

Drainage Service Department

Monthly Environmental Monitoring & Auditing report for

Contract No.DC/2006/11

Drainage Improvement in Southern Lantau


September 2009

1st Revision

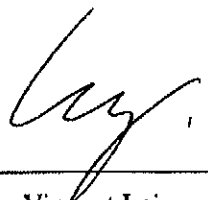
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EXECUTIVE SUMMARY

This is the fourteenth 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 1 September 2009 to 30 September 2009. The major activities in this reporting month include excavation for pipe trench at Ling Tsui Tau, construction of box culverts, retaining wall at Pak Ngan Heung (PNH), construction of retaining wall at Tai Tei Tong (TTT) River and construction of gabion walls as well as retaining wall at Luk Tei Tong (LTT) 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.

A non-compliance event regarding site water management at site retaining wall H of TTT River was recorded on 03 September 2009 during weekly site inspection. Further findings and outcome refer to Section 11.2.

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 83 non-compliance events of water quality criteria were recorded on 2, 3, 7, 9, 11, 14, 16, 18, 21, 23, 24, 28, 29 and 30 September 2009. Exceedances were mainly caused by natural fluctuation and adverse rainy weather.

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 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.

Key construction activity in the coming month will include construction of box culvert and retaining wall at PNH, 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 fourteenth 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.

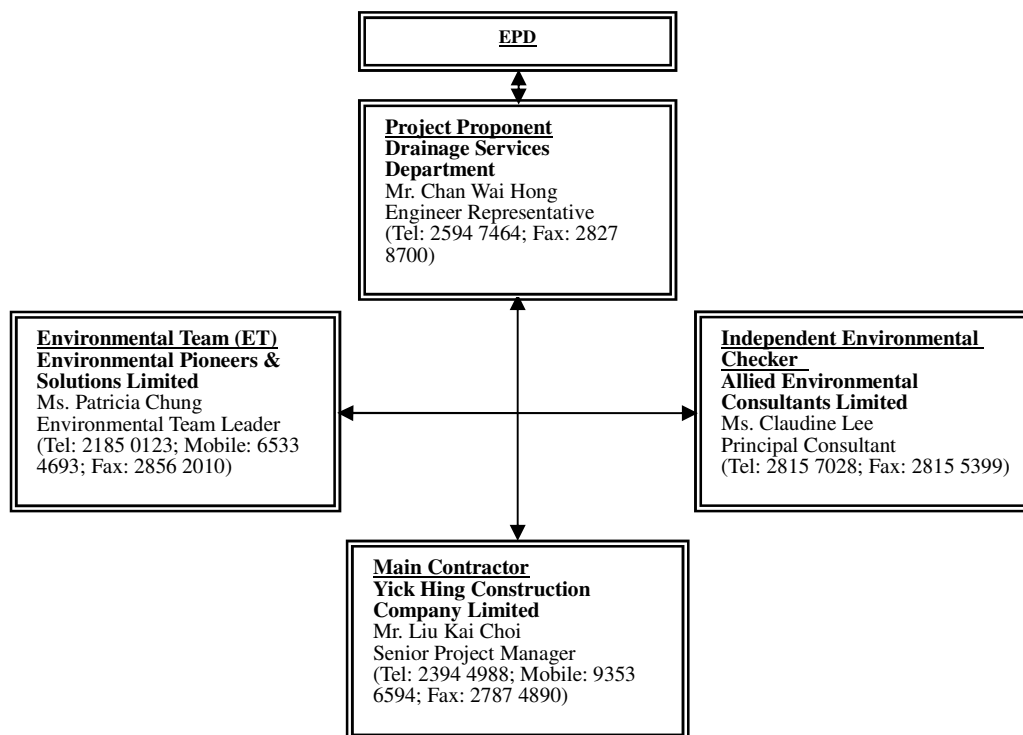


Figure. 2.2.1 Environmental Management structure for the project

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 gabion wall along PNH River;
3. Construction of retaining wall D at PNH River;
4. Construction of box culvert A at LTT
5. Construction of gabion wall at bottleneck B of TTT River;
6. Construction of retaining wall H at TTT River
7. Construction of pipe trench along Ling Tsui Tau;
8. Construction of gabion wall (near Yuen's Compound) at LTT River; and
9. 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. Construction of box culverts BC5 to 8 at PNH;
2. Construction of gabion wall along PNH River;
3. Construction of retaining wall D at PNH River;
4. Construction of gabion wall at bottleneck B of TTT River;
5. Construction of box culvert A at LTT;
6. Construction of pipe trench along Ling Tsui Tau; and
7. 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 were 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.

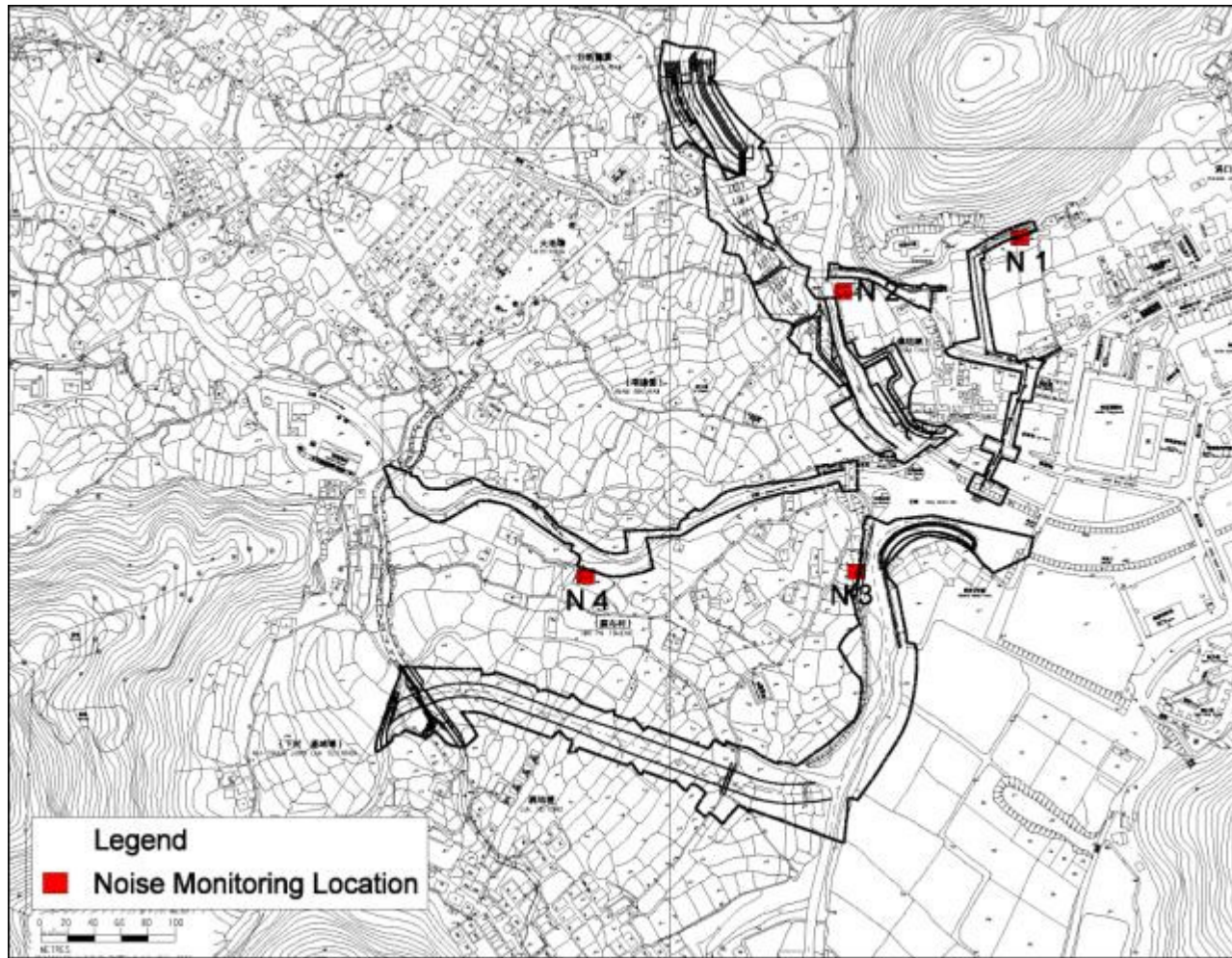


Figure 4.3.1 Impact noise monitoring locations

4.4 Monitoring Results and Interpretation

Relevant details of the noise monitoring results are presented in Table 4.4.1. The results, ranged between 43.8 dB (A) and 62.5 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	07/09/09	14:15	48.7	75	N	Sunny
N1	L _{eq} 30mins	16/09/09	14:10	49.5	75	N	Cloudy
N1	L _{eq} 30mins	21/09/09	14:50	45.3	75	N	Sunny
N1*	L _{eq} 30mins	02/10/09	10:55	43.8	75	N	Sunny
N2	L _{eq} 30mins	07/09/09	13:00	55.9	75	N	Sunny
N2	L _{eq} 30mins	16/09/09	14:45	60.0	75	N	Cloudy
N2	L _{eq} 30mins	21/09/09	14:10	56.2	75	N	Sunny
N2*	L _{eq} 30mins	02/10/09	10:15	54.5	75	N	Sunny
N3**	L _{eq} 30mins	07/09/09	10:45	56.7	75	N	Sunny
N3**	L _{eq} 30mins	16/09/09	13:35	62.5	75	N	Cloudy
N3**	L _{eq} 30mins	21/09/09	10:40	57.1	75	N	Sunny
N3**	L _{eq} 30mins	02/10/09	09:37	48.6	75	N	Sunny
N4	L _{eq} 30mins	07/09/09	11:20	51.3	75	N	Sunny
N4	L _{eq} 30mins	16/09/09	13:00	56.6	75	N	Cloudy
N4	L _{eq} 30mins	21/09/09	11:15	49.8	75	N	Sunny
N4	L _{eq} 30mins	28/09/09	13:30	60.9	75	N	Cloudy

Remarks: Raw datasheet for noise monitoring are attached in Appendix E for reference.

Remark*: Noise monitoring for N1, N2 and N3 was postponed to 2 October 2009 from 28 September due to major breakdown of the sound level meter.

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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IC(E); 2. Implement Noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to 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°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.

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.

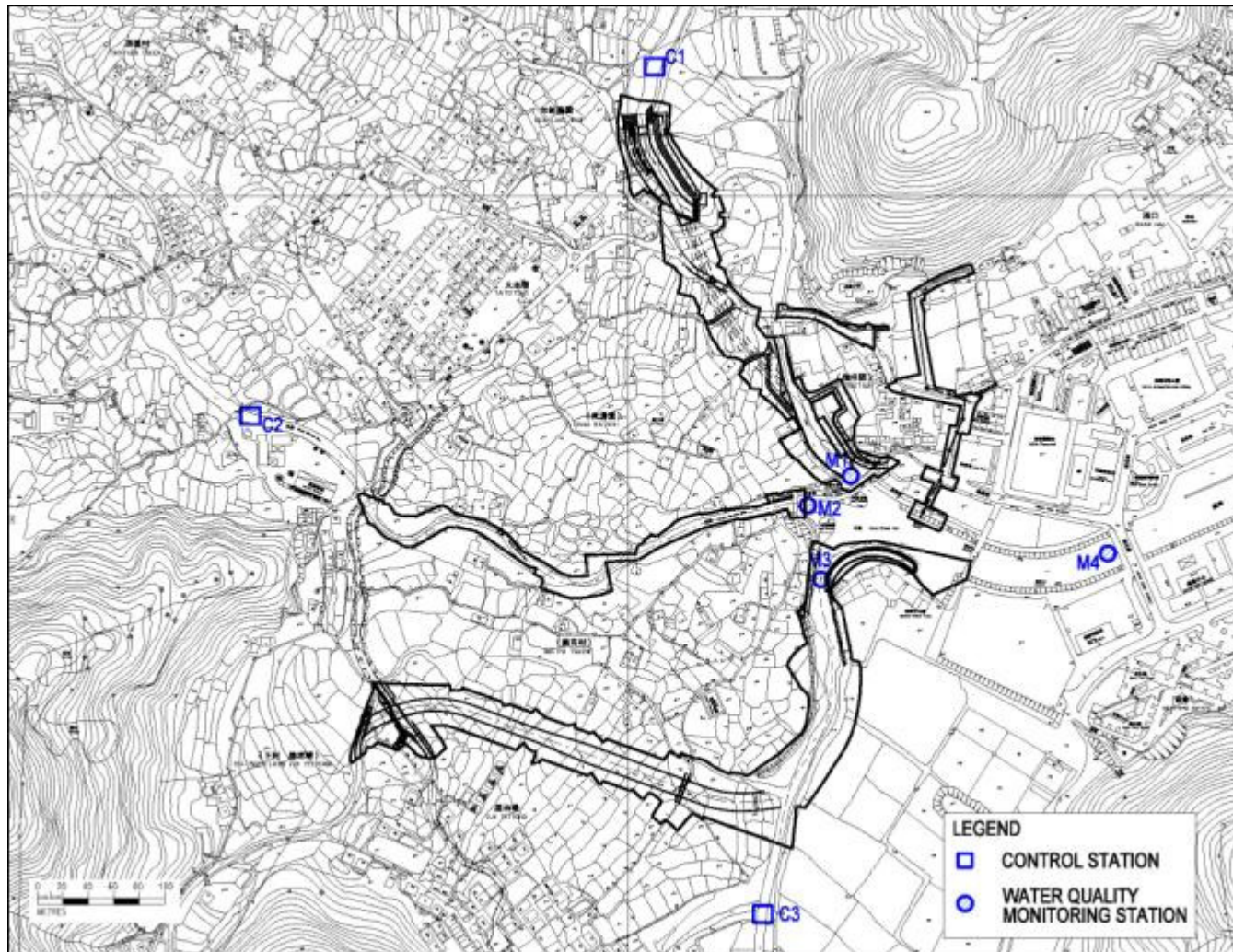


Figure 5.3.1 Water Quality Monitoring Locations

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 fourteen times during September. 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 on 2, 3, 7, 9, 11, 14, 16, 18, 21, 23, 24, 28, 29 and 30 September according to the established level. Findings from the investigations showed that the total 83 exceedance events were mainly caused by natural fluctuation and adverse rainy weather.

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

Table 5.5.1 Water quality monitoring results in September 2009

	M1			M2			M3			M4		
	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave
Turbidity (NTU)	2.9	14.6	7.8	1.2	31.7	5.6	0.8	30.3	11.6	1.8	34.2	11.5
DO (mg/l)	6.1	7.7	7.0	5.9	7.2	6.8	4.2	8.0	6.4	5.5	7.7	6.6
Suspended Solid (mg/l)	3.7	10.7	6.6	2.0	10.2	3.6	3.7	19.0	10.3	3.3	31.0	9.6

	C1			C2			C3		
	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave
Turbidity (NTU)	0.0	8.6	2.4	0.0	2.8	1.0	1.6	13.5	7.8
DO (mg/l)	6.2	7.7	6.8	6.7	7.7	7.1	3.6	7.2	6.2
Suspended Solid (mg/l)	1.0	5.6	1.7	1.0	2.1	1.2	3.7	11.2	6.8

* 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	<ol style="list-style-type: none"> Repeat in <i>situ</i> measurement to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform IC(E) and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IC(E) and Contractor; Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> Discuss with ET and Contractor on the mitigation measures; Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Discuss with IC(E) on the proposed mitigation measures; make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IC(E) and propose mitigation measures to IC(E) and ER; Implement the agreed mitigation measures.
Action level being exceed by more than two consecutive sampling days	<ol style="list-style-type: none"> Repeat in <i>situ</i> measurement to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform IC(E) and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IC(E) and Contractor; Ensure mitigation measures are implemented; prepare to increase the monitoring frequency to daily Repeat measurement on next day of exceedance 	<ol style="list-style-type: none"> Discuss with ET and Contractor on the mitigation measures; Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Discuss with IC(E) on the proposed mitigation measures; make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IC(E) and propose mitigation measures to IC(E) and ER within three working days; Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> Repeat in <i>situ</i> measurement to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform IC(E) and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IC(E) and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit Level 	<ol style="list-style-type: none"> Discuss with ET and Contractor on the mitigation measures; Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Discuss with IC(E) on the proposed mitigation measures; make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IC(E) and propose mitigation measures to IC(E) and ER; 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 5, 7, 9, 14, 15, 16, 19, 21, 22, 28, 29 and 30 October 2009.

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°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.

