

**Drainage Service Department**

**Monthly Environmental Monitoring & Auditing report for**

**Contract No.DC/2006/11**

**Drainage Improvement in Southern Lantau**

**July 2010**

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## **EXECUTIVE SUMMARY**

This is the twenty-fourth monthly environmental Monitoring and audit (EM&A) report for “Drainage Improvement in Southern Lantau Investigation”. The environmental permit number is “EP-237/2005/B”. The report concludes the impact monitoring for the activities undertaken during the period of 1 July 2010 to 31 July 2010. The major activities in this reporting month include construction of fish ladder at Pak Ngan Heung (PNH) River, construction of inlet of Luk Tei Tong (LTT) bypass channel and provision of granite facing to concrete structures constructed.

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 53 non-compliance events of water quality criteria were recorded in this reporting period while 8 of them were believed to be mainly attributed to improper site practice and insufficient of water quality mitigation measures on site. As such, contractor was advised to implement necessary corrective actions and mitigation measures as to minimize further deterioration of water quality.

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

There was no complaint, notification of any summons and successful

prosecutions against the project received during the reporting period.

Construction activities being carried out in this reporting period will be continued in the upcoming month. 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 twenty-fourth monthly Environmental Monitoring and Audit (EM&A) Report for “Drainage Improvement in Southern Lantau Investigation” project (Environmental Permit No. EP-237/2005/B)

## **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 (TTT) 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.

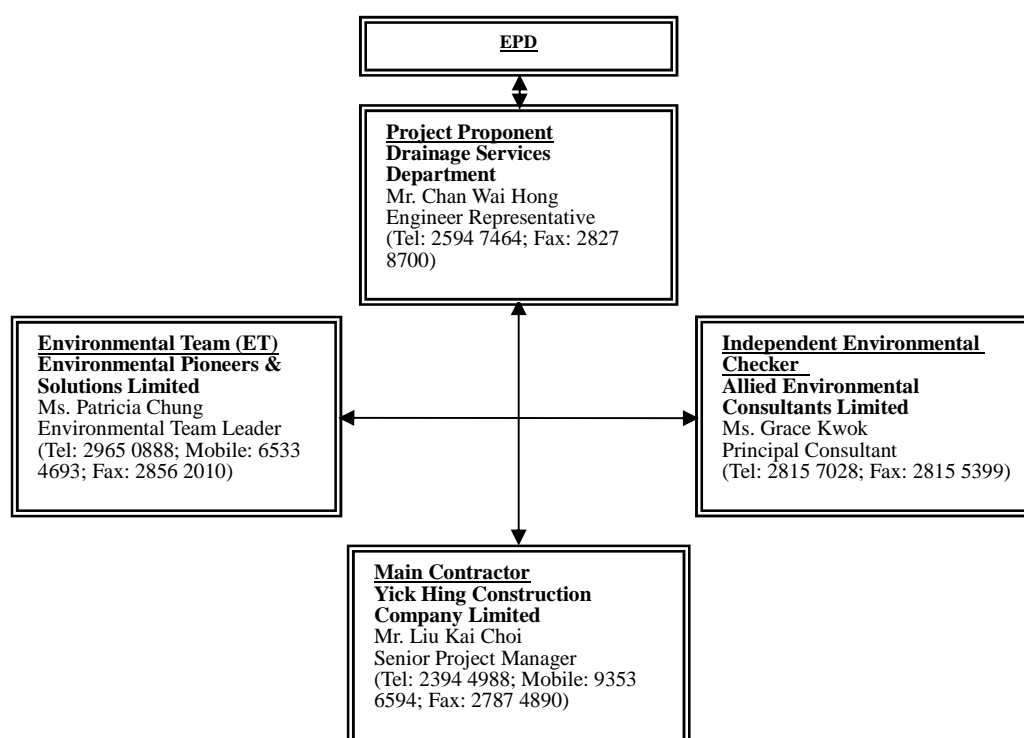


Figure. 2.2.1 Environmental Management structure for the project

## 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 the inlet of LTT bypass channel.
2. Construction of gabion wall at PNH River.
3. Construction of granite facing for concrete structures.

#### **3.2 Construction activities for the coming month**

Construction activities aforementioned will be continued in the upcoming month.

#### **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	B & K, model 4231	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.

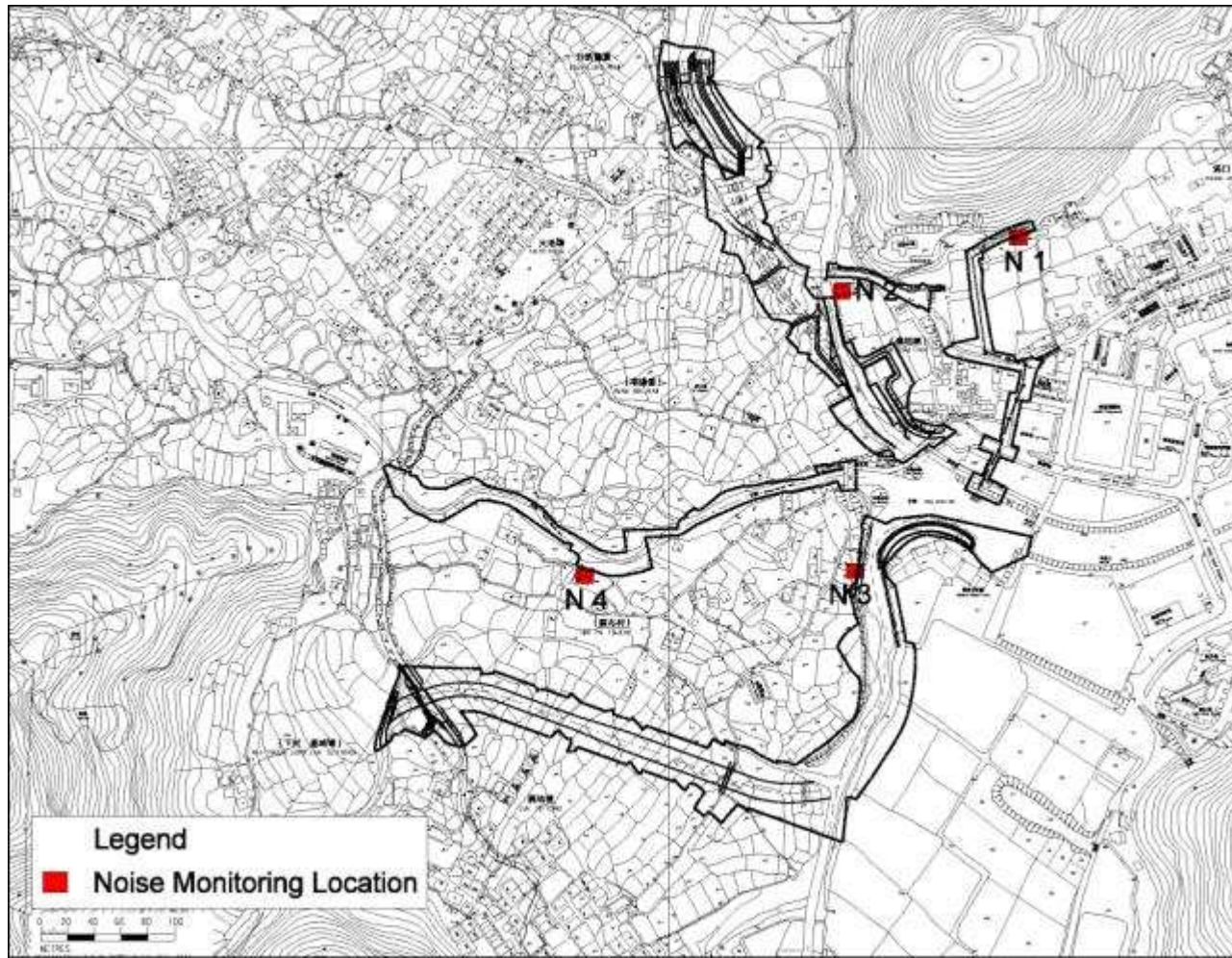


Figure 4.3.1 Impact noise monitoring locations

#### 4.4 Monitoring Results and Interpretation

Relevant details of the noise monitoring results are presented in Table 4.4.1. The results, ranged between 47.6 dB(A) and 62.2 dB(A), were within the limit levels and therefore, no exceedance was found.

Monitoring originally scheduled on 21 and 28 July 2010 was postponed to 24 and 30 July 2010 respectively due to rainy weather.

Table 4.4.1 Noise monitoring results

Location	Parameter	Date	Time	L <sub>Aeq</sub> dB(A)	Limit dB(A)	Exceedance	Weather
N1	L <sub>eq</sub> 30mins	7-Jul-10	14:10	51.3	75	N	Sunny
N1	L <sub>eq</sub> 30mins	14-Jul-10	15:55	54.3	75	N	Sunny
N1	L <sub>eq</sub> 30mins	24-Jul-10	11:30	54.2	75	N	Sunny
N1	L <sub>eq</sub> 30mins	30-Jul-10	13:30	60.3	75	N	Sunny
N2	L <sub>eq</sub> 30mins	7-Jul-10	14:50	62.2	75	N	Sunny
N2	L <sub>eq</sub> 30mins	14-Jul-10	12:05	49.9	75	N	Sunny
N2	L <sub>eq</sub> 30mins	24-Jul-10	12:03	47.8	75	N	Sunny
N2	L <sub>eq</sub> 30mins	30-Jul-10	11:55	47.6	75	N	Sunny
N3*	L <sub>eq</sub> 30mins	7-Jul-10	13:25	59.3	75	N	Sunny
N3*	L <sub>eq</sub> 30mins	14-Jul-10	11:30	54.3	75	N	Sunny
N3*	L <sub>eq</sub> 30mins	24-Jul-10	10:25	51.6	75	N	Sunny
N3*	L <sub>eq</sub> 30mins	30-Jul-10	11:20	51.6	75	N	Sunny
N4	L <sub>eq</sub> 30mins	7-Jul-10	12:50	55.9	75	N	Sunny
N4	L <sub>eq</sub> 30mins	14-Jul-10	10:50	48.3	75	N	Sunny
N4	L <sub>eq</sub> 30mins	24-Jul-10	10:58	51.1	75	N	Sunny
N4	L <sub>eq</sub> 30mins	30-Jul-10	10:50	55.6	75	N	Sunny

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 exceedance recorded in the reporting month.

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

Table 4.5.2 Event / Action Plan for Construction Noise

EVENT	ACTION			
	ET	IC(E)	ER	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Notify IC(E) and Contractor;</li> <li>2. Carry out investigation;</li> <li>3. Report the results of investigation to the IC(E), ER and Contractor;</li> <li>4. Discuss with the Contractor and formulate remedial measures;</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analysed results submitted by the ET;</li> <li>2. Review the proposed remedial measures by the Contractor and advise ER accordingly;</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem;</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IC(E);</li> <li>2. Implement Noise mitigation proposals.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform IC(E), ER, EPD and Contractor;</li> <li>3. Repeat measurements to confirm findings;</li> <li>4. Increase monitoring frequency;</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>6. Inform IC(E), ER and EPD the causes and actions taken for the exceedances;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results</li> <li>8. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem;</li> <li>4. Ensure remedial measures properly implemented;</li> <li>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</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IC(E) within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Resubmit proposals if problem still not under control;</li> <li>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated</li> </ol>

#### **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.

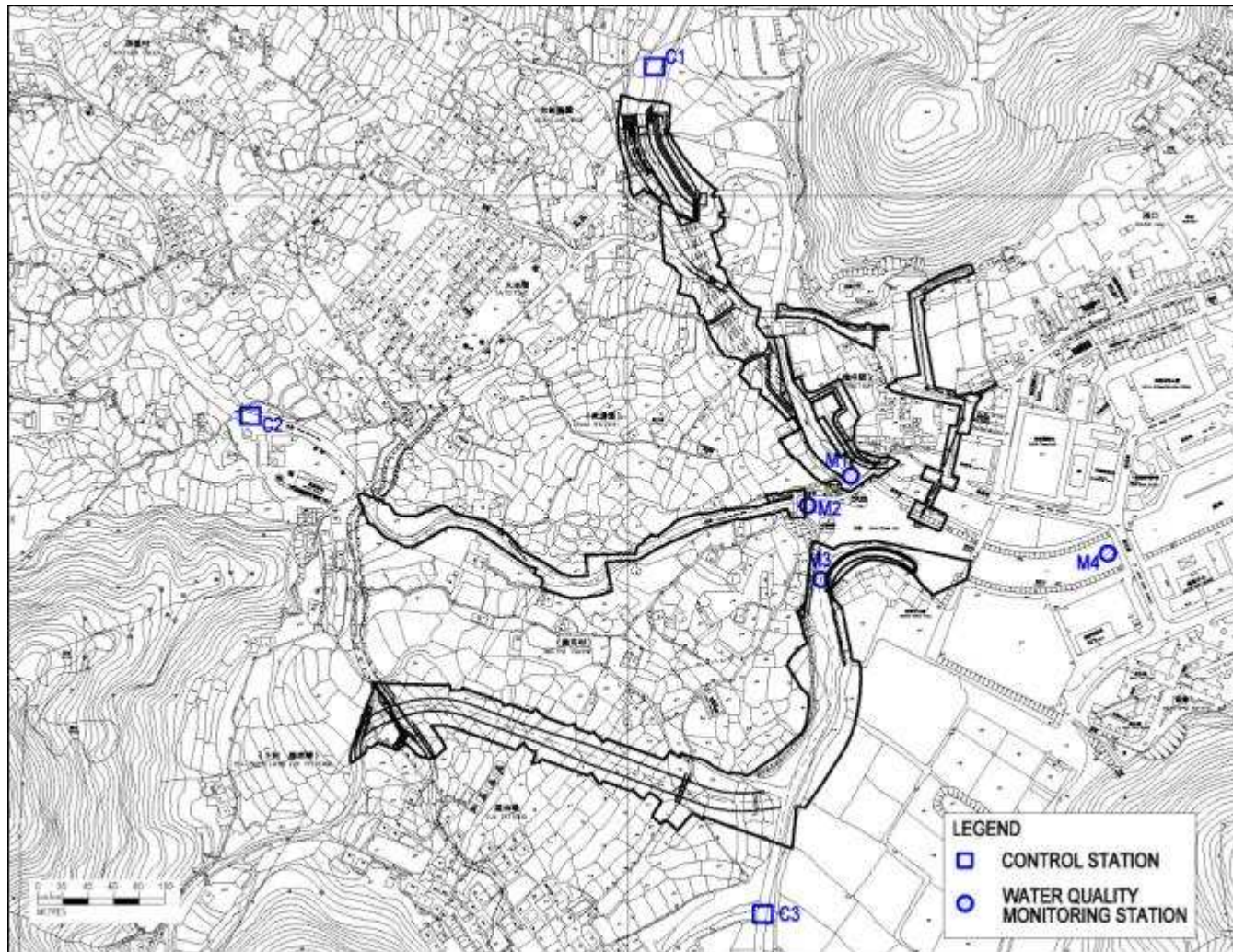


Figure 5.3.1 Water Quality Monitoring Locations

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

Total 53 exceedance events on parameters of turbidity and suspended solids were recorded in this reporting month according to the established level. Findings from the investigations showed most of the exceedance events were mainly caused by natural fluctuation and deficiencies of site practice.

As 8 events were suspected to be related to improper site practices, contractor was seriously reminded to review the site conditions and implement corrective actions as well as mitigation measures as soon as possible to minimize further deterioration of water quality.

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

Table 5.5.1 Water quality monitoring results in July 2010

	M1			M2			M3			M4		
	MIN	MAX	Average	MIN	MAX	Average	MIN	MAX	Average	MIN	MAX	Average
Turbidity (NTU)	1.2	16.3	6.5	0.0	1.8	0.5	1.6	67.2	13.9	0.6	70.9	12.7
DO (mg/l)	7.3	9.0	7.8	7.4	8.4	7.7	6.1	8.0	7.3	7.2	8.4	7.5
Suspended Solid (mg/l)	4.4	12.5	7.5	1.0	3.0	2.0	5.0	56.9	14.7	4.9	64.4	13.2

	C1			C2			C3		
	MIN	MAX	Average	MIN	MAX	Average	MIN	MAX	Average
Turbidity (NTU)	0.0	3.4	0.9	0.0	0.0	0.0	3.9	13.6	7.9
DO (mg/l)	6.8	7.9	7.4	7.4	8.0	7.7	5.1	7.7	6.4
Suspended Solid (mg/l)	1.2	7.0	2.8	1.0	3.6	1.5	3.8	16.8	8.1

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

## **5.7 Water Quality Mitigation Measures**

### **Construction Run-off and Drainage**

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

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

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

## **5.8 Water Monitoring Schedule for the Next reporting period**

Water monitoring scheduled for the next reporting period is 2, 5, 6, 9, 11, 13, 16, 19, 20, 23, 25, 27 and 30 August 2010.

## **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, 20<sup>th</sup> 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.

