


KWAN ON CONSTRUCTION CO. LTD.

**Contract No. YL/2009/01
Hang Hau Tsuen Channel
at Lau Fau Shan**

**Quarterly Environmental Monitoring and Audit
Report
September 2011 to November 2011 (Version 1.0)**

Certified By 
(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

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EXECUTIVE SUMMARY

1. This is the Seventh Quarterly Environmental Monitoring and Audit (EM&A) Summary Report prepared by Cinotech Consultants Limited (the Environmental Team, ET) for CEDD's Civil Contract No. YL/2009/01 "Hang Hau Channel at Lau Fau Shan" under an Environmental Permit (Permit No. EP-343/2009). This report documents the findings of EM&A Works conducted in September 2011 to November 2011.
2. The construction activities undertaken in the reporting quarter included:
 - Site Clearance works;
 - Construction of Retaining Walls (Bays 18-19, north and Type L2 & Type L5 at car-park);
 - Construction of stone wall;
 - Construction the U-channel, type II railing, catchpits and pipelaying;
 - Construction of outstanding section of low flow channel with precast concrete edge blocks;
 - Construction of pedestrian ramp/ staircase;
 - Construction of Ramp A & F completed, Ramp B & G in progress;
 - Construction of low flow channel in progress – majority completed (99%);
 - Constructions of stonewall facing to channel in progress;
 - Construction of drainage works - 450 dia. Pipe in progress;
 - Construction of precast grasscrete slab maintenance access in progress;
 - U-channel & catch pit construction in progress;
 - Backfilling work behind retaining wall in progress;
 - Type II railing installation in progress;
 - Diversion of CLP cable at new road junction completed;
 - Mainlaying installation work at (access ramp) of Bridge A completed;
 - Tree transplanting work in progress;
 - Construction of stair at Bridge A completed; and
 - Proposed UU U/G duct work in progress.

Environmental Monitoring and Audit Works

3. Environmental monitoring and audit works for the Project was performed regularly as stipulated in the Project Specific EM&A Manual and the results were checked and reviewed. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
4. Summary of the events and action taken in the reporting quarter is tabulated in Table 1.1.

Table 1.1 Summary Table for Events Recorded in the Reporting Quarter

Parameter	No. of Exceedance		No. of Events Due to this Project	Action Taken
	Action Level	Limit Level		
1-hr TSP	0	0	0	N/A
24-hr TSP	0	0	0	N/A
Noise	0	0	0	N/A
Water	0	0	0	N/A

Air Quality

1-hr TSP Monitoring

5. All 1-hour TSP monitoring was conducted as scheduled in the reporting quarter. No Action / Limit Level exceedance was recorded in the reporting quarter.

24-hr TSP Monitoring

6. All 24-hour TSP monitoring was conducted as scheduled in the reporting quarter. No Action / Limit Level exceedance was recorded in the reporting quarter.

Construction Noise

7. All construction noise monitoring was conducted as scheduled in the reporting quarter. No Action / Limit Level exceedance was recorded in the reporting quarter.

Water Quality

8. All water quality monitoring was conducted as scheduled in the reporting quarter. No Action / Limit Level exceedance was recorded in the reporting quarter.

Environmental Complaint and Prosecution

9. No environmental complaint, prosecution or notification of summons was received in this reporting quarter.

Environmental Licensing and Permitting

10. Licenses/Permits granted to the Project include the Environmental Permit (EP); waste water discharge license and Waste Producer under Waste Disposal (Chemical Waste) (General) Regulation for the Project were in place and valid during the reporting quarter. Permits under Dumping at Sea Ordinance with No. EP/MD/11-006 and EP/MD/11-045 are expired.

Future Key Issues

11. Major site activities for the coming quarter include:
- Construction of pedestrian ramp G; B; C; D & E;
 - NS 90 PE pipe laying;
 - DN150 DI pipe installation at access road;
 - Construction of grasscrete slab;
 - Construction of pedestrian ramp;
 - Relocation of gauging station;
 - Backfilling behind retaining walls & Subsoil drain installation;
 - Construction of drainage works (1200 dia. pipe, outfall pipes, U-channels, catch-pits & manholes);
 - Noise insulation works at SR 37 in Yuen Long Areas 13 & 14;
 - Arrange UU to carry out lowering of existing services at road Junction D. B. Road; and
 - Proposed UU U/G duct work in progress.

12. The major noise sources identified at the designated noise monitoring stations were road noise, construction noise and human activities.
13. The major dust sources identified at the monitoring stations were mainly generated when loading materials and vehicles movement.
14. No major water polluting sources were identified at the designated water quality monitoring stations.

1 INTRODUCTION

Background

- 1.1 The Project comprises the construction of the Hang Hau Tsuen Channel and associated works to improve the local drainage systems in the Hang Hau Tsuen area. The Project is located in Hang Hau Tsuen at Lau Fau Shan, North West New Territories. It is located between Deep Bay Road and Deep Bay. The general location plan of the Project is shown in **Figure 1**.
- 1.2 The Project is a designated project (Register No. : AEIAR-134/2009) and an Environmental Permit (Permit No. EP-343/2009) was issued on 21st May 2009 to the Civil Engineering and Development Department (hereinafter called the CEDD) as the Permit Holder.
- 1.3 The implementation programme for the Project is tentatively expected to start in end 2009 for completion by end 2012.
- 1.4 Kwan On Construction Company Limited (hereafter called the Contractor) was commissioned by the CEDD to undertake the construction of the Contract No. YL/2009/01 “Hang Hau Channel at Lau Fau Shan”
- 1.5 Cinotech Consultants Limited was commissioned by Kawn On Construction Co. Ltd. to undertake the Environmental Monitoring and Audit (EM&A) works for “Hang Hau Tsuen Channel at Lau Fau Shan” and was appointed as the Environmental Team (ET) of the Project under Condition 2.1 of the EP.
- 1.6 This is the seventh quarterly EM&A report summarizing the EM&A works conducted for the Project in September 2011 to November 2011.

2 PROJECT CHARACTERISTICS

Project Organization and Contacts of Key Management

2.1 Different parties with different levels of involvement in the project organization include:

- Project Proponent - Civil Engineering & Development Department (CEDD).
- Engineer's Representative (ER) - Black & Veatch Hong Kong Ltd (B&V).
- Environmental Team (ET) - Cinotech Consultants Limited (Cinotech).
- Independent Environmental Checker (IEC) - ENVIRON Hong Kong Limited (ENVIRON).
- Contractor - Kwan On Construction Co. Ltd. (Kwan On).

2.2 The key contacts of the Project are shown in **Appendix A** and the organization chart of ET is shown in **Figure 5**.

Construction Programme and Synopsis of Work

2.3 The construction programme is presented in **Appendix B**. The site activities undertaken during the reporting quarter included:

- Site Clearance works;
- Construction of Retaining Walls (Bays 18-19, north and Type L2 & Type L5 at car-park);
- Construction of stone wall;
- Construction the U-channel, type II railing, catchpits and pipelaying;
- Construction of outstanding section of low flow channel with precast concrete edge blocks;
- Construction of pedestrian ramp/ staircase;
- Construction of Ramp A & F completed, Ramp B & G in progress;
- Construction of low flow channel in progress – majority completed (99%);
- Constructions of stonewall facing to channel in progress;
- Construction of drainage works - 450 dia. Pipe in progress;
- Construction of precast grasscrete slab maintenance access in progress;
- U-channel & catch pit construction in progress;
- Backfilling work behind retaining wall in progress;
- Type II railing installation in progress;
- Diversion of CLP cable at new road junction completed;
- Mainlaying installation work at (access ramp) of Bridge A completed;
- Tree transplanting work in progress;
- Construction of stair at Bridge A completed; and
- Proposed UU U/G duct work in progress.

3 ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

Monitoring Parameters and Monitoring Locations

- 3.1 The Project Specific EM&A Manual designated locations for the ET to monitor environmental impacts in terms of air quality, noise and water quality due to the Project. The Project area and monitoring locations are depicted in **Figure 2 to Figure 4**. **Appendix C** gives details of monitoring requirements.

Monitoring Methodology and Calibration Details

- 3.2 Monitoring works/equipments were conducted/calibrated regularly in accordance with the Project Specific EM&A Manual. Copies of calibration certificates are attached in the appendices of the Monthly Reports.

Environmental Quality Performance Limits (Action and Limit Levels)

- 3.3 The environmental quality performance limits, i.e. Action and Limit Levels were derived from the baseline monitoring results. Should the measured environmental quality parameters exceed the Action/Limit Levels, the respective action plans would be implemented. The Action/Limit Levels for each environmental parameter are given in **Appendix D**.

Environmental Mitigation Measures

- 3.4 Relevant mitigation measures as recommended in the project EIA report have been stipulated in the Project Specific EM&A Manual for the Contractor to implement. A summary of the Environmental Mitigation Implementation Schedule (EMIS) is given in **Appendix H**.

4 MONITORING RESULTS

Weather Conditions

- 4.1 The weather conditions during monitoring sessions were mainly sunny. The weather conditions for each individual monitoring session were presented in the field record sheets.

Air Quality

1-hr TSP Monitoring

- 4.2 All 1-hour TSP monitoring was conducted as scheduled during the reporting quarter.
- 4.3 No Action/Limit Level exceedance was recorded in this reporting quarter.

24-hr TSP Monitoring

- 4.4 All 24-hr TSP monitoring was conducted as scheduled in this reporting quarter.
- 4.5 No Action / Limit Level exceedance was recorded in the reporting quarter.
- 4.6 The monitoring data of 1-hr and 24-hr TSP Levels were attached in the appendices of the Monthly Reports for September 2011 to November 2011. The graphical presentations of the monitoring results for the reporting quarter are shown in **Appendix E**.
- 4.7 The summary of the 1-hr and 24-hr TSP exceedance is shown in **Appendix K**.

Noise

- 4.8 All construction noise monitoring was conducted as scheduled in the reporting quarter.
- 4.9 No Action (public complaint) / Limit Level exceedance was recorded in the reporting quarter.
- 4.10 All the Construction Noise Levels (CNLs) reported in this report were adjusted with the corresponding baseline level (i.e. Measured Leq - Baseline Leq = Measured CNL), in order to facilitate the interpretation of the noise exceedance.
- 4.11 The noise monitoring results were attached in the appendices G of the Monthly Reports for September 2011 to November 2011. The graphical presentations of the monitoring results for the reporting quarter are shown in **Appendix F**.
- 4.12 The summary of the construction noise exceedance is shown in **Appendix K**.

Water Quality

- 4.13 All construction water quality monitoring was conducted as scheduled in the reporting quarter.
- 4.14 No Action / Limit Level exceedance was recorded in the reporting quarter.
- 4.15 Since the proposal of change of water quality monitoring station W2 and W3 was not approved by the EPD, all water quality monitoring stations will be maintained as the stated in the approval EM&A Manual.
- 4.16 The monitoring data were attached in the appendices of the Monthly Reports for September 2011 to November 2011. The graphical presentations of the monitoring results for the reporting quarter are shown in **Appendix G**.
- 4.17 The summary of the water quality exceedance is shown in **Appendix K**.
- 4.18 All monitoring data was checked and reviewed, no exceedance was recorded in reporting quarter.
- 4.19 A quarterly analytical assessment of construction impact on Water Quality was done to confirm sufficient statistical power to identify and conform the absence of the impact attributable to the work. The Quarterly mean of water Quality was not higher than 1.3 on water quality times of the ambient mean.
- 4.20 In accordance with Condition 4.2 of the EP, all environmental monitoring data was made available to the public via internet access at the website: <http://www.cinotech.com.hk/projects/LFS>.

5 ENVIRONMENTAL AUDIT**Implementation Status of Environmental Mitigation Measures**

5.1 The implementation status of environmental mitigation measures (EMIS) is given in Appendix H.

Site Audit Summary

5.2 During site inspections in the reporting period, no non-conformance was identified. The observations and recommendations made in each site audit session in the reporting period are summarized in Table 5.1.

Table 5.1 ET's Observations and Recommendations of Site Audits

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	01-09-11 (110901-R02)	To well-maintain the wheel washing procedure and facilities before leaving the site.	The situation was observed improved / rectified during site inspection on 08-09-11.
	15-09-11 (110915-R02)	Ponding water should be cleaned between north bridge A&B. The Contractor was reminded to remove the soil to maintain the water flow.	The situation was observed improved / rectified during site inspection on 22-09-11.
	10-11-11 (111110-R01)	Ponding water should be avoided or well treated near North bridge B to prevent mosquito breeding.	The situation was observed improved / rectified during site inspection on 17-11-11
	24-11-11 (111124-R02)	Ponding water should be handled and provided with mitigation measure to prevent mosquito breeding near bridge D.	The situation was observed improved / rectified during site inspection on 01-12-11
Air Quality	08-09-11 (110908-R01)	Stockpiling near Deep Bay Road should be covered with tarpaulin or similar means.	The situation was observed improved / rectified during site inspection on 15-09-11.
	15-09-11 (110915-R03)	The haul road at entrance of South Bay should be provided with sufficient water spraying regularly.	The situation was observed improved / rectified during site inspection on 22-09-11
	27-10-11 (111027-R01)	Sufficient water spraying should be provided on the haul road.	The situation was observed improved / rectified during site inspection on 03-11-11
	27-10-11 (111027-R02)	To cover the stockpile properly with tarpaulin near Deep Bay Road	The situation was observed improved / rectified during site inspection on 03-11-11
	03-11-11 (111103-R03)	To provide regular water spraying on-site (haul road, soil surface, etc).	The situation was observed improved / rectified during site inspection on 10-11-11
	24-11-11 (111124-R01)	Water spraying should be provided regularly from entrance to the haul road.	The situation was observed improved / rectified during site inspection on 01-12-11
Waste/Chemical Management	08-09-11 (110908-R02)	C&D materials and general refuse should be well-segregated for storage and housekeeping near Footbridge B.	The situation was observed improved / rectified during site inspection on 15-09-11.

Parameters	Date	Observations and Recommendations	Follow-up
	15-09-11 (110915-R01)	C&D wastes and general refuse should be disposed of or stored properly at North Bay 8-12.	The situation was observed improved / rectified during site inspection on 22-09-11
	22-09-11 (110922-R01)	Oil drum should be stored properly or provided with drip tray at footbridge C near South Bay. The Contractor was reminded to keep them properly	The situation was observed improved / rectified during site inspection on 4-10-11
	22-09-11 (110922-R02)	Stagnant water in the drip tray should be collected near South Footbridge C	The situation was observed improved / rectified during site inspection on 4-10-11
	22-09-11 (110922-R03)	To clean the contaminated soil at the entrance near Deep Bay Road	The situation was observed improved / rectified during site inspection on 4-10-11
	06-10-11 (111006-R01)	Chemical waste container should be disposed of or stored properly near footbridge D.	The situation was observed improved / rectified during site inspection on 13-10-11
	13-10-11 (111013-R01)	C&D materials (broken nail, segregates, etc) should be disposed of or stored properly along the channel.	The situation was observed improved / rectified during site inspection on 20-10-11
	27-10-11 (111027-R03)	Contaminated soil near South bridge entrance and North Bridge B, and the oil containers with oil stain near bridge B should be disposed of properly.	The situation was observed improved / rectified during site inspection on 03-11-11
	03-11-11 (111103-R02)	Drip tray should be covered properly to prevent surface runoff. The Contractor was reminded to well-maintain it near bridge B.	The situation was observed improved / rectified during site inspection on 10-11-11
	17-11-11 (111117-R01)	C&D materials (e.g. timbers) should be well-stored between South bridge A&B.	The situation was observed improved / rectified during site inspection on 24-11-11
Landscape and Visual	01-09-11 (110901-R01)	The tree T115 should be free of inert waste (e.g. stone, soil, rubble, sand etc) for protection.	The situation was observed improved / rectified during site inspection on 08-09-11.
	20-10-11 (111020-R01)	Proper surface should be maintained to prevent surface runoff and clean for tidiness at North footbridge B and near the car park.	The situation was observed improved / rectified during site inspection on 27-10-11
	24-11-11 (111124-R03)	General refuse near the tree should be cleaned to well maintain the tree condition near bridge B.	The situation was observed improved / rectified during site inspection on 01-12-11
Ecology	03-11-11 (111103-R01)	Fencing should be provided around the existing mangrove. The Contractor was reminded to well maintain them for protection.	The situation was observed improved / rectified during site inspection on 10-11-11
Permit/ Licenses	--	--	--

5.3 The joint site audits with the representatives of IEC, ER, the Contractor and the ET was carried out on 8th September 2011, 6th October 2011 and 3rd November 2011. The observations and recommendations made by IEC during the audit sessions are summarized in Table 5.2.

Table 5.2 IEC's Observations and Recommendations of Site Audits

8 September 2011	<i>Follow-up (for previous month)</i>	NIL
	<i>Item(s)</i>	1) Soil stockpile near Deep bay Road should be covered properly.
		2) Wheel-washing facility near Deep Bay Road should be maintained and improved.
		3) Construction material / waste sorting should be improved /enhanced.
6 October 2011	<i>Follow-up (for previous month)</i>	NIL
	<i>Item(s)</i>	1) Chemical waste container should be disposed of properly or stored at designated storage area (near Bridge D).
3 November 2011	<i>Follow-up (for previous month)</i>	NIL
	<i>Item(s)</i>	1) Regular watering should be provided on site, especially for haul road and soil stockpile.
		2) Mangrove should be fenced off properly to avoid disturbance from human activity.
		3) Cover of the drip tray for generator is found broken and thus should be replaced.

Effectiveness of Mitigation Measures

- 5.4 The mitigation measures recommended in the EIA report and required by the EP are considered effective in minimizing environmental impacts. The Contractor has implemented the recommended mitigation measures except those mitigation measures not applicable at this stage.

Status of Environmental Licensing and Permitting

- 5.5 Licenses/Permits granted to the Project include the Environmental Permit (EP); waste water discharge license and waste Producer under Waste Disposal (Chemical Waste) (General) Regulation for the Project were in place and valid during the reporting quarter. Permits under Dumping at Sea Ordinance with No. EP/MD/11-006 and EP/MD/11-045 are expired. A summary status of licenses and permits is given in **Appendix I**.

Advice on Waste Management Status

- 5.6 No inert C&D waste and 5.22m³ of general refuse were generated in the reporting period. No inert C&D waste was reused in the contract and no broken concrete was used for recycling into aggregates. No inert C&D material was disposed as public fill. No imported fill was generated. Excavated materials, as the main C&D materials generated in the reporting period, were stored inside the Site Area and Stockpiling Area of the Project. Besides, no chemical waste was generated in the reporting period. The amount of wastes generated by the activities of the Project in the reporting period was attached

in the appendices of the Monthly Reports for September 2011 to November 2011. Waste flow table please refer to **Appendix L**.

6 NON-COMPLIANCE (EXCEEDANCES) OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS (ACTION AND LIMIT LEVELS)

Summary of Exceedances

- 6.1 Environmental monitoring works were performed in the reporting period and all monitoring results were checked and reviewed. A summary of exceedance is attached in **Appendix K**.
- 6.2 No Action/Limit Level exceedance was recorded for construction noise monitoring in the reporting period.
- 6.3 No Action/Limit Level exceedance was recorded for both 1-hour TSP and 24-hour TSP of air quality monitoring in the reporting period.
- 6.4 No Action/Limit Level exceedance was recorded for water quality monitoring in the reporting period.

Review of the Reasons for and the Implications of Non-compliance

- 6.5 There was no non-compliance from the site audits in the reporting period. The observations and recommendations made in each individual site audit session were presented in Table 5.1.

Summary of action taken in the event of and follow-up on non-compliance

- 6.6 There was no particular action taken since no non-compliance was observed from the site audits in the reporting period.

7 ENVIRONMENTAL COMPLAINTS

- 7.1 No environmental complaint was received in the reporting period. The updated Complaint Log is attached in **Appendix J**.

8 NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

- 8.1 No environmental prosecution was recorded in the reporting period.

9 COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

- 9.1 Major site activities for the coming quarter include:
 - Construction of pedestrian ramp G; B; C; D & E;
 - NS 90 PE pipe laying;
 - DN150 DI pipe installation at access road;
 - Construction of grasscrete slab;
 - Construction of pedestrian ramp;

- Relocation of gauging station;
- Backfilling behind retaining walls & Subsoil drain installation;
- Construction of drainage works (1200 dia. pipe, outfall pipes, U-channels, catch-pits & manholes);
- Noise insulation works at SR 37 in Yuen Long Areas 13 & 14;
- Arrange UU to carry out lowering of existing services at road Junction D. B. Road; and
- Proposed UU U/G duct work in progress

9.2 Key issues to be considered in the coming quarter include:

- Accumulation of C&D waste and general waste on site;
- Increase dust suppression on the access road and in site areas;
- Wastewater generation and affecting on retaining Mangrove when erecting temporary footbridge;
- Oil leakage from equipments;
- Maintenance of de-silting facilities and drainage system such as U-channels; and
- Maintenance of the protection fence around the Mangrove.

9.3 According to the environmental audit sessions performed in the reporting period, the following recommendations were made:

Dust Impact

- To regularly maintain the machinery and vehicles on site;
- To follow up any exceedance caused by the construction works;
- To implement dust suppression measures on all haul roads, stockpiles, dried/unpaved surfaces and excavation/road breaking works; and
- To provide adequate wheel washing facilities at each exit.

Noise Impact

- To inspect the noise sources inside the site;
- To follow up any exceedance caused by the construction works;
- To space out noisy equipment and position the equipment as far away as possible from sensitive receivers; and
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers in an appropriate location.
- To provide adequate lubricant on mechanical equipments to reduce frictional noise; and
- To well maintain the mechanical equipments / machineries to avoid abnormal noise nuisance.

Water Impact

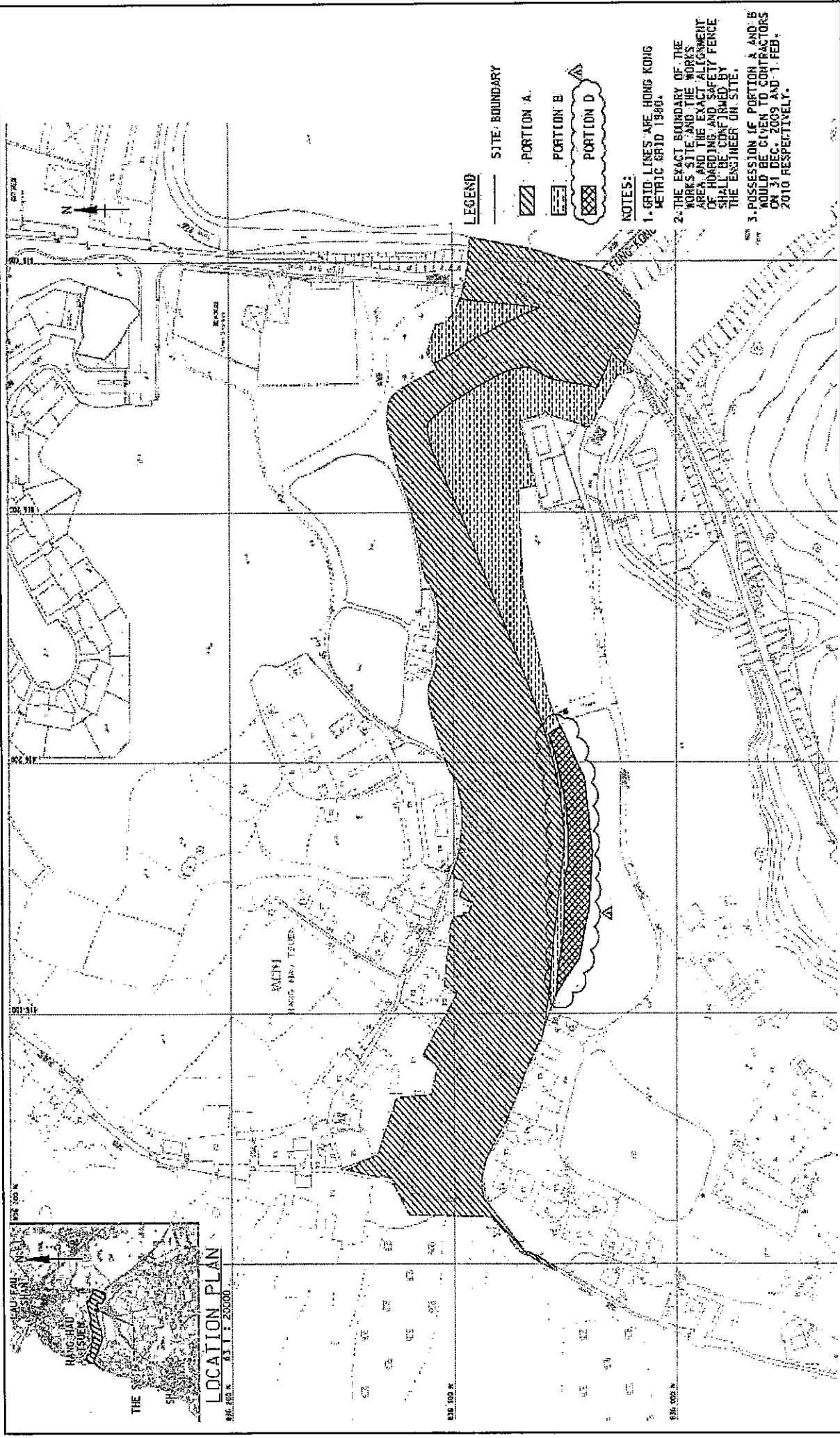
- To identify any discharge of wastewater from the construction site;
- To avoid any discharge of wastewater by-pass/ without the desilting facilities from the construction site;

- To regularly clear up and maintain the condition of u-channel, catch pits and wheel washing facilities on site;
- To regularly maintain the sediment control measures after rainstorms; and
- To avoid water from accumulation on site and carry out larviciding against mosquito breeding for stagnant water when mosquito larvae are observed.

Waste/Chemical Management

- To provide proper rubbish bins / skips for waste collection;
- To check for any accumulation of wasted materials or rubbish on site;
- To provide proper storage area or drip trays for oil containers/ equipments on site;
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the equipment;
- To well maintain the equipments and drip trays to avoid oil leakage; and
- To avoid improper handling or storage of oil drum on site.

