

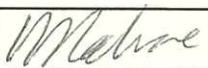


FEP-01B/167/2003/D

**Proposed Submarine Gas Pipelines from Cheng Tou Jiao  
Liquefied Natural Gas Receiving Terminal, Shenzhen to  
Tai Po Gas Production Plant, Hong Kong**

**Final EM&A Summary Report  
(Final)**

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**Meinhardt Infrastructure and Environment Limited**  
**June 2006**

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## FINAL EM&A SUMMARY REPORT

### TABLE OF CONTENTS

<b>Executive Summary .....</b>	<b>i</b>
<b>1. Project Information.....</b>	<b>1</b>
1.1 Introduction .....	1
1.2 Major Construction Activities .....	1
<b>2. Summary of EM&amp;A Requirements .....</b>	<b>1</b>
2.1 Types of Works and Monitoring Requirements .....	1
2.2 Monitoring Locations .....	3
2.3 Monitoring Parameters .....	3
2.4 Environmental Quality Performance Limits .....	3
<b>3. Environmental Monitoring Results .....</b>	<b>3</b>
3.1 Exceedance of Environmental Quality Performance Limits .....	3
3.2 Trends of Water Quality and Marine Ecological Monitoring Parameters.....	4
3.3 Post project Monitoring Results .....	4
<b>4. Implementation Status of Pollution Control and Mitigation Measures .....</b>	<b>4</b>
4.1 Pollution Control and Mitigation Measures Status .....	4
4.2 Waste Management Status .....	5
<b>5. Environmental Non-conformance.....</b>	<b>5</b>
5.1 Non-compliance and Accidental Event.....	5
5.2 Complaints .....	5
5.3 Notification of Summons and Successful Prosecution.....	6
<b>6. Conclusion and Recommendation .....</b>	<b>6</b>
6.1 Comparison of EM&A Results and EIA Prediction.....	6
6.2 Review of Monitoring Programme.....	6
6.3 Environmental Acceptability of The Project.....	6
<b>7. References .....</b>	<b>6</b>

### ANNEXES

- Annex A General Figures and Construction Programme*
- Annex B Environmental Quality Performance Limits*
- Annex C Trends of Water Quality and Marine Ecological Monitoring Parameters*
- Annex D Implementation Schedule and Status*
- Annex E Cumulative Summary of Non-compliances*
- Annex F Cumulative Summary of Complaints*

## EXECUTIVE SUMMARY

This report constitutes the Final EM&A Summary Report required under *Section 7.5* of the *EM&A Manual* covering all the environmental monitoring and audit work over the period 1 April 2005 to 25 May 2006 for the construction of the submarine gas pipelines from Cheng Tou Jiao LNG Receiving Terminal in Shenzhen to Tai Po Gas Production Plant, HKSAR (the Project). Monitoring for water quality and marine ecology (corals) were undertaken as required by the *Environmental Permit* and *EM&A Manual*. No exceedances of environmental performance limits attributable to the works were recorded and there was no indication of any significant deterioration of environmental conditions caused by construction activities. Overall, the environmental monitoring results indicate that the works did not cause any significant impacts on the water quality and marine ecology in the works areas.

In general, the pollution control and mitigation measures stipulated in the *EP* and *EM&A Manual* had been properly implemented throughout the Project. Although a total of 2 incidences of non-compliance were identified during the weekly site inspections, these were rectified quickly without causing any significant environmental impacts. Thirteen environmental complaints were received and they were subsequently closed based on the investigations conducted and actions taken. No notification of summons and prosecution was received for the Project. Overall, the EM&A results obtained for the Project indicate that the environmental measures were effective in pollution prevention, control and mitigation and the construction activities did not cause any significant environmental impacts. It is, therefore, concluded that the environmental performance of the Project is acceptable.

## 1. PROJECT INFORMATION

### 1.1 Introduction

The Hong Kong and China Gas Company Limited (Towngas) conducted a feasibility study for the development of a natural gas supply system from the Cheng Tou Jiao Liquefied Natural Gas Receiving Terminal (GRT), Shenzhen, People's Republic of China, to the Towngas Gas Production Plant (GPP) located in the Tai Po Industrial Estate, Hong Kong Special Administrative Region (HKSAR). The system comprises two natural gas pipelines which convey liquefied natural gas (LNG) from Shenzhen to Tai Po and associated facilities include a launching station at the GRT and a gas receiver station at the GPP. An EIA study (ERM, 2003a) was undertaken for this project and an *Environmental Permit* (EP-167/2003) was issued with detailed monitoring requirements stipulated in the *EM&A Manual* (ERM, 2003b). The pipeline alignment in the study area is shown in *Figure 1.1a (Annex A)*.

While the Project was progressing, applications for variations to the *EP* (VEP) had been approved at different stages of construction. A VEP for using grab dredgers rather than a trailer suction hopper dredger (EP-167/2003/B) was approved and a further permit (FEP-01/167/2003/B) was issued on 16 June 2005 with Leighton Contractors Asia Limited (Leighton) as the permit holder. Another VEP application for modifying the jetting method used in Mirs Bay was approved (FEP-01A/167/2003/C) on 12 August 2005. Recently, a VEP application for using grout mattresses instead of a rock armour to protect a small section of the pipelines was approved by EPD on 20 March 2006 and the currently effective EP is FEP-01B/167/2003/D.

Leighton Contractors Asia Limited (Leighton) was employed by Towngas to construct the LNG pipelines. Meinhardt Infrastructure and Environment Ltd (formerly Meinhardt Mouchel Limited) was appointed by Leighton to perform as the Environmental Team (ET) undertaking the environmental monitoring and audit (EM&A) work required by the *EP* and *EM&A Manual*. The project organisation and contact information for the key personnel with respect to EM&A work are shown in *Figure 1.1b (Annex A)*. Major construction activities of the Project with potential environmental implications commenced in April 2005 and finished in May 2006 while the related EM&A work was undertaken by the ET in the same period of time based on the requirements stipulated in the *EP* and *EM&A Manual*.

### 1.2 Major Construction Activities

The major works of this Project with potential environmental effects comprised:

- pipe-laying (Mainland waters, Mirs Bay and Tolo Harbour and Channel);
- dredging (Mainland waters and Mirs Bay);
- excavation at the seawall at the Tai Po landing point;
- jetting (Mirs Bay and Tolo Harbour and Channel);
- placement of rock armour (Mainland waters, Mirs Bay and Tolo Harbour and Channel); and
- installation of grout mattresses (outer Tolo Channel).

The complete works programme (as-constructed) is attached in *Annex A*.

## 2. SUMMARY OF EM&A REQUIREMENTS

### 2.1 Types of Works and Monitoring Requirements

Requirements of water quality and marine ecological monitoring triggered by various types of works of the Project are summarised in *Table 2.1a* below:

**Table 2.1a Types of Works and Monitoring Requirements**

Works	Type of Monitoring	Compartment	Frequency
Prior to works commencement (Zone A, B, C and D)	Baseline	Water quality	<ul style="list-style-type: none"> <li>• 3 days per week for 4 weeks</li> <li>• mid-flood and mid-ebb</li> </ul>
		Marine ecology (corals)	<ul style="list-style-type: none"> <li>• 1 survey</li> </ul>
Dredging in Mainland waters (within 1 km off Hong Kong boundary)	Impact	Water quality	<ul style="list-style-type: none"> <li>• Every 2 days (mid-flood and mid-ebb) while dredging in progress</li> </ul>
		Marine ecology (corals)	<ul style="list-style-type: none"> <li>• Every 2 days while dredging in progress</li> </ul>
	Post-project	Water quality	<ul style="list-style-type: none"> <li>• 3 days (mid-flood and mid-ebb) within 1 week after dredging completion</li> </ul>
		Marine ecology (corals)	<ul style="list-style-type: none"> <li>• 1 survey within 1 week after dredging completion</li> </ul>
Excavation at the Tai Po landing point	Impact	Water quality	<ul style="list-style-type: none"> <li>• 3 days per week (mid-flood and mid-ebb)</li> </ul>
	Post-project	Water quality	<ul style="list-style-type: none"> <li>• 3 days (mid-flood and mid-ebb) within 1 week after completion of excavation</li> </ul>
Jetting in Zone A, B, C and D	Pilot test	Water quality	<ul style="list-style-type: none"> <li>• First 3 days since jetting commencement</li> <li>• 1-hourly turbidity monitoring</li> <li>• 3-hourly SS monitoring</li> </ul>
		Marine ecology (corals)	<ul style="list-style-type: none"> <li>• Not required</li> </ul>
	Impact	Water quality	<ul style="list-style-type: none"> <li>• Daily monitoring (mid-flood and mid-ebb) while jetting in progress</li> </ul>
		Marine ecology (corals)	<ul style="list-style-type: none"> <li>• Daily monitoring while jetting in progress*</li> </ul>
	Post-project	Water quality	<ul style="list-style-type: none"> <li>• 3 days (mid-flood and mid-ebb) within 1 week after jetting completion</li> </ul>
		Marine ecology (corals)	<ul style="list-style-type: none"> <li>• 1 survey within 2 weeks after jetting completion*</li> </ul>
Grout mattress installation	Pilot test	Water quality	<ul style="list-style-type: none"> <li>• First 3 days since grouting commencement</li> <li>• 3-hourly continuous monitoring for 72 hrs</li> </ul>
		Marine ecology (corals)	<ul style="list-style-type: none"> <li>• Daily monitoring in the first 3 days since grouting commencement</li> </ul>
	Post-project	Water quality	<ul style="list-style-type: none"> <li>• 1 day (mid-flood and mid-ebb) within 1 week after grouting completion</li> </ul>
		Marine ecology (corals)	<ul style="list-style-type: none"> <li>• 1 day within 1 week after grouting completion</li> </ul>

\* Marine ecological monitoring not required for jetting in Zone A, C and D.

## 2.2 Monitoring Locations

The locations of the baseline and post-project water quality monitoring stations and the nearby sensitive receivers are shown in Figure 2.2a (*Annex A*). The stations for the water quality impact monitoring triggered by the jetting and seawall excavation works in Zone A are shown in Figure 2.2b (*Annex A*). The stations for the impact monitoring triggered by the jetting works in Zone B and D, as well as those for the post-project monitoring for the grouting operation in outer Tolo Channel, are shown in Figure 2.2c (*Annex A*). Monitoring stations for jetting in Zone C and dredging in Mainland waters (within 1 km from the boundary of Hong Kong waters) are shown in Figure 2.2d and 2.2e, respectively (*Annex A*). Monitoring locations for the pilot test on jetting and grouting performance are shown in Figure 2.2f and 2.2g, respectively (*Annex A*).

The locations of the marine ecological monitoring for the corals at Tung Ping Chau and along Tolo Channel are shown in Figure 2.2e and 2.2h, respectively (*Annex A*).

## 2.3 Monitoring Parameters

Water quality monitoring parameters included:

- dissolved oxygen (mg/L);
- turbidity (NTU);
- suspended solids (mg/L);
- pH (pH unit; for monitoring for grout mattress installation only);
- temperature (°C); and
- salinity (ppt);

Marine ecological monitoring parameters included:

- sediment cover (hard corals only);
- bleaching (hard corals only); and
- partial mortality (hard, soft and black corals).

## 2.4 Environmental Quality Performance Limits

The Action and Limit levels applicable to the water quality impact monitoring and *ad hoc* water quality monitoring for grout mattress installation are detailed in *Annex B*. For the marine ecological impact monitoring, exceedance levels were determined by the decision graphs on the Coral Survey Proforma attached in *Annex B*.

# 3. ENVIRONMENTAL MONITORING RESULTS

## 3.1 Exceedance of Environmental Quality Performance Limits

Over the whole project, a total of 230 Action level exceedances for DO, SS and turbidity and 9 Limit level exceedances for DO and SS were recorded in the water quality impact monitoring. Subsequent investigations indicated that the majority of the Action Level exceedances were minor to marginal and likely due to natural background variations or factors other than the works of the project. Furthermore, although 9 isolated incidences of Limit Level exceedances were recorded, they were probably caused by to elevated SS levels or lowered DO levels in the background (e.g. possibly due to red tides or local discharges) and there were no indications that they were caused by the works. No follow-up actions were, therefore, required in accordance with the Event and Action Plan in the *EM&A Manual*.

In the marine ecological impact monitoring, 1 Limit Level exceedance for sediment cover on hard corals were recorded in a coral survey conducted at Tung Ping Chau while the dredging works in Mainland waters (within 1 km off the boundary of Hong Kong waters) were in progress. As revealed by the subsequent investigation, however, the Limit Level exceedance was unlikely due to the works but rather factors unrelated to the Project. No further follow-up action were implemented in accordance with the Event and Action Plan in the *EM&A Manual*.

### 3.2 Trends of Water Quality and Marine Ecological Monitoring Parameters

Trends of the water quality parameters in Zone A, B, C and D of the project area in the last 4 months when jetting was in progress are presented in *Figures 3.2a-b, 3.2c-d, 3.2e-f and 3.2g-h*, respectively (*Annex C*). As shown in the figures, although there were occasional incidences where depth averaged SS and turbidity were above the respective Action and Limit Levels and depth averaged DO levels slightly below the Limit Level for surface and mid-depth (5 mg/L), all these elevated/reduced levels had been demonstrated to be unrelated to the Project by the subsequent investigations (see also *Section 3.1* above). Sustained elevations and increasing trends for any one of these parameters were not apparent. Furthermore, water quality parameters have generally returned to baseline levels after jetting was finished except for Zone A where elevated levels of SS and turbidity were observed at stations A2 and A4 in the post-project monitoring. It was noted, however, that in the 3 days just before jetting completion, only marginal Action Level exceedances were recorded for SS and turbidity which had been determined to be unrelated to the works and these SS and turbidity levels were generally comparable to the baseline. The elevated SS and turbidity levels recorded at A2 and A4 after jetting completion were, therefore, unlikely due to the previous jetting works but rather elevated background levels caused by other factors. Trends of the hard and soft corals monitoring parameters in the last 4 months are presented in *Figures 3.2i-j* (*Annex C*). It can be seen that no significant elevations nor increasing trends in any one of the coral monitoring parameters were apparent. Therefore, there were no indications that the Project caused any significant and sustained impacts on the water quality and marine ecology in the works area.

### 3.3 Post project Monitoring Results

Post-project monitoring for water quality and marine ecology had been undertaken after completion of the dredging (Mainland waters), excavation (Tai Po landing point), jetting and grouting works. The results showed that the water quality and marine ecological conditions after works completion were generally comparable to the baseline except for SS and turbidity levels at stations A2 and A4 in Zone A which were at elevated levels were observed after jetting completion. Subsequent review of the monitoring results, however, indicated that these high levels were unlikely due to the jetting work. Overall, there was no indication of any significant and sustained impacts from the dredging, excavation, jetting and grout mattress installation works (see the *Monthly EM&A Reports* for June 2005, September 2005 and April 2006 for detailed discussions of the post-project monitoring results). It should also be noted that the post-project monitoring results are consistent with the fact that no significant impacts attributable to these works had been detected in the impact monitoring.

## 4. IMPLEMENTATION STATUS OF POLLUTION CONTROL AND MITIGATION MEASURES

### 4.1 Pollution Control and Mitigation Measures Status

The environmental pollution control and mitigation measures, as required in the *EP and EM&A Manual*, are detailed in the Implementation Schedule appended in *Annex D*. Overall, these measures had been implemented properly all along, except for two incidences of non-



compliances in relation to silt curtain deployment and jetting speed control, which had been corrected in a timely manner on identification (see *Section 5.1* below). There was also no indication that the non-compliances caused any significant environmental impacts. The implementation statuses of the environmental pollution control and mitigation measures are indicated in the Schedule attached in *Annex D*.

#### 4.2 Waste Management Status

The total amount of wastes generated in the whole Project and their management status (including inert and non-inert C&D wastes, recycled C&D wastes and chemical wastes) are summarised below in *Table 4.2a*.

**Table 4.2a Summary of Waste Management Status for the Whole Project**

Type of Waste	Inert C&D Materials <sup>1</sup> Reused/Recycled <sup>2</sup>	Inert C&D Materials <sup>1</sup> to Public Fill	Non-inert C&D Waste <sup>3</sup> Recycled	Non-inert C&D Waste <sup>3</sup> to Landfill	Chemical Waste
<b>Total Quantity</b>	0 tonne	11065.38 tonne	76528.22 kg	329.08 tonnes	2400 litre (liquid) 0 kg (solid)
<b>Disposal Location</b>	--	--	--	SENT, WENT and NENT	--

- Notes:
1. Includes concrete, rubble, earth, boulder, sand, tile, masonry and used bentonite.
  2. Reused in this Project, other Projects (including third parties) or as broken concrete for recycling into aggregates.
  3. Includes general refuse, metals, paper, cardboard packaging, plastics, timber and others (e.g. tyres and computer equipment).

## 5. ENVIRONMENTAL NON-CONFORMANCE

### 5.1 Non-compliance and Accidental Event

A total of 2 incidences of non-compliance in relation to silt curtain deployment (3 June 2005) and jetting speed control (31 October 2005) were identified during the site inspections for the Project. For the non-compliance related to silt curtains used during dredging in Mirs Bay, curtains that met the requirements stipulated in the *EM&A Manual* were subsequently installed before dredging in Mirs Bay was started again and thus the case closed. The non-compliance on jetting speed was corrected shortly after the implementation of an enhanced jetting speed control and monitoring system by the Contractor. It was also noted from the site inspections and environmental monitoring programme that there was no indication that the non-compliances caused any significant environmental impacts. A cumulative summary of all the non-compliances recorded is presented in *Annex E*.

It was also noted that an accident considered as a minor event (in accordance with the Event-Action Plan in Appendix E of the EP) occurred during grout mattress installation when water slurry of low grout material content was accidentally released from the mixer and spilled into the sea. In accordance with the Event-Action Plan stipulated in the EP, actions including *ad hoc* monitoring for water quality and corals as well as implementation of additional pollution control-mitigation measures had been taken. Results of the *ad hoc* monitoring indicated no significant environmental impact resulted from the minor accidental event and the additional pollution control-mitigation measures implemented were considered adequate.

### 5.2 Complaints

In the whole project, a total of 13 complaints have been received. Among them 9 complaints were related to water quality changes, mortality of cultured fish and pearl oysters and elevated



cadmium levels in cultured pearl oysters. Subsequent investigations indicated that the issues raised in these 9 complaints were not related to the Project and the complaints closed. Four complaints were received for noise nuisance caused by the jetting works as perceived by residents at Tai Po and Ma On Shan. These noise complaints were subsequently closed as the complaint investigations indicated that the jetting works complied with the conditions of the Construction Noise Permit and actions taken by the Contractor for noise impact mitigation were considered adequate. A summary of all the complaints received is presented in *Annex F*.

### **5.3 Notification of Summons and Successful Prosecution**

No notification of summons and successful prosecution for breaches of environmental legislation was recorded for the Project.

## **6. CONCLUSION AND RECOMMENDATION**

### **6.1 Comparison of EM&A Results and EIA Prediction**

Overall the EM&A results indicate that the Project did not cause any significant impacts on the water quality and marine ecology in the works areas and this is generally consistent with the predictions of the EIA.

### **6.2 Review of Monitoring Programme**

The monitoring programme is considered adequate in detecting any water quality and marine ecological impacts from the works to ensure satisfactory environmental performance of the Project. Given the consistent environmental performance of the jetting observed in this Project, in the future reduction of monitoring frequency in similar projects involving jetting should be considered if the jetting methodologies are comparable.

### **6.3 Environmental Acceptability of The Project**

The EM&A results obtained over the whole project indicate that the environmental pollution control and mitigation measures were effective in pollution prevention and mitigation and the construction activities did not cause any significant impacts on the water quality and marine ecology in the works areas from Mirs Bay to Tolo Harbour and Channel. It is, therefore, concluded that the overall environmental performance of the Project is acceptable.

