



Proposed Comprehensive Development at Wo Shang Wai, Yuen Long

Monthly EM&A Report for October 2011 (Rev. B)

November 2011
Report No.: 266567/28/B

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Heng Shung Construction Co. Ltd.

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Executive Summary

Mott MacDonald Hong Kong Ltd. ("MMHK") has been commissioned by Heng Shung Construction Co. Ltd. to undertake the Environmental Team (ET) services to carry out environmental monitoring and audit (EM&A) for both pre-construction and construction phases of the Proposed Comprehensive Development at Wo Shang Wai, Yuen Long.

This is the 18th EM&A report submitted under the Condition 4.5 of Environmental Permit No. EP-311/2008/B. This report summarises the findings on EM&A during the period from 1 October to 31 October 2011.

Exceedance of Action and Limit Levels

There was no breach of Action or Limit levels for Air Quality (1-hr TSP and 24-hr TSP) and Noise level (as L_{eq}) in the reporting month.

Exceedances of pH, DO, turbidity and SS were observed at MP1 to MP6 in October 2011. Exceedances of pH were often observed at MP1 to MP3 and a few times at MP4 to MP6. DO were exceeded frequently at MP3 and exceeded several times at MP4 to MP6. Turbidity and/or SS exceedances were recorded on one monitoring date at MP3, MP5 and MP6 respectively. The summary of measured water quality is presented in **Section 3.2.3**.

Investigations have been carried out to identify the causes of exceedance. From investigation, the Contractor has implemented water quality mitigation measures as recommended in the EIA report. With external factors affect the adjacent environments, such as natural variations, pond fish culture activities, heavy rainfall, and microbe growth (including algae), the exceedances were considered not due to construction works.

Implementation of mitigation measures

Site audits were carried out on 7, 14, 21 and 27 October 2011 to confirm the implementation measures undertaken by the Contractor in the reporting month. The outcomes are presented in **Section 6** and the status of implementation of mitigation measures in the site is shown in [Appendix L](#).

Record of Complaints

There was no record of complaints received in the reporting month.

Record of Notification of summons and successful prosecution

There was no record of Notification of summons and successful prosecution in the reporting month.

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

The major site works to be commissioned in the coming three months include band drain installation (to be completed by end of December 2011), Trial Embankment for Ground Improvement installation (to be completed by end of December 2011) and Site Formation (Filling). Potential environmental impacts due to the construction activities, including air quality, noise, water quality, ecology and landscape and visual, will be monitored.

Environmental mitigation measures will be implemented on site as recommended and weekly site audits will be carried out to ensure that the environmental conditions are acceptable.

1. Introduction

1.1 Background

In March 2005, the Project Proponent, Profit Point Enterprises Limited, acquired the development site in Yuen Long at Wo Shang Wai. An Environmental Impact Assessment (EIA) was carried out under the EIA Ordinance (EIAO) since then and the Environmental Permit (EP-311/2008B) for construction of the comprehensive development in Wo Shang Wai was granted by EPD on 29 July 2010. The Project involves the residential development and associated infrastructure and wetland restoration area and linear landscape area. The construction works under the Environmental Permit commenced on 12 May 2010.

Heng Shung Construction Co. Ltd. was commissioned as the Contractor for the Project. Mott MacDonald Hong Kong Ltd. ("MMHK") has been commissioned by Heng Shung Construction Co. Ltd. to undertake the Environmental Team (ET) services to carry out environmental monitoring and audit (EM&A) for both pre-construction and construction phases of the Proposed Comprehensive Development at Wo Shang Wai, Yuen Long.

According to the EP Condition 4.5, the monthly EM&A Report shall be submitted to the Director within 2 weeks after the end of the reporting month. This report summarises the findings during the period from 1 October 2011 to 31 October 2011.

1.2 Project Organization

The organisation chart and lines of communication with respect to the on-site environmental management structure together with the contact information of the key personnel are shown in [Appendix A](#).

1.3 Environmental Status in the reporting period

During the reporting period, construction works of the Project undertaken include:

- Band drain installation;
- Trial Embankment for Ground Improvement; and
- Site formation (Filling)

The Construction Works Programme of the Project is provided in [Appendix B](#). The general layout plan of the Project site is shown in [Figure 1.1](#).

1.4 Summary of EM&A Requirements

The EM&A programme requires environmental monitoring of air quality, noise, water quality, ecology and landscape and visual as specified in the approved EM&A Manual.

A summary of impact EM&A requirements is presented in **Table 1.1**:

Table 1.1: Summary of Impact EM&A Requirements

Parameters	Descriptions	Locations	Frequencies
Air Quality	24-Hour TSP	ASR1, ASR2A, ASR3, ASR4	Once every 6 days
	1-Hour TSP	ASR1, ASR2A, ASR3, ASR4	3 times every 6 days
Noise	L_{eq} , 30min	NSR1, NSR3, NSR5, NSR7	Weekly
Water Quality	Dissolved Oxygen (DO), temperature, pH, suspended solids (SS) and Biological Oxygen Demand (BOD)	MP1 to MP6	3 days per week
Ecology	Birds	Within the Project Area and Assessment Area of 500m	Weekly
	Dragonflies and Butterflies	Within the Project Area and Assessment Area of 500m	Once per month during Mar and Sep to November, and twice per month during Apr to Aug
	Herpetofauna	Within the Project Area and Assessment Area of 500m	Once per month during Apr to Nov
	Water quality of WRA	Wetland Restoration Area	After filling of WRA with water, monthly for in situ water quality and every six months (end of wet season and end of dry season) for laboratory testing
	Site Inspections	Within the Project Area and Assessment Area of 500m	Weekly
Landscape and Visual	Auditing of protection of existing trees, the transplanting of existing trees, the creation of new wetland, the planting of new trees and shrubs and other landscape and visual mitigation measures	CM1 to CM10 and OM1 to OM7 within the Project Area	Site inspections once every two weeks during construction phase; once every two months during operational phase

The Environmental Quality Performance Limits for air quality, noise and water quality are shown in [Appendix C](#).

The Event and Action Plan for air quality, noise and water quality are shown in [Appendix D](#).

The monitoring schedule for the reporting month is shown in **Table 1.2** below:

Table 1.2: Environmental Monitoring and Audit Schedule for October 2011

Tentative Environmental Monitoring and Audit Schedule for Oct 2011

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1 National Day
2	3	4 Water 24-hr TSP 1-hr TSP Noise Monitoring Bird	5 Chung Yeung Festival	6 Water Water (WRA)	7 *	8 Water
9	10 Water 24-hr TSP 1-hr TSP Noise Monitoring	11 Herpetofauna Dragonfly & Butterfly	12 Water Bird	13	14 Water * *	15 24-hr TSP 1-hr TSP
16	17 Water	18	19 Water	20	21 Water 24-hr TSP 1-hr TSP Noise Monitoring Bird *	22
23	24 Water	25	26 Water Bird Herpetofauna	27 24-hr TSP 1-hr TSP Noise Monitoring *	28 Water	29
30	31 Water Bird					

- Air Quality Monitoring (1-hr)
- Air Quality Monitoring (24-hr)
- Noise Monitoring
- Water Quality Monitoring
- Bird Survey
- Insect Survey
- Herpetofauna Survey
- Water Quality Monitoring (Ecology)
- * Site Audit by Mott MacDonald (MM)
- ⊗ Report Submission (EM&A Report)

2. Impact Monitoring Methodology

2.1 Introduction

For air quality, construction noise and water quality, ecology, landscape and visual monitoring methodology, including the monitoring locations, monitoring equipments used, monitoring parameters, and frequency and duration etc., are detailed in this Chapter.

2.2 Air Quality

2.2.1 Monitoring Parameters, Frequency and Duration

In accordance with the EM&A Manual, 1-hour and 24-hour TSP levels monitoring are to be conducted during the construction phase. **Table 2.1** summarizes the monitoring parameters, frequency and duration of air quality monitoring.

Table 2.1: Air Quality Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Frequency and Duration
ASR1, ASR2A, ASR3 & ASR4	24-hour TSP	At least once in every six-days
	1-hour TSP	3 times every six-days

2.2.2 Monitoring Locations

The 4 air quality monitoring stations were established in the EM&A manual and were slightly adjusted during the baseline monitoring phase. Locations of the agreed air quality monitoring stations are listed in **Table 2.2** and as shown in [Figure 2.1](#).

Table 2.2: Air monitoring stations

Monitoring Stations	Locations
ASR1	Works Site Boundary
ASR2A	At the rooftop of refuse collection point, which is located at the southwest of the project area
ASR3	At the commercial centre at Palm Springs, which is located at the south of the project area
ASR4	Works Site Boundary

2.2.3 Monitoring Equipments

Continuous 24-hour TSP air quality monitoring is conducted using High Volume Sampler (HVS) (Model: GMWS-2310 Accu-vol). The HVS meets all the requirements of the EM&A Manual. Portable direct reading dust meters were used to carry out the 1-hour TSP monitoring. **Table 2.3** summarizes the equipment used in the impact air quality monitoring.

Table 2.3: TSP Monitoring Equipment

Equipment	Model
24-hr TSP monitoring	
High Volume Sampler	GMWS 2310 Accu-vol
Calibrator	GMW 25
1-hr TSP monitoring	
Portable direct reading dust meter	AM510 SidePak Personal Aerosol Monitor

2.2.4 Monitoring Methodology

24-hour TSP Monitoring

Installation

The HVS was installed in the vicinity of the air sensitive receiver. The following criteria were considered in the installation of the HVS.

- A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
- The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
- A minimum of 2 meters separation from walls, parapets and penthouse was required for rooftop sampler.
- A minimum of 2 meters separation from any supporting structure, measured horizontally was required.
- No furnace or incinerator flues or building vent were nearby.
- Airflow around the sampler was unrestricted.
- The sampler has been more than 20 metres from any drip line.
- Permission was obtained to set up the samplers and to obtain access to the monitoring stations.
- A secured supply of electricity is needed to operate the samplers.

Preparation of Filter Papers

- Glass fibre filters, were labelled and sufficient filters that were clean and without pinholes were selected.
- All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ± 3 °C with relative humidity (RH) < 50% and was not variable by more than ± 5 %. A convenient working RH was 40%.

Field Monitoring

- The power supply was checked to ensure the HVS works properly.
- The filter holder and the area surrounding the filter were cleaned.