FIGURE



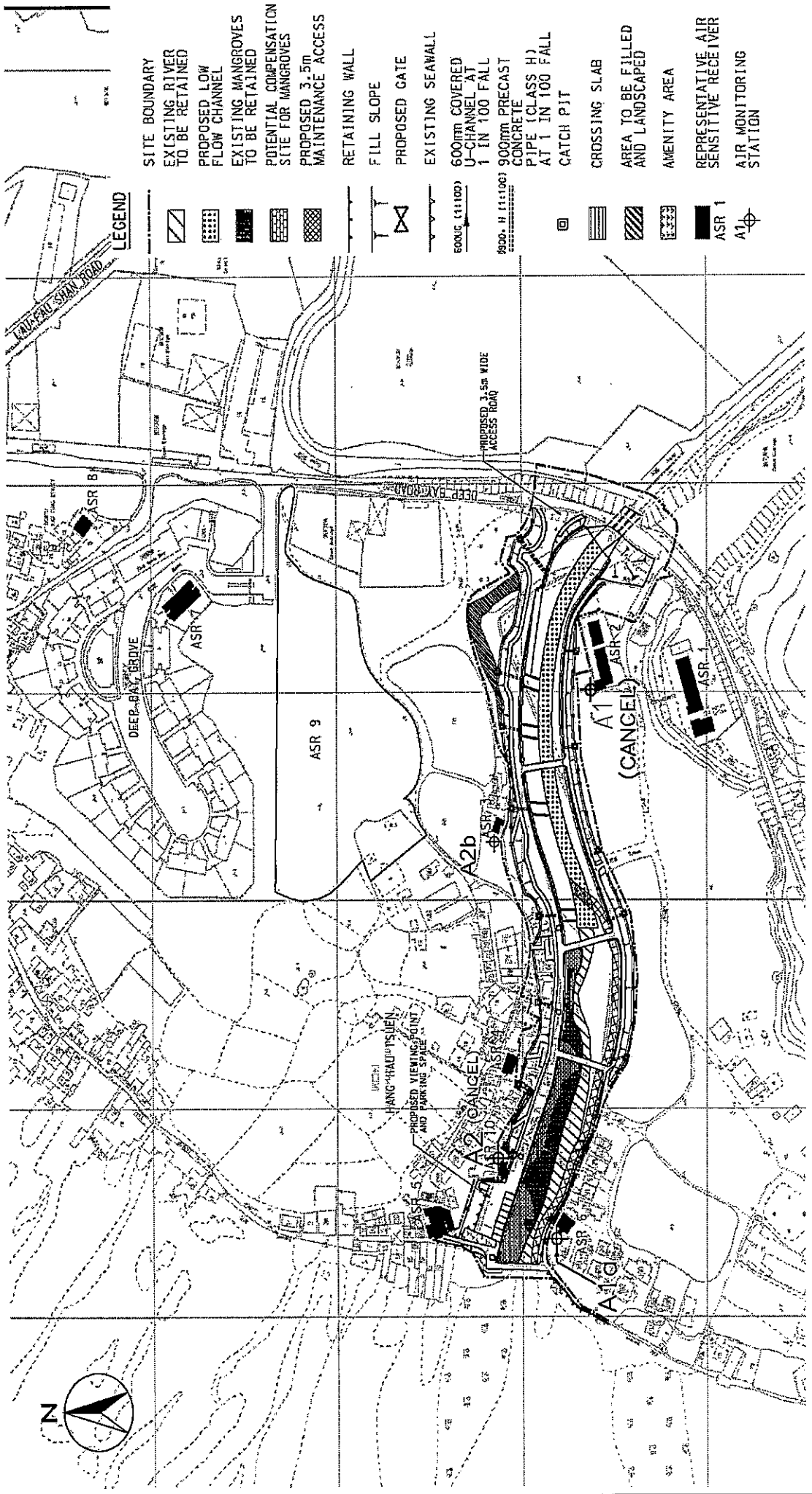
LEGEND

- SITE BOUNDARY
- ▨ PORTION A
- ▩ PORTION B
- ▧ PORTION C
- ▦ PORTION D

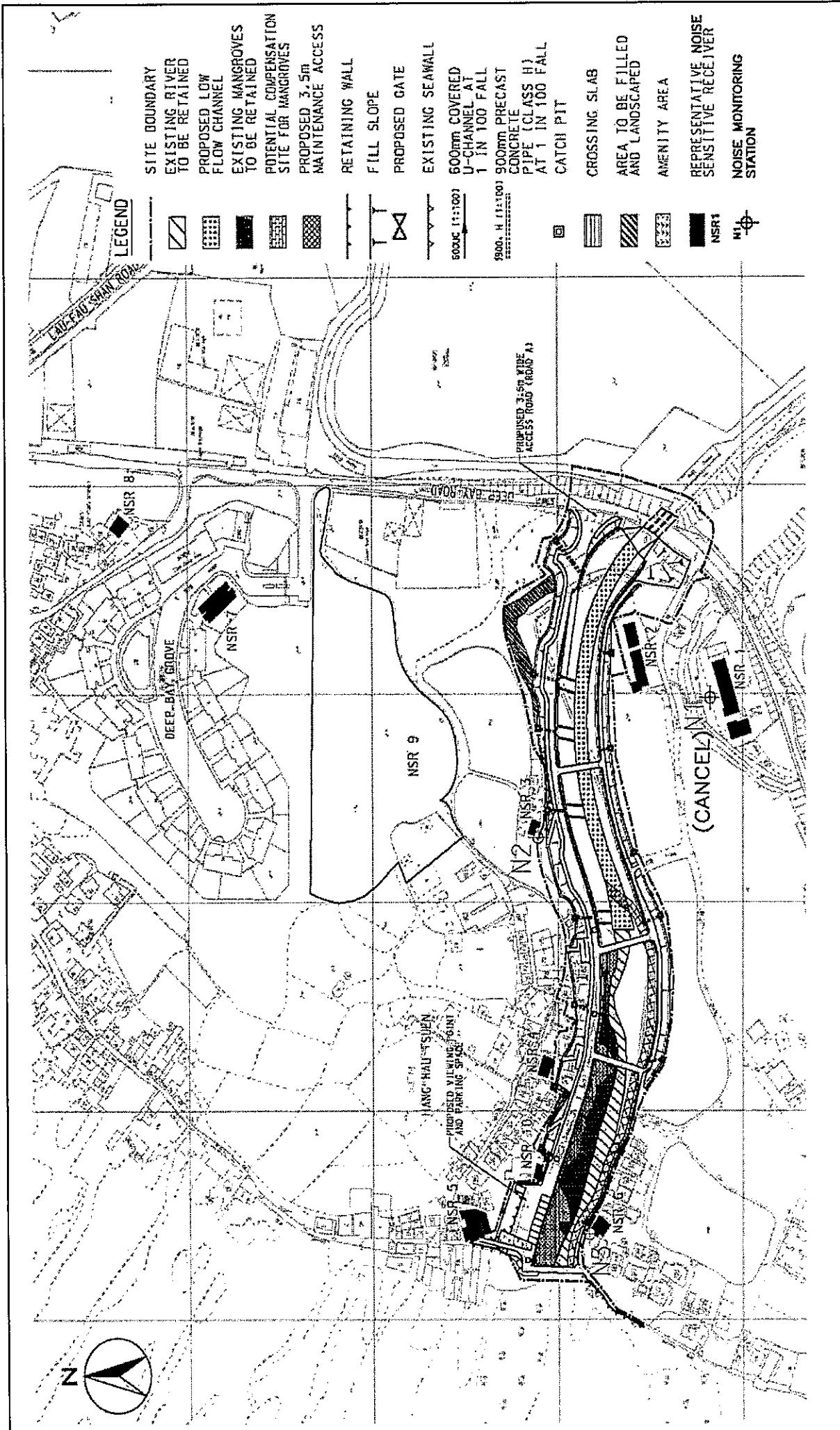
NOTES:

1. GRID LINES ARE HONG KONG METRIC GRID 1980.
2. THE EXACT BOUNDARY OF THE WORKS SITE AND THE WORKS AREA AND THE EXACT ALIGNMENT OF HOUSING AND SAFETY FENCE SHALL BE CONFIRMED BY THE ENGINEER ON SITE.
3. POSSESSION OF PORTION A AND B WOULD BE GIVEN TO CONTRACTORS ON 31 DEC. 2009 AND 1 FEB. 2010 RESPECTIVELY.

CINOTECH Cinotech Consultants Limited	YL/2009/01 HANG HAU TSUEN CHANNEL AT LAU FAU SHAN General Location Plan		SCALE	N.T.S.	DATE	Apr-10
	CHECK	CH	DRAWN	SL		
	JOB NO.	MA0002	DRAWING No.	Fig. 1	Rev	-



CINOTECH Cinotech Consultants Limited	YL/2009/01 HANG HAU TSUEN CHANNEL AT LAU FAU SHAN Locations of Air Quality Monitoring Stations		SCALE	N.T.S.	DATE	Apr-10
	CHECK	CH	DRAWN	SL		
	JOB NO.	MA0002	DRAWING No.	Fig. 2	Rev	-



<p>Y1/2009/01 HANG HAU TSUEN CHANNEL AT LAU FAU SHAN Locations of Noise Monitoring Stations</p>	SCALE	N.T.S.	DATE	Jan-10
	CHECK	CH	DRAWN	SL
	JOB NO.	MA0002	DRAWING No.	Fig. 3

YL/2009/01

HANG HAU TSUEN CHANNEL AT LAU FAU SHAN

Locations of Water Quality Monitoring Stations

SCALE

N.T.S.

DATE

Jan-10

CHECK

CH

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SL

JOB NO.

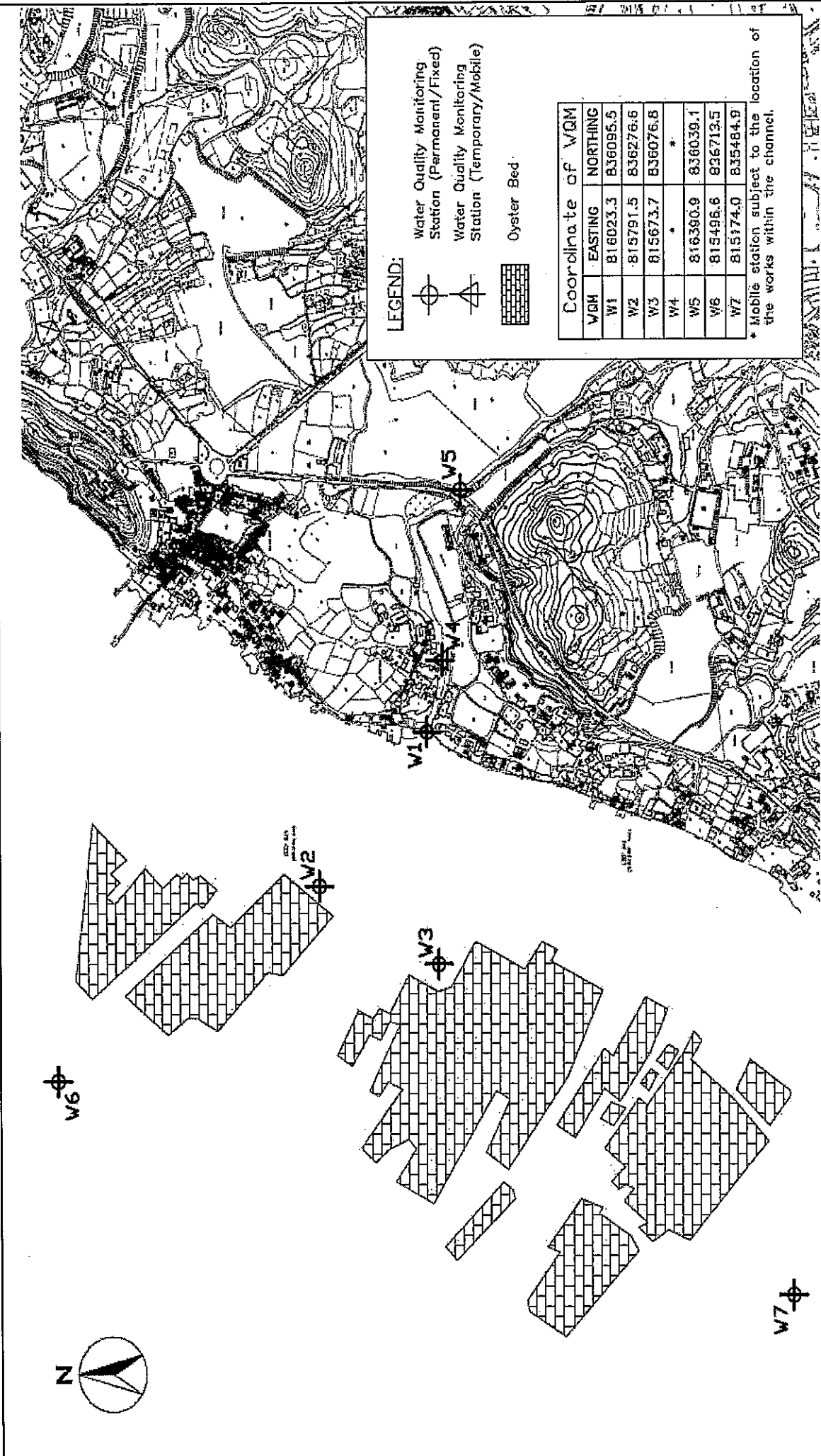
MA0002

DRAWING No.

Fig. 4

Rev

-



Environmental Team Leader
Dr. Priscilla Choy
 (Tel: 2151 2089)

Project Coordinator
 - coordination of the Project and compile reports
Gary Lau, William Lai
 (Tel: 2151 2098) (Tel: 2151 2078)

Monitoring Team
 - perform environmental monitoring works
Team Leader: Henry SM Leung
 (Tel: 2151 2087)
Team Members: Tang Wing Kwai, Yeung Wing Kun, Tsang Tsz Keung, Tao Ching Hang, Choi Wai Yi.

Audit Team
 - conduct site inspection, complete the environmental checklist once a week
Team Leader: Gary Lau
 (Tel: 2151 2098)
Team Members: Ivy Tam, William Lai

Title

Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan

Scale

N.T.S

Project No.

MA0002

Date

Aug-10

Figure

5

Organization Chart

CINOTECH

**APPENDIX A
CONTACT DETAILS OF THE PROJECT
ORGANISATION**

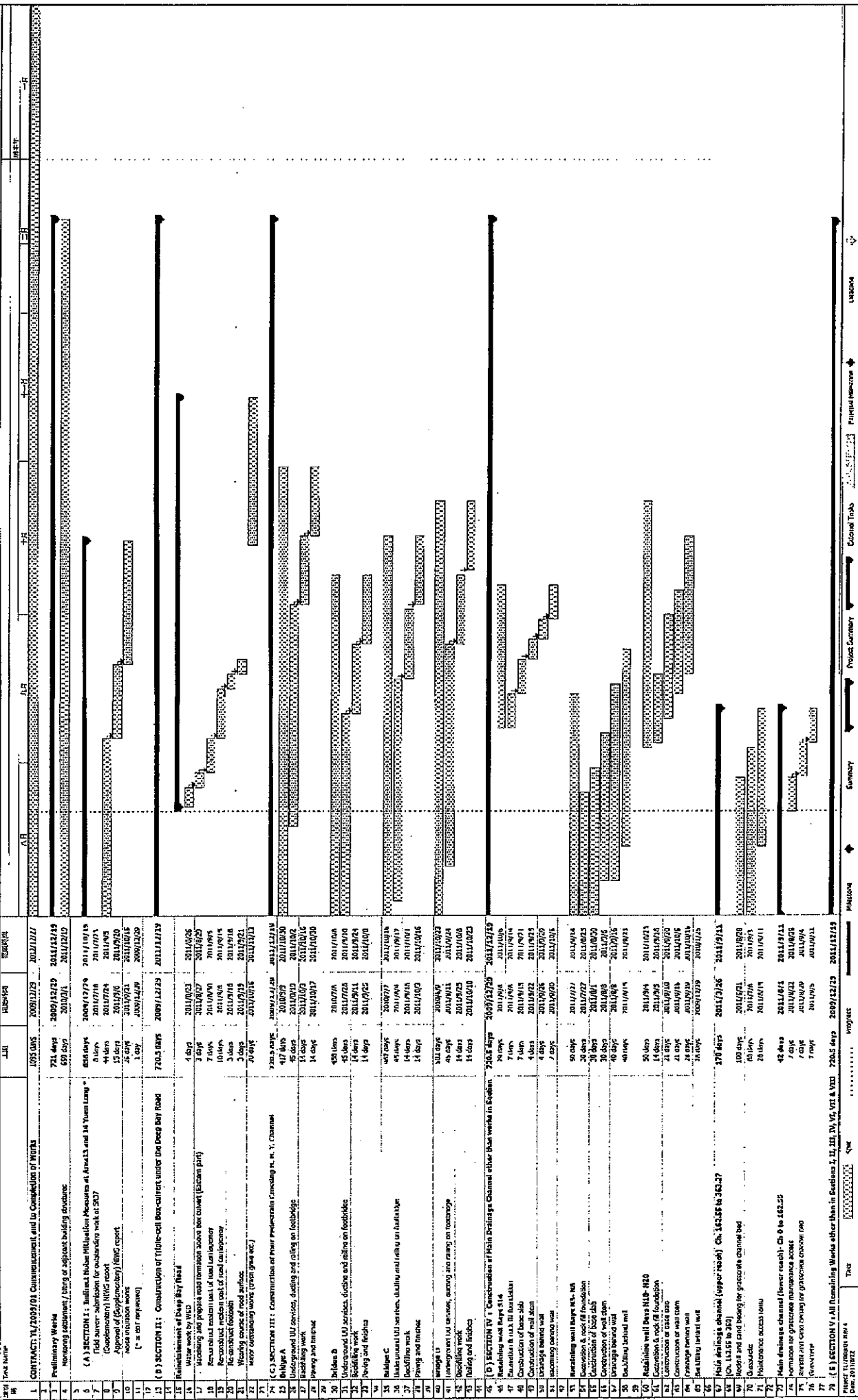
Appendix A - Contact Details of the Project Organisation

Party	Role	Name	Position	Phone No.	Fax No.
CEDD	Permit Holder	General Enquiry Counter		2762 5111	2714 0140
		Mr. Y.M. Chan	Chief Engineer	2158 5612	2693 2918
		Mr. S.W. Wong	Senior Engineer	2158 5632	
		Mr. CK Choi	Engineer	--	
B&V	Engineer	Mr. Kelvin Lau	Director	2601 1000	2601 3988
	Engineer's Representative	Mr. Victor Go	Resident Engineer	2475 4871/ 9686 4575	2470 3266
		Mr. Vincent Wan	Assistant Resident Engineer	2442 8007/ 61178711	
		Mr. Tim Law	AIOW	2475 4871/ 9845 6346	
Cinotech	Environmental Team	Dr. Priscilla Choy	ET Leader	2151 2089	3107 1388
		Mr. William Lai	Project Coordinator & Audit Team Leader	2151 2078	
		Mr. Henry Leung	Monitoring Team Leader	2151 2087	
ENVIRON	Independent Environmental Checker	Mr. David Yeung	Independent Environmental Checker	3743 0717/ 9019 3740	3548 6988
		Mr. Tony Cheng	Deputy Independent Environmental Checker	3743 0722	
		Mr. Justin Ye	IEC Team Member	3743 0705/ 6576 9531	
Kwan On	Contractor	Mr. Ambrose Kwong	Project Director	2889 2675	2558 6900
		Mr. P.H Ho	Project Manager	2889 2675	
		Mr. K.L Lee	Acting Site Agent	6113 6926	
		Mr. Michael Chung	Environmental Manager	6198 7781	/
		Ms. Joey Wong	Environmental Officer	6108 7906	/