## **7. REFERENCES**

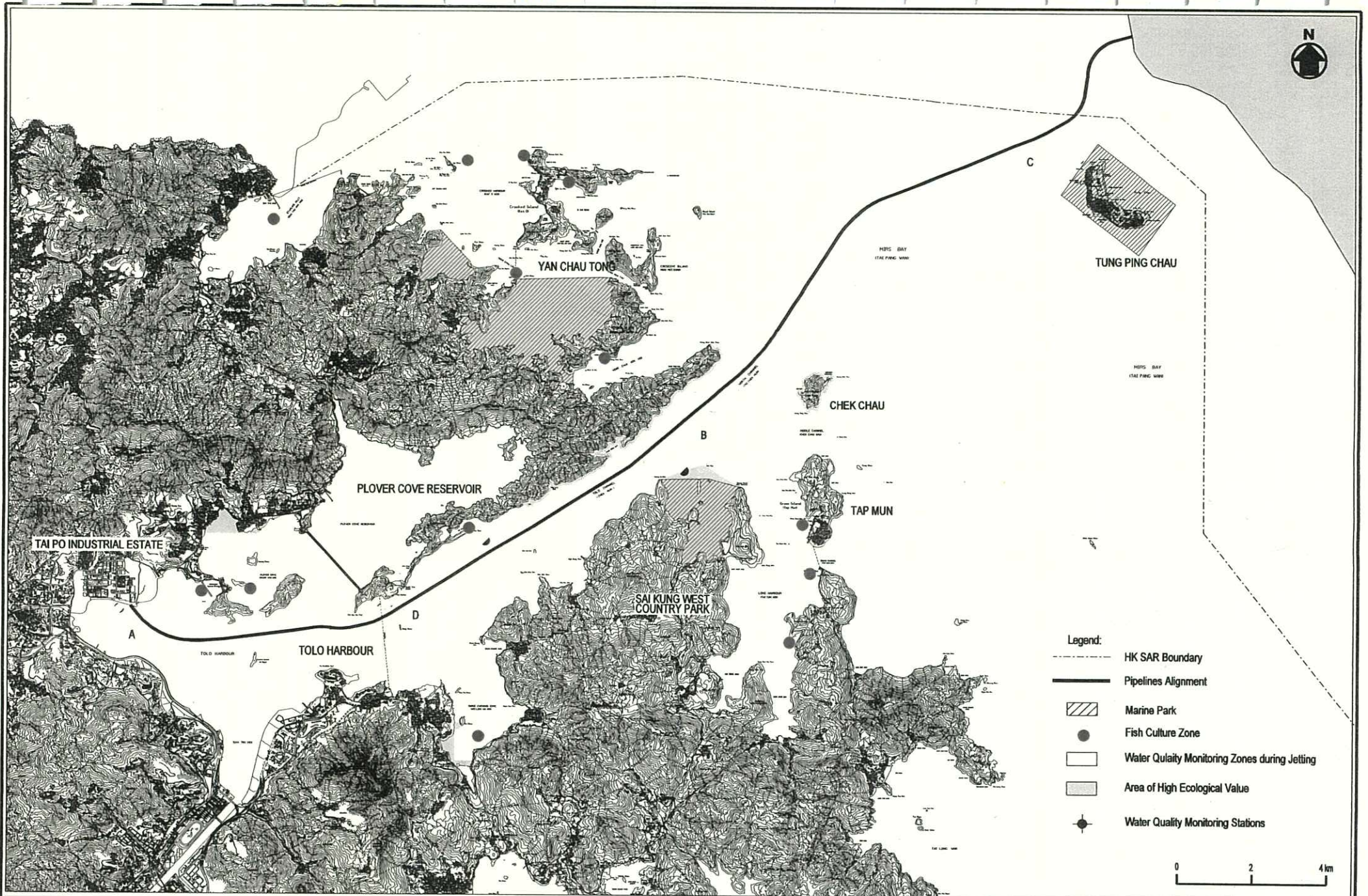
FEP-01B/167/2003/D. Further Environmental Permit for the Proposed Submarine Gas Pipelines from Cheng Tou Jiao Liquefied Natural Gas Receiving Terminal, Shenzhen to Tai Po Gas Production Plant, Hong Kong.

ERM (2003a). Proposed Submarine Gas Pipelines from Cheng Tou Jiao Liquefied Natural Gas Receiving Terminal, Shenzhen to Tai Po Gas Production Plant, Hong Kong – EIA Study. Environmental Impact Assessment Report.

ERM (2003b). Proposed Submarine Gas Pipelines from Cheng Tou Jiao Liquefied Natural Gas Receiving Terminal, Shenzhen to Tai Po Gas Production Plant, Hong Kong – EIA Study. Environmental Monitoring and Audit (EM&A) Manual.

## **Annex A**

### **General Figures and Construction Programme**



PROJECT BOUNDARY AND KEY AREAS ALONG PIPELINE ALIGNMENT

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Figure No. 1.1a

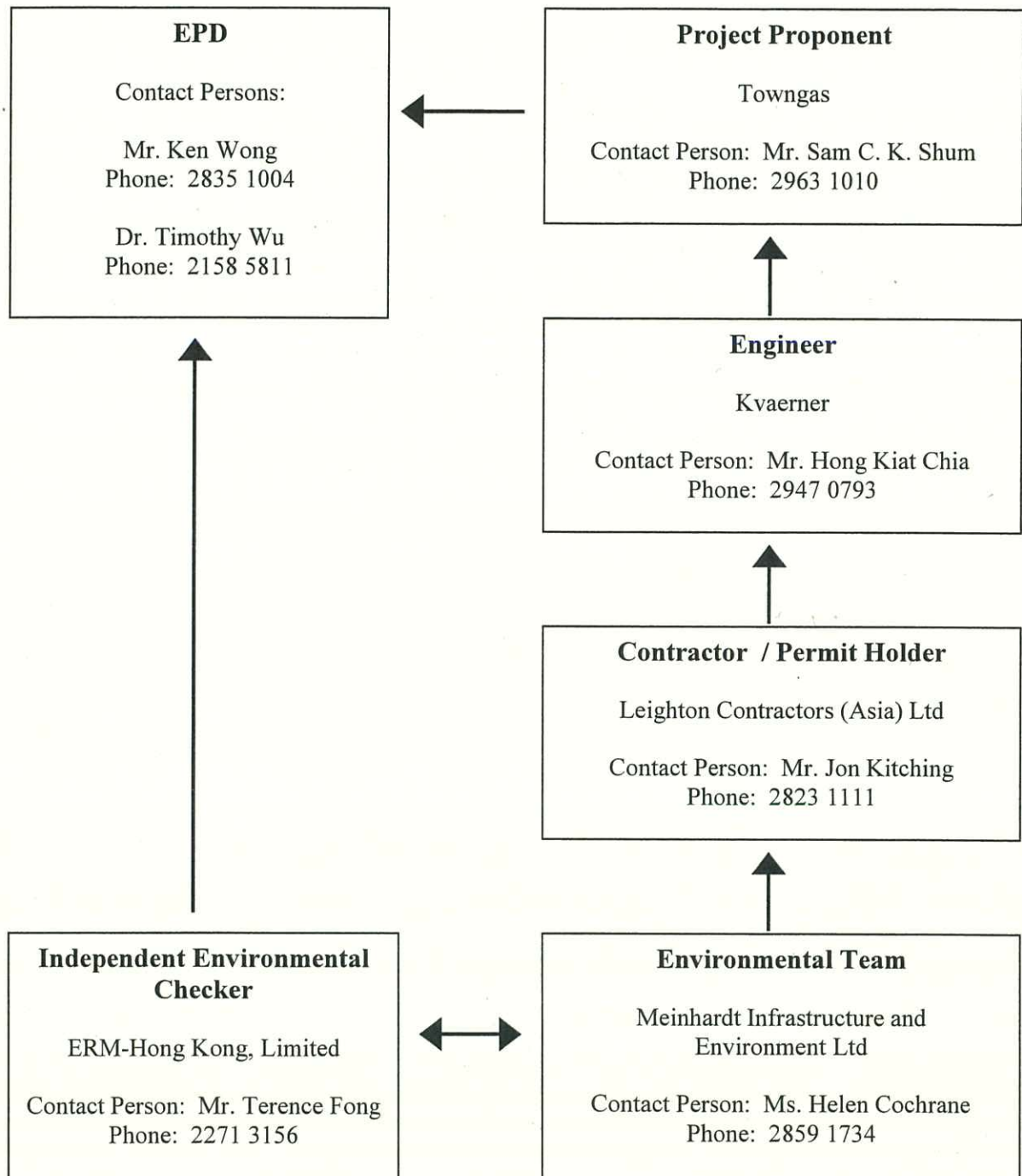
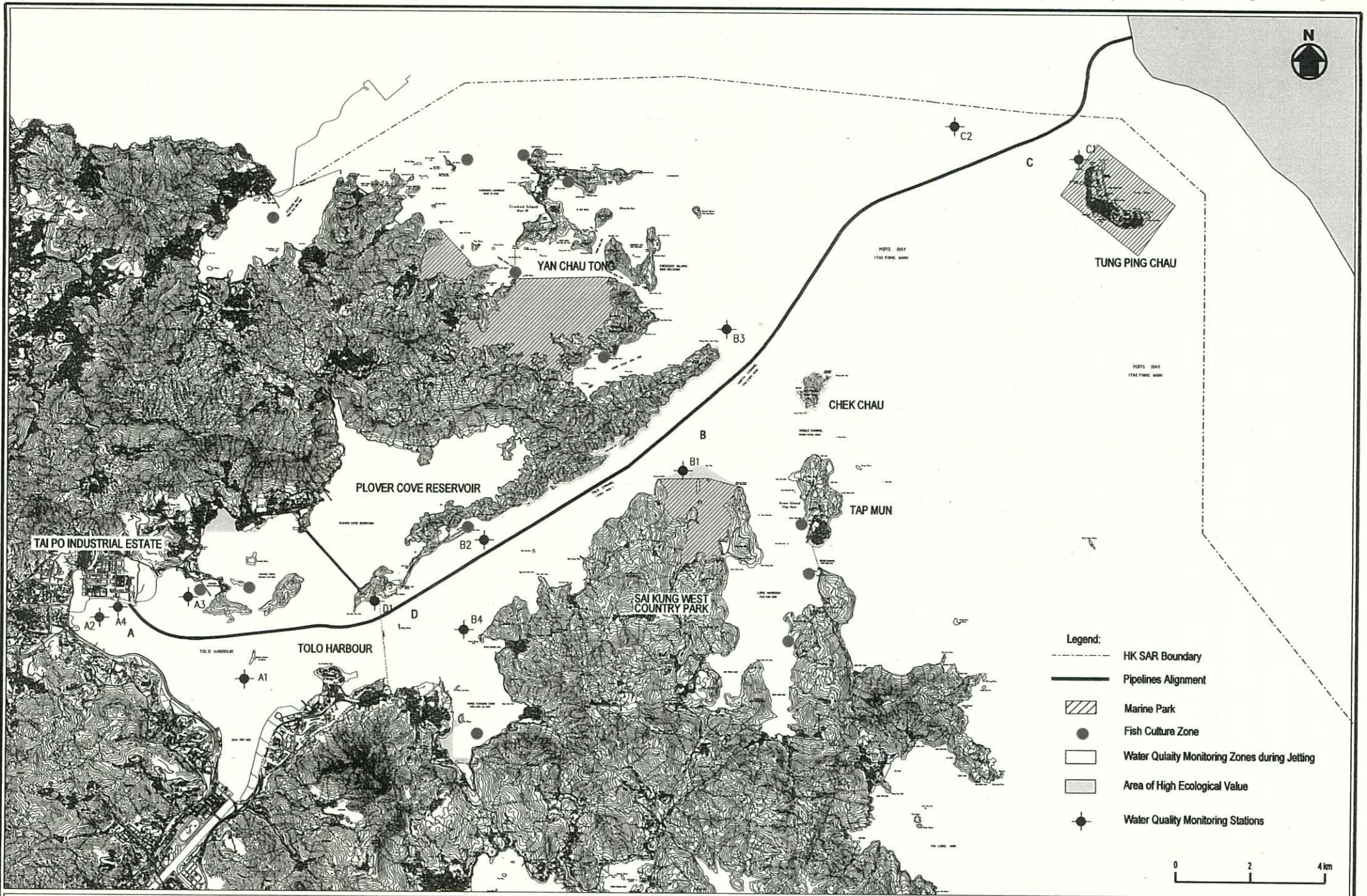


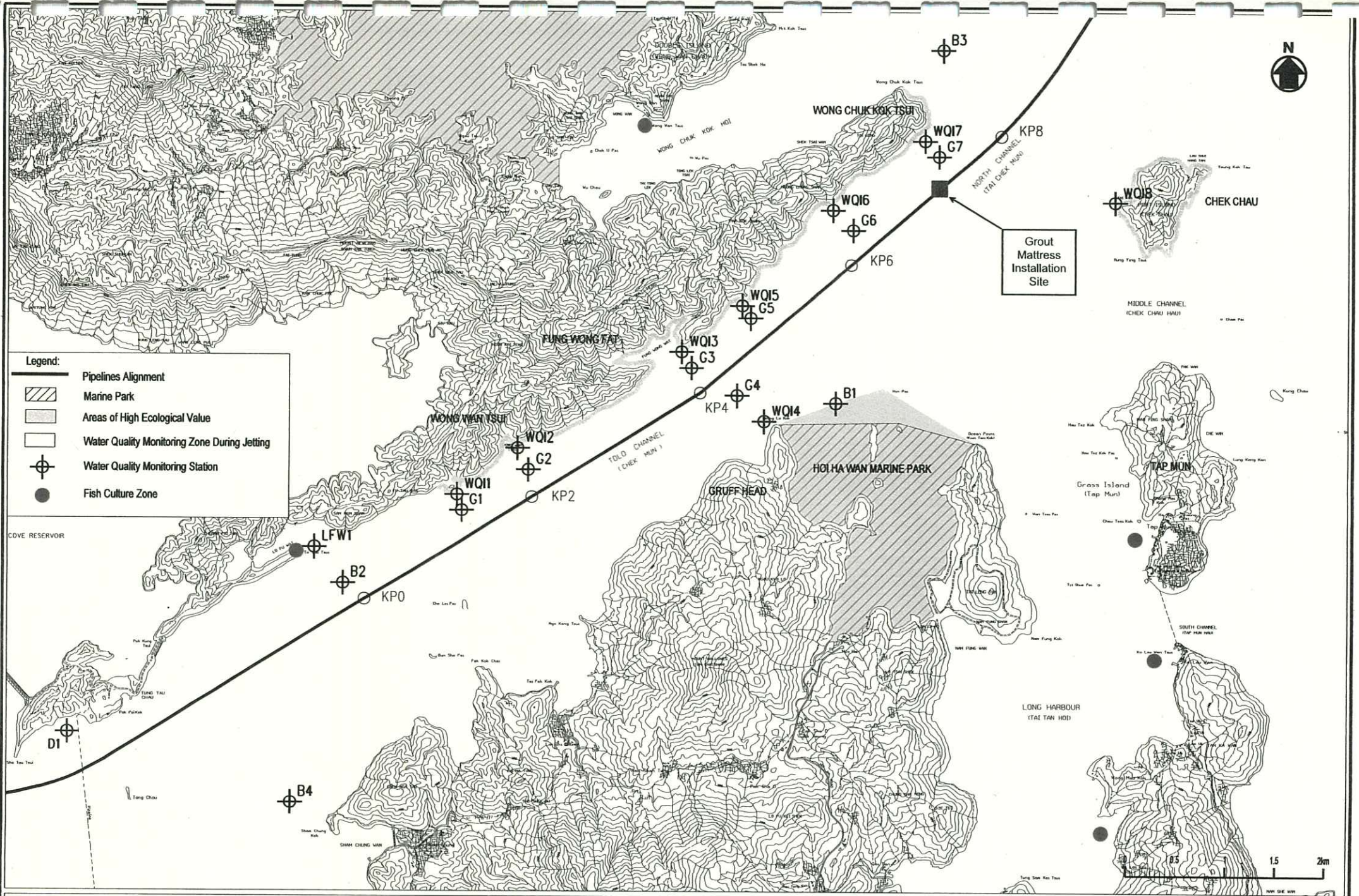
Figure 1.1b Project Organisation Chart with respect to Environmental Monitoring and Audit



- Legend:**
- - - - - HK SAR Boundary
  - Pipelines Alignment
  - ▨ Marine Park
  - Fish Culture Zone
  - Water Quality Monitoring Zones during Jetting
  - Area of High Ecological Value
  - Water Quality Monitoring Stations

Baseline and Post-project Water Quality Monitoring Stations

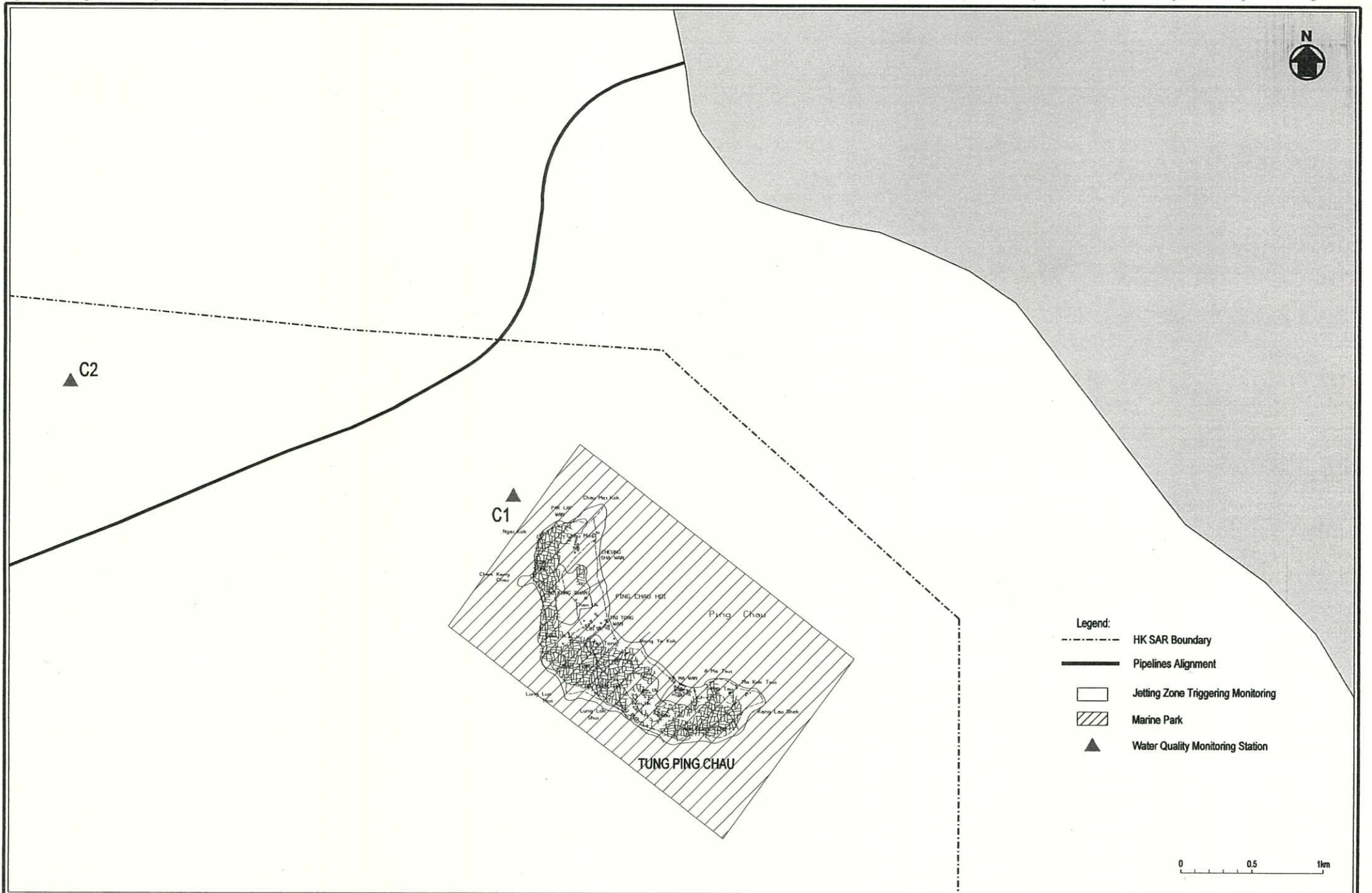




Water Quality Monitoring Stations for Jetting Works in Zone B and D and Post-project Monitoring for Grouting in Outer Tolo Channel

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Figure No. 2.2c

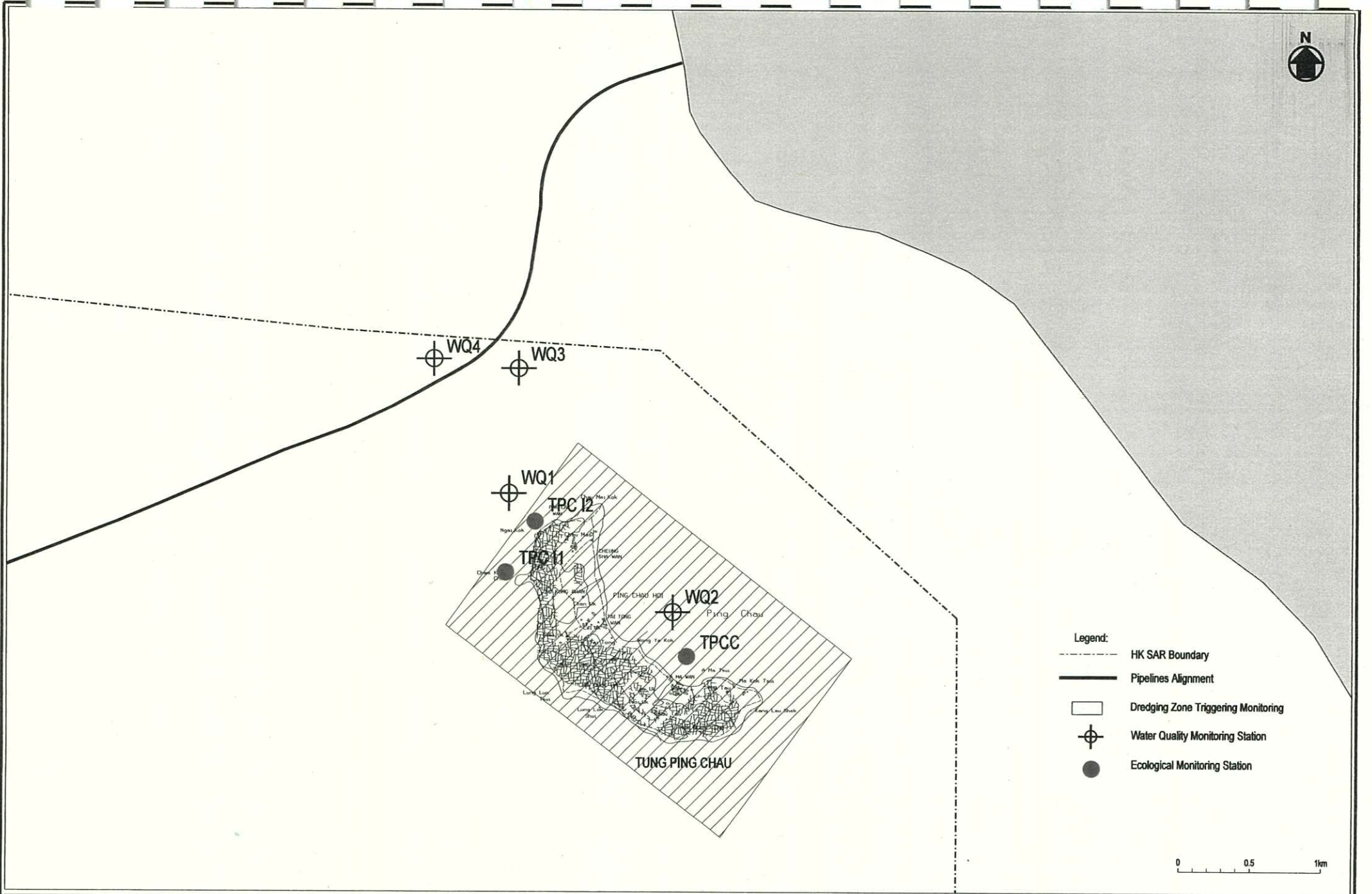







Water Quality Monitoring Stations for Jetting Works in Zone C

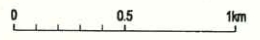
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Figure No. 2.2d