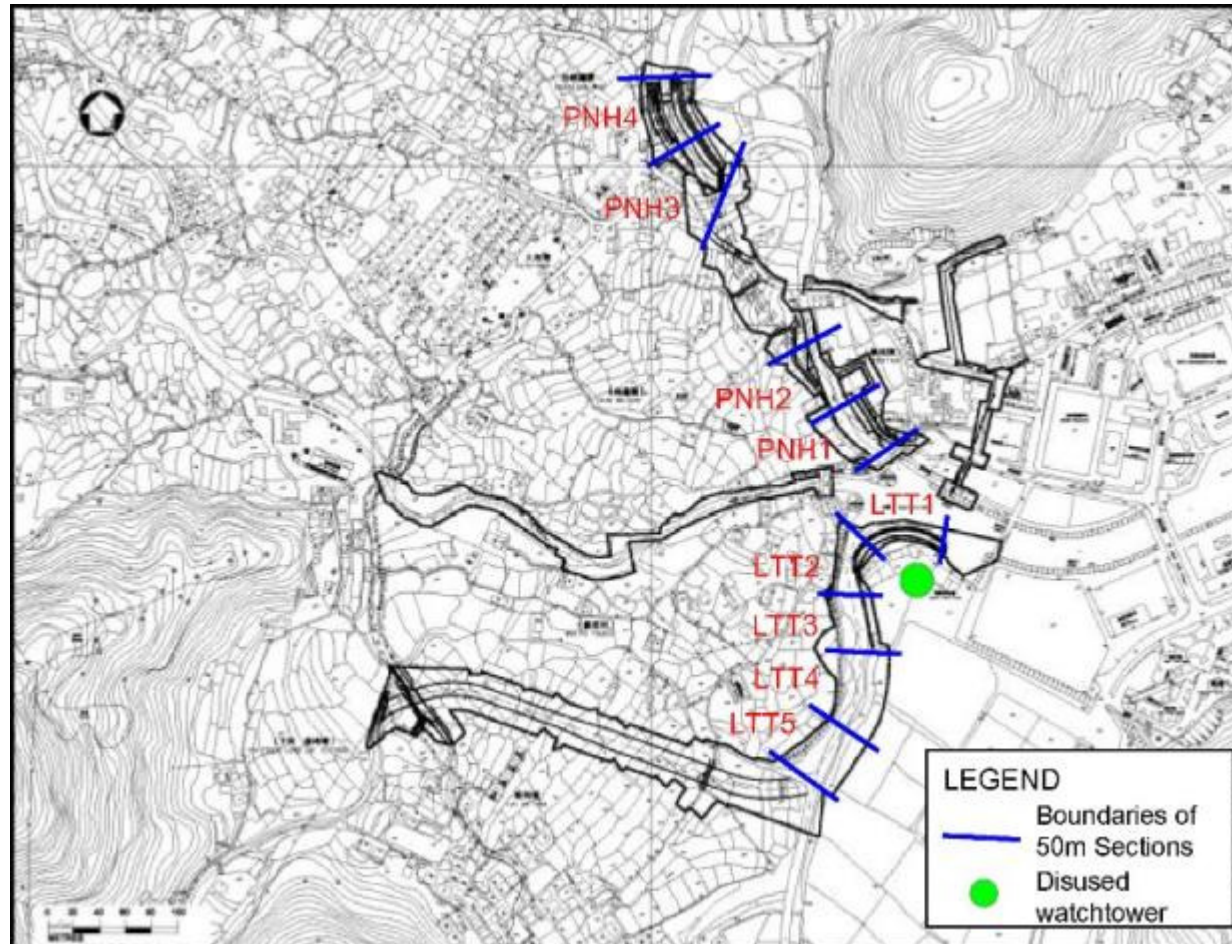


Figure 6.1 Ecological Monitoring Locations

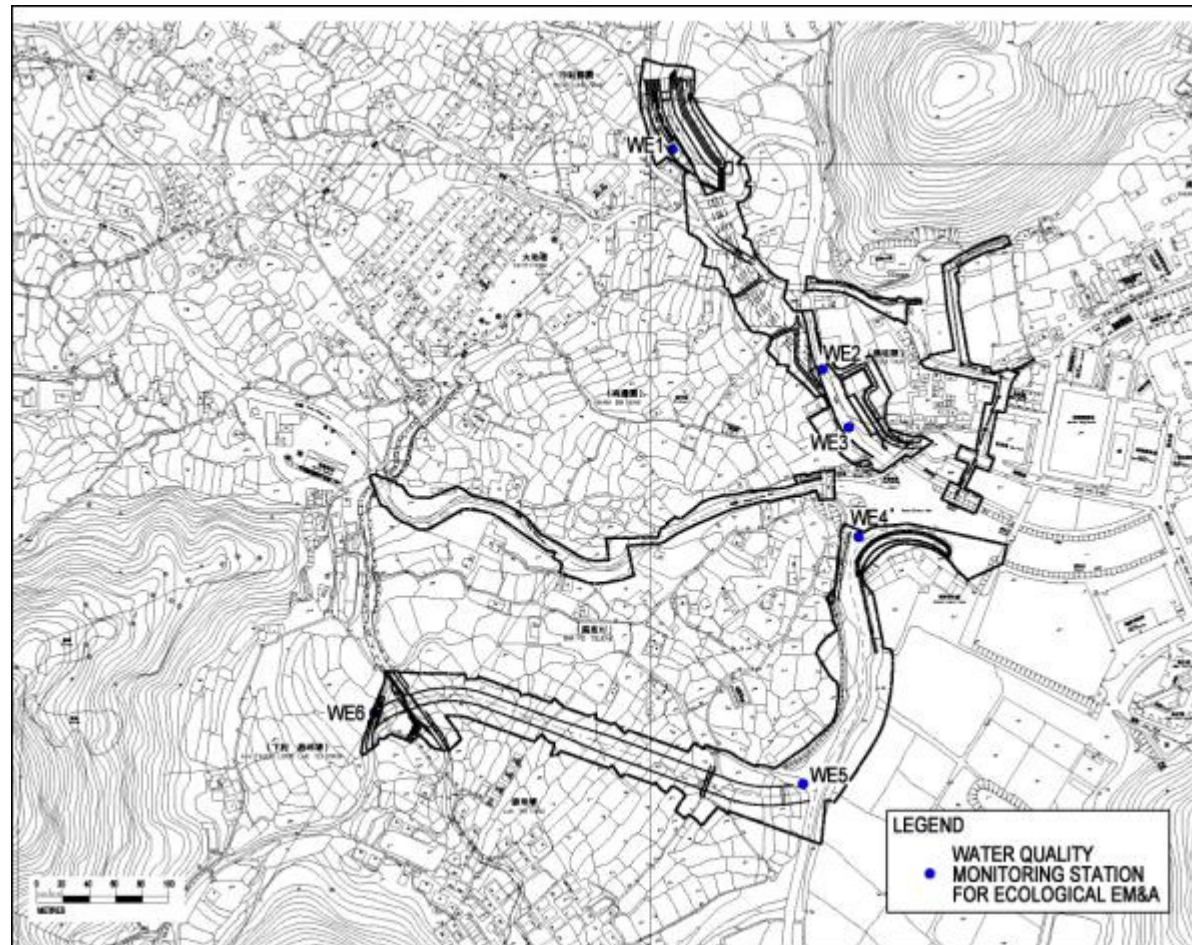


Figure 6.2 Ecological Water Quality monitoring locations

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

Vegetation

Surveys were conducted on 17 September 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. During the current survey, site clearance for construction was underway along the eastern bank

The walk through survey recorded a total of 67 species, including 20 trees, 12 shrub, 17 herb and 7 grass species (Appendix D1). 53 of the species recorded are natives, while 15 were exotics. The quantitative sampling recorded 24 species at the north section. Large native (e.g. *Celtis sinensis*, *Cleistocalyx operculata*, *Ficus hispida*) 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

Species	Relative % cover	
	PNH3	PNH4
<i>Acorus graminifolia</i>		0.87
<i>Alocasia macrorrhiza</i>		2.32
<i>Aporosa dioica</i>		12.12
Bamboo	6.98	
<i>Celtis sinensis</i>		15.55

<i>Christella parasitica</i>	1.05	1.53
<i>Cleistocalyx operculata</i>	32.82	
<i>Embelia ribes</i>		0.53
<i>Ficus hispida</i>	22.00	27.80
<i>Hibiscus rosa-sinensis</i>		0.53
<i>Litsea glutinosa</i>		12.91
<i>Lygodium japonicum</i>	2.09	
<i>Macaranga tanarius</i>		10.01
<i>Mallotus paniculatus</i>	27.93	
<i>Microstegium ciliatum</i>		5.80
<i>Mikania micrantha</i>	0.70	1.05
<i>Neyraudia reynaudiana</i>		0.79
<i>Phyllanthus urinaria</i>		1.19
<i>Pueraria phaseoloides</i>	0.70	0.42
<i>Sageretia thea</i>		2.37
<i>Sporobolus fertilis</i>		4.22
<i>Sterculia lanceolata</i>	1.40	
<i>Syngonium</i> sp.	0.70	
<i>Syzygium jambos</i>	3.63	
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 12 species recorded, 10 of which were native and 2 were exotic. It was composed of isolated individuals of mangrove (*Acrostichum aureum*), backshore species (*Clerodendrum inerme*) and native (*Celtis sinensis*, *Ficus microcarpa*) (Appendix D2). No species of conservation interest was recorded. During the monitoring site clearance for construction work on the eastern bank at Section PNH1 was underway, while the western bank was still intact.

Terrestrial Fauna

Surveys were conducted on 11 September 2009.

A total of seven 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
Spotted Dove	<i>Streptopelia</i>			2	2	CW

	<i>chinensis</i>					
Chinese Bulbul	<i>Pycnonotus sinensis</i>		1		2	CW
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>			1	1	CW
Sooty-headed Bulbul	<i>Pycnonotus aurigaster</i>				1	CW
Asian Brown Flycatcher	<i>Muscicapa dauurica</i>			1		CL
Magpie Robin	<i>Copsychus saularis</i>		1		1	CW
Yellow-browed Warbler	<i>Phylloscopus inornatus</i>			1	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
Common Blue Jewel	<i>Rhinocypha perforata</i>			1	1	A
Orange-tailed Sprite	<i>Ceriagrion auranticum</i>			2		A
Yellow Featherlegs	<i>Copera marginipes</i>				3	A
Blue Dasher	<i>Brachydiplax chalybea</i>		1			C
Wandering Glider	<i>Pantala flavescens</i>	12	3			A
Pied Skimmer	<i>Pseudothemis zonata</i>			1		C
Indigo Dropwing	<i>Trithemis festiva</i>			1		A
Crimson Dropwing	<i>Trithemis aurora</i>				1	A

A = abundant, C = common

Aquatic fauna and fish

8 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	<i>Caridina elongata</i>				++
Palaemonid shrimp	<i>Macrobrachium hainanensis</i>			+	
Crab	<i>Varuna litterata</i>				
Mitten Crab	<i>Eriocheir japonica</i>	+		+	
Fish					
Mosquito fish	<i>Gamusia affinis</i>				+
Goby	<i>Rhinogobius duospilus</i>				+
Barcheek Goby	<i>Rhinogobius giurinus</i>		+		
Swordtail	<i>Xiphophorus hellerii</i>				
Six-banded Barb	<i>Puntius semifasciolatus</i>				
Unidentified Cichlid fish					
Tilapia		+	++	+	
Predaceous Chub	<i>Parazacco spilurus</i>			++	
Jarboa Terapon	<i>Terapon jarbua</i>	++			
Common Silver-biddy	<i>Gerres oyena</i>	+			
Mullet	<i>Mugil cephalus</i>	+	+++		
Broken-band Hillstream Loach	<i>Liniparhomaloptera disparis</i>				

+ = 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 17 September 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 30 species, including 11 tree, 6 shrub, 5 grass species (Appendix D3). 24 of the species recorded are natives, while 6 were exotics. The quantitative sampling recorded 7 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. Vegetation clearance also started on part of Section 2 under the project, resulting in reduced number of species recorded during quantitative sampling.

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

Species	Relative % cover
	LLT2
<i>Terminalia catappa</i>	38.57
<i>Acanthus ilicifolius</i>	21.85
<i>Toxocarpus wightianum</i>	1.19
<i>Wollastonia biflora</i>	24.61
<i>Excoecaria agallocha</i>	5.05
<i>Celtis sinensis</i>	2.75
<i>Fimbristylis</i> sp.	5.97
Total	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 11 September 2009.

A total of eleven 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
Little Egret	<i>Egretta garzetta</i>	1					CW
Great Egret	<i>Casmerodius albus</i>	1					CW
Common Sandpiper	<i>Actitis hypoleucos</i>	1					CW
Spotted Dove	<i>Streptopelia chinensis</i>			1	1		CW
Chinese Bulbul	<i>Pycnonotus sinensis</i>		1				CW
Yellow-browed Warbler	<i>Phylloscopus inornatus</i>	1					CW
Japanese White-eye	<i>Zosterops japonica</i>		1				CW
Long-tailed Shrike	<i>Lanius schach</i>		1				CW
Crested Myna	<i>Acridotheres cristatellus</i>				2		CW
White-shouldered Starling	<i>Sturnus sinensis</i>		2				CL
Black-necked Starling	<i>Sturnus nigricollis</i>				1		CW

CW = common and widespread, CL = common/uncommon 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	<i>Orthetrum sabina</i>				1	1	C
Wandering Glider	<i>Pantala flaviventris</i>	20	12				A
Crimson Dropwing	<i>Trithemis aurora</i>		1		1		A

A = abundant, C = common

Aquatic invertebrates and fish

4 species of fish, 3 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 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 had decreased in previous monitoring. But the diversity and abundance of aquatic fauna might progressively resume as more aquatic fauna were observed in these areas in the present monitoring survey.

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	<i>Geloina erosa</i>					
Rock oyster	<i>Saccostrea cuculata</i>		++			
Snail	<i>Melanoides tuberculata</i>					
Snail	<i>Terebralia</i> sp.					
Snail	<i>Nerita</i> sp.		+			
Snail	<i>Littoraria articulata</i>		+			
Crab	<i>Varuna litterata</i>					
Fiddler crab	<i>Uca lactea</i>			+		
Fiddler crab	<i>Uca arcuata</i>			+		
Fiddler crab	<i>Uca crassipes</i>					
Crab	<i>Perisesarma bidens</i>		++	+		
Mangrove mud crab	<i>Scylla paramamosain</i>					
Mitten crab	<i>Eriocheir japonica</i>					
Fish						
Common mudskipper	<i>Periophthalmus cantonensis</i>		+	+		

Tilapia		++	+			
Jarbug terapon	<i>Terapon jarbua</i>		+			
Mullet	<i>Mugil cephalus</i>	++	+	+		
Common Silver-biddy	<i>Gerres oyena</i>					
Barcheek Goby	<i>Rhinogobius giurinus</i>					

+ = 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 11 September 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.

White-shouldered Starlings were observed near Section 2 of Luk Tei Tong River during the September 2009 monitoring. The two birds did not enter the watchtowers, and flew to the direction of Tai Tei Tong. Another bird was sighted roosting on power line in the Luk Tei Tong marsh. The White-shouldered Starlings observed during the September 2009 monitoring were likely to be passage migrants. 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. The prime time of breeding season of 2009 was already over.

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 September 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 Sept 2009)

Parameters	Limit of detection	WE1	WE2	WE3	WE4	WE5	WE6
Suspended Solid (mg/l)	1	1.00	3.15	4.40	3.70	7.60	1.00
Nitrogen (Ammonia) (mg/l)	0.01	0.02	0.32	0.12	0.19	0.52	0.02
Nitrogen (Nitrate) (mg/l)	0.01	0.09	0.21	0.17	0.18	0.09	0.11
Phosphorous (mg/l)	0.01	0.02	0.06	0.07	0.07	0.13	0.01
BOD ₅ (mg/l)	1	1.00	2.00	2.00	2.00	2.00	1.00
DO (mg/l)	0.01	7.11	7.67	7.31	6.55	6.21	7.98
Turbidity (NTU)	0.1	0.00	2.00	5.20	6.70	8.80	1.80
Temperature (oC)	0.1	29.0	29.2	30.7	31.1	30.3	30.5
pH	0.01	7.33	7.36	7.51	7.31	6.93	7.05
Salinity (ppt)	0.1	0.1	1.4	11.9	13.8	2.9	0.1
Conductivity (ms/m)	0.1	47.0	271.0	1940.0	2230.0	53.3	6.0
Water Flow (m/s)	N/A	0.075	0.1	0.1	0.02	0.05	0.075

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 9 and 13 October 2009, while ecological water quality monitoring is scheduled on 15 October 2009.

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 83 non-compliance events of water quality limits (Dissolved Oxygen, Turbidity and Suspended Solids) were recorded on 2, 3, 7, 9, 11, 14, 16, 18, 21, 23, 24, 28, 29 and 30 September 2009 according to the established level. ET has arranged site investigations for the exceedance events. Findings from the inspection showed causes were substantially attributable to natural fluctuation and adverse rainy weather.

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

Despite the fact that most of the exceedance events were caused by non-project related factors, contractor was reminded to review their site conditions and implement necessary environmental mitigation measures as to minimize water quality impact due to project works.

Table 7.1 Summary of Non-compliance for Water Quality

Date	Location	Parameter	Level of exceedance	Main cause of exceedance
02/09/09	M1	Turbidity, S.S	Limit Level	M1, M2 & M3 – No particular observations (suspected non-project related)
	M2	Turbidity, S.S	Limit Level	
	M3	S.S	Limit Level	
03/09/09	M1	Turbidity, S.S.	Limit Level	M1& M2– No particular observations (suspected non-project related)
	M2	Turbidity, S.S.	Limit Level	
07/09/09	M1	Turbidity, S.S.	Limit Level	M1, M2 & M3 – No particular observations (suspected non-project related)
	M2	Turbidity, S.S.	Limit Level	
	M3	Turbidity, S.S.	Limit Level	
09/09/09	M1	Turbidity, S.S	Limit Level	M1, M2 & M3 – No particular observations (suspected non-project related)
	M2	Turbidity, S.S	Limit Level	
	M3	S.S	Action Level	
11/09/09	M1	Turbidity, S.S	Limit Level	M1, M2, M3 & M4 – Disturbance due to adverse rainy weather before sampling. (suspected non-project related)
	M2	Turbidity, S.S	Limit Level	
	M3	Turbidity, S.S	Limit Level	
	M4	Turbidity	Limit Level	
14/09/09	M1	Turbidity, S.S.	Limit Level	M1, M2 & M3 – No particular observations (suspected non-project related)
	M2	Turbidity, S.S.	Limit Level	
	M3	Turbidity, S.S.	Action Level, Limit Level	
16/09/09	M1	Turbidity, S.S.	Limit Level	M1, M2 & M3 – No particular observations (suspected non-project related)
	M2	Turbidity, S.S	Limit Level	
	M3	S.S	Limit Level	
18/09/09	M1	Turbidity, S.S.	Limit Level	M1, M2 & M3 – No particular observations (suspected non-project related)
	M2	Turbidity, S.S.	Limit Level	
	M3	Turbidity, S.S.	Action Level, Limit Level	
21/09/09	M1	Turbidity, S.S.	Limit Level	M1, M2 & M3 – No particular observations (suspected non-project related)
	M2	S.S.	Limit Level	
	M3	Turbidity, S.S	Limit Level	
23/09/09	M1	Turbidity, S.S	Action Level, Limit Level	M1, M2 & M3 – No particular observations (suspected non-project related)
	M2	Turbidity, S.S	Limit Level	
	M3	Turbidity, S.S	Limit Level	
24/09/09	M1	Turbidity, S.S	Limit Level	M1, M2 & M3 – No particular observations (suspected non-project related)
	M2	Turbidity, S.S	Limit Level	

	M3	Turbidity, S.S	Limit Level	
28/09/09	M1	Turbidity, S.S.	Limit Level	M1, M2, M3 & M4 – Disturbance due to adverse weather condition (typhoon warning signal was hoisted during sampling). No construction works were being carried out during sampling. (suspected non-project related)
	M2	D.O., S.S.	Action Level, Limit Level	
	M3	Turbidity, D.O., S.S.	Limit Level, Action Level, Limit Level	
	M4	D.O.	Action Level	
29/09/09	M1	Turbidity, S.S	Limit Level	M1, M2, M3 & M4 – Disturbance due to adverse rainy weather (suspected non-project related)
	M2	Turbidity, S.S	Limit Level	
	M3	Turbidity, S.S	Limit Level	
	M4	Turbidity, S.S	Limit Level, Action Level	
30/09/09	M1	Turbidity, S.S	Limit Level	M1, M2, M3 & M4 – Disturbance due to adverse rainy weather before sampling. No construction works were being carried out during sampling (suspected non-project related)
	M2	S.S.	Limit Level	
	M3	D.O., S.S.	Action Level, Limit Level	
	M4	D.O.	Action Level	

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 figures of the construction wastes disposal provided by Contractor.

Table 8.1 Summary of Construction Waste Disposal

Month	Amount of Construction Waste disposed		
	Inert Waste (to Public Fill)	Non-inert Waste (to Landfill)	Chemical Waste (to treatment plant)
1 st to 31 st Aug 09	1006.7 (ton)	12.3 (ton)	Nil
1 st to 30 th Sept 09	459.50 (ton)	0.63 (ton)	Nil
Total (from June 08 to Sept 09)	18596.66 (ton)	77.53 (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 2007	--	Issued
Varied Environmental Permit	EP-237/2005/B	23 April 2009	--	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.

