

**Drainage Service Department**

**Monthly Environmental Monitoring & Auditing report for**

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

**Drainage Improvement in Southern Lantau**

**January 2011**

**Environmental Pioneers & Solutions Limited**

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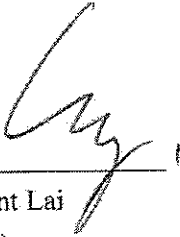
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## APPROVAL SHEET

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## **EXECUTIVE SUMMARY**

This is the thirtieth 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 January 2011 to 31 January 2011. Landscaping and site clearance works were major site activities being carried out within this reporting month.

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 30 non-compliance events of water quality criteria were recorded in this reporting period. No particular observation of defective site activities were found causing water contamination and such conditions were believed to be mainly attributed by natural fluctuation.

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.

Future site activities to be carried out will be mainly site clearance and

landscaping works. It is expected that environmental impact in different aspects 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 thirtieth 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.

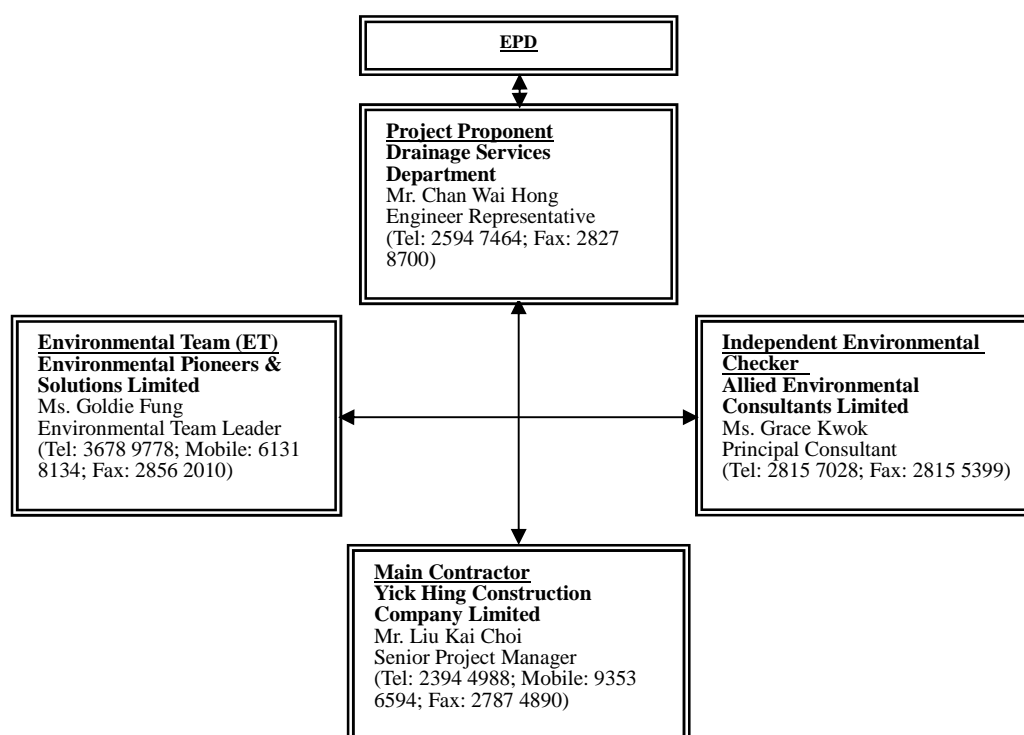


Figure. 2.2.1 Environmental Management structure for the project

## 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. Landscaping works.
2. Site clearance works for completion.

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

Proposed key construction works in the coming month will include:

1. Landscaping works
2. Site clearance works for completion.

#### **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 Svantek 949	IEC 651 Type 1 IEC 804 Type 1	2
Windscreen	Microtech gefell model W2	N/A	1
Acoustical calibrator	Castle GA607 Svantek SV30A	IEC 942 Type 1	2
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.

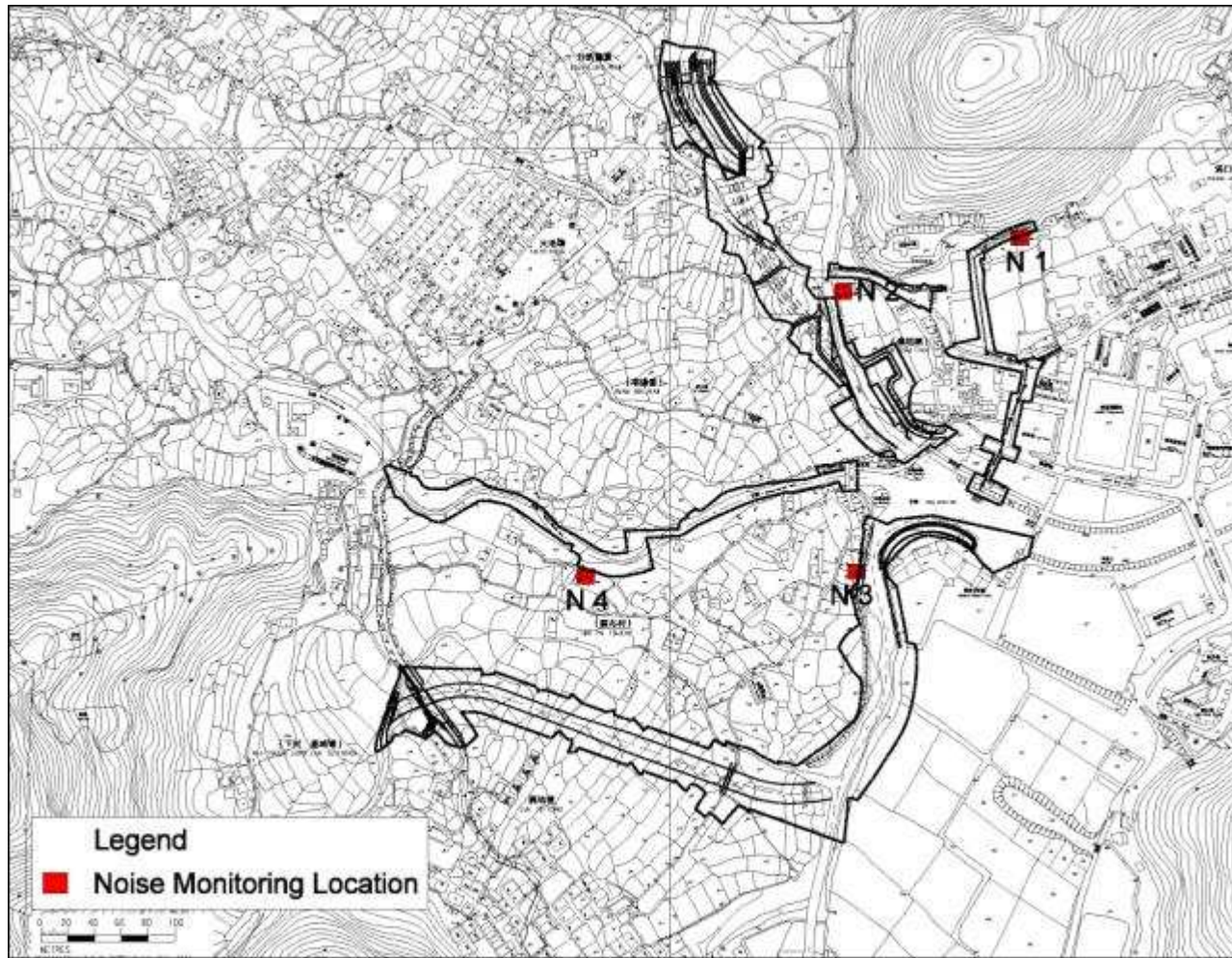


Figure 4.3.1 Impact noise monitoring locations

#### 4.4 Monitoring Results and Interpretation

Relevant details of the noise monitoring results are presented in Table 4.4.1. The results, ranged between 48.1 dB(A) and 70.5 dB(A), were within the limit levels and therefore, no exceedance was found.

Table 4.4.1 Noise monitoring results

Table 4.4.1 Noise Monitoring Results for the reporting month							
Location	Parameter	Date	Time	L <sub>Aeq</sub> dB(A)	Limit dB(A)	Exceedance	Weather
N1	L <sub>eq</sub> 30mins	3-Jan-11	14:35	54.6	75	N	Cloudy
N1	L <sub>eq</sub> 30mins	10-Jan-11	13:40	58.0	75	N	Sunny
N1	L <sub>eq</sub> 30mins	17-Jan-11	14:45	48.1	75	N	Sunny
N1	L <sub>eq</sub> 30mins	24-Jan-11	13:25	51.1	75	N	Cloudy
N1	L <sub>eq</sub> 30mins	31-Jan-11	14:00	53.7	75	N	Sunny
N2	L <sub>eq</sub> 30mins	3-Jan-11	15:10	61.6	75	N	Cloudy
N2	L <sub>eq</sub> 30mins	10-Jan-11	12:55	70.5	75	N	Sunny
N2	L <sub>eq</sub> 30mins	17-Jan-11	14:10	54.0	75	N	Sunny
N2	L <sub>eq</sub> 30mins	24-Jan-11	12:50	51.2	75	N	Cloudy
N2	L <sub>eq</sub> 30mins	31-Jan-11	14:35	67.3	75	N	Sunny
N3*	L <sub>eq</sub> 30mins	3-Jan-11	14:35	52.5	75	N	Cloudy
N3*	L <sub>eq</sub> 30mins	10-Jan-11	12:25	54.3	75	N	Sunny
N3*	L <sub>eq</sub> 30mins	17-Jan-11	14:00	57.2	75	N	Sunny
N3*	L <sub>eq</sub> 30mins	24-Jan-11	12:08	49.2	75	N	Cloudy
N3*	L <sub>eq</sub> 30mins	31-Jan-11	12:05	60.7	75	N	Sunny
N4	L <sub>eq</sub> 30mins	3-Jan-11	14:00	58.8	75	N	Cloudy
N4	L <sub>eq</sub> 30mins	10-Jan-11	11:50	49.4	75	N	Sunny
N4	L <sub>eq</sub> 30mins	17-Jan-11	13:20	49.5	75	N	Sunny
N4	L <sub>eq</sub> 30mins	24-Jan-11	11:35	46.2	75	N	Cloudy
N4	L <sub>eq</sub> 30mins	31-Jan-11	11:30	56.2	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.

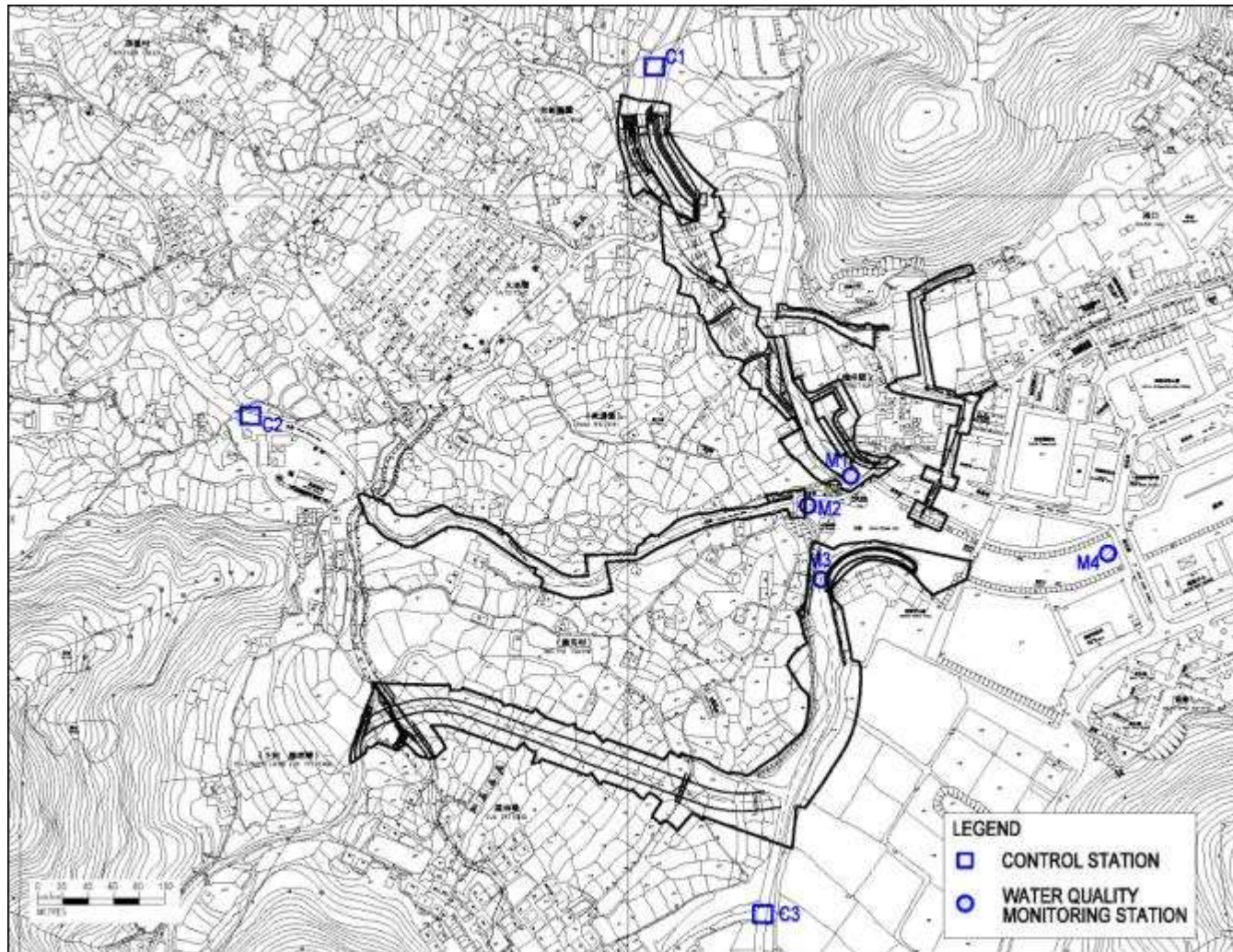


Figure 5.3.1 Water Quality Monitoring Locations

#### **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 thirteen times in this reporting month. 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 30 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. No particular observations of defective site activities were found causing the exceedance and such conditions were believed to be attributed by natural fluctuation.