- Legend:
-  HK SAR Boundary
  -  Pipelines Alignment
  -  Dredging Zone Triggering Monitoring
  -  Water Quality Monitoring Station
  -  Ecological Monitoring Station

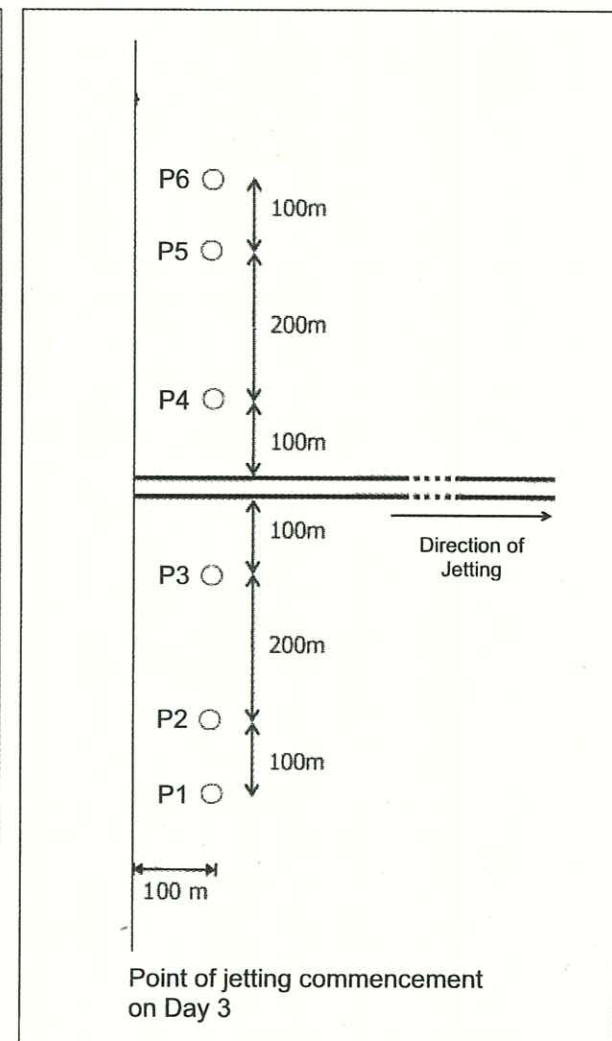
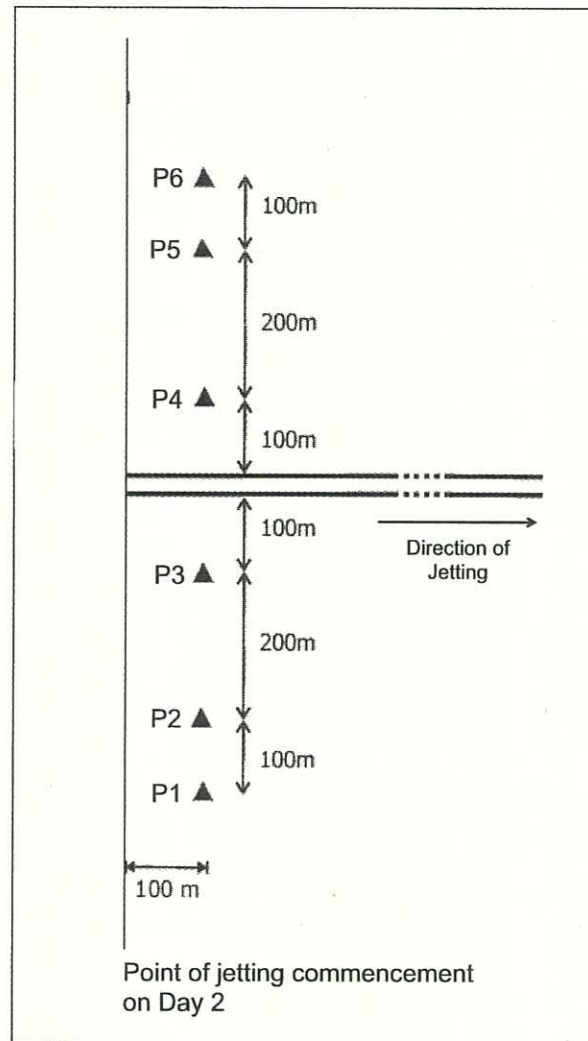
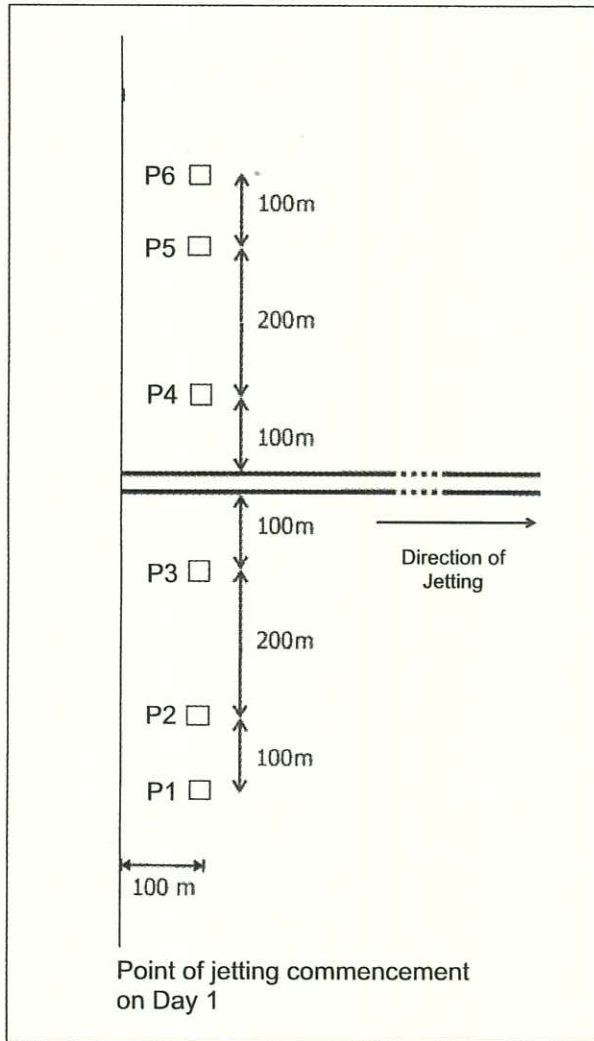


Water Quality and Marine Ecological Monitoring Stations for Dredging in Mainland Waters near Tung Ping Chau

Day 1

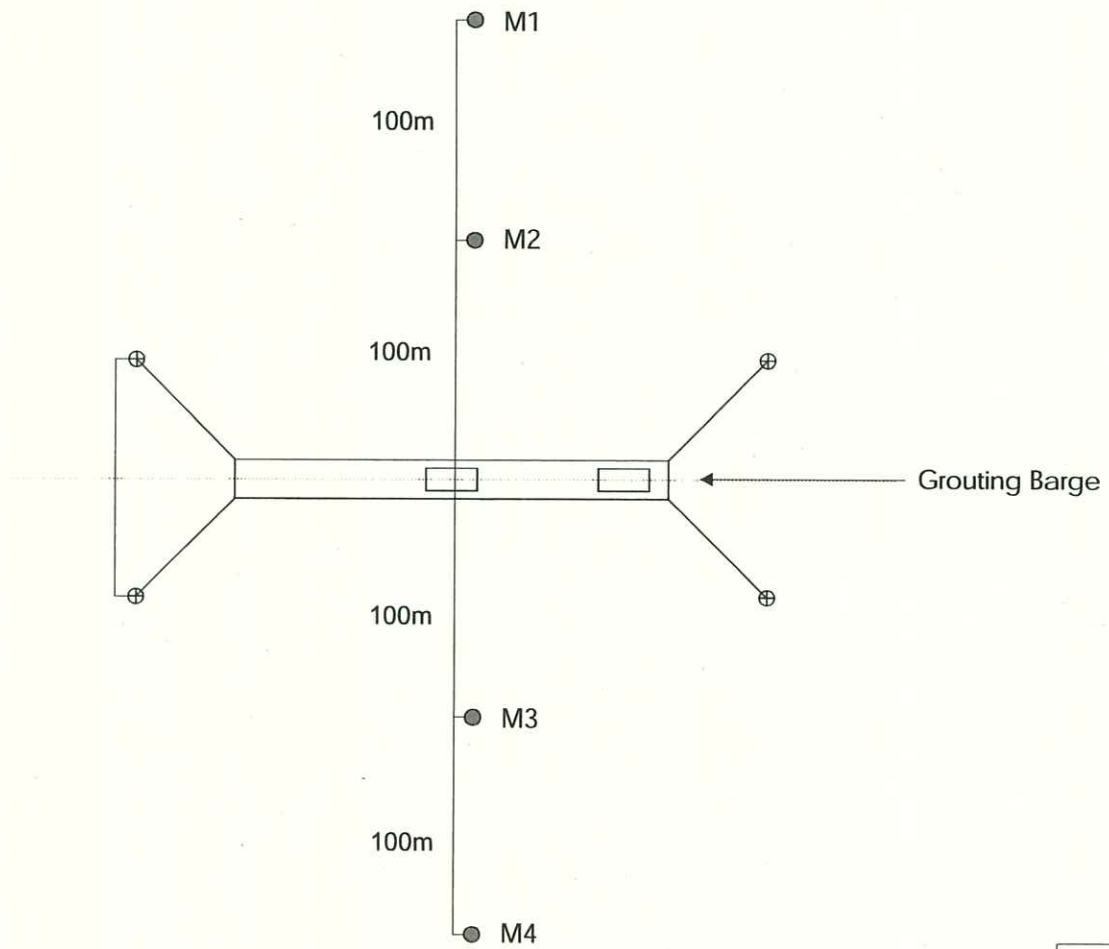
Day 2

Day 3



- Fixed Monitoring Station on Day 1
- ▲ Fixed Monitoring Station on Day 2
- Fixed Monitoring Station on Day 3
- ≡ Pipeline Alignment

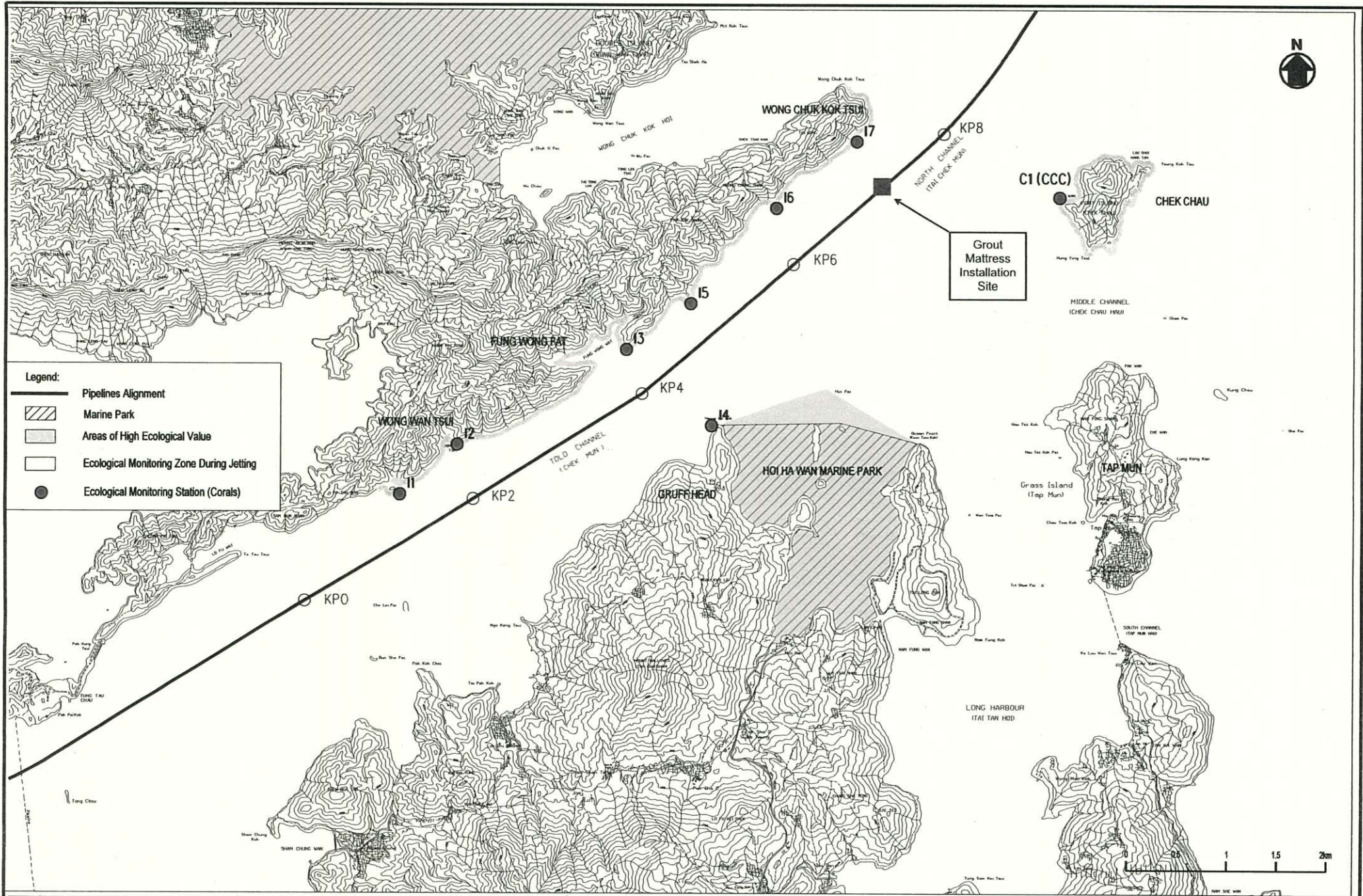
Figure 2.2f Water Quality Monitoring Stations for Pilot Test on Jetting Performance



Water Quality Monitoring Stations for Pilot Test on Grouting Performance

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Figure No.  
2.2g



Marine Ecological Monitoring Stations for Jetting and Grouting Works in Zone B

Data Date 13MAY06  
Run Date 08MAY06 11:32

# TOWNGAS TWIN 18" SUBMARINE PIPELINE

## All Activities



Act. ID	Activity Description	Actual Duration	Actual Start	Actual Finish	2004																							
					DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY						
<b>CC-A GENERAL AND PRELIMINARIES</b>																												
<b>CC-A.10 Contract Key Dates &amp; Milestones</b>																												
<b>CC-A.10.20 Key Milestones</b>																												
A01	EC Contract Award	0	18DEC04		◆																							
A03	Free Issue Coated Line Pipe with Anodes & Bends	0	31MAR05		◆																							
A02	Completion of All Design to Company for Approval	0		31MAR05	◆																							
A04	Completion of Shenzhen Approach & PRC Water Pipe	0		13JUL05	◆																							
A05	Completion of Tai Po Approach & Pipelay	0		28SEP05	◆																							
A06	Completion of Onshore Pipeline	0		14DEC05	◆																							
A07	Completion Jetting	0		21MAR06	◆																							
A08	Completion of Rock Dumping	0		06MAY06	◆																							
A09	Completion of Hydrotest & Pre-commissioning	0		08MAY06	◆																							
A10	Handover Completed Pipeline to Company	0		12MAY06	◆																							
A11	Completion	0		12MAY06	◆																							
<b>CC-A.10.30 Blackout Period</b>																												
B01	No Dumping allowed in PRC Water from May to Aug	123	01MAY05	31AUG05	▬																							
B02	No Construction in Tai Po Water for Dragon Boat	2	11JUN05	12JUN05	▬																							
<b>CC-A.10.40 Interface Dates</b>																												
C06	Arrival of LNG Tanker at DPLNG	0		28MAY06	◆																							
<b>CC-A.10.45 Further Constraints</b>																												
D01	Piggable Wye Ball Valve Free Issue	0	31MAY05		◆																							
D02	Commencement of Tai Po Water-front Pipeline	0	30JUN05		◆																							
<b>CC-A.20 Submittals &amp; Approvals</b>																												
<b>CC-A.20.10 General</b>																												
173	Checklist for all Permits Prepare & Submit	17	04JAN05	20JAN05	▬																							
183	Checklist for all Permits Review & Approval	17	04JAN05	20JAN05	▬																							
193	Detail Environmental Team Prepare & Submit	5	28JAN05	01FEB05	▬																							
133	Environmental Management Plan Prepare & Submit	49	11FEB05	31MAR05	▬																							
153	Waste Management Plan Prepare & Submit	49	11FEB05	31MAR05	▬																							
143	Environmental Management Plan Review & Approval	8	06APR05	13APR05	▬																							
163	Waste Management Plan Review & Approval	7	06APR05	12APR05	▬																							
<b>CC-A.20.15 Air / Water / Waste / Noise</b>																												
213	Submit Form NA Notification Commencement of Work	15	14FEB05	28FEB05	▬																							

Current Schedule  
 Progress Bar  
 Critical Activity

Pattern  
 General & Preliminaries  
 Construction

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### Leighton Contractors (Asia) Limited

## AS CONSTRUCTED SCHEDULE

Proj. Name: ACRA  
 Targ 1 Name:  
 Layout: AS CONSTRUCTED SCHEDULE  
 Filter: All Activities  
 Run Date: 08MAY06 11:32  
 Data Date: 13MAY06  
 Page No: Sheet 1 of 7

As Constructed Schedule			
Date	Revision	Checked	Approved
04JAN05	Base Line Rev "A"	DY	NS
17JAN05	Base Line Rev "B"	DY	
25APR05	Base Line Rev "C" 1st Issu	DY	
31MAY05	Base Line Rev "C" 2nd Issu	DY	
30JUN05	Update June 2005	DY	
31JUL05	Update July 2005	DY	
31AUG05	Update August 2005	DY	



Act. ID	Activity Description	Actual Duration	Actual Start	Actual Finish	2004																			
					2005												2006							
					DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY		
111	Temp Works Tai Po Trenches Design & Submit	5	28FEB05	04MAR05																				
112	Temp Works Tai Po Trenches Approval	6	05MAR05	10MAR05																				
101	Temp Works Shenzhen Approach Consultant Approve	8	01APR05	08APR05																				
109	Temp Works Tai Po Approach Approval	12	01APR05	12APR05																				
132	Method Statement Work inside TG Plant Approval	11	01APR05	11APR05																				
<b>CC-A.30.40 Spacer Design</b>																								
52443	Spacer - Design Data Finalised	48	15JAN05	03MAR05																				
52444	Spacer - Design Prepare & Submit	44	19JAN05	03MAR05																				
52454	Spacer - Design Approve	1	03MAR05	03MAR05																				
<b>CC-A.35 Coordination</b>																								
52464	Coordination with HEC & LNG Dredging Contractors	37	19JAN05	24FEB05																				
<b>CC-A.38 Risk Meeting</b>																								
52524	Risk Meeting - General	0		21MAR05																				
52534	Risk Meeting - Pipelay	0		26MAY05																				
52544	Risk Meeting - Jetting	0		26JUL05																				
52554	Risk Meeting - Backfill	0		15AUG05																				
52564	Risk Meeting - Hydrotesting	0		14FEB06																				
<b>CC-A.40 Major Sub-Contracts &amp; PO Awards</b>																								
52212	Place Order Winches and Tensioners	11	18DEC04	28DEC04																				
52314	Appoint Marine Survey Sub-contractor	53	18DEC04	08FEB05																				
52324	Spacer - Place Order	64	10JAN05	14MAR05																				
52336	Place Order E&M Equipment for Laybarge	10	16MAR05	25MAR05																				
52356	Appoint Jetting Sub-contractor	32	23MAR05	23APR05																				
<b>CC-A.50 Major Manufacturing &amp; Deliveries</b>																								
52211	Manufacture Winches & Tensioners	126	30DEC04	04MAY05																				
52436	Spacer - Bulk Manufacture	87	15MAR05	09JUN05																				
52446	Spacer - Prototype Assembly & Test	29	15MAR05	12APR05																				
52334	E&M Equipment for Laybarge Manufacture & Deliver	20	26MAR05	14APR05																				
52217	Pipe Delivery - Inspect, Document for shipping	18	01APR05	18APR05																				
52456	Spacer - Prototype Approve (by LCAL)	6	13APR05	18APR05																				
52219	Pipe Delivery (1st Batch)	20	28APR05	18MAY05																				
52437	Spacer - Delivery (1st Batch)	16	04MAY05	20MAY05																				
52439	Spacer - Delivery (2nd Batch)	17	01JUN05	19JUN05																				
52221	Pipe Delivery (2nd Batch)	10	06JUN05	15JUN05																				
52223	Pipe Delivery (3rd Batch)	10	04JUL05	13JUL05																				
53282	Procure, Manufacture & Delivery Grout Mattress	22	01MAR06	22MAR06																				
<b>CC-A.55 Laybarge Modification</b>																								
52300	Laybarge Modification Design Prepare & Submit	70	18DEC04	25FEB05																				
52343	E&M Equipment Schedule Prepare & Finalize	89	25DEC04	23MAR05																				
52323	Electrical Design for Laybarge Prepare & Submit	45	07FEB05	23MAR05																				
52320	Laybarge Modification Design Approval	20	26FEB05	17MAR05																				
52330	Laybarge Shell Modification in HK	37	19MAR05	02MAY05																				
52340	Laybarge Electrical & Mechanical Instal' in HK	28	30MAR05	02MAY05																				