APPENDIX B
CONSTRUCTION PROGRAMME

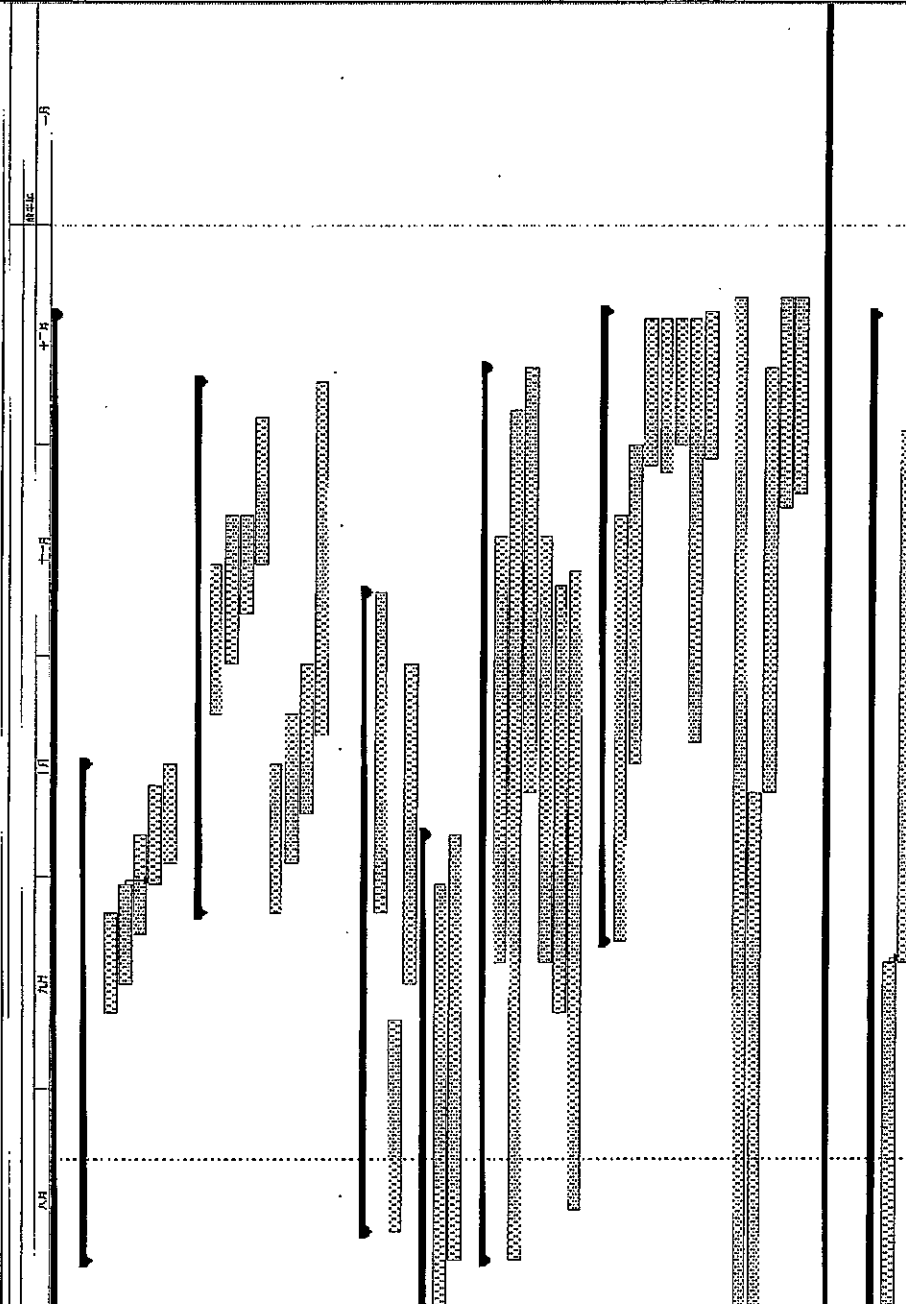
Master Programme

CEDD CONTRACT NO. YL / 2009 / 01



Master Programme

CEPP CONTRACT NO. YL / 2009 / 01



Task No.	Task Name	Unit	Start Date	End Date	Duration (Days)
70	(1) SECTION VI: All Infrastructure Works under Items III, IIIA, IIIA, IIIA, IIIA & VIIC	720.5 days	2009/12/29	2011/12/29	
71	Amenity Area (remediation earth, road and drainage works included under Access Road & Footpath)	70 days	2011/01/18	2011/02/26	
81	Excavation & re-laying of base side	14 days	2011/02/26	2011/03/10	
82	Construction of wall along	14 days	2011/03/10	2011/03/24	
83	Excavation behind wall	14 days	2011/03/24	2011/04/07	
84	Excavation behind wall	14 days	2011/04/07	2011/04/21	
85	Excavation behind wall	14 days	2011/04/21	2011/05/05	
86	Excavation behind wall	14 days	2011/05/05	2011/05/19	
87	Excavation behind wall	14 days	2011/05/19	2011/06/02	
88	Excavation behind wall	14 days	2011/06/02	2011/06/16	
89	Excavation behind wall	14 days	2011/06/16	2011/06/30	
90	Excavation behind wall	14 days	2011/06/30	2011/07/14	
91	Excavation behind wall	14 days	2011/07/14	2011/07/28	
92	Excavation behind wall	14 days	2011/07/28	2011/08/11	
93	Excavation behind wall	14 days	2011/08/11	2011/08/25	
94	Excavation behind wall	14 days	2011/08/25	2011/09/08	
95	Excavation behind wall	14 days	2011/09/08	2011/09/22	
96	Excavation behind wall	14 days	2011/09/22	2011/10/06	
97	Excavation behind wall	14 days	2011/10/06	2011/10/20	
98	Excavation behind wall	14 days	2011/10/20	2011/11/03	
99	Excavation behind wall	14 days	2011/11/03	2011/11/17	
100	Excavation behind wall	14 days	2011/11/17	2011/12/01	
101	Excavation behind wall	14 days	2011/12/01	2011/12/15	
102	Excavation behind wall	14 days	2011/12/15	2012/01/01	
103	Excavation behind wall	14 days	2012/01/01	2012/01/15	
104	Excavation behind wall	14 days	2012/01/15	2012/01/29	
105	Excavation behind wall	14 days	2012/01/29	2012/02/12	
106	Excavation behind wall	14 days	2012/02/12	2012/02/26	
107	Excavation behind wall	14 days	2012/02/26	2012/03/10	
108	Excavation behind wall	14 days	2012/03/10	2012/03/24	
109	Excavation behind wall	14 days	2012/03/24	2012/04/07	
110	Excavation behind wall	14 days	2012/04/07	2012/04/21	
111	Excavation behind wall	14 days	2012/04/21	2012/05/05	
112	Excavation behind wall	14 days	2012/05/05	2012/05/19	
113	Excavation behind wall	14 days	2012/05/19	2012/06/02	
114	Excavation behind wall	14 days	2012/06/02	2012/06/16	
115	Excavation behind wall	14 days	2012/06/16	2012/06/30	
116	Excavation behind wall	14 days	2012/06/30	2012/07/14	
117	Excavation behind wall	14 days	2012/07/14	2012/07/28	
118	Excavation behind wall	14 days	2012/07/28	2012/08/11	
119	Excavation behind wall	14 days	2012/08/11	2012/08/25	
120	Excavation behind wall	14 days	2012/08/25	2012/09/08	
121	Excavation behind wall	14 days	2012/09/08	2012/09/22	
122	Excavation behind wall	14 days	2012/09/22	2012/10/06	
123	Excavation behind wall	14 days	2012/10/06	2012/10/20	
124	Excavation behind wall	14 days	2012/10/20	2012/11/03	
125	Excavation behind wall	14 days	2012/11/03	2012/11/17	
126	Excavation behind wall	14 days	2012/11/17	2012/12/01	
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128	Excavation behind wall	14 days	2012/12/15	2013/01/01	
129	Excavation behind wall	14 days	2013/01/01	2013/01/15	
130	Excavation behind wall	14 days	2013/01/15	2013/01/29	
131	Excavation behind wall	14 days	2013/01/29	2013/02/12	
132	Excavation behind wall	14 days	2013/02/12	2013/02/26	
133	Excavation behind wall	14 days	2013/02/26	2013/03/10	
134	Excavation behind wall	14 days	2013/03/10	2013/03/24	
135	Excavation behind wall	14 days	2013/03/24	2013/04/07	
136	Excavation behind wall	14 days	2013/04/07	2013/04/21	
137	Excavation behind wall	14 days	2013/04/21	2013/05/05	
138	Excavation behind wall	14 days	2013/05/05	2013/05/19	
139	Excavation behind wall	14 days	2013/05/19	2013/06/02	
140	Excavation behind wall	14 days	2013/06/02	2013/06/16	
141	Excavation behind wall	14 days	2013/06/16	2013/06/30	
142	Excavation behind wall	14 days	2013/06/30	2013/07/14	
143	Excavation behind wall	14 days	2013/07/14	2013/07/28	
144	Excavation behind wall	14 days	2013/07/28	2013/08/11	
145	Excavation behind wall	14 days	2013/08/11	2013/08/25	
146	Excavation behind wall	14 days	2013/08/25	2013/09/08	
147	Excavation behind wall	14 days	2013/09/08	2013/09/22	
148	Excavation behind wall	14 days	2013/09/22	2013/10/06	
149	Excavation behind wall	14 days	2013/10/06	2013/10/20	
150	Excavation behind wall	14 days	2013/10/20	2013/11/03	
151	Excavation behind wall	14 days	2013/11/03	2013/11/17	
152	Excavation behind wall	14 days	2013/11/17	2013/12/01	
153	Excavation behind wall	14 days	2013/12/01	2013/12/15	
154	Excavation behind wall	14 days	2013/12/15	2014/01/01	
155	Excavation behind wall	14 days	2014/01/01	2014/01/15	
156	Excavation behind wall	14 days	2014/01/15	2014/01/29	
157	Excavation behind wall	14 days	2014/01/29	2014/02/12	
158	Excavation behind wall	14 days	2014/02/12	2014/02/26	
159	Excavation behind wall	14 days	2014/02/26	2014/03/10	
160	Excavation behind wall	14 days	2014/03/10	2014/03/24	
161	Excavation behind wall	14 days	2014/03/24	2014/04/07	
162	Excavation behind wall	14 days	2014/04/07	2014/04/21	
163	Excavation behind wall	14 days	2014/04/21	2014/05/05	
164	Excavation behind wall	14 days	2014/05/05	2014/05/19	
165	Excavation behind wall	14 days	2014/05/19	2014/06/02	
166	Excavation behind wall	14 days	2014/06/02	2014/06/16	
167	Excavation behind wall	14 days	2014/06/16	2014/06/30	
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169	Excavation behind wall	14 days	2014/07/14	2014/07/28	
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176	Excavation behind wall	14 days	2014/10/20	2014/11/03	
177	Excavation behind wall	14 days	2014/11/03	2014/11/17	
178	Excavation behind wall	14 days	2014/11/17	2014/12/01	
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182	Excavation behind wall	14 days	2015/01/15	2015/01/29	
183	Excavation behind wall	14 days	2015/01/29	2015/02/12	
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185	Excavation behind wall	14 days	2015/02/26	2015/03/10	
186	Excavation behind wall	14 days	2015/03/10	2015/03/24	
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189	Excavation behind wall	14 days	2015/04/21	2015/05/05	
190	Excavation behind wall	14 days	2015/05/05	2015/05/19	
191	Excavation behind wall	14 days	2015/05/19	2015/06/02	
192	Excavation behind wall	14 days	2015/06/02	2015/06/16	
193	Excavation behind wall	14 days	2015/06/16	2015/06/30	
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196	Excavation behind wall	14 days	2015/07/28	2015/08/11	
197	Excavation behind wall	14 days	2015/08/11	2015/08/25	
198	Excavation behind wall	14 days	2015/08/25	2015/09/08	
199	Excavation behind wall	14 days	2015/09/08	2015/09/22	
200	Excavation behind wall	14 days	2015/09/22	2015/10/06	
201	Excavation behind wall	14 days	2015/10/06	2015/10/20	
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203	Excavation behind wall	14 days	2015/11/03	2015/11/17	
204	Excavation behind wall	14 days	2015/11/17	2015/12/01	
205	Excavation behind wall	14 days	2015/12/01	2015/12/15	
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207	Excavation behind wall	14 days	2016/01/01	2016/01/15	
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211	Excavation behind wall	14 days	2016/02/26	2016/03/10	
212	Excavation behind wall	14 days	2016/03/10	2016/03/24	
213	Excavation behind wall	14 days	2016/03/24	2016/04/07	
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216	Excavation behind wall	14 days	2016/05/05	2016/05/19	
217	Excavation behind wall	14 days	2016/05/19	2016/06/02	
218	Excavation behind wall	14 days	2016/06/02	2016/06/16	
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220	Excavation behind wall	14 days	2016/06/30	2016/07/14	
221	Excavation behind wall	14 days	2016/07/14	2016/07/28	
222	Excavation behind wall	14 days	2016/07/28	2016/08/11	
223	Excavation behind wall	14 days	2016/08/11	2016/08/25	
224	Excavation behind wall	14 days	2016/08/25	2016/09/08	
225	Excavation behind wall	14 days	2016/09/08	2016/09/22	
226	Excavation behind wall	14 days	2016/09/22	2016/10/06	
227	Excavation behind wall	14 days	2016/10/06	2016/10/20	
228	Excavation behind wall	14 days	2016/10/20	2016/11/03	
229	Excavation behind wall	14 days	2016/11/03	2016/11/17	
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232	Excavation behind wall	14 days	2016/12/15	2017/01/01	
233	Excavation behind wall	14 days	2017/01/01	2017/01/15	
234	Excavation behind wall	14 days	2017/01/15	2017/01/29	
235	Excavation behind wall	14 days	2017/01/29	2017/02/12	

**APPENDIX C
MONITORING REQUIREMENTS**

APPENDIX C – Monitoring Requirements

Type of Monitoring	Parameter	Frequency	Location of Measurement
Air Quality	1-hour TSP	3 times / 6-day	<ul style="list-style-type: none"> A1a ⁽¹⁾ (Village house at No. 88 Hang Hau Tsuen) A2b ⁽²⁾ (Village house at No.84 Hang Hau Tsuen)
	24-hour TSP	Once / 6-day	
Noise ⁽³⁾	L ₁₀ (30 min.) dB(A) L ₉₀ (30 min.) dB(A) L _{eq} (30 min.) dB(A) (0700 to 1900 on holidays)	Once / week	<ul style="list-style-type: none"> N2 - Village house at No.84 Hang Hau Tsuen N3 - Village house at No.88 Hang Hau Tsuen
Water Quality	Temperature, (°C) pH, (pH) Turbidity, (NTU) Water depth, (m) Salinity, (mg/L) Dissolved oxygen (mg/L and % of saturation) Suspended solids (mg/L)	3 days per week at mid-flood and mid-ebb tides throughout construction phase	<ul style="list-style-type: none"> W1(Downstream of the works immediately at the discharge point to Deep Bay) W2 (Near the oyster bed in Deep Bay) W3(Near the oyster bed in Deep Bay) W4(Immediate downstream of any specific works within Hang Hau Tsuen channel) W5(Upstream of the works at the confluence of San Hing Tsuen Channel and Fung Kong Tsuen Channel) W6(Waters of Deep Bay) W7 (Waters of Deep Bay)

⁽¹⁾ – Alternative location for Air Quality Monitoring Station A1.

⁽²⁾ – Air Quality Monitoring Station A2 (Village house at No.57 Hang Hau Tsuen) was not identifiable and therefore Village house at No. 29 Hang Hau Tsuen was proposed as the alternative station. Later, EPD have no objection to replace the air monitoring at Village house at No. 29 Hang Hau Tsuen by Village house at No. 84 Hang Hau Tsuen(A2b) . The monitoring works at A2b station was started from 15 July 2010. Stopping the sampler is requested by the house's owners at A2b. 24-hour TSP was temporarily suspended after 19 Mar 2011. Referring to the letter sent to EPD by courier on 15 April 2011 and a copy of fax from CEDD to EPD on 18 May 2011, No further comment from EPD was received. The shifting process of A2b was completed and the 24-hour TSP monitoring has resumed in normal state on 25 May 2011 afterward.

⁽³⁾ – Noise Monitoring Station N1 (Wing Jan Kindergarten) was cancelled because it was found abandoned.

APPENDIX D
ACTION AND LIMIT LEVELS

Appendix D Action and Limit Levels

Table A-1 Action and Limit Levels for 1-Hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
A1a	320	500
A2b	324	500

Table A-2 Action and Limit Levels for 24-Hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
A1a	159	260
A2b	156	260

Table A-3 Action and Limit Level for Construction Noise

Time Period	Action Level	Limit Level
0700-1900 hrs on normal weekdays	When one documented complaint is received	75* dB(A)

* reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

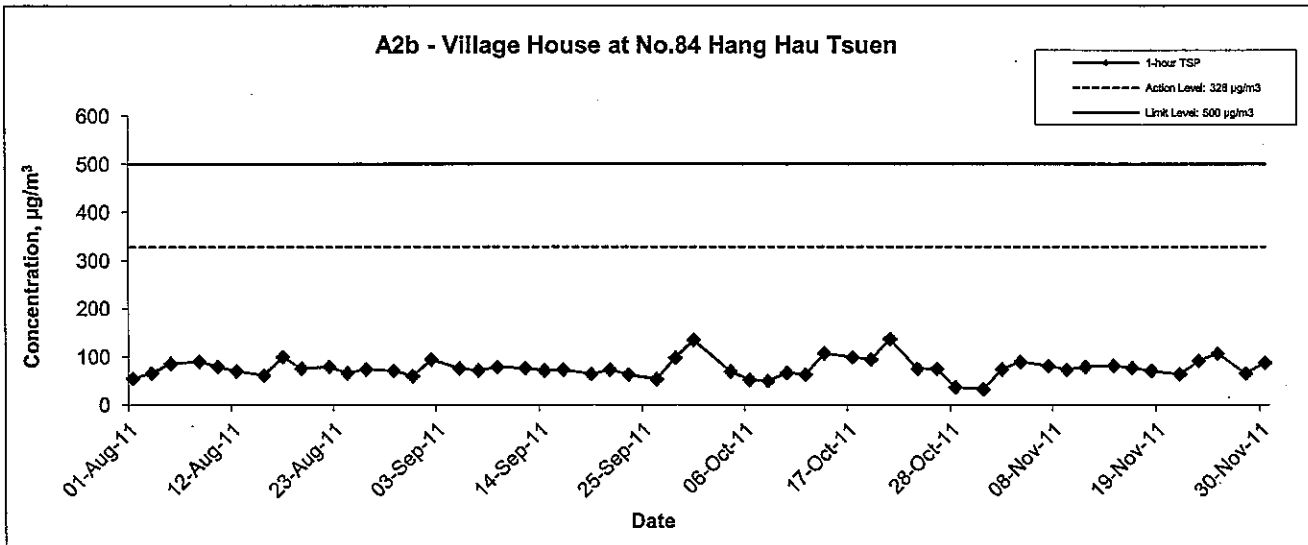
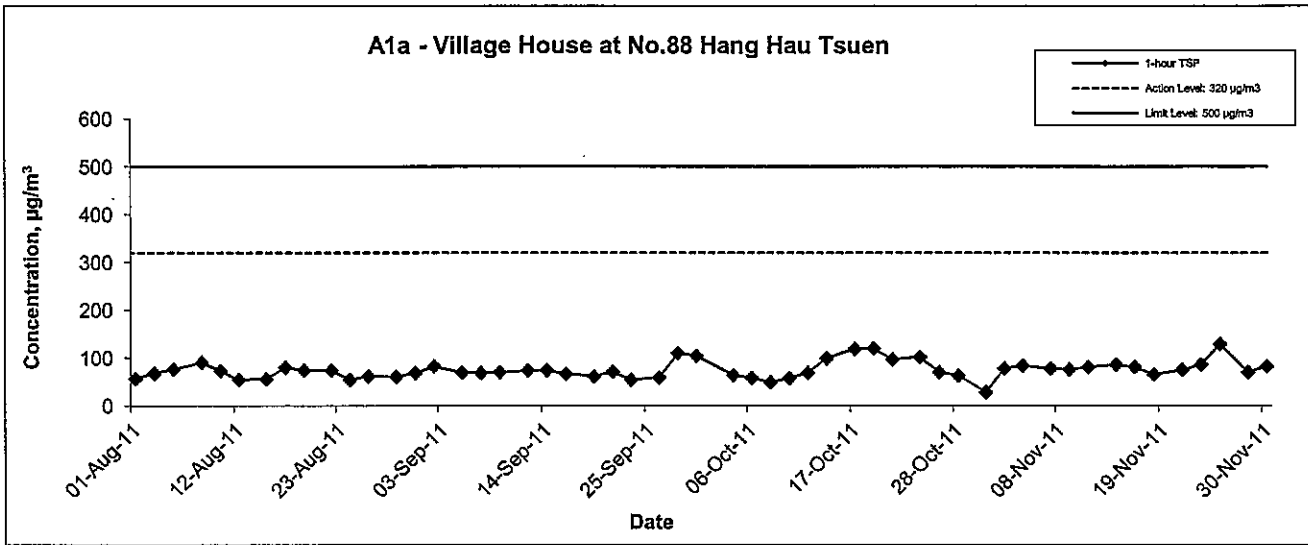
Table A-4 Action and Limit Level for Water Quality

Parameter		Action		Limit	
DO, mg/L	Surface and Middle	W2, W3: 4.5	W1, W4: 5.1	W2, W3: 4.4	W1, W4: 5.0
	Bottom	N/A *		N/A *	
SS, mg/L		97.8		162.8	
		or 120% of upstream control station's SS at the same tide of the same day		or 130% of SS readings at the upstream control station at the same tide of same day and specific sensitive receiver water quality requirements	
Turbidity, NTU		W2, W3: 135.0	W1, W4: 49.1	W2, W3: 142.6	W1, W4: 177.7
		or 120% of upstream control station's turbidity at the same tide of the same day		or 130% of turbidity at the upstream control station at the same tide of same day	

* Since the water depths were less than 3 meters at all monitoring stations, only middle depth samples were taken.

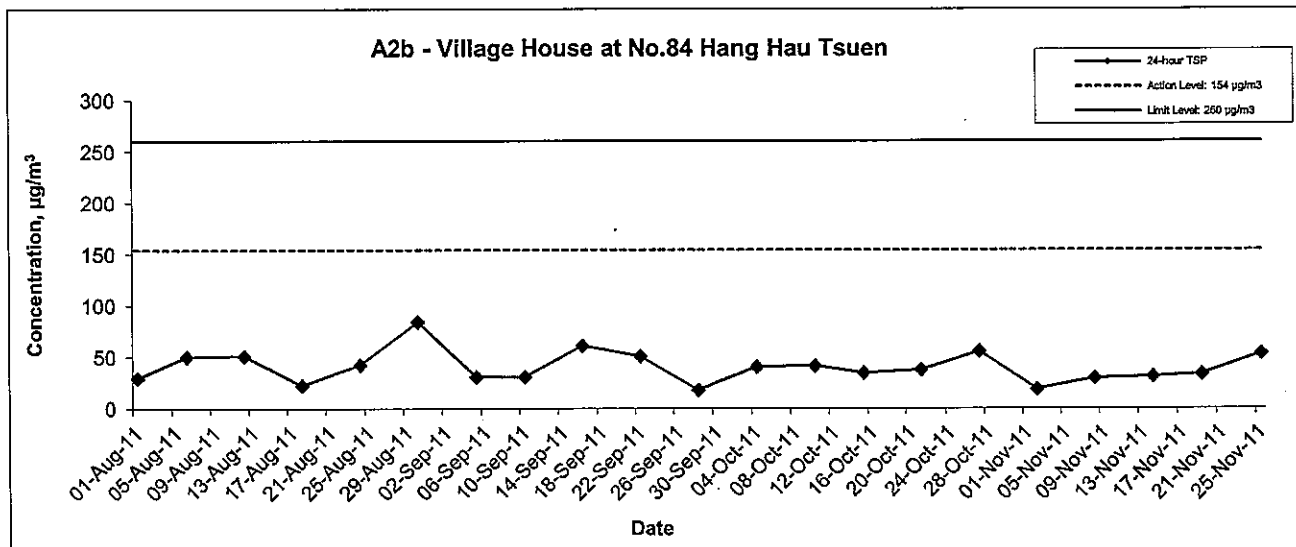
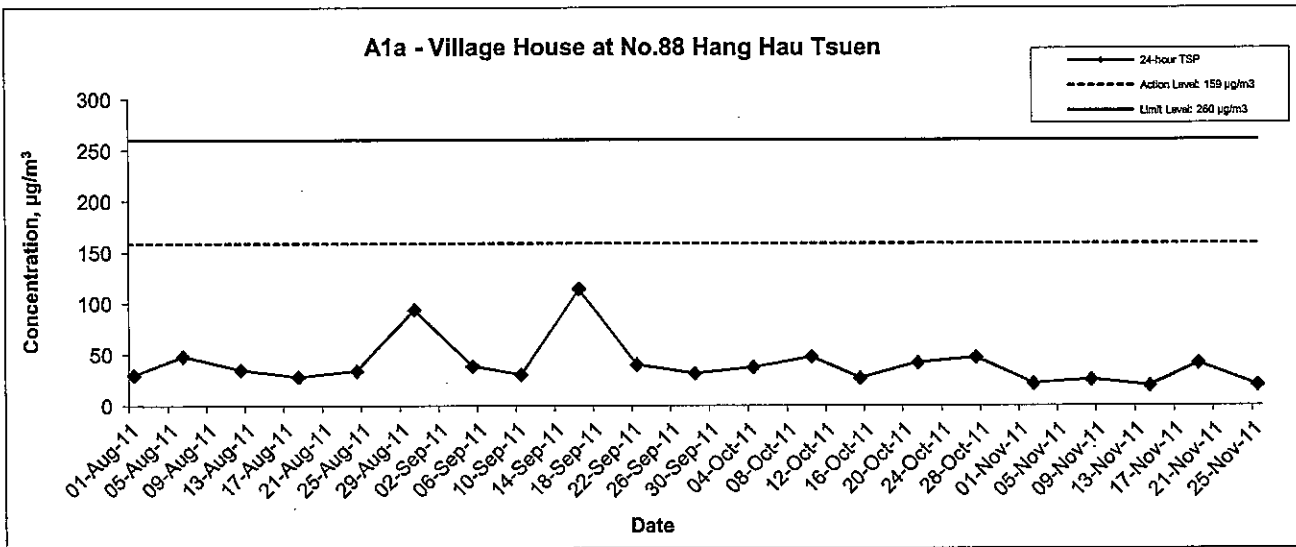
**APPENDIX E
GRAPHICAL PRESENTATION OF AIR
QUALITY MONITORING RESULTS**

1-hr TSP Concentration Levels



Title Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan Graphical Presentation of 1-hour TSP Monitoring Results	Scale N.T.S	Project No. MA0002	CINOTECH
	Date Nov 11	Appendix E	

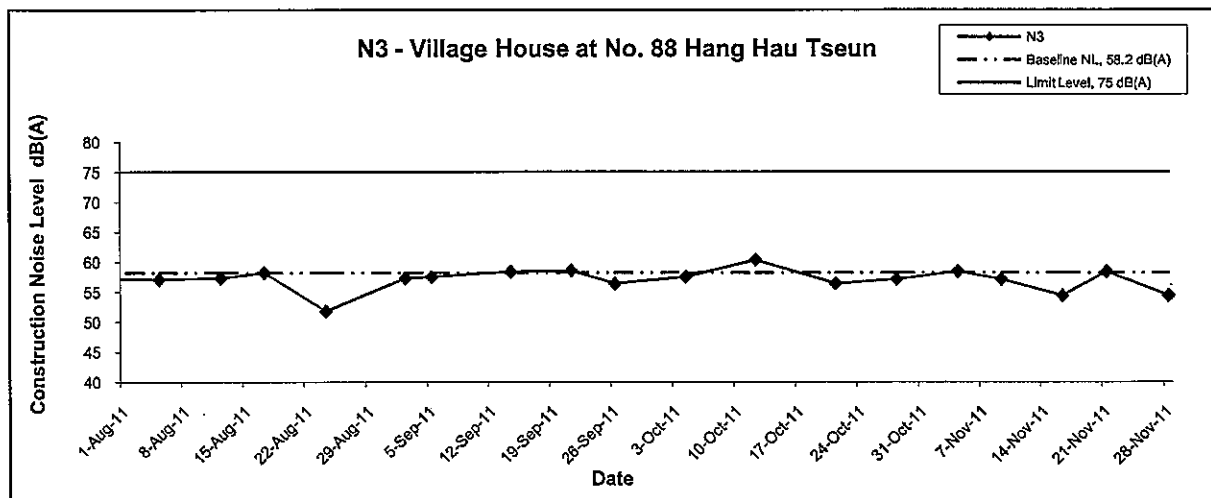
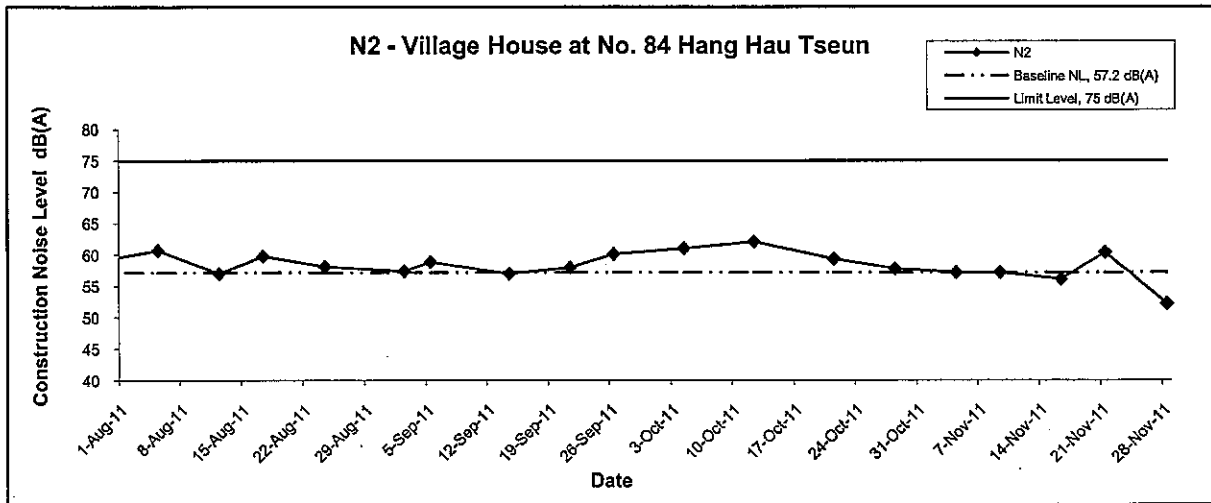
24-hr TSP Concentration Levels



Title Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan Graphical Presentation of 24-hour TSP Monitoring Results	Scale	N.T.S	Project No.	MA0002	CINOTECH
	Date	Nov 11	Appendix	E	

**APPENDIX F
GRAPHICAL PRESENTATION OF
NOISE MONITORING RESULTS**

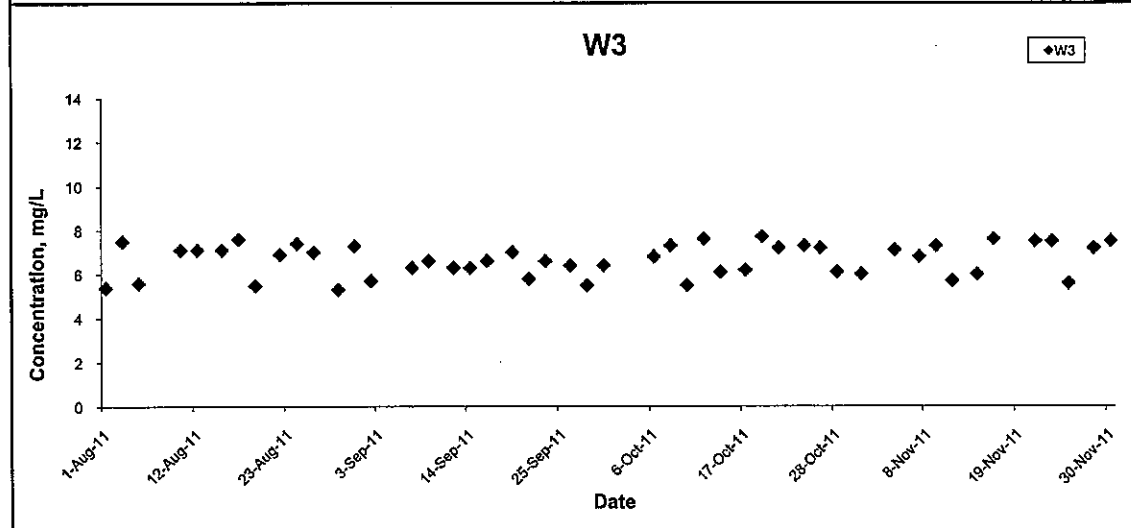
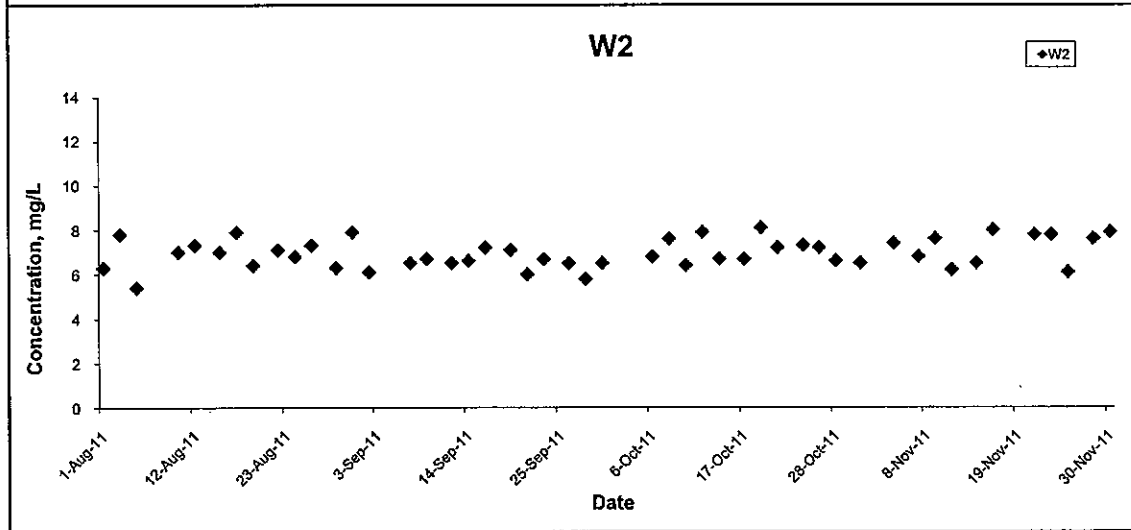
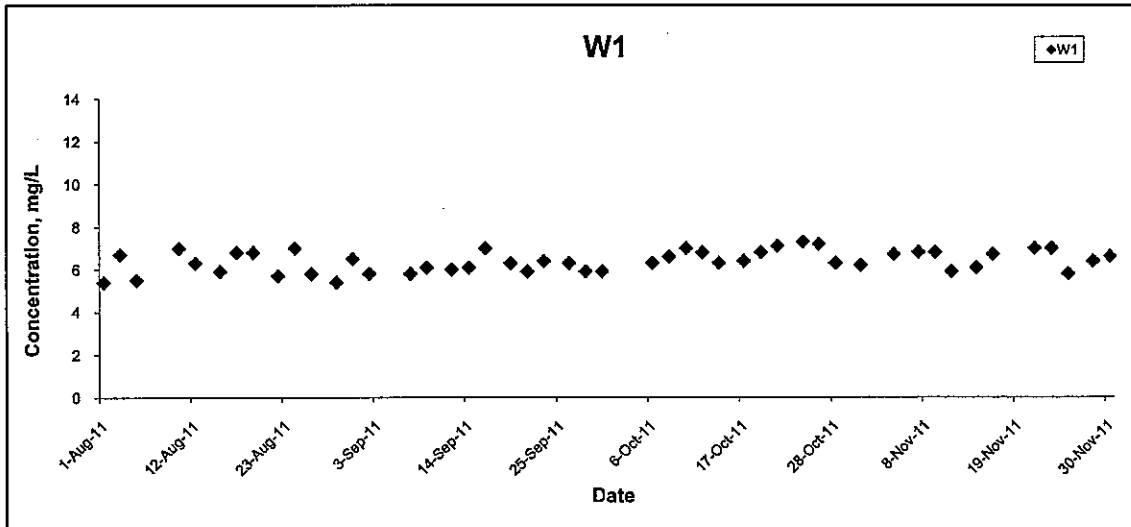
Noise Levels