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

Table 5.5.1 Water quality monitoring results in January 2011

	M1			M2			M3			M4		
	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave
Turbidity (NTU)	0.0	5.1	0.8	0.0	0.7	0.1	0.0	15.4	4.4	0.0	7.8	2.0
DO (mg/l)	9.3	10.8	10.3	9.5	10.7	10.1	8.1	10.9	9.5	8.2	10.3	9.2
Suspended Solid (mg/l)	1.0	6.2	2.6	1.0	2.0	1.4	2.8	12.2	5.3	2.5	7.7	4.3

	C1			C2			C3		
	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave
Turbidity (NTU)	0.0	2.9	0.4	0.0	0.0	0.0	0.8	13.7	5.7
DO (mg/l)	9.8	11.0	10.5	8.2	10.9	9.7	8.4	10.7	9.4
Suspended Solid (mg/l)	1.0	2.4	1.4	1.0	1.8	1.1	3.9	11.8	6.3

\* 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 quality monitoring schedule is proposed to be carried out on 9, 11, 15, 16, 18, 21, 23, 24, 28 February 2011.

As major construction activities, especially river-based construction activities, were finished by the end of January 2011, ET proposed to commence the post-construction phase water quality monitoring to confirm the restoration of water quality for the rivers according to requirement stated in the EM&A manual. The post-construction phase monitoring will commence in March 2011 and cover for 4 weeks. The schedule for post-construction phase monitoring is subject to be confirmed.

## **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.

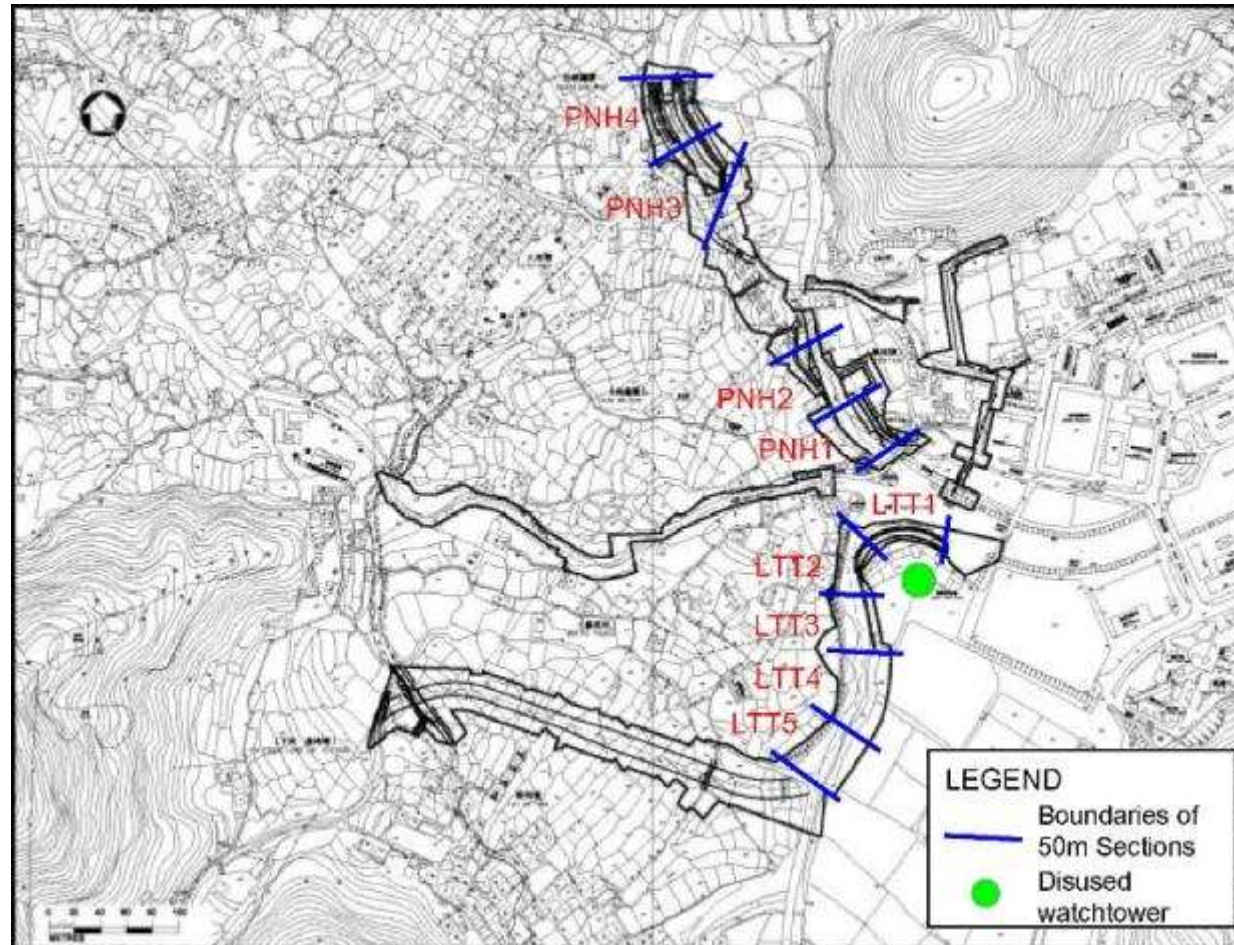


Figure 6.1 Ecological Monitoring Locations

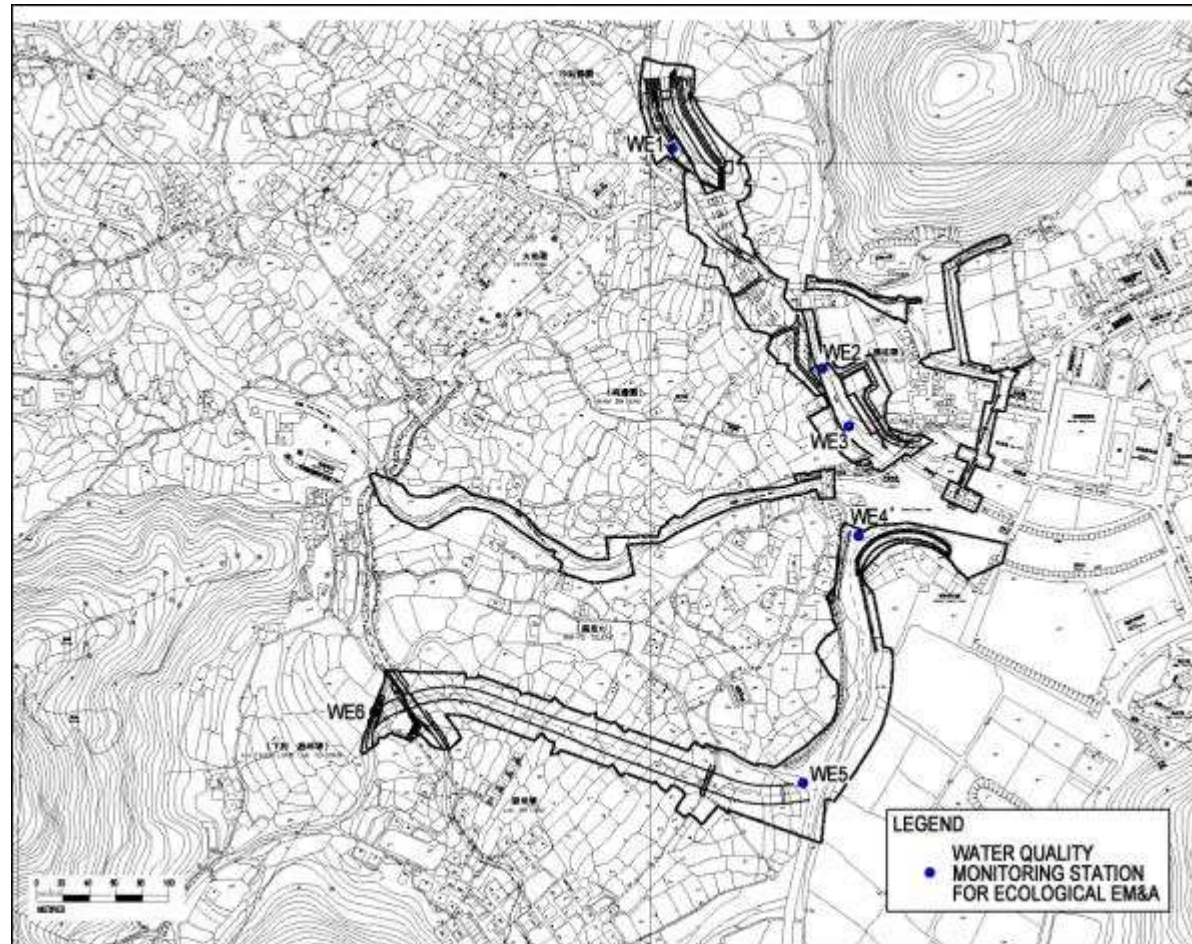


Figure 6.2 Ecological Water Quality monitoring locations

## 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 11 January 2011. During the current monitoring session, construction of new rock gabion wall was completed, and soft landscape works are underway. The understorey of the existing tree canopy along PNH4 was cleared and temporary works area along both sides of gabions were planted with tree and shrub seedlings.

The walk through survey recorded a total of 31 species, including 15 tree, 3 shrub, 7 herb and 3 grass species (Appendix D1) on PNH N section. 23 of the species recorded are natives, while 8 were exotics. Remnants of vegetation including native trees (e.g. *Macaranga tanarius*) and grasses species (e.g. *Microstegium ciliatum*) were still seen along the east stream bank. Newly planted species included seedlings of such as *Ficus microcarpa*, *Gardenia jasminoides*, *Celtis sinensis*, *Liquidambar formosana* and *Mallotus paniculatus*. 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.

Vegetation was only found on remnants of the old concrete bank along PNH S section. A total of 5 species recorded, 3 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*) (Appendix D2). No species of conservation interest was recorded.

### *Terrestrial Fauna*

Surveys were conducted on 7 January 2011.

One species of birds were recorded in the proposed work area of the Pak Ngan Heung River (Table 6.5.2). Chinese Bulbul is common in Hong Kong.

**Table 6.5.2 Avifauna in Pak Ngan Heung**

Common names	Latin names	PNH 1	PNH 2	PNH 3	PNH 4	Commonness & distribution
Chinese Bulbul	<i>Pycnonotus sinensis</i>				1	CW

CW = common and widespread

No dragonfly was recorded in the proposed work area of the Pak Ngan Heung River (Table 6.5.3) in December 2010.

### *Aquatic fauna and fish*

The major construction works for the fish ladder inside PNH3 have been finished, and the flow in this section was restored. The monitoring survey covered all 4 sections in Pak Ngan Heung again. 8 species of fish and 3 crustacean were recorded in the 4 sections at PNH. All are common and widespread in Hong Kong. Though Predaceous Chub was observed, the another one fish species of conservation concern reported in the EIA report, i.e. Flagtail *Kuhlia marginata*, was not recorded in PNH during the present monthly monitoring survey. Aquatic fauna including Predaceous Chub were recorded in the recently finished fish ladder and it demonstrated that the design of the fish ladder could provide habitat for stream fauna.

**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 hainanense</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 11 January 2011. During the current survey, construction of concrete channel bank and rock gabions are completed, and soft landscape works are underway. Some remnants of vegetation and mangroves remained at both LLT1 and LLT2 respectively.

The walk through survey recorded a total of 19 species, including 8 tree, 4 herb and 5 grass species (Appendix D3). 14 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 7 January 2011.

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



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

Common names	Latin names	LTT	LTT	LTT	LTT	LTT	Commonness & distribution
		1	2	3	4	5	
Little Egret	<i>Egretta garzetta</i>	2	1	1	1		CW
Great Egret	<i>Casmerodius alba</i>	1					CL
Chinese Pond Heron	<i>Ardeola bacchus</i>	1					CW
Grey Heron	<i>Ardea cinerea</i>						CL
Common Sandpiper	<i>Actitis hypoleucos</i>	1					CW
Common Snipe	<i>Gallinago gallinago</i>				1		CL
White Wagtail	<i>Motacilla alba</i>	2					CW
Rufous-backed Shrike	<i>Lanius schach</i>					1	CW
Crested Myna	<i>Acridotheres cristatellus</i>					2	CW

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

No species of dragonfly were recorded in the Luk Tei Tong River in January 2011 (Table 6.5.7).

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

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

### **Disused Watchtowers**

Surveys were conducted on 7 January 2011.

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 January 2011 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 19 January 2011. 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, no abnormal results were found when comparing with baseline results.