	Noise	Water	Ecology	Cultural	Others
September 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 3, 11, 18 and 25 September 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.	Status is not cleared that no wheel washing facility was provided.	Ongoing
28 Aug 09	Idling de-silting tank provided in retaining wall D at PNH was accumulated with muddy water, suspected that the tank was not in effective condition	Contractor was recommended to provide regular cleaning and maintenance in order to maintain the effectiveness of the tank for site water treatment	Contractor took the advice and implement follow up action prior the site inspection on 03 Sep	03 Sept 09
03, 11, 18 & 25 Sep	Open stockpiles of earth materials were observed at sites of PNH, TTT and LTT respectively	Contractor was advised to provide tarpaulin coverings to the stockpiles as to prevent erosion and surface run-off	Some of the stockpiles were still without proper coverings. To be follow up	Ongoing
03 Sep 09	(Non-compliance event) Site water generate from site retaining wall H at TTT River was observed directly discharged to the stream course	Contractor was requested to stop such practice immediately. Site water shall be directed to water treatment facility for proper treatment and then discharge to designated discharge point in accordance with the applied wastewater discharge license	The defective practice was ceased as requested. No further improper discharge was observed during the inspection on 11 Sep	11 Sep 09
03 Sep 09	Oil spillage to the ground was observed generated from the chemical tank without drip pan placed at site bottleneck B of TTT River	Contractor was advised to implement remedial actions to remove spilled oil and provide drip pan to the chemical drum	Chemical drum was re-located to designated chemical storage cabinet prior the inspection on 11 Sep 09	11 Sep 09
03 & 11 Sep 09	Earth bunds along site bottleneck B of TTT River was not covered properly	Contractor was recommended to implement improvement works to the defective bunds to minimize water quality impact due to site works	As the construction of gabion walls within the earth bunds was finished, the bunds was removed prior the inspection on 25 Sep	25 Sep 09
11 Sep 09	Track of mud was observed left on the EVA, outside the exit of haul access at bottleneck A	Contractor was advised to provide wheel and body washing area for vehicles left from sites to prevent deposition of earth materials to public area.	Cleaning to the EVA public access was implemented prior to the site inspection. However, provision of vehicle washing facilities was still outstanding at TTT bottleneck A.	Ongoing
11 Sep 09	Site water accumulated in the excavated pit at site bottleneck B of TTT River, was seeping into the river course through the earth bunds during inspection	Contractor was advised to increase the height of bunds to prevent further site water seepage	The outstanding pit and earth bunds were backfilled and removed respectively due to work completion at the area	25 Sep 09
18 Sep 09	Site water was observed seeping into the river course from the gaps of concrete bund provided at retaining wall H at TTT River	Contractor was advised to rectify the discrepancy by fill up the gaps between the pre-case concrete blocks for the bunds	Contractor took the advice and fill up the gaps with cement and sand bags prior the inspection on 25 Sep	25 Sep 09
25 Sep 09	There was a chemical container without secondary containment and tipping placed at bushes area of LTT site, where was suspected to be outside of site boundary	Contractor was advised to rectify such discrepancies immediately to avoid chemical spillage; Idling chemicals should be re-located to designated chemical storage area as far as practicable.	To be followed in the next reporting month	Ongoing
25 Sep 09	Site materials were found stockpiled next to the trees at pipe trench site at Ling Tsui Tau	Contractor was advised to remove those materials away from the tree as to avoid damaging to retaining plants; proper fencing should be set to protect retaining trees whenever necessary.	To be followed in the next reporting month	Ongoing
25 Sep 09	Bare soil slopes were observed at the haul access area to fish ladder site at PNH	Contractor was advised to provide proper covering by either geo-textile or cement to prevent soil erosion affecting the nearby river course	To be followed in the next reporting month	Ongoing

Table 11.1 Summary of site inspection

Date	Observations	Advice from ET	Action taken	Closing Date
25 Sep 09	No protective measures of coverings and sealing were provided to the public U-channel connected with pipe trench site at Ling Tsui Tau	Contractor was advised to implement proper protective measures to prevent soil and construction debris dropping into the public drainage	To be followed in the next reporting month	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.

A non-compliance event regarding site water management at site retaining wall H of TTT River was recorded on 03 September 2009 during weekly site inspection. Site water accumulated at the site area was found directly discharged to the river course. Contractor was requested to stop such practice immediately. Contractor was recommended to provide proper de-silting facilities for site water treatment; treated site water should be discharged to designated discharge point in accordance with the applied effluent discharge license.

Follow up investigation was carried out in the next inspection on 11 September 2009. Findings from the investigation showed improper practice were ceased that no further direct discharge was observed.

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 as reported by contractor.

12. Future key issues

As informed by contractor major site activities will include construction of box culverts, retaining walls and gabion walls on project sites. 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 advised to provide proper measures to mitigate water quality impacts to the river channels due to construction works. River based construction sites should be well enclosed by bunds in dry condition, as to prevent surface run-off and site water seepage to the stream. Surface of earth bunds should be properly 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 connected with project sites should be sealed to prevent site water and any construction materials entering public drainage and causing water quality impact.

Construction activities such as backfilling, earth movement may generate dust impact to the vicinity of sensitive receivers. Contractor is advised to provide regular water spraying for the dusty static area. Stockpiling may be found on site and those should be covered by tarpaulin to prevent erosion and run-off.

Heavy plants and vehicles may be deployed for the construction and those would generate certain noise impacts to the sensitive receivers. Noisy activities should be well planned and scheduled to avoid parallel operation of multiple plants, so as to minimize noise impacts to the nearby sensitive receivers.

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 83 non-compliance events of water quality criteria were recorded on 2, 3, 7, 9, 11, 14, 16, 18, 21, 23, 24, 28, 29 and 30 September 2009. Exceedances were mainly caused by natural fluctuation and adverse rainy weather.

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 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. Non-compliance events regarding site water seepage and direct discharge of site water were recorded in this reporting month. Contractor was urged to rectify the discrepancies as soon as possible to stop further deterioration of water quality.

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

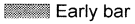


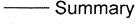


Location plan

Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	%	Predecessors	2008												2009												2010												2011													
								JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB												
0000	DRAINAGE IMPROVEMENT WORK IN S LANTAU	534	534	06AUG2009	21JAN2011	0		Gantt chart showing project progress from August 2009 to January 2011. The chart includes bars for various activities such as Section Commencement, Preliminaries, Engineer's Accommodation, etc., with their respective durations and completion percentages.																																																0	
0001	Section Commencement	11	0	07JAN2008	17JAN2008	100		Gantt chart for Section Commencement, showing completion from Jan 7 to Jan 17, 2008.																																																100	
0010	Preliminaries	534	534	06AUG2009	21JAN2011	0		Gantt chart for Preliminaries, showing completion from Aug 6, 2009 to Jan 21, 2011.																																																0	
0020	Engineer's Accommodation	80	0	07JAN2008	26MAR2008	100		Gantt chart for Engineer's Accommodation, showing completion from Jan 7 to Mar 26, 2008.																																																100	
0030	Contractor's Accommodation	55	0	07JAN2008	01MAR2008	100		Gantt chart for Contractor's Accommodation, showing completion from Jan 7 to Mar 1, 2008.																																																100	
0040	Engineer's Accommodation (Secondary)	40	0	07JAN2008	15FEB2008	100		Gantt chart for Engineer's Accommodation (Secondary), showing completion from Jan 7 to Feb 15, 2008.																																																100	
0050	Record Survey & Site Investigation	180	0	07JAN2008	04JUL2008	100		Gantt chart for Record Survey & Site Investigation, showing completion from Jan 7 to Jul 4, 2008.																																																100	
0060	Recruitment of Environment Team	80	0	07JAN2008	26MAR2008	100		Gantt chart for Recruitment of Environment Team, showing completion from Jan 7 to Mar 26, 2008.																																																100	
0070	Establish Base line monitoring for EP	30	0	27MAR2008	25APR2008	100	0060	Gantt chart for Establish Base line monitoring for EP, showing completion from Mar 27 to Apr 25, 2008.																																																100	0060
0080	Monitoring for Environmental Permit	1001	534	26APR2008	21JAN2011	47	0070	Gantt chart for Monitoring for Environmental Permit, showing progress from Apr 26, 2008 to Jan 21, 2011.																																																47	0070
0100	Temporary Traffic Management Schemes	180	0	07JAN2008	04JUL2008	100		Gantt chart for Temporary Traffic Management Schemes, showing completion from Jan 7 to Jul 4, 2008.																																																100	
0110	Construction Proposals and Submissions	80	0	07JAN2008	26MAR2008	100		Gantt chart for Construction Proposals and Submissions, showing completion from Jan 7 to Mar 26, 2008.																																																100	
0120	Permits Application & Approval	180	0	07JAN2008	04JUL2008	100		Gantt chart for Permits Application & Approval, showing completion from Jan 7 to Jul 4, 2008.																																																100	
0130	Liaison Works with Others (Initial)	220	0	07JAN2008	13AUG2008	100		Gantt chart for Liaison Works with Others (Initial), showing completion from Jan 7 to Aug 13, 2008.																																																100	
0140	Temporary Noise Barrier (Fabrication)	60	0	14AUG2008	12OCT2008	100	0130	Gantt chart for Temporary Noise Barrier (Fabrication), showing completion from Aug 14 to Oct 12, 2008.																																																100	0130
1000	Works at Ling Tsui Tau & TTT River (D2&D3, D4)	510	0	18JAN2008	10JUN2009	100	0001	Gantt chart for Works at Ling Tsui Tau & TTT River (D2&D3, D4), showing completion from Jan 18, 2008 to Jun 10, 2009.																																																100	0001
1010	Drainage Channel at Ling Tsui Tau (D2&D3)	510	0	18JAN2008	10JUN2009	100	0001	Gantt chart for Drainage Channel at Ling Tsui Tau (D2&D3), showing completion from Jan 18, 2008 to Jun 10, 2009.																																																100	0001
1020	Sub. & app. from AMO by Archaeologist	268	0	07JAN2008	30SEP2008	100		Gantt chart for Sub. & app. from AMO by Archaeologist, showing completion from Jan 7 to Sep 30, 2008.																																																100	
1030	Covered U-Channel	0	0	01OCT2008	0	100	1020	Gantt chart for Covered U-Channel, showing completion from Oct 1, 2008.																																																100	1020
1031	600 & Covered 750 U-Channel (D3)	120	0	01OCT2008	28JAN2009	100	1030	Gantt chart for 600 & Covered 750 U-Channel (D3), showing completion from Oct 1, 2008 to Jan 28, 2009.																																																100	1030
1032	Covered 300 U-Channel (D2)	30	0	25FEB2009	26MAR2009	100	1030	Gantt chart for Covered 300 U-Channel (D2), showing completion from Feb 25, 2009 to Mar 26, 2009.																																																100	1030
1040	Concrete Pipe Drainage at Ling Tsui Tau (D3)	0	0	22APR2009	0	100	1030	Gantt chart for Concrete Pipe Drainage at Ling Tsui Tau (D3), showing completion from Apr 22, 2009.																																																100	1030
1041	CP1.3 to MH1.4 (2 x DN600)	14	0	22APR2009	05MAY2009	100	1040	Gantt chart for CP1.3 to MH1.4 (2 x DN600), showing completion from Apr 22 to May 5, 2009.																																																100	1040
1042	MH1.4 to MH1 (2 x DN 600)	14	0	06MAY2009	19MAY2009	100	1041	Gantt chart for MH1.4 to MH1 (2 x DN 600), showing completion from May 6 to May 19, 2009.																																																100	1041
1043	MH1 to MH2 (2 x DN 600)	21	0	20MAY2009	09JUN2009	100	1042	Gantt chart for MH1 to MH2 (2 x DN 600), showing completion from May 20 to Jun 9, 2009.																																																100	1042
1044	MH2 to MH3 (2 x DN 600)	75	18	10JUN2009	23AUG2009	76	1043	Gantt chart for MH2 to MH3 (2 x DN 600), showing progress from Jun 10 to Aug 23, 2009.																																																76	1043
1045	MH3 to MH4 (2 x DN 600)	21	21	21AUG2009	10SEP2009	0	1044	Gantt chart for MH3 to MH4 (2 x DN 600), showing start on Aug 21, 2009.																																																0	1044
1046	MH4 to MH5 (2 x DN 600)	14	14	11SEP2009	24SEP2009	0	1045	Gantt chart for MH4 to MH5 (2 x DN 600), showing start on Sep 11, 2009.																																																0	1045
1047	MH5 to MH6 (2 x DN 600)	14	14	25SEP2009	08OCT2009	0	1046	Gantt chart for MH5 to MH6 (2 x DN 600), showing start on Sep 25, 2009.																																																0	1046
1048	MH6 to MH7 (2 x DN 600)	14	14	09OCT2009	22OCT2009	0	1047	Gantt chart for MH6 to MH7 (2 x DN 600), showing start on Oct 9, 2009.																																																0	1047
1049	MH7 to MH8 (2 x DN 750)	80	42	29JUN2009	16SEP2009	48	1048, 1049	Gantt chart for MH7 to MH8 (2 x DN 750), showing progress from Jun 29 to Sep 16, 2009.																																																48	1048, 1049
1050	MH8 to Outlet Structure	21	21	23OCT2009	12NOV2009	0	1048, 1049	Gantt chart for MH8 to Outlet Structure, showing start on Oct 23, 2009.																																																0	1048, 1049
1100	Gabion Channel at Tai Tei Tong River (D4)	510	0	18JAN2008	10JUN2009	100	0001	Gantt chart for Gabion Channel at Tai Tei Tong River (D4), showing completion from Jan 18, 2008 to Jun 10, 2009.																																																100	0001
1110	Preparation Work for Gabion Channel	409	0	18JAN2008	01MAR2009	100	0001	Gantt chart for Preparation Work for Gabion Channel, showing completion from Jan 18, 2008 to Mar 1, 2009.																																																100	0001
1120	Bottleneck A widening excavation (LHS)	10	0	02MAR2009	11MAR2009	100	1110	Gantt chart for Bottleneck A widening excavation (LHS), showing completion from Mar 2, 2009 to Mar 11, 2009.																																																100	1110
1121	Bottleneck A type 6 gabion (LHS)	20	0	12MAR2009	31MAR2009	100	1120	Gantt chart for Bottleneck A type 6 gabion (LHS), showing completion from Mar 12 to Mar 31, 2009.																																																100	1120
1122	Bottleneck A widening excavation (RHS)	10	0	01APR2009	10APR2009	100	1121	Gantt chart for Bottleneck A widening excavation (RHS), showing completion from Apr 1, 2009 to Apr 10, 2009.																																																100	1121
1123	Bottleneck A type 6 gabion (RHS) & river bed	20	0	11APR2009	30APR2009	100	1122	Gantt chart for Bottleneck A type 6 gabion (RHS) & river bed, showing completion from Apr 11 to Apr 30, 2009.																																																100	1122
1130	Approval of temp access from bottleneck A to B	60	0	31MAR2009	29MAY2009	100	1123	Gantt chart for Approval of temp access from bottleneck A to B, showing completion from Mar 31, 2009 to May 29, 2009.																																																100	1123
1131	Forming of access form bottleneck A to B	12	0	30MAY2009	10JUN2009	100	1130	Gantt chart for Forming of access form bottleneck A to B, showing completion from May 30, 2009 to Jun 10, 2009.																																																100	1130
1132	Bottleneck B widening excavation (North Side)	85	29	11JUN2009	03SEP2009	66	1131	Gantt chart for Bottleneck B widening excavation (North Side), showing progress from Jun 11 to Sep 3, 2009.																																																66	1131
1133	Bottleneck B type 6 gabion (South Side)	25	25	04SEP2009	28SEP2009	0	1132	Gantt chart for Bottleneck B type 6 gabion (South Side), showing start on Sep 4, 2009.																																																0	1132
1134	Bottleneck B widening excavation (RHS)	14	14	29SEP2009	12OCT2009	0	1133	Gantt chart for Bottleneck B widening excavation (RHS), showing start on Sep 29, 2009.																																																0	1133
1135	Bottleneck B type 6 gabion (RHS) & river bed	14	14	13OCT2009	26OCT2009	0	1134	Gantt chart for Bottleneck B type 6 gabion (RHS) & river bed, showing start on Oct 13, 2009.																																																0	1134
1140	Reinforced Concrete Retaining Wall [H]	0	0	01APR2009	0	100	1135	Gantt chart for Reinforced Concrete Retaining Wall [H], showing completion from Apr 1, 2009.																																																100	1135
1141	R C Retaining Wall H	180	53	01APR2009	27SEP2009	71	1140	Gantt chart for R C Retaining Wall H, showing progress from Apr 1, 2009 to Sep 27, 2009.																																																71	1140
1150	Drainage Works for Channels & Retaining Wall	0	0	07JAN2008	0	100	1141	Gantt chart for Drainage Works for Channels & Retaining Wall, showing completion from Jan 7, 2008.																																																100	1141
1151	U-Channel and Catchpit for Widened Bottle Neck A	15	15	27OCT2009	10NOV2009	0	1123, 1135	Gantt chart for U-Channel and Catchpit for Widened Bottle Neck A, showing start on Oct 27, 2009.																																																0	1123, 1135
1152	U-Channel and Catchpit for Widened Bottle Neck B	15	15	27OCT2009	10NOV2009	0	1135	Gantt chart for U-Channel and Catchpit for Widened Bottle Neck B, showing start on Oct 27, 2009.																																																0	1135
1153	U-Channel and Catchpit for Retaining Wall H	20	20	28SEP2009	17OCT2009	0	1141	Gantt chart for U-Channel and Catchpit for Retaining Wall H, showing start on Sep 28, 2009.																																																0	1141
1160	Soft & Hard Landscaping Works	0	0	18OCT2009	0	100	1153, 1155	Gantt chart for Soft & Hard Landscaping Works, showing completion from Oct 18, 2009.																																																100	1153, 1155
1170	Hard Landscaping & Paving Works	50	50	18OCT2009	06DEC2009	0	1153	Gantt chart for Hard Landscaping & Paving Works, showing start on Oct 18, 2009.																																																0	1153
1180	Soft Landscaping (Planting) Works	50	50	18OCT2009	06DEC2009	0	1153	Gantt chart for Soft Landscaping (Planting) Works, showing start on Oct 18, 2009.																																																0	1153
1200	Phase 2 sewerage works at TTT river	60	60	01SEP2009	30OCT2009	0		Gantt chart for Phase 2 sewerage works at TTT river, showing start on Sep 1, 2009.																																																0	
1210	Submission and approval MS by DSD & EPD	90	0	01MAY2009	29JUL2009	100		Gantt chart for Submission and approval MS by DSD & EPD, showing completion from May 1, 2009 to Jul 29, 2009.																																																100	
1220	Excavation 1st half trench at TTT river	20	20	01SEP2009	20SEP2009	0	1210	Gantt chart for Excavation 1st half trench at TTT river, showing start on Sep 1, 2009.																																																0	1210
1230	Pipe laying and backfilling 1st half trench	5	5	21SEP2009	25SEP2009	0	1220	Gantt chart for Pipe laying and backfilling 1st half trench, showing start on Sep 21, 2009.																																																0	1220
1240	Excavation 2nd half trench at TTT river	20	20	26SEP2009	15OCT2009	0	1230	Gantt chart for Excavation 2nd half trench at TTT river, showing start on Sep 26, 2009.																																																0	1230

Start date 07JAN2008
 Finish date 21JAN2011
 Data date 06AUG2009
 Run date 15AUG2009
 Page number 1A
 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	2008												2009												2010												2011											
								JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB										
7010	Preparation for works (Minor Portion)	131	0	18JAN2008 A	27MAY2008 A	100	0001	Preparation for works (Minor Portion)																																															
7020	Non-working Period at TWT Beach (1)	196	0	01APR2008 A	13OCT2008 A	100		Non-working Period at TWT Beach (1)																																															
7030	uPVC Sewer (DN160-400) M/H A16 - M/H A34	465	30	28MAY2008 A	04SEP2009	94	7010	uPVC Sewer (DN160-400) M/H A16 - M/H A34																																															
7040	uPVC Sewer (DN160-400) M/H A15 - M/H A13	50	0	14OCT2008 A	02DEC2008 A	100	7020	uPVC Sewer (DN160-400) M/H A15 - M/H A13																																															
7050	uPVC Sewer (DN160-400) M/H A11 - M/H A7	50	0	03DEC2008 A	21JAN2009 A	100	7040	uPVC Sewer (DN160-400) M/H A11 - M/H A7																																															
7060	uPVC Sewer (DN160-400) M/H A1 - M/H A3	65	0	22JAN2009 A	27MAR2009 A	100	7050	uPVC Sewer (DN160-400) M/H A1 - M/H A3																																															
8000	Sewerage works at PNH (S4)	772	206	18JAN2008 A	27FEB2010	73	0001	Sewerage works at PNH (S4)																																															
8010	Preparation of works	168	0	07JAN2008 A	22JUN2008 A	100		Preparation of works																																															
8020	uPVC Sewer (DN160-400) M/H ED2 -D28 - D118	320	0	23JUN2008 A	08MAY2009 A	100	8010	uPVC Sewer (DN160-400) M/H ED2 -D28 - D118																																															
8030	uPVC Sewer (DN160-400) M/H D1 - D27	280	191	09MAY2009 A	12FEB2010	32	8020	uPVC Sewer (DN160-400) M/H D1 - D27																																															
9000	Preservation & Protection of Exist Trees	534 *	534 *	06AUG2009	21JAN2011	0	0001	Preservation & Protection of Exist Trees																																															
9010	Preparton for works	100	0	07JAN2008 A	15APR2008 A	100		Preparton for works																																															
9020	Protection & Transplanting Works	1011	534	16APR2008 A	21JAN2011	47	9010	Protection & Transplanting Works																																															

Start date 07JAN2008
 Finish date 21JAN2011
 Data date 06AUG2009
 Run date 15AUG2009
 Page number 6A
 Primavera Systems, Inc.