- The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
- The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
- The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.
- The shelter lid was closed and was secured with the aluminium strip.
- The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
- A new flow rate record sheet was set into the flow recorder.
- The flow rate of the HVS was checked and adjusted at around 1.1 m³/min. The range specified in the EM&A Manual was between 0.6-1.7 m³/min.
- The programmable timer was set for a sampling period of 24 hrs + 1 hr, and the starting time, weather condition and the filter number were recorded.
- The initial elapsed time was recorded.
- At the end of sampling, the sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
- It was then placed in a clean plastic envelope and sealed.
- All monitoring information was recorded on a standard data sheet.
- Filters were sent to a HOKLAS accredited laboratory for analysis.

Maintenance and Calibration

- The HVS and its accessories are maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVSs were calibrated at 2-month intervals.
- Calibration records for HVSs are shown in [Appendix E](#).

1-hour TSP Monitoring

Field Monitoring

The measuring procedures of the 1-hour dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

- Set POWER to "ON", push BATTERY button, make sure that the meter's indicator is in the range with a red line and allow the instrument to stand for about 3 minutes (Then, the air sampling inlet has been capped).
- Push the knob at MEASURE position.
- Push "O-ADJ" button. (Then meter's indication is 0).
- Push the knob at SENSI ADJ position and set the meter's indication to S value described on the Test Report using the trimmer for SENSI ADJ.
- Pull out the knob and return it to MEASURE position.

- Push “START” button.

Maintenance and Calibration

- The 1-hour dust meter would be checked at 3-month intervals and calibrated at 1-year intervals throughout all stages of the air quality monitoring.
- Calibration records for direct dust meters are shown in [Appendix E](#).

2.3 Construction Noise

2.3.1 Monitoring Parameters, Frequency and Duration

Following the requirements in the EM&A Manual for noise, noise monitoring has to be carried out during the construction phase. Continuous noise monitoring for the A-weighted levels L_{eq} , L_{10} and L_{90} is undertaken once per every week.

Table 2.4 summarizes the monitoring parameters, frequency and duration of air quality monitoring.

Table 2.4: Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Frequency and Duration
NSR1, NSR3, NSR5, NSR7	L_{eq} , L_{90} & L_{10}	Once every week

2.3.2 Monitoring Locations

The 4 noise quality monitoring stations were established in the EM&A manual and were slightly adjusted during the baseline monitoring phase. Locations of the agreed noise quality monitoring stations are listed in **Table 2.5** and as shown in [Figure 2.2](#).

Table 2.5: Noise monitoring stations

Monitoring Stations	Locations	Type of measurement
NSR1	Noise monitoring equipment was set up near the boundary wall at Palm Springs.	Free-field
NSR3	The monitoring station was located next to the guard house at Palm Springs.	Facade
NSR5	The monitoring station was located within the work site boundary.	Free-field
NSR7	The monitoring station was located near the boundary wall of the house of Mai Po San Tsuen.	Free-field

2.3.3 Monitoring Equipments

Integrating Sound Level Meter will be used for noise monitoring. It is a Type 1 sound level meter capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level (L_{eq}) and percentile sound pressure level (L_x). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). **Table 2.6** summarizes the noise monitoring equipment model being used.

Table 2.6: Noise Monitoring Equipment

Monitoring locations	Equipment Model	
	Integrating Sound Level Meter	Calibrator
NSR1	Rion NL-31	Rion NC-74
NSR3		
NSR5		
NSR7		

2.3.4 Monitoring Methodology

Field Monitoring

- The Sound Level Meter was set on a tripod at a height of at least 1.2 m above the ground.
- Façade and free-field measurements were made at the monitoring locations.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - frequency weighting: A
 - time weighting: Fast
 - time measurement: 30 minutes intervals (between 0700 and 1900)
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1 kHz. If the difference in the calibration level before and after measurement was more than 1 dB, the measurement would be considered invalid has to be repeated after re-calibration or repair of the equipment.
- During the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, any site observations and noise sources were recorded on a standard record sheet.

Maintenance and Calibration

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The meter and calibrator are sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- Calibration records are shown in [Appendix E](#).

2.4 Water Quality

2.4.1 Monitoring Parameters, Frequency and Duration

In accordance with the requirements in the EM&A Manual for water quality, water quality parameters including Dissolved Oxygen (DO), temperature, pH, turbidity, suspended solids (SS) and Biochemical Oxygen Demand (BOD) have to be monitored at designated monitoring stations during construction of the Project. DO, temperature and pH were measured in-situ whereas SS and BOD were analysed in a laboratory. The measurements should be taken at all designated monitoring stations, 3 days per week. The

interval between any two sets of monitoring was not less than 36 hours. **Table 2.7** summarizes the monitoring parameters, frequency and duration of water quality monitoring.

Table 2.7: Water Quality Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Frequency and Duration
MP1, MP2, MP3, MP4, MP5 & MP6	DO, temperature, pH, SS, turbidity, BOD	Three days every week

2.4.2 Monitoring Locations

The 6 water quality monitoring stations were established in the EM&A manual. Locations of the agreed water quality monitoring stations are listed in **Table 2.8** and as shown in [Figure 2.3](#).

Table 2.8: Water quality monitoring stations

Monitoring Stations	Easting	Northing
MP1	838 730.50	822 862.25
MP2	838 933.26	823 247.41
MP3	839 107.17	823 596.84
MP4	839 286.14	823 638.55
MP5	839 134.35	823 722.99
MP6	839 063.02	823 842.25

2.4.3 Monitoring Equipments

The Water Quality Monitoring Equipments and Analytical Methods applied to Water Quality Samples are given in **Table 2.9** and **Table 2.10** respectively. Details of which are discussed below.

Table 2.9: Water Quality Monitoring Equipments

Equipment	Model	Equipment /Serial Number
Dissolved oxygen, temperature & pH Measuring Meter	YSI Professional Plus	10D101566; 10D101565
Turbidimeter	Hach 2100Q	09120C000514
Global Positioning System (GPS)	Garmin eTrex Vista	ENO 007

Table 2.10: Analytical Methods applied to Water Quality Samples

Determinant, unit	Standard Method
Total Suspended Solids, mg/L	In house method based on APHA 2540D; ALS Method Code: EA-025
Biochemical Oxygen Demand (BOD), mg/L	In house method based on APHA 5210B; ALS Method Code: EP-030

All in-situ monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use.

Dissolved Oxygen (DO), temperature and pH measuring equipment

A portable, weatherproof multiparameter instrument YSI 556 MPS was used in the monitoring. It can be capable for measuring dissolved oxygen (DO), pH, and temperature simultaneously with the following limits:

- a dissolved oxygen level in the range of 0-50 mg/L and 0-500 % saturation;
- a temperature of -5 to 45 degree Celsius; and
- pH value of 0-14 with 0.1 as the base unit.

Turbidity Measurement Instrument

Portable and weatherproof turbidity meter (HACH model 2100P) was used during impact monitoring. It has a photoelectric sensor capable of measuring turbidity between 0-1000 NTU. Response of the sensor was checked with certified standard turbidity solutions before the start of measurement.

Global Positioning System

A hand-held GPS navigator (Garmin eTrex Vista) was used to identify the designated monitoring stations prior to water sampling.

Suspended Solids and BOD Measurements (Sample Containers and Storage)

Water samples for SS analysis were stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen), delivered to the laboratory, and analysed as soon as possible after collection. Analysis was carried out in a HOKLAS accredited laboratory.

Detection Limit

The limits of detection for the in-situ and laboratory measurements are shown in **Table 2.11**.

Table 2.11: Detection Limits for Water Quality Determinants

Determinant	Limit of Detection
Dissolved Oxygen	0.1 mg/L
Temperature	0.1 degree Celsius
pH	0.01 unit
Turbidity	0.1 NTU
Suspended Solids	1 mg/L
BOD	2 mg/L

2.4.4 Monitoring Methodology

In situ measurement

All pH meters, DO/ temperature meters had been checked and calibrated prior to use. Standard buffer solution of at least 2 pH levels (either pH 4 and pH 7 or pH 7 and pH 10) had been used for calibration of the instrument before and after use.

DO meters had been calibrated by a laboratory accredited under HOKLAS or any other international accreditation scheme, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring. Responses of sensors and electrodes had been checked with certified standard solutions before each use. Wet bulb calibrations for all DO meters had been carried out before measurement at each monitoring location. For the on site calibration of field equipment, BS 127:1993, "Guide to field and on-site test methods for the analysis of waters" had been observed.

Measurements shall be at 3 water depths, namely, 1m below water surface, mid-depth and 1m above stream bed/pond bed, except where the water depth less than 6m, the mid-depth station maybe omitted. Should the water depth be less than 3m, only the mid-depth station will be monitored.

Replicates in-situ measurements and samples collected from each independent monitoring event are required for all parameters to ensure a robust statistically interpretable dataset.

Water Samples Preparation and Analysis

For collection of water sampling within the water courses, a 500ml clean plastic beaker was used. After collection, the water samples were stored in high-density polythene bottles. The sample container was rinsed with a portion of the water sample. The water sample was then transferred to the container, labelled with a unique sample ID and sealed with a screw cap. The water samples were stored in a cool box maintained at 4°C. The water samples were then delivered to a local HOKLAS-accredited laboratory (ALS) on the same day for analysis.

The testing methods of testing parameters as recommended by EIA or required by EPD, with the QA/QC results are in accordance with the requirement of HOKLAS or international accredited scheme.

The calibration certificates for equipments used for in-situ monitoring of water quality are attached in [Appendix E](#).

2.5 Ecology

2.5.1 Monitoring Parameters, Frequency and Duration

Target species and certain other fauna will be monitored within the Project Area and Assessment Area during the wetland and residential construction phase. This will be important to ensure that any unexpected events or impacts either on- or off-site are quickly identified so that remedial action can be taken. The groups to be monitored and frequency of monitoring are shown in **Table 2.12**.

Table 2.12: Summary of Construction Phase Ecological Monitoring for the Wo Shang Wai WRA

Construction Phase Ecological Monitoring	
Birds	Weekly (including Assessment Area).
Dragonflies and Butterflies	Once per month during March and September to November, and twice per month during April to August.
Herpetofauna	Once per month during April to November.
Water Quality	After filling of WRA with water, monthly for <i>in situ</i> water quality and every six months (end of the wet season and end of the dry season) for laboratory testing.
Site Inspections	Weekly.

