



PROJECT No.: TCS/00512/09

**DSD CONTRACT NO. DC/2009/13
CONSTRUCTION OF SEWAGE TREATMENT WORKS AT
YUNG SHUE WAN AND SOK KWU WAN**

**YUNG SHUE WAN PORTION AREA
QUARTERLY ENVIRONMENTAL MONITORING AND
AUDIT (EM&A) SUMMARY REPORT NO.Q15
(MARCH TO MAY 2014)**

PREPARED FOR
**LEADER CIVIL ENGINEERING CORPORATION
LIMITED**

Quality Index Date	Reference No.	Prepared By	Certified By
15 July 2014	TCS00512/09/600/R0791v1	 Martin Li Assistant Environmental Consultant	 T.W. Tam Environmental Team Leader

Version	Date	Description
1	15 July 2014	First submission

URS CDM Joint Venture

Chief Engineer/Harbour Area Treatment Scheme
Drainage Services Department
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2A, Pok Fu Lam Road
Hong Kong

Your reference:

Our reference:

05117/6/16/432316

Date:

18 September 2014

Attention: Mr F.K. Pong

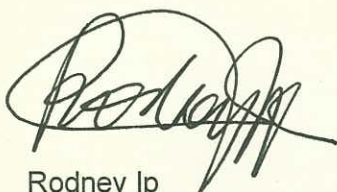
BY FAX

Dear Sir,

Contract No. DC/2009/13
Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan
Yung Shue Wan Portion Area
Quarterly EM&A Summary Report No. Q15 (March to May 2014)

We refer to the Environmental Permit (EP-282/2007/A) and the email from the Environmental Team, Action-United Environmental Services and Consulting (AUES), with the revised report for the captioned project, dated 23 July 2014. We have no comment and have verified the captioned report.

Yours faithfully
URS CDM JOINT VENTURE



Rodney Ip
Independent Environmental Checker

ICWR/CKCH/wwsc

Encl

cc Leader Civil Engineering (Attn: Mr Ron Hung)
AUES (Attn: Mr T.W. Tam)
ER/LAMMA (Attn: Mr Kenneth Kwong)
CDM (Attn: Mr Sylvester Hsu)

EXECUTIVE SUMMARY

ES.01 This is the 15th Quarterly Environmental Monitoring and Audit (EM&A) Summary Report for Yung Shue Wan Portion Area under the Project, covering the construction period from **26 February 2014 to 25 May 2014** (the Reporting Period).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.02 Environmental monitoring activities under the EM&A programme in this Reporting Period are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Air Quality	1-hour TSP	96
	24-hour TSP	28
Construction Noise	L _{eq(30min)} Daytime	16
Water Quality	Marine Water Sampling	0
Ecology	Coral Monitoring	0
Inspection / Audit	ET Regular Environmental Site Inspection	12

ES.03 Two (2) events of power failure of the high volume sampler occurred during 24-hour TSP monitoring on 22 and 26 April 2014. The incidents were reported to relevant parties on the next day and the provision of power supply was rectified the before the next monitoring event.

ES.04 According to the construction information provided by the Contractor, the marine works in Yung Shue Wan has been completed on 22 April 2013. As agreed by the Contractor, the ecology monitoring was ceased in May 2013 due to no ecological impact and concern after the completion of marine work, whereas impact marine water quality monitoring was terminated in July 2013. In this regards, an associated letter ref. TCS00512/10/300/L0656 dated 28 June 2013 has been issued to EPD for approval and no comment was received.

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.05 No exceedances in air quality and construction noise monitoring were recorded in this Reporting Period. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	L _{eq(30min)} Daytime	0	0	0	--	--
Water Quality	DO	0	0	0	--	--
	Turbidity	0	0	0	--	--
	SS	0	0	0	--	--
Ecology (Coral)	Sediment Cover (%)	0	0	0	--	--
	Bleaching (%)	0	0	0	--	--
	Mortality (%)	0	0	0	--	--

Note: NOE – Notification of Exceedance

ES.06 **12** events of site inspection were carried out by ET in this Reporting Period and no non-compliance was observed during the inspection. In general, all the observation has been rectified during the next week site inspection. The environmental performance of the Project was therefore considered as satisfactory.

ENVIRONMENTAL COMPLAINT, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.07 No written or verbal complaint, environmental summons or successful prosecutions were recorded in this Reporting Period.

REPORTING CHANGE

ES.08 No reporting changes were made in this Reporting Period.

FUTURE KEY ISSUES

ES.09 During dry and windy season, construction dust would be the key environmental issue to concern. The construction dust mitigation measures identified at the EM&A Manual such as watering at haul road and covering of dusty material should be implemented and properly maintained.

ES.10 Nevertheless, the Contractor shall keep paying attention on the potential water impact as the construction site is adjacent to the coastline. Muddy water and other water quality pollutants via site surface water runoff into the sea body within Fish culture zone at Picnic Bay and the Secondary recreation contact subzone at Mo Tat Wan should be avoided. Therefore, mitigation measures for water quality should be fully implemented.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.01 The Leader Civil Engineering Corporation Limited (Leader) has been awarded the *Contract DC/2009/13 - Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan* (the Project) by the Drainage Services Department (DSD) on 4 May 2010. The Project is part of an overall plan approved under a statutory EIA for Outlying Islands Sewerage Stage 1 Phase 2 Package J – Sok Kwu Wan Sewage Collection and Treatment (Register No. AEIAR-075/2003) and Disposal Facilities and Outlying Islands Sewerage Stage 1 Phase 1 Package C – Yung Shue Wan Sewage Treatment Works and Outfall (Register No. EIA-124/BC). The Environmental Permit No. EP-281/2007 and EP-282/2007 for the Project have been obtained by the DSD on 29 June 2007 for the relevant works. After July 2009, EP-281/2007/A instead EP-281/2007 is EP for Sok Kwu Wan relevant Works.
- 1.02 The Project involves construction of sewage treatment works at Sok Kwu Wan and Yung She Wan with a capacity of 1,430m³/day and 2,850m³/day to provide secondary treatment. The majority of works include construction of pumping stations, construction of submarine outfall from the coastline and laying of underground sewerage pipeline. The site layout plan for the captioned work under the Project is showing in [Appendix A](#).
- 1.03 According to the Particular Specification (PS) and [Appendix 25](#) of the Project, Leader should establish an Environmental Team to implement the environmental monitoring and auditing works to fulfill the requirements as stipulated in the Environmental Monitoring and Audit (EM&A) Manuals.
- 1.04 Action-United Environmental Services and Consulting (AUES) has been commissioned by Leader as the ET to implement the relevant EM&A program. Organization chart of the Environmental Team for the Project is shown in [Appendix B](#). For ease of reporting, the proposed EM&A programme for baseline and impact monitoring is split to two copies:
- (a) Proposed EM&A Programme for Baseline and Impact Monitoring – Sok Kwu Wan (under EP No. 281/2007/A, varied on 23 September 2009)
 - (b) Proposed EM&A Programme for Baseline and Impact Monitoring – Yung Shue Wan (under EP No. 282/2007)
- 1.05 According to the EM&A Manuals of Sok Kwu Wan and Yung Shue Wan, baseline water quality monitoring should be carried out for consecutive six months before commencement of the marine work. Therefore, the baseline reports of Sok Kwu Wan and Yung Shue Wan are divided to two volumes, i.e. the Volume 1 for air quality and noise monitoring; and the Volume II for water quality monitoring for separate submission.
- 1.06 This is the 15th Quarterly EM&A Summary report for Yung Shue Wan Portion Area presenting the monitoring results and inspection findings for the Reporting Period from **26 February 2013** to **25 May 2014**.

1.2 REPORT STRUCTURE

The Quarterly Environmental Monitoring and Audit (EM&A) Summary Report is structured by following sections:-

SECTION 1	INTRODUCTION
SECTION 2	PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS
SECTION 3	SUMMARY OF MONITORING REQUIREMENTS
SECTION 4	IMPACT MONITORING RESULTS
SECTION 5	WASTE MANAGEMENT
SECTION 6	SITE INSPECTION
SECTION 7	ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE
SECTION 8	IMPLEMENTATION STATUS OF MITIGATION MEASURES
SECTION 9	CONCLUSIONS AND RECOMMENDATIONS

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.01 Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in [Appendix B](#).

2.2 CONSTRUCTION PROGRESS

2.02 The master and three month rolling construction programs are enclosed in [Appendix C](#) and the major construction activities undertaken in this quarter are listed below:-

Reporting Period	Major Construction Activities
March 2014	<ul style="list-style-type: none"> • Construction of drainage works in yard area • Rebar fixing, formwork erection/removal • Excavation, backfilling and soil compaction • E&M installation • Plumb and Drain installation • Plastering, painting, placing wall tiles and 5 legged concrete tiles • Construction of boundary wall • Installation of steel work, FRP covers and cat ladders
April 2014	<ul style="list-style-type: none"> • Construction of drainage works in yard area • Construction of concrete pavements • Rebar fixing, formwork erection/removal • Excavation, backfilling and soil compaction • E&M installation • Plumb and Drain installation • Plastering, painting, placing wall tiles and 5 legged concrete tiles • Construction of boundary wall • Installation of steel work, FRP covers and cat ladders
May 2014	<ul style="list-style-type: none"> • Construction of drainage works in yard area • Construction of concrete pavements • Rebar fixing, formwork erection/ removal • Excavation, backfilling and soil compaction • E&M installation • Plumb and Drain installation • Plastering, painting, placing wall tiles and 5 legged concrete tiles • Construction of road pavement • Construction of boundary wall • Installation of steel work, roller shutter, FRP covers and cat ladders

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.03 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this Reporting Period is presented in [Table 2-1](#).

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status
1	Air Pollution Control (Construction Dust) Regulation	Notified 19/5/2010 Case No: 317486
2	Chemical Waste Producer Registration	Issued on 8/6/2010 WPN 5213-912-L2720-01
3	Water Pollution Control Ordinance	Issued on 22/9/2010 WT00007566-2010
4	Billing Account for Disposal of Construction Waste	Issued on 26 May 2010 A/C No: 7010815

3 SUMMARY OF MONITORING REQUIREMENTS

3.1 ENVIRONMENTAL ASPECT

- 3.01 The EM&A baseline monitoring programme cover the following environmental issues:
- Air quality;
 - Construction noise;
 - Marine water quality; and
 - Ecology
- 3.02 The ET implements the EM&A programme in accordance with the aforementioned requirements. Detailed air quality, construction noise, water quality and ecology monitoring of the EM&A program are presented in the following sub-sections.
- 3.03 A summary of the air, noise, marine water and ecology monitoring parameters is presented in **Table 3-1**:

Table 3-1 Summary of EM&A Requirements

Environmental Issue	Parameters
Air Quality	<ul style="list-style-type: none"> • 1-hour TSP Monitoring by Real-Time Portable Dust Meter; and • 24-hour TSP Monitoring by High Volume Air Sampler.
Noise	<ul style="list-style-type: none"> • $L_{eq(30min)}$ during normal working hours; and • $L_{eq(15min)}$ during Restricted Hours.
Marine Water Quality	<p><i>In-situ Measurements</i></p> <ul style="list-style-type: none"> • Dissolved Oxygen Concentration (mg/L); • Dissolved Oxygen Saturation (%); • Turbidity (NTU); • pH unit; • Salinity (ppt); • Water depth (m); and • Temperature (°C). <p><i>Laboratory Analysis</i></p> <ul style="list-style-type: none"> • Suspended Solids (mg/L)
Ecology	<ul style="list-style-type: none"> • Coral Monitoring

3.2 MONITORING LOCATIONS

Air Quality

- 3.04 Two designated monitoring stations, AC02a, located at Yung Shue Wan Refuse Transfer Station, and AC04, located at residential area nearby Yung Shue Wan football pitch, were recommended in the *EM&A Manual Section 2.5*. In order to identify and seek for the access of the air monitoring locations designated in the EM&A Manual, site visit was conducted by the Contractor and ET.
- 3.05 At the site visit, all designated monitoring locations were identified, however the premises for high volume sampler installation were objected by the owner or the residents of nearby. Therefore, an alternative air monitoring locations were proposed in accordance with the criteria set out in *EM&A manual Section 2.5.2 and 2.5.3*. The proposed alternative air monitoring stations was accepted by the ER and IEC, and EPD endorsed. Details of renewal air monitoring stations are described in **Table 3-2**. The graphical of air monitoring stations is shown in **Appendix D**.

Table 3-2 Locations of Air Quality Monitoring Station

Sensitive Receiver	Location
AC02b	The entrance of RE's site office
AC04c	Next to a power transformer station TP208 Yung Shue Wan and adjacent to the road direct to the construction site

Construction Noise

- 3.06 According to *EM&A Manual Section 3.4*, one noise sensitive receivers (NC05) designated for the construction noise monitoring was recommended at Yung Shue Wan Portion Area of the Project. The designated monitoring station is identified and successfully granted the premises. The detailed construction noise monitoring station is described in **Table 3-3** and graphical is shown in **Appendix D**.

Table 3-3 Location of Construction Noise Monitoring Station

Sensitive Receiver	Location
NC05	North Lamma Clinic

Marine Water Quality

- 3.07 Two control stations (CY1 and CY2) and three impact stations (WY1-WY3) were recommended in the *EM&A Manual Section 4.5*. Impact stations WY1-WY3 were identified close to the sensitive receivers (the coral colonies in the vicinity of Yung Shue Wan, and secondary contact recreation subzone). It is proposed to monitor the impacts from the construction of the submarine outfall as well as the effluent discharge from the proposed STW on water quality. Two control stations: CY1 and CY2 were recommended at locations representative of the project site in its undisturbed condition and located at upstream and downstream of the works area. The marine water quality monitoring stations to be performed under the Project is described in **Table 3-4** and shown in **Appendix D**.

Table 3-4 Locations of Marine Water Quality Monitoring Station

Station	Description	Coordinates	
		Easting	Northing
WY1	Coral colonies on seawall at STW site	829 170	809 550
WY2	Coral colonies at Shek kok Tsui	829 000	810 400
WY3	Coral colonies at O Tsai (headland N at SW ferry pier)	829 200	809 850
CY1 (flood)	Control Station	828 400	810 800
CY2 (ebb)	Control Station	828 000	808 800

Coral Monitoring

- 3.08 The coral monitoring station to be performed under the Project is show in **Appendix D**. The ecology monitoring was ceased since the completion of marine work on 22 April 2013.
- 3.09 It is concluded that Sham Wan is more suitable as a control site than Beaufort Island. The proposal for relocation of control station was submitted to IEC and AFCD and both parties have no comment on the proposal. The coral monitoring stations to be performed under the Project is described in **Table 3-5** and shown in **Appendix D**.

Table 3-5 Location of Coral Monitoring

Dive Site	Number	Coordinates	
		Easting	Northing
Yung Shu Wan, Lamma Island	1	829180.06E	809555.76N
Sham Wan, Lamma Island	2	832160.86E	805738.31N

3.3 MONITORING FREQUENCY AND PERIOD

3.10 The Impact monitoring carried out in the EM&A programme is basically in accordance with the requirements in *EM&A Manual Sections 2.7, 3.6, 4.7, 4.8, 7.3 and 7.4*. The monitoring requirements are listed as follows:

Air Quality Monitoring

Parameters: 1-hour TSP and 24-hour TSP.

Frequency: Once in every six days for 24-hour TSP and three times in every six days for 1-hour TSP.

Duration: Throughout the construction period.

Noise Monitoring

Parameters: $L_{eq(30min)}$ & $L_{eq(5min)}$, L10 and L90.
 $L_{eq(15min)}$ & $L_{eq(5min)}$, L10 and L90 during the construction undertaken during Restricted Hours (19:00 to 07:00 hours next of normal working day and full day of public holiday and Sunday).

Frequency: Once per week during 0700-1900 hours on normal weekdays. Restricted Hour monitoring should depend on conditions stipulated in Construction Noise Permit.

Duration: Throughout the construction period.

Marine Water Quality Monitoring

Parameters: Duplicate in-situ measurements: water depth, temperature, Dissolved Oxygen, pH, turbidity and salinity;

HOKLAS-accredited laboratory analysis: Suspended Solids

Frequency: Three days a week, at mid ebb and mid flood tides. The interval between 2 sets of monitoring will be more than 36 hours.

Sampling Depth (i.) Three depths: 1m below water surface, 1m above sea bottom and at mid-depth when the water depth exceeds 6m.

(ii.) If the water depth is between 3m and 6m, two depths: 1m below water surface and 1m above sea bottom.

(iii.) If the water depth is less than 3m, 1 sample at mid-depth is taken

Duration: During the course of marine works

Coral Monitoring

- Parameters:** Presence and coverage of hard and soft corals such as diversity, abundance and health status of the corals in the general area, plus other physical and biological condition at the underwater environment. The monitoring parameters are categorized in (1) percentage sediment cover; (2) percentage bleached tissue; and (3) percentage dead of each tagged coral
- Frequency:** One per week for the first three months of the marine works;
If no exceedances are reported during the first three months, the frequency may be reduced to twice every month. Monitoring frequency shall be increase if there is indication/trend of increase in the monitoring parameters, upon the decision of Inspecting Officer
- Duration:** During the course of marine works

Post-Construction Monitoring – Marine Water

- 3.11 Upon the marine works (dredging and HDD pipe installation) completion, 4 weeks of post-construction monitoring would be undertaken in accordance with the *Section 4.8 of EM&A Manual*. The requirements of post-construction monitoring such as the parameter, frequency, location and sampling depth is same as the impact monitoring.

3.4 MONITORING EQUIPMENT

Air Quality Monitoring

- 3.12 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve. The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

1-hour TSP

- 3.13 The 1-hour TSP monitor, a TSI Dust Track Aerosol Monitor Model 8520 or Sibata LD-3 Laser Dust Meter is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90° light scattering. The 1-hour TSP monitor consisted of the following:
- A pump to draw sample aerosol through the optic chamber where TSP is measured;
 - A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
 - A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

24-hour TSP

- 3.14 The equipment used for 24-hour TSP measurement will be a TISCH High Volume Air Sampler, HVS Model TE-5170, which complied with EPA Code of Federal Regulation, Appendix B to Part 50. The HVS consists of the following:
- An anodized aluminum shelter;
 - A 8"x10" stainless steel filter holder;
 - A blower motor assembly;
 - A continuous flow/pressure recorder;
 - A motor speed-voltage control/elapsed time indicator;
 - A 7-day mechanical timer, and
 - A power supply of 220v/50 hz

- 3.15 For HVS for 24-hour TSP monitoring, the HVS is mounted in a metallic cage with a top for protection and also it is sat on the existing ground. The flow rate of the HVS between

0.63m³/min and 1.7m³/min will be properly set in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50. Glass Fiber Filter 8" x 10" of TE-653 will be used for 24-hour TSP monitoring and would be supplied by laboratory. The general procedures of sampling are described as below:-

- A horizontal platform with appropriate support to secure the samples against gusty wind should be provided;
- No two samplers should be placed less than 2 meters apart;
- The distance between the sampler and an obstacle, such as building, must be at least twice the height that the obstacle protrudes above the sample;
- A minimum of 2 meters of separation from any supporting structure, measured horizontally is required;
- Before placing any filter media at the HVS, the power supply will be checked to ensure the sampler work properly;
- The filter paper will be set to align on the screen of HVS to ensure that the gasket formed an air tight seal on the outer edges of the filter. Then filter holder frame will be tightened to the filter hold with swing bolts. The holding pressure should be sufficient to avoid air leakage at the edge.
- The mechanical timer will be set for a sampling period of 24 hours (00:00 mid-night to 00:00 mid-night next day). Information will be recorded on the field data sheet, which would be included the sampling data, starting time, the weather condition at current and the filter paper ID with the initial weight;
- After sampling, the filter paper will be collected to transfer from the filter holder of the HVS to a sealed in the envelope and sent to a local HOKLAS accredited laboratory for quantifying.

