

Drainage Service Department

Monthly Environmental Monitoring & Auditing report for

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

May 2009

2nd Revision

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EXECUTIVE SUMMARY

This is the tenth monthly Environmental Monitoring and Audit (EM&A) report for “Drainage Improvement in Southern Lantau Investigation”. The environmental permit number is “EP-237/2005/A”. The report concludes the impact monitoring for the activities undertaken during the period of 1st May 2009 to 31st May 2009. The major activities in this reporting month include construction works of box culvert at Pak Ngan Heung (PNH) River, box culvert at Luk Tei Tong (LTT), as well as U-channel at Ling Tsui Tau.

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

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

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

Furthermore, impact monitoring for water quality was conducted. Total 60 non-compliance events of water quality criteria were recorded in this reporting month. Exceedances were mainly caused by site water discharge by the other project and influence of rainstorm.

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

Furthermore, there was no complaint, notification of any summons and successful prosecutions against the project received during the reporting period.

Environmental concerns regarding the mangrove area to the east of Luk Tei Tong River and the widened rip-rap based river channel at bottleneck A of Tai Tei Tong River were raised by green groups during site visit. Outcome and follow up actions please refer to Section 11.3

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

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

1. Introduction

This is the tenth 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.

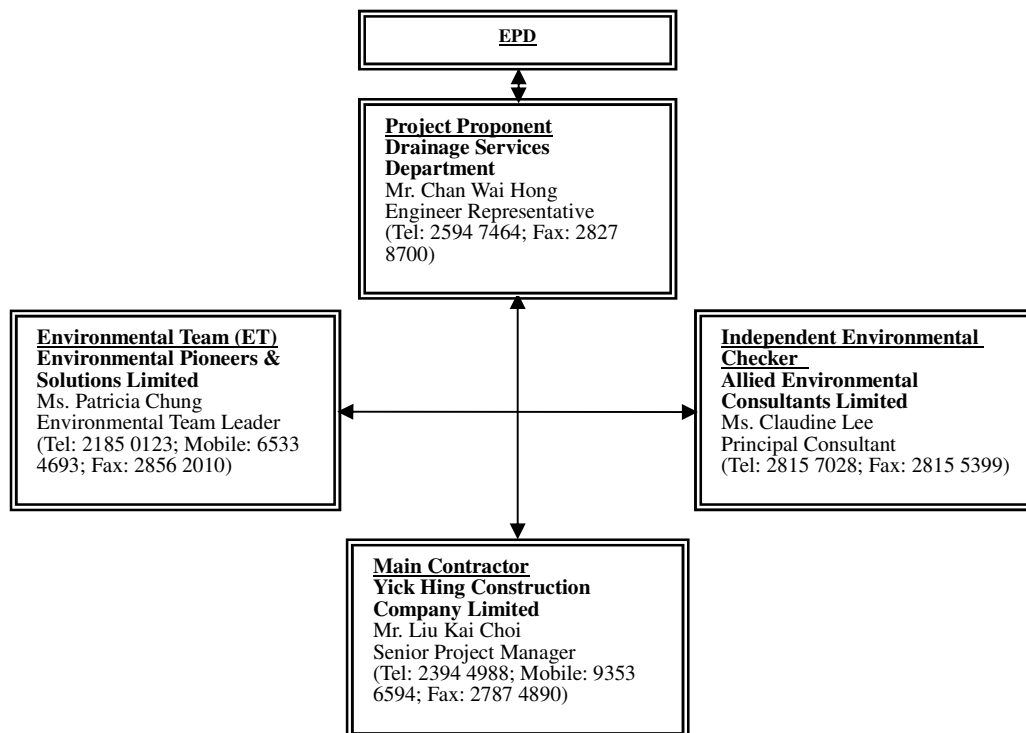


Figure. 2.2.1 Environmental Management structure for the project

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 retaining wall H at TTT River;
2. Construction works of box culvert at PNH River;
3. Construction of retaining wall J, Gabion blocks & box culvert A at LTT River; and
4. Sewerage works at Ling Tsui Tau.

3.2 Construction Activities for the coming month

Key Construction works in the coming month will include:

1. Construction of box culvert at PNH River;
2. Formation of haul road access in TTT River between bottleneck A and B;
3. Construction of gabion walls at TTT River bottleneck B;
4. Construction of retaining wall J, gabion blocks and box culvert A at LTT River; and
5. Sewerage works at Ling Tsui Tau.

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.

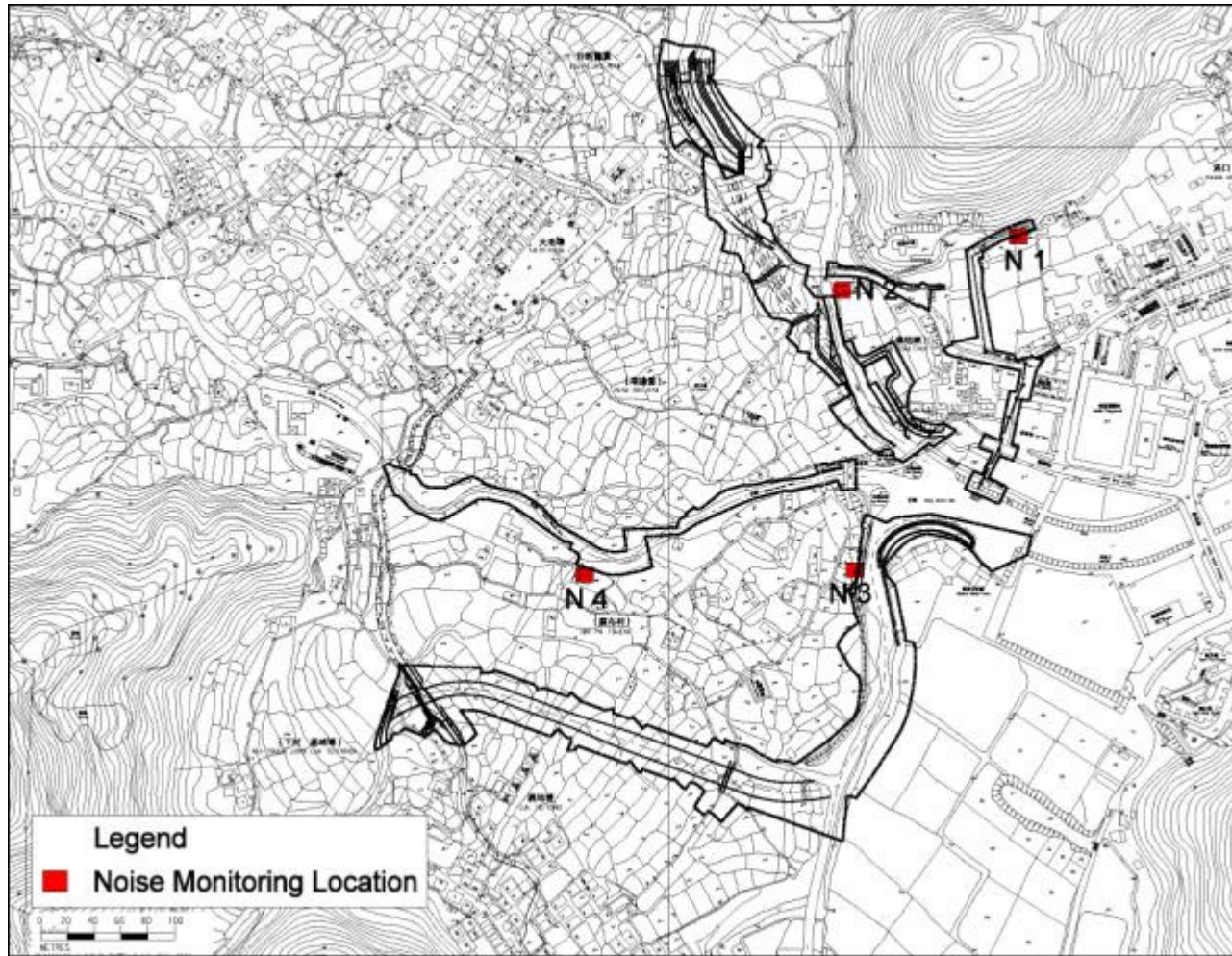


Figure 4.3.1 Impact noise monitoring locations

4.4 Monitoring Results and Interpretation

Relevant details of the noise monitoring results are presented in Table 4.4.1. The results, ranged between 46.7 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	4/05/09	14:15	46.7	75	N	Sunny
N1	L _{eq} 30mins	11/05/09	14:20	48.6	75	N	Sunny
N1	L _{eq} 30mins	20/05/09	14:45	51.3	75	N	Cloudy
N1	L _{eq} 30mins	29/05/09	14:45	48.1	75	N	Cloudy
N2	L _{eq} 30mins	4/05/09	13:40	53.5	75	N	Sunny
N2	L _{eq} 30mins	11/05/09	10:35	52.3	75	N	Sunny
N2	L _{eq} 30mins	20/05/09	14:10	60.4	75	N	Cloudy
N2	L _{eq} 30mins	29/05/09	14:10	52.6	75	N	Cloudy
N3*	L _{eq} 30mins	4/05/09	13:05	62.4	75	N	Sunny
N3*	L _{eq} 30mins	11/05/09	11:10	62.5	75	N	Sunny
N3*	L _{eq} 30mins	20/05/09	13:00	58	75	N	Cloudy
N3*	L _{eq} 30mins	29/05/09	13:00	60.9	75	N	Cloudy
N4	L _{eq} 30mins	4/05/09	14:25	52.6	75	N	Sunny
N4	L _{eq} 30mins	11/05/09	15:00	52.6	75	N	Sunny
N4	L _{eq} 30mins	20/05/09	13:35	55.9	75	N	Cloudy
N4	L _{eq} 30mins	29/05/09	13:35	54.1	75	N	Cloudy

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

Remark*: The equivalent noise level of N3 is corrected by +3 dB from the raw data result due to the fact that free field measurement was carried out in the location.

4.5 Action and Limit level for Construction noise

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

There was no recorded exceedance in the reporting month.

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.

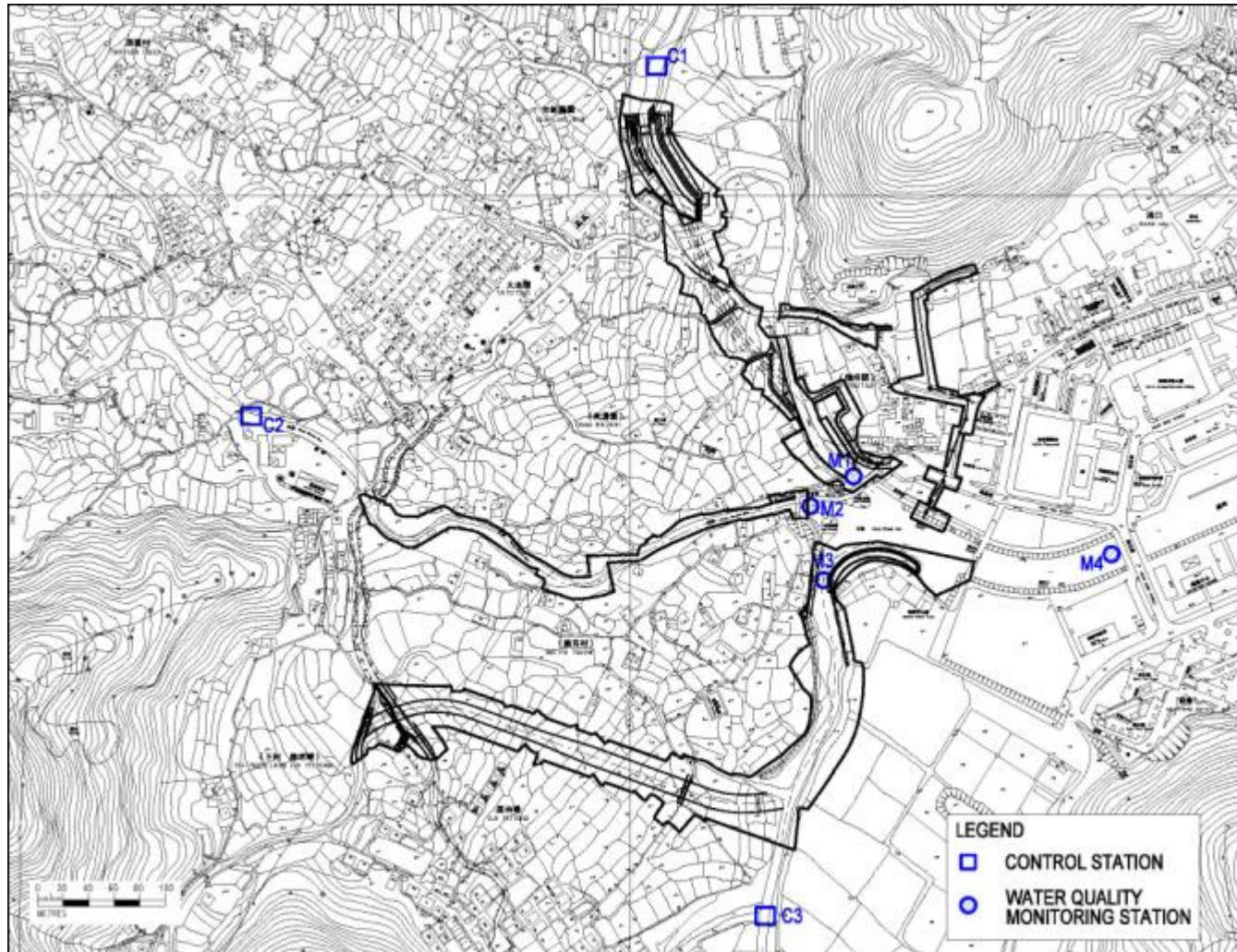


Figure 5.3.1 Water Quality Monitoring Locations

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 twelve times during May. Detailed on-site measurements and laboratory analysis reports including QA/QC results are shown in Appendix F1 and F2 respectively, while Table 5.5.1 presents consolidated results throughout the reporting month.

Exceedance events on parameters of turbidity and suspended solids were recorded in this reporting period according to the established level. Findings from the investigations showed that the total 60 exceedance events were mainly caused by:

- 1.) Construction activities belonged to the other projects carried out at the upper stream area of TTT River.
- 2.) Water quality changes due to heavy rainstorm.

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

Table 5.5.1 Water quality monitoring results in May 2009

	M1			M2			M3			M4		
	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave
Turbidity (NTU)	2.7	14.7	9.8	2.4	54.1	12.7	5.9	25.9	13.7	0.1	56.3	12.3
DO (mg/l)	6.5	9.2	7.9	7.4	10.1	8.8	6.0	9.0	7.1	6.0	8.1	7.1
Suspended Solid (mg/l)	4.1	12.0	8.5	2.4	17.3	6.8	5.6	20.2	11.2	4.6	32.6	10.3

	C1			C2			C3		
	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave
Turbidity (NTU)	0.0	7.3	2.6	6.8	385.7	147.7	4.7	14.1	9.1
DO (mg/l)	4.4	8.2	6.6	6.2	9.0	7.7	4.4	8.3	6.3
Suspended Solid (mg/l)	1.0	8.6	3.1	2.1	186.6	75.4	3.4	13.4	8.5

* 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"> 1. Repeat in <i>situ</i> measurement to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IC(E) and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IC(E) and Contractor; 6. Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IC(E) on the proposed mitigation measures; 2. make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IC(E) and propose mitigation measures to IC(E) and ER; 6. Implement the agreed mitigation measures.
Action level being exceed by more than two consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat in <i>situ</i> measurement to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IC(E) and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IC(E) and Contractor; 6. Ensure mitigation measures are implemented; prepare to increase the monitoring frequency to daily 7. Repeat measurement on next day of exceedance 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IC(E) on the proposed mitigation measures; 2. make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IC(E) and propose mitigation measures to IC(E) and ER within three working days; 6. Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat in <i>situ</i> measurement to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IC(E) and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IC(E) and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IC(E) on the proposed mitigation measures; 2. make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IC(E) and propose mitigation measures to IC(E) and ER; 6. Implement the agreed mitigation measures.