2.5.2 Monitoring Locations and Methodology

Ecological monitoring locations during construction phase are shown in [Figure 4.1](#) and the methodology for ecological monitoring is detailed in **Section 4**.

2.6 Landscape and Visual

2.6.1 Monitoring Parameters, Frequency and Duration

All measures undertaken by both the Contractor and the specialist Landscape Sub-Contractor during the construction phase and first year of the operational phase shall be audited by a Registered Landscape Architect, as a member of the ET, on a regular basis to ensure compliance with the intended aims of the measures. Site inspections should be undertaken at least once every two weeks throughout the construction period and once every two months during the operational phase.

The broad scope of audit is detailed below but should also be undertaken with reference to the more specific checklist provided in **Table 2.13** below. Operational phase auditing will be restricted to the last 12 months of the establishment works of the landscaping proposals and thus only the items below concerning this period are relevant to the operational phase.

- The extent of the agreed works area should be regularly checked during the construction phase. Any trespass by the Contractor outside the limit of the works, including any damage to existing trees and woodland shall be noted;
- The progress of the engineering works should be regularly reviewed on site to identify the earliest practical opportunities for the landscape works to be undertaken;
- All existing vegetation, streams and other features within the study area which are not directly affected by the works are retained and protected;
- The methods of protecting existing vegetation proposed by the Contractor are acceptable and enforced;
- Preparation, lifting transport and re-planting operations for any transplanted trees;
- The layout, design and construction of buildings conforms to requirements specified in the EIA report;
- All landscaping works are carried out in accordance with the EIA recommendations and with specifications;
- The planting of new trees, shrubs, groundcover, climbers, grasses and other plants, together with the replanting of any transplanted trees are carried out properly and within the right season;
- All necessary horticultural operations and replacement planting are undertaken throughout the Establishment Period to ensure the healthy establishment and growth of both transplanted trees and all newly establishment plants.

Table 2.13: Construction and Operation Phase Audit Checklist

Area of Works	Items to be Monitored
Works Area	Check the extent of the Works to ensure that the Works Area is not exceeded
Protection of all trees and woodland blocks to be retained	Identification and demarcation of trees / vegetation to be retained, erection of physical protection (e.g. fencing), monitoring against possible incursion, physical damage, fire, pollution, surface erosion, etc.
Streams	Ensure no run-off into existing streams
Clearance of existing vegetation	Identification and demarcation of trees / vegetation to be cleared, checking of extent of works to minimize damage, monitoring of adjacent areas against possible incursion, physical damage, fire, pollution, surface erosion, etc.
Transplanting of trees	Identification and demarcation of trees / vegetation to be transplanted, monitoring of extent of pruning / lifting works to minimize damage, timing of operations implementation of all stages of preparatory and translocation works, and maintenance of transplanted vegetation, etc.
Topsoil stripping	Ensuring existing topsoil is stripped and stored under recognized good practice and is hydroseeded and regularly turned to prevent anaerobic conditions
New buildings	Ensure that building finishes accord with mitigation proposals with regard to colour and albedo.
Boundaries	Ensuring hoarding are erected as required
Noise Barrier	Ensure noise barrier design accords with the mitigation proposals with regard to location, materials and finishes.
Night-time lighting	Ensuring night-time lighting is directional, hooded and shielded away from VSRs
Plant supply	Monitoring of operations relating to the supply of specialist plant material (including the collecting, germination and growth of plants from seed) to ensure that plants will be available in time to be used within the construction works.
Landscape and wetland treatments generally	Check that wetland, and hard / soft landscape designs conform to intent of mitigation measures and agreed designs
Soiling, planting, etc.	Monitoring of implementation and maintenance of soiling and planting works against possible incursion, physical damage, fire, pollution, surface erosion, etc.
Establishment Works	Monitoring of implementation of maintenance operation during Establishment Period

2.6.2 Monitoring Locations

The monitoring locations should check against the mitigation measures proposed under the approved Environmental Impact Assessment, which are summarised as follows:

Table 2.14: Proposed Construction Phase Mitigation Measures

ID No.	Landscape and Visual Mitigation Measure
CM1	The construction area and contractor's temporary works areas should be minimised to avoid impacts on adjacent landscape.
CM2	Screening of construction works by hoardings/noise barriers around Works area in visually unobtrusive colours, to screen Works.
CM3	Reduction of construction period to practical minimum.
CM4	Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where the soil material meets acceptable criteria and where practical. The Contract Specification shall include storage and reuse of topsoil as appropriate.
CM5	Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material (in earth tone).
CM6	Advance screen planting to noise barriers.
CM7	Control night-time lighting and glare by hooding all lights.
CM8	Ensure no run-off into streams adjacent to Project Area.
CM9	Protection of existing trees on boundary of project area shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas. (Tree protection measures will be detailed at S16 and Tree Removal Application stage).
CM10	Trees unavoidably affected by the works shall be transplanted where practical. Trees should be transplanted straight to their destinations and not held in a nursery. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, if applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme.

Table 2.15: Proposed Operation Phase Mitigation Measures

ID No.	Landscape Mitigation Measure
OM1	Compensatory Tree Planting for all felled trees shall be provided to the satisfaction of relevant Government departments. Required numbers and locations of compensatory trees shall be determined and agreed separately with Government during the Tree Felling Application process under ETWBTC 3/2006.
OM2	A continuous belt of screen planting along southern perimeter of project area with fast growing tree species. At least 450 trees capable of reaching a height > 10m within 10 years should be planted. Planting of the belt of trees shall be carried out as advance works ahead of other site formation and building works.
OM3	Maximise soft landscape and amenity water bodies in residential areas of the development. Approximately 750 of trees (of Heavy Standard size) should be planted. Where space permits, roadside berms should be created. Street trees should be of species that reach a mature height of no less than 15m.
OM4	Maximise freshwater habitat wetland creation consistent with achieving other parameters. Min 4.74 ha to be provided. Wetlands must have natural edge profiles with >1m wide emergent zone. No access to the wetland by residents and all wetlands must be screened from residential development by a continuous tree screen at interface with residential development or earth mounding such that disturbance is minimised. Implementation of the wetland shall be carried out as advance works.
OM5	Use appropriate (visually unobtrusive and non-reflective) building materials and colours in built structures.
OM6	During detailed design, refine building layout to create a min 10m wide gap between

ID No.	Landscape Mitigation Measure
	buildings north of Wo Shang Wai pond and also two min 10m wide gaps in the row of buildings adjacent to Royal Palms.
OM7	Streetscape elements (e.g. paving, signage, street furniture, lighting etc.) shall be sensitively designed in a manner that responds to the local context, and minimises potential negative landscape and visual impacts. Lighting units should be directional and minimise unnecessary light spill.

3. Monitoring Results

3.1 Impact Monitoring Schedule

Impact monitoring for air quality (dust), noise and water quality due to the construction work were undertaken during the reporting month in compliance with the EM&A manual in the reporting period. Regular site inspections were carried out on 7, 14, 21 and 27 October 2011 in the reporting month to assess the compliance with environmental requirements.

3.2 Result of Impact Monitoring

3.2.1 Air Quality Monitoring

3.2.1.1 1-hr TSP

Results of 1-hour TSP at the four monitoring locations are summarised in **Table 3.1**. Graphical plots of the monitoring results are shown in [Appendix F](#).

Table 3.1: Summary of 1-hour TSP monitoring results

Monitoring Date	Start Time	1-hr TSP ($\mu\text{g}/\text{m}^3$)			Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
		1 st Result	2 nd Result	3 rd Result			
ASR1							
04-Oct-11	08:58	68	68	64	64 - 180	378	500
10-Oct-11	13:03	89	88	85			
15-Oct-11	09:02	120	119	115			
21-Oct-11	08:46	179	180	176			
27-Oct-11	09:00	125	122	122			
ASR2A							
04-Oct-11	13:16	66	67	66	66 - 176	357	500
10-Oct-11	09:16	79	80	83			
15-Oct-11	13:17	115	115	116			
21-Oct-11	12:52	172	176	175			
27-Oct-11	12:47	117	115	119			
ASR3							
04-Oct-11	12:59	67	65	65	65 - 178	358	500
10-Oct-11	09:02	75	78	72			
15-Oct-11	12:49	118	117	117			
21-Oct-11	12:38	178	177	177			
27-Oct-11	12:39	118	120	120			
ASR4							
04-Oct-11	08:48	72	70	70	70 - 183	372	500
10-Oct-11	12:53	88	88	83			
15-Oct-11	08:50	123	122	120			
21-Oct-11	08:35	182	183	180			
27-Oct-11	08:53	132	133	136			

3.2.1.2 24-hr TSP

Results of 24-hour TSP at the four monitoring locations are summarised in **Table 3.2**. Graphical plots of the monitoring results are shown in [Appendix F](#).

Table 3.2: Summary of 24-hour TSP monitoring results

Monitoring Date	Monitoring Results ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
ASR1				
04-Oct-11	84	70 - 96	226	260
10-Oct-11	73			
15-Oct-11	76			
21-Oct-11	96			
27-Oct-11	70			
ASR2A				
04-Oct-11	88	70 - 88	213	260
10-Oct-11	74			
15-Oct-11	70			
21-Oct-11	71			
27-Oct-11	74			
ASR3				
04-Oct-11	90	63 - 97	205	260
10-Oct-11	73			
15-Oct-11	97			
21-Oct-11	63			
27-Oct-11	90			
ASR4				
04-Oct-11	77	72 - 87	237	260
10-Oct-11	72			
15-Oct-11	81			
21-Oct-11	87			
27-Oct-11	87			

No exceedance of 1-hour and 24-hour TSP (Action or Limit Level) was recorded in the reporting period.

The weather conditions in the reporting period are provided in [Appendix G](#).

3.2.2 Construction Noise Monitoring

The construction noise monitoring results are summarized in **Table 3.3**. Graphical plots of the monitoring data are shown in [Appendix F](#).