- 3.16 All the sampled 24-hour TSP filters will be kept in normal air conditioned room conditions, i.e. 70% HR (Relative Humidity) and 25°C, for six months prior to disposal.
- 3.17 The HVS used for 24-hour TSP monitoring will be calibrated before the commencement for sampling, and after in two months interval for 1 point checking of maintenance and six months interval for five points calibrate in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5028A) to establish a relationship between the follow recorder meter reading in cfm (cubic feet per minute) and the standard flow rate, Qstd, in m³/min.

Noise Monitoring

- 3.18 Sound level meter in compliance with the *International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1)* specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m s⁻¹.
- 3.19 All noise measurements will be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq(30 min) in six consecutive Leq(5 min) measurements will be used as the monitoring parameter for the time period between 0700-1900 hours on weekdays throughout the construction period. Leq(15 min) in three consecutive Leq(5 min) measurements for other time periods (e.g. during restricted hours) will only be conducted for monitoring the construction noise during restricted hours as necessary.
- 3.20 The sound level meter will be mounted on a tripod at a height of 1.2 m and placed at the assessment point and oriented such that the microphone is pointed to the site with the microphone facing perpendicular to the line of sight. The windshield will be fitted for all measurements. Where a measurement is to be carried out at a building, the assessment point would normally be

at a position 1 m from the exterior of the building façade. Where a measurement is to be made for noise being received at a place other than a building, the assessment point would be at a position 1.2 m above the ground in a free-field situation, i.e. at least 3.5 m away from reflective surfaces such as adjacent buildings or walls.

- 3.21 Immediately prior to and following each noise measurement the accuracy of the sound level meter will be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements will be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0dB.
- 3.22 Noise measurements will not be made in fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed will be checked with a portable wind speed meter capable of measuring the wind speed in m/s. An acoustic calibrator and sound level meter will be calibrated yearly. A valid of Calibration certificates will be shown in the Environmental Monitoring Report accordingly.

Water Quality Monitoring

- 3.23 Marine water quality monitoring will be conducted at the designated locations in accordance with EM&A Manual. The operating and analytical of sampling procedures are described as below:

- A Global Positioning System (GPS) will be used to ensure that the correct location was selected prior to sample collection. A portable, battery-operated echo sounder will be used for the determination of water depth at each designated monitoring station.
- The marine water sampler will be lowered into the water body at a predetermined depth. The trigger system of the sampler is activated with a messenger and opening ends of the sampler are closed accordingly then the sample of water is collected.
- During the sampling, the sampling container will be rinsed to use a portion of the marine water sample before the water sample is transferred to the container. Upon sampling completion, the container is sealed with a screw cap.
- Before the sampling process, general information such as the date and time of sampling, weather condition and tidal condition as well as the personnel responsible for the monitoring will be recorded on the monitoring field data sheet.
- In-situ measurement including water temperature, turbidity, dissolved oxygen, salinity, pH and water depth undertake at the identified monitoring point. At each station, marine water samples are collected at three depths: 1m below water surface, 1m above sea bottom and at mid-depth when the water depth exceeds 6m. Samples at 1m below water surface and 1m above sea bottom are collected when the water depth is between 3m and 6m. Only 1 sample at mid-depth is taken when the water depth is below 3m.
- For the in-situ measurement, two consecutive measurements of sampling depth, temperature, dissolved oxygen, salinity, turbidity and pH concentration will be measured at the sea. The YSI Model 6820 Multi-parameter Water Quality Sonde is retrieved out of the water after the first measurement and then re-deployed for the second measurement. Where the difference in the value between the first and second readings of each set is more than 25% of the value of the first reading, the reading is discarded and further readings is taken.
- Water sample collection would be used the water sampler. During the water sample collected from the sea, it is fill in high-density polythene bottles. Before the water sample storage, the sampling bottles will be pre-rinsed with the same water sample. The sample bottles then is packed in cool-boxes (cooled at 4°C without being frozen), and delivered to HOKLAS accredited laboratory for the chemical analysis as followed APHA *Standard Methods for the Examination of Water and Wastewater* 19ed 2540D, unless otherwise specified.
- The laboratory has be comprehensive quality assurance and quality control programmes. For QA/QC procedures, one duplicate samples of every batch of 20 samples is analyzed as

followed the HOKLAS accredited requirement.

- 3.24 All water samples will be analyzed with various chemical tests as specified in the EM&A Manual by a local HOKLAS-accredited testing laboratory (ALS Technichem (HK) Pty Ltd HOKLAS registration no. 66). Duplicate samples from each independent sampling event are required for all parameters and the samples will be mixed and analyzed in one set of laboratory analysis. The mixed process would be carried by the laboratory. The determination works should start within 24 hours after collection of the water samples or within the holding time as advised by the laboratory. The laboratory analysis result will be input in our computer database upon received from the laboratory

Coral Monitoring

- 3.25 The monitoring equipments used for the coral monitoring could be referred to *Impact Coral Monitoring report*.

3.5 EQUIPMENT CALIBRATION

- 3.26 Calibration of the HVS is performed upon installation in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A). The calibration data are properly documented and the records are maintained by ET for future reference.
- 3.27 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment was checked before and after each monitoring event. In-house calibration with the High Volume Sampler (HVS) in same condition was undertaken in yearly basis.
- 3.28 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis.
- 3.29 For the marine water sampling period, the Multi-parameter Water Quality Monitoring System will be calibrated by three month interval accordingly. The available calibration certificate will be issued to ensure the performance of Multi-parameter Water Quality Monitoring System to use for in-situ measurement.
- 3.30 All updated calibration certificates of the monitoring equipment used for the impact monitoring program in the relevant Monthly EM&A Report.

3.6 METEOROLOGICAL INFORMATION

- 3.31 The meteorological information during the construction phase is obtained from the Wong Chuk Hang Station of the Hong Kong Observatory (HKO) which near the Project site. The meteorological information in this Reporting Period is presented in [Appendix F](#).

3.7 DATA MANAGEMENT AND DATA QA/QC CONTROL

- 3.32 The impact monitoring data are handled by the ET's systematic data recording and management, which complies with in-house Quality Management System. Standard Field Data Sheets (FDS) are used in the impact monitoring program.
- 3.33 The monitoring data recorded in the equipment e.g. 1-hour TSP meter, noise meter and Multi-parameter Water Quality Monitoring System, are downloaded directly from the equipments at the end of each monitoring day. The downloaded monitoring data are input into a computerized database properly maintained by the ET. The laboratory results are input directly into the computerized database and QA/QC checked by personnel other than those who input the data. For monitoring activities require laboratory analysis, the local laboratory follows the QA/QC requirements as set out under the HOKLAS scheme for all laboratory testing.

3.8 DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

3.34 According to the Yung Shue Wan Environmental Monitoring and Audit Manual, the air quality, construction noise, marine water quality and coral monitoring were established, namely Action and Limit levels are listed in *Tables 3-6, 3-7, 3-8 and 3-9* as below.

Table 3-6 Action and Limit Levels for Air Quality Monitoring

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)		Limit Level ($\mu\text{g}/\text{m}^3$)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AC02b	288	161	500	260
AC04c	290	176	500	260

Table 3-7 Action and Limit Levels for Construction Noise Monitoring

Recommended Action & Limit Levels of Construction Noise		
Monitoring Location	Action Level	Limit Level
	0700-1900 hours on normal weekdays	
NC05	When one or more documented complaints are received	75 dB(A)*

Note: * Reduces to 70dB(A) for schools and 65dB(A) during the school examination periods.

Table 3-8 Action and Limit Levels for Marine Water Quality Monitoring

Parameter	Performance Criteria	Impact Station		
		WY1	WY2	WY3
DO Concentration (Surface and Middle) (mg/L)	Action Level	3.63	3.53	3.61
	Limit Level	3.32	3.47	3.42
DO Concentration (Bottom) (mg/L)	Action Level	3.33	2.92	3.36
	Limit Level	3.23	2.63	3.14
Turbidity (Depth-Average) (NTU)	Action Level	10.94	14.16	14.99
	Limit Level	17.35	15.20	16.21
Suspended Solids (Depth-Average) (mg/L)	Action Level	17.52	14.04	14.52
	Limit Level	25.62	16.51	16.88

Table 3-9 Action and Limit Levels for Coral Monitoring

Step	Action
1	Commence tagged coral monitoring at the impact site. If no increase in sedimentation cover/bleaching/partial mortality is observed on the hard corals or partial mortality on the soft/black corals, no action is required. The coral survey specialist should present this information to the IC(E) at the end of each survey day for verification. If an increase in sedimentation cover/bleaching/partial mortality is observed on the hard corals or partial mortality on the soft/black corals at one or more impact monitoring stations Step 3 should be enacted, if not, Step 2.
2	If non actions are triggered a formal report should be issued along with evidentiary photographs following completion of the survey. Meanwhile monitoring work and construction works should continue uninterrupted.
3	If during the impact monitoring a 15% increase in the percentage of sedimentation on the hard corals occurs at more than 20% of the tagged coral colonies at the Impact Monitoring Station that is not reported at the Control Monitoring Station, then the Action Level is exceeded (Step 4).
4	If the Action Level is exceeded the IC(E) should inform all parties. The data from the water quality monitoring should also be reviewed. If the water quality monitoring shows no attributable effects of the installation works, then the Action Level is not triggered. If the water quality data indicate exceedances (for SS and/or turbidity) the IC(E) should discuss with the Contractor the most appropriate method of reducing suspended solids during construction (e.g. reduce rate of dredging). The water quality data reviewed should then be enacted on the next working day.
5	Monitoring should proceed the following day as per Step 1. If during the Impact Monitoring a 25% increase in the percentage of sedimentation on the hard corals at more than 20% of the tagged coral colonies at the Impact Monitoring Station that is not reported at the Control Monitoring Station, then the Limit Level is exceeded (Step 6). If the Limit Level is not exceeded Step 2 is enacted and work continues according to the mitigated method.
6	If the Limit Level is exceeded the Inspector Officer should inform all parties immediately. Should the Limit Level be exceeded, the Contractor should stop works immediately and work out a solution to the satisfaction of the IC(E), EPD and AFCD. The IC(E) should inform the Contractor to suspend marine construction works until an effective solution is identified. Once the solution has identified and agreed with all parties, backfilling works may re-commence.

4 IMPACT MONITORING RESULTS

4.01 The environmental monitoring results will be compared against the Action and Limit Levels established based on the baseline monitoring results and statutory criteria. In case the measured data exceed the environmental quality criteria, remedial actions will be triggered according to the Event and Action Plan. In the Reporting Period, the graphical plots of the trends of monitored parameter over the past four months are presented in [Appendix E](#).

4.1 RESULTS OF AIR QUALITY MONITORING

4.02 The monitoring results of air quality monitoring at the identified locations during the Reporting Period are summarized in [Tables 4-1](#). In this Reporting Period, a total of **96** events of 1-hour TSP and **28** events of 24-hour TSP measurements were therefore performed.

4.03 Power failure of HVS occurred during 24-hour TSP monitoring at AC02b on 22 and 26 April 2014. The incidents have been reported to relevant parties on the next day and the provisions of power supply were rectified by the Contractor before the next monitoring event. To avoid the recurrence of power failure, the Contractor was reminded to pay more attention to the power issue and ensure a stable power source for the HVS.

Table 4-1 Summary of 1-hour and 24-hour TSP Monitoring Results

Monitoring Location	1-hour TSP ($\mu\text{g}/\text{m}^3$)			24-hour TSP ($\mu\text{g}/\text{m}^3$)		
	Max	Min	Mean	Max	Min	Mean
AC02b	208	23	85	157	26	58
Record Date	4-Mar-14	31-Mar-14	48 events	6-Mar-14	20-May-14	13 events
AC04c	211	23	89	111	30	60
Record Date	4-Mar-14	31-Mar-14	48 events	15-Apr-14	9-Apr-14	15 events

4.04 The 1-hour TSP and 24-hour TSP monitoring values fluctuated below the Action and Limit Levels during the Reporting Period. No Notification of Exceedance (NOE) of air quality criteria or corrective action was therefore required.

4.2 RESULTS OF CONSTRUCTION NOISE MONITORING

4.05 Summary of construction noise monitoring at the identified locations during the Reporting Period are summarized in [Table 4-2](#). In this Reporting Period, a total of **16** events of construction noise measurement were conducted while no documented construction complaint was received and all the construction noise results were below the Limit level. No NOE or corrective action was recommended for this parameter.

Table 4-2 Summary of Construction Noise Monitoring Results

Station	Leq, 30min (dB((A))	
	Max	Min
NC05	67.8	57.0
Record Date	10-Apr-14	8-May-14

4.3 RESULTS OF MARINE WATER QUALITY MONITORING

6.01 According to the EM&A Manual of Yung Shue Wan, water quality monitoring should be carried out during the course of marine work. As informed by the Contractor in June 2013, the marine works in Yung Shue Wan has been completed on 22 April 2013. Marine water quality monitoring was therefore terminated in July 2013 after consent was obtained with IEC. In this regards, an associated letter ref. TCS00512/10/300/L0656 dated 28 June 2013 has been issued to EPD for approval and no comment was received.

4.4 RESULTS OF ECOLOGY MONITORING

- 7.01 According to the EM&A Manual of Yung Shue Wan, ecology monitoring should be carried out during the course of marine work. As informed by the Contractor in June 2013, the marine works in Yung Shue Wan has been completed on 22 April 2013. Ecology monitoring was therefore terminated in June 2013 after consent was obtained with IEC. In this regards, an associated letter ref. TCS00512/10/300/L0656 dated 28 June 2013 has been issued to EPD for approval and no comment was received.

5 WASTE MANAGEMENT

5.01 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

5.1 RECORDS OF WASTE QUANTITIES

5.02 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

5.03 The quantities of waste for disposal in this Reporting Period are summarized in [Table 5-1](#) and [5-2](#) and the Monthly Summary Waste Flow Table is shown in [Appendix G](#). Whenever possible, materials were reused on-site as far as practicable.

Table 5-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity			Disposal Location
	Mar 14	Apr 14	May 14	
C&D Materials (Inert) ('000m ³)	0	0	0	-
Reused in this Contract (Inert) ('000m ³)	0	0	0	-
Reused in other Projects (Inert) ('000m ³)	0	0	0	-
Disposal as Public Fill (Inert) ('000m ³)	0.305	0	0	Tuen Mun Area 38

Table 5-2 Summary of Quantities of C&D Wastes

Type of Waste	Quantity			Disposal Location
	Mar 14	Apr 14	May 14	
Metal (kg)	0	0	0	-
Paper / Cardboard Packing (kg)	0	0	0	-
Plastic (kg)	0	0	0	-
Chemical Wastes (kg)	0	0	0	
General Refuses (tonne)	5.150	4.030	35.810	Yung Shue Wan RTS

5.04 There was no site effluent discharged but the estimated volume of surface runoff was less than 50m³ in this reporting quarter.

6 SITE INSPECTION

- 6.01 According to the Final Report Environmental Monitoring and Audit Manual, the environmental site inspection should be formulated by ET Leader. Regular environmental site inspections had been carried out by the ET to confirm the environmental performance. In this reporting period, weekly joint-site visits by RE, the Contractor and ET were carried out on **4, 11, 21, 27 March 2014; 1, 8, 15, 22 April 2014; 2, 6, 13 and 20 May 2014.**
- 6.02 Observations for the site inspections and monthly audits within this Reporting Period are summarized in *Table 6-1*.

Table 6-1 Site Observations

Date	Findings / Deficiencies	Follow-Up Status
4 Mar 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
11 Mar 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
21 Mar 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
27 Mar 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
1 Apr 2014	<ul style="list-style-type: none"> The Contractor was reminded to remove or cover the used cement bag with tarpaulin sheet to prevent fine particle dispersal into air. 	The used cement bag has been removed.
8 Apr 2014	<ul style="list-style-type: none"> The Contractor was reminded to clean up the stagnant water at U-channel after rainy day. 	Stagnant water has been removed.
15 Apr 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
22 Apr 2014	<ul style="list-style-type: none"> The Contractor was reminded to manage the used cement properly. 	The used cement bag was removed.
2 May 2014	<ul style="list-style-type: none"> The Contractor was reminded to clean all obstacles in the U-channel to prevent overflow of the runoff in construction site. 	The U-channel was clean and well covered to avoid obstacles.
6 May 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
13 May 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA
20 May 2014	<ul style="list-style-type: none"> No environmental issue was observed during the site inspection 	NA

7 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

7.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

7.01 No environmental complaint, summons and prosecution was received in this Reporting Period. The statistical summary table of environmental complaint is presented in *Tables 7-1, 7-2 and 7-3*.

Table 7-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
March 2014	0	0	NA
April 2014	0	0	NA
May 2014	0	0	NA

Table 7-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
March 2014	0	0	NA
April 2014	0	0	NA
May 2014	0	0	NA

Table 7-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
March 2014	0	0	NA
April 2014	0	0	NA
May 2014	0	0	NA

8 IMPLEMENTATION STATUS OF MITIGATION MEASURES

8.01 The environmental mitigation measures that recommended in the Yung Shue Wan Environmental Monitoring and Audit Manual covered the issues of dust, noise, water and waste and they are summarized as following:

Dust Mitigation Measure

8.02 Installation of 2m high solid fences around the construction site of Pumping Station P2 is recommended. Implementation of the requirements stipulated in the Air Pollution Control (Construction Dust) Regulation and the following good site practices are recommended to control dust emission from the site:

- (a) Stockpiles of imported material kept on site should be contained within hoardings, dampened and / or covered during dry and windy weather;
- (b) Material stockpiled alongside trenches should be covered with tarpaulins whenever works are close to village houses;
- (c) Water sprays should be used during the delivery and handling of cement, sands, aggregates and the like.
- (d) Any vehicle used for moving sands, aggregates and construction waste shall have properly fitting side and tail boards. Materials should not be loaded to a level higher than the side and tail boards, and should be covered by a clean tarpaulin.

Noise Mitigation Measure

8.03 As detailed in the EIA report, concreting work of the Pumping Station P1a and sewer alignment construction activities would likely cause adverse noise impacts on some of the noise sensitive receivers. Appropriate mitigation measures have therefore been recommended. The mitigation measures recommended in the EIA report are summarised below:

- (a) Use of quiet equipment for the construction activities of the Pumping Stations and sewer alignment;
- (b) Use of temporary noise barrier around the site boundary of Pumping Station P1a;
- (c) Use of kick ripper (saw and lift) method to replace the breaker for pavement removal during sewer alignment construction;
- (d) Restriction on the number of plant during sewer alignment construction;
- (e) Use of noise screening structures in the form of acoustic shed or movable barrier wherever practicable and feasible in areas with sufficient clearance and headroom during the construction of sewer alignment;
- (f) Adoption of manual working method wherever practicable and feasible in areas where the worksites of the proposed sewer alignment are located less than 20m from the residential noise sensitive receivers and less than 30m from the temple and the public library; and
- (g) Implementation of the following good site practices:
 - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.
 - Mobile plant, if any, should be sited as far away from NSRs as possible.
 - Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.
 - Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.
 - Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.