**Table 6.9 Summarized Ecological water quality monitoring results (19 January 2011)**

Parameters	Limit of detection	WE1	WE2	WE3	WE4	WE5	WE6
Suspended Solid (mg/l)	1	2.00	1.00	1.45	6.10	7.45	2.00
Nitrogen (Ammonia) (mg/l)	0.01	0.03	0.04	1.05	0.06	0.81	0.05
Nitrogen (Nitrate) (mg/l)	0.01	0.15	0.17	0.34	0.20	0.17	0.06
Phosphorous (mg/l)	0.01	0.04	0.04	0.14	0.07	0.17	0.05
BOD <sub>5</sub> (mg/l)	1	1.00	1.00	3.00	1.00	4.00	1.00
DO (mg/l)	0.01	10.65	9.91	10.22	9.36	10.73	10.37
Turbidity (NTU)	0.1	0.00	0.00	0.50	6.20	4.80	0.00
Temperature (oC)	0.1	15.6	15.6	18.5	18.5	23.7	18.1
pH	0.01	7.7	7.7	8.6	7.7	7.4	7.8
Salinity (ppt)	0.1	0.0	0.3	2.1	22.2	14.3	0.0
Conductivity (s/m)	0.1	10.6	516.0	0.4	3.6	2.4	5.7
Water Flow (m/s)	N/A	0.1	0.1	0.1	0.1	0.1	0.1

**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 8 and 11 February 2011, while ecological water quality monitoring is scheduled on 16 February 2011.

## **7. Action taken in Event of Exceedence**

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

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

Total 30 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. No particular observations of defective site activities were found causing the exceedance and such conditions were believed to be attributed by natural fluctuation.

## 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> Jan 11	1967.40 (ton)	34.50 (ton)	Nil
Total	35381.16 (ton)	247.43 (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
January 2011	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 3, 14, 17 and 27 January 2011

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
Nov 10, 6, 20 & 31 Dec 10	Issue of follow up actions in removing abandoned site materials and wastes within site area was still outstanding	Contractor was reminded to implement necessary rectification as soon as possible	Partial of wastes tipped at LTT inlet A and end section of PNH box culvert has been removed	3 Jan 11
Nov 10 & 31 Dec 10	Open stockpile of earth material was observed at PNH fish ladder site	Contractor was advised to provide tarpaulin covering to earthy stockpile to prevent erosion and dust generation	Still outstanding. To be followed during the next reporting period	Ongoing
3, 14, 17 & 27 Jan 11	C&D wastes, site materials and general wastes were observed within site area	Contractor should remove wastes and site materials from the concerned area as soon as possible as works finished	Still outstanding. To be followed during the next reporting period	Ongoing
3 Jan 11	Earthy stockpile at PNH fish ladder site was not properly covered during inspection	Contractor was advised to rectify discrepancy observed by completely cover the stockpile with tarpaulin coverings	The concerned stockpile has been removed for disposal prior to the inspection on 14 Jan	14 Jan 11
14, 17 & 27 Jan 11	Site surface was observed to be dry and dusty	Contractor was advised to provide regular water spraying to dusty static area for dust suppression	Follow up action was unsatisfactory and to be followed with the improvement during next reporting period	Ongoing
27 Jan 11	Concrete debris has been tipped at private land where was rented by Contractor	Contractor was remind illegal dumping at private land is not allowed and they should assign licensed waste collector to collect and dispose observed wastes as soon as possible	To be followed during 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**

Site clearance and defects rectification would be major site activities to be carried out in the upcoming month. Although environmental impact arisen from those activities would be expected to be minimal, Contractor was still reminded to pay serious attention to the following key issues:

- Dust generation due to handling of earthy material and dusty site surface.
- Housekeeping of site, such as stockpiling of C&D waste and earthy material.
- Removal of wastes as part of site clearance and evacuation.

Contractor was recommended to provide tarpaulin coverings to all earthy stockpiles on site. Dusty static area should be dampened regularly to avoid dust generation.

Contractor should also prevent excessive storage of wastes on site. Wastes should be collected and disposed to designated public fill.

### **13. Conclusions**

Site clearance and landscaping works were major site activities being carried out within this reporting period.

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 27 January 2011.

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

For water quality monitoring, total 30 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. No particular observations of defective site activities were found causing the exceedance and such conditions were believed to be attributed by natural fluctuation.

During ecological monitoring survey, no White-shouldered Starling was recorded breeding in the watch tower. The breeding season of White-shouldered Starling in this year has finished. 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.

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**














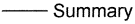




Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	%	Predecessors	2008												2009												2010												2011											
								JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB										
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	Pres																																															
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	Prot																																															

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











## 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. Goldie Fung	3678 9778	2856 2010

## Appendix C

# **Calibration Certificates for Measuring Equipments**



## CERTIFICATE OF CALIBRATION

Certificate No.: 10CA0306 01

Page: 1 of 2

### Item tested

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

### Item submitted by

Customer: Geotechnics & Concrete Engineering (H.K.) Ltd.  
Address of Customer: 6 Ko Shan Road, Ground FL., Hung Hom, Kowloon, Hong Kong  
Request No.: RS/10/023-PO  
Date of request: 06-Mar-2010

Date of test: 06-Mar-2010

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	23-Jun-2010	SCL
Preamplifier	B&K 2673	2239857	15-Dec-2010	CEPREI
Measuring amplifier	B&K 2610	2346941	11-Dec-2010	CEPREI
Signal generator	DS 360	61227	22-Jun-2010	CEPREI
Digital multi-meter	34401A	US36087050	03-Dec-2010	CIGISMEC
Audio analyzer	8903B	GB41300350	07-Dec-2010	CEPREI
Universal counter	53132A	MY40003662	23-Jun-2010	CEPREI

### Ambient conditions

Temperature:  $22 \pm 1$  °C  
Relative humidity:  $60 \pm 5$  %  
Air pressure:  $1005 \pm 5$  hPa

### Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

### Test results

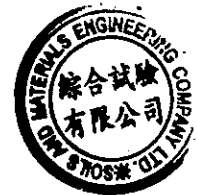
Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:

  
Huang Jian-Min/Feng Jun Qi

Date: 09-Mar-2010

Company Chop:



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



# Calibration Certificate

Certificate No. 01100

Page 1 of 2 Pages

**Customer :** Environmental Pioneers and Solutions Limited

**Address :** Flat A, 8 Floor, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, Hong Kong.

**Order No. :** Q00196

**Date of receipt :** 5-Mar-10

## Item Tested

**Description :** Sound Level Calibrator

**Manufacturer :** Svantek

**Model :** SV30A

**Serial No. :** 7908

## Test Conditions

**Date of Test :** 5-Mar-10

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure : F21, Z02.

## Test Results

All results were within the IEC 942 Class 1 specification.

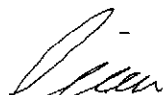
The results are shown in the attached page(s).


Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceable to</u>
S014	Spectrum Analyzer	93091	18-Jun-10	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	93758	16-Jul-10	NIM-PRC & SCL-HKSAR
S041	Universal Counter	94005	6-Aug-10	SCL-HKSAR
S206	Sound Level Meter	93966	5-Aug-10	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).  
The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
P.F. Wong

**Approved by :**   
Dorothy Cheuk

**Date:** 5-Mar-10



# Calibration Certificate

Certificate No. 01100

Page 2 of 2 Pages

Results :

## 1. Level Accuracy

UUT Nominal Value (dB)	Measured Value (dB)	IEC 942 Class 1 Spec.
94	94.09	± 0.3 dB
114	114.21	

Uncertainty : ± 0.2 dB

## 2. Frequency

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

Uncertainty : ± 3.6 x 10<sup>-6</sup>

## 3. Level Stability : 0.0 dB

IEC 942 Class 1 Spec. : ± 0.1 dB

Uncertainty : ± 0.01 dB

## 4. Total Harmonic Distortion : < 1.6 %

IEC 942 Class 1 Spec. : < 3 %

Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test

2. The above measured values are the mean of 3 measurements.

3. The uncertainty claimed is for a confidence probability of not less than 95%.

4. Atmospheric Pressure : 1 005 hPa.

----- END -----

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 100104  
Serial No. of body: \_\_\_\_\_  
マイクロホン製造番号 39967  
Serial No. of Microphone: \_\_\_\_\_  
Ver:1.6E-09-11

年月日: 平成22年1月7日  
Date: January 7, 2010

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22年1月7日                      January 7, 2010

2. 検査条件 Inspection Condition

- 1) 温度    Temperature    :            20 °C
- 2) 湿度    Humidity            :            44 %
- 3) 気圧    Barometric pressure :            987 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	-0.1	-0.1
20-100	70	0.0	0.0	0.0
20-110	80	0.0	0.0	0.0
30-120	90	-0.1	0.0	0.0
40-130	100	-0.1	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	0.1	0.1
105	±0.7	-0.1	0.0	-0.1
100	±0.7	-0.1	0.0	-0.1
95	±0.7	0.0	0.0	0.0
90	±0.7	0.0	0.2	0.1
85	±0.7	0.2	0.2	0.2
80	±0.7	0.2	0.1	0.1
75	±0.7	0.0	0.1	0.0
70	±0.7	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0
60	±0.7	0.1	0.0	0.0
55	±0.7	0.0	-0.1	-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	0.1	0.0	0.0
30	±0.7	0.0	-0.1	-0.1
25	±0.7	0.1	0.0	0.0
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	-49.1	1.4	-6.2	-5.3	0.9	-0.9	±3.0
40	-34.6	-34.0	0.6	-2.0	-1.8	0.2	-0.2	±1.5
100	-19.1	-18.6	0.5	-0.3	-0.2	0.1	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	1.2	0.0	-0.2	-0.2	0.0	0.1	±1.0
4k	1.0	0.9	-0.1	-0.8	-0.8	0.0	0.2	±1.0
5k	0.5	0.7	0.2	-1.3	-1.1	0.2	0.4	±1.5
6.3k	-0.1	0.1	0.2	-2.0	-1.7	0.3	0.5	+1.5 -2
8k	-1.1	-0.9	0.2	-3.0	-2.8	0.2	0.3	+1.5 -3
10k	-2.5	-2.4	0.1	-4.4	-4.2	0.2	-0.1	+2 -4
12.5k	-4.3	-3.6	0.7	-6.2	-5.4	0.8	-0.1	+3 -6
16k							0.0	
20k							-1.6	
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)	16.4	23.6	26.0
判定 Passed	Pass		



# Calibration Certificate

Certificate No. **00987**

Page 1 of 3 Pages

**Customer :** Environmental Pioneers and Solutions Limited

**Address :** Flat A, 8 Floor, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, Hong Kong.

**Order No. :** Q00196

**Date of receipt :** 1-Mar-10

## Item Tested

**Description :** Digital Sound Level Meter

**Manufacturer :** SVAN

**Model :** 949

**Serial No. :** 8569

## Test Conditions

**Date of Test :** 5-Mar-10

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure: Z01.

## Test Results

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

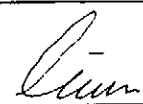
The results are shown in the attached page(s).


Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C081456	18-Mar-10	SCL-HKSAR
S024	Sound Level Calibrator	93758	16-Jul-10	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).  
The test results apply to the above Unit-Under-Test only

Calibrated by :   
P.F. Wong

Approved by :   
Dorothy Cheuk

Date: 8-Mar-10

This Certificate is issued by:  
Hong Kong Calibration Ltd.  
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.  
Tel: 2425 8801 Fax: 2425 8646

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# Calibration Certificate

Certificate No. 00987

Page 2 of 3 Pages

Results :

## 1. SPL Accuracy

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Level Range	Octave Filter	Weight	Response		
105 dB	OFF	A	Fast	94.03	94.0
			Slow		94.0
		C	Fast		94.0
130 dB	OFF	A	Fast	94.03	94.1
			Slow		94.1
		C	Fast		94.1
	OFF	A	Fast	113.97	113.9
			Slow		113.9
		C	Fast		113.9

IEC 651 Type 1 Spec. :  $\pm 0.7$  dB

Uncertainty :  $\pm 0.1$  dB

## 2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. :  $\pm 0.3$  dB

Uncertainty :  $\pm 0.01$  dB

## 3. Linearity

### 3.1 Level Linearity

UUT Range	Applied Value (dB)	UUT Rdg (dB)	Variation (dB)	IEC 651 Type 1 Spec. (inside Primary)
130	114.0	114.0	-0.1	$\pm 0.7$ dB
	104.0	104.0	-0.1	
	94.0	94.1 (Ref.)	--	
105	84.0	84.0	-0.1	
	74.0	74.0	-0.1	
	64.0	64.0	-0.1	
	54.0	54.0	-0.1	

Uncertainty :  $\pm 0.1$  dB



# Calibration Certificate

Certificate No. 00987

Page 3 of 3 Pages

## 3.2 Differential level linearity

UUT Range	Applied Value (dB)	UUT Rdg (dB)	Variation (dB)	IEC 651 Type 1 Spec.
130	84.0	83.9	-0.2	± 0.4 dB
	94.0	94.1(Ref.)	--	
	95.0	95.2	+0.1	± 0.2 dB
	104.0	104.0	-0.1	± 0.4 dB
	105.0	105.0	-0.1	
	114.0	114.0	-0.1	± 1.0 dB

Uncertainty : ± 0.1 dB

## 4. Frequency Weighting

### A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	-40.6	- 39.4 dB, ± 1.5 dB
63 Hz	-27.4	- 26.2 dB, ± 1.5 dB
125 Hz	-17.0	- 16.1 dB, ± 1 dB
250 Hz	-9.7	- 8.6 dB, ± 1 dB
500 Hz	-4.0	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref)	0 dB, ± 1 dB
2 kHz	+1.8	+ 1.2 dB, ± 1 dB
4 kHz	+1.8	+ 1.0 dB, ± 1 dB
8 kHz	-0.2	- 1.1 dB, + 1.5 dB ~ -3 dB
16 kHz	-6.1	- 6.6 dB, + 3 dB ~ - ∞

Uncertainty : ± 0.1 dB

## 5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	50.0	--	--
1/10	50.0	49.9	± 0.5 dB
1/10 <sup>2</sup>	50.0	49.9	
1/10 <sup>3</sup>	50.0	50.0	± 1.0 dB
1/10 <sup>4</sup>	50.0	50.0	

Uncertainty : ± 0.1 dB

Remarks : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. Atmospheric Pressure : 1 005 hPa.

