

The Hongkong Electric Co Ltd
香港電燈有限公司



ENVIRONMENTAL IMPACT ASSESSMENT (EIA) ORDINANCE, CAP. 499

ENVIRONMENTAL PERMIT NO. EP-165/2003

**LAMMA POWER STATION
NAVIGATION CHANNEL IMPROVEMENT**

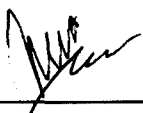
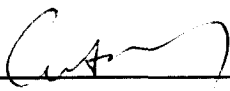
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EXECUTIVE SUMMARY

This is the ninth monthly Environmental Monitoring and Audit (EM&A) report for the Project “Lamma Navigation Channel Improvement” prepared by the Environmental Team (ET). This report presents the results of impact monitoring on marine water quality for the said project in February 2004.

Marine water quality monitoring was performed. The results were checked against the established Action/Limit (AL) levels. On-site audit was conducted once per week. The implementation status of the environmental mitigation measures, Event/Action Plan and environmental complaint handling procedures were also checked.

Construction Activities Undertaken

The proposed dredging work was substantially completed in December 2003. However, the subsequent sounding survey conducted in January 2004 revealed that there were still a few spot of soundings higher than the design dredging level (i.e. -16.0 mPD). In order to meet the requirements of Hong Kong Pilots Association Limited on the navigation depth, dredging operation for removing those high spots above the design dredging level was required. The trimming of high spots by dredging was started on 22nd February 2004 and completed on 23rd February 2004.

Construction activities for the project during the reporting month was dredging and dumping of dredged mud. The maximum hourly and daily dredging rates actually achieved by the contractors were within the limits specified in the latest dredging schedule.

Environmental Monitoring Works

Marine water monitoring was conducted as scheduled in the reporting month.

Water Quality

There was no exceedance of Action and Limit Levels for water quality in the reporting month.

Site Environmental Audit

Site audits were carried out on a weekly basis to monitor environmental issues on the construction site. The site conditions were generally satisfactory. All required mitigation measures were implemented.

Environmental Licensing and Permitting

Description	Permit No.	Valid Period		Issued To	Date of Issuance
		From	To		
Environmental Permit	EP-165/2003	08/04/03	-	HEC	08/04/03
Construction Noise Permit	GW-UW0041-04	15/02/04	30/04/04	Contractor	11/02/04
Marine Dumping Permit	EP/MD/04-121	21/02/04	15/03/04	Contractor	20/02/04
Registration of Chemical Waste Producer	WPN5296-912-P2800-17	22/07/03	-	Contractor	22/07/03

Implementation Status of Environmental Mitigation Measures

Environmental mitigation measures for the construction activities as recommended in the EM&A manual were implemented in the reporting month.

Environmental Complaints

No complaint was received in the reporting month.

Future Key Issues

After the completion of dredging works to trim high spots on 23rd February 2004, post-project monitoring for seawater quality would be carried out for 4 weeks (with the same schedule as the impact monitoring during the project, i.e. thrice weekly). The post-project monitoring results will be provided in the Final EM&A Summary Report in accordance with section 7.4 of the EM&A Manual. The results of final sounding survey conducted in end February 2004 will be provided under a separate submission.

Concluding Remarks

The environmental performance of the project was generally satisfactory.

As the dredging works were completed in February 2004, the impact monitoring programme was no longer required and therefore had been terminated since March 2004. Hence, this would be the last monthly EM&A report.

1. INTRODUCTION

1.1 Background

The Environmental Team (hereinafter called the “ET”) was formed within the Hongkong Electric Co. Ltd (HEC) to undertake Environmental Monitoring and Audit for “Lamma Power Station Navigation Channel Improvement” (hereinafter called the “Project”). Under the requirements of Clause 4 of Environmental Permit EP-165/2003, an EM&A programme for impact environmental monitoring is required to be implemented. In accordance with the EM&A Manual, environmental monitoring of water quality and regular environmental audits are required for the Project.

The Project involves restoring the depth of existing channel by dredging to a water depth of -16 mPD approximately with an estimated total dredging volume of 2.98 million m³.

The Project Area is illustrated in Figure 1.1. The shaded area shows the region of the Channel where dredging will be required under this Project. According to the latest bathymetric survey of the Channel, there is already sufficient water depth in the remaining section of the Channel in the south (beyond the shaded area in Figure 1.1) and no dredging will be required.

The dredging options for the Project are:

- (1) continuous dredging using grab dredgers with cage-type silt curtains or
- (2) intermittent dredging using one Trailer Suction Hopper Dredger (TSHD).

Only one of these two dredging options will be deployed. The contractor has chosen to adopt the continuous dredging method using grab dredgers with cage-type silt curtains.

This report summarizes the environmental monitoring and audit work for the Project for the month of February 2004.