Water Quality Mitigation Measure

- 8.04 No-dig method using Horizontal Directional Drilling (HDD) would be used for the installation of outfall pipe of about 480 m from shore to minimize the potential water quality impacts arising from the dredging works required for the submarine outfall construction. For the remaining outfall pipe of about 240m and the diffuser section, open trench dredging would still be required.
- 8.05 During the dredging works, the Contractor should be responsible for the design and implementation of the following mitigation measures.
- Dredging should be undertaken using closed grab dredgers with a total production rate of 55m³/hr;
 - Deployment of 2-layer silt curtains with first layer enclosing the grab and the second layer at around 50, from the dredging area while dredging works are in progress;
 - all vessels should be sized such that adequate clearance (i.e. minimum clearance of 0.6m) is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;
 - all pipe leakages should be repaired promptly and plant shall not be operated with leaking pipes;
 - excess material should be cleaned from the decks and exposed fittings of barges before the vessel is moved;
 - adequate freeboard (i.e. minimum of 200m) should be maintained on barges to ensure that decks are not washed by wave action;
 - all barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and
 - loading of barges and hoppers should be controlled to prevent splashing of dredged material to the surrounding water, and barges and hoppers should not be filled to a level which would cause the overflow of materials or sediment laden water during loading or transportation; and
 - the decks of all vessels should be kept tidy and free of oil or other substances that might be accidentally or otherwise washed overboard.

Construction Run-off and Drainage

- 8.06 The Contractor should observe and comply with the Water Pollution Control Ordinance and the subsidiary regulations. The Contractor should follow the practices, and be responsible for the design, construction, operation and maintenance of all the mitigation measures as specified in ProPECC PN 1/94 “Construction Site Drainage”. The design of the mitigation measures should be submitted by the Contractor to the Engineer for approval. These mitigation measures should include the following practices to minimise site surface runoff and the chance of erosion, and also to retain and reduce any suspended solids prior to discharge:
- Provision of perimeter channels to intercept storm-runoff from outside the site. These should be constructed in advance of site formation works and earthworks.
 - Works programmes should be designed to minimize works areas at any one time, thus minimising exposed soil areas and reducing the potential for increased siltation and runoff.
 - Sand/silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove the sand/silt particles from run-off. These facilities should be properly and regularly maintained. These facilities shall be carefully planned to ensure that they would be installed at appropriate locations to capture all surface water generated on site.
 - Careful programming of the works to minimise soil excavation works during rainy seasons.
 - Exposed soil surface should be protected by paving or hydroseeding as soon as possible to reduce the potential of soil erosion.
 - Trench excavation should be avoided in the wet season, and if necessary, these should be excavated and backfilled in short sections.
 - Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric.

General Construction Activities

- 8.07 Debris and rubbish generated on-site should be collected, handled and disposed of properly to avoid entering the nearby coastal waters and stormwater drains. 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. Open drainage channels and culverts near the works areas should be covered to block the entrance of large debris and refuse.

Wastewater Arising from Workforce

- 8.08 Portable toilets shall be provided by the Contractors, where necessary, to handle sewage from the workforce. The Contractor shall also be responsible for waste disposal and maintenance practices

Sediment Contamination Mitigation Measure

- 8.09 The basic requirements and procedures for dredged mud disposal are specified under the WBTC No. 34/2002. The management of the dredging, use and disposal of marine mud is monitored by the MFC, while the licensing of marine dumping is the responsibility of the Director of Environmental Protection (DEP).
- 8.10 The uncontaminated dredged sediment will be loaded onto barges and transported to the designated marine disposal site. Appropriate dredging methods have been incorporated into the recommended water quality mitigation measures including the use of closed-grab dredgers and silt curtains. Category L sediment would be suitable for disposal at a gazetted open sea disposal ground.
- 8.11 During transportation and disposal of the dredged marine sediments, the following measures should be taken to minimize potential impacts on water quality:
- Bottom opening of barges should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved.
 - Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels should be equipped with automatic self-monitoring devices as specified by the DEP.

Construction Waste Mitigation Measure

Good Site Practices and Waste Reduction Measures

- 8.12 It is not anticipated that adverse waste management related impacts would arise, provided that good site practices are strictly followed. Recommendations for good site practices for the construction waste arising include:
- Nomination of an approved person, such as a site manager, to be responsible for the implementation of good site practices, arranging for collection and effective disposal to an appropriate facility, of all wastes generated at the site.
 - Training of site personnel in proper waste management and chemical handling procedures.
 - Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.
 - Provision of sufficient waste disposal points and regular collection for disposal.
 - Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility.
 - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.
 - Maintain records of the quantities of wastes generated, recycled and disposed.

- 8.13 In order to monitor the disposal of C&D waste at landfills and to control fly tipping, a trip-ticket system should be included as one of the contractual requirements and implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. An Independent Environmental Checker should be responsible for auditing the results of the system.
- 8.14 Good management and control can prevent the generation of significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:
- 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 encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the work force;
 - any unused chemicals or those with remaining functional capacity should be recycled;
 - use of reusable non-timber formwork to reduce the amount of C&D material;
 - prior to disposal of C&D waste, it is recommended that wood, steel and other metals should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;
 - proper storage and site practices to minimise the potential for damage or contamination of construction materials; and
 - plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.

General Site Wastes

- 8.15 A collection area should be provided where waste can be stored prior to removal from site. An enclosed and covered area is preferred for the collection of the waste to reduce 'wind blow' of light material.

Chemical Wastes

- 8.16 After use, chemical waste (e.g. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Any unused chemicals or those with remaining functional capacity should be recycled. Spent chemicals should be properly stored on site within suitably designed containers, and should be collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licenced facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation under the Waste Disposal Ordinance.
- 8.17 Any service shop and minor maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakages and spillage should only be undertaken with the areas appropriately equipped to control these discharges.

Construction and Demolition Material

- 8.18 The C&D material should be separated on-site into three categories: (i) public fill, the inert portion of the C&D material (e.g. concrete and rubble), which should be re-used on-site or disposed of at a public filling area; (ii) C&D waste for re-use and/or recycling, the non-inert portion of the C&D material, (e.g. steel and other metals, wood, glass and plastic); (iii) C&D waste which cannot be re-used and/or recycled. The waste producers are responsible for its disposal at strategic landfills.

- 8.19 In order to minimise the impact resulting from collection and transportation of material for off-site disposal, it was recommended that inert material should be re-used on-site where possible. Prior to disposal of C&D material, it was also recommended that steel and other metals should be separated for re-use and/or recycling where practicable to minimise the quantity of waste to be disposed of to landfill.

Ecology Mitigation Measure

- 8.20 The following general good practice measures should be adopted to mitigate ecological impacts during marine works (including dredging and HOD);
- Excess material from vessel loading should be cleaned from the decks and exposed fittings before vessels are moved to the backfilling location;
 - Dredging should cause no foam, oil, grease, scum, litter or other objectionable matter to be present on the water;
 - Adequate freeboard should be maintained to ensure that decks are not washed by wave action;
 - All pie leakages should be repaired promptly and plant should not be operated with leaking pipes; and
 - All barges and other vessels should maintain adequate clearance between vessels and the seabed at all states of the tide and reduce operational speeds to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.
- 8.21 In the event of exceedances of ecological action or limit level, the Contractor will be required to revise his operations as a further mitigation measure. Revisions to the operation method may include (but not be limited to):
- Reduction in dredging rate;
 - Restriction of dredging in particular areas to specific periods in the tidal cycle
- 8.22 Should repeated non-compliances with limit level(s) occur the Contractor shall modify his working method until he is able to achieve the required compliances with the limit levels to the satisfaction of the IC(E)

Fisheries Mitigation Measure

- 8.23 Closed grab dredger, deployment of silt curtains around the immediate dredging area and low dredging rate have been recommended in Water Quality of the EIA report in order to minimise sediment release into the water column.

Landscape & Visual Mitigation Measure

- 8.24 Mitigation measures recommended in the EIA Report for landscape and visual impacts during the construction stage are summarised below.
- Screening of site construction works by use of hoarding that is appropriate to its site context;
 - Retaining existing trees and minimising damage to vegetation where possible by close co-ordination and on site alignment adjusted of rising main and gravity sewer pipelines. Tree protective measures should be implemented to ensure trees identified as to be retained are satisfactorily protected during the construction phase;
 - Careful and efficient transplanting of affected trees (1 no.) to temporary or final transplant location (the proposed tree to be transported is a semi-mature *Macaranga tanarius* and is located at the proposed Pumping Station P2 location);
 - Short excavation and immediate backfilling of sections upon completion of works to reduce active site area;
 - Conservation of top-soil for reuse.
 - Night-time light source from marine fleets should be directed away from the residential units

- 8.25 The implementation schedule of mitigation measures is presented in *Appendix H*.
- 8.26 Leader had been implementing the required environmental mitigation measures according to the Yung Shue Wan Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented by Leader in this Reporting Month are summarized in *Table 8-1*.

Table 8-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	<ul style="list-style-type: none"> • Drainage channels were provided to convey run-off into the treatment facilities; and • Drainage systems were regularly and adequately maintained.
Air Quality	<ul style="list-style-type: none"> • Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet; • Public roads around the site entrance/exit had been kept clean and free from dust; and • Tarpaulin covering of any dusty materials on a vehicle leaving the site.
Noise	<ul style="list-style-type: none"> • Good site practices to limit noise emissions at the sources; • Use of quiet plant and working methods; • Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs; and • To minimize plant number use at the worksite.
Waste and Chemical Management	<ul style="list-style-type: none"> • Excavated material should be reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment should be recycled if possible; • Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner; • The Contractor should adopt a trip ticket system for the disposal of C&D materials to any designed public filling facility and/or landfill; and • Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.
General	<ul style="list-style-type: none"> • The site was generally kept tidy and clean.

9 CONCLUSIONS AND RECOMMENTATIONS

9.1 CONCLUSIONS

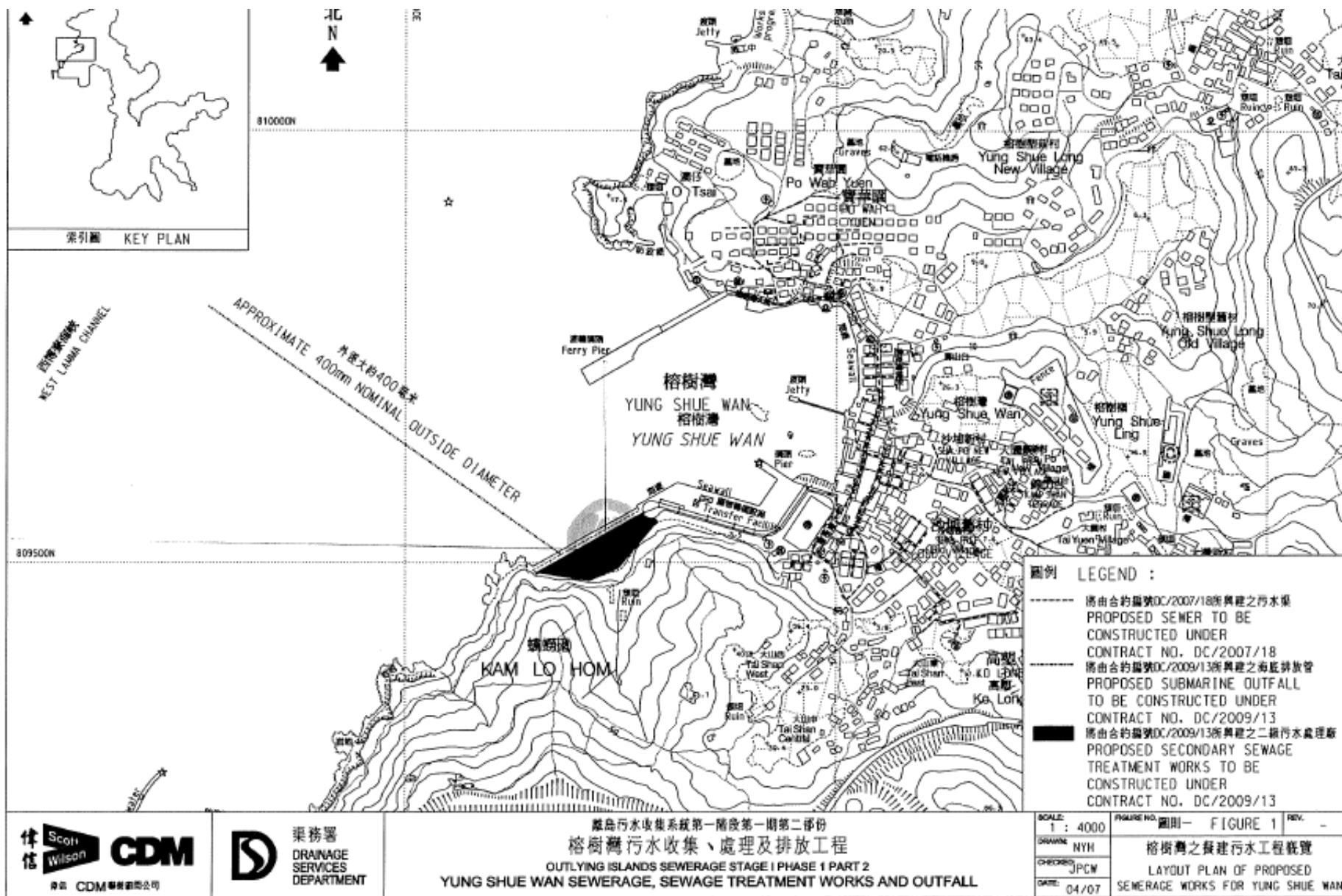
- 9.01 This is the **15th** Quarterly EM&A Summary Report for Yung Shue Wan Portion Area under the Project covering the construction period from **26 February 2014 to 25 May 2014**.
- 9.02 No 1-hour and 24-hour TSP monitoring results were found to trigger the Action or Limit Level in this Reporting Period. No Notification of Exceedance (NOE) of air quality criteria or corrective action was therefore required.
- 9.03 No exceedance in construction noise monitoring was recorded in this Reporting Period.
- 9.03.1 As informed by the Contractor in June 2013, the marine works in Yung Shue Wan has been completed on 22 April 2013. Marine water quality monitoring was therefore terminated in July 2013 after consent was obtained with IEC. In this regards, an associated letter ref. TCS00512/10/300/L0656 dated 28 June 2013 has been issued to EPD for approval and no comment was received.
- 9.04 According to the construction information provided by the Contractor, the marine works in Yung Shue Wan has been completed on 22 April 2013. As agreed by the Contractor, the ecology monitoring was ceased in May 2013 due to no ecological impact and concern after the completion of marine work, whereas impact marine water quality monitoring was terminated in July 2013. In this regards, an associated letter ref. TCS00512/10/300/L0656 dated 28 June 2013 has been issued to EPD for approval and no comment was received.
- 9.05 No documented complaint, notification of summons or successful prosecution was received.
- 9.06 **12** events of site inspection were carried out by ET in this Reporting Period and no non-compliance was observed during the inspection. In general, all the observation has been rectified during the next week site inspection. The environmental performance of the Project was therefore considered as satisfactory.

9.2 RECOMMENDATIONS

- 9.07 During wet season, the Contractor should pay attention to the potential water impact as the construction site is adjacent to the coastline. Muddy water and other water quality pollutants via site surface water runoff into the coral zones of Yung Shue Wan seawall, Shek Kok Tsui and O Tsai should be avoided. Mitigation measures for water quality should be fully implemented.
- 9.08 Moreover, the construction dust mitigation measures identified at the EM&A Manuel such as watering at haul road and covering of dusty material should also be implemented and properly maintained during wet season.

Appendix A

Site Layout Plan – Yung Shue Wan Portion Area



Appendix B

Organization Structure and Contact Details of Relevant Parties

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr. F K Pong	2159-3550	2833-9162
UCJV	Engineer's Representative	Mr. Kenneth W K Kwong	2982 0240	2982 4129
URS	Independent Environmental Checker	Mr. Rodney Ip	2410 3750	2428 9922
Leader	Director	Mr. Wilfred So	2982 1750	2982 1163
Leader	Contracts Manager	Mr. Vincent Chan	2982 1750	2982 1163
Leader	Site Agent	Mr. Ron Hung	2982 1750	2982 1163
Leader	Environmental Officer	Mr. Leung Man Kin	2982 8652	2982 8650
Leader	Sub-Agent	Mr. Leung Man Kin	2982 1750	2982 1163
Leader	Senior Safety Officer	Mr. Andy Lau	2982 1750	2982 1163
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Team Supervisor	Mr. Ben Tam	2959 6059	2959 6079
AUES	Coral Specialist	Mr. Keith Kei	2959 6059	2959 6079

Legend:

DSD (Employer) – Drainage Services Department

UCJV (Engineer) – URS CDM Joint Venture

Leader (Main Contractor) – Leader Civil Engineering Corporation Limited

URS (IEC) – URS Hong Kong Limited

AUES (ET) – Action-United Environmental Services & Consulting

Appendix C

Master and Three Months Rolling Construction Programs

Activity	Start Date	End Date	Duration (Days)	Resources	Notes
Survey	17/05/10 A	15/07/10 A	60	SKW0593B, SKW059416	KD0125, KD0135, SKW05941
Engineer's Site Accommodation at YSW	17/05/10 A	15/07/10 A	60	SKW0741	KD0125
Secondary Engineer's Site Accommodation from Marine Department	17/05/10 A	30/07/10 A	75	SKW0971	KD0125
Consent from Marine Department	17/05/10 A	15/07/10 A	60	E&M3360, SKW1221, SKW1291, SKW1431, SKW1441, SKW1521, SKW1611, SKW1621	KD0125, KD0165, SKW0491
Feeling for Outfall Construction	17/05/10 A	13/09/10 A	120	SKW1631	KD0125
Consent of XP from Hyd (Mo Tat Rd) for EM&A Reporting	17/05/10 A	14/08/10 A	90	0 * SKW1631	
YSWSTW	15/01/13 A	17/01/14	90	0 * SKW1631	
Submission by ER	17/05/10 A	23/06/10 A	38	0 * KD0010, KD0020, KD0030, KD0040, KD0050, KD0060, KD0070, KD0080, KD0090, KD0110, SKW0541	E&M0630, E&M0640
Submission	24/06/10 A	14/07/10 A	21	0 * KD0010, KD0020, KD0030, KD0040, KD0050, KD0060, KD0070, KD0080, KD0090, KD0110, SKW0541	E&M0020, E&M0040, E&M0235
Engineer	15/07/10 A	16/11/10 A	125	0 * E&M3360, SKW1221, SKW1291, SKW1431, SKW1441, SKW1521, SKW1611, SKW1621	E&M0030, E&M0040
Engineer	17/11/10 A	30/11/10 A	14	-269d * SKW1611, SKW1621	E&M0080
Engineer	15/07/10 A	04/08/10 A	21	0 * SKW1631	E&M0295
Engineer	05/08/10 A	18/08/10 A	14	0 * SKW1631	YSW1538
Engineer	19/08/10 A	10/10/10 A	97	0 * KD0010, KD0020, KD0030, KD0040, KD0050, KD0060, KD0070, KD0080, KD0090, KD0110, SKW0541	E&M0050, E&M0101, E&M0240, E&M0060
Engineer	24/11/10 A	30/11/10 A	7	0 * KD0010, KD0020, KD0030, KD0040, KD0050, KD0060, KD0070, KD0080, KD0090, KD0110, SKW0541	E&M0430
Engineer	12/08/13 A	26/08/13 A	40	-269d * SKW1611, SKW1621	E&M0295
Engineer	17/05/10 A	05/07/10 A	50	0 * SKW1631	YSW1500
Engineer	06/07/10 A	19/07/10 A	14	0 * SKW1631	E&M0090
Engineer	20/07/10 A	24/02/11 A	14	0 * SKW1631	E&M0100
Engineer	05/08/10 A	30/11/11 A	90	0 * SKW1631	E&M0160
Engineer	03/11/10 A	30/11/11 A	60	0 * SKW1631	E&M0102
Engineer	01/02/11 A	30/11/11 A	60	0 * SKW1631	E&M0103
Engineer	25/05/11 A	25/05/11 A	30	0 * SKW1631	E&M0110, E&M0120, E&M0130, E&M0390
Engineer	12/09/11 A	12/09/11 A	30	0 * SKW1631	E&M0400, E&M3060
Engineer	22/06/11 A	22/06/11 A	30	0 * SKW1631	E&M0410, E&M3070