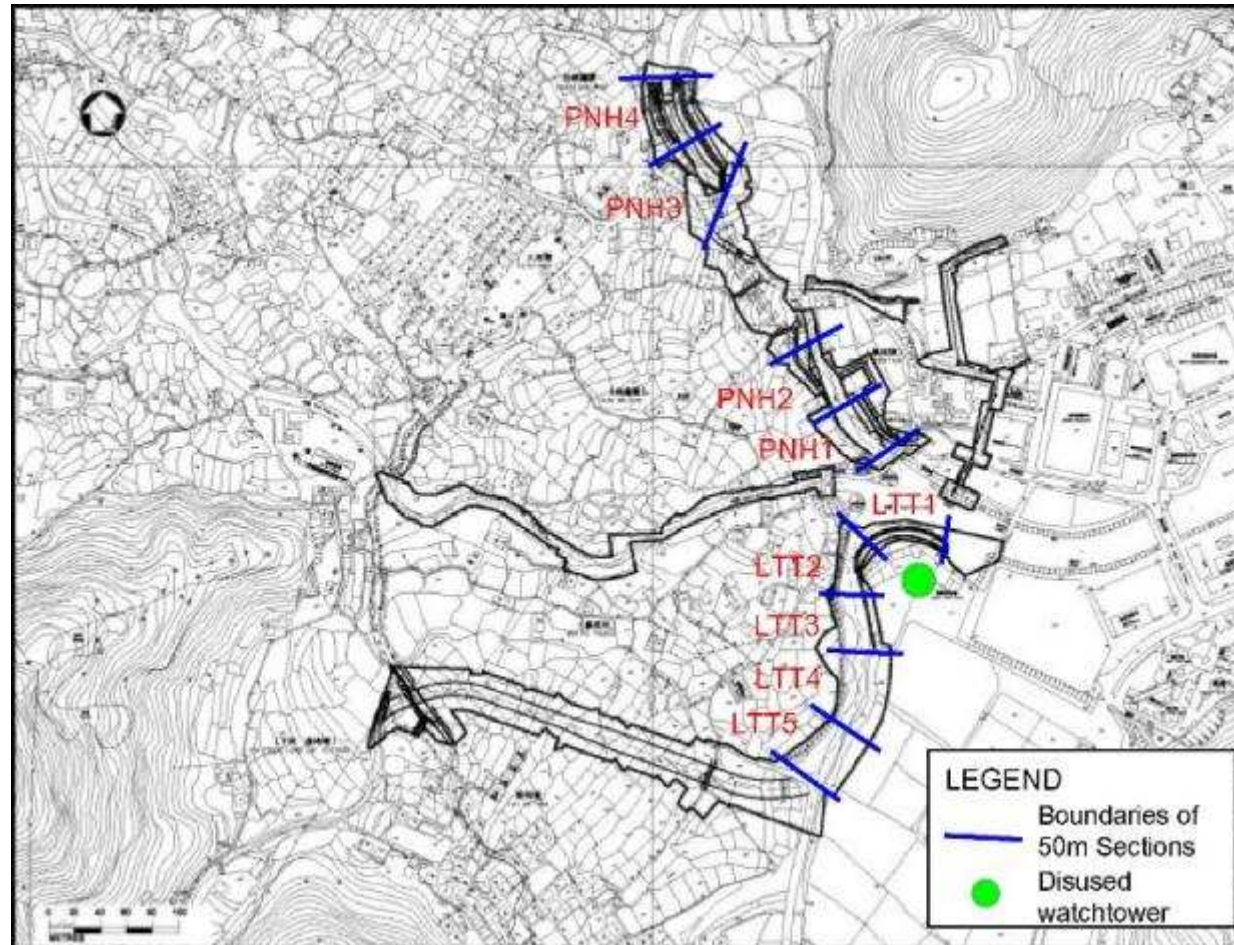


Figure 6.1 Ecological Monitoring Locations

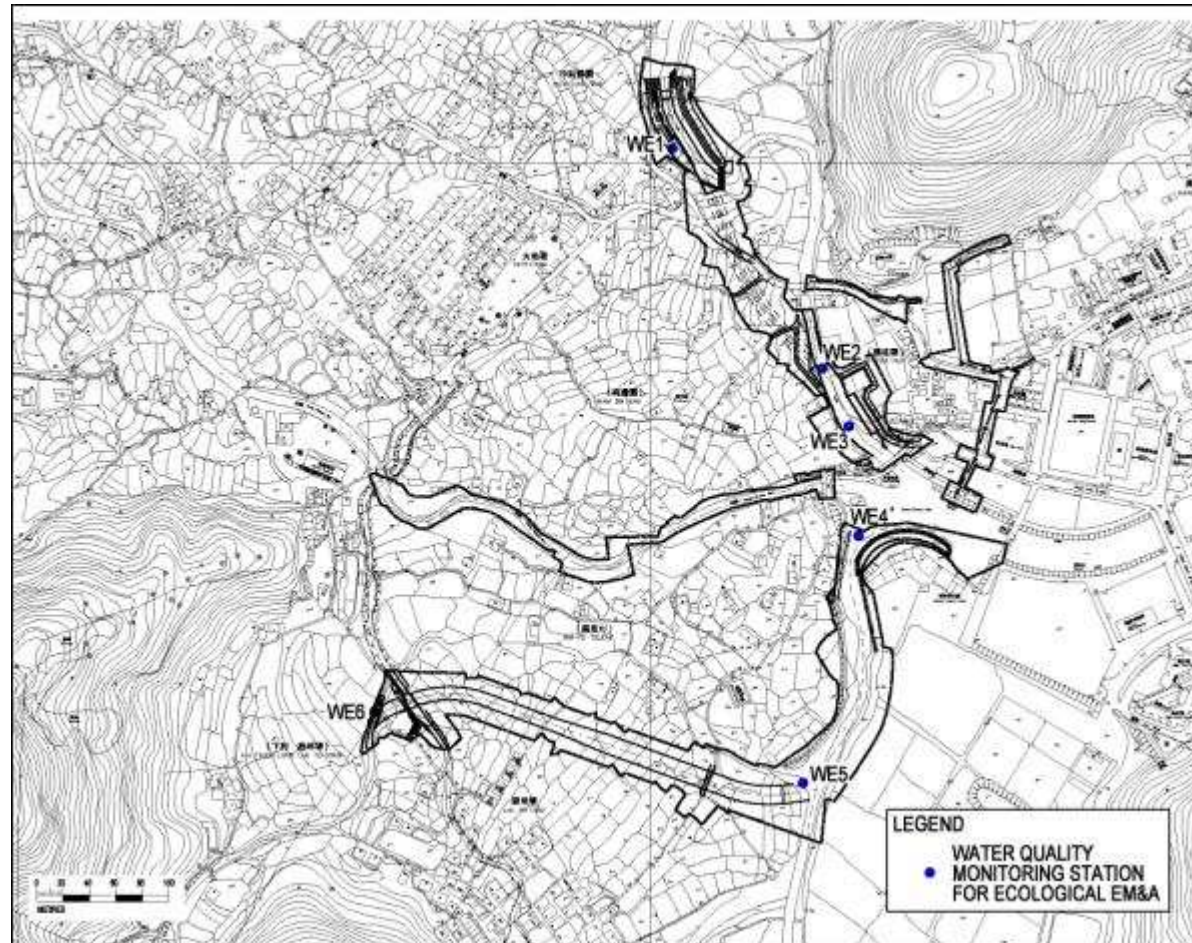


Figure 6.2 Ecological Water Quality monitoring locations

## **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 8 July 2010. During the current monitoring session, new rock gabion wall was under construction. Stream bank and stream bed of PNH3 was completely cleared. Stream bank of PNH4 was mostly cleared, while the weir is still intact.

The walk through survey recorded a total of 33 species, including 16 trees, 1 shrub, 7 herb and 4 grass species (Appendix D1) on PNH N section. 25 of the species recorded are natives, while 8 were exotics. Remnants of vegetation including native trees (e.g. *Ficus hispida*, *Macaranga tanarius*) and grasses species (e.g. *Microstegium ciliatum*) were still seen along the weir or retained at east stream bank. No species of conservation interest was recorded. No quantitative surveys were carried out on both PNH3 and PNH4 due to vegetation clearance and construction works on stream banks as part of the site clearance works under the project.

During the current monitoring session, construction work ongoing along PNH S section. Vegetation was only found on remnants of the old concrete bank. A total of 6 species recorded, 4 of which were native and 2 were exotic. It was composed of isolated individuals of mangrove (*Kandelia obovata*), exotic shrub (*Lantana camara*) and native trees (*Ficus supbera*, *Ficus microcarpa*) (Appendix D2). No species of conservation interest was recorded.

### ***Terrestrial Fauna***

Surveys were conducted on 9 July 2010.

No bird was recorded in the proposed work area of the Pak Ngan Heung River (Table 6.5.2).

One species of dragonfly was recorded in the proposed work area of the Pak Ngan Heung River in July 2010. This species is common in Hong Kong.

**Table 6.5.2 Dragonfly in Pak Ngan Heung**

<b>Common names</b>	<b>Latin names</b>	<b>PNH 1</b>	<b>PNH 2</b>	<b>PNH 3</b>	<b>PNH 4</b>	<b>Commonness &amp; distribution</b>
Wandering Glider	<i>Pantala flavescens</i>				2	A

**A = abundant**

### ***Aquatic fauna and fish***

Sections of stream within the PNH3 boundary had been diverted to a bypass channel to facilitate the construction of the fish ladder. Therefore the PNH 3 was not covered by the present monitoring. In the remaining three survey section at PNH, 5 species of fish and 1 crustacean were recorded. 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
<b>Invertebrates</b>					
Atyid shrimp	<i>Caridina elongata</i>			\	++
Palaemonid shrimp	<i>Macrobrachium hainanensis</i>			\	
Crab	<i>Varuna litterata</i>			\	
Mitten Crab	<i>Eriocheir japonica</i>			\	
<b>Fish</b>					
Mosquito fish	<i>Gamusia affinis</i>			\	+
Goby	<i>Rhinogobius duospilus</i>			\	+
Barcheek Goby	<i>Rhinogobius giurinus</i>			\	
Swordtail	<i>Xiphophorus hellerii</i>			\	
Six-banded Barb	<i>Puntius semifasciolatus</i>			\	
Unidentified Cichlid fish				\	
Tilapia		++	++	\	
Predaceous Chub	<i>Parazacco spilurus</i>			\	
Jarboa Terapon	<i>Terapon jarbua</i>	++	+	\	
Common Silver-biddy	<i>Gerres oyena</i>			\	
Mullet	<i>Mugil cephalus</i>	++	+++	\	
Broken-band Hillstream Loach	<i>Liniparhomaloptera disparis</i>			\	

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

## Luk Tei Tong Stream Section

### Vegetation

Surveys were conducted on 7 July 2010. During the current survey, site clearance was completed in most sections. New gabion bank at LLT1 was completed, while some remnants of vegetation and mangroves remained at both LLT1 and LLT2 respectively. Some vegetation cleared and trimmed on existing rocky bank of LLT1 in March 2010 for maintenance purpose resprouted or grew back.,

The walk through survey recorded a total of 14 species, including 6 tree, 2 herb and 4 grass species (Appendix D3). 9 species recorded are natives, while 5 were exotics. No quantitative survey was carried out due to vegetation clearance on stream banks as part of the site clearance works under the project.

### 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 9 July 2010.

A total of two species of birds were recorded in these sections (Table 6.5.6). Both are common in Hong Kong.

**Table 6.5.6 Avifauna in Luk Tei Tong River**

Common names	Latin names	LTT 1	LTT 2	LTT 3	LTT 4	LTT 5	Commonness & distribution
Little Egret	<i>Egretta garzetta</i>	1					CW
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>		2				CW

CW = common and widespread



Three species of dragonfly were recorded in the Luk Tei Tong River in June 2010 (Table 6.5.7). All are common in Hong Kong (Wilson 2004).

**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
Variegated Flutterer	<i>Rhyothemis variegata</i>					1	C
Saddlebag Glider	<i>Tramea virginia</i>					1	C
Wandering Glider	<i>Pantala flavescens</i>	3					A

A = abundant, C = common

### Aquatic invertebrates and fish

4 species of fish, 3 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
<b>Invertebrates</b>						
Mangrove clam	<i>Geloina erosa</i>					
Rock oyster	<i>Saccostrea cuculata</i>		++			
Snail	<i>Melanoides tuberculata</i>				+	++
Snail	<i>Terebralia</i> sp.					
Snail	<i>Nerita</i> sp.		+			
Snail	<i>Littoraria articulata</i>		+++			
Crab	<i>Varuna litterata</i>				+	
Fiddler crab	<i>Uca lactea</i>					
Fiddler crab	<i>Uca arcuata</i>			+		
Fiddler crab	<i>Uca crassipes</i>					
Crab	<i>Perisesarma bidens</i>			++		

Mangrove mud crab	<i>Scylla paramamosain</i>					
Mitten crab	<i>Eriocheir japonica</i>					
<b>Fish</b>						
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 9 July 2010.

There was no sign (e.g., adults carrying food or nesting materials) of use of the watchtower as nesting habitat by White-shouldered Starling.

White-shouldered Starling was not observed during the July 2010 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 nesting habitat.

### **Ecological Water Quality Monitoring (EWQM)**

EWQM was conducted on 9 July 2010. 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 of Suspended Solids and Turbidity measured at WE6 (LTT River) were higher than the results taken at baseline monitoring shown in Table 6.10. Such condition was believed to be caused by construction of inlet of LTT bypass channel and contractor was advised to implement corrective actions as soon as possible.

**Table 6.9 Summarized Ecological water quality monitoring results (9 July 2010)**

Parameters	Limit of detection	WE1	WE2	WE3	WE4	WE5	WE6
Suspended Solid (mg/l)	1	1.00	1.80	7.80	12.25	8.70	84.60
Nitrogen (Ammonia) (mg/l)	0.01	0.03	0.32	0.17	0.34	0.02	0.04
Nitrogen (Nitrate) (mg/l)	0.01	0.15	0.22	0.24	0.29	0.18	0.18
Phosphorous (mg/l)	0.01	0.05	0.08	0.08	0.11	0.05	0.04
BOD <sub>5</sub> (mg/l)	1	1.00	2.00	1.00	2.00	1.00	1.00
DO (mg/l)	0.01	6.80	7.62	9.02	6.06	7.76	7.47
Turbidity (NTU)	0.1	0.00	0.00	4.80	12.30	14.65	155.35
Temperature (oC)	0.1	28.9	28.8	29.7	29.9	29.6	28.9
pH	0.01	6.96	7.54	8.78	7.37	7.22	6.67
Salinity (ppt)	0.1	0.0	0.0	0.3	3.9	0.0	0.0
Conductivity (ms/m)	0.1	4.4	7.7	78.7	0.7	35.1	4.8
Water Flow (m/s)	N/A	0.110	0.090	0.100	0.080	0.080	0.050

**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 <sub>5</sub> (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 6 and 19 August 2010, while ecological water quality monitoring is scheduled on 9 August 2010.

## 7. Action taken in Event of Exceedance

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 53 non-compliance events of water quality limits (Turbidity and Suspended Solids) were recorded in this reporting month according to the established level. ET has arranged site investigations for the exceedance events. Except the reasons of natural fluctuation, 8 events were identified to be substantially attributable to improper site practices. As such, the contractor was strongly recommended to review their sites condition and working method. Necessary as well as effective mitigation measures have to be implemented to minimize water quality impact from project site activities.

The summary of non-compliance events for water quality exceedance is listed in Table 7.1 for reference.

Table 7.1 Summary of Non-compliance for Water Quality

Date	Location	Parameter	Level of exceedance	Main cause of exceedance
5/7/10	M3	Turbidity, S.S.	Limit Level	M3 & M4 – Disturbance of sediments and soil runoff caused by channel clearance and removal of earth bund / haul access
	M4			
7/7/10	M3	Turbidity, S.S.	Limit Level	M3 & M4 - Clearance of riverbed and removal of earth bund / haul access that soil runoff and disturbance of sediment
	M4			

## 8. Construction waste disposal

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

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

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

**Table 8.1 Summary of Construction Waste Disposal**

Month	Amount of Construction Waste disposed		
	Inert Waste (to Public Fill)	Non-inert Waste (to Landfill)	Chemical Waste (to treatment plant)
1 <sup>st</sup> to 31 <sup>st</sup> July 10	143.40 (ton)	6.10 (ton)	Nil
Total	27883.76 (ton)	212.93 (ton)	0

## 9. Status of Permits and Licenses obtained

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

Table 9 .1 Status of Permits and Licenses Obtained

Description	License / Permit No.#	Date of Issue	Date of Expiry	Remarks
Environmental Permit	EP-237/2005/A	05 Mar 2007	--	Issued
Varied Environmental Permit	EP-237/2005/B	23 April 2009	--	Issued
Registration of C&D Waste Producer	7006521	--	--	Issued
Chemical Waste Producer	5213-950-Y2443-03	12 Aug 2008	--	Issued
Construction Noise Permit	N/A	N/A	N/A	N/A
Effluent Discharge License	EP890/W2/XG032 EP890/W2/XG033 EP890/W2/XG034 EP890/W2/XG035 EP890/W2/XG036 EP890/W2/XG037 EP890/W2/XG038 EP890/W2/XG039 EP890/W2/XG040 EP890/W2/XG041	23 Oct 2008	31 Oct 2013	Issued

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



## 10. Complaint Log

There was no formal complaint received during the reporting month.

	Noise	Water	Ecology	Cultural	Others
July 2010	0	0	0	0	0
Total	0	1	0	0	0

## 11. Site Environmental Audits

### 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, 22 and 28 July 2010.

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
27 May 10	Open stockpiles of earth materials were observed at haul access of PNH retaining wall site	Contractor was advised to provide tarpaulin coverings to the earthy stockpiles to prevent erosion and runoff.	Still outstanding. To be followed in the next reporting period	Ongoing
3 Jun 10	Open stockpile of earth material was observed at LTT site area opposite to Yuen's Compound.	Contractor was recommended to provide tarpaulin coverings to the concerned stockpile to prevent erosion and runoff from causing environmental impact.	Still outstanding. To be followed in the next reporting period.	Ongoing
11 Jun 10	Accumulation of stagnant water was observed at the abandoned site water diversion drainage and soak-away pond	Contractor was advised to backfill the concerned site water treatment system and temporary drainage to prevent accumulation of stagnant water.	Still outstanding. To be followed in the next reporting period.	Ongoing
28 Jun 10	Site materials and equipments were brought to the confluence at downstream from site along PNHR by the flood water.	Contractor was recommended to remove the concerned materials away from the river channel to minimize deterioration of water quality.	Follow up action was taken as reported by the contractor	8 Jul 10
28 Jun 10	Muddy water was being overflowed into the river channel from the wheel washing bay of PNH fish ladder site	Contractor was recommended to provide proper bund wall at the concerned haul access and removed the muddy water accumulated in the wheel washing bay to minimize generation of runoff from site.	Still Outstanding. To be followed in the next reporting period	Ongoing
28 Jun 10	The alternative mass concrete wall site at PNHR was flooded and caused pollution to the river channel.	Contractor was recommended to implement necessary corrective action to the eroded earth bund to stop further deterioration of water quality as soon as possible.	Further enhancement to the earth bund was taken and no deficiency causing water quality impact was observed at the concerned site area	8 Jul 10
8 Jul 10	Site materials and equipments were stockpiled outside site boundary at the EVA access	Contractor was advised to relocate those equipments and materials to proper storage area as soon as possible	Still Outstanding. To be followed in the next reporting period	15 Jul 10
8 Jul 10	Riverbank and earth bund was exposed without protection at	Contractor was advised to protect the exposed earth surface with		

**Table 11.1 Summary of site inspection**

Date	Observations	Advice from ET	Action taken	Closing Date
	site Box Culvert A of LTT bypass channel	geo-textile covering as to avoid erosion		
8 Jul 10	Fuel drum and power generator without secondary containment measures were found at site Box Culvert A of LTT bypass channel	Contractor was recommended to provide proper drip trays to all fuel containers, chemicals and stationary powered equipments to prevent chemical spillage	Concerned fuel drums and containers were removed from the site area prior to the inspection on 15 Jul	15 Jul 10
15 Jul 10	General wastes and wood logs were clogged within the fish ladder	Contractor was advised to remove those wastes for hygiene issues	Follow up action was taken as advised prior to the inspection on 22 Jul	22 Jul 10
15 Jul 10	Sandbags acting as bund walls for temporary crossing at LTT River were damaged	Contractor was advised to replace those damaged sandbags	Follow up action was taken as advised prior to the inspection on 28 Jul	28 Jul 10
22 Jul 10	Site materials were stockpiled on top of the river wall at LTT River	Contractor was advised to remove those materials as to prevent those from dropping into the river channel	Follow up action was taken as advised prior to the inspection on 28 Jul	28 Jul 10
28 Jul 10	No high jet water sprayer or wheel washing facility was provided at site entrance of TTT site bottleneck A	Contractor was advised to rectify such discrepancies as soon as possible	To be followed in the next reporting period	Ongoing
28 Jul 10	Turbid water was observed at the downstream area of TTT River	Contractor was recommended to trace the source and implement necessary corrective if those condition was caused by site activities	To be followed in the next reporting period	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.