5.7 Water Quality Mitigation Measures

Construction Run-off and Drainage

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

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

As for the forthcoming wet season, contractor was recommended to provide sufficient water treatment facilities for accumulated site water.

5.8 Water Monitoring Schedule for the Next reporting period

Water monitoring in the next reporting period is scheduled for 3, 4, 5, 8, 10, 12, 15, 18, 19, 22, 24, 26 and 29 June.

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.

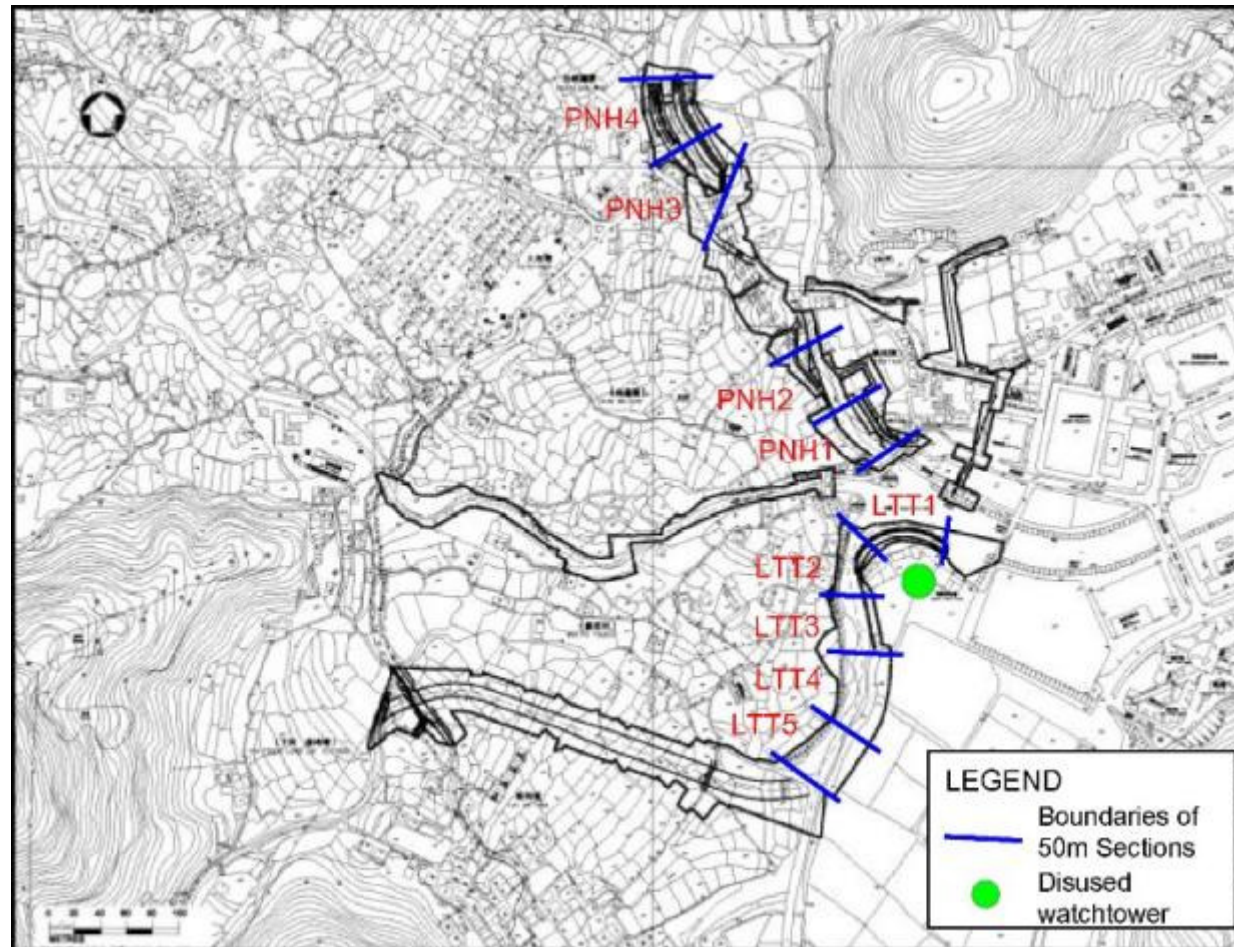


Figure 6.1 Ecological Monitoring Locations

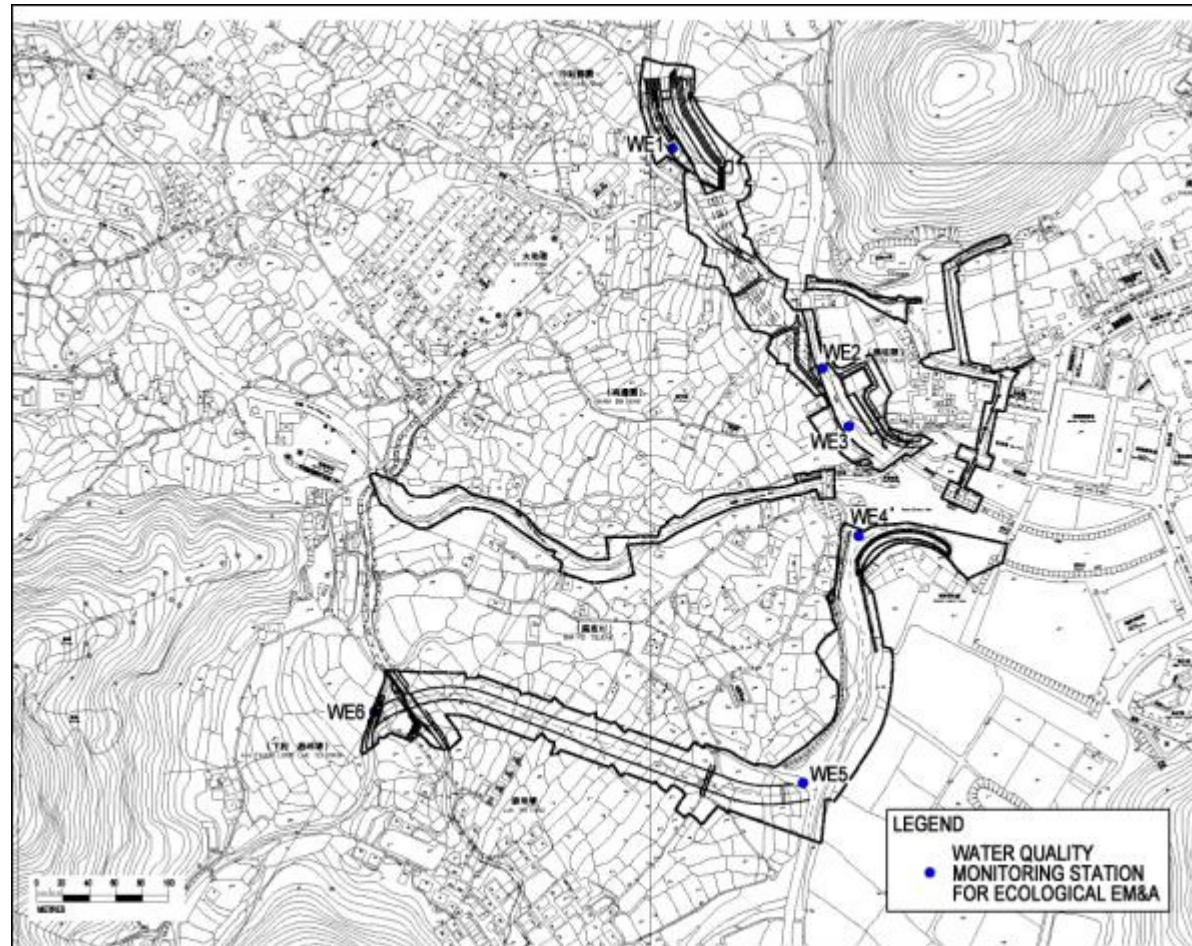


Figure 6.2 Ecological Water Quality monitoring locations

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

The walk through survey recorded a total of 75 species, including 21 trees, 14 shrub, 21 herb and 8 grass species (Appendix D1). 60 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*) and exotic trees (*Acacia confusa*) dominated the transects. Other species recorded include common and typical native pioneer forest and streamside tree species and ruderal species. No species of conservation interest was recorded.

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

Species	Relative % cover	
	PNH3	PNH4
<i>Acacia confusa</i>		13.56
<i>Acorus graminifolia</i>		0.52
<i>Alocasia macrorrhiza</i>		0.78
<i>Aporosa dioica</i>		2.22
<i>Bamboo</i>	8.52	
<i>Celtis sinensis</i>	30.66	22.06
<i>Christella parasitica</i>	0.68	3.00
<i>Cleistocalyx operculata</i>	28.28	
<i>Embelia ribes</i>		1.04
<i>Ficus hispida</i>	2.39	20.86
<i>Hibiscus rosa-sinensis</i>		0.52
<i>Liriope spicata</i>		0.52
<i>Litsea glutinosa</i>		6.52
<i>Macaranga tanarius</i>		12.78
<i>Mallotus paniculatus</i>	13.63	
<i>Microstegium ciliatum</i>		1.96
<i>Mikania micrantha</i>	4.43	2.97
<i>Neyraudia reynaudiana</i>		2.22
<i>Phyllanthus urinaria</i>		0.26
<i>Pueraria phaseoloides</i>		1.96
<i>Sageretia thea</i>		2.48
<i>Sporobolus fertilis</i>		3.78
<i>Syzygium jambos</i>	11.07	
<i>Wedelia triloba</i>	0.34	
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 19 species recorded, 14 of which were native

and 5 were exotic. It was composed of isolated individuals of mangrove (*Kandelia obovata*), backshore species (*Clerodendrum inerme*), native (*Celtis sinensis*) and planted trees (*Acacia confusa*) (Appendix D2). No species of conservation interest was recorded.

Terrestrial Fauna

Surveys were conducted on 15 May 2009.

A total of nine 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
Large Hawk Cuckoo	<i>Hierococcyx sparveroides</i>			1		CW
Spotted Dove	<i>Streptopelia chinensis</i>		1			CW
Chinese Bulbul	<i>Pycnonotus sinensis</i>	1			1	CW
Magpie Robin	<i>Copsychus saularis</i>				1	CW
Black-faced Laughingthrush	<i>Garrulax perspicillatus</i>		2			CW
Common Tailorbird	<i>Orthotomus sutorius</i>				1	CW
Black-necked Starling	<i>Sturnus nigricollis</i>	2				CW
Great Tit	<i>Parus major</i>			1	1	CW
Fork-tailed Sunbird	<i>Aethopyga christinae</i>				1	CW

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

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

Table 6.5.3 Dragonfly in Pak Ngan Heung River

Common names	Latin names	PNH 1	PNH 2	PNH 3	PNH 4	Commonness & distribution
Black-banded Gossamerwing	<i>Euphaea decorata</i>			2	7	A
Orange-tailed Sprite	<i>Ceriagrion auranticum</i>				2	A
Common Blue Jewel	<i>Rhinocypha perforata</i>				1	A
Black Threadtail	<i>Prodasineura autumnalis</i>			5	1	A
Common Blue Skimmer	<i>Orthetrum glaucum</i>			1		A
Crimson Dropwing	<i>Trithemis aurora</i>				5	A

A = abundant, UC = uncommon

Aquatic fauna and fish

10 species of fish and 4 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>				+
Palaemond shrimp	<i>Macrobrachium hainanensis</i>			+	+
Crab	<i>Varuna litterata</i>	++	++		
Mitten Crab	<i>Eriocheir japonica</i>				
Mangrove mud crab	<i>Scylla paramamosain</i>	+			
Fish					
Mosquito fish	<i>Gamusia affinis</i>				+
Barcheek Goby	<i>Rhinogobius giurinus</i>				+
Goby	<i>Rhinogobius duospilus</i>		+		
Swordtail	<i>Xiphophorus hellerii</i>				+
Six-banded Barb	<i>Puntius semifasciolatus</i>				+
Unidentified Cichlid fish					
Tilapia		++	++	+	
Predaceous Chub	<i>Parazacco spilurus</i>			++	
Jarbua 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 27 May 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 27 species, including 11 tree, 5 shrub, 4 grass species (Appendix D3). 22 of the species recorded are natives, while 5 were exotics. The quantitative sampling recorded 8 species at Sections 2. Section 2 was dominated by *Terminalia catappa* and *Wollastonia biflora*. No quantitative survey was carried out on Section 3 and 4 due to vegetation clearance on stream banks as part of the site clearance works under the project. Remnants of mangrove stand were still observed along Section 3, which will be cleared in due course.

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>Acanthus ilicifolius</i>	6.42
<i>Celtis sinensis</i>	13.70
<i>Execoecaria agallocha</i>	6.34
<i>Fimbristylis sp.</i>	10.96
<i>Papalum paspaloides</i>	2.35
<i>Premna serratifolia</i>	3.13
<i>Terminalia catappa</i>	38.37
<i>Wollastonia biflora</i>	18.72
<i>Total Relative % Cover*</i>	100.0
<i>Total Transect Length (m)</i>	11

*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 15 May 2009.

A total of seventeen species of birds were recorded in these sections (Table 6.5.6). Most of these species are common and widely distributed in Hong Kong. Crested Goshawk is uncommon 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				1	CW
Grey Heron	<i>Ardea cinerea</i>	1					CL
Crested Goshawk	<i>Accipiter trivirgatus</i>	1					R
Common Koel	<i>Eudynamis scolopacea</i>			1			CW
Greater Coucal	<i>Centropus sinensis</i>					1	CW
House Swift	<i>Apus nipalensis</i>	1					CW
Chinese Bulbul	<i>Pycnonotus sinensis</i>			4			CW
Crested Bulbul	<i>Pycnonotus jocosus</i>	1		4			CW
Magpie Robin	<i>Copsychus saularis</i>	1					CW
Black-necked Starling	<i>Sturnus nigricollis</i>	1					CW
Great Tit	<i>Parus major</i>	1					CW
Japanese White-eye	<i>Zosterops japonica</i>	2					CW
Yellow-bellied Prinia	<i>Prinia flaviventris</i>					2	CW
Crested Myna	<i>Acridotheres crisatellus</i>		4			2	CW
Black-necked Starling	<i>Sturnus nigricollis</i>				3		CW
Jungle Crow	<i>Corvus macrorhynchus</i>		3				CW
Common Magpie	<i>Pica pica</i>					1	CW

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

Two species of dragonfly were recorded in the Luk Tei Tong River (Table 6.5.7). Both 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
Saddlebag Glider	<i>Tramea virginia</i>					1	C
Crimson Dropwing	<i>Trithemis aurora</i>					1	A

A = abundant, C = common

Aquatic invertebrates and fish

6 species of fish, 4 species of crustacean and 4 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.

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>Melanooides 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		+				
Jarbua 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 15 May 2009.