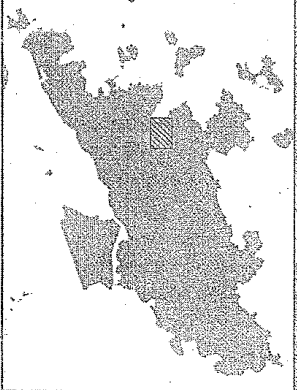
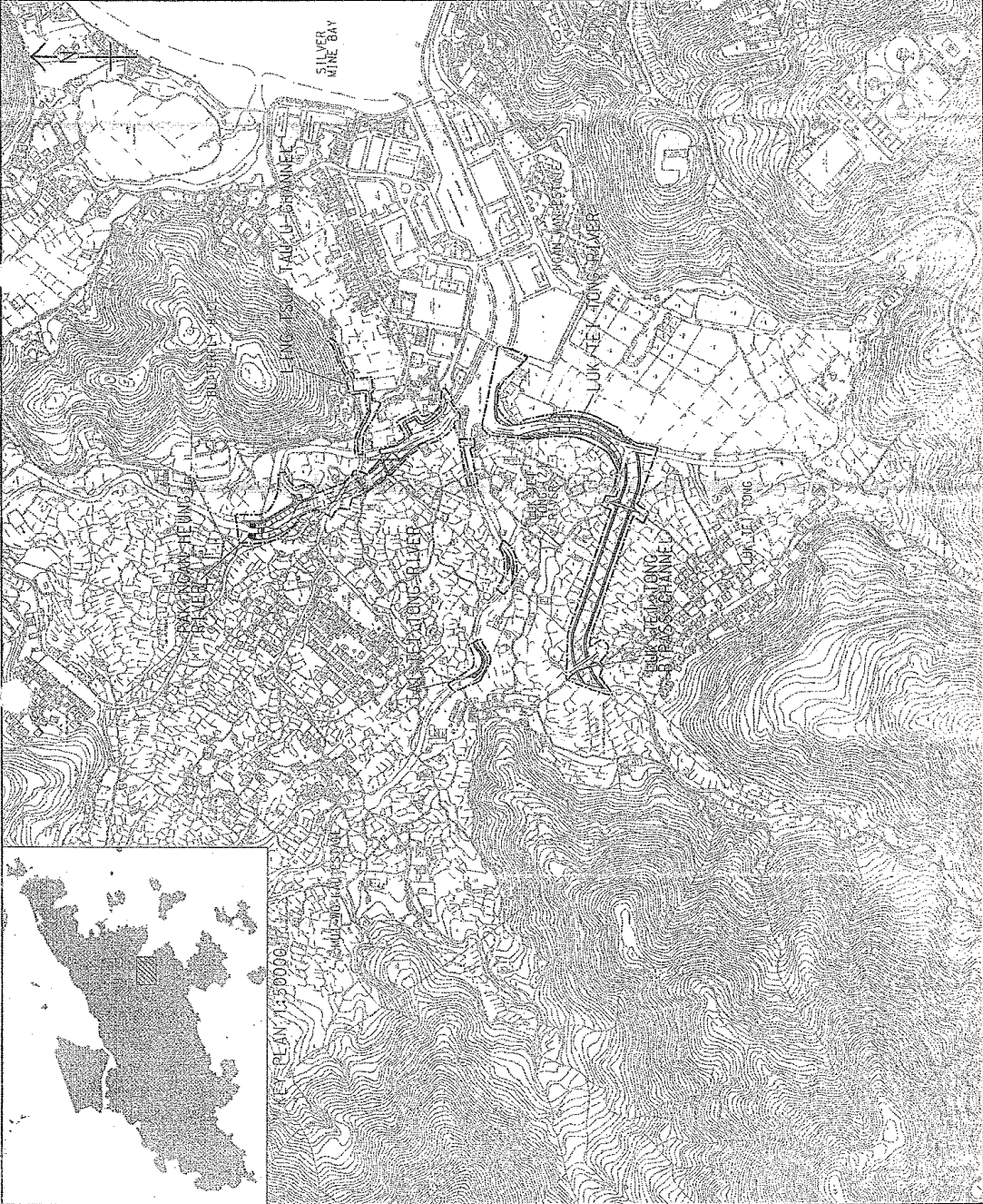
Yick Hing Construction Co. Ltd.

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

NOTES:

1. GRID LINES ARE IN METERS
2. ALL LEVELS ARE IN METERS AND REFERRED TO MSL+95.



DATE: 15/11/2007
 DRAWN BY: [Name]
 CHECKED BY: [Name]

LOCATION PLAN OF THE PROJECT

PROJECT NO.	1.1
SCALE	1:1
DATE	15/11/2007
DRAWN BY	[Name]
CHECKED BY	[Name]
STATUS	PRELIMINARY
DESIGNED BY	[Name]
DATE	[Date]

Metcalf & Eddy Ltd
 30/F, 300, Nathan Road, Kowloon, Hong Kong

PROJECT NO: 1.1 / DATE: 15/11/2007 / SCALE: 1:1

NOTES :

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

LEGENDS :

- [Symbol] SITE BOUNDARIES
- [Symbol] PORTION D1 - PAK NGAM BEIANG
- [Symbol] PORTION D2 - LING TSHU TSHU LAI
- [Symbol] PORTION D3 - LING TSHU TSHU (B)
- [Symbol] PORTION D4 - TAI TEI TONG RIVER
- [Symbol] PORTION D5 - LUK TEI TONG
- [Symbol] PORTION D6 - FUU O
- [Symbol] PORTION D7 - LO UK TSEEN
- [Symbol] PORTION D8 - CHEUNG SHA SHEUNG YESHEN
- [Symbol] PORTION D9 - EMERGENCY VEHICULAR ACCESS (EVA) AT 101' N

FOR TENDER PURPOSES ONLY

DRAWING NO.	DC/2006/11		
	DP/08/4129CD		
PROJECT NO.	128CD		
	CONTRACT		
DESIGNED BY	H. Y. CHAN	12 FEB 2006	
	B. D. CHAN	13 MAR 2006	
CHECKED BY	W. H. CHAN	10 MAY 2007	
	T. Y. CHAN	11 MAY 2007	

DESIGNED BY
H. Y. CHAN 12 FEB 2006
B. D. CHAN 13 MAR 2006

CHECKED BY
W. H. CHAN 10 MAY 2007
T. Y. CHAN 11 MAY 2007

CONTRACT NO. DC/2006/11
DP/08/4129CD

PROJECT NO. 128CD
CONTRACT

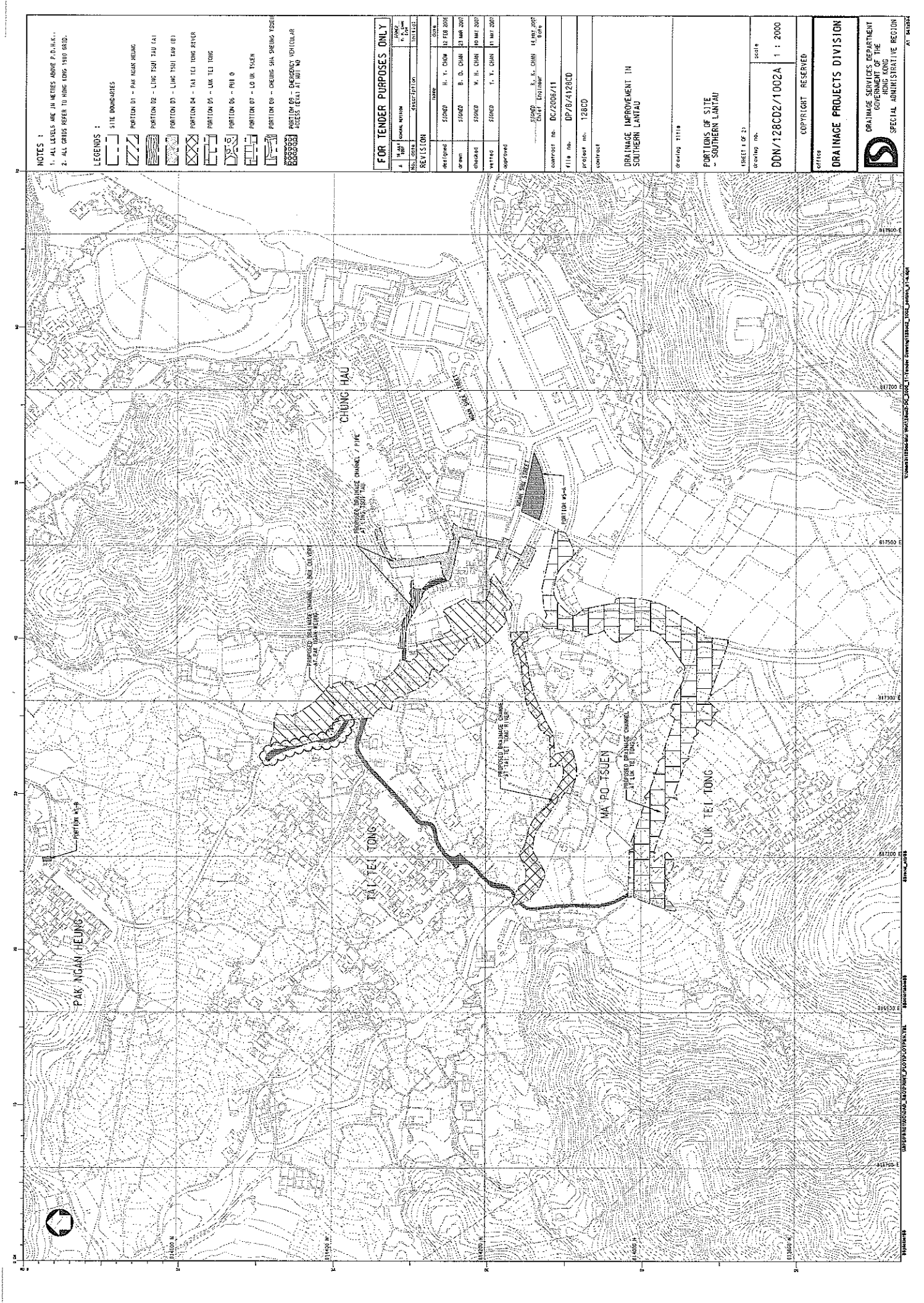
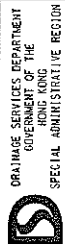
DRAINAGE IMPROVEMENT IN SOUTHERN LANTAU

Drawing Title
PORTIONS OF SITE - SOUTHERN LANTAU

SHEET 1 OF 2
Drawing No. DDN/128CDZ/1002A
Scale 1 : 2000

OFFICE COPYRIGHT RESERVED

DRAINAGE PROJECTS DIVISION



Comments: 128CD_Z/1002A (1) DRAIN IMPROVEMENT IN SOUTHERN LANTAU

911200 E

911500 N

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

Inspection Certificate
Standard Sensor Module
for Hand-held Water Quality Meter
Model WQC-24

Serial No. 640274
 Date Jun.26,2009
 Temp.&Humidity 25 °C 81 %

Judgement

1. Outside view and Shape

Criterion : No abnormality

Good

2. Equivalent value indication test; Indication when equivalent value is impressed to input

Good

2.1 pH input test

2.1.1 Linearity test

Criterion : Within $\pm 0.05\text{pH}$ against standard value

Good

Standard Value[pH]	0.00	4.00	7.00	10.00	14.00
Indicated Value[pH]	0.00	4.00	7.00	10.00	14.00

2.1.2 Repeatability test

Criterion : Within $\pm 0.05\text{pH}$ against average value

Good

Standard Value[pH]	14		
Indicated Value[pH]	1 st time	2 nd time	3 rd time
	14.00	14.00	14.00

2.1.3 Input resistance test

Criterion : Difference both values is within $\pm 0.2\text{pH}$

Good

Input Value	pH14 (0M Ω in)	pH14(1000M Ω in)
Indicated Value[pH]	14.00	14.00

2.2 ORP input test

2.2.1 Linearity test

Criterion : Within $\pm 5\text{mV}$ against standard value

Good

Standard Value[mV]	-2000	-1000	0	1000	2000
Indicated Value[mV]	-2002	-1001	0	999	2000

2.2.2 Repeatability test

Criterion : Within $\pm 5\text{mV}$ against average value

Good

Standard Value[mV]	2000		
Indicated Value[mV]	1 st time	2 nd time	3 rd time
	2000	2001	2001

2.3 Dissolved oxgen input test

2.3.1 Linearity test

Criterion : Within $\pm 0.1\text{mg/L}$ against standard value

Good

Standard Value[mg/L]	0.00	4.06	8.11	12.17	16.22	19.46
Indicated Value[mg/L]	0.00	4.06	8.12	12.17	16.24	19.52

2.3.2 Repeatability test

Criterion : Within $\pm 0.1\text{mg/L}$ against average value

Good

Standard Value[mg/L]	8.11		
Indicated Value[mg/L]	1 st time	2 nd time	3 rd time
	8.11	8.12	8.12

2.4 Electric conductivity input test

2.4.1 Linearity test

Good

Criterion : Within $\pm 1\%$ F.S. against standard value

LOW range	Standard Value[mS/m]	0	50.0	100.0
	Indicated Value[mS/m]	0.0	50.1	100.0
MID range	Standard Value[S/m]	0.500	1.000	/
	Indicated Value[S/m]	0.500	1.000	
HI range	standard Value[S/m]	5.00	10.00	
	Indicated Value[S/m]	5.07	10.00	

2.4.2 Repeatability test

Criterion : Within $\pm 1\%$ F.S. against average value

Good

Standard Value[S/m]	10		
Indicated Value[S/m]	1 st time	2 nd time	3 rd time
	10.00	10.00	10.00

2.5 Temperature input test

2.5.1 Linearity test

Good

Criterion : $\pm 0.5^\circ\text{C}$ against standard value; (Ambient $5\sim 45^\circ\text{C}$); (Others $\pm 0.8^\circ\text{C}$)

Standard Value[$^\circ\text{C}$]	-5.0	15.0	25.0	35.0	55.0
Indicated Value[$^\circ\text{C}$]	-5.00	15.00	25.00	35.00	55.00

2.5.2 Repeatability test

Criterion : Within $\pm 0.25^\circ\text{C}$ against average value

Good

Standard Value[$^\circ\text{C}$]	55		
Indicated Value[$^\circ\text{C}$]	1 st time	2 nd time	3 rd time
	55.00	55.00	55.00

2.6 Turbidity input test

2.6.1 Sensitivity test

Good

Criterion : (Raw value before calibration) Light OFF: 0 ± 50 Light ON: 600~1200

Input	Zero	Span
Status	Light OFF	Light ON
Indication	0	800

2.6.2 Repeatability test

Criterion : Within $\pm 3\%$ F.S. against average value

Good

Indicated Value	1 st time	2 nd time	3 rd time
	800	800	800

3. RS232C test: Action test with test program

Criterion : No abnormality

Good

4. Analog output test: Action test with test program

Criterion : Within 8mV for both Zero and Span

Good

Tested by E. Negishi
 Approved by Y. Haketa



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

Calibration Reference No. : GCE/CAL/2009/MW/WQM/C3

Client : ENVIRONMENTAL PIONEER AND SOLUTION LIMITED

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

Manufacturer : DKK-TOA Serial No.: 640274

Calibration Date : 24-09-2009 Due Date : 23-12-2009

Criterion: (Repeatability, Linearity)

pH : Both within ± 0.05 pH
 Dissolved oxygen : Both within ± 0.1 mg/L
 Electric conductivity : Both within $\pm 1\%$ FS
 Turbidity : Repeatability : within $\pm 3\%$ FS
 Temperature : Repeatability $\pm 0.25^\circ\text{C}$; Linearity $\pm 0.5^\circ\text{C}$; (Ambient $5\sim 45^\circ\text{C}$)

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	14.9 mS/m	
0.005	71.8 mS/m	72.0 mS/m	Acceptance Criterion
0.01	0.141 S/m	0.142 S/m	$R^2 > 0.995$ Within $\pm 1\%$ F.S. against calibration standard value 71.8 mS/m, 0.667 S/m and 5.87 S/m.
0.05	0.667 S/m	0.678 S/m	
0.1	1.29 S/m	1.29 S/m	
0.5	5.87 S/m	5.87 S/m	
Repeatability	1 st time	0.00, 5.87 S/m	Within $\pm 1\%$ F.S. against average value
	2 nd time	0.00, 5.87 S/m	
	3 rd time	0.00, 5.87 S/m	
	0.00, 5.87 S/m	Ave.: 0.00, 5.87	

* $1 \text{ S/m} = 10^4 \mu\text{mhos/cm} = 10^3 \text{ mS/m}$

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



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	1.0000
3.95		3.89	
6.50		6.45	Acceptance Criterion
8.70		8.65	R ² > 0.995 Within ± 0.1 mg/L against standard value
10.80		10.76	
13.90		13.84	
Repeatability	1 st time	0.00 , 8.63	Within ± 0.1 mg/L against average value
	2 nd time	0.00 , 8.69	
	3 rd time	0.00 , 8.64	
	0.00 , 8.70	Ave.: 0.00 , 8.65	

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	1.69	Acceptance Criterion
pH = 6.86	4.00	4.01	
pH = 7.42	7.00	7.01	R ² > 0.995 Within ± 0.05 pH against standard value
pH = 9.18	10.00	10.03	
pH = 12.45	12.45	12.48	
Repeatability	1 st time	4.01 , 10.04	Within ± 0.05 pH against average value
	2 nd time	4.01 , 10.03	
	3 rd time	4.01 , 10.03	
	pH 4.00 , 10.00	Ave.: 4.01 , 10.03	

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



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 (R ²)
5.0	5.2		1.0000
15.0	15.1		
25.0	25.1		Acceptance Criterion R ² > 0.995 Within ± 0.5°C against standard value
35.0	35.1		
45.0	45.2		
55.0	55.3		
Repeatability	1 st time	15.1 , 45.2	Within ± 0.25°C against average value
	2 nd time	15.2 , 45.3	
	3 rd time	15.1 , 45.2	
	15.0 , 45.0	Ave.: 15.1 , 45.2	

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	20.8		Acceptance Criterion R ² > 0.995 Within ± 3% F.S. against span calibration value 100.0 and 400.0 NTU
100.0	102.0		
400.0	403.3		
800.0	804.5		
Repeatability	1 st time	0.0 , 804.4	Within ± 3% F.S. against average value
	2 nd time	0.0 , 804.5	
	3 rd time	0.0 , 804.5	
	0.0 , 800.0	Ave.: 0.0 , 804.5	

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 : 24-9-2009



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



CERTIFICATE OF CALIBRATION

D094

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

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 responses 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.

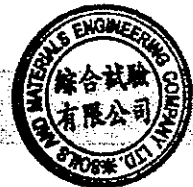
Actual Measurement data are documented on worksheets.

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 02-01-2009

Company Chop:



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.



CERTIFICATE OF CALIBRATION

(Continuation Page)

D094

Certificate No.: 09CA0102 01-01

Page 2 of 2

1, Electrical Tests

The electrical tests were performed 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	
		Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	A	Pass	0.3	
	C	Pass	0.3	
Frequency weightings	Lin	Pass	0.3	
	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Time weightings	Single 100µs rectangular pulse	N/A	N/A	
Peak response	Crest factor of 3	Pass	0.3	
R.M.S. accuracy	Single burst 5 ms at 2000 Hz	Pass	0.3	
Time weighting I	Repeated at frequency of 100 Hz	Pass	0.3	
	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
	Single burst 10 ms at 4 kHz	Pass	0.4	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	SPL	Pass	0.3	
Overload Indication	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: G.Y. Fung
Date: 02-01-2009

Checked by: 
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



CERTIFICATE OF CALIBRATION

2095

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

Customer: 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


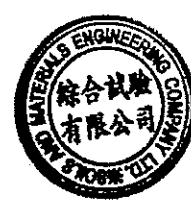
Temperature: 22 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1010 ± 15 hPa

Test specifications

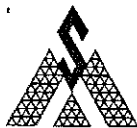
- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results 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:  Date: 02-01-2009 Company Chop: 

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.