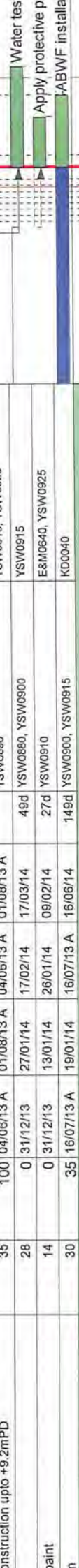
Item No.	Description	Quantity	Unit	Start Date	End Date	Lead Time	Material Code	Material Description	Remarks
30	Approval on MCC & LVSB	30	Days	15/11/11 A	15/11/11 A		E&M0103	E&M0470, E&M3130	Approval on MCC & LVSB
30	Equipment	95	Days	19/11/11 A	11/09/11	-843d	E&M0103	E&M0480, E&M3140	Equipment
30	Equipment	85	Days	30/11/11 A	10/05/12	-635d	E&M0103, E&M0280	E&M0490, E&M3150	Equipment
30	Equipment	85	Days	30/11/11 A	20/11/11	-819d	E&M0103, E&M0290	E&M0285, E&M0320, E&M0500,	Equipment
75	Drawings	75	Days	24/08/10 A	28/10/11	-819d	E&M0010	E&M0250	Drawings
68	Drawings	68	Days	04/08/10 A	28/10/11	-808d	E&M0040	E&M0250, E&M0280, E&M0290	Drawings
100	Drawings	100	Days	04/08/10 A	31/01/13 A		E&M0235, E&M0240, E&M0260,	E&M0280, E&M0290	Drawings
70	Drawings	70	Days	27/09/10 A	28/10/11	-812d	E&M0040	E&M0250	Drawings
75	Drawings	75	Days	27/09/10 A	28/10/11	-809d	E&M0040	E&M0250, E&M0280	Drawings
95	Drawings	95	Days	27/09/10 A	06/05/12	-635d	E&M0240, E&M0250, E&M0270	E&M0220	Drawings
85	Drawings	85	Days	13/11/11 A	15/11/11	-819d	E&M0240, E&M0250	E&M0230	Drawings
100	Drawings	100	Days	01/11/11 A	30/11/11 A		E&M0080, E&M0230, E&M0430	E&M0300	Drawings
90	Drawings	90	Days	01/11/11 A	22/11/12	-466d	E&M0295	E&M0305	Drawings
0	Drawings	0	Days	03/03/14	21/05/13	-466d	E&M0300	E&M0680	Drawings
0	Drawings	0	Days	16/02/14	21/05/13	-285d	E&M0230	E&M0325, E&M0670	Drawings
100	Drawings	100	Days	01/11/11 A	29/02/12 A		E&M0320	E&M0670, E&M0680	Drawings
0	Drawings	0	Days	11/11/15	11/12/13	-728d	E&M0500	E&M0700	Drawings
0	Drawings	0	Days	06/08/14	08/07/14	-57d	E&M3160	E&M3360	Drawings
0	Drawings	0	Days	28/01/14	11/12/12	-441d	E&M2016	E&M11800, E&M2180	Drawings
0	Drawings	0	Days	17/05/10 A	17/05/10 A			E&M0010, E&M0070, E&M1001, E&M2001, KD0125, PRE0020, PRE0040, PRE0050, PRE0060, PRE0090, PRE0100, PRE0130, SKW0250, SKW0588, SKW0651, SKW0881, SKW1131, SKW1481, SKW1591, SKW1811, YSW0020, YSW0050, YSW0075, YSW0180, YSW0200, YSW0220, YSW0240, YSW00201, YSW0030, YSW00351, YSW0030	Drawings
100	Drawings	100	Days	17/05/10 A	01/06/10 A		KD0020	YSW00351	Drawings
100	Drawings	100	Days	02/06/10 A	30/07/10 A		YSW0020	YSW0030	Drawings
100	Drawings	100	Days	31/07/10 A	22/08/10 A		YSW0020, YSW00201	YSW0035	Drawings
100	Drawings	100	Days	23/08/10 A	07/09/10 A		YSW0030	YSW0120, YSW01545, YSW0500,	Drawings
100	Drawings	100	Days	02/06/10 A	29/07/10 A		YSW0020	YSW0040	Drawings
100	Drawings	100	Days	30/07/10 A	31/12/10 A		YSW0020, YSW00351	YSW0350	Drawings
100	Drawings	100	Days	19/05/10 A	17/07/10 A		KD0020	YSW0155	Drawings
100	Drawings	100	Days	17/05/10 A	15/06/10 A		KD0020	YSW0080, YSW0100	Drawings
100	Drawings	100	Days	16/06/10 A	15/07/10 A		YSW0075	YSW0085, YSW0090, YSW0120	Drawings
100	Drawings	100	Days	02/07/10 A	15/07/10 A		YSW0080	YSW0120	Drawings
100	Drawings	100	Days	16/07/10 A	21/03/11 A		YSW0080	YSW0100, YSW0110	Drawings
100	Drawings	100	Days	20/09/10 A	03/06/11 A		YSW0075, YSW0080	KD0030	Drawings
100	Drawings	100	Days	16/07/11 A	19/08/11 A		YSW0090	KD0030	Drawings
100	Drawings	100	Days	24/09/10 A	25/09/10 A		YSW0035, YSW0080, YSW0085	YSW0131, YSW0155, YSW0170	Drawings
100	Drawings	100	Days	12/09/10 A	25/09/10 A		YSW0120	YSW0132	Drawings
100	Drawings	100	Days	26/09/10 A	27/09/10 A		YSW0131	YSW0133	Drawings
100	Drawings	100	Days	11/11/10 A	11/11/10 A		YSW0132	YSW0134	Drawings
100	Drawings	100	Days	19/10/10 A	30/11/10 A		YSW0133	YSW0135	Drawings
100	Drawings	100	Days	12/12/10 A	12/12/10 A		YSW0134	YSW0136	Drawings
100	Drawings	100	Days	15/12/10 A	15/12/10 A		YSW0135	YSW01361	Drawings
30	Drawings	30	Days	17/05/10 A	15/06/10 A				Drawings
30	Drawings	30	Days	16/06/10 A	15/07/10 A				Drawings
14	Drawings	14	Days	02/07/10 A	15/07/10 A				Drawings
249	Drawings	249	Days	16/07/10 A	21/03/11 A				Drawings
257	Drawings	257	Days	20/09/10 A	03/06/11 A				Drawings
35	Drawings	35	Days	16/07/11 A	19/08/11 A				Drawings
2	Drawings	2	Days	24/09/10 A	25/09/10 A				Drawings
14	Drawings	14	Days	12/09/10 A	25/09/10 A				Drawings
2	Drawings	2	Days	26/09/10 A	27/09/10 A				Drawings
45	Drawings	45	Days	28/09/10 A	11/11/10 A				Drawings
43	Drawings	43	Days	19/10/10 A	19/10/10 A				Drawings
12	Drawings	12	Days	01/12/10 A	12/12/10 A				Drawings
3	Drawings	3	Days	13/12/10 A	13/12/10 A				Drawings

125	100	09/06/11 A	11/10/11 A	09/06/11 A	09/05/13 A	06/02/14	09/05/13 A	29/04/14	81d	E&M1110	E&M1800
76	100	09/06/11 A	23/08/11 A	09/06/11 A	09/06/11 A	05/05/10 A		23/08/11 A			KD0030
7	100	12/10/11 A	08/02/12 A	12/10/11 A	17/05/10 A	05/05/10 A		08/02/12 A			KD0030
14	100	06/12/12 A	31/12/12 A	06/12/12 A	17/05/10 A	15/06/10 A		31/12/12 A			KD0130
87	100	03/09/12 A	28/11/12 A	03/09/12 A	17/05/10 A	15/06/10 A		28/11/12 A			YSW01755, YSW01810
14	100	02/03/13 A	02/03/13 A	02/03/13 A	02/06/10 A	02/03/13 A		02/03/13 A			KD0130
30	100	29/11/12 A	22/12/12 A	29/11/12 A	02/06/10 A	15/06/10 A		22/12/12 A			KD0130, YSW01805
Marine Outfall											
Pipeworks											
7	85	09/05/13 A	06/02/14	09/05/13 A	08/09/10 A	05/05/10 A		29/04/14			E&M1800
0	100		05/05/10 A		22/12/10 A	05/05/10 A		05/05/10 A			KD0125
30	100	17/05/10 A	15/06/10 A	17/05/10 A	30/04/11 A	15/06/10 A		15/06/10 A			YSW0422
30	100	17/05/10 A	15/06/10 A	17/05/10 A	01/01/11 A	15/06/10 A		15/06/10 A			YSW0432, YSW0500, YSW0610,
14	100	02/06/10 A	15/06/10 A	02/06/10 A	29/09/11 A	02/06/10 A		15/06/10 A			YSW0510
for Inlet Pumping Station											
105	100	08/09/10 A	21/12/10 A	08/09/10 A	08/09/10 A	21/12/10 A		21/12/10 A			YSW0510
129	100	22/12/10 A	29/04/11 A	22/12/10 A	22/12/10 A	29/04/11 A		29/04/11 A			YSW0520
40	100	30/04/11 A	08/06/11 A	30/04/11 A	08/06/11 A	08/06/11 A		08/06/11 A			YSW05701
159	100	01/01/11 A	08/06/11 A	01/01/11 A	01/01/11 A	08/06/11 A		08/06/11 A			YSW0540, YSW05701
112	100	09/06/11 A	28/09/11 A	09/06/11 A	29/09/11 A	28/09/11 A		28/09/11 A			YSW0550, YSW05901
20	100	29/09/11 A	18/10/11 A	29/09/11 A	18/10/11 A	18/10/11 A		18/10/11 A			YSW05901
28	100	09/06/11 A	06/07/11 A	09/06/11 A	09/06/11 A	06/07/11 A		06/07/11 A			YSW05711, YSW05731
106	100	07/07/11 A	20/10/11 A	07/07/11 A	20/10/11 A	20/10/11 A		20/10/11 A			YSW05721, YSW05911
12	100	21/10/11 A	01/11/11 A	21/10/11 A	21/10/11 A	01/11/11 A		01/11/11 A			YSW05911
34	100	07/07/11 A	09/08/11 A	07/07/11 A	07/07/11 A	09/08/11 A		09/08/11 A			YSW05741
52	100	10/06/11 A	30/09/11 A	10/06/11 A	10/08/11 A	30/09/11 A		30/09/11 A			YSW05751
27	100	01/10/11 A	27/10/11 A	01/10/11 A	01/10/11 A	27/10/11 A		27/10/11 A			YSW05752
48	100	28/10/11 A	14/12/11 A	28/10/11 A	28/10/11 A	14/12/11 A		14/12/11 A			YSW05761
10	100	15/12/11 A	24/12/11 A	15/12/11 A	15/12/11 A	24/12/11 A		24/12/11 A			YSW0580, YSW05921
10	100	25/12/11 A	03/01/12 A	25/12/11 A	25/12/11 A	03/01/12 A		03/01/12 A			YSW05801, YSW05922
40	100	04/01/12 A	12/02/12 A	04/01/12 A	04/01/12 A	12/02/12 A		12/02/12 A			YSW05802, YSW05923
10	100	13/02/12 A	22/02/12 A	13/02/12 A	13/02/12 A	22/02/12 A		22/02/12 A			YSW05924
90	100	29/09/11 A	27/12/11 A	29/09/11 A	29/09/11 A	27/12/11 A		27/12/11 A			YSW06001
80	100	21/10/11 A	08/01/12 A	21/10/11 A	21/10/11 A	08/01/12 A		08/01/12 A			YSW06011, YSW06035
45	100	25/12/11 A	07/02/12 A	25/12/11 A	25/12/11 A	07/02/12 A		07/02/12 A			YSW06021
80	100	04/01/12 A	23/03/12 A	04/01/12 A	04/01/12 A	23/03/12 A		23/03/12 A			YSW06022
60	100	13/02/12 A	12/04/12 A	13/02/12 A	13/02/12 A	12/04/12 A		12/04/12 A			E&M0530, E&M0540, E&M0550,
50	100	28/05/12 A	16/07/12 A	28/05/12 A	28/05/12 A	16/07/12 A		16/07/12 A			YSW06034
87	100	28/12/11 A	23/03/12 A	28/12/11 A	28/12/11 A	23/03/12 A		23/03/12 A			YSW0600
75	100	09/01/12 A	23/03/12 A	09/01/12 A	09/01/12 A	23/03/12 A		23/03/12 A			YSW0600
44	100	08/02/12 A	22/03/12 A	08/02/12 A	08/02/12 A	22/03/12 A		22/03/12 A			YSW07201
60	100	24/03/12 A	22/05/12 A	24/03/12 A	24/03/12 A	22/05/12 A		22/05/12 A			YSW0600
45	100	13/04/12 A	27/05/12 A	13/04/12 A	13/04/12 A	27/05/12 A		27/05/12 A			E&M0560, YSW05924
28	100	27/07/12 A	13/08/12 A	27/07/12 A	27/07/12 A	13/08/12 A		13/08/12 A			YSW0600
90	100	18/04/12 A	16/07/12 A	18/04/12 A	18/04/12 A	16/07/12 A		16/07/12 A			YSW07204
60	100	23/03/12 A	21/05/12 A	23/03/12 A	23/03/12 A	21/05/12 A		21/05/12 A			YSW07202, YSW0800
42	100	22/05/12 A	02/07/12 A	22/05/12 A	22/05/12 A	02/07/12 A		02/07/12 A			E&M0600, YSW07203, YSW0800
42	100	17/09/12 A	29/09/12 A	17/09/12 A	17/09/12 A	29/09/12 A		29/09/12 A			YSW07204, YSW0800
32	100	03/10/12 A	31/10/12 A	03/10/12 A	03/10/12 A	31/10/12 A		31/10/12 A			E&M0570, YSW07205, YSW0800
21	100	31/08/13 A	23/09/13 A	31/08/13 A	31/08/13 A	23/09/13 A		23/09/13 A			YSW0800

or water channels

64	100	15/12/11 A	16/02/12 A	16/03/12 A	16/02/11 A	15/12/11 A	16/02/12 A	YSW0635	YSW0630	E&M0610, E&M0620, E&M0630,
80	100	28/12/11 A	16/03/12 A	16/03/12 A	28/12/11 A	16/03/12 A	YSW0640	YSW0640		
37	100	08/09/10 A	14/10/10 A	08/09/10 A	08/09/10 A	14/10/10 A	YSW0655, YSW0422	YSW0660		
78	100	15/10/10 A	31/12/10 A	15/10/10 A	15/10/10 A	31/12/10 A	YSW0660	YSW0650, YSW0670		
70	100	01/01/11 A	11/03/11 A	01/01/11 A	01/01/11 A	11/03/11 A	YSW0660	YSW0660		
17	100	12/03/11 A	28/03/11 A	12/03/11 A	12/03/11 A	28/03/11 A	YSW0670	YSW0690		
82	100	29/03/11 A	18/06/11 A	29/03/11 A	29/03/11 A	18/06/11 A	YSW0680	YSW0710, YSW0620		
28	100	15/05/12 A	11/06/12 A	15/05/12 A	15/05/12 A	11/06/12 A	YSW0735	YSW0830		
47	100	01/10/12 A	16/11/12 A	01/10/12 A	01/10/12 A	16/11/12 A	YSW0710	E&M0510, E&M0640, YSW07055,		
54	100	17/11/12 A	10/01/13 A	17/11/12 A	17/11/12 A	10/01/13 A	YSW0705, YSW07105	E&M0610		
7	100	24/09/12 A	30/09/12 A	24/09/12 A	24/09/12 A	30/09/12 A	YSW0690	YSW0705, YSW07105		
7	100	01/10/12 A	07/10/12 A	01/10/12 A	01/10/12 A	07/10/12 A	YSW0710	YSW07055		
28	100	14/07/13 A	13/09/13 A	14/07/13 A	14/07/13 A	13/09/13 A	YSW06901	YSW0850		
6	100	27/04/13 A	11/07/13 A	27/04/13 A	27/04/13 A	11/07/13 A	YSW0690	E&M0610		
0	100	21/01/12 A	09/02/12 A	21/01/12 A	21/01/12 A	09/02/12 A	YSW03601, YSW03605	YSW0732		
20	100	21/01/12 A	09/02/12 A	21/01/12 A	21/01/12 A	09/02/12 A	YSW0730	YSW0733		
20	100	10/02/12 A	29/02/12 A	10/02/12 A	10/02/12 A	29/02/12 A	YSW0732	YSW0735, YSW0740		
75	100	01/03/12 A	14/05/12 A	01/03/12 A	01/03/12 A	14/05/12 A	YSW0733	YSW06901, YSW0736, YSW08302,		
100	100	15/05/12 A	14/05/12 A	15/05/12 A	15/05/12 A	14/05/12 A	YSW0735	YSW08302, YSW08305		
75	100	01/03/12 A	14/05/12 A	01/03/12 A	01/03/12 A	14/05/12 A	YSW0733	YSW0750		
19	100	15/05/12 A	02/06/12 A	15/05/12 A	15/05/12 A	02/06/12 A	YSW0740	YSW07501		
5	100	03/06/12 A	07/06/12 A	03/06/12 A	03/06/12 A	07/06/12 A	YSW0750	YSW07502		
16	100	08/06/12 A	23/06/12 A	08/06/12 A	08/06/12 A	23/06/12 A	YSW0760	YSW0760		
8	100	24/06/12 A	01/07/12 A	24/06/12 A	24/06/12 A	01/07/12 A	YSW07502	YSW01800, YSW07601, YSW07603,		
30	100	03/07/12 A	31/07/12 A	03/07/12 A	03/07/12 A	31/07/12 A	YSW0760	YSW08301, YSW08305		
25	100	01/06/12 A	25/06/12 A	01/06/12 A	01/06/12 A	25/06/12 A	YSW0760	YSW07604		
24	100	26/06/12 A	19/07/12 A	26/06/12 A	26/06/12 A	19/07/12 A	YSW07603	YSW07605		
12	100	20/07/12 A	31/07/12 A	20/07/12 A	20/07/12 A	31/07/12 A	YSW07604	YSW07607		
24	100	01/08/12 A	24/08/12 A	01/08/12 A	01/08/12 A	24/08/12 A	YSW07605	YSW07608, YSW07609		
37	100	25/08/12 A	30/09/12 A	25/08/12 A	25/08/12 A	30/09/12 A	YSW07607	YSW08304, YSW08305		
37	100	25/08/12 A	30/09/12 A	25/08/12 A	25/08/12 A	30/09/12 A	YSW07607	YSW07610, YSW08303, YSW1470		
31	100	03/10/12 A	31/10/12 A	03/10/12 A	03/10/12 A	31/10/12 A	YSW07609	YSW0840, YSW16606, YSW16607,		
42	100	03/04/13 A	18/04/13 A	03/04/13 A	03/04/13 A	18/04/13 A	YSW0380, YSW07601	E&M0690		
95	100	10/08/13 A	24/08/13 A	10/08/13 A	10/08/13 A	24/08/13 A	YSW0735, YSW0736	E&M0520, E&M0590, E&M0605,		
19	100	30/11/12 A	18/12/12 A	30/11/12 A	30/11/12 A	18/12/12 A	YSW07609	E&M0520		
32	100	31/08/13 A	01/10/13 A	31/08/13 A	31/08/13 A	01/10/13 A	YSW07608	E&M0610		
120	100	02/10/12 A	15/08/13 A	02/10/12 A	02/10/12 A	15/08/13 A	YSW0735, YSW0736, YSW07601,	E&M0610		
40	100	25/02/13 A	18/04/13 A	25/02/13 A	25/02/13 A	18/04/13 A	YSW07610, YSW16606	YSW0860		
40	100	19/04/13 A	12/06/13 A	19/04/13 A	19/04/13 A	12/06/13 A	YSW0640	YSW0890		
35	100	21/06/13 A	26/08/13 A	21/06/13 A	21/06/13 A	26/08/13 A	YSW0890	YSW0910		
40	100	04/06/13 A	14/07/13 A	04/06/13 A	04/06/13 A	14/07/13 A	YSW0690	YSW0890, YSW0900		
35	100	04/06/13 A	01/08/13 A	04/06/13 A	04/06/13 A	01/08/13 A	YSW0690	YSW0910, YSW0925		
28	0	31/12/13	27/01/14	17/02/14	17/02/14	17/03/14	45d	YSW0980, YSW0900	YSW0915	
14	0	31/12/13	13/01/14	26/01/14	26/01/14	09/02/14	27d	YSW0910	E&M0640, YSW0925	
30	35	16/07/13 A	19/01/14	16/07/13 A	16/07/13 A	16/06/14	145d	YSW0900, YSW0915	KD0040	
16	100	17/09/12 A	02/10/12 A	17/09/12 A	17/09/12 A	02/10/12 A	YSW07609	YSW1480		

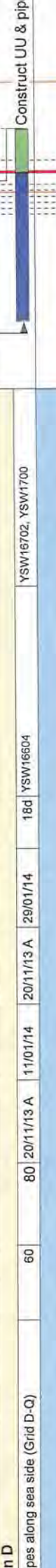
est for FSH Water Supply Tank.



