3	186.5	186.5	Average 186.5	6.7	6.7	Average 6.7	5.9	5.9	Average 5.9	0.0	0.0	Average 0.0	45.1	45.1	Average 45.1	3.8	3.8	Average 3.8
DO (mg/l)	7.50	7.50	Average 7.50	7.36	7.36	Average 7.36	8.26	8.26	Average 8.26	8.77	8.77	Average 8.77	7.36	7.36	Average 7.36	7.68	7.68	Average 7.68	6.03	6.03	Average 6.03
DO Saturation (%)	98	98	Average 98	99	99	Average 99	114	114	Average 114	120	120	Average 120	97	97	Average 97	100	100	Average 100	76	76	Average 76

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		15/7/2009

remark or observation: Muddy water is observed at locaion C2 due to the construction works being carried out at point C2 by the HAD. Muddy water is observed at location M2 due to the construction works being carried out beside the point M2 by Yick Hing Construction.

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: **16/7/2009** Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)				1630												1615					
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			Muddy			normal		
Water Depth (m)	<1			< 1			< 1			1.1			< 1			< 1			< 1		
pH value				6.65												6.87					
Temperature (oC)				31.4												29.3					
Salinity (ppt)				0.0												0.0					
Turbidity (NTU)			Average	7.1	7.1	Average			Average			Average			Average	33.5	33.5	Average			Average
			#DIV/0!			7.1			#DIV/0!			#DIV/0!			#DIV/0!			33.5			#DIV/0!
DO (mg/l)			Average	7.68	7.68	Average			Average			Average			Average	7.23	7.23	Average			Average
			#DIV/0!			7.68			#DIV/0!			#DIV/0!			#DIV/0!			7.23			#DIV/0!
DO Saturation (%)			Average	104	104	Average			Average			Average			Average	94	94	Average			Average
			#DIV/0!			104			#DIV/0!			#DIV/0!			#DIV/0!			94			#DIV/0!

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		16/7/2009

remark or observation: Muddy water is observed at location C2 due to the construction works being carried out at location C2 by the HAD construction activity

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 20/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1045			1050			1100			1035			1130			1120			1110		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			Muddy			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			< 1			< 1			< 1			< 1		
pH value	6.79			6.71			6.75			6.91			6.73			6.53			6.95		
Temperature (oC)	28.4			27.6			29.1			27.8			27.4			27.1			29.0		
Salinity (ppt)	0.0			0.0			1.1			0.3			0.0			0.0			0.1		
Turbidity (NTU)	11.5	11.5	Average 11.5	0.0	0.0	Average 0.0	66.0	66.0	Average 66.0	11.1	11.1	Average 11.1	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	1.2	1.2	Average 1.2
DO (mg/l)	7.98	7.98	Average 7.98	7.94	7.94	Average 7.94	6.92	6.92	Average 6.92	7.76	7.76	Average 7.76	7.86	7.86	Average 7.86	7.54	7.54	Average 7.54	5.12	5.12	Average 5.12
DO Saturation (%)	103	103	Average 103	101	101	Average 101	91	91	Average 91	100	100	Average 100	101	101	Average 101	98	98	Average 98	67	67	Average 67

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		20/7/2009

remark or observation: Muddy water was observed generated from the streamlet at the upstream area of LTTR. No construction activities were being carried out during measurement.

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 22/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1255			1250			1245			1305			1215			1225			1235		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			Muddy			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			< 1			< 1			< 1			< 1		
pH value	7.02			7.12			6.91			7.07			6.71			6.74			6.54		
Temperature (oC)	29.1			29.7			30.0			30.5			28.0			28.7			29.7		
Salinity (ppt)	2.2			0.7			5.9			5.1			0.0			0.0			0.8		
Turbidity (NTU)	1.3	1.3	Average 1.3	11.2	11.2	Average 11.2	4.8	4.8	Average 4.8	5.7	5.7	Average 5.7	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	2.4	2.4	Average 2.4
DO (mg/l)	7.84	7.84	Average 7.84	7.35	7.35	Average 7.35	6.55	6.55	Average 6.55	7.11	7.11	Average 7.11	7.84	7.84	Average 7.84	7.78	7.78	Average 7.78	5.86	5.86	Average 5.86
DO Saturation (%)	104	104	Average 104	97	97	Average 97	89	89	Average 89	98	98	Average 98	101	101	Average 101	100	100	Average 100	81	81	Average 81

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		22/7/2009

remark or observation: Muddy water is observed at location M2 due to the construction activities being carried carried out at Tiger House the upper location M2

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 23/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)				1315												1330					
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.1			< 1			< 1			< 1		
pH value				7.18												7.14					
Temperature (oC)				29.7												28.6					
Salinity (ppt)				1.5												0.1					
Turbidity (NTU)			Average #DIV/0!	2.8	2.8	Average 2.8			Average #DIV/0!			Average #DIV/0!			Average #DIV/0!	0.0	0.0	Average 0.0			Average #DIV/0!
DO (mg/l)			Average #DIV/0!	7.27	7.27	Average 7.27			Average #DIV/0!			Average #DIV/0!			Average #DIV/0!	7.62	7.62	Average 7.62			Average #DIV/0!
DO Saturation (%)			Average #DIV/0!	97	97	Average 97			Average #DIV/0!			Average #DIV/0!			Average #DIV/0!	99	99	Average 99			Average #DIV/0!

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		23/7/2009

remark or observation: _____

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 24/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1410			1415			1420			1400			1500			1445			1450		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.1			< 1			< 1			< 1		
pH value	7.26			7.16			7.01			7.19			6.73			6.87			7.12		
Temperature (oC)	28.9			29.0			29.3			29.6			28.7			28.7			29.1		
Salinity (ppt)	2.6			1.1			5.9			9.6			0.0			0.0			0.5		
Turbidity (NTU)	4.2	4.0	Average 4.1	0.0	0.0	Average 0.0	5.0	5.2	Average 5.1	5.4	5.2	Average 5.3	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	2.4	2.2	Average 2.3
DO (mg/l)	7.94	7.92	Average 7.93	9.48	9.50	Average 9.49	7.29	7.27	Average 7.28	6.77	6.75	Average 6.76	7.83	7.83	Average 7.83	7.88	7.86	Average 7.87	5.73	5.71	Average 5.72
DO Saturation (%)	105	105	Average 105	98	98	Average 98	98	98	Average 98	94	94	Average 94	103	103	Average 103	102	102	Average 102	76	76	Average 76

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		24/7/2009

remark or observation: _____

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 27/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1610			1605			1600			1620			1530			1540			1550		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.2			< 1			< 1			< 1		
pH value	6.92			7.34			6.91			7.08			6.68			6.19			6.36		
Temperature (oC)	28.6			28.6			29.3			29.1			28.2			27.9			28.4		
Salinity (ppt)	0.2			0.1			1.8			1.5			0.0			0.0			0.1		
Turbidity (NTU)	5.1	5.1	Average 5.1	0.4	0.4	Average 0.4	7.3	7.3	Average 7.3	5.4	5.4	Average 5.4	0.9	0.9	Average 0.9	0.0	0.0	Average 0.0	4.9	4.9	Average 4.9
DO (mg/l)	7.58	7.58	Average 7.58	7.44	7.44	Average 7.44	6.91	6.91	Average 6.91	7.59	7.59	Average 7.59	7.54	7.54	Average 7.54	7.52	7.52	Average 7.52	5.43	5.43	Average 5.43
DO Saturation (%)	97	97	Average 97	96	96	Average 96	91	91	Average 91	100	100	Average 100	97	97	Average 97	97	97	Average 97	69	69	Average 69