CERTIFICATE OF CALIBRATION

(Continuation Page)

2095

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.

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

(Output level in dB re 20 µPa)

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 Date: 02-01-2009	Checked by: 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)

Species	Habit	Native	Relative Abundance	Occurrence	
				PNH3	PNH4
<i>Acacia confusa</i>	tree	no	occasional		+
<i>Achyranthes aspera</i>	herb	yes	scarce		+
<i>Acorus gramineus</i>	herb	yes	scarce		+
<i>Alangium chinensis</i>	tree	yes	scarce		+
<i>Alocasia macrorrhiza</i>	herb	yes	occasional		+
<i>Aporosa dioica</i>	tree	yes	occasional	+	+
<i>Ardisia crenata</i>	shrub	yes	occasional	+	+
<i>Bamboo</i>	herb	-	scarce	+	
<i>Bischofia javanica</i>	herb	yes	scarce	+	
<i>Caryota mitis</i>	tree	no	scarce		+
<i>Celtis sinensis</i>	tree	yes	occasional	+	+
<i>Centotheca lappacea</i>	grass	yes	scarce	+	+
<i>Christella parasitica</i>	fern	yes	occasional	+	+
<i>Cleistocalyx operculata</i>	tree	yes	occasional	+	
<i>Cocculus orbiculatus</i>	climber	yes	scarce		+
<i>Colocasia esculenta</i>	herb	no	scarce	+	
<i>Commelina sp.</i>	herb	yes	scarce	+	+
<i>Desmos chinensis</i>	shrub	yes	occasional	+	
<i>Dimocarpus longan</i>	tree	no	occasional		+
<i>Embelia ribes</i>	climber	yes	scarce		+
<i>Ficus hispida</i>	tree	yes	common	+	+
<i>Ficus superba</i>	tree	yes	occasional		+
<i>Garcinia oblongifolia</i>	tree	yes	occasional		+
<i>Glochidion puberum</i>	shrub	yes	scarce	+	
<i>Hedychium coronarium</i>	herb	no	scarce		+
<i>Hedyotis hedyotideia</i>	climber	yes	scarce		+
<i>Hibiscus rosa-sinensis</i>	shrub	no	occasional		+
<i>Liriope spicata</i>	herb	yes	scarce		+
<i>Litsea glutinosa</i>	tree	yes	occasional	+	+
<i>Litsea rotundifolia</i>	shrub	yes	scarce	+	
<i>Lophatherum gracile</i>	grass	yes	scarce	+	
<i>Lygodium japonicum</i>	fern	yes	scarce	+	+
<i>Macaranga tanarius</i>	tree	yes	occasional	+	+
<i>Machilus breviflora</i>	tree	yes	scarce		+

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

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

Species	Habit	Native	Relative Abundance	Occurrence	
				PNH1	PNH2
<i>Acrostichum aureum</i>	fern	yes	scarce	+	
<i>Celtis sinensis</i>	tree	yes	occasional		+
<i>Clerodendrum inerme</i>	shrub	yes	occasional	+	
<i>Cocculus orbiculatus</i>	climber	yes	scarce	+	
<i>Ficus microcarpa</i>	tree	yes	scarce		+
<i>Ficus superba</i>	tree	yes	occasional		+
<i>Ipomoea cairica</i>	climber	yes	occasional		+
<i>Kandelia obovata</i>	tree	yes	scarce	+	
<i>Neyraudia reynaudiana</i>	grass	yes	occasional	+	
<i>Panicum maximum</i>	grass	no	common	+	+
<i>Sapium sebiferum</i>	tree	yes	occasional		+
<i>Wedelia triloba</i>	climber	no	occasional		+

Appendix D3 Plant species recorded at Luk Tei Tong River

Species	Habit	Native	Relative Abundance	Occurrence				
				LLT1	LLT2	LLT3	LLT4	LLT5
<i>Acanthus ilicifolius</i>	shrub	yes	common	+	+		+	
<i>Acrostichum aureum</i>	fern	yes	scarce					+
<i>Aegiceras corniculatum</i>	shrub	yes	scarce	+				
<i>Bougainvillea spectabilis</i>	climber	no	scarce	+				
<i>Bridelia tomentosa</i>	tree	yes	occasional	+				
<i>Celtis sinensis</i>	tree	yes	scarce	+	+			
<i>Clerodendrum inerme</i>	shrub	yes	abundant	+	+		+	
<i>Cyperus malaccensis</i>	sedge	yes	occasional		+			
<i>Derris trifoliata</i>	climber	yes	occasional		+			
<i>Excoecaria agallocha</i>	shrub	yes	common	+	+			
<i>Ficus microcarpa</i>	tree	yes	scarce	+				
<i>Ficus superba</i>	tree	yes	occasional	+				
<i>Fimbristylis ferruginea</i>	sedge	yes	occasional		+		+	
<i>Hibiscus tiliaceus</i>	tree	yes	abundant	+			+	
<i>Kandelia obovata</i>	tree	yes	common	+	+			
<i>Lantana camara</i>	shrub	no	scarce		+			
<i>Leucaena leucocephala</i>	tree	no	occasional	+				
<i>Litsea glutinosa</i>	tree	yes	scarce		+			
<i>Neyraudia reynaudiana</i>	grass	yes	occasional	+				+
<i>Panicum maximum</i>	grass	no	common	+				
<i>Paspalum paspaloides</i>	grass	no	occasional					
<i>Phragmites australis</i>	grass	yes	occasional				+	
<i>Premna serratifolia</i>	tree	yes	scarce		+			
<i>Pueraria phaseoloides</i>	climber	yes	scarce				+	
<i>Saccharum arundinaceum</i>	grass	yes	scarce	+				
<i>Scolopia chinensis</i>	tree	yes	scarce				+	
<i>Terminalia catappa</i>	tree	no	scarce		+			
<i>Toxocarpus wightianus</i>	climber	yes	scarce				+	
<i>Wikstroemia indica</i>	shrub	yes	scarce				+	
<i>Wollastonia biflora</i>	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: 3/9/2009

Weather Condition: Sunny

Monitoring Location	WE1			WE2			WE3			WE4			WE5			WE6		
Time (hhmm)	1230			1220			1150			1210			1300			1250		
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	7.33			7.36			7.51			7.31			6.93			7.05		
Temperature (oC)	29.0			29.2			30.7			31.1			30.3			30.5		
Salinity (ppt)	0.1			1.4			11.9			13.8			2.9			0.1		
Conductivity (ms/m)	47.0			271.0			1940.0			2230.0			53.3			6.0		
Water flow (m/s)	0.075			0.100			0.100			0.020			0.050			0.075		
Turbidity (NTU)	0.0	0.0	Average	2.0	2.0	Average	5.2	5.2	Average	6.7	6.7	Average	8.8	8.8	Average	1.8	1.8	Average
			0.00			2.00			5.20			6.7			8.80			1.8
DO (mg/l)	7.11	7.11	Average	7.67	7.67	Average	7.31	7.31	Average	6.55	6.55	Average	6.21	6.21	Average	7.98	7.98	Average
			7.11			7.67			7.31			6.55			6.21			7.98
DO Saturation (%)	93	93	Average	102	102	Average	98	98	Average	81	81	Average	76	76	Average	107	107	Average
			93			102			98			81			76			107

Name
Prepared By: Jimmy Cheng

Signature


Date
3/9/2009

remark or
observation: _____

Appendix D5

Ecological Water Monitoring Results **(lab report)**



TEST SUMMARY ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900038 Date of Issue : 08-09-2009

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

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 04-09-2009

GCE Serial No. : WQM092009 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	494	1.4	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 Sep 2009 / 12:30		03 Sep 2009 / 12:20		03 Sep 2009 / 11:50			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	3.1	3.2	4.3	4.5	

TEST RESULTS	Sample ID	WE4	WE4 Duplicate	WE5	WE5 Duplicate	WE6	WE6 Duplicate		
	Sampling Date/Time	03 Sep 2009 / 12:10		03 Sep 2009 / 13:00		03 Sep 2009 / 12:50			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	3.5	3.9	7.6	7.6	< 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

Approved Signatory : 

Checked By : GU CHIN

Name : GU CHIN

Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC090900135 Date of Issue : 30-09-2009

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

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-09-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 22-09-2009

GCE Serial No. : WQM092009 Sampling Date* : 03-09-2009 / 12:30 Sample Type* : River Water

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

Description : 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	0.02
Biochemical Oxygen Demand (BOD ₅) mg/L	APHA 20ed 5210 B	1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

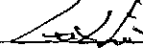
* : Information provided by client

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 September 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



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC090900143

Date of Issue : 30-09-2009

Client* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

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

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon.

Date Started : 03-09-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 22-09-2009

GCE Serial No. : WQM092009

Sampling Date* : 03-09-2009 / 12:30

Sample Type* : River Water

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Sample I.D.* : WE1 Duplicate

Description : 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	0.02
Biochemical Oxygen Demand (BOD ₅) mg/L	APHA 20ed 5210 B	1
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 September 2009.

REMARKS : Sample Location WE1.

----- End -----

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

Certified By

Name

Post

Gu Chin

Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090900151

Date of Issue : 30-09-2009

Client* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

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

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon.

Date Started : 03-09-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 22-09-2009

GCE Serial No. : WQM092009

Sampling Date* : 03-09-2009 / 12:20

Sample Type* : River Water

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Sample I.D.* : WE2

Description : 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
		APHA 20ed 4500-NH ₃ E
		APHA 18ed 4500-NH ₃ C
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO ₃ ⁻ E
Phosphorus	mg/L	APHA 20ed 4500-P D
Biochemical Oxygen Demand (BOD ₅)	mg/L	APHA 20ed 5210 B
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 September 2009.

REMARKS : Sample Location WE2.

----- End -----

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

Certified By

Name

Post

Gu Chin

Chemist

Checked By : Gu Chin



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC090900169 Date of Issue : 30-09-2009

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

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-09-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 22-09-2009

GCE Serial No. : WQM092009 Sampling Date* : 03-09-2009 / 12:20 Sample Type* : River Water

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

Description : 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	0.32
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.21
Phosphorus mg/L	APHA 20ed 4500-P D	0.05
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	--

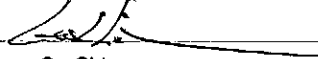
* : Information provided by client

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 September 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



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC090900177

Date of Issue : 30-09-2009

Client* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

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

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon.

Date Started : 03-09-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 22-09-2009

GCE Serial No. : WQM092009

Sampling Date* : 03-09-2009 / 11:50

Sample Type* : River Water

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Sample I.D.* : WE3

Description : 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	0.12
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.16
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 September 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



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090900185

Date of Issue : 30-09-2009

Client* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

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

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon.

Date Started : 03-09-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 22-09-2009

GCE Serial No. : WQM092009

Sampling Date* : 03-09-2009 / 11:50

Sample Type* : River Water

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Sample I.D.* : WE3 Duplicate

Description : 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	0.12
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.17
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 September 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



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC090900193

Date of Issue : 30-09-2009

Client* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

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

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon.

Date Started : 03-09-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 22-09-2009

GCE Serial No. : WQM092009

Sampling Date* : 03-09-2009 / 12:10

Sample Type* : River Water

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Sample I.D.* : WE4

Description : 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	0.19
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.18
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 September 2009.

REMARKS : Sample Location WE4.

----- End -----

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

Certified By

Name

Post

Gu Chin

Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC090900208 Date of Issue : 30-09-2009

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

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-09-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 22-09-2009

GCE Serial No. : WQM092009 Sampling Date* : 03-09-2009 / 12:10 Sample Type* : River Water

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

Description : 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	0.18
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.18
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

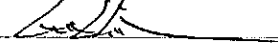
Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 September 2009.

REMARKS : Sample Location WE4.

----- End -----

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

Certified By : 
 Name : Gu Chin
 Post : Chemist

Checked By : Gu Chin



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC090900216

Date of Issue : 30-09-2009

Client* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

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

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon.

Date Started : 03-09-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 22-09-2009

GCE Serial No. : WQM092009

Sampling Date* : 03-09-2009 / 13:00

Sample Type* : River Water

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Sample I.D.* : WE5

Description : 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	0.52
	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	0.13
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 September 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



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC090900224 Date of Issue : 30-09-2009

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

Client Address* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-09-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 22-09-2009

GCE Serial No. : WQM092009 Sampling Date* : 03-09-2009 / 13:00 Sample Type* : River Water

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

Description : 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	0.51
	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	0.13
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

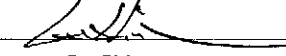
Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 03 September 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



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC090900232

Date of Issue : 30-09-2009

Client* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

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

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon.

Date Started : 03-09-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 22-09-2009

GCE Serial No. : WQM092009

Sampling Date* : 03-09-2009 / 12:50

Sample Type* : River Water

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Sample I.D.* : WE6

Description : 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	0.10
Phosphorus mg/L	APHA 20ed 4500-P D	0.01
Biochemical Oxygen Demand (BOD ₅) mg/L	APHA 20ed 5210 B	1
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 September 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



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC090900240

Date of Issue : 30-09-2009

Client* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

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

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon.

Date Started : 03-09-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 22-09-2009

GCE Serial No. : WQM092009

Sampling Date* : 03-09-2009 / 12:50

Sample Type* : River Water

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Sample I.D.* : WE6 Duplicate

Description : 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	0.01
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.11
Phosphorus mg/L	APHA 20ed 4500-P D	0.01
Biochemical Oxygen Demand (BOD ₅) mg/L	APHA 20ed 5210 B	1
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 September 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		7/9/2009	
Measurement Start Time (hhmm)		14:15	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)		0.5	1.2
Measurement Results	L90 (dB(A))	45.2	52.9
	L10 (dB(A))	50.5	57.3
	Leq (dB(A))	48.7	55.9
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		no construction works are being carried out during measurement.	1. Hammer noise 2. House keeping noise
Other Noise Source(s) During Monitoring			1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

7/9/2009



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	Facade
Date of Monitoring		7/9/2009	
Measurement Start Time (hhmm)		10:45	11:20
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.9	0.8
Measurement Results	L90 (dB(A))	48.0	47.1
	L10 (dB(A))	54.8	52.7
	Leq (dB(A))	53.7	51.3
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		no construction works are being carried out during measurement.	1. Power generator noise 2. Hammer noise
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

7/9/2009



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		16/9/2009	
Measurement Start Time (hhmm)		14:10	14:45
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.1	0.2
Measurement Results	L90 (dB(A))	46.5	58.2
	L10 (dB(A))	51.0	60.8
	Leq (dB(A))	49.5	60.0
Weather condition:		Cloudy	
Major Construction Noise Source(s) During Monitoring		1. Excavator noise	1. Excavator noise 2. Power generator noise
Other Noise Source(s) During Monitoring		1. Traffic noise	1. Traffic noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

16/9/2009



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	Facade
Date of Monitoring		16/9/2009	
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)		0.5	0.7
Measurement Results	L90 (dB(A))	54.1	52.2
	L10 (dB(A))	60.7	57.1
	Leq (dB(A))	59.5	56.6
Weather condition:		Cloudy	
Major Construction Noise Source(s) During Monitoring		1. Excavator noise	1. Excavator noise
Other Noise Source(s) During Monitoring		1. Public noise	1. Dog barking noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

16/9/2009



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		21/9/2009	
Measurement Start Time (hhmm)		14:50	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)		0.6	1.1
Measurement Results	L90 (dB(A))	44.1	54.5
	L10 (dB(A))	49.6	57.1
	Leq (dB(A))	45.3	56.2
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	1. Hammer noise 2. House keeping noise
Other Noise Source(s) During Monitoring			1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

21/9/2009



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	Facade
Date of Monitoring		21/9/2009	
Measurement Start Time (hhmm)		10:40	11:15
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		1.2	1.0
Measurement Results	L90 (dB(A))	49.5	44.4
	L10 (dB(A))	56.1	52.9
	Leq (dB(A))	54.1	49.8
Weather condition:		Sunny	
Major Construction Noise Source(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 (Bicycle)	1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

21/9/2009



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		/	
Measurement Start Time (hhmm)		/	/
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		/	/
Measurement Results	L90 (dB(A))	/	/
	L10 (dB(A))	/	/
	Leq (dB(A))	/	/
Weather condition:		/	/
Major Construction Noise Source(s) During Monitoring		/	/
Other Noise Source(s) During Monitoring		/	/
Remarks		N1 and N2 was postponed to 2 October 2009 from 28 September due to major breakdown of the sound level meter.	

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

28/9/2009



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	Facade
Date of Monitoring	/	28/9/2009
Measurement Start Time (hhmm)	/	13:30
Measurement Time Length (mins.)	30 mins	
Noise Meter Model/ Identification	ACO Japan, model 6224	
Calibrator Model/ Identification	Castle Group, GA607	
Wind Speed (m/s)	/	1.1
Measurement Results	L90 (dB(A))	56.9
	L10 (dB(A))	62.4
	Leq (dB(A))	60.9
Weather condition:	/	Cloudy
Major Construction Noise Source(s) During Monitoring	/	1. Excavator noise
Other Noise Source(s) During Monitoring	/	
Remarks	N3 was postponed to 2 Oct 2009 from 28 September due to major breakdown of the sound level meter.	