----- END -----



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

Calibration Reference No. : GCE/CAL/2010/MW/WQM/C1

Client : ENVIRONMENTAL PIONEER AND SOLUTION LIMITED

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

Manufacturer : DKK-TOA Serial No.: 640274

Calibration Date : 11 to 15-09-2010 Due Date : 10-12-2010

### 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	15.1 mS/m	
0.005	71.8 mS/m	72.4 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	0.145 S/m	
0.05	0.667 S/m	0.671 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	Ave.: 0.00, 5.88	

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

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	
3.20	3.26		
5.70	5.77	Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 0.1 mg/L against standard value	
8.50	8.55		
10.45	10.39		
13.20	13.12		
Repeatability	1 <sup>st</sup> time	0.00 , 8.57	Within ± 0.1 mg/L against average value
	2 <sup>nd</sup> time	0.00 , 8.55	
	3 <sup>rd</sup> time	0.00 , 8.53	
	0.00 , 8.50	Ave.: 0.00 , 8.55	

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	1.64	0.9999
pH = 6.88	4.00	4.01	Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 0.05 pH against standard value
pH = 7.00	6.88	6.85	
pH = 9.22	7.00	7.03	
pH = 10.00	7.43	7.45	
	9.22	9.19	
	10.00	9.97	
	12.64	12.60	
Repeatability	1 <sup>st</sup> time	4.01 , 9.96	Within ± 0.05 pH against average value
	2 <sup>nd</sup> time	4.01 , 9.97	
	3 <sup>rd</sup> time	4.02 , 9.98	
	pH 4.00 , 10.00	Ave.: 4.01 , 9.97	

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	4.7		0.9999  Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 0.5°C against standard value
15.0	14.7		
25.0	24.7		
35.0	34.8		
45.0	45.2		
55.0	55.4		
Repeatability	1 <sup>st</sup> time	14.7 , 45.3	Within ± 0.25°C against average value
	2 <sup>nd</sup> time	14.7 , 45.2	
	3 <sup>rd</sup> time	14.6 , 45.2	
	15.0 , 45.0	Ave.: 14.7 , 45.2	

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


**Turbidity:**

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

Formazin Standards (NTU)	Indicated value by meter (NTU)		Linearity (R <sup>2</sup> )
0.0	0.0		1.0000
20.0	19.5		Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 3% F.S. against span calibration value 100.0 and 400.0 NTU
100.0	98.3		
400.0	396.9		
800.0	795.9		
Repeatability	1 <sup>st</sup> time	0.0 , 796.2	
	2 <sup>nd</sup> time	0.0 , 795.5	
	3 <sup>rd</sup> time	0.0 , 795.9	
	0.0 , 800.0	Ave.: 0.0 , 795.9	

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 : 15-9-2010



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

<i>Species</i>	Habit	Native	Relative	Occurrence	
			Abundance	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>Amaranthus viridus</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>Conyza canadensis</i>	herb	no	scarce		+
<i>Desmos chinensis</i>	shrub	yes	scarce		+
<i>Dimocarpus longan</i>	tree	no	occasional		+
<i>Eleusine indica</i>	grass	yes	scarce		+
<i>Ficus microcarpa</i>	tree	yes	scarce		+
<i>Ficus superba</i>	tree	yes	occasional		+
<i>Ficus virens</i>	tree	yes	occasional		+
<i>Gardenia jasminoides</i>	shrub	yes	occasional		+
<i>Hedychium coronarium</i>	herb	no	occasional		+
<i>Liquidambar formosana</i>	tree	yes	occasional		+
<i>Macaranga tanarius</i>	tree	yes	occasional		+
<i>Mallotus paniculatus</i>	tree	yes	occasional		+
<i>Microcos paniculata</i>	tree	yes	scarce		+
<i>Microstegium ciliatum</i>	grass	yes	common		+
<i>Mikania micrantha</i>	climber	no	occasional	+	+
<i>Panicum maximum</i>	grass	no	scarce		+
<i>Phyllanthus urinaria</i>	shrub	yes	scarce		+
<i>Pteris vittata</i>	fern	yes	scarce		+
<i>Pterocypsela indica</i>	herb	yes	scarce		+
<i>Pueraria phaseloides</i>	climber	yes	scarce		+
<i>Rhus succedanea</i>	tree	yes	scarce		+
<i>Sterculia lanceolata</i>	tree	yes	scarce		+

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

Species	Habit	Native	Relative	Occurrence	
			Abundance	PNH1	PNH2
<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	Occurrence				
			Abundance	LLT1	LLT2	LLT3	LLT4	LLT5
<i>Acanthus ilicifolius</i>	shrub	yes	scarce		+			
<i>Achyranthes aspera</i>	herb	yes	scarce		+			
<i>Apluda mutica</i>	grass	yes	scarce		+			
<i>Bidens pilosa</i>	herb	no	scarce	+				
<i>Celtis sinensis</i>	tree	yes	scarce	+				
<i>Ficus superba</i>	tree	yes	scarce	+				
<i>Mikania micrantha</i>	climber	no	scarce	+				
<i>Ficus microcarpa</i>	tree	yes	scarce	+				
<i>Ficus hispida</i>	tree	yes	scarce	+				
<i>Mimosa pudica</i>	herb	yes	scarce		+			
<i>Wollastonia biflora</i>	herb	yes	scarce		+			
<i>Hibiscus tiliaceus</i>	tree	yes	scarce	+				
<i>Kandelia obovata</i>	tree	yes	occasional		+			
<i>Leucaena leucocephala</i>	tree	no	scarce	+				
<i>Macaranga tanarius</i>	tree	yes	scarce	+				
<i>Neyraudia reynaudiana</i>	grass	yes	scarce		+			
<i>Panicum maximum</i>	grass	no	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: 19/1/2011

Weather Condition: Sunny

Monitoring Location	WE1			WE2			WE3			WE4			WE5			WE6		
Time (hhmm)	1235			1225			1150			1210			1320			1310		
Tide Mode	ebb			ebb			ebb			ebb			ebb			ebb		
River Condition	Normal			Normal			Normal			Normal			Normal			Normal		
Water Depth (m)	< 1.0			< 1.0			< 1.0			< 1.0			< 1.0			< 1.0		
pH value	7.70			7.70			8.61			7.70			7.35			7.78		
Temperature (oC)	15.6			15.6			18.5			18.5			23.7			18.1		
Salinity (ppt)	0.0			0.3			2.1			22.2			14.3			0.0		
Conductivity (s/m)	10.6			516.0			0.4			3.6			2.4			5.7		
Water flow (m/s)	0.100			0.100			0.100			0.100			0.100			0.100		
Turbidity (NTU)	0.0	0.0	Average	0.0	0.0	Average	0.5	0.5	Average	6.2	6.2	Average	4.8	4.8	Average	0.0	0.0	Average
			0.00			0.00			0.50			6.2			4.80			0.0
DO (mg/l)	10.64	10.65	Average	9.89	9.93	Average	10.23	10.21	Average	9.35	9.37	Average	10.73	10.73	Average	10.36	10.37	Average
			10.65			9.91			10.22			9.36			10.73			10.37
DO Saturation (%)	107	107	Average	100	100	Average	104	104	Average	114	114	Average	101	101	Average	104	104	Average
			107			100			104			114			101			104

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
19/1/2011

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

## **Appendix D5**

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



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC110100683 Date of Issue : 07-02-2011

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

Client Address\* : Flat B, 6/F, Hop Shi Factory Building, 29 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 : 19-01-2011

W.O. No.\* : -- Contract No.\* : -- Date Completed : 31-01-2011

GCE Serial No. : WQM012011 Sampling Date\* : 19-01-2011 / 12:35 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) mg/L	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> E	0.15
Phosphorus mg/L	APHA 20ed 4500-P D	0.03
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

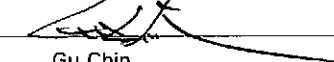
**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 19 January 2011.

**REMARKS :** Sample Location WE1.

----- End -----

Tested By : K.L. Fong, C.S. Chan

Certified By :   
 Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER**

Report No. : GCC110100691 Date of Issue : 07-02-2011

---

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

Client Address\* : Flat B, 6/F, Hop Shi Factory Building, 29 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 : 19-01-2011

W.O. No.\* : -- Contract No.\* : -- Date Completed : 31-01-2011

GCE Serial No. : WQM012011 Sampling Date\* : 19-01-2011 / 12:35 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	0.03
	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	0.15
Phosphorus mg/L	APHA 20ed 4500-P D	0.04
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 19 January 2011.

**REMARKS :** Sample Location WE1.

----- End -----

Tested By : K.L. Fong, C.S. Chan

Certified By :   
 Name : Gu Chin

Checked By : Gu Chin

Post : Chemist





## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC110100706

Date of Issue : 07-02-2011

Client\* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

Client Address\* : Flat B, 6/F, Hop Shi Factory Building, 29 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 : 19-01-2011

W.O. No.\* : --

Contract No.\* : --

Date Completed : 31-01-2011

GCE Serial No. : WQM012011

Sampling Date\* : 19-01-2011 / 12:25

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	0.04
	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	0.04
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 19 January 2011.

**REMARKS :** Sample Location WE2.


---- End ----

Tested By : K.L. Fong, C.S. Chan

Certified By

Name

Post

:   
 : Gu Chin  
 : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC110100714

Date of Issue : 07-02-2011

Client\* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

Client Address\* : Flat B, 6/F, Hop Shi Factory Building, 29 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 : 19-01-2011

W.O. No.\* : --

Contract No.\* : --

Date Completed : 31-01-2011

GCE Serial No. : WQM012011

Sampling Date\* : 19-01-2011 / 12:25

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	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	0.16
Phosphorus mg/L	APHA 20ed 4500-P D	0.04
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 19 January 2011.

**REMARKS :** Sample Location WE2.


----- End -----

Tested By : K.L. Fong, C.S. Chan

Certified By

Name

Post

  
 Gu Chin  
 Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC110100722 Date of Issue : 07-02-2011

---

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

Client Address\* : Flat B, 6/F, Hop Shi Factory Building, 29 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 : 19-01-2011

W.O. No.\* : -- Contract No.\* : -- Date Completed : 31-01-2011

GCE Serial No. : WQM012011 Sampling Date\* : 19-01-2011 / 11:50 Sample Type\* : River Water

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

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <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	1.07
	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	0.34
Phosphorus mg/L	APHA 20ed 4500-P D	0.14
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	3
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

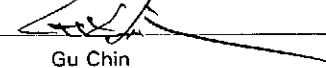
\* : Information provided by client

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

Sample received on 19 January 2011.

**REMARKS :** Sample Location WE3.

----- End -----

Tested By : K.L. Fong, C.S. Chan Certified By :   
 Name : Gu Chin  
 Checked By : Gu Chin Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER**

Report No. : GCC110100730 Date of Issue : 07-02-2011

---

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

Client Address\* : Flat B, 6/F, Hop Shi Factory Building, 29 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 : 19-01-2011

W.O. No.\* : -- Contract No.\* : -- Date Completed : 31-01-2011

GCE Serial No. : WQMO12011 Sampling Date\* : 19-01-2011 / 11:50 Sample Type\* : River Water

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

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <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	1.03
	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	0.34
Phosphorus mg/L	APHA 20ed 4500-P D	0.14
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	3
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client


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

Sample received on 19 January 2011.

**REMARKS :** Sample Location WE3.

----- End -----

Tested By : K.L. Fong, C.S. Chan

Certified By :   
 Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER**

Report No. : GCC110100748

Date of Issue : 07-02-2011

Client\* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

Client Address\* : Flat B, 6/F, Hop Shi Factory Building, 29 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 : 19-01-2011

W.O. No.\* : --

Contract No.\* : --

Date Completed : 31-01-2011

GCE Serial No. : WQMO12011

Sampling Date\* : 19-01-2011 / 12:10

Sample Type\* : River Water

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Sample I.D.\* : WE4

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <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	0.06
	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	0.2
Phosphorus mg/L	APHA 20ed 4500-P D	0.07
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 19 January 2011.

**REMARKS :** Sample Location WE4.

----- End -----

Tested By : K.L. Fong, C.S. Chan

Certified By : 

Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC110100756

Date of Issue : 07-02-2011

Client\* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

Client Address\* : Flat B, 6/F, Hop Shi Factory Building, 29 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 : 19-01-2011

W.O. No.\* : --

Contract No.\* : --

Date Completed : 31-01-2011

GCE Serial No. : WQM012011

Sampling Date\* : 19-01-2011 / 12:10

Sample Type\* : River Water

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Sample I.D.\* : WE4 Duplicate

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <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	0.06
	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	0.20
Phosphorus mg/L	APHA 20ed 4500-P D	0.06
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 19 January 2011.

**REMARKS :** Sample Location WE4.

----- End -----

Tested By : K.L. Fong, C.S. Chan

Certified By

Name

Gu Chin

Checked By : Gu Chin

Post

Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC110100764

Date of Issue : 07-02-2011

Client\* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

Client Address\* : Flat B, 6/F, Hop Shi Factory Building, 29 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 : 19-01-2011

W.O. No.\* : --

Contract No.\* : --

Date Completed : 31-01-2011

GCE Serial No. : WQM012011

Sampling Date\* : 19-01-2011 / 13:20

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	0.79
	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	0.17
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	4
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

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

Sample received on 19 January 2011.

**REMARKS :** Sample Location WE5.

----- End -----

Tested By : K.L. Fong, C.S. Chan

Certified By

Name

Post

Gu Chin

Chemist

Checked By : Gu Chin



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC110100772

Date of Issue : 07-02-2011

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 : 19-01-2011

W.O. No.\* : --

Contract No.\* : --

Date Completed : 31-01-2011

GCE Serial No. : WQM012011

Sampling Date\* : 19-01-2011 / 13:20

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	0.82
	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	0.16
Phosphorus mg/L	APHA 20ed 4500-P D	0.16
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	4
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

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

Sample received on 19 January 2011.