Title Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S	Project No. MA0002	CINOTECH
	Date Nov 11	Appendix F	

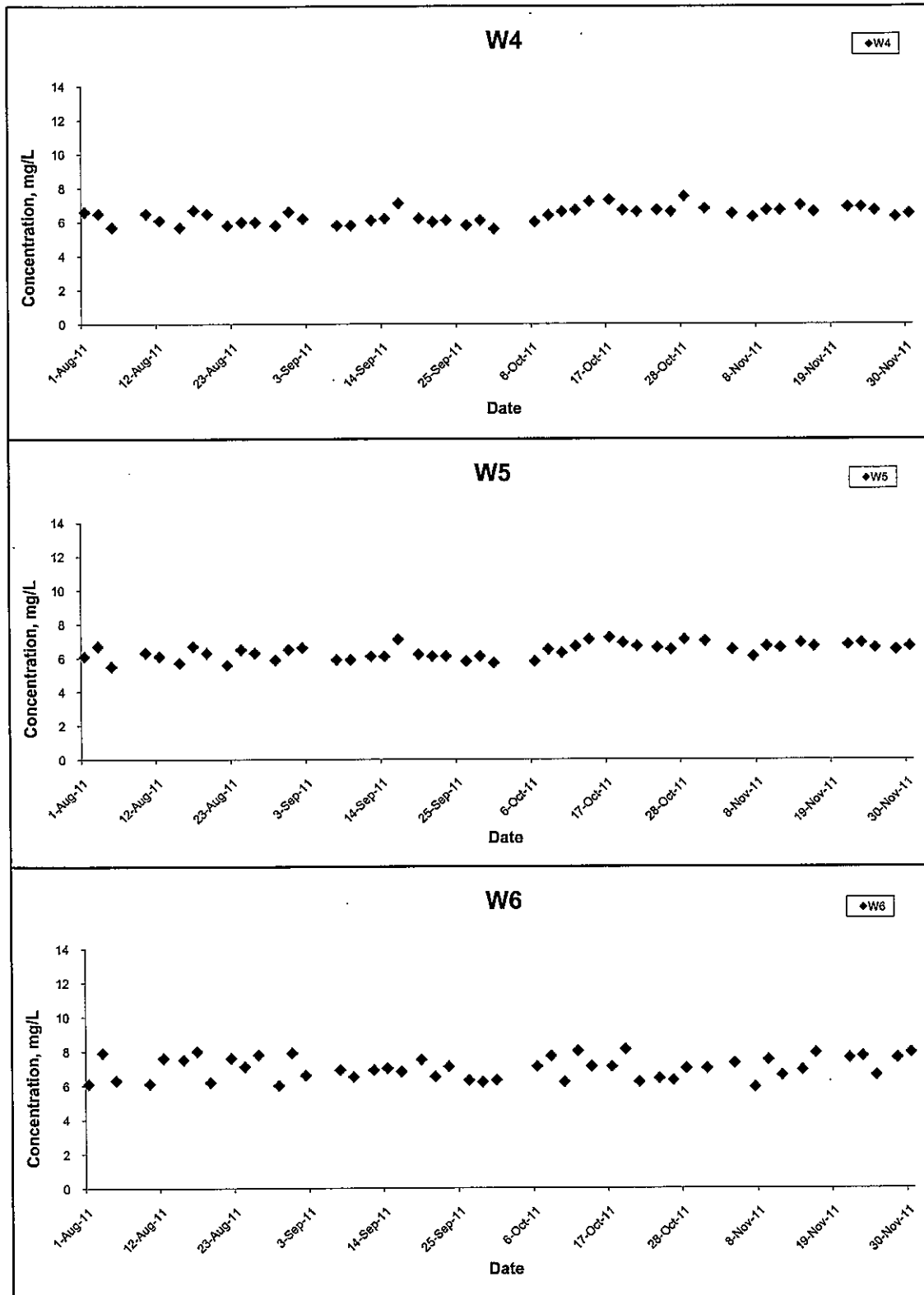
**APPENDIX G
GRAPHICAL PRESENTATION OF
WATER MONITORING RESULTS**

Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



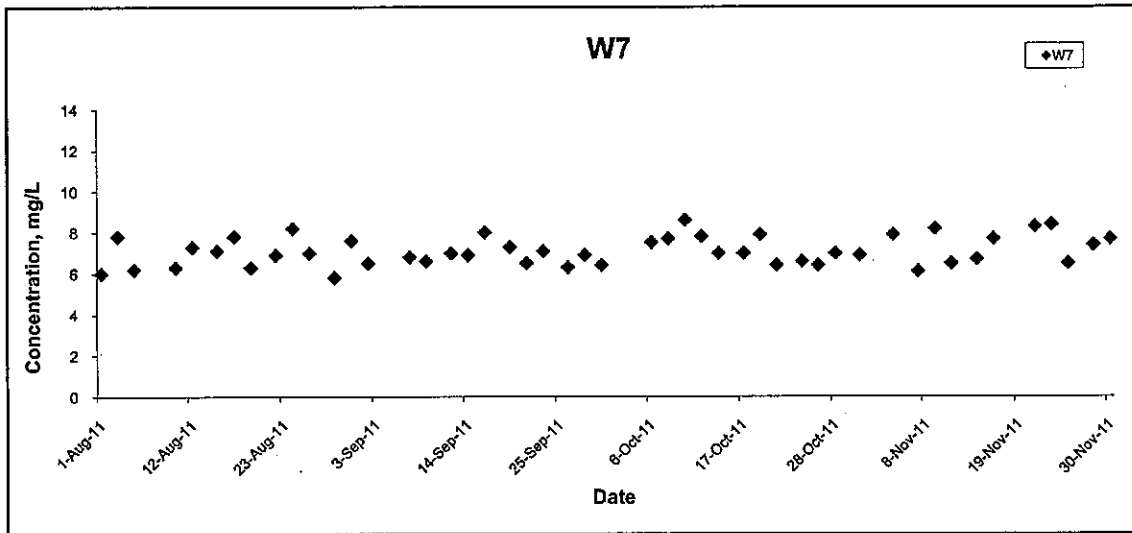
Title Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA0002	CINOTECH
	Date Nov 11	Appendix G	

Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



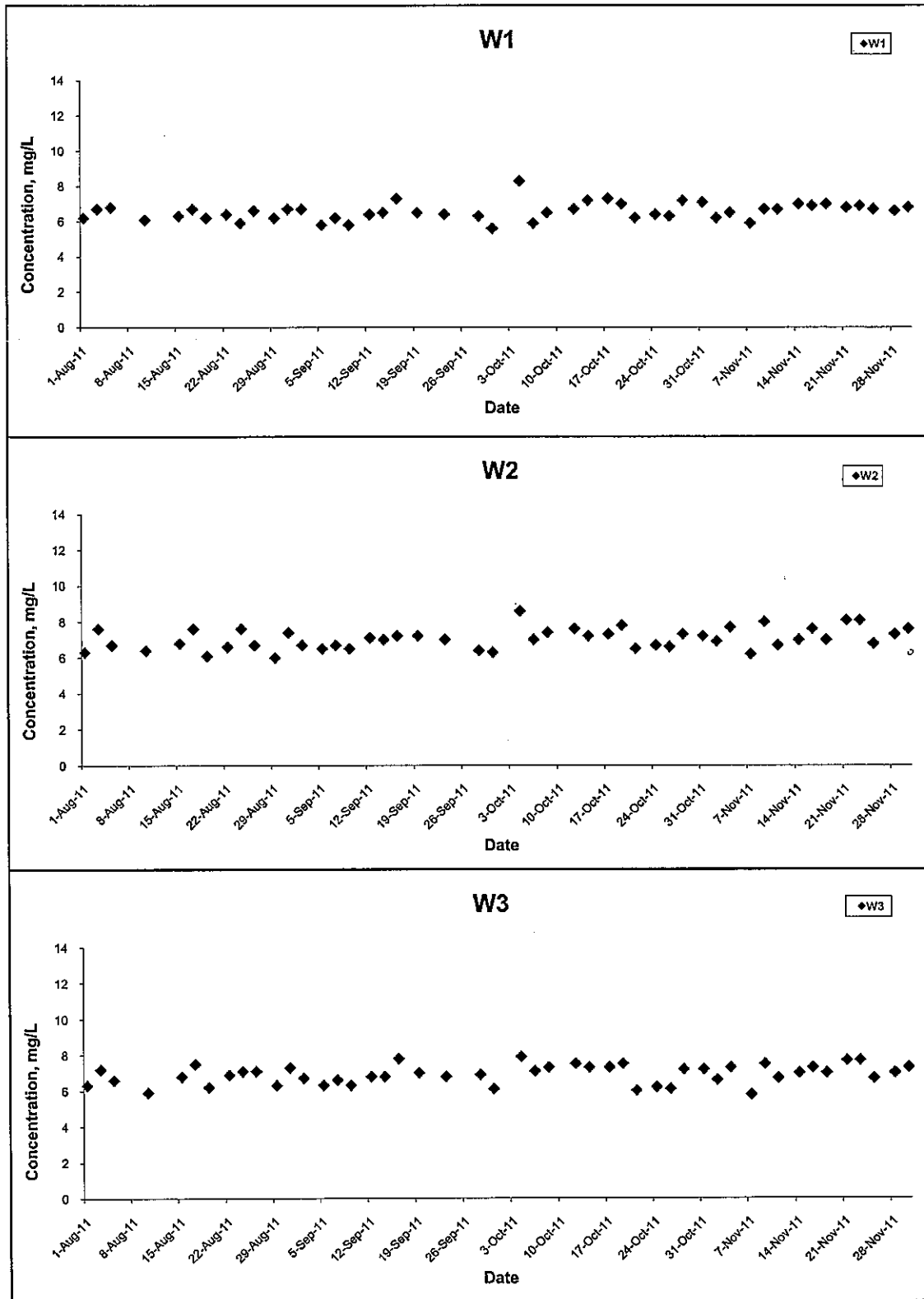
Title Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA0002	CINOTECH
	Date Nov 11	Appendix G	

Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



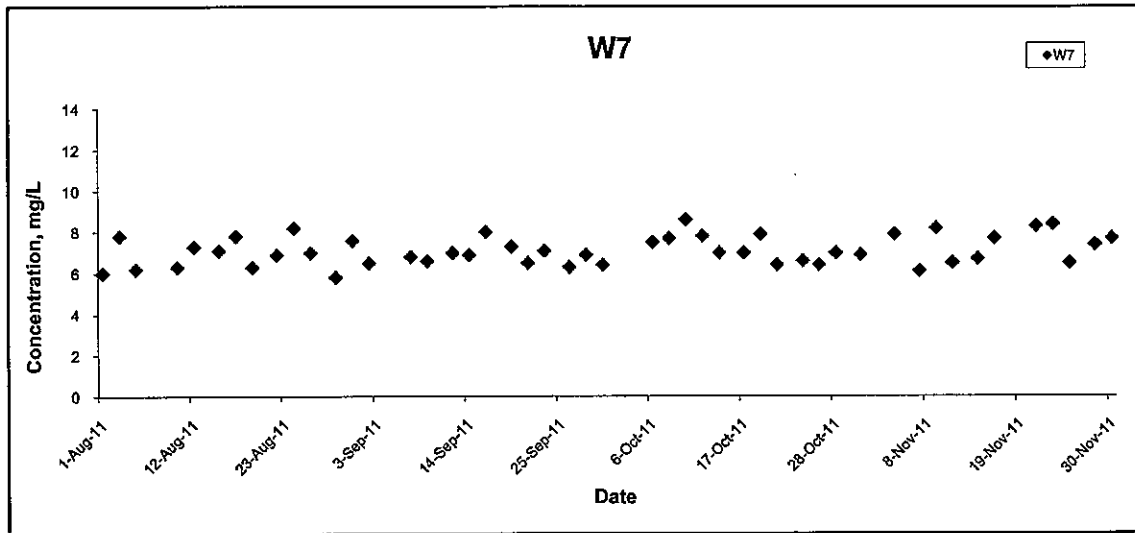
Title Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA0002	CINOTECH
	Date Nov 11	Appendix G	

Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



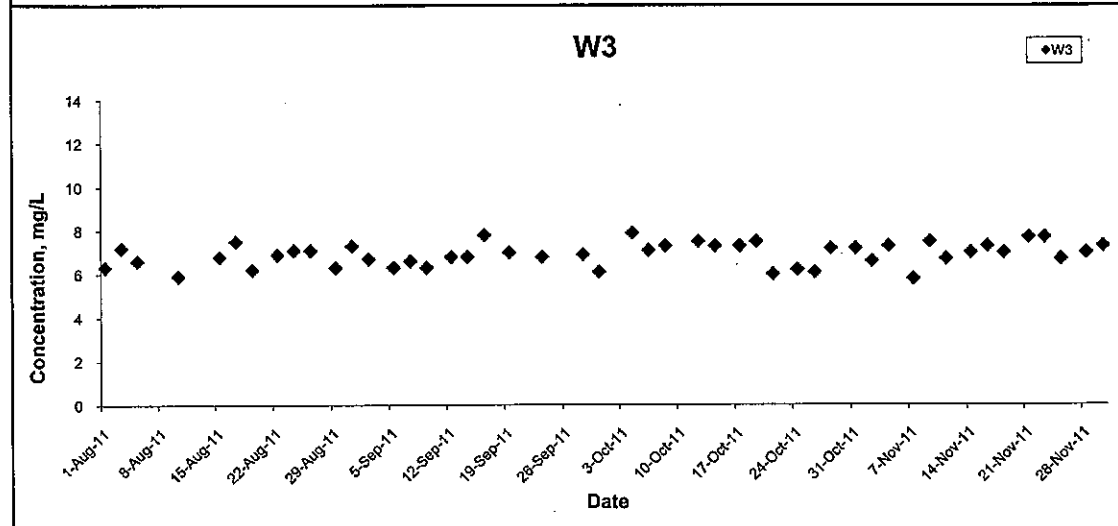
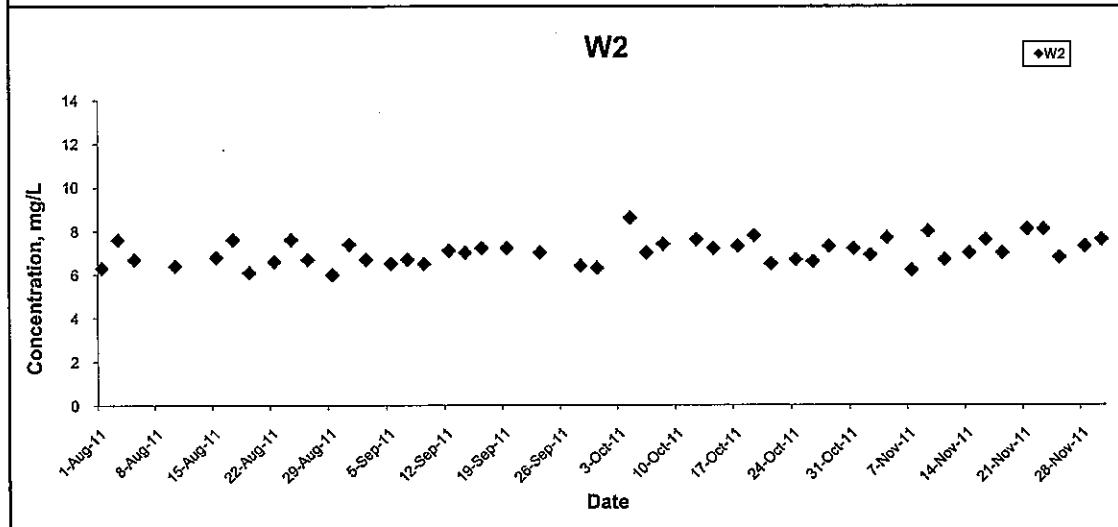
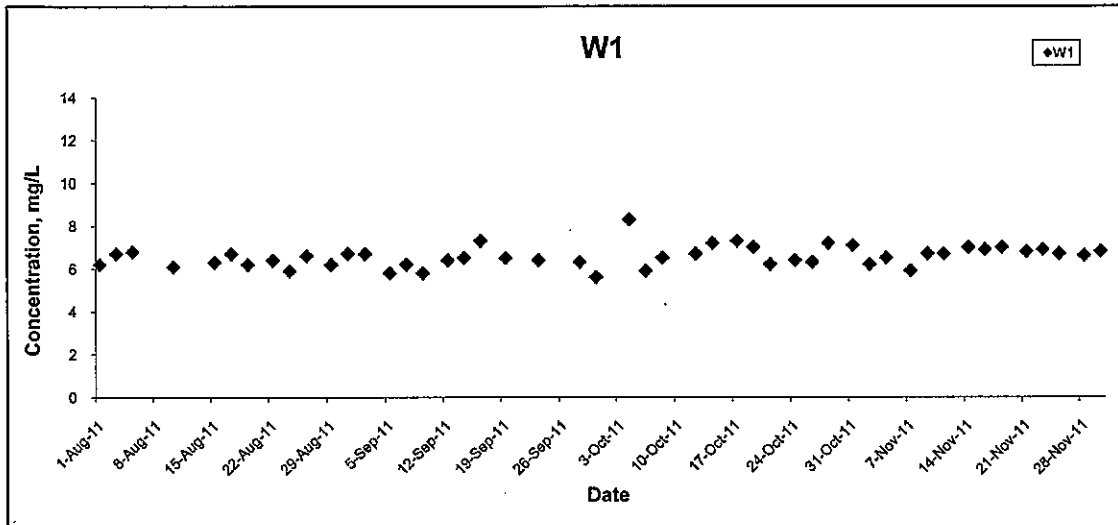
Title Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan Graphical Presentation of Water Quality Monitoring Results	Scale	N.T.S	Project No. MA0002	CINOTECH
	Date	Nov 11	Appendix G	

Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



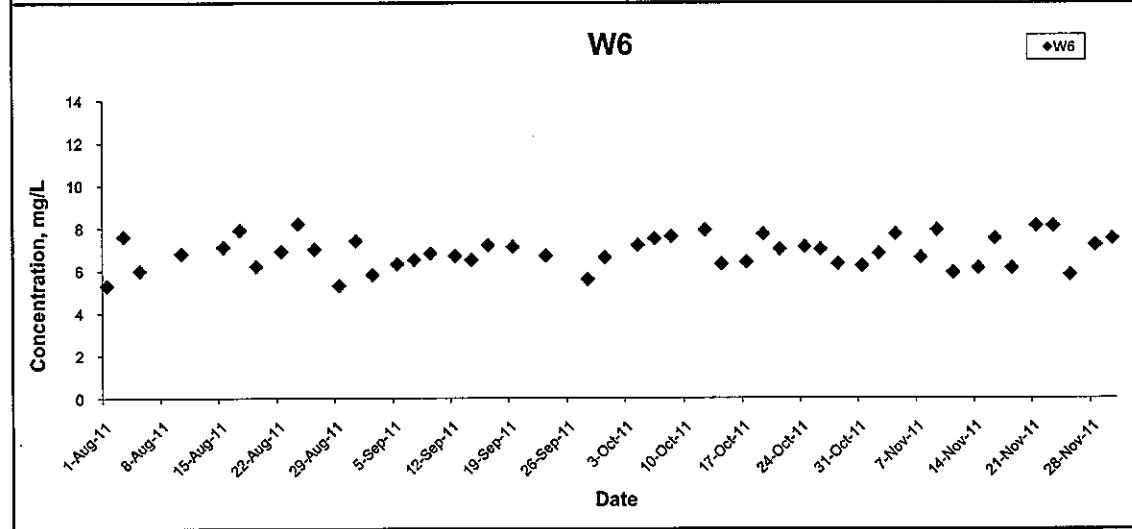
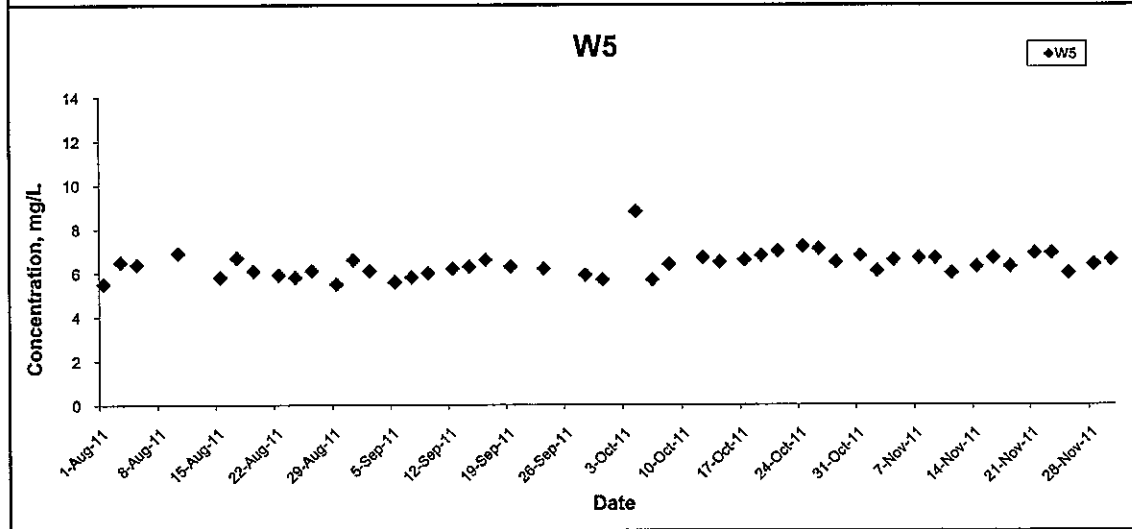
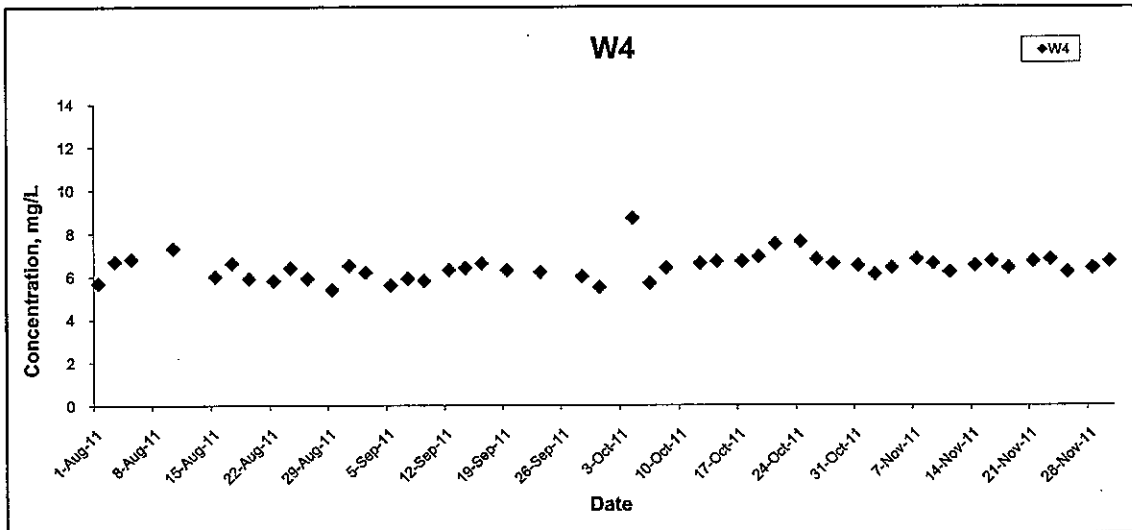
Title Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA0002	CINOTECH
	Date Nov 11	Appendix G	

Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



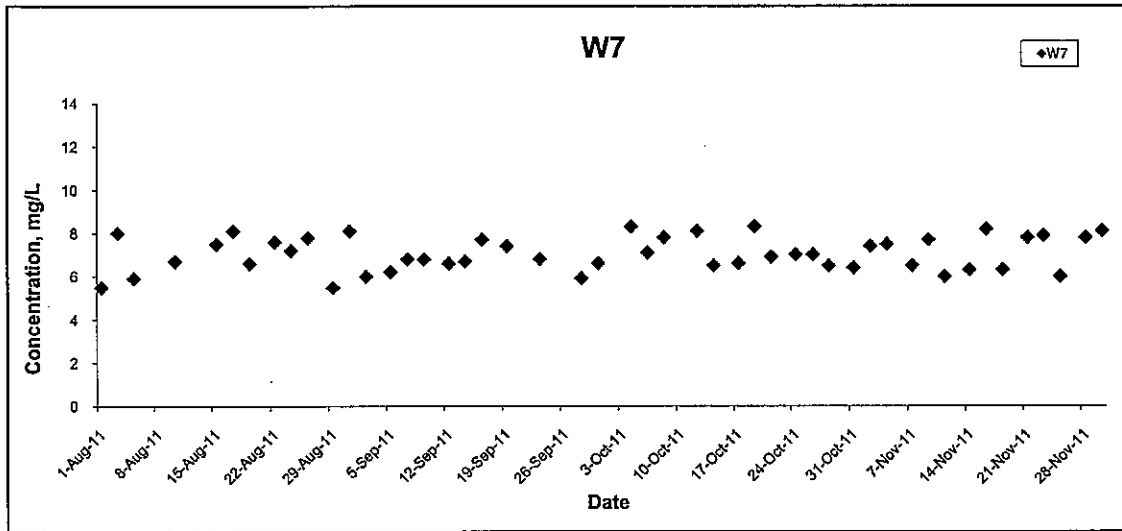
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	Date Nov 11	Appendix G	

Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



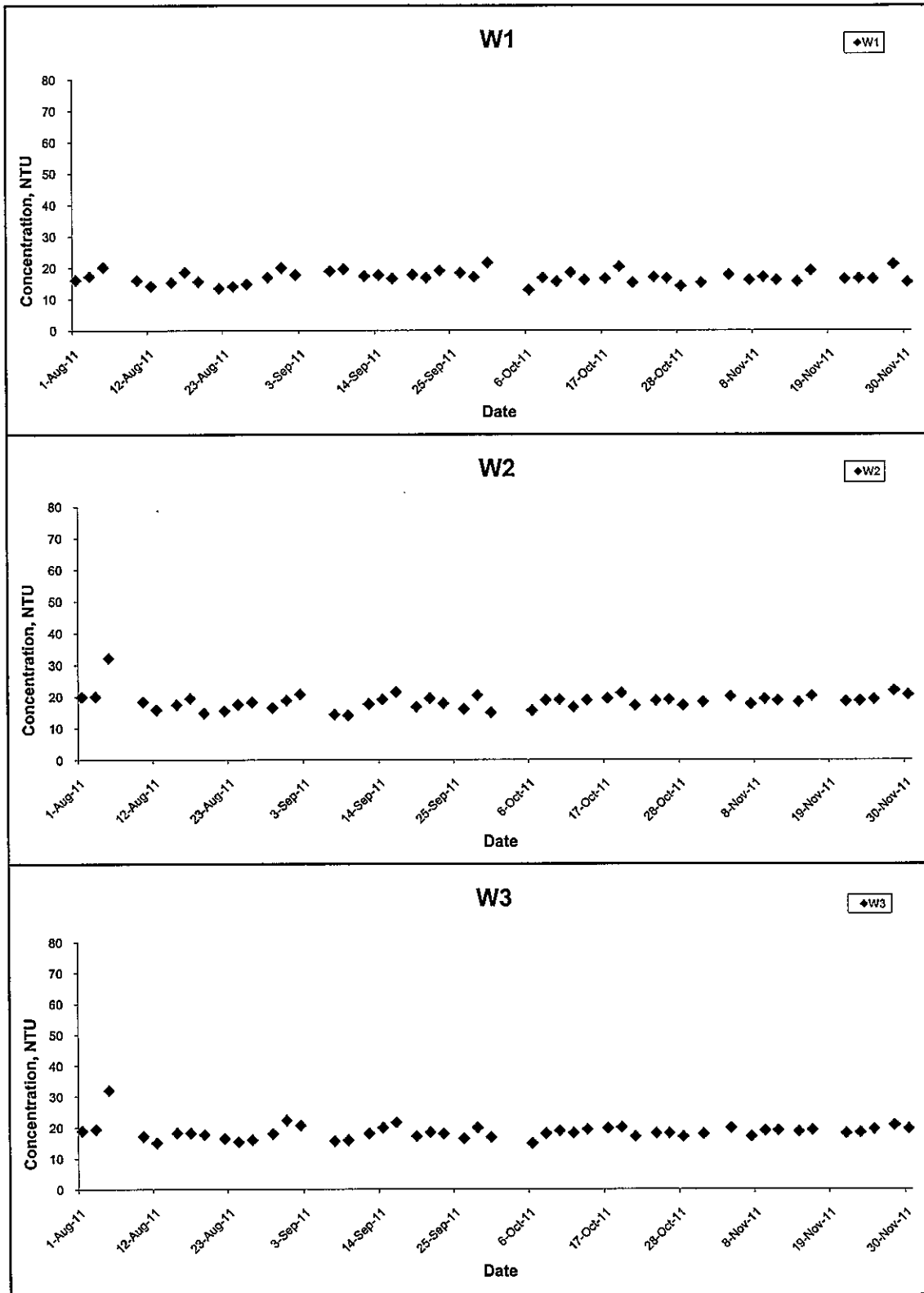
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	Date Nov 11	Appendix G	

Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



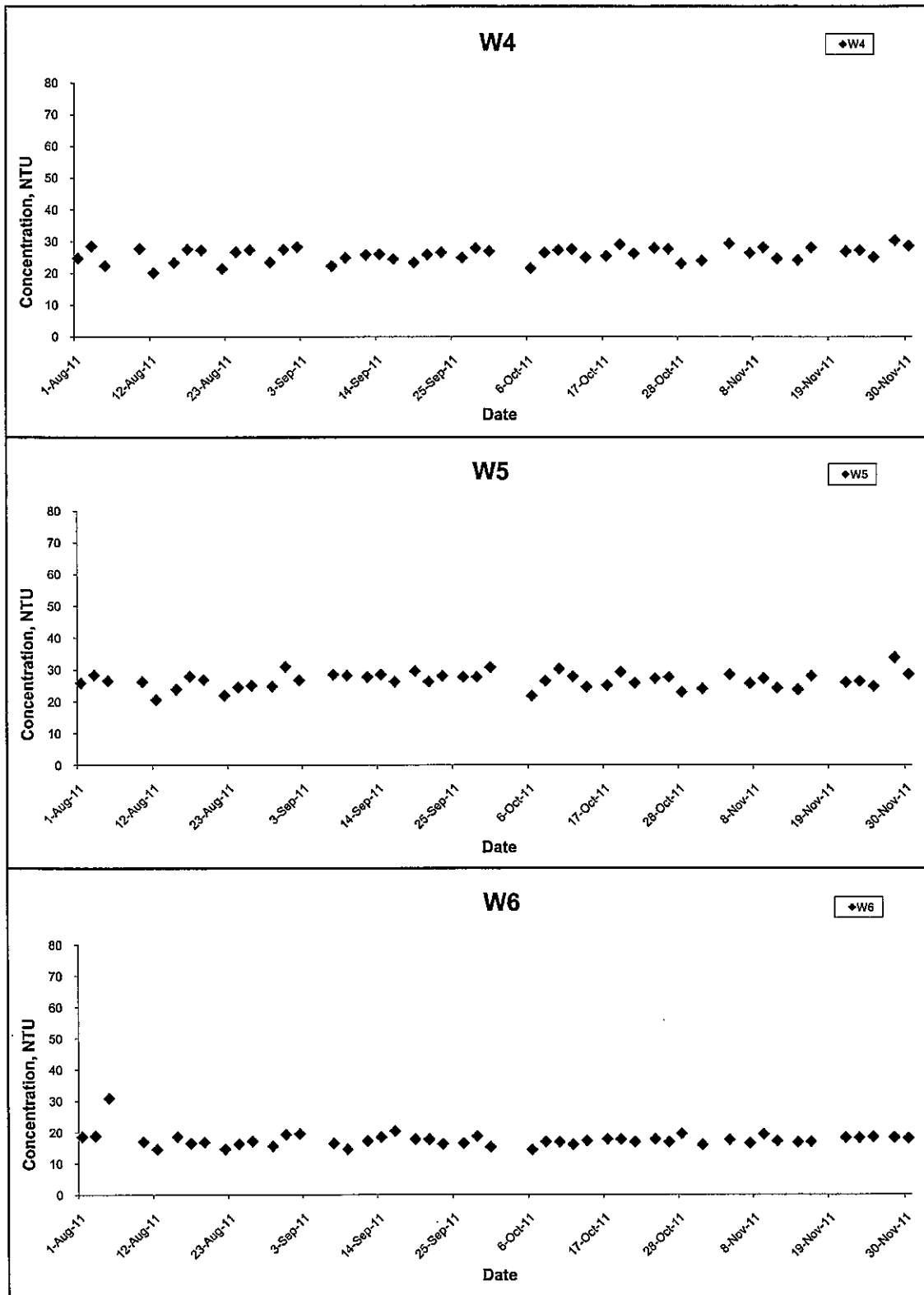
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Turbidity (Depth-averaged) at Mid-Ebb Tide



Title Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA0002	CINOTECH
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Turbidity (Depth-averaged) at Mid-Ebb Tide



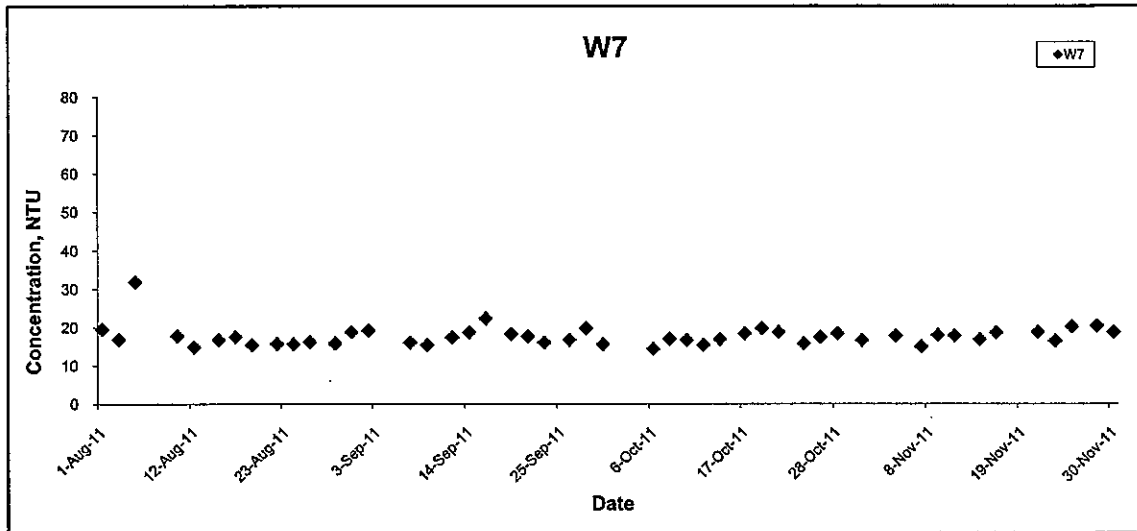
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 Hang Hau Tsuen Channel at Lau Fau Shan
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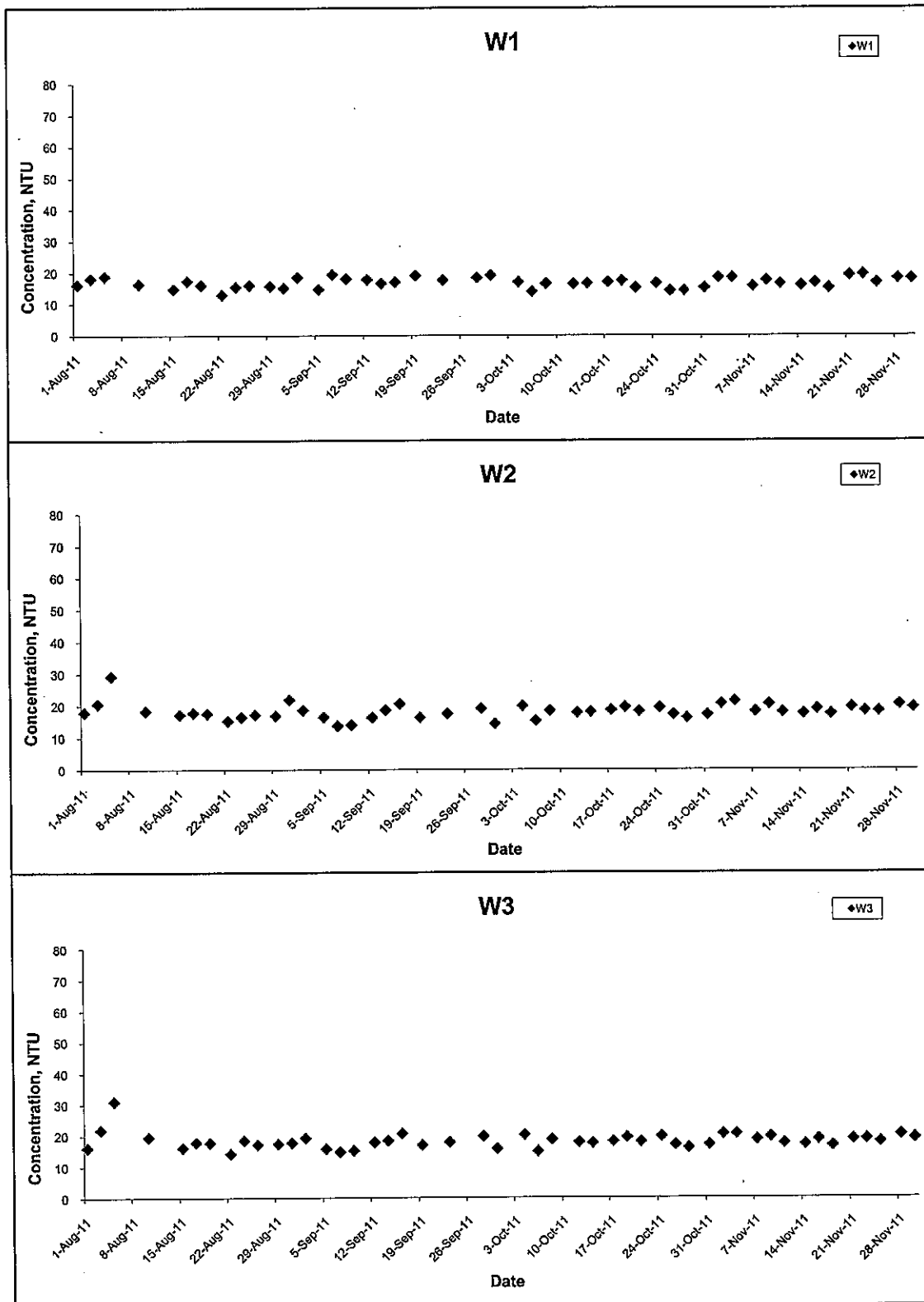


Turbidity (Depth-averaged) at Mid-Ebb Tide



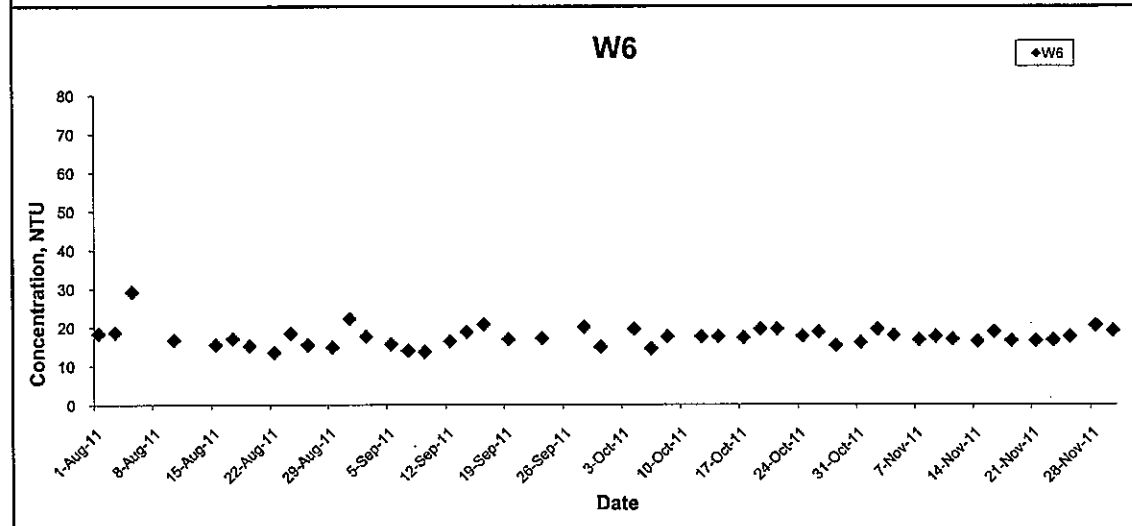
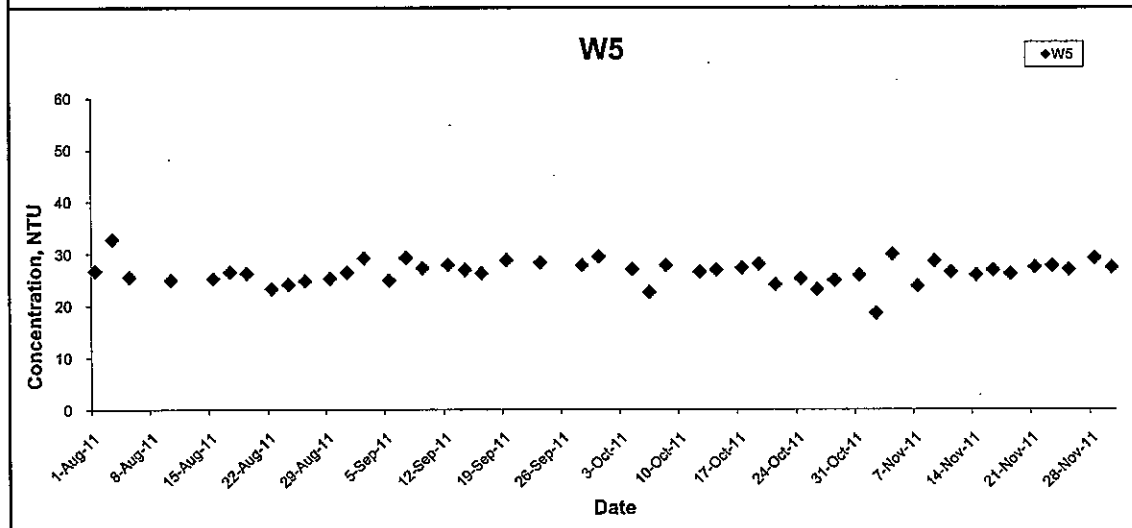
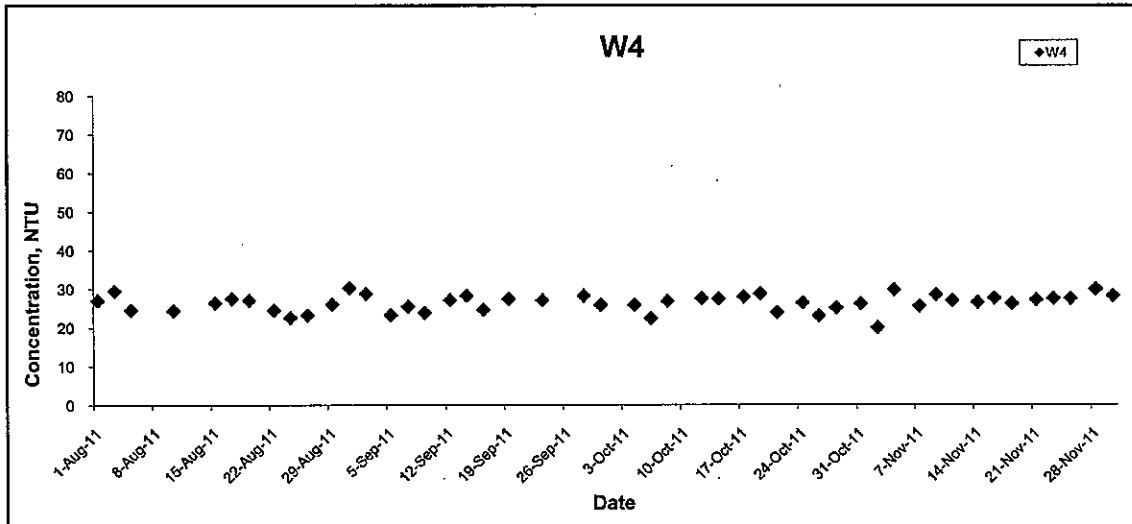
Title Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA0002	CINOTECH
	Date Nov 11	Appendix G	

Turbidity (Depth-averaged) at Mid-Flood Tide



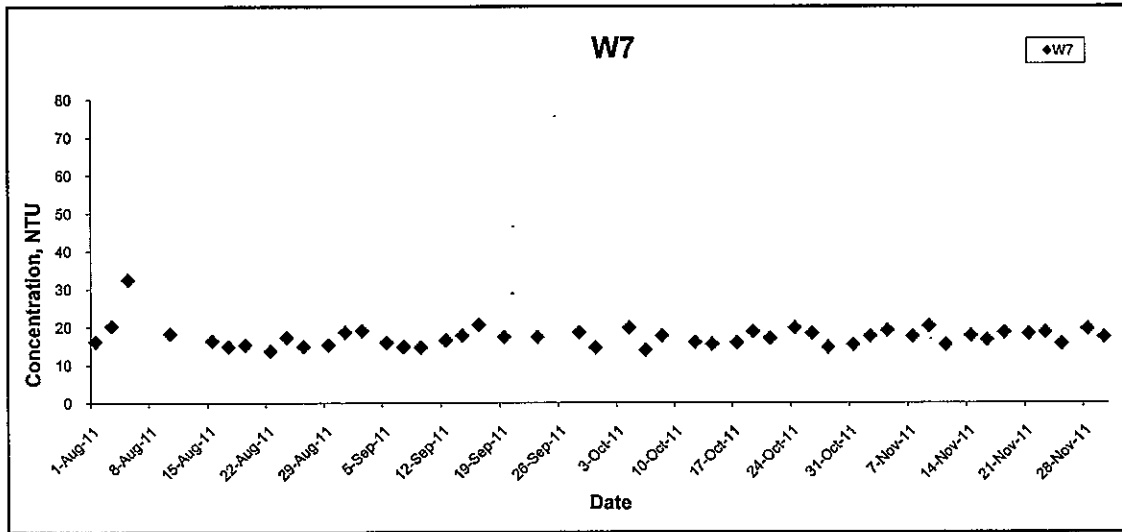
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	Date Nov 11	Appendix G	

Turbidity (Depth-averaged) at Mid-Flood Tide



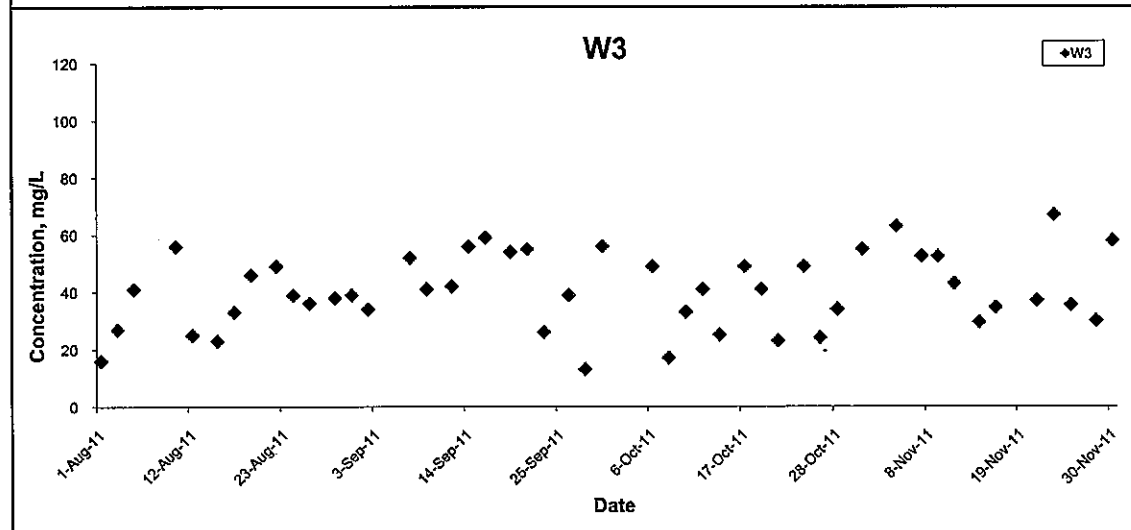
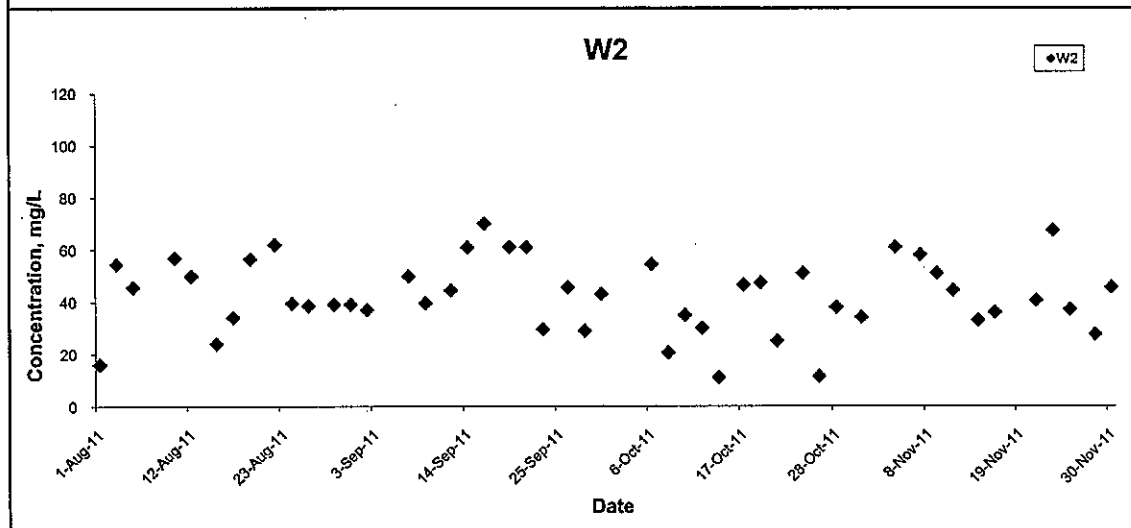
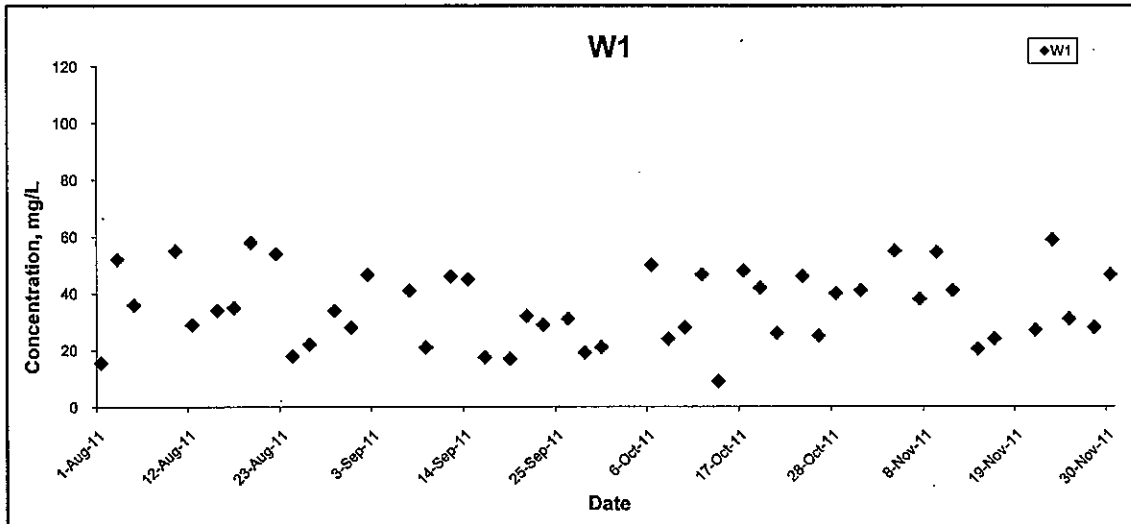
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	Date	Nov 11	Appendix G	