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

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 6 May 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 (6 May 2009)

Parameters	Limit of detection	WE1	WE2	WE3	WE4	WE5	WE6
Suspended Solid (mg/l)	1	1.90	4.95	6.35	12.20	7.40	1.00
Nitrogen (Ammonia) (mg/l)	0.01	0.03	0.93	0.40	0.53	2.76	0.01
Nitrogen (Nitrate) (mg/l)	0.01	0.06	0.38	0.24	0.33	0.21	0.06
Phosphorous (mg/l)	0.01	0.03	0.16	0.11	0.08	0.48	0.03
BOD ₅ (mg/l)	1	3	4	4	2	4	2
DO (mg/l)	0.01	6.49	7.72	8.76	7.35	9.98	6.16
Turbidity (NTU)	0.01	2.15	2.30	7.55	15.90	8.45	0.70
Temperature (oC)	0.1	24.0	23.8	24.3	23.7	25.9	23.4
pH	0.01	6.29	7.07	7.34	6.95	6.88	5.92
Salinity (ppt)	0.1	0.1	1.7	11	15.4	3.3	0
Conductivity (ms/m)	0.1	19.8	336.0	1840.0	2500.0	602.0	7.7
Water Flow (m/s)	N/A	0	0.038	0.015	0.025	0.007	0

Table 6.10 Baseline Results of Ecological water quality monitoring

Parameters	WE1	WE2	WE3	WE4	WE5	WE6
Suspended Solid (mg/l)	1.0	2.0	3.0	3.0	<1	<1
Nitrogen (Ammonia) (mg/l)	0.07	0.12	0.11	0.23	0.03	0.02
Nitrogen (Nitrate) (mg/l)	0.12	0.13	0.13	0.31	0.04	0.05
Phosphorous (mg/l)	0.04	0.06	0.06	0.09	0.06	0.05
BOD ₅ (mg/l)	<2	<2	<2	<2	<2	<2
DO (mg/l)	6.58	6.82	6.37	7.61	6.87	5.70
Turbidity (NTU)	4.44	5.12	5.93	6.96	4.65	2.73
PH	6.4	7.1	7.0	6.8	6.6	6.1
Salinity (ppt)	<0.1	0.1	0.3	7.6	0.1	<0.1

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

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

There was no recorded event in the reporting month.

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

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

6.7 Ecological monitoring Schedule

The next ecological surveys are scheduled on 11th, 12th and 26th June, while ecological water quality monitoring is scheduled on 6th June.

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 60 non-compliance events of water quality limits (Turbidity and Suspended Solids) were recorded in this reporting period according to the established level. ET has arranged site investigations for the exceedance events. Findings from the inspection showed causes were substantially attributable Channel clearance works carried out at the upper stream are of TTT River, and water quality changes due to heavy rainstorm.

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

Among the 60 events of non-compliance recorded in this reporting month, 16 of them were believed to be caused by improper site practice carried out by the contractor.

Although the deterioration of water quality was not mainly caused by the project, Contractor was reminded to be cautious on their site practice and conduct necessary mitigation measures so as to keep the disturbance on water quality to minimal levels.

Table 7.1 Summary of Non-compliance for Water Quality

Date	Location	Parameter	Level of exceedance	Main cause of exceedance
04/05/2009	M1	Turbidity, S.S.	Limit Level	M1 & M3 - No particular observations
	M3	Turbidity	Limit Level	
06/05/2009	M1	Turbidity, S.S.	Limit Level	M1 & M3 - No particular observations
	M3	Turbidity, S.S.	Limit Level, Action Level	
08/05/2009	M1	Turbidity, S.S.	Limit Level	M1 – No particular observation
	M2	S.S.	Action Level	M2 - Channel clearance works at upper stream area
11/05/2009	M1	Turbidity, S.S.	Limit level	M1, M2 & M3 - No particular observations
	M2	S.S	Limit level	
	M3	Turbidity, S.S	Action Level	
13/05/2009	M1	Turbidity, S.S.	Limit Level	M1 – No particular observation
	M2	Turbidity, S.S.	Limit Level	M2 - Channel clearance works at upper stream area
	M3	S.S.	Limit Level	M3 – No particular observation
15/05/2009	M1	Turbidity, S.S.	Limit Level	M1 – No particular observation
	M2	Turbidity, S.S.	Limit Level	M2 - Channel clearance works at upper stream area
	M3	S.S.	Limit Level	M3 – No particular observation
20/05/2009	M1	Turbidity, S.S.	Limit Level	M1 – No particular observation
	M2	Turbidity, S.S	Limit Level	M2 - Channel clearance works at upper stream area
21/05/2009	M1	Turbidity, S.S.	Limit Level	M1 – No particular observation
	M2	Turbidity, S.S	Limit Level	M2 - Channel clearance works at the upper stream
	M3	Turbidity, S.S.	Limit Level	General Observation – Heavy rainstorm occurred at early morning before monitoring
	M4	Turbidity, S.S	Limit Level, Action Level	
22/05/2009	M1	Turbidity, S.S.	Limit Level	M1 – No particular observation
	M2	Turbidity, S.S.	Limit Level	M2 - Channel clearance works at upper stream area
	M3	Turbidity, S.S	Limit Level	M3 – No particular observation
25/05/2009	M1	Turbidity	Limit Level	General Observation - Heavy rainstorm occurred at early morning before monitoring
	M2	Turbidity, S.S.		
	M4	Turbidity		
27/05/2009	M1	Turbidity, S.S.	Limit Level	M1 – No particular observations
	M2	Turbidity, S.S.		M2 - Channel clearance works at upper stream area
	M3	Turbidity, S.S.		M3 – No particular observations
	M4	Turbidity, S.S.		M4 – Water quality was affected by the upper stream area
29/05/2009	M1	Turbidity, S.S.	Limit Level	M1 - No particular observations
	M2	S.S.	Action Level	M2 - Channel clearance works at upper stream area
	M3	Turbidity, S.S.	Action Level, Limit Level	M3 - No particular observations

8. Construction waste disposal

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

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

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

Table 8.1 Summary of Construction Waste Disposal

Month	Amount of Construction Waste disposed		
	Inert Waste (to Public Fill)	Non-inert Waste (to Landfill)	Chemical Waste (to treatment plant)
1 st May, 09 to 31 st May 09	1021.23 (ton)	Nil	Nil
Total (from June 08 to April 09)	10044.12 (ton)	65.23 (ton)	0

9. Status of Permits and Licenses obtained

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

Table 9 .1 Status of Permits and Licenses Obtained

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

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

10. Complaint Log

There was no formal complaint received during the reporting month.

	Noise	Water	Ecology	Cultural	Others
May 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 8, 15, 21 and 29 May.

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
2 Apr 09	Underground water was found accumulated in the excavated pits of box culvert bay 3 and bay 12 at PNH	Accumulated water on site should be removed for mosquito control and hygiene issues.	Regular removal of accumulated water was conducted as reported by contractor	Ongoing
17 Apr, 23 Apr & 30 Apr 09	Stagnant water was observed at the site ground located at the end of LTT bypass channel	Contractor was advised to trace the source of the water, stagnant water should be removed for mosquito control	Regular removal of accumulated water was conducted as reported by contractor	08 May 09
08 May 09	Open stockpile of fine earthy material was found at the site entrance of Ling Tsui Tau	Contractor was advised to prevent stockpiling.	Stockpile was removed and/or used prior to the site inspection on 15 May	15 May 09
08 May 09	Wood board coverings to the U-channel outside of the PNH BC12 were found seriously damaged U-channel next to the excavated pit for BC8 was not well covered also	Contractor was urged to rectify such discrepancies as soon as possible to prevent debris of construction materials entering the public drain	Still outstanding until the end of reporting month. To be follow up.	Ongoing
08 May & 15 May 09	Earth bunds at ch.2B 150~200 of LTT River was found poorly covered with geo-textile during inspection	Contractor was advised to rectify the defective coverings to prevent erosion from the exposed soil surface.	Discrepancy has been rectified prior the site inspection on 22 May	21 May 09
15 May 09	Chemical container without proper drip pan was found at LTT ch.2B 150~200 where under gabion wall construction.	Contractor was reminded to provide proper secondary spillage containment for chemicals used on site. Unused chemical should be returned to designate chemical storage area and should not be stored on site.	The chemical container was removed from the site prior to site inspection on 22 May	21 May 09

Table 11.1 Summary of site inspection

Date	Observations	Advice from ET	Action taken	Closing Date
15 May 09	Water was leaking from the hydrant located at the site entrance of PNH BC12 and caused surface runoff to the public U-channel	Contractor was advised to rectify the discrepancy and provide proper coverings to the public drains nearby project site.	Idle hydrant was properly locked up during the inspection on 22 May.	21 May 09
15 May & 21 May & 29 May 09	Definition of site boundary for the area of gabion walls at LTT River ch.2B 150~200 was still outstanding. Vegetation at the area was removed and excavated during inspection	Contractor was urged to define their site boundaries as soon as possible and reinstate the area out of boundaries as if practicable.	Still outstanding until the end of the reporting month. To be follow up	Ongoing
21 May 09	Vehicle was found washing at the entrance of temporary access at behind of Yuen's compound, where without proper water collection facility.	Contractor was advised to assign a proper wheel washing area with proper water collection facilities, to avoid site runoff entering the mangrove area.	Still outstanding until the end of the reporting month. To be follow up	Ongoing
29 May 09	River water was found entered the enclosed section of retaining wall H during high tide	Contractor was reminded on site water should be entered the river course and site at the river sides should be well enclosed.	To be follow up	Ongoing
29 May 09	Accumulated rain water in the LTT bypass channel was found seeped into the branch of LTTR due to overflow	Contractor was advised to provide proper bunds or barriers to prevent site water directly enter the river course. Also contractor was reminded to remove accumulated rain water from the bypass channel in accordance with the mitigation measures proposed for the application of VEP.	To be follow up	Ongoing

11.2 Compliance with legal and Contractual requirement

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

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

During the month of May 2009, concerns on the mangrove area to the east of Luk Tei Tong River and the widened rip-rap based river channel at bottleneck A of Tai Tei Tong River were raised by green groups during site visit.

The mangrove area was located to the east of the section of Luk Tei Tong River to be channelised under the present Project. The mangrove area, based upon its location and the bund structures inside, might be originally ponds for aquaculture, but were colonized by species of mangroves and mangrove associates after the ponds were abandoned. There were regular water exchanges between the mangrove areas and Luk Tei Tong River via a small box culvert. During high tide, the water level in Luk Tei Tong River is elevated due to the incoming tidal flush, and water would go into the mangrove area, while during low tide, water inside the mangrove area would flow into Luk Tei Tong River, which is usually of low water level during low tide.

Due to the works for the gabion wall along Luk Tei Tong River, the small box culvert had to be temporarily removed, before a replacement box culvert is provided in the new gabion wall.

A site visit with green groups was made on 11 May 2009. One of the major concerns from green groups was the temporary blockage of tidal flow to the mangrove area due to construction of the Gabion Wall

Green groups proposed that the tidal flow in the mangrove area should be

maintained.

Pipe or pipes of sufficient diameter that pumps river water into the mangrove areas shall be installed.

It was agreed in the follow-up meetings that, a twin temporary inlet pipes, each with a diameter of 400mm would be installed to allow flowing of water from Luk Tei Tong River to the mangrove area until completion of gabion construction and reinstatement of the tidal inlet. And before the pipes are installed, water pumps would be provided to create water exchanges.

Furthermore, the ecologist of the ET will monitor the mangrove area beside the Luk Tei Tong River weekly for one month starting form 27 May 2009. Thereafter, the monitoring will be monthly till the original water inlet is reinstated.

For the widened bottleneck at the downstream of Mui Wo School (hereafter as bottleneck A). A major concern was raised by green groups that there was no surface flow on top of the rip-rap based channel bed observed. This made movement of aqua fauna between the upstream and downstream areas become impossible.

For the connectivity for movement of aqua fauna along the river, Green groups suggested decreasing the riverbed level by removing boulders and forming a meandering dry weather flow on top of the riverbed. Advises were taken and the follow up actions would be carried out in June.

ET will continue to inspect implementation status and performance of the mitigation measures taken and give comment whenever necessary.

12. Future key issues

Key construction activity in the coming month will include construction of box culvert at PNH, haul access and gabion walls at TTT River and retaining walls,

gabion blocks as well as box culvert at LTT River. It is expected that 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 reminded to provide proper measures to mitigate water quality impacts to the river channels due to construction works. River based construction activities should be carried out in enclosed as well as dry condition to prevent discharge of site water to the stream; containment measures such as bunds and barriers should be provided as to restrict the carrying out of construction works within enclosed dry area of the river.

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.

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

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

13. Conclusions

In this reporting month, construction works of box culvert at PNH River, box culvert at LTT, as well as U-channel at Ling Tsui Tau.

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 60 non-compliance events of water quality criteria were recorded in this reporting month. Although exceedances were found mainly caused by site water discharged by the other project at the upper stream area of TTT River, and influence of heavy rainstorm. Contractor was reminded to be cautious on their site condition and implementation status of mitigation measures. According to the monthly ecological water monitoring results performed on 06 May 2009, measurements recorded in the monitoring locations were found similar with past months.

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

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

Also, there were not any notifications of summons recorded during the reporting period. Furthermore, there were not any formal prosecution and complaints recorded.

Site water control was the major concern in this reporting month. Contractor was recommended to provide proper de-silting facilities for site water treatment, and provide necessary mitigation measures to minimize impacts to the river streams.

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

LEGENDS :

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

FOR TENDER PURPOSES ONLY

DATE	BY	FOR
DESIGNED	H. T. CHAN	12 FEB 2006
DRAWN	B. D. CHAN	23 MAR 2006
CHECKED	W. H. CHAN	10 MAY 2007
VERTICALS	T. Y. CHAN	17 MAY 2007
APPROVED		

DESIGNED BY: H. T. CHAN 12 FEB 2006
 CHECKED BY: W. H. CHAN 10 MAY 2007
 CONTRACT NO: DC/2006/11
 FILE NO: DP/06/4128CD
 PROJECT NO: 128CD
 CONTRACT:

DRAINAGE IMPROVEMENT IN SOUTHERN LANTAU

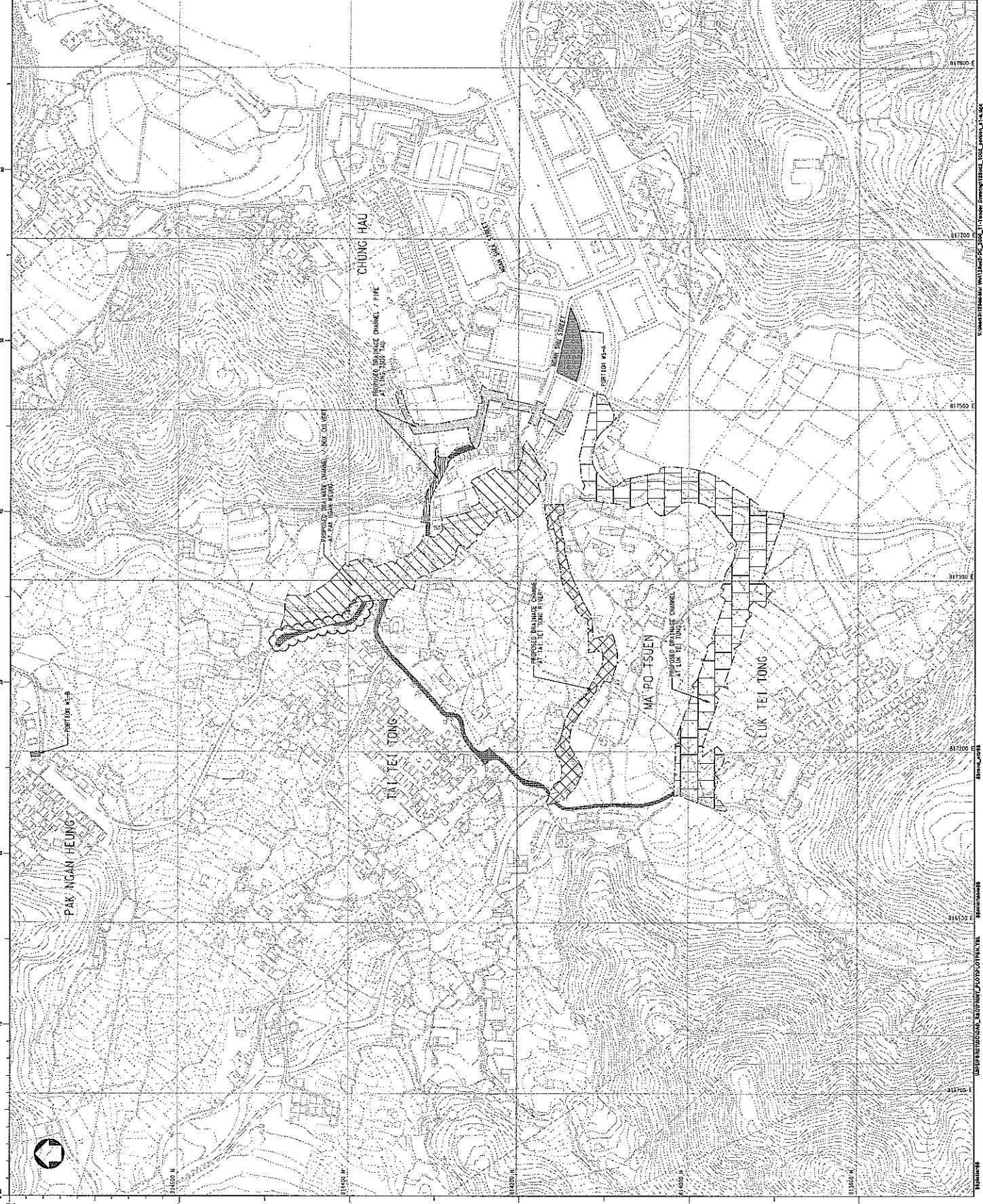
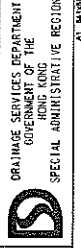
Drawing Title

PORTIONS OF SITE - SOUTHERN LANTAU

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

OFFICE COPYRIGHT RESERVED

DRAINAGE PROJECTS DIVISION



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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



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

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

Client : ENVIRONMENTAL PIONEER AND SOLUTION LIMITED

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

Manufacturer : DKK-TOA Serial No.: 617892

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

Criterion: (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 5~45°C)

Electric Conductivity (Salinity converted from EC):

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

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

* 1 S/m = 10^4 $\mu\text{mhos/cm}$ = 10^3 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	0.9990
3.72		3.85	
6.28		6.47	
8.56		8.81	
10.69		10.58	
13.77		13.58	Acceptance Criterion R ² > 0.995
Repeatability	1 st time	0.00 , 8.83	-
	2 nd time	0.00 , 8.80	
	3 rd time	0.00 , 8.81	
	0.00 , 8.56	0.00 , 0.03	

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

pH Value:

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

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

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



Temperature:

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

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

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

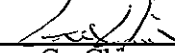
Turbidity:

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

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

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

Comments : Pass, comply with the criteria.

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

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



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

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香港黃竹坑道37號利達中心地下, 9樓, 12樓, 13樓及20樓
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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.

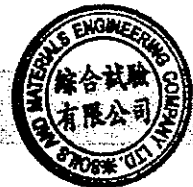
Actual Measurement data are documented on worksheets.

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.



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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


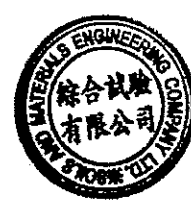
Temperature: 22 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1010 ± 15 hPa

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.

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

Species	Habit	Native	Relative	Occurrence	
			Abundance	PNH3	PNH4
<i>Acacia confusa</i>	tree	no	occasional		+
<i>Acorus gramineus</i>	herb	yes	scarce		+
<i>Acronychia pedunculata</i>	tree	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>Atalantia buxifolia</i>	tree	yes	scarce		+
<i>Bamboo</i>	herb	-	scarce	+	
<i>Bischofia javanica</i>	herb	yes	scarce	+	
<i>Breynia fruticosa</i>	shrub	yes	scarce		+
<i>Bridelia tomentosa</i>	tree	yes	scarce		+
<i>Caryota mitis</i>	herb	yes	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>Commelina sp.</i>	herb	yes	scarce	+	+
<i>Conyza canadensis</i>	herb	no	scarce	+	+
<i>Desmos chinensis</i>	shrub	yes	occasional	+	
<i>Dimocarpus longan</i>	tree	no	occasional		+
<i>Elephantopus tomentosa</i>	herb	yes	scarce		+
<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>Hibiscus rosa-sinensis</i>	shrub	no	occasional		+
<i>Ipomoea cairica</i>	climber	yes	occasional		+
<i>Lantana camara</i>	shrub	no	scarce		+
<i>Liriope spicata</i>	herb	yes	scarce		+
<i>Litsea glutinosa</i>	tree	yes	occasional		+

Species	Habit	Native	Relative	Occurrence	
			Abundance	PNH3	PNH4
<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>Maesa perlarius</i>	shrub	yes	scarce	+	
<i>Mallotus paniculatus</i>	tree	yes	scarce	+	
<i>Microcos paniculata</i>	tree	yes	scarce		+
<i>Microstegium ciliatum</i>	grass	yes	common	+	+
<i>Mikania micrantha</i>	climber	no	common	+	+
<i>Millettia nitida</i>	climber	yes	scarce	+	
<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>Mussaenda pubescens</i>	shrub	yes	scarce	+	
<i>Neyraudia reynaudiana</i>	grass	yes	occasional	+	+
<i>Oxalis corymbosa</i>	herb	yes	scarce		+
<i>Panicum maximum</i>	grass	no	common		+
<i>Paspalum conjugatum</i>	grass	yes	scarce	+	
<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 barbatum</i>	herb	yes	scarce	+	
<i>Polygonum chinense</i>	herb	yes	occasional	+	
<i>Polygonum sp.</i>	herb	yes	scarce	+	
<i>Psychotria asiatica</i>	shrub	yes	common	+	+
<i>Psychotria asiatica</i>	shrub	yes	scarce		+
<i>Pteris ensiformis</i>	fern	yes	scarce		+
<i>Pueraria phaseoloides</i>	climber	yes	occasional	+	+
<i>Sageretia thea</i>	climber	yes	occasional		+
<i>Scleria sp.</i>	herb	yes	scarce		+
<i>Sida rhombifolia</i>	herb	yes	scarce		+
<i>Sporobolus fertilis</i>	grass	yes	scarce		+
<i>Sterculia lanceolata</i>	tree	yes	common	+	+

Species	Habit	Native	Relative	Occurrence	
			Abundance	PNH3	PNH4
<i>Syngonium podophyllum</i>	climber	no	occasional	+	
<i>Syzygium jambos</i>	tree	no	common	+	+
<i>Syzygium levinei</i>	tree	yes	scarce	+	
<i>Urena lobata</i>	herb	yes	scarce		+
<i>Uvaria microcarpa</i>	shrub	yes	occasional		+
<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	Occurrence	
			Abundance	PNH1	PNH2
<i>Acacia confusa</i>	tree	no	occasional	+	
<i>Acanthus ilicifolius</i>	shrub	yes	scarce	+	
<i>Acrostichum aureum</i>	fern	yes	scarce	+	
<i>Celtis sinensis</i>	tree	yes	occasional	+	
<i>Clerodendrum inerme</i>	shrub	yes	occasional	+	
<i>Dendrotrophe frutescens</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>	shrub	yes	scarce	+	
<i>Melaleuca quinquenervia</i>	tree	no	common	+	
<i>Morus alba</i>	tree	no	scarce		+
<i>Neyraudia reynaudiana</i>	grass	yes	occasional	+	
<i>Panicum maximum</i>	grass	no	common		+
<i>Phyllanthus urinaria</i>	shrub	yes	common		+
<i>Sapium sebiferum</i>	tree	yes	occasional		+
<i>Toxocarpus wightianum</i>	climber	yes	scarce	+	
<i>Wedelia triloba</i>	climber	no	occasional	+	+
<i>Wollastonia biflora</i>	climber	yes	occasional	+	

Appendix D3 Plant species recorded at Luk Tei Tong River

Species	Habit	Native	Relative	Occurrence				
			Abundance	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>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>Premna serratifolia</i>	tree	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: 6/5/2009

Weather Condition: Sunny

Monitoring Location	WE1			WE2			WE3			WE4			WE5			WE6		
Time (hhmm)	1150			1140			1115			1130			1230			1210		
Tide Mode	ebb			ebb			ebb			ebb			ebb			ebb		
River Condition	Normal			Normal			Normal			Normal			Normal			Normal		
Water Depth (m)	< 1.0			< 1.0			< 1.0			< 1.0			< 1.0			< 1.0		
pH value	6.29			7.07			7.34			6.95			6.88			5.92		
Temperature (oC)	24.0			23.8			24.3			23.7			25.9			23.4		
Salinity (ppt)	0.1			1.7			11.0			15.4			3.3			0.0		
Conductivity (ms/m)	19.8			336.0			1840.0			2500.0			602.0			7.7		
Water flow (m/s)	0.000			0.038			0.015			0.025			0.007			0.000		
Turbidity (NTU)	2.2	2.1	Average	2.3	2.3	Average	7.5	7.6	Average	15.9	15.9	Average	8.4	8.5	Average	0.7	0.7	Average
			2.15						2.30						7.55			
DO (mg/l)	6.49	6.49	Average	7.72	7.72	Average	8.75	8.76	Average	7.35	7.35	Average	9.98	9.98	Average	6.16	6.16	Average
			6.49			7.72			8.76			7.35			9.98			6.16
DO Saturation (%)	77	77	Average	92	92	Average	112	112	Average	95	95	Average	127	127	Average	73	73	Average
			77			92			112			95			127			73

Name
Prepared By: Jimmy Cheng

Signature


Date
6/5/2009

remark or
observation: _____

Appendix D5

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



TEST SUMMARY ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090500040 Date of Issue : 11-05-2009

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 : 06-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 07-05-2009

GCE Serial No. : WQM052009 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	483	3.3	27.3
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	06 May 2009 / 11:50		06 May 2009 / 11:40		06 May 2009 / 11:15			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.1	1.7	4.8	5.1	6.1	6.6	

TEST RESULTS	Sample ID	WE4	WE4 Duplicate	WE5	WE5 Duplicate	WE6	WE6 Duplicate		
	Sampling Date/Time	06 May 2009 / 11:30		06 May 2009 / 12:30		06 May 2009 / 12:10			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	12.1	12.3	7.6	7.2	< 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 : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC090500252 Date of Issue : 30-05-2009

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 : 06-05-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 27-05-2009

GCE Serial No. : WQM052009 Sampling Date* : 06-05-2009 / 11:50 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	0.03
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.06
Phosphorus mg/L	APHA 20ed 4500-P D	0.03
Biochemical Oxygen Demand (BOD ₅) mg/L	APHA 20ed 5210 B	3
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

* : Information provided by client

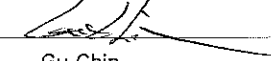
Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 May 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. : GCC090500260 Date of Issue : 30-05-2009

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 : 06-05-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 27-05-2009

GCE Serial No. : WQM052009 Sampling Date* : 06-05-2009 / 11:50 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
		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

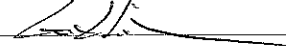
* : Information provided by client

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

Sample received on 06 May 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. : GCC090500278 Date of Issue : 30-05-2009

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 : 06-05-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 27-05-2009

GCE Serial No. : WQM052009 Sampling Date* : 06-05-2009 / 11:40 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	0.93
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.38
Phosphorus mg/L	APHA 20ed 4500-P D	0.16
Biochemical Oxygen Demand (BOD ₅) mg/L	APHA 20ed 5210 B	4
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

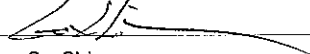
* : Information provided by client

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

Sample received on 06 May 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. : GCC090500286 Date of Issue : 30-05-2009

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

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

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-05-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 27-05-2009

GCE Serial No. : WQM052009 Sampling Date* : 06-05-2009 / 11:40 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	0.92
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.37
Phosphorus mg/L	APHA 20ed 4500-P D	0.16
Biochemical Oxygen Demand (BOD ₅) mg/L	APHA 20ed 5210 B	4
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 06 May 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

Report No. : GCC090500294 Date of Issue : 30-05-2009

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

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

Project* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-05-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 27-05-2009

GCE Serial No. : WQM052009 Sampling Date* : 06-05-2009 / 11:15 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	0.39
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.24
Phosphorus mg/L	APHA 20ed 4500-P D	0.1
Biochemical Oxygen Demand (BOD ₅) mg/L	APHA 20ed 5210 B	4
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 06 May 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. : GCC090500309

Date of Issue : 30-05-2009

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 : 06-05-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 27-05-2009

GCE Serial No. : WQM052009

Sampling Date* : 06-05-2009 / 11:15

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	0.40
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.24
Phosphorus mg/L	APHA 20ed 4500-P D	0.11
Biochemical Oxygen Demand (BOD ₅) mg/L	APHA 20ed 5210 B	4
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 06 May 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. : GCC090500317

Date of Issue : 30-05-2009

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 : 06-05-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 27-05-2009

GCE Serial No. : WQM052009

Sampling Date* : 06-05-2009 / 11:30

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	0.52
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.33
Phosphorus mg/L	APHA 20ed 4500-P D	0.08
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 06 May 2009.

REMARKS : Sample Location WE4.

----- End -----

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

Certified By

Name

Gu Chin

Checked By : Gu Chin

Post

Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC090500325 Date of Issue : 30-05-2009

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 : 06-05-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 27-05-2009

GCE Serial No. : WQM052009 Sampling Date* : 06-05-2009 / 11:30 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	0.53
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.33
Phosphorus mg/L	APHA 20ed 4500-P D	0.08
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 06 May 2009.

REMARKS : Sample Location WE4.