Findings of monthly survey was still pending therefore relevant was not provided in this reporting month.

## **12. Future key issues**

As construction activities include construction of bypass inlet, gabion wall and provision of granite facing of concrete structures will be continued in the upcoming month, 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 again to provide proper measures to mitigate water quality impacts to the river channels due to construction works. River based construction sites should be well enclosed by bunds in dry condition, as to prevent surface run-off and site water seepage to the stream. Bare soil surface, which is directly exposed to the river channel in the site area, should be completely covered with geo-textile to prevent soil erosion. For river-based and any construction activities carried at riverside, contractor should implement proper protection measures such as barriers and/or silt curtains to prevent surface run-off from entering water bodies.

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; reuse of site water should be considered also. Channel, trench and manholes connected with project sites should be sealed to prevent site water and any construction materials entering public drainage and causing water quality impact.

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

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

Construction activities and operation of site equipments may require use of chemicals and fuel on site. Secondary containment and spillage preventative measures should be implemented to such chemicals using on site.

### **13. Conclusions**

In this reporting month, major site activities included haul access formation, construction of retaining walls, gabion wall and box culvert at PNH River and LTT River respectively.

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 on 28 July 2010.

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

For water quality monitoring, total 53 non-compliance events of water quality criteria were recorded in this reporting month. Except the natural fluctuation, 8 events were believed to be caused by improper site practices. Hence, the contractor was urged to review the site condition and implement necessary mitigation measures and corrective actions as soon as possible to minimize water quality impact due to site works.

During ecological monitoring survey, no White-shouldered Starling was recorded breeding in the watch tower. The absence of nesting of White-shouldered Starling in the watch tower did not seem to be related to construction works in Luk Tei Tong River. A bird species nests in village houses 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. Therefore, ET recommended the contractor to implement sufficient and effective mitigation measures to minimize water quality impact from site works. Proper de-silting facilities should be provided for site water treatment. To prevent

surface run-off and soil erosion from site activities, earth bunds with complete coverage of geo-textile materials should be formed at river-based and/or riverside project sites. Contractor should be cautious on change of river water quality, immediate corrective action was required once muddy effluent discharge, or disturbance of sediment was found from site works.

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

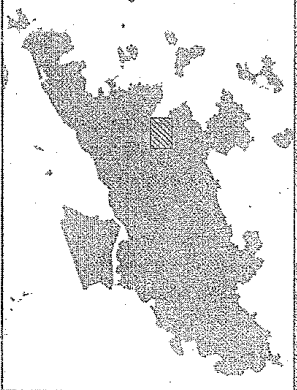






NOTES:

- 1. GRID LINES ARE IN METERS
- 2. ALL LEVELS ARE IN METERS AND REFERRED TO M.A.S.L.



DATE	1987	NO.	1
<b>D</b> DRAWING SHEET TERMINAL ON BEHALF OF THE ROAD WORKS DEPARTMENT OF THE GOVERNMENT CONSTRUCTION DEPARTMENT			
LOCATION PLAN OF THE PROJECT			
Mercator & Eddy Ltd 測量師行有限公司			
SCALE	1:1	DATE	SEP 1987
PROJECT	1:1	STATUS	PRELIMINARY
BY		DATE	
CHKD BY		DATE	
APPROVED BY		DATE	

SCALE: 1:1

NOTES :

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

LEGENDS :

- SITE BOUNDARIES
- PORTION D1 - PAK NGAM BEIANG
- PORTION D2 - LUNG TSUI TAI LAI
- PORTION D3 - LUNG TSUI TAI (B)
- PORTION D4 - TAI TEI TONG RIVER
- PORTION D5 - LUK TEI TONG
- PORTION D6 - FUU O
- PORTION D7 - LO UK TSEN
- PORTION D8 - CHENG SHI SHEUNG YESHEN
- PORTION D9 - EMERGENCY VEHICULAR ACCESS (EVA) AT 1/11/10

FOR TENDER PURPOSES ONLY

NO.	DATE	REVISION
1	14 FEB 2006	ISSUE FOR TENDER
2	12 FEB 2006	REVISED
3	13 MAR 2006	REVISED
4	10 MAY 2007	REVISED
5	17 MAY 2007	REVISED

DESIGNED BY: H. Y. CHAN 12 FEB 2006  
DRAWN BY: B. D. CHAN 13 MAR 2006  
CHECKED BY: W. H. CHAN 10 MAY 2007  
VERTICAL BY: T. Y. CHAN 17 MAY 2007  
APPROVED BY: L. S. CHAN 14 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

SHEET 1 OF 2  
DRAWING NO: DDN/128CDZ/1002A  
SCALE: 1 : 2000

OFFICE: DRAINAGE SERVICES DEPARTMENT  
COPYRIGHT: RESERVED

DRAINAGE PROJECTS DIVISION

DRAINAGE SERVICES DEPARTMENT  
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION



## Appendix B Key Personal Contact information chart

<b>Organization Name</b>	<b>Role</b>	<b>Title</b>	<b>Name</b>	<b>Telephone</b>	<b>Fax Number</b>
Drainage Service Department	Project Proponent	Engineering Representative	Mr. Chan Wai Hong	2594 7464	2827 8700
Ellied Environmental Consultants Limited	Independent Environmental Checker (IEC)	Principal Consultant	Ms. Grace Kwok	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	2965 0888	2856 2010



华南国家计量测试中心  
广东省计量科学研究院  
SOUTH CHINA NATIONAL CENTER OF METROLOGY  
GUANGDONG INSTITUTE OF METROLOGY



# 检定证书

VERIFICATION CERTIFICATE

证书编号: SSD20093126  
Certificate No.

第 1 页 共 3 页  
Page of

委托方  
Client

委托方地址  
Add. of Client

计量器具名称: Sound Level Calibrator  
Description

型号规格: 4231  
Model/Type

制造厂: B & K  
Manufacturer

出厂编号: 1820929/E-028-4  
Serial No.

接收日期: 2009年 9月 21日  
Date of Receipt Y M D

结论: 1级合格 (Class 1)  
Conclusion

检定日期: 2009年 9月 22日  
Date of Verification Y M D

依据检定规程, 被检仪器检定周期为 壹 年  
The verification period is 1 Year(s)

批准人: [Signature]  
Approved Signatory

核 验: [Signature]  
Inspected by

检 定: [Signature]  
Verified by

证书专用章

本中心地址: 中国广州市广园中路松柏东街30号 邮政编码: 510405  
电话: (8620)86594172 传真: (8620)86590743 E-mail: scm@scm.com.cn  
Add: No.30, Songbaidong Street, Guangyuanzhong Road, Guangzhou, P. R. China  
Post Code: 510405 Tel: (8620)86594172 Fax: (8620)86590743

090921P01 2



华南国家计量测试中心  
广东省计量科学研究院  
SOUTH CHINA NATIONAL CENTER OF METROLOGY  
GUANGDONG INSTITUTE OF METROLOGY



## 说 明

证书编号: SSD20093126  
Certificate No.:

### DIRECTIONS

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Page of

1. 本中心是国家质量监督检验检疫总局在华南地区设立的国家法定计量检定机构, 计量授权证书号是 (国) 法计 (2007) 01043 号, (国) 法计 (2007) 01032 号。  
This laboratory is the National Legal Metrological Verification Institution in southern China set up by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ) under authorization certificates No. (2007)01043 & (2007)01032.
2. 本中心所出具的数据均可溯源至保存在中国计量科学研究院的国家计量基准和国际单位制 (SI); 中国计量科学研究院于 1999 年代表中国签署了“国家计量基准及国家计量研究院出具的校准和测量证书相互承认协议”。  
All data issued by this laboratory are traceable to national primary standards maintained in National Institute of Metrology (NIM) and International System of Units (SI). NIM is the signatory to the Mutual Recognition Arrangement (MRA) for national measurement standards and for calibration and measurement certificates issued by national metrology institutes.
3. 本次检定的技术依据  
Reference documents for the verification:  
JJG 176-2005 声校准器检定规程 V.R. of Sound Calibrators.

4. 本次检定所使用的主要计量标准器具  
Major standards of measurement used in the verification:

设备名称/型号 Name of Equipment (Model)	编号 Serial No.	证书号/有效期 Certificate No. (Due Date)	计量特性 Metrological Characteristic
电声标准装置 Sound Level Meters Verification Device	声01	[1992] 国量标检定字 第 085 号 /2010-01-08	声压级: (0.4~110) dB(k=2) 在参考频率上: 0.08 dB(k=2) (压力场) Sound Level Meters: 0.3 dB(k=2); Sound Calibrator 0.15 dB(k=2)

5. 检定地点、环境条件

Place and environmental conditions of the verification:

地点: 声学/振动实验室 温度: (23±3) °C 相对湿度: (40~80) %  
Place: Acoustics/Vibration Lab. Temperature RH

6. 被检仪器限制使用条件:

Limiting condition of the instrument verified:

注: 1. 本证书检定结果只与受检仪器有关。

2. 未经本中心书面批准, 不得部分复制此证书。

Note: 1. The results relate only to the items verified.

2. This certificate shall not be reproduced except in full, without the written approval of our laboratory.



# 检定结果

## RESULTS OF VERIFICATION

证书编号: SSD20093126  
Certification No.

原始记录编号: 220093126  
Record No.

第 3 页, 共 3 页  
Page of

1. 外观检查: 合格  
Check on appearance: pass

2. 声压级 (dB): 见表1  
Sound Pressure Level: The value showed in table 1

表1 Table 1

标称值 (dB) Nominal Value	实测值 (dB) Measured Value	允差 (dB) Tolerance	结论 Conclusion	稳定度 (dB) Stabilization	稳定度允差 (dB) Stabilization Tolerance	结论 Conclusion
94	94.06	±0.40	合格(Pass)	0.02	0.10	合格(Pass)
114	114.07	±0.40	合格(Pass)	0.02	0.10	合格(Pass)

3. 频率: 见表2  
Frequency: The value showed in table 2

表2 Table 2

标称值 (Hz) Nominal Value	实测值 (Hz) Measured Value	允差 (%) Tolerance	结论 Conclusion
1000	999.84	±1.0	合格(Pass)

4. 总失真: 见表3  
Total harmonic distortion: The value showed in table 3

表3 Table 3

声压级 (dB) Sound Pressure Level	失真度 (%) THD	允差 (%) Tolerance	结论 Conclusion
94	0.6	≤3	合格(Pass)
114	0.5	≤3	合格(Pass)

### 说明(Note)

1. 声压级测量结果扩展不确定度:

Expanded uncertainty of measurement in Sound Pressure Level Calibration:

$U=0.15$  dB,  $k=2$

(依据 JJF1059-1999 测量不确定度评定与表示)

(According to JJF1059-1999 Evaluation and Expression of Uncertainty in Measurement)

## 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/C4

Client : ENVIRONMENTAL PIONEER AND SOLUTION LIMITED

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

Manufacturer : DKK-TOA Serial No.: 640274

Calibration Date : 15 to 17-6-2010 Due Date : 14-09-2010

### Criterion: (Repeatability, Linearity)

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

### Electric Conductivity (Salinity converted from EC):

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

Concentration of KCl Standard Solution (M)	Reference conductivity value at $25.0^\circ\text{C}$	Indicated value by meter	Linearity ( $R^2$ )
0	0.0 mS/m*	0.0 mS/m	1.0000
0.001	14.7 mS/m	15.2 mS/m	
0.005	71.8 mS/m	72.3 mS/m	Acceptance Criterion  $R^2 > 0.995$ Within $\pm 1\%$ F.S. against calibration standard value 71.8 mS/m, 0.667 S/m and 5.87 S/m.
0.01	0.141 S/m	0.146 S/m	
0.05	0.667 S/m	0.670 S/m	
0.1	1.29 S/m	1.30 S/m	
0.5	5.87 S/m	5.88 S/m	
Repeatability	1 <sup>st</sup> time	0.00, 5.88 S/m	Within $\pm 1\%$ F.S. against average value
	2 <sup>nd</sup> time	0.00, 5.88 S/m	
	3 <sup>rd</sup> time	0.00, 5.88 S/m	
	Ave.:	0.00, 5.88 S/m	

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

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





**Dissolved Oxygen:**

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

DO value evaluated by Iodometric Method (mg/L)		Indicated value by meter (mg/L)	Linearity (R <sup>2</sup> )
0.00		0.00	0.9999
3.08		3.15	
5.57		5.62	
8.33		8.40	Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 0.1 mg/L against standard value
10.38		10.32	
13.10		13.05	
Repeatability	1 <sup>st</sup> time	0.00 , 8.40	Within ± 0.1 mg/L against average value
	2 <sup>nd</sup> time	0.00 , 8.42	
	3 <sup>rd</sup> time	0.00 , 8.37	
	0.00 , 8.33	Ave.: 0.00 , 8.40	

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

**pH Value:**

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

pH buffer for Meter Calibration (20°C)	Input value (pH buffer) (20°C)	Indicated pH value by meter (20°C)	Linearity (R <sup>2</sup> )
pH = 4.00	1.67	1.63	1.0000
pH = 6.88	4.00	3.98	Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 0.05 pH against standard value
pH = 7.00	6.88	6.84	
pH = 9.22	7.00	6.97	
pH = 10.00	7.43	7.40	
	9.22	9.18	
	10.00	9.95	
	12.64	12.60	
Repeatability	1 <sup>st</sup> time	3.98 , 9.95	Within ± 0.05 pH against average value
	2 <sup>nd</sup> time	3.99 , 9.96	
	3 <sup>rd</sup> time	3.98 , 9.95	
	pH 4.00 , 10.00	Ave.: 3.98 , 9.95	

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



**Temperature:**

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

Setting Temperature (°C)	Indicated value by meter (°C)		Linearity (R <sup>2</sup> )
5.0	4.8		0.9998
15.0	14.6		
25.0	24.7		Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 0.5°C against standard value
35.0	34.6		
45.0	45.3		
55.0	55.5		
Repeatability	1 <sup>st</sup> time	14.7 , 45.3	Within ± 0.25°C against average value
	2 <sup>nd</sup> time	14.5 , 45.4	
	3 <sup>rd</sup> time	14.6 , 45.2	
	15.0 , 45.0	Ave.: 14.6 , 45.3	

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 <sup>2</sup> )
0.0	0.0		1.0000
20.0	19.4		Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 3% F.S. against span calibration value 100.0 and 400.0 NTU
100.0	98.1		
400.0	396.3		
800.0	795.4		
Repeatability	1 <sup>st</sup> time	0.0 , 796.0	Within ± 3% F.S. against average value
	2 <sup>nd</sup> time	0.0 , 795.4	
	3 <sup>rd</sup> time	0.0 , 794.9	
	0.0 , 800.0	Ave.: 0.0 , 795.4	

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 : 17-6-2010

# 校正証明書

## CALIBRATION CERTIFICATE

品名 PRODUCT NAME : 積分形精密騒音計  
Integrating Precision Sound Level Meter  
型式 TYPE : 6224  
器物番号 PRODUCT NUMBER : 060166  
マイク MICROPHONE : 34733  
製造者 MANUFACTURER : 株式会社アコー ACO CO., LTD.

### ※特記事項

[基準器、校正機器のトレーサビリティ証明]

校正に使用した基準器、校正機器は国家基準にトレーサブル  
であることを証明致します。

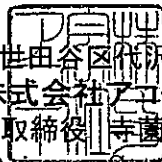
### ※Special notes

[Traceability certificate of standard instruments and calibration equipment.]

We certify that the standard instruments and calibration equipment  
are traceable to the national standards.

平成21年11月16日

November 16, 2009



東京都世田谷区代沢2-6-10  
株式会社アコー  
代表取締役 寺園信一  
2-6-10 Daizawa Setagaya-ku  
Tokyo Japan  
President : Shinichi Terazono  
ACO CO., LTD.

**1 試験成績 Test Results**

別紙試験成績表添付 Test results are attached as an exhibit.