Act. ID	Activity Description	Actual Duration	Actual Start	Actual Finish	2004												2005					2006																						
					DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC															
52370	Laybarge Install Winches & Tensioners	6	05MAY05	11MAY05																																								
52390	Laybarge Testing and Commissioning	4	12MAY05	16MAY05																																								
<b>CC-A.60 Major Plant Mobilization and Demobilization</b>																																												
52467	Grab Dredger for PRC Mobilization	8	22MAR05	29MAR05																																								
52447	Grab Dredger for HK Mobilization	7	03MAY05	10MAY05																																								
52507	Rock Dumping Barge Modification & Mobilization	85	14MAY05	12AUG05																																								
52477	Grab Dredger for PRC Demobilization	7	16MAY05	23MAY05																																								
52487	Jetting Spread Mobilization	7	01AUG05	07AUG05																																								
52457	Grab Dredger for HK Demobilization	8	07SEP05	14SEP05																																								
52220	Laybarge Demobilization	8	29SEP05	06OCT05																																								
52497	Jetting Spread Demobilization	10	22MAR06	31MAR06																																								
52517	Rock Dumping Barge Demobilization	5	08MAY06	12MAY06																																								
<b>CC-A.62 Import Special Skilled Labor</b>																																												
52627	Apply Exemption for Local Recruit to Labor Dept	15	14APR05	28APR05																																								
52637	Advertising for Local Recruitment	31	14APR05	14MAY05																																								
52647	Review Local Recruit & Apply Labor Import	10	15MAY05	24MAY05																																								
52657	Labor Department Process & Approve Import Labor	32	25MAY05	25JUN05																																								
52667	Visa Application for Import Labor	29	27JUN05	25JUL05																																								
<b>CC-A.65 Weld Procedure Qualification (WPQ)</b>																																												
52537	WPQ - Prepare & Submit pWPS	23	31JAN05	04MAR05																																								
52557	WPQ - Prepare Procedure Qualification Test	18	13FEB05	07MAR05																																								
52547	WPQ - Company Review & Approve pWPS	5	05MAR05	10MAR05																																								
<b>CC-A.65.10 WPQ Offshore Main Line (1)</b>																																												
52567	WPQ 001 - Perform Procedure Qualification Test	34	08APR05	17MAY05																																								
52577	WPQ 001 - Prepare & Submit WPQR & WPS	2	18MAY05	19MAY05																																								
52607	WPQ 001 - Welder Qualification Test	12	18MAY05	31MAY05																																								
52587	WPQ 001 - Company Review & Approve WPQR & WPS	6	20MAY05	26MAY05																																								
<b>CC-A.65.20 WPQ Onshore M Line/Bend/ Iso Joint (3, 4, 5 &amp; 9)</b>																																												
52569	WPQ (3,4,5,9) - Perform Procedure Quali Test	42	11APR05	28MAY05																																								
52579	WPQ (3,4,5,9) - Prepare & Submit WPQR & WPS	2	30MAY05	31MAY05																																								
52597	WPQ (3,4,5,9) - Welder Qualification Test	18	30MAY05	20JUN05																																								
52589	WPQ (3,4,5,9) - Company Review & Appv WPQR & WPS	6	14JUN05	20JUN05																																								
<b>CC-A.65.30 WPQ Tie-in (2)</b>																																												
52570	WPQ 002 - Perform Procedure Qualification Test	27	18APR05	18MAY05																																								
52580	WPQ 002 - Prepare & Submit WPQR & WPS	2	19MAY05	20MAY05																																								
52598	WPQ 002 - Welder Qualification Test	8	19MAY05	27MAY05																																								
52590	WPQ 002 - Company Review & Appv WPQR & WPS	6	21MAY05	27MAY05																																								
<b>CC-A.65.40 WPQ Offshore Line to Flange/Wye/Valve (6, 7 &amp; 8)</b>																																												
52572	WPQ (6,7,8) - Perform Procedure Quali Test	51	19APR05	17JUN05																																								
52582	WPQ (6,7,8) - Prepare & Submit WPQR & WPS	2	18JUN05	20JUN05																																								
52592	WPQ (6,7,8) - Company Review & Appv WPQR & WPS	25	21JUN05	20JUL05																																								
52599	WPQ (6,7,8) - Welder Qualification Test	25	21JUN05	20JUL05																																								



Act. ID	Activity Description	Actual Duration	Actual Start	Actual Finish	2005												2006										
					2004												2006										
					DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY					
<b>CC-B CONSTRUCTION</b>																											
<b>CC-B.90 Construction Works</b>																											
<b>CC-B.90.10 Pre-construction Survey</b>																											
52460	T P On - Pre-construction Survey inside TG Plant	28	19JAN05	26FEB05																							
52310	Hydrographic Survey	31	25FEB05	27MAR05																							
52317	Coral Survey and Condition Check	31	25FEB05	27MAR05																							
52311	Initial Survey Report Approved	40	28MAR05	06MAY05																							
120	Utility Survey (Tai Po On-shore Pipe)	5	01APR05	07APR05																							
128	Trial Pits (Tai Po On-shore Pipe)	12	01APR05	15APR05																							
<b>CC-B.90.15 Anchor Test</b>																											
52350	AT - Prepare and Agree Test Specification	11	10JAN05	21JAN05																							
52360	AT - Manufacture the Anchor Model	13	01FEB05	22FEB05																							
52380	AT - Baseline Test	7	23FEB05	02MAR05																							
52400	AT - Baseline Test with Alternative Rock	7	03MAR05	10MAR05																							
52410	AT - Baseline Test with Conforming Rock	7	11MAR05	18MAR05																							
52430	AT - Intermediate Report for Alternative Test	7	19MAR05	26MAR05																							
52530	AT - Re-test with Alternative Protection Layout	9	28MAR05	07APR05																							
52540	AT - Intermediate Report for Alternative Layout	6	08APR05	14APR05																							
<b>CC-B.90.30 Dredging</b>																											
53010	Dredging - CH 31.2 to 28.8 (PRC) by Grab	46	30MAR05	15MAY05																							
53020	Dredging - CH 18.9 to 22.4 (HK) by Grab	38	13MAY05	22JUN05																							
<b>CC-B.90.40 Shenzhen Approach Works</b>																											
52002	SZ Approach - Prepare Seawall	15	21MAY05	07JUN05																							
52035	SZ Approach - Install Riser First Stage to +2.7	11	30JUN05	13JUL05																							
52045	SZ App - Complete Seawall & Launcher (by DPLNG)	176	14JUL05	15FEB06																							
52010	SZ Approach - Install Riser Second Stage	14	10OCT05	26OCT05																							
52020	SZ Approach - Final Installation and Connection	6	16FEB06	22FEB06																							
<b>CC-B.90.50 WSD Crossing</b>																											
52613	WSD Crossing - Locate Water Pipe & Setting-out	2	03JUN05	04JUN05																							
52615	WSD Crossing - Install Pile & Cross Beam	12	28JUN05	10JUL05																							
52619	WSD Crossing - Remove Rock	6	11JUL05	17JUL05																							
<b>CC-B.90.55 Gas Pipe Crossing</b>																											
52620	GP Crossing - Locate Gas Pipe & Setting-out	2	23MAY05	24MAY05																							
52621	GP Crossing - Install Pile & Cross Beam	6	25MAY05	30MAY05																							
52626	GP Crossing - Remove Rock	2	31MAY05	01JUN05																							
<b>CC-B.90.60 Pipelaying</b>																											
52215	Pipelaying - CH 28.5 to 31.2	12	17JUN05	29JUN05																							
52230	Pipelaying - CH 26.9 to 28.5	6	17JUL05	23JUL05																							
52240	Pipelaying - CH 22.4 to 26.9	6	24JUL05	29JUL05																							
52250	Pipelaying - CH 18.9 to 22.4	6	30JUL05	05AUG05																							
52260	Pipelaying - Piggable Wye Installation	7	06AUG05	12AUG05																							
52270	Pipelaying - CH 17.3 to 18.9	8	13AUG05	21AUG05																							
52280	Pipelaying - CH 11.4 to 17.3	10	22AUG05	01SEP05																							

Act. ID	Activity Description	Actual Duration	Actual Start	Actual Finish	2005												2006						
					DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	
52290	Pipelaying - CH 0.04 to 11.4	20	02SEP05	23SEP05																			
<b>CC-B.90.65 Intermediate Hydrotest</b>																							
53230	Inter - Filling, Cleaning, Gauging & Pigging	7	03OCT05	10OCT05																			
53231	Inter - Pressure Test	5	12OCT05	17OCT05																			
<b>CC-B.90.70 Tai Po Approach Works</b>																							
52433	TP Approach - Temporary Works for Open Seawall	36	18JUL05	27AUG05																			
52432	TP Approach - Open Existing Seawall	6	28AUG05	03SEP05																			
52435	TP Approach - Prepare for Pipe Installation	2	05SEP05	06SEP05																			
52445	TP Approach - Dredging	2	05SEP05	06SEP05																			
52440	TP Approach - Install Pipe Up & Through Seawall	4	24SEP05	28SEP05																			
52450	TP Approach - Reinstate Seawall	32	05OCT05	11NOV05																			
<b>CC-B.90.75 Tai Po Onshore Works</b>																							
<b>CC-B.90.75.10 Tai Po Onshore Pipeline inside Towngas Plant</b>																							
52426	TP OnSh - Excavation inside Towngas Plant	98	30MAY05	23SEP05																			
52442	TP OnSh - Install Pipeline inside Towngas Plant	104	16JUL05	17NOV05																			
52423	TP OnSh - 600mm Gas Line by Others	92	23AUG05	10DEC05																			
52424	TP OnSh - Backfill & Reinstate inside Towngas	73	14SEP05	10DEC05																			
52494	TP OnSh - Final Connection	3	30NOV05	02DEC05																			
<b>CC-B.90.75.20 Tai Po Onshore Pipeline 0 - 280m from Approach</b>																							
52420	TP OnSh - Excavation (0-280m from Approach)	50	24JUL05	21SEP05																			
52422	TP OnSh - Install Pipeline (0-280m from Apph)	40	08AUG05	23SEP05																			
52452	TP OnSh- Backfill & Reinstate (0-280m from Apph)	13	15SEP05	30SEP05																			
<b>CC-B.90.75.30 Tai Po Onshore Pipeline 280-500m from Approach</b>																							
54256	TP OnSh - Excavation (280-500m from Approach)	20	05OCT05	28OCT05																			
52458	TP OnSh - Install Pipeline (280-500m from Apprh)	25	14OCT05	11NOV05																			
52462	TP OnSh- Backfill & Reinstate (280-500m fr Apph)	13	09NOV05	23NOV05																			
<b>CC-B.90.75.50 Tai Po Onshore Pipeline 500-600m from Approach</b>																							
52472	TP OnSh - Temp Support to Cross Existing Pipe	15	01NOV05	17NOV05																			
52474	TP OnSh - Excavation (500-600m fr Approach)	15	01NOV05	17NOV05																			
52476	TP OnSh - Install Pipeline (500-600m from Apph)	17	10NOV05	29NOV05																			
52478	TP OnSh - Backfill & Reinstate (500-600m fr App)	13	30NOV05	14DEC05																			
<b>CC-B.90.75.55 Tai Po Onshore Pipeline 600-680m from Approach</b>																							
52490	TP OnSh - Excavation (600-680m fr Approach)	7	16SEP05	24SEP05																			
52492	TP OnSh - Install Pipeline (600-680m from Apph)	19	21SEP05	14OCT05																			
52496	TP OnSh - Backfill & Reinstate (600-680m fr App)	12	14OCT05	27OCT05																			
<b>CC-B.90.75.60 Tai Po Onshore Pipeline Intermediate Hydrotest</b>																							
52434	TP OnSh - Intermediate Hydrotest	11	22FEB06	06MAR06																			
<b>CC-B.90.80 Jetting</b>																							
52810	Jetting - Pilot Test	7	07AUG05	13AUG05																			
52840	Jetting (CH 22.4 to 28.8)	70	14AUG05	28OCT05																			
52820	Jetting (CH 0.04 to 18.9)	144	29OCT05	21MAR06																			
<b>CC-B.90.90 Rock Dumping</b>																							
53210	Rock Dump Berm Tremie - CH 28.8-31.2 (PRC)	59	27JUL05	28SEP05																			

Act. ID	Activity Description	Actual Duration	Actual Start	Actual Finish	2004	2005												2006				
					DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
53220	Rock Dump Berm Tremie - CH 18.9 to 22.4 (HK)	47	13AUG05	02OCT05																		
53212	Rock Dumping Bulk - CH 28.8 to 31.2 (PRC)	107	21AUG05	10DEC05																		
53222	Rock Dumping Bulk - CH 18.9 to 22.4 (HK)	97	21AUG05	30NOV05																		
53242	Rock Dumping Tremie - CH 22.4-28.8 (HK)	46	15OCT05	30NOV05																		
53270	Rock Dumping Tremie - CH 0.04-18.9 (HK) Barge 1	101	25DEC05	12APR06																		
53272	Rock Dumping Tremie - CH 0.04-18.9 (HK) Barge 2	79	16JAN06	12APR06																		
53302	Rock Dumping - Transition with Grout Mattress	3	14APR06	16APR06																		
<b>CC-B.90.92 Grout Mattress to Oyster Bed Section</b>																						
53292	Installation of Grout Mattress	22	23MAR06	13APR06																		
<b>CC-B.90.98 Hydrotest and Pre-commissioning</b>																						
53821	Test for Cathodic Protection (by snake)	5	20FEB06	24FEB06																		
53810	Gauging and Pigging	4	14APR06	17APR06																		
53811	Pressure Test	3	18APR06	20APR06																		
53812	Dewatering and Swabbing / Air Drying / Re-Gauge	18	21APR06	08MAY06																		
53610	Post Construction Survey	12	25APR06	06MAY06																		
53815	Handover to Company	13	30APR06	12MAY06																		

## **Annex B**

### **Environmental Quality Performance Limits**



### Action and Limit Levels for Water Quality Monitoring

Parameter	Sensitive Receiver	Depth	Action Level	Limit Level
<b>Zone A – Tai Po Landing Area</b>				
DO (mg/L)	WSD Intake	Surface, Middle, Bottom	Data from impact stations (A3 and A4) show a depletion of 30% compared with corresponding data from control stations.	5 mg/L at the surface and mid depth 2 mg/L at the bottom
	Fish Culture Zone			
SS (mg/L)	WSD Intake	Depth-averaged	Impact stations exceed 6 mg/L or 120% of the control station's SS at the same tide of the same day.	10 mg/L
	Fish Culture Zone	Depth-averaged	Same as above.	14 mg/L
Turbidity (NTU)	WSD Intake	Depth-averaged	Impact stations exceed 3.9 NTU or 120% of the control station's turbidity at the same tide of the same day.	10 NTU.
	Fish Culture Zone	Depth-averaged	Same as above.	12.2 NTU
<b>Zone B – Jetting within Tolo Channel</b>				
DO (mg/L)	Fish Culture Zone	Surface, Middle, Bottom	Data from impact station (LFW1) shows a depletion of 30% compared with corresponding data from control station (B4). If gradient station (B2) reports higher DO values than LFW1 the Action Level is not exceeded.	5 mg/L at the surface and mid depth 2 mg/L at the bottom
SS (mg/L)	Fish Culture Zone	Depth-averaged	Impact stations exceed 4 mg/L or 120% of control station's SS at the same tide of the same day. If gradient stations report lower SS values than impact stations then Action Level is not exceeded.	13 mg/L
	Corals	Bed layer	Impact stations exceed 4 mg/L or 120% of control station's SS at the same tide of the same day. If gradient stations report lower SS values than impact stations then Action Level is not exceeded.	13 mg/L
Turbidity (NTU)	Fish Culture Zone	Depth-averaged	Impact stations exceed 2.5 NTU or 120% of control station's turbidity at the same tide of the same day. If gradient stations report lower NTU values than impact stations the Action Level is not exceeded.	11.4 NTU
	Corals	Bed layer	Impact stations exceed 2.5 NTU or 120% of control station's turbidity at the same tide of the same day. If gradient stations report lower NTU values than impact stations the Action Level is not exceeded.	11.4 NTU
<b>Zone C – Jetting in HKSAR water within 2 km of boundary of Tung Ping Chau Marine Park</b>				
SS (mg/L)	Marine Park	Bed layer	Impact station (C1) exceeds 5 mg/L or 120% of control station (C2) SS at the same tide of the same day.	13 mg/L
Turbidity (NTU)	Marine Park	Bed layer	Impact station (C1) exceeds 5.2 NTU or 120% of control station (C2) turbidity at the same tide of the same day.	11.7 NTU

Parameter	Sensitive Receiver	Depth	Action Level	Limit Level
<b>Zone D – Jetting works within 2 km either side of Pak Sha Tau</b>				
SS (mg/L)	Corals	Bed layer	Impact station (D1) exceeds 4 mg/L or 120% of control station (B2) SS at the same tide of the same day.	13 mg/L
Turbidity (NTU)	Corals	Bed layer	Impact station (D1) exceeds 2.4 NTU or 120% of control station (B2) turbidity at the same tide of the same day.	11.5 NTU
<b>Tung Ping Chau Marine Park during dredging on Mainland side within 1 km of boundary of HKSAR waters</b>				
SS (mg/L)	Marine Park	Bed layer	Impact station (WQ1) exceeds 5 mg/L or 120% of control station (WQ2) SS at the same tide of the same day. If gradient stations (WQ3 and WQ4) report lower SS values than impact stations then Action Level is not exceeded.	13 mg/L
Turbidity (NTU)	Marine Park	Bed layer	Impact station (WQ1) exceeds 5.2 NTU or 120% of control station (WQ2) turbidity at the same tide of the same day. If gradient stations (WQ3 and WQ4) report lower turbidity values than impact stations then Action Level is not exceeded.	11.7 NTU
<b>Ad hoc Water Quality Monitoring during Grout Mattress Installation</b>				
SS (mg/L)	Corals	Bed layer	Impact stations exceed 4 mg/L or 120% of control station's SS at the same tide of the same day. If gradient stations report lower SS values than impact stations then Action Level is not exceeded.	13 mg/L
Turbidity (NTU)	Corals	Bed layer	Impact stations exceed 2.5 NTU or 120% of control station's turbidity at the same tide of the same day. If gradient stations report lower NTU values than impact stations the Action Level is not exceeded.	11.4 NTU
pH (Unit)	Corals	Bed layer	Impact station exceeds pH 8.4. If pH at the impact station is higher than that at the gradient station, and/or if pH at the impact station is not greater than the control station, then the Action Level is not exceeded.	pH 8.5. If pH at the impact station is higher than that at the gradient station, and/or if pH at the impact station is not greater than the control station, then the Limit Level is not exceeded.

**FEP-01B/167/2003/D Submarine Gas Pipelines from Shenzhen to Tai Po - EM&A  
Coral Survey Proforma**

<b>Survey particulars</b>		<b>Impact Station:</b>	
Date of survey _____	<b>Survey Conditions:</b>	_____	
Survey Team _____	Temp _____	_____	
Dive Leader _____	Current m/s _____	_____	
Coral Specialist _____	Tidal level mCD _____	<b>Zone</b>	
	Tide State ebb _____ flood _____	Shallow Deep	

A= Mean Coverage of parameter 1,2,3. Colonies with coverage greater than or equal to 10%.  
B= % Colonies with patches of parameters 1,2,3 greater than or equal to 10%.

**Hard Coral Monitoring Results**

<b>Impact Site</b>	Total _____ Colonies Monitored																										
Parameter / Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	A	B
1/ Sediment Cover (%)																											
2/ Bleaching (%)																											
3/ Partial Mortality (%)																											

<b>Control Site</b>	Total _____ Colonies Monitored																										
Parameter / Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
1/ Sediment Cover (%)																											
2/ Bleaching (%)																											
3/ Partial Mortality (%)																											
Parameter / Number	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	A	B
1/ Sediment Cover (%)																											
2/ Bleaching (%)																											
3/ Partial Mortality (%)																											

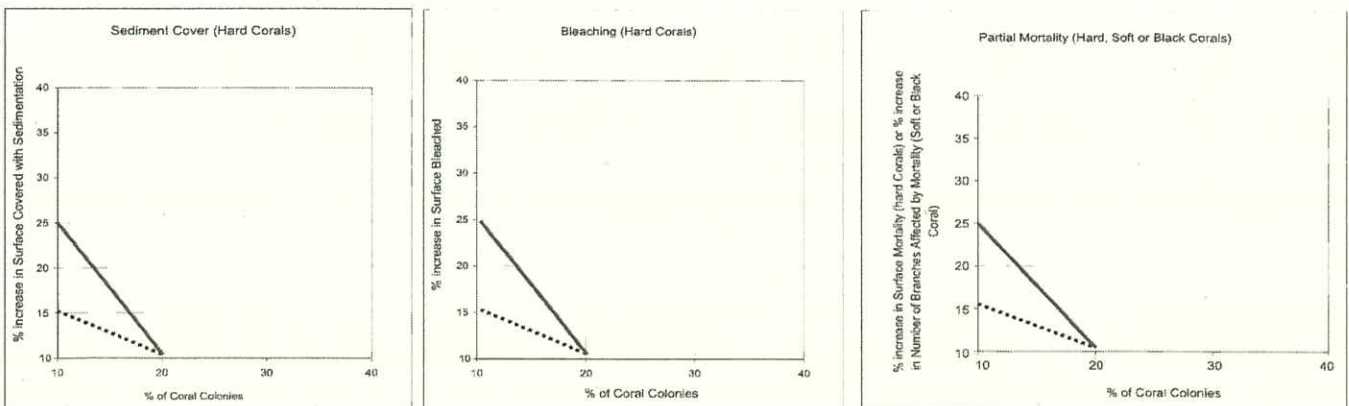
**Soft/Black Coral Monitoring Results**

<b>Impact Site</b>	Total _____ Colonies Monitored																										
Parameter / Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	A	B
1/ Partial Mortality (%)																											

<b>Control Site</b>	Total _____ Colonies Monitored																										
Parameter / Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
1/ Partial Mortality (%)																											
Parameter / Number	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	A	B
1/ Partial Mortality (%)																											

Notes: The values recorded reflect the change from the baseline survey  
Bleaching should be regarded as when the tissue is completely white.

