Drainage Service Department

Monthly Environmental Monitoring & Auditing report for

Contract No.DC/2009/22

Drainage Improvement in Shuen Wan, Tai Po – Contract 1

April 2011

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EXECUTIVE SUMMARY

This is the second monthly Environmental Monitoring and Audit (EM&A) Report for the drainage improvement works in Shuen Wan, Tai Po under Drainage Services Department Contract No. DC/2009/22 entitled "Drainage Improvement Works in Shuen Wan, Tai Po – Contract 1". This report concludes the impact monitoring for the activities undertaken during the period from 1st of April 2011 to 30th April 2011. The major site activities in this reporting period were mainly transplanting, piling construction and excavation works.

The Environmental Team (ET) is responsible for the EM&A works required in the EM&A manual (revision 3). Site inspections were carried out on weekly basis to investigate and audit the equipment and work methodologies with respect to pollution control and environmental mitigation. The weekly inspections records and photos taken were kept.

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

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 11 abnormal incidents of water quality criteria were recorded in this reporting month. No particular observation of defective site activities were found causing water contamination and such conditions were believed to be mainly attributed by natural fluctuation.

No exceedance of A/L level was reported for the monitoring of hydrological characteristics in the reporting period.

The ecological monitoring of the Ecological Compensatory Area (ECA) of the project is conducted. Details of the findings are referred to sections 6.2.

Visual and landscape monitoring has been conducted for the project. Details of

the observations are referred to sections 7.3.

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

Site works proposed to be carried out in the upcoming month at Area A, B & C are refer to section 2.2.

It is expected that noise, air and water quality impacts will be resulted from the works. ET has reminded the contractor to provide environmental pollution control measures wherever necessary and to keep a good environmental management at site practice. The recommended mitigation measures proposed for the project as well as implementation status are refer to section 12.3.

The ET will continue to implement the environmental monitoring & audit programme in accordance with the EM&A Manual (revision 3) and Environmental Permit requirement.

1. Introduction

This is the second monthly Environmental Monitoring and Audit (EM&A) Report for the drainage improvement works in Shuen Wan, Tai Po under Drainage Services Department Contract No. DC/2009/22 entitled "Drainage Improvement Works in Shuen Wan, Tai Po – Contract 1". The site layout plan is shown in Appendix A. The Environmental Team, Environmental Pioneers & Solutions Limited appointed by Kwan Lee – Kuly Joint Venture, prepares the report. The report is to be submitted to the Contractor, the Engineer and the IEC.

This report presents the results of the environmental monitoring of the project activities conducted within the reporting period from 1st April 2011 to 30th April 2011. This included the noise monitoring, water quality monitoring, hydrological characteristics monitoring, ecological monitoring, visual and landscape monitoring, and regular site inspections once per week for verification of implementation of the mitigation measures as recommended in the Environmental Permit (EP-303/2008) (EP), EM&A Manual (revision 3) and the Contractor's Environmental Management Plan (EMP).

2. Construction Stage

2.1 Construction activities in the reporting period

Major activities in the reporting period included the followings:

Area A – Piling Works

Area A – Excavation for Box Culvert

Area A & B – Tree Transplantating

Area B – Erection of Site Hoarding

Area C – Retouring of Existing fish pond.

2.2 Construction activities for the coming month

Proposed key construction works in the coming month will include:

Area A

- 1. Pile Loading Test
- 2. Proof Drilling
- 3. Excavation for the construction of box culvert and outfall structure near pumping station.
- 4. Sheet piling and Excavation for the construction of pumping station

Area B

- 1. Excavation for the construction of box culvert in Tung Tsz Nursery.
- 2. Tree Transplanting
- 3. Erection of Site Hoarding

Area C

- 1. Dewatering of existing fish pond.
- 2. Retouring of existing fish pond.
- 3. Tree Transplanting

Appendix J shows the three month rolling programme.

2.3 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 3.3, 4.3, and 5.3 for noise, water quality, and hydrological characteristics respectively.

3. Noise Monitoring

3.1 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 D) 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 3.5.2, 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.

3.2 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 3.2.1 summarizes the equipment list for noise monitoring

Table 5.2.1 Equipment List for Noise Monitoring							
Equipment	Manufacturer & Model No.	Precision Grade	Qty				
Integrated sound level meter	Svantek 949	IEC 651 Type 1 IEC 804 Type 1	2				
Windscreen	Microtech gefell model W2	N/A	1				
Acoustical calibrator	Svantek SV30A	IEC 942 Type 1	1				
Wind speed indicator	Kestrel K1000	N/A	1				
Remarks: Calibration	Remarks: Calibration details of the sound level meter is given in Appendix C for reference						

Table 3.2.1 Equipment List for Noise Monitoring

3.3 Monitoring Locations

According to the Environmental Monitoring and Audit manual, impact noise monitoring for contract 1 was undertaken at two locations during the construction phase of the project. The proposed monitoring locations are summarized in Table 3.3.1. Figure 3.3.1 shows the Noise Monitoring Locations

Noise measurement at each monitoring location was taken at a point 1m from the exterior of the selected premises and at a height of 1.2m above ground with no disturbance to the dweller and least obstructed view.

Table 3.3.1 Noise Monitoring Locations during Construction Phase

Noise Monitoring Station	Location
M1	14, Shuen Wan Chim Uk
AL1	Joint Village Office for Villages in Shuen Wan, Tai Po

In accordance with the requirements in the EM&A manual (revision 3), 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 (i.e. 1900-2300, 2300-0700 of next day and Sundays / general holiday), impact monitoring that comprises 3 consecutive $L_{eq~(5minutes)}$ would be carried out.

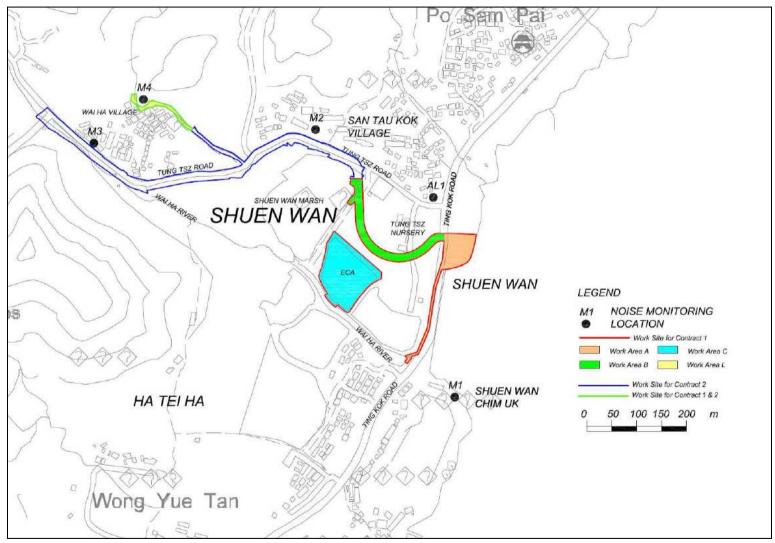


Figure 3.3.1 Impact noise monitoring locations

3.4 Monitoring Results and Interpretation

Relevant details of the noise monitoring results are presented in Table 3.4.1. The results of M1, ranged between 58.2dB(A) and 60.2dB(A), and AL1, ranged between 61.4(A) and 68.3dB(A), were within the limit levels and therefore, no exceedance was found.

Table 3.4.1 Noise Monitoring Results for the reporting period							
Location	Parameter	Date	Time	L _{Aeq} dB(A)	Limit dB(A)	Exceedance	Weather
M1	L _{eq 30mins}	7-Apr-11	13:13	59.8	75	N	Overcast
M1	L _{eq 30mins}	14-Apr-11	14:51	58.8	75	N	Sunny
M1	L _{eq 30mins}	21-Apr-11	09:20	60.2	75	N	Overcast
M1	L _{eq 30mins}	28-Apr-11	11:03	58.2	75	N	Overcast
AL1	L _{eq 30mins}	7-Apr-11	11:38	63.6	75	N	Overcast
AL1	L _{eq 30mins}	14-Apr-11	14:14	68.3	75	N	Sunny
AL1	L _{eq 30mins}	21-Apr-11	14:41	65.8	75	N	Overcast
AL1	L _{eq 30mins}	28-Apr-11	10:02	61.4	75	N	Overcast

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

3.5 Action and Limit level for Construction noise

The Action and Limit (A/L) levels for construction noise are defined in Table 3.5.1. Should non-compliance of the criteria occur, action in accordance with the Action Plan in Table 3.5.2 should be carried out.

There was no exceedance recorded in the reporting period.

Table 3.5.1 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.

3.6 Monitoring Schedule for the next reporting period

Noise monitoring schedule is proposed to be carried out on 5th, 12th, 19th, and 26th of May 2011.

Table 3.5.2 Event / Action Plan for Construction Noise

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

4. Water Monitoring

4.1 Water Quality Monitoring Parameters and methodology

Turbidity in Nephelometric Turbidity Unit (NTU), and Dissolved Oxygen (DO) in mg/L, temperature, and pH measurements were in-situ measurements and suspended solids measurements were performed by a HOKLAS accredited laboratory using recommended reference method APHA 2540D.

4.2 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.

The measurements were performed by a portable and weatherproof multi-meter, model TOA-DKK WQC-24. The equipment was calibrated and verified by certified laboratory every 3 months to ensure they perform to the same level of accuracy as stated in the manufacturer's specification. Detailed calibration records of the multi-meter were shown in Appendix C for reference

Suspended solids 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.

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4.3 Monitoring Locations

In accordance with the EM&A Manual (revision 3), monitoring stations for contract 1 were established at two locations, which are summarized in Table 4.3.1.

Table 4.3.1 – Water Quality Monitoring Stations

Monitoring Station	Location	Coordinates	
W1	Between the Shuen Wan Marsh	E:839301	
VV 1	and ECA	N:836386	
W2.	Between Tolo Harbour and	E:839542	
VV Z	Proposed Penstock	N:836184	

As illustrated in Figure 4.3.1, W1 served as the control station while W2 was the monitoring location of water quality.

In accordance with the EM&A Manual (revision 3), measurements shall be taken at 3 water depths, namely, 1m below water surface, mid-depth and 1m above river bed, except where the water depth less than 6m, the mid-depth station may be omitted. Should the water depth be less than 3m, only the mid-depth station will be monitored.

As the depth of water was less than 3m, water samples were collected at mid-depth of each proposed monitoring stations for measurements and sample collection.

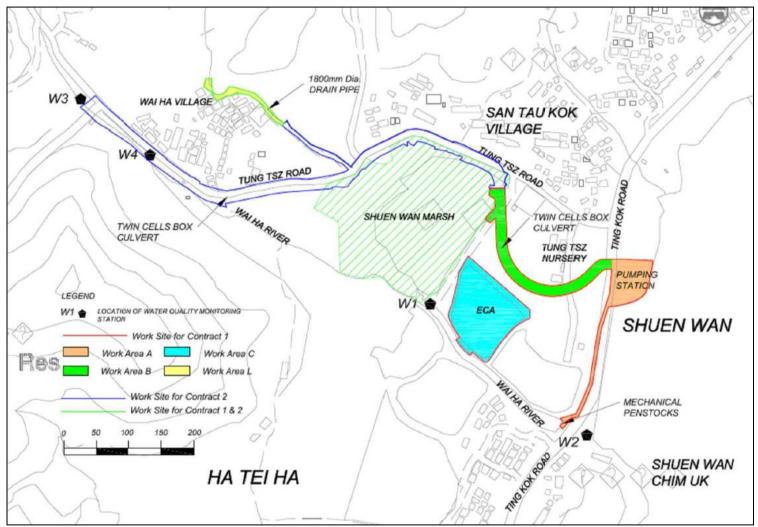


Figure 4.3.1 Water Quality Monitoring Locations

4.4 Monitoring Frequency

Impact water quality monitoring for each monitoring station were performed at mid-flood or mid-ebb tides for 3 days per week during the course of the construction river works.

Monitoring were carried out on 2nd, 4th, 7th, 9th, 12th, 14th, 16th, 18th, 19th, 21st, 26th, 28th and 30th of April 2011.

4.5 Monitoring Results and Interpretation

Water quality monitoring was carried out thirteen times in this reporting month. Detailed on-site measurements are shown in Appendix E. Table 4.5.1 presents consolidated results throughout the reporting month.

For water quality monitoring, total 11 abnormal accidents of water quality limits (Dissolved Oxygen, Turbidity and Suspended Solids) were recorded in this reporting month according to the established level. ET has arranged site investigations for the abnormal incidents and finding from the investigations showed no particular observations of defective site activities were found. Therefore, such conditions were believed to be attributed by natural fluctuation and are not considered as non-compliance events.

Detailed information of these incidents was presented in Section 8.

Table 4.5.1 Summary of Water Quality Monitoring Results of April 2011

		Average of Monitoring Results				
	Temperature (°C)	Turbidity (NTU)	рН	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	Suspended Solids (mg/L)
W1	24	13.2	8.05	6.5	77	5.9
W2	24.3	13.5	7.94	5.7	74	4.5

Table 4.5.2 Interpretations of abnormal incidents recorded in the reporting month

Date	Tide	Parameter	Interpretations
2011/4/2	Ebb	DO	Incident was regarded as natural fluctuation since no particular site
2011/4/2	EUU	Turbidity	practice deficiency was observed.
2011/4/4	Ebb	DO	Incident was regarded as natural fluctuation since no particular site practice deficiency was observed.
2011/4/7	Ebb	Turbidity	Incident was regarded as natural fluctuation since no particular site practice deficiency was observed.
		Turbidity	Incident was regarded as natural fluctuation since no particular site
2011/4/14	Flood	DO	practice deficiency was observed.
		SS	
2011/4/16	Flood	DO	Incident was regarded as natural fluctuation since no particular site practice deficiency was observed.
2011/4/18	Ebb	DO	Incident was regarded as natural fluctuation since no particular site
2011/4/16	Edd	Turbidity	practice deficiency was observed.
2011/4/19	11/4/19 Ebb DC		Incident was regarded as natural fluctuation since no particular site
2011/4/17	LUU	Turbidity	practice deficiency was observed.
2011/4/21	Ebb	DO	Incident was regarded as natural fluctuation since no particular site
2011/4/21	LUU	Turbidity	practice deficiency was observed.
2011/4/26	Flood	DO	Incident was regarded as natural fluctuation since no particular site
2011/4/20	11000	Turbidity	practice deficiency was observed.
2011/4/28	Flood	DO	Incident was regarded as natural fluctuation since no particular site
2011/4/20	11000	Turbidity	practice deficiency was observed.
2011/4/30	Flood	DO	Incident was regarded as natural fluctuation since no particular site
2011/4/30	11000	Turbidity	practice deficiency was observed.

Table 4.5.3 Construction work conducted during abnormal incidents period

Date	Area	Construction work conducted during abnormal incidents period Construction works conducted		
Date				
2011/4/2	A	Excavating trench, breaking up existing concrete in trench, backfilling the void with soil		
	D % C	and driving sheet piles for box culvert construction. Construction of Pre-bore H-pile		
	B & C	No activity		
	A	Excavating trench, breaking up existing concrete in trench, backfilling the void with soil		
2011/4/4	D	and driving sheet piles for box culvert construction. Construction of Pre-bore H-pile		
	B C	No activity Stockpiling soil materials from Area F		
	A	Excavating trench to expose existing concrete, backfilling the void with soil and driving sheetpile shoring for box culvert construction, Drilling and sampling of pre-bored H-pile,		
2011/4/7		Cement grouting of pre-bored H-pile, Welding to splice H-pile.		
2011/4/7	В	No activity		
	С	Stockpiling soil materials from Area F		
	A	Breaking up existing concrete in trench, backfilling at both sides of sheet pile shoring and		
	Α			
2011/4/14	В	driving sheet piles along box culvert trench. Trimming formation for hoarding construction.		
	С	Stockpiling soil materials from Area F		
	A	Breaking up existing concrete in trench, backfilling at both sides of sheet pile shoring and		
	A	driving sheet piles along box culvert trench.		
2011/4/16	В	No activity		
	C	Forming site access and working platform with the imported soil form Area A		
	A	Excavating trench for driving sheet pile, shoring, and breaking up existing concrete in		
	A	trench and driving sheet piles along box culvert trench.		
2011/4/18	В	Placing precast concrete footings for hoarding post.		
	C	Stocking of soil materials.		
	A	Excavating trench for driving sheet pile, shoring, and breaking up existing concrete in		
	11	trench and driving sheet piles along box culvert trench. Forming soil platform, setting up		
2011/4/19		kentledge and installing equipments for test of preliminary pile TP1.		
2011/ 1/15	В	Placing precast concrete footings for hoarding post.		
	С	No activity		
	A	Excavating trench and driving sheetpile shoring along box culvert. Leveling the soil		
2011/4/21		formation for sheetpiling works.		
2011/4/21	В	Erecting steel post and fixing corrugated sheets for hoarding.		
	С	Forming temporary site access and working platform with imported soil from Area A		
	A	Breaking up existing concrete in trench, backfilling at both sides of sheet pile shoring and		
2011/4/26		driving sheet piles along box culvert trench.		
2011/4/20	В	Erecting steel post and fixing corrugated sheets for hoarding. Tree Transplant.		
	C	Stockpiling soil materials from Area A & F.		
	A	Driving sheetpile shoring for pump station. Excavating and breaking up existing concrete		
2011/4/28		in trench, installing top layer of 1-beam waling to sheetpile shoring of box culvert trench.		
2011/4/20	В	No activity		
	С	Spreading the imported soil materials (Area A) to form site access and working platform.		
	A	Excavating and breaking up existing concrete in trench, installing top layer of 1-beam		
2011/4/30		waling to sheetpile shoring of box culvert trench. Loading test of preliminary pile TP1.		
2011/7/30	В	Excavating to expose existing watermain pipe for temporary waterpoint diversion.		
	C	Spreading the imported soil materials (Area A) to form site access and working platform.		

4.6 Action and limit level for Water Quality

Based on the criteria stipulated in EM&A manual (revision 3) and baseline water quality monitoring data obtained, the A/L levels are shown in Table 4.6.1, Table 4.6.2. The A/L levels for W1 were ignored since W1 functions as the control station for contract 1. 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 4.6.3 should be taken.