**REMARKS :** Sample Location WE5.


----- End -----

Tested By : K.L. Fong, C.S. Chan

Certified By

Name

Post

:   
 : Gu Chin  
 : Chemist





## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC110100780

Date of Issue : 07-02-2011

Client\* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

Client Address\* : Flat B, 6/F, Hop Shi Factory Building, 29 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 : 19-01-2011

W.O. No.\* : --

Contract No.\* : --

Date Completed : 31-01-2011

GCE Serial No. : WQM012011

Sampling Date\* : 19-01-2011 / 13:10

Sample Type\* : River Water

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Sample I.D.\* : WE6

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ 1 °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	0.05
	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	0.06
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 19 January 2011.

**REMARKS :** Sample Location WE6.

----- End -----

Tested By : K.L. Fong, C.S. Chan

Certified By : 

Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC110100798 Date of Issue : 07-02-2011

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

Client Address\* : Flat B, 6/F, Hop Shi Factory Building, 29 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 : 19-01-2011

W.O. No.\* : -- Contract No.\* : -- Date Completed : 31-01-2011

GCE Serial No. : WQM012011 Sampling Date\* : 19-01-2011 / 13:10 Sample Type\* : River Water

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

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <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	0.05
	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	0.06
Phosphorus mg/L	APHA 20ed 4500-P D	0.04
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	--

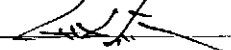
\* : Information provided by client

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

Sample received on 19 January 2011.

**REMARKS :** Sample Location WE6.

----- End -----

Tested By : K.L. Fong, C.S. Chan 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		3/1/2011	
Measurement Start Time (hhmm)		14:35	15:10
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		1.0	0.9
Measurement Results	L90 (dB(A))	48.6	52.3
	L10 (dB(A))	57.5	64.1
	Leq (dB(A))	54.6	61.6
Weather condition:		Cloudy	
Major Construction Noise Source(s) During Monitoring		1. Trucks noise	1. Excavators noise
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

3/1/2011



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

Construction Noise Monitoring Data Sheet

Monitoring Location		N3	N4
Description of Location		Freefield	Facede
Date of Monitoring		3/1/2011	
Measurement Start Time (hhmm)		14:00	12:15
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		1.0	1.1
Measurement Results	L90 (dB(A))	47.6	51.2
	L10 (dB(A))	55.4	60.7
	Leq (dB(A))	49.5	58.8
Weather condition:		Cloudy	
Major Construction Noise Source(s) During Monitoring		1. Excavators 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
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

3/1/2011



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		10/1/2011	
Measurement Start Time (hhmm)		13:40	12:55
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.4	0.4
Measurement Results	L90 (dB(A))	44.3	45.2
	L10 (dB(A))	58.5	73.0
	Leq (dB(A))	58.0	70.5
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	1. Compactor noise
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

10/1/2011



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		10/1/2011	
Measurement Start Time (hhmm)		12:20	11:45
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.4	0.5
Measurement Results	L90 (dB(A))	40.0	44.6
	L10 (dB(A))	53.5	52.1
	Leq (dB(A))	51.3	49.4
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

10/1/2011



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		17/1/2011	
Measurement Start Time (hhmm)		14:45	14:10
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.3	0.3
Measurement Results	L90 (dB(A))	40.2	44.0
	L10 (dB(A))	30.2	58.2
	Leq (dB(A))	48.1	54.0
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	1. Worker paring a road.
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

17/1/2011





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

Construction Noise Monitoring Data Sheet

Monitoring Location		N3	N4
Description of Location		Freefield	Facede
Date of Monitoring		17/1/2011	
Measurement Start Time (hhmm)		13:35	13:00
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.4	0.4
Measurement Results	L90 (dB(A))	43.6	39.7
	L10 (dB(A))	56.3	51.8
	Leq (dB(A))	54.2	49.5
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		1. Excavator noise	1. Excavator noise
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise	1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

17/1/2011



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		24/1/2011	
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)		0.1	0.2
Measurement Results	L90 (dB(A))	46.2	35.7
	L10 (dB(A))	56.3	52.3
	Leq (dB(A))	51.1	51.2
Weather condition:		Cloudy	
Major Construction Noise Source(s) During Monitoring		1. Road works 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

24/1/2011



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		24/1/2011	
Measurement Start Time (hhmm)		12:15	11:40
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.1	0.2
Measurement Results	L90 (dB(A))	36.2	38.6
	L10 (dB(A))	47.7	49.3
	Leq (dB(A))	46.2	46.2
Weather condition:		Cloudy	
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

24/1/2011



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		31/1/2011	
Measurement Start Time (hhmm)		14:00	14:35
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.2	0.3
Measurement Results	L90 (dB(A))	41.1	52.7
	L10 (dB(A))	54.7	63.5
	Leq (dB(A))	53.7	67.3
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	1. Other construction
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

31/1/2011



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		31/1/2011	
Measurement Start Time (hhmm)		15:45	15:10
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.3	0.2
Measurement Results	L90 (dB(A))	41.0	45.0
	L10 (dB(A))	59.0	59.8
	Leq (dB(A))	57.7	56.2
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		1. Other construction	1. Other construction
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise	1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

31/1/2011

# **Appendix F1**

## **Water Quality**

### **Monitoring Data Sheet**

**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 3/1/11

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1140			1150			1200			1135			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			1.4			< 1			< 1			< 1		
pH value	8.15			7.77			7.09			7.25			7.82			7.20			7.09		
Temperature (oC)	13.6			13.6			14.5			14.6			14.0			15.6			13.8		
Salinity (ppt)	1.9			1.9			18.0			20.2			0.0			0.0			1.6		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	15.4	15.4	Average 15.4	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	3.8	3.7	Average 3.8
DO (mg/l)	10.30	10.31	Average 10.31	9.89	9.89	Average 9.89	8.08	8.08	Average 8.08	8.16	8.14	Average 8.15	9.80	9.80	Average 9.80	8.79	8.77	Average 8.78	8.35	8.37	Average 8.36
DO Saturation (%)	100	100	Average 100	96	96	Average 96	88	88	Average 88	91	91	Average 91	97	97	Average 97	89	89	Average 89	81	81	Average 81

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
3/1/11

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

**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 5/1/11

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1250			1300			1310			1240			1140			1150			1200		
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	8.01			7.70			7.24			7.60			7.41			6.98			6.96		
Temperature (oC)	16.9			17.2			18.1			16.8			14.9			17.8			17.5		
Salinity (ppt)	1.3			4.0			17.3			23.9			0.0			0.0			1.9		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	1.0	1.0	Average 1.0	5.6	5.6	Average 5.6	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	5.7	5.7	Average 5.7
DO (mg/l)	10.21	10.21	Average 10.21	9.80	9.82	Average 9.81	8.71	8.75	Average 8.73	8.15	8.15	Average 8.15	10.92	10.86	Average 10.89	8.15	8.16	Average 8.16	9.34	9.36	Average 9.35
DO Saturation (%)	107	107	Average 107	105	105	Average 105	103	103	Average 103	97	97	Average 97	108	108	Average 108	86	86	Average 86	99	99	Average 99

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
5/1/11

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



**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 7/1/11

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1430			1440			1450			1425			1345			1355			1405		
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	7.93			7.76			7.21			7.73			7.86			7.21			6.99		
Temperature (oC)	14.4			14.0			14.8			14.6			13.1			15.2			14.9		
Salinity (ppt)	1.9			1.2			17.6			20.6			0.2			0.1			1.1		
Turbidity (NTU)	0.0	0.0	Average	0.0	0.0	Average	6.2	6.2	Average	7.8	7.8	Average	0.5	0.5	Average	0.0	0.0	Average	0.8	0.8	Average
			0.0			0.0			6.2			7.8			0.5			0.0			0.8
DO (mg/l)	10.73	10.75	Average	10.10	10.10	Average	10.24	10.28	Average	10.20	10.16	Average	10.73	10.76	Average	10.01	9.98	Average	9.87	9.88	Average
			10.74			10.10			10.26			10.18			10.75			10.00			9.88
DO Saturation (%)	107	107	Average	101	101	Average	103	103	Average	102	102	Average	107	107	Average	100	100	Average	99	99	Average
			107			101			103			102			107			100			99

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
7/1/11

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

**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 10/1/11      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1500			1505			1510			1450			1530			1540			1550		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.3			<1			<1			<1		
pH value	7.81			7.64			7.39			7.35			8.10			7.68			7.00		
Temperature (oC)	16.6			15.9			16.6			16.8			13.6			15.6			16.8		
Salinity (ppt)	13.7			10.1			20.6			24.8			0.4			0.1			1.1		
Turbidity (NTU)	0.7	0.7	Average 0.7	0.0	0.0	Average 0.0	4.1	4.1	Average 4.1	0.6	0.6	Average 0.6	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	2.4	2.4	Average 2.4
DO (mg/l)	10.48	10.48	Average 10.48	10.31	10.32	Average 10.32	9.30	9.31	Average 9.31	9.19	9.18	Average 9.19	10.63	10.63	Average 10.63	10.01	10.04	Average 10.03	10.63	10.64	Average 10.64
DO Saturation (%)	106	106	Average 106	105	105	Average 105	100	100	Average 100	99	99	Average 99	107	107	Average 107	101	101	Average 101	106	106	Average 106

Name  
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Signature  


Date  
10/1/11

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

**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 11/1/11      Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1545			1550			1600			1540			1620			1630			1640		
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	8.51			8.47			8.00			8.14			8.02			8.08			7.45		
Temperature (oC)	13.2			13.2			13.8			14.3			12.0			14.8			12.4		
Salinity (ppt)	9.9			10.3			24.2			25.3			0.5			0.1			1.0		
Turbidity (NTU)	0.6	0.6	Average 0.6	0.0	0.0	Average 0.0	0.8	0.8	Average 0.8	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	6.4	6.4	Average 6.4
DO (mg/l)	10.59	10.56	Average 10.58	10.65	10.66	Average 10.66	10.40	10.36	Average 10.38	9.00	9.01	Average 9.01	10.80	10.81	Average 10.81	10.17	10.19	Average 10.18	9.53	9.53	Average 9.53
DO Saturation (%)	107	107	Average 107	108	108	Average 108	107	107	Average 107	103	103	Average 103	109	109	Average 109	101	101	Average 101	89	89	Average 89

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
11/1/11

remark or observation: \_\_\_\_\_  
 \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 12/1/11

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1635			1640			1645			1550			1600			1610			1620		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.3			<1			<1			<1		
pH value	8.09			8.01			8.01			8.14			8.62			8.41			7.55		
Temperature (oC)	11.5			11.6			12.0			12.1			10.5			12.4			10.8		
Salinity (ppt)	13.7			14.1			21.7			25.4			0.5			0.0			2.9		
Turbidity (NTU)	3.6	3.6	Average 3.6	0.3	0.3	Average 0.3	8.3	8.3	Average 8.3	7.5	7.5	Average 7.5	2.3	2.3	Average 2.3	0.0	0.0	Average 0.0	10.1	10.1	Average 10.1
DO (mg/l)	10.75	10.78	Average 10.77	10.69	10.69	Average 10.69	9.73	9.76	Average 9.75	9.13	9.10	Average 9.12	10.56	10.55	Average 10.56	10.65	10.66	Average 10.66	10.75	10.74	Average 10.75
DO Saturation (%)	107	107	Average 107	108	108	Average 108	104	104	Average 104	100	100	Average 100	107	108	Average 108	100	100	Average 100	99	99	Average 99

Name  
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Signature  


Date  
12/1/11

remark or  
observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 17/1/11      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1035			1040			1050			1030			1100			1110			1120		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.3			<1			<1			<1		
pH value	8.46			7.73			7.58			8.04			8.51			7.63			7.13		
Temperature (oC)	13.7			14.0			14.4			14.0			13.1			15.2			14.8		
Salinity (ppt)	1.4			3.2			17.5			24.0			0.3			0.1			1.2		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	3.0	3.0	Average 3.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	6.9	6.9	Average 6.9
DO (mg/l)	10.32	10.31	Average 10.32	10.66	10.67	Average 10.67	10.93	10.93	Average 10.93	8.55	8.54	Average 8.55	10.44	10.41	Average 10.43	9.52	9.50	Average 9.51	9.31	9.30	Average 9.31
DO Saturation (%)	100	100	Average 100	106	106	Average 106	116	116	Average 116	96	96	Average 96	108	108	Average 108	95	95	Average 95	93	93	Average 93

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
17/1/11

remark or  
observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 19/1/11      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1150			1100			1210			1140			1235			1300			1325		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.1			<1			<1			<1		
pH value	8.61			7.93			7.70			7.85			7.29			7.11			6.93		
Temperature (oC)	18.5			17.1			18.5			17.0			21.4			17.6			17.1		
Salinity (ppt)	2.1			2.4			22.2			22.8			7.1			0.0			0.0		
Turbidity (NTU)	0.5	0.5	Average	0.0	0.0	Average	6.2	6.2	Average	0.0	0.0	Average	2.9	2.9	Average	0.0	0.0	Average	4.1	4.2	Average
			0.5			0.0			6.2			0.0			2.9			0.0			4.2
DO (mg/l)	10.23	10.21	Average	10.10	10.10	Average	9.35	9.37	Average	8.51	8.52	Average	10.31	10.31	Average	9.59	9.59	Average	9.02	9.01	Average
			10.22			10.10			9.36			8.52			10.31			9.59			9.02
DO Saturation (%)	104	104	Average	106	106	Average	114	114	Average	101	101	Average	124	124	Average	100	100	Average	101	101	Average
			104			106			114			101			124			100			101