**2 試験条件 Test Requirements**

試験日 Test date : 平成21年11月16日 November 16, 2009

温度 Temperature : 22 °C

湿度 Humidity : 73 %

気圧 Barometric pressure : 980 hPa

**3 使用機器 Used Equipment**

デジタルマルチメーター Digital multimeter VP-2661B No. 780010E122

( 有効期間 : 平成21年3月から平成22年3月 )

( Effective life : from March, 2009 to March, 2010 )

アッテネーター Attenuator STA-115 No. 11075

( 有効期間 : 平成21年3月から平成22年3月 )

( Effective life : from March, 2009 to March, 2010 )

周波数カウンター Frequency counter VP-4545A No. 700008E122

( 有効期間 : 平成21年3月から平成22年3月 )

( Effective life : from March, 2009 to March, 2010 )

オーディオアナライザー Audio Analyzer VP-7721A No. 740039D125

( 有効期間 : 平成21年3月から平成22年3月 )

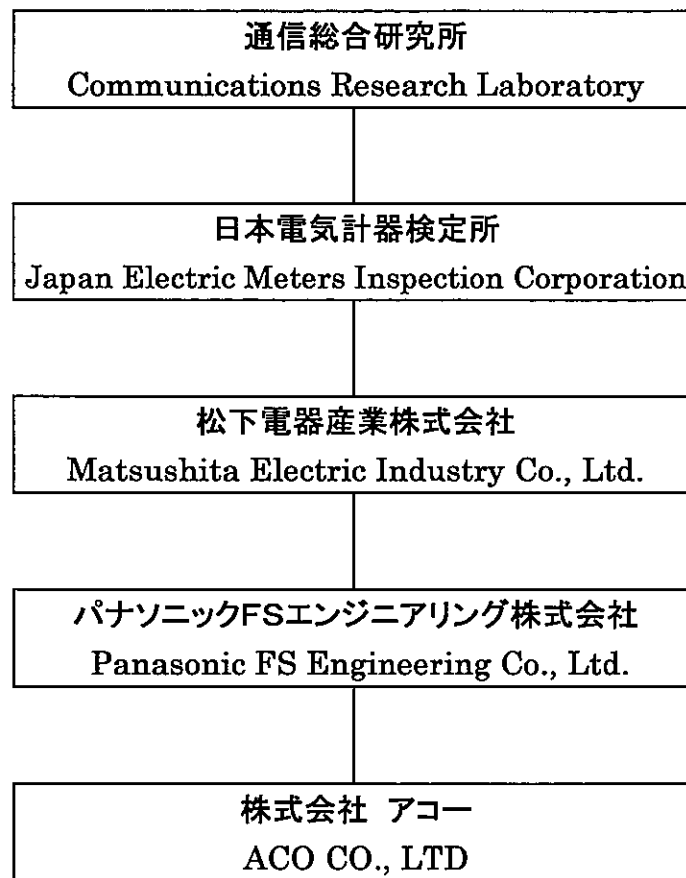
( Effective life : from March, 2009 to March, 2010 )

コンデンサマイクロホン Condenser Microphone 4160 No. 1248087

( 有効期間 : 平成21年2月から平成23年2月 )

( Effective life : from February, 2009 to February, 2011 )

デジタルマルチメーター、アッテネーター  
周波数カウンター、オーディオアナライザー  
トレーサビリティ体系図  
Traceability Flow Chart  
of  
Digital Multimeters, Attenuators,  
Frequency Counters, and Audio Analyzers



基準静電型マイクロホン  
トレーサビリティ体系図  
Traceability Flow Chart  
of  
Standard Electrostatic Microphones



積分形精密騒音計  
Integrating Precision Sound Level Meter  
TYPE 6224

検査成績書  
INSPECTION CERTIFICATE

本体製造番号 060166  
Serial No. of body: \_\_\_\_\_  
マイクロホン製造番号 34733  
Serial No. of Microphone: \_\_\_\_\_  
Ver:1.6D-06-10

年月日: 平成21年11月16日

Date: November 16, 2009

承認 Approved	点検 Passed	担当 Inspected
J. Yasukage	T. Matsumoto	S. Imoue

株式会社 アコー  
ACO CO., LTD.

### 1. 検査年月日 Inspection Date

平成21年11月16日 November 16, 2009

### 2. 検査条件 Inspection Condition

- 1) 温度 Temperature : 22 °C
- 2) 湿度 Humidity : 73 %
- 3) 気圧 Barometric pressure : 980 hPa

### 3. 検査項目及び結果 Inspection Results

#### 1) RANGE 切換誤差検査 The RANGE Shifting Error

RANGE : 20-100dB 70dB 入力基準 ±0.5dB以下

Within ±0.5dB of the value at 70dB input, Range 20-100dB.

RANGE (dB)	入力レベル Input level (dB)	周波数 Frequency (Hz)		
		31.5	1000	8000
20-80	50	-0.1	-0.1	-0.1
20-90	60	0.0	0.0	-0.1
20-100	70	0.0	0.0	0.0
20-110	80	0.0	0.0	0.0
30-120	90	0.0	0.0	0.0
40-130	100	0.0	0.0	0.0
判定	Passed	Pass		

#### 2) 安定性特性検査 Stability Characteristic

RANGE : 20-100dB 1分後基準 ±0.5dB以下

Within ±0.5dB of the value one minute later, Range 20-100dB.

	10分後 ten minutes later
誤差 Error (dB)	0.0
判定 Passed	Pass



3) 目盛誤差特性検査 The Scale Error

RANGE : 20-110dB 65dB入力基準

Error of the value at 65dB input, Range 20-110dB.

入力 Input (dB)	規格 Standard (dB)	周波数 Frequency (Hz)		
		31.5	1000	8000
110	±0.7	0.0	0.0	-0.1
105	±0.7	-0.1	-0.1	-0.1
100	±0.7	-0.1	-0.1	0.0
95	±0.7	-0.1	-0.1	-0.1
90	±0.7	0.1	0.1	0.0
85	±0.7	0.1	0.1	0.0
80	±0.7	0.0	0.0	0.0
75	±0.7	0.0	0.0	0.0
70	±0.7	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0
60	±0.7	0.0	0.0	0.0
55	±0.7	0.0	0.0	-0.1
50	±0.7	0.0	0.0	0.0
45	±0.7	0.0	0.0	0.0
40	±0.7	0.0	0.0	0.0
35	±0.7	0.0	0.0	0.0
30	±0.7	0.0	0.0	0.0
25	±0.7	0.2	0.2	0.2
判定	Passed	Pass		

4) 動特性検査 Dynamic Characteristic

RANGE : 20-100dB 100dB、1kHz 入力基準

When 100dB input, Range 20-100dB at 1kHz.

	規格 Standard	測定値 Measured Value
FAST	-1.0+0.5 -1.0 (dB)	-1.5
SLOW	-4.0±1.0 (dB)	-4.5
判定	Passed	Pass

5) 周波数特性検査 Frequency Response

RANGE : 20-100dB 95dB入力基準(マイクを含む)

When 95dB input, including Microphone value, Range 20-100dB.

周波数 Frequency (Hz)	A特性			C特性			FLAT(Z)特性	許容差 Tolerance
	規格 Standard (dB)	レスポンス Response (dB)	偏差 Deviation (dB)	規格 Standard (dB)	レスポンス Response (dB)	偏差 Deviation (dB)	レスポンス Response (dB)	
20	-50.5	-50.0	0.5	-6.2	-5.8	0.4	-0.9	±3.0
40	-34.6	-34.3	0.3	-2.0	-1.9	0.1	-0.1	±1.5
100	-19.1	-18.9	0.2	-0.3	-0.3	0.0	0.1	±1.0
250	-8.6	-8.4	0.2	0.0	0.0	0.0	0.1	±1.0
500	-3.2	-3.1	0.1	0.0	0.0	0.0	0.1	±1.0
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.1	±1.0
2k	1.2	1.1	-0.1	-0.2	-0.3	-0.1	0.0	±1.0
4k	1.0	0.8	-0.2	-0.8	-0.9	-0.1	0.2	±1.0
5k	0.5	0.5	0.0	-1.3	-1.2	0.1	0.3	±1.5
6.3k	-0.1	-0.1	0.0	-2.0	-1.8	0.2	0.3	+1.5 -2
8k	-1.1	-1.1	0.0	-3.0	-3.5	-0.5	0.3	+1.5 -3
10k	-2.5	-2.5	0.0	-4.4	-4.2	0.2	-0.1	+2 -4
12.5k	-4.3	-3.5	0.8	-6.2	-5.2	1.0	0.2	+3 -6
16k							0.1	
20k							-0.9	
判定 Passed		Pass						

6) 実効値指示誤差検査 Effective Value Error

RANGE : 20-100dB 波高率3のバースト信号に対して1.0dB以内

Within 1.0dB on the Burst signal of the peak factor 3, Range 20-100dB.

周波数 Frequency 2kHz、繰り返し周波数 Repeat frequency 40Hz

実効値指示誤差 Effective value Error (dB)	判定
0.3	Pass

7) 自己雑音特性検査 Self-noise

RANGE : 20-80dB (マイクを含む)

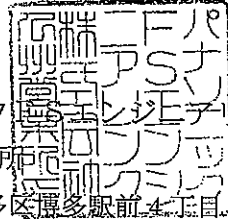
RANGE : 20-80dB (Including Microphone value)

RANGE : 20-80dB (Including Microphone value)	A特性	C特性	FLAT(Z)特性
規格 Standard (dB)	18以下 Below 18	29以下 Below 29	32以下 Below 32
自己雑音 Self-noise (dB)	16.6	22.1	25.3
判定 Passed	Pass		

# 校正証明書

株式会社 アコー 殿

パナソニック エレクシテリ ング株式会社  
九州営業所  
福岡市博多区博多駅前4丁目9番2号



品 名： デジタルマルチメータ

型 番： VP-2661B

製造会社： 松下通信工業株式会社

管理番号： EMC-10004

製造番号： 780010E122

校正日： 2009年 3月

温 湿 度： 温度 23℃ 湿度 42%

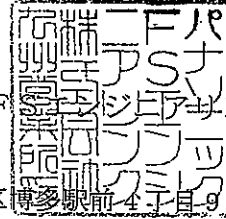
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品 名	型 名	製造会社	製造番号	管理番号	校正有効月
キャリブレータ	5700A	フルク	5440004	KNK1007	2009/06

# 校正証明書

株式会社 アコー 殿

パナソニック F  
九州営業所  
福岡市博多区博多駅前4丁目9番2号



品 名 : アッテネータ  
型 番 : STA-115  
製造会社 : 東京光音電波株式会社  
管理番号 : EMC-1 0006  
製造番号 : 11075  
校正日 : 2009年 3月  
温湿度 : 温度 23℃ 湿度 40%

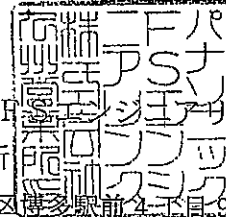
上記の測定器は、当社が運用する標準器により校正した結果、所定の基準に適合していることを証明致します。尚、使用標準器は当社管理規定により管理され、また、トレーサビリティ体系に基づき国家標準（日本電気計器検定所・日本品質保証機構）にトレーサされております。

品 名	型 名	製造会社	製造番号	管理番号	校正有効月
オーディオアライザ	VP-7723A	松下通信工業	101417B122	KNK1006	2009/06

# 校正証明書

株式会社 アコー 殿

パナソニック エレクトロニクス株式会社  
九州営業所  
福岡市博多区博多駅前2丁目9番2号



品 名 : 周波数カウンタ  
型 番 : VP-4545A  
製造会社 : 松下通信工業株式会社  
管理番号 : EMC-1 0005  
製造番号 : 700008E122  
校正日 : 2009年 3月  
温湿度 : 温度 23℃ 湿度 42%

上記の測定器は、当社が運用する標準器により校正した結果、所定の基準に適合していることを証明致します。尚、使用標準器は当社管理規定により管理され、また、トレーサビリティ体系に基づき国家標準（日本電気計器検定所・日本品質保証機構）にトレースされております。

品 名	型 名	製造会社	製造番号	管理番号	校正有効月
周波数カウンタ	R5363	アドバンテスト	40260090	KNK1016	2010/01

# 校正証明書

株式会社 アコー 殿

パナソニックシステムズリング株式会社  
九州営業所  
福岡市博多区博多駅前4丁目9番2号

品 名 : オーディオアナライザー

型 番 : VP-7721A

製造会社 : 松下通信工業株式会社

管理番号 : EMC-1 0007

製造番号 : 740039D125

校正日 : 2009年 3月

温湿度 : 温度 23 °C 湿度 40 %

上記の測定器は、当社が運用する標準器により校正した結果、所定の基準に適合していることを証明致します。  
尚、使用標準器は当社管理規定により管理され、また、トレーサビリティ体系に基づき国家標準（日本電気計  
器検定所・日本品質保証機構）にトレーサされております。

品 名	型 名	製造会社	製造番号	管理番号	校正有効月
キャリブレータ	5700A	フルク	5440004	KNK1007	2009/06
周波数カウンタ	R5363	アドバンテスト	40260090	KNK1016	2010/01
オーディオアナライザー	VP-7723A	松下通信工業	101417B122	KNK1006	2009/06

# 基準器検査成績書

09SL第4号

## 騒音基準器

種類 基準静電型マイクロホン

器物番号 1248087 (BK4160)

### (1) 音圧感度の周波数特性

(音圧感度レベルは1V/Paを0dBとする)

測定周波数 (Hz)	音圧感度レベル (dB)	測定周波数 (Hz)	音圧感度レベル (dB)
20	-27.1	3000	-26.9
30	-27.2	4000	-26.7
50	-27.2	5000	-26.6
100	-27.3	6000	-26.7
150	-27.2	7000	-27.0
200	-27.3	8000	-27.9
300	-27.3	9000	-29.1
500	-27.3	10000	-30.6
700	-27.3	11000	-32.3
1000	-27.2	12000	-34.1
1500	-27.2	12500	-34.8
2000	-27.1		

(2) 測定条件 温度 23℃、湿度 27%、気圧 1012 hPa、バイアス電圧 200V

(3) 有効期間 平成21年2月17日から平成23年2月16日まで

(4) その他

平成21年2月16日

独立行政法人 産業技術総合研究所





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

Calibration Reference No. : GCE/CAL/2009/MW/WQM/C4

Client : ENVIRONMENTAL PIONEER AND SOLUTION LIMITED

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

Manufacturer : DKK-TOA Serial No.: 640274

Calibration Date : 15 to 17-6-2010 Due Date : 14-09-2010

**Criterion: (Repeatabilty, Linearity)**

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

**Electric Conductivity (Salinity converted from EC):**

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

Concentration of KCl Standard Solution (M)	Reference conductivity value at 25.0 °C	Indicated value by meter	Linearity ( $R^2$ )
0	0.0 mS/m*	0.0 mS/m	1.0000
0.001	14.7 mS/m	15.2 mS/m	
0.005	71.8 mS/m	72.3 mS/m	Acceptance Criterion
0.01	0.141 S/m	0.146 S/m	$R^2 > 0.995$ Within $\pm 1\%$ F.S. against calibration standard value 71.8 mS/m, 0.667 S/m and 5.87 S/m.
0.05	0.667 S/m	0.670 S/m	
0.1	1.29 S/m	1.30 S/m	
0.5	5.87 S/m	5.88 S/m	
Repeatability	1 <sup>st</sup> time	0.00 , 5.88 S/m	Within $\pm 1\%$ F.S. against average value
	2 <sup>nd</sup> time	0.00 , 5.88 S/m	
	3 <sup>rd</sup> time	0.00 , 5.88 S/m	
	0.00 , 5.87 S/m	Ave.: 0.00 , 5.88	

\* 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 <sup>2</sup> )
0.00		0.00	0.9999
3.08		3.15	
5.57		5.62	
8.33		8.40	Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 0.1 mg/L against standard value
10.38		10.32	
13.10		13.05	
Repeatability	1 <sup>st</sup> time	0.00 , 8.40	
	2 <sup>nd</sup> time	0.00 , 8.42	
	3 <sup>rd</sup> time	0.00 , 8.37	
	0.00 , 8.33	Ave.: 0.00 , 8.40	

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

**pH Value:**

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

pH buffer for Meter Calibration (20°C)	Input value (pH buffer) (20°C)	Indicated pH value by meter (20°C)	Linearity (R <sup>2</sup> )
pH = 4.00	1.67	1.63	1.0000
pH = 6.88	4.00	3.98	Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 0.05 pH against standard value
pH = 7.00	6.88	6.84	
pH = 9.22	7.00	6.97	
pH = 10.00	7.43	7.40	
	9.22	9.18	
	10.00	9.95	
	12.64	12.60	
Repeatability	1 <sup>st</sup> time	3.98 , 9.95	Within ± 0.05 pH against average value
	2 <sup>nd</sup> time	3.99 , 9.96	
	3 <sup>rd</sup> time	3.98 , 9.95	
	pH 4.00 , 10.00	Ave.: 3.98 , 9.95	

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



**Temperature:**

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

Setting Temperature (°C)	Indicated value by meter (°C)		Linearity (R <sup>2</sup> )
5.0	4.8		0.9998
15.0	14.6		
25.0	24.7		Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 0.5°C against standard value
35.0	34.6		
45.0	45.3		
55.0	55.5		
Repeatability	1 <sup>st</sup> time	14.7 , 45.3	Within ± 0.25°C against average value
	2 <sup>nd</sup> time	14.5 , 45.4	
	3 <sup>rd</sup> time	14.6 , 45.2	
	15.0 , 45.0	Ave.: 14.6 , 45.3	

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 <sup>2</sup> )
0.0	0.0		1.0000
20.0	19.4		Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 3% F.S. against span calibration value 100.0 and 400.0 NTU
100.0	98.1		
400.0	396.3		
800.0	795.4		
Repeatability	1 <sup>st</sup> time	0.0 , 796.0	Within ± 3% F.S. against average value
	2 <sup>nd</sup> time	0.0 , 795.4	
	3 <sup>rd</sup> time	0.0 , 794.9	
	0.0 , 800.0	Ave.: 0.0 , 795.4	

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 : 17-6-2010

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

<i>Species</i>	Habit	Native	Relative Abundance	Occurrence	
				PNH3	PNH4
<i>Acacia confusa</i>	tree	no	occasional		+
<i>Achyranthes aspera</i>	herb	yes	scarce		+
<i>Alangium chinensis</i>	tree	yes	scarce		+
<i>Alocasia macrorrhiza</i>	herb	yes	occasional		+
<i>Acorus gramineus</i>	herb	yes	scarce		+
<i>Annoa squamosa</i>	tree	no	scarce		+
<i>Bidens pilosa</i>	herb	no	occasional		+
<i>Bridelia tomentosa</i>	tree	yes	scarce		+
<i>Celtis sinensis</i>	tree	yes	scarce		+
<i>Christella parasitica</i>	fern	yes	occasional		+
<i>Dimocarpus longan</i>	tree	no	occasional		+
<i>Ficus hispida</i>	tree	yes	occasional		+
<i>Ficus microcarpa</i>	tree	yes	scarce		+
<i>Ficus superba</i>	tree	yes	occasional		+
<i>Ficus variegata</i>	tree	yes	scarce		+
<i>Hedychium coronarium</i>	herb	no	occasional		+
<i>Litsea glutinosa</i>	tree	yes	scarce		+
<i>Ludwigia perennis</i>	herb	yes	scarce		+
<i>Macaranga tanarius</i>	tree	yes	occasional		+
<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	occasional		+
<i>Morus alba</i>	tree	no	scarce		+
<i>Paedaria scandens</i>	climber	yes	scarce		+
<i>Panicum maximum</i>	grass	no	scarce		+
<i>Phyllanthus urinaria</i>	shrub	yes	scarce		+
<i>Pogonatherum crinitum</i>	grass	yes	scarce		+
<i>Pteris vittata</i>	fern	yes	scarce		+
<i>Pueraria phaseoloides</i>	climber	yes	occasional		+
<i>Sida rhombifolia</i>	herb	yes	scarce		+
<i>Sporobolus fertilis</i>	grass	yes	scarce		+
<i>Sterculia lanceolata</i>	tree	yes	scarce		+