Table 4.6.1 Action and Limit Levels for Water Quality at All Monitoring Stations

Parameters	Action	Limit
DO in mg/L	5 percentile of baseline data	4 mg/L or 1 percentile of baseline
DO III IIIg/L	3 percentile of basefine data	data
pН	N/A	6.0 - 9.0
	95 percentile of baseline data and	99 percentile of baseline data and
SS in mg/L	120% of upstream control station's	130% of upstream control station's
	SS	SS
Turbidity in	95 percentile of baseline data and	99 percentile of baseline data and
NTU	120% of upstream control station's	130% of upstream control station's
NIU	Turbidity	Turbidity

Table 4.6.2 Action and Limit Levels for Water Quality at All Monitoring Stations

	Monito	oring Stati	ons (Floo	d Tide)	Monitoring Stations (Ebb Tide)					
Parameters	W1		W2		W1		W2			
1 at afficiers	Action	Limit	Action	Limit	Action	Limit	Action	Limit		
	Level	Level	Level	Level	Level	Level	Level	Level		
DO (mg/L)	8.07	8.07	7.81	7.69	7.12	7.02	6.77	6.31		
pН	N/A	6.0-9.0	N/A	6.0-9.0	N/A	6.0-9.0	N/A	6.0-9.0		
SS (mg/L)	7.7	8.1	7.7	8.6	10.5	10.9	9.4	9.9		
Turbidity (NTU)	4.9	5.3	1.7	1.8	4.2	4.7	3.0	3.5		

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 4.6.3 Event and action Plan for Water Quality

Action level being exceeded by one sampling day 1. Repeat in-situ measurements to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IEC, Contractor and Engineer; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures. 5. Discuss mitigation measures. 6. Ensure mitigation measures. 6. Ensure mitigation measures. 7. Repeat measurement on next day of exceedance. 7. Repeat in-situ measures with ET, Engineer and Contractor; 8. Action level being exceeded by more than two consecutive sampling days 8. Action level being exceeded by more than two consecutive sampling days 9. Inform Engineer confirm in writing measures with ET, Engineer and Contractor; 9. Make agreement on mitigation measures. 9. Make agreement on mitigation measures. 9. Make agreement on mitigation measures. 9. Make agreement on measures to IEC, Engineer within working days; 9. Inform Engineer confirm in writing measures with ET, Engineer and Contractor; 9. Make agreement on mitigation measures. 9. Make agreement on mitigation measures. 9. Inform Engineer confirm in writing measures with ET, Engineer and Engineer and mitigation measures. 9. Discuss proposed mitigation measures. 9. Discuss mitigation measures. 9. Discuss proposed mitigation measures. 9. Discuss with ET, Engineer and mitigation measures with ET, Engineer and Contractor; 2. Rectify unaccept practice; 3. Check all plant and contractor; 2. Rectify unaccept practice; 3. Check all plant and contractor; 2. Rectify unaccept practice; 3. Check all plant and contractor; 2. Make agreement 3. Discuss proposed mitigation measures. 9. Discuss mitigation meas		ET Leader	IEC	ER	Contractor
being exceeded by one sampling day Measurements to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IEC, Contractor and Engineer; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented. 7. Repeat measurement on next day of exceedance. Action level being exceeded by more than two consecutive sampling days Action level being days 4. Check implements oconfirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 1. Discuss mitigation measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures with IEC, Engineer and Contractor; 3. Assess effectiveness of implemented mitigation measures. 4. Consider change working method; 5. Discuss with ET, and Engineer and measures. 5. Discuss with ET, and Engineer and measures. 6. Implement agree mitigation measures with IEC, Engineer with in working days; 6. Implement agree mitigation measures with ET, Engineer and Contractor; 1. Discuss proposed mitigation measures with ET, Engineer and Contractor; 2. Rectify unaccept contractor; 2. Make agreement on mitigation on measures to edition of the contractor; 2. Make agreement on non-compliance; 2. Make agreement on non-compliance; 3. Check all plant a equipment measures of implemented; 3. Assess effectiveness of implemented mitigation measures. 4. Consider change working measures of implemented mitigation measures. 6. Implement agree mitigation measures with ET, Engineer and Contractor; 1. Inform Engineer confirm in writing notification of the contractor; 2. Rectify unaccept proctice; 2. Rectify unaccept contractor; 2. Rectify unaccept contractor; 3. Assess effectiveness of implemented mitigation measures. 4. Consider change accordingly; 3. Assess effectiveness of implemented mitigation measures. 4. Consider change accordingly; 3. Assess					
Action level being exceeded by more than two consecutive sampling days 1. Repeat in-situ measurements to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 2. Review proposals on mitigation measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures of mitigation measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures of mitigation measures with ET, Engineer and Contractor; 2. Rectify unaccept practice;	being exceeded by one sampling	measurements to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IEC, Contractor and Engineer; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented. 7. Repeat measurement on next day of	measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; 3. Assess effectiveness of implemented	mitigation measures with IEC, ET and Contractor; 2. Make agreement on mitigation measures to be implemented; 3. Assess effectiveness of implemented mitigation	confirm in writing notification of the non-compliance; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes in working methods; 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three
and Engineer; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented. 7. Prepare to increase the monitoring frequency to daily; A contractor and advise the Engineer accordingly; 3. Assess effectiveness of implemented; 3. Assess effectiveness of implemented; 3. Assess effectiveness of implemented mitigation measures. equipment; 4. Consider change working methods; 5. Discuss with ET, and Engineer an propose mitigation measures. Engineer within working days; 6. Implement agree mitigation measures. equipment; 4. Consider change working methods; 6. Discuss with ET, and Engineer an propose mitigation measures. Engineer within working days; 6. Implement agree mitigation measures.	being exceeded by more than two consecutive	 Repeat in-situ measurements to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform IEC, Contractor and Engineer; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, Engineer and Contractor; Ensure mitigation measures are implemented. Prepare to increase the 	measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; 3. Assess effectiveness of implemented mitigation measures.	mitigation measures with IEC, ET and Contractor; 2. Make agreement on mitigation measures to be implemented; 3. Assess effectiveness of implemented mitigation	confirm in writing notification of the non-compliance; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes in working methods; 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three
8. Repeat measurement on next day of exeedance.		daily; 8. Repeat measurement on next day of			

Limit level being exceeded by one sampling day	 Repeat in-situ measurements to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform EPD, IEC, Contractor and Engineer; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, Engineer and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level. 	Engineer and Contractor; 2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; 3. Assess effectiveness of implemented mitigation measures.	mitigation measures with IEC, ET and Contractor; 2. Request Contractor to critically review the working methods; 3. Make agreement on mitigation measures to be implemented; 4. Assess effectiveness of implemented mitigation measures.	 Inform Engineer and confirm in writing notification of the non-compliance; Rectify unacceptable practice; Check all plant and equipment; Consider changes in working methods; Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; Implement agreed mitigation measures.
Limit level being exceeded by more than two consecutive sampling days	 Repeat in-situ measurements to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform EPD, IEC, Contractor and Engineer; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, Engineer and Contractor; Ensure mitigation measures are implemented. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days. 	advise the Engineer accordingly; 3. Assess effectiveness of implemented mitigation measures.	mitigation measures with IEC, ET and Contractor; 2. Request Contractor to critically review the working methods; 3. Make agreement on mitigation measures to be implemented; 4. Assess effectiveness of implemented mitigation	 Inform Engineer and confirm in writing notification of the non-compliance; Rectify unacceptable practice; Check all plant and equipment; Consider changes in working methods; Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; Implement agreed mitigation measures; As directed by the Engineer, slow down or stop all or part of the construction activities until no exceedance of Limit level.

4.7 Monitoring Schedule for the next reporting period

Water quality monitoring schedule is proposed to be carried out on 3^{rd} , 5^{th} , 7^{th} , 10^{th} , 12^{th} , 14^{th} , 17^{th} , 19^{th} , 21^{st} , 24^{th} , 26^{th} , and 28^{th} and 31^{st} of May 2011.

5. Hydrological Characteristics Monitoring

5.1 Hydrological Characteristics Monitoring Parameters and methodology

Impact monitoring of hydrological characteristics was undertaken to establish hydrological characteristics of sections of Wai Ha River adjacent to Drainage Improvement Works in Shuen Wan, Tai Po.

The hydrological characteristics of sections of Wai Ha River were measured by water flow rate and depth.

5.2 Monitoring Equipment

Monitoring performed by a portable echo-sounder, model Greyline Stingray. The equipment was calibrated and verified by certified laboratory or manufacturer every year to ensure they perform to the same level of accuracy as stated in the manufacturer's specification.

Calibration Certificate of the multi-meter is given in Appendix C.

5.3 Monitoring Locations

In accordance with the EM&A Manual (revision 3), monitoring stations for contract 1 were established at two locations and summarized in Table 5.3.1.

Table 5.3.1 – Water Quality Monitoring Stations

Monitoring Station	Location	Coordinates
H1	Between the Shuen Wan Marsh and	E:839301
	ECA	N:836386
H2	Route to Sam Kung Temple	E:839163
		N:836433

As illustrated in Figure 5.3.1, H2 served as the control station while H1 was the monitoring location of hydrological characteristics.

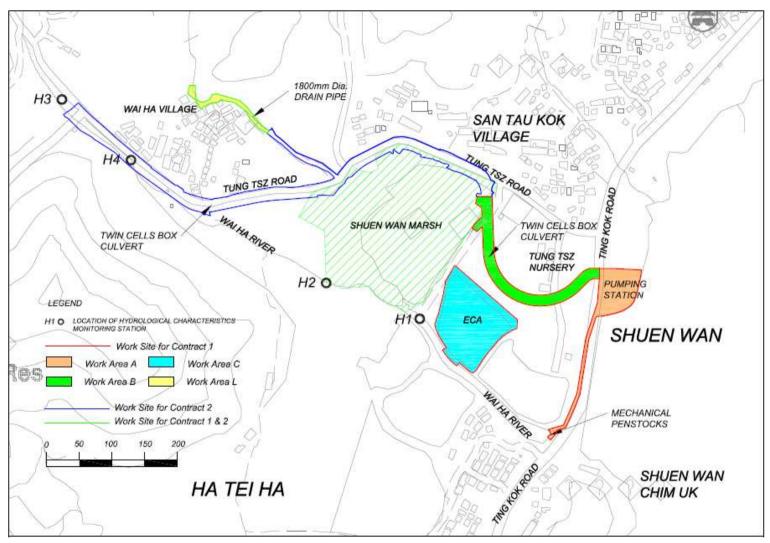


Figure 5.3.1 Hydrological Characteristics Monitoring Locations

5.4 Monitoring Frequency

Hydrological characteristics monitoring for each monitoring station were performed at mid-flood and mid-ebb tides for once per week during the course of the construction river works.

Monitoring was carried out on 2^{nd} , 9^{th} , 16^{th} , 18^{th} and 30^{th} of April 2011.

5.5 Monitoring Results and Interpretation

Hydrological characteristics monitoring was carried out five times in this reporting period. The monitoring results are summarized in Table 5.5. All results were within the action and limit levels, therefore, no exceedance was found.

Table 5.5 Summary of Water Quality Monitoring Results

	Average of Mon	nitoring Results
	Water Depth (m)	Water Flow Rate (m ³ /s)
H1	~0.2*	0.120
H2	~0.4*	0.689

^{*:} Since the water levels were too low for the depth detector to determine, tape measure was instead adopted for estimation.

Details of the monitoring data were presented in Appendix F.

5.6 Action and limit level for Hydrological Characteristics

The Action and Limit levels for all monitoring stations are summarized in Table 5.6.1, which would be applied for compliance assessment of hydrological characteristics for this project. If the hydrological characteristics monitoring results at any impact stations exceeded the criteria, the actions in accordance with the Event and Action Plan in Table 5.6.2 should be taken.

Table 5.6.1 Action and Limit Levels for Hydrological Characteristics at All Monitoring Stations

Parameters	Action	Limit
Water Depth at Mid-flood (m)	0.08	0.06
Water Depth at Mid-ebb (m)	0.08	0.06
Water Flow Rate (m³/s)	120% of control station's water flow rate on the same day of measurement	140% of control station's water flow rate on the same day of measurement

Table 5.6.2 Event and action Plan for Hydrological Characteristics

Contractor
Inform Engineer and confirm in writing notification of the non-compliance; Rectify unacceptable practice; Check working methods and any excavation works or dewatering processes; Consider changes in working methods and plans; Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; Implement agreed

								mitigation
								measures.
Action level being exceeded by more than two consecutive sampling days	 1. 2. 4. 7. 8. 	Repeat in-situ measurements to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform IEC, Contractor and Engineer; Check monitoring data, Contractor's working methods and any excavation works or dewatering processes; Discuss mitigation measures with IEC, Engineer and Contractor; Ensure mitigation measures are implemented. Prepare to increase the monitoring frequency to daily; Repeat measurement on next day of exeedance.	2.	Discuss mitigation measures with ET, Engineer and Contractor; Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; Assess effectiveness of implemented mitigation measures.	2	Discuss proposed mitigation measures with IEC, ET and Contractor; Make agreement on mitigation measures to be implemented; Assess effectiveness of implemented mitigation measures.		Inform Engineer and confirm in writing notification of the non-compliance; Rectify unacceptable practice; Check working methods and any excavation works or dewatering processes; Consider changes in working methods and plans; Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; Implement agreed mitigation
				LIMIT LEVEL				measures.
Limit level being exceeded by one sampling day	 2. 4. 6. 	Repeat in-situ measurements to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform AFCD, IEC, Contractor and Engineer; Check monitoring data, and Contractor's working methods and any excavation works or dewatering processes; Discuss mitigation measures with IEC, Engineer and Contractor; Ensure mitigation measures are	2.	Discuss mitigation measures with ET, Engineer and Contractor; Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; Assess effectiveness of implemented mitigation measures.	2	Discuss proposed mitigation measures with IEC, ET and Contractor; Request Contractor to critically review the working methods; Make agreement on mitigation measures to be implemented; Assess effectiveness of implemented mitigation measures.	2.F 2.F 3.0 7 4.0 4.0 5.E 7 F F	nform Engineer and confirm in writing notification of the non-compliance; Rectify unacceptable practice; Check working methods and any excavation works or dewatering processes; Consider changes in working methods and plans; Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; mplement agreed

	implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level.			mitigation measures.
Limit level being exceeded by more than two consecutive sampling days	 Repeat in-situ measurements to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform AFCD, IEC, Contractor and Engineer; Check monitoring data, and Contractor's working methods and any excavation works or dewatering processes; Discuss mitigation measures with IEC, Engineer and Contractor; Ensure mitigation measures are implemented. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days. 	 Discuss mitigation measures with ET, Engineer and Contractor; Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; Assess effectiveness of implemented mitigation measures. 	mitigation measures with IEC, ET and Contractor; 2. Request Contractor to critically review the working methods; 3. Make agreement on mitigation measures to be implemented; 4. Assess effectiveness of implemented mitigation	and Engineer and propose mitigation measures to IEC and Engineer within three working days; 6. Implement agreed mitigation measures; 7. As directed by the Engineer, slow down or stop all or part of

5.7 Monitoring Schedule for the next reporting period

Hydrological characteristics monitoring schedule is proposed to be carried out on 5^{th} , 12^{th} , 19^{th} and 26^{th} of May 2011.

6. Ecology Monitoring

6.1 Introduction

The Ecological Monitoring of the Ecological Compensatory Area (ECA) of the Project is conducted to fulfill Clauses 5.2 and 5.4 of EP-303/2008 and the monitoring requirements in accordance with Section 6 of the approved updated EM&A Manual (approved by EPD on 21st December 2010) and the approved Habitat Creation Plan (HCP) (approved by EPD on 24th September 2010) of the Project.

This report documents monitoring findings on vegetation health and site inspections in the ECA undertaken in April 2011.

6.2 Ecological Monitoring of ECA

6.2.1 Scope of Monitoring

A specific ecological monitoring programme and ecological monitoring requirements of the ECA are detailed in Section 7 of the approved Habitat Creation Plan (HCP) and Section 6.18 of the approved updated Environmental Monitoring & Audit (EM&A) Manual of the Project.

During the construction phase of the ECA, monthly monitoring of vegetation health (including the planted, retained and transplanted trees and shrub, and the proposed planting) and weekly site inspections should be undertaken. Monthly monitoring of *in situ* water quality check will be carried out once the ECA is filled with water from the nearby Wai Ha River.

During the 12-month establishment phase of the ECA, monitoring on habitat types, vegetation cover, intertidal fauna and other fauna (including avifauna, herpetofauna, fish, odonates and butterflies) will be undertaken on a six-monthly basis, while the vegetation health and *in situ* water quality check will be monitored monthly. Site inspections will be conducted twice per month.

6.2.2 Monitoring Methodology during the construction phase

Monitoring of vegetation health

Monthly monitoring on the health condition of the retained and transplanted trees and vegetation will be conducted. Once the proposed vegetation are planted in the ECA, monitoring on the growth and health conditions of these planted vegetation in various created habitats (i.e. brackish marsh, mangrove, woodland areas of planted trees and shrubs, and wooded areas with retained and (trans)planted trees) within the ECA will be conducted during the

construction and establishment phases. General health and growth status of the retained trees within the ECA are recorded and recommendation of appropriate tree care will be made to the maintenance party.

All planted, retained and transplanted trees and shrubs will be surveyed to update their growth and health. Any signs of pests and/ or poor growth of planted, retained and transplanted trees and shrubs will be recorded. Appropriate treatment or removal of pest will be implemented if necessary. Supplemental planting will be arranged if needed.

A fixed transect line will be run through the wetland habitats (including intertidal mudflat, brackish marsh and mangrove) and the general growth and health of the planted vegetation along both sides of the transect will be inspected and evaluated. Any adverse plant health, such as dieback of planted species, will be noted and supplemental planting will be arranged. Any signs of pests which cause adverse health problems to the plants will be identified and recorded.

Monitoring of water quality

Since there will be free movement of brackish river water in and out of the ECA, water quality in the ECA will be largely dependent on water quality in the river. In this open system it is not appropriate to set specific targets for water quality parameters. Nevertheless, baseline data on water quality, in particular seasonal patterns, would potentially be useful long term management of the ECA. Once the ECA is filled with water during construction phase of the ECA, *in-situ* water quality will be measured once per month during both Construction and Establishment Phases. Parameters, including temperature, pH, salinity, turbidity and dissolved oxygen, will be monitored. Additional measurements of these parameters should also be made by the ecologist in response to unexpected events (e.g. algal blooms or fish die-offs) in order to inform remedial management measures.

Site inspection

Weekly site inspection will be carried out by the Wetland Specialist to update the status and monitor the progress of the construction of the ECA. Any adverse ecological impact resulting from the construction should be identified and remedial action should be recommended.

6.2.3 Monitoring Methodology during the establishment phase

Monitoring of vegetation health Same monitoring methodology as in Section 6.2.2.

Monitoring of water quality Same monitoring methodology as in Section 6.2.2.

Site inspection

Site inspection during the establishment phase of the ECA will be conducted twice per month for monitoring the health and condition of the wetland during the establishment period. Any unsatisfied health and habitat criteria of the wetland will be identified and remedial action should be recommended.

Monitoring of habitat types and vegetation cover

Monitoring of habitat types and vegetation cover will be conducted twice during the 12 month Establishment Phase of the ECA; specifically at the end of the dry season and the end of the subsequent wet season after completion of the planting work. The monitoring aims to determine the exact extent of the wetland habitats and vegetation cover (i.e. open water, intertidal mudflat, brackish marsh and mangrove) during the establishment period and control any excessive colonization of unwanted vegetation specific habitats.

Monitoring of intertidal fauna

As the ECA would largely comprise an intertidal mudflat, monitoring for intertidal fauna will be conducted. Recolonisation will take time: accordingly monitoring will be tentatively conducted in February 2012 and August 2012. As the important aim of monitoring of intertidal fauna in the ECA is to examine the diversity of the colonising community, a qualitative manner by walk-through survey (i.e. walk through the site with species and relative abundance recorded) will be conducted. Core sampling will also be conducted at different levels to record infauna. Three samples at each level (low, middle and high) will be collected during each monitoring event and the monitoring will be conducted at low tide.

Monitoring of other fauna

Monitoring of other faunal groups, including birds, herpetofauna, fish, odonate and butterflies, will be conducted. Monitoring of any aquatic invertebrates will be covered by the intertidal surveys. Since the site will be intertidal, it is considered no suitable for local amphibian species. Therefore, no nighttime survey for detecting mating calls of amphibians is necessary and only daytime surveys are needed. Monitoring of these faunal groups will be conducted on a walk-through survey basis. The surveyor will walk through the site, recording and counting the fauna observed. Microhabitats for herpetofauna will be actively searched. This monitoring will be conducted twice within the establishment period (once in the dry season (tentatively in February 2012) and once in the wet season (tentatively in August 2012).

Monitoring of wild mammals is not necessary in this case; however, if signs of wild mammals are observed (such as footprints) during any field surveys, these will be recorded.

6.2.4 Monitoring time and weather condition

Site inspection and monitoring of vegetation, fauna groups and water quality should be carried out during day-time with calm weather. Monitoring of birds should commence within one hour of sunrise, when is the peak activity period for birds. Other fauna groups shall be undertaken during the warmer part of the monitoring day.

6.3 Monitoring Results

Monitoring of Vegetation Health

The monitoring of vegetation health will start from May of 2011.

Monitoring of Water Quality

No water quality check was conducted in April 2011 since the ECA has not yet filled with water from Wai Ha River.

Site Inspections

Four site inspections were carried out on 6th, 15th, 20th and 29th April 2011. Table 1 summarizes the observations and recommendations for each site inspection.

Table 6-1. Observation and recommendation for each site inspection, April 2011.

Inspection Date	Observation	Recommendation
06 Apr 2011	No major works was carried out.	Not required.
	The constructed temporary haul	
	road remains unchanged. The	
	Main Contractor would fasten the	
	construction process by seeking	
	appropriate soil materials.	
15 Apr 2011	No works carried out since	Not required.
	previous visit.	
20 Apr 2011	Construction of the temporary haul	Not required.
	road was resumed and suitable soil	
	was deposited along the temporary	
	haul road. Water pumping had	
	been continued.	
29 Apr 2011	Site formation was in progress.	Not required.
	Fishpond mud being stockpiled.	
	Quality of both soil being brought	
	in and fishpond soil was good.	

6.4 Management Activities

6.4.1 Ecological Issues/ Management Activities

No significant ecological issues or management activities were identified.

6.5 Implication of the Survey Findings

6.5.1 Implication to the Wetland design of the ECA

There were no implications to the wetland design from the monthly monitoring data and weekly site inspection.

6.6 Recommendations

All existing trees to be retained within the ECA should be maintained with acceptable health condition. These trees should be protected appropriately in accordance with the specification for landscape softworks stipulated in the approved Landscape Plan.

7. Landscape and Visual

7.1 Introduction

The Landscape and Visual Monitoring of the Project is conducted to fulfill Clauses 5.2 and 5.4 of EP-303/2008 and the monitoring requirements in accordance with Section 7 of the approved updated EM&A Manual (approved by EPD on December 2010) of the Project. A Baseline Review on updating the landscape and visual condition, and the mitigation measures of the Project (including Contracts 1 and 2 of the Project) was undertaken before the commencement of the Project. The review findings were updated in the Baseline Environmental Monitoring Report submitted to the EPD on 14 February 2011.