Table 3.3: Summary of Construction noise monitoring results

Monitoring Date	Start Time	Mean & Range of Noise Levels, dB(A)			Limit Level for L_{eq} (dB)
		L_{eq}	L_{10}	L_{90}	
NSR1					
04-Oct-11	13:25	58	60	46	> 75
10-Oct-11	09:23	58	58	51	
21-Oct-11	13:06	58	60	54	
27-Oct-11	13:00	54	57	44	
NSR3					
04-Oct-11	14:00	57	58	50	> 75
10-Oct-11	09:59	59	60	46	
21-Oct-11	13:56	57	59	49	

Monitoring Date	Start Time	Mean & Range of Noise Levels, dB(A)			Limit Level for L _{eq} (dB)
		L _{eq}	L ₁₀	L ₉₀	
27-Oct-11	13:41	50	51	47	
NSR5					
04-Oct-11	08:55	59	60	55	
10-Oct-11	12:59	59	61	54	
21-Oct-11	08:40	59	60	57	
27-Oct-11	08:57	57	58	54	
NSR7					
04-Oct-11	09:40	65	67	62	
10-Oct-11	13:48	64	65	58	
21-Oct-11	09:25	64	66	60	
27-Oct-11	09:35	63	66	60	

No exceedance (Action/Limit Level) of construction noise was recorded in the reporting period.

3.2.3 Water Quality Monitoring

The water quality monitoring results are summarized in **Table 3.4**. Graphical plots of the monitoring data are shown in [Appendix F](#).

Table 3.4: Summary of Water quality monitoring results

Monitoring Date	Temp (°C)	pH	Dissolved Oxygen (mg/L)	DOS (%)	Turbidity (NT)	BOD (mg/L)	Suspended Solids (mg/L)
MP1							
04/10/2011	24.7	7.8	4.8	59.6	11.1	6.5	12.5
06/10/2011	25.6	8.0	5.0	61.2	12.8	7	18
08/10/2011	26.4	7.5	3.6	45.9	18.0	2	12.5
10/10/2011	26.8	7.7	4.1	53.1	39.0	2.5	35.5
12/10/2011	25.6	7.7	4.7	58.1	27.5	3	18.5
14/10/2011	26.0	7.3	3.5	43.6	59.3	2	44.5
17/10/2011	27.4	7.6	4.8	60.4	52.2	3.5	45.5
19/10/2011	26.1	7.4	4.5	56.6	24.4	2	19
21/10/2011	26.2	7.5	5.2	65.3	8.8	3	7.5
24/10/2011	27.5	7.6	4.9	62.4	23.5	2	15
26/10/2011	24.2	7.4	3.4	43.1	48.9	4	48
28/10/2011	25.0	7.2	4.1	52.7	76.2	5.5	71.5
31/10/2011	25.3	7.8	4.1	50.9	20.6	3	13
Action Level	-	<5.5 or >7.5	<1.23	-	>173	-	>231
Limit Level	-	<4.0 or >8.0	<1.17	-	>177	-	>299
MP2							
04/10/2011	25.1	7.7	4.5	56.4	9.8	2	12
06/10/2011	25.8	7.9	5.2	64.9	14.5	2.5	14
08/10/2011	26.7	7.4	3.5	44.2	18.9	3	13.5
10/10/2011	26.8	7.5	3.9	50.7	24.2	3	23
12/10/2011	25.9	7.7	5.9	72.4	25.5	2	18.5
14/10/2011	26.0	7.3	3.4	41.8	61.1	3	46.5
17/10/2011	27.1	7.8	6.1	76.1	32.5	4	25.5
19/10/2011	26.0	7.5	5.0	61.9	16.4	2	14
21/10/2011	26.3	7.5	5.6	69.9	8.3	3	6.5

Monitoring Date	Temp (°C)	pH	Dissolved Oxygen (mg/L)	DOS (%)	Turbidity (NT)	BOD (mg/L)	Suspended Solids (mg/L)
24/10/2011	27.2	7.5	5.3	67.4	19.9	2	13
26/10/2011	24.1	7.4	2.9	35.6	41.9	3	33.5
28/10/2011	25.7	7.5	4.3	54.0	87.1	5	64
31/10/2011	25.3	7.7	4.1	51.8	19.9	3	14
Action Level	-	<5.5 or >7.5	<1.04	-	>132	-	>170
Limit Level	-	<4.0 or >8.0	<0.89	-	>163	-	>209
MP3							
04/10/2011	22.6	8.2	6.8	79.4	22.8	3	14.5
06/10/2011	23.1	8.0	6.4	75.5	28.0	4.5	25.5
08/10/2011	24.9	7.6	6.0	73.6	20.8	4	13.5
10/10/2011	25.9	7.5	4.9	59.8	97.2	15.5	112
12/10/2011	25.2	7.2	5.0	60.6	29.7	4	18.5
14/10/2011	25.6	7.6	5.0	61.5	29.3	4	23
17/10/2011	26.2	7.2	5.7	71.3	27.6	2	15.5
19/10/2011	25.5	7.1	6.0	73.5	31.9	2	18
21/10/2011	25.6	7.1	5.5	67.7	25.0	3	15.5
24/10/2011	28.4	7.2	6.1	78.8	21.0	2	9
26/10/2011	24.5	7.5	5.6	66.9	25.0	3	16.5
28/10/2011	25.4	7.4	5.7	69.9	17.4	3	11.5
31/10/2011	24.8	8.1	2.7	31.3	54.1	8	50
Action Level	-	<5.5 or >7.5	<6.85	-	>64	-	>65
Limit Level	-	<4.0 or >8.0	<6.65	-	>67	-	>66
MP4							
04/10/2011	21.8	7.6	5.2	61.8	48.3	3.5	35
06/10/2011	23.3	7.8	3.9	47.1	39.9	5	25.5
08/10/2011	25.9	7.3	2.9	37.1	24.7	3.5	14.5
10/10/2011	26.8	7.4	4.7	60.5	24.4	4	17
12/10/2011	25.8	7.2	3.5	42.8	36.5	4	25
14/10/2011	25.5	7.1	3.1	39.4	43.5	3	32.5
17/10/2011	26.5	7.3	5.6	70.2	59.5	3	46
19/10/2011	25.3	7.3	4.2	51.2	47.7	3.5	32
21/10/2011	26.3	7.3	4.4	55.0	37.8	4	26
24/10/2011	28.4	7.4	7.9	103.1	47.6	3.5	34.5
26/10/2011	23.0	7.3	3.7	43.4	30.7	3	22.5
28/10/2011	25.5	7.3	8.3	102.6	35.8	3	28
31/10/2011	24.1	8.1	5.5	67.3	47.6	9.5	44
Action Level	-	<5.5 or >7.5	<3.91	-	>60	-	>50
Limit Level	-	<4.0 or >8.0	<3.82	-	>64	-	>53
MP5							
04/10/2011	21.3	7.7	4.6	52.0	35.1	4	19.5
06/10/2011	23.2	7.5	3.5	42.7	46.7	2	36
08/10/2011	26.3	7.3	4.4	55.8	35.1	2	23.5
10/10/2011	27.2	7.5	5.2	64.1	28.1	4.5	23
12/10/2011	25.1	7.2	4.7	57.0	58.9	3	38
14/10/2011	25.6	7.2	3.2	40.5	55.7	3	41.5
17/10/2011	26.2	7.3	10.0	124.9	94.2	11	77
19/10/2011	25.0	7.0	3.9	48.0	57.1	4	46
21/10/2011	25.4	7.1	4.4	54.0	44.8	4	37
24/10/2011	28.6	7.2	6.7	87.8	27.6	3	20

Monitoring Date	Temp (°C)	pH	Dissolved Oxygen (mg/L)	DOS (%)	Turbidity (NT)	BOD (mg/L)	Suspended Solids (mg/L)
26/10/2011	22.9	7.1	3.7	43.9	43.9	4	38
28/10/2011	24.8	7.2	8.3	101.0	45.6	4.5	36.5
31/10/2011	24.7	7.7	4.7	56.8	43.5	3.5	33.5
Action Level	-	<5.5 or >7.5	<4.13	-	>81	-	>66
Limit Level	-	<4.0 or >8.0	<3.87	-	>84	-	>69
MP6							
04/10/2011	21.0	7.7	4.4	47.4	35.7	3	20.5
06/10/2011	22.9	7.7	3.7	47.1	44.4	2	34
08/10/2011	25.8	7.2	4.2	52.9	37.9	2	26.5
10/10/2011	25.9	7.7	5.0	62.1	25.5	4.5	22
12/10/2011	24.9	8.8	6.6	80.2	255.5	2	155
14/10/2011	24.9	7.4	3.4	42.5	58.1	3	43.5
17/10/2011	25.2	7.8	10.1	123.2	81.0	15	65.5
19/10/2011	24.8	7.2	4.7	56.6	45.4	3	31.5
21/10/2011	24.8	7.4	5.2	63.6	27.7	2.5	21
24/10/2011	27.5	7.4	7.8	100.1	39.2	3	26.5
26/10/2011	22.6	7.4	4.4	51.2	42.7	9	35.5
28/10/2011	24.4	7.3	7.9	94.7	57.6	5.5	44
31/10/2011	24.7	7.6	4.5	54.3	49.9	4	41.5
Action Level	-	<5.5 or >7.5	<4.61	-	>94	-	>75
Limit Level	-	<4.0 or >8.0	<4.52	-	>96	-	>75

Notes:

Values **Bold** indicate Action Level exceedance.

Values **Underlined and Bold** indicate Limit Level exceedance.

Exceedances of pH, DO, turbidity and SS were observed at MP1 to MP6 in October 2011. Exceedances of pH were often observed at MP1 to MP3 and a few times at MP4 to MP6. DO were exceeded frequently at MP3 and exceeded several times at MP4 to MP6. Turbidity and/or SS exceedances were recorded on one monitoring date at MP3, MP5 and MP6 respectively.

The Event and Action Plan in [Appendix D](#) was followed under these cases of exceedances.

From investigation, construction activities during the period of exceedance included mainly band drain installation, trial embankment for ground improvement and site formation (filling). It was observed that the Contractor has implemented water quality mitigation measures as recommended in the EIA report, including the provision of temporary drainage facility and associated treatment facility. Sand bags are in place in the temporary drainage channel to enhance the desilting efficiency. The Contractor further enhanced the water quality mitigation measures by erecting several segments of rock bunds at the discharge outlet to avoid site runoff draining directly to the northern ditches.

Exceedances of action or limit level of pH were observed at MP1 and MP2 frequently within the monitoring days and pH ranged from 7.2 to 8.0. From investigation, there was no direct discharge from the site to the ditch where MP1 and MP2 are located, so the exceedances were not considered to be related to the construction activities.