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		27/7/2009

remark or observation: _____

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: **28/7/2009** Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1650			1645			1640			1700			1600			1620			1630		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.2			< 1			< 1			< 1		
pH value	6.98			7.18			6.91			6.96			6.93			6.44			6.63		
Temperature (oC)	29.7			30.1			30.6			30.6			29.1			29.3			30.1		
Salinity (ppt)	0.0			0.1			2.5			1.3			0.0			0.0			0.8		
Turbidity (NTU)	3.1	3.1	Average 3.1	8.7	8.7	Average 8.7	11.8	11.8	Average 11.8	5.8	5.8	Average 5.8	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	6.5	6.5	Average 6.5
DO (mg/l)	7.37	7.37	Average 7.37	7.02	7.02	Average 7.02	6.96	6.96	Average 6.96	7.37	7.37	Average 7.37	7.46	7.46	Average 7.46	7.62	7.62	Average 7.62	7.31	7.31	Average 7.31
DO Saturation (%)	97	97	Average 97	94	94	Average 94	94	94	Average 94	99	99	Average 99	98	98	Average 98	100	100	Average 100	95	95	Average 95

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		28/7/2009

remark or observation: The reading of Turbidity at location M2 exceeded the limit level due to the construction activities being carried out at the bottleneck B of Tai Tei Tong River the Location M2

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 29/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)				1630												1620					
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.1			< 1			< 1			< 1		
pH value				6.87												6.61					
Temperature (oC)				28.6												28.0					
Salinity (ppt)				0.0												0.0					
Turbidity (NTU)			Average	0.0	0.0	Average			Average			Average			Average	0.0	0.0	Average			Average
			#DIV/0!			0.0			#DIV/0!			#DIV/0!			#DIV/0!			0.0			#DIV/0!
DO (mg/l)			Average	7.33	7.33	Average			Average			Average			Average	7.86	7.86	Average			Average
			#DIV/0!			7.33			#DIV/0!			#DIV/0!			#DIV/0!			7.86			#DIV/0!
DO Saturation (%)			Average	96	96	Average			Average			Average			Average	101	101	Average			Average
			#DIV/0!			96			#DIV/0!			#DIV/0!			#DIV/0!			101			#DIV/0!

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		29/7/2009

remark or observation:

Environmental Pioneers & Solutions Limited

Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 31/7/2009 Sunny

Monitoring Location	**M1**			**M2**			**M3**			**M4**			**C1**			**C2**			**C3**		
Time (hhmm)	1040			1050			1100			1110			1140			1130			1120		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.1			< 1			< 1			< 1		
pH value	7.04			6.82			6.96			7.47			6.65			7.31			7.17		
Temperature (oC)	28.9			29.5			30.6			30.9			29.0			29.7			30.7		
Salinity (ppt)	0.0			0.0			2.3			1.7			0.0			0.0			0.3		
Turbidity (NTU)	1.1	1.1	Average 1.1	0.0	0.0	Average 0.0	3.7	3.7	Average 3.7	11.8	11.8	Average 11.8	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	4.1	4.1	Average 4.1
DO (mg/l)	8.14	8.14	Average 8.14	8.03	8.03	Average 8.03	7.85	7.85	Average 7.85	7.69	7.69	Average 7.69	7.72	7.72	Average 7.72	8.11	8.11	Average 8.11	5.60	5.60	Average 5.60
DO Saturation (%)	106	106	Average 106	105	105	Average 105	107	107	Average 107	104	104	Average 104	101	101	Average 101	107	107	Average 107	75	75	Average 75

	Name	**Signature**	**Date**
Prepared By:	**Jimmy Cheng**		31/7/2009

remark or observation: _____

Appendix F2

Water Quality
Monitoring Lab report

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700014 Date of Issue : 09-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 02-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 03-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	499	493	1.2	24.1
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		02 July 2009 / 11:40		02 July 2009 / 11:50		02 July 2009 / 12:05			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	4.6	4.3		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		02 July 2009 / 11:10		02 July 2009 / 11:15		02 July 2009 / 11:23		02 July 2009 / 11:30	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	4.2	4.1	1.5	1.7	10.4	10.1	9.3	9.2

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST SUMMARY ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700022 Date of Issue : 09-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 04-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	499	494	1.0	25.3
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		03 July 2009 / 11:35		03 July 2009 / 11:40		03 July 2009 / 11:58			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	< 1.0	1.1	< 1.0	< 1.0	4.4	4.7		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		03 July 2009 / 10:45		03 July 2009 / 10:55		03 July 2009 / 11:10		03 July 2009 / 10:35	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	8.4	8.3	1.4	1.6	16.2	17.2	5.4	5.5

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : Location M1 & WE3 and Location M3 & WE4 are the same location.

----- End -----

Tested By : K.L. Fong Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700030 Date of Issue : 09-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 04-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 06-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	497	502	-1.0	24.5
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		04 July 2009 / 11:40		--		04 July 2009 / 11:30			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	--	--	4.5	4.3		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		04 July 2009 / 11:10		--		04 July 2009 / 11:20		--	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	5.0	4.9	--	--	12.0	12.1	--	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700098 Date of Issue : 16-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 07-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	492	486	1.2	25.3
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		06 July 2009 / 13:05		06 July 2009 / 13:15		06 July 2009 / 11:50			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.1	1.3	1.5	1.4	3.8	3.8		
TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		06 July 2009 / 12:15		06 July 2009 / 12:05		06 July 2009 / 12:00		06 July 2009 / 12:25	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	15.9	16.1	1.1	1.3	9.5	9.3	6.7	6.3

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700103 Date of Issue : 16-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 07-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 08-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	499	491	1.6	24.0
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		07 July 2009 / 12:55		--		--			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.7	1.9	--	--	--	--		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		07 July 2009 / 12:45		--		--		--	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	10.2	10.4	--	--	--	--	--	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700111 Date of Issue : 16-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 08-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 09-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	497	502	-1.0	22.9
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		08 July 2009 / 14:00		08 July 2009 / 13:50		08 July 2009 / 13:40			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.9	2.1	2.2	2.7	4.2	3.8		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		08 July 2009 / 13:20		08 July 2009 / 13:25		08 July 2009 / 13:30		08 July 2009 / 13:10	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	3.9	3.7	2.0	2.2	11.6	11.2	5.5	5.9

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700129 Date of Issue : 16-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 10-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 11-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	501	495	1.2	23.5
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		10 July 2009 / 14:45		10 July 2009 / 14:55		10 July 2009 / 15:05			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	3.4	3.7	5.7	5.2		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		10 July 2009 / 14:25		10 July 2009 / 14:30		10 July 2009 / 14:40		10 July 2009 / 14:15	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	3.0	2.8	2.2	2.5	9.5	9.5	5.1	5.2

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
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TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700195 Date of Issue : 21-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 13-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 14-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	498	503	-1.0	23.7
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		13 July 2009 / 16:25		13 July 2009 / 16:15		13 July 2009 / 16:05			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	5.6	5.2	< 1.0	< 1.0	6.4	6.7		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		13 July 2009 / 15:40		13 July 2009 / 15:50		13 July 2009 / 15:55		13 July 2009 / 15:30	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	5.7	6.0	2.3	2.6	10.9	10.9	5.5	5.9

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
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TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700200 Date of Issue : 21-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 14-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 15-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	497	501	-0.8	25.0
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		14 July 2009 / 15:10		14 July 2009 / 15:25		14 July 2009 / 15:40			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.1	1.3	< 1.0	< 1.0	6.2	6.5		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		14 July 2009 / 16:10		14 July 2009 / 16:20		14 July 2009 / 15:55		14 July 2009 / 16:30	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	4.1	3.9	2.6	2.5	11.5	10.9	6.3	6.5

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700218 Date of Issue : 21-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 15-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 17-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	502	491	2.2	24.1
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		15 July 2009 / 16:10		15 July 2009 / 16:20		15 July 2009 / 16:30			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	31.2	32.4	9.5	10.0		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		15 July 2009 / 16:50		15 July 2009 / 16:45		15 July 2009 / 16:40		15 July 2009 / 17:00	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	2.5	2.5	122.8	128.4	11.2	11.6	6.1	6.4