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

Species	Habit	Native	Relative Abundance	Occurrence	
				PNH1	PNH2
<i>Ficus microcarpa</i>	tree	yes	scarce		+
<i>Ficus superba</i>	tree	yes	occasional		+
<i>Ipomoea cairica</i>	climber	yes	occasional		+
<i>Kandelia obovata</i>	tree	yes	scarce	+	
<i>Lantana camara</i>	shrub	no	scarce		+
<i>Panicum maximum</i>	grass	no	common		+

Appendix D3 Plant species recorded at Luk Tei Tong River

Species	Habit	Native	Relative Abundance	Occurrence				
				LLT1	LLT2	LLT3	LLT4	LLT5
<i>Achyranthes aspera</i>	herb	yes	scarce		+			
<i>Bidens pilosa</i>	herb	no	scarce	+				
<i>Celtis sinensis</i>	tree	yes	scarce	+				
<i>Cyperus malaccensis</i>	sedge	yes	scarce		+			
<i>Ficus microcarpa</i>	tree	yes	scarce	+				
<i>Ficus superba</i>	tree	yes	scarce	+				
<i>Hibiscus tiliaceus</i>	tree	yes	scarce	+	+			
<i>Kandelia obovata</i>	tree	yes	scarce		+			
<i>Leucaena leucocephala</i>	tree	no	scarce	+				
<i>Mikania micrantha</i>	climber	no	scarce	+				
<i>Panicum maximum</i>	grass	no	scarce	+	+			
<i>Panicum repens</i>	grass	yes	scarce		+			
<i>Rhynchelytrum repens</i>	grass	no	scarce	+				
<i>Saccharum arundinaceum</i>	grass	yes	scarce	+				

## **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: 9/7/2010

Weather Condition: Sunny

Monitoring Location	WE1			WE2			WE3			WE4			WE5			WE6		
Time (hhmm)	1100			1045			1015			1025			1140			1130		
Tide Mode	ebb			ebb			ebb			ebb			ebb			ebb		
River Condition	Normal			Normal			Normal			Normal			Normal			Muddy		
Water Depth (m)	< 1.0			< 1.0			< 1.0			< 1.0			< 1.0			< 1.0		
pH value	6.96			7.54			8.78			7.37			7.22			6.67		
Temperature (oC)	28.9			28.8			29.7			29.9			29.6			28.9		
Salinity (ppt)	0.0			0.0			0.3			3.9			0.0			0.0		
Conductivity (ms/m)	4.4			7.7			78.7			0.7			35.1			4.8		
Water flow (m/s)	0.110			0.090			0.100			0.080			0.080			0.050		
Turbidity (NTU)	0.0	0.0	Average	0.0	0.0	Average	4.8	4.8	Average	12.3	12.3	Average	14.6	14.7	Average	155.3	155.4	Average
			0.00			0.00			4.80			12.3			14.65			155.4
DO (mg/l)	6.79	6.80	Average	7.48	7.76	Average	9.01	9.02	Average	6.05	6.06	Average	7.75	7.76	Average	7.47	7.47	Average
			6.80			7.62			9.02			6.06			7.76			7.47
DO Saturation (%)	89	89	Average	98	98	Average	120	120	Average	81	81	Average	102	102	Average	97	97	Average
			89			98			120			81			102			97

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
9/7/2010

remark or  
observation: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## **Appendix D5**

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





## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC100700106 Date of Issue : 12-07-2010

---

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 : 09-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 09-07-2010

GCE Serial No. : WQM072010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	497	497	0.0	27.0
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		09 July 2010 / 11:00		09 July 2010 / 10:45		09 July 2010 / 10:15			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	<1.0	<1.0	1.9	1.7	7.6	8.0		

TEST RESULTS	Sample ID		WE4	WE4 Duplicate	WE5	WE5 Duplicate	WE6	WE6 Duplicate		
	Sampling Date/Time		09 July 2010 / 10:25		09 July 2010 / 11:20		09 July 2010 / 11:30			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	12.4	12.1	8.5	8.9	86	83.2		

\* : 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 :** 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. : GCC100700148

Date of Issue : 21-07-2010

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 : 09-07-2010

W.O. No.\* : --

Contract No.\* : --

Date Completed : 16-07-2010

GCE Serial No. : WQM072010

Sampling Date\* : 09-07-2010 / 11:00

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 <sup>+</sup> 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)	APHA 20ed 4500-NH <sub>3</sub> D	0.03
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E
Phosphorus	mg/L	APHA 20ed 4500-P D
Biochemical Oxygen Demand (BOD <sub>5</sub> )	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 9 July 2010.

**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**

Report No. : GCC100700156 Date of Issue : 21-07-2010

---

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 : 09-07-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 16-07-2010

GCE Serial No. : WQM072010 Sampling Date\* : 09-07-2010 / 11:00 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 <sup>+</sup> 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 <sub>3</sub> D	0.02
	mg/L APHA 20ed 4500-NH <sub>3</sub> E	--
	mg/L APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate)	mg/L APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.15
Phosphorus	mg/L APHA 20ed 4500-P D	0.05
Biochemical Oxygen Demand (BOD <sub>5</sub> )	mg/L APHA 20ed 5210 B	1
Chemical Oxygen Demand (COD)	mg/L APHA 20ed 5220 D	--
Total Suspended Solid	mg/L APHA 20ed 2540 D	--


\* : Information provided by client

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

Sample received on 9 July 2010.

**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. : GCC100700164 Date of Issue : 21-07-2010

---

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 : 09-07-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 16-07-2010

GCE Serial No. : WQM072010 Sampling Date\* : 09-07-2010 / 10:45 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 <sup>+</sup> 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 <sub>3</sub> D
		APHA 20ed 4500-NH <sub>3</sub> E
		APHA 18ed 4500-NH <sub>3</sub> C
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E
Phosphorus	mg/L	APHA 20ed 4500-P D
Biochemical Oxygen Demand (BOD <sub>5</sub> )	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 9 July 2010.

**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. : GCC100700172

Date of Issue : 21-07-2010

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 : 09-07-2010

W.O. No.\* : --

Contract No.\* : --

Date Completed : 16-07-2010

GCE Serial No. : WQM072010

Sampling Date\* : 09-07-2010 / 10:45

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 <sup>+</sup> 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 <sub>3</sub> D
		APHA 20ed 4500-NH <sub>3</sub> E
		APHA 18ed 4500-NH <sub>3</sub> C
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E
Phosphorus	mg/L	APHA 20ed 4500-P D
Biochemical Oxygen Demand (BOD <sub>5</sub> )	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 9 July 2010.

**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. : GCC100700180

Date of Issue : 21-07-2010

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 : 09-07-2010

W.O. No.\* : --

Contract No.\* : --

Date Completed : 16-07-2010

GCE Serial No. : WQM072010

Sampling Date\* : 09-07-2010 / 10:15

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 <sup>+</sup> 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 <sub>3</sub> D	0.16
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.24
Phosphorus mg/L	APHA 20ed 4500-P D	0.08
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

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

Sample received on 9 July 2010.

**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. : GCC100700198

Date of Issue : 21-07-2010

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 : 09-07-2010

W.O. No.\* : --

Contract No.\* : --

Date Completed : 16-07-2010

GCE Serial No. : WQM072010

Sampling Date\* : 09-07-2010 / 10:15

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 <sup>+</sup> 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)	APHA 20ed 4500-NH <sub>3</sub> D	0.17
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E
Phosphorus	mg/L	APHA 20ed 4500-P D
Biochemical Oxygen Demand (BOD <sub>5</sub> )	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 9 July 2010.

**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. : GCC100700203

Date of Issue : 21-07-2010

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 : 09-07-2010

W.O. No.\* : --

Contract No.\* : --

Date Completed : 16-07-2010

GCE Serial No. : WQM072010

Sampling Date\* : 09-07-2010 / 10:25

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 <sup>+</sup> 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)	APHA 20ed 4500-NH <sub>3</sub> D	0.33
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E
Phosphorus	mg/L	APHA 20ed 4500-P D
Biochemical Oxygen Demand (BOD <sub>5</sub> )	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 9 July 2010.

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. : GCC100700211 Date of Issue : 21-07-2010

---

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 : 09-07-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 16-07-2010

GCE Serial No. : WQM072010 Sampling Date\* : 09-07-2010 / 10:25 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 <sup>+</sup> 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 <sub>3</sub> D
		APHA 20ed 4500-NH <sub>3</sub> E
		APHA 18ed 4500-NH <sub>3</sub> C
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E
Phosphorus	mg/L	APHA 20ed 4500-P D
Biochemical Oxygen Demand (BOD <sub>5</sub> )	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

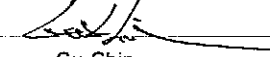
**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 9 July 2010.

**REMARKS :** Sample Location WE4.

----- End -----

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

Certified By :   
 Name : Gu Chin  
 Post : Chemist

Checked By : Gu Chin



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC100700229

Date of Issue : 21-07-2010

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 : 09-07-2010

W.O. No.\* : --

Contract No.\* : --

Date Completed : 16-07-2010

GCE Serial No. : WQM072010

Sampling Date\* : 09-07-2010 / 11:20

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 <sup>+</sup> 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 <sub>3</sub> D	0.02
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.18
Phosphorus mg/L	APHA 20ed 4500-P D	0.05
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

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

Sample received on 9 July 2010.

**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. : GCC100700237

Date of Issue : 21-07-2010

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 : 09-07-2010

W.O. No.\* : --

Contract No.\* : --

Date Completed : 16-07-2010

GCE Serial No. : WQM072010

Sampling Date\* : 09-07-2010 / 11:20

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 <sup>+</sup> 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 <sub>3</sub> D	0.02
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.17
Phosphorus mg/L	APHA 20ed 4500-P D	0.05
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

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

Sample received on 9 July 2010.

**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. : GCC100700245

Date of Issue : 21-07-2010

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 : 09-07-2010

W.O. No.\* : --

Contract No.\* : --

Date Completed : 16-07-2010

GCE Serial No. : WQM072010

Sampling Date\* : 09-07-2010 / 11:30

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 <sup>+</sup> 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 <sub>3</sub> D
		APHA 20ed 4500-NH <sub>3</sub> E
		APHA 18ed 4500-NH <sub>3</sub> C
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E
Phosphorus	mg/L	APHA 20ed 4500-P D
Biochemical Oxygen Demand (BOD <sub>5</sub> )	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 9 July 2010.

**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. : GCC100700253

Date of Issue : 21-07-2010

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 : 09-07-2010

W.O. No.\* : --

Contract No.\* : --

Date Completed : 16-07-2010

GCE Serial No. : WQM072010

Sampling Date\* : 09-07-2010 / 11:30

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 <sup>+</sup> 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 <sub>3</sub> D
		APHA 20ed 4500-NH <sub>3</sub> E
		APHA 18ed 4500-NH <sub>3</sub> C
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E
Phosphorus	mg/L	APHA 20ed 4500-P D
Biochemical Oxygen Demand (BOD <sub>5</sub> )	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 9 July 2010.

**REMARKS :** Sample Location WE6.

----- End -----

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

Certified By :

Name

Gu Chin

Checked By : Gu Chin

Post

Chemist

# **Appendix E**

## **Construction Noise Monitoring Data Sheet**



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

Construction Noise Monitoring Data Sheet

Monitoring Location		N1	N2
Description of Location		Façade	Façade
Date of Monitoring		7/7/2010	
Measurement Start Time (hhmm)		14:10	14:50
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.2	0.2
Measurement Results	L90 (dB(A))	42.7	56.7
	L10 (dB(A))	54.0	64.4
	Leq (dB(A))	51.3	62.2
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	1. Excavator noise
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise (bicycle)	1. Public noise 2. Traffic noise (bicycle)
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

7/7/2010



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

Construction Noise Monitoring Data Sheet

Monitoring Location		N3	N4
Description of Location		Freefield	Facade
Date of Monitoring		7/7/2010	
Measurement Start Time (hhmm)		13:25	12:50
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.2	0.2
Measurement Results	L90 (dB(A))	50.8	47.6
	L10 (dB(A))	60.7	59.2
	Leq (dB(A))	56.3	55.9
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

7/7/2010





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		14/7/2010	
Measurement Start Time (hhmm)		15:55	12:05
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.2	0.2
Measurement Results	L90 (dB(A))	44.4	45.0
	L10 (dB(A))	56.7	52.1
	Leq (dB(A))	54.3	49.9
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		1. Construction trucks 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 2. Traffic noise (bicycle)
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

14/7/2010



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		14/7/2010	
Measurement Start Time (hhmm)		11:30	10:50
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.2	0.2
Measurement Results	L90 (dB(A))	41.6	42.2
	L10 (dB(A))	53.9	50.1
	Leq (dB(A))	51.3	48.3
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 (bicycle)	1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

14/7/2010



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		24/7/2010	
Measurement Start Time (hhmm)		11:30	12:03
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.1	0.2
Measurement Results	L90 (dB(A))	42.4	38.1
	L10 (dB(A))	54.6	49.6
	Leq (dB(A))	54.2	47.8
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		1. Excavator noise 2. Construction truck noise	No construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise	1. Public noise 2. Traffic noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

24/7/2010



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		24/7/2010	
Measurement Start Time (hhmm)		10:25	10:58
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	0.2
Measurement Results	L90 (dB(A))	40.2	47.9
	L10 (dB(A))	51.5	52.1
	Leq (dB(A))	48.6	51.1
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. Traffic noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

24/7/2010



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		30/7/2010	
Measurement Start Time (hhmm)		13:30	11:55
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	0.3
Measurement Results	L90 (dB(A))	45.6	40.4
	L10 (dB(A))	60.8	50.4
	Leq (dB(A))	60.3	47.6
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	1. Public noise 2. Traffic noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

30/7/2010



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		30/7/2010	
Measurement Start Time (hhmm)		11:20	10:50
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.2	0.3
Measurement Results	L90 (dB(A))	39.6	50.2
	L10 (dB(A))	51.7	56.5
	Leq (dB(A))	48.6	55.6
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

30/7/2010

# **Appendix F1**

## **Water Quality**

### **Monitoring Data Sheet**

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

Date of Sampling: **02/07/2010**      **Sunny**

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1450			1500			1505			1445			1340			1350			1400		
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	7.88			7.61			7.00			7.12			7.28			6.93			6.60		
Temperature (oC)	28.0			28.3			29.1			28.8			26.0			26.5			27.1		
Salinity (ppt)	0.3			0.0			0.2			3.7			0.0			0.0			0.0		
Turbidity (NTU)	10.6	10.6	Average 10.6	1.4	1.4	Average 1.4	14.8	14.9	Average 14.9	12.4	12.2	Average 12.3	2.5	2.5	Average 2.5	0.0	0.0	Average 0.0	3.8	3.9	Average 3.9
DO (mg/l)	7.77	7.79	Average 7.78	7.71	7.69	Average 7.70	7.51	7.52	Average 7.52	8.41	8.42	Average 8.42	7.89	7.90	Average 7.90	7.88	7.90	Average 7.89	6.96	6.97	Average 6.97
DO Saturation (%)	100	100	Average 100	99	99	Average 99	98	98	Average 98	110	110	Average 110	98	98	Average 98	98	98	Average 98	88	88	Average 88

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
02/07/2010

remark or observation: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



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

Date of Sampling: **05/07/2010**      **Sunny**

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1625			1610			1630			1615			1540			1550			1600		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			Muddy			Muddy			normal			normal			normal		
Water Depth (m)	<1			< 1			< 1			1.3			< 1			< 1			< 1		
pH value	6.91			7.00			6.81			7.67			6.66			6.54			6.51		
Temperature (oC)	29.0			28.7			30.7			30.4			28.6			27.9			27.8		
Salinity (ppt)	0.0			0.0			0.1			9.7			0.0			0.0			0.1		
Turbidity (NTU)	9.7	9.7	Average 9.7	0.5	0.5	Average 0.5	67.2	67.1	Average 67.2	33.7	33.8	Average 33.8	1.5	1.6	Average 1.6	0.0	0.0	Average 0.0	10.4	10.4	Average 10.4
DO (mg/l)	7.46	7.44	Average 7.45	7.62	7.61	Average 7.62	7.54	7.55	Average 7.55	7.65	7.66	Average 7.66	7.16	7.15	Average 7.16	7.65	7.66	Average 7.66	6.43	6.46	Average 6.45
DO Saturation (%)	97	97	Average 97	99	99	Average 99	101	101	Average 101	104	104	Average 104	93	93	Average 93	98	98	Average 98	82	82	Average 82

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
05/07/2010

remark or observation: M3 & M4 - Clearance of riverbed

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

Date of Sampling: 06/07/2010      Sunny

Monitoring Location	M1		M2		M3		M4		C1		C2		C3				
Time (hhmm)					1010		1000						1020				
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					7.48		7.31						7.48				
Temperature (oC)					29.0		29.2						29.2				
Salinity (ppt)					0.2		5.5						0.3				
Turbidity (NTU)			Average			14.9	14.9	Average	14.6	14.5	Average			Average	8.1	8.2	Average
			#DIV/0!			#DIV/0!	14.9	14.6			#DIV/0!			#DIV/0!			8.2
DO (mg/l)			Average			7.06	7.09	Average	7.52	7.51	Average			Average	5.79	5.78	Average
			#DIV/0!			#DIV/0!	7.08	7.52			#DIV/0!			#DIV/0!			5.79
DO Saturation (%)			Average			92	92	Average	99	99	Average			Average	76	76	Average
			#DIV/0!			#DIV/0!	92	99			#DIV/0!			#DIV/0!			76

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
06/07/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-site measurement results**

Date of Sampling: 07/07/2010      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1025			1035			1020			1010			1100			1050			1045		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			Muddy			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.3			<1			<1			<1		
pH value	7.94			7.80			7.85			8.07			6.83			6.97			7.09		
Temperature (oC)	27.4			27.9			28.2			27.6			28.1			27.7			28.5		
Salinity (ppt)	0.0			0.0			0.4			4.5			0.0			0.0			0.0		
Turbidity (NTU)	4.1	4.1	Average 4.1	0.0	0.0	Average 0.0	20.4	20.3	Average 20.4	70.8	70.9	Average 70.9	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	8.5	8.4	Average 8.5
DO (mg/l)	8.22	8.21	Average 8.22	7.79	7.81	Average 7.80	7.48	7.46	Average 7.47	7.73	7.73	Average 7.73	7.11	7.11	Average 7.11	7.66	7.67	Average 7.67	6.39	6.39	Average 6.39
DO Saturation (%)	104	104	Average 104	100	100	Average 100	97	97	Average 97	98	98	Average 98	91	91	Average 91	98	98	Average 98	83	83	Average 83

Name  
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Signature  


Date  
07/07/2010

remark or observation: M3 & M4 - Clearance of riverbed

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

Date of Sampling: 08/07/2010      Sunny

Monitoring Location	M1		M2		M3		M4		C1		C2		C3				
Time (hhmm)					1000		955						1010				
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					5.93		8.64						7.04				
Temperature (oC)					29.0		28.3						28.8				
Salinity (ppt)					0.5		3.5						0.1				
Turbidity (NTU)			Average			8.6	8.7	Average	12.2	12.0	Average			Average	5.4	5.3	Average
			#DIV/0!					#DIV/0!			8.7			12.1			#DIV/0!
DO (mg/l)			Average			7.08	7.09	Average	7.71	7.71	Average			Average	6.74	6.75	Average
			#DIV/0!					#DIV/0!			7.09			7.71			#DIV/0!
DO Saturation (%)			Average			92	92	Average	99	99	Average			Average	88	88	Average
			#DIV/0!					#DIV/0!			92			99			#DIV/0!