Turbidity (Depth-averaged) at Mid-Flood Tide



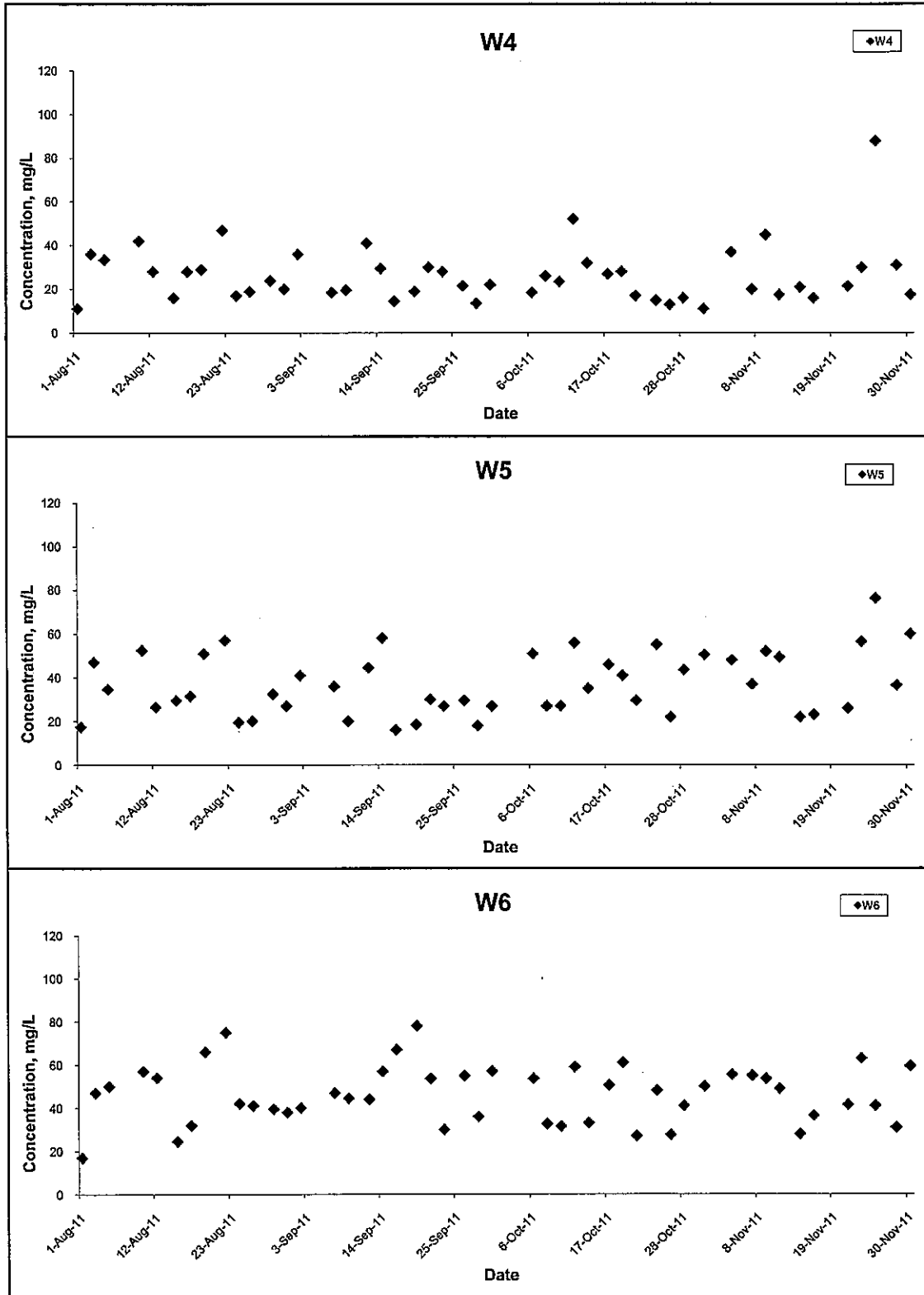
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Suspended Solids (Depth-averaged) at Mid-Ebb Tide



Title	Contract No. YL/2009/01	Scale	Project No.	CINOTECH
	Hang Hau Tsuen Channel at Lau Fau Shan	N.T.S	MA0002	
Graphical Presentation of Water Quality Monitoring Results		Date	Appendix	
		Nov 11	G	

Suspended Solids (Depth-averaged) at Mid-Ebb Tide



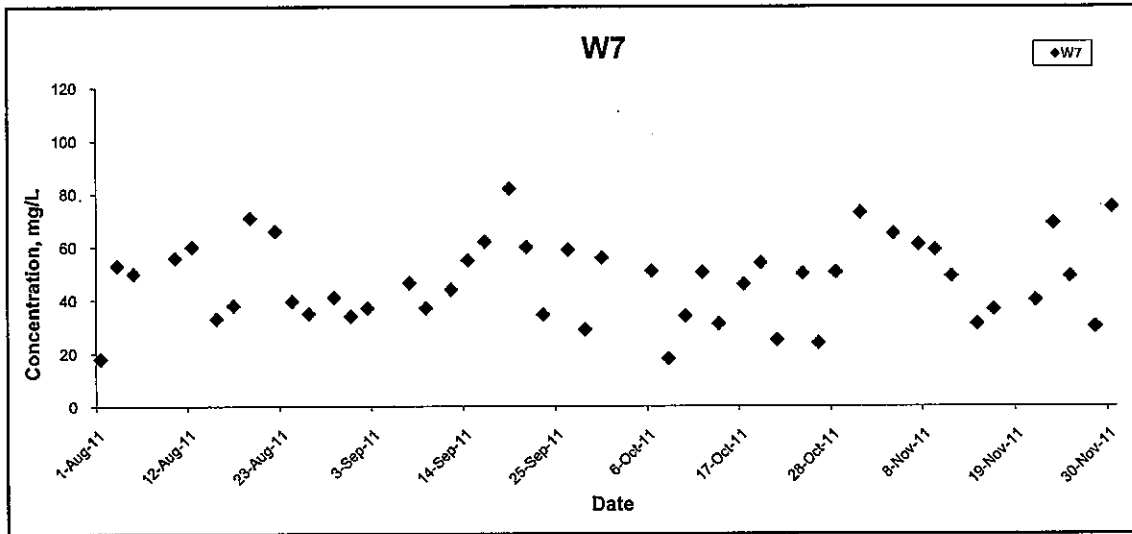
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 Hang Hau Tsuen Channel at Lau Fau Shan
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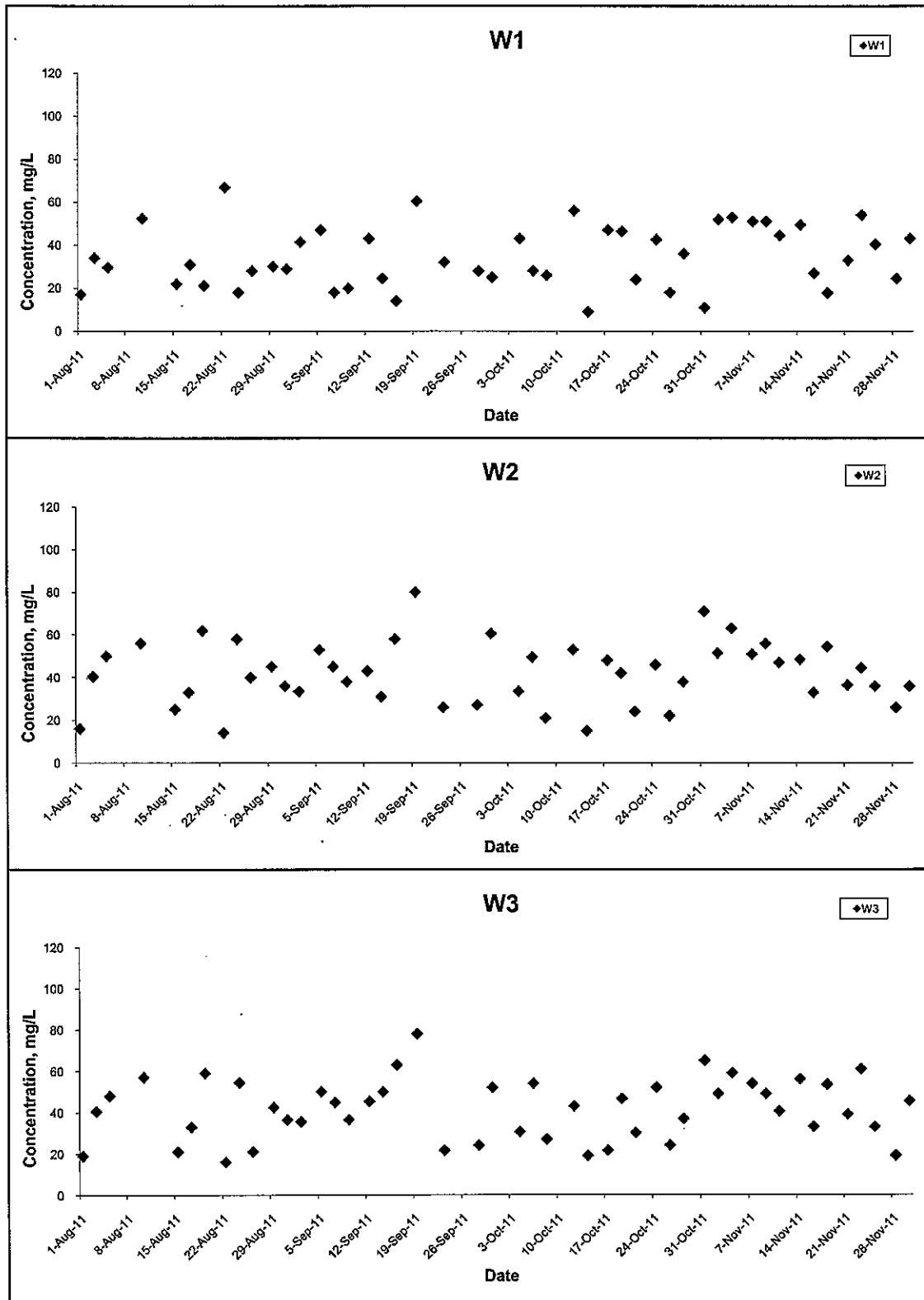


Suspended Solids (Depth-averaged) at Mid-Ebb Tide



Title Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA0002	CINOTECH
	Date Nov 11	Appendix G	

Suspended Solids (Depth-averaged) at Mid-Flood Tide



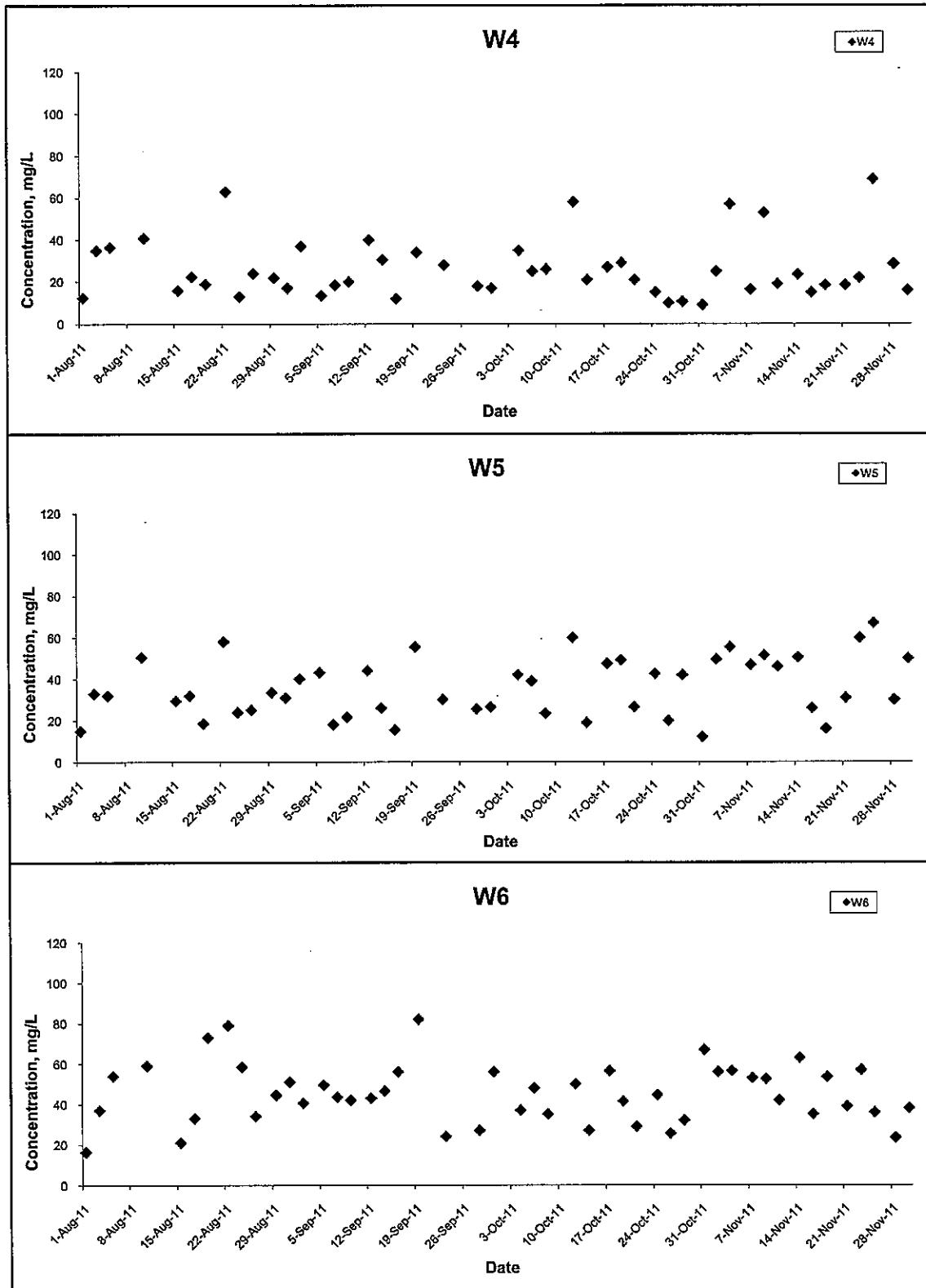
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 Hang Hau Tsuen Channel at Lau Fau Shan
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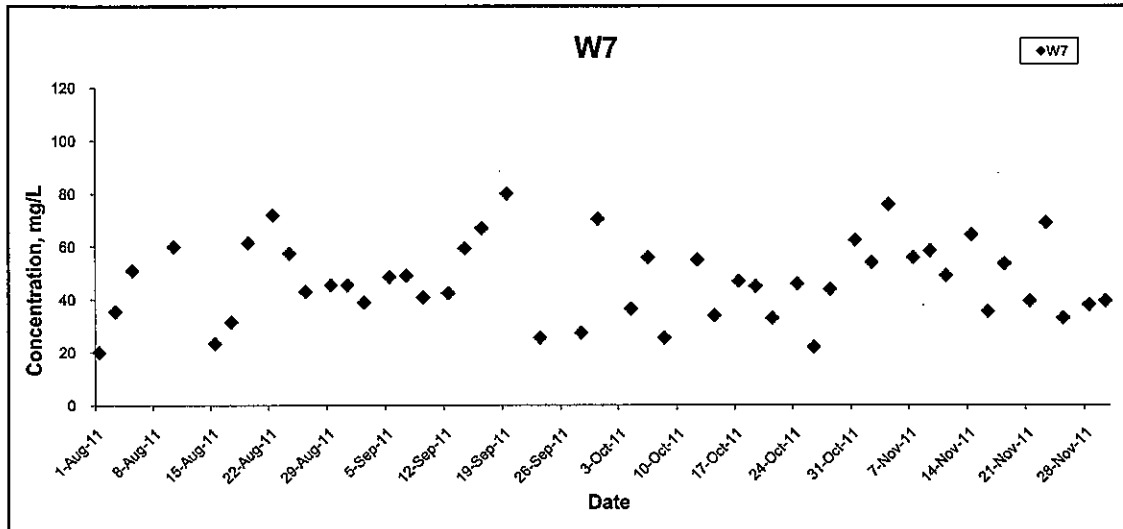
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Suspended Solids (Depth-averaged) at Mid-Flood Tide



Title Contract No. YL/2009/01 Hang Hau Tsuen Channel at Lau Fau Shan Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA0002	CINOTECH
	Date Nov 11	Appendix G	

Suspended Solids (Depth-averaged) at Mid-Flood Tide



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**APPENDIX H
IMPLEMENTATION STATUS OF
ENVIRONMENTAL MITIGATION
MEASURES (EMIS)**

Appendix H - Implementation Schedule of Environmental Mitigation Measures

EIA Ref.	EM &A Ref.	Recommended Mitigation Measures	Objectives of Recommended Measures and Main Concerns to address	Location /Timing	Implementation on Agent	Implementation Stages*			Relevant Legislation & Guidelines	Status
						D	C	O		
Air Quality – Construction Phase										
3.8.1	2.9.1	<p><i>Construction Dust</i></p> <p>In order to comply with Air Pollution Control Ordinance (APCO), the Contractor should undertake at all times measures to prevent dust nuisance as a result of his activities. The Contractors are required to follow all the requirements for dust control stipulated in the Air Pollution Control (Construction Dust) Regulation. Dust suppression measures should be installed as part of good construction practice, and they should be incorporated in the Contract Specification and implemented to minimize dust nuisance to within acceptable levels arising from the works. The followings are examples of the dust suppression measures.</p> <p>(i) The area in which excavation takes place shall be sprayed with water immediately prior to, during and immediately after the excavation to minimise dust generation.</p> <p>(ii) The Contractor shall frequently clean and water the site to minimize fugitive dust emissions.</p> <p>(iii) Effective water sprays shall be used during the delivery and handling of aggregate, and other similar materials, when dust is likely to be created and to dampen all stored materials during dry and windy weather.</p>	To prevent dust nuisance on ASRs during construction	All work site / during construction	Construction Contractor	✓			Air Pollution Control Ordinance Air Pollution Control (Construction Dust) Regulation	#

	<p>(iv) Watering of exposed surfaces shall be conducted at least 2 times per day especially during dry and windy weather.</p> <p>(v) Areas within the site where there is a regular movement of vehicles must be regularly watered as often as necessary for effective suppression of dust or as often as directed by the Engineer.</p> <p>(vi) Where dusty material are being discharged to vehicle from a conveying system at a fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhaust fans shall be provided for this enclosure and vented to a suitable fabric filter system.</p> <p>(vii) The Contractor shall restrict all motorised vehicles within the site, excluding those on public roads, to a maximum speed of 15 km per hour and confine haulage and delivery vehicles to designated roadways inside the site.</p> <p>(viii) Wheel washing facilities shall be installed and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads. Water in the wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The Contractor shall submit details of proposals for the wheel cleaning facility. Such wheel washing facilities shall be usable prior to any earthworks excavating activity on the site. The Contractor shall also provide a hard-surfaced road between any washing facility and the public road.</p> <p>(ix) All vehicle exhausts shall be directly vertically upwards or directed away from the ground.</p> <p>(x) Any materials dropped on paved roads shall be cleaned up immediately to prevent dust nuisance.</p>							
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3.8.2	2.9.2	<p>Odour</p> <p>In the event that excavated materials are found to be odorous, the following measures should be implemented by the Contractor.</p> <ul style="list-style-type: none"> i. Place odorous excavated material as far away (say, at least 20m) from air sensitive receivers as possible. ii. Temporary stockpiles of odorous excavated material should be properly covered with tarpaulin and should be removed off-site as soon as practically possible within 2 days to avoid any odour nuisance arising. 	To prevent odour nuisance on ASRs During construction	All work site / during construction	Construction Contractor	✓	<p>Air Pollution Control Ordinance</p> <p>Environmental Impact Assessment Ordinance</p> <p>Technical Memorandum on EIA Process</p>	^
Air Quality – Operational Phase								
3.8.3	2.9.3	<p>No adverse air quality impact is identified during operational phase. In the event that sediment excavated during maintenance are found to be odorous, the following measures should be implemented by DSD (or DSD's maintenance contractor).</p> <ul style="list-style-type: none"> i. Place odorous excavated material as far away (say, at least 20m) from air sensitive receivers as possible. ii. Odorous excavated material should be properly covered with tarpaulin or packed in plastic bags or stored in enclosed skips and should be removed off-site as soon as practically possible within 2 days to avoid any odour nuisance arising. 	To prevent odour nuisance on ASRs during maintenance	The proposed channel / during operation	DSD (or DSD's maintenance contractor)+	✓	<p>Environmental Impact Assessment Ordinance</p> <p>Technical Memorandum on EIA Process</p>	N/A

EIA Ref.	EM & A Ref.	Recommended Mitigation Measures	Objectives of Recommended Measures and Main Concerns to addressed	Location /Timing	Implementation Agent	Implementation Stages*			Relevant Legislation & Guidelines	Status
						D	C	O		
Noise – Construction Phase										
4.7.2	3.8.2	<i>Level 1 Mitigation - Use of Quiet Plant</i> The quiet plant used in construction noise calculation is shown in Table 3.4 (and Appendix 4.1 of the EIA). The Contractor can propose other suitable alternative equipment with similar or lower sound power level.	To protect NSRs from noise during construction	All work site / during construction	Construction Contractor	✓			Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	^
4.7.3	3.8.3	The use of quiet plant is considered to be the most effective ways of alleviating construction noise impact. The Contractor should use quiet plant with sound power level lower than that stipulated in the TM-GW as the Level 1 mitigation for construction noise.	To protect NSRs from noise during construction	All work site / during construction	Construction Contractor	✓			Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	^
4.7.4	3.8.4	The use of mini or lower power rating equipment (e.g. mini excavator) should also be considered where practical. This technique would be feasible and practical at some locations given the limited space available for using large size construction equipment and the small scale works involved.	To protect NSRs from noise during construction	All work site / during construction	Construction Contractor	✓			Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	^

4.7.5	3.8.5	The Contractor should take note of ETWB TCW No. 19/2005 – “Environmental Management on Construction Sites” which sets out the policy and procedures requiring contractors to, among others, adopt Quality Powered Mechanical Equipment (QPME).	To protect NSRs from noise during construction	All work site / during construction	Construction Contractor	✓	Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process ETWB TCW No. 19/2005	^
4.7.6 Table 4.11	3.8.6 Table 3.4	A list of quiet powered mechanical equipment (PME) recommended for use during construction phase is tabulated below in <i>Table 3.4</i> .	To protect NSRs from noise during construction	All work site / during construction	Construction Contractor	✓	Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process ETWB TCW No. 19/2005	^
4.7.8	3.8.7	<i>Level 2 Mitigation - Use of Temporary Noise Barriers</i> Since most of the NSRs within the Project area are typically low-rise tin-sheeted village houses of not more than 2 storeys (all are less than 5 m tall), it would be effective to have noise screening structures or temporary noise barriers purposely-built along the site boundary to provide additional protection to	To protect NSRs from noise during construction	All work site located at 30m or less from NSRs as shown in Figure 4.2 of the EIA / during construction	Construction Contractor	✓	Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process ETWB TCW No. 19/2005	N/A

	4.7.9	<p>NSRs close to the construction site boundary. This could be in the form of purposely-built site hoarding constructed from appropriate materials with a minimum superficial density of 7 kg/m². Noise barrier should be provided for noisy construction activities that would be undertaken close (about 30 m or less) to NSRs. The noise barrier should have a vertical height of at least 3 m or (depending on the height of the NSRs to be protected) a height ensuring that the operating equipment can be shielded from the view of the NSRs. The temporary noise barrier should have no gaps or opening at joints. The Contractor should regularly inspect and maintain the noise barrier to ensure its effectiveness.</p>	To protect NSRs from noise during construction	All work site for NSRs whose line of sight cannot be effectively blocked by the temporary noise barriers / during construction	Construction Contractor	✓		<p>Environmental Impact Assessment Ordinance</p> <p>Technical Memorandum on EIA Process</p>	N/A
4.7.1 2	3.8.1 0	<p>For the construction works which have the potential to exceed the noise standards on nearby NSR and whose line of sight cannot be effectively blocked by the temporary noise barrier, movable (mobile) barriers should be provided. This may also be applicable in situation where construction of a temporary noise barrier may not be possible due to site / space constraints, for example blocking village or emergency vehicle access. Movable barriers of at least 2.5 m height with a small cantilevered upper portion and skid footing can be located within a few meters of stationary plant (e.g. generator) and within about 5 m or more of a mobile equipment (e.g. excavator), such that the line of sight to the NSR is blocked by the barriers.</p> <p><i>Good Site Practices</i></p> <p>In general, potential construction noise impact can be minimised or avoided by imposing a combination of the following good site practices as mitigation measures:</p>	To protect NSRs from noise during construction	All work site / during construction	Construction Contractor	✓		<p>Environmental Impact Assessment Ordinance</p> <p>Technical Memorandum</p>	^