**Decision Graphs**



**Event Action Plan**

- Below ..... = No Actions Required.
- Below \_\_\_\_\_ = Action Level Exceeded Reduce Working Rates/jetting pressure
- Above \_\_\_\_\_ = Limit Level Exceeded Stop Work

<b>Exceedance:</b>	None	Action	Limit

**Remarks** \_\_\_\_\_

**Certified by** \_\_\_\_\_ **Date** \_\_\_\_\_

Environmental Team Leader

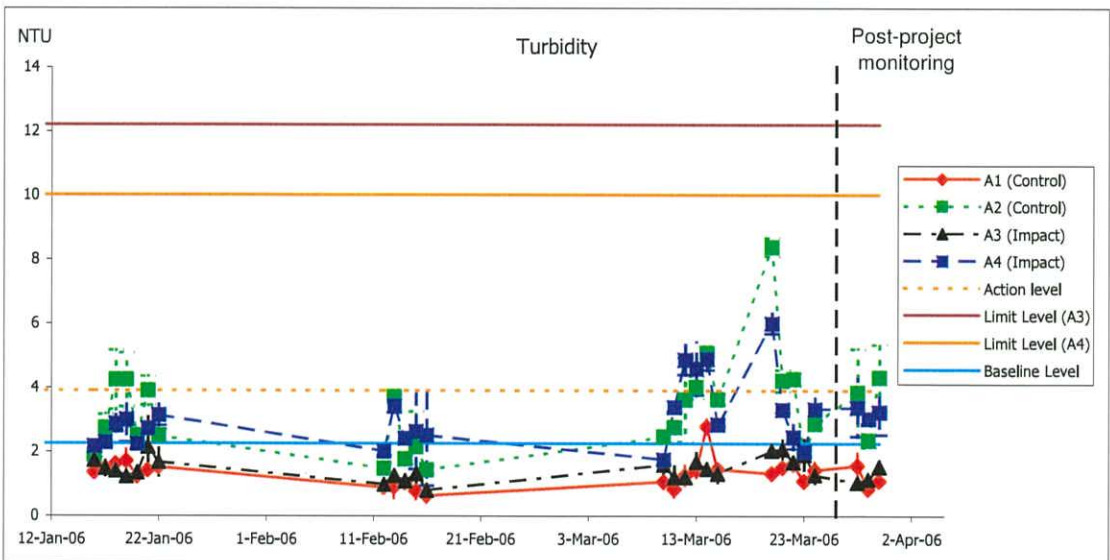
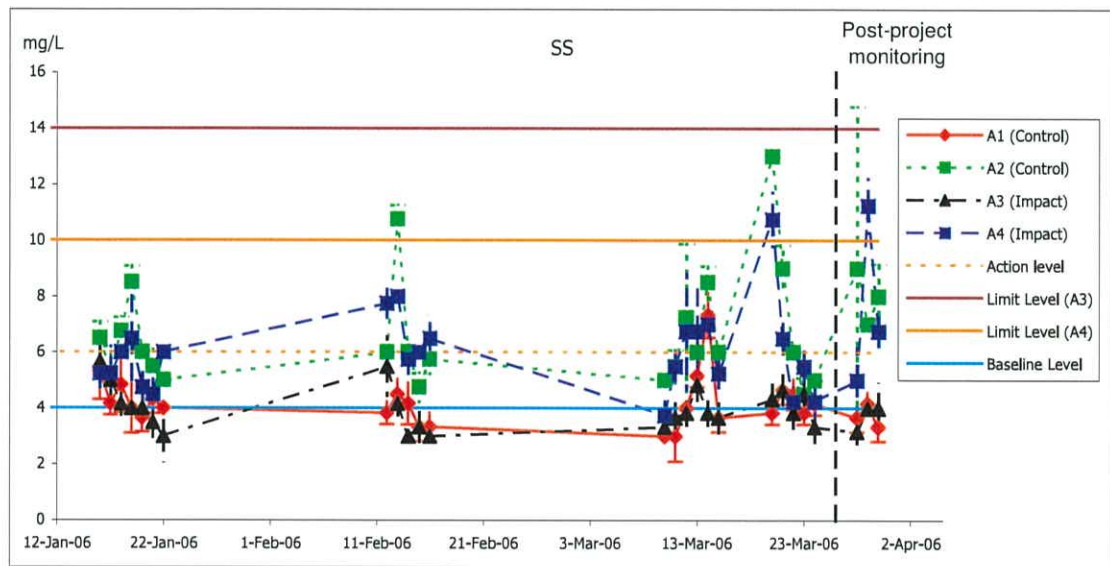
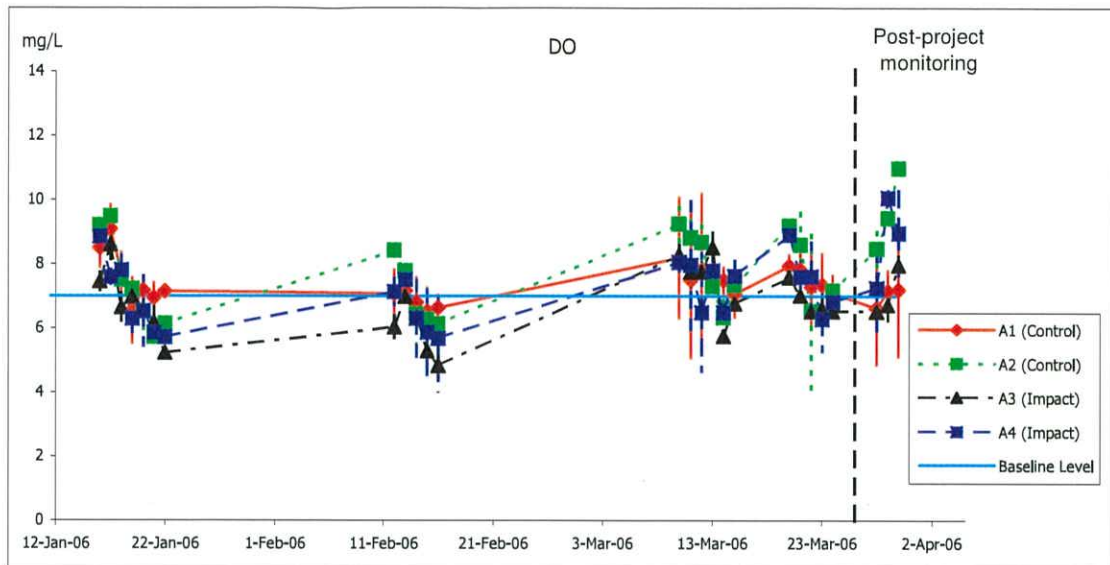
## **Annex C**

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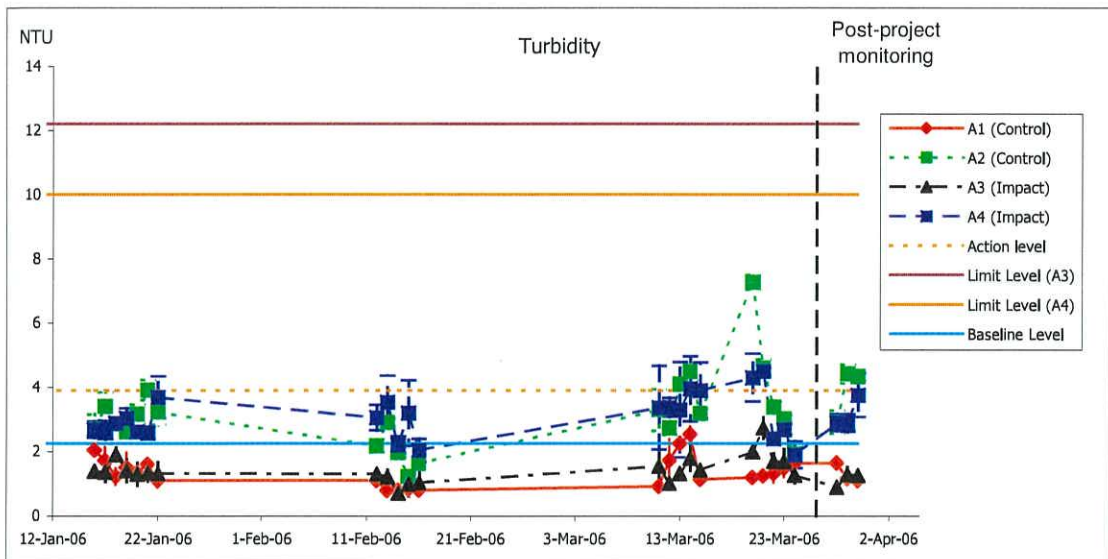
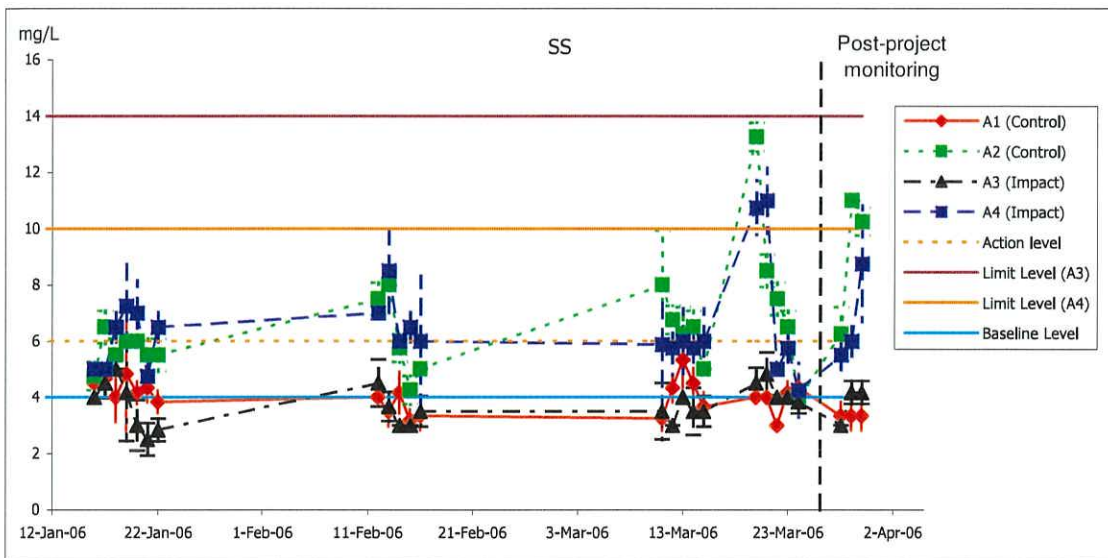
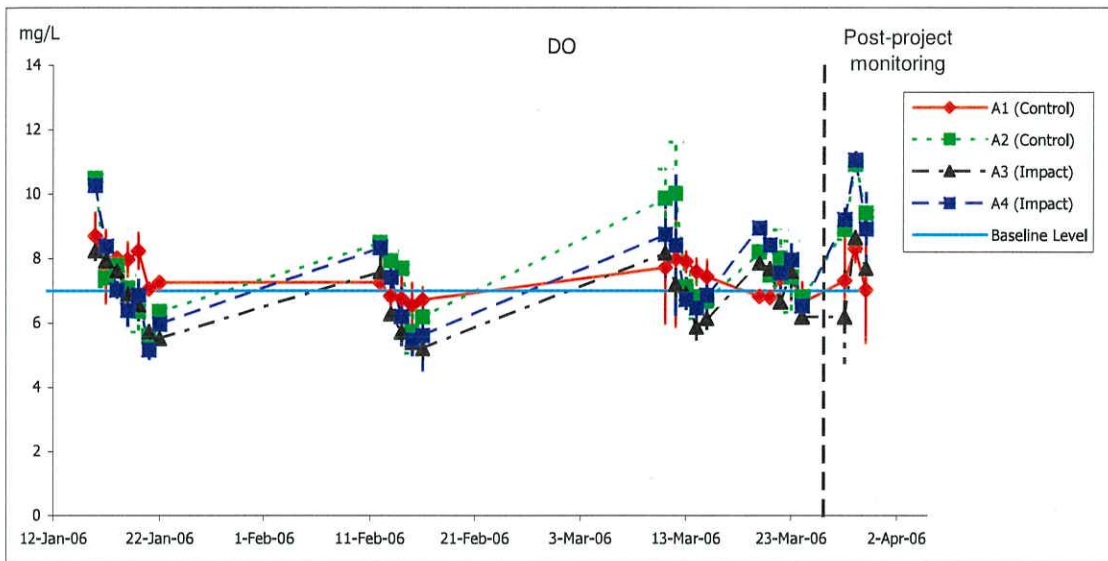
### **Trends of Water Quality and Marine Ecological Monitoring Parameters**

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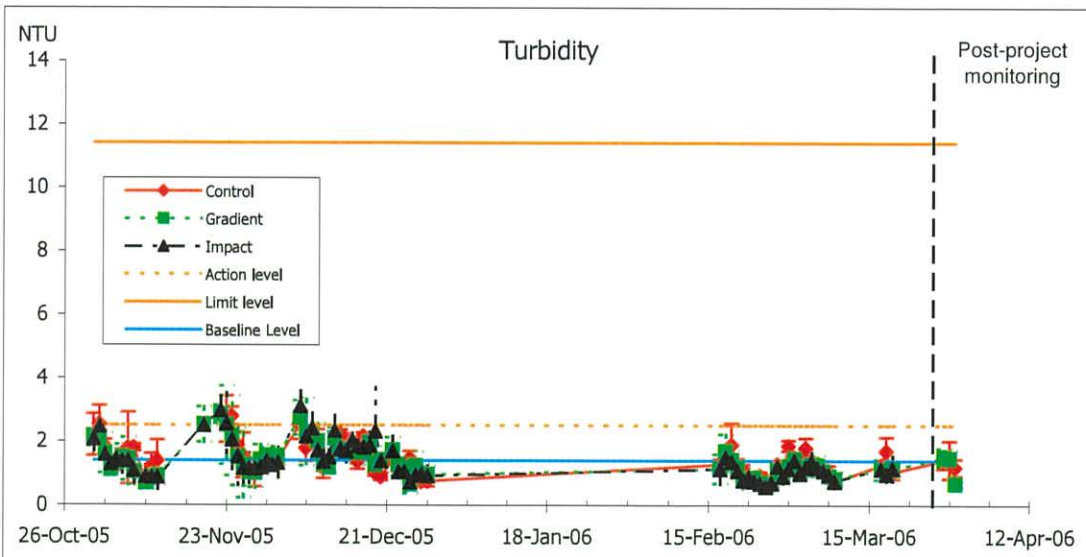
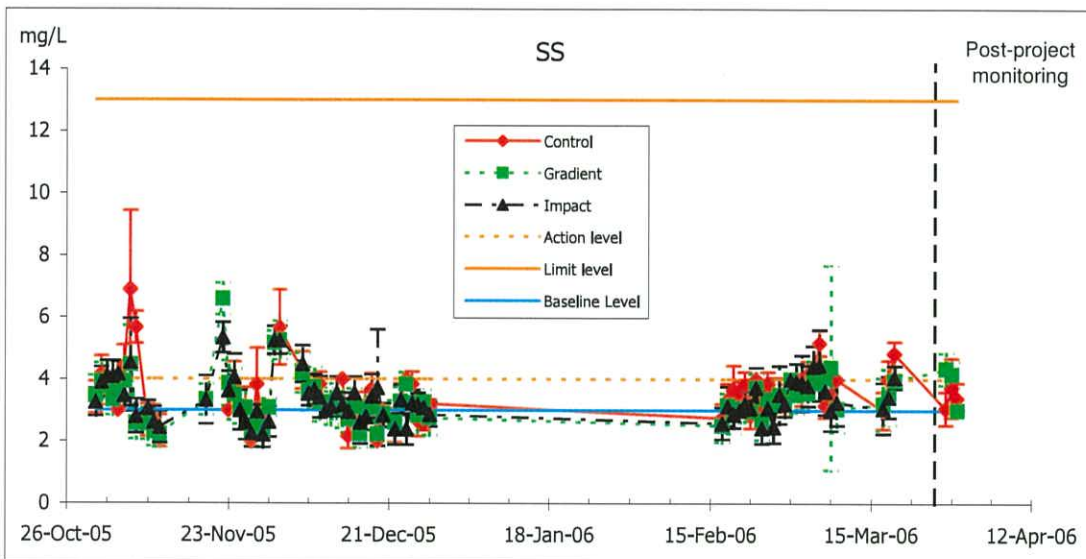
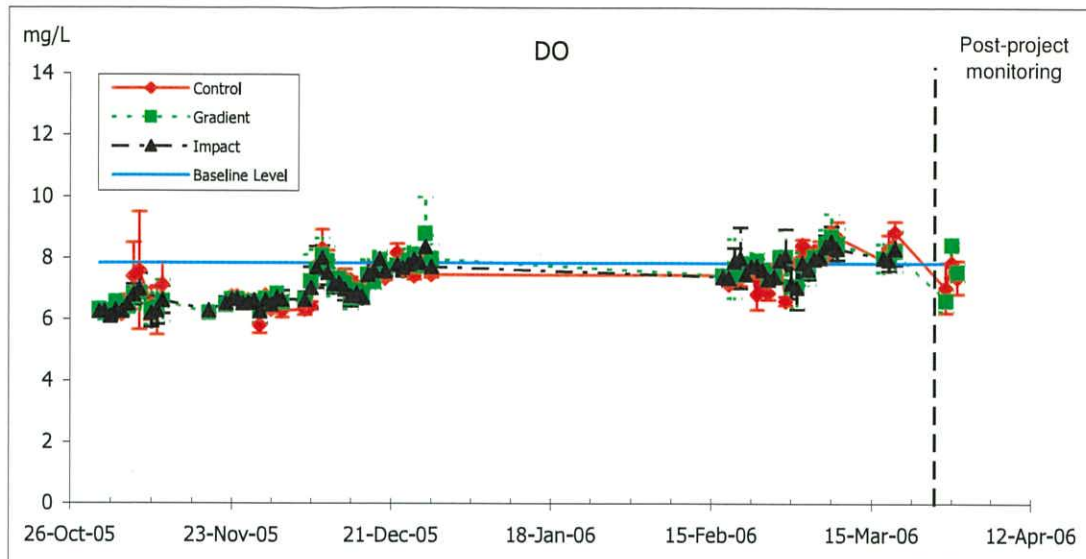




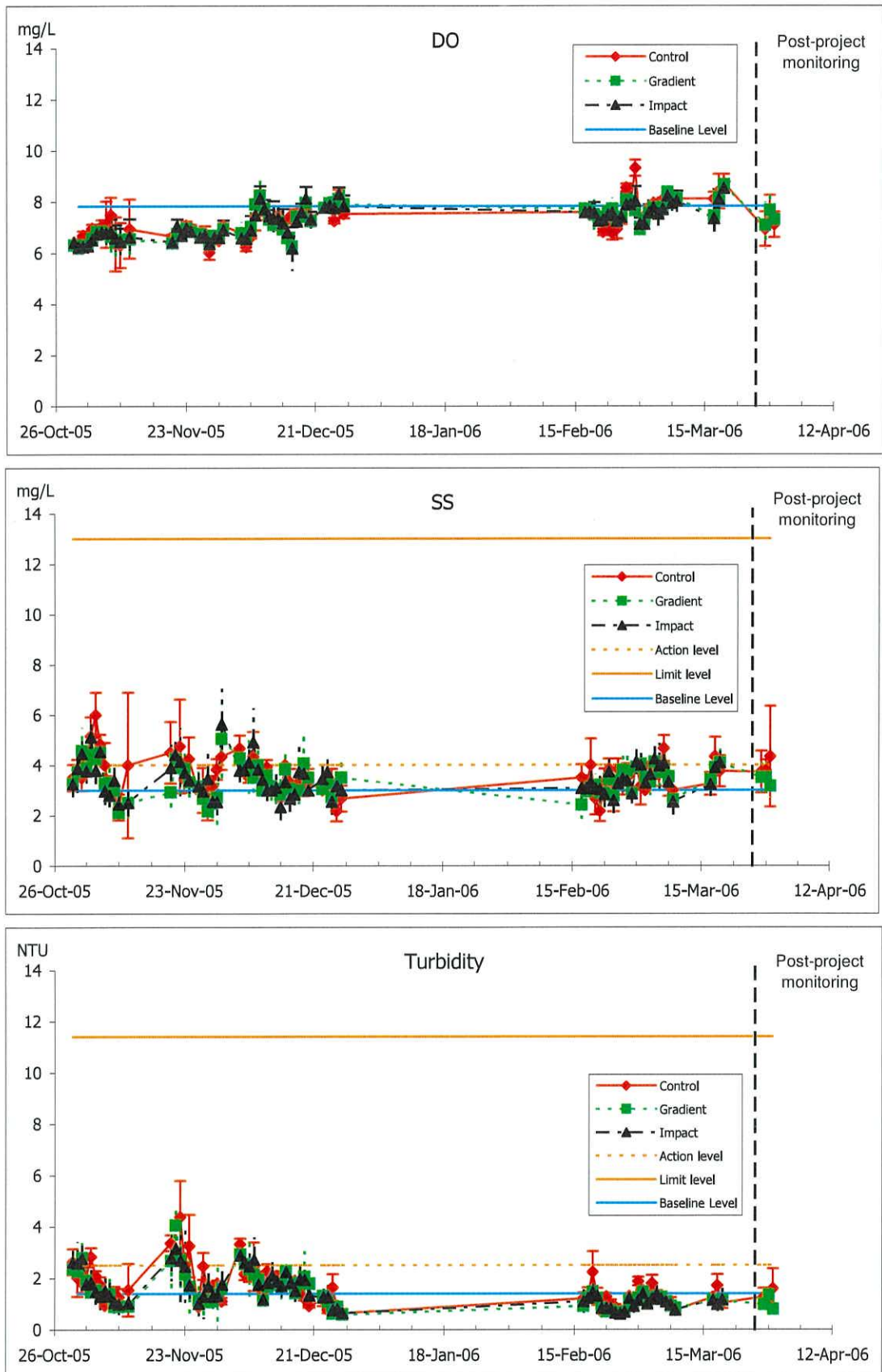
**Figure 3.2a** Trends of water quality parameters (depth-averaged) in the impact and post-project monitoring for jetting in Zone A during ebb tide (Error bar = 1 SD)