This monthly monitoring report will detail the scope of landscape and visual monitoring work, monitoring findings and observations, and any recommendation and advice on proper implementation of the landscape mitigation measures.

7.2 Scope of Monitoring

7.2.1 Monitoring Objectives

Landscape and Visual Monitoring of the Project should be conducted in a bi-weekly basis for checking the design, implementation and maintenance of the landscape and visual mitigation measures throughout the construction phase and in a quarterly basis during operational phase of the Project. Observations of any potential conflicts between the proposed mitigation measures and the project works carried out by the Contractors should be recorded. Recommendation and advice on proper implementation of the landscape mitigation measures should be provided to the Contractor for minimizing any potential impacts on the landscape and visual elements.

7.2.2 Monitoring during Construction Phase

The following landscape and visual mitigation measure should be implemented during the construction phase of the project to minimize the potential impacts:

- *Visual Screen* Use of hoardings as visual screens for the construction in the works areas;
- *Contaminant/ Sediment Control* Use of temporary barriers, covers and drainage provision around the construction works as contaminant/ sediment control to prevent the contaminants and sediments from entering the sensitive water-based habitats;
- *Pollution Control* Implementation of pollution control measures to minimize any adverse environmental impacts to the surrounding habitats:
- *Liaison with Nursery* Liaison with the nursery operator as necessary to minimize any adverse impact to the daily operation and plant holding capacity of the nursery;
- Existing Trees within Works Area Maintenance and protection of the existing trees, especially their crowns, trunks and roots, within work sites; and
- Construction Light Provision of construction light should be controlled at night to avoid excessive glare to the surrounding villages and to Plover Cove.

7.2.3 Monitoring during Operational Phase

The following landscape and visual mitigation measure should be implemented during the operational phase of the project to minimize the potential impacts:

- Viewing area formation by planting with shrubs, grasses and benches along the area;
- Architectural design of the pump house will help it fit into the existing suburban, natural to semi-natural surroundings;
- Landscape design of pump house by providing sufficient planting around its boundary fence;
- Enhancement planting along Tung Tsz Road with shrubs/ trees of suitable species to help protect the stream and marshes;
- Construction of box culvert should be with at least 1.0m soil depth for enhancement planting;

- Transplanting of existing affected trees to adjacent locations should be carried out:
- Preparation for transplanting is needed to allow sufficient time for root pruning and rootball preparation prior to transplanting; and
- Reinstatement of affected area should be carried out to check that the works areas are properly reinstated.

7.3 Landscape and Visual Monitoring Results

7.3.1 Monitoring Date(s)

This monthly Landscape and Visual Monitoring (April 2011) was conducted to cover only Areas A, B and C of Contract 1 of the Project since Contract 2 (i.e. the construction of a twin-cell box culvert close to Shuen Wan Conservation Area and Wai Ha River along Tung Tsz Road, and a drainage pipe near Wai Ha Village) has not yet commenced. The bi-weekly monitoring was conducted on 6th and 20th April 2011.

7.3.2 Visual Screen

No follow-up action by the Contractor is required as from the *Monthly EM&A Report for March 2011*.

Observation

Construction hoardings have been erected in Area A and Area C along the entire site boundary. In Area B, a new section of temporary hoarding has been erected from northwest to southwest parts of Tung Tsz Nursery (approximately along the works boundary from Trees U42 to U62). , while a line of hoardings have been maintained to the western part of Area B falling within the northwestern part of Tung Tsz Nursery. **Photos 1-5** show the views of the newly erected hoardings in Area B.

Recommendation

No specific recommendation is required.

7.3.3 Contaminant/ Sediment Control

No follow-up action on contaminant/sediment control in all areas is required as from the *Monthly EM&A Report for March 2011*.

Observation

Area A

Provision of vehicle wheel washing facilities was observed at the exit point of Area A.

Used water for washing vehicle wheel and groundwater from the excavated sites were pumped into the silt/sand removal facilities for filtration before discharging into the manhole adjacent to Area A.

Area B

No discharge of contaminants or any fluid was observed during the establishment of the temporary works hoarding and footings.

All surplus backfilled soil for the transplanted trees was removed appropriately after the transplant.

Area C

The existing pond has been drained as a preparation work for the later recontouring work and earthwork. Water pumped out from the pond was observed to be filtrated in the silt/sand removal facilities before discharging into the manhole adjacent to Area C.

Recommendation

No specific recommendation is required.

7.3.4 Pollution Control

Dust control measures (such as the vehicle wheel washing facilities at the exit of Area A) and sedimentation tanks in Areas A and C have been provided by the Contractor. Used water from Area B was drained to Area C for filtration and sedimentation.

No remedial measures from the Contractor are required as from the *Monthly EM&A Report for March 2011*.

Observation

Area A

Provision of vehicle wheel washing facilities was observed at the exit point of Area A to reduce the contamination to the surrounding habitats in Plover Cove.

Used water for washing vehicle wheel and groundwater from the excavated sites were pumped into the silt/sand removal facilities for filtration before discharging into the manhole adjacent to Area A.

Area B

No discharge of contaminants or any fluid was observed during the establishment of the temporary works hoarding and footings.

All surplus backfilled soil for the transplanted trees was removed appropriately after the transplant.

Area C

Drained water from the existing pond was observed to be filtered in the silt/sand removal facilities before discharging into the manhole adjacent to Area C. No direct discharge of water into the adjacent Wai Ha River was observed.

Recommendation

No specific recommendation is required.

7.3.5 Liaison with Nursery

Observation

Establishment of temporary hoarding and hoarding footings from northwest to southwest parts of Tung Tsz Nursery was undertaken during the monitoring.

- 8 trees, including U55, U57, U58, U60, U61, U63, U64 and A23, were transplanted on 20th April 2011.
- 5 trees, including U69, U72, U73, U75 and A24, were transplanted on 21st April 2011
- 6 trees, including U43, U45, U46, U52, U53 and A22, were transplanted on 26thApril 2011

The trees were transplanted directly after undertaking the root pruning work on the same transplant date. Trees were transplanted to the final receptor sites as proposed in the approved Landscape Plan.

Neither canopy reduction nor thinning was conducted for the transplanted trees, and all transplanted trees were maintained with temporary bamboo staking.

Additional site inspection was conducted for the transplanted trees on 29th April 2011 especially for Tree *Grevillea robusta* (U58).

<u>Recommendation</u>

The works area and the construction work should be properly maintained and implemented without influencing the daily operation of the nursery (i.e. provide enough access road and works area for the nursery operation).

All transplanted trees should be watered regularly (e.g. at least every two days) by the appointed landscape contractor.

7.3.6 Existing Trees within Works Areas

Tree protection zones (TPZs) on the retained and trees to be transplanted within the active construction works area in Area A were generally maintained properly, except for several trees (details refer to the following section). Regular watering of the retained trees and transplanted trees was anticipated

Significant signs of damage of existing tree crowns, trunks and roots were not observed in this monthly monitoring. Any observed issues related to the maintenance of existing trees within works areas are highlighted in this section *Observation*

Area A

TPZs for trees to be transplanted along the western boundary of Area A were generally maintained appropriately by the Main Contractor, except for the trees. E19, E20, E22, E38, E55, T150, E152 and T250 in which no proper Tree Protection Zones were established (e.g. no solid Tree Protection Zones or not enough growth space within the Zones).

Two *Melaleuca quinquenervia* (E21 and E22), which are proposed to be transplanted, were in poor health condition (such as with dry and unhealthy foliage). The poor health condition of these trees may due to the transplantation shock and unskillful transplantation practice resulting from the recent relocation of trees. The Contractor was informed to have more frequent watering (at least once every two days) to improve their health.

Area B

Transplant of 8 trees (U55, U57, U58, U60, U61, U63, U64 and A23), 5 trees (U69, U72, U73, U75 and A24) and 6 trees (U43, U45, U46, U52, U53 and A22,) were conducted on 20th, 21st and 26th April 2011 respectively.

Trees within the nursery were maintained generally as fair condition.

Tree *Bauhinia purpurea* (U17) was found on the ground with the trunk still attached with the roots. It may be crushed by vehicle using the nearby access road.

Tree *Lagerstroemia speciosa* (T97) was in poor health condition, with decayed branches and low vigor. Only a few buds were observed in the monitoring on 20th April 2011.

Area C

No tree felling was undertaken in April 2011. The existing trees were maintained generally in fair health condition. No branch pruning was observed in the monitoring.

Recommendations

Area A

Proper Tree Protection Zones should be established for the highlighted trees. All Tree Protection Zones should be maintained appropriately in accordance with the soft landscape works specification appended in the approved Landscape Plan,

including but not limited to the maintenance work such as removal of any surplus soil and construction equipments around the trunk flare of the retained and transplanted trees.

More frequent watering should be carried out for the two *Melaleuca quinquenervia* (E21 and E22).

Area B

All transplanted trees should be watered regularly (e.g. at least every two days) by the appointed landscape contractor.

In regard to the issue of vehicular damage on the existing tree within the Project Area, the Main Contractor is recommended to inspect the status and condition of the retained/ transplanted trees routinely for a better management.

Regular monitoring and watering of *Lagerstroemia speciosa* (T97) are recommended to monitor and enhance its vigorousness.

Area C

No specific recommendation is required.

7.3.7 Construction Lights

No follow-up action on maintenance of construction light is required as from the *Monthly EM&A Report for March 2011*.

Observation

No construction light impact to the surrounding villages and to Plover Cove as all construction activities and construction sites are halted at 1800. No construction light at night is provided by the Main Contractor.

Recommendation

No specific recommendation is required.

7.4 AUDIT SCHEDULE

The next bi-weekly Landscape & Visual Monitoring in May 2011 is scheduled to be conducted in the week of 3rd and 16th May 2011.

8. Action taken in Event of Exceedance

If the measurements (Noise, Water, Hydrological Characteristics, and 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 month there was no exceedance for noise, hydrological characteristics, and ecological measurements recorded; therefore, no actions were taken.

For water quality monitoring, total 11 abnormal accidents of water quality limits (Dissolved Oxygen, Turbidity and Suspended Solids) were recorded in this reporting month according to the established level. ET has arranged site investigations for the incidents. No major site activity that may affect water quality was observed and no particular observations of defective site activities were found. There were emissions of water from Area C to Wai Ha River within this report month. No muddy water and site runoff was observed at fish pond and Wai Ha River, water condition of fish pond and Wai Ha River are presented in photo attached in Appendix L. During the incidents occurred, Contractor had already implemented sedimentation tank and sump pit, with 2 layer of geotextile and type A and B aggregate, to prevent water quality impact. As no particular defect of site practices was observed, such conditions were believed to be attributed by natural fluctuation and are not considered as non-compliance events. No further actions for those incidents are required.

9. 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.

Table 9.1 is a summary of figures of the construction wastes disposal provided by Contractor

Table 9.1 Summary of Construction Waste Disposal

		Actual Quantities	of Inert C & D M	aterials Generated	Monthly		Actual Quantities of C & D Wastes Generated Monthly				Monthly
Month	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/cardboard packaging	Plastics (see note3)	Chemical Waste	Others, e.g. general refuse
	(in'000m3)	(in'000m3)	(in'000m3)	(in'000m3)	(in'000m3)	(in'000m3)	(in'000kg)	(in'000kg)	(in'000kg)	(in'000kg)	(in'000kg)
Mar-1	0.330				0.33						0.055
Apr-1	0.280				0.28						.02
May-1	1										
Jun-11											
Total	0.610				0.61						0.075
			Forecast of T	otal Quantities of (C & D Materials t	o be Generate	ed from the	Contract			
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/cardboard packaging	Plastics (see note3)	Chemical Waste	Others, e.g. general refuse
	(in'000m3)	(in'000m3)	(in'000m3)	(in'000m3)	(in'000m3)	(in'000m3)	(in'000kg)	(in'000kg)	(in'000kg)	(in'000kg)	(in'000kg)
	37.37	8.27	12.09	0	25.28	2.1	10	2	0.5	1	1

Notes: (1) The Performance targets are given in PS Clause 26.23 (14)

⁽²⁾ The waste flow table shall also include C & D materials that are specified in the Contract to be imported for used at the sites

⁽³⁾ Plastics refer to plastics bottles/containers, plastic sheets/foam from packaging materials.

The summary table shall be submitted to the Engineer's Representative monthly together with the Waste Flow Table for review and monitoring in accordance with the PS Clause 25.20A(4)

10. Status of Permits and Licenses obtained

Table 10.1 is the updated status of environmental related permits/ license obtained for the construction activities

Table 10.1 Status of Permits and Licenses Obtained

Description	License / Permit No.#	Date of Issue	Date of expiry	Status
Environmental Permit	EP-303/2008	2008/2/25	not applicable	Valid
Discharge Licence	WT00006448-2010	2010/6/15	30/6/2015	Valid
Registration as a Chemical Waste Producer	316597	2010/4/26	not applicable	Valid
Waste Disposal	7010348	2010/3/2	not applicable	Valid

11. Complaint Log

There was no formal complaint received during the reporting period. Therefore, follow up actions for the environmental complaint is not required.

Table 11.1 Summary of Formal Complaints received

	Noise	Water	Ecology	Others
Mar 2011	0	0	0	0
April 2011	0	0	0	0
Total	0	0	0	0

12. Site Environmental Audits

12.1 Site Inspection

Site inspections were undertaken weekly to inspect the construction activities in active site areas to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented.

Within this reporting period, site inspections were conducted on 1st, 7th, 14th, 20th and 26th of April 2011. A detailed checklist of each site inspection together with comments and relevant photos have been filed and kept. The findings from inspection were summarized in Table 12.1.

Table 12.1 Summary results of site inspections findings

Date	Findings	Identification	Advice from ET	Action taken	Closing date	Remarks
1 April 2011	Storage of site materials next to preserved trees	Observation	Contractor was advised to prevent storage of site materials next to the preserved trees. Proper fencings should be erected as tree protection zone also.	Site material has been removed by contractor	7 April 2011	-
7 April 2011	Chemical containers without secondary containment measures were observed tipped	Observation	Contractor was advised to provide proper drip pan for chemical using on site; chemicals not in use should be relocated to designated chemical store for storage.	outstanding	-	-
14 April 2011	The water condition in the wheel washing bay at the entrance of Area A was observed to be muddy	Observation	Contractor was advised to provide regular maintenance to the wheel washing bay in order to prevent carrying muddy water and earthy materials to the public through vehicles leaving from site.	,	20 April 2010	·
	Stagnant water was observed on the unused drip pan	Observation	Contractor was recommended to clean up the stagnant water for the prevention of mosquito breeding.	Stagnant water and drip pans had been removed from construction site.	5 May 2011	-

Date	Findings	Identification	Advice from ET	Action taken	Closing date	Remarks
			Contractor was			
			advised to relocate			
			the construction	Unused drip		
	Construction materials		materials for proper	pans had been		
20 April 2011	were observed on the	Observation	storage and to	removed from	5 May 2011	-
	unused drip pans		remove the unused	construction		
	' '		drip pans from site to	site.		
			avoid the storage of			
			stagnant water.			
			Contractor was advised to set			
			up wheel washing			
			facility, e.g. wheel			
			washing bay, for			
	Wheel washing facility was		construction vehicles			
	not provided at the	Observation	and ensure their use	outstanding	_	_
	entrance of Area C		before leaving from	odiotarianig		
	entrance of Alea C		site in order to			
			prevent them from			
			carrying dusty			
			construction			
			materials to the			
	Contractorius		public.			
	Contractor was					
	recommended to maintain					
	the condition of wheel					
	washing bay provided at					
26 April 2011	the entrance of Area A by					
20 April 2011	draining off accumulated	Reminder	-	-	-	-
	water regularly as to					
	prevent muddy water from					
	bringing to the public area					
	through vehicles leaving					
	from site					
			Contractor was			
	Fencing for preserved tree		advised to provide			
	numbered E55 was		proper fencings as	Fencings were		
	removed. It is also	Observation	tree protection zone	erected for the	F.Mov. 2011	
	observed that the trunks of	Observation	as soon as possible	preserved tree	5 May 2011	-
	the tree E55 were		to prevent further	E55 as		
	damaged.		possible damage to	protection.		
	3 90 -		the preserved tree.			
	Haul access at the		Contractor was			
	entrance of Area C was		advised to provide			
	observed to be dry and	Observation	regular water	outstanding	-	-
	, in the second		spraying for dust			
	dusty	L	suppression.			

12.2 Compliance with legal and Contractual requirement

There was no non-compliance recorded for the month of April 2011.

12.3 Implementation status and effectiveness of the mitigation measures

Contractor has implemented mitigation measures to address those problems as advised by ER and ET. Some of the measures taken by the contractor were considered as effective to minimize negative impact to the environment. Ongoing investigation will be carried out to observe performance and effectiveness of those measures. Outstanding environmental items will be inspected in next month.

As there were some ongoing follow up practices, contractor was reminded to regularly review and rectify the discrepancy once found and maintain good site condition. The contractor implemented various environmental mitigation measures as recommended in the Environmental Permit and Final Mitigation Measures Report.

The recommend mitigation measures of EM&A manual (revision 3) are presented in Appendix H (A).

The implemented statues of mitigation measures are presented in Appendix H (B).

13. Future key issues and recommendations.

According to the forecasted site activities, key environmental issued to be considered should at least include:

- Site water control and relevant protective measures.
- Quality of effluent discharge from Area A.
- Noise abatement measures for piling works.
- Control and disposal for construction wastes generated from works.

14. Conclusions

Tree transplanting, piling construction and excavation works, erection of site hoarding and retouring of existing fish pond 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 26th of April 2011.

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

For water quality monitoring, total 11 abnormal accidents of water quality limits (Dissolved Oxygen, Turbidity and Suspended Solids) were recorded in this reporting month according to the established level. ET has arranged site investigations for the abnormal incidents. No particular observations of defective site activities were found causing the incidents and such conditions were believed to be attributed by natural fluctuation.

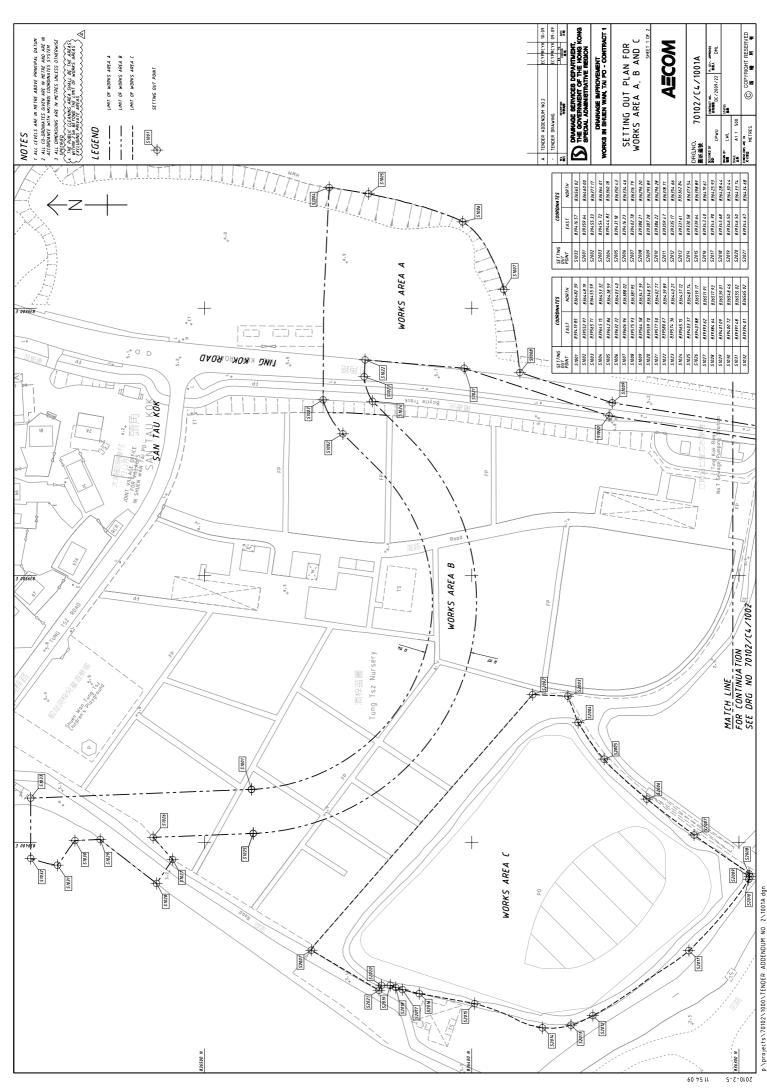
For ecological monitoring survey, all trees have been maintained in acceptable health condition, with no significance sign of health deterioration for the retained trees. In addition, there was no ecological water quality monitoring conducted in this reporting period.