The action and limit level of pH and limit level of DO exceedances were frequently observed at MP3. As understood, the fish pond near the site (represented by MP3) was being separated from the construction site by the WRA since November 2010, so the exceedances were not considered to be related to the

construction activities. The exceedances of pH, DO, turbidity and SS maybe due to external factors such as pond fish culture activities which were out of the control of the project.

Exceedances of action level of pH were observed at MP4, MP5 and MP6 on a few monitoring days. Action and limit levels of DO were exceeded several times at all these monitoring stations. Limit level exceedances of turbidity and SS were observed at MP5 on 17 Oct 2011 and at MP6 on 12 Oct 2011.

From record of the Hong Kong Observatory, heavy local rainfall was recorded on 12 Oct 2011. The local heavy rainfall could have caused large amount of surface runoff from all sources in the vicinity of the ditch and have significantly increased the turbidity and SS inside the ditch water.

Another occasion of limit level exceedance of turbidity and SS was recorded at MP5 on 17 Oct 2011. The high sediment content in the water was potentially caused by the fish movement.

The exceedances of pH during the period could be due to natural variation as the values were in similar range compared to other stations where exceedances were also observed. Starting from early May 2011, the DO measured at the ditch has fallen significantly due to microbe growth (including algae). The ditch continued to be affected by this factor (respiration and degradation of microbes which consumed oxygen). However, on sunny days, photosynthesis of the algae sometimes increases the DO sharply in the water. As algae grows further and dies, it causes increase in suspended solid and a decrease in DO in the water.

Since the site discharge was controlled and treated by the AquaSed system during the period, the exceedance was not considered to be related to the project.

4. Ecological Monitoring

4.1 Introduction

This report documents surveys conducted in the Survey Area between 1 October and 31 October 2011. The Wetland Restoration Area (hereafter WRA) is also surveyed as the area is accessible and site formation works for WRA has been completed. The updated survey transect is provided in [Figure 4.1](#). Dates and ecological surveys conducted during this period are summarised in [Appendix H](#).

4.2 Monitoring of Birds

Monitoring was undertaken following the survey methodology in the EM&A Manual. A transect was followed in the bird surveys (see [Figure 4.1](#)). All bird species of conservation importance and/or wetland dependent were identified and enumerated. Flying birds were not recorded unless they were foraging and/or associated with the habitat (such as swifts). Further, notable bird observations during other surveys were also recorded.

Bird surveys were conducted on a weekly basis. 33 bird species of conservation importance and/or wetland-dependence were recorded in the Survey Area (excluding the WRA). Within the WRA, 29 bird species of conservation importance and/or wetland-dependent species were recorded. A summary of survey data is provided in [Appendix I](#).

The WRA continues to attract a number of species of conservation importance, including one Purple Heron *Ardea purpurea*, a species of “Regional Concern” and a first record for the site, was recorded this month. Pheasant-tailed Jacana *Hydrophasianus chirurgus*, a species listed as Local Concern (Fellowes et al. 2002), was recorded twice outside of routine bird surveys.

4.3 Monitoring of Herpetofauna

Two day time herpetofauna surveys were conducted in the period. One Chinese Soft-shelled Turtle *Pelodiscus sinensis* was recorded within the WRA outside of routine herpetofauna surveys. This species is listed as vulnerable in both the IUCN red list and the China Red Data Book and as of “Global Concern” in Fellowes et al. (2002). This is the first record for the site of this species. In addition, a Checkered Keelback *Xenochrophis piscator* was also recorded outside of routine surveys.



Photo 1: Chinese Soft-shelled Turtle photographed in the WRA on 24th October 2011

4.4 Monitoring of Dragonfly and Butterfly

One dragonfly and butterfly survey was conducted in October. One dragonfly species and three butterfly species were recorded in the Survey Area (excluding the WRA). A higher diversity of dragonflies was recorded at the WRA, with two dragonfly and two butterfly species. One dragonfly species of conservation importance (i.e. Coastal Glider *Macrodiplex cora*) was recorded in the WRA. A summary of the survey findings is provided in [Appendix J](#).

4.5 Monitoring of Mammal

Monitoring of mammals was conducted concurrently with other surveys. One Asian Mongoose *Herpestes javanicus* was found within the Survey Area.

4.6 Monitoring of Water Quality

Water quality monitoring is required to stocking the cells with fish. There are no water quality issues in the reporting period. Monitoring date and data are presented in [Appendix K](#).

4.7 Management Activities

4.7.1 Vegetation Management

Vegetation management activities undertaken at the site involved primarily watering of plants, reviewing and adjusting treesupports, some replacement planting, patching up hydroseeding where germination was considered unsatisfactory and treating unhealthy/heavily infested *Litsea* and *Sapium* plants with pesticide or fungicide.

4.7.2 Wildlife Management

No management actions were required during the reporting period.

4.8 Summary

Ecological monitoring during October 2011 was carried out according to the survey methodology and frequency outlined in the EM&A Manual.

29 bird species of conservation importance and/or wetland dependence, 2 dragonfly species, 2 butterfly species and 1 reptile species were recorded in the WRA.

33 bird species of conservation importance and/or wetland dependence, 1 dragonfly species, 3 butterfly species and 1 mammal species were recorded in the Survey Area (excluding WRA). Survey findings indicate that the ponds within the Survey Area supported numbers and diversity of wetland-dependent birds and other species of conservation importance typical of fish pond areas in the late wet season.

5. Landscape and Visual

5.1 Site Inspection

The EM&A programme for Landscape and Visual impact due to the construction commenced in May 2010 and was continued during the reporting period. Site inspections on Landscape and Visual impact were carried out on 10 and 27 October 2011 to confirm the implementation of mitigation measures at construction stage.

5.2 Construction Phase Audit Summary

The audit was undertaken with references to the specific checklists provided in **Tables 2.13 – 2.15** and audit results are summarized as below:

Table 5.1: Construction and Operation Phase Audit Summary

Area of Works	Items to be Monitored
Works Area	<p>The boundaries of the works area have been established on site in accordance with the contract documents and approved plans (EP), and the limit of current heavy construction activity is now confined to within the site hoardings (North side of the site / access road) and the noise barriers (other sides of the site). Minor works such as horticultural maintenance of the planting and transplanted trees, and boundary fence repair was proceeding along the Royal Palms - Palm Springs boundary.</p> <p>No construction works were observed to have exceeded the site boundaries.</p> <p>Moreover, no construction was carried out at the wetland restoration area after 15 November 2010.</p>
Protection of all trees and woodland blocks to be retained	<p>Trees retained within the site along the northeast boundary, beside wetland restoration area, have been identified and protected by temporary protective fencing.</p>
Streams	<p>The works site is encircled by a berm / perimeter channel to intercept surface water and prevent it from washing off into any of the neighboring sites. Surface water is collected within the site in a temporary drainage channel. Gravels beds and barriers have been installed to filter site runoff, sedimentation tanks provided to enable primary treatment before discharge to mains drains.</p>
Clearance of existing vegetation	<p>Site clearance was completed prior to the commencement of construction.</p>
Transplanting of trees	<p>Tree transplanting has been completed, with the trees relocated to various points within the planting strip along the southern boundary of the site, outside the noise barrier. The trees continue to re-establish well.</p>
Topsoil stripping	<p>Suitable pond bund and soil material which had been excavated and stockpiled from the original site, has now largely been re-used within the landscape works</p> <p>Dust suppression measures are active along all internal site access tracks.</p>
New buildings	<p>No new permanent buildings have yet been constructed on site</p>

Boundaries	Hoardings have been erected along most of the boundaries of the site. Installation of new screen fence between the future residential sites and the constructed wetland restoration areas is complete. Fence has been painted green to match with the surrounding vegetated environment.
Noise Barrier	Noise barriers have been installed along the southern and western boundaries of the site in accordance with the contract requirements. Their design complies with the mitigation requirements, with upper 6 to 7m portion of the barrier being made from a translucent material with green tinted (to match with the environment). Supporting GMS structure, likewise, has been painted green.
Night-time lighting	No night-time works were reported to have been carried out during the monitoring period
Landscape and wetland treatments	<p>Continuous belt of screen planting along the southern and western boundaries of the site has been completed. The formation, soiling and water control structures of the wetland restoration area has been completed.</p> <p>The wetland areas are being established, with the ponds partially filled with rain water. Planting of areas around the WRA cells is almost complete.</p> <p>No construction was carried out at the wetland restoration area after 15 November 2010.</p>
Soiling	The soiling for the advance planting strip has been completed. The soil placement and grading for each of the wetland restoration areas has been completed.
Plant supply	<p>The plant material used in the Advance Planting Strip along the southern and western boundaries of the site are all common species and came from commercial sources.</p> <p>Transplanted reeds (<i>Phragmites australis</i>) at the wetland habitat are come from the temporary holding nursery onsite.</p>
Planting	<p>The total numbers of trees that will reach a minimum of 10m in the advance planting strip meet the contract requirements. The tree species are all from the approved list. This planting should achieve the required screening effect within the permitted time period.</p> <p>Trees that were identified as dead in previous month have been replaced, but additionally one further tree was recorded as having died (T61), eleven (T60, T109, T223, T277, T386, T388, T394, T400, T445, T469, T479) have severe bark damage and one has fallen over (T180). All need replacement.</p> <p>Whip size trees, shrubs, and herb species have been planted on the slopes along the wetland. Some specimens appear to be in poor condition. Work is required to rectify or improve the situation.</p>

<p>Establishment Works</p>	<p>The advance planting, the compensatory planting and the transplanted trees are generally being maintained by the landscape sub-contractor in accordance with the specification to ensure that the contract requirements are met.</p> <p>Some 65 taller trees (especially <i>Eucalyptus sp.</i>) that have been partially blown over and others that are growing into the noise barrier structure need to be corrected, (T23, T24, T31, T39, T49, T93, T111, T115, T124, T130, T150, T153, T159, T T163, T165, T169, T173, T T175, T182, T236, T240, T243, T246, T247, T249, T261, T271, T274, T278, T288, T297, T303, T305, T321, T328, T338, T340, T341, T342, T345, T348, T354, T357, T360, T373, T378, T383, T391, T398, T402, T406, T414, T415, T417, T424, T425, T427, T431, T434, T436, T439, T455, T462, T467, T481). Precautions should be taken to prevent damage to the trees by the structure.</p> <p>A number of trees (T1, T16, T29, T32, T59, T251, T265, T367, T413, T420, T453) which are leaning due to the recent typhoons, need to be set upright and supported.</p> <p>Cables around the transplanted tree trunks are no longer effective. As the typhoon season is passed these should now be removed to allow full establishment of the trees.</p> <p>Fungal growths and infestation of insects were found on a number of trees, which have previously suffered trunk bark damage (T40, T54, T223, T277, T291, T394, T400, T445) These need to be treated.</p> <p>Low coverage of some areas of shrubs need to be rectified with further infill shrubs planting. Minor areas of shrubs have been cleared and these need to be replaced.</p> <p>Extensive growth of weeds and invasive climbers in the space behind screen noise barrier and within the shrub planting areas is inhibiting growth of the advance planting, and urgently clearance is recommended.</p> <p>Conditions of some stands of <i>Phragmites australis</i> reeds (translocated from the original site) which were set away from the water edge of the ponds have been improved somewhat with increased water level.</p> <p>Hydroseeded grass has been established along the access path around the WRA cells.</p>
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6. Environmental Site Inspection and Audit

6.1 Site Inspection

The ET had carried out construction phase weekly site inspections on 7, 14, 21 and 27 October 2011. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary. The key observations from site inspections and associated recommendations are summarized in **Table 6.1**.