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
19/1/11

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 21/1/11      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1245			1255			1305			1235			1200			1210			1220		
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	8.10			7.64			7.19			7.31			7.69			7.30			7.02		
Temperature (oC)	14.9			14.8			14.7			14.2			15.0			15.3			13.9		
Salinity (ppt)	2.3			4.1			17.9			20.1			0.0			0.0			0.0		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	4.3	4.3	Average 4.3	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	2.1	2.3	Average 2.2
DO (mg/l)	10.29	10.27	Average 10.28	9.91	9.93	Average 9.92	9.01	9.02	Average 9.02	9.31	9.28	Average 9.30	10.00	10.02	Average 10.01	9.03	9.04	Average 9.04	8.61	8.63	Average 8.62
DO Saturation (%)	104	104	Average 104	100	100	Average 100	91	91	Average 91	94	94	Average 94	99	99	Average 99	91	91	Average 91	83	83	Average 83

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
21/1/11

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 24/1/11

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1550			1600			1610			1540			1625			1635			1645		
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	7.73			7.43			6.99			7.83			8.09			7.41			6.85		
Temperature (oC)	15.6			15.6			16.5			16.1			14.3			16.8			15.7		
Salinity (ppt)	2.6			7.0			19.5			23.3			0.2			0.1			1.3		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	1.1	1.1	Average 1.1	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	4.4	4.4	Average 4.4
DO (mg/l)	9.94	9.94	Average 9.94	9.73	9.71	Average 9.72	8.72	8.76	Average 8.74	9.86	9.87	Average 9.87	10.10	10.11	Average 10.11	10.01	10.00	Average 10.01	8.83	8.83	Average 8.83
DO Saturation (%)	102	102	Average 102	101	101	Average 101	96	96	Average 96	106	106	Average 106	110	110	Average 110	108	108	Average 108	89	89	Average 89

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
24/1/11

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 25/1/11      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1555			1605			1620			1545			1510			1520			1530		
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	7.81			7.64			7.89			8.04			7.55			7.08			7.10		
Temperature (oC)	17.8			17.4			17.7			17.8			15.9			17.9			19.0		
Salinity (ppt)	12.2			14.8			22.0			24.2			0.0			0.0			14.0		
Turbidity (NTU)	5.1	5.1	Average 5.1	0.4	0.4	Average 0.4	5.4	5.4	Average 5.4	4.5	4.5	Average 4.5	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	10.1	10.1	Average 10.1
DO (mg/l)	9.32	9.34	Average 9.33	9.52	9.50	Average 9.51	9.39	9.45	Average 9.42	9.65	9.65	Average 9.65	10.48	10.46	Average 10.47	10.89	10.89	Average 10.89	9.35	9.35	Average 9.35
DO Saturation (%)	114	114	Average 114	117	117	Average 117	115	115	Average 115	118	118	Average 118	108	108	Average 108	115	115	Average 115	109	109	Average 109

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
25/1/11

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 26/1/11      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1625			1635			1645			1615			1540			1550			1500		
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	7.93			7.62			7.83			7.87			7.90			7.50			7.32		
Temperature (oC)	18.7			18.1			18.0			17.7			16.1			17.4			18.5		
Salinity (ppt)	12.7			20.4			23.8			25.9			0.0			0.0			16.7		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.7	0.7	Average 0.7	1.6	1.6	Average 1.6	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	3.9	3.9	Average 3.9
DO (mg/l)	10.10	10.10	Average 10.10	9.95	9.97	Average 9.96	10.31	10.30	Average 10.31	9.81	9.84	Average 9.83	10.37	10.37	Average 10.37	10.82	10.81	Average 10.82	9.81	9.81	Average 9.81
DO Saturation (%)	103	103	Average 103	104	104	Average 104	107	107	Average 107	104	104	Average 104	106	106	Average 106	113	113	Average 113	117	117	Average 117

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
26/1/11

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

**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 31/1/11      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1150			1200			1210			1140			1230			1240			1250		
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	7.63			7.20			7.03			7.78			8.03			7.06			6.84		
Temperature (oC)	16.5			15.1			17.1			15.5			15.2			16.3			19.9		
Salinity (ppt)	1.4			2.0			20.4			25.0			0.0			0.0			1.3		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	13.6	13.8	Average 13.7
DO (mg/l)	10.39	10.36	Average 10.38	10.48	10.44	Average 10.46	9.36	9.38	Average 9.37	10.34	10.34	Average 10.34	10.98	10.98	Average 10.98	9.10	9.11	Average 9.11	9.34		Average 9.34
DO Saturation (%)	105	105	Average 105	106	106	Average 106	98	98	Average 98	105	105	Average 105	109	109	Average 109	93	93	Average 93	105	105	Average 105

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
31/1/11

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

## **Appendix F2**

### **Water Quality**

### **Monitoring Lab report**



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC110100057 Date of Issue : 27-01-2011

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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 : 03-01-2011

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 04-01-2011

GCE Serial No. : WQM012011 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	498	-0.4	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	03 Jan 2011 / 10:50		03 Jan 2011 / 11:00		03 Jan 2011 / 11:10			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.3	1.4	<1.0	<1.0	6.7	6.8	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	03 Jan 2011 / 11:40		03 Jan 2011 / 11:50		03 Jan 2011 / 12:00		03 Jan 2011 / 11:35	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.1	2.6	<1.0	<1.0	12.3	12.1	5.8

\* : Information provided by client

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

Remarks : --

----- End -----

Tested By : C.S. CHAN

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC110100065 Date of Issue : 27-01-2011

---

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 : 05-01-2011

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 05-01-2011

GCE Serial No. : WQM012011 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	26.4
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate			
		Sampling Date/Time	05 Jan 2011 / 11:40		05 Jan 2011 / 11:50		05 Jan 2011 / 12:00			
		LOD	Units							
Suspended Solids (SS)	1	mg/L	1.7	1.5	1.1	1.1	5.1	5.1		

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
		Sampling Date/Time	05 Jan 2011 / 12:50		05 Jan 2011 / 13:00		05 Jan 2011 / 13:10		05 Jan 2011 / 12:40	
		LOD	Units							
Suspended Solids (SS)	1	mg/L	3.2	3.7	1.4	1.1	4.7	4.7	6.6	6.8

\* : Information provided by client

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

**Remarks :** --

----- End -----

Tested By : C.S. CHAN

Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC110100073 Date of Issue : 27-01-2011

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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 : 07-01-2011

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 07-01-2011

GCE Serial No. : WQM012011 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	27.4
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate			
		Sampling Date/Time	07 Jan 2011 / 13:45		07 Jan 2011 / 13:45		07 Jan 2011 / 14:05			
		LOD	Units							
Suspended Solids (SS)	1	mg/L	2.5	2.3	<1.0	<1.0	5.9	6.0		

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
		Sampling Date/Time	07 Jan 2011 / 14:30		07 Jan 2011 / 14:40		07 Jan 2011 / 14:50		07 Jan 2011 / 14:25	
		LOD	Units							
Suspended Solids (SS)	1	mg/L	<1.0	<1.0	<1.0	<1.0	5.1	4.8	5.6	5.8

\* : Information provided by client

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

Remarks : --

---- End ----

Tested By : C.S. CHAN

Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC110100081

Date of Issue : 27-01-2011

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 : 10-01-2011

W.O. No.\* : --

Sample Type\* : River Water

Date Completed : 11-01-2011

GCE Serial No. : WQM012011

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	495	0.4	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	10 Jan 2011 / 15:30		10 Jan 2011 / 15:40		10 Jan 2011 / 15:50				
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.9	2.0	<1.0	<1.0	4.9	4.8		
TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	10 Jan 2011 / 15:00		10 Jan 2011 / 15:05		10 Jan 2011 / 15:10		10 Jan 2011 / 14:50		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	3.5	3.8	1.8	1.5	5.0	5.0	3.4	3.7

\* : 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 : C.S. CHAN

Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist





## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC110100099 Date of Issue : 27-01-2011

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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 : 11-01-2011

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 12-01-2011

GCE Serial No. : WQM012011 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	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	11 Jan 2011 / 16:20		11 Jan 2011 / 16:30		11 Jan 2011 / 16:40			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	<1.0	<1.0	<1.0	<1.0	5.3	5.5	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	11 Jan 2011 / 15:45		11 Jan 2011 / 15:50		11 Jan 2011 / 16:00		11 Jan 2011 / 15:40		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	2.1	2.4	1.6	1.7	2.8	2.8	3.6	3.8

\* : Information provided by client

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

Remarks : --

----- End -----

Tested By : C.S. CHAN

Approved Signatory :

Checked By : GU CHIN

Name : GU CHIN  
 Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC110100104 Date of Issue : 27-01-2011

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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 : 12-01-2011

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 13-01-2011

GCE Serial No. : WQM012011 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	494	496	-0.4	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	12 Jan 2011 / 16:00		12 Jan 2011 / 16:10		12 Jan 2011 / 16:20			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	<1.0	<1.0	<1.0	<1.0	3.6	4.1	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	12 Jan 2011 / 16:35		12 Jan 2011 / 16:40		12 Jan 2011 / 16:45		12 Jan 2011 / 15:50		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	4.0	3.8	1.4	1.3	8.8	8.3	7.8	7.5

\* : Information provided by client

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

Remarks : --

----- End -----

Tested By : C.S. CHAN

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC110100112

Date of Issue : 27-01-2011

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 : 17-01-2011

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

Date Completed : 18-01-2011

GCE Serial No. : WQM012011

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	496	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	17 Jan 2011 / 11:00		17 Jan 2011 / 11:10		17 Jan 2011 / 11:20			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.0	1.0	<1.0	<1.0	9.1	9.7	
TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	17 Jan 2011 / 10:35		17 Jan 2011 / 10:40		17 Jan 2011 / 10:50		17 Jan 2011 / 10:30	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.3	1.4	<1.0	<1.0	3.6	3.1	2.4 2.6

\* : 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 : C.S. CHAN

Approved Signatory :

Name

GU CHIN

Checked By : GU CHIN

Post

Chemist



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

Report No. : GCC110100120 Date of Issue : 27-01-2011

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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 : 19-01-2011

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 19-01-2011

GCE Serial No. : WQM012011 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	492	495	-0.6	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	19 Jan 2011 / 12:35		19 Jan 2011 / 13:00		19 Jan 2011 / 13:25			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	<1.0	<1.0	<1.0	<1.0	6.4	6.3	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	19 Jan 2011 / 11:50		19 Jan 2011 / 12:00		19 Jan 2011 / 12:10		19 Jan 2011 / 11:40	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.3	1.6	1.0	1.2	6.2	6.0	3.0 2.8

\* : Information provided by client


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

**Remarks :** 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. : GCC110100146 Date of Issue : 27-01-2011

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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 : 21-01-2011

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 21-01-2011

GCE Serial No. : WQM012011 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results							
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L			
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	494	496	-0.4	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	21 Jan 2011 / 12:00		21 Jan 2011 / 12:10		21 Jan 2011 / 12:20				
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.2	1.1	1.8	1.8	4.3	4.4		
TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	21 Jan 2011 / 12:45		21 Jan 2011 / 12:55		21 Jan 2011 / 13:05		21 Jan 2011 / 12:35		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.6	2.2	1.4	1.2	5.2	5.1	2.9	2.7

\* : 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 : C.S. CHAN

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



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

Report No. : GCC110100154 Date of Issue : 27-01-2011

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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 : 24-01-2011

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 25-01-2011

GCE Serial No. : WQM012011 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	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	24 Jan 2011 / 16:25		24 Jan 2011 / 16:35		24 Jan 2011 / 16:45			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.1	1.2	<1.0	<1.0	4.8	4.9	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	24 Jan 2011 / 15:50		24 Jan 2011 / 16:00		24 Jan 2011 / 16:10		24 Jan 2011 / 15:40	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.4	1.3	<1.0	<1.0	3.2	2.9	2.7

\* : 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 : C.S. CHAN

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC110100162 Date of Issue : 27-01-2011

---

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

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Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 25-01-2011

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 26-01-2011

GCE Serial No. : WQM012011 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	499	494	1.0	27.2
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	25 Jan 2011 / 15:10		25 Jan 2011 / 15:20		25 Jan 2011 / 15:30			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.5	1.4	1.2	1.1	7.5	7.2	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	25 Jan 2011 / 15:55		25 Jan 2011 / 16:05		25 Jan 2011 / 16:20		25 Jan 2011 / 15:45	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	5.8	6.5	2.0	1.7	5.8	5.1	5.8

\* : Information provided by client

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

Remarks : --

----- End -----

Tested By : C.S. CHAN

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC110100170 Date of Issue : 27-01-2011

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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 : 26-01-2011

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 27-01-2011

GCE Serial No. : WQM012011 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	26.0		
Acceptance Criteria			<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29		
<b>TEST RESULTS</b>	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	26 Jan 2011 / 15:40		26 Jan 2011 / 15:50		26 Jan 2011 / 16:00			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.2	1.1	1.2	1.2	5.7	6.1	
<b>TEST RESULTS</b>	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	26 Jan 2011 / 16:25		26 Jan 2011 / 16:35		26 Jan 2011 / 16:45		26 Jan 2011 / 16:15	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.7	3.1	2.1	1.9	3.8	3.7	3.0

\* : Information provided by client

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

**Remarks :** --

----- End -----

Tested By : C.S. CHAN

Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist





## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC110100227 Date of Issue : 01-02-2011

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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 : 31-01-2011

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 01-02-2011

GCE Serial No. : WQM012011 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	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	31 Jan 2011 / 12:30		31 Jan 2011 / 12:40		31 Jan 2011 / 12:50			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.3	2.3	<1.0	<1.0	11.9	11.7	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	31 Jan 2011 / 11:50		31 Jan 2011 / 12:00		31 Jan 2011 / 12:10		31 Jan 2011 / 11:40	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.7	1.9	1.9	2.1	3.8	3.9	3.0 3.3