----- End -----

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

Certified By : 

Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC090500333 Date of Issue : 30-05-2009

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 : 06-05-2009

W.O. No.* : -- Contract No.* : -- Date Completed : 27-05-2009

GCE Serial No. : WOM052009 Sampling Date* : 06-05-2009 / 12:30 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	2.74
	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	0.48
Biochemical Oxygen Demand (BOD ₅) mg/L	APHA 20ed 5210 B	4
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

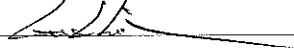
* : Information provided by client

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

Sample received on 06 May 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. : GCC090500341

Date of Issue : 30-05-2009

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 : 06-05-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 27-05-2009

GCE Serial No. : WQM052009

Sampling Date* : 06-05-2009 / 12:30

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	2.77
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.20
Phosphorus mg/L	APHA 20ed 4500-P D	0.48
Biochemical Oxygen Demand (BOD ₅) mg/L	APHA 20ed 5210 B	4
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 06 May 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. : GCC090500359

Date of Issue : 30-05-2009

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 : 06-05-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 27-05-2009

GCE Serial No. : WQM052009

Sampling Date* : 06-05-2009 / 12:10

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	0.01
	APHA 20ed 4500-NH ₃ E	--
	APHA 18ed 4500-NH ₃ C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO ₃ ⁻ E	0.05
Phosphorus mg/L	APHA 20ed 4500-P D	0.03
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 06 May 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. : GCC090500367

Date of Issue : 30-05-2009

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 : 06-05-2009

W.O. No.* : --

Contract No.* : --

Date Completed : 27-05-2009

GCE Serial No. : WQM052009

Sampling Date* : 06-05-2009 / 12:10

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	0.06
Phosphorus mg/L	APHA 20ed 4500-P D	0.03
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 06 May 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		4/5/2009	
Measurement Start Time (hhmm)		14:15	13:40
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.4	0.9
Measurement Results	L90 (dB(A))	43.4	47.4
	L10 (dB(A))	48.6	54.5
	Leq (dB(A))	46.7	53.5
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		1. Excavator noise	1. Excavator noise
Other Noise Source(s) During Monitoring			1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

4/5/2009



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		4/5/2009	
Measurement Start Time (hhmm)		13:05	14:25
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.7	1.1
Measurement Results	L90 (dB(A))	51.4	43.7
	L10 (dB(A))	60.5	53.7
	Leq (dB(A))	59.4	52.6
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 (Bicycles)	1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

4/5/2009



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		11/5/2009	
Measurement Start Time (hhmm)		14:20	10:35
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.4	0.8
Measurement Results	L90 (dB(A))	41.7	46.1
	L10 (dB(A))	49.8	55.3
	Leq (dB(A))	48.6	52.3
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		1. Excavator noise	1. Excavator noise
Other Noise Source(s) During Monitoring			1. Public noise 2. Traffic noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

11/5/2009



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

Construction Noise Monitoring Data Sheet

Monitoring Location		N3	N4
Description of Location		Freefield	Facede
Date of Monitoring		11/5/2009	
Measurement Start Time (hhmm)		11:10	15:00
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.9	1.2
Measurement Results	L90 (dB(A))	48.5	43.8
	L10 (dB(A))	62.9	54.9
	Leq (dB(A))	59.5	52.6
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. Public noise 2. Traffic noise	1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

11/5/2009



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

Construction Noise Monitoring Data Sheet

Monitoring Location		N1	N2
Description of Location		Façade	Façade
Date of Monitoring		20/5/2009	
Measurement Start Time (hhmm)		14:45	14:10
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.7	1.2
Measurement Results	L90 (dB(A))	42.9	50.5
	L10 (dB(A))	53.6	61.8
	Leq (dB(A))	51.3	60.4
Weather condition:		Cloudy	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	1. Excavator noise 2. Power generator noise 3. Hammer noise
Other Noise Source(s) During Monitoring			1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

20/5/2009



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		20/5/2009	
Measurement Start Time (hhmm)		13:00	13:35
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.6	0.8
Measurement Results	L90 (dB(A))	47.0	48.3
	L10 (dB(A))	55.8	59.3
	Leq (dB(A))	55.0	55.9
Weather condition:		Cloudy	
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

20/5/2009



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		29/5/2009	
Measurement Start Time (hhmm)		14:45	14:10
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.3	0.4
Measurement Results	L90 (dB(A))	44.6	50.5
	L10 (dB(A))	50.3	53.5
	Leq (dB(A))	48.1	52.6
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	1. Power generator noise 2. Excavator noise 3. Construction truck noise
Other Noise Source(s) During Monitoring			1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

29/5/2009



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		29/5/2009	
Measurement Start Time (hhmm)		13:00	13:35
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.7	0.6
Measurement Results	L90 (dB(A))	44.3	44.9
	L10 (dB(A))	61.3	56.9
	Leq (dB(A))	57.9	54.1
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

29/5/2009

Appendix F1

Water Quality

Monitoring Data Sheet

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

Date of Sampling: 2009/5/4 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1045			1050			1100			1110			1120			1130			1140		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.1			<1			<1			<1		
pH value	6.96			6.77			6.62			7.58			6.52			6.20			6.78		
Temperature (oC)	24.1			23.5			24.1			24.9			24.2			23.7			23.9		
Salinity (ppt)	1.7			0.1			8.6			22.1			0.2			0.0			1.7		
Turbidity (NTU)	10.3	10.3	Average	2.4	2.4	Average	14.3	14.3	Average	5.5	5.5	Average	0.0	0.0	Average	31.5	31.5	Average	7.3	7.3	Average
			10.3			2.4			14.3			5.5			0.0			31.5			7.3
DO (mg/l)	7.86	7.86	Average	9.64	9.64	Average	6.84	6.84	Average	6.60	6.60	Average	5.46	5.46	Average	8.41	8.41	Average	5.33	5.33	Average
			7.86			9.64			6.84			6.60			5.46			8.41			5.33
DO Saturation (%)	95	95	Average	114	114	Average	86	86	Average	91	91	Average	66	66	Average	100	100	Average	64	64	Average
			95			114			86			91			66			100			64

Name
Prepared By: Jimmy Cheng

Signature


Date
2009/5/4

remark or
observation: _____

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

Date of Sampling: 2009/5/6 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1115			1120			1130			1058			1150			1200			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			1.2			<1			<1			<1		
pH value	7.34			7.18			6.95			7.91			6.29			6.12			6.80		
Temperature (oC)	24.3			23.3			23.7			24.4			24.0			23.6			24.4		
Salinity (ppt)	11.0			2.1			15.4			21.2			0.1			0.0			2.0		
Turbidity (NTU)	7.5	7.5	Average	3.1	3.1	Average	15.9	15.9	Average	2.7	2.8	Average	2.2	2.1	Average	18.3	18.3	Average	8.4	8.4	Average
			7.5			3.1			15.9			2.8			2.2			18.3			8.4
DO (mg/l)	8.75	8.76	Average	10.07	10.07	Average	7.35	7.35	Average	7.92	7.92	Average	6.49	6.49	Average	8.24	8.24	Average	7.50	7.50	Average
			8.76			10.07			7.35			7.92			6.49			8.24			7.50
DO Saturation (%)	112	112	Average	120	120	Average	95	95	Average	107	107	Average	77	77	Average	98	98	Average	93	93	Average
			112			120			95			107			77			98			93

Name
Prepared By: Jimmy Cheng

Signature


Date
2009/5/6

remark or
observation: _____

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

Date of Sampling: 2009/5/8 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1150			1155			1205			1140			1220			1230			1240		
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	7.68			7.70			7.56			8.03			6.25			6.51			6.81		
Temperature (oC)	23.4			24.5			25.0			23.4			22.6			24.6			24.4		
Salinity (ppt)	16.9			7.9			19.3			22.9			0.0			0.0			11.3		
Turbidity (NTU)	11.8	11.8	Average	4.4	4.5	Average	8.8	8.9	Average	4.8	4.8	Average	0.0	0.1	Average	30.8	30.8	Average	8.3	8.3	Average
			11.8			4.5			8.9			4.8			0.1			30.8			8.3
DO (mg/l)	8.11	8.11	Average	8.54	8.54	Average	7.68	7.68	Average	7.87	7.87	Average	8.17	8.17	Average	8.61	8.61	Average	5.47	5.47	Average
			8.11			8.54			7.68			7.87			8.17			8.61			5.47
DO Saturation (%)	105	105	Average	108	108	Average	104	104	Average	105	105	Average	95	95	Average	104	104	Average	79	79	Average
			105			108			104			105			95			104			79

Name
Prepared By: Jimmy Cheng

Signature


Date
2009/5/8

remark or observation: _____

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

Date of Sampling: 2009/5/11 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1400			1350			1340			1410			1305			1320			1330		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.2			<1			<1			<1		
pH value	7.85			7.87			7.76			8.04			6.66			6.45			7.11		
Temperature (oC)	29.7			29.0			30.0			30.0			28.7			28.6			30.6		
Salinity (ppt)	18.0			10.5			22.4			23.5			0.0			0.0			12.2		
Turbidity (NTU)	10.4	10.4	Average	4.7	4.7	Average	14.4	14.4	Average	8.1	8.1	Average	0.0	0.0	Average	6.8	6.8	Average	11.7	11.7	Average
			10.4			4.7			14.4			8.1			0.0			6.8			11.7
DO (mg/l)	8.35	8.35	Average	8.75	8.75	Average	7.88	7.88	Average	7.75	7.75	Average	6.50	6.50	Average	8.31	8.31	Average	5.68	5.68	Average
			8.35			8.75			7.88			7.75			6.50			8.31			5.68
DO Saturation (%)	121	121	Average	121	121	Average	118	118	Average	117	117	Average	85	85	Average	108	108	Average	73	73	Average
			121			121			118			117			85			108			73

Name
Prepared By: Jimmy Cheng

Signature


Date
2009/5/11

remark or observation: _____

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

Date of Sampling: 13/5/2009 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1455			1445			1450			1510			1410			1425			1435		
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	7.87			7.93			7.79			8.17			6.76			6.42			7.13		
Temperature (oC)	30.7			29.7			30.3			29.7			28.9			30.1			31.6		
Salinity (ppt)	18.2			10.6			21.2			28.5			0.3			0.1			12.5		
Turbidity (NTU)	13.8	13.8	Average	7.9	7.9	Average	12.7	12.7	Average	0.1	0.1	Average	2.4	2.4	Average	307.4	307.4	Average	13.6	13.6	Average
			13.8			7.9			12.7			0.1			2.4			307.4			13.6
DO (mg/l)	9.15	9.15	Average	9.66	9.66	Average	8.35	8.35	Average	7.33	7.33	Average	5.96	5.96	Average	7.77	7.77	Average	6.78	6.78	Average
			9.15			9.66			8.35			7.33			5.96			7.77			6.78
DO Saturation (%)	134	134	Average	135	135	Average	125	125	Average	113	113	Average	78	78	Average	98	98	Average	87	87	Average
			134			135			125			113			78			98			87

Name
Prepared By: Jimmy Cheng

Signature


Date
13/5/2009

remark or observation: Muddy water is observed at location C2 because the construction works being carried out in the upper stream of TTT River the location C2.

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

Date of Sampling: 15/5/2009 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1620			1555			1610			1630			1525			1535			1545		
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	7.95			7.99			8.03			8.21			6.71			6.23			7.14		
Temperature (oC)	29.6			29.2			30.1			29.8			29.0			28.0			30.1		
Salinity (ppt)	17.0			10.8			22.4			25.3			0.1			0.0			13.7		
Turbidity (NTU)	12.9	12.9	Average	6.4	6.4	Average	9.3	9.3	Average	5.6	5.6	Average	1.1	1.1	Average	283.7	283.7	Average	11.8	11.8	Average
			12.9			6.4			9.3			5.6			1.1			283.7			11.8
DO (mg/l)	8.86	8.86	Average	9.30	9.30	Average	8.95	8.95	Average	8.14	8.14	Average	6.12	6.12	Average	7.08	7.08	Average	8.34	8.34	Average
			8.86			9.30			8.95			8.14			6.12			7.08			8.34
DO Saturation (%)	129	129	Average	129	129	Average	131	131	Average	124	124	Average	80	80	Average	91	91	Average	107	107	Average
			129			129			131			124			80			91			107

Name
Prepared By: Jimmy Cheng

Signature


Date
15/5/2009

remark or observation: Muddy water is observed at location C2 due to the
construction works being carried out in the upper stream of
TTT River the location C2.

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

Date of Sampling: 20/5/2009 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1045			1050			1055			1035			1105			1115			1130		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.3			<1			<1			<1		
pH value	7.32			7.47			7.15			7.84			6.74			6.54			7.05		
Temperature (oC)	27.8			26.6			27.8			28.1			28.3			26.5			28.7		
Salinity (ppt)	5.8			0.2			15.9			20.6			0.2			0.1			1.2		
Turbidity (NTU)	7.6	7.6	Average	8.1	8.1	Average	13.7	13.7	Average	7.9	7.9	Average	5.0	5.1	Average	14.8	14.8	Average	14.1	14.1	Average
			7.6			8.1			13.7			7.9			5.1			14.8			14.1
DO (mg/l)	7.82	7.82	Average	9.63	9.63	Average	6.07	6.07	Average	6.11	6.11	Average	5.87	5.87	Average	6.20	6.20	Average	7.01	7.01	Average
			7.82			9.63			6.07			6.11			5.87			6.20			7.01
DO Saturation (%)	101	101	Average	120	120	Average	83	83	Average	84	84	Average	76	76	Average	81	81	Average	91	91	Average
			101			120			83			84			76			81			91

Name
Prepared By: Jimmy Cheng

Signature


Date
20/5/2009

remark or observation: Construction works being carried out at the upstream of location C2.

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

Date of Sampling: 21/5/2009 Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1045			1050			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	7.06			7.27			7.03			7.71			7.11			6.95			6.89		
Temperature (oC)	28.0			27.9			29.8			28.7			28.6			27.9			28.2		
Salinity (ppt)	0.2			0.4			2.6			10.2			0.4			0.1			0.4		
Turbidity (NTU)	11.6	11.6	Average	54.1	54.1	Average	25.9	25.9	Average	23.4	23.4	Average	6.3	6.3	Average	227.9	227.9	Average	7.3	7.3	Average
			11.6			54.1			25.9			23.4			6.3			227.9			7.3
DO (mg/l)	7.09	7.09	Average	8.69	8.69	Average	6.66	6.66	Average	7.14	7.14	Average	7.44	7.44	Average	7.15	7.15	Average	4.41	4.41	Average
			7.09			8.69			6.66			7.14			7.44			7.15			4.41
DO Saturation (%)	91	91	Average	109	109	Average	89	89	Average	98	98	Average	98	98	Average	90	90	Average	58	58	Average
			91			109			89			98			98			90			58

Name
Prepared By: Jimmy Cheng

Signature


Date
21/5/2009

remark or observation: Muddy water is observed at location C2 and M2 due to the construction works being carried out in the upper stream of TTT River the location C2. Heavy rainstorm at early morning.

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

Date of Sampling: 22/5/2009

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1050			1055			1100			1040			1110			1120			1130		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.2			<1			<1			<1		
pH value	7.21			7.01			7.14			7.84			7.05			6.24			6.81		
Temperature (oC)	27.8			26.9			27.9			27.9			27.5			27.2			29.2		
Salinity (ppt)	6.7			1.2			10.9			15.7			0.4			0.1			1.4		
Turbidity (NTU)	8.6	8.8	Average	8.9	8.9	Average	14.2	14.2	Average	7.1	7.1	Average	4.3	4.4	Average	108.3	108.3	Average	5.8	5.8	Average
			8.7			8.9			14.2			7.1			4.4			108.3			5.8
DO (mg/l)	6.49	6.49	Average	7.89	7.89	Average	6.01	6.01	Average	6.05	6.05	Average	4.44	4.44	Average	7.10	7.10	Average	6.76	6.76	Average
			6.49			7.89			6.01			6.05			4.44			7.10			6.76
DO Saturation (%)	86	86	Average	100	100	Average	81	81	Average	85	85	Average	56	56	Average	90	90	Average	89	89	Average
			86			100			81			85			56			90			89

Name
Prepared By: Jimmy Cheng

Signature


Date
22/5/2009

remark or observation: Muddy water is observed at location C2 due to the construction works being carried out in the upper stream of TTT River the location C2

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

Date of Sampling: 25/5/2009

Heavy Rain

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1310			1315						1300			1330			1345			1355		
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	7.06			7.34						7.25			6.77			6.93			6.56		
Temperature (oC)	23.4			22.8						23.9			22.3			23.1			22.1		
Salinity (ppt)	0.1			0.0						1.6			0.0			0.0			0.0		
Turbidity (NTU)	14.7	14.7	Average	16.7	16.7	Average			Average	18.7	18.7	Average	7.3	7.3	Average	59.7	59.7	Average	8.7	8.7	Average
			14.7			16.7			#DIV/0!			18.7			7.3			59.7			8.7
DO (mg/l)	7.88	7.88	Average	8.37	8.37	Average			Average	7.32	7.32	Average	7.19	7.19	Average	8.96	8.96	Average	6.78	6.78	Average
			7.88			8.37			#DIV/0!			7.32			7.19			8.96			6.78
DO Saturation (%)	91	91	Average	99	99	Average			Average	87	87	Average	85	85	Average	109	109	Average	79	79	Average
			91			99			#DIV/0!			87			85			109			79

Name
Prepared By: Jimmy Cheng

Signature


Date
25/5/2009

remark or observation: Location M3 have not been monitored due to safety issue of the access.