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700226 Date of Issue : 21-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 16-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 17-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	502	491	2.2	24.1
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		--		16 July 2009 / 16:15		--			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	--	--	17.8	18.2	--	--		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		--		16 July 2009 / 16:30		--		--	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	--	--	3.7	3.6	--	--	--	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
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TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700365 Date of Issue : 30-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 20-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 21-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	504	496	1.6	24.1
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		20 July 2009 / 11:30		20 July 2009 / 11:20		20 July 2009 / 11:10			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.8	1.9	1.7	1.9	4.0	3.7		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		20 July 2009 / 10:45		20 July 2009 / 10:50		20 July 2009 / 11:00		20 July 2009 / 10:35	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	6.8	6.4	2.3	2.1	45.0	44.6	10.4	10.8

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
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TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700373 Date of Issue : 30-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 22-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 24-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	499	494	1.0	25.3
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		22 July 2009 / 12:15		22 July 2009 / 12:25		22 July 2009 / 12:35			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.3	1.2	< 1.0	< 1.0	2.9	3.3		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		22 July 2009 / 12:55		22 July 2009 / 12:50		22 July 2009 / 12:45		22 July 2009 / 13:05	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	3.7	3.8	9.0	8.9	9.4	9.3	6.5	6.2

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700381 Date of Issue : 30-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 23-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 24-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	499	494	1.0	25.3
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		--		23 July 2009 / 13:30		--			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	--	--	< 1.0	< 1.0	--	--		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		--		23 July 2009 / 13:15		--		--	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	--	--	3.1	3.0	--	--	--	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700399 Date of Issue : 30-07-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 24-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 25-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	505	496	1.8	24.5
			Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514	≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		24 July 2009 / 15:00		24 July 2009 / 14:45		24 July 2009 / 14:30			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	5.1	4.9		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		24 July 2009 / 14:10		24 July 2009 / 14:15		24 July 2009 / 14:20		24 July 2009 / 14:00	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	3.4	3.1	2.8	2.9	10.5	10.9	5.6	5.5

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700412 Date of Issue : 04-08-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 27-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 28-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	505	498	1.4	25.7
Acceptance Criteria			<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		27 July 2009 / 15:30		27 July 2009 / 15:40		27 July 2009 / 15:50			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	2.7	2.6	< 1.0	< 1.0	4.5	4.3		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		27 July 2009 / 16:10		27 July 2009 / 16:05		27 July 2009 / 16:00		27 July 2009 / 16:20	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	4.6	4.6	2.9	2.7	10.9	10.6	6.6	6.4

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

Form No. : WQM/R1 (19-01-2009)

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700420 Date of Issue : 04-08-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 28-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 30-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	502	497	1.0	25.7
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		28 July 2009 / 16:00		28 July 2009 / 16:20		28 July 2009 / 16:30			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	7.0	6.6		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		28 July 2009 / 16:50		28 July 2009 / 16:45		28 July 2009 / 16:40		28 July 2009 / 17:00	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	2.7	2.4	8.2	8.2	11.5	11.2	6.9	7.0

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700438 Date of Issue : 04-08-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 29-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 30-07-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	502	497	1.0	25.7
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		--		29 July 2009 / 16:20		--			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	--	--	1.4	1.5	--	--		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		--		29 July 2009 / 16:30		--		--	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	--	--	2.3	2.5	--	--	--	--

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H. K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090700446 Date of Issue : 04-08-2009

Client* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

Project* : DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 31-07-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 01-08-2009

GCE Serial No. : WQM072009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	498	505	-1.4	25.1
		Acceptance Criteria	<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		31 July 2009 / 11:40		31 July 2009 / 11:30		31 July 2009 / 11:20			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.4	1.2	2.7	2.7	6.2	5.7		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		31 July 2009 / 10:40		31 July 2009 / 10:50		31 July 2009 / 11:00		31 July 2009 / 11:10	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	3.8	4.0	3.0	2.9	11.5	11.2	11.4	11.2

* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks :

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : Chemist

Appendix G

Monitoring Schedule

for July 2009

Environmental Pioneers and Solutions Limited

DC/2006/11 - DRAINAGE IMPROVEMENT IN SOUTHERN LANTAU

Master Schedule of EM&A works in July 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
6/28	6/29	6/30	7/1	7/2	7/3	7/4
				WQM at: 10:30 Site Inspection	WQM, EWQM at: 10:02	additional WQM at: 11:25
7/5	7/6	7/7	7/8	7/9	7/10	7/11
	WQM at: 11:56 Noise monitoring	additional WQM at: 12:50	WQM at: 13:04		WQM at: 14:07 Ecological Survey Site Inspection	
7/12	7/13	7/14	7/15	7/16	7/17	7/18
	WQM at: 15:39 Noise monitoring	WQM at: 16:14	WQM at: 16:56	additional WQM at: 16:20	 Ecological Survey Site Inspection	
7/19	7/20	7/21	7/22	7/23	7/24	7/25
	WQM at: 10:40 Noise monitoring		WQM at: 12:29	additional WQM at: 13:20	WQM at: 14:04 Site Inspection	
7/26	7/27	7/28	7/29	7/30	7/31	8/1
	WQM at: 16:06 Noise monitoring	WQM at: 16:48	additional WQM at: 16:25		WQM at: 10:00 Site Inspection	

Noise Monitoring Locations: Total 4 Locations as N1, N2, N3 and N4

Water Quality Monitoring (WQM) Locations: Total 7 Locations as M1, M2, M3, M4, C1, C2 and C3

Ecological Water Quality Monitoring (EWQM) Locations: Total 6 Locations as WE1, WE2, WE3, WE4, WE5 and WE6

Appendix H Implementation Status of environmental protection / mitigation measures

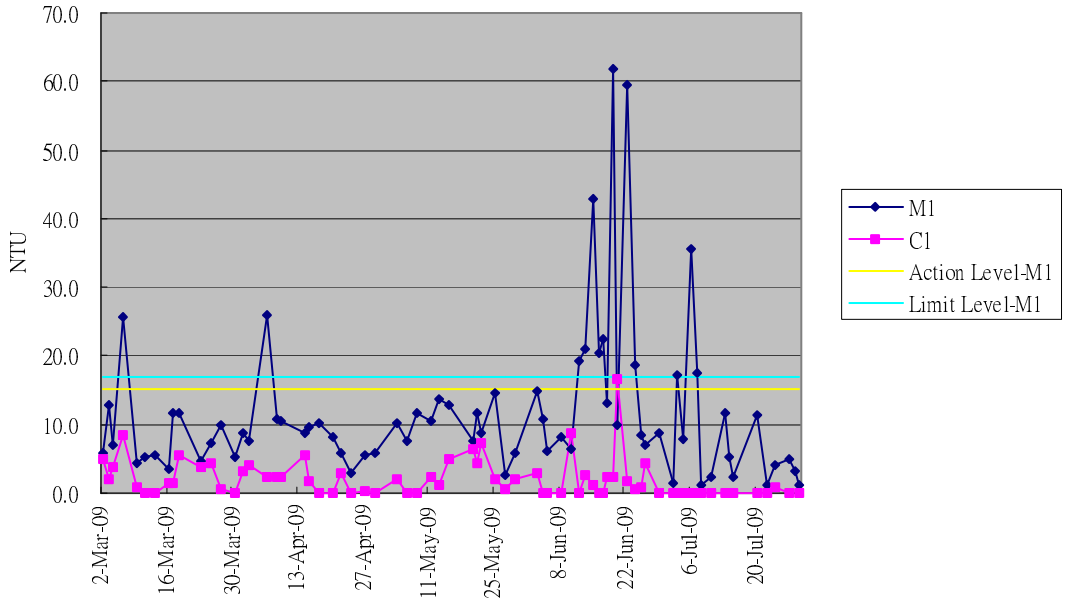
Environmental Aspect	Protection / Mitigation Measures	Implementation status	Follow-up action
Air Quality	Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved road, with complete coverage.	Implemented	
	Use of frequent watering for particular dusty static construction areas and areas close to ASRs.	Implemented	-
	Tarpaulin covering of all dusty vehicle loads transported to and from and between site location;	Implemented	-
	Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.	Defects found on May 09	Ongoing
	Routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.	Implemented	-
Noise	Use of quiet powered mechanical equipment (PME)	Implemented	-
	Adoption of movable noise barriers and temporary noise barriers	Not applicable at this stage	-
	Application of good site practices mentioned in EM&A manual Clause 3.8.1	Implemented	-
Water Quality	Before commencing any site formation works, all sewer and drainage connections should be sealed to prevent debris, soil, sand etc. from entering public sewers/drains.	Defects found on June 09	Ongoing
	Temporary ditches should be provided to facilitate run-off discharge into appropriate watercourses, via a silt retention pond. No site run-off should enter the freshwater marshes at Luk Tei Tong.	Defects found in this reporting month	Ongoing
	Sand/ silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove sand/ silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance.	Defects found in this reporting month	Ongoing
	Water pumped out from foundation excavations should be discharged into silt removal facilities.	Deficiencies found in this reporting month	Ongoing
	During rainstorms, exposed slope surface should be covered by a tarpaulin or the means.	Implemented	-
	Exposed soil areas should be minimized to reduce potential for increased siltation and contamination of runoff.	Implemented	-
	Exposed soil surfaces should be protected by paving or fill material as soon as possible to reduce potential of soil erosion.	Defect found in this month	Follow up actions were taken. Defects were settled on 27 July
	Open stockpiles of construction materials or construction wastes on-site of more than $50m^3$ should be covered with tarpaulin or similar fabric during rainstorms.	Defects found in this reporting month	Ongoing
	Oils and fuels should only be used and stored on designated areas which have pollution prevention facilities.	Implemented	-
	Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site.	Not applicable	-
	The excavation and widening works for the drainage improvements to the Pak Ngan Heung River, Tai Tei Tong River, Luk Tei Tong River and Luk Tei Tong By-pass Channel should be carried out in sections (approximately 300 –400 m in length) and in dry condition.	Implemented	-