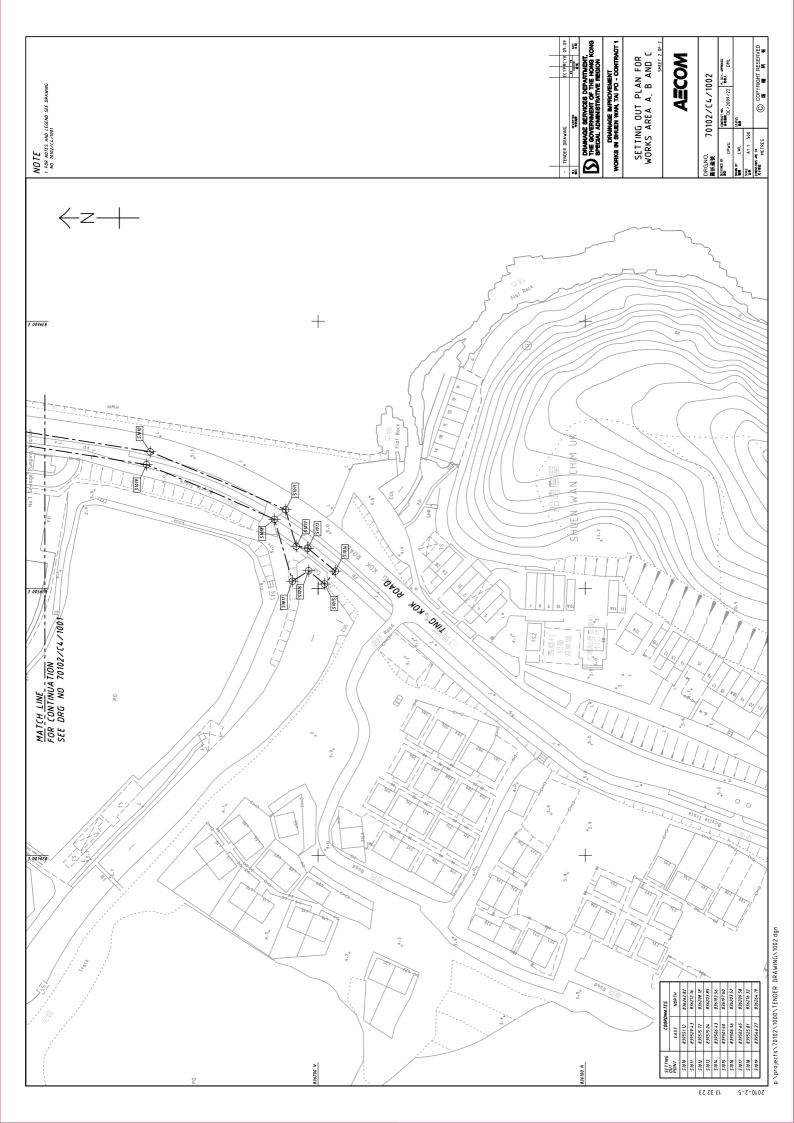
Also, there were not any notifications of summons recorded during the reporting period. Furthermore, there were not any formal prosecution and complaints recorded.

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 (revision 3) and Environmental Permit requirement.

Appendix A: Site Location







Post	Name	Contact No.	Contact Fax	e-mail
Project Manager	Mr. W. K. Chan	6821 1136	2674 6688	dc200922jv_pmcwk @yahoo.com.hk
Site Agent	Mr. C. L. Wong	9280 0166	2674 6688	dc200922jv_sa@yaho o.com.hk
Environmental Officer / Sub-agent	Mr. K. M. Ma	9552 1734	2674 6688	dc200922jv_suba@ya hoo.com.hk
Environmental Supervisor	Mr. Anthony Chan	9179 2092	2674 6688	anthony277@hotmail.
Asia Ecological Consultants Ltd. (Wetland Specialist)	Dr. Mike Leven	2486 2885	2471 8389	mrleven@asiaecol.co m.hk
Environmental Pioneers & Solutions Limited (Environmental Team)	Mr. Johnny Lee	2889 0569	2856 2010	johnnylee@epsl.com. hk



Environmental Pioneers and Solutions Limited



Certificate No.

11494

Page

3 Pages of

Customer: Environmental Pioneers and Solutions Limited

Address: Flat B, 6/F., Hop Shi Factory Building, 29 Lee Chung Street, Chai Wan, Hong Kong.

Order No.: Q10260

Date of receipt

15-Mar-11

Item Tested

Description: Digital Sound Level Meter

Manufacturer: SVAN Model

: 949

Serial No.

: 8571

Test Conditions

Date of Test: 17-Mar-11

Supply Voltage

Ambient Temperature:

 $(23 \pm 3)^{\circ}C$

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:

Equipment No. Description

Cert. No.

Traceable to

S017A

Multi-Function Generator

07279

SCL-HKSAR

S024

Sound Level Calibrator

04062

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 :

This Certificate is issued by:

Hong Kong Calibration Ltd.

21-Mar-11

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



Certificate No. 11494

Page 2 of 3 Pages

Results:

1. SPL Accuracy

	UUT Set	ting			
Level Range	Octave Filter	Weight	Response	Applied Value (dB)	UUT Reading (dB)
105 dB	OFF	Α	Fast	94.0	93.9
			Slow		93.9
		C	Fast	·	93.9
130 dB	OFF	Α	Fast	94.0	94.0
			Slow		94.0
		C	Fast		94.0
	OFF	Α	Fast	114.0	113.8
			Slow		113.8
		С	Fast		113.8

IEC 651 Type 1 Spec. : \pm 0.7 dB

Uncertainty: ± 0.1 dB

2. Level Stability: 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB

Uncertainty: ± 0.01 dB

3. Linearity

3.1 Level Linearity

UUT Range	Applied			IEC 651 Type 1 Spec.
(dB)	Value (dB)	UUT Reading (dB)	Variation (dB)	(inside Primary)
130	114.0	114.0	0.0	± 0.7 dB
	104.0	104.0	0.0	
	94.0	94.0 (Ref.)		
105	84.0	84.2	-0.2	
	74.0	74.1	-0.1	
	64.0	64.1	-0.1	
	54.0	54.2	-0.2	

Uncertainty: ± 0.1 dB



Certificate No. 11494

Page 3 of 3 Pages

3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Read	ling (dB)	Variation (dB)	IEC 651 Type 1 Spec.
130	84.0	84.1		-0.1	± 0.4 dB
	94.0	94.0	(Ref.)	0.0	
	95.0	95.0		0.0	± 0.2 dB

Uncertainty: ± 0. 1 dB

4. Frequency Weighting

A weighting

Frequ	ency	Attenuation (dB))	IEC 651 Type 1 Spec.
31.5	Hz	-39.8		$-39.4 \text{ dB}, \pm 1.5 \text{ dB}$
63	Hz	-26.5		- 26.2 dB, ± 1.5 dB
125	Hz	-16.5		- 16.1 dB, ± 1 dB
250	Hz	-9.0		- $8.6 dB, \pm 1 dB$
500	Hz	-3.4		- 3.2 dB, ±1 dB
1	kHz	0.0	(Ref)	$0 \text{ dB}, \pm 1 \text{ dB}$
2	kHz	+1.6		+ 1.2 dB, ± 1 dB
4	kHz	+1.6		+ 1.0 dB, ± 1 dB
8	kHz	-0.5		- 1.1 dB , + $1.5 \text{ dB} \sim -3 \text{ dB}$
16	kHz	-6.3		- 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	50.3	± 0.5 dB
$1/10^2$	50.0	49.8	
1/10 ³	50.0	50.0	± 1.0 dB
1/104	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: 1 012 hPa.

----- END -----



Certificate No.

11218

Page

1 of 3 Pages

Customer: Environmental Pioneers and Solutions Limited

Address: Flat B, 6/F., Hop Shi Factory Building, 29 Lee Chung Street, Chai Wan, Hong Kong.

Order No.: Q10260

Date of receipt

1-Mar-11

Item Tested

Description: Digital Sound Level Meter

Manufacturer: SVAN

Model

: 949

Serial No.

: 8569

Test Conditions

Date of Test: 14-Mar-11

Supply Voltage : --

Ambient Temperature:

 $(23 \pm 3)^{\circ}C$

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 after adjustment.

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

Main Test equipment used:

Equipment No. Description

Cert. No.

Traceable to

S017A

Multi-Function Generator

07279

SCL-HKSAR

S024

Sound Level Calibrator

04062

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:

Approved by:

15-Mar-11

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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Certificate No. 11218

Page 2 of 3 Pages

Results:

1. SPL Accuracy

	UUT Set	ting	Applied Value	UUT Rea	ding (dB)	
Level Range	Octave Filter	Weight	Response	(dB)	Before Adjust.	After Adjust.
105 dB	OFF	A	Fast	94.0	*92.2	93.9
			Slow			93.9
		С	Fast]	·	93.9
130 dB	OFF	Α	Fast	94.0		93.9
			Slow]		93.9
		С	Fast			93.9
	OFF	A	Fast	114.0		113.9
			Slow			113.9
		С	Fast			113.9

IEC 651 Type 1 Spec. : \pm 0.7 dB

Uncertainty: ± 0.1 dB

2. Level Stability: 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB

Uncertainty: ± 0.01 dB

3. Linearity

3.1 Level Linearity

	Applied				IEC 651 Type 1 Spec.
UUT Range	Value (dB)	UUT Readin	g (dB)	Variation (dB)	(inside Primary)
130	114.0	113.9		0.0	± 0.7 dB
	104.0	103.9		0.0	
	94.0	93.9	(Ref.)		
105	84.0	83.9		0.0	
	74.0	74.0		+0.1	
	64.0	64.1		-0.2	
	54.0	54.1		-0.2	

Uncertainty: $\pm 0.1 dB$



Certificate No. 11218

Page 3 of 3 Pages

3.2 Differential level linearity

UUT Range	Applied Value (dB)	UUT Readin	ng (dB)	Variation (dB)	IEC 651 Type 1 Spec.
130	84.0	83.9		0.0	± 0.4 dB
	94.0	93.9	(Ref.)		
	95.0	95.0		-0.1	± 0.2 dB

Uncertainty: $\pm 0.1 dB$

4. Frequency Weighting

A weighting

A weight	mg .				
Frequ	uency	Attenuation (dE	3)	IEC 651 Type 1 S	Spec.
31.5	5 Hz	-39.7		- 39.4 dB, ± 1.5	i dB
63	Hz	-26.5		- 26.2 dB, ± 1.5	i dB
125	Hz	-16.5		- 16.1 dB, ± 1	dB
250	Hz	-9.0		- $8.6 dB, \pm 1$	dB
500	Hz	-3.5		- 3.2 dB, ± 1	dB
1	kHz	0.0	(Ref)	0 dB, ± 1	dB
2	kHz	+1.5		+ 1.2 dB, ± 1	dB
4	kHz	+1.4		+ 1.0 dB, ± 1	dB
8	kHz	-0.7		- 1.1 dB, + 1.5 dB	~ -3 dB
16	kHz	-6.6		- 6.6 dB, + 3 dB	~- ∞

Uncertainty: $\pm 0.1 \text{ dB}$

5. Time Averaging

Applied Burst duty Factor	Applied Leq. Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0		
1/10	40.0	40.1	± 0.5 dB
1/10 ²	40.0	40.0	
$1/10^3$	40.0	40.2	± 1.0 dB
1/104	40.0	40.0	

Uncertainty: $\pm 0.1 \text{ dB}$

Remarks: 1. UUT: Unit-Under-Test

- 2. The uncertainty claimed is for a confidence probability of not less than 95%.
- 3. Atmospheric Pressure: 1 010 hPa.
- 4. *Out of Specification

----- END -----



Certificate No. 11495

Page 1 of 2 Pages

15-Mar-11

Customer: Environmental Pioneers and Solutions Limited

Address: Flat B, 6/F., Hop Shi Factory Building, 29 Lee Chung Street, Chai Wan, Hong Kong.

Order No.: Q10260 Date of receipt :

Item Tested

Description: Sound Level Calibrator

Manufacturer: Svantek

Model: SV30A Serial No.: 7908

Test Conditions

Date of Test: 17-Mar-11 Supply Voltage : --

Ambient Temperature : $(23 \pm 3)^{\circ}$ 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>Description</u>	Cert. No.	Traceable to
Spectrum Analyzer	03926	NIM-PRC & SCL-HKSAR
Sound Level Calibrator	04062	NIM-PRC & SCL-HKSAR
Universal Counter	04461	SCL-HKSAR
Sound Level Meter	04462	SCL-HKSAR
	Spectrum Analyzer Sound Level Calibrator Universal Counter	Spectrum Analyzer 03926 Sound Level Calibrator 04062 Universal Counter 04461

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. Wona

Approved by :

21-Mar-11

orothy Cheuk

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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Certificate No. 11495

Page 2 of 2 Pages

Results:

1. Level Accuracy

UUT Nominal Value (dB)	Measured Value (dB)	IEC 942 Class 1 Spec.
94	94.08	± 0.3.dB
114	114.18	

Uncertainty: ± 0.1 dB

2. Frequency

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

Uncertainty: $\pm 3.6 \times 10^{-6}$

3. Level Stability: 0.0 dB

IEC 942 Class 1 Spec. : ± 0.1 dB

Uncertainty: ± 0.01 dB

4. Total Harmonic Distortion : < 1.0 %

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: 1012 hPa.

----- END -----



QUALITY CONTROL CALIBRATION AND TEST CERTIFICATE

Date Issued:

10/27/2010

Instrument Description

Model

Serial Number

Level-Velocity Logger

Stingray

45525

Greyline's quality control calibration and testing program includes distance measurement verification using fixed, calibrated targets.

CALIBRATION CONDITIONS

Minimum Level = 1.00"
Intermediate Level = 16.00 ft
Pipe I.D. = 8.00"
Maximum Velocity = 10 ft/s

CERTIFICATION

The above product has been tested to meet or exceed the following specifications:

Accuracy	+/- 2%
Repeatability	+/- 0.1%
Linearity	+/- 0.5%

Level / Velocity

and has also passed the following tests:

- 1. Functional test including output signals.
- 2. Adjustment of circuit variables to calibrated values
- 3. Reliability test (burn-in) 48 hr



CERTIFICATE OF ANALYSIS

CONTACT:

MR RONAN CHAN

CLIENT:

ENVIRONMENTAL PIONEERS & SOLUTIONS LTD

ADDRESS:

FLAT B, 6/F, HOP SHI FACTORY BUILDING,

29 LEE CHUNG STREET,

CHAI WAN, HONG KONG. Work Order:

HK1106005

LABORATORY:

HONG KONG

DATE RECEIVED: DATE OF ISSUE:

14/03/2011

SAMPLE TYPE:

18/03/2011 **EQUIPMENT**

No. of SAMPLES:

1

COMMENTS

The calibration procedure used for the analysis has been applied for the calibration of the above instrument.

NOTES

This is the Final Report and supersedes any preliminary report with this batch number. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd

11/F

Chung Shun Knitting Centre

1-3 Wing Yip Street

Kwai Chung HONG KONG Phone:

852-2610 1044

Fax:

852-2610 2021

Email:

hongkong@alsenviro.com

Kwok Fai, Godfrey Laborato Manager – Hong Kong

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Abbreviations: % SPK REC denotes percentage spike recovery

CHK denotes duplicate check sample LOR denotes limit of reporting

LCS % REC denotes Laboratory Control Sample percentage recovery

Page 1 of 2

ALS TECHNICHEM (HK) PTY LTD Part of the ALS Laboratory Group A Campbell Brothers Limited Company Environmental 🕽

www.alsglobal.com

ADDRESS 11/F, Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong PHONE +852 2610 1044 FAX +852 2610 2021

CERTIFICATE OF ANALYSIS

Work Order: Date of Issue: HK1106005

18/03/2011

Client:

ENVIRONMENTAL PIONEERS & SOLUTIONS LTD

Client Reference:

Calibration of Mulitimeter

Item:

Multimeter

Model No.: TOA DK WQC-24

ALS Lab ID:

HK1106005 -001

Equipment No.: --

18 March, 2011

Serial No.: 617892

Testing Results:

Date of Calibration:

рН

Expected Reading	Recording Reading
4.00	4.03
7.00	6.96
10.0	9.99
Allowing Deviation	± 0.2 unit

Testing Method:

APHA (21st edition), 4500-H⁺B

Dissolved Oxygen

Expected Reading	Recording Reading
6.05 mg/L 7.40 mg/L 9.20 mg/L	5.97 mg/L 7.45 mg/L 9.17 mg/L
Allowing Deviation	± 0.2 mg/L

Testing Method:

APHA (21st edition), 4500-OC & G

Turbidity

E>	pected Reading	Recording Reading
	0 NTU	0.00 NTU
	4 NTU	4.10 NTU
	40 NTU	40.2 NTU
	80 NTU	80.6 NTU
	400 NTU	418 NTU
	800 NTU	798 NTU
All	lowing Deviation	± 10%

Testing Method:

APHA (21st edition), 2130B

Chan Kwok Fai, Godfrey Laboratory Manager - Hong Kong



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

Noise Monitoring Data Sheet

Monitoring Location		M1	AL1
Monitoring Method		Façade	Façade
Date of Monitoring	g	7/4/2011	7/4/2011
Weather Conditio	n	Overcast	Overcast
Measurement Sta	rt Time (hh:mm)	13:13	11:38
Measurement Tin	ne Length (mins)	30 r	nins
SLM Model & S/N	l	SVAN	N 949
Wind Speed (m/s)	0.4	0.3
	L _{eq} (dB(A))	59.8	63.6
Measurement Results	L ₁₀ (dB(A))	62.9	66.2
. recano	L ₉₀ (dB(A))	59.8	49.6
Major Construction During Monitoring	n Noise Source(s)	was dominated by the	-Hydraulic breaker
Other Noise Source(s) During Monitoring		Background NoiseTraffic Noise	Background NoiseTraffic Noise

	<u>iname</u>	<u>Signature</u>	<u>Date</u>
		1	
Perpared by:	Jimmy Cheng	>	2011/04/07

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

Noise Monitoring Data Sheet

Monitoring Location		M1	AL1	
Monitoring Method		Façade	Façade	
Date of Monitoring		14/4/2011	14/4/2011	
Weather Condition		Sunny	Sunny	
Measurement Start Time (hh:mm)		8:45	14:14	
Measurement Time Length (mins)		30 mins		
SLM Model & S/N		SVAN 949		
Wind Speed (m/s)		0.4	0.3	
	L _{eq} (dB(A))	58.8	68.3	
Measurement Results	L ₁₀ (dB(A))	61.2	68.8	
	L ₉₀ (dB(A))	54.3	52.0	
Major Construction Noise Source(s) During Monitoring		The measured noise level was dominated by the background noise in the immediate vicinity of the monitoring location due to its large distance from the construction activities	– Drilling noise	
Other Noise Source(s) During Monitoring		Background NoiseTraffic Noise	– Public Noise – Traffic Noise	

	<u>iname</u>	<u>Signature</u>	<u>Dale</u>
		1	
		V —	
Perpared by:	<u>Jimmy Cheng</u>		2011/04/14

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

Noise Monitoring Data Sheet

Monitoring Location		M1	AL1
Monitoring Method		Façade	Façade
Date of Monitoring	ng	21/4/2011	21/4/2011
Weather Condition	on	Overcast	Overcast
Measurement St	art Time (hh:mm)	9:20	14:41
Measurement Ti	me Length (mins)	30 r	nins
SLM Model & S/I	V	SVAN	N 949
Wind Speed (m/s	s)	0.2	0.5
	L _{eq} (dB(A))	60.2	65.8
Measurement Results	L ₁₀ (dB(A))	68.4	71.4
riodano	L ₉₀ (dB(A))	55.2	61.2
Major Construction Noise Source(s) During Monitoring		– Drilling	–Drilling
Other Noise Source(s) During Monitoring		– Background Noise – Traffic Noise	– Public Noise – Traffic Noise