Item No.	Description	Quantity	Start Date	End Date	Unit	Material / Specification	Notes
90	100m deep sewer (FM1 - YFMH13)	100	04/08/13 A	15/01/14 A	15/01/14 A	YSW0760, YSW16606, YSW16607, YSW16602	ELS & excavate 6m Lay
45	100m deep sewer (FM1 - YFMH13)	100	20/01/14 A	10/02/14 A	10/02/14 A	YSW16601	Construct
60	50m pipes along sea side (Grid Q-X)	50	04/03/14 A	29/01/14 A	04/03/14 A	YSW16607, YSW16608	
60	100m pipes along sea side (Grid XA-D)	100	22/07/13 A	06/02/14 A	06/02/14 A	YSW16603	
90	100m pipes along hill side (Grid D-Q)	100	10/10/12 A	01/09/13 A	01/09/13 A	YSW07610	de (Grid D-Q)
72	100m pipes along hill side (Grid Q-X)	100	20/08/12 A	01/09/13 A	01/09/13 A	YSW07610	de (Grid Q-X)
72	100m pipes along hill side (Grid XA-D)	100	30/11/12 A	01/09/13 A	01/09/13 A	YSW07610	de (Grid XA-D)
80	100m Boundary Wall (Grid XA-D)	100	10/01/13 A	15/12/13 A	15/12/13 A	YSW16604	Construct Boundary Wall (Grid XA-D)
80	60m Boundary Wall (Grid D-Q)	60	01/01/14 A	12/02/14 A	02/03/14 A	YSW16605, YSW16701	
80	30m Boundary Wall (Grid Q-X)	30	21/02/14 A	26/03/14 A	07/04/14 A	YSW16603, YSW16702	
240	0m pipeline installation	0	31/12/13 A	27/08/14 A	16/06/14 A	YSW16703	
120	60m road kerbs, downpipes, U-channel	60	26/01/13 A	16/02/14 A	20/02/14 A	YSW1530	
180	60m road kerbs, downpipes, U-channel	60	02/01/13 A	29/04/14 A	03/05/14 A	YSW16608, YSW1680	
110	60m road kerbs, downpipes, U-channel	60	23/05/14 A	12/06/14 A	16/06/14 A	YSW16602, YSW16605, YSW16703, YSW1680, YSW1690	
53	IEC	100	17/05/10 A	08/07/10 A	08/07/10 A	KD0020	
60	Approval of Ecologist	100	17/05/10 A	15/07/10 A	15/07/10 A	KD0020	
211	Approval of In. Hydro Survey	100	16/07/10 A	11/02/11 A	11/02/11 A	YSW0200	
103	100m Survey (YSW)	100	17/05/10 A	17/05/10 A	27/08/10 A	KD0020	
157	100m Survey (YSW)	100	28/08/10 A	31/01/11 A	31/01/11 A	YSW0220	
319	100m Survey (YSW)	100	17/05/10 A	17/05/10 A	31/03/11 A	KD0020	
83	100m Survey (YSW)	100	28/06/10 A	18/09/10 A	18/09/10 A	KD0020	
188	100m Survey (YSW)	100	19/09/10 A	25/03/11 A	25/03/11 A	YSW02401	
14	100m Survey (YSW)	100	26/03/11 A	08/04/11 A	08/04/11 A	YSW0250	
123	100m Survey (YSW)	100	19/09/10 A	19/01/11 A	19/01/11 A	YSW0250	
44	100m Survey (YSW)	100	20/01/11 A	04/03/11 A	04/03/11 A	YSW0270	
69	100m Survey (YSW)	100	20/01/11 A	29/03/11 A	29/03/11 A	YSW0270	
27	100m Survey (YSW)	100	05/03/11 A	31/03/11 A	31/03/11 A	YSW0280	
28	100m Survey (YSW)	100	01/04/11 A	28/04/11 A	28/04/11 A	YSW0310	
6	100m Survey (YSW)	100	09/04/11 A	14/04/11 A	14/04/11 A	YSW0320	
14	100m Survey (YSW)	100	15/04/11 A	28/04/11 A	28/04/11 A	YSW0330	
229	100m Survey (YSW)	100	29/04/11 A	13/12/11 A	13/12/11 A	YSW0350	
17	100m Survey (YSW)	100	14/12/11 A	30/12/11 A	30/12/11 A	YSW0360	
7	100m Survey (YSW)	100	31/12/11 A	06/01/12 A	06/01/12 A	YSW03601	
14	100m Survey (YSW)	100	07/01/12 A	20/01/12 A	20/01/12 A	YSW0360	
14	100m Survey (YSW)	100	31/12/11 A	13/01/12 A	13/01/12 A	YSW0365	
120	100m Survey (YSW)	100	07/01/12 A	05/05/12 A	05/05/12 A	YSW03651	
2	100m Survey (YSW)	100	23/11/12 A	24/11/12 A	24/11/12 A	SKW1431, YSW03620, YSW03641	
5	100m Survey (YSW)	100	24/11/12 A	29/11/12 A	29/11/12 A	YSW0360	
60	100m Survey (YSW)	100	30/11/12 A	20/06/13 A	20/06/13 A	YSW0370	
30	100m Survey (YSW)	100	30/04/13 A	31/05/13 A	31/05/13 A	YSW0380	
118	100m Survey (YSW)	100	24/02/11 A	24/02/11 A	21/06/11 A	E&M0160	
236	100m Survey (YSW)	100	24/02/11 A	24/02/11 A	17/10/11 A	E&M0160	
81	100m Survey (YSW)	100	10/10/11 A	29/12/11 A	29/12/11 A	E&M0150	
129	100m Survey (YSW)	100	06/09/11 A	12/01/12 A	06/09/11 A	E&M0110	
80	100m Survey (YSW)	100	12/09/11 A	12/09/11 A	30/11/11 A	E&M0120	
118	100m Survey (YSW)	100	24/02/11 A	24/02/11 A	21/06/11 A	E&M0160	
236	100m Survey (YSW)	100	24/02/11 A	24/02/11 A	17/10/11 A	E&M0160	
81	100m Survey (YSW)	100	10/10/11 A	29/12/11 A	29/12/11 A	E&M0150	
129	100m Survey (YSW)	100	06/09/11 A	12/01/12 A	06/09/11 A	E&M0110	
80	100m Survey (YSW)	100	12/09/11 A	12/09/11 A	30/11/11 A	E&M0120	

90	100	03/12/12 A	04/03/13 A	03/12/12 A	10/12/11 A	23/06/13	E&M0220	E&M0630	
446	65	10/12/11 A	20/03/15	10/12/11 A	11/12/11 A	14/08/13	E&M0230	E&M0330, E&M0540	
507	25	11/12/11 A	11/11/15	11/12/11 A	03/11/12 A	28/02/13 A	E&M0360, YSW0705	E&M0690	
89	100	03/11/12 A	28/02/13 A	03/11/12 A	03/12/12 A	28/02/13 A	E&M0370, YSW08302, YSW08303	E&M0690	
57	100	03/12/12 A	28/02/13 A	03/12/12 A	01/06/12 A	30/09/12 A	E&M0380, YSW05923	E&M0590, E&M0660	
122	100	01/06/12 A	30/09/12 A	01/06/12 A	23/08/13 A	23/08/13 A	E&M0390, YSW05923	E&M0660	
240	100	23/04/12 A	23/08/13 A	23/04/12 A	01/06/12 A	12/08/13 A	E&M0400, YSW05923	E&M0590, E&M0660	
122	100	01/06/12 A	12/08/13 A	01/06/12 A	23/04/12 A	12/05/13	E&M0410, YSW05923	E&M0660	Install
355	90	23/04/12 A	04/02/14	23/04/12 A	15/01/13 A	12/05/13	E&M0420, YSW07204	E&M0660, E&M0690	Install Submersible
163	90	15/01/13 A	16/01/14	15/01/13 A	29/05/12 A	09/06/13	E&M0440, YSW06023	E&M0690	Install
361	60	29/05/12 A	24/05/14	15/01/13 A	10/06/13	21/05/13 A	E&M0450, E&M0530, E&M0650,	E&M0650, E&M0690	Install
232	85	15/01/13 A	03/02/14	23/04/12 A	02/01/13 A	10/06/13	E&M0460, YSW07202	E&M0690	
213	100	23/04/12 A	21/05/13 A	02/01/13 A	10/06/13	02/01/13 A	E&M0470, YSW07055, YSW0810,	E&M0690	
74	5	02/01/13 A	11/03/14	02/01/13 A	02/01/13 A	02/01/15 A	E&M0480, YSW0810	E&M0650, E&M0680	
8	100	02/01/13 A	02/01/15 A	02/01/13 A	14/07/13	14/07/13	E&M0490, YSW0810, YSW0820	E&M0690	
180	55	02/01/13 A	10/04/15	02/01/13 A	14/07/13	14/07/13	E&M0500, YSW0705, YSW0810,	E&M0690	
180	50	02/01/13 A	11/10/15	02/01/13 A	15/06/13	21/05/13	E&M0590, YSW08302	E&M0670	
153	60	02/01/13 A	02/03/14	04/02/15 A	08/06/13	03/04/15 A	E&M0550, E&M0540, E&M0550,	E&M0670	
15	42	04/02/15 A	11/09/15	02/04/15 A	03/04/15 A	03/04/15 A	E&M0560, E&M0570, E&M0620,	E&M0690	
26	30	11/04/15 A	29/09/15	11/04/15 A	25/03/15 A	27/06/13 *	E&M0630, YSW08301, YSW1530,	E&M0730, KD0040	
1	100	02/04/15 A	03/04/15 A	18/10/15	08/06/13	08/06/13	YSW1540	KD0132	
35	45	25/03/15 A	18/10/15	04/05/16	12/12/13	27/04/14	E&M0330, E&M0690		Install Penstock
137	0	09/12/15	04/05/16	04/12/17	28/04/14	14/06/15	E&M0700		
413	0	04/05/16	04/12/17						
131	85	02/01/13 A	19/01/14	02/01/13 A	08/06/13	08/06/13	E&M0460, YSW08302	E&M0690	
16	100	17/05/10 A	01/06/10 A	17/05/10 A	01/06/10 A	01/06/10 A	KD0020	SKW0260	
14	100	02/06/10 A	15/06/10 A	02/06/10 A	15/06/10 A	15/06/10 A	SKW0250	SKW0242, SKW0265, SKW0592,	
14	100	16/06/10 A	08/07/10 A	16/06/10 A	08/07/10 A	08/07/10 A	SKW0260	SKW0242, SKW0592, SKW0681,	
in Portion G									
21	100	17/05/10 A	06/06/10 A	17/05/10 A	06/06/10 A	06/06/10 A	SKW0241, SKW0260, SKW0265	SKW0241	
9	100	07/06/10 A	15/06/10 A	07/06/10 A	15/06/10 A	15/06/10 A	SKW0242	SKW0242	
177	100	30/06/10 A	23/12/10 A	30/06/10 A	23/12/10 A	23/12/10 A	SKW0471	SKW0461	
70	100	24/12/10 A	03/03/11 A	24/12/10 A	03/03/11 A	03/03/11 A	SKW0461	SKW0471	
7	100	04/03/11 A	10/03/11 A	04/03/11 A	10/03/11 A	10/03/11 A	SKW0461	SKW0461	
14	100	11/03/11 A	24/03/11 A	11/03/11 A	24/03/11 A	24/03/11 A	SKW0471	KD0050, SKW04811, SKW0491	
37	100	25/03/11 A	30/04/11 A	25/03/11 A	30/04/11 A	30/04/11 A	SKW0481	SKW04821	
3	100	01/05/11 A	03/05/11 A	01/05/11 A	03/05/11 A	03/05/11 A	SKW04811	SKW04831	
26	100	04/05/11 A	29/05/11 A	04/05/11 A	29/05/11 A	29/05/11 A	SKW04821	SKW04841	
12	100	20/05/11 A	31/05/11 A	20/05/11 A	31/05/11 A	31/05/11 A	SKW04831	SKW04851	
14	100	01/06/11 A	14/06/11 A	01/06/11 A	14/06/11 A	14/06/11 A	SKW04841	SKW04861	
7	100	15/06/11 A	21/06/11 A	15/06/11 A	21/06/11 A	21/06/11 A	SKW04851	SKW04871	
57	100	22/06/11 A	17/08/11 A	22/06/11 A	17/08/11 A	17/08/11 A	SKW04861	SKW04881	
138	100	18/08/11 A	02/01/12 A	18/08/11 A	02/01/12 A	02/01/12 A	SKW04871	SKW04885	
7	100	03/01/12 A	06/01/12 A	03/01/12 A	09/01/12 A	09/01/12 A	SKW04881	SKW1261	

42	0	12/12/14	22/01/15	02/08/15	12/09/15	Z330	SKW0591
30	100	15/06/10 A	14/07/10 A	15/06/10 A	14/07/10 A		SKW0590
100	100	15/07/10 A	22/10/10 A	15/07/10 A	22/10/10 A		SKW0591
28	100	21/09/10 A	18/10/10 A	21/09/10 A	18/10/10 A		SKW0592
43	100	31/08/10 A	12/10/10 A	31/08/10 A	12/10/10 A		SKW0593
50	100	03/09/10 A	22/10/10 A	03/09/10 A	22/10/10 A		SKW05932
68	100	23/10/10 A	29/12/10 A	23/10/10 A	29/12/10 A		SKW059322
121	100	03/11/10 A	03/03/11 A	03/11/10 A	03/03/11 A		SKW059411
174	100	11/01/11 A	03/07/11 A	11/01/11 A	03/07/11 A		SKW05932
1	100	17/03/11 A	17/03/11 A	17/03/11 A	17/03/11 A		SKW059324
12	100	18/03/11 A	29/03/11 A	18/03/11 A	29/03/11 A		SKW059325
17	100	30/03/11 A	15/04/11 A	30/03/11 A	15/04/11 A		SKW05933
2	100	16/04/11 A	17/04/11 A	16/04/11 A	17/04/11 A		SKW059331
45	100	18/04/11 A	01/06/11 A	18/04/11 A	01/06/11 A		SKW05934
32	100	02/06/11 A	03/07/11 A	02/06/11 A	03/07/11 A		SKW05935
1	100	04/07/11 A	04/07/11 A	04/07/11 A	04/07/11 A		SKW059322, SKW05934
83	100	08/07/11 A	28/09/11 A	08/07/11 A	28/09/11 A		SKW05936
61	100	29/09/11 A	28/11/11 A	29/09/11 A	28/11/11 A		SKW05937
39	100	29/11/11 A	06/01/12 A	29/11/11 A	06/01/12 A		SKW05938
90	100	07/01/12 A	27/03/12 A	07/01/12 A	27/03/12 A		KD0060, SKW1261, SKW1311,
300	100	28/03/12 A	25/05/12 A	28/03/12 A	25/05/12 A		SKW05942
72	100	04/03/11 A	14/05/11 A	04/03/11 A	14/05/11 A		SKW059412
82	100	15/05/11 A	04/08/11 A	15/05/11 A	04/08/11 A		SKW059413
55	100	05/08/11 A	28/09/11 A	05/08/11 A	28/09/11 A		SKW059414
61	100	29/09/11 A	28/11/11 A	29/09/11 A	28/11/11 A		SKW059415
39	100	29/11/11 A	06/01/12 A	29/11/11 A	06/01/12 A		SKW059416
81	100	07/01/12 A	27/03/12 A	07/01/12 A	27/03/12 A		KD0060, SKW1311, SKW1371
61	100	26/05/12 A	31/07/12 A	26/05/12 A	31/07/12 A		SKW05943, SKW0595
60	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A		SKW05944
60	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A		SKW05945
60	100	01/08/12 A	30/09/12 A	01/08/12 A	30/09/12 A		SKW05946
60	100	10/09/12 A	28/02/13 A	10/09/12 A	28/02/13 A		SKW05947
60	100	01/11/12 A	28/02/13 A	01/11/12 A	28/02/13 A		KD0135
300	100	10/02/12 A	28/02/13 A	10/02/12 A	28/02/13 A		SKW05963
60	0	31/12/13	28/02/14	07/08/15	05/10/15	584d	SKW05942, SKW05972
120	100	10/02/12 A	08/06/12 A	10/02/12 A	08/06/12 A		SKW059631, SKW05964,
70	100	09/06/12 A	31/07/12 A	09/06/12 A	31/07/12 A		SKW05968
180	100	09/06/12 A	30/11/12 A	09/06/12 A	30/11/12 A		SKW05972
62	100	09/06/12 A	31/07/12 A	09/06/12 A	31/07/12 A		SKW05967
14	100	02/01/13 A	15/01/13 A	02/01/13 A	15/01/13 A		SKW05968
180	100	16/01/13 A	17/08/13 A	16/01/13 A	17/08/13 A		SKW05969
120	100	11/07/13 A	23/08/13 A	11/07/13 A	23/08/13 A		SKW05970
60	100	31/07/13 A	28/09/13 A	31/07/13 A	28/09/13 A		SKW05971
30	100	31/07/13 A	29/08/13 A	31/07/13 A	29/08/13 A		SKW05972
90	100	31/07/13 A	28/10/13 A	31/07/13 A	28/10/13 A		KD0165, SKW0595
60	80	20/11/13 A	11/01/14	20/11/13 A	29/01/14	18d	YSW16702, YSW1700