4.7.1	3.8.1	<p>a. Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction period.</p> <p>b. Construction plant should be sited away from NSRs</p> <p>c. Machines and plant that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.</p> <p>d. Equipment known to emit sound strongly in one direction should be orientated such that the noise is directed away from nearby NSRs.</p> <p>e. Material stockpiles and other structures (such as site offices) should be effectively utilised to shield on-site construction activities.</p> <p>f. Stationary equipment should be located within the channel when weather conditions permit (e.g. dry season).</p> <p>g. The Contractor shall devise, arrange methods of working and carrying out the works in such manner as to minimise noise impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these measures are implemented properly.</p> <p>h. In the event that new schools are built near the works area, the Contractor should minimise construction noise exposure to the schools (especially during examination periods). The Contractor should liaise with the school and the Examination Authority to ascertain the exact dates and times of all examination periods during the course of the contract and to avoid noisy activities during these periods.</p>	To promote	All work	Project Office	✓	um on EIA Process	^
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5	2	with the public, a 24-hour hotline system should be established by the project office for the Contractor to receive any enquiry and complaint lodged by the public in respect of the Project. Upon receipt of enquiry / complaint, the Contractor (or its Environmental Team) should investigate the causes of the incident and take the appropriate action to rectify the situation. Periodic newsletters, information leaflets, notices or other means of communication should be provided to the affected villages, communities, and residents advising them the current progress, the schedule of works in future, the potential environmental impacts arising from the works and the corresponding mitigation measures. It is considered that such a close relation between the local communities and the project site office could ensure speedy resolution of any environmental non-compliance and maintain an environmental standard acceptable to the local communities during construction.	good public relation and maintain effective communication during construction	site/ during construction	(Engineer) & Construction Contractor			Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	
4.7.1 8	3.8.1 3	Further mitigation is recommended for NSRs 3, 4, 6 & 10 by restricting concurrent usage of several equipment at the same time during excavation and construction of the channel lining, crossings.	To further mitigate construction noise at NSR 3,4,6 &10	For work within 20m of NSRs 3, 4, 6 &10 / during construction	Construction Contractor	✓		Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	^
4.7.1 9	3.8.1 4	All these construction noise mitigation measures should be implemented by the Contractor during the construction stage of the works. The location of the temporary noise barriers and mobile noise barriers should be further reviewed by the Contractor during the construction stage based on the latest construction	To protect NSRs from noise during construction and to ensure the Contractor will	All works site/ during construction	Construction Contractor	✓		Environmental Impact Assessment Ordinance	^

	<p>programme and contemporary conditions, including any changes with respect to NSRs. The Contractor should design, construct, operate and maintain the mitigation measures throughout the construction stage and as required by the Engineer. Before commencement of the works, the Contractor should submit to the Engineer for approval (as part of their method statement) details of the mitigation measures to be employed under the works. The Contractor's proposed mitigation measures should also be certified by the ET Leader and verified by the IEC to ensure the intended noise reduction effectiveness can be achieved.</p>	<p>properly implement the mitigation measures</p>				<p>Technical Memorandum on EIA Process</p>
<p>Noise – Operational Phase</p>						
						<p>N/A</p>

EIA Ref.	EM & A Ref.	Recommended Mitigation Measures	Objectives of Recommended Measures and Main Concerns to addressed	Location /Timing	Implementation Agent	Implementation Stages*			Relevant Legislation & Guidelines	Status
						D	C	O		
Water Quality – Construction Phase										
5.7.2	4.9.2	<i>General</i> The Contractor shall observe and comply with the Water Pollution Control Ordinance (WPCO) and its subsidiary regulations. The Contractor shall carry out the works in such a manner as to minimise adverse impacts on the water quality during execution of the works. In particular the Contractor shall arrange his method of working to minimise the effects on the water quality within and outside the site and on the transport routes.	To minimize adverse water quality impact during construction	All work site / during construction	Construction Contractor	✓			Water Pollution Control Ordinance	#
5.7.3	4.9.3	The Contractor shall follow the practices, and be responsible for the design, construction, operation and maintenance of all the mitigation measures below and as specified in ProPECC PN 1/94 – “Construction Site Drainage”. The design of the mitigation measures shall be submitted by the Contractor to the Engineer for approval.	To minimize adverse water quality impact during construction	All work site / during construction	Construction Contractor	✓			ProPECC PN 1/94	#
5.7.4	4.9.4	<i>Site Preparation / Clearance</i> Proper construction site drainage management measures should be implemented to control site runoff and drainage, and thereby prevent high sediment loadings from reaching Deep Bay or the nearby abandoned fishponds. Site runoff and wastewater should not be discharged into the fishponds irrespective of the status of the fishponds.	To minimize adverse water quality impact during construction	All work site / during construction	Construction Contractor	✓			ProPECC PN 1/94	^
5.7.5	4.9.5	Turbid water from construction sites must be treated to minimise the solids content before being discharged. Advice on the handling and disposal of	To minimize adverse water quality impact during construction	All work site / during construction	Construction Contractor	✓			ProPECC PN 1/94	^

		site discharge is given in the ProPECC Note PN 1/94 – "Construction Site Drainage".	during construction	All work site / during construction	Construction Contractor	✓	ProPECC PN 1/94	#
5.7.6	4.9.6	In general, surface run-off from construction sites should be discharged into water bodies via adequately designed silt removal facilities such as sand traps, silt traps and sediment basins. Channels or earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries should be provided to intercept storm run-off from outside the site so that it will not wash across the site (or into the proposed channel works area). Catchpits and perimeter channels should be constructed in advance of earthworks.	To minimize adverse water quality impact during construction	All work site / during construction	Construction Contractor	✓	ProPECC PN 1/94	#
5.7.7	4.9.7	Silt removal facilities and diversion channels should be maintained and the deposited silt and grit should be removed regularly, especially at the onset of and after each rainstorm to ensure proper functioning of these facilities at all times.	To minimize adverse water quality impact during construction	All work site / during construction	Construction Contractor	✓	ProPECC PN 1/94	#
5.7.8	4.9.8	Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into the nearby water bodies. Open stockpiles susceptible to erosion should be covered with tarpaulin or similar fabric and provided with containment such as bunds, sand bag barriers or equivalent measures, especially during the wet season (April – September) or when heavy rainstorm is predicted. Runoff to watercourses should be reduced by minimising flat exposed areas of permeable soil, and by forming pits or diversion channels into which runoff can flow to suitable treatment facilities before discharge.	To minimize adverse water quality impact during construction	All work site / during construction	Construction Contractor	✓	ProPECC PN 1/94	#
5.7.9	4.9.9	<i>De-watering / Excavation of Stream / Pond and Removal of Sediment</i> Excavation works within the existing stream section and pond should be programmed to be carried out	To minimize adverse water quality impact from excavation	Existing stream section and pond to be	Construction Contractor	✓	Water Pollution Control Ordinance	^

		during dry season from 1 st October to 31 st March as far as practicable to minimise impacts on downstream water quality and nearby sensitive receivers.	works during wet season.	excavated / during construction	Contractor				
5.7.1 0	4.9.1 0	The use of containment structure such as sheet pile barriers, earth bunds, sand bag barriers wrapped with geotextile fabric or similar material, diversion channels or other similar techniques should be installed surrounding the excavation area to facilitate a dry or at least confined excavation within the stream. Schematic diagram of typical drainage measures during excavation of the stream is shown in Figure 5.3 (of the EIA). The Contractor should submit details of the temporary drainage measures along with the proposed measures to ameliorate the potential water quality impacts to the Environmental Team (ET) for verification and to the Engineer for approval before commencement of the construction works.	To minimize adverse water quality impact during construction	All works site / during construction	Construction Contractor				Water Pollution Control Ordinance ^
5.7.1 1	4.9.1 1	The excavation area should be limited to section of half width of the stream in order to maintain continuous water flow within the stream during the construction phase.	Restrict width of excavation work to minimize impacts on downstream water quality and sensitive receivers.	Existing stream section to be excavated / during construction	Construction Contractor	✓			Water Pollution Control Ordinance ^
5.7.1 2	4.9.1 2	After dewatering of the stream and pond, the sediments should be allowed to dry before excavation (yet still maintain a moist state to avoid dust nuisance). This will facilitate excavation of the sediments and also minimise the risk of drained water flowing back into watercourses as the sediment is handled. Where time or weather constraints require handling of wet sediment, care should be taken in the removal of sediment and the storage area should be	To minimize adverse water quality impact during construction (in particular when excavating and handling sediments)	All works site where sediment removal is required / during construction	Construction Contractor	✓			Water Pollution Control Ordinance ^

5.7.1 3	4.9.1 3	bunded to prevent silty runoff entering water bodies. Tightly sealed closed grab excavators should be employed to minimize leakage and loss of sediments during excavation works within the stream.	To minimize adverse water quality impact during construction (in particular when excavating and handling sediments)	All works site where sediment removal is required / during construction	Construction Contractor	✓		Water Pollution Control Ordinance	N/A
5.7.1 4	4.9.1 4	Excavated sediment material from stream should be stored in covered impermeable skips and disposed within 2 days, to avoid inadvertent release of silty runoff and contaminants to nearby water bodies. If sediment material is identified to be suitable for reuse as stream bed material, it should be properly stockpiled, adequately covered and provided with containment to prevent runoff during wet season.	To minimize adverse water quality impact during construction (in particular when excavating and handling sediments)	All works site where sediment removal is required / during construction	Construction Contractor	✓		Water Pollution Control Ordinance	N/A
5.7.1 5	4.9.1 5	Regular monitoring of suspended solids and turbidity should be conducted during excavation works. Any exceedance of water quality in the nearby water bodies caused by inadvertent release of site runoff should be rectified in accordance with EM&A programme for this Project.	To minimize adverse water quality impact during construction	All works site / during construction	Construction Contractor	✓		Water Pollution Control Ordinance	^
5.7.1 6	4.9.1 6	<i>Concreting Work</i> Runoff should be carefully channelled to prevent concrete-contaminated water from entering watercourses. Adjustment of pH can be achieved by adding a suitable neutralising reagent to wastewater prior to discharge. Reuse of the supernatant from the sediment pits for washing out of concrete lorries should be practised.	To minimize adverse water quality impact during construction (in particular concreting works)	All works site / during construction	Construction Contractor	✓		Water Pollution Control Ordinance	N/A
5.7.1 7	4.9.1 7	Any exceedance of acceptable range of pH levels in the nearby water bodies caused by inadvertent release	To minimize adverse water	All works site / during	Construction Contractor	✓		Water Pollution	#

		of site runoff containing concrete should be monitored and rectified under the EM&A programme for this Project.	quality impact during construction (in particular concreting works)	construction			Control Ordinance	
5.7.1 8	4.9.1 8	<p><i>Site Workshop or Depot</i> <i>General Construction Works</i> Any Contractor generating waste oil or other chemicals as a result of his activities should register as a chemical waste producer and provide a safe designated storage area for chemicals on site. The storage site should be located away from existing water courses.</p>	To minimize adverse water quality impact during construction	All works site / during construction	Construction Contractor	✓	Water Pollution Control Ordinance	^
5.7.1 9	4.9.1 9	<p>All compounds in works areas should be located on areas of hard standing surface with provision of diversion channels and settlement ponds where necessary to allow interception and controlled release of settled / treated water. Hard standing compounds should drain via an oil interceptor. The oil interceptor should be regularly inspected and cleaned to avoid wash-out of oil during storm conditions. A bypass should be provided to avoid overload of the interceptor's capacity. To prevent spillage of fuels or other chemicals to water courses, all fuel tanks and storage areas should be sited on sealed areas within a bund of a capacity equal to 110% of the storage capacity of the largest tank. Where temporary storage of chemicals or fuel drums outside the storage area is necessary, drip tray should be provided. Disposal of the waste oil should be carried out by a licensed collector. Good housekeeping practices should be implemented to minimise careless spillage and to keep the storage and the work space in a tidy and clean condition. Appropriate training including safety</p>	To minimize adverse water quality impact during construction	All works site / during construction	Construction Contractor	✓	Water Pollution Control Ordinance	^

5.7.2 0	4.9.2 0	codes and relevant manuals should be given to the personnel who regularly handle the chemicals on site. <i>Emergency Contingency Plan</i> The Contractor should prepare an emergency contingency plan (spill response plan) for the Project to contain and remove accidental spillage of chemicals and all hazardous materials on-site including fuels at short notice and to prevent or to minimize the quantities of contaminants from entering the stream water and affecting the sensitive habitats. The Contractor should submit the emergency contingency plan to the ET for review & comment and the Engineer for approval. The Plan should include, but not limited to, the following: (i) potential emergency situations (ii) chemicals or hazardous materials used on-site (and their location) (iii) emergency response team (iv) emergency action plans and procedures (v) list of emergency telephone hotlines (vi) locations and types of emergency response equipment (vii) training plan and emergency drill (viii) schedules for review and audit.	To prevent or minimize the quantities of contaminants entering the stream water and affecting the habitats in case of accidental spillage of chemicals and hazardous materials	All works site / during construction	Construction Contractor	✓	Water Pollution Control Ordinance	^
5.7.2 1	4.9.2 1	<u>General Guidance for Handling of Spillage / Leakage</u> In the event that accidental spillage or leakage of hazardous substances / chemical wastes takes place, the response procedures as listed below should be followed. It should be noted that the procedures below are not exhaustive. The Contractor should propose other response procedures in the emergency contingency plan based on actual site conditions as	To prevent or minimize the quantities of contaminants entering the stream water and affecting the habitats in case of accidental	All works site / during construction	Construction Contractor	✓	Water Pollution Control Ordinance	#

	<p>well as the particular types and quantities of chemicals or hazardous substances used, handled and stored on-site.</p> <ul style="list-style-type: none"> • Contact person in charge or nominated person immediately and initiate action plans based on the emergency contingency plan. • Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance. • Instruct untrained personnel to keep at a safe distance well away from the spillage area. • If the spillage / leakage involves high toxic, volatile or hazardous waste, initiate emergency evacuation and call the emergency service. • Only trained persons equipped with suitable protective clothing and equipment should be allowed to enter and clean up the waste spillage / leakage area. • Where the spillage / leakage is contained in the enclosed storage area, the waste can be transferred back into suitable containers by suitable handheld equipment, such as hand operated pumps, scoops or shovels. If the spillage / leakage quantity is small, it can be covered and mixed with suitable absorbing materials such as tissue paper, dry soft sand or vermiculite. The resultant slurry should be treated as chemical waste and transferred to suitable containers for disposal. • For spillage / leakage in other areas, immediate action is required to contain the spillage / leakage. Suitable liquid absorbing materials such as tissue paper, dry soft sand or vermiculite should be used to 	<p>spillage of chemicals and hazardous materials</p>						
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5.7.2 2	4.9.2 2	<p>cover the spill. The resultant slurry should be treated as chemical waste and transferred to suitable containers for disposal.</p> <ul style="list-style-type: none"> • Areas that have been contaminated by chemical waste spillage / leakage should be cleaned. While water is a soluble solvent for aqueous chemical wastes and water soluble organic waste, kerosene or turpentine should be used for organic chemical wastes that are not soluble in water. The waste from the cleanup operation should be treated and disposed of as chemical waste. • In incidents where the spillage / leakage may result in significant contamination of an area or risk of pollution, the Environmental Protection Department should be informed immediately. <p><i>Presence of Additional Population (Workers)</i></p> <p>Sewage arising from construction workers on site should be collected in a suitable storage facility, such as portable chemical toilets. An adequate number of portable toilets should be provided for the construction workforce. The portable toilets should be maintained in a state that will not deter the workers from using them. Wastewater collected should be discharged into foul sewers and collected by licensed collectors.</p>	<p>To minimize adverse water quality impact during construction</p>	<p>All works site / during construction</p>	<p>Construction Contractor</p>	<p>✓</p>		<p>ProPECC PN 1/94 Water Pollution Control Ordinance</p>	<p>^</p>
5.7.2 3	4.9.2 3	<p>The collected wastewater from sewage facilities and also from eating areas or washing facilities of site offices should be disposed to foul sewer. If there is no foul sewer in the vicinity, a septic tank and soakaway system or for larger flow, a sewage treatment plant should be provided. All domestic sewage discharges (except into foul sewer) are controlled under the WPCO. The Contractor must</p>	<p>To minimize adverse water quality impact during construction</p>	<p>All works site / during construction</p>	<p>Construction Contractor</p>	<p>✓</p>		<p>ProPECC PN 1/94 Water Pollution Control Ordinance</p>	<p>^</p>

	apply for a discharge licence from EPD and must comply with the terms and conditions of a valid WPCO licence.								
Water Quality – Operational Phase									
5.9.1	4.9.2 4	<p><i>Measures to Reduce Pollution Loadings entering the Channel</i></p> <p>Appropriate location along the toe zone of the channel will be filled with about 200 mm thick original stream bed materials. The upstream dry weather flow channel will also be filled with a layer of about 100 mm thick original stream bed materials on top of the rip-rap lining. The most important feature of such measure is the prospect of natural recolonization of benthic communities and re-establishment of vegetation along the toe zone of the channel replicating riparian vegetation. The vegetation is not expected to be detrimental in any way to the channel structure or to the conveyance of flood flow. Specific planting is considered not necessary as vegetation will recolonized and established itself naturally similar to current condition. Non-woody species (such as sedges) is preferred for ease of maintenance and pruning as they are easier to be pruned and will impede the flow of water to lesser extent during large flow as the vegetation will just collapse and spring back. However, seasonal cutting and clearance of vegetation, particularly in advance of the wet season may be required. This mitigation measure has additional benefits of aesthetic and ecological value.</p>	To minimize adverse water quality impact during operation	The proposed channel / operation	DSD (or DSD's maintenance contractor)+	✓	--		N/A
5.9.2	4.9.2 5	<p>In addition, the use of rock fill base or original stream bed materials for the channel bed has the benefit of providing uneven surfaces and cavities for sediment to accumulate. Ultimately a sediment layer will build up on the channel bed, forming a natural layer for</p>	To minimize adverse water quality impact during operation	The proposed channel / operation	DSD (or DSD's maintenance contractor)+	✓	--		N/A

		<p>to silt removal when the accumulated silt will adversely affect the hydraulic capacity of the channel (except during emergency situations where flooding risk is imminent). Desilting should be carried out by hand or light machinery during the dry season (October to March) when water flow is low.</p> <p>(b) The management of woody / emergent vegetation should be limited to manual cutting, to be carried out during dry season and only when unchecked growth of such vegetation is very likely to impede channel flow.</p> <p>(c) Mangroves within the mangrove zone should be retained if the hydraulic capacity of the channel is adequate. Mangroves found outside the mangrove zone but within the proposed channel should be remove as they will affect the hydraulic capacity of the channel. Rip-rap that are used to delineate the mangrove zone should be replaced if found damaged.</p> <p>(d) A minimum of 100 mm thick sediment should be allowed to accumulate on the channel bed to permit recolonization of benthic communities.</p> <p>(e) Phasing of the works should be considered to better control and minimize any impacts caused, and to provide refuges for aquatic organisms. Where possible, works should be carried out along half width of the channel in short sections. A free passage along the channel is necessary to avoid forming stagnant water in any phase of the works and to</p>	(maintenance works) of the channel						
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5.9.7	4.9.3 0	<p>maintain the integrity of aquatic communities.</p> <p>(f) Containment structures (such as sand bags barrier or similar method) should be provided for the active desilting works area to facilitate a dry or at least confined working area within the channel.</p> <p>(g) Where no maintenance access is available for the channel, temporary access to the works site should be carefully planned and located to minimize disturbance caused to the channel, adjacent vegetation (especially mangroves) and nearby sensitive receivers by construction plants.</p> <p>(h) The use of lesser or smaller construction plants should be considered to reduce disturbance to the channel bed. Quiet construction plants should be used.</p> <p>(i) The locations for the disposal of the removed materials should be identified and agreement sought with the relevant departments before commencement of the maintenance works. Temporary stockpile of waste materials should be located away from the channel and properly covered. These waste materials should be disposed of in a timely and appropriate manner.</p>	To minimize adverse water quality impact during operation of the proposed access road,	The proposed access road, viewing point and carpark / during	CEDD (to incorporate HyD standard road drainage system design)	✓	✓	--	N/A
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EIA Ref.	EM &A Ref.	Recommended Mitigation Measures	Objectives of Recommended Measures and Main Concerns to addressed	Location /Timing	Implementati on Agent	Implementatio n Stages*			Relevant Legislation & Guidelines	Status
						D	C	O		
Waste – Construction Phase										
6.5.1	5.1.1	<p><i>General</i></p> <p>The HKSAR Government's construction and demolition waste management policy follows the same hierarchy as for other wastes, i.e. in order of desirability: avoidance, minimisation, recycling, treatment and safe disposal of waste. During the construction period the Contractor, Engineer and environmental specialists (Environmental Team, Independent Environmental Check) should work closely together with a view to reduce the volumes of materials requiring removal and final disposal.</p>	To reduce the volumes of materials requiring removal and final disposal	All work site / during construction	Construction Contractor, Engineer, Environmental Team and Independent Environmental Checker	✓			Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	^
6.5.2	5.1.2	<p>Upon appointment, the main Contractor of each construction contract should prepare and implement an Environmental Management Plan (EMP) in accordance with ETWB TCW No. 19/2005 – “Environmental Management on Construction Sites” which should describe the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. The EMP should incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP should be submitted to the Engineer for approval. The Contractor should implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP should be reviewed regularly and updated</p>	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓		Waste Disposal Ordinance ETWB TCW No. 19/2005	^	

6.5.3	5.1.3	(preferably monthly) by the Contractor. The EMP should take into account the recommended mitigation measures in the approved EIA Report. The Contractor should refer to the simplified Construction and Demolition Material Management Plan (C&DMMP) conducted for this Project (Appendix 6.2 of the EIA) to facilitate him in the preparation of the EMP.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005	^
6.5.4	5.1.4	Training of construction staff should be undertaken by the Contractor about the concept of site cleanliness and appropriate waste management procedures. The Contractor should develop and provide toolbox talk for on-site sorting of C&D materials to enhance worker's awareness in handling, sorting, reuse and recycling of C&D materials. Requirements for staff training should be included in the EMP.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005	^
6.5.5	5.1.5	Good planning and site management practice should be employed to eliminate over ordering or mixing of construction materials to reduce wastage. Proper storage and site practices will minimise the damage or contamination of construction materials. Regular cleaning and maintenance of the waste storage area should be provided.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005	#
6.5.6	5.1.6	Where waste generation is unavoidable, the potential for recycling or reuse should be rigorously explored. If waste cannot be recycled, disposal routes described in the EMP should be followed. A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be implemented. In order to monitor the disposal of C&D material and solid wastes at public fill reception facilities and landfills and to control fly-	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005	^

6.5.7	5.1.7	tipping, a trip-ticket system should be included. One may make reference to ETWB TCW No. 31/2004 for details. Imported soft fill and rocks should be source from CEDD's fill bank, other projects or other approved sources instead of using new materials. Approval from the Engineer and all other relevant parties should be obtained by the Contractor before importation of the fill materials.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005	^
6.5.8	5.1.8	On-site Sorting, Reuse and Recycling All waste materials should be segregated into categories covering: <ul style="list-style-type: none"> excavated materials suitable for reuse on-site; excavated materials suitable for public filling facilities; remaining C&D waste for landfill; chemical waste; and general refuse for landfill. 	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005	#
6.5.9	5.1.9	Proper segregation and disposal of construction waste should be implemented. Separate containers should be provided for inert and non-inert wastes.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005	#
6.5.10	5.1.10	Sorting is important to recover materials for reuse and recycling. Specific area should be allocated for on-site sorting of C&D materials and to provide a temporary storage area for those sorted materials such as metals, concrete, timber, plastics, glass, excavated spoils, bricks / tiles and waste papers. If area is limited, all C&D materials should at least be sorted on-site into inert and non-inert components.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005	#

		Non-inert materials (C&D waste) such as bamboo, timber, vegetation, packaging waste and other organic materials should be reused and recycled wherever possible and disposed of to designated landfill only as a last resort. Inert materials (public fill) such as concrete, stone, clay, brick, soil, asphalt and the like should be separated and reused in this or other projects (subject to approval by the relevant parties in accordance with the ETWB TCW No. 31/2004) before disposed of at a public fill reception facility operated by Civil Engineering and Development Department (CEDD). Steel and other metals should be recovered from demolition waste stream and recycled.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓		Waste Disposal Ordinance ETWB TCW No. 19/2005	^
6.5.1 1	5.1.1 1	The reuse of inert materials such as soil, rock and broken concrete should be maximised. Waste should be separated into fine, soft and hard materials. With the use of a crusher coarse material can be crushed to make it suitable for use as fill material where fill is required in the works. This minimises the use of imported material and maximises use of the C&D material produced.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓		Waste Disposal Ordinance ETWB TCW No. 19/2005	^
6.5.1 3	5.1.1 3	Prior to export of material from the site, the potential for it to be reused should be assessed. Most C&D material can easily be reused with minimum processing. Waste separation methods should be followed to ensure that C&D waste is separated at source. Suitable soft materials should be used for landscaping and grading of embankments. Fine material should be separated out and used as topsoil. The feasibility of using recycled aggregates in lieu of virgin materials should be rigorously considered during the detailed design and construction phases as stipulated in WBTC No. 12/2002 and ETWB TCW No. 24/2004. In general, recycled aggregates are suitable for use as fill materials in earthworks, road	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓		Waste Disposal Ordinance ETWB	^

6.5.1 4	5.1.1 4	<p>sub-base formation, and drainage works. Recycled aggregates can also be used in concrete (up to Grade 35) for mass concrete walls and other minor structures such as planter boxes, toe wall planters and pavement, etc.</p> <p>Recycled inert C&D material should be used in the works as sub-bases for access roads and footpaths of the proposed channel. Recycled aggregates should be considered for use in concrete as outlined in the above mentioned technical circulars. Some recycled rock material can be reused as rock fill or as stream bed material. This is dependent on size of rock fragments but can be achieved by appropriate use of a crusher.</p>	<p>Waste reduction, reuse, recycling and proper disposal of waste</p>	<p>All work site / during construction</p>	<p>Construction Contractor</p>	<p>✓</p>	<p>TCW No. 19/2005, 24/2004 WBTC No. 12/2002 Waste Disposal Ordinance ETWB TCW No. 19/2005</p>	<p>^</p>
6.5.1 5	5.1.1 5	<p>Site Clearance / Demolition Materials Excavated Materials All C&D materials should be sorted on-site into inert and non-inert components by the Contractor. Non inert materials (C&D waste) such as wood, glass and plastic should be reused and recycled before disposal to a designated landfill as a last resort (currently assume to be the WENT Landfill). Inert materials (public fill) such as soil, rubble, sand, rock, brick and concrete should be separated and where appropriate broken down to size suitable for subsequent filling. Suitable C&D material should be use as pipe bedding or for backfilling of retaining walls, box culvert and formation of channel embankments. Excavated rocks from existing streams should be reused for rip-rap lining. Inert materials should be reused on-site or in other projects approved by relevant parties in accordance with the ETWB TCW No. 31/2004 before disposed of at public fill reception facilities. Steel and other metals should be recovered from</p>	<p>Waste reduction, reuse, recycling and proper disposal of waste</p>	<p>All work site / during construction</p>	<p>Construction Contractor</p>	<p>✓</p>	<p>Waste Disposal Ordinance ETWB TCW No. 19/2005, 31/2004</p>	<p>#</p>