1.2 Project Organisation

The management structure to oversee the Project includes the following:

- Environmental Protection Department (The Authority);
- Chief Engineer (Projects) (The official contact person between HEC and EPD);
- Engineer;
- Independent Environmental Checker (IEC);
- Environmental Team (ET);
- Contractor.

The project organisation chart for the construction EM&A programme is shown in Appendix A.

1.3 Construction Works undertaken during the Reporting Month

The proposed dredging work was substantially completed in December 2003. However, the subsequent sounding survey conducted in January 2004 revealed that there were still a few spot of soundings higher than the design dredging level (i.e. -16.0 mPD). In order to meet the requirements of Hong Kong Pilots Association Limited on the navigation depth, dredging operation for removing those high spots above the design dredging level was required. The trimming of high spots by dredging was started on 22nd February 2004 and completed on 23rd February 2004.

Construction activities undertaken during the reporting month for this Project were dredging and dumping of dredged mud. The total volume of dredged materials from 22nd to 23rd February 2004 was 7,500m³. Uncontaminated materials were dumped at the designated location within the South Cheung Chau Disposal Area and the total dumped volume in February 2004 was 7,500m³. Figure 1.2 shows all dumping locations for this project. Daily records of dredged / dumped volume are presented in Appendix B. The maximum hourly and daily dredging rates actually achieved by the contractors were within the limits specified in the latest dredging schedule.

The main construction activities carried out during the reporting month and the corresponding environmental mitigation measures are summarized in Table 1.1. The implementation of major mitigation measures in the month is provided in Appendix I.

Table 1.1 Construction Activities and Their Corresponding Environmental Mitigation Measures

Construction Activities	Environmental Mitigation Measures
Dredging	<p>Water Quality</p> <ul style="list-style-type: none"> – One number of grab dredger with grab capacity of no less than 8m³ was operated on site. – Both maximum total hourly and daily dredging rates specified in the latest dredging schedule were strictly followed. – Daily dredging volume was spread as evenly as possible over the 24-hour period. – Cage-type silt curtain was deployed for the grab dredger. – Grabs were tightly closed and the hoist speed was suitably low. – All barges for transportation of dredged materials were fitted with tight bottom seals. <p>Noise</p> <ul style="list-style-type: none"> – General noise mitigation measures were employed at work site throughout the construction phase. – The number of dredgers and operation conditions as specified in the CNP were strictly followed.

Construction Activities	Environmental Mitigation Measures
	<p data-bbox="507 367 730 400">Dredging Waste</p> <ul data-bbox="507 416 1374 745" style="list-style-type: none"><li data-bbox="507 416 1374 521">– All vessels for marine transportation of dredged sediment were fitted with tight fitting seals at the bottom openings to prevent leakage.<li data-bbox="507 528 1374 595">– All vessels were filled to a level such that dredged materials would not spill over during loading and transportation.<li data-bbox="507 602 1374 669">– Dredged wastes were disposed of at licensed dumping site – South Cheung Chau Disposal Area.<li data-bbox="507 676 1374 745">– Records of the quantities of waste generated and disposed of off-site were taken. <p data-bbox="507 784 727 817">Marine Ecology</p> <ul data-bbox="507 833 1374 976" style="list-style-type: none"><li data-bbox="507 833 1374 900">– All construction related vessels approached the site from the designated route to avoid the Finless Porpoise habitat area.<li data-bbox="507 907 1374 976">– The dumping of chemicals, rubbish, oils etc. into the water was strictly prohibited.

1.4 Summary of EM&A Requirements

The EM&A program requires environmental monitoring of water quality. Regular environmental site audits for water quality and waste management were carried out. The detailed EM&A monitoring work for water quality are described in Sections 2.

The following environmental audits are summarized in Section 3 of this report:

- Environmental monitoring results;
- Waste Management Records;
- Weekly site audit results;
- The status of environmental licensing and permits for the Project;
- The implementation status of environmental protection and pollution control/mitigation measures.

Future key issues will be reported in Section 4 of this report.