Environmental Aspect	Protection / Mitigation Measures	Implementation status	Follow-up action
	Maintenance desilitng of the re-profiled river channels of the Pak Ngan Heung River, Tai Tei Tong River, Luk Tei tong River and Luk Tei Tong By-pass Channel, temporary barrier walls should be used to provide a dry zone for desilitng work.	Not applicable at this stage	-
Ecology	Existing natural habitats should be retained as far as practicable	Implemented	-
	Boundary of working areas should be identified to prevent loss of vegetation	Implemented	
	All existing trees / plant should be well protected within the site or transplanted properly	Implemented	-
	Turf removal from the Luk Tei Tong marsh due to the construction of Luk Tei Tong Bypass Channel shall be minimized	Implemented	
	Turf from the Luk Tei Tong marsh shall be properly removed, stored, maintained and reused for lining the riverbed of the Luk Tei Tong Bypass Channel	Implemented	
Chemical and Solid Waste	Chemical wastes should be properly stored in a proper store as per statutory requirements (i.e. on a hard standing, within an enclosed and locked area)	Implemented	-
	Chemical waste stores should be provided with fire precaution facilities (i.e. fire extinguisher, no smoking warning etc).	Implemented	-
	Chemical wastes should be properly stored in corrosion resistant containers placed inside the store and labelled with warning signs in English and Chinese.	Implemented	-
	Chemical wastes should be disposed of by licensed chemical waste collector with supporting delivery records.	Implemented	-
	All containers for fuel, diesel and fluid chemical (in use) and oil filled stationery plants located with proper drip pans.	Deficiencies found in this reporting month	Ongoing
	Construction wastes should be managed and disposed to the designated public fill and landfill areas in acceptable manner.	Implemented	-
	All waste disposals managed in a proper manner i.e. trip ticket system implementation.	Implemented	-

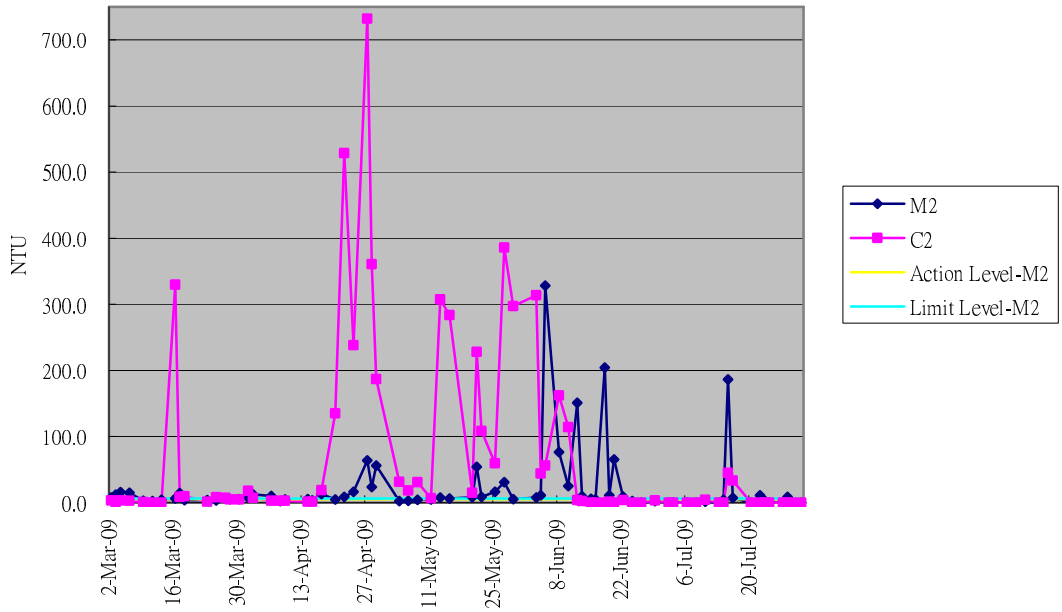
Appendix I

Graphical plot of water quality monitoring results (SS, DO, turbidity)

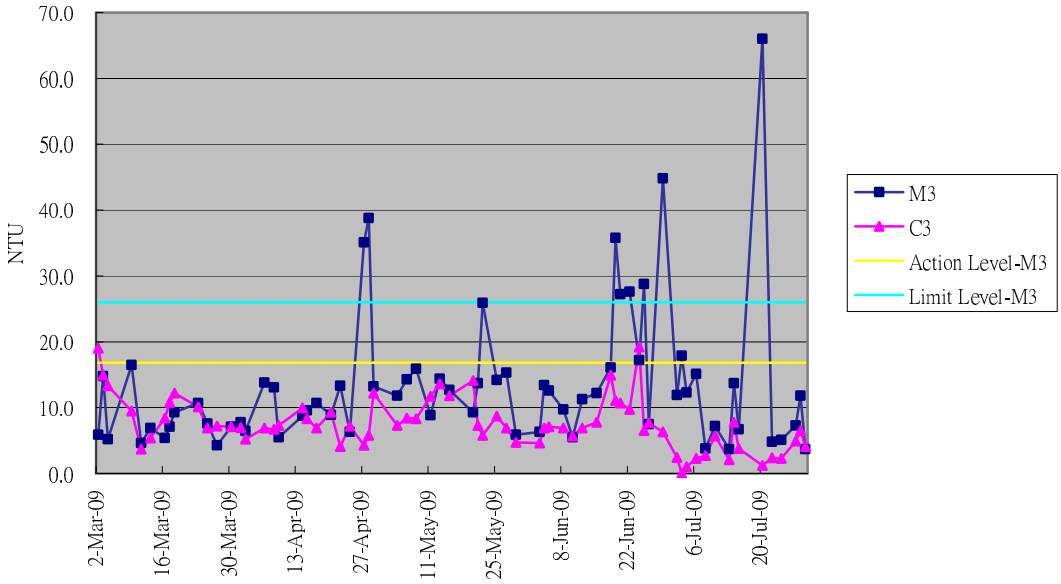
Graphical Plot of Turbidity Trend M1&C1 (Apr - July 09)