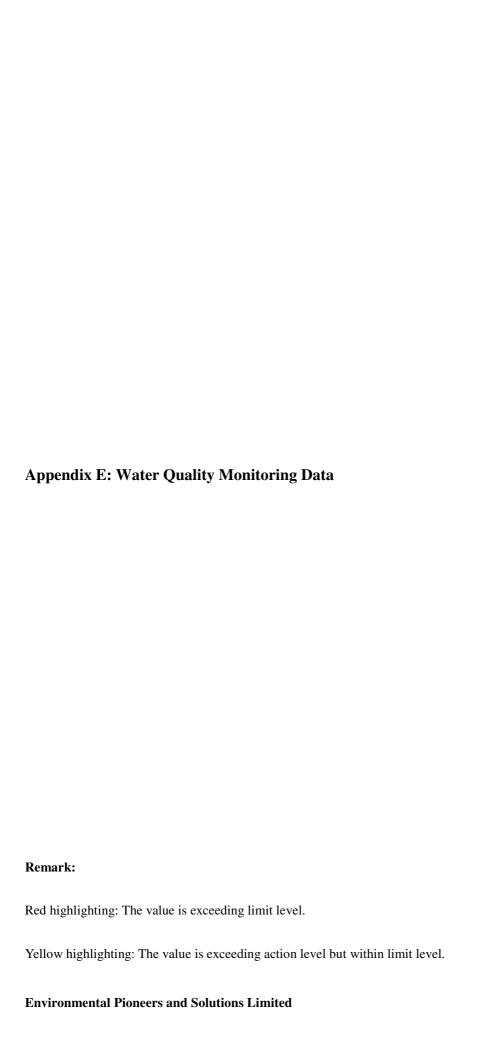
	<u>Name</u>	<u>Signature</u>	<u>Date</u>
		1	
Perpared by:	Jimmy Cheng		<u>2011/04/21</u>

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

Noise Monitoring Data Sheet

Monitoring Location		M1	AL1
Monitoring Method		Façade	Façade
Date of Monitoring	g	28/4/2011	28/4/2011
Weather Conditio	n	Cloudy	Cloudy
Measurement Sta	rt Time (hh:mm)	11:03	10:20
Measurement Tin	ne Length (mins)	30 r	nins
SLM Model & S/N	l	SVAN	N 949
Wind Speed (m/s)	0.6	0.5
	L _{eq} (dB(A))	58.2	61.4
Measurement Results	L ₁₀ (dB(A))	60.2	62.7
	L ₉₀ (dB(A))	55.3	56.1
Major Construction Noise Source(s) During Monitoring		The measured noise level was dominated by the background noise in the immediate vicinity of the monitoring location due to its large distance from the construction activities	The measured noise level was dominated by the background noise in the immediate vicinity of the monitoring location due to its large distance from the construction activities
Other Noise Source(s) During Monitoring		Background NoiseTraffic Noise	Background NoiseTraffic Noise

	<u>Name</u>	<u>Signature</u>	<u>Date</u>
		1	
Perpared by:	Jimmy Cheng	<u> </u>	2011/04/28



Date of Sampling: 2/4/2011

Monitoring Location	W1	v	1 2
Time (hhmm)	12:30	13	:05
Tide Mode	Mid	-ebb	
River Condition	Normal	Normal	
Water Depth (m)	< 1.0	< 1.0	
pH value	7.90	7.94	
Salinity (ppt)	12.1	8	
Temperature (°C)	23.4	25.1	
Turbidity (NTU)	6.9	16.9 16.9	
DO (mg/L)	3.56	5.38	
DO Saturation (%)	50%	65%	
Suspended Solids (mg/L)	7.2	3.2 3.2	

Remark or Observation :			
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	<u>Name</u>	<u>Signature</u>	<u>Date</u>
Prepared By : _	Jimmy Cheng		2/4/2011

 Date of Sampling :
 4/4/2011

 Weather :
 Sunny

Monitoring Location	W 1	v	/ 2
Time (hhmm)	12:44	13	:07
Tide Mode	Mid	-ebb	
River Condition	Normal	Noi	rmal
Water Depth (m)	< 1.0	< 1.0	
pH value	7.68	7.64	
Salinity (ppt)	16.1	19.2	
Temperature (°C)	20.9	20.7	
Turbidity (NTU)	7.0	0.0 0.0	
DO (mg/L)	6.57	6.22	
DO Saturation (%)	85%	79%	
Suspended Solids (mg/L)	3.6	4.6 4.6	

Remark or Observation :			
	<u>Name</u>	<u>Signature</u>	<u>Date</u>
		4	
Prepared By :	Jimmy Cheng		4/4/2011

Date of Sampling: 7/4/2011

Weather: Sunny

Monitoring Location	W1	V	/2
Time (hhmm)	14:10	13	:35
Tide Mode	Mid	-ebb	
River Condition	Normal	Noi	mal
Water Depth (m)	< 1.0	< 1.0	
pH value	8.04	8.25	
Salinity (ppt)	18.6	24.3	
Temperature (°C)	23.6	22.6	
Turbidity (NTU)	20.2	17.8 17.8	
DO (mg/L)	7.85	7.44	
DO Saturation (%)	115%	91%	
Suspended Solids (mg/L)	5.8	2.6	2.6

Remark or Observation :			
	<u>Name</u>	<u>Signature</u>	<u>Date</u>
		1	
Prepared By :	Jimmy Cheng		7/4/2011

Date of Sampling: 9/4/2011

Weather: Cloudy

Monitoring Location	W 1	W2	
Time (hhmm)	14:45	14	:00
Tide Mode	Mid	-ebb	
River Condition	Normal	Noi	rmal
Water Depth (m)	1.2	1.8	
pH value	7.42	8.04	
Salinity (ppt)	16.4	22.7	
Temperature (°C)	22.4	22	
Turbidity (NTU)	7.2	2.8 2.8	
DO (mg/L)	8.04	7.47	
DO Saturation (%)	78%	73%	
Suspended Solids (mg/L)	4.6	8.4 8.4	

Remark or Observation:			
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<u>-</u>			
	Nama	Ciamatura	Data
	<u>Name</u>	<u>Signature</u>	<u>Date</u>
Prepared By :	Jimmy Cheng	y	9/4/2011

Date of Sampling: 12/4/2011

Weather: Overcast

Monitoring Location	W1	W2	
Time (hhmm)	7:52	8:21	
Tide Mode	Mid-	flood	
River Condition	Normal	Normal	
Water Depth (m)	< 1.0	< 1.0	
pH value	7.86	7.82	
Salinity (ppt)	7.5	14.5	
Temperature (°C)	21.5	21.8	
Turbidity (NTU)	1.7	0.0 0.0	
DO (mg/L)	6.90	8.23	
DO Saturation (%)	72%	117%	
Suspended Solids (mg/L)	3.2	< 2 < 2	

Remark or Observation:			
	<u>Name</u>	<u>Signature</u>	<u>Date</u>
		1	
Prepared By :	Jimmy Cheng	Y	12/4/2011

Date of Sampling: 14/4/2011

Weather: Sunny

Monitoring Location	W 1	W2	
Time (hhmm)	14:00	14:57	
Tide Mode	Mid-	flood	
River Condition	Normal	Noi	mal
Water Depth (m)	< 1.0	< 1.0	
pH value	8.15	7.80	
Salinity (ppt)	1.4	24.5	
Temperature (°C)	25.8	27.7	
Turbidity (NTU)	26.4	55.8 55.8	
DO (mg/L)	6.79	5.62	
DO Saturation (%)	85%	89%	
Suspended Solids (mg/L)	6.0	8.2 8.2	

Prepared By: _____ Jimmy Cheng

Remark or Observation :			
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	<u>Name</u>	<u>Signature</u>	<u>Date</u>
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14/4/2011

Date of Sampling: 16/4/2011 Weather: Sunny

Monitoring Location	W1	W2	
Time (hhmm)	16:53	16:25	
Tide Mode	Mid-flood		
River Condition	Turbid	Normal	
Water Depth (m)	< 1.0	< 1.0	
pH value	8.24	7.95	
Salinity (ppt)	2.3	13.8	
Temperature (°C)	25.3	27.5	
Turbidity (NTU)	6.8	0.0 0.0	
DO (mg/L)	5.97	4.00	

77%

4.4

Prepared By: _____Jimmy Cheng

DO Saturation (%)

Suspended Solids (mg/L)

Remark or Observation:			
	<u>Name</u>	<u>Signature</u>	<u>Date</u>
		1	

49%

< 2

16/4/2011

< 2

Date of Sampling: 18/4/2011

Monitoring Location	W1	W2	
Time (hhmm)	12:25	12:45	
Tide Mode	Mid-ebb		
River Condition	Normal	Normal	
Water Depth (m)	< 1.0	< 1.0	
pH value	7.91	7.76	
Salinity (ppt)	15.1	15.3	
Temperature (°C)	25.6	25.2	
Turbidity (NTU)	18.3	17.1	17.1
DO (mg/L)	5.40	4.30	
DO Saturation (%)	58%	69%	
Suspended Solids (mg/L)	7.8	6.4 6.4	

Remark or Observation :			
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	<u>Name</u>	<u>Signature</u>	<u>Date</u>
		1	
Prepared By :	Jimmy Cheng		18/4/2011

Date of Sampling: 19/4/2011

Weather: Sunny

Monitoring Location	W 1	W2	
Time (hhmm)	13:04	13:29	
Tide Mode	Mid-ebb		
River Condition	Normal	Normal	
Water Depth (m)	0.6	1.2	
pH value	8.12	7.95	
Salinity (ppt)	13.5	17.2	
Temperature (°C)	24.7	26.2	
Turbidity (NTU)	11.7	10.2 10.2	
DO (mg/L)	6.09	5.25	
DO Saturation (%)	74%	75%	
Suspended Solids (mg/L)	5.0	5.0 5.0	

Prepared By: _____ Jimmy Cheng

Remark or Observation:			
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	<u>Name</u>	<u>Signature</u>	<u>Date</u>
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19/4/2011

Date of Sampling: 21/4/2011

Monitoring Location	W1	W2	
Time (hhmm)	14:01	14:28	
Tide Mode	Mid	-ebb	
River Condition	Normal	Normal	
Water Depth (m)	< 1.0	< 1.0	
pH value	8.41	8.14	
Salinity (ppt)	19.7	27.6	
Temperature (°C)	23.8	23.9	
Turbidity (NTU)	11.4	6.4 6.4	
DO (mg/L)	6.99	6.43	
DO Saturation (%)	78%	81%	
Suspended Solids (mg/L)	6.2	4.6 4.6	

Remark or Observation:			
	<u>Name</u>	<u>Signature</u>	<u>Date</u>
		1	
		4	
Prepared By:	Jimmy Cheng		21/4/2011

Date of Sampling: 26/4/2011

Weather: Sunny

Monitoring Location	W 1	W	/ 2	
Time (hhmm)	12:55	13:23		
Tide Mode	Mid-	flood		
River Condition	Normal	Nor	mal	
Water Depth (m)	< 1.0	< 1.0		
pH value	8.14	7.78		
Salinity (ppt)	3.0	23	3.6	
Temperature (°C)	26.6	26	5.3	
Turbidity (NTU)	14.7	21.5	21.5	
DO (mg/L)	7.10	5.73		
DO Saturation (%)	86%	79%		
Suspended Solids (mg/L)	7.8	5.6 5.6		

Remark or Observation :			
	<u>Name</u>	<u>Signature</u>	<u>Date</u>
		4	
Prepared By:	Jimmy Cheng		26/4/2011

Date of Sampling: 28/4/2011

Weather: Rainy

1				
Monitoring Location	W 1	٧	12	
Time (hhmm)	15:00	15	:41	
Tide Mode	Mid-	flood		
River Condition	Normal	Noi	mal	
Water Depth (m)	< 1.0	< 1.0		
pH value	8.37	8.16		
Salinity (ppt)	18.9	23	3.6	
Temperature (°C)	22.9	22	2.3	
Turbidity (NTU)	23.4	19.7	19.7	
DO (mg/L)	6.65	6.42		
DO Saturation (%)	77%	69%		
Suspended Solids (mg/L)	6.0	2.6 2.6		

Remark or Observation :			
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	<u>Name</u>	<u>Signature</u>	<u>Date</u>
		1	
Prepared By :	Jimmy Cheng		28/4/2011

Date of Sampling : 30/4/2011

Monitoring Location	W1	W2			
Time (hhmm)	12:15	11	:45		
Tide Mode	Mid	-ebb			
River Condition	Normal	Noi	rmal		
Water Depth (m)	< 1.0	< 1.0			
pH value	8.43	7.96			
Salinity (ppt)	5.2	1	12		
Temperature (°C)	25.0	24	1.4		
Turbidity (NTU)	16.4	7.7 7.7			
DO (mg/L)	6.09	2.17			
DO Saturation (%)	68%	28%			
Suspended Solids (mg/L)	9.2	3.8 3.8			

Remark or Observation :			
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	<u>Name</u>	<u>Signature</u>	<u>Date</u>
		1	
		4	
Prepared By :	Jimmy Cheng		30/4/2011



Location	Position	Tide	Date**	Time	Weather	Water Depth (m)*	Water Flow (m/s)	Water Flow (m³/s)
H1	Mid	Flood	2 April, 2011	18:19	Sunny	~0.2	0.12	0.152
H1	Mid	Flood	9 April, 2011	8:15	Cloudy	~0.2	0.12	0.152
H1	Mid	Flood	16 April, 2011	16:53	Cloudy	~0.1	0.06	0.076
H1	Mid	Flood	30 April, 2011	16:47	Sunny	~0.1	0.12	0.152
H2	Mid	Flood	2 April, 2011	17:30	Sunny	~0.5	0.06	0.383
H2	Mid	Flood	9 April, 2011	8:25	Cloudy	~0.3	0.06	0.383
H2	Mid	Flood	16 April, 2011	16:41	Cloudy	~0.5	0.00	0.000
H2	Mid	Flood	30 April, 2011	16:30	Sunny	~0.5	0.18	1.148
H1	Mid	Ebb	2 April, 2011	12:30	Sunny	~0.1	0.06	0.076
H1	Mid	Ebb	9 April, 2011	14:45	Cloudy	~0.2	0.18	0.229
H1	Mid	Ebb	16 April, 2011	12:04	Cloudy	~0.1	0.06	0.076
H1	Mid	Ebb	18 April, 2011	12:25	Sunny	~0.2	0.12	0.152
H1	Mid	Ebb	30 April, 2011	12:15	Sunny	~0.2	0.12	0.152
H2	Mid	Ebb	2 April, 2011	13:30	Sunny	~0.5	0.06	0.383
H2	Mid	Ebb	9 April, 2011	11:55	Cloudy	~0.5	0.06	0.383
H2	Mid	Ebb	16 April, 2011	11:30	Sunny	~0.4	0.00	0.000
H2	Mid	Ebb	18 April, 2011	12:01	Cloudy	~0.4	0.06	0.383
H2	Mid	Ebb	30 April, 2011	12:30	Sunny	~0.4	0.24	1.531

 $^{^{\}star}$: Since the water levels were too low for the depth detector to determine, a tape measure was used for estimation.

^{**:} Only one mid-tide is within working hours of construction activity at 04/18.





Photo 1. Hoardings have been erected in Area B from northwest to southwest.



Photo 2.



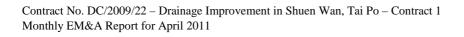
Photo 3.



Photo 4.



Photo 5.



Appendix H:

A)

The recommended mitigation measures of EM&A manual (revision 3)

B)

Implementation status of environmental protection and mitigation measures

A) The recommended mitigation measures of EM&A manual (revision 3)

EIA Ref.		Recommended Mitigation Measures Noise Impact		Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
S 3.30	2.18	Good Site Practice:	To minimize construction	Contractor	Works areas	Construction	EIAO-TM
			noise impacts			phase	NCO
		Only well-maintained plant shall					
		be operated on-site and plant shall					
		be serviced regularly during the					
		construction program					
		Silencers or mufflers on					
		construction equipment shall be					
		utilized and shall be properly					
		maintained during the construction					
		program					
		Mobile plant, if any, shall be sited					
		as far from NSRs as possible					
		Machines and plant (such as					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		trucks) that may be in intermittent					
		use shall be shut down between					
		work periods or shall be throttled					
		down to a minimum					
		Plant known to emit noise					
		strongly in one direction shall,					
		wherever possible, be orientated so					
		that the noise is directed away from					
		the nearby NSRs					
		Material stockpiles and other					
		structures shall be effectively					
		utilized, wherever practicable, in					
		screening noise from on-site					
		construction activities.					
S 3.31 -	2.19	Use of quieter PME	To minimize construction	Contractor	Works areas	Construction	EIAO-TM
3.32			noise impacts			phase	NCO
S 3.33 –	2.20-2.	Use of temporary noise barrier	To minimize construction	Contractor	Works areas as	Construction	EIAO-TM
3.34	21		noise impacts		shown in Figure	phase	NCO

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
3.36-3.3	2.23-2.				3.5		
8	24						
S 3.35	2.22	Use of alternative quieter	To minimize construction	Contractor	Part of the works	Construction	EIAO-TM
and		construction method (the Low	noise impacts		area for pipe	phase	NCO
Table		Impact Method)			laying in Wai Ha		
3.6					(refer to Figure		
					3.5)		
3.36	2.23-2.	Use of noise enclosure	To minimize construction	Contractor	Part of the works	Construction	EIAO-TM
-3.38	24		noise impacts		area for pipe	phase	NCO
					laying in Wai Ha		
					(refer to Figure		
					3.5)		
В		Air Quality Impact					,
S4.16	3.5	Implementation of mitigation	To minimize construction	Contractor	Construction	Construction	EIAO-TM
		measures stipulated in the Air	dust impacts		Sites	Phase	
		Pollution Control (Construction Dust)					
		Regulation and good site practices					
		including but not limited to the					
		following:					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		 Use of regular watering to reduce 					
		dust emissions from exposed site					
		surfaces and unpaved road, with					
		complete coverage, particularly					
		during dry weather;					
		 Use of frequent watering for 					
		particularly dusty static construction					
		areas and areas close to ASRs;					
		 Tarpaulin covering of all dusty 					
		vehicle loads transported to, from					
		and between site location;					
		Establishment and use of vehicle					
		wheel and body washing facilities at					
		the exit points of the site;					
		Routing of vehicles and					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		positioning of construction plant					
		should be at the maximum possible					
		distance from ASRs.					
		Stockpiled excavated materials					
		should be covered with tarpaulin,					
		and should be removed off-site					
		within 24 hours to avoid any odour					
		nuisance arising.					
С	•	Water Quality Impact			•	•	
S5.29	4.5	Construction Site Run-off and	To minimize water quality	Contractor	Works sites	Construction	ProPECC PN 1/94
		Drainage:	impacts			phase	Construction Site
							Drainage
		 Before commencing any site 					
		formation work, all sewer and					
		drainage connections shall be					
		sealed to prevent debris, soil, sand					
		etc. from entering public					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		sewers/drains.					
		 Temporary ditches shall be 					
		provided to facilitate run-off					
		discharge into appropriate					
		watercourses, via a silt retention					
		pond. No site run-off shall enter the					
		fishponds at Shuen Wan.					
		Sand/silt removal facilities such					
		as sand traps, silt traps and					
		sediment basins shall be provided to					
		remove sand/silt particles from					
		runoff to meet the requirements of					
		the Technical Memorandum					
		standard under the Water Pollution					
		Control Ordinance. The design of					
		silt removal facilities shall be based					
		on the guidelines provided in					
		ProPECC PN 1/94. All drainage					

EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
		Main Concern to Address	measure?		measure?	measure to
						achieve?
	facilities and erosion and sediment					
	control structures shall be inspected					
	monthly and maintained to ensure					
	proper and efficient operation at all					
	times and particularly during					
	rainstorms.					
	 Water pumped out from 					
	excavated pits shall be discharged					
	into silt removal facilities.					
	During rainstorms, exposed					
	slope/soil surfaces shall be covered					
	by a tarpaulin or other means.					
	Other measures that need to be					
	implemented before, during, and					
	after rainstorms as summarized in					
	ProPECC PN 1/94 shall be followed.					
	Ref.	facilities and erosion and sediment control structures shall be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Water pumped out from excavated pits shall be discharged into silt removal facilities. During rainstorms, exposed slope/soil surfaces shall be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and	Ref. Measures facilities and erosion and sediment control structures shall be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Water pumped out from excavated pits shall be discharged into silt removal facilities. During rainstorms, exposed slope/soil surfaces shall be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and after rainstorms as summarized in	Ref. Measures Recommended Measure & Main Concern to Address facilities and erosion and sediment control structures shall be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Water pumped out from excavated pits shall be discharged into silt removal facilities. During rainstorms, exposed slope/soil surfaces shall be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and after rainstorms as summarized in	Ref. Measures Recommended Measure & implement the measure? facilities and erosion and sediment control structures shall be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Water pumped out from excavated pits shall be discharged into silt removal facilities. During rainstorms, exposed slope/soil surfaces shall be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and after rainstorms as summarized in	Ref. Measures Recommended Measure & Implement the measure? Implement the measure? facilities and erosion and sediment control structures shall be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. • Water pumped out from excavated pits shall be discharged into silt removal facilities. • During rainstorms, exposed slope/soil surfaces shall be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and after rainstorms as summarized in