\* : 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 : C.S. CHAN

Approved Signatory :   
 Name : GU CHIN

Checked By : GU CHIN

Post : Chemist

Appendix G  
Monitoring Schedule  
for January 2011

## Environmental Pioneers and Solutions Limited

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

#### Master Schedule of EM&A works in January 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1/2	1/3	1/4	1/5	1/6	1/7	1/8
	WQM at: 11:53  Noise monitoring		WQM at: 13:10		WQM at: 14:21	
1/9	1/10	1/11	1/12	1/13	1/14	1/15
	WQM at: 15:00  Noise monitoring	WQM at: 15:30	WQM at: 16:10			
1/16	1/17	1/18	1/19	1/20	1/21	1/22
	WQM at: 10:22  Noise monitoring		WQM, EWQM at: 11:52		WQM at: 13:14	
1/23	1/24	1/25	1/26	1/27	1/28	1/29
	WQM at: 15:30  Noise monitoring	WQM at: 16:00	WQM at: 16:30			
1/30	1/31					
	WQM at: 11:09  Noise monitoring					

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

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

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

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

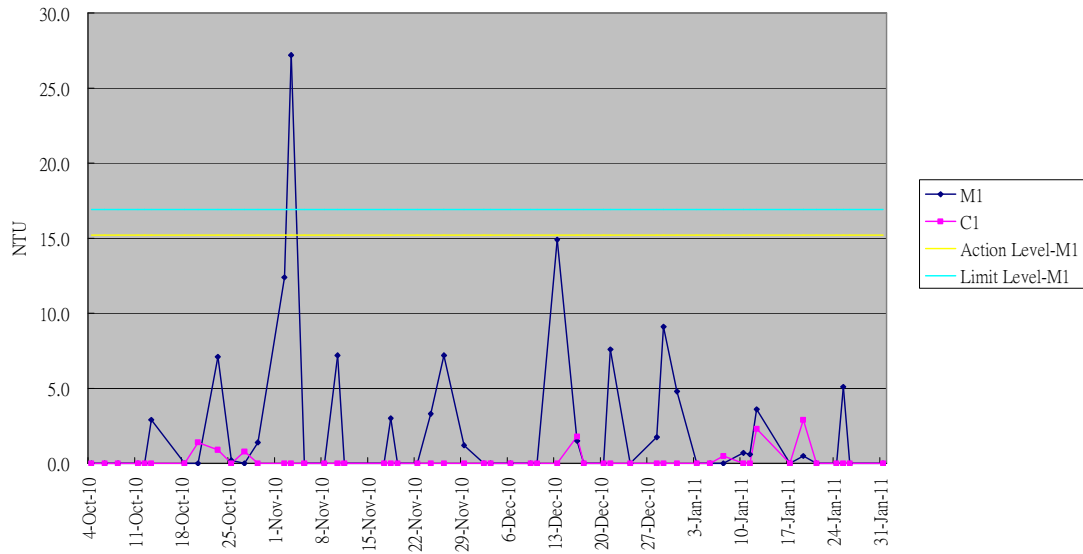
<b>Environmental Aspect</b>	<b>Protection / Mitigation Measures</b>	<b>Implementation status</b>	<b>Follow-up action</b>
<b>Air Quality</b>	Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved road, with complete coverage.	Implemented	-
	Use of frequent watering for 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 on 3 Jan 2011	Rectified as advised
	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.	Implemented	-
	Temporary ditches should be provided to facilitate run-off discharge into appropriate watercourses, via a silt retention pond. No site run-off should enter the freshwater marshes at Luk Tei Tong.	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.	Implemented	-
	Water pumped out from foundation excavations should be discharged into silt removal facilities.	Implemented	-
	During rainstorms, exposed slope surface should be covered by a tarpaulin or the means.	Implemented	-
	Exposed soil areas should be minimized to reduce potential for increased siltation and contamination of runoff.	Implemented	-
	Exposed soil surfaces should be protected by paving or fill material as soon as possible to reduce potential of soil erosion.	Implemented	-
	Open stockpiles of construction materials or construction wastes on-site of more than 50m <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	Rectification done
	All waste disposals managed in a proper manner i.e. trip ticket system implementation.	Implemented	-

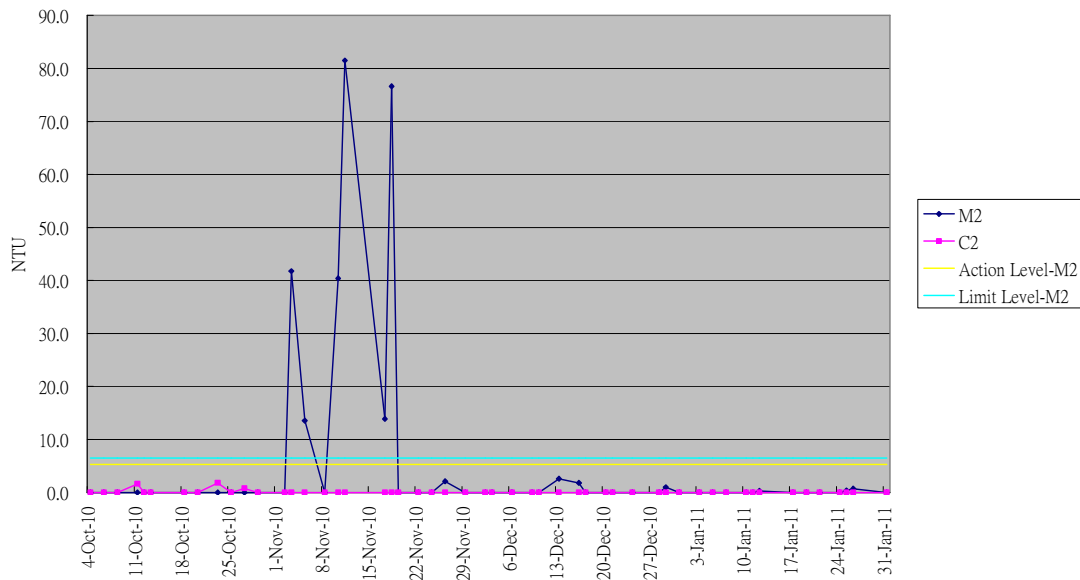
## Appendix I

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

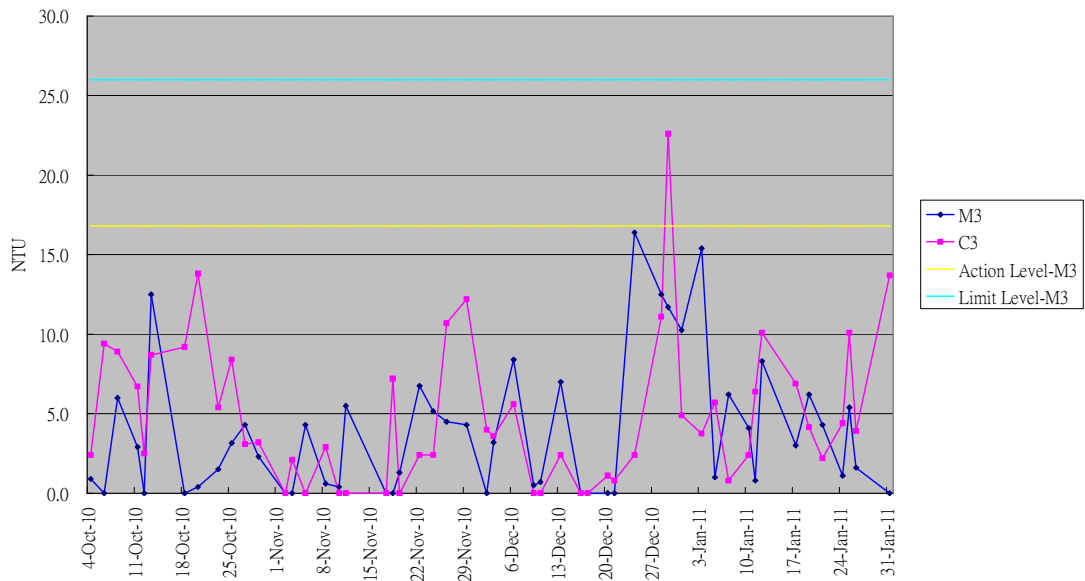
**Graphical Plot of Turbidity Trend M1&C1(Oct 10 - Jan 11)**



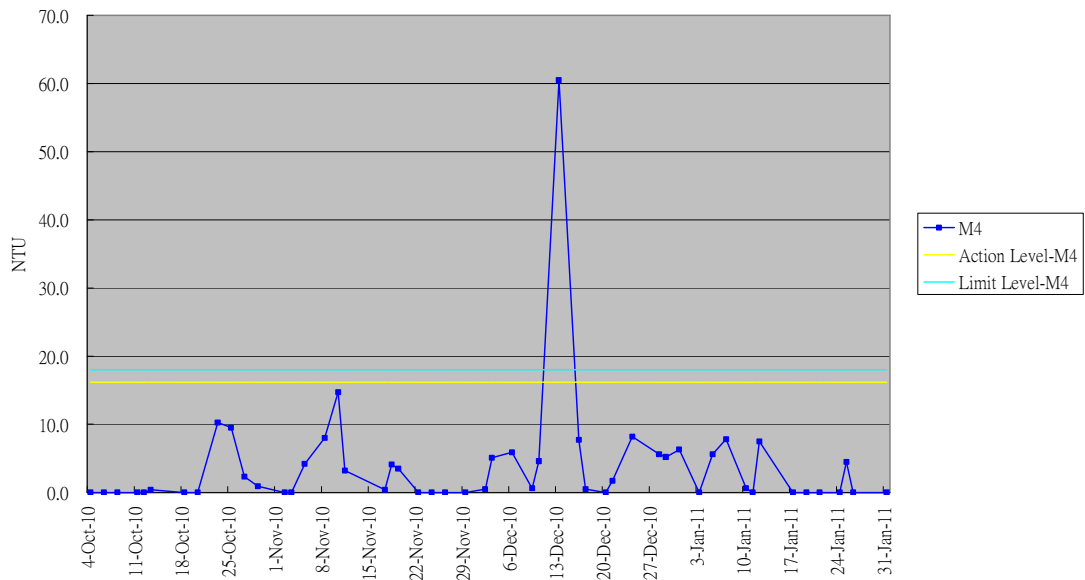
**Graphical Plot of Turbidity Trend M2&C2 (Oct 10 - Jan 11)**