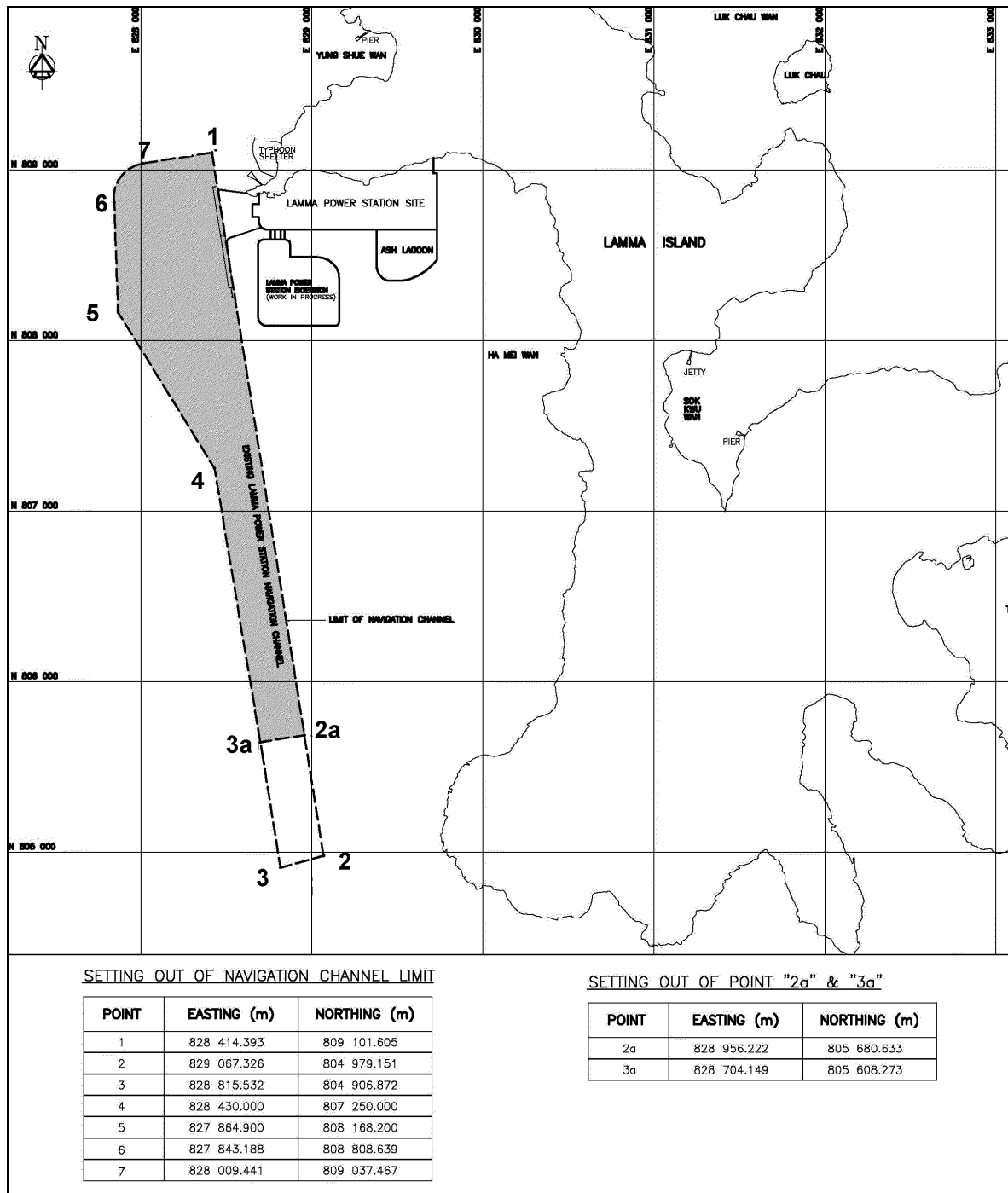


Figure 1.1 Layout of Work Site

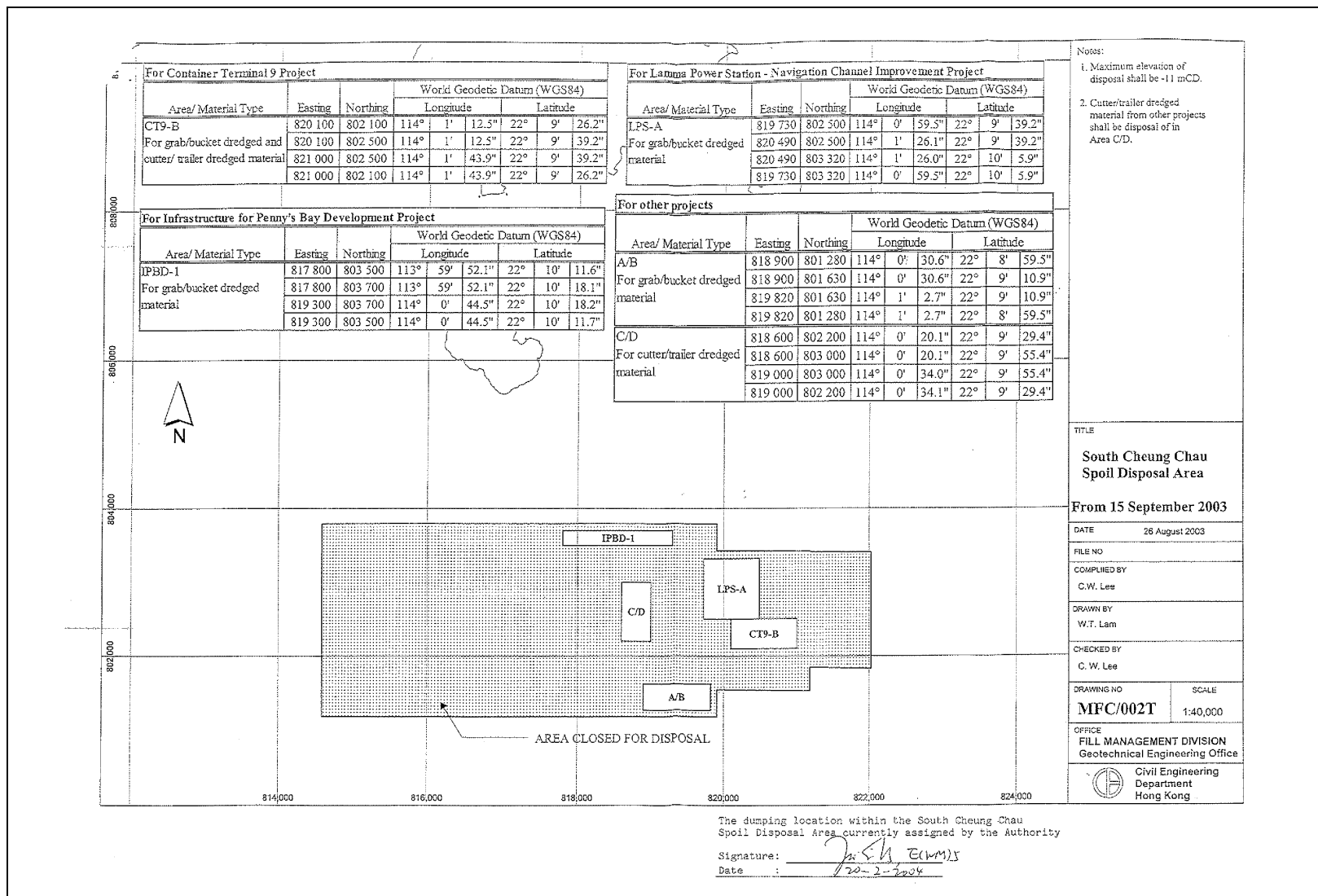


Figure 1.2 Location of Dumping Area

2. WATER QUALITY MONITORING

2.1 Monitoring Requirements

Marine water quality monitoring at the monitoring locations adjacent to the project area was carried out. The purpose was to ensure that deterioration of water quality, if any, would immediately be detected and that timely action could be taken to rectify the situation. The impact monitoring data were checked against the AL levels set out in the Baseline Monitoring Report (Revision 1).

2.2 Monitoring Locations

A total of 10 water quality monitoring locations were selected. 7 Sensitive Receiver (SR) stations were chosen on the basis of their proximity to the construction site. 3 Marine Control stations (CS) as recommended in the EIA were selected to facilitate comparison of the water quality of the SR stations with ambient water quality conditions. Table 2.1 describes the locations of these monitoring stations. Their locations are shown in Figure 2.1.

Table 2.1 Water Quality Monitoring Locations

Type	Monitoring Location	HK Metric Grid E	HK Metric Grid N
Sensitive Receiver Stations	SR6	830 150	811 500
	SR7	829 004	810 903
	SR10	829 194	808 600
	SR11	830 119	808 650
	SR12	830 386	807 189
	SR14	829 977	805 758