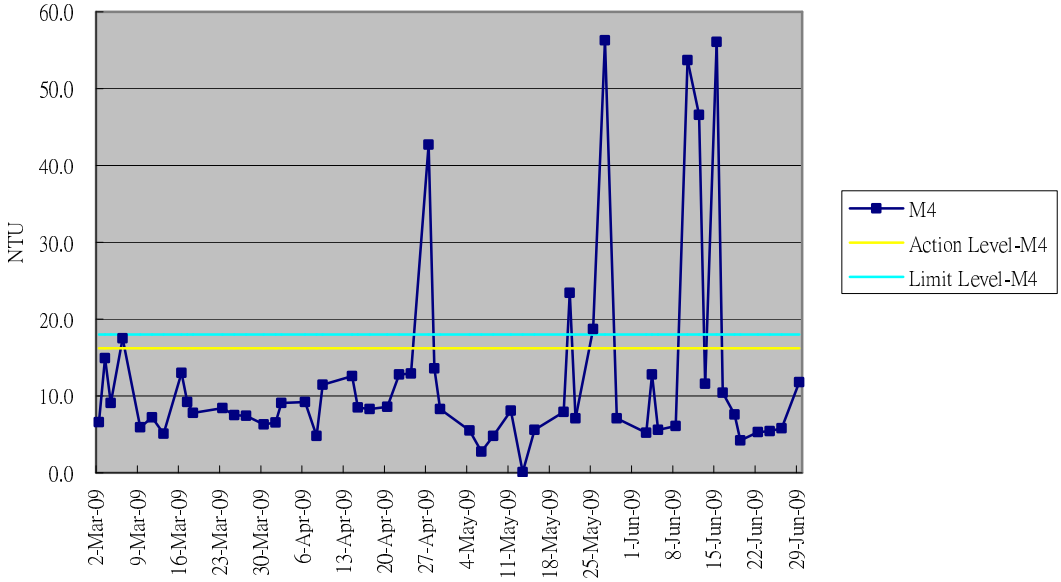
Graphical Plot of Turbidity Trend M2&C2 (Apr - July 09)



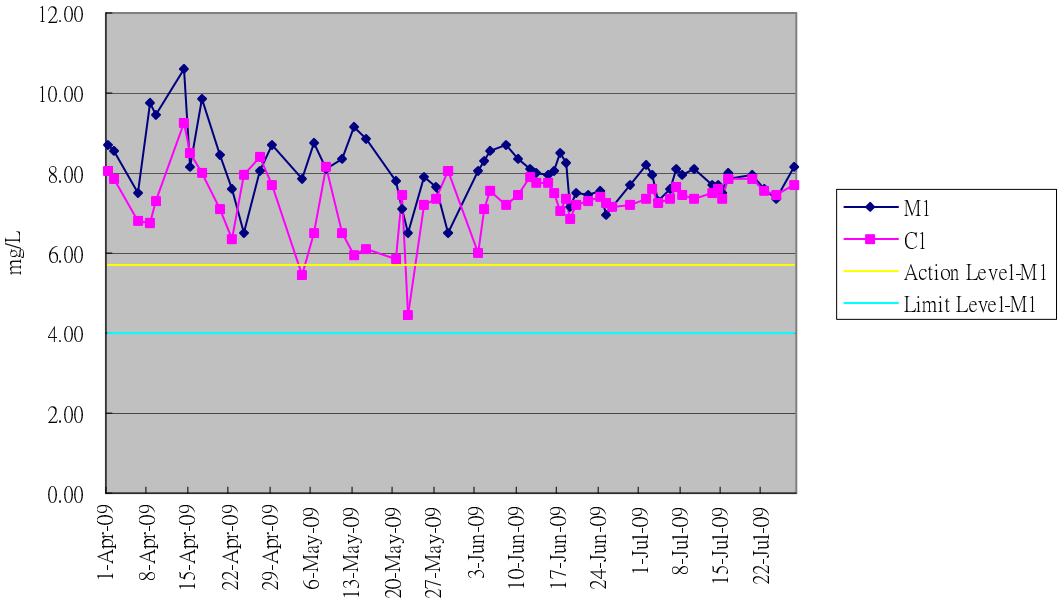
Graphical Plot of Turbidity Trend M3&C3 (Apr - July 09)



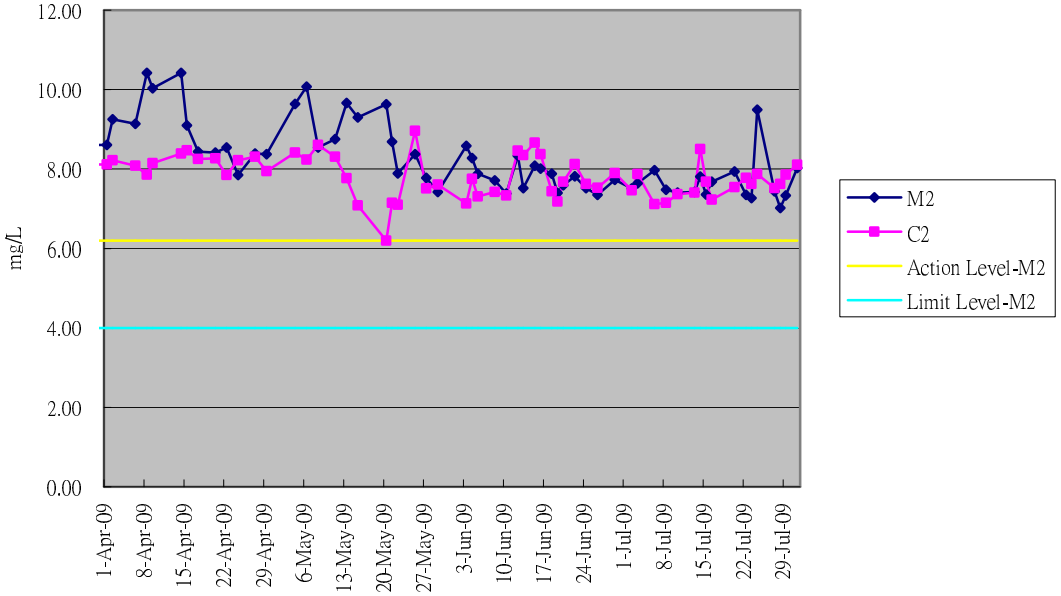
Graphical Plot of Turbidity Trend M4 (Apr - July 09)



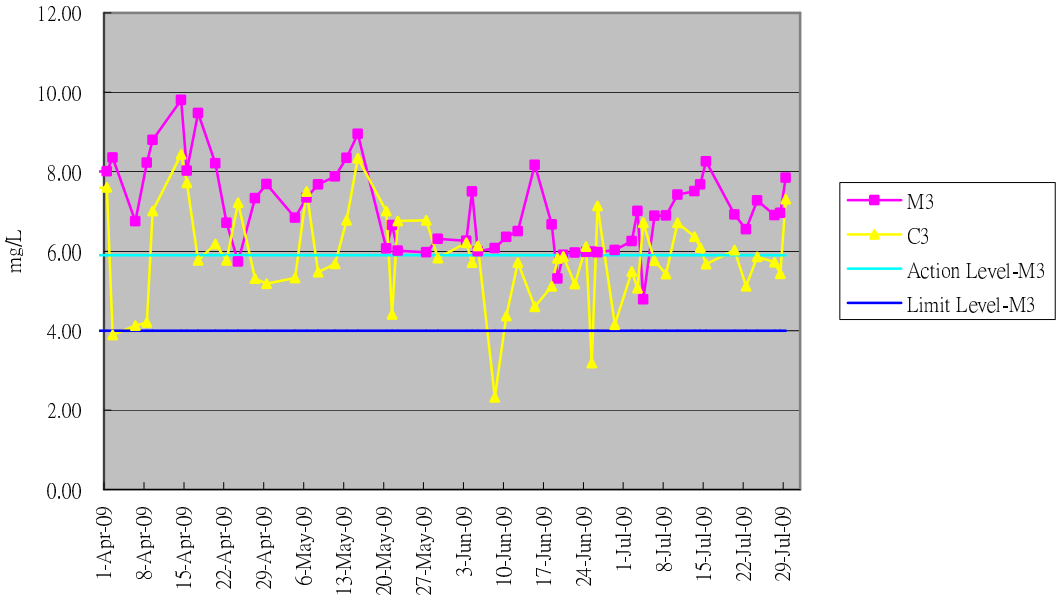
Graphical Plot of Dissolved Oxygen Trend M1&C1 (Apr - July 09)