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

Date of Sampling: 27/5/2009

Rainy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1410			1415			1425			1400			1435			1440			1450		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.3			<1			<1			<1		
pH value	7.24			7.07			7.06			7.12			7.33			7.01			6.85		
Temperature (oC)	27.1			26.8			27.1			27.7			27.1			27.4			26.7		
Salinity (ppt)	7.1			2.3			9.5			6.3			0.0			0.0			3.7		
Turbidity (NTU)	2.7	2.7	Average	30.9	30.9	Average	15.3	15.3	Average	56.3	56.3	Average	1.9	1.9	Average	385.7	385.7	Average	6.9	6.9	Average
			2.7			30.9			15.3			56.3			1.9			385.7			6.9
DO (mg/l)	7.66	7.66	Average	7.78	7.78	Average	5.97	5.97	Average	6.02	6.02	Average	7.34	7.34	Average	7.51	7.51	Average	5.83	5.83	Average
			7.66			7.78			5.97			6.02			7.34			7.51			5.83
DO Saturation (%)	101	101	Average	99	99	Average	76	76	Average	80	80	Average	95	95	Average	97	97	Average	70	70	Average
			101			99			76			80			95			97			70

Name
Prepared By: Jimmy Cheng

Signature


Date
27/5/2009

remark or observation: Muddy water is observed at location C2 and M2 due to the construction works being carried out in the upper stream of TTT River the location C2

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

Date of Sampling: 29/5/2009

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1615			1620			1625			1605			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			1.5			<1			<1			<1		
pH value	7.07			7.07			6.86			6.45			7.11			6.28			6.36		
Temperature (oC)	24.0			23.6			24.2			23.3			22.6			23.0			23.1		
Salinity (ppt)	10.8			2.6			10.9			6.1			0.0			0.0			6.8		
Turbidity (NTU)	5.7	5.7	Average	5.1	5.1	Average	5.9	5.9	Average	7.1	7.1	Average	0.5	0.5	Average	297.1	297.1	Average	4.7	4.7	Average
			5.7			5.1			5.9			7.1			0.5			297.1			4.7
DO (mg/l)	6.52	6.52	Average	7.42	7.42	Average	6.31	6.31	Average	6.92	6.92	Average	8.03	8.03	Average	7.61	7.61	Average	6.21	6.21	Average
			6.52			7.42			6.31			6.92			8.03			7.61			6.21
DO Saturation (%)	83	83	Average	88	88	Average	71	71	Average	84	84	Average	93	93	Average	89	89	Average	69	69	Average
			83			88			71			84			93			89			69

Name
Prepared By: Jimmy Cheng

Signature


Date
29/5/2009

remark or observation: Muddy water is observed at location C2 due to the
construction works being carried out in the upper stream of
TTT River the location C2

Appendix F2

Water Quality

Monitoring Lab report



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090500024 Date of Issue : 11-05-2009

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 : 05-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 06-05-2009

GCE Serial No. : WQM052009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results						
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L		
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	505	503	0.4	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	04 May 2009 / 11:20		04 May 2009 / 11:30		04 May 2009 / 11:40			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.1	2.5	14.5	14.3	10.3	10.3	
TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	04 May 2009 / 10:45		04 May 2009 / 10:50		04 May 2009 / 11:00		04 May 2009 / 11:10	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	7.7	8.1	2.9	2.5	12.0	12.1	5.9

* : Information provided by client

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

Remarks : _____

----- End -----

Tested By : K.L. Fong

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. : GCC090500032 Date of Issue : 11-05-2009

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 : 06-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 07-05-2009

GCE Serial No. : WQM052009 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	483	3.3	27.3
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ± 5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	06 May 2009 / 11:50		06 May 2009 / 12:00		06 May 2009 / 12:25			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.7	2.1	8.9	8.9	9.6	10.0	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	06 May 2009 / 11:15		06 May 2009 / 11:20		06 May 2009 / 11:30		06 May 2009 / 10:58	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	6.1	6.6	2.3	2.4	12.1	12.3	6.0 5.9

* : Information provided by client

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

Remarks : 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 AND WASTEWATER

Page 1 of 1

Report No. : GCC090500058 Date of Issue : 11-05-2009

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 : 08-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 09-05-2009

GCE Serial No. : WQM052009 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	484	486	-0.4	26.4
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ± 5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	08 May 2009 / 12:20		08 May 2009 / 12:30		08 May 2009 / 12:40			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.5	2.5	24.0	23.6	13.6	13.1	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	08 May 2009 / 11:50		08 May 2009 / 11:55		08 May 2009 / 12:05		08 May 2009 / 11:40	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	10.0	9.9	3.9	3.7	8.7	8.7	6.4

* : Information provided by client

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

Remarks : _____

----- End -----

Tested By : K.L. Fong

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090500066 Date of Issue : 21-05-2009

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 : 12-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 13-05-2009

GCE Serial No. : WQM052009 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	485	1.4	26.7
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	11 May 2009 / 13:05		11 May 2009 / 13:20		11 May 2009 / 13:30			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.9	1.9	2.0	2.2	6.9	7.2	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	11 May 2009 / 14:00		11 May 2009 / 13:50		11 May 2009 / 13:40		11 May 2009 / 14:10	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	10.5	10.9	2.9	3.0	8.9	9.4	11.1 11.6

* : 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

Report No. : GCC090500074 Date of Issue : 21-05-2009

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 : 13-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 14-05-2009

GCE Serial No. : WQM052009 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	484	490	-1.2	22.9
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	13 May 2009 / 14:10		13 May 2009 / 14:25		13 May 2009 / 14:35			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	5.2	5.5	187.6	185.6	8.1	7.9	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	13 May 2009 / 14:55		13 May 2009 / 14:45		13 May 2009 / 14:50		13 May 2009 / 15:10	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	11.7	11.3	8.8	9.2	11.3	11.2	6.0 5.9

* : Information provided by client

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

Remarks : _____

----- End -----

Tested By : K.L. Fong

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. : GCC090500082 Date of Issue : 21-05-2009

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 : 16-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 16-05-2009

GCE Serial No. : WQM052009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	502	510	-1.6	24.2
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	15 May 2009 / 15:25		15 May 2009 / 15:35		15 May 2009 / 15:45			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.3	2.8	170.4	172.0	8.9	9.5	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	15 May 2009 / 16:20		15 May 2009 / 15:55		15 May 2009 / 16:10		15 May 2009 / 16:30		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	11.9	12.1	8.6	9.0	12.2	12.2	7.6	7.8

* : 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

Report No. : GCC090500090 Date of Issue : 26-05-2009

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 : 21-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 21-05-2009

GCE Serial No. : WQM052009 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	483	2.3	27.4
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ± 5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	20 May 2009 / 11:05		20 May 2009 / 11:15		20 May 2009 / 11:30			
	LOD								
Suspended Solids (SS)	1	mg/L	3.2	3.2	6.0	6.4	12.8	12.9	

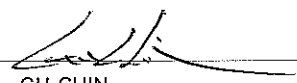
TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	20 May 2009 / 10:45		20 May 2009 / 10:50		20 May 2009 / 10:55		20 May 2009 / 10:35	
	LOD								
Suspended Solids (SS)	1	mg/L	9.2	9.8	6.0	5.7	8.9	8.7	9.2

* : Information provided by client

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

Remarks : _____

----- End -----

Tested By : K.L. Fong 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. : GCC090500105 Date of Issue : 26-05-2009

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 : 21-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 23-05-2009

GCE Serial No. : WQM052009 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	510	504	1.2	23.9
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	21 May 2009 / 11:25		21 May 2009 / 11:35		21 May 2009 / 11:45			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.4	2.3	118.4	119.6	6.5	6.1	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	21 May 2009 / 10:45		21 May 2009 / 10:50		21 May 2009 / 10:55		21 May 2009 / 11:10	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	8.3	8.4	10.2	10.1	20.0	20.4	14.8

* : 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

Report No. : GCC090500113 Date of Issue : 26-05-2009

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 : 23-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 25-05-2009

GCE Serial No. : WQM052009 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	486	488	-0.4	27.5
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	22 May 2009 / 11:10		22 May 2009 / 11:20		22 May 2009 / 11:30			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	3.4	3.8	56.4	54.8	7.1	6.9	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	22 May 2009 / 10:50		22 May 2009 / 10:55		22 May 2009 / 11:00		22 May 2009 / 10:40	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	7.5	7.6	7.2	7.4	11.5	11.1	7.0 7.3

* : Information provided by client

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

Remarks : _____
 ----- End -----

Tested By : K.L. Fong Approved Signatory : 
 Name : GU CHIN
 Checked By : GU CHIN Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC090500472 Date of Issue : 01-06-2009

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 : 26-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 27-05-2009

GCE Serial No. : WQM052009 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	502	498	0.8	24.5
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	25 May 2009 / 13:30		25 May 2009 / 13:45		25 May 2009 / 13:55			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	8.7	8.5	31.7	32.5	10.0	9.9	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	25 May 2009 / 13:10		25 May 2009 / 13:15				25 May 2009 / 13:00	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	7.6	8.1	8.3	8.4		11.6	12.0

* : 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 : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC090500480 Date of Issue : 01-06-2009

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 : 27-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 29-05-2009

GCE Serial No. : WQM052009 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	494	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	27 May 2009 / 14:35		27 May 2009 / 14:40		27 May 2009 / 14:50			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	< 1.0	< 1.0	152.4	149.2	4.5	4.2	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	27 May 2009 / 14:10		27 May 2009 / 14:15		27 May 2009 / 14:25		27 May 2009 / 14:00		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	4.3	3.9	17.5	17.1	12.3	12.0	32.8	32.4

* : 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. : GCC090500498 Date of Issue : 01-06-2009

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 : 29-05-2009

W.O. No.* : -- Sample Type* : River Water Date Completed : 30-05-2009

GCE Serial No. : WQM052009 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	512	500	2.4	27.6
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 May 2009 / 15:30		29 May 2009 / 15:40		29 May 2009 / 15:50			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.4	1.7	133.6	134.4	3.3	3.5	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	29 May 2009 / 16:15		29 May 2009 / 16:20		29 May 2009 / 16:25		29 May 2009 / 16:05	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	5.9	5.7	3.5	3.1	5.4	5.7	4.7

* : 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

Checked By : GU CHIN

Post : Chemist

Appendix G
Monitoring Schedule
for May 2009

Environmental Pioneers and Solutions Limited

DC/2006/11 - DRAINAGE IMPROVEMENT IN SOUTHERN LANTAU

Master Schedule of EM&A works in May 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					5/1	5/2
5/3	5/4	5/5	5/6	5/7	5/8	5/9
	WQM at: 10:18 Noise monitoring		WQM & EWQM at: 10:47	Ecological Survey	WQM at: 11:55 Ecological Survey Site inspection	
5/10	5/11	5/12	5/13	5/14	5/15	5/16
	WQM at: 13:39 Noise monitoring		WQM at: 14:49		WQM at: 16:08 Ecological Survey Site inspection	
5/17	5/18	5/19	5/20	5/21	5/22	5/23
			WQM at: 10:11 Noise monitoring	WQM at: 10:18	WQM at: 10:49 Site inspection	
5/24 & 5/31	5/25	5/26	5/27	5/28	5/29	5/30
	WQM at: 12:49		WQM at: 13:42		WQM at: 16:26 Noise monitoring Site inspection	

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

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

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

Appendix H Implementation Status of environmental protection / mitigation measures

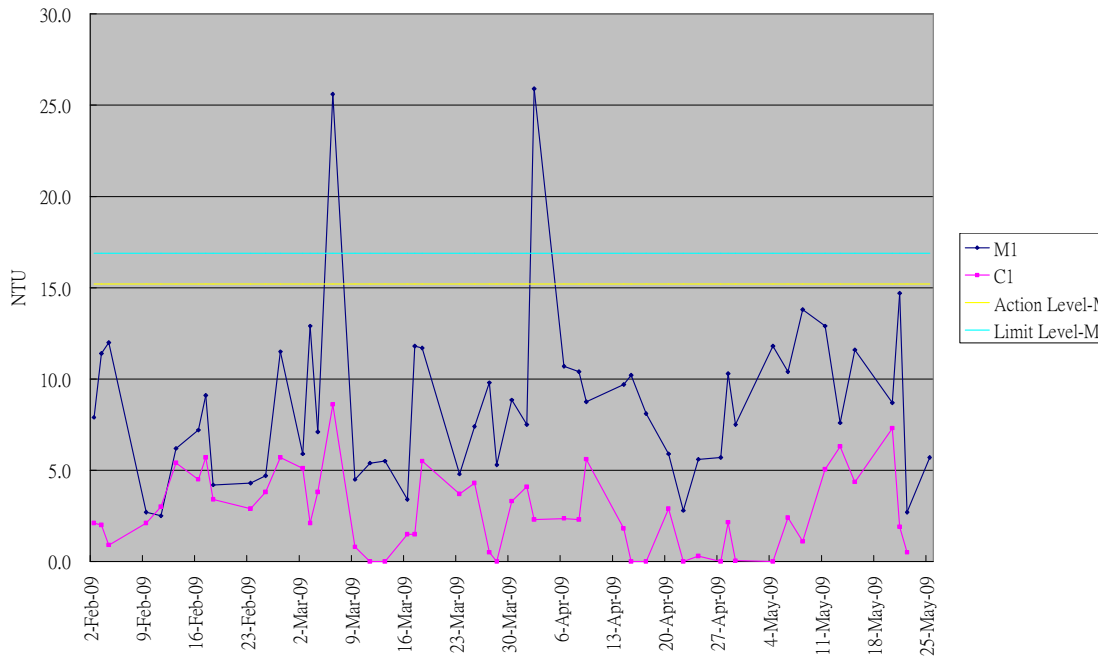
Environmental Aspect	Protection / Mitigation Measures	Implementation status	Follow-up action
Air Quality	Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved road, with complete coverage.	Deficiencies found on 08 May 09	- Ongoing
	Use of frequent watering for particular 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 found on 21 May 09	- To be follow up
	Routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.	Implemented	-
Noise	Use of quiet powered mechanical equipment (PME)	Implemented	-
	Adoption of movable noise barriers and temporary noise barriers	Not applicable at this stage	-
	Application of good site practices mentioned in EM&A manual Clause 3.8.1	Implemented	-
Water Quality	Before commencing any site formation works, all sewer and drainage connections should be sealed to prevent debris, soil, sand etc. from entering public sewers/drains.	Implemented	-
	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.	Not applicable	-
	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.	Implemented	-
	Water pumped out from foundation excavations should be discharged into silt removal facilities.	Implemented	-
	During rainstorms, exposed slope surface should be covered by a tarpaulin or the means.	Implemented	-
	Exposed soil areas should be minimized to reduce potential for increased siltation and contamination of runoff.	Implemented	-
	Exposed soil surfaces should be protected by paving or fill material as soon as possible to reduce potential of soil erosion.	Implemented	-
	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.	Implemented	-
	Oils and fuels should only be used and stored on designated areas which have pollution prevention facilities.	Deficiencies found on 15 May 09	Follow up actions has been taken and settled on 21 May
	Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site.	Not applicable	-
	The excavation and widening works for the drainage improvements to the Pak Ngan Heung River, Tai Tei Tong River, Luk Tei Tong River and Luk Tei Tong By-pass Channel should be carried out in sections (approximately 300 –400 m in length) and in dry condition.	Implemented	-