	SR15	829 566	804 545
Marine Control Stations	CS1	828 000	813 492
	CS2	825 000	808 000
	CS3	829 000	802 000

2.3 Monitoring Equipment

Table 2.2 summarizes the equipment used in the water-quality monitoring programme.

Table 2.2 Water Quality Monitoring Equipment

Equipment	Detection Limit
YSI 6920 Water Quality Monitor	Temperature: -5 to 45 °C; +/- 0.15 °C Salinity: 0 to 70 ppt; +/- 0.1 ppt Dissolved Oxygen: 0 to 200%; +/- 0.2% 0 to 20 mg/L; +/- 0.2 mg/L Turbidity: 0 to 1000 NTU; +/- 5% of the range pH: 0 to 14 units; +/- 0.2 units
Trimble NT300D GPS	Accuracy better than 3m
Eagle Fisheasy ST Portable Depth Finder	Accuracy better than 0.5m

2.4 Monitoring Parameters, Frequency and Duration

Table 2.3 summarizes the monitoring parameters, frequencies and total duration of water quality monitoring. The monitoring schedule for reporting month is shown in Appendix D.

Table 2.3 Water Quality Monitoring Parameters and Frequency

Monitoring Stations	Parameters	Frequency	No. of Depths	No. of Samples
Sensitive Receiver Stations SR6, SR7, SR10, SR11, SR12, SR14 & SR15 Marine Control Stations CS1, CS2, CS3	<ul style="list-style-type: none"> • Depth, m • Temperature, °C • Salinity, ppt • DO, mg/L • DO Saturation, % • Turbidity, NTU • SS, mg/L • pH 	Three times per week	3 Surface, Mid-Depth and Bottom	2 Mid-ebb and Mid-flood