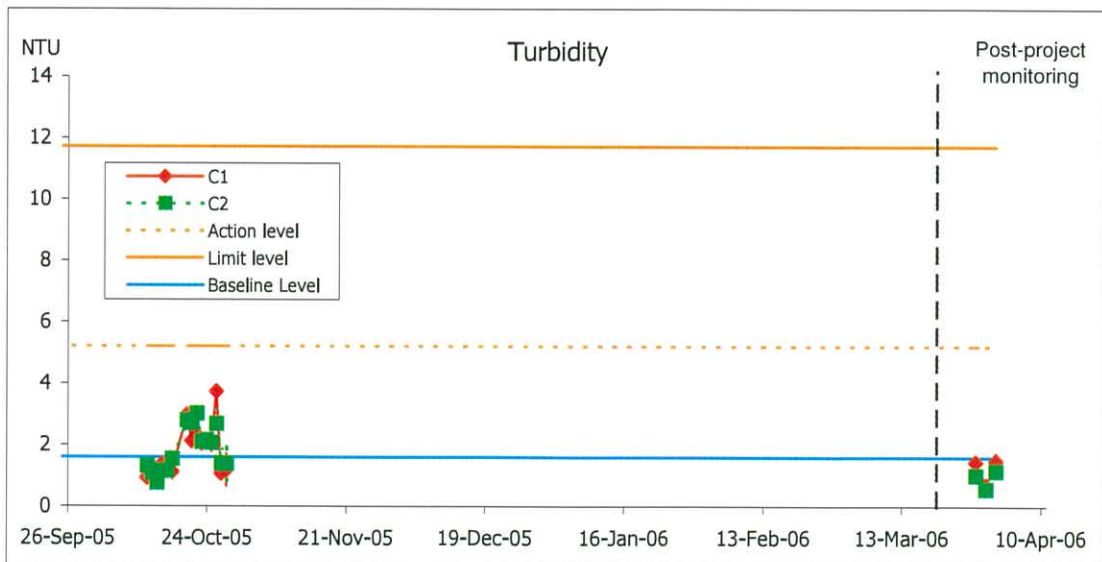
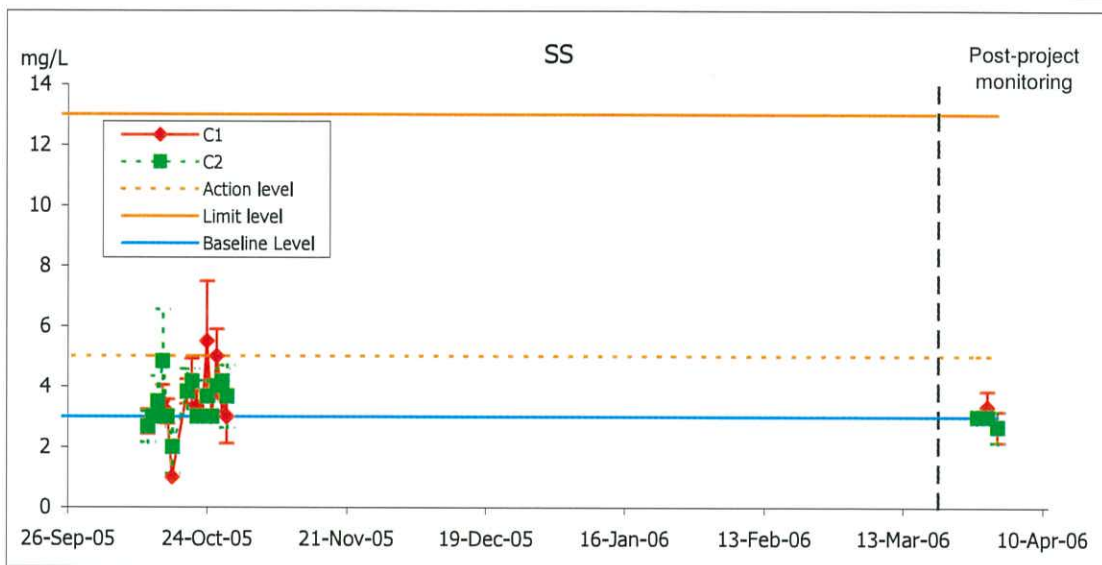
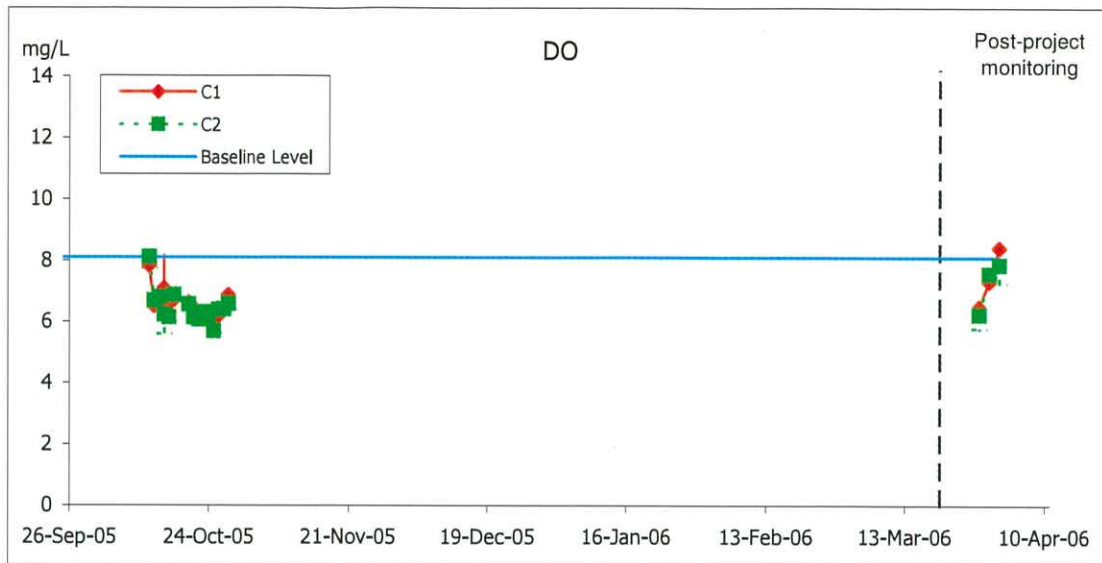
**Figure 3.2b** Trends of water quality parameters (depth-averaged) in the impact and post-project monitoring for jetting in Zone A during flood tide (Error bar = 1 SD)



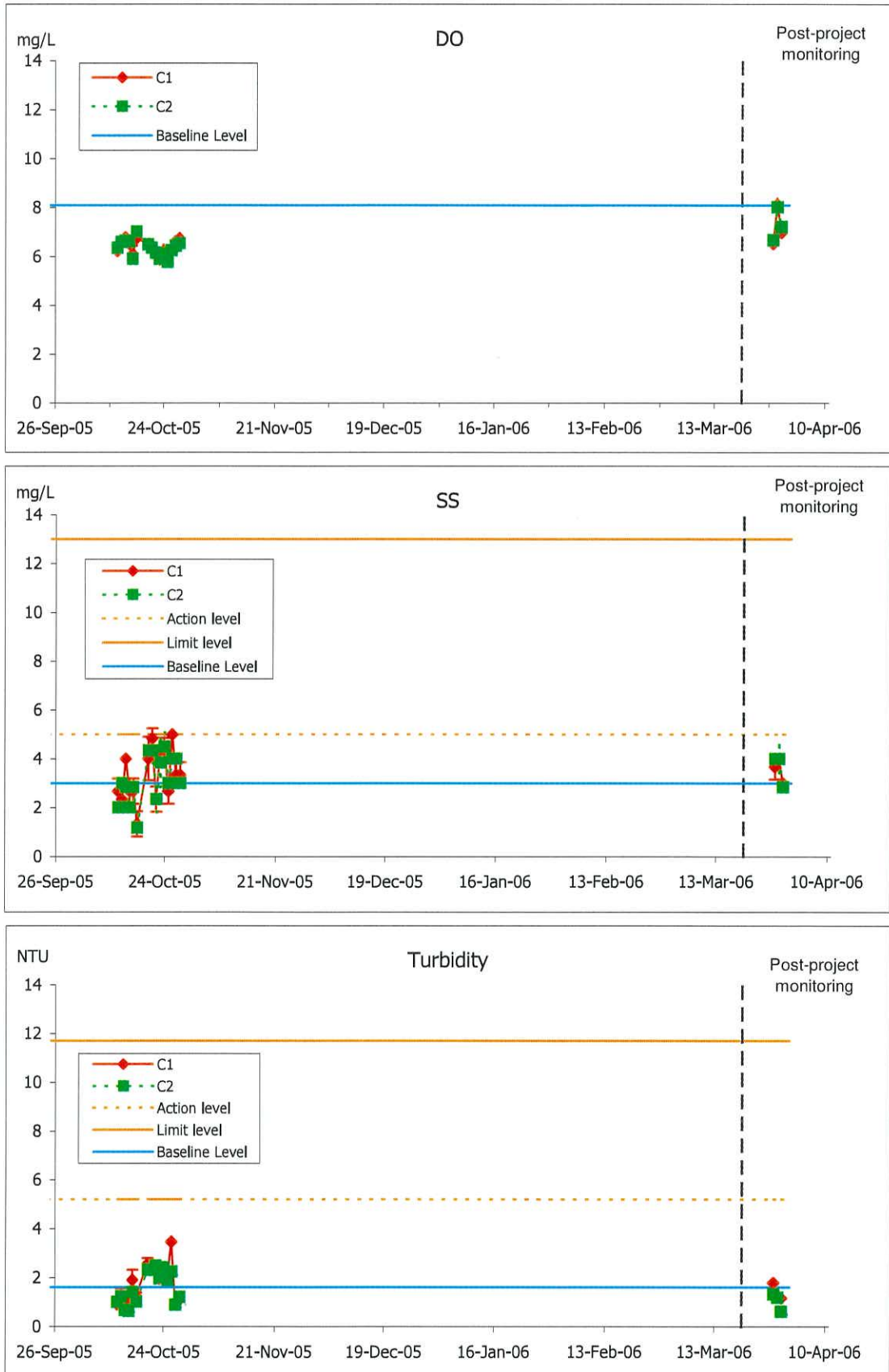
**Figure 3.2c** Trends of water quality parameters (depth-averaged) in the impact and post-project monitoring for jetting in Zone B during ebb tide (Error bar = 1 SD)



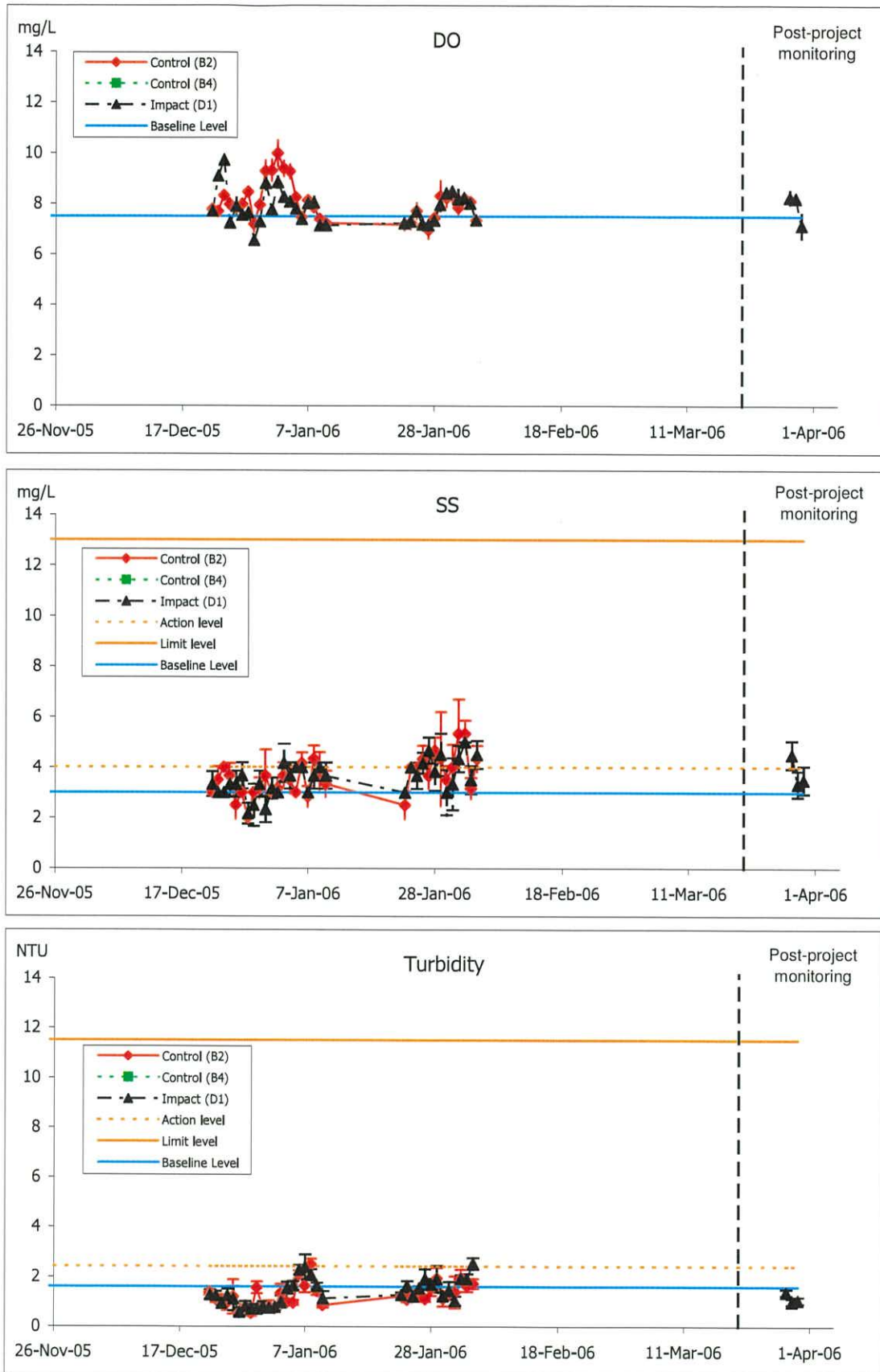
**Figure 3.2d** Trends of water quality parameters (depth-averaged) in the impact and post-project monitoring for jetting in Zone B during flood tide (Error bar = 1 SD)



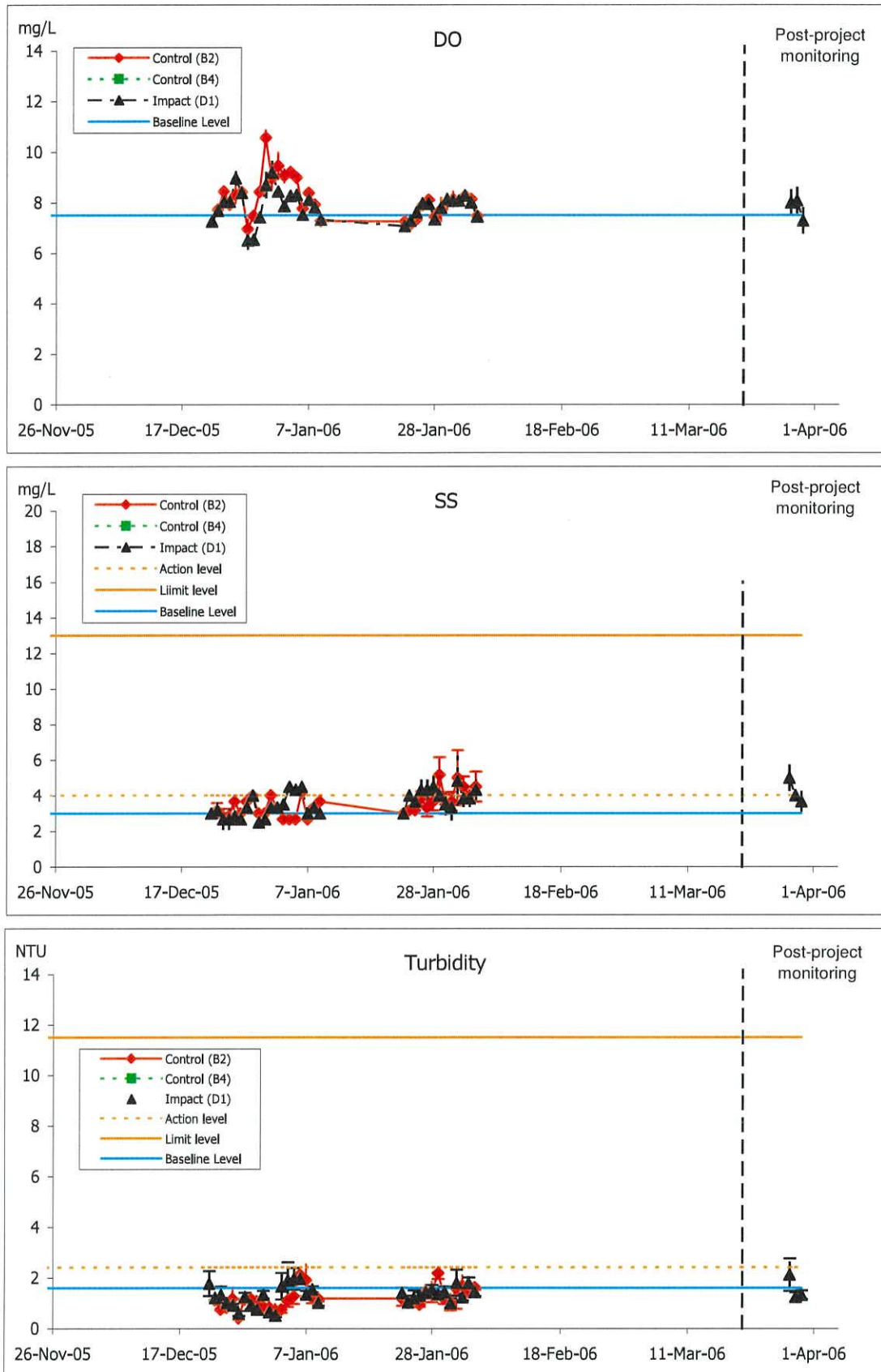
**Figure 3.2e** Trends of water quality parameters (depth-averaged) in the impact and post-project monitoring for jetting in Zone C during ebb tide (Error bar = 1 SD)



**Figure 3.2f Trends of water quality parameters (depth-averaged) in the impact and post-project monitoring for jetting in Zone C during flood tide (Error bar = 1 SD)**