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
08/07/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-site measurement results**

Date of Sampling: 09/07/2010      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1015			1035			1025			1000			1100			1110			1135		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.3			<1			<1			<1		
pH value	8.78			7.53			7.37			7.54			6.96			6.83			6.76		
Temperature (oC)	29.7			29.2			29.9			29.6			28.9			29.4			30.9		
Salinity (ppt)	0.3			0.4			3.9			7.8			0.0			0.0			0.5		
Turbidity (NTU)	4.8	4.8	Average 4.8	0.0	0.0	Average 0.0	12.3	12.3	Average 12.3	8.3	8.3	Average 8.3	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	13.5	13.5	Average 13.5
DO (mg/l)	9.01	9.02	Average 9.02	8.40	8.40	Average 8.40	6.05	6.06	Average 6.06	7.19	7.20	Average 7.20	6.79	6.80	Average 6.80	7.85	7.86	Average 7.86	5.12	5.14	Average 5.13
DO Saturation (%)	120	120	Average 120	110	110	Average 110	81	81	Average 81	95	95	Average 95	89	89	Average 89	103	103	Average 103	69	69	Average 69

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
09/07/2010

remark or observation: \_\_\_\_\_  
 \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-site measurement results**

Date of Sampling: 12/07/2010      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1155			1200			1210			1145			1310			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			1.4			<1			<1			<1		
pH value	7.95			7.58			7.58			7.82			7.81			7.05			6.74		
Temperature (oC)	29.1			30.0			30.3			29.5			28.2			28.6			29.5		
Salinity (ppt)	1.4			4.5			12.9			10.2			0.0			0.0			4.2		
Turbidity (NTU)	9.6	9.6	Average 9.6	1.8	1.8	Average 1.8	3.9	4.0	Average 4.0	2.6	2.7	Average 2.7	2.3	2.1	Average 2.2	0.0	0.0	Average 0.0	9.7	9.7	Average 9.7
DO (mg/l)	7.35	7.37	Average 7.36	7.49	7.48	Average 7.49	6.98	6.96	Average 6.97	7.38	7.35	Average 7.37	7.26	7.27	Average 7.27	7.36	7.39	Average 7.38	6.04	6.01	Average 6.03
DO Saturation (%)	96	96	Average 96	100	100	Average 100	93	93	Average 93	97	97	Average 97	93	93	Average 93	95	95	Average 95	79	79	Average 79

Name  
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Signature  


Date  
12/07/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-site measurement results**

Date of Sampling: 14/07/2010      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1415			1420			1430			1410			1435			1525			1535		
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	8.10			7.76			7.68			7.90			6.70			6.81			6.88		
Temperature (oC)	29.8			30.2			30.9			29.0			29.1			29.0			29.8		
Salinity (ppt)	4.5			6.4			15.4			8.6			0.1			0.0			10.1		
Turbidity (NTU)	12.7	12.7	Average	0.0	0.0	Average	5.3	5.3	Average	3.6	3.6	Average	0.0	0.0	Average	0.0	0.0	Average	10.7	10.7	Average
			12.7			0.0			5.3			3.6			0.0			0.0			10.7
DO (mg/l)	7.46	7.45	Average	7.84	7.86	Average	7.99	8.01	Average	7.31	7.33	Average	7.11	7.08	Average	7.54	7.53	Average	7.65	7.67	Average
			7.46			7.85			8.00			7.32			7.10			7.54			7.66
DO Saturation (%)	98	98	Average	105	105	Average	108	108	Average	95	95	Average	93	93	Average	98	98	Average	101	101	Average
			98			105			108			95			93			98			101

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
14/07/2010

remark or observation: \_\_\_\_\_  
 \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-site measurement results**

Date of Sampling: 16/07/2010      Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1545			1550			1600			1540			1630			1620			1610		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	Muddy			normal			Muddy			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.3			<1			<1			<1		
pH value	8.31			7.65			7.62			8.07			6.91			7.47			7.43		
Temperature (oC)	27.6			27.6			28.8			28.7			28.4			27.8			28.0		
Salinity (ppt)	0.4			0.6			8.1			13.8			0.0			0.0			0.6		
Turbidity (NTU)	16.3	16.3	Average 16.3	1.4	1.4	Average 1.4	20.0	20.0	Average 20.0	10.3	10.4	Average 10.4	1.2	1.2	Average 1.2	0.0	0.0	Average 0.0	6.2	6.2	Average 6.2
DO (mg/l)	7.57	7.59	Average 7.58	7.40	7.40	Average 7.40	7.44	7.45	Average 7.45	7.25	7.25	Average 7.25	6.91	6.92	Average 6.92	7.66	7.63	Average 7.65	6.86	6.87	Average 6.87
DO Saturation (%)	97	97	Average 97	94	94	Average 94	97	97	Average 97	94	94	Average 94	89	89	Average 89	98	98	Average 98	88	88	Average 88

Name  
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Signature  


Date  
16/07/2010

remark or observation: Heavy rainfall causing disturbance of sediment



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

Date of Sampling: 21/07/2010      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1000			1010			1020			950			1030			1040			1050		
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	8.05			7.39			7.08			7.57			7.64			7.10			6.90		
Temperature (oC)	28.0			27.4			28.5			28.0			27.9			27.8			27.9		
Salinity (ppt)	0.3			0.3			7.4			7.4			0.2			0.0			0.2		
Turbidity (NTU)	2.2	2.2	Average	0.0	0.0	Average	1.6	1.6	Average	1.1	1.0	Average	0.0	0.0	Average	0.0	0.0	Average	4.6	4.5	Average
			2.2			0.0			1.6			1.1			0.0			0.0			4.6
DO (mg/l)	7.64	7.65	Average	7.61	7.60	Average	7.39	7.41	Average	7.34	7.35	Average	7.44	7.46	Average	7.59	7.59	Average	6.32	6.31	Average
			7.65			7.61			7.40			7.35			7.45			7.59			6.32
DO Saturation (%)	98	98	Average	97	97	Average	96	96	Average	94	94	Average	96	96	Average	97	97	Average	81	81	Average
			98			97			96			94			96			97			81

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
21/07/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-site measurement results**

Date of Sampling: **22/07/2010**      **Rainy**

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1050			1100			1110			1040			1140			1130			1120		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.2			<1			<1			<1		
pH value	7.14			7.92			7.09			7.22			6.97			7.60			7.29		
Temperature (oC)	26.2			25.6			26.3			26.1			25.5			24.3			25.9		
Salinity (ppt)	5.0			0.4			4.9			4.9			0.0			0.0			0.5		
Turbidity (NTU)	6.1	6.0	Average 6.1	0.0	0.0	Average 0.0	6.2	6.2	Average 6.2	4.4	4.4	Average 4.4	3.4	3.3	Average 3.4	0.0	0.0	Average 0.0	6.2	6.4	Average 6.3
DO (mg/l)	7.34	7.35	Average 7.35	7.58	7.60	Average 7.59	7.41	7.43	Average 7.42	7.14	7.16	Average 7.15	7.47	7.49	Average 7.48	7.91	7.93	Average 7.92	6.74	6.72	Average 6.73
DO Saturation (%)	92	92	Average 92	95	95	Average 95	92	92	Average 92	88	88	Average 88	91	91	Average 91	94	94	Average 94	83	83	Average 83

Name  
Prepared By: Jimmy Cheng

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Date  
22/07/2010

remark or  
observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-site measurement results**

Date of Sampling: 24/07/2010      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1030			1040			1050			1100			1140			1150			1110		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	< 1			< 1			< 1			1.4			< 1			< 1			< 1		
pH value	7.18			7.04			6.94			7.14			7.38			6.97			6.91		
Temperature (oC)	26.1			26.7			27.6			28.2			27.6			27.6			30.2		
Salinity (ppt)	1.4			2.2			8.3			5.8			0.0			0.0			3.1		
Turbidity (NTU)	3.2	3.3	Average	0.0	0.0	Average	4.1	4.1	Average	0.6	0.6	Average	0.0	0.0	Average	0.0	0.0	Average	13.5	13.6	Average
			3.3			0.0			4.1			0.6			0.0			0.0			13.6
DO (mg/l)	7.86	7.88	Average	7.59	7.59	Average	7.00	7.01	Average	7.21	7.21	Average	7.78	7.79	Average	7.95	7.96	Average	5.26	5.27	Average
			7.87			7.59			7.01			7.21			7.79			7.96			5.27
DO Saturation (%)	98	98	Average	95	95	Average	90	90	Average	93	93	Average	99	99	Average	101	101	Average	70	70	Average
			98			95			90			93			99			101			70

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
24/07/2010

remark or  
observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-site measurement results**

Date of Sampling: **26/07/2010**      **Sunny**

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1155			1205			1210			1150			1050			1100			1110		
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	7.76			7.34			7.51			7.46			7.27			6.96			6.72		
Temperature (oC)	28.9			28.8			29.5			28.6			26.1			27.2			27.8		
Salinity (ppt)	2.5			14.0			16.8			8.0			0.0			0.0			8.3		
Turbidity (NTU)	4.2	4.1	Average 4.2	0.3	0.3	Average 0.3	4.0	4.0	Average 4.0	1.1	1.0	Average 1.1	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	5.8	5.8	Average 5.8
DO (mg/l)	7.78	7.79	Average 7.79	7.49	7.51	Average 7.50	7.74	7.74	Average 7.74	7.55	7.57	Average 7.56	7.63	7.63	Average 7.63	7.84	7.84	Average 7.84	5.40	5.40	Average 5.40
DO Saturation (%)	102	102	Average 102	98	98	Average 98	102	102	Average 102	98	98	Average 98	95	95	Average 95	100	100	Average 100	69	69	Average 69

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
26/07/2010

remark or  
observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-site measurement results**

Date of Sampling: 28/07/2010

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1335			1345			1350			1330			1400			1410			1420		
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	7.74			7.14			7.02			7.59			8.19			7.21			6.74		
Temperature (oC)	26.8			26.6			27.4			26.8			27.1			26.6			27.1		
Salinity (ppt)	0.4			0.5			10.3			9.8			0.3			0.0			0.2		
Turbidity (NTU)	1.2	1.2	Average 1.2	0.0	0.0	Average 0.0	11.5	11.5	Average 11.5	2.4	2.3	Average 2.4	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	4.4	4.2	Average 4.3
DO (mg/l)	7.97	7.99	Average 7.98	7.59	7.57	Average 7.58	7.60	7.61	Average 7.61	7.41	7.43	Average 7.42	7.65	7.66	Average 7.66	7.74	7.74	Average 7.74	7.54	7.56	Average 7.55
DO Saturation (%)	100	100	Average 100	95	95	Average 95	97	97	Average 97	93	93	Average 93	96	96	Average 96	97	97	Average 97	96	96	Average 96

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
28/07/2010

remark or observation: \_\_\_\_\_  
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## **Appendix F2**

### **Water Quality**

### **Monitoring Lab report**



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC100700041 Date of Issue : 08-07-2010

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 : 02-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 03-07-2010

GCE Serial No. : WQM072010 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	495	496	-0.2	28.1
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ± 5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		02 July 2010 / 13:40		02 July 2010 / 13:50		02 July 2010 / 14:00			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.5	1.1	2.2	2.6	4.0	3.6		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		02 July 2010 / 14:50		02 July 2010 / 15:00		02 July 2010 / 15:05		02 July 2010 / 14:45	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	11.6	11.8	1.2	1.5	11.9	12.1	10.8	9.9

\* : 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**

Report No. : GCC100700059 Date of Issue : 08-07-2010

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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 : 05-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 06-07-2010

GCE Serial No. : WQM072010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	497	501	-0.8	25.3
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		05 July 2010 / 15:40		05 July 2010 / 15:50		05 July 2010 / 16:00			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	2.4	2.4	1.3	1.5	5.0	4.6		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		05 July 2010 / 16:25		05 July 2010 / 16:10		05 July 2010 / 16:30		05 July 2010 / 16:15	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	4.5	4.7	2.9	3.1	57.4	56.4	20.8	20.0

\* : Information provided by client


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

Remarks : --

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :   
 Name : GU CHIN  
 Post : Chemist





## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC100700067 Date of Issue : 08-07-2010

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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 : 06-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 06-07-2010

GCE Serial No. : WQM072010 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	497	0.2	25.5
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		---				---		06 July 2010 / 10:20		
	LOD	Units									
Suspended Solids (SS)	1	mg/L	---	---	---	---	11.3	10.9			

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time		---				---		06 July 2010 / 10:10		06 July 2010 / 10:00
	LOD	Units									
Suspended Solids (SS)	1	mg/L	---	---	---	---	12.2	12.0	11.8	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                    

Checked By :                     GU CHIN                    

Approved Signatory :

Name :                     GU CHIN                    

Post :                     Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC100700075 Date of Issue : 08-07-2010

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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 : 07-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 08-07-2010

GCE Serial No. : WQM072010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	496	495	0.2	27.7
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ± 5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID		C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time		07 July 2010 / 11:00		07 July 2010 / 10:50		07 July 2010 / 10:45			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	2.0	2.0	<1.0	<1.0	4.8	4.6		

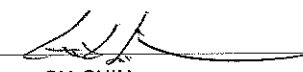
TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		07 July 2010 / 10:25		07 July 2010 / 10:35		07 July 2010 / 10:20		07 July 2010 / 10:10	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	4.3	4.4	1.6	1.7	30.8	30.8	64.4	64.4

\* : Information provided by client

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

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

Tested By : K.L. FONG  
 Checked By : GU CHIN

Approved Signatory :   
 Name : GU CHIN  
 Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC100700083

Date of Issue : 08-07-2010

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 : 08-07-2010

W.O. No.\* : --

Sample Type\* : River Water

Date Completed : 08-07-2010

GCE Serial No. : WQM072010

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	500	501	-0.2	26.0		
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	---		---		08 July 2010 / 10:10			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	---	---	---	---	6.4	5.9	
TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	---		---		08 July 2010 / 10:00		08 July 2010 / 09:55	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	---	---	---	---	7.4	8.6	11.6 12.0

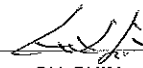
\* : Information provided by client

**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. : GCC100700091 Date of Issue : 12-07-2010

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

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

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 09-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 09-07-2010

GCE Serial No. : WQM072010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	497	497	0.0	27.0
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		09 July 2010 / 11:00		09 July 2010 / 11:10		09 July 2010 / 11:35			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.3	1.0	<1.0	<1.0	13.2	12.8		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		09 July 2010 / 10:15		09 July 2010 / 10:35		09 July 2010 / 10:25		09 July 2010 / 10:00	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	7.6	8.0	<1.0	<1.0	12.4	12.1	8.3	7.9

\* : Information provided by client

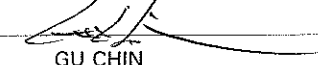
Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

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

---- End ----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :   
 Name : GU CHIN  
 Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC100700261 Date of Issue : 17-07-2010

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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 : 12-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 13-07-2010

GCE Serial No. : WQM072010 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	497	0.2	26.1
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	12 July 2010 / 13:10		12 July 2010 / 13:20		12 July 2010 / 13:30			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.2	2.3	<1.0	<1.0	5.6	5.4	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	12 July 2010 / 11:55		12 July 2010 / 12:00		12 July 2010 / 12:10		12 July 2010 / 11:45	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	10.1	9.7	2.3	2.1	4.8	5.2	6.4

\* : Information provided by client

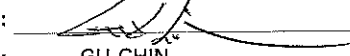
**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :   
 Name : GU CHIN  
 Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC100700279 Date of Issue : 17-07-2010

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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 : 14-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 15-07-2010

GCE Serial No. : WQM072010 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	500	499	0.2	27.9
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	14 July 2010 / 14:35		14 July 2010 / 15:25		14 July 2010 / 15:35			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.4	1.9	1.5	1.3	9.0	9.6	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	14 July 2010 / 14:15		14 July 2010 / 14:20		14 July 2010 / 14:30		14 July 2010 / 14:10	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	7.0	7.4	1.9	2.3	9.1	9.1	6.1 6.0

\* : Information provided by client

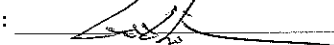
Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :   
 Name : GU CHIN  
 Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC100700287 Date of Issue : 29-07-2010

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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 : 16-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 17-07-2010

GCE Serial No. : WQM072010 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	498	0.2	26.6
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	16 July 2010 / 16:30		16 July 2010 / 16:20		16 July 2010 / 16:10			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	3.1	3.0	<1.0	<1.0	5.2	5.0	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	16 July 2010 / 15:45		16 July 2010 / 15:50		16 July 2010 / 16:00		16 July 2010 / 15:40	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	12.0	13.0	2.8	2.8	16.0	16.6	12.3

\* : Information provided by client

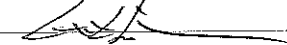
Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :   
 Name : GU CHIN  
 Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC100700863

Date of Issue : 29-07-2010

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 : 21-07-2010

W.O. No.\* : --

Sample Type\* : River Water

Date Completed : 22-07-2010

GCE Serial No. : WQM072010

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results						
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L		
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	501	503	-0.4	26.9		
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 July 2010 / 10:30		21 July 2010 / 10:40		21 July 2010 / 10:50			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	3.0	3.6	3.7	3.4	9.4	8.6	
TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	21 July 2010 / 10:00		21 July 2010 / 10:10		21 July 2010 / 10:20		21 July 2010 / 09:50	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	5.6	5.6	2.4	2.4	6.0	5.7	5.0