2.5 Monitoring Procedures and Calibration Details

Monitoring Procedures

- The monitoring stations were accessed using survey boat to within 3m, guided by Differential Global Positioning System (DGPS).
- The water depth of the monitoring location at sampling time was measured using depth meter. Afterwards, the probes of the in-situ measurement equipment were lowered to the predetermined depths and the measurements taken accordingly.
- A water sampler was lowered into the water to the required sampling depths. Upon reaching the pre-determined depth, a messenger to activate the sampler was released which travel down the wire. The water sample was sealed within the sampler before retrieving.
- All measurements were taken at 3 water depths where appropriate, namely 1m below water surface, mid-depth, and 1 meter from seabed, except where the water depth was less than 6m, whereupon the mid-depth measurement would be omitted. If the water depth was less than 3m, only the mid-depth position was monitored.
- One duplicate in-situ measurement and water sample for laboratory analyses were taken at all sampling locations.
- At each measurement depth, two consecutive measurements were taken. The probe was retrieved out of the water after the first measurement and then redeployed for the second measurement. When the difference in value between the first and second measurement of on-site parameters was more than 25% of the value of the first reading, the reading was discarded and further readings were taken.
- A water sampler, consisting of a transparent PVC or glass cylinder of not less than two litres which could be effectively sealed with cups at both ends, was used. The water sampler had a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler was at the selected water depth.
- Water samples for SS measurements were transferred directly to high density polythene sample bottles, packed in ice (cooled to 4°C without being frozen), and delivered to a HOKLAS laboratory as soon as possible after collection.
- In addition, field information such as the general meteorological conditions and observations regarding any significant activities in the vicinity of each monitoring location were also recorded.

Equipment Calibration

The equipment deployed for in-situ measurement of marine water quality was calibrated before use. The methodologies for the calibration follow the instruction manuals provided by the corresponding manufacturers. The calibration records are shown in Appendix F.

Laboratory Analysis & QA/QC

The collected marine water samples were analyzed for Suspended Solids with methodologies shown in Table 2.4.

Table 2.4 Laboratory Analysis Methodologies of Marine Water Samples

Parameter	Method	Limit of Reporting (mg/L)
Suspended Solids	APHA 17 ed 2540 D	1.0

In order to ensure that the laboratory analysis works were carried out properly, stringent QA/QC procedures (which include sample preparation as well as subsequent instrumentation analysis) were followed. According to the requirements stipulated in the EM&A Manual, QA/QC requirements for laboratory testing include:

- 1) "Blind" duplicate samples analysis of 10% collected marine water samples; and
- 2) in-house QA/QC procedures of the testing laboratory (this includes the use of blank, batch duplicates and quality control samples).

Blind Duplicate:

In order to cross check the accuracy of the measurement results by the laboratory analysis, "blind" duplicate samples of 10% of the collected marine water samples were analyzed alongside the normal samples. The sample codes for the "blind" duplicates were determined by the sampling team and are not identifiable by the laboratory. The results of the "blind" duplicate samples are summarized in Appendix F.

Blank:

A laboratory blank is an analyte free matrix to which all reagents are added in the same volumes or proportions as used in the standard sample preparation to monitor contamination introduced in laboratory. All the laboratory blank values and acceptance criterion of suspended solids are summarized in Appendix F.

Batch Duplicate:

Batch duplicate is an intra-laboratory split sample randomly selected from the sample batch to monitor the method precision in a given matrix. The acceptance limit of duplicate values of suspended solids and their duplicate results are summarized in Appendix F.

Quality Control Sample:

The quality control sample is the analysis of a material with a known concentration of contaminants to determine the accuracy of results in a given matrix. The results of quality control samples for suspended solids are shown in Appendix F.

A total of 120 sets of samples for Suspended Solids analysis were received during the marine monitoring period including both ebb and flood tides. At least 5% laboratory blanks, batch duplicates and quality control samples for Suspended Solids were used. The acceptance criteria are outlined in Quality Control data.

The QA/QC results in Appendix F indicated that the laboratory analysis works of the collected marine water samples were properly carried out and the measurement results obtained were valid in accordance with the Hong Kong Laboratory Accreditation Scheme (HOKLAS) requirements. Moreover, the “blind” duplicate measurement results indicated that the precision of the measurements for Suspended Solids complied with HOKLAS requirements.

2.6 Results and Observations

Marine water monitoring was conducted as scheduled in the reporting month. All monitoring data and graphical presentation of the monitoring results are provided in Appendix E.

There was no Action / Limit Level exceedance for water quality in the reporting month.