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		Exposed soil areas shall be					
		minimized to reduce potential for					
		increased siltation and					
		contamination of runoff.					
		■ Earthwork final surfaces shall be					
		well compacted and subsequent					
		permanent work or surface					
		protection shall be immediately					
		performed to reduce the potential of					
		soil erosion.					
		Open stockpiles of construction					
		materials or construction wastes					
		on-site shall be covered with					
		tarpaulin or similar fabric during					
		rainstorms.					
S5.30	4.7	Further precautionary measures	To minimize water quality	Contractor	Works areas near	Rainy seasons	EIAO-TM
		during rainy season:	impacts to the designated		the Conservation	during	Water Pollution
			Conservation Area		Area	construction	Control Ordinance

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		■ For the construction of the box				phase	(WPCO)
		culvert next to the existing channel					
		of the Wai Ha River, sand bags					
		should be deployed around the					
		boundary of the works trench to					
		prevent muddy water ingress into					
		the adjacent CA or Wai Ha River.					
		Sand bags should also be used to					
		surround the excavated trench.					
		Generally, the sand bags will be					
		placed up to a height of 300mm to					
		provide adequate allowance for the					
		built-up water level during rainstorm					
		event. With sand bags in place,					
		surface runoff will be intercepted					
		and flow to Wai Ha River or					
		collected by the existing drainage					
		system as usual. For the construction of the box					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		culvert in the extreme northeast corner of Shuen Wan Marsh					
		Conservation Area sand bags					
		should be deployed along the limit					
		of the works area to prevent muddy water ingress into the CA. Sand					
		bags should be placed to a height					
		of at least 300mm from ground level and +2.5 mPD (whichever is					
		greater) to provide adequate allowance for the built-up water					
		level during rainstorm events.					
		Unpolluted surface runoff within the					
		works area should then be					
		collected and directed into the					
		existing drainage system.					
		■ Sheet-piles, which would be					
		installed around the works trench					
		near the Conservation Area, would					

EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
		Main Concern to Address	measure?		measure?	measure to
						achieve?
	be extended above ground level for					
	about 2m to serve as hoardings to					
	isolate the works site.					
	 Tarpulin sheets would be used to 					
	cover the excavation areas during					
	heavy rainstorms. This would					
	prevent the ingress of rainwater into					
	the trench minimising the risk of					
	muddy water getting into Wai Ha					
	River and the adjacent Conservation					
	Area.					
	 Any concrete washing water 					
	would be contained inside the works					
	site surrounded by the extended					
	sheet piles. A pump sump at the					
	bottom of the trench would be					
	provided to pump any excess water					
	during concrete washing.					
		be extended above ground level for about 2m to serve as hoardings to isolate the works site. Tarpulin sheets would be used to cover the excavation areas during heavy rainstorms. This would prevent the ingress of rainwater into the trench minimising the risk of muddy water getting into Wai Ha River and the adjacent Conservation Area. Any concrete washing water would be contained inside the works site surrounded by the extended sheet piles. A pump sump at the bottom of the trench would be provided to pump any excess water	Ref. Measures Be extended above ground level for about 2m to serve as hoardings to isolate the works site. Tarpulin sheets would be used to cover the excavation areas during heavy rainstorms. This would prevent the ingress of rainwater into the trench minimising the risk of muddy water getting into Wai Ha River and the adjacent Conservation Area. Any concrete washing water would be contained inside the works site surrounded by the extended sheet piles. A pump sump at the bottom of the trench would be provided to pump any excess water	Ref. Measures Recommended Measure & implement the measure? be extended above ground level for about 2m to serve as hoardings to isolate the works site. Tarpulin sheets would be used to cover the excavation areas during heavy rainstorms. This would prevent the ingress of rainwater into the trench minimising the risk of muddy water getting into Wai Ha River and the adjacent Conservation Area. Any concrete washing water would be contained inside the works site surrounded by the extended sheet piles. A pump sump at the bottom of the trench would be provided to pump any excess water	Ref. Measures Recommended Measure & implement the measure? be extended above ground level for about 2m to serve as hoardings to isolate the works site. Tarpulin sheets would be used to cover the excavation areas during heavy rainstorms. This would prevent the ingress of rainwater into the trench minimising the risk of muddy water getting into Wai Ha River and the adjacent Conservation Area. Any concrete washing water would be contained inside the works site surrounded by the extended sheet piles. A pump sump at the bottom of the trench would be provided to pump any excess water	Ref. Measures Recommended Measure & Implement the measure? Implement the measure? be extended above ground level for about 2m to serve as hoardings to isolate the works site. Tarpulin sheets would be used to cover the excavation areas during heavy rainstorms. This would prevent the ingress of rainwater into the trench minimising the risk of muddy water getting into Wai Ha River and the adjacent Conservation Area. Any concrete washing water would be contained inside the works site surrounded by the extended sheet piles. A pump sump at the bottom of the trench would be provided to pump any excess water

EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
		Main Concern to Address	measure?		measure?	measure to
						achieve?
	Stockpiling the excavated					
	materials adjacent to the					
	Conservation Area would not be					
	allowed. The excavated materials					
	would be either removed off site					
	immediately after excavation, or					
	stockpile at location(s) away from					
	the Conservation Area. The					
	stockpile locations shall be					
	approved by the site engineer.					
4.8-4.9	General Construction Activities:	To minimize water quality	Contractor	Works sites	Construction	EIAO-TM
	 Debris and refuse generated 	impacts			phase	WPCO
	on-site should be collected, handled					
	and disposed of properly to avoid					
	entering the Wa Ha River and fish					
	ponds at Shuen Wan. Stockpiles					
	of cement and other construction					
	materials should be kept covered					
	Ref.	Ref. Measures Stockpiling the excavated materials adjacent to the Conservation Area would not be allowed. The excavated materials would be either removed off site immediately after excavation, or stockpile at location(s) away from the Conservation Area. The stockpile locations shall be approved by the site engineer. 4.8-4.9 General Construction Activities: Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering the Wa Ha River and fish ponds at Shuen Wan. Stockpiles of cement and other construction	Ref. Measures Stockpiling the excavated materials adjacent to the Conservation Area would not be allowed. The excavated materials would be either removed off site immediately after excavation, or stockpile at location(s) away from the Conservation Area. The stockpile locations shall be approved by the site engineer. General Construction Activities: Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering the Wa Ha River and fish ponds at Shuen Wan. Stockpiles of cement and other construction	Ref. Measures Recommended Measure & implement the measure? Stockpiling the excavated materials adjacent to the Conservation Area would not be allowed. The excavated materials would be either removed off site immediately after excavation, or stockpile at location(s) away from the Conservation Area. The stockpile locations shall be approved by the site engineer. General Construction Activities: Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering the Wa Ha River and fish ponds at Shuen Wan. Stockpiles of cement and other construction	Ref. Measures Recommended Measure & implement the measure? Stockpiling the excavated materials adjacent to the Conservation Area would not be allowed. The excavated materials would be either removed off site immediately after excavation, or stockpile at location(s) away from the Conservation Area. The stockpile locations shall be approved by the site engineer. 4.8-4.9 General Construction Activities: Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering the Wa Ha River and fish ponds at Shuen Wan. Stockpiles of cement and other construction	Ref. Measures Recommended Measure & Implement the measure? Implement the measure? * Stockpiling the excavated materials adjacent to the Conservation Area would not be allowed. The excavated materials would be either removed off site immediately after excavation, or stockpile at location(s) away from the Conservation Area. The stockpile locations shall be approved by the site engineer. 4.8-4.9 General Construction Activities: • Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering the Wa Ha River and fish ponds at Shuen Wan. Stockpiles of cement and other construction

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		when not being used.					
		Oils and fuels should only be					
		used and stored in designated areas					
		which have pollution prevention					
		facilities. To prevent spillage of					
		fuels and solvents to nearby water					
		bodies, all fuel tanks and storage					
		areas should be provided with locks					
		and be sited on sealed areas, within					
		bunds of a capacity equal to 110%					
		of the storage capacity of the largest tank. The bund should be drained					
		of rainwater after a rain event.					
S5.33	4.10	Sewage from Construction	To minimize water quality	Contractor	Works sites	Construction	EIAO-TM
		workforce:	impacts			phase	WPCO
		 Temporary sanitary facilities, 					
		such as portable chemical toilets,					
		should be employed on-site. A					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		licensed contractor would be					
		responsible for appropriate disposal					
		and maintenance of these facilities.					
S5.34	4.11	River Channel Excavation Works:	To minimize water quality	Contractor	Works sites	Construction	EIAO-TM
			impacts			phase	WPCO
		The excavation works within the					
		upstream end of the existing river					
		channel of the Wai Ha River for the					
		construction of the proposed box					
		culvert shall be carried out in dry					
		condition. Containment					
		measures such as bunds and					
		barriers shall be used within the					
		affected length of the river channel					
		and the excavation works restricted					
		to within an enclosed dry section of					
		the channel. The excavation works					
		within Wai Ha River shall be					
		restricted to the period from October					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		to April.					
D	<u> </u>	Waste Management Implications	<u> </u>				
S6.20 -	5.5	Good site practices:	To reduce waste	Contractor	Works sites	Construction	ETWB TCW
6.22			management impacts			phase	No.19/2005
		 Nomination of approved 					ETWB TCW
		personnel, such as a site manager,					No.31/2004
		to be responsible for good site					
		practices and making arrangements					
		for collection of all wastes generated					
		at the site and effective disposal to					
		an appropriate facility.					
		■ Training of site personnel in					
		proper waste management and					
		chemical waste handling					
		procedures.					
		■ Provision of sufficient waste					
		disposal points and regular					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		collection for disposal.					
		 Appropriate measures to 					
		minimise windblown litter and dust					
		during transportation of waste by					
		either covering trucks or by					
		transporting wastes in enclosed					
		containers.					
		Separation of chemical waste for					
		special handling and appropriate					
		treatment at the Chemical Waste					
		Treatment Facility.					
		Regular cleaning and					
		maintenance programme for					
		drainage systems, sumps and oil					
		interceptors.					
		A Waste Management Plan					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		should be prepared and submitted to					
		the Engineer for approval. One					
		may make reference to ETWB TCW					
		No. 15/2003 for details.					
		A recording system for the					
		amount of wastes generated,					
		recycled and disposed (including the					
		disposal sites) should be proposed.					
S6.23-	5.7	Waste reduction measures:	To achieve waste reduction	Contractor	Works sites	Construction	EIAO-TM
6.24						phase	
		Segregation and storage of					
		different types of waste in different					
		containers, skips or stockpiles to					
		enhance reuse or recycling of					
		materials and their proper disposal.					
		To an accuracy collection of					
		■ To encourage collection of					
		aluminium cans by individual					
		collectors, separate labelled bins					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		shall be provided to segregate this					
		waste from other general refuse					
		generated by the work force.					
		Any unused chemicals or those					
		with remaining functional capacity					
		shall be recycled.					
		Maximising the use of reusable					
		steel formwork to reduce the amount					
		of C&D material.					
		 Proper storage and site practices 					
		to minimise the potential for damage					
		or contamination of construction					
		materials.					
		 Plan and stock construction 					
		materials carefully to minimise					
		amount of waste generated and					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		avoid unnecessary generation of					
		waste.					
S6.25-		Construction & Demolition (C&D)	To minimize off-site disposal	Contractor	Works sites	Construction	EIAO-TM
6.26		Material:	of C&D material			phase	
		Excavated material with suitable	To minimize environmental				
		characteristics/size should be	impacts during the handling				
		reused on-site as fill material as far	of C&D material				
		as practicable, such as for					
		backfilling of the box culvert and					
		drainage pipe works.					
		Suitable areas should be					
		designated within the works site					
		boundaries for temporary stockpiling					
		of C&D material.					
		Within stockpile areas, the					
		following measures should be taken					
		to control potential environmental					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		impacts or nuisance:					
		- covering material during					
		heavy rainfall;					
		- locating stockpiles to minimize					
,		potential visual impacts; and					
		- minimizing land intake of					
		stockpile areas as far as possible.					
		■ When disposing C&D material at					
		a public filling area, the material					
		shall only consist of soil, rock,					
,		concrete, brick, cement					
,		plaster/mortar, inert building debris,					
,		aggregates and asphalt. The					
		material shall be free from marine					
		mud, household refuse, plastic,					
		metals, industrial and chemical					
		waste, animal and vegetable matter,					
		and other material considered to be					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		unsuitable by the Filling Supervisor.					
S6.27		Chemical waste:	To minimize environmental	Contractor	Works sites	Construction	EIAO-TM
		Contractor should register with	impacts during the handling,			phase	Waste Disposal
		the EPD as a Chemical Waste	transportation and disposal				(Chemical Waste)
		Producer and to follow the	of chemical waste				(General) Regulation
		guidelines stated in the Code of					
		Practice on the Packaging,					
		Labelling and Storage of Chemical					
		Wastes.					
		 Good quality containers 					
		compatible with the chemical					
		wastes should be used, and					
		incompatible chemicals should be					
		stored separately.					
		 Appropriate labels should be 					
		securely attached on each chemical					
		waste container indicating the					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		corresponding chemical					
		characteristics of the chemical					
		waste, such as explosives,					
		flammable, oxidizing, irritant, toxic,					
		harmful, corrosive, etc.					
		■ The Contractor should use a					
		licensed collector to transport and					
		dispose of the chemical wastes					
		generated at the Chemical Waste					
		Treatment Centre at Tsing Yi, or					
		other licenced facility, in accordance					
		with the Waste Disposal (Chemical					
		Waste) (General) Regulation.					
S6.28		General refuse:	To minimize environmental	Contractor	Works sites	Construction	EIAO-TM
		It should be stored in enclosed	impacts during the handling			phase	
			and transportation of general				
		from C&D material.	refuse				
		A reputable waste collector					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		should be employed by the					
		contractor to remove general refuse					
		from the site, separately from C&D					
		material.					
		An enclosed and covered area					
		is preferred to reduce the					
		occurrence of 'wind blown' light					
		material.					
E		Ecological Impact				l	
S. 7.95	6.6	Sheet-pilings, which will be	To minimize the impacts on	Contractor	Whole site	Construction	EIAO-TM
		installed around the trench of	the stream and natural river			Phase	
		excavation, should be extended	bank				
		above ground level for ~2m to act as					
		hoarding to isolate the works site.					
		The trenching works for the					
		construction of the proposed box					
		culvert should be carried out in					
		phases, with a trench length of not					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		more than 120m in each phase.					
		The trench should be backfilled and					
		compacted with suitable materials					
		upon completion of each phase of					
		the construction works.					
S7.117	6.6	The construction of intercept	To minimize the impacts on	Contractor	Whole site	Construction	EIAO-TM
		point of twin cell box culvert at the	the stream and natural river			Phase	
		upstream of Wai Ha River should be	bank				
		confined to only one side of the river					
		bank.					
		To restore and enhance the					
		ecological value of the stream, the					
		affected river bank should be					
		reinstated to its original condition or					
		lined with rock-filled gabion.					
		Planting pits should be provided					
		in the gabion bank to allow the					
		re-establishment of riparian					
		vegetation.					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		The existing natural riverbed and					
		substrates should be retained and					
		the natural pool-riffle sequence					
		should be re-created in the new					
		channel bed.					
S 7.118	6.7	All works carried out within the	To minimise sedimentation/	Contractor	Whole Site	Construction	EIAO-TM
		the river channel of Wai Ha River	water quality impacts			Phase	
		should be carried out from October					
		to April, with construction carried out					
		by land-based plant.					
		Works within river/stream					
		channels should be restricted to an					
		enclosed dry section of the river,					
		with containment measures such as					
		bunds and barriers used within the					
		river to minimize the impacts upon					
		the downstream water body.					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		Site runoff should be directed					
		towards regularly cleaned and					
		maintained silt traps and oil/grease					
		separators to minimize the risk of					
		sedimentation and pollution of river					
		water.					
		■ The silt and oil/grease separators					
		should be appropriately designed for					
		the local drainage and ground					
		conditions.					
		To minimize leakage and loss of					
		sediments during excavation in					
		narrow channels, tightly sealed					
		closed grab excavators should be					
		deployed where material to be					
		handled is wet.					
S 7.119	6.8	■ The construction of the	To protect plant species of	Contractor/	Whole site	Construction	EIAO-TM
		proposed box-culvert would have the	conservation interest	qualified		Phase	
		potential to directly impact a few		botanist/horticu			

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		individual of a plant species of		lturalist			
		conservation interest (Hong Kong					
		Pavetta, Pavetta hongkongensis).					
		The affected individuals should be					
		transplanted to a suitable nearby					
		habitats prior to the construction					
		phase.					
		A detailed vegetation survey of					
		the affected species of conservation					
		interest should be conducted by a					
		suitably qualified botanist/ecologist					
		to identify the affected individuals in					
		order to provide details for					
		transplantation scheme.					
		■ Transplantation should be					
		supervised by a suitably qualified					
		botanist/horticulturalist. A detailed					
		transplantation methodology should					
		be formulated during the detailed					
		design stage of this Project.					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
S 7.120	6.9	Noise mitigation measures such	To minimise disturbance	Contractor	Whole site	Construction	EIAO-TM
		as the use of quieter construction	impacts.			Phase	
		plant and temporary noise barriers					
		should be implemented to minimize					
		disturbance to habitats adjacent to					
		the works areas.					
		 Temporary noise barriers should 					
		be used during the construction of					
		the box-culvert along Tung Tsz					
		Road, the floodwater pumping					
		station, the mechanical gate, and					
		drainage pipe to minimize potential					
		construction phase disturbance to					
		ardeids and avifauna foraging in					
		marsh habitat.					
		Noise generating construction					
		works near the Shuen Wan Egretry					
		SSSI should be avoided as far as					
		practicable during the breeding					
		season (March to June) of the					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		ardeids.					
		Works near the SSSI (i.e.					
		installation of mechanical gate)					
		should be restricted to be executed					
		outside the breeding season by					
		provision of special conditions in the					
		contract document.					
		Hoardings with minimum height					
		of 2m should be set up along the					
		south side of the proposed box					
		culvert works area adjacent to the					
		marsh, extending at least 20m at					
		both ends, throughout the					
		construction period.					
S 7.121	6.10	Placement of equipment or	To minimise disturbance to	Contractor	Whole site	Construction	EIAO-TM
		stockpile in designated works areas	habitats.			Phase	
		and access routes selected on					
		existing disturbed land to minimise					
		disturbance to natural or					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		moderate-high ecological value					
		habitats.					
S 7.121	6.10	Construction activities should be	To minimise disturbance to	Contractor	Whole site	Construction	EIAO-TM
		restricted to work areas that would	natural habitats outside			Phase	
		be clearly demarcated. The work	works area.				
		areas should be reinstated after					
		completion of the works.					
S 7.121	6.10	 Waste skips should be provided 	To minimise disturbance to	Contractor	Whole site	Construction	EIAO-TM
		to collect general refuse and	habitats.			Phase	
		construction wastes. The wastes					
		would be disposed of timely and					
		properly off-site.					
S 7.121	6.10	General drainage arrangements	To minimise sedimentation/	Contractor	Whole site	Construction	EIAO-TM
		should include sediment and oil	water quality impacts			Phase	
		traps to collect and control					
		construction site run-off.					
S 7.121	6.10	Open burning on works sites is	To prevent accidental	Contractor	Whole site	Construction	EIAO-TM
		illegal, and should be strictly	hill-fires.			Phase	
		prohibited.					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
S 7.122	6.11	De-silting should be limited to the	To minimise sedimentation/	Maintenance	Whole site	Operation	EIAO-TM
		dry season.	water quality impacts	parties of the		Phase	
				channel			
S 7.122	6.11	 Waste material produced during 	To minimise sedimentation/	Maintenance	Whole site	Operation	EIAO-TM
		de-silting should be disposed of in a	water quality impacts	parties of the		Phase	
		timely and appropriate manner.		channel			
S 7.123	6.12	 Planting of trees should be 	To compensate the loss of	Contractor	Whole site	Construction	EIAO-TM
		provided within the project area to	vegetation			Phase	
		compensate for the unavoidable					
		loss of approximately 0.08ha					
		secondary woodland habitat due to					
		the Project.					
		Planting of trees and other					
		vegetation within project area along					
		the banks of Wai Ha River and Tung					
		Tsz Road should be carried out to					
		provide compensation for					
		unavoidable tree-felling and loss of					
		riparian vegetation resulting from the					

EIA Ref.	EM&A	Recommended Mitigation	Objectives of the	Who to	Location of the	When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		Project.					
		The compensatory planting					
		should make use of native plant					
		species with flowers/fruits attractive					
		to wildlife.					
S 7.124	6.13	 Compensation would be required 	To compensate the loss of	Contractor /	The recreational	Construction	EIAO-TM
		for the loss of a small area of marsh	marsh habitat and enhance	qualified	fish pond located	Phase	
		habitat (about 0.30ha) within the CA	the quality compensatory	ecologist	to the southwest		
		resulting from the construction of the	habitat		of the existing		
		box-culvert.			Tung Tsz Nursery		
		An existing low ecological value					
		recreational fishpond on government					
		land adjacent to the marsh would be					
		used as a proposed area (about					
		0.8ha) for the compensation for the					
		marsh as well as secondary					
		woodland habitats loss (0.08ha).					
		■ The pond should be enhanced					
		by removing boardwalks around the					

EIA Ref.		Recommended Mitigation	Objectives of the			When to	What requirements
	Ref.	Measures	Recommended Measure &	implement the	measure	implement the	or standards for the
			Main Concern to Address	measure?		measure?	measure to
							achieve?
		existing pond, and restoring					
		vegetation along the pond bunds,					
		and it would be re-profiled to provide					
		areas of shallow water					
		(approximately 15-50cm deep),					
		creating a suitable foraging habitat					
		for avifauna, particularly ardeids and					
		other waders.					
		 Screen planting of shrubs and 					
		trees along the south-eastern bund					
		of the pond should be implemented					
		to minimise disturbance to avifauna					
		and other wildlife from the adjacent					
		recreational fishpond. The enhanced					
		pond is expected to provide a					
		moderate-high ecological value					
		wetland habitat.					