\* : 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. : GCC100700871 Date of Issue : 29-07-2010

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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 : 22-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 22-07-2010

GCE Serial No. : WOM072010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	496	495	0.2	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 July 2010 / 11:40		22 July 2010 / 11:30		22 July 2010 / 11:20			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	7.1	6.9	< 1.0	< 1.0	6.4	6.9	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	22 July 2010 / 10:50		22 July 2010 / 11:00		22 July 2010 / 11:10		22 July 2010 / 10:40	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	7.5	7.3	< 1.0	< 1.0	10.1	9.9	9.6

\* : Information provided by client

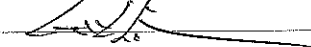
**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :   
 Name : GU CHIN  
 Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC100700889 Date of Issue : 29-07-2010

---

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 : 24-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 26-07-2010

GCE Serial No. : WQM072010 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	497	0.2	25.2
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		24 July 2010 / 11:40		24 July 2010 / 11:50		24 July 2010 / 11:10			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	3.2	3.0	1.7	1.7	16.8	16.8		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		24 July 2010 / 10:30		24 July 2010 / 10:40		24 July 2010 / 10:50		24 July 2010 / 11:00	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	7.4	7.8	2.1	2.0	5.3	4.6	4.6	5.2

\* : Information provided by client

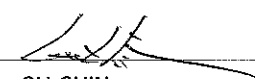
Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :   
 Name : GU CHIN  
 Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC100700897 Date of Issue : 29-07-2010

---

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 : 26-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 26-07-2010

GCE Serial No. : WQM072010 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	495	0.6	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		26 July 2010 / 10:50		26 July 2010 / 11:00		26 July 2010 / 11:00			
	LOD	Units								
Suspended Solids (SS)	1	mg/L	3.0	3.0	< 1.0	< 1.0	10.2	10.2		

TEST RESULTS	Sample ID		M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time		26 July 2010 / 11:55		26 July 2010 / 12:05		26 July 2010 / 12:10		26 July 2010 / 11:50	
	LOD	Units								
Suspended Solids (SS)	1	mg/L	5.3	5.7	2.0	1.9	9.8	10.2	6.3	6.1

\* : Information provided by client

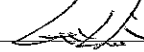
Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :   
 Name : GU CHIN  
 Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC100700902 Date of Issue : 29-07-2010

---

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 : 28-07-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 29-07-2010

GCE Serial No. : WQM072010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	496	495	0.2	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	28 July 2010 / 14:00		28 July 2010 / 14:10		28 July 2010 / 14:20			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	3.6	3.7	2.1	2.1	7.2	6.6	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	28 July 2010 / 13:35		28 July 2010 / 13:45		28 July 2010 / 13:50		28 July 2010 / 13:30	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	6.8	5.9	2.0	2.1	12.1	11.9	6.7

\* : Information provided by client

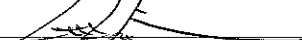
**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

**Remarks :** --

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :   
 Name : GU CHIN  
 Post : Chemist

Appendix G  
Monitoring Schedule  
for July 2010

## Environmental Pioneers and Solutions Limited

### DC/2006/11 - DRAINAGE IMPROVEMENT IN SOUTHERN LANTAU

#### Master Schedule of EM&A works in July 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				7/1	7/2	7/3
					WQM at: 15:38	
7/4	7/5	7/6	7/7	7/8	7/9	7/10
	WQM at: 16:45	WQM at: 11:20	WQM at: 10:00  Noise monitoring	WQM at: 14:30	WQM at: 10:25	
7/11	7/12	7/13	7/14	7/15	7/16	7/17
	WQM at: 12:44		WQM at: 14:19  Noise monitoring		WQM at: 15:47	
7/18	7/19	7/20	7/21	7/22	7/23	7/24
			WQM at: 10:05	WQM at: 10:25		WQM at: 10:20  Noise monitoring
	Noise Monitoring					
7/25	7/26	7/27	7/28	7/29	7/30	7/31
	WQM at: 12:41		WQM at: 13:43			
					Noise monitoring	

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

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

**Appendix H Implementation Status of environmental protection / mitigation measures**

<b>Environmental Aspect</b>	<b>Protection / Mitigation Measures</b>	<b>Implementation status</b>	<b>Follow-up action</b>
<b>Air Quality</b>	Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved road, with complete coverage.	Implemented	-
	Use of frequent watering for particular dusty static construction areas and areas close to ASRs.	Implemented	-
	Tarpaulin covering of all dusty vehicle loads transported to and from and between site location;	Deficiencies found	Outstanding. Improvements were required
	Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.	Implemented	-
	Routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.	Implemented	-
<b>Noise</b>	Use of quiet powered mechanical equipment (PME)	Implemented	-
	Adoption of movable noise barriers and temporary noise barriers	Implemented	-
	Application of good site practices mentioned in EM&A manual Clause 3.8.1	Implemented	-
<b>Water Quality</b>	Before commencing any site formation works, all sewer and drainage connections should be sealed to prevent debris, soil, sand etc. from entering public sewers/drains.	Deficiencies found	Outstanding. Improvements were required
	Temporary ditches should be provided to facilitate run-off discharge into appropriate watercourses, via a silt retention pond. No site run-off should enter the freshwater marshes at Luk Tei Tong.	Implemented	-
	Sand/ silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove sand/ silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance.	Deficiencies found	Outstanding. Improvements were required
	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.	Deficiencies found	Outstanding. Improvements were required
	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 <sup>3</sup> 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.	Implemented	-
	Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site.	Not available	-
	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	-

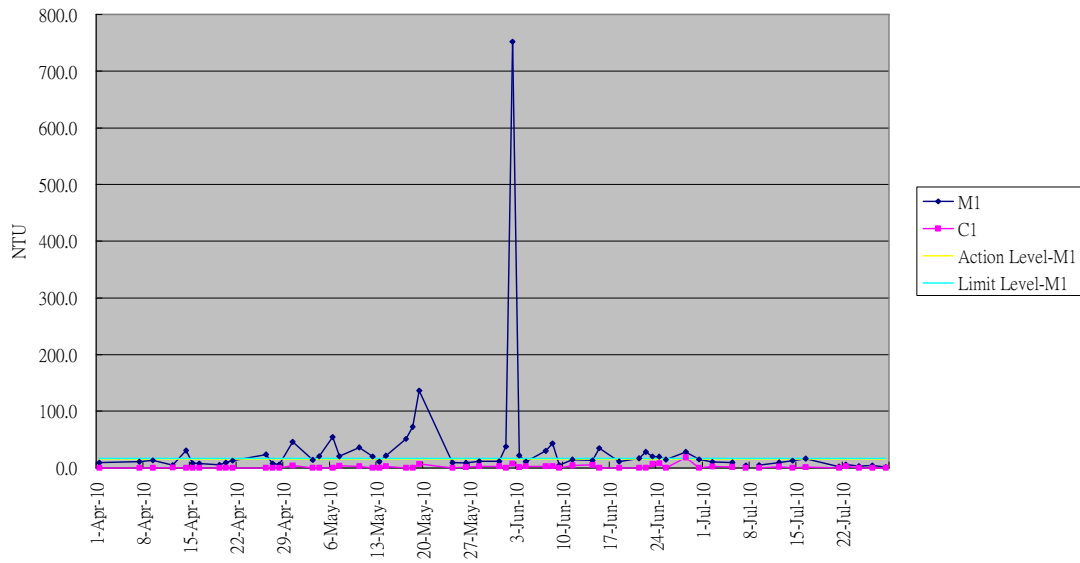
<b>Environmental Aspect</b>	<b>Protection / Mitigation Measures</b>	<b>Implementation status</b>	<b>Follow-up action</b>
	Maintenance desilting of the re-profiled river channels of the Pak Ngan Heung River, Tai Tei Tong River, Luk Tei tong River and Luk Tei Tong By-pass Channel, temporary barrier walls should be used to provide a dry zone for desilting work.	Not applicable at this stage	-
<b>Ecology</b>	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	-
<b>Chemical and Solid Waste</b>	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.	Implemented	-
	Construction wastes should be managed and disposed to the designated public fill and landfill areas in acceptable manner.	Deficiencies found	Improvements were required
	All waste disposals managed in a proper manner i.e. trip ticket system implementation.	Implemented	-



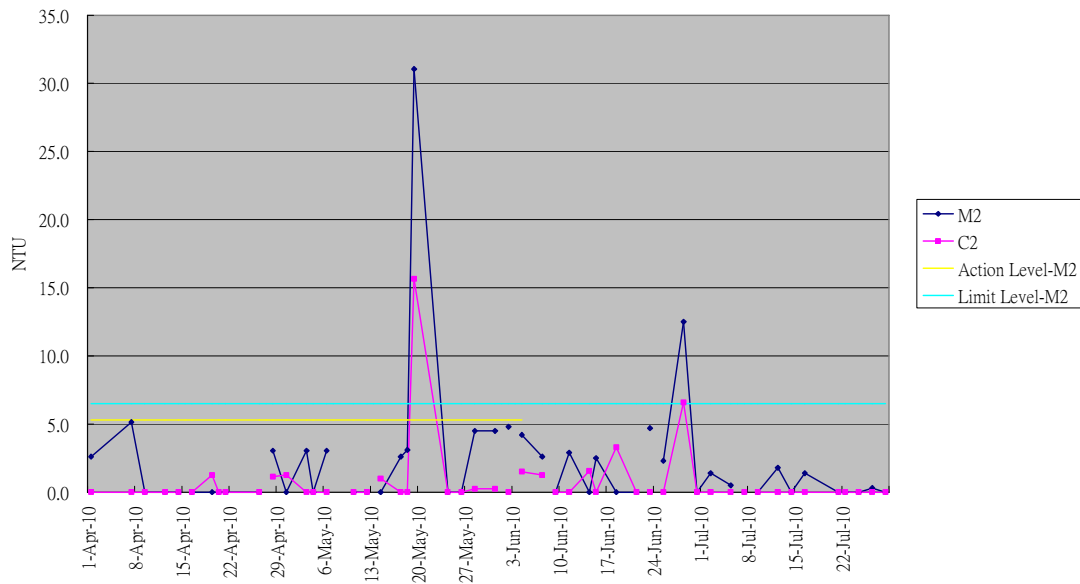
## Appendix I

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

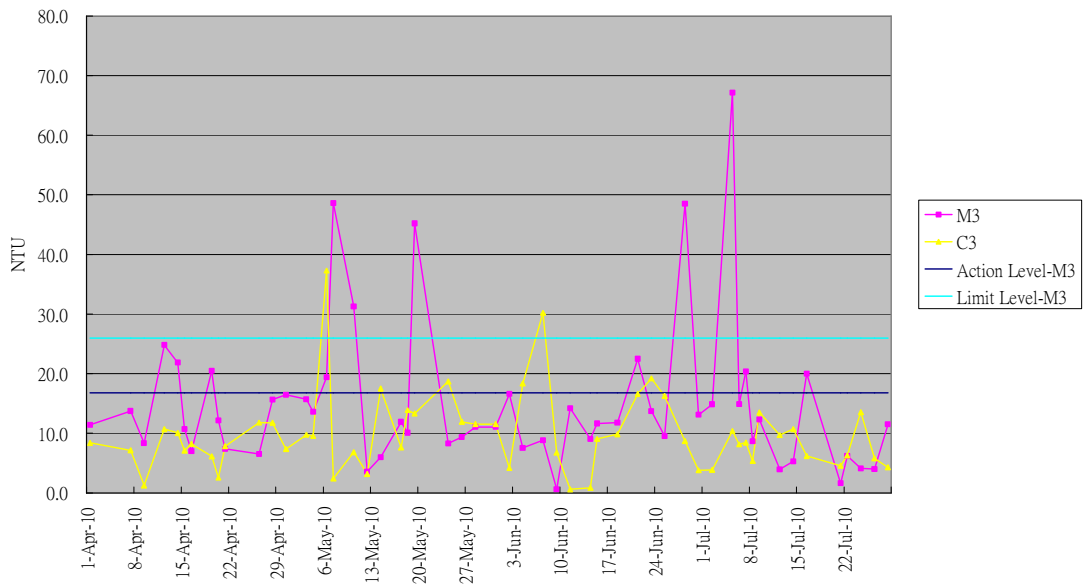
**Graphical Plot of Turbidity Trend M1&C1(Apr - Jul 10)**



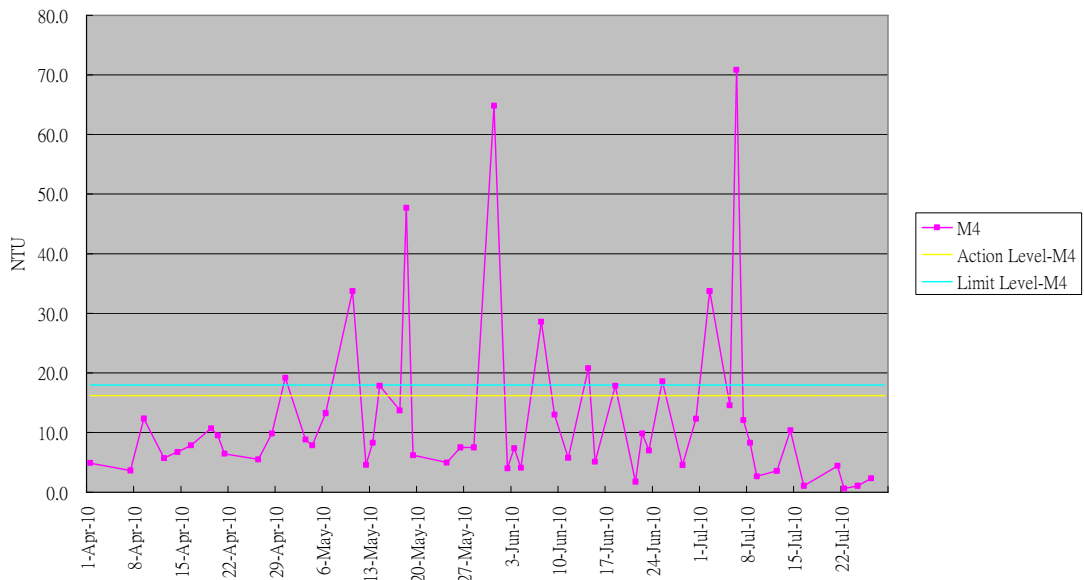
**Graphical Plot of Turbidity Trend M2&C2 (Apr - Jul 10)**



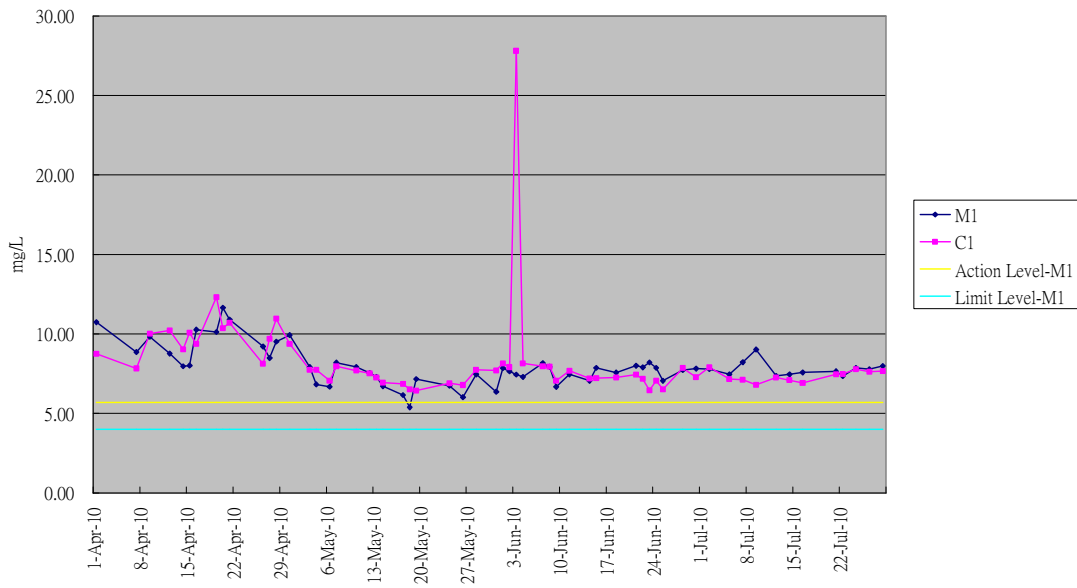
**Graphical Plot of Turbidity Trend M3&C3 (Apr - Jul 10)**



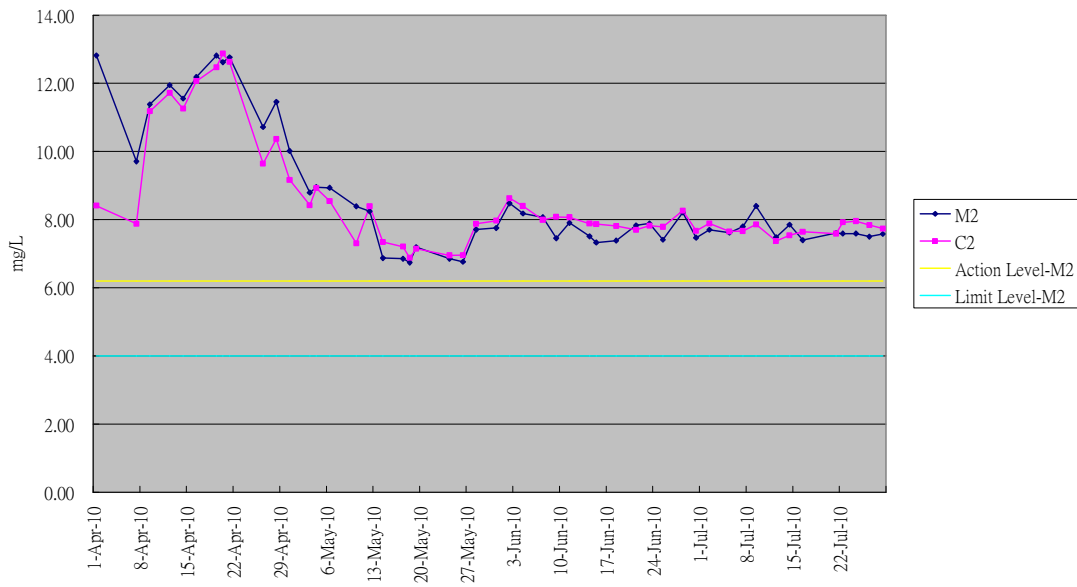
**Graphical Plot of Turbidity Trend M4 (Apr - Jul 10)**