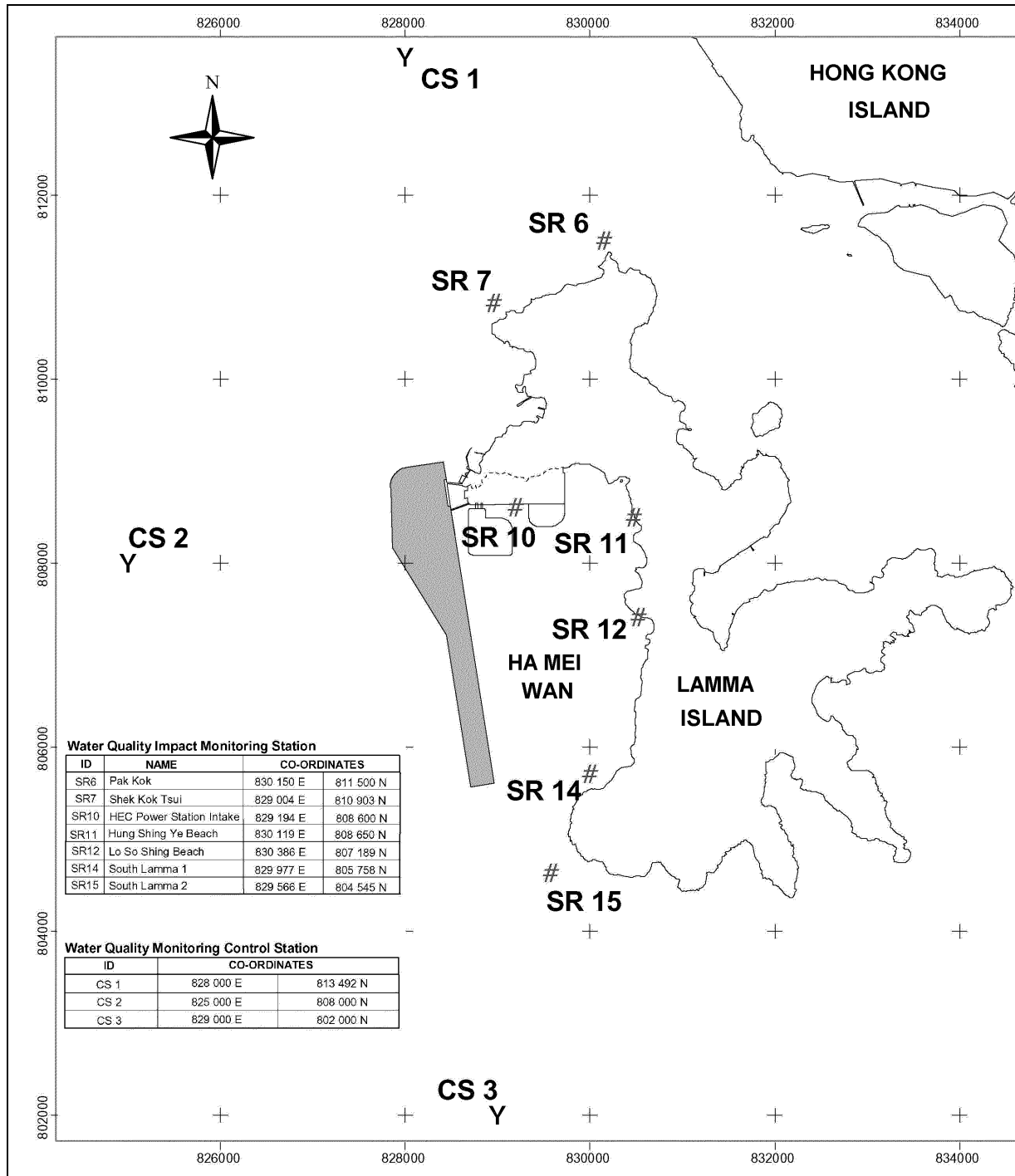


Figure 2.1 Location of Water Quality Monitoring Stations

3. ENVIRONMENTAL AUDIT

3.1 Review of Environmental Monitoring Procedures

The environmental monitoring procedures were regularly reviewed by the Environmental Team. No modification to the existing monitoring procedures was recommended.

3.2 Assessment of Environmental Monitoring Results

Monitoring results for Water Quality

The environmental monitoring results for Water Quality in the reporting month presented in Sections 2 are summarized in Table 3.1.

Table 3.1 Summary of AL Level Exceedances on Monitoring Parameters

Item	Parameter Monitored	Monitoring Period	No. of Exceedances In		Event/Action Plan Implementation Status and Results
			Action Level	Limit Level	
Water					
1	DO (Surface & Middle)	22/02/04-23/02/04	0	0	
2	DO (Bottom)	22/02/04-23/02/04	0	0	
3	SS	22/02/04-23/02/04	0	0	
4	Turbidity	22/02/04-23/02/04	0	0	

Waste Management Records

The estimated amounts of different types of waste generated in February 2004 are shown in Table 3.2.

Table 3.2 Estimated Amounts of Waste Generated in February 2004

Waste Type	Examples	Estimated Amount (m ³)
Dredged Materials	Marine Mud	7,500

The total bulk volume of dredged material was 7,500m³.

3.3 Site Environmental Audit

Site audits were carried out by ET on a weekly basis to monitor environmental issues at the project area to ensure that all mitigation measures were implemented timely and properly. The site conditions were generally satisfactory. All required mitigation measures were implemented. The weekly site inspection results are attached in Appendix H.