EIA Ref.		Recommended Mitigation Measures		Who to implement the measure?	measure	When to implement the measure?	What requirements or standards for the measure to achieve?
F		Landscape and Visual					
Table 8.4	7.6	Visual screen, contaminant/ liaison with nursery, protection of existing trees with works area and construction light are used or practiced to mitigate the impacts during construction phase.	To mitigate the landscape	Contractor	Whole site	Construction	EIAO-TM
Table 8.4	7.7	Viewing area formation, architectural design for pump house, landscape design for pump house, enhancement planting along Tung Tsz Road, sufficient soil depth for enhancement planting, transplanting of trees to adjacent locations, preparation for transplanting and reinstatement of affected area are practiced to mitigate the impacts during operational phase.	To mitigate the landscape and visual impacts during the operational phase.	Contractor		Detail Design / Operational Phase	EIAO-TM

B) Implementation status of environmental protection and mitigation

EM&A Ref.	Recommended Mitgation Measures	Objectives of the Recommended Measure & main concern to Address	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?	Implementation status
	Use well maintained construction plant					Implemented
	Shut down plants between work periods					Implemented
2.18	Install silencers on construction equipment	To minimize construction noise impact	Works areas			Implemented
	Locate mobile plant far away from NSRs			Construction phase	EIAO-TM NCO	Implemented
	Quiet plants should be used					Implemented
2.19	Use of quieter PME					Not applicable
2.20 - 2.21	Use of temporary noise barrier		Pipe laying in Wai Ha			Not applicable
2.22	Use of alternative quieter construction method		Part of the Works Pipe laying in Wai Ha			Not applicable
2.23 – 2.24	Use of noise enclosure		Pipe laying in Wai Ha			Not applicable

EM&A Ref.	Recommended Mitgation Measures	Objectives of the Recommended Measure & main concern to Address	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?	Implementation status
3.5	Implement regular watering and vehicle washing facilities				EIAO-TM	Outstanding
	Cover excavated or stockpile of dusty material by impervious sheeting or sprayed with water	To minimize construction dust impact	Construction Site	Construction phase		Implemented
	Use tarpaulin to cover dusty materials on vehicles					Implemented
4.5	Provide silt trap and oil interceptor to remove the oil, lubricants, grease, silt, grit and debris from the wastewater before pumped to the public storm water drainage system					Implemented
4.5	During rainstorms, exposed slope/soil surfaces shall be covered by a tarpaulin or other means. Others measures that need to be implemented before, during, and after rainstorms as summarized in ProPECC PN 1/94 shall be followed	To minimize water quality impact	Construction Site	Construction phase	EIAO-TM WPCO	Not applicable

EM&A Ref.	Recommended Mitgation Measures	Objectives of the Recommended Measure & main concern to Address	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?	Implementation status
4.10	Provide site toilet facilities	To minimize water quality impact	Construction Site	Construction phase	EIAO-TM WPCO	Implemented
4.7	Further precautionary measures during rainy season: For the construction of the box culvert next to the existing channel of the Wai Ha River, sand bags should be deployed around the boundary of the works trench to prevent muddy water ingress into the adjacent CA or Wai Ha River. Sand bags should also be used to surround the excavated trench. Generally, the sand bags will be placed up to a height of 300mm to provide adequate allowance for the built-up water level during rainstorm event. With sand bags in place, surface runoff will be intercepted and flow to Wai Ha River or collected by the existing drainage system as usual. For the construction of the box culvert in the extreme northeast corner of Shuen Wan Marsh Conservation Area sand bags should be deployed along the limit of the works area to prevent muddy water ingress into the CA. Sand bags should be placed to a height of at least 300mm from round level and +2.5 mPD (whichever is greater) to provide adequate allowance	To minimize water quality impact to the designated Conservation Area	Works areas near the Conservation Area	Rainy seasons during construction	EIAO-TM WPCO	Not applicable

EM&A	Recommended	Objectives of the	Location of the	When to implement	What requirements	Implementation status
Ref.	Mitgation Measures	Recommended	measure	the measure?	or standards for the	
		Measure & main			measure to achieve?	
		concern to Address				
	for the built-up water level during rainstorm events. Unpolluted surface runoff within the works area should then be collected and directed into the existing drainage system.					
	Sheet-piles, which would be installed around the works trench near the Conservation Area, would be extended above ground level for about 2m to serve as hoardings to isolate the works site.					
	Tarpulin sheets would be used to cover the excavation areas during heavy rainstorms. This would prevent the ingress of rainwater into the trench minimising the risk of muddy water getting into Wai Ha River and the adjacent Conservation Area.					
	Any concrete washing water would be contained inside the works site surrounded by the extended sheet piles. A pump sump at the bottom of the trench would be provided to pump any excess water during concrete					
5.9	Reuse excavated material as much as possible					Implemented
5.7	Any unused chemicals or those with remaining functional capacity shall be recycled.	To achieve waste reduction	Works areas	Construction phase	EIAO-TM	Not applicable
	Recycle scrap metals or abandoned equipment					Implemented

EM&A Ref.	Recommended Mitgation Measures	Objectives of the Recommended Measure & main concern to Address	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?	Implementation status
5.5	A recording system for the amount of wastes generated, recycled and disposed should be proposed Adopt a trip ticket system for the disposal of C&D materials All general refuse should be segregated and	To reduce waste management impacts	Works areas	Construction phase	ETWB TCW No. 19/2005 ETWB TCW	Implemented Implemented
5.11	stored in enclosed bins or compaction units Contractor should be a required to register				NO. 31/2004	Implemented
	with the EPD as a Chemical Waste Producer and to follow the guidelines states in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the					Implemented
5.10	chemical wastes should be used, and Incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating	To minimize the environmental impacts associated with the handling, transportation and disposal of chemical waste.	Work site	Construction phase	EIAO-TM Waste Disposal (Chemical Waste)(General) Regulation	Not applicable
	the corresponding chemical characteristics of the chemical waste, such as explosives, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc.					

EM&A Ref.	Recommended Mitgation Measures	Objectives of the Recommended Measure & main concern to Address	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?	Implementation status
5.5	A recording system for the amount of wastes generated, recycled and disposed should be proposed	To reduce waste management impacts	Works areas	Construction phase	ETWB TCW No. 19/2005 ETWB TCW NO. 31/2004	Implemented
6.6	Sheet-pilings, which will be installed around the trench of excavation, should be extended above ground level for ~2m to act as hoarding to isolate the works site. The trenching works for the construction of the proposed box culvert should be carried out in phases, with a trench length of not more than 120m in each phase. The trench should be backfilled and compacted with suitable materials upon completion of each phase of the construction works.	To minimize the impacts on the steam and natural river bank.	Whole site	Construction phase	EIAO-TM	Implemented
6.6	The construction of intercept oint of twin cell box culvert at the upstream of Wai Ha River should be confined to only one side of the river bank. To restore and enhance the ecological value of the stream, the affected river bank should be reinstated to its original condition or lined with rock-filled gabion. Planting pits should be provided in the gabion bank to allow the re-establishment of riparian vegetation.	To minimize the impacts on the steam and natural river bank.	Whole site	Construction phase	EIAO-TM	No applicable

EM&A Ref.	Recommended Mitgation Measures	Objectives of the Recommended Measure & main concern to Address	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?	Implementation status
	The existing natural riverbed and substrates should be retained and the natural pool-riffle sequence should be re-created in the new channel bed. All works carried out within the the river					
6.7	channel of Wai Ha River should be carried out from October to April, with construction carried out by land-based plant. Works within river/stream channels should be restricted to an enclosed dry section of the river, with containment measures such as bunds and barriers used within the river to minimize the impacts upon the downstream water body. Site runoff should be directed towards regularly cleaned and maintained silt traps and oil/grease separators to minimize the risk of sedimentation and pollution of river water. The silt and oil/grease separators should be appropriately designed for the local drainage and ground conditions. To minimize leakage and loss of sediments during excavation in narrow channels, tightly sealed closed grab excavators should be deployed where material to be handled is wet.	To minimize sedimentation/ water quality impacts	Whole site	Construction phase	EIAO-TM	No applicable

EM&A Ref.	Recommended Mitgation Measures	Objectives of the Recommended Measure & main concern to Address	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?	Implementation status
6.8	The construction of the proposed box-culvert would have the potential to directly impact a few individual of a plant species of conservation interest (Hong Kong Pavetta, Pavetta hongkongensis). The affected individuals should be transplanted to a suitable nearby habitats prior to the construction phase. A detailed vegetation survey of the affected species of conservation interest should be conducted by a suitably qualified botanist/ecologist to identify the affected individuals in order to provide details for transplantation scheme. Transplantation should be supervised by a suitably qualified botanist/horticulturalist. A detailed transplantation methodology should be formulated during the detailed design stage of this Project.	To protect plant species of conservation interest	Whole site	Construction phase	EIAO-TM	No applicable
6.9	Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimize disturbance to natural or moderate-high ecological value habitats.	To minimise disturbance to habitats.	Whole site	Construction phase	EIAO-TM	No applicable
6.13	General drainage arrangements should include sediment and oil traps to collect and control construction site run-off.	To minimise sedimentation/ water quality impacts	Whole site	Construction phase	EIAO-TM	Implemented

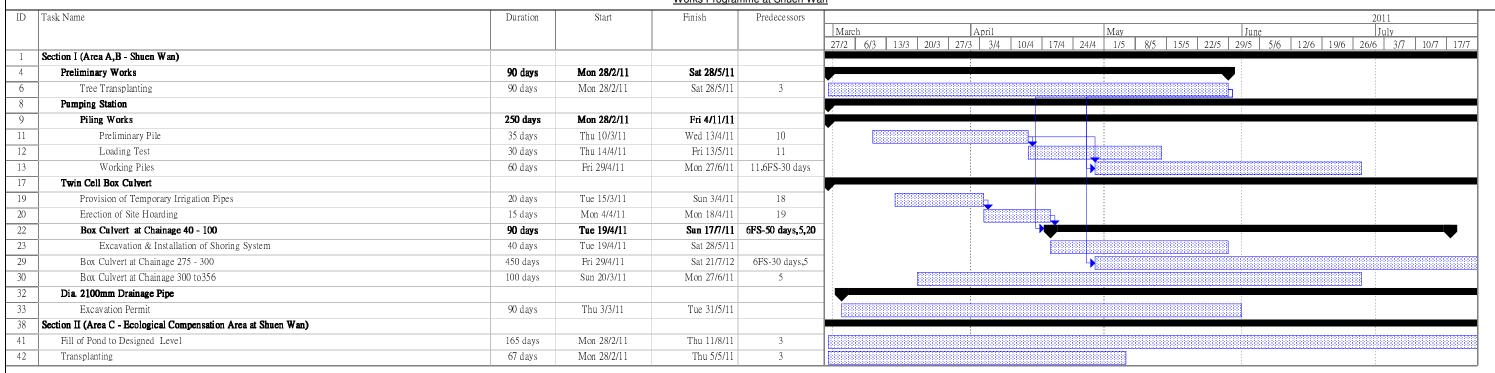
EM&A Ref.	Recommended Mitgation Measures	Objectives of the Recommended Measure & main concern to Address	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?	Implementation status
6.13	Construction activities should be restricted to work areas that would be clearly demarcated. The work areas should be reinstated after completion of the works.	To minimise disturbance to natural habitats outside works area.	Whole site	Construction phase	EIAO-TM	Implemented
6.13	Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimize disturbance to natural or moderate-high ecological value habitats.	To minimise disturbance to natural habitats	Whole site	Construction phase	EIAO-TM	Implemented
7.6	Visual screen, contaminant/ liaison with nursery, protection of existing trees with works area and construction light are used or practiced to mitigate the impacts during construction phase	To mitigate the landscape	Whole site	Construction phase	EIAO-TM	Implemented
7.7	Viewing area formation, architectural design for pump house, landscape design for pump hose, enhancement planting along Tung Tsz Road, sufficient soil depth for enhancement planting, transplanting of trees to adjacent locations preparation for transplanting and reinstatement of affected area are practiced to mitigate the impacts during operational phase.	To mitigate the landscape and visual impacts during the operational phase	Whole site	Detail Design / Operational Phase	EIAO-TM	Not Applicable

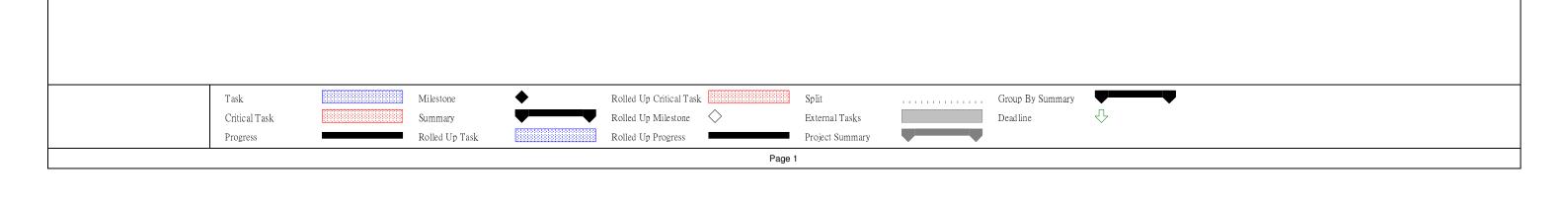
Appendix I: Construction programme

Environmental Pioneers and Solutions Limited

Contract No.: DC/2009/22 Contract Title: Drainage Improvement Works in Shuen Wan, Tai Po - Contract 1

Monthly EMman Report (for April 2011) Works Programme at Shuen Wan

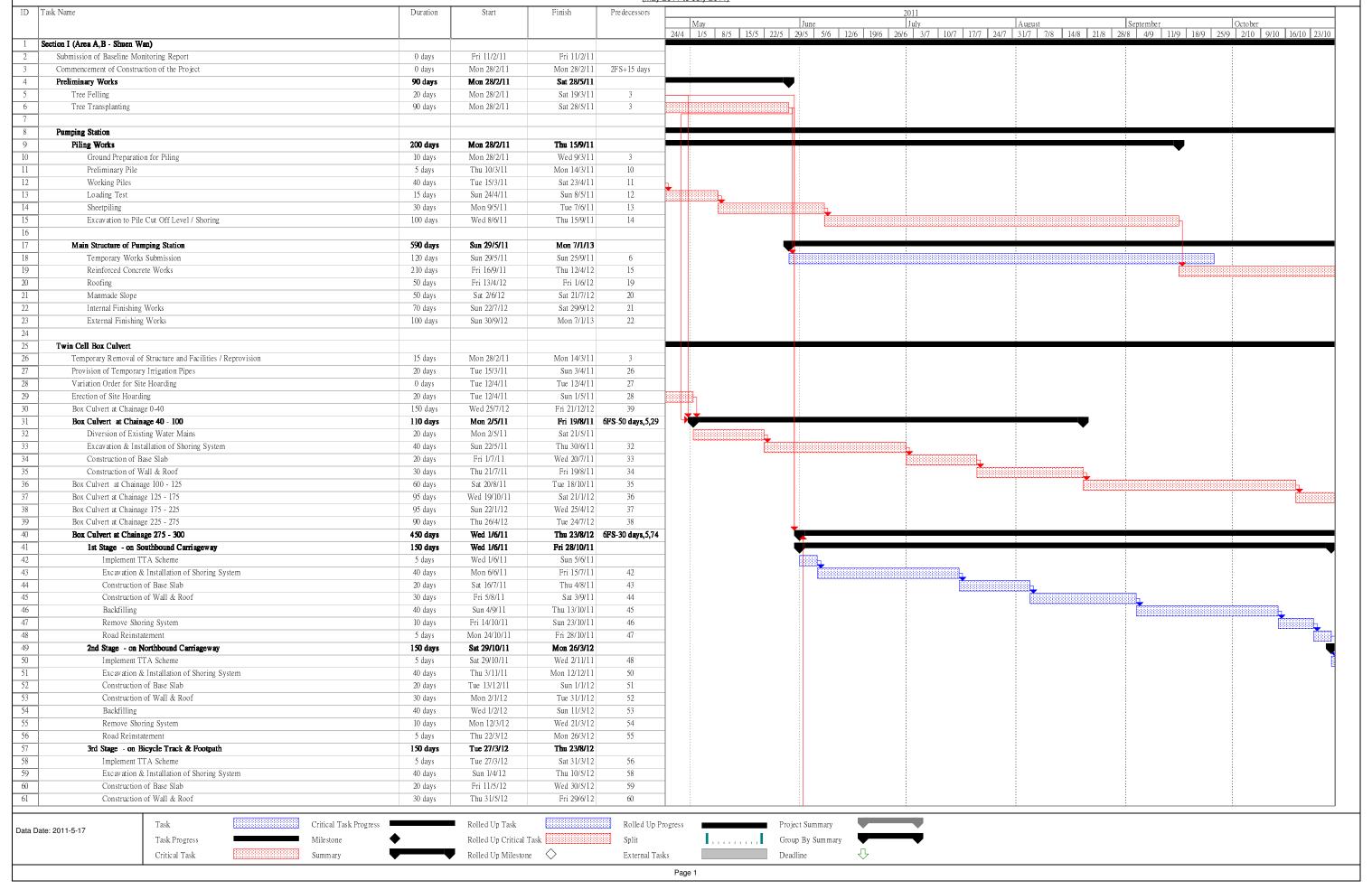






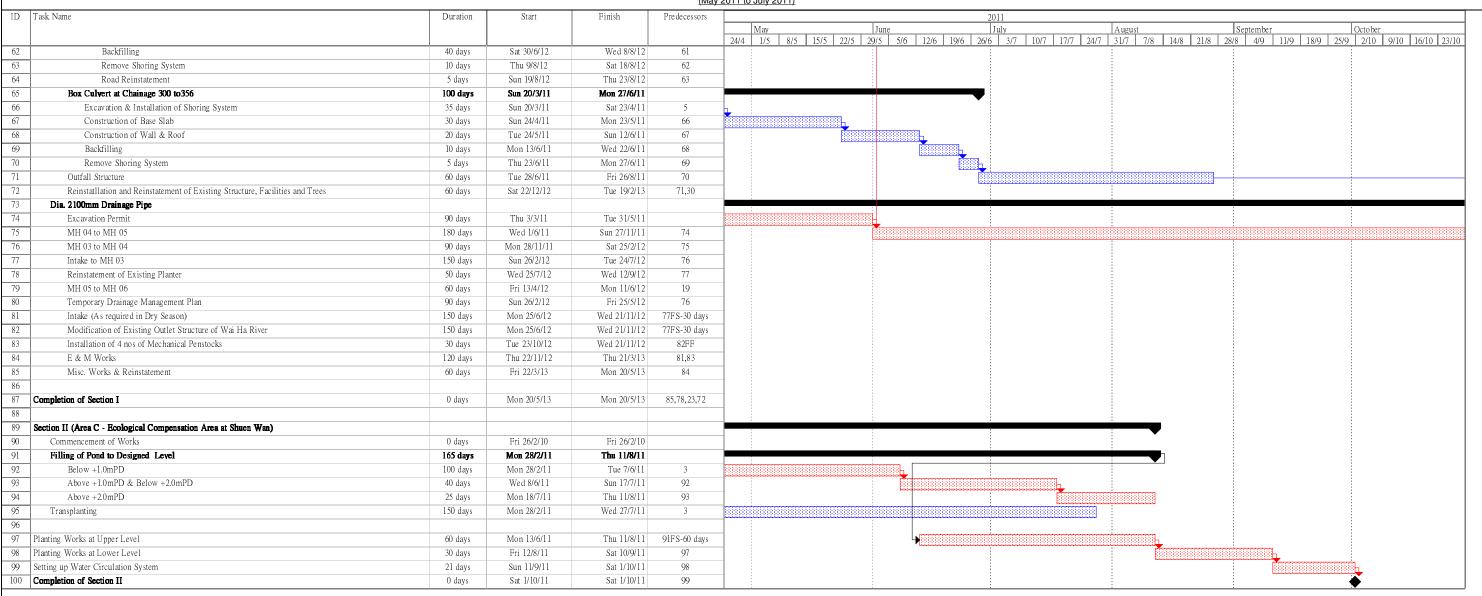
Contract No.: DC/2009/22 Contract Title: Drainage Improvement Works in Shuen Wan, Tai Po - Contract 1