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

28/9/2009



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	2/10/2009		
Measurement Start Time (hhmm)	10:55	10:15	
Measurement Time Length (mins.)	30 mins		
Noise Meter Model/ Identification	ACO Japan, model 6224		
Calibrator Model/ Identification	Castle Group, GA607		
Wind Speed (m/s)	1.0	1.3	
Measurement Results	L90 (dB(A))	39.8	52.5
	L10 (dB(A))	45.5	55.5
	Leq (dB(A))	43.8	54.5
Weather condition:	Sunny		
Major Construction Noise Source(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. Dog barking noise	
Remarks	To compensate the schedule monitoring on 28 September 2009	To compensate the schedule monitoring on 28 September 2009	

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

2/10/2009



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	Facade
Date of Monitoring	2/10/2009	/
Measurement Start Time (hhmm)	9:37	/
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	/
Measurement Results	L90 (dB(A))	41.0
	L10 (dB(A))	50.0
	Leq (dB(A))	48.6
Weather condition:	Sunny	/
Major Construction Noise Source(s) During Monitoring	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 4. Helicopter noise	/
Remarks	To compensate the schedule monitoring on 28 September 2009	

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

2/10/2009

Appendix F1

Water Quality

Monitoring Data Sheet

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 2/9/2009 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1130			1140			1145			1155			1205			1215			1225		
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	7.30			7.25			6.92			7.40			7.21			7.10			6.78		
Temperature (oC)	30.2			30.4			31.0			31.3			28.4			30.2			30.8		
Salinity (ppt)	4.3			3.2			8.5			9.1			0.3			0.0			1.7		
Turbidity (NTU)	5.5	5.5	Average 5.5	1.6	1.6	Average 1.6	0.8	0.8	Average 0.8	6.7	6.7	Average 6.7	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	1.6	1.6	Average 1.6
DO (mg/l)	7.48	7.48	Average 7.48	7.11	7.11	Average 7.11	7.06	7.06	Average 7.06	7.34	7.34	Average 7.34	7.65	7.65	Average 7.65	7.67	7.67	Average 7.67	6.91	6.91	Average 6.91
DO Saturation (%)	99	99	Average 99	95	95	Average 95	95	95	Average 95	99	99	Average 99	99	99	Average 99	102	102	Average 102	72	72	Average 72

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Date
2/9/2009

remark or
observation: _____

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 3/9/2009 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1150			1200			1210			1140			1230			1240			1300		
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			1.5			< 1			< 1			< 1		
pH value	7.51			7.43			7.31			7.47			7.27			7.03			6.93		
Temperature (oC)	30.7			30.8			31.1			31.1			29.3			31.0			30.3		
Salinity (ppt)	11.9			8.1			13.8			13.0			0.0			0.0			2.7		
Turbidity (NTU)	5.2	5.2	Average 5.2	4.9	4.9	Average 4.9	6.7	6.7	Average 6.7	2.6	2.6	Average 2.6	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	8.6	8.6	Average 8.6
DO (mg/l)	7.31	7.31	Average 7.31	6.70	6.70	Average 6.70	6.55	6.55	Average 6.55	6.01	6.01	Average 6.01	7.17	7.17	Average 7.17	7.25	7.25	Average 7.25	6.25	6.25	Average 6.25
DO Saturation (%)	98	98	Average 98	90	90	Average 90	81	81	Average 81	72	72	Average 72	93	93	Average 93	94	94	Average 94	76	76	Average 76

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Date
3/9/2009

remark or observation: _____

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 7/9/2009 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1400			1355			1350			1410			1320			1330			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			1.4			<1			<1			<1		
pH value	7.18			8.07			7.34			7.31			7.01			6.53			6.46		
Temperature (oC)	30.8			31.9			32.3			32.4			28.9			31.0			31.1		
Salinity (ppt)	5.0			5.9			12.1			11.9			0.0			0.0			3.5		
Turbidity (NTU)	2.9	2.9	Average 2.9	4.3	4.3	Average 4.3	6.4	6.4	Average 6.4	5.8	5.8	Average 5.8	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	3.6	3.6	Average 3.6
DO (mg/l)	7.65	7.65	Average 7.65	6.68	6.68	Average 6.68	6.53	6.53	Average 6.53	6.71	6.71	Average 6.71	6.67	6.67	Average 6.67	6.80	6.80	Average 6.80	5.82	5.82	Average 5.82
DO Saturation (%)	105	105	Average 105	94	94	Average 94	96	96	Average 96	99	99	Average 99	87	87	Average 87	92	92	Average 92	71	71	Average 71

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Date
7/9/2009

remark or
observation: _____

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 9/9/2009 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1500			1510			1520			1530			1450			1440			1430		
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			1.3			<1			<1			<1		
pH value	6.81			7.25			7.35			7.85			6.92			7.62			7.09		
Temperature (oC)	30.1			29.9			32.1			31.5			29.5			30.8			31.3		
Salinity (ppt)	3.2			3.4			6.4			6.2			0.0			0.0			1.0		
Turbidity (NTU)	6.2	6.6	Average 6.4	4.5	4.7	Average 4.6	9.4	9.6	Average 9.5	14.0	13.6	Average 13.8	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	13.7	13.2	Average 13.5
DO (mg/l)	7.24	7.22	Average 7.23	7.18	7.10	Average 7.14	7.29	7.22	Average 7.26	7.71	7.68	Average 7.70	6.81	6.83	Average 6.82	7.17	7.17	Average 7.17	6.84	6.82	Average 6.83
DO Saturation (%)	98	98	Average 98	96	96	Average 96	103	103	Average 103	108	108	Average 108	90	90	Average 90	96	96	Average 96	93	93	Average 93

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Date
9/9/2009

remark or
observation: _____

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 11/9/2009

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1630			1615			1625			1640			1545			1555			1605		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			Muddy			Muddy			Muddy			normal			normal			normal		
Water Depth (m)	< 1			< 1			< 1			1.4			< 1			< 1			< 1		
pH value	8.53			7.12			6.79			8.18			7.33			7.04			6.81		
Temperature (oC)	26.7			27.6			27.8			27.7			26.2			27.1			27.5		
Salinity (ppt)	0.2			0.0			1.8			2.6			0.0			0.0			1.2		
Turbidity (NTU)	14.5	14.5	Average 14.5	31.7	31.7	Average 31.7	30.3	30.3	Average 30.3	22.8	22.8	Average 22.8	8.0	8.0	Average 8.0	1.4	1.4	Average 1.4	8.5	8.5	Average 8.5
DO (mg/l)	6.84	6.84	Average 6.84	6.73	6.73	Average 6.73	6.19	6.19	Average 6.19	6.37	6.37	Average 6.37	6.71	6.71	Average 6.71	7.01	7.01	Average 7.01	6.02	6.02	Average 6.02
DO Saturation (%)	86	86	Average 86	86	86	Average 86	80	80	Average 80	82	82	Average 82	83	83	Average 83	89	89	Average 89	77	77	Average 77

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Prepared By: Jimmy Cheng

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Date
11/9/2009

remark or observation: Muddy water is observed due to the heavy raining before sampling

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 14/9/2009

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1040			1045			1050			1030			1100			1110			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			1.2			<1			<1			<1		
pH value	7.51			7.43			6.85			7.38			7.11			7.23			6.83		
Temperature (oC)	27.6			27.8			28.9			28.0			27.2			27.4			27.8		
Salinity (ppt)	3.8			0.9			11.4			11.8			0.3			0.0			3.7		
Turbidity (NTU)	8.1	8.1	Average 8.1	5.0	5.0	Average 5.0	11.6	11.6	Average 11.6	14.9	14.9	Average 14.9	2.1	2.1	Average 2.1	0.0	0.0	Average 0.0	9.3	9.3	Average 9.3
DO (mg/l)	6.54	6.54	Average 6.54	6.44	6.44	Average 6.44	6.11	6.11	Average 6.11	6.24	6.24	Average 6.24	6.46	6.46	Average 6.46	7.01	7.01	Average 7.01	3.57	3.57	Average 3.57
DO Saturation (%)	85	85	Average 85	83	83	Average 83	81	81	Average 81	83	83	Average 83	82	82	Average 82	89	89	Average 89	48	48	Average 48

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Date
14/9/2009

remark or observation: _____

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 16/9/2009

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1030			1040			1050			1100			1115			1125			1135		
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	7.11			7.10			6.75			7.14			7.43			6.65			6.48		
Temperature (oC)	26.8			26.7			27.6			27.4			26.3			26.7			26.8		
Salinity (ppt)	1.0			0.1			5.9			3.0			0.1			0.0			0.2		
Turbidity (NTU)	9.5	9.9	Average 9.7	4.0	3.8	Average 3.9	9.8	10.2	Average 10.0	15.3	15.1	Average 15.2	6.3	6.1	Average 6.2	1.9	1.7	Average 1.8	8.4	8.3	Average 8.4
DO (mg/l)	6.69	6.67	Average 6.68	7.19	7.21	Average 7.20	6.05	6.07	Average 6.06	6.55	6.53	Average 6.54	6.99	6.97	Average 6.98	7.36	7.35	Average 7.36	6.98	7.00	Average 6.99
DO Saturation (%)	80	80	Average 80	86	86	Average 86	80	80	Average 80	80	80	Average 80	84	84	Average 84	87	87	Average 87	84	84	Average 84

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Date
16/9/2009

remark or
observation: _____

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 18/9/2009 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1150			1155			1200			1140			1210			1220			1230		
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	7.57			7.41			7.32			7.56			7.12			6.81			6.97		
Temperature (oC)	29.3			29.5			29.8			30.2			28.3			29.1			30.1		
Salinity (ppt)	6.9			2.1			9.4			11.5			0.2			0.0			5.7		
Turbidity (NTU)	7.4	7.4	Average 7.4	1.9	1.9	Average 1.9	8.2	8.2	Average 8.2	6.3	6.3	Average 6.3	0.2	0.2	Average 0.2	0.0	0.0	Average 0.0	6.7	6.7	Average 6.7
DO (mg/l)	6.52	6.52	Average 6.52	6.39	6.39	Average 6.39	6.05	6.05	Average 6.05	6.76	6.76	Average 6.76	6.69	6.69	Average 6.69	6.71	6.71	Average 6.71	6.01	6.01	Average 6.01
DO Saturation (%)	87	87	Average 87	85	85	Average 85	81	81	Average 81	89	89	Average 89	86	86	Average 86	88	88	Average 88	79	79	Average 79

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Prepared By: Jimmy Cheng

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Date
18/9/2009

remark or observation: _____

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 21/9/2009 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1340			1335			1330			1350			1300			1310			1320		
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			1.3			<1			<1			<1		
pH value	7.61			7.85			7.57			7.84			6.83			6.53			6.61		
Temperature (oC)	30.2			30.8			32.0			31.7			29.8			29.7			30.4		
Salinity (ppt)	2.2			2.4			12.5			12.1			0.0			0.0			5.8		
Turbidity (NTU)	3.5	3.5	Average 3.5	1.3	1.3	Average 1.3	6.7	6.7	Average 6.7	1.8	1.8	Average 1.8	1.3	1.3	Average 1.3	2.1	2.1	Average 2.1	4.6	4.6	Average 4.6
DO (mg/l)	7.33	7.33	Average 7.33	7.19	7.19	Average 7.19	7.54	7.54	Average 7.54	7.01	7.01	Average 7.01	6.38	6.38	Average 6.38	6.76	6.76	Average 6.76	5.72	5.72	Average 5.72
DO Saturation (%)	99	99	Average 99	97	97	Average 97	111	111	Average 111	102	102	Average 102	85	85	Average 85	89	89	Average 89	71	71	Average 71

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Date
21/9/2009

remark or observation: _____

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 23/9/2009

Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1525			1515			1505			1535			1430			1440			1455		
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			1.3			<1			<1			<1		
pH value	7.51			7.59			7.28			7.98			7.03			6.70			7.78		
Temperature (oC)	28.9			29.8			30.9			31.6			28.8			29.0			29.4		
Salinity (ppt)	1.4			0.2			9.8			13.2			0.0			0.0			0.1		
Turbidity (NTU)	4.4	4.5	Average 4.5	2.4	2.6	Average 2.5	15.3	15.1	Average 15.2	5.3	5.2	Average 5.3	3.7	3.5	Average 3.6	0.0	0.0	Average 0.0	10.5	10.7	Average 10.6
DO (mg/l)	7.33	7.35	Average 7.34	7.12	7.16	Average 7.14	6.80	6.82	Average 6.81	6.90	6.92	Average 6.91	6.91	6.93	Average 6.92	6.81	6.83	Average 6.82	7.17	7.19	Average 7.18
DO Saturation (%)	96	96	Average 96	94	94	Average 94	88	88	Average 88	98	98	Average 98	91	91	Average 91	89	89	Average 89	94	94	Average 94

Name
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Signature


Date
23/9/2009

remark or observation: _____

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 24/9/2009 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	7.33			7.64			7.37			7.62			7.21			7.03			6.97		
Temperature (oC)	29.5			30.2			32.0			31.3			28.8			29.4			31.5		
Salinity (ppt)	1.4			0.2			4.7			7.1			0.0			0.0			0.4		
Turbidity (NTU)	11.9	11.9	Average 11.9	2.7	2.7	Average 2.7	15.1	15.1	Average 15.1	8.4	8.4	Average 8.4	1.1	1.1	Average 1.1	1.5	1.5	Average 1.5	5.9	5.9	Average 5.9
DO (mg/l)	7.19	7.19	Average 7.19	7.13	7.13	Average 7.13	7.97	7.97	Average 7.97	7.34	7.34	Average 7.34	6.73	6.73	Average 6.73	6.98	6.98	Average 6.98	6.15	6.15	Average 6.15
DO Saturation (%)	95	95	Average 95	94	94	Average 94	112	112	Average 112	103	103	Average 103	88	88	Average 88	92	92	Average 92	84	84	Average 84

Name
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Signature


Date
24/9/2009

remark or observation: _____

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 28/9/2009

Rainy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1035			1045			1055			1110			1125			1135			1145		
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			1.3			< 1			< 1			< 1		
pH value	7.46			7.35			7.00			7.43			6.53			7.13			7.24		
Temperature (oC)	26.7			26.6			27.9			27.1			25.7			25.7			25.7		
Salinity (ppt)	4.1			0.3			14.5			15.3			0.0			0.0			0.4		
Turbidity (NTU)	8.9	8.7	Average 8.8	2.6	2.5	Average 2.6	12.0	11.8	Average 11.9	7.9	7.7	Average 7.8	2.5	2.4	Average 2.5	2.4	2.2	Average 2.3	6.4	6.3	Average 6.4
DO (mg/l)	6.15	6.13	Average 6.14	5.92	5.90	Average 5.91	4.26	4.23	Average 4.25	5.48	5.46	Average 5.47	6.26	6.23	Average 6.25	6.88	6.86	Average 6.87	6.52	6.50	Average 6.51
DO Saturation (%)	80	80	Average 80	75	75	Average 75	60	60	Average 60	75	75	Average 75	78	78	Average 78	86	86	Average 86	81	81	Average 81

Name
Prepared By: Jimmy Cheng

Signature


Date
28/9/2009

remark or observation: D.O. value of M2, M3 and M4 exceeded action level. No construction work were carried out during sampling.
Typhoon signal no.1 was in force during sampling.

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 29/9/2009

Rainy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1145			1150			1155			1135			1205			1215			1225		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	Muddy			normal			Muddy			Muddy			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.1			< 1			< 1			< 1		
pH value	7.25			7.31			7.09			7.62			7.03			7.12			6.92		
Temperature (oC)	24.9			24.1			24.5			24.7			23.8			23.7			24.5		
Salinity (ppt)	0.2			0.0			1.2			2.3			0.0			0.0			0.4		
Turbidity (NTU)	14.6	14.6	Average 14.6	9.7	9.7	Average 9.7	20.4	20.4	Average 20.4	34.2	34.2	Average 34.2	8.6	8.6	Average 8.6	2.8	2.8	Average 2.8	12.6	12.6	Average 12.6
DO (mg/l)	6.96	6.96	Average 6.96	6.71	6.71	Average 6.71	6.31	6.31	Average 6.31	6.53	6.53	Average 6.53	6.87	6.87	Average 6.87	7.13	7.13	Average 7.13	6.04	6.04	Average 6.04
DO Saturation (%)	84	84	Average 84	82	82	Average 82	78	78	Average 78	81	81	Average 81	83	83	Average 83	86	86	Average 86	75	75	Average 75

Name
Prepared By: Jimmy Cheng

Signature


Date
29/9/2009

remark or observation: The turbidity at locaton M2, M3 and M4 exceeded limit level due to heavy rain.

Environmental Pioneers & Solutions Limited
Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 30/9/2009

Overcast/Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1125			1115			1105			1135			1035			1045			1055		
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	7.13			7.42			6.86			7.39			6.99			6.90			6.84		
Temperature (oC)	26.7			26.6			28.3			28.4			25.1			25.9			27.4		
Salinity (ppt)	0.2			0.0			7.4			12.0			0.0			0.0			0.2		
Turbidity (NTU)	5.7	5.9	Average 5.8	1.1	1.3	Average 1.2	10.0	9.6	Average 9.8	15.5	15.3	Average 15.4	0.0	0.0	Average 0.0	2.8	2.6	Average 2.7	8.8	8.4	Average 8.6
DO (mg/l)	7.21	7.23	Average 7.22	7.21	7.19	Average 7.20	4.47	4.49	Average 4.48	5.58	5.62	Average 5.60	6.97	6.99	Average 6.98	7.37	7.40	Average 7.39	6.59	6.61	Average 6.60
DO Saturation (%)	91	91	Average 91	90	90	Average 90	58	58	Average 58	73	73	Average 73	85	85	Average 85	92	92	Average 92	84	84	Average 84

Name
Prepared By: Jimmy Cheng

Signature


Date
30/9/2009

remark or observation: No construction work were carried out during sampling. The D.O. value of M3 & M4 exceeded action level, because it was raining before sampling.

Appendix F2

Water Quality

Monitoring Lab report



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900012 Date of Issue : 08-09-2009

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.

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 02-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 03-09-2009

GCE Serial No. : WQM092009 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	24.7
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	02 Sep 2009 / 12:05		02 Sep 2009 / 12:15		02 Sep 2009 / 12:25			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	3.8	3.5	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	02 Sep 2009 / 11:30		02 Sep 2009 / 11:40		02 Sep 2009 / 11:45		02 Sep 2009 / 11:55		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	3.6	3.7	2.9	2.8	6.8	6.3	4.3	4.5

* : 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

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



TEST SUMMARY ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900020 Date of Issue : 08-09-2009

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.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 03-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 04-09-2009

GCE Serial No. : WQM092009 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	494	1.4	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 Sep 2009 / 12:30		03 Sep 2009 / 12:40		03 Sep 2009 / 13:00			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.4	1.2	< 1.0	< 1.0	7.5	7.7	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	03 Sep 2009 / 11:50		03 Sep 2009 / 12:00		03 Sep 2009 / 12:10		03 Sep 2009 / 11:40	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	4.3	4.5	2.7	3.0	3.5	3.9	3.4

* : 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 : 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



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900046 Date of Issue : 18-09-2009

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.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 07-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 08-09-2009

GCE Serial No. : WQM092009 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	494	498	-0.8	24.7
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	07 Sep 2009 / 13:20		07 Sep 2009 / 13:30		07 Sep 2009 / 13:40			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	1.0	1.1	4.1	3.9	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	07 Sep 2009 / 14:00		07 Sep 2009 / 13:55		07 Sep 2009 / 13:50		07 Sep 2009 / 14:10	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	4.3	4.4	2.6	2.4	5.9	6.1	4.4

* : 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



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900054 Date of Issue : 18-09-2009

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.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 09-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 10-09-2009

GCE Serial No. : WQM092009 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	492	1.4	26.1		
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	09 Sep 2009 / 14:50		09 Sep 2009 / 14:40		09 Sep 2009 / 14:30			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	1.1	1.0	7.1	7.2	
TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	09 Sep 2009 / 15:00		09 Sep 2009 / 15:10		09 Sep 2009 / 15:20		09 Sep 2009 / 15:30	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	5.9	6.2	2.4	2.6	8.5	8.8	11.5

* : 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 Approved Signatory :

Checked By : GU CHIN Name : GU CHIN

Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900062 Date of Issue : 18-09-2009

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.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 11-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 12-09-2009

GCE Serial No. : WQM092009 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	493	1.6	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	11 Sep 2009 / 15:45		11 Sep 2009 / 15:55		11 Sep 2009 / 16:05		
	LOD								
	Units								
Suspended Solids (SS)	1	mg/L	3.2	3.1	< 1.0	< 1.0	10.5	10.8	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
		Sampling Date/Time	11 Sep 2009 / 16:30		11 Sep 2009 / 16:15		11 Sep 2009 / 16:25		11 Sep 2009 / 16:40
	LOD								
	Units								
Suspended Solids (SS)	1	mg/L	5.2	5.4	10.0	10.3	19.1	18.9	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

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900070 Date of Issue : 21-09-2009

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.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 14-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 15-09-2009

GCE Serial No. : WQM092009 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	489	499	-2.0	27.2
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 Sept. 2009 / 11:00		14 Sept. 2009 / 11:10		14 Sept. 2009 / 11:20			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.3	1.2	< 1.0	< 1.0	5.1	5.3		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		14 Sept. 2009 / 10:40		14 Sept. 2009 / 10:45		14 Sept. 2009 / 10:50		14 Sept. 2009 / 10:30	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	5.6	5.8	2.8	2.6	9.9	10.1	10.6	10.7

* : 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 : 

Checked By : GU CHIN

Name : GU CHIN

Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090900088 Date of Issue : 21-09-2009

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.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 16-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 17-09-2009

GCE Serial No. : WQM092009 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	491	491	0.0	22.8
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 Sept. 2009 / 11:15		16 Sept. 2009 / 11:25		16 Sept. 2009 / 11:35			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.7	1.6	< 1.0	< 1.0	4.2	4.4	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	16 Sept. 2009 / 10:30		16 Sept. 2009 / 10:40		16 Sept. 2009 / 10:50		16 Sept. 2009 / 11:00	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	7.6	8.1	1.8	2.1	11.9	11.7	7.9

* : 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

Approved Signatory : 

Checked By : GU CHIN

Name : GU CHIN
 Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900096 Date of Issue : 21-09-2009

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.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 18-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 19-09-2009

GCE Serial No. : WQM092009 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	491	484	1.4	22.1
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	18 Sept. 2009 / 12:10		18 Sept. 2009 / 12:20		18 Sept. 2009 / 12:30			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.4	1.5	< 1.0	< 1.0	5.0	4.9	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	18 Sept. 2009 / 11:50		18 Sept. 2009 / 11:55		18 Sept. 2009 / 12:00		18 Sept. 2009 / 11:40	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	6.6	6.7	2.1	2.2	8.1	7.9	6.0

* : 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

Approved Signatory : 

Checked By : GU CHIN

Name : GU CHIN

Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900101 Date of Issue : 28-09-2009

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.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 21-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 22-09-2009

GCE Serial No. : WQM092009 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	502	-0.8	26.3
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	21 Sep 2009 / 13:00		21 Sep 2009 / 13:10		21 Sep 2009 / 13:20			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	4.4	4.3	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	21 Sep 2009 / 13:40		21 Sep 2009 / 13:35		21 Sep 2009 / 13:30		21 Sep 2009 / 13:50		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	5.4	5.1	1.9	2.3	6.3	6.6	3.5	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

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900119 Date of Issue : 28-09-2009

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.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 23-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 24-09-2009

GCE Serial No. : WQM092009 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	496	501	-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	23 Sep 2009 / 14:30		23 Sep 2009 / 14:40		23 Sep 2009 / 14:55			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	11.1	11.3	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	23 Sep 2009 / 15:25		23 Sep 2009 / 15:15		23 Sep 2009 / 15:05		23 Sep 2009 / 15:35	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	6.3	6.2	2.7	2.8	15.0	14.6	5.4

* : 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



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090900127 Date of Issue : 28-09-2009

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.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 24-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 25-09-2009

GCE Serial No. : WQM092009 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	489	0.6	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	24 Sep 2009 / 15:30		24 Sep 2009 / 15:40		24 Sep 2009 / 15:50			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	< 1.0	< 1.0	8.6	8.4	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	24 Sep 2009 / 16:10		24 Sep 2009 / 16:05		24 Sep 2009 / 16:00		24 Sep 2009 / 16:20	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	10.4	10.1	2.2	2.5	11.9	11.5	8.1

* : 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

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900282

Date of Issue : 05-10-2009

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.