Table 6.1: Summary of Site Inspections and Recommendations

Key Observations	ET Recommendation	Contractor's Responses / Action(s) Undertaken	Close-out (Date)
Dust at works area and haul roads	To further increase the frequency of watering spraying	Agreed and action taken	27 Oct 2011
Some tarpaulin sheet weathered out at the trial embankment	To replace the tarpaulin for better dust suppression	Agreed and action taken	14 Oct 2011
General refuse within site area	To maintain good housekeeping	Agreed and action taken	21 Oct 2011
Broken noise barrier at southern boundary	To replace a new noise barrier	Agreed and action to be taken	On-going
Dust at mixing of soil area	To further increase the frequency of watering spraying and cover with tarpaulin	Agreed and action to be taken	On-going
Mud settled in the drainage channel	To clear the mud	Agreed and action to be taken	On-going
Chemical drip tray of Aqua-sed system is broken	To replace a new drip tray	Agreed and action to be taken	On-going

6.2 Advice on the Solid and Liquid Waste Management Status

The Contractor has been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting was carried out on site. A sufficient number of receptacles were available for general refuse collection.

As advised by the Contractor, 8765.6 tonnes of C&D material were generated on site during the period. No metals was generated and collected by registered recycling collector. No paper cardboard packing and plastic were generated on site and collected by registered recycling collector. No chemical waste was generated and collected by licensed chemical waste collector. 7.1 tonnes of other types of wastes (e.g. general refuse) was generated on site and disposed of at public landfill facility.

The Contractor is advised to maintain on site waste sorting and recording system and maximize reuse/recycling of C&D wastes.

6.3 Status of Environmental Licenses and Permits

The environmental permits, licenses, and/or notifications on environmental protection for this Project which were valid during the period is summarised in **Table 6.2**.

Table 6.2: Status of Environmental Submissions, Licenses and Permits

Statutory Reference	Description	Permit /Reference No.	Status
EIAO	Environmental Permit	EP-311/2008B	Valid
APCO	Notification of Construction Work under APCO	316688 (27 Apr 2010)	Valid
WPCO	Discharge License	WT00007442-2010 (2 Nov 2010)	Valid
WDO	Registration as Chemical Waste Producer	WPN0000-542-H3083-04	Valid
WDO	Bill Account for disposal	700945423	Valid

Legend: EIAO – Environmental Impact Assessment Ordinance
APCO – Air Pollution Control Ordinance
WPCO – Water Pollution Control Ordinance
WDO – Waste Disposal Ordinance

6.4 Recommended Mitigation Measures

The EM&A programme followed the recommended mitigation measures in the EM&A manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in [Appendix M](#). In particular, the following mitigation measures were brought to attention during the site audits:

Air Quality

- All stockpiles should be covered by tarpaulin or kept wet by water spraying;
- All vehicles should be washed to remove any dusty materials before leaving the construction sites;
- the portion of road leading the construction site that is within 30m of a designated vehicle entrance or exit should be kept clear of dusty materials;
- During the dry season, sufficient water spraying should be provided at haul road to reduce dust emission; and
- Ensure proper functioning of the wheel wash facility.

Noise

- Mobile plant should be sited as far away from NSRs as possible;
- Plant known to emit noise strongly in one direction should be orientated to direct noise away from the NSRs; and
- The construction activities should be better scheduled to reduce noise nuisance.

Water Quality

- Water accumulated in the site (including water inside drip trays) should be cleared frequently;
- Ensure proper functioning of the wastewater treatment facility; and
- Silt and debris should be removed from the temporary drainage channel regularly.

Waste management

- Reuse the excavated materials as far as practical to reduce the amount of waste disposal;
- Ensure drip trays are provided for chemical containers to prevent leakage or soil contamination;
- All plants and vehicles should be properly maintained to prevent oil leakage; and
- Oil stains on soil should be cleared by disposal of contaminated soil.

7. Report on Non-compliance, Complaints, Notifications of Summons and Successful Prosecutions

7.1 Record on Non-compliance of Action and Limit Levels

There is no breach of Action or Limit Levels for Air Quality and Noise monitoring in the reporting month.

Exceedances of pH, DO, turbidity and SS were observed at MP1 to MP6 in October 2011. Exceedances of pH were often observed at MP1 to MP3 and a few times at MP4 to MP6. DO were exceeded frequently at MP3 and exceeded several times at MP4 to MP6. Turbidity and/or SS exceedances were recorded on one monitoring date at MP3, MP5 and MP6 respectively.

Table 7.1: Summary of exceedances in Water Quality

Monitoring Date	pH	Dissolved Oxygen (mg/L)	Turbidity (NT)	Suspended Solids (mg/L)
MP1				
04/10/2011	24.7	7.8	4.8	11.1
06/10/2011	25.6	8.0	5.0	12.8
10/10/2011	26.8	7.7	4.1	39.0
12/10/2011	25.6	7.7	4.7	27.5
17/10/2011	27.4	7.6	4.8	52.2
24/10/2011	27.5	7.6	4.9	23.5
31/10/2011	25.3	7.8	4.1	20.6
Action Level	<5.5 or >7.5	<1.23	>173	>231
Limit Level	<4.0 or >8.0	<1.17	>177	>299
MP2				
04/10/2011	25.1	7.7	4.5	9.8
06/10/2011	25.8	7.9	5.2	14.5
12/10/2011	25.9	7.7	5.9	25.5
17/10/2011	27.1	7.8	6.1	32.5
31/10/2011	25.3	7.7	4.1	19.9
Action Level	<5.5 or >7.5	<1.04	>132	>170
Limit Level	<4.0 or >8.0	<0.89	>163	>209
MP3				
04/10/2011	22.6	8.2	6.8	22.8
06/10/2011	23.1	8.0	6.4	28.0
08/10/2011	24.9	7.6	6.0	20.8
10/10/2011	25.9	7.5	4.9	97.2
12/10/2011	25.2	7.2	5.0	29.7
14/10/2011	25.6	7.6	5.0	29.3
17/10/2011	26.2	7.2	5.7	27.6
19/10/2011	25.5	7.1	6.0	31.9
21/10/2011	25.6	7.1	5.5	25.0
24/10/2011	28.4	7.2	6.1	21.0
26/10/2011	24.5	7.5	5.6	25.0
28/10/2011	25.4	7.4	5.7	17.4
31/10/2011	24.8	8.1	2.7	54.1
Action Level	<5.5 or >7.5	<6.85	>64	>65

Monitoring Date	pH	Dissolved Oxygen (mg/L)	Turbidity (NT)	Suspended Solids (mg/L)
Limit Level	<4.0 or >8.0	<6.65	>67	>66
MP4				
04/10/2011	21.8	7.6	5.2	48.3
06/10/2011	23.3	7.8	3.9	39.9
08/10/2011	25.9	7.3	<u>2.9</u>	24.7
12/10/2011	25.8	7.2	<u>3.5</u>	36.5
14/10/2011	25.5	7.1	<u>3.1</u>	43.5
26/10/2011	23.0	7.3	3.7	30.7
31/10/2011	24.1	8.1	5.5	47.6
Limit Level	<4.0 or >8.0	<3.82	>64	>53
MP5				
04/10/2011	21.3	7.7	4.6	35.1
06/10/2011	23.2	7.5	3.5	46.7
14/10/2011	25.6	7.2	<u>3.2</u>	55.7
17/10/2011	26.2	7.3	10.0	94.2
19/10/2011	25.0	7.0	3.9	57.1
26/10/2011	22.9	7.1	3.7	43.9
31/10/2011	24.7	7.7	4.7	43.5
Action Level	<5.5 or >7.5	<4.13	>81	>66
Limit Level	<4.0 or >8.0	<3.87	>84	>69
MP6				
04/10/2011	21.0	7.7	4.4	35.7
06/10/2011	22.9	7.7	3.7	44.4
08/10/2011	25.8	7.2	4.2	37.9
10/10/2011	25.9	7.7	5.0	25.5
12/10/2011	24.9	8.8	6.6	255.5
14/10/2011	24.9	7.4	3.4	58.1
17/10/2011	25.2	7.8	10.1	81.0
26/10/2011	22.6	7.4	4.4	42.7
31/10/2011	24.7	7.6	4.5	49.9
Action Level	<5.5 or >7.5	<4.61	>94	>75
Limit Level	<4.0 or >8.0	<4.52	>96	>75

Notes:

Values **Bold** indicate Action Level exceedance.

Values **Underlined and Bold** indicate Limit Level exceedance.

7.2 Record on Environmental Complaints received

No environmental complaint was received the reporting month.

7.3 Record on Notifications of Summons and Successful Prosecution

No notifications of summons or successful prosecution were received the reporting month.

7.4 Review of reasons for and implications of non-compliance, complaints, summons and prosecutions

Investigations have been carried out to identify the causes of exceedance.

From investigation, construction activities during the period of exceedance included mainly band drain installation, trial embankment and site formation (filling). It was observed that the Contractor has implemented water quality mitigation measures as recommended in the EIA report, including the provision of temporary drainage facility and associated treatment facility. Sand bags are in place in the temporary drainage channel to enhance the desilting efficiency. The Contractor further enhanced the water quality mitigation measures by erecting several segments of rock bunds at the discharge outlet to avoid site runoff draining directly to the northern ditches.