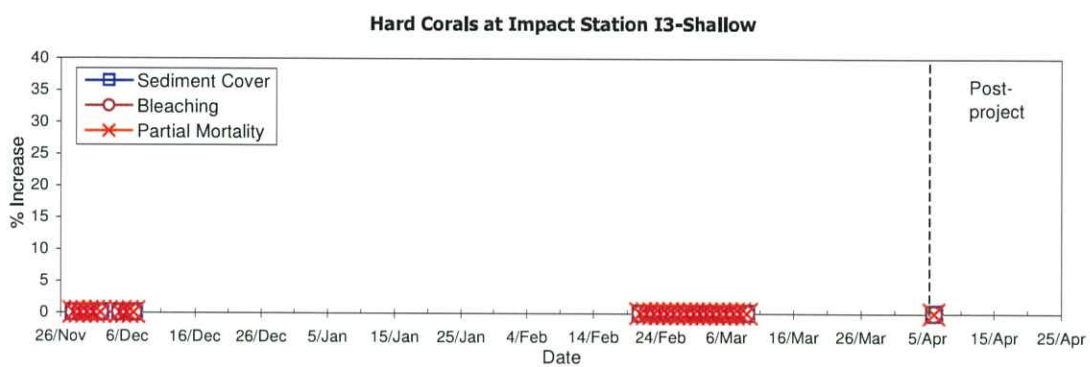
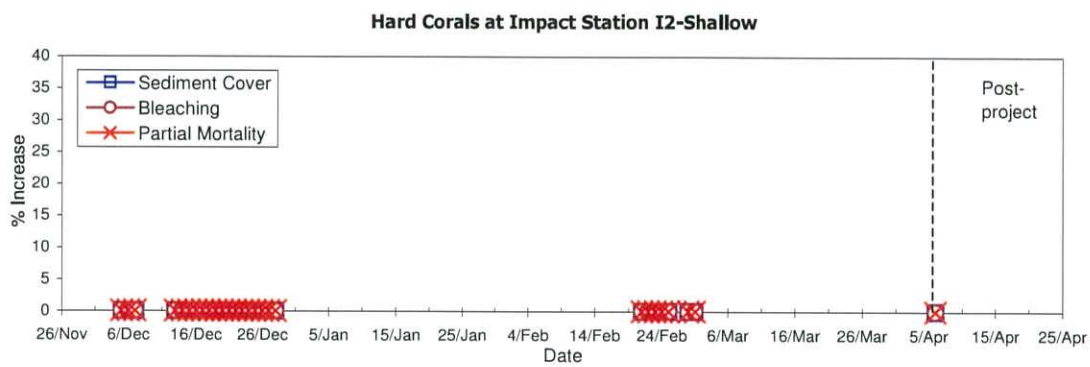
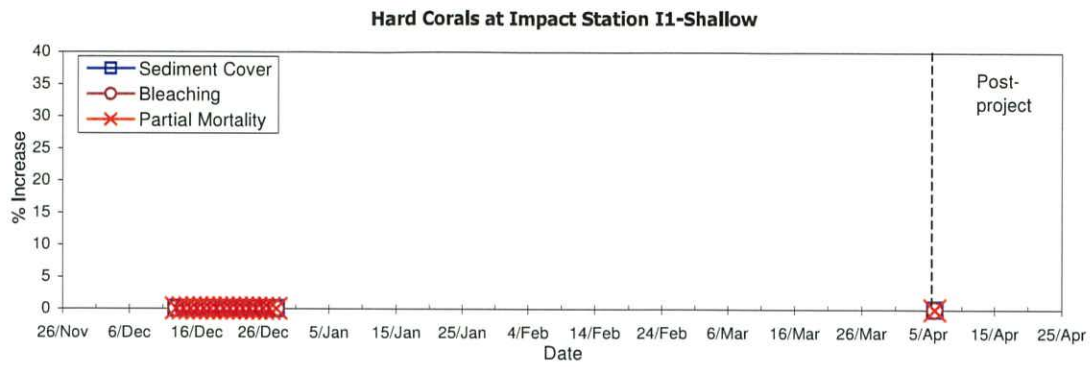


**Figure 3.2g** Trends of water quality parameters (depth-averaged) in the impact and post-project monitoring for jetting in Zone D during ebb tide (Error bar = 1 SD)



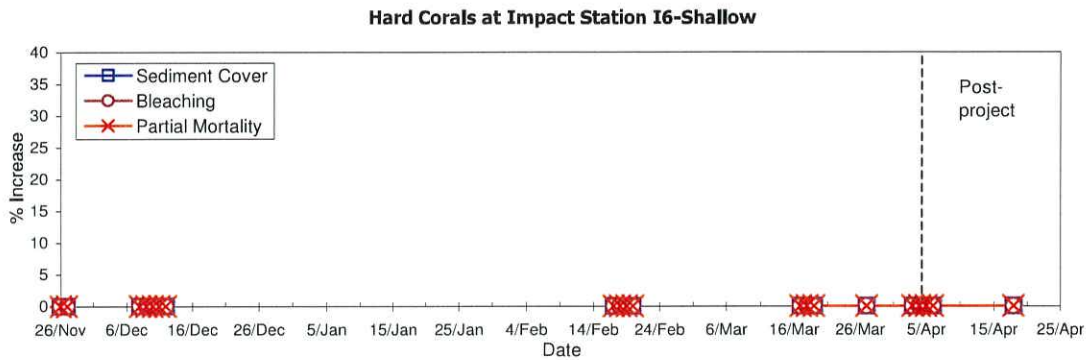
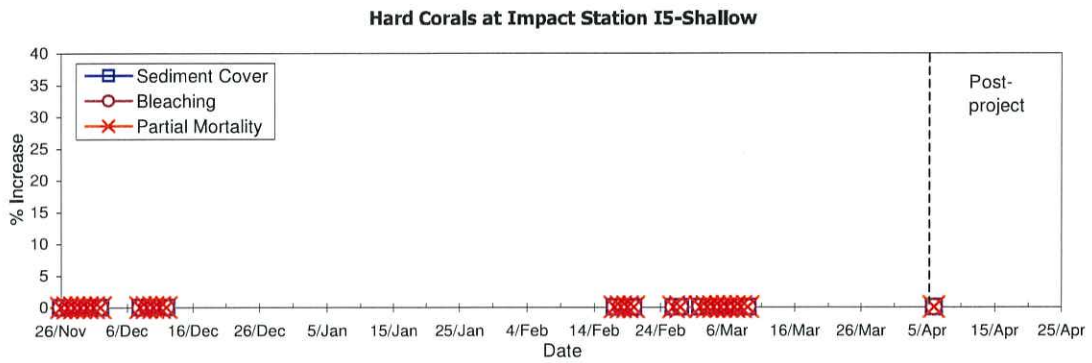
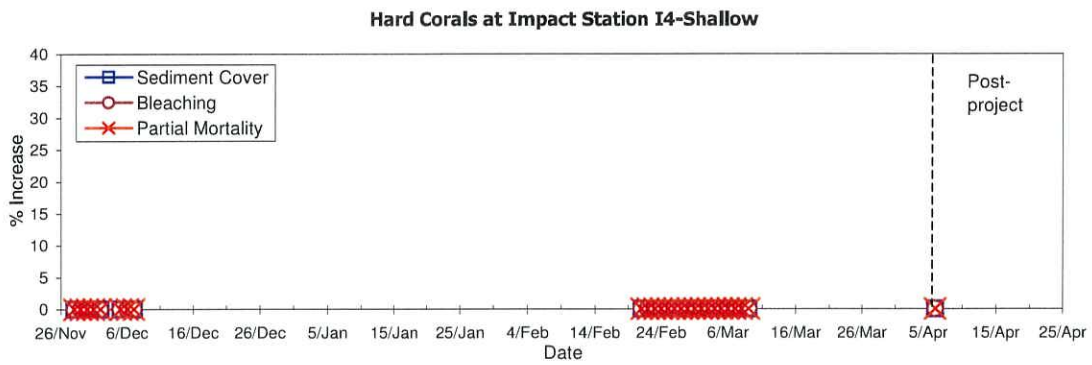
**Figure 3.2h** Trends of water quality parameters (depth-averaged) in the impact and post-project monitoring for jetting in Zone D during flood tide (Error bar = 1 SD)





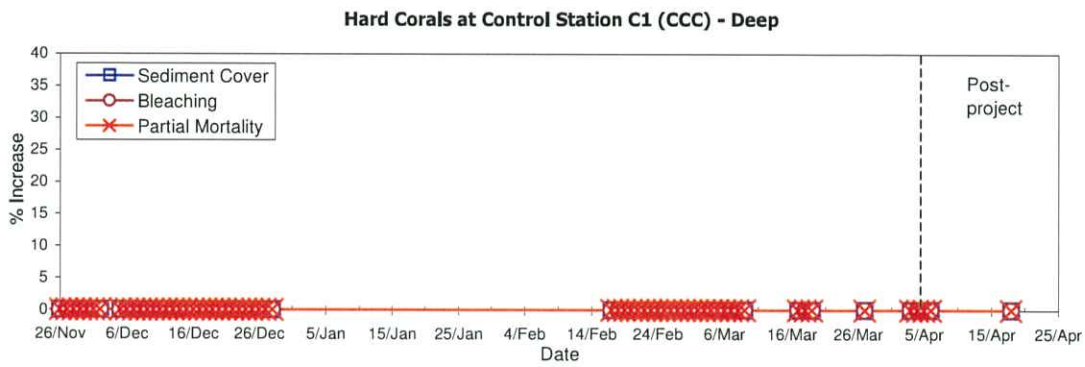
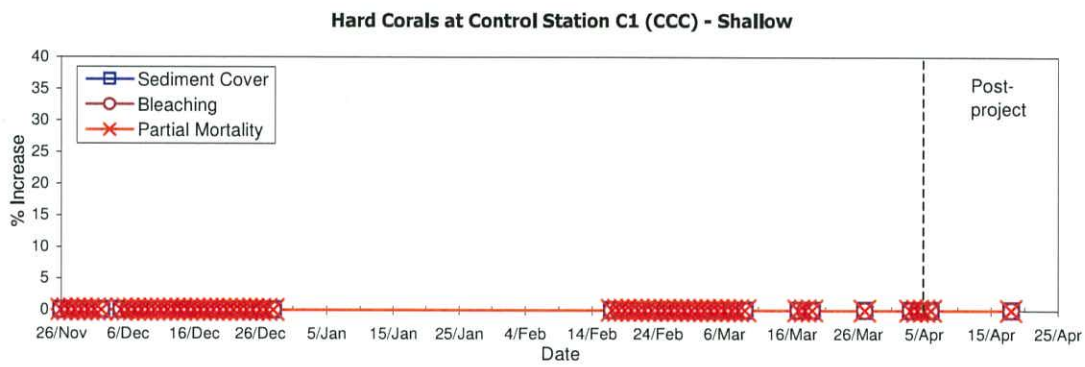
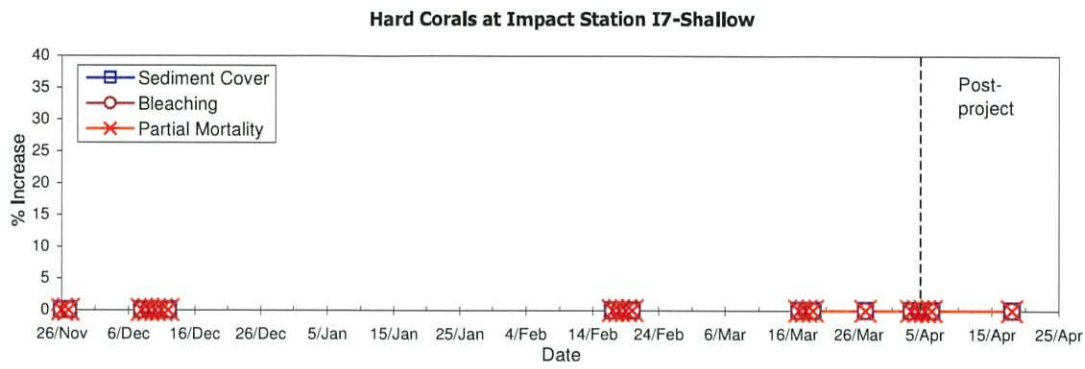
**Figure 3.2i Trends of Sediment Cover, Bleaching and Partial Mortality for Hard Corals Monitored in Tolo Channel**

Note: % Increase equals to the value of "A" on each Coral Proforma Report



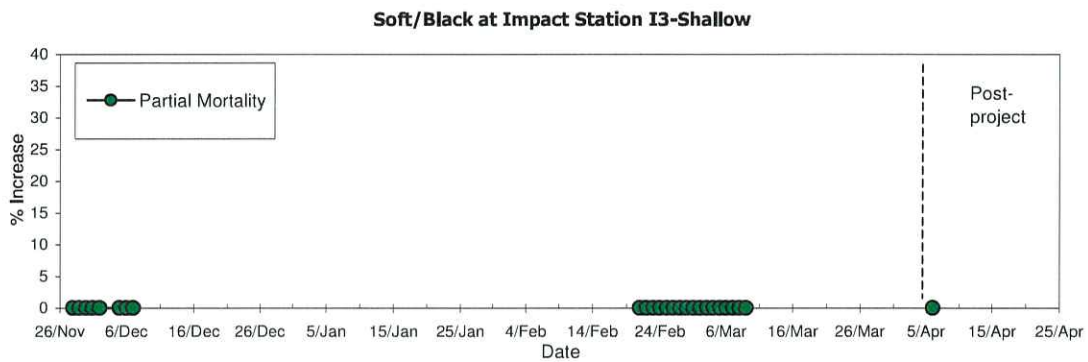
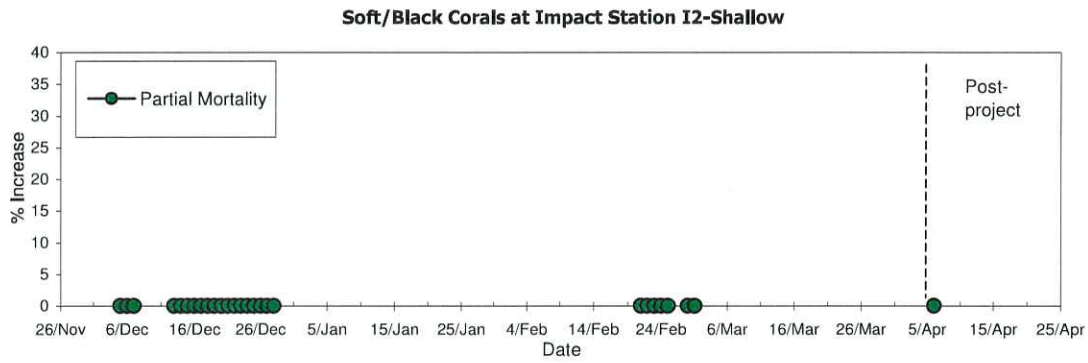
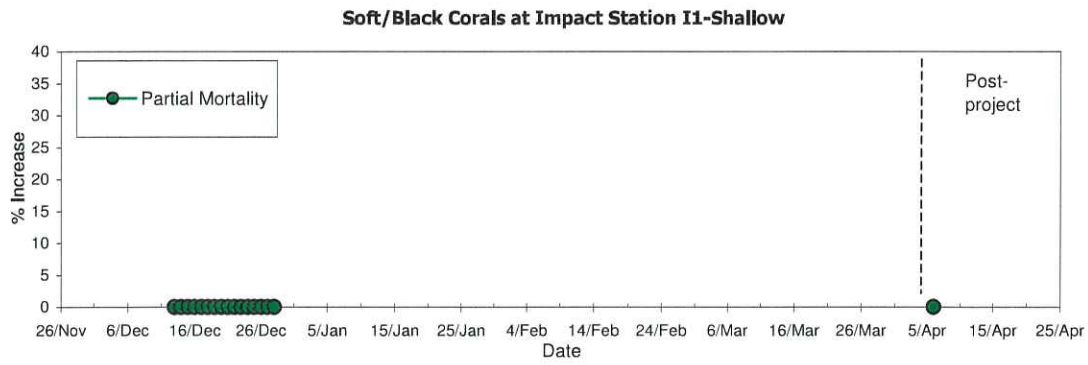
**Figure 3.2i Trends of Sediment Cover, Bleaching and Partial Mortality for Hard Corals Monitored in Tolo Channel (cont'd)**

Note: % Increase equals to the value of "A" on each Coral Proforma Report



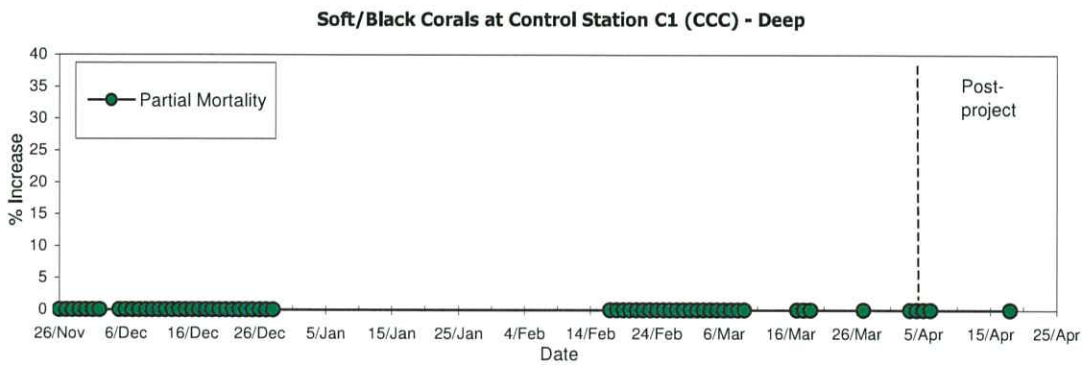
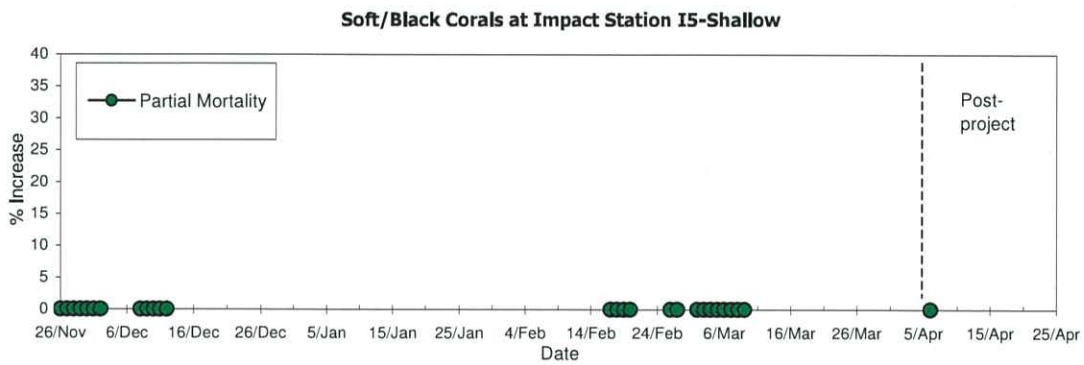
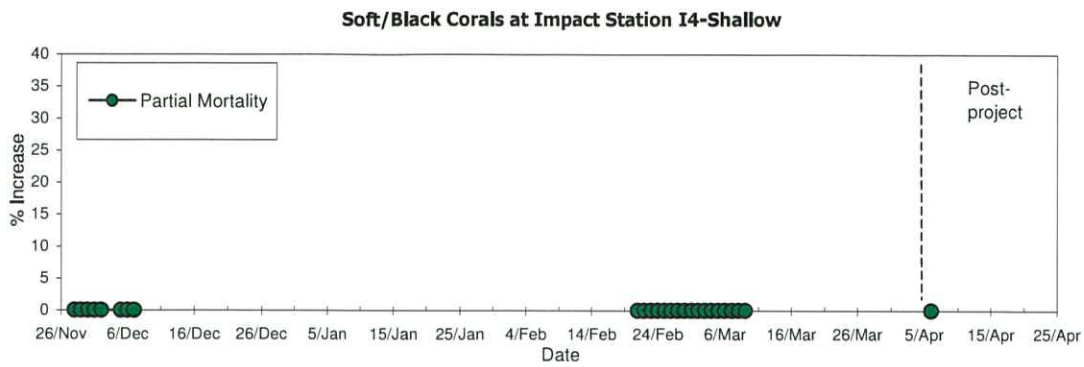
**Figure 3.2i Trends of Sediment Cover, Bleaching and Partial Mortality for Hard Corals Monitored in Tolo Channel (cont'd)**

Note: % Increase equals to the value of "A" on each Coral Proforma Report



**Figure 3.2j Trends of Partial Mortality for Soft/Black Corals Monitored in Tolo Channel**

Notes: % Increase equals to the value of "A" on each Coral Proforma Report



**Figure 3.2j Trends of Partial Mortality for Soft/Black Corals Monitored in Tolo Channel (cont'd)**

Notes: (1) % Increase equals to the value of "A" on each Coral Proforma Report

(2) There were no soft / black corals suitable for tagging in the following: I6, I7 and C1 (CCC shallow)

## **Annex D**

### **Implementation Schedule and Status**

### Implementation Schedule and Status of Environmental Protection and Mitigation Measures

EIA Ref.	EM&A Log Ref.	Environmental Protection and Mitigation Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Implementation Status
					Des	C	O	Dec	
4.7		<b>WATER QUALITY - Construction Phase</b>							
	1	<b>Operational Constraints</b>							
		The following operational constraints should be applied to the jetting and dredging works.	During jetting and dredging	Construction Contractor		√			
		<ul style="list-style-type: none"> <li>The forward speed of the jetting machine should be limited to a maximum of 1.08 km day<sup>-1</sup> (67.5 m hr<sup>-1</sup> for 16 hours per day) in Tolo Harbour and Channel (Location A to Location C, as shown in Figure 1 of the current Environmental Permit) and 1.62 km day<sup>-1</sup> (67.5 m hr<sup>-1</sup> for 24 hours per day) in Mirs Bay (Location C to Location G, as shown in Figure 1 of the current Environmental Permit).</li> </ul>							N/A (Completed)
		<ul style="list-style-type: none"> <li>A grab dredger should conduct the dredging and no more than three dredgers are allowed to dredge at the same time along the pipelines route.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>The dredging rate for the section within Mirs Bay should not exceed 250 m<sup>3</sup> hour<sup>-1</sup> and 6,000 m<sup>3</sup> day<sup>-1</sup>.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>Frame type silt curtains (15m x15m) of at least 5-m deep shall be used by the grab dredgers.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>During jetting works within 2 km of the Tai Po Industrial Estate Seawall a silt curtain should be established as detailed in Figure 4.6a in the EM&amp;A Manual.</li> </ul>							N/A (Completed)
		<ul style="list-style-type: none"> <li>Excavation works at the Tai Po Landing Site should be conducted within a silt curtain established as detailed in Figure 4.6a in the EM&amp;A Manual.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>Dredged marine mud shall be disposed of in a gazetted marine disposal area in accordance with the Dumping at Sea Ordinance (DASO) permit conditions.</li> </ul>							N/A
	2	<b>Good Practices</b>							
		The following good practices shall apply.	During jetting and dredging	Construction Contractor		√			
		<ul style="list-style-type: none"> <li>All barges shall be fitted with tight bottom seals.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>All barges shall be filled to an appropriate level, which ensures that material does not spill over during transport to the disposal site.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>Adequate freeboard shall be maintained for all barges.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>After dredging, any excess materials shall be cleaned from decks and exposed fittings before the vessel is moved from the dredging area.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>The contractor(s) shall ensure that the works cause no visible foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the dredging site.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>When the dredged material has been unloaded at the disposal areas, any material that has accumulated on the deck or other exposed parts of the vessel shall be removed and placed in the hold or a hopper. Under no circumstances should decks be washed clean in a way that permits material to be released overboard.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>All pipe leakages shall be repaired promptly and plant shall not be operated</li> </ul>							N/A