Construct UU & pipe

Activity	Duration	Start Date	End Date	Resources	Notes
Anchorholes (VO. No. 21A)	107	28/10/13 A	08/06/14	E&M1800	
Structure	240	14/06/11 A	08/02/12 A	SKW0721	KD0070, SKW0841
Oil & 675mm Step Channel	30	26/01/14 A	21/06/14	E&M1800, SKW0841	E&M1101, E&M1102, E&M1103, KD0165
Pumps	198	17/05/10 A	24/02/11 A	KD0020	E&M1011
In-Set	198	17/05/10 A	24/02/11 A		E&M1012
O System	198	17/05/10 A	16/07/13 A		E&M1013
SB & MCC	180	17/05/10 A	09/01/12 A		E&M1014
Instrumentation	243	17/05/10 A	12/03/12 A		E&M1015
System	243	17/05/10 A	30/09/12 A		E&M1016
System	243	17/05/10 A	07/01/14	45d	E&M1017
System	150	24/02/11 A	21/07/11 A	E&M1001	E&M1101
System	150	24/02/11 A	23/09/11 A	E&M1002	E&M1102
System	150	11/07/11 A	28/10/11 A	E&M1003	E&M1103
System & MCC	150	01/06/12 A	31/07/12 A	E&M1004	E&M1104
System	90	01/11/11 A	03/11/11 A	E&M1005	E&M1105
System	107	01/12/11 A	21/01/14	E&M1006	E&M1106
System	107	15/11/11 A	28/01/14	E&M1007	E&M1107
System	55	02/10/12 A	05/01/14	E&M1011, SKW0841	E&M1110, E&M1140
System	55	02/10/12 A	05/05/13 A	E&M1012, SKW0841	E&M1110, E&M1140
System	55	03/12/12 A	02/01/14	E&M1013, SKW0841	E&M1110, E&M1140
System	55	02/01/13 A	26/03/13 A	E&M1014, SKW0841	E&M1140
System	55	01/11/12 A	28/01/14	E&M1015, SKW0841	E&M1140
System	55	02/10/12 A	20/02/14	E&M1016, SKW0841	E&M1130, E&M1140
System	55	02/10/12 A	05/02/14	E&M1017, SKW0841	E&M1110, E&M1140
System	46	02/01/13 A	27/03/13 A	E&M1101, E&M1102, E&M1103,	E&M1120
System	28	20/02/14	20/03/14	E&M1106	E&M11800
System	43	21/05/13 A	01/03/14	E&M1101, E&M1102, E&M1103,	E&M1150
System	7	25/06/13 A	02/03/14	E&M1140	E&M1160
System	3	01/07/13 A	02/08/13 A	E&M1150	E&M1170
System	30	02/01/13 A	29/03/14	E&M1160	E&M11800
System	60	29/03/14	28/05/14	E&M0350, E&M1120, E&M1130,	SKW0722, SKW0861
2 in Portions E&H					
System	7	17/05/10 A	23/05/10 A	KD0020	SKW0891
System	7	17/05/10 A	17/05/10 A	SKW0881	SKW0892
System	30	24/05/10 A	22/06/10 A	SKW0891	SKW0901
System	90	23/06/10 A	20/09/10 A	SKW0892	SKW0921
System	14	21/09/10 A	04/10/10 A	SKW0260, SKW0265, SKW0901	SKW0931, SKW0951
System	14	05/10/10 A	18/10/10 A	SKW0921	SKW0950, SKW0951
System	66	19/10/10 A	23/12/10 A	SKW0931	SKW0951
System	169	24/12/10 A	10/06/11 A	SKW0921, SKW0931, SKW0950	SKW0971
System	90	16/01/13 A	06/01/14	SKW1081	KD0155
System	90	24/03/12 A	21/06/12 A	PRE0100, SKW1021	SKW15111
System	180	23/06/12 A	30/11/12 A	SKW1491	SKW1531

Activity	Duration	Start Date	End Date	Resources	Notes
Submission of FS System	100	17/05/10 A	24/02/11 A	E&M2011	
Submission of BS System	100	17/05/10 A	24/02/11 A	E&M2012	
Installation of Equipment	100	17/05/10 A	11/07/11 A	E&M2013	
Installation of Equipment	100	17/05/10 A	30/06/12 A	E&M2014	
Installation of Equipment	100	17/05/10 A	30/06/12 A	E&M2015	
Installation of Equipment	97	17/05/10 A	12/09/12	E&M2016	-481d
Installation of Equipment	97	17/05/10 A	04/10/12	E&M2017	-459d
Installation of Equipment	100	24/02/11 A	21/07/11 A	E&M2101	
Installation of Equipment	100	24/02/11 A	23/09/11 A	E&M2102	
Installation of Equipment	100	11/07/11 A	28/10/11 A	E&M2103	
Installation of Equipment	100	29/02/12 A	31/07/12 A	E&M2104	
Installation of Equipment	100	21/06/11 A	03/11/11 A	E&M2105	
Installation of Equipment	80	01/12/11 A	04/10/12	E&M20350, E&M2106	-481d
Installation of Equipment	80	15/01/11 A	26/10/12	E&M2107	-459d
Installation of Equipment	55	02/10/12 A	12/01/13	E&M2110	-363d
Installation of Equipment	55	01/09/12 A	05/05/13 A	E&M2110	
Installation of Equipment	55	03/12/12 A	12/01/13	E&M2110	-358d
Installation of Equipment	55	02/01/13 A	31/01/13 A	E&M2140	
Installation of Equipment	40	31/05/13 A	03/11/12	E&M2140	-455d
Installation of Equipment	45	02/10/12 A	03/11/12	E&M2140	-481d
Installation of Equipment	85	01/09/12 A	03/11/12	E&M2140	-459d
Installation of Equipment	100	02/01/13 A	31/01/13 A	E&M2101, E&M2102, E&M2103,	
Installation of Equipment	100	02/01/13 A	31/01/13 A	E&M2120	
Installation of Equipment	0	05/02/14	09/02/13	E&M2130	-389d
Installation of Equipment	80	01/02/13 A	12/11/12	KD0155	
Installation of Equipment	60	01/02/13 A	14/11/12	E&M2150	-481d
Installation of Equipment	100	01/02/13 A	25/03/13 A	E&M2160	-481d
Installation of Equipment	10	15/01/13 A	11/12/12	E&M2170	-481d
Installation of Equipment	60	07/04/14	09/02/13	E&M2180	-481d
Installation of Equipment	0	07/04/14	09/02/13	KD0155	
Installation of Equipment	180	17/05/10 A	27/08/10 A	SKW1131	
Installation of Equipment	300	01/02/11 A	28/02/11 A	SKW1231	
Installation of Equipment	213	27/07/10 A	31/12/10 A	SKW1151	
Installation of Equipment	90	15/06/11 A	30/09/11 A	SKW1171	
Installation of Equipment	90	01/09/11 A	30/09/11 A	SKW1181	
Installation of Equipment	8	06/01/12 A	07/01/12 A	SKW1191	
Installation of Equipment	7	09/01/12 A	14/01/12 A	SKW1201	
Installation of Equipment	33	16/01/12 A	16/02/12 A	SKW1211	
Installation of Equipment	13	16/01/12 A	29/02/12 A	SKW1221	
Installation of Equipment	61	31/03/12 A	31/03/12 A	SKW1211	
Installation of Equipment	50	01/05/12 A	19/06/12 A	SKW1131, SKW1221	
Installation of Equipment	16	20/06/12 A	05/07/12 A	SKW1231	
Installation of Equipment	77	01/09/12 A	16/11/12 A	SKW1241	
Installation of Equipment	180	17/05/10 A	27/08/10 A	SKW1131	
Installation of Equipment	300	01/02/11 A	28/02/11 A	SKW1231	
Installation of Equipment	213	27/07/10 A	31/12/10 A	SKW1151	
Installation of Equipment	90	15/06/11 A	30/09/11 A	SKW1171	
Installation of Equipment	90	01/09/11 A	30/09/11 A	SKW1181	
Installation of Equipment	8	06/01/12 A	07/01/12 A	SKW1191	
Installation of Equipment	7	09/01/12 A	14/01/12 A	SKW1201	
Installation of Equipment	33	16/01/12 A	16/02/12 A	SKW1211	
Installation of Equipment	13	16/01/12 A	29/02/12 A	SKW1221	
Installation of Equipment	61	31/03/12 A	31/03/12 A	SKW1211	
Installation of Equipment	50	01/05/12 A	19/06/12 A	SKW1131, SKW1221	
Installation of Equipment	16	20/06/12 A	05/07/12 A	SKW1231	
Installation of Equipment	77	01/09/12 A	16/11/12 A	SKW1241	

Removal Equipment	180	100	10/10/11 A	29/12/11 A	10/10/11 A	10/10/11 A	29/12/11 A	E&M3190	
creens	136	100	12/09/11 A	30/11/11 A	12/09/11 A	12/09/11 A	30/11/11 A	E&M3210	
3	136	100	23/06/11 A	05/09/11 A	23/06/11 A	23/06/11 A	05/09/11 A	E&M3220	
ersible Mixers	180	100	26/07/11 A	17/11/11 A	26/07/11 A	26/07/11 A	17/11/11 A	E&M3230	
b Dewatering Equipment	210	70	01/09/11 A	03/03/14	01/09/11 A	11/01/14	-51d	E&M3240	
i, Pipes & Fittings	180	70	30/08/11 A	22/02/14	30/08/11 A	19/11/13	-95d	E&M3250	
ocks	180	100	12/08/11 A	24/12/11 A	12/08/11 A	24/12/11 A		E&M3260	
enents	180	100	21/06/11 A	03/11/11 A	21/06/11 A	03/11/11 A		E&M3270	
USB	180	0	01/01/14	30/06/14	07/04/13	03/10/13	-270d	E&M3261	
upment	180	8	03/07/12 A	20/07/14	03/07/12 A	04/12/13	-227d	E&M3291	
upment	180	5	30/06/12 A	06/08/14	30/06/12 A	23/12/13	-226d	E&M3240, E&M3300	
Y STW Structure (Grid A -G)	164	100	28/03/12 A	31/08/12 A	28/03/12 A	31/08/12 A		SKW1271, SKW1371	
le Water Tank (FL +0.9 mPD)	36	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A		SKW1281	
b (Grid A-G)	46	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A		SKW1291	
to 1/F & 1/F Slab (Grid A-G)	50	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A		KD0090, SKW1301	
to R/F & R/F Slab (Grid A-G)	50	100	01/09/12 A	31/01/13 A	01/09/12 A	31/01/13 A		E&M3261, E&M3291, E&M3311,	
	105	65	01/02/13 A	05/02/14	01/02/13 A	19/06/13	-231d	E&M3261, E&M3291, E&M3311,	ABW
Y STW Structure (Grid G-N)	90	100	28/03/12 A	25/06/12 A	28/03/12 A	25/06/12 A		SKW1321, SKW1371	
r no.1 & 2 with base slabs (-2.1	42	100	26/06/12 A	30/09/12 A	26/06/12 A	30/09/12 A		SKW1331	
from B/S to G/F Slab (Grid G-N)	35	100	01/09/12 A	30/09/12 A	01/09/12 A	30/09/12 A		SKW1341	
b (Grid G-N)	35	100	01/09/12 A	17/12/12 A	01/09/12 A	17/12/12 A		SKW1351	
to 1/F & 1/F Slab (Grid G-N)	28	100	01/11/12 A	15/01/13 A	01/11/12 A	15/01/13 A		SKW1361	
to R/F & R/F Slab (Grid G-N)	35	100	01/11/12 A	03/08/13 A	01/11/12 A	03/08/13 A		SKW1351	
	54	65	05/06/13 A	18/01/14	05/06/13 A	17/05/13	-246d	SKW1361	ABWF Works
Y STW Structure (Grid N-T)	97	100	03/07/12 A	25/01/13 A	03/07/12 A	25/01/13 A		SKW1381	
ts include MBR Tank (Grid N-T)	58	100	02/10/12 A	31/01/13 A	02/10/12 A	31/01/13 A		SKW1391	
to 1/F & 1/F Slab (Grid N-T)	35	100	31/05/13 A	05/07/13 A	31/05/13 A	05/07/13 A		SKW1401	
to R/F & R/F Slab (Grid N-T)	35	100	03/07/13 A	15/09/13 A	03/07/13 A	15/09/13 A		E&M3240, SKW0491, SKW1421	
	60	45	06/08/13 A	20/02/14	06/08/13 A	19/06/13	-246d	E&M3240, SKW1551	
1-SSMH7)	35	0	20/02/14	27/03/14	20/06/13	24/07/13	-246d	SKW1561	
MFH2, SMFH3-SMFH7)	220	0	27/03/14	02/11/14	25/07/13	01/03/14	-246d	SKW1571	
age Channel (SKW)	220	0	02/11/14	10/06/15	02/03/14	07/10/14	-246d	KD0090	
Modules in MBR Tank No. 1 to 2	100	0	18/01/14	28/04/14	07/01/14	16/04/14	-12d	E&M3311	
al Equipment	60	0	19/03/14	18/05/14	21/09/13	19/11/13	-180d	E&M3250, E&M3320	
ns	60	0	18/01/14	19/03/14	24/05/13	22/07/13	-240d	E&M3190, E&M3220, E&M3250, E&M3260, E&M3320	
le Mixers	75	0	19/03/14	02/06/14	23/07/13	05/10/13	-240d	E&M3230, E&M3250, E&M3260,	
dewatering Equipment	45	0	02/06/14	17/07/14	06/10/13	19/11/13	-240d	E&M3250, E&M3260, E&M3311,	
es & Fittings	74	0	04/03/14	16/05/14	12/01/14	26/03/14	-51d	E&M3320	
	75	0	17/07/14	30/09/14	20/11/13	02/02/14	-240d	E&M3100, E&M3190, E&M3210, E&M3220, E&M3250	
C & LVSB	135	10	05/03/14 A	16/11/14	05/03/14 A	16/04/14	-213d	E&M3311	
	174	0	30/06/14	21/12/14	04/10/13	26/03/14	-270d	E&M3311, E&M3320	
	60	0	30/09/14	29/11/14	16/02/14	16/04/14	-227d	E&M3311	

Item	Quantity	Start Date	End Date	Duration	Notes
Delivery of Cables and Cable Termination	21	06/02/15	27/02/15	-270d	E&M3330, E&M3340, E&M3361
Performance Tests of Equipment	1	27/02/15	28/02/15	-270d	E&M3331
	35	28/02/15	04/04/15	-270d	E&M3291, E&M3300, E&M3311, E&M3359
	91	04/04/15	04/07/15	-270d	E&M3291, E&M3300, E&M3310, E&M3311, E&M3331, SKW1241, E&M3360
Period	456	04/07/15	15/12/16	252d	E&M3370, KD0090
Delivery of DI pipes	120	17/05/10 A	13/09/10 A		E&M3360
ChB1+20	300	14/09/10 A	10/07/11 A		KD0020
Preserving Main (ChB0+00 - ChA4+55)	250	11/07/11 A	24/01/14	256d	PRE0100, SKW1481
Works in All Portions	21	17/05/10 A	06/06/10 A		SKW1501
Protection of Trees	1053	17/05/10 A	10/01/14	-282d	KD0020
at SKW	90	07/06/10 A	04/09/10 A		SKW1591
Works in All Portions	365	10/01/14	10/01/15	-282d	SKW1611
Establishment Works					