With external factors affect the adjacent environments, such as natural variations, pond fish culture activities, heavy rainfall, microbe growth (including algae) and water plant clearing, the exceedances were considered not due to construction works.

7.5 Follow-up actions taken

As non-compliances have been recorded, the Event and Action Plan has been followed. Although it is considered that the exceedances were not related to the Project, the Contractor was reminded to implement the water quality mitigation measures in accordance with the recommendation stated in Section 5.6.1 – 5.6.4 of the EIA Report as far as practicable and regular spot check would be conducted on the nearby discharge by Contractor and inform ET for investigation.

To cater for the site runoff in wet season, the Contractor has further enhanced the water quality mitigation measures by erecting several segments of rock bunds at the discharge outlet to avoid site runoff draining directly to the northern ditches.

7.6 Cumulative statistics for complaints, notifications of summons and successful prosecutions

Cumulative statistics for complaints, notifications of summons and successful prosecutions for the Project account for period starting from the date of commencement of construction (i.e. 12 May 2010) to the end of the reporting month and are summarized in the **Table 7.2** below.

Table 7.2: Statistics for complaints, notifications of summons and successful prosecutions

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of summons	Successful prosecutions
This reporting month (Oct 2011)	0	0	0
From 12 May 2010 to end of the reporting month (Oct 2011)	1	0	0

8. Future key Issue

8.1 Site Preparatory Works and Construction Works for the Coming Month

The major site works to be commissioned in the coming month include:

- Band Drain installation,
- Trial Embankment for Ground Improvement
- Site Formation (Filling)

8.2 Key Issues for the Coming Month

Key issues to be considered in the coming month include:

- Generation of dust from activities on-site during dry weather condition;
- Noise impact from operating equipment and machinery on-site;
- Generation of site surface runoffs and wastewater from activities on-site;
- Sorting, recycling, storage and disposal of general refuse and construction waste from activities on-site; and
- Management of chemicals and avoidance of oil spillage on-site and to the drainage.

8.3 Monitoring Schedule for the Coming Month

The environmental site inspection and environmental monitoring will be continued in the coming month. Impact monitoring for air, noise, water quality, ecology and landscape and visual in accordance with the approved EM&A Manual has commenced since 12 May 2010. The tentative monitoring schedule for November 2011 is shown in the **Table 8.1**.

Table 8.1: Tentative Environmental Monitoring and Audit Schedule for November 2011

Tentative Environmental Monitoring and Audit Schedule for Nov 2011

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
		Bird	Water 24-hr TSP 1-hr TSP Noise Monitoring		Water	
6	7	8	9	10	11	12
	Water Bird	24-hr TSP 1-hr TSP Noise Monitoring	Water Herpetofauna	Water (WRA)	Water	
13	14	15	16	17	18	19
	Water Bird 24-hr TSP 1-hr TSP Noise Monitoring		Water Dragonfly & Butterfly		Water 24-hr TSP 1-hr TSP	
20	21	22	23	24	25	26
	Water Bird		Water Herpetofauna	24-hr TSP 1-hr TSP Noise Monitoring	Water	
27	28	29	30			
	Water Bird		Water 24-hr TSP 1-hr TSP Noise Monitoring			

- Air Quality Monitoring (1-hr)
- Air Quality Monitoring (24-hr)
- Noise Monitoring
- Water Quality Monitoring
- Bird Survey
- Insect Survey
- Herpetofauna Survey
- Water Quality Monitoring (Ecology)

8.4 Conclusions and Recommendations

8.4.1 Conclusions

The EM&A programme as recommended in the EM&A manual has been undertaken in the reporting month since 12 May 2010.

Monitoring of Air Quality, Noise, Water Quality, Ecology and Landscape and Visual impacts due to the Project was under way. In particular, the 1-hr TSP, 24-hr TSP, noise level (as L_{eq}) and water quality parameters (such as pH, DO and SS) under monitoring have been checked against established Action and Limit levels.

There was no breach of Action and Limit Levels for 1-hr TSP, 24-hr TSP and noise in the reporting month.

Exceedances of pH, DO, turbidity and SS were observed at MP1 to MP6 in October 2011. Exceedances of pH were often observed at MP1 to MP3 and a few times at MP4 to MP6. DO were exceeded frequently at MP3 and exceeded several times at MP4 to MP6. Turbidity and/or SS exceedances were recorded on one monitoring date at MP3, MP5 and MP6 respectively.

From investigation, the Contractor has implemented water quality mitigation measures as recommended in the EIA report. With external factors affect the adjacent environments, such as natural variations, pond fish culture activities, heavy rainfall, microbe growth (including algae) and water plant clearing, the exceedances were considered not due to construction works.

8.4.2 Recommendations

With considerations on the construction activities and environment, the following recommendations were provided:

Air Quality

- All stockpiles should be covered by tarpaulin or kept wet by water spraying;
- All vehicles should be washed to remove any dusty materials before leaving the construction sites;
- the portion of road leading the construction site that is within 30m of a designated vehicle entrance or exit should be kept clear of dusty materials;
- Sufficient water spraying should be provided at haul road to reduce dust emission, especially during dry weather conditions; and
- Ensure proper functioning of the wheel wash facility.

Noise

- Mobile plant should be sited as far away from NSRs as possible;
- Plant known to emit noise strongly in one direction should be orientated to direct noise away from the NSRs; and
- The construction activities should be better scheduled to reduce noise nuisance.

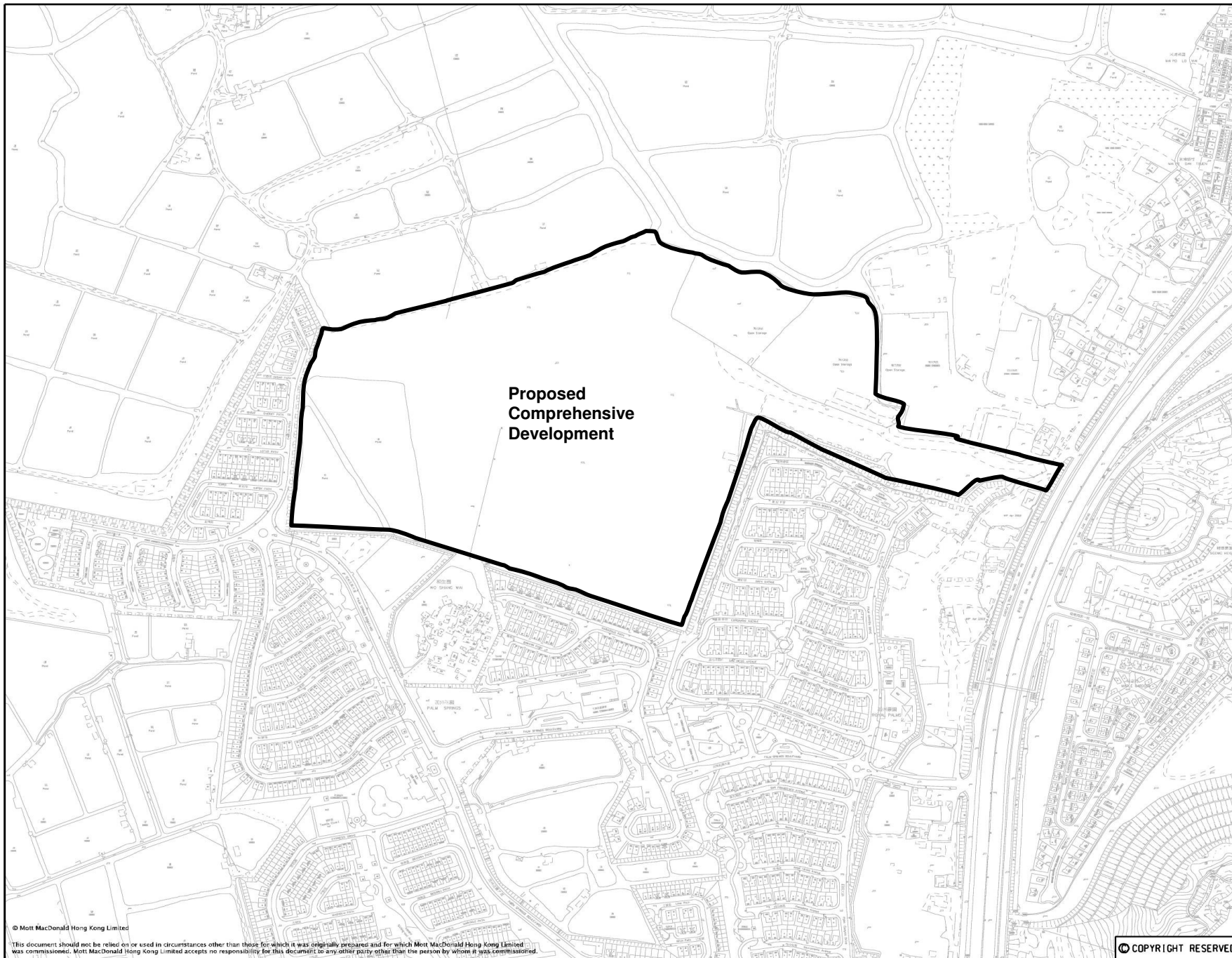
Water Quality

- Water accumulated in the site (including water inside drip trays) should be cleared frequently;
- Ensure proper functioning of the wastewater treatment facility; and

- Silt and debris should be removed from the temporary drainage channel regularly.

Waste management

- Reuse the excavated materials as far as practical to reduce the amount of waste disposal;
- Ensure drip trays are provided for chemical containers to prevent leakage or soil contamination;
- All plants and vehicles should be properly maintained to prevent oil leakage; and
- Oil stains on soil should be cleared by disposal of contaminated soil.