**Graphical Plot of Turbidity Trend M3&C3 (Oct 10 - Jan 11)**

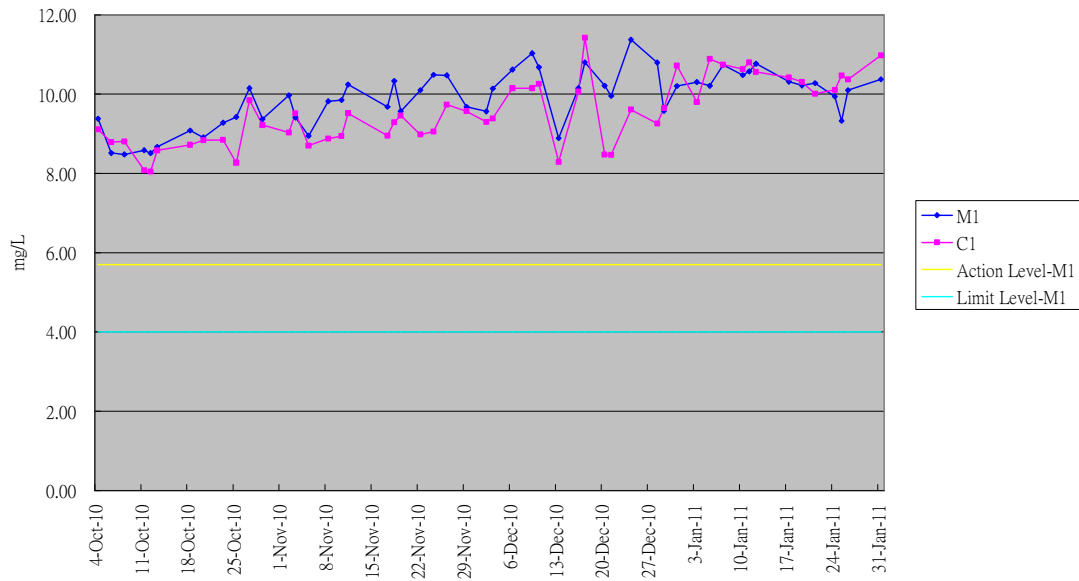


**Graphical Plot of Turbidity Trend M4 (Oct 10 - Jan 11)**

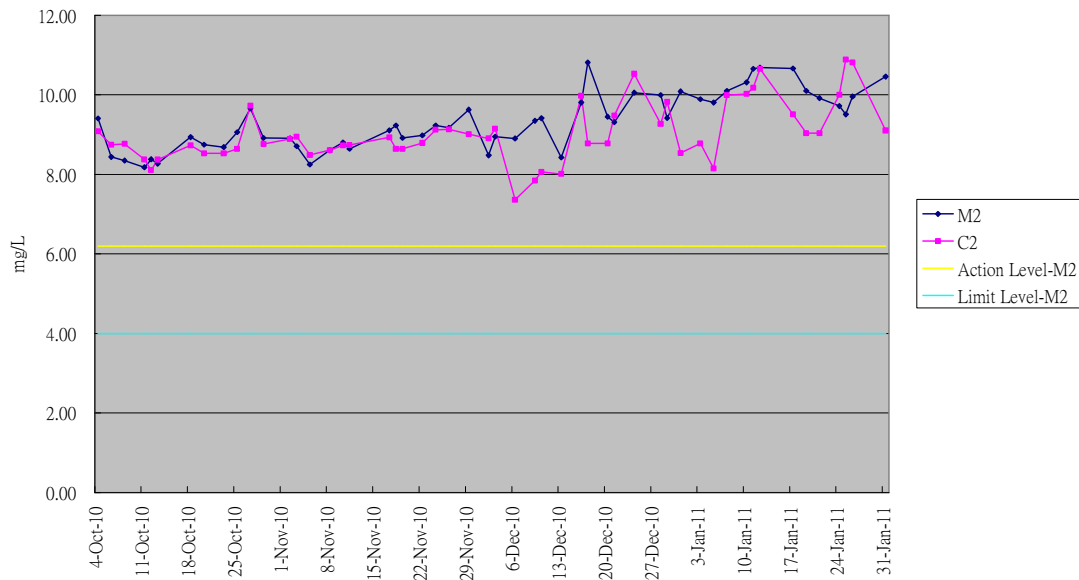




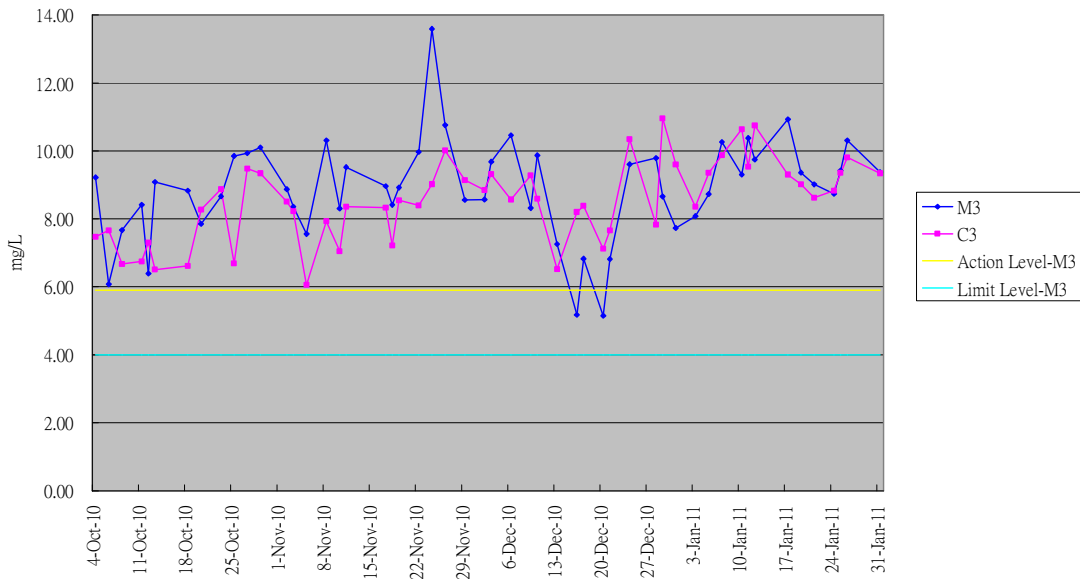
**Graphical Plot of Dissolved Oxygen Trend M1&C1 (Oct 10 - Jan 11)**



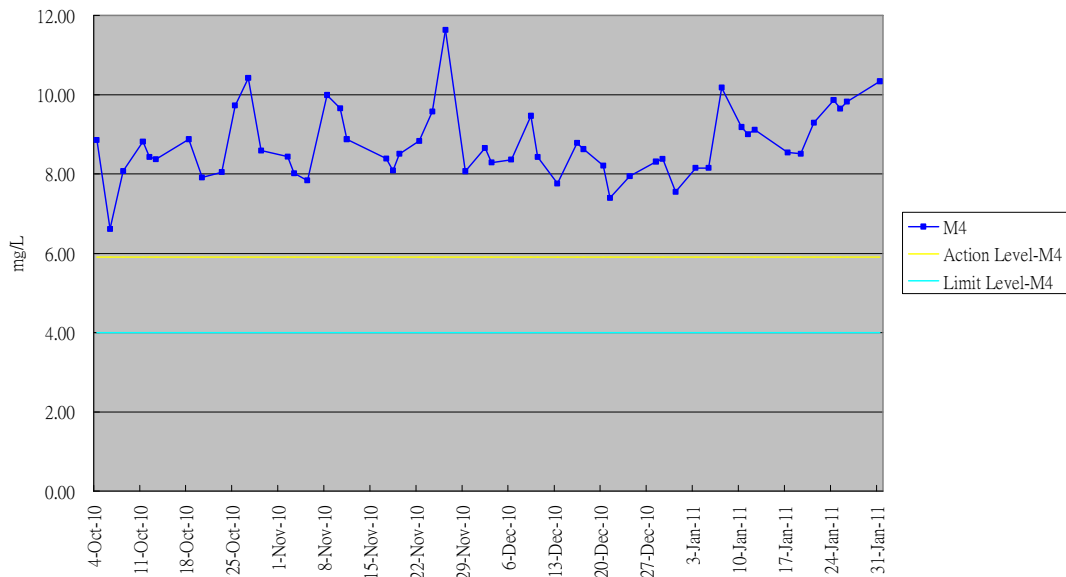
**Graphical Plot of Dissolved Oxygen Trend M2&C2 (Oct 10 - Jan 11)**



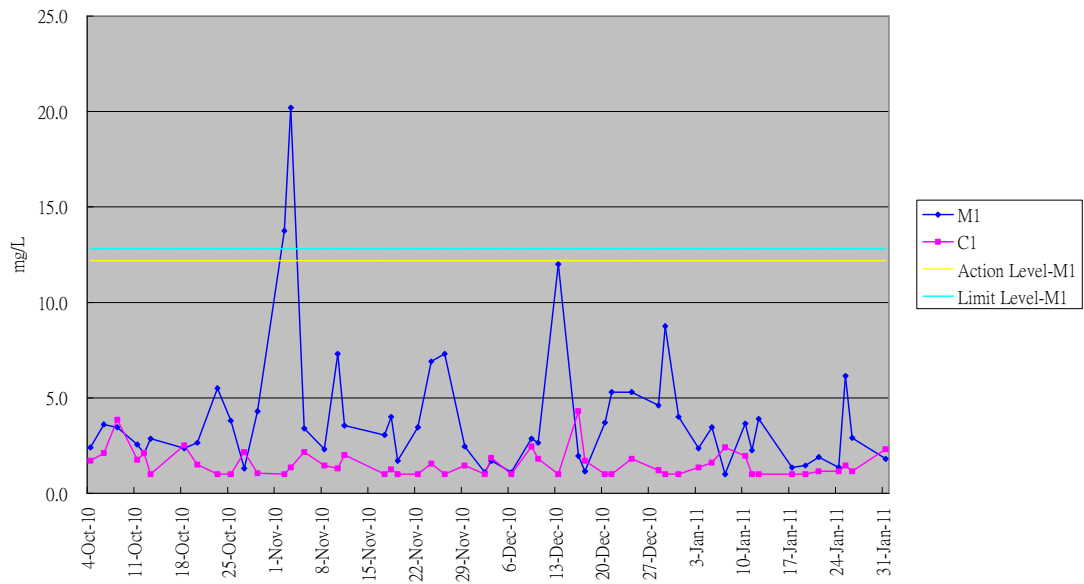
**Graphical Plot of Dissolved Oxygen Trend M3&C3 (Oct 10 - Jan 11)**



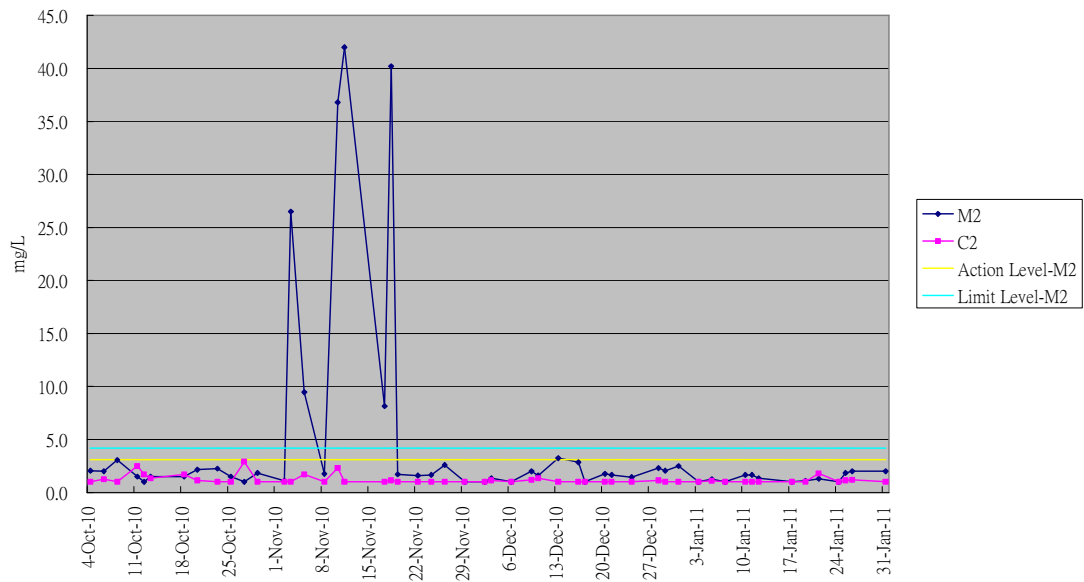
**Graphical Plot of Dissolved Oxygen Trend M4 (Oct 10 - Jan 11)**



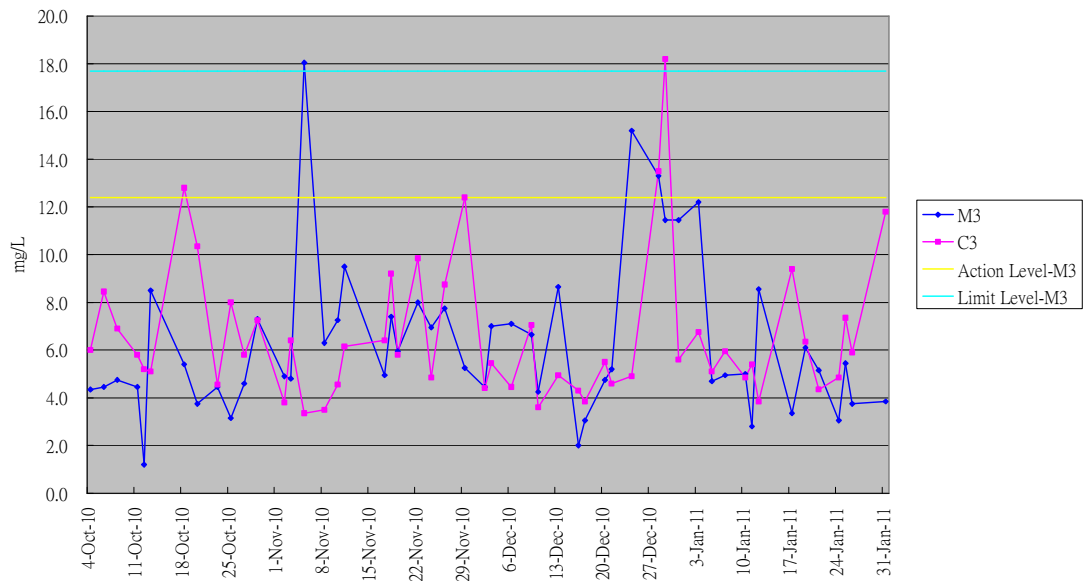
**Graphical Plot of Suspended Soild M1&C1 (Oct 10 - Jan 11)**



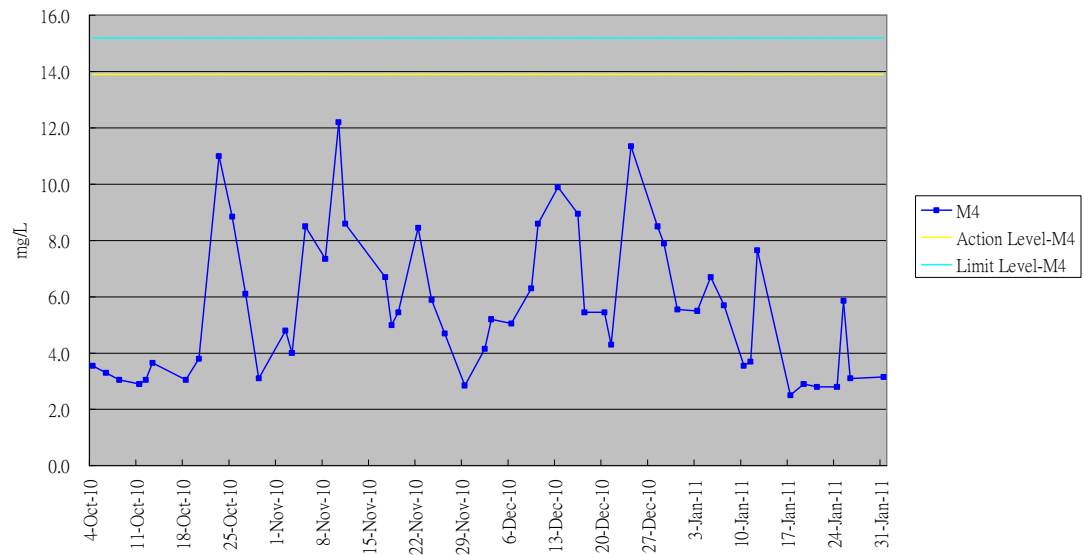
**Graphical Plot of Suspended Soild M2&C2 (Oct 10 - Jan 11)**



Graphical Plot of Suspended Soild M3&C3 (Oct 10 - Jan 11)



Graphical Plot of Suspended Soild M4 (Oct 10 - Jan 11)



## Appendix J

Graphical plot of noise  
monitoring results