Environmental Aspect	Protection / Mitigation Measures	Implementation status	Follow-up action
	Maintenance 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	Implemented	-
	Turf removal from the Luk Tei Tong marsh due to the construction of Luk Tei Tong Bypass Channel shall be minimized	Implemented	
	Turf from the Luk Tei Tong marsh shall be properly removed, stored, maintained and reused for lining the riverbed of the Luk Tei Tong Bypass Channel	Implemented	
Chemical and Solid Waste	Chemical wastes should be properly stored in a proper store as per statutory requirements (i.e. on a hard standing, within an enclosed and locked area)	Implemented	-
	Chemical waste stores should be provided with fire precaution facilities (i.e. fire extinguisher, no smoking warning etc).	Implemented	-
	Chemical wastes should be properly stored in corrosion resistant containers placed inside the store and labelled with warning signs in English and Chinese.	Implemented	-
	Chemical wastes should be disposed of by licensed chemical waste collector with supporting delivery records.	Implemented	-
	All containers for fuel, diesel and fluid chemical (in use) and oil filled stationery plants located with proper drip pans.	Deficiencies found on 15 May 09	- To be follow up
	Construction wastes should be managed and disposed to the designated public fill and landfill areas in acceptable manner.	Deficiencies found on 15 May 09	- To be follow up
	All waste disposals managed in a proper manner i.e. trip ticket system implementation.	Implemented	-

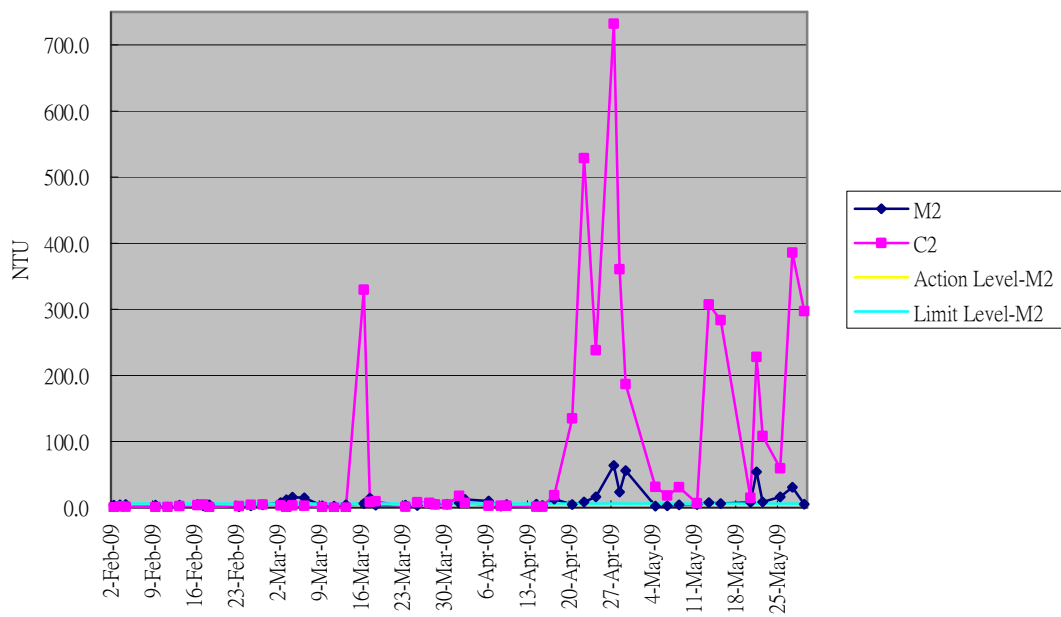
Appendix I

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

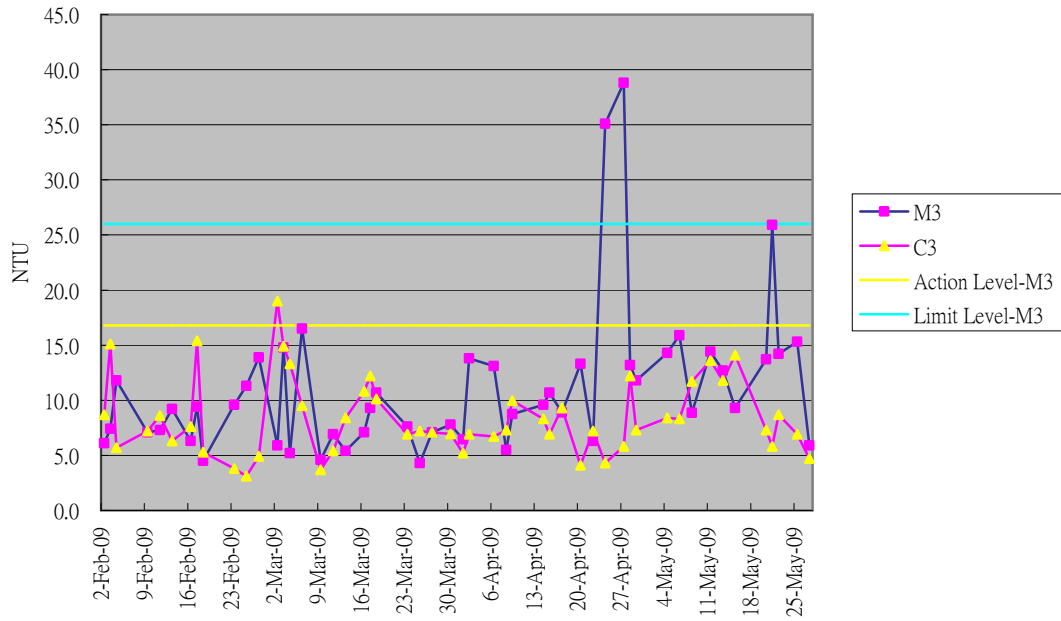
Graphical Plot of Turbidity Trend M1&C1 (Feb - May 09)



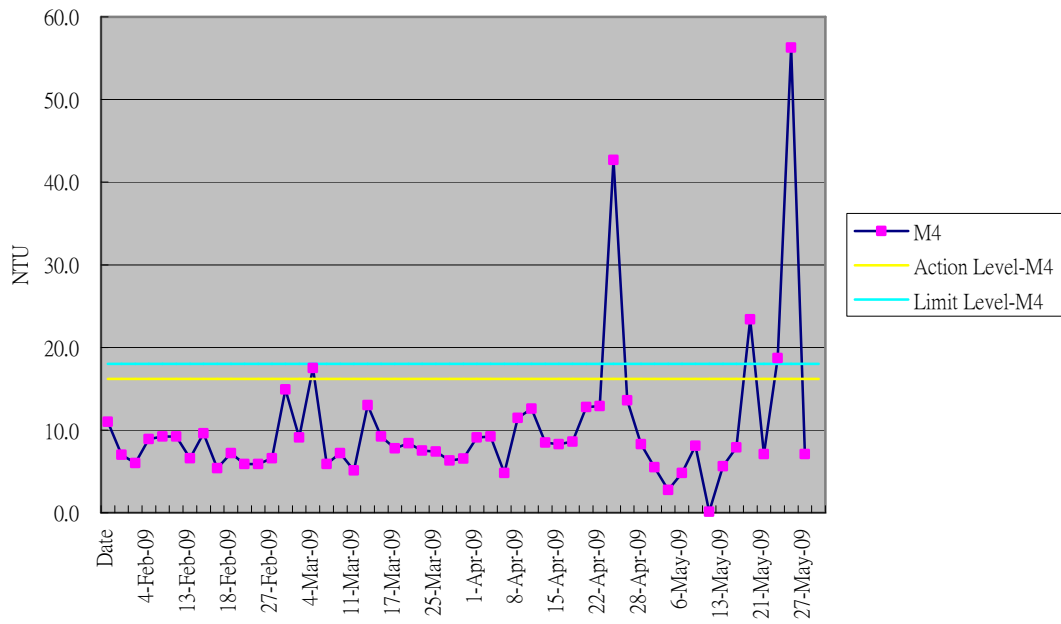
Graphical Plot of Turbidity Trend M2&C2 (Feb - May 09)



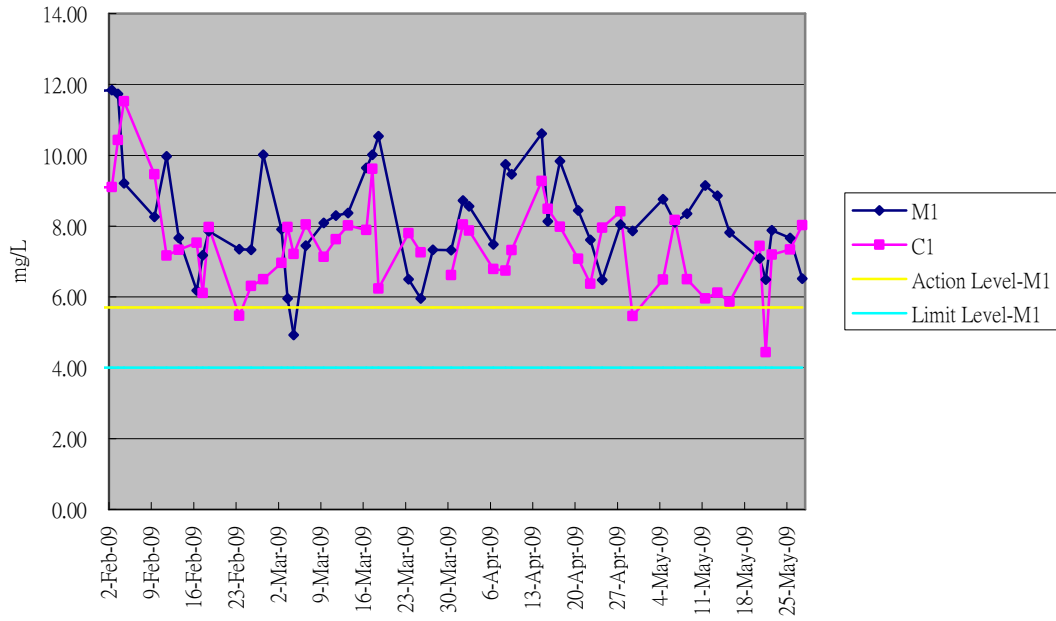
Graphical Plot of Turbidity Trend M3&C3 (Feb - May 09)



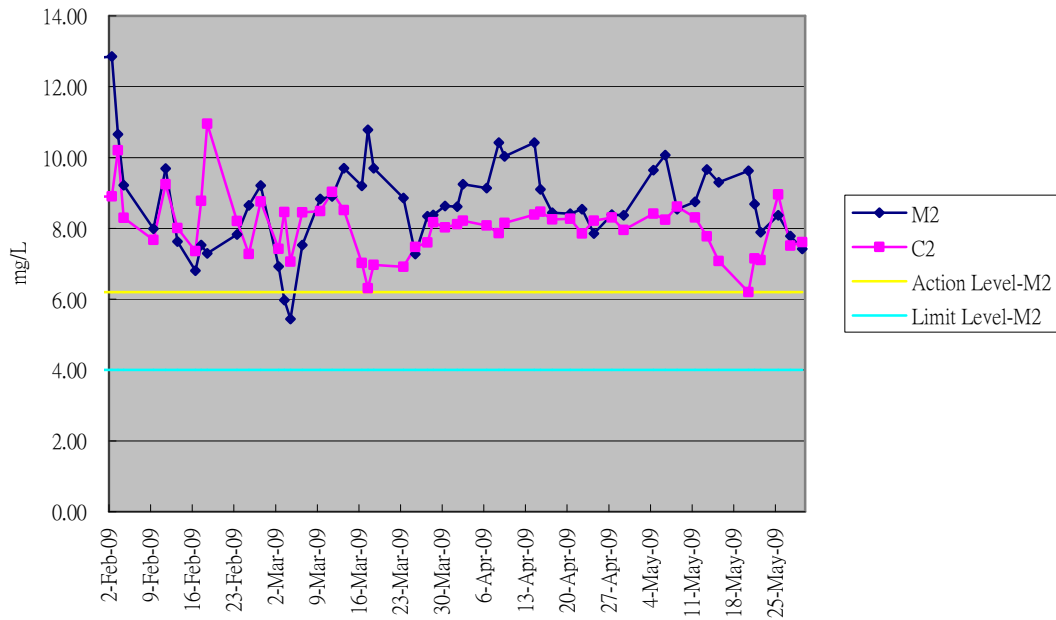
Graphical Plot of Turbidity Trend M4 (Feb - May 09)



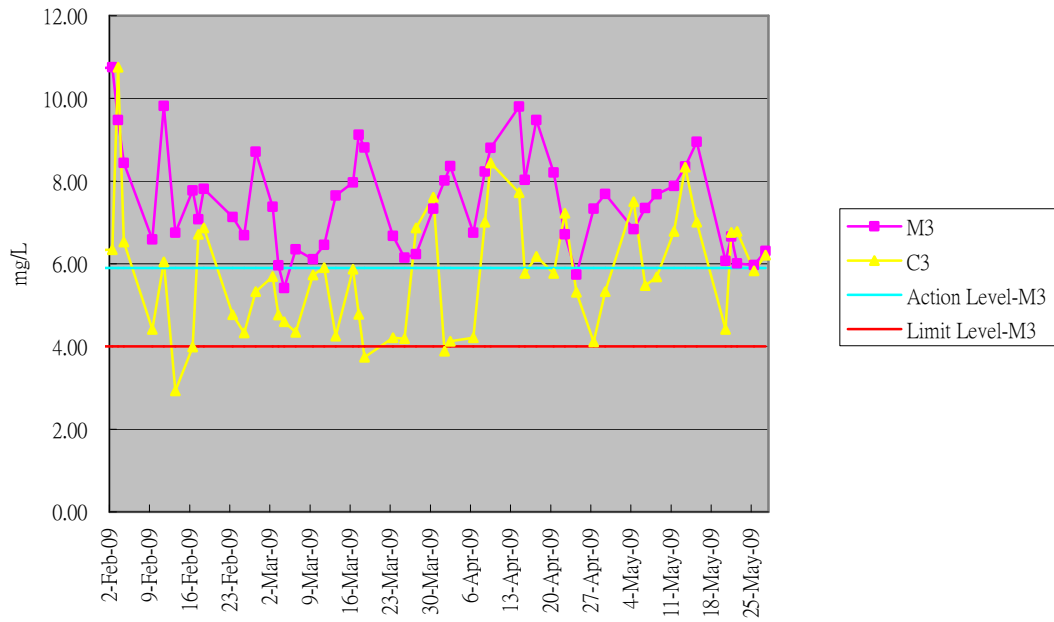
Graphical Plot of Dissolved Oxygen Trend M1&C1 (Feb - May 09)