Legend:
 — Site Boundary

**Proposed
 Comprehensive
 Development**

Rev	Date	Drawn	Description	Checked	Approved



Mott MacDonald
 Mott MacDonald Hong Kong Ltd
 7th Floor
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 23 Salisbury Road
 Tsim Sha Tsui, Kowloon
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 Tel: 2828 5757
 Fax: 2827 1823
 Web: www.mottmac.com.hk

Client:
HENG SHUNG CONSTRUCTION CO. LTD

Project:
**PROPOSED COMPREHENSIVE DEVELOPMENT AT
 WO SHANG WAI, YUEN LONG**

Title:
**General Layout Plan of the
 Project Site**

Designed		Eng Chk	
Drawn		Coordination	
Dwg Chk		Approved	
Scale		Project	Status
		CAD File	
Drawing No.	1422009-DEP01\ENR\CHINA\manus\080301\080301.dwg		Rev

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Figure 1.1



Legend:

- ★ Indicative Air Quality Monitoring Locations

Rev	Date	Drawn/Description	Cr'd/App'd
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Mott MacDonald Hong Kong Ltd
 7th Floor
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 Fax: 2827 1823
 Web: www.mottmac.com.hk

Client:
HENG SHUNG CONSTRUCTION CO. LTD

Project:
**PROPOSED COMPREHENSIVE DEVELOPMENT
 AT WO SHANG WAI, YUEN LONG**

Title:
**Locations of Air Quality
 Monitoring Stations**

Designed		Eng. Chk.	
Drawn		Coordination	
Dwg. Chk.		Approved	
Scale	Project	Status	
	CAD File		
	ak22005\REP\01\WPH\01\WPH_01A_mocul000001.dwg		
Drawing No.		Rev	


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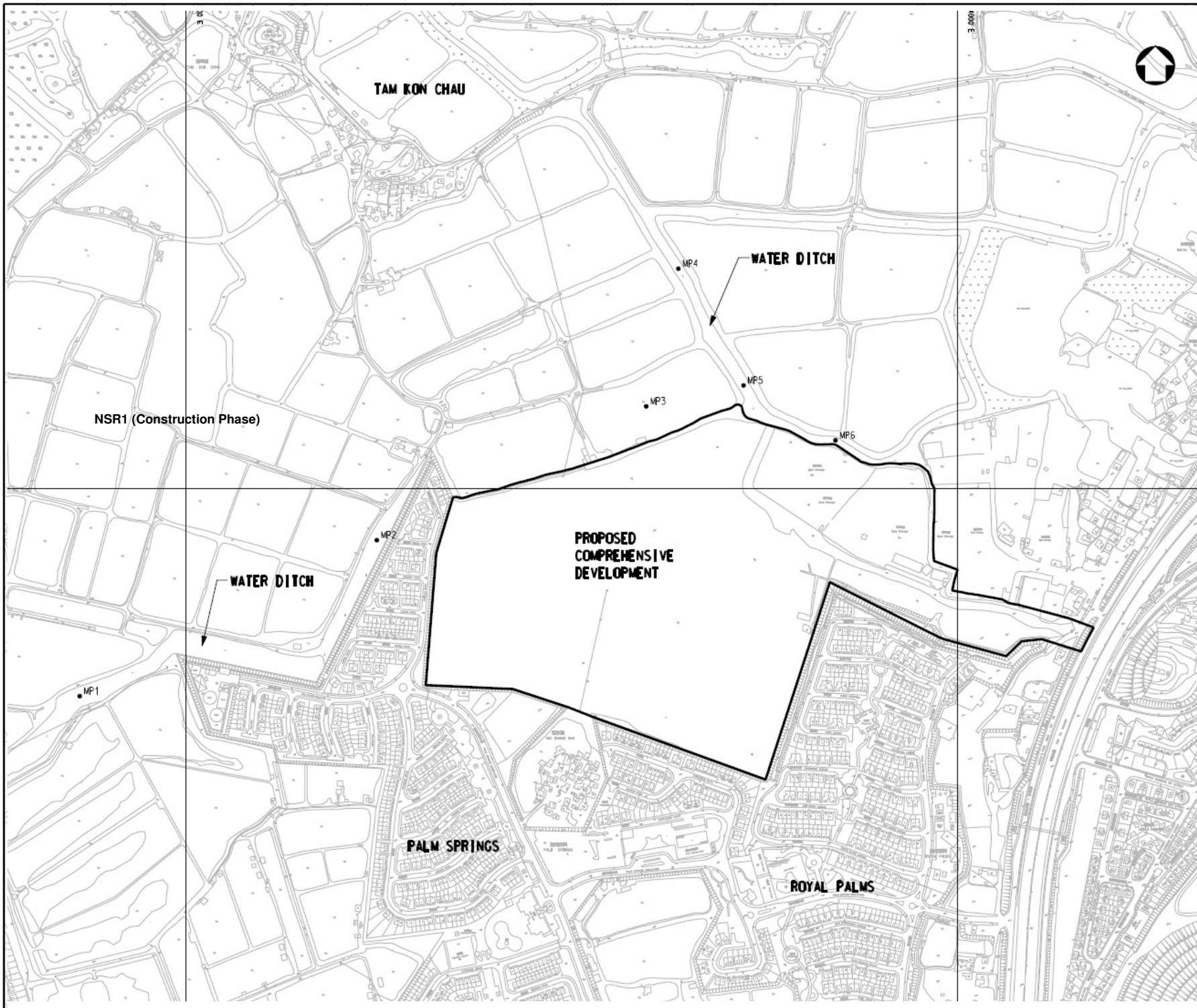
Figure 2.1



Legend:

- Indicative Baseline Noise Monitoring Stations

Rev	Date	Drawn/Description	Cr'd/App'd
			
<small>Mott MacDonald Hong Kong Ltd 7th Floor West Wing Office Building New World Centre 23 Salisbury Road Tsim Sha Tsui, Kowloon Hong Kong Tel: 2826 5757 Fax: 2827 1823 Web: www.mottmac.com.hk</small>			
Client			
HENG SHUNG CONSTRUCTION CO. LTD			
Project			
PROPOSED COMPREHENSIVE DEVELOPMENT AT WO SHANG WAI, YUEN LONG			
Title			
Locations of Noise Monitoring Stations			
Designed		Eng. Chk.	
Drawn		Coordination	
Dwg. Chk.		Approved	
Scale	Project	Status	
	CAD File		
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Drawing No.			Rev



Legend:

- Water Quality Sampling Stations

Rev	Date	Drawn/Description	Cr'd/App'd



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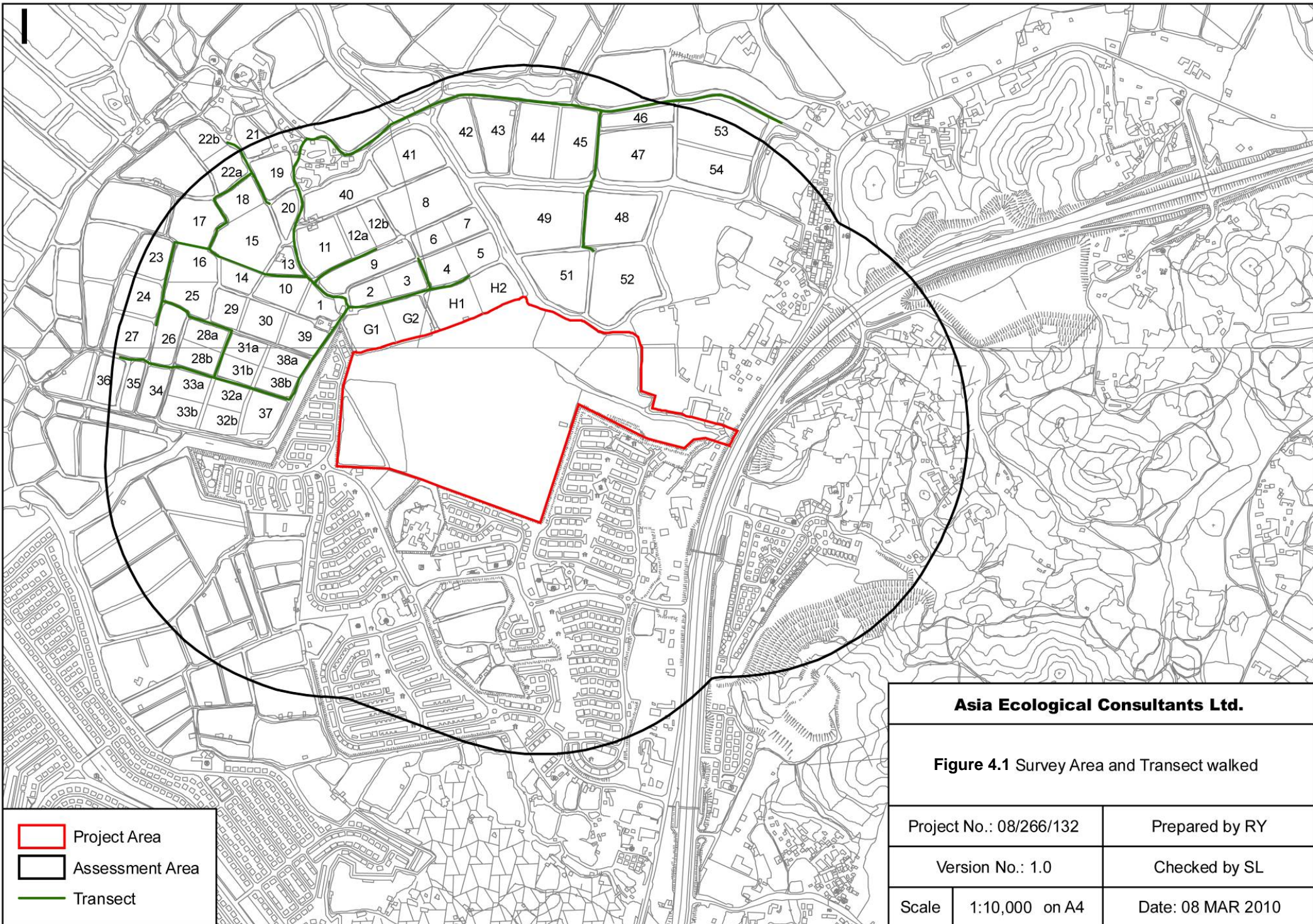
Client:
HENG SHUNG CONSTRUCTION CO. LTD

Project:
**PROPOSED COMPREHENSIVE DEVELOPMENT
AT WO SHANG WAI, YUEN LONG**

Title:
**Locations of Water Quality
Monitoring Stations**

Designed		Eng. Chk.	
Drawn		Coordination	
Dwg. Chk.		Approved	
Scale	Project	Status	
CAD File			
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Drawing No. **Figure 2.3** Rev



Asia Ecological Consultants Ltd.		
Figure 4.1 Survey Area and Transect walked		
Project No.: 08/266/132		Prepared by RY
Version No.: 1.0		Checked by SL
Scale	1:10,000 on A4	Date: 08 MAR 2010