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon.

Date Started : 28-09-2009

W.O. No.* : -- Sample Type* : River Water

Date Completed : 29-09-2009

GCE Serial No. : WQM092009

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	493	496	-0.6	26.5		
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	28 Sep 2009 / 11:25		28 Sep 2009 / 11:35		28 Sep 2009 / 11:45			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.1	1.9	2.2	2.0	5.4	5.0	
TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	28 Sep 2009 / 10:35		28 Sep 2009 / 10:45		28 Sep 2009 / 10:55		28 Sep 2009 / 11:10	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	9.2	9.2	2.9	2.8	12.0	11.9	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

Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900290 Date of Issue : 05-10-2009

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.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 29-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 30-09-2009

GCE Serial No. : WQM092009 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	496	-0.8	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	29 Sep 2009 / 12:05		29 Sep 2009 / 12:15		29 Sep 2009 / 12:25			
		LOD	Units							
Suspended Solids (SS)	1	mg/L	5.5	5.6	2.0	1.9	11.1	11.3		

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
		Sampling Date/Time	29 Sep 2009 / 11:45		29 Sep 2009 / 11:50		29 Sep 2009 / 11:55		29 Sep 2009 / 11:35	
		LOD	Units							
Suspended Solids (SS)	1	mg/L	10.7	10.6	9.4	9.1	13.9	13.8	31.2	30.8

* : 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



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090900305 Date of Issue : 05-10-2009

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.
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 30-09-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 02-10-2009

GCE Serial No. : WQM092009 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	485	489	-0.8	25.9
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	30 Sep 2009 / 10:35		30 Sep 2009 / 10:45		30 Sep 2009 / 10:55			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.6	1.2	< 1.0	< 1.0	6.6	7.0	

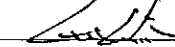
TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	30 Sep 2009 / 11:25		30 Sep 2009 / 11:15		30 Sep 2009 / 11:05		30 Sep 2009 / 11:35	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	6.4	6.6	2.6	2.9	11.9	12.1	13.7

* : 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
 Post : Chemist

Checked By : GU CHIN

Appendix G
Monitoring Schedule
for Sept 2009

Environmental Pioneers and Solutions Limited

DC/2006/11 - DRAINAGE IMPROVEMENT IN SOUTHERN LANTAU

Master Schedule of EM&A works in September 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8/30	8/31	9/1	9/2	9/3	9/4	9/5
			WQM at: 11:12	WQM, EWQM at: 11:45		
9/6	9/7	9/8	9/9	9/10	9/11	9/12
	WQM at: 13:49 Noise monitoring		WQM at: 14:55		WQM at: 16:22 Ecological Survey	
9/13	9/14	9/15	9/16	9/17	9/18	9/19
	WQM at: 10:15		WQM at: 10:21 Noise monitoring	Ecological Survey	WQM at: 11:57	
9/20	9/21	9/22	9/23	9/24	9/25	9/26
	WQM at: 13:53 Noise monitoring		WQM at: 15:05	WQM at: 15:49		
9/27	9/28	9/29	9/30	10/1	10/2	10/3
	WQM at: 10:10 Noise monitoring*	WQM at: 10:30	WQM at: 10:50		Compensatory noise monitoring*	

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

Remark*: Noise monitoring for N1, N2 and M3 was postponed to 2 October 2009 from 28 September due to major breakdown of the sound level meter.

Appendix H Implementation Status of environmental protection / mitigation measures

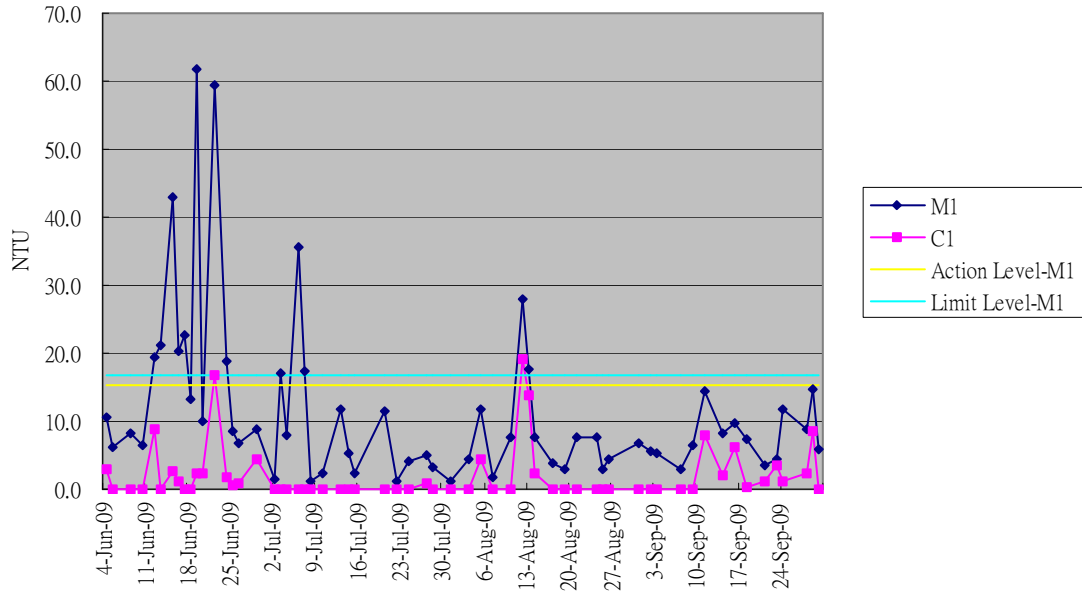
Environmental Aspect	Protection / Mitigation Measures	Implementation status	Follow-up action
Air Quality	Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved road, with complete coverage.	Implemented	-
	Use of frequent watering for particular dusty static construction 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.	Deficiencies identified	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	Implemented	Follow up actions have been taken and settled on 18 Sept 09
	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.	Deficiencies identified	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.	Implemented	-
	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.	Deficiencies identified	Follow up actions have been taken and settled on 03 Sept 09
	Water pumped out from foundation excavations should be discharged into silt removal facilities.	Non-compliance identified	Follow up actions have been taken and settled on 11 Sept 09
	During rainstorms, exposed slope surface should be covered by a tarpaulin or the means.	Deficiencies identified	Ongoing
	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.	Deficiencies identified	To be follow up
	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.	Deficiencies identified	Ongoing
	Oils and fuels should only be used and stored on designated areas which have pollution prevention facilities.	Deficiencies identified	Follow up actions have been taken and settled on 11 Sept 09
	Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site.	Not applicable	-

Environmental Aspect	Protection / Mitigation Measures	Implementation status	Follow-up action
	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	-
	Maintenance desilting 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 desilting 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	Deficiencies identified	To be follow up
	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 identified	Follow up actions have been taken and settled on 11 Sept 09
	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	-

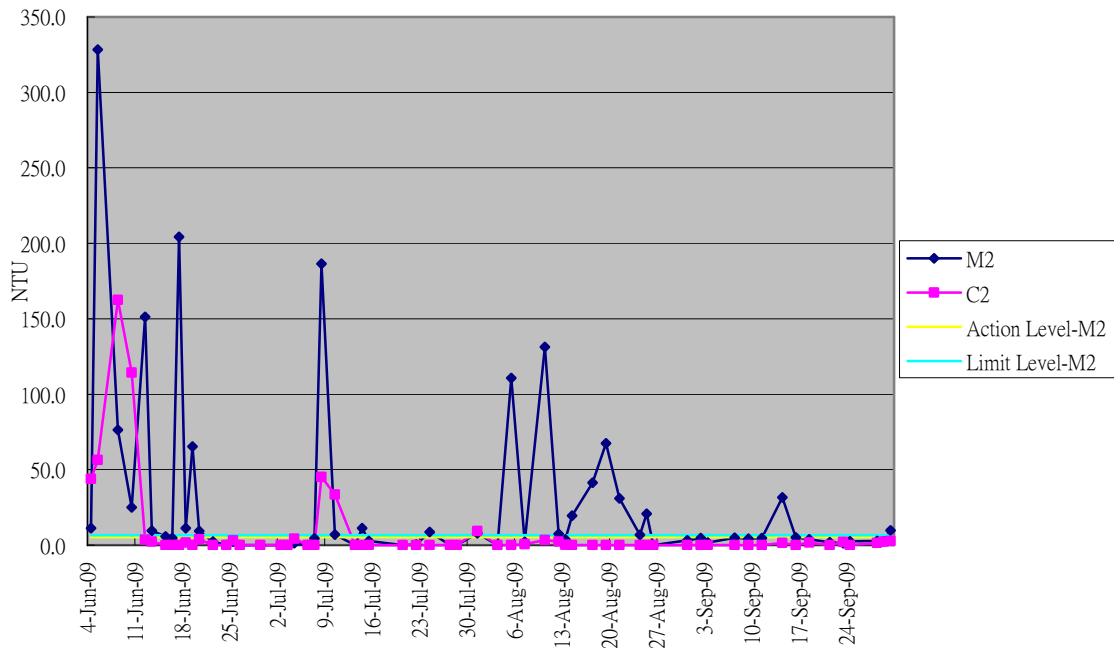
Appendix I

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

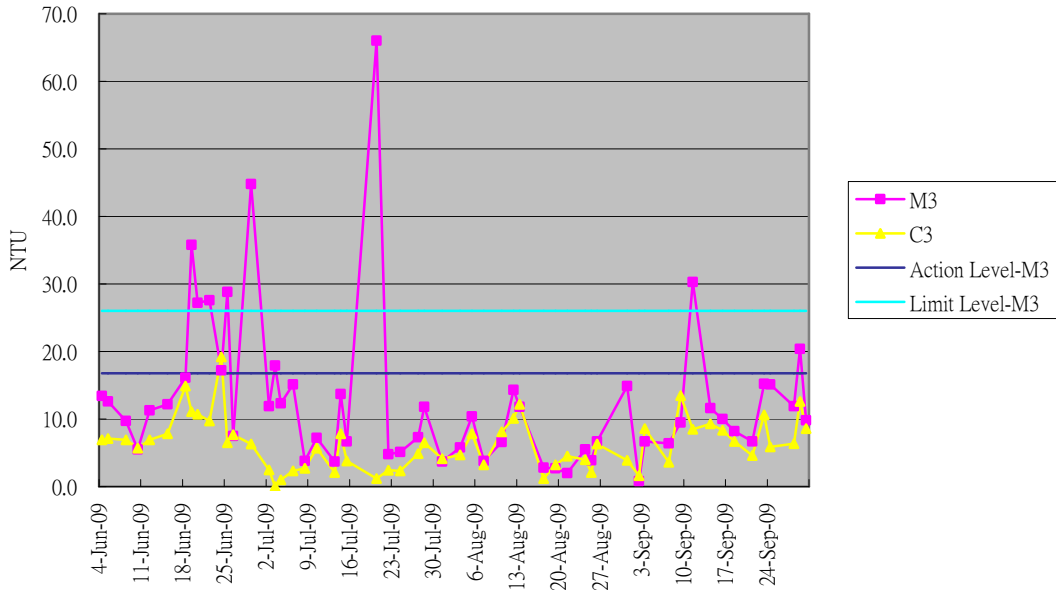
Graphical Plot of Turbidity Trend M1&C1 (June - Sept 09)



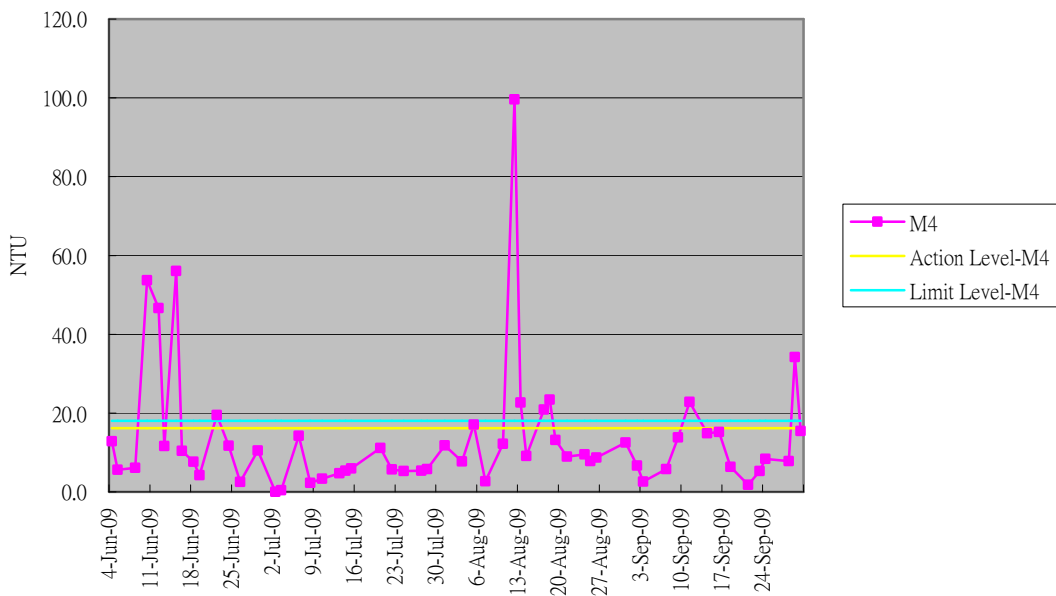
Graphical Plot of Turbidity Trend M2&C2 (June - Sept 09)



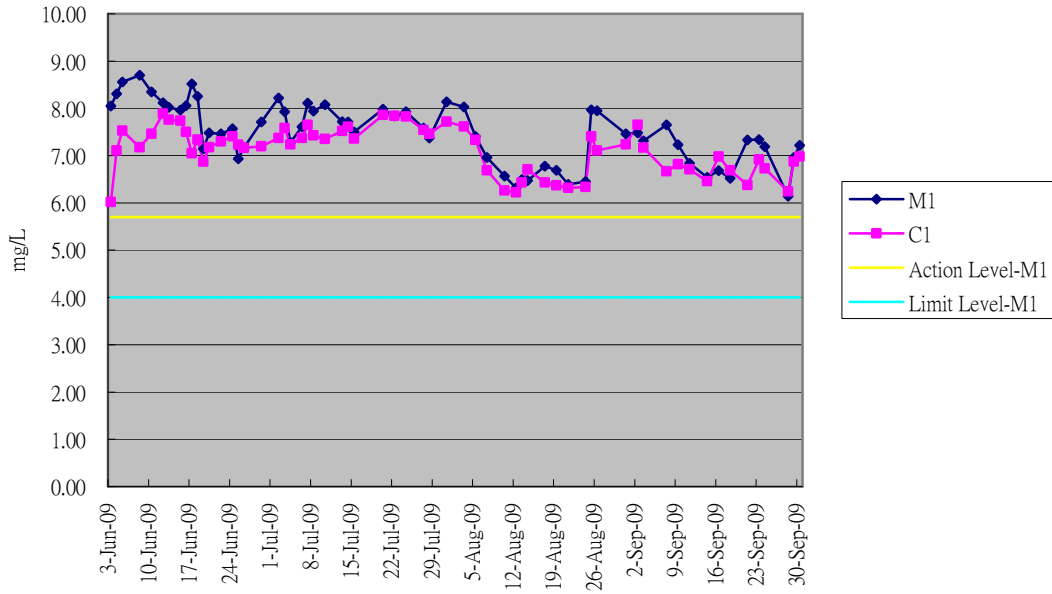
Graphical Plot of Turbidity Trend M3&C3 (June - Sept 09)



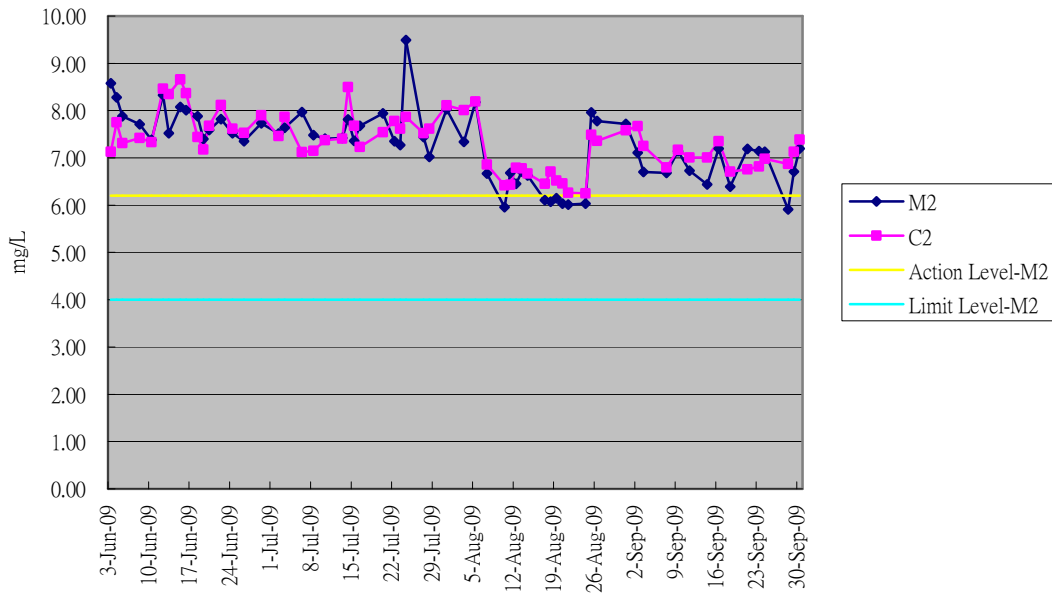
Graphical Plot of Turbidity Trend M4 (June - Sept 09)