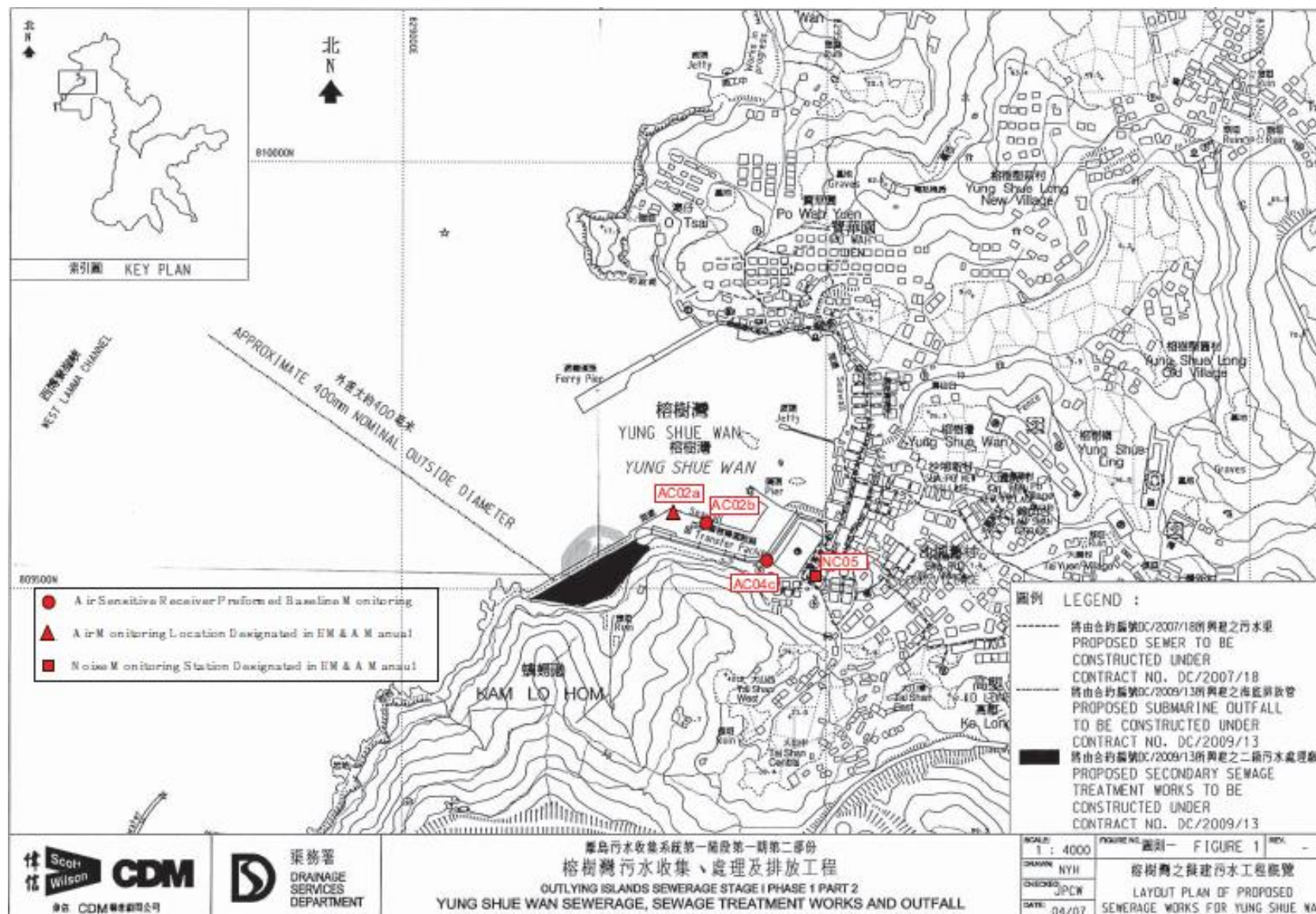
Twin DNI150

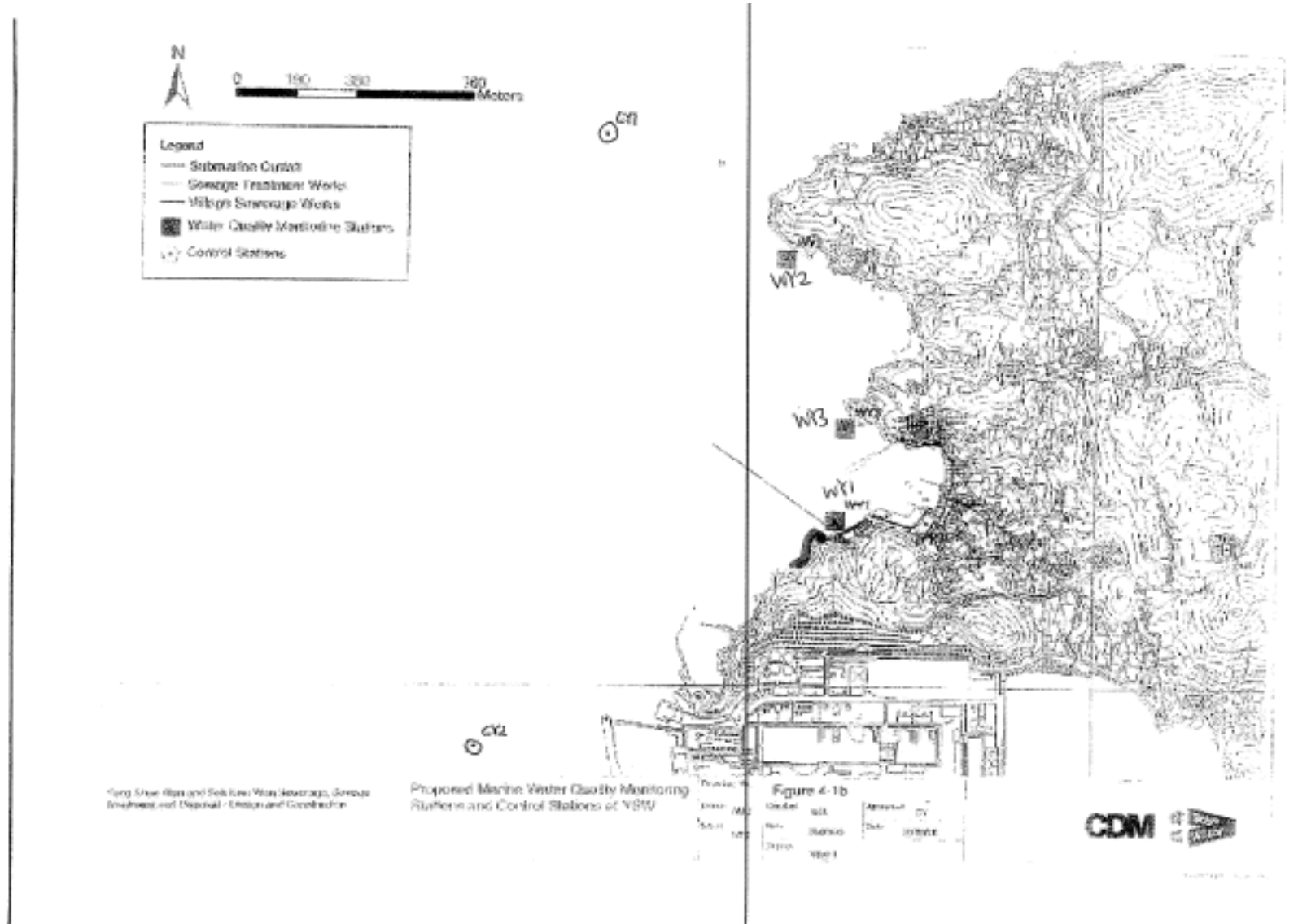
Preservation & Protection



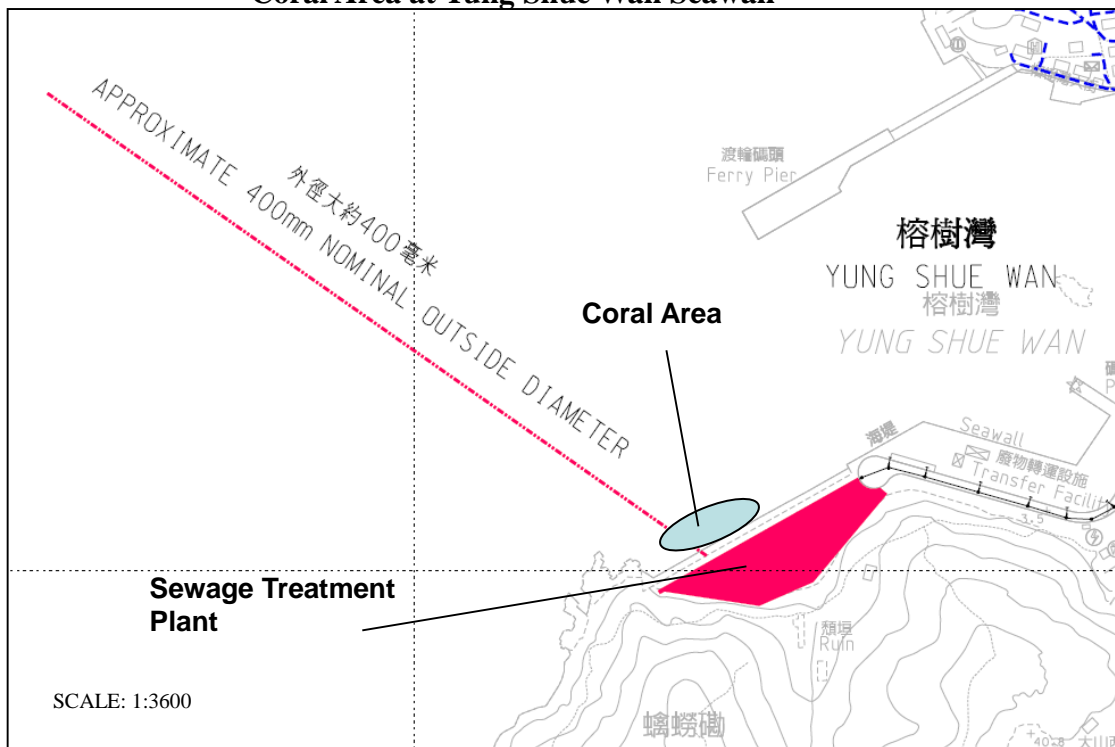
Appendix D

Location of Monitoring Stations (Air Quality / Construction Noise / Marine Water Quality / Ecology)

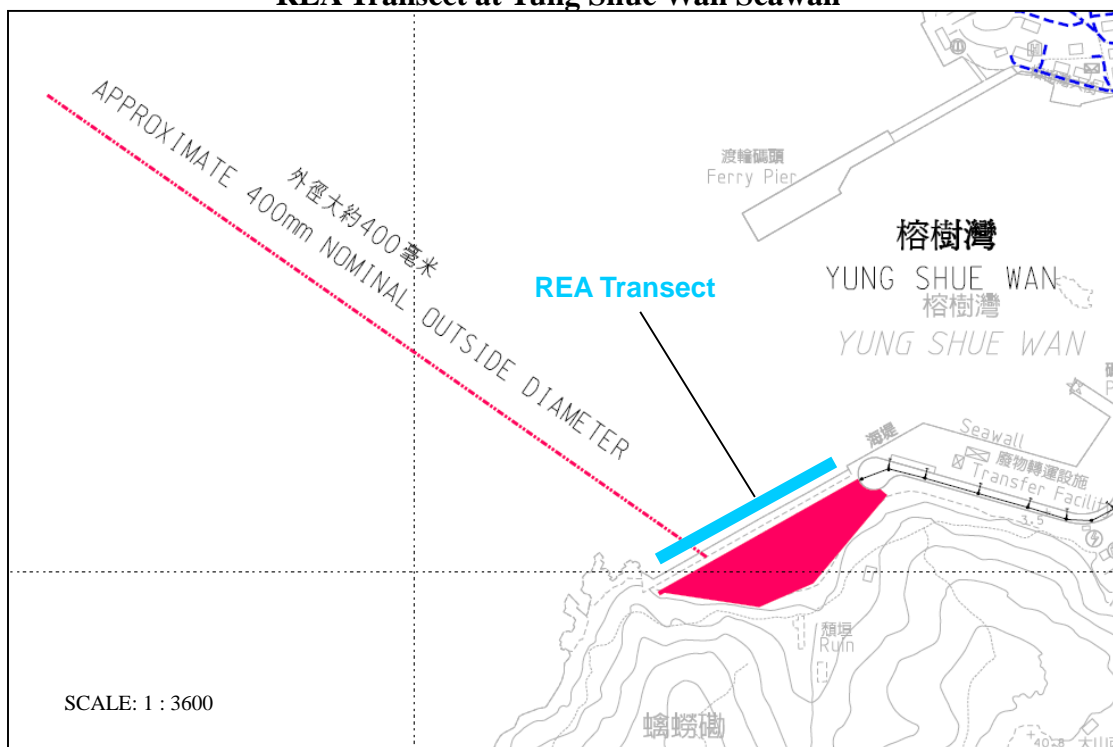




Coral Area at Yung Shue Wan Seawall



REA Transect at Yung Shue Wan Seawall



Coral Area at Sham Wan



REA Transect at Sham Wan

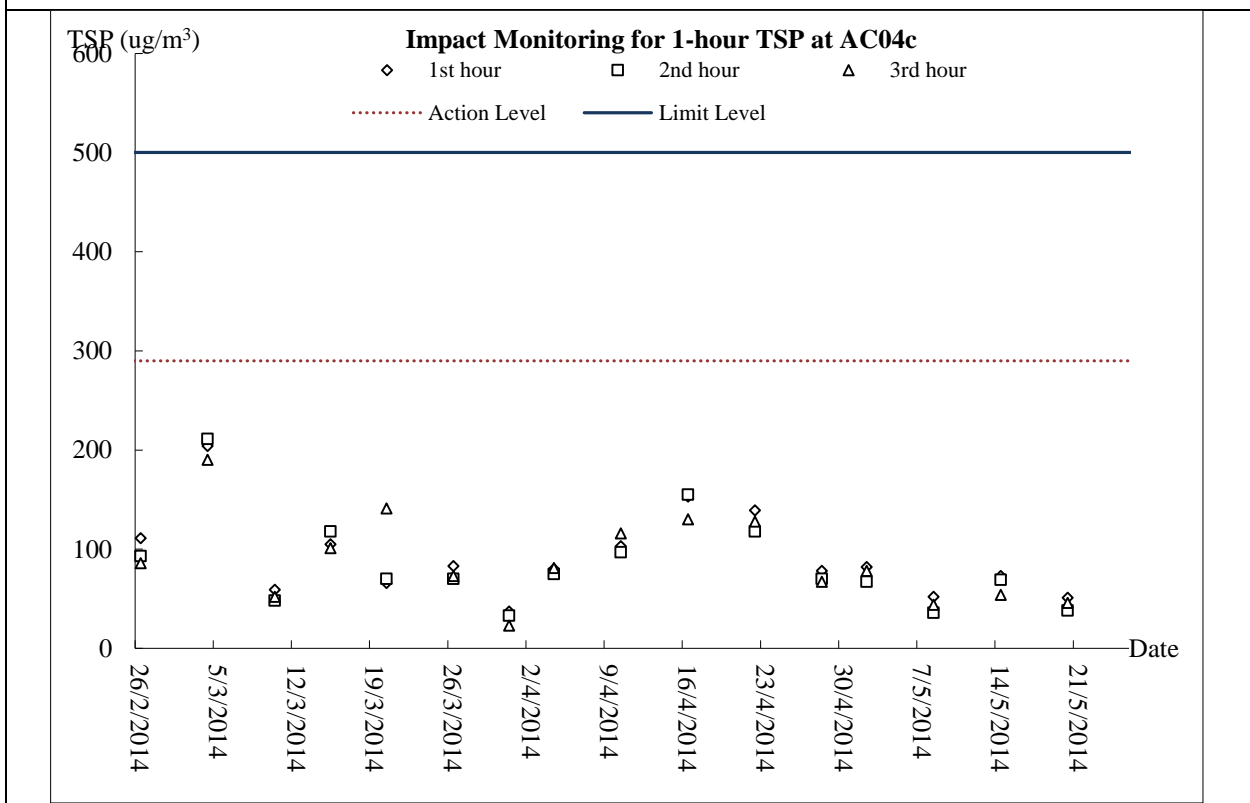
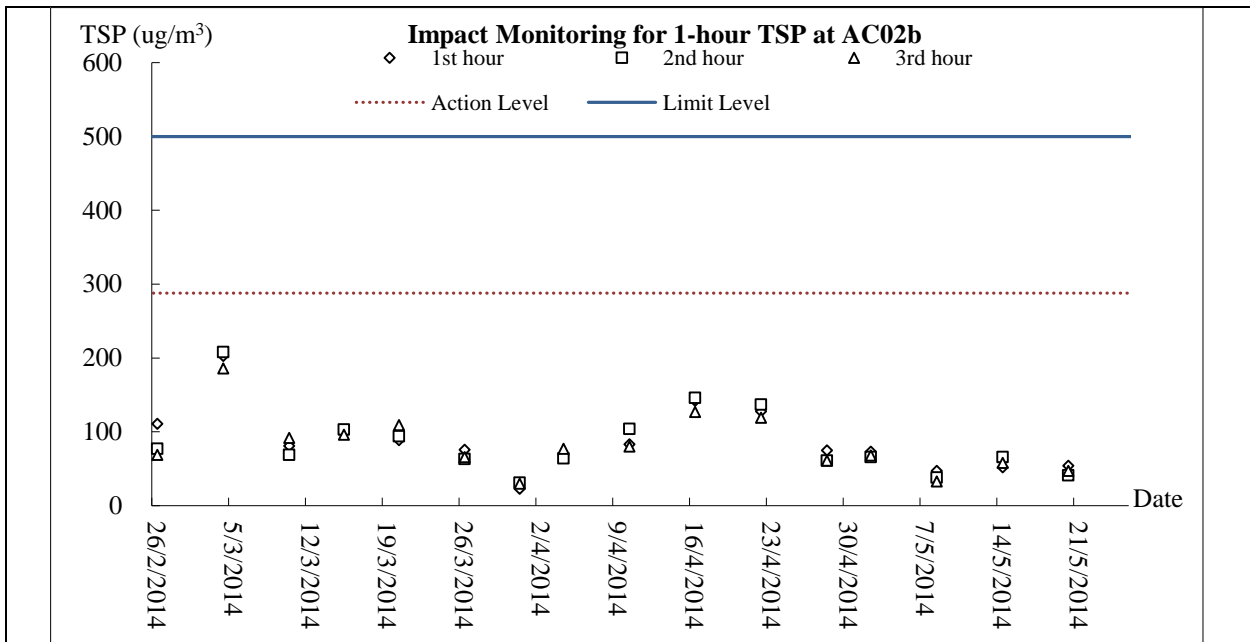


Appendix E

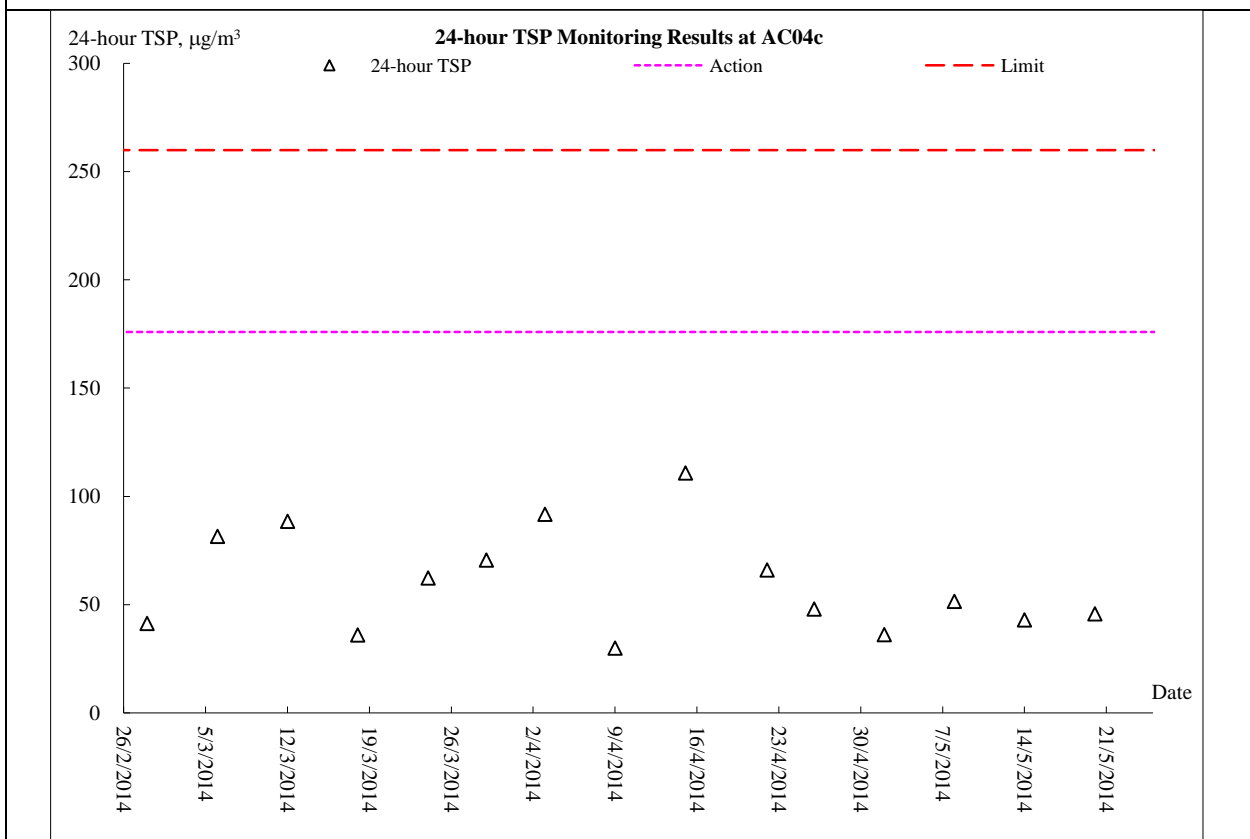
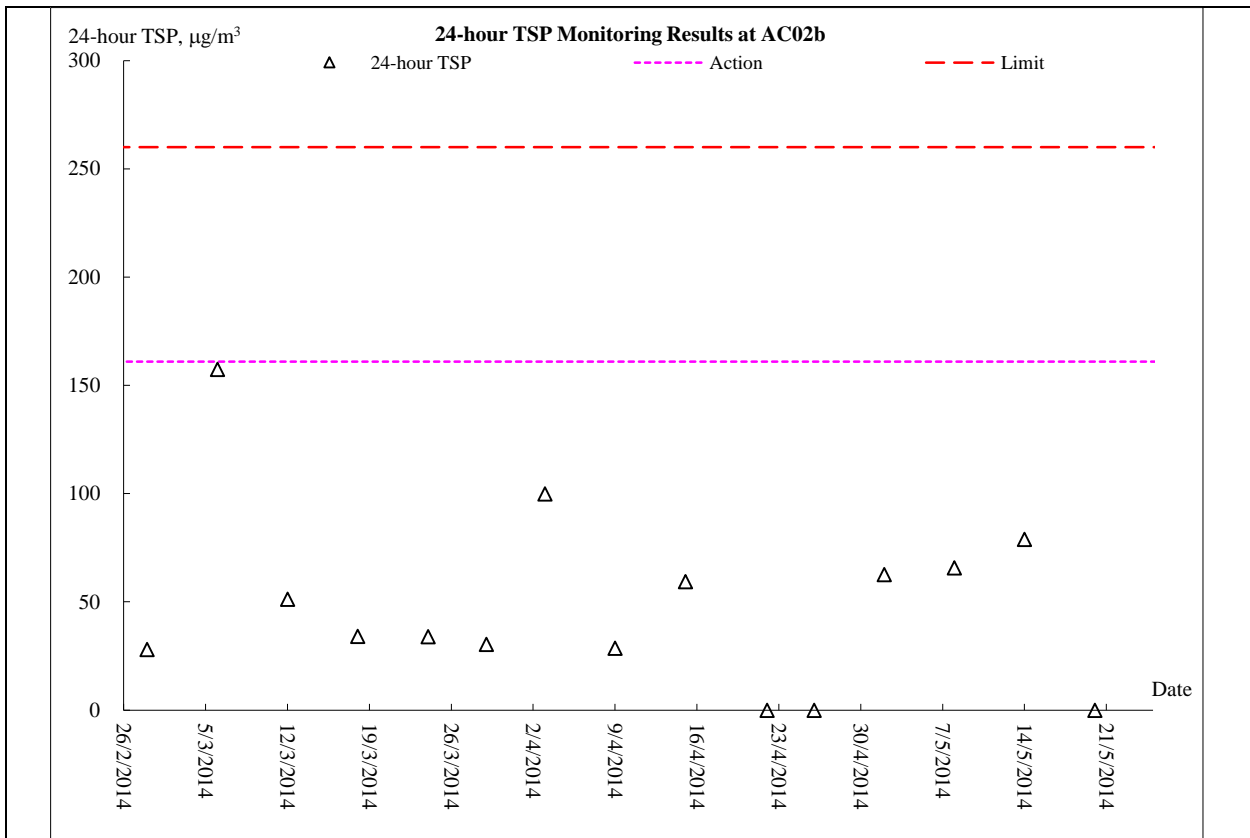
Graphical Plots of Impact Monitoring