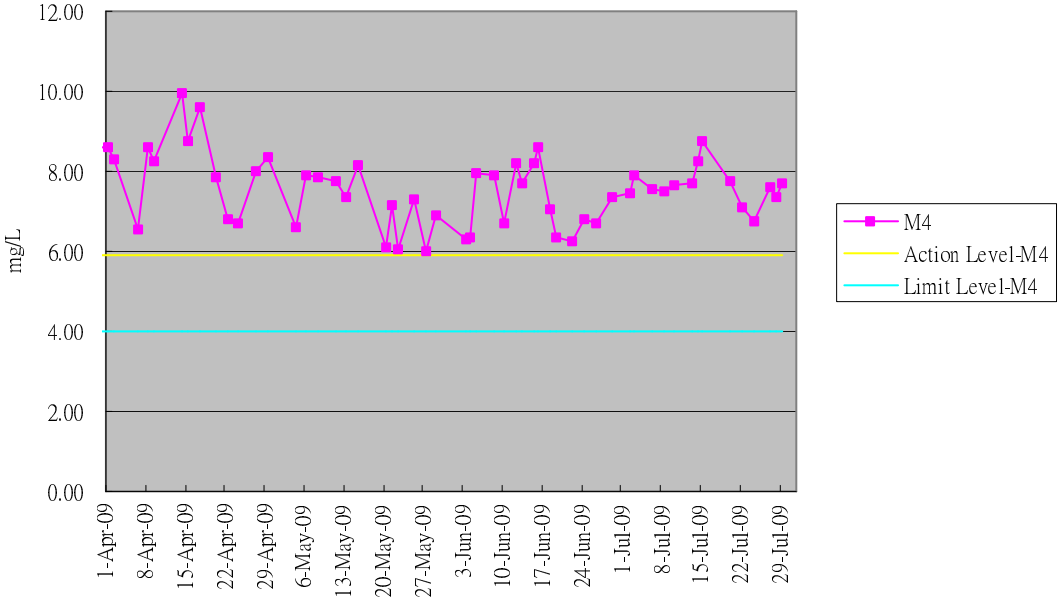
Graphical Plot of Dissolved Oxygen Trend M2&C2 (Apr - July 09)



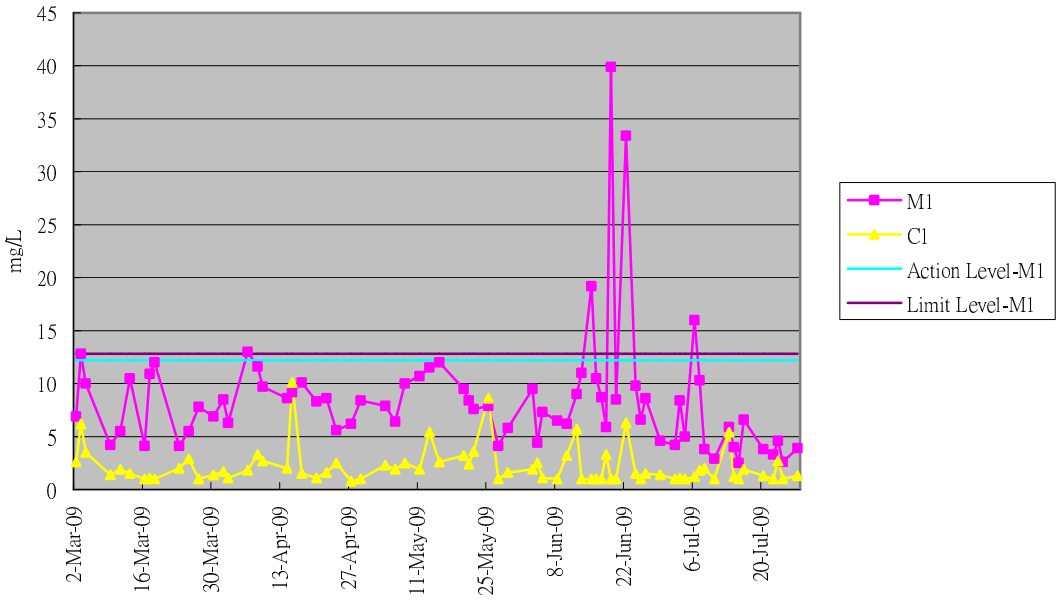
Graphical Plot of Dissolved Oxygen Trend M3&C3 (Apr - July 09)



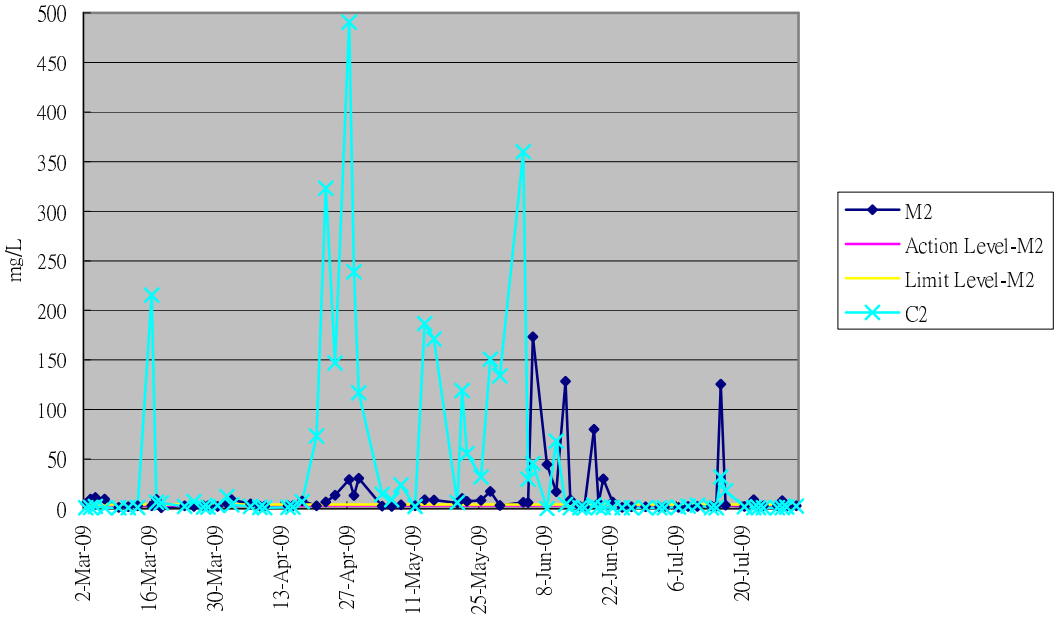
Graphical Plot of Dissolved Oxygen Trend M4 (Apr - July 09)



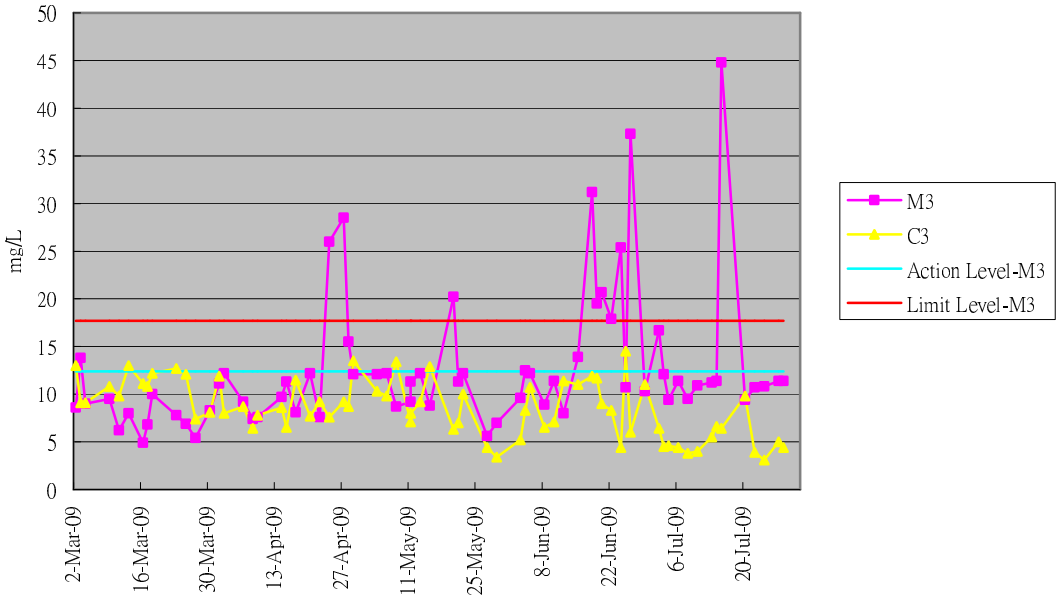
Graphical Plot of Suspended Soild M1&C1 (Apr - July 09)