3.4 Status of Environmental Licensing and Permitting

All permits/licenses obtained for the project are summarised in Table 3.3.

Table 3.3 Summary of Environmental Licensing and Permit Status

Description	Permit No.	Valid Period		highlights	Status
		From	To		
Environmental Permit	EP-165/2003	08/04/03	-	The whole construction work site	Valid
Construction Noise Permit	GW-UW0041-04	15/02/04	30/04/04	Operation of PME's (2 grab dredgers and 2 tug boats) allowed during the restricted hours (07:00-07:00 of next day on holidays and 19:00-07:00 of next day on all other days). Not more than one grab dredger allowed to be operated within each zone (viz. Zone A, B and C) between 2300 and 0700 hrs. Only one tug boat allowed to be operated within Zone A and B combined between 2300 and 0700 hrs.	Valid
Marine Dumping Permit	EP/MD/04-121	21/02/04	15/03/04	Dumping at South Cheung Chau Disposal Area	Valid
Registration of Chemical Waste Producer	WPN5296-912-P2800-17	22/7/03	-	Major Chemical Waste Type: Waste solvent and waste lubricating oil	Valid

3.5 Implementation Status of Environmental Mitigation Measures

Mitigation measures detailed in the permits and the EM&A Manual (Construction Phase) are required to be implemented. An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is presented in Appendix I.

3.6 Implementation Status of Action/Limit Plans

The Action/Event Plans for water quality extracted from the EM&A Manual (Construction Phase) and the review report on marine water quality monitoring are presented in Appendix G.

3.7 Implementation Status of Environmental Complaint Handling Procedures

In February 2004, no complaint against the construction activities was received.

Table 3.4 Environmental Complaints / Enquiries Received in February 2004

Case Reference / Date, Time Received / Date, Time Concerned	Descriptions /Actions Taken	Conclusion / Status
Nil	N/A	N/A

Table 3.5 Outstanding Environmental Complaints / Enquiries Carried Over

Case Reference / Date, Time Received / Date, Time Concerned	Descriptions /Actions Taken	Conclusion / Status
Nil	N/A	N/A

4. FUTURE KEY ISSUES

4.1 Key Issues for the Coming Month

After the completion of dredging works to trim high spots on 23rd February 2004, post-project monitoring for seawater quality would be carried out for 4 weeks (with the same schedule as the impact monitoring during the project, i.e. thrice weekly). The post-project monitoring results will be provided in the Final EM&A Summary Report in accordance with section 7.4 of the EM&A Manual. The results of final sounding survey conducted in end February 2004 will be provided under a separate submission.

4.2 Monitoring Schedule for the Next Month

The post-project monitoring schedule is shown in Appendix D.

5. CONCLUSION

Marine water monitoring was conducted as scheduled in the reporting month. All monitoring results were checked and reviewed. No Action/Limit level exceedance on water quality parameters was recorded in the reporting month.