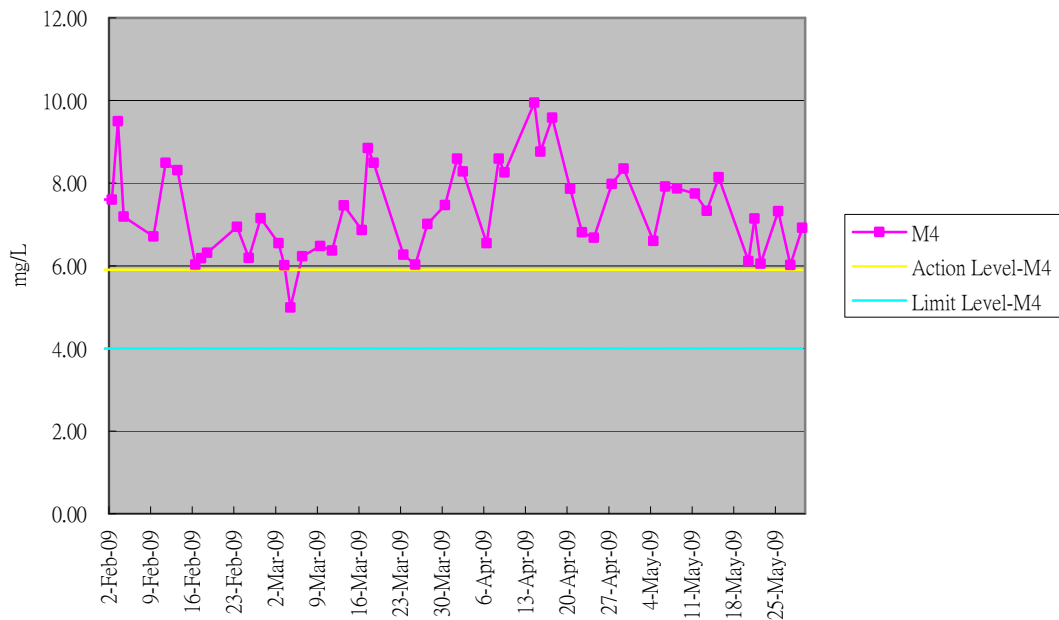
Graphical Plot of Dissolved Oxygen Trend M2&C2 (Feb - May 09)



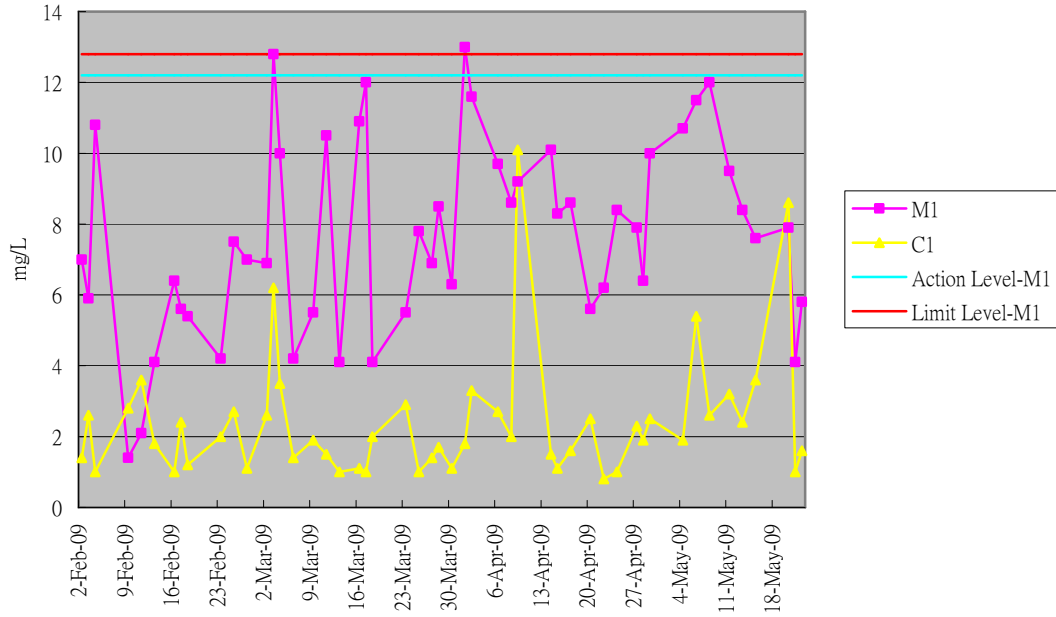
Graphical Plot of Dissolved Oxygen Trend M3&C3 (Feb - May 09)



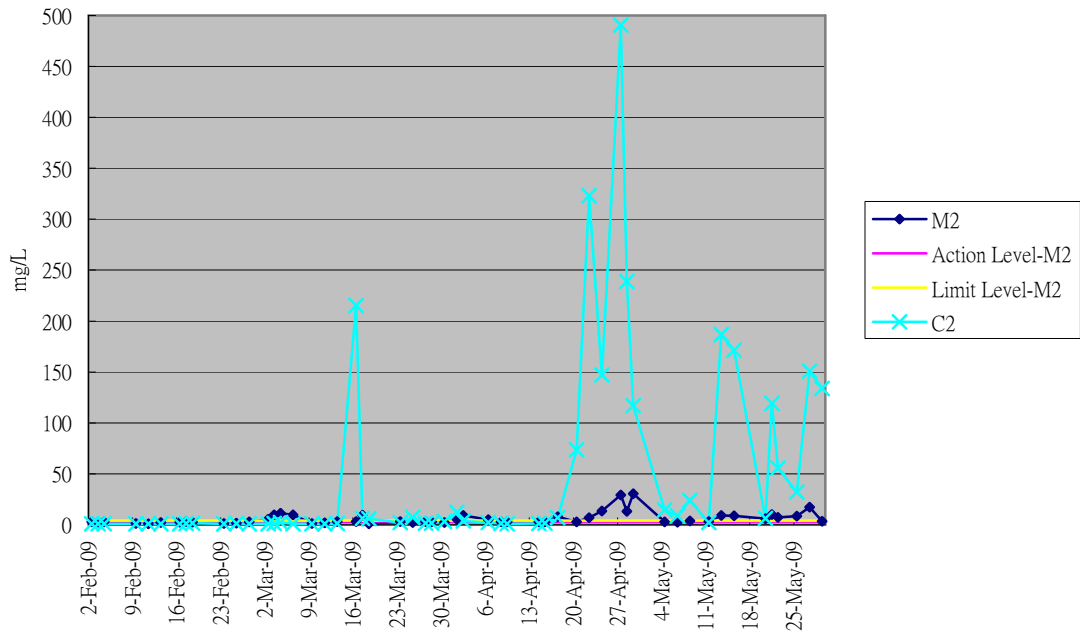
Graphical Plot of Dissolved Oxygen Trend M4 (Feb - May 09)



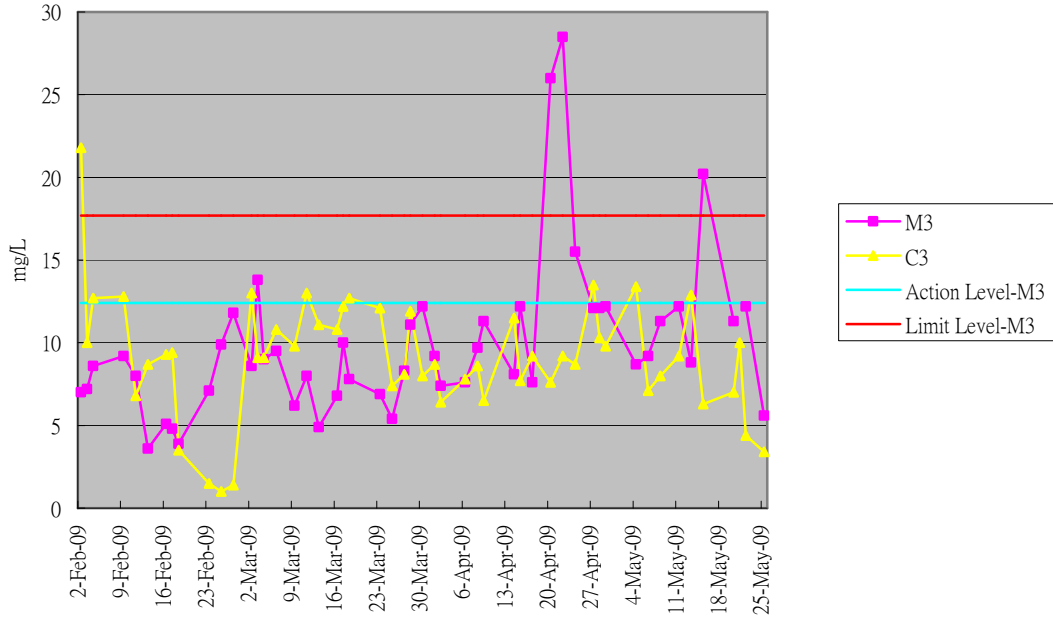
Graphical Plot of Suspended Solid M1&C1 (Feb - May 09)



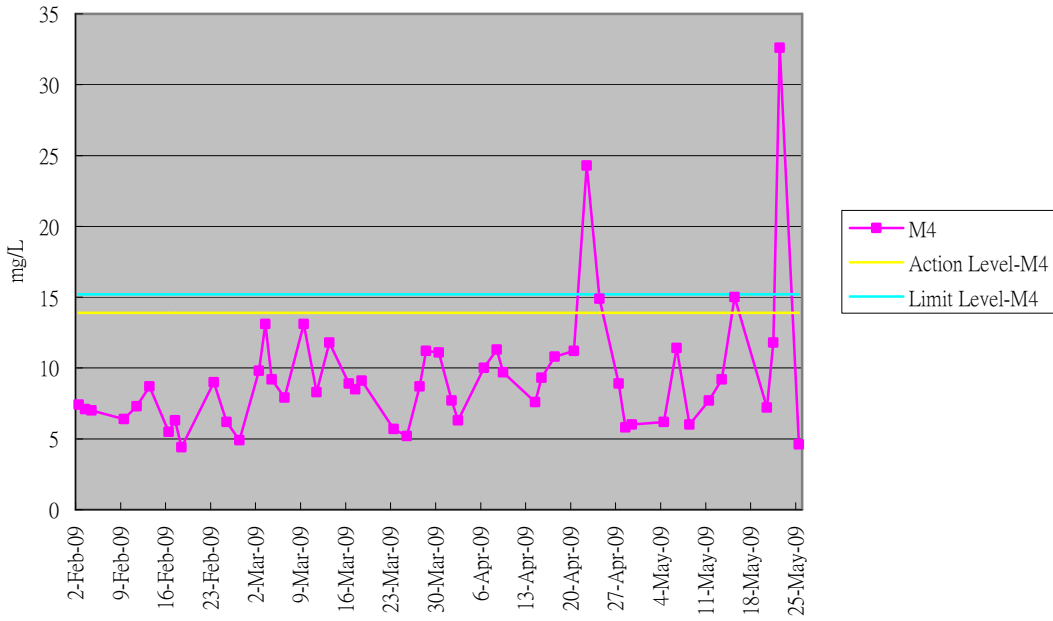
Graphical Plot of Suspended Solid M2&C2 (Feb - May 09)



Graphical Plot of Suspended Soild M3&C3 (Feb - May 09)

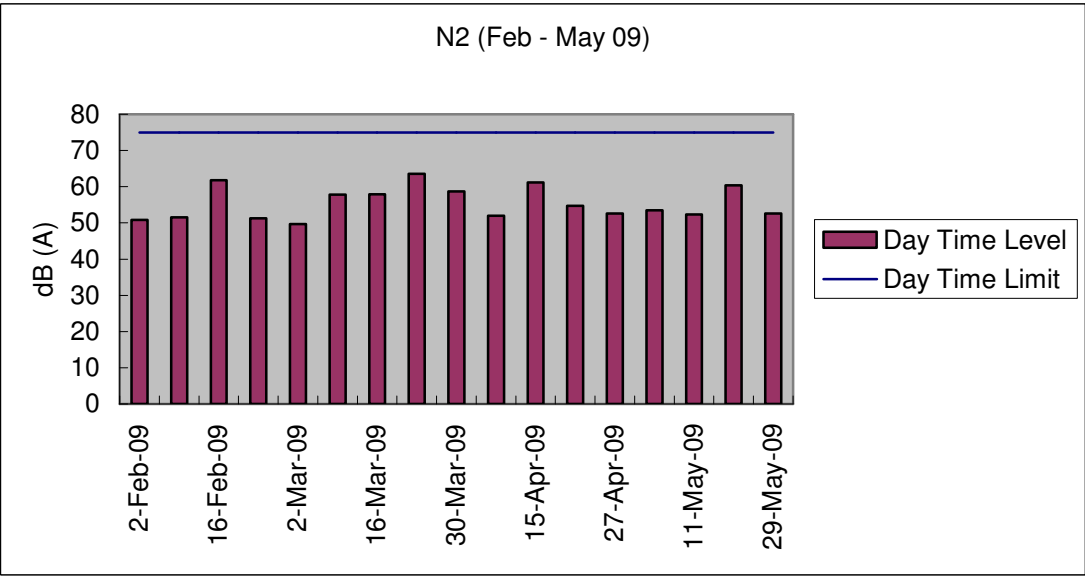
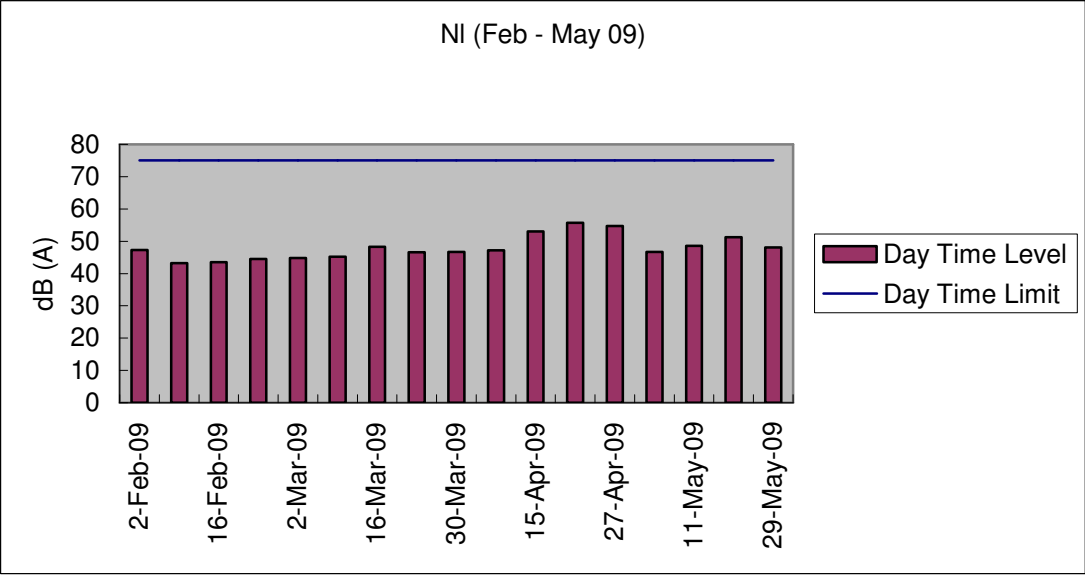


Graphical Plot of Suspended Soild M4 (Feb - May 09)

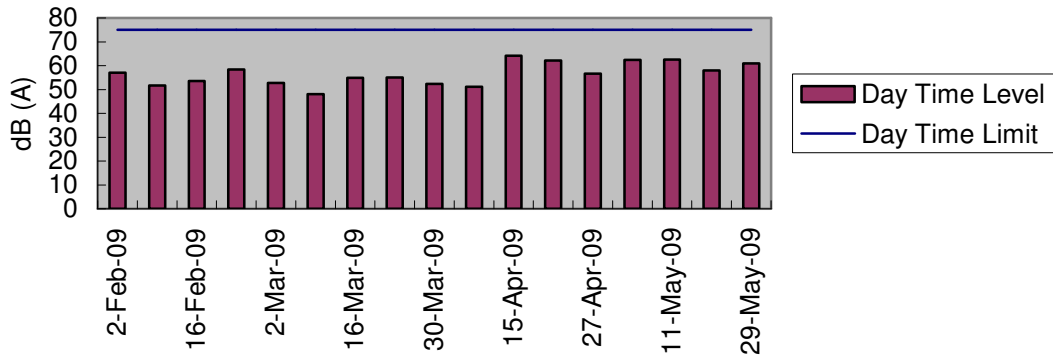


Appendix J

Graphical plot of noise
monitoring results



N3 (Feb - May 09)



N4 (Feb - May 09)