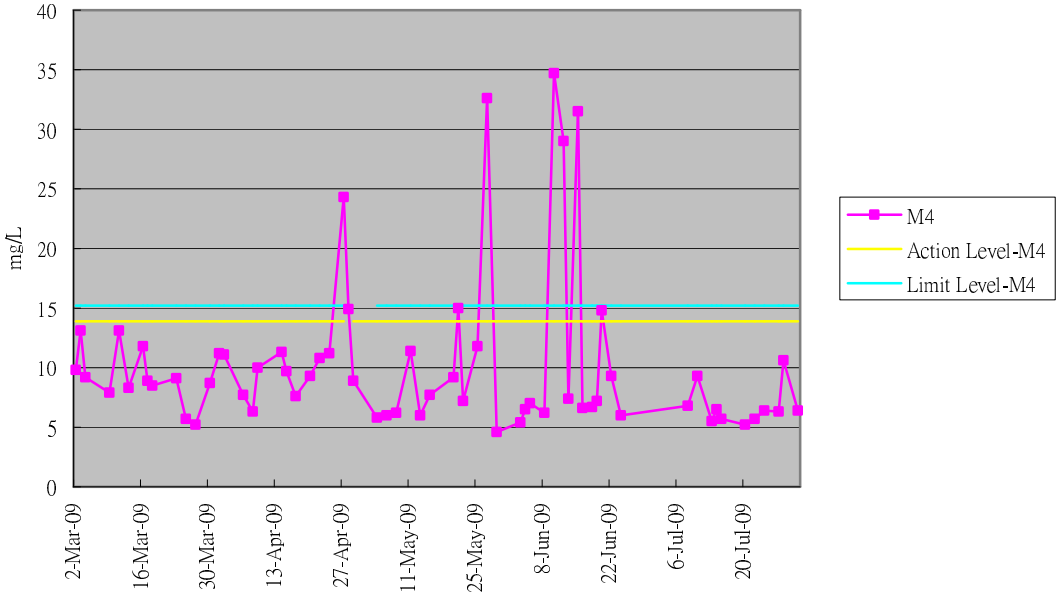
Graphical Plot of Suspended Soild M2&C2 (Apr - July 09)



Graphical Plot of Suspended Soild M3&C3 (Apr - July 09)

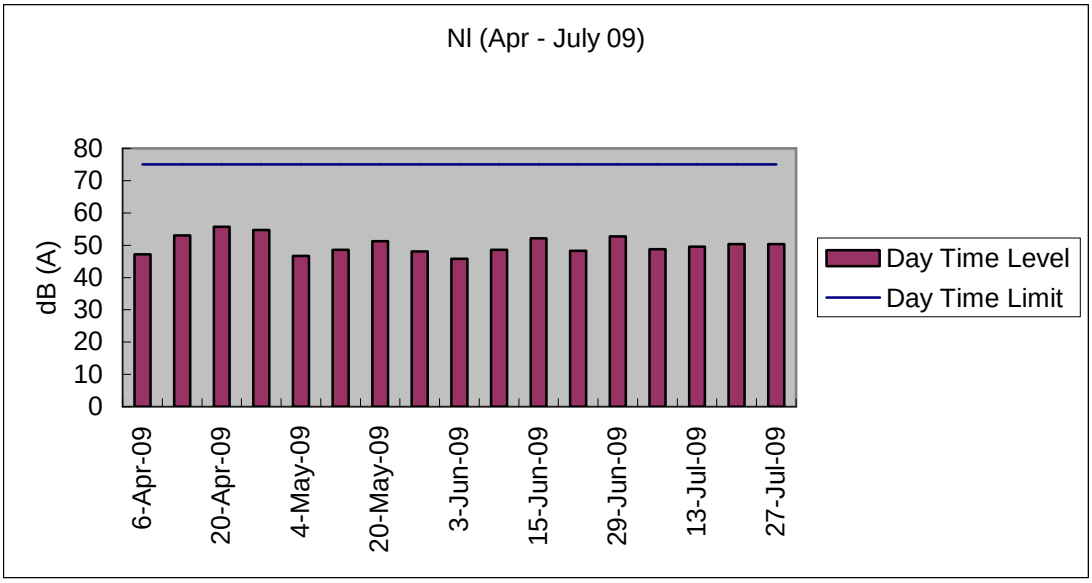


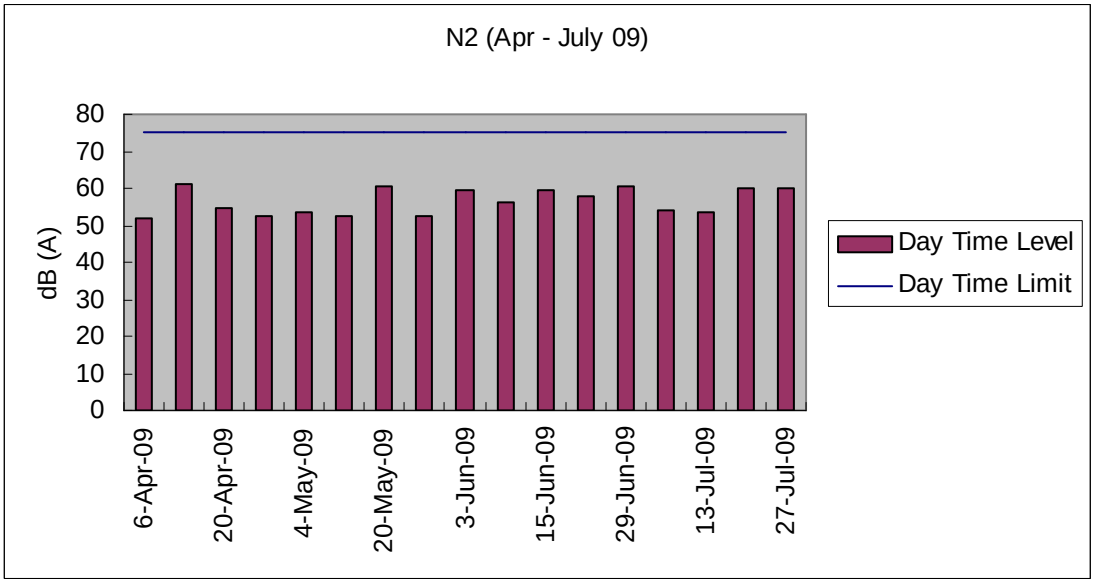
Graphical Plot of Suspended Soild M4 (Apr - July 09)