- 1. Air Quality**
- 2. Construction Noise**
- 3. Marine Water Quality**

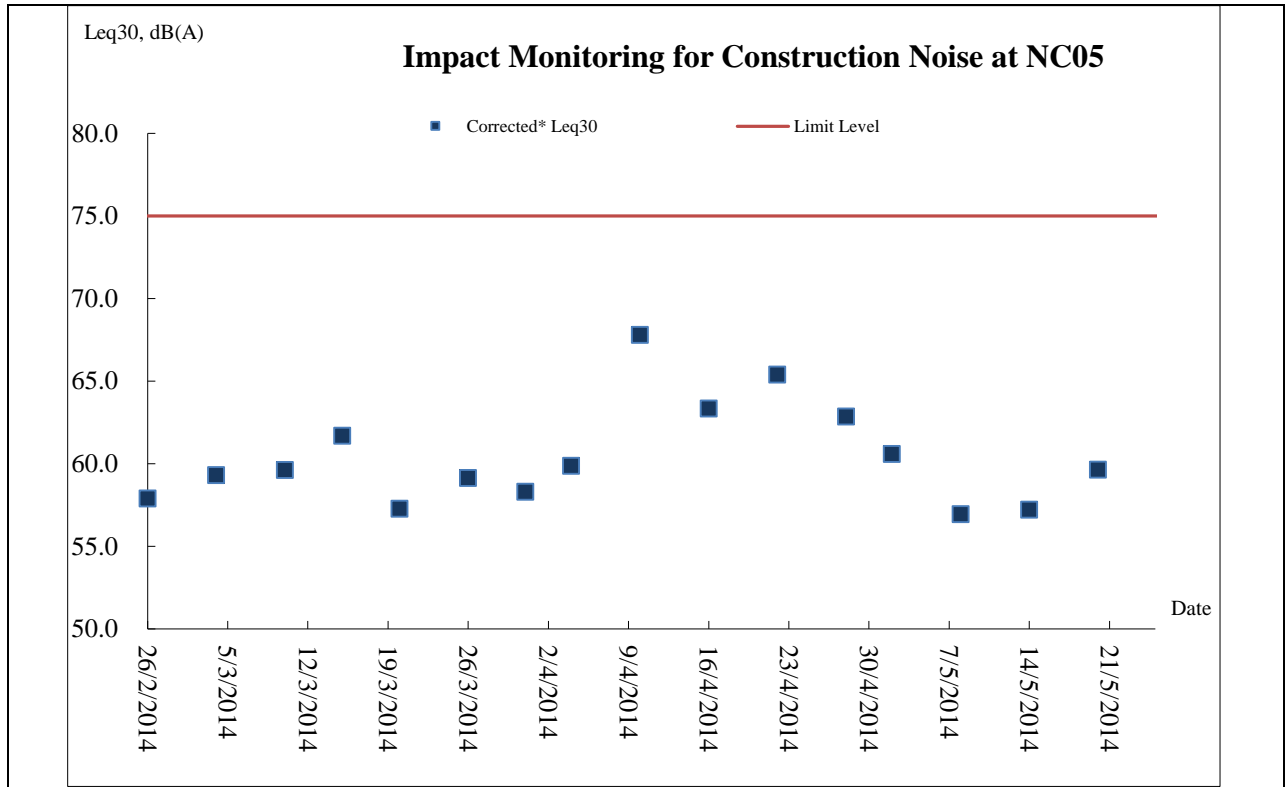
Air Quality – 1-hour TSP Monitoring



Air Quality – 24-hour TSP Monitoring



Construction Noise



Appendix F

Meteorological Information

Meteorological condition – March 2014

March 2014 was characterized by gloomy weather during the first-half of the month and heavy rain episodes towards the end of the month. While the monthly total duration of bright sunshine of 86.0 hours was slightly below normal by 5 percent, there were only 5.0 hours of bright sunshine from 1 to 15 March. The month was also cooler and wetter than usual. The monthly mean temperature of 18.7 degrees was 0.4 degree below the normal figure of 19.1 degrees. The total rainfall of the month was 207.6 millimetres, more than double of the normal figure of 82.2 millimetres. About 99 percent of the monthly rainfall fell between 29 and 31 March. The accumulated rainfall of 247.1 millimetres since 1 January was about 53 percent above the normal figure of 161.3 millimetres for the same period.

Meteorological condition– April 2014

The weather of April 2014 was drier and sunnier than usual. The total rainfall of the month was 132.4 millimetres, about 24 percent below the normal figure of 174.7 millimetres. However, the accumulated rainfall since 1 January of 379.5 millimetres was about 13 percent above the normal figure of 336.1 millimetres for the same period. The total duration of bright sunshine of the month was 119.4 hours, about 17 percent above the normal figure of 101.7 hours. The mean temperature of 22.6 degrees for the month was on par with normal. Under the influence of a trough of low pressure, the weather was cloudy with showers and a few squally thunderstorms in Hong Kong for the first three days of the month. Rainfall was heavy at times, exceeding 50 millimetres at some places in the territory. Hail was reported at Yuen Long, Sheung Shui and Fanling during the passage of thunderstorms on the night of 2 April.

Meteorological condition– May 2014

May 2014 was characterized by gloomy and rainy conditions during the first part of the month and persistent hot weather in the latter part. The total rainfall of 687.3 millimetres was more than double the normal amount for May and the seventh highest May rainfall on record. The accumulated rainfall since 1 January of 1066.8 millimetres was about 67 percent above the normal figure of 640.7 millimetres for the same period. With about three quarters of the sunshine occurring in the second half of the month, the total duration of bright sunshine of the month was 107.8 hours, about 23 percent below the normal figure of 140.4 hours. Sunny and hot weather in the last week of the month also brought the average temperature for the month up to 26.4 degrees, half a degree above the normal figure of 25.9 degrees.

Note: please refer to the monthly EM&A report (March – May 2014) for the weather details on each successive day.

Appendix G

Monthly Summary Waste Flow Table

Monthly Summary Waste Flow Table for May 2014

Month	Actual Quantities of Inert C&D Materials Generated Monthly												Actual Quantities of C&D Wastes Generated Monthly									
	Total Quantity Generated (a) = (c)+(d)+(e)		Hard Rock and Large Broken Concrete (b)		Reused in the Contract (c)		Reused in other Projects (d)		Disposed as Public Fill (e)		Imported Fill (f)		Metals		Paper/ cardboard packaging		Plastics		Chemical Waste		Others, e.g. rubbish	
	(in '000m ³)		(in '000m ³)		(in '000m ³)		(in '000m ³)		(in '000m ³)		(in '000m ³)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in tonne)	
	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW
2014	15.933	50.762	0.160	0.432	0.740	2.802	0.000	0.000	15.194	47.960	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	487.580	290.030
Jan	0.342	0.325	0.000	0.005	0.000	0.000	0.000	0.000	0.342	0.325	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.480	4.820
Feb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.110	4.300
Mar	0.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.150	4.340
Apr	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.030	3.900
May	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	35.810	4.180
Jun																						
Sub-total	16.581	51.087	0.160	0.442	0.740	2.802	0.000	0.000	15.841	48.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	555.160	311.570
Jul																						
Aug																						
Sep																						
Oct																						
Nov																						
Dec																						
Total	16.581	51.087	0.160	0.442	0.740	2.802	0.000	0.000	15.841	48.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	555.160	311.570
	67.668		0.602		3.542		0.000		64.126		0.000		0.000		0.000		0.000		0.000		866.730	

Remark: Assume 1.0 m³ vehicle dump load = 1.6 tonnes C&D materials

YSW: Yung Shue Wan

SKW: Sok Kwu Wan

Appendix H

Implementation Schedule of Mitigation Measures

Implementation Schedule of Air Quality Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.3.18	2.10.2	Adopting the following good site practices and follow the dust control requirements of the Air Pollution Control (Construction Dust) Regulation: <ul style="list-style-type: none"> • Stockpiles of imported material kept on site should be contained within hoardings, dampened and / or covered during dry and windy weather; • Material stockpiled alongside trenches should be covered with tarpaulins whenever works are close to village houses; • Water sprays should be used during the delivery and handling of cement, sands, aggregates and the like. • Any vehicle used for moving sands, aggregates and construction waste should have properly fitting side and tail boards. Materials should not be loaded to a level higher than the side and tail boards, and should be covered by a clean tarpaulin. 	Work site / during construction	All contractors		√		TM- EIAO, APCO, Air Pollution Control (Construction Dust) Regulation
2.10.3	Section 2	1 hour and 24 hour dust monitoring and site audit	Designated air monitoring locations / throughout construction period	Contractor/ Environmental Team		√		EM&A Manual

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** D=Design, C=Construction, O=Operation

N/A Not applicable

Implementation Schedule of Noise Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location/Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.4.16	3.8.2	Implementation of following measures during the sewer construction: <ul style="list-style-type: none"> • Use of quiet PME or method; • Restriction on the number plant (1 item for each type of plant); and • Good Site Practices <ul style="list-style-type: none"> ➤ Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme. ➤ Mobile plant, if any, should be sited as far away from NSRs as possible. ➤ Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. ➤ Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. ➤ Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities. 	Work site /during the construction of Sewer.	Contractor		√		EIAO-TM, NCO
2.10.5 to 2.10.9	Section 35	Noise monitoring	Designated noise monitoring locations / throughout construction period	Contractor/ Environmental Team		√		EM&A Manual

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** D=Design, C=Construction, O=Operation

N/A Not applicable

Implementation Schedule of Water Quality Control Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location (duration /completion of measures)	Implementation Agent	Implementation Stages**			Relevant Legislation and Guidelines
					D	C	O	
Construction Phase								
2.5.23	4.12.1	No-dig method using Horizontal Directional Drilling (HDD) would be used for the installation of main portion of outfall pipes	Marine works site / During construction of submarine outfall	Contractor		√		
4.5.38	4.12.3	Dredging Works Implementation of following measures during the dredging works: <ul style="list-style-type: none"> dredging should be undertaken using closed grab dredgers with a maximum total production rate of 55m³/hr; deployment of 2-layer silt curtains with the first layer enclosing the grab and the second layer at around 50m from the dredging area while dredging works are in progress; dredging operation should be undertaken during ebb tide only; all vessels should be sized such that adequate clearance (i.e. minimum clearance of 0.6m) is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; all pipe leakages should be repaired promptly and plant should not be operated with leaking pipes; excess material should be cleaned from the decks and exposed fittings of barges before the vessel is moved; adequate freeboard (i.e. minimum of 200mm) should be maintained on barges to ensure that decks are not washed by wave action; all barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; loading of barges should be controlled to prevent splashing of dredged material to the surrounding water, and barges should not be filled to a level which will cause the overflow of materials or polluted water during loading or transportation; and 	Marine works site and at the identified water sensitive receivers/ During construction	Contractor		√		

		<ul style="list-style-type: none"> the decks of all vessels should be kept tidy and free of oil or other substances that might be accidentally or otherwise washed overboard. 						
2.5.39	4.12.4	<p><u>Construction Run-off and Drainage</u></p> <p>Implementation of the following site practices outlined in ProPECC PN 1/94 for “Construction Site Drainage”</p> <ul style="list-style-type: none"> Provision of perimeter channels to intercept storm-runoff from outside the site. These should be constructed in advance of site formation works and earthworks. Works programmes should be designed to minimize works areas at any one time, thus minimizing exposed soil areas and reducing the potential for increased siltation and runoff. Sand / silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove the sand / silt particles from run-off. These facilities should be properly and regularly maintained. These facilities should be carefully planned to ensure that they would be installed at appropriate locations to capture all surface water generated on site. Careful programming of the works to minimise soil excavation works during rainy seasons. Exposed soil surface should be protected by paving or hydroseeding as soon as possible to reduce the potential of soil erosion. Trench excavation should be avoided in the wet season, and if necessary, these should be excavated and backfilled in short sections. Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric 	Construction works sites	Contractor		√		ProPECC PN 1/94
2.5.39	4.12.5	<p><u>General Construction Activities</u></p> <ul style="list-style-type: none"> Debris and rubbish generated on-site should be collected, handled and disposed of properly to avoid entering the nearby coastal waters and stormwater drains. 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. 	Construction works sites	Contractor		√		

		<ul style="list-style-type: none"> Open drainage channels and culverts near the works areas should be covered to block the entrance of large debris and refuse. 						
2.5.39	4.12.6	<u>Wastewater Arising from Workforce</u> Portable toilets should be provided by the Contractors, where necessary, to handle sewage from the workforce. The Contractor should also be responsible for waste disposal and maintenance practices.	Construction works sites	Contractor		√		
2.10.10	Section 4	Water quality monitoring	Designated water monitoring locations/ throughout construction period	Contractor		√		EM&A Manual

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** D=Design, C=Construction, O=Operation

N/A Not applicable

Implementation Schedule of Sediment Contamination Mitigation Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
2.9.24	5.2.1	Carrying out Sediment Quality Investigation	Marine works site / prior to construction	DSD	√			WBTC No. 34/2002
2.9.23	5.2.1	Follow the requirement and procedures for dredged mud disposal specified under the WBTC No. 34/2002.	Marine works site / during dredging works	Contractor		√		WBTC No. 34/2002
2.9.23	5.2.2	Implement appropriate dredging methods which have been incorporated into the recommended water quality mitigation measures.	Marine works site, during dredging works	Contractor		√		
2.9.23	5.2.3	During the transportation and disposal of the dredged sediment, the following measures should be taken: <ul style="list-style-type: none"> Bottom opening of barges should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved. Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels should be equipped with automatic self monitoring devices as specified by the DEP. 	Marine works site and at the identified sensitive receivers	Contractor		√		

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** D=Design, C=Construction, O=Operation

N/A Not applicable

Implementation Schedule of Solid Waste Management Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.9.14	6.6.2	<u>Good site practices</u> <ul style="list-style-type: none"> Nomination of an approved person, such as a site manager, to be responsible for implementation of good site practices, arranging for collection and effective disposal to an appropriate facility, of all wastes generated at the site Training (proper waste management and chemical handling procedure) should be provided for site staffs Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers. Provision of sufficient waste disposal points and regular collection for disposal. Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility. Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. Maintain records of the quantities of wastes generated, recycled and disposed. 	Work sites/During construction	Contractor		√		Waste Disposal Ordinance (Cap.54)
2.9.15	6.2.3	The Contractor will be required to open a billing account under the Construction Waste Disposal Charging Scheme, and to pay for disposal of all construction waste. The construction waste will be sent to a designated reception facility, which in this case will be YSW RTS, where drivers must present a valid chit for disposal of each load.	Work sites/During construction	Contractor		√		Waste disposal (Amendment) Ordinance 2004
2.9.16	6.2.4	Recommendations to achieve waste reduction include: <ul style="list-style-type: none"> 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 encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to 	Work sites/During construction	Contractor		√		WBTC No. 4/98, 5/98

		<p>segregate this waste from other general refuse generated by the work force;</p> <ul style="list-style-type: none"> any unused chemicals or those with remaining functional capacity should be recycled; use of reusable non-timber formwork to reduce the amount of C&D material; prior to disposal of C&D waste, it is recommended that wood, steel and other metals should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill; proper storage and site practices to minimise the potential for damage or contamination of construction materials; and plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. 						
2.9.18	6.2.5	<p><u>General Site Wastes</u></p> <ul style="list-style-type: none"> A collection area for construction site waste should be provided where waste can be stored prior to removal from site An enclosed and covered area for the collection of the waste is recommended to reduce ‘wind blow’ of light material 	Work sites/During construction	Contractor		√		Public Health and Municipal Services Ordinance (Cap. 132)
2.9.19	6.2.6 and 6.2.7	<p><u>Chemical Wastes</u></p> <ul style="list-style-type: none"> After use, chemical waste should be handled according to the Code of Practice on the Package, Labelling and Storage of Chemical Wastes Any unused chemicals or those with remaining functional capacity should be recycled Waste should be properly stored on site within suitably designed containers and should be collected by an approved licensed waste collectors for disposal at the Chemical Waste Treatment Facility or other licenced facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation under the Waste Disposal Ordance. Any service shop and minor maintenance facilities should be located on hard standing within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should be undertaken 	Work sites/During construction	Contractor		√		Waste Disposal (Chemical Waste) (General) Regulation, Code of Practice on the Packaging Labelling and Storage of Chemical Wastes

		within the designated areas equipped control these discharges						
2.9.21 and 2.9.22	6.2.8 and 6.2.9	<p><u>Construction and Demolition Material</u></p> <ul style="list-style-type: none"> • The C&D waste should be separated on-site into three categories: <ul style="list-style-type: none"> ➤ public fill, the inert portion of the C&D material (e.g. concrete and rubble), which should be re-used on-site or disposed of at a public filling area; ➤ C&D waste for re-use and / or recycling, the non-inert portion of the C&D material, (e.g. steel and other metals, woods, glass and plastic); ➤ C&D waste which cannot be re-used and / or recycled (e.g. wood, glass and plastic) • Where possible, inert material should be re-used on-site • Where practicable, steel and other metals should be separated for re-use and/or recycling prior to disposal of C&D material 	During all construction phases	Contractors		√		WBTC No. 4/98, 5/98, 21/2002, 25/99, 12/2000

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** D=Design, C=Construction, O=Operation

N/A Not applicable

Implementation Schedule of Ecological Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.10.11 and 2.10.12	7.2 and 7.3	Carry out monitoring of corals before, during and after marine works.	Work sites / during construction phase	Contractor		√		
2.6.45 to 2.6.48	7.6.1	Use horizontal directional drilling to avoid direct disturbance to corals	Marine works site / during dredging works	Contractor		√		
2.6.57 to 2.6.58	4.12.3	Deploying of 2-layer silt curtains with the first layer enclosing the grab and the second layer at around 50m from the dredging area while dredging works are in progress	All work sites / during construction phase	Contractor		√		
2.6.51	7.6.1	Fence off the slope stabilisation works area from surrounding shrubland and/ woodland, to prevent access to or disturbance of adjacent habitats. The works area should be as small as is possible, consistent with the requirements of the works.	STW/ During construction	Contractor		√		

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** D=Design, C=Construction, O=Operation

N/A Not applicable

Implementation Schedule of Fisheries Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
2.5.37	4.12.4	Use of closed grab dredging and silt curtains around the immediate dredging area and low dredging rates as recommended in Water Quality of the EIA report	Marine works site, during dredging works	Contractor		√		TM on EIA Process

* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

** D=Design, C=Construction, O=Operation

N/A Not applicable

Implementation Schedule of Landscape and Visual Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.8.37	9.2.2	Careful and efficient transplanting of affected trees to temporary or final transplant location (the proposed tree to be transplanted is a semi-mature <i>Macaranga tanarius</i> and is located at the proposed Pumping Station P2 location).	All sites	Contractor		√		WBTC No. 14/2002
2.8.37	9.2.2	Short excavation and immediate backfilling sections upon completion of works to reduce active site area.	All sites	Contractor		√		
2.8.37	9.2.2	Screening of site construction works by use of hoarding that is appropriate to its site.	All sites	Contractor		√		WBTC No. 19/2001
2.8.37	9.2.2	Conservation of topsoil for reuse.	All sites	Contractor		√		
2.8.30	9.2.2	Night-time light source from marine fleets should be directed away from the residential units.	Outfall area	Contractor		√		

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** D=Design, C=Construction, O=Operation

N/A Not applicable