Three - Month Rolling Programme (May 2011 to July 2011)



Contract No.: DC/2009/22 Contract Title: Drainage Improvement Works in Shuen Wan, Tai Po - Contract 1

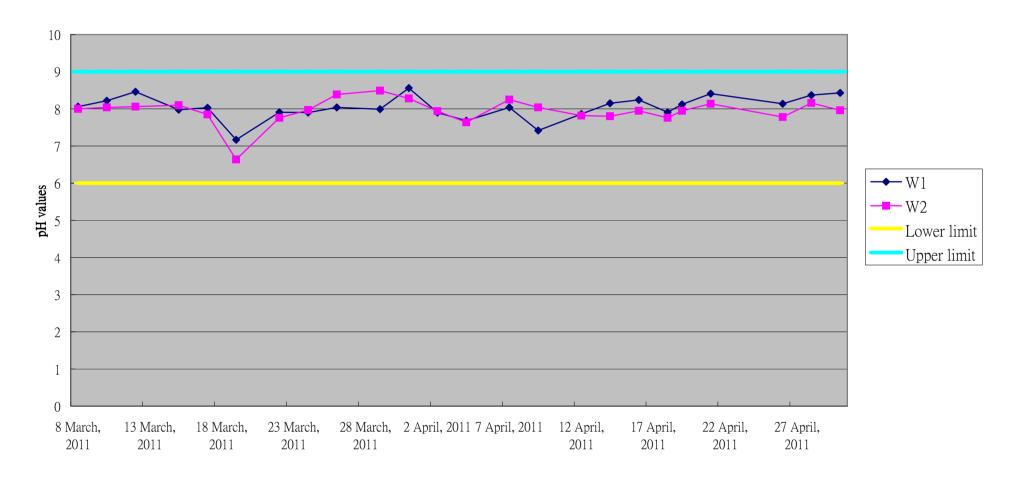
Three - Month Rolling Programme (May 2011 to July 2011)



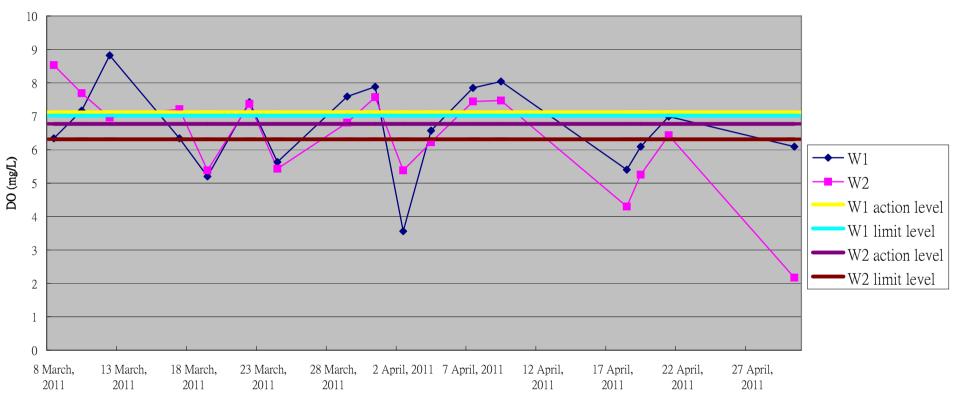




Graphical plots of pH values W1&W2

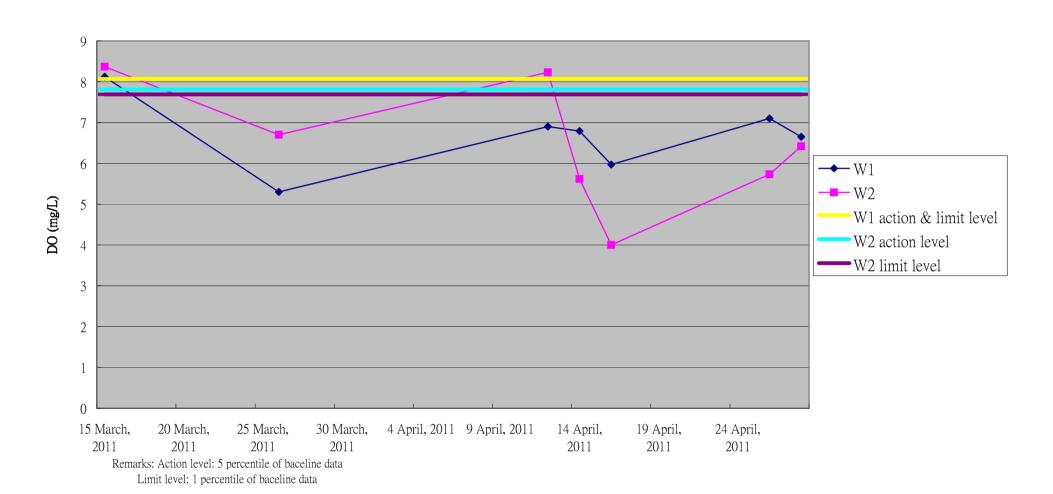


Graphical plots of DO (ebb tide) for W1&W2

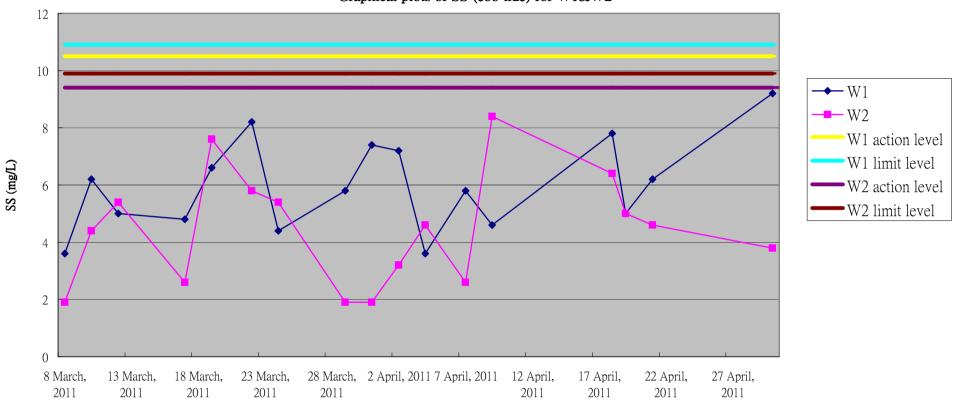


Remarks: Action level: 5 percentile of baceline data Limit level: 1 percentile of baceline data

Graphical plot of DO (flood tide) of W1&W2

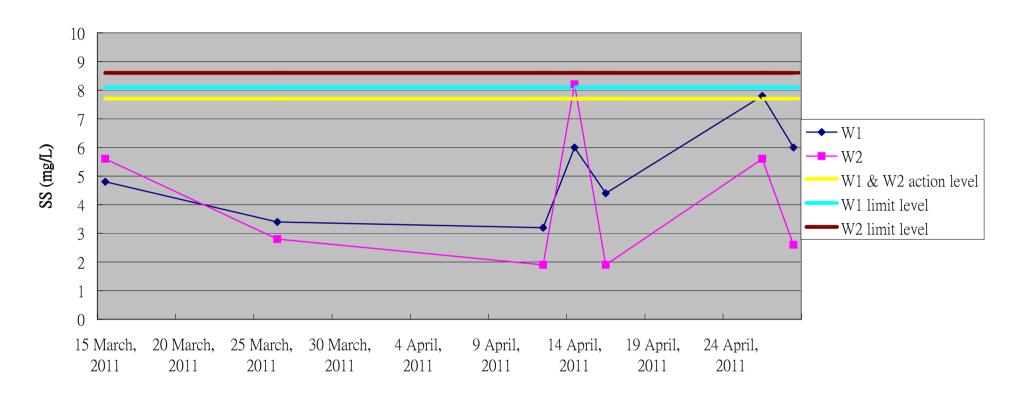


Graphical plots of SS (ebb tide) for W1&W2



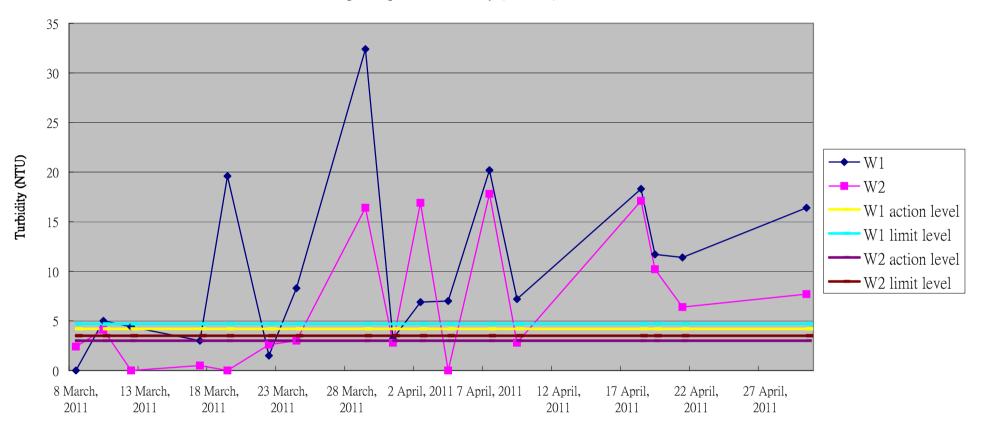
Remarks: Action limit is 95% of baseline data or 120% of upsteam control station's SS Limit level is 99% of baseline data or 130% of upsteam control station's SS

Graphical plots of SS (flood tide) for W1&W2



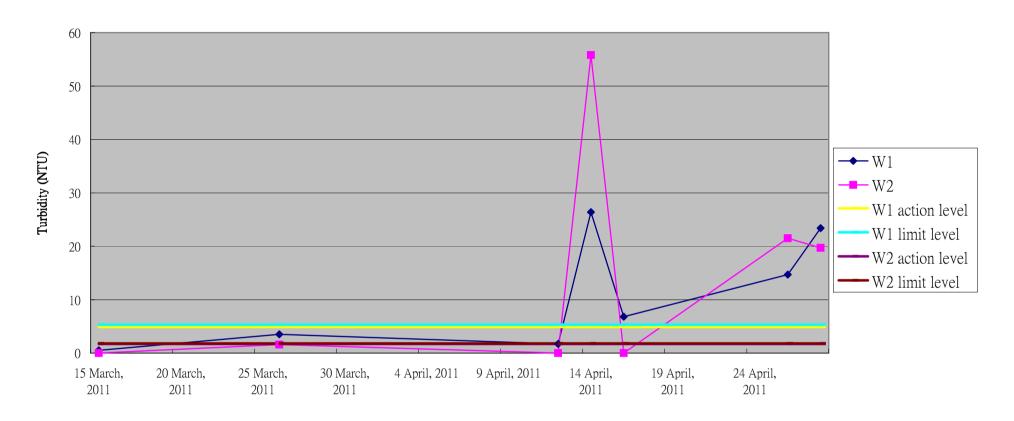
Remarks: Action limit is 95% of baseline data or 120% of upsteam control station's SS Limit level is 99% of baseline data or 130% of upsteam control station's SS

Graphical plots of Turbidity (ebb tide) for W1&W2



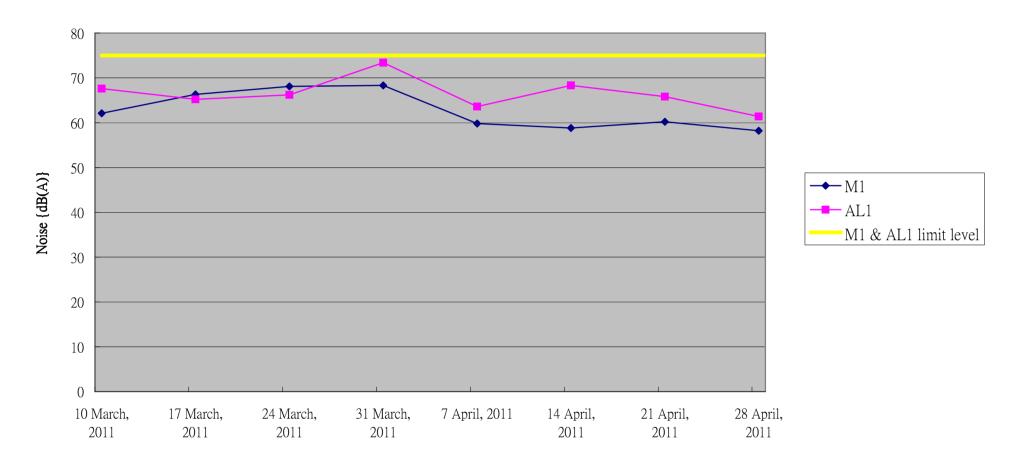
Remarks: Action limit is 95% of baseline data or 120% of upsteam control station's Turbidity Limit level is 99% of baseline data or 130% of upsteam control station's Turbidity

Graphical plots of Turbidity (flood tide) for W1&W2



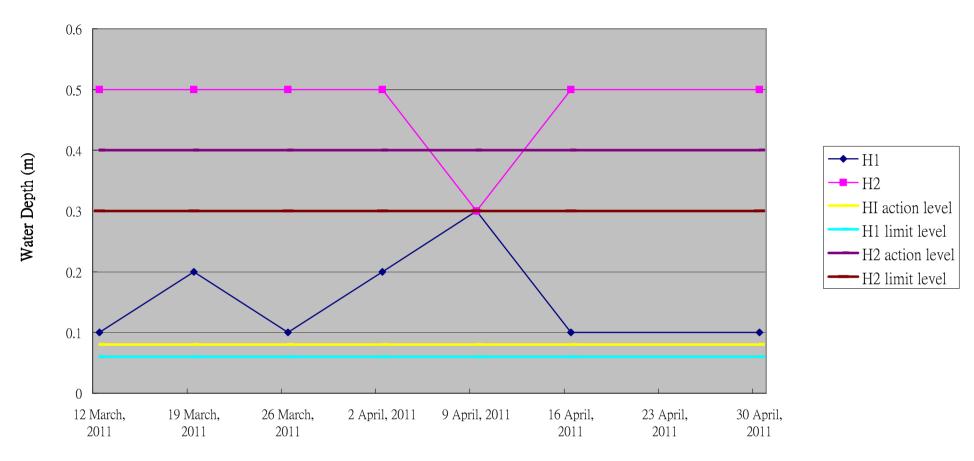
Remarks: Action limit is 95% of baseline data or 120% of upsteam control station's Turbidity Limit level is 99% of baseline data or 130% of upsteam control station's Turbidity

Graphical plots of Noise for M1 & AL1



Remarks: Action limit is when one documented complaint is received

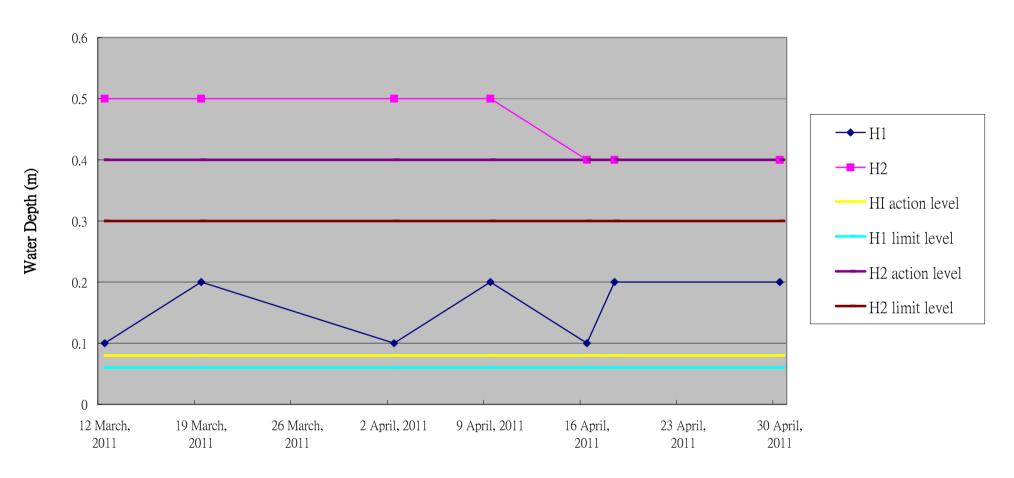
Graphical plots of Hydrological Monitoring(water depth at flood tide) for H1 & H2



Remarks: Action level: 80% of baseline water depth.

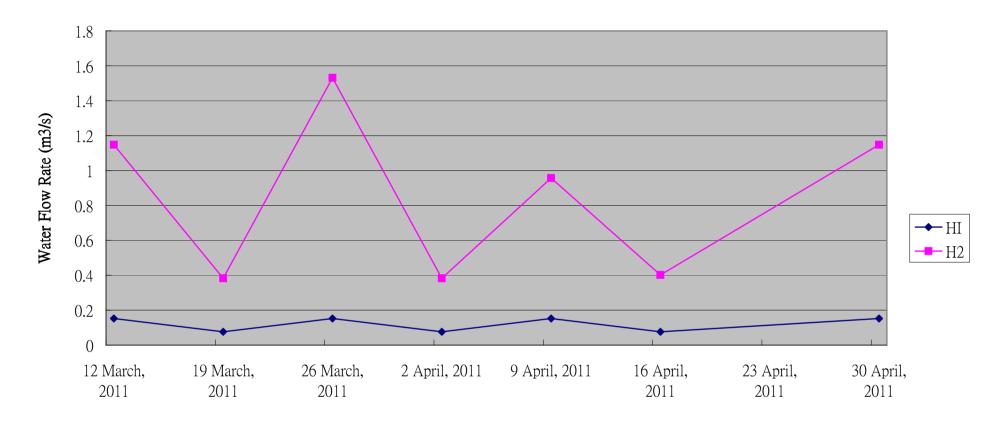
Limit level: 60% of baseline water depth.

Graphical plots of Hydrological Monitoring(water depth at ebb tide) for H1 & H2



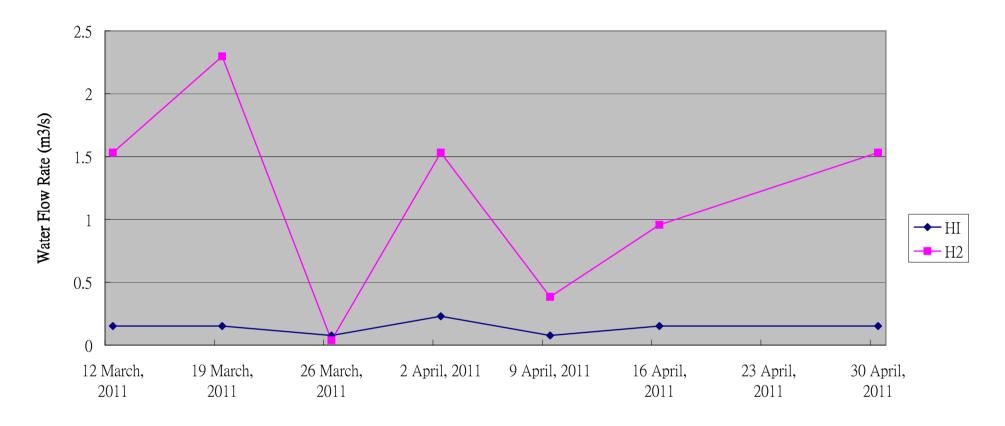
Remarks: Action level: 80% of baseline water depth. Limit level: 60% of baseline water depth.

Graphical plots of Hydrological Monitoring(water flow rate at flood tide) for H1 & H2



Remarks: Action level: 120% of control station's water flow rate on the same day of measurement. Limit level: 140% of control station's water flow rate on the same day of measurement.

Graphical plots of Hydrological Monitoring(water flow rate at ebb tide) for H1 & H2



Remarks: Action level: 120% of control station's water flow rate on the same day of measurement. Limit level: 140% of control station's water flow rate on the same day of measurement.