EIA Ref.	EM&A Log Ref.	Environmental Protection and Mitigation Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Implementation Status
					Des	C	O	Dec	
		with leaking pipes.							
		<ul style="list-style-type: none"> <li>All dredgers shall maintain adequate clearance between vessels and the seabed at all states of the tide and reduce operations speed.</li> </ul>							N/A
4.10	3	<p>Water quality monitoring will be required for the following activities:</p> <ul style="list-style-type: none"> <li>excavation works at the Tai Po seawall;</li> <li>jetting works within 2 km of the Tai Po seawall;</li> <li>jetting works within 2 km either side of Pak Sha Tau;</li> <li>jetting works within Tolo Channel (between Wong Wan Tsui and Wong Chuk Kok Tsui);</li> <li>jetting works within 2 km of the boundary of the Tung Ping Chau Marine Park;</li> <li>dredging works within 1 km of the HKSAR boundary on the Mainland side.</li> </ul> <p>A pilot test, as detailed in the EM&amp;A Manual will be required during the first three days of the jetting works to verify the jetting machine's performance.</p> <p>A pilot test for the grouting performance will be required during the first 3 days of the grouting operation.</p>				√			√
5.6.2		<b>WASTE- Planning and Design Phases</b>							
	4	<b>Construction &amp; Demolition Material (C&amp;DM)</b>							
		The following waste management hierarchy shall be implemented during project planning and design.	During project planning and design stages Onshore Areas	Construction Contractor	√	√			
		<ul style="list-style-type: none"> <li>avoidance and minimisation, that is, reduction of waste generation through changing or improving practices and design.</li> <li>reuse of materials, thus avoiding disposal.</li> <li>recovery and recycling, thus avoiding disposal.</li> <li>treatment and disposal, according to relevant law, guidelines and good practice.</li> </ul>							N/A
5.6.2		<b>WASTE- Construction Phase</b>							
	5	<b>Excavated Materials</b>							
		Excavated materials should be segregated from other wastes.	Worksite/during construction	Construction Contractors		√			√
		A recording system shall be implemented to keep records of quantities of wastes generated, recycled and disposed (locations).	Worksite/during construction	Construction Contractors		√			√
	6	<b>Construction &amp; Demolition Material (C&amp;DM)</b>							
		C&DM shall be recycled as much as possible on-site. Public fill and C&D waste shall be segregated and stored in different containers or skips to facilitate reuse or recycling and proper disposal. Specific areas of the work site should be designated for such segregation and storage if immediate use is not practicable.	Work site/during construction	Construction Contractors		√			√
		The use of wooden hoardings shall not be allowed. An alternative material, which can be reused or recycled, for example, metal (aluminium, alloy, etc) shall be used.	Work site / during construction	Construction Contractors		√			√
	7	<b>Dredged Materials</b>							
		Dredged marine mud shall be disposed of in a gazetted marine disposal area in accordance with the DASO permit conditions.	Worksite / during construction	Construction Contractors		√			√



EIA Ref.	EM&A Log Ref.	Environmental Protection and Mitigation Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Implementation Status
					Des	C	O	Dec	
	8	<b>Chemical Waste</b>							
		Chemical waste, as defined by <i>Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation</i> , shall be handled in accordance with the <i>Code of Practice on the Packaging, Handling and Storage of Chemical Wastes</i> as follows.	Work site/during construction	Construction Contractors		√			
		• Containers used for storage of chemical wastes shall:				√			√
		• be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed.				√			√
		• have a capacity of less than 450 L unless the specifications have been approved by the EPD.				√			√
		• display a label in English and Chinese in accordance with instructions prescribed in <i>Schedule 2 of the Regulations</i> .				√			√
		• The storage area for chemical wastes shall:							
		• be clearly labelled and used solely for the storage of chemical waste.				√			√
		• be enclosed on at least 3 sides.				√			√
		• have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest.				√			√
		• have adequate ventilation.				√			√
		• be covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary).				√			√
		• be arranged so that incompatible materials are appropriately separated.				√			√
		• Disposal of chemical waste shall:							
		• via a licensed waste collector.				√			√
		• to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility which also offers a chemical waste collection service and can supply the necessary storage containers.							
	9	<b>Sewage</b>							
		An adequate number of portable toilets shall be provided for the on-site construction workforce. The portable toilets shall be maintained in a state that will not deter the workers from using them. Night soil should be regularly collected by a licensed collector for disposal at the Tai Po Sewage Treatment Works.	Worksite/during construction	Construction Contractors		√			√
	10	<b>General Refuse</b>							
		The following procedures and measures shall be implemented for the management of general refuse.	Work site/during construction	Construction Contractors		√			
		• General refuse shall be stored in enclosed bins or compaction units separately from construction and chemical wastes. A reputable waste collector shall be employed to remove general refuse from the site daily, separately from construction and chemical wastes, to minimise odour, pest and litter impacts.				√			√
		• Aluminium cans are often recovered from the waste stream by individual				√			√

EIA Ref.	EM&A Log Ref.	Environmental Protection and Mitigation Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Implementation Status
					Des	C	O	Dec	
		collectors if they are segregated and made easily accessible. As such, separate, labelled bins for their deposit shall be provided if feasible.							
		<ul style="list-style-type: none"> <li>Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme shall be considered if available. In addition, waste separation facilities for paper, aluminium cans, plastic bottles etc., should be provided.</li> </ul>				√			√
	11	<b>Trip Ticketing System</b>							
		A trip-ticket system shall be established in accordance with <i>Works Bureau Technical Circular No. 21/2002</i> . The trip-ticket system shall be included as one of the contractual requirements and implemented by the Towngas. Towngas should also conduct regular audits of the results of the system.	Worksite/during construction	Towngas		√			√
	12	<b>Staff Training</b>							
		Training shall be provided to workers on the concepts of site cleanliness and on appropriate waste management procedures, including waste reduction, reuse and recycling at the beginning of the Contract.	Prior to commencement of construction	Construction Contractors		√			√ (On-going)
Annex H	13	<b>Waste Management Plan</b>							
		The construction Contractors shall incorporate the above recommendations into a Waste Management Plan (WMP) for the construction works. The WMP shall be submitted to Towngas for approval prior to commencement of works. The WMP shall incorporate site-specific factors, such as the designation of areas for the segregation and temporary storage of reusable and recyclable materials.	Prior to construction	Construction Contractors		√			√ (Completed)
5.6.3	14	<b>WASTE - Operation Phase</b>							
		No mitigation measures are required.							N/A
6.7	15	<b>Marine Ecology – Planning and Design Phases</b>							
		In accordance with the guidelines in the <i>EIAO TM</i> on marine ecology impact assessment, the general policy for mitigating impacts to marine ecological resources, in order of the following priority, shall be applied.	During project planning and design	Design Team	√				
		<ul style="list-style-type: none"> <li>Avoidance: Potential impacts should be avoided to the maximum extent practicable by adopting suitable alternatives.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>Minimisation: Unavoidable impacts should be minimised by taking appropriate and practicable measures such as constraints on the intensity of works operations (eg dredging rates) or timing of works operations.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>Compensation: The loss of important species and habitats may be provided for elsewhere as compensation. Enhancement and other conservation measures should always be considered whenever possible.</li> </ul>							N/A
		Impacts to marine ecological resources have largely been avoided during the installation of the pipelines through the following measures.	During project planning and design	Design Team	√				
		<ul style="list-style-type: none"> <li>Pipelines Alignment: A number of alternative pipeline routes were studied and the preferred alignment avoids direct impacts to ecologically sensitive habitats and species.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>Bundle Configuration: As the pipelines will be bundled together and laid in the</li> </ul>							N/A

EIA Ref.	EM&A Log Ref.	Environmental Protection and Mitigation Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Implementation Status
					Des	C	O	Dec	
		same trench the area of direct impact has been reduced and consequently the magnitude of potential impacts to ecological resources reduced.							
		<ul style="list-style-type: none"> <li>Reduction in Indirect Impacts: The alignment chosen for the two pipelines is located at a sufficient distance from ecological sensitive receivers so that the temporary dispersion of sediment from the installation works does not affect the receivers at levels of concern (as defined by the WQO and tolerance criteria). By laying the pipelines in the same trench, the horizontal spread of suspended sediment is restricted to a confined area in the centre of the Tolo Channel. Should the pipelines have been laid in separate trenches the horizontal spread of suspended sediment would have been much larger.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>Installation Equipment: The use of injection jetting along the majority of the route has minimised the severity of perturbations to water quality and hence allowed compliance with the WQOs at the sensitive receivers. This careful selection of installation equipment has helped avoid impacts to sensitive ecological receivers such as corals.</li> </ul>							N/A
		<ul style="list-style-type: none"> <li>Adoption of Acceptable Working Rates: The modelling work has demonstrated that the selected working rates for the dredging and jetting works will not cause unacceptable impacts to the receiving water quality. Consequently, unacceptable indirect impacts to marine ecological resources have been avoided.</li> </ul>							N/A
6.7	16	<b>Marine Ecology – Construction Phase</b>							
		Marine ecology monitoring will be required for the following activities: <ul style="list-style-type: none"> <li>jetting works within Tolo Channel (between Wong Wan Tsui and Wong Chuk Kok Tsui); and,</li> <li>dredging works on the Mainland side within 1km of the HKSAR border.</li> </ul>	During pipelines installation	Contractor		√			√
6.7	17	<b>Marine Ecology – Operation Phase</b>							
		No mitigation measures are required.							N/A
7.7	18	<b>Fisheries – Planning and Design Phases</b>							
		In accordance with the guidelines in the <i>EIAO TM</i> , the general policy for mitigating impacts to fisheries shall be applied in order of the following priority: avoidance, minimization and compensation.	During project planning and design	Design Team	√				N/A
7.7	19	<b>Fisheries – Construction Phase</b>							
		No mitigation measures are required.							N/A
7.7	20	<b>Fisheries – Operation Phase</b>							
		No mitigation measures are required.							N/A
8.9	21	<b>Risk</b>							
		<b>Gas Receiver Station</b>							

EIA Ref.	EM&A Log Ref.	Environmental Protection and Mitigation Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Implementation Status
					Des	C	O	Dec	
		Well-defined operational and maintenance procedures for receiving operations shall be implemented.	During operation of the Gas Receiver Station			√		N/A	
		Liaison with external parties (e.g Fire Services Department and adjoining facilities) shall be undertaken.	During operation of the Gas Receiver Station			√		N/A	
	22	<b>Route Option 2 Onshore Pipelines</b>							
		The location of the pipelines shall be clearly marked on admiralty charts.	During operation of the pipelines			√		N/A	
		Liaison with external parties (e.g Fire Services Department and adjoining facilities) shall be undertaken.	During operation of the pipelines			√		N/A	
	23	<b>Subsea Pipelines</b>							
		The location of the pipelines shall be clearly marked on admiralty charts.	During operation of the pipelines			√		N/A	
		Additional pipeline protection ie rock armour, shall be provided. The practicability of additional pipeline protection should has been subjected to a detailed risk assessment.	During operation of the pipelines			√		N/A	
		<b>Landfill Gas – Construction Phase</b>							
9.8	24	<b>Safety Plan</b>							
		The Contractor's Safety Plan shall be reviewed and verified to ensure adequate consideration has been given by the Contractor to the occurrence and management of emergency situations and that emergency plans have been developed to cover contingencies relating to landfill gas and leachate.	Prior to commencement of construction	Towngas		√		√ (Completed)	
9.8	25	<b>Method Statements</b>							
		The Contractor shall submit Method Statements or statements of working procedures to the Engineer prior to commencing specific activities on site.	Prior to commencement of construction	Construction Contractor		√		√ (on going)	
9.7.3	26	<b>Precautionary Measures</b>							
		The following precautionary measures shall be implemented when works are to be carried out within the Consultation Zone of Shuen Wan Landfill.	During construction within the Consultation Zone of Shuen Wan Landfill.			√			
		<ul style="list-style-type: none"> <li>During all works, safety procedures should be implemented to minimise the risks of fires and explosions, asphyxiation of workers and toxicity effects resulting from contact with contaminated soils and groundwater.</li> </ul>				√		N/A	
		<ul style="list-style-type: none"> <li>Safety officers, specifically trained with regard to landfill gas and leachate related hazards and the appropriate actions to take in adverse circumstances, shall be present on the site throughout the works, in particular, when works are undertaken below ground.</li> </ul>				√		N/A	

EIA Ref.	EM&A Log Ref.	Environmental Protection and Mitigation Measures	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Implementation Status
					Des	C	O	Dec	
		<ul style="list-style-type: none"> <li>All personnel who work inside the pipeline trench should be made aware of the possibility of ignition of gas in the vicinity of the works, the possible presence of contaminated water and the need to avoid physical contact with it.</li> </ul>				√			N/A
		<ul style="list-style-type: none"> <li>Monitoring for methane, carbon dioxide and oxygen shall be undertaken at work areas within the Consultation Zone of the Shuen Wan Landfill where works involve deep excavations or entry into confined spaces ie manhole. The frequency and areas to be monitored shall be documented in the Contractors Safety Plan prior to commencement of works.</li> </ul>				√			N/A
		<ul style="list-style-type: none"> <li>All monitoring shall be carried out by trained technicians and equipment calibrated according to the manufacturers instructions. A standard record form, detailing the location, time of monitoring and equipment used, together with the gas concentrations measured, shall be used to ensure all relevant data are recorded for future reference.</li> </ul>				√			N/A
		<ul style="list-style-type: none"> <li>Depending on the results of gas monitoring and the environment under which it is conducted (ie confined space or atmospheric works), appropriate actions will vary and shall be stated as part of the Contractor's safety plan.</li> </ul>				√			N/A
		<ul style="list-style-type: none"> <li>Enhanced personal hygiene practices including washing thoroughly after working and eating only in "clean" areas should be adopted where contact may have been made with any groundwater which is thought to be contaminated with leachate.</li> </ul>				√			N/A
<b>9.8.1</b>	<b>27</b>	<b>Landfill Gas – Operation Phase</b>							
		No mitigation measures are required.							N/A
<b>10.5</b>	<b>28</b>	<b>Air Quality</b>							
		Dust suppression measures in accordance with the <i>Air Pollution Control (Construction Dust) Regulation</i> shall be implemented and incorporated into the Contract Specification.	During construction	Construction Contractor		√			√
<b>11.7</b>	<b>29</b>	<b>Cultural Heritage</b>							
		No mitigation measures are required.							N/A

## Key:

- √ = Compliance with mitigation measures  
X = Non-compliance with mitigation measures  
Δ = Deficiency but rectified by designated implementation agent  
N/A = Not applicable

## **Annex E**

### **Cumulative Summary of Non-compliances**

**FEP-01B/167/2003/D**  
**CUMULATIVE SUMMARY OF NON-COMPLIANCES**

Date of Inspection	Location	Non-compliance/Deficiency	Requested Follow-up Action	Action Implemented and Date	ET Conclusion
3 June 05	Mirs Bay dredging site	Silt curtains used were only 3m deep while 5m curtains are required in the EP (Condition 3.8). The contractor stated that 5-m silt curtains were initially installed but they appeared to be susceptible to damage by the strong wave action around the dredging site. Three-metre silt curtains were thus used instead of the 5-m curtains subsequently.	The contractor was requested to install 5-m silt curtains to replace the 3-m silt curtains immediately.	It was observed in the inspection on 9 June 2005 that although 5-m silt curtains were already available on the dredgers and ready for installation, they were not yet installed to replace the 3-m curtains. The Contractor stated that due to the strong wind and waves in the past few days (6-8 June) the dredging works stopped most of the time (especially for the dredger in the more exposed area further away from Tolo Channel) and all dredgers stopped works on 9 June due to severe sea conditions. The Contractor also indicated that it was difficult and potentially dangerous to install the silt curtains under such sea conditions. Installation of the 5-m silt curtains was subsequently completed on 10 June 2005.	Corrective action completed and the non-compliance closed.
31 Oct 05	Jetting barge near Tolo Channel	One NC identified for exceedance of jetting speed limit (67.5 m/hr). Isolated incidences of marginal exceedances were also recorded in the period 3-7 Nov 05.	The contractor was reminded that intensive monitoring and tight control of jetting speed must be kept up continually throughout the jetting operations in Tolo Harbour and Channel.	As seen by the ET in the follow-up audit on 10 Nov 05, the Contractor has implemented a jetting speed monitoring and control system accessible to both the engineers and surveyors in the control rooms and to the winch operator who directly controls the forward speed of the jetting barge. The system shows the exact location of the jetting barge determined by a GPS and the winch operator is provided with information about the expected locations (distances traveled) of the jetting barge in consecutive time intervals (15 min.) calculated from the pre-set speed limit. Based on this information the winch operator was able to adjust the speed should the jetting barge moved beyond the expected location within a 15 min period, thus preventing any speed exceedance from occurring as far as possible. Direct communication between the engineers and the winch operator has also been established by the use of a dedicated set of Walkie Talkie so that the engineers can remind the operator to slow down when necessary.	There was no further jetting speed exceedance since 8 Nov 05. The jetting speed monitoring and control system appeared to be effective. The ET recommended to close this NC on 16 Nov 05.

## **Annex F**

### **Cumulative Summary of Complaints**



**FEP-01B/167/2003/D**

**Cumulative Summary of Complaints**

Log ID	Date	Source	Nature of Complaint	Investigation Report Date	Conclusion of Investigation	Further Action	Status
050903/01	3/Sep/05	By AFCD and forwarded to Towngas; also by EPD on 4 Sept.	Observed water quality deterioration and increased shell mortality at Lo Fu Wat Fish Culture Zone, suspected to be caused by the Project.	12/Sep/05	Issues raised not related to the works of the Project	Responses to the IEC's comment were provided and the IEC agreed to close the complaint on 23-Sep-05	Closed
050907/02	7/Sep/05	Towngas	Fish kill suspected to be caused by the Project.	15/Sep/05	Issues raised not related to the works of the Project	none necessary	Closed
050921/03	21/Sep/05	Tai Po District Office and forward to EPD.	Dead fish observed around pipe laying barge; fish kill observed at Yim Tin Tsai (West) Fish Culture Zone; water quality deterioration observed at Lo Fu Wat Fish Culture Zone;	26/Sep/05	Issues raised not related to the works of the Project	none necessary	Closed
051115/04	15/Nov/05	Complaint received by AFCD and forwarded to Towngas	Fish mortality observed at the complainant's fish raft.	24/Nov/05	The fish kills were unlikely related to the activities of the project	None necessary for this complaint.	Closed
051117/05	17/Nov/05	Complaint received by EPD and forwarded to Towngas and ET	Noise nuisance	22/Nov/05	Actions taken by the Contractor including additional mitigation measures were sufficient to mitigate the noise nuisance. No further action was required.	None necessary	Closed
051220/06	20/Dec/05	Complaint received by Towngas and forwarded to ET	Fish kill suspected to be caused by the Project.	30/Dec/05	The fish kills and other issues raised were unlikely related to the works of the Project	None necessary	Closed
051221/07	21/Dec/05	Complaint received by EPD and forwarded to Towngas and ET	Increase bivalve mortality	30/Dec/05	The bivalve mortality was unlikely related to the works of the Project	None necessary	Closed

Log ID	Date	Source	Nature of Complaint	Investigation Report Date	Conclusion of Investigation	Further Action	Status
051227/08	27/Dec/05	Complaint received by EPD and forwarded to Towngas and ET	Muddy water observed at 9:38am on 27 Dec 2005, suspected to be generated by the jetting operation.	4/Jan/06	No evidence to suggest that the jetting barge caused any significant water quality deterioration	Information requested provided to the IEC who agreed to close the complaint on 17-Jan-06	Closed
051229/09	29/Dec/05	Complaint received by Towngas and forwarded to ET	Abnormally high fish mortality rate observed on 25 Dec 2005	4/Jan/06	There appeared to be no relationship between the jetting and the fish kill.	None necessary	Closed
060109/10	9/Jan/06	Complaint received by EPD and forwarded to Towngas and ET	Noise nuisance	16/Jan/06	Noise enclosures have been erected around the noisiest equipment and were in proper condition. Jetting works complied with the CNP, and in the new CNP jetting is not allowed between 23:00 and 07:00 the next day when the jetting barge is located between Pak Sha Tau and Tai Po Kau.	None necessary	Closed
060112/11	12/Jan/06	Complaint received by EPD and forwarded to Towngas and ET	Cadmium was detected in some bivalves from his pearl farm, suspected to be due to resuspension of sediments from Tolo Harbour/Channel.	18/Jan/06	There was no evidence to support that the cadmium found accumulated in the oysters were related to the works of the Project.	None necessary	Closed
060216/12	16/Feb/06	Complaint received by EPD and forwarded to Towngas and ET	Noise nuisance	21/Feb/06	Jetting works complied with the CNP. Contractor will ensure compliance with the CNP and noise emitted will be minimized by turning off all unnecessary equipment. Actions to be taken were deemed adequate.	None necessary	Closed
060320/13	20/Mar/06	Complaint received by EPD and forwarded to ET	Noise nuisance	24/Mar/06	Jetting works complied with the CNP. All jetting works completed after receipt of complaint and no further action necessary.	None necessary	Closed