6.5.1 6	5.1.1 6	C&D materials and recycled. Some of the excavated sediment from the stream bed will be contaminated with high levels of heavy metals. Contaminated sediment should be disposed of in accordance with ETWB TCW No. 34/2002 and WBTC No. 12/2000. In order to minimise off-site disposal, uncontaminated sediment should be reused as channel bed material as far as possible.	Proper disposal of excavated sediment	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 34/2002 WBTC No. 12/2000	^
6.5.1 7	5.1.1 7	Good quality reusable topsoil should be stockpiled for later landscaping works. Stockpiles should be less than 2 m in height, formed to a safe angle of repose and hydroseeded or covered with tarpaulin to prevent erosion during the rainy season and to minimise dust generation.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005	^
6.5.1 8	5.1.1 8	Control measures for temporary stockpiles on-site should be taken in order to minimize the noise, generation of dust, pollution of water and visual impact. These measures include: <ul style="list-style-type: none"> • surface of stockpiled soil should be regularly wetted with water especially during dry season; • disturbance of stockpiled soil should be minimized; • stockpiled soil should be properly covered with tarpaulin especially when heavy rain storms are predicted; • stockpiling areas should be enclosed where space is available; • stockpiling location should be away from the water bodies; and 	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005	#

6.5.1 9	5.1.1 9	<ul style="list-style-type: none"> an independent surface water drainage system equipped with silt traps should be installed at the stockpiling area. <p>The identification of final disposal sites for C&D materials generated by the construction works will be considered during the detailed design stage of the Project when the volume and types of C&D materials can be more accurately estimated. The Public Fill Committee of CEDD should be consulted on designated outlets (e.g. public fill reception facility) for public fill, whilst EPD should be consulted on landfills for C&D waste. Marine Fill Committee of CEDD should be consulted on the marine disposal sites of the excavated sediment if needed. The public fill to be disposed to public fill reception facilities must consist entirely of inert construction materials. Disposal of C&D waste to landfill must not have more than 50% (by weight) inert material. The C&D waste delivered for landfill disposal should contain no free water and the liquid content should not exceed 70% by weight.</p>	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005, 34/2002 WBTC No. 12/2002	^
6.5.2 0	5.1.2 0	<p>In order to avoid dust or odour impacts, any vehicles leaving a works area carrying C&D waste or public fill should have their load covered up before leaving the construction site.</p>	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005 WBTC No. 19/2001	^
6.5.2 1	5.1.2 1	<p>C&D materials should be disposed of at designated public fill reception facilities or landfills. Reuse of public fill materials at other construction projects is subject to the approval of the relevant project</p>	Waste reduction, reuse, recycling and proper disposal	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance	^

		proponents, Engineer and/or other relevant authorities, such as LandsD, PlanD, etc. Furthermore, unauthorized disposal of C&D materials in particular on private agricultural land is prohibited and may be subject to relevant enforcement and regulating actions. The Contractor shall refer and strictly follow the trip-ticket system for the disposal of C&D materials as stipulated in the ETWB TCW No. 31/2004.	of waste						ETWB TCW No. 19/2005, 31/2004	
6.5.2 2	5.1.2 2	<i>Chemical Waste</i> Where the construction processes produce chemical waste, the Contractor must register with EPD as a chemical waste producer. Wastes classified as chemical wastes are listed in the Waste Disposal (Chemical Waste) (General) Regulation. These wastes are subject to stringent disposal routes. EPD requires information on the particulars of the waste generation processes including the types of waste produced, their location, quantities and generation rates. A nominated contact person must be registered with EPD. An updated list of licensed chemical waste collector can be obtained from EPD.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓			Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging Labelling and Storage of Chemical Waste	^
6.5.2 3	5.1.2 3	Storage, handling, transport and disposal of chemical waste should be arranged in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published by EPD, and should be collected by a licensed chemical waste collector.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓			Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the	#

6.5.2 4	5.1.2 4	Suitable containers should be used for specific types of chemical wastes, containers should be properly labelled (English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations), resistance to corrosion, safely stored and securely closed. Stored volume should not be kept more than 450 liters unless the specification has been approved by the EPD. Storage area should be enclosed by three sides by a wall, partition of fence that is at least 2 m height or height of tallest container with adequate ventilation and space.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Packaging Labelling and Storage of Chemical Waste	Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging Labelling and Storage of Chemical Waste	#
6.5.2 5	5.1.2 5	Hard standing, impermeable surfaces draining via oil interceptors should be provided in works area compounds. Interceptors should be regularly emptied to prevent release of oils and grease into the surface water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain. Oil and fuel bunkers should be banded and/or enclosed on three sides to prevent discharge due to accidental spillages or breaches of tanks. Bunding should be of sufficient capacity to accommodate 110% of the volume of the largest container or 20% of the total volume of waste, whichever is largest. Waste collected from any grease traps should be collected and disposed of by a	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging Labelling and Storage	Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging Labelling and Storage	^

	licensed contractor.							of Chemical Waste	#
6.5.2 6	5.1.2 6	Lubricants, waste oils and other chemical wastes are likely to be generated during the maintenance of vehicles and mechanical equipment. Used lubricants should be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place. If possible, such waste should be sent to oil recycling companies, and the empty oil drums collected by appropriate companies for reuse or refill.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓		Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging Labeling and Storage of Chemical Waste	
6.5.2 7	5.1.2 7	The registered chemical waste producer (i.e. the contractor) has to arrange for the chemical waste to be collected by licensed collectors. The licensed collector should regularly take chemical waste to a licensed chemical waste treatment facility (such as the Chemical Waste Treatment Centre in Tsing Yi). A trip ticket system operates to control the movement of chemical wastes.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓		Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging Labeling and Storage of Chemical Waste	^

6.5.2 8	5.1.2 8	No lubricants, oils, solvents or paint products should be allowed to discharge into water courses, either by direct discharge, or as contaminants carried in surface water runoff from the construction site.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging Labelling and Storage of Chemical Waste	#
6.5.2 9	5.1.2 9	General Works Waste Concrete Waste Dry concrete waste (considered as public fill) should be sorted out from the other wastes and recycled for reuse or sorted out for disposal at designated public fill reception facilities.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005, 33/2002	^
6.5.3 0	5.1.3 0	Wooden Materials All wooden materials used on-site should be kept separate from other wastes to avoid damage and to facilitate reuse. Timber which cannot be reused should be sorted out from other waste and stored separately from all inert waste before being disposed of to landfill.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance ETWB TCW No. 19/2005, 33/2002	^
6.5.3 1	5.1.3 1	Reusable steel or concrete panel shutters, fencing and hoarding and signboard should be used as a preferred alternative to items made of wood, to minimise	Waste reduction, reuse, recycling and	All work site / during construction	Construction Contractor	✓	Waste Disposal Ordinance	^

		wastage of wood. Attention should be paid to WBTC No. 19/2001 – “Metallic Site Hoardings and Signboards” to reduce the amount of timber used on construction sites. Metallic alternatives to timber are readily available and should be used rather than new timber. Precast concrete units should be adopted wherever feasible to minimize the use of timber formwork.	proper disposal of waste						ETWB TCW No. 19/2005, 33/2002	
6.5.3 2	5.1.3 2	Only waste material need to be taken to a landfill. It should be separated from recyclable wood and steel materials. As for all waste types these materials should be reused on-site or other approved sites before disposal is considered as an option. Disposal to landfill should only be considered as a final option. Contractors are responsible for storage of re-usable materials on-site.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓			Waste Disposal Ordinance ETWB TCW No. 19/2005, 33/2002	^
6.5.3 3	5.1.3 3	<i>Municipal Waste</i> General refuse generated on-site should be stored in enclosed bins or skips and collected separately from other construction and chemical wastes and disposed of at designated landfill. A temporary refuse collection point should be set up by the Contractor to facilitate the collection of refuse by licensed contractors. The removal of waste from the site should be arranged on a daily or at least on every second day by the Contractor to minimise any potential odour impacts, minimise the presence of pests, vermin and other scavengers and prevent unsightly accumulation of waste.	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓			Waste Disposal Ordinance ETWB TCW No. 19/2005	#
6.5.3 4	5.1.3 4	The recyclable component of the municipal waste generated by the workforce, such as aluminium cans, paper and cleansed plastic containers should be separated from other waste. Provision and collection of recycling bins for different types of recyclable	Waste reduction, reuse, recycling and proper disposal of waste	All work site / during construction	Construction Contractor	✓			Waste Disposal Ordinance ETWB	^

6.5.3	5.1.3	waste should be set up by the Contractor. The contractor should also be responsible for arranging recycling companies to collect these materials.	Waste reduction, reuse, recycling and proper disposal of waste as well as air pollution control	All work site / during construction	Construction Contractor	✓	TCW No. 19/2005	Waste Disposal Ordinance ETWB TCW No. 19/2005 Air Pollution Control Ordinance	^
Waste – Operational Phase									
6.6.2	5.3.1	Adequate litter bins should be provided at the viewing point and carpark and should be regularly emptied by Food and Environmental Hygiene Department (FEHD). Normal road sweeping and street cleansing routinely carried out by FEHD on a need basis is considered adequate to minimise impact from such waste. Road side gullies should be cleared and desilted regularly to ensure proper operation of the road drainage system.	Proper management of wastes during operation	Proposed access road, viewing point, carpark and associated road drainage system / during operation	FEHD+	✓	Waste Disposal Ordinance	N/A	
6.6.5	5.3.2	In general, desilting or maintenance works should be carried out during dry season where flow in the watercourse is low. Non-inert materials such as excess vegetation and garbage should be properly packed and disposed of to landfill. Inert material such as excess silt should be dried and disposed of public fill reception facilities or to landfill if the amount is negligible. The locations for the disposal of the above materials should be identified and agreement sought	Proper disposal of wastes during routine maintenance	The proposed channel / during operation	DSD (or DSD's maintenance contractor)+	✓	Waste Disposal Ordinance	N/A	

EIA Ref.	EM &A Ref.	Recommended Mitigation Measures	Objectives of Recommended Measures and Main Concerns to addressed	Location /Timing	Implementati on Agent	Implementation Stages*			Relevant Legislation & Guidelines	Status
						D	C	O		
Ecology – Construction Phase										
7.9.2	6.5.2	Impact Avoidance / Minimisation Mitigation The layout of the preferred option had avoided the mangroves at the lower reach of the Hang Hau Tsuen stream.	Avoid the mangroves at the lower reach of Hang Hau Tsuen	The proposed channel / during detailed design	CEED (Detailed Design engineer) to incorporate the preferred option into the design)	✓			Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	^
7.9.3	6.5.3	Good site practices and precautionary measures should be implemented to avoid encroachment onto the nearby natural habitats, minimise disturbance to wildlife, and ensure good water quality. Examples of water quality mitigation measures are detailed in Section 4.9 of this EM&A Manual (and Section 5.7 of the EIA report). Other precautionary measures include: <ul style="list-style-type: none"> Temporary fencing should be erected along the portion of the mangroves proposed to be retained to form protection zones to restrict access by construction workers or equipment or works. Unnecessary felling of the mangroves within these protection zones is prohibited. Signage should be provided at conspicuous location to warn workers from entering and disturbing these zones. 	Avoid, minimize and mitigate ecological impacts during construction	All works sites / during construction	Construction Contractor	✓		Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	**	

			All works sites / during construction	Construction Contractor	✓	Environmental Impact Assessment	#
7.9.6	6.5.6	<ul style="list-style-type: none"> • All workers should be regularly briefed to avoid disturbing the flora and fauna near the works area. • Surface run-off and wastewater from construction sites should be discharged into water bodies via adequately designed silt removal facilities such as sand traps, silt traps and sediment basins. • Open stockpiles susceptible to erosion should be covered with tarpaulin or similar fabric and provided with containment such as bunds, sand bag barriers or equivalent measures, especially during the wet season (April – September) or when heavy rainstorm is predicted. • Excavation works within the existing stream section should be programmed to be carried out during periods of low flow (dry season from 1st October to 31st March) as far as practicable to minimise impacts on downstream water quality and sensitive receivers. The excavation area should be limited to section of half width of the stream in order to maintain continuous water flow within the stream during the construction phase. • Sewage arising from construction workers on site should be collected in a suitable storage facility, such as portable chemical toilets and disposed via licensed contractors. 	Compensate the loss of trees	The channel layout has been designed to retain as much trees as possible. To mitigate the loss of 16 trees, 114 nos. of new trees in heavy standard size			

7.9.7 Figure 7.3	will be planted within the site. The proposed trees consisting mostly of native species will include <i>Celtis sinensis</i> , <i>Cinnamomum parthenoxylon</i> , <i>Ficus microcarpa</i> , <i>Hibiscus tiliaceus</i> and <i>Cassia siamea</i> .	Compensate the loss of trees	Mangrove planting area as shown in Figure 7.3 of the EIA / upon completion of construction; monitoring & maintenance after completion of planting	Construction Contractor (for planting) CEDD (for 2 years of monitoring during operation)	✓	✓	Ordinance Technical Memorandum on EIA Process ETWB TCW No. 3/2006 Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	N/A
	To mitigate the loss of 0.07 ha of mangrove patches, a total of 0.07 ha, mainly of newly formed surface at the northern part of the downstream section of the channel is identified for compensatory mangrove planting (Figure 7.3 of the EIA). Therefore, loss of mangrove will be compensated with a ratio of 1:1. Upon completion of construction, the mangrove compensation area will be filled with mud of at least 60 cm in depth to be collected from suitable stream bed material excavated during construction, the abandoned fish pond, or mudflat outside the project area. The final level of the planted area should be about 1-2 mCD. Mangrove species to be planted will include <i>Kandelia obovata</i> at about 1-1.5 mCD and <i>Acanthus ilicifolius</i> at about 1.5-2 mCD, the major species found at the site. Mangrove seedlings of at least 60 cm in height purchased at Futian or Mai Po Nature Reserve should be planted at 1 m spacing. Upon completion of planting, monitoring for survival and growth should be conducted for two years during the operation phase. The monitoring of the compensatory mangrove will be implemented by the project proponent. It is anticipated that both the retained and the compensated mangrove in the mangrove zone (Figure 2.7; Figure 7.3 of the EIA) would need no maintenance in the long run.							

7.9.8	6.5.8	Before commencement of the works, the Contractor should submit details of the mitigation measures to be implemented during construction stage as part of their working method statement to the Engineer for approval. This should also include the details of the mangrove planting. This should be reviewed by the Environmental Team Leader and verified by the Independent Environmental Checker.	To ensure the Contractor will properly implement the mitigation measures	All works site / before commencement of construction	Construction Contractor	✓	✓	Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	^
Ecology – Operational Phase									
7.9.9	6.5.9	During operation phase, management and maintenance of the channel bed should be limited to the minimum required to prevent flooding and ensure safety. The channel should be permitted to find (and adjust) its own low flow channel and natural changes in the deposition of silt, sand, rock should be tolerated except where a specific flooding or safety issue is identified. Environmental considerations for maintenance of the proposed channel (see Section 5.9 of the EIA) should be adopted.	To minimize ecological impact during maintenance of the completed channel	The proposed channel / during operation	DSD (or DSD's maintenance contractor)+		✓	Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	N/A
7.9.10	6.5.10	Vegetation management within the channel should be restricted to removing of obstructions and preventing tree establishment, while the presence of vegetation should be tolerated as much as possible. If clearance of vegetation is required to prevent obstruction of water flow, where specific flooding or safety issues have been identified, this should be undertaken during the dry season. Expert advice from AFCDD should be sought in case of doubt.	To minimize ecological impact during maintenance of the completed channel	The proposed channel / during operation	DSD (or DSD's maintenance contractor)+		✓	Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	N/A
7.9.11	6.5.11	To further mitigate stream loss, a layer of approximately 100 mm thick original river bed material will be added on top of the rip-rap bedding of the dry weather flow channel to recreate a natural stream environment. This would allow recolonization of benthic communities and re-establishment of	To further mitigate stream loss	The dry weather flow channel / during detailed design,	CEDD (Detailed Design Engineer) to incorporate into channel	✓	✓	Environmental Impact Assessment Ordinance Technical	N/A

	vegetation within the channel.		construction and operation	design Contractor to construct DSD (or DSD's maintenance contractor)+			Memorandum on EIA Process
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EIA Ref.	EM & A Ref.	Recommended Mitigation Measures	Objectives of Recommended Measures and Main Concerns to addressed	Location /Timing	Implementation Agent	Implementation Stages*			Relevant Legislation & Guidelines	Status
						D	C	O		
Landscape and Visual – Construction and Operation Phase										
9.9.4 Tabl e 9.9	8.5.2 Tabl e 8.2	Recommended landscape mitigation measures at construction stage are: <ul style="list-style-type: none"> • LMM1 Advance tree transplanting • LMM2 Sensitive design site hoarding • LMM3 Preservation of existing tree to be retained • LMM4 Demarcation of tree protection zone • LMM5 Minimize of construction works in stream • LMM6 Soil conservation • LMM7 Operational time restriction 	Mitigate landscape and visual impacts during construction	All works sites / during construction	Construction Contractor	✓			Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	^
Tabl e 9.9	Tabl e 8.2	LMM1 - Advance tree transplanting of existing trees affected by the proposed development.	Preservation of existing trees	Project area / during construction	Construction Contractor	✓			Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process ETWB TCW No. 3/2006	^
Tabl e 9.9	Tabl e 8.2	LMM2 - Sensitive designed site hoarding in both color and form to screen view to the construction	Visual enhancement	Project area / during construction	Construction Contractor	✓			Environmental Impact Assessment	^

Table 9.9	Table 8.2	LMM6 - Soil conservation - conservation of existing and imported soil resources.	resources and landscape character	Project area / during construction	Construction Contractor	✓	✓	Technical Memorandum on EIA Process ETWB TCW No. 5/2005	Environmental Impact Assessment Ordinance	^
Table 9.9	Table 8.2	LMM7 - Operational time restrictions to limit after dark welding and lighting.	Limit night time glare	Project area / during construction	Construction Contractor	✓	✓	Technical Memorandum on EIA Process	Environmental Impact Assessment Ordinance	^
9.9.5 Table 9.9	8.5.3 Table 8.2	To minimize the impact on landscape and visual features, proper provision of mitigation measures during the design stage would result in a visually more compatible design when viewed at adjacent environment. Subject to the detailed design, possible	To minimize the impact on landscape and visual features	Project area / during detailed design, construction and operation	CEDD (Detailed designed Engineer) to incorporate into design	✓	✓	Technical Memorandum on EIA Process	Environmental Impact Assessment Ordinance	^

Table 9.9	mitigation measures to be considered during design stage should include: <ul style="list-style-type: none"> • LMM8 Selection of fast growing native tree and shrub mixes • LMM9 Preservation of stream and pond not affected • LMM10 Sensitive treatment and design to the external finish of channels walls • LMM11 Maintenance of planting works • LMM12 Compensation planting of mangrove 			Construction Contractor to construct DLO, DSD, LCSD to maintain+	✓	✓	Memorandum on EIA Process ETWB TCW No. 2/2004	^
Table 8.2	LMM8 - Selection of fast growing native trees and shrubs mix in compensation for the removal / disturbance area. Planting will be planted along the channel bunds as landscape treatment to screen the built element and mitigate the landscape and visual impact. The combination of natives trees and shrubs mix will provide a more diverse edge effect and break up the overall visual dominance.	Visual screen; Landscape compensation	Project area / during construction and operation	Construction Contractor for planting DLO/LCSD for management and maintenance+	✓	✓	Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process ETWB TCW No. 2/2004	^
Table 8.2	LMM9 - Preservation of existing stream and pond not affected by the development.	Preservation of Landscape resources and character	Section of existing stream and pond not affected by the project / during construction and operation	Construction Contractor during construction DSD for management and maintenance (for area within DSD)	✓	✓	Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process ETWB	^

Table 9.9	Table 8.2	LMM10 - Provide sensitive treatment and design to the external finish of the channel walls such as adopting the use of natural materials and planting to soften surface of built structures	Visual enhancement	Project area / during construction and operation	boundary)+ Construction Contractor during construction DSD for management and maintenance (for area within DSD boundary)+ DLO/LCSD for management and maintenance of planting outside DSD boundary +	✓	✓	TCW No. 5/2005 Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process ETWB TCW No. 2/2004	N/A
Table 9.9	Table 8.2	LMM11 - Maintenance of planting works upon completion.	Landscape compensation	Operation period	Construction Contractor for planting and maintenance during establishment period DLO/LCSD for management and maintenance+	✓	✓	Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process ETWB TCW No.	N/A

Table 9.9	Table 8.2	LMM12 - Compensation planting of mangrove to stream bed	Landscape compensation	Mangrove zone / during construction (no long term maintenance necessary)	Construction Contractor for planting and maintenance during establishment period No long term maintenance necessary	✓	2/2004 Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process ETWB TCW No. 2/2004	N/A
9.9.6	8.5.4	To mitigate the loss of 16 trees, 114 nos. of new trees in heavy standard size will be planted within the site. The proposed trees consisting mostly of native species will include <i>Celtis sinensis</i> , <i>Cinnamomum parthenoxylon</i> , <i>Ficus microcarpa</i> , <i>Hibiscus tiliaceus</i> and <i>Cassia siamea</i> . The total aggregated girth size of compensatory trees of 8.55 m is more than the felled 3.59 m. Therefore, loss of tree will be compensated with a ratio of more than 1:1 in terms of numbers and aggregated girth size.	Mitigate landscape and visual impacts during construction Compensate for the loss of tree fell	All works sites / during construction	Construction Contractor	✓	Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process ETWB TCW No. 3/2006	N/A
9.9.7	8.5.5	The following native shrub species are recommended to be planted on the hydroseeded slope of the embankments: <i>Calliandra haematocephala</i> , <i>Cordia variegatum</i> , <i>Duranta repen</i> and <i>Lxora stricta</i> . Drooping plants such as <i>Jasminum mesnyi</i> , <i>Russelia equisetiformis</i> and <i>Asparagus sprengeri</i> are recommended to be planted to soften and provide greenery to the channel walls.	Mitigate landscape and visual impacts during construction	All works sites / during construction	Construction Contractor	✓	Environmental Impact Assessment Ordinance Technical Memorandum on EIA	N/A

9.9.9	8.5.6	As details of the proposed planting cannot be ascertain at the EIA stage, the preliminary design stage of the Project, it is recommended that a detailed Landscape Plan be submitted before commencement of planting or landscape works of the Project. The Landscape Plan should include the locations, size, number and species of plantings, design details, implementation programme, maintenance and management schedules, and drawings in scale of 1:1000 showing the landscape and visual mitigation measures. The Landscape Plan should be certified by the ET Leader and verified by the Independent Environmental Checker (IEC) as conforming to the information, requirements and recommendations set out in the approved EIA Report before submission to the relevant authorities.	Mitigate landscape and visual impacts during construction	All works sites / during construction	Construction Contractor	✓	Environmental Impact Assessment Ordinance Technical Memorandum on EIA Process	N/A
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Remarks:	^	Compliance of mitigation measure;	X	Non-compliance of mitigation measure;
	N/A	Not Applicable;		
	#	Recommendation was made during site audit but improved/rectified by the contractor.		• Non-compliance but rectified by the contractor * D = Design, C = Construction, O = Operation
	**	Recommendation was made during site audit but not yet improved/rectified by the contractor.		
	+	CEDD will assume to be responsible for the mitigation measures until an agreement is reach between CEDD and relevant parties on the management and maintenance of the mitigation measures.		

**APPENDIX I
SUMMARY OF ENVIRONMENTAL
LICENCES AND PERMITS**

Appendix I - Summary of Environmental Licensing and Permit Status

Permit No.	Valid Period		Details	Status
	From	To		
Environmental Permit				
EP-343/2009	21/05/09	N/A	Waterways and drainage works for the Project - Hang Hau Tsuen Channel at Lau Fau Shan (Register No.: AEIAR-134/2009)	Valid
Wastewater Discharge Licence				
WT00006437-2010	13/04/10	30/04/15	Discharge of Industrial Trade Effluent at Deep Bay Water Control Zone	Valid
Waste Producer under Waste Disposal (Chemical Waste) (General) Regulation				
5123-513-K2958-01	16/01/10	N/A	Major Chemical Waste: Spent lubricating oil	Valid
Permit under Dumping at Sea Ordinance				
EP/MD/11-006	22/11/10	21/12/10	Type 1 – Open Sea Disposal Type 2 – Confined Marine Disposal	Expired
EP/MD/11-045	01/11/10	30/04/11	Type 1 – Open Sea Disposal	Expired

**APPENDIX J
COMPLAINT LOG**

APPENDIX J – COMPLAINT LOG

Reporting Month: September 2011 to November 2011

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Remarks: No environmental complaint was received in the reporting quarter.

**APPENDIX K
SUMMARY OF EXCEEDANCES**

APPENDIX K – SUMMARY OF EXCEEDANCE

Reporting Quarter: September 2011 to November 2011

- a) **Exceedance Report for 1-hr TSP (NIL)**
- b) **Exceedance Report for 24-hr TSP (NIL)**
- c) **Exceedance Report for Construction Noise (NIL)**
- d) **Exceedance Report for Water quality (NIL)**

**APPENDIX L
WASTE FLOW TABLE IN REPORTING
QUARTER**

Appendix I

Contract No.: YL/2009/01

Quarterly Summary Waste Flow Table For 2011 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Waste Generated Monthly					
	Total Quantity Generated (in '000m ³)	Broken Concrete (see Note 2) (in '000m ³)	Reused in the Contract (in '000m ³)	Reused in other Projects (in '000m ³)	Disposed as Public Fill (in '000m ³)	Imported Fill (in '000m ³)	Metals (in '000 kg)	Paper/ cardboard packaging (in '000 kg)	Plastics (see Note 1) (in '000 kg)	Chemical Waste (in '000 kg)	Others, e.g. general refuse (in '000m ³)	
Jan	Nil	0.05000	Nil	Nil	Nil	Nil	Nil	Nil	0.06000	0.00362		
Feb	Nil	Nil	Nil	Nil	0.017958	0.017958	Nil	Nil	Nil	0.00020		
Sub-total	0.00310	0.05000	Nil	0.00310	Nil	0.017958	Nil	Nil	0.06000	0.00637		
Mar	Nil	Nil	Nil	Nil	Nil	0.671667	Nil	Nil	Nil	0.02189		
Apr	Nil	30	30	Nil	Nil	Nil	Nil	Nil	Nil	0.00602		
May	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.00220		
Sub-total	Nil	30	30	Nil	0.671667	Nil	Nil	Nil	Nil	0.03010		
Jun	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.00300	0.00198		
July	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.00140		
Aug	1.58417	Nil	Nil	Nil	1.58417	Nil	Nil	Nil	Nil	0.00897		
Sub-total	Nil	Nil	Nil	Nil	1.58417	Nil	Nil	Nil	0.00300	0.01235		
Sep	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.00337		
Oct	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.00098		
Nov	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.00087		
Sub-total	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.00522		
Dec												

Notes: (1) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(2) Broken concrete for recycling into aggregates.