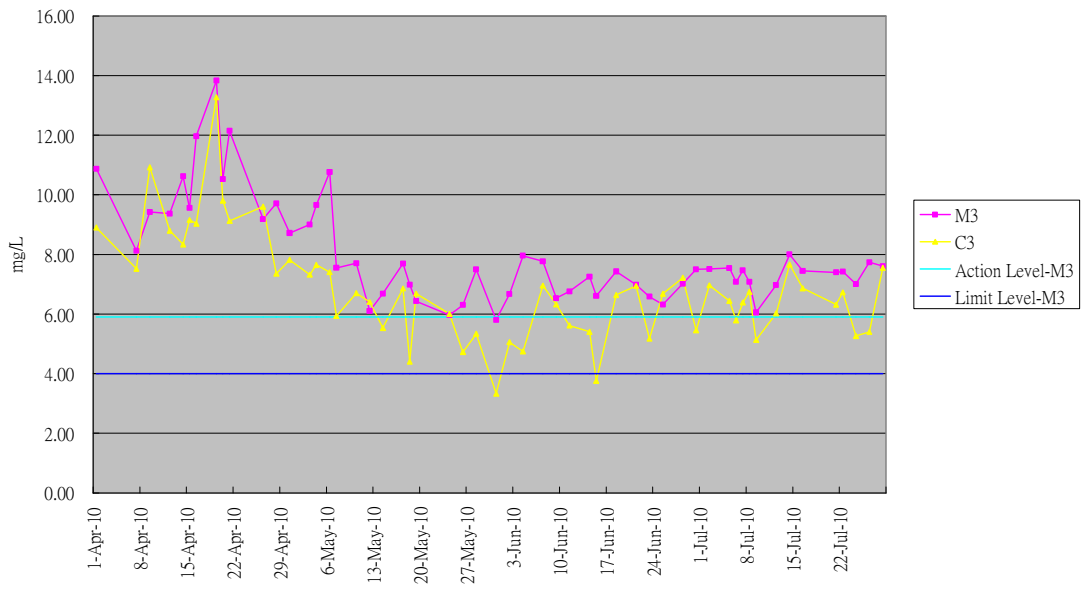
**Graphical Plot of Dissolved Oxygen Trend M1&C1 (Apr - Jul 10)**



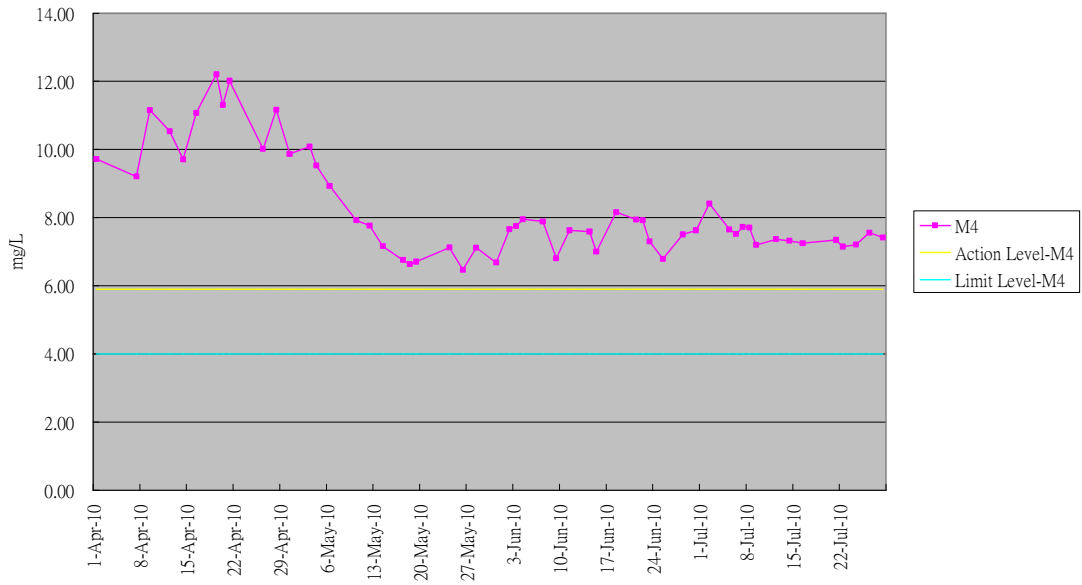
**Graphical Plot of Dissolved Oxygen Trend M2&C2 (Apr - Jul 10)**



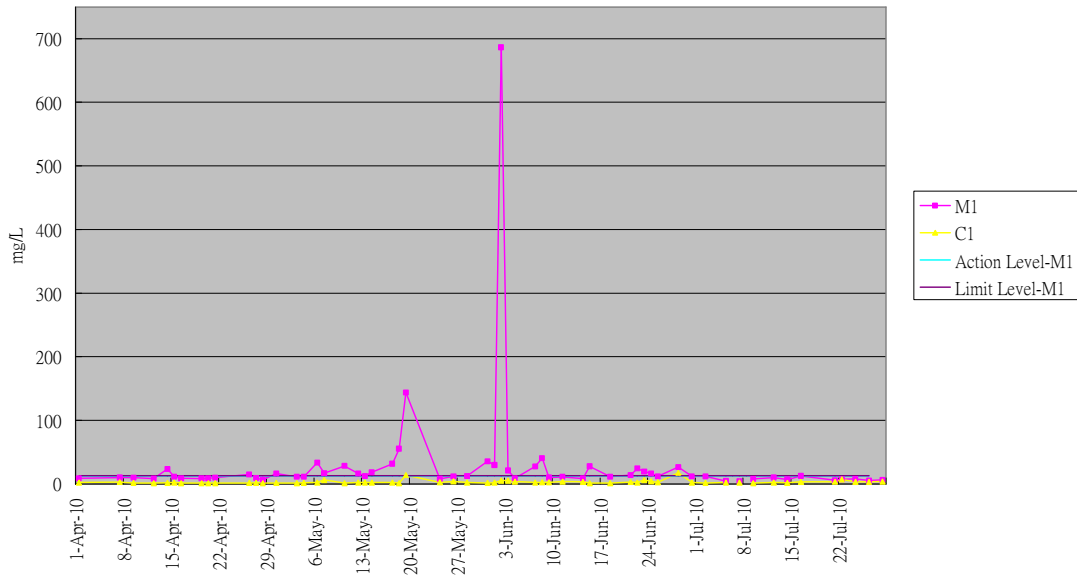
**Graphical Plot of Dissolved Oxygen Trend M3&C3 (Apr - Jul 10)**



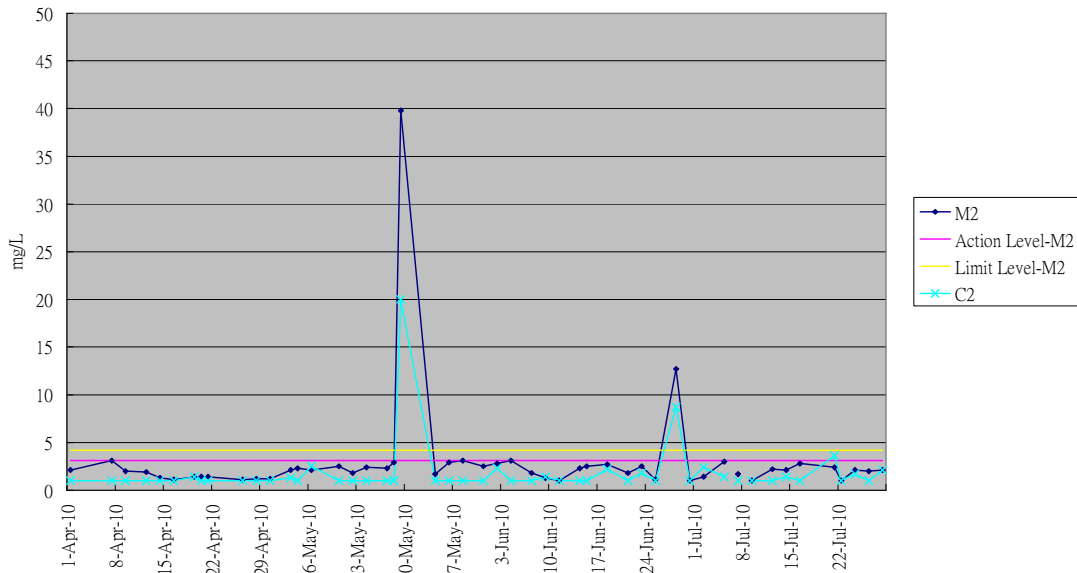
**Graphical Plot of Dissolved Oxygen Trend M4 (Apr - Jul 10)**



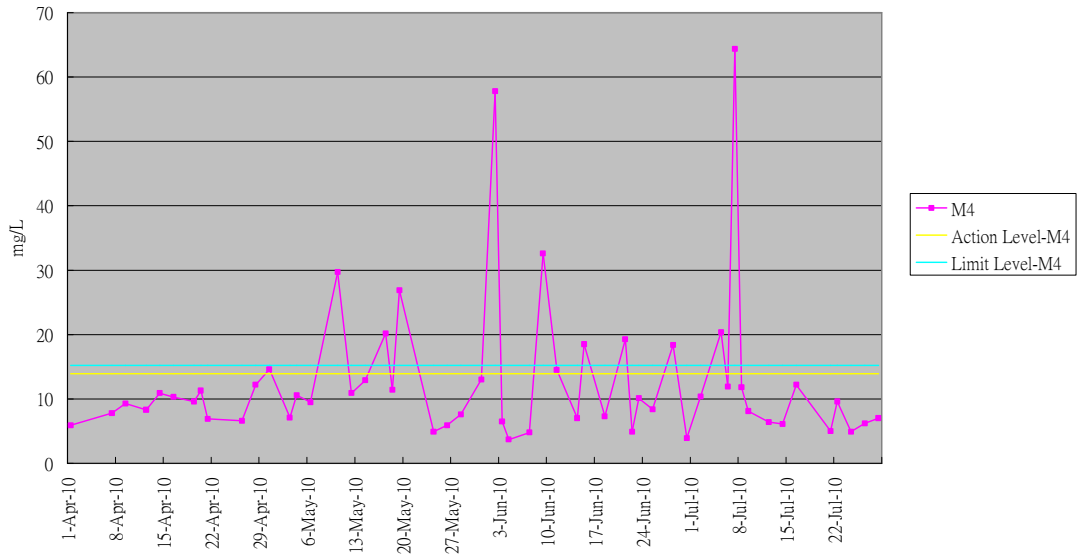
**Graphical Plot of Suspended Solid M1&C1 (Apr - Jul 10)**



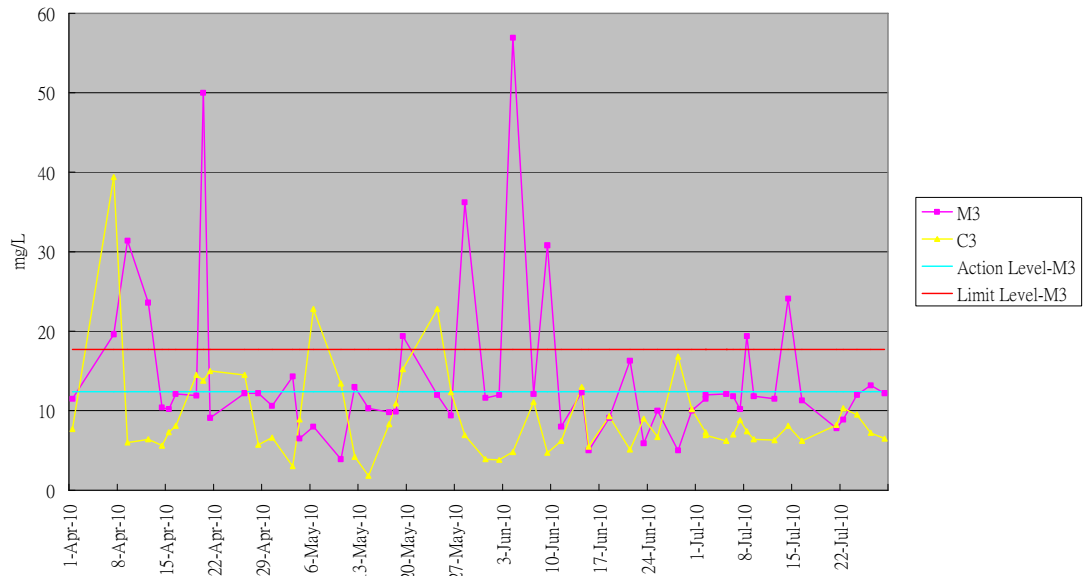
**Graphical Plot of Suspended Solid M2&C2 (Apr - Jul 10)**



**Graphical Plot of Suspended Soild M4 (Apr - Jul 10)**



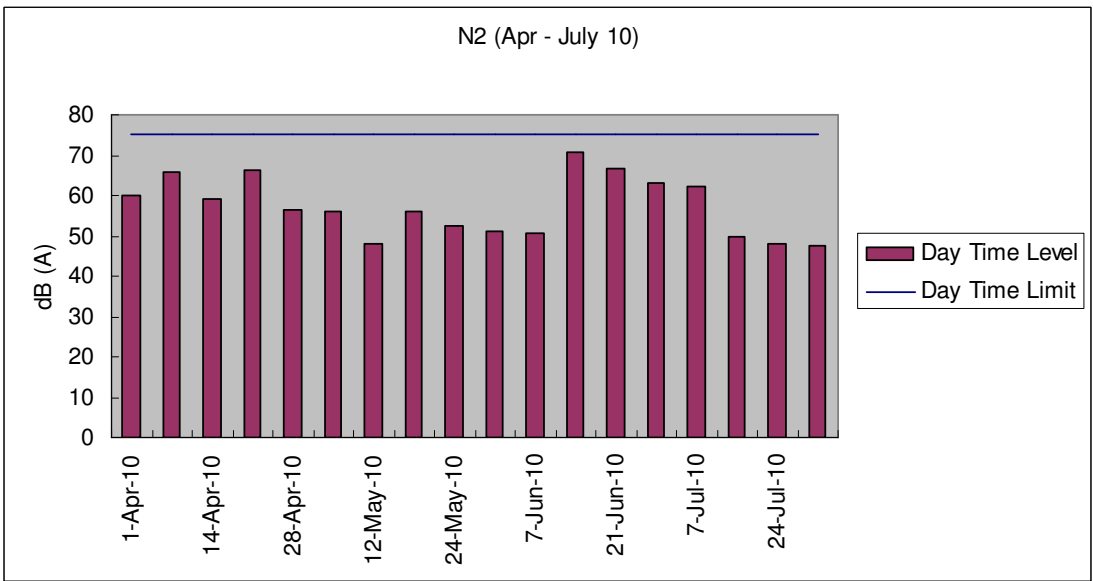
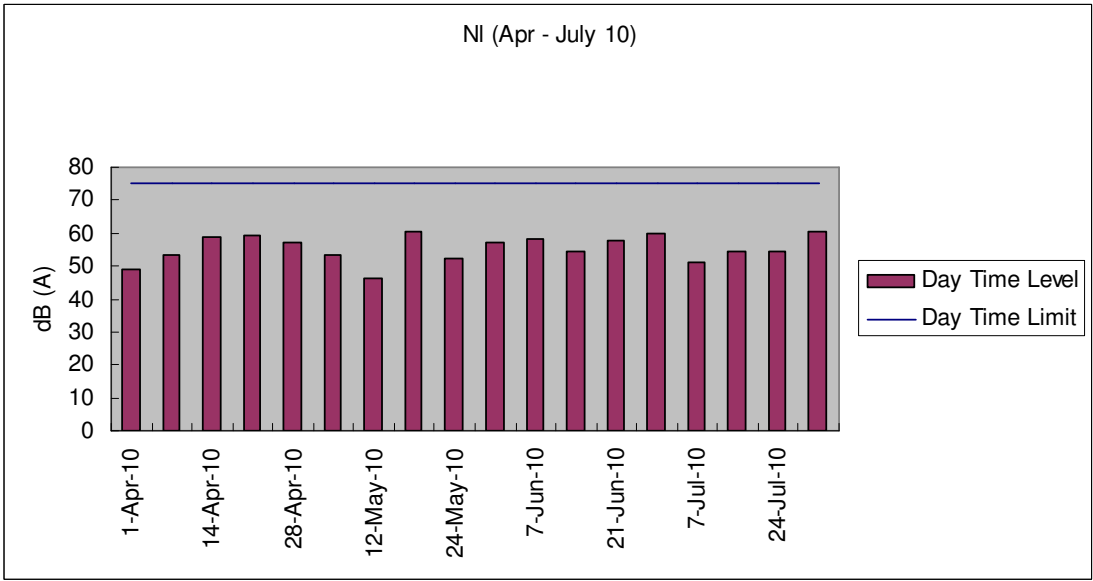
**Graphical Plot of Suspended Soild M3&C3 (Apr - Jul 10)**



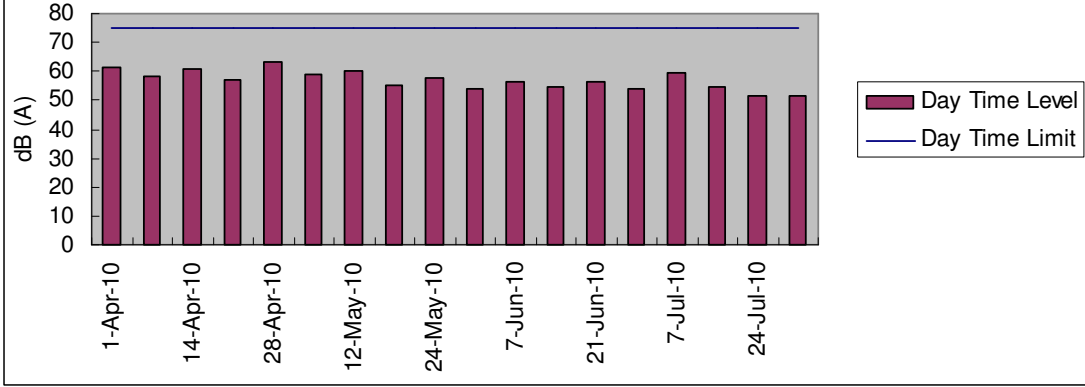
## Appendix J

Graphical plot of noise  
monitoring results





N3 (Apr - July 10)



N4 (Apr - July 10)