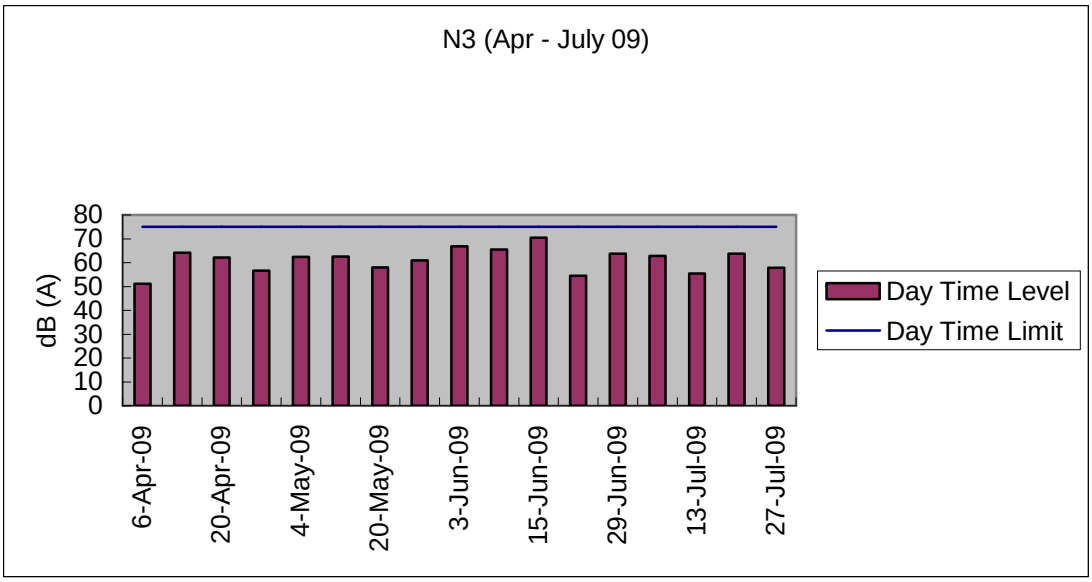


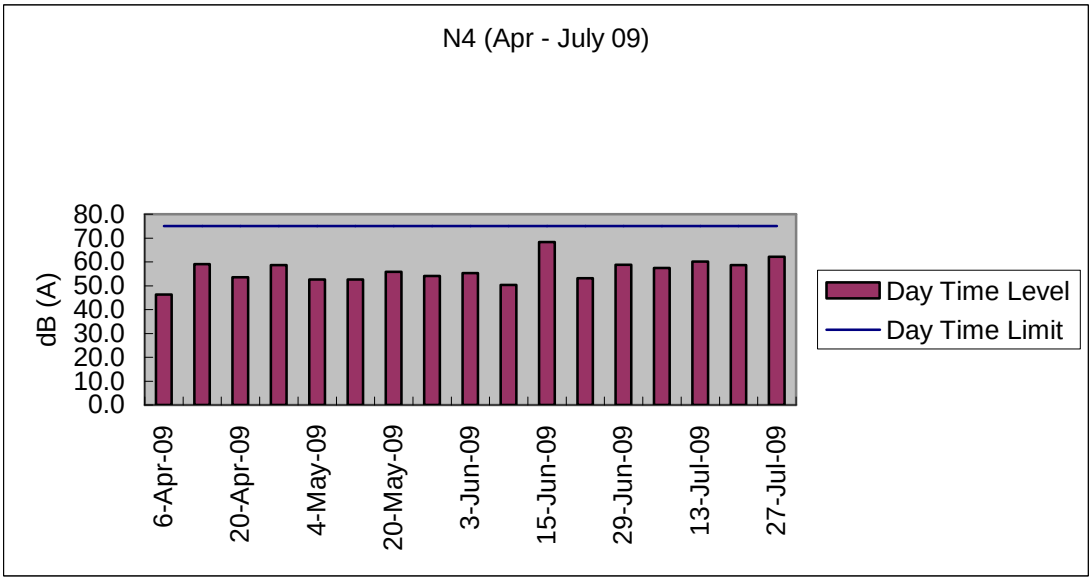
Appendix J

Graphical plot of noise monitoring results


Nl (Apr - July 09)
dB (A)
80
70
60
50
40
30
20
10
0
6-Apr-09
20-Apr-09
4-May-09
20-May-09
3-Jun-09
15-Jun-09
29-Jun-09
13-Jul-09
27-Jul-09
Day Time Level
Day Time Limit


N2 (Apr - July 09)
dB (A)
80
70
60
50
40
30
20
10
0
6-Apr-09
20-Apr-09
4-May-09
20-May-09
3-Jun-09
15-Jun-09
29-Jun-09
13-Jul-09
27-Jul-09
Day Time Level
Day Time Limit


N3 (Apr - July 09)
dB (A)
80
70
60
50
40
30
20
10
0
6-Apr-09
20-Apr-09
4-May-09
20-May-09
3-Jun-09
15-Jun-09
29-Jun-09
13-Jul-09
27-Jul-09
Day Time Level
Day Time Limit


N4 (Apr - July 09)
dB (A)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
6-Apr-09
20-Apr-09
4-May-09
20-May-09
3-Jun-09
15-Jun-09
29-Jun-09
13-Jul-09
27-Jul-09
Day Time Level
Day Time Limit

Appendix K

Ecological Survey Report

for the mangrove area at Luk Tei Tong

Ecological Survey Report for the mangrove area at Luk Tei Tong

Background

In response to the concerns from green groups on the mangrove area to the east of Luk Tei Tong River, contractor took action to install pipes between Luk Tei Tong River and the mangrove area on 25 May 2009 as agreed on a meeting in mid May.

The inlet pipes from Luk Tei Tong River to the mangrove area consist of two sections. The first section is between the mangrove area wetland and the excavation area. The second section is between the excavation area and Luk Tei Tong River.

The inlet pipes would be constructed at a level of 1.7mPD so as to allow water to flow naturally from Luk Tei Tong River during high tide into the wetland.

Meanwhile river water would be pumped into the mangrove areas from the river at high tide. The tidal effects on the mangroves shall be maintained at all times throughout the remaining part of the river works.

A monitoring for the mangrove area was conducted, weekly for one month starting form 27 May 2009 after installation of the twin pipes. Thereafter, the monitoring will be monthly till the completion of gabion wall construction and the original water inlet is reinstated (tentatively by the end of August 2009).

The objectives of the ecological monitoring are to:

- to document the completion installation and proper operation of the temporary twin 400mm pipes
- to document the general health condition of the mangrove community at Luk Tei Tong
- to evaluate reinstatement of the natural tidal flow

Method

Field survey was conducted on 24 July 2009. This is the first monthly monitoring for the concerned mangrove area.

The survey was conducted during low tide period (around 4pm). Photos of the construction site, including the twin inlet pipes and the mangrove communities were taken for documentation. The condition of the pipe was checked, and the health condition of the mangroves were observed and recorded.

Results

The installed inlet pipes were general in fair condition. It was noted that sand bags and part of the bund supporting the end of inlet pipe at Luk Tei Tong River disappeared and probably washed away by recent rainstorms. One pipe outlet was covered by the plastic sheet previously covering the bund (**Photo 1**). During the survey the water level was below the pipe openings, and therefore no water flow between the mangroves and was observed.

The mangrove communities were more exposed during the current survey. Most of the dominant mangrove or mangrove associated species, including *Phragmites australis, Aegiceras corniculatum* and *Acrostichum aureum* were in fair conditions (**Photos 2**). The latter two species had somewhat more yellowing and dry leaves (**Photos 3 and 4**), but no signs of mortality were observed. Mortality of a dominant mangrove associate, *Acanthus ilicifolius*, was prominent especially at the patch near the margin of the northern pond (**Photo 5**), while survival of other *Acanthus* stands appeared to be stabilized (**Photo 6**). A few individuals of another less dominant species, *Kandelia obovata*, also had fallen leaves and appeared dead. Mangrove fauna including mangrove crabs and fishes were observed, and they appeared active during the survey period.

Conclusions and Recommendations

The temporary bunds on the Long Tei River side should be repaired and stabilized in order to support the inlet pipes.

It is anticipated that the gabion installation of this section of Luk Tei Tong River will be completed soon. It is recommended that the new box culvert should be reinstated to its original level. With all temporary bunds removed and the stream bed reinstated to its original condition, it is expected that original tidal exchange pattern could be restored.

The majority of the mangrove plants inside the concerned area were still in good conditions, but partial mortality of a dominant mangrove associate, *Acanthus ilicifolius*, was observed. With the reinstatement of the box culvert, it is expected that these mangrove associate plants would recover gradually after.

The next monthly mangrove monitoring would be conducted in August 2009.

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6