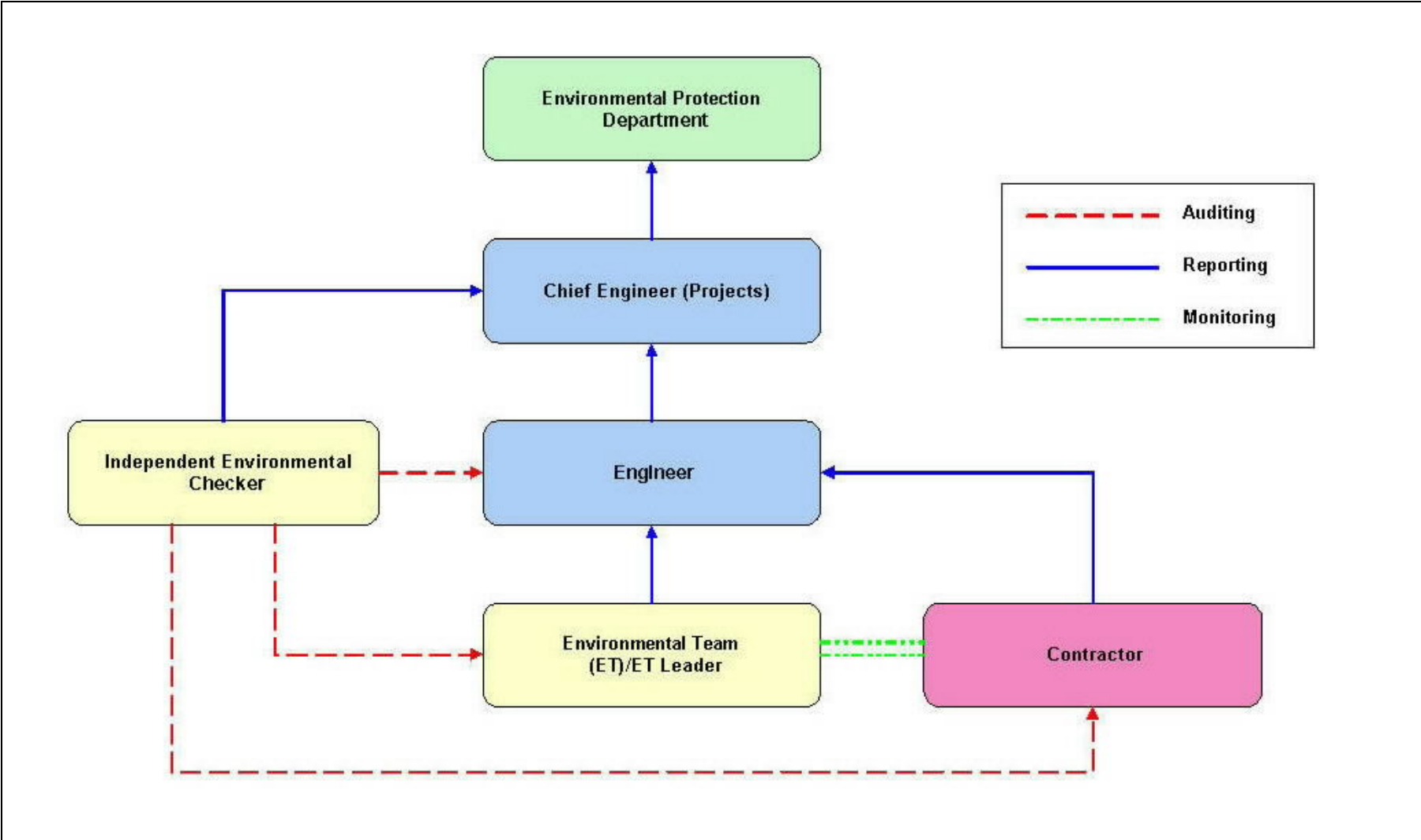
The maximum hourly and daily dredging rates actually achieved by the contractor were within the limits specified in the latest dredging schedule.

Environmental mitigation measures recommended in the EM&A manual for the Project were implemented in the reporting month. No complaint against the Project was received. No prosecution was received for this Project in the reporting period.

The environmental performance of the Project was generally satisfactory.

As the dredging works were completed in February 2004, the impact monitoring programme was no longer required and therefore had been terminated since March 2004. Hence, this would be the last monthly EM&A report.

Appendix A Organization Chart



Appendix B

Table B1 Amount of Dredged and Dumped Marine Sediment

Date	Dredged Marine Mud (bulk volume m ³)	Dumped Marine Mud (bulk volume m ³)	Maximum Hourly Dredging Rate (bulk volume m ³ /hr)
1/2/2004	0	0	0
2/2/2004	0	0	0
3/2/2004	0	0	0
4/2/2004	0	0	0
5/2/2004	0	0	0
6/2/2004	0	0	0
7/2/2004	0	0	0
8/2/2004	0	0	0
9/2/2004	0	0	0
10/2/2004	0	0	0
11/2/2004	0	0	0
12/2/2004	0	0	0
13/2/2004	0	0	0
14/2/2004	0	0	0
15/2/2004	0	0	0
16/2/2004	0	0	0
17/2/2004	0	0	0
18/2/2004	0	0	0
19/2/2004	0	0	0
20/2/2004	0	0	0
21/2/2004	0	0	0
22/2/2004	5,250	5,250	750
23/2/2004	2,250	2,250	750
24/2/2004	0	0	0
25/2/2004	0	0	0
26/2/2004	0	0	0
27/2/2004	0	0	0
28/2/2004	0	0	0
29/2/2004	0	0	0

Summary of dredging rates for the reporting month

1. According to the latest dredging schedule (Table B2), the allowable daily and hourly dredging rates for February 2004 are 33,200m³/day and 1,522m³/hour respectively. The unit is in “in-situ” volume.
2. For the reporting month, the largest quantity of dredged mud was 5,250m³ (bulk volume) on 22/02/2004. The volume of dredged mud equals to (5,250m³/1.3) 4,038m³/day in in-situ volume, where 1.3 is a bulking factor. Similarly, the largest maximum hourly dredging rate for the reporting month was (750m³/1.3) 577m³/hour in in-situ volume on 22/02/2004.
3. Hence, it can be concluded that the maximum hourly and daily dredging rates actually achieved by the contractors were within the limit specified in the latest dredging schedule.

Table B2 Dredging Schedule for Grab Dredger Option (Revision 4) – Effective from 15 February 2004

Working Zone *	Construction Programme	
	February & March 2004	April 2004
ABn	2 Nos. **	2 Nos. **
ABs		
BCn		
BCs	No dredging	No dredging
Maximum total daily dredging rate (m ³ /day)	33,200	26,300
Maximum total hourly dredging rate (m ³ /hr)	1,522	1,205

Remarks:

*: This table should be read in conjunction with Figure