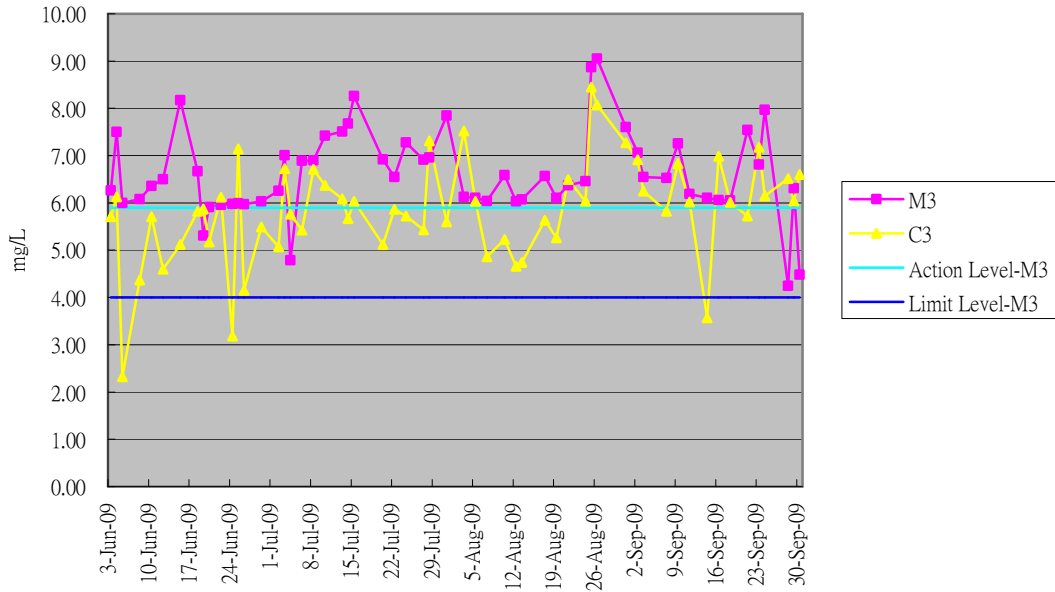
Graphical Plot of Dissolved Oxygen Trend M1&C1 (June - Sept 09)



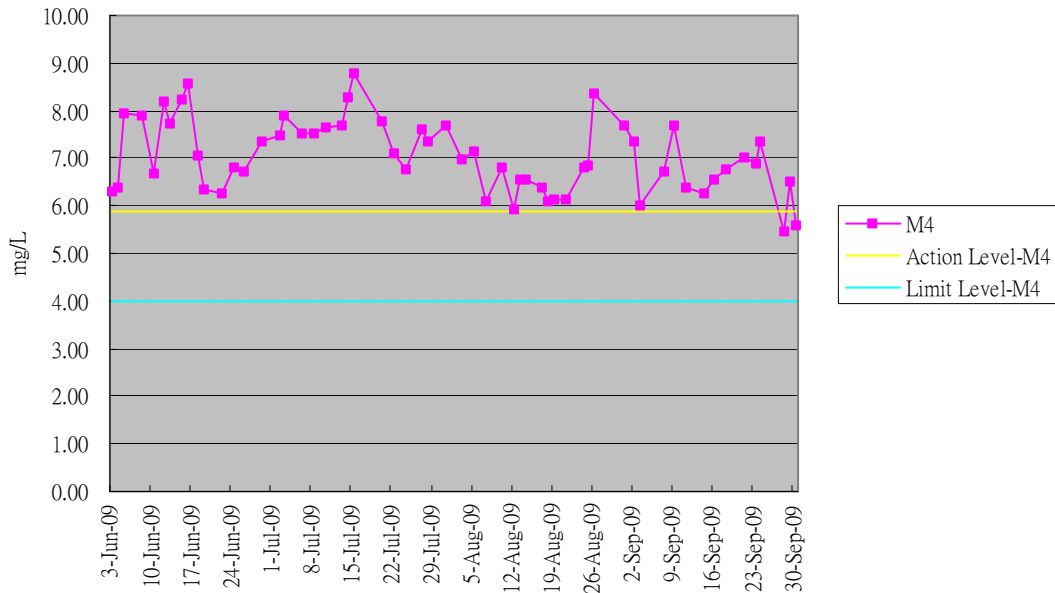
Graphical Plot of Dissolved Oxygen Trend M2&C2 (June - Sept 09)



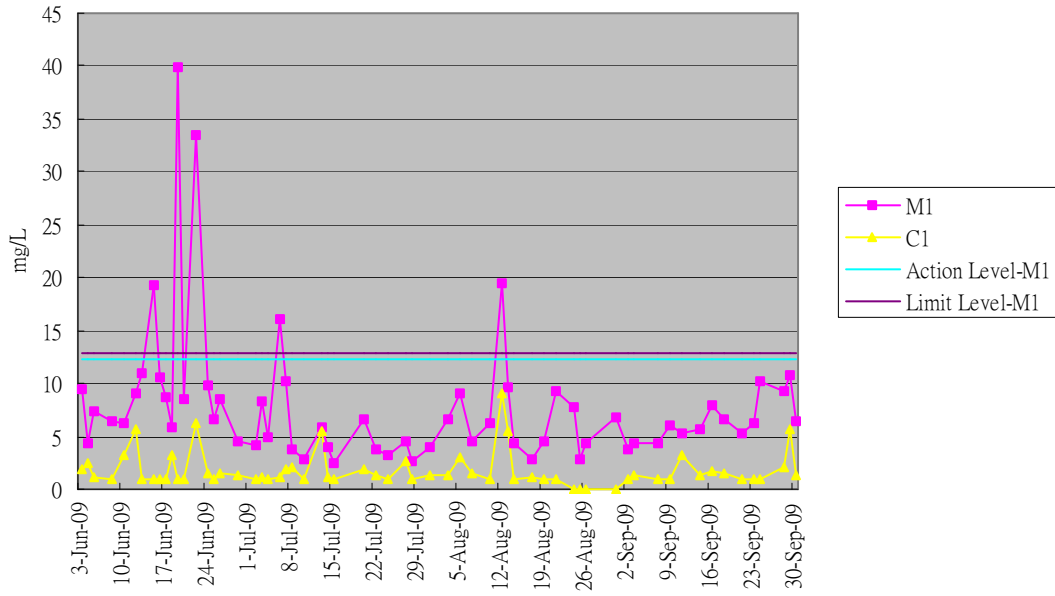
Graphical Plot of Dissolved Oxygen Trend M3&C3 (June - Sept 09)



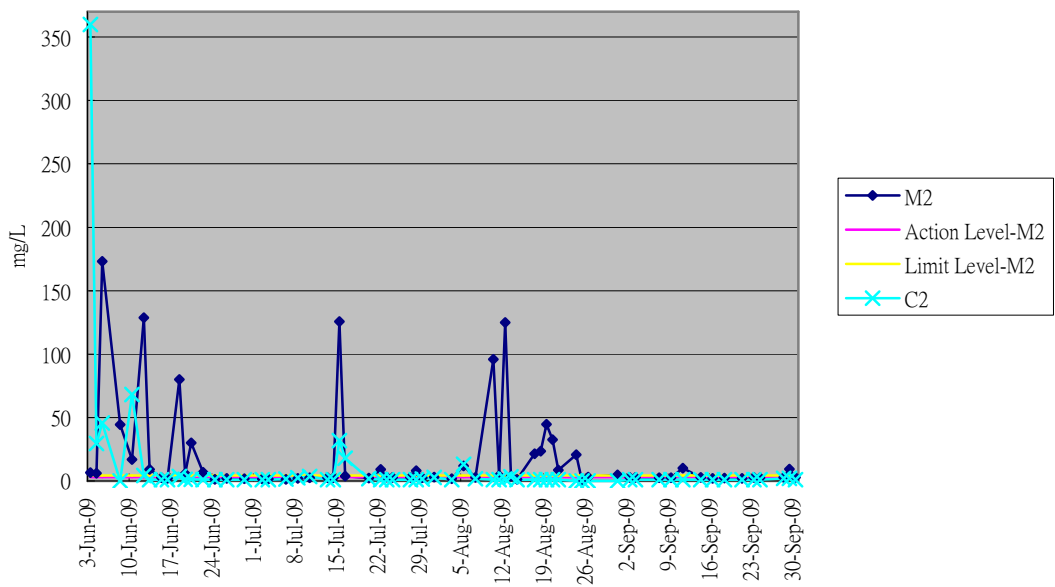
Graphical Plot of Dissolved Oxygen Trend M4 (June - Sept 09)



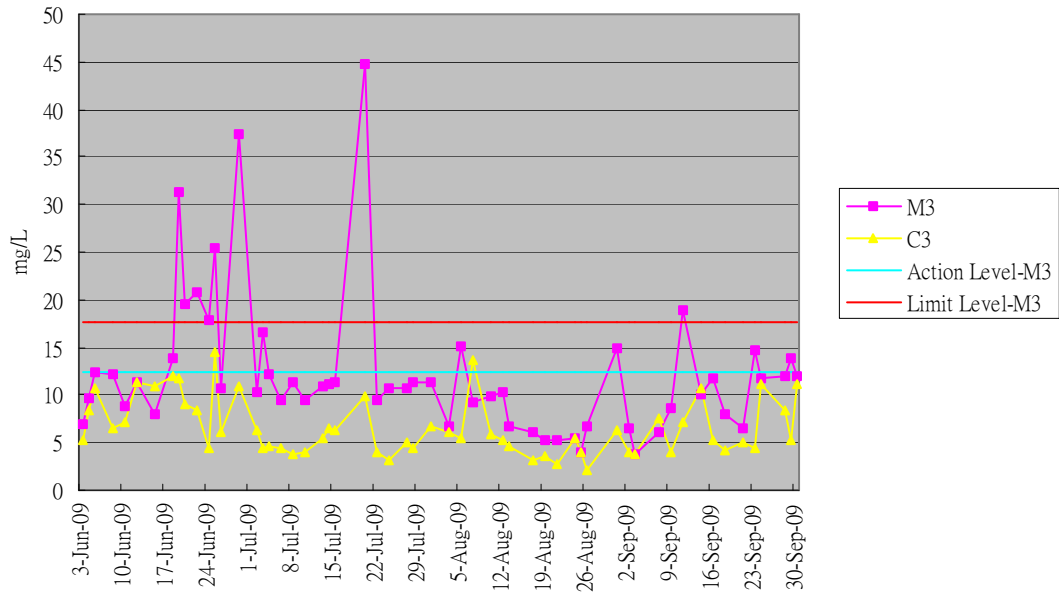
Graphical Plot of Suspended Soild M1&C1 (June - Sept 09)



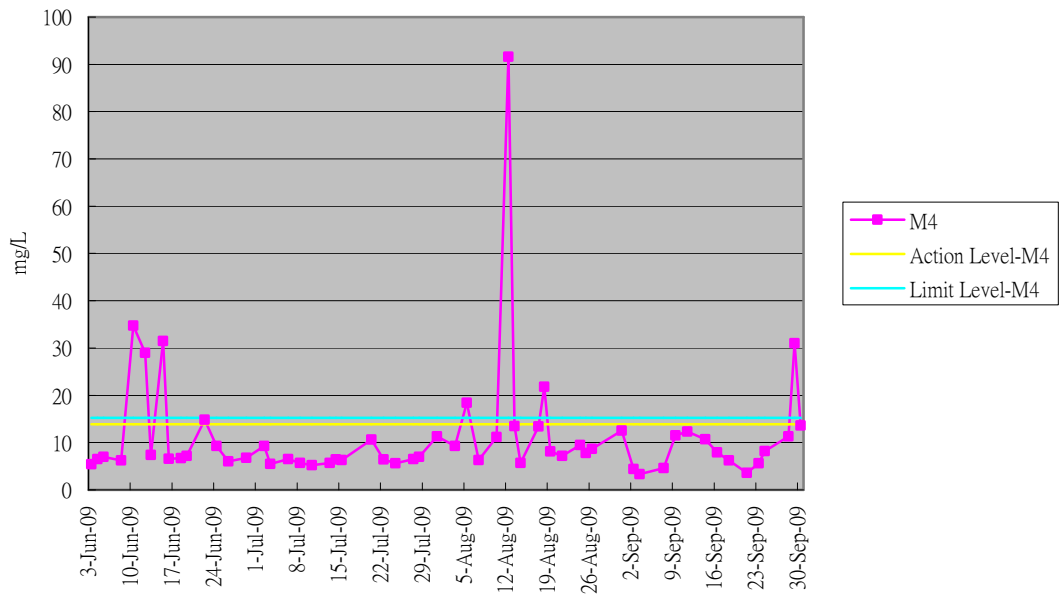
Graphical Plot of Suspended Soild M2&C2 (June - Sept 09)



Graphical Plot of Suspended Soild M3&C3 (June - Sept 09)

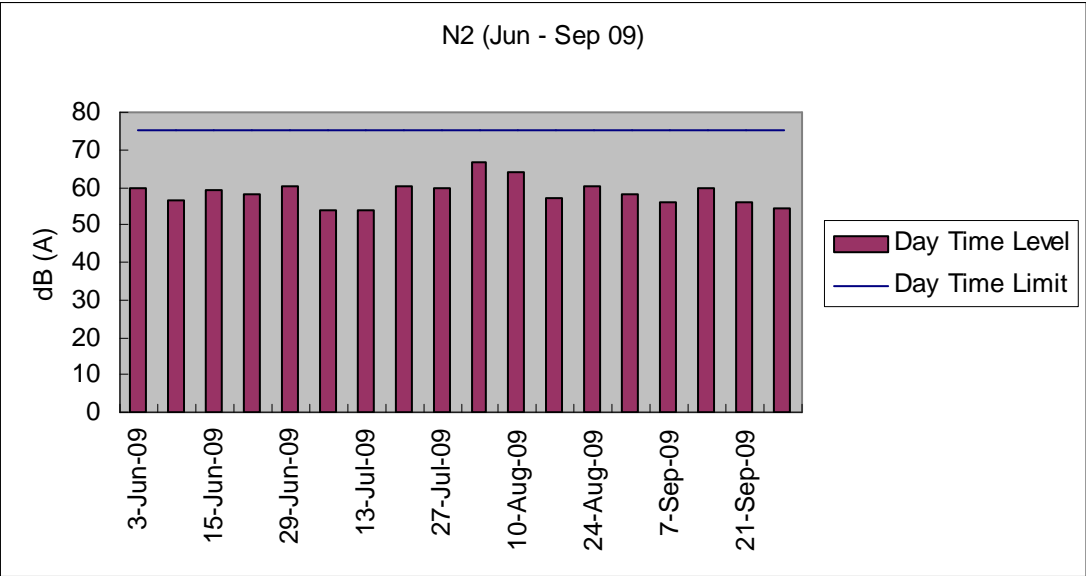
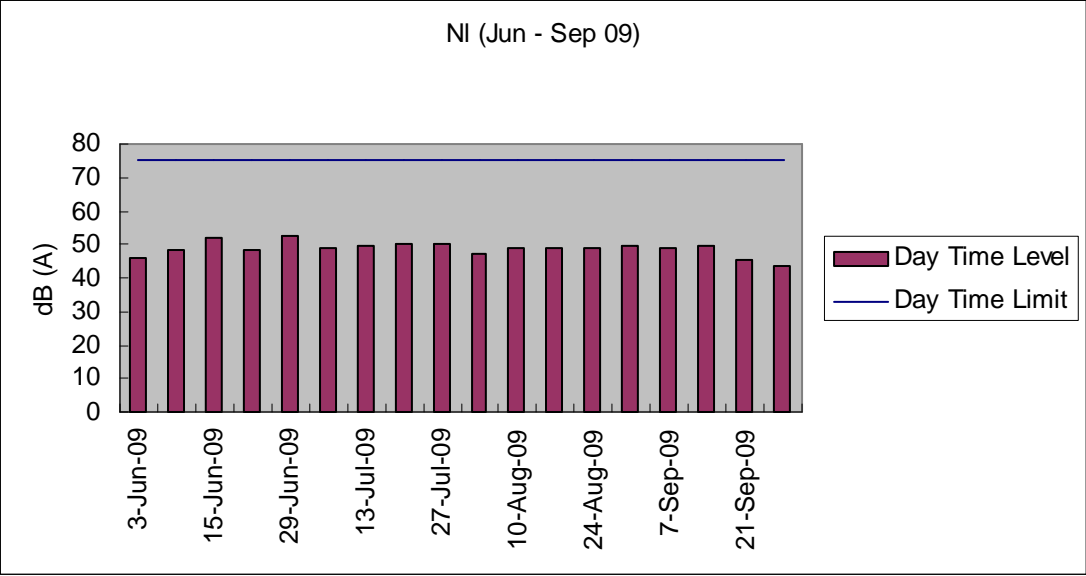


Graphical Plot of Suspended Soild M4 (June - Sept 09)

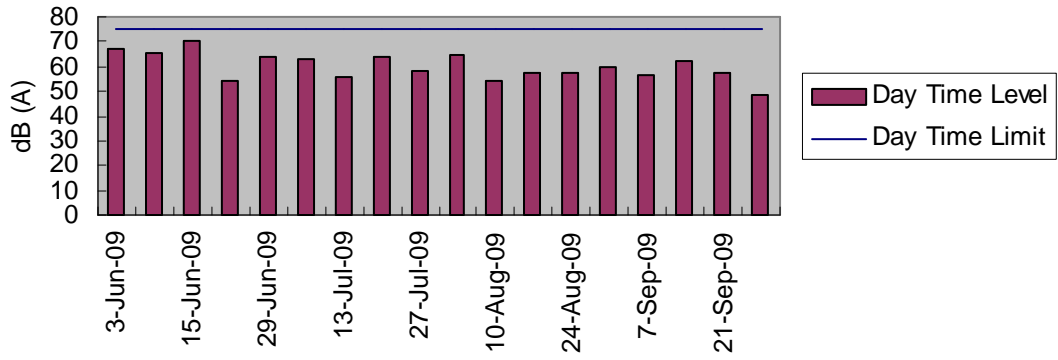


Appendix J

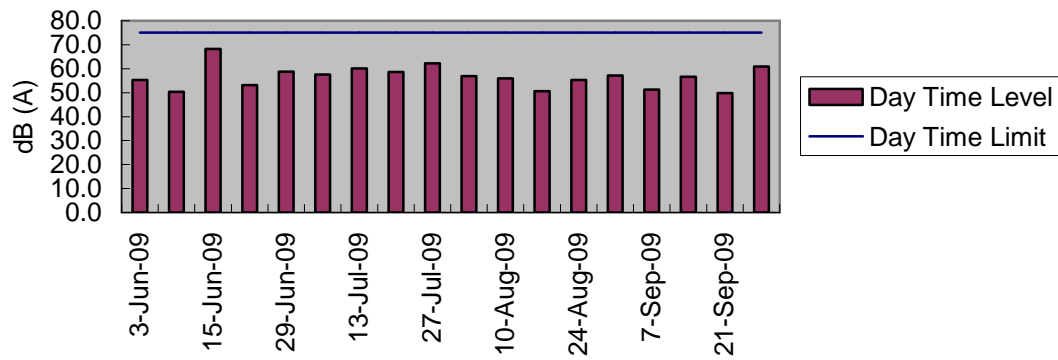
Graphical plot of noise
monitoring results



N3 (Jun - Sep 09)



N4 (Jun - Sep 09)



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 from 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 17 September 2009.

The survey was conducted during low tide period (around 3pm). 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 and part of the rock gabions were removed to allow tidal exchange (**Photo 1**). The tidal inlet was of its original level before construction. The temporary access between the new gabion wall and the mangrove area has also been reprofiled (**Photo 2**). During the survey the water was flowing out from the mangrove area to the stream channel.

The mangrove communities were exposed during the current survey. Most of the dominant mangrove or mangrove associated species, including *Phragmites australis*(**Photos 2**), *Aegiceras corniculatum* (**Photos 3**) and *Acrostichum aureum* (**Photo 4**) were in fair conditions. The extent of yellowing leaves observed on individuals of *Aegiceras corniculatum* was obviously reduced. Mortality of a dominant mangrove associate species, *Acanthus ilicifolius*, was stabilised, and some individuals were resprouted from the withered stands (**Photo 5**). Abundant fishes were observed in the standing water, although mangrove crabs were not observed during the current survey .

Conclusions and Recommendations

According to the contractor, the reinstatement of inlet will be completed by the end of September; and only minor reinforcement work at the gabions surrounding the inlet would be required after. Removal of pipes and rock gabions to the original level of the tidal inlet has significantly improved the tidal exchange. Mangrove communities are recovering despite the end of growing season. It is expected that with all temporary bunds removed the original tidal exchange pattern could be restored, and the mangrove associate plants would continue to recover.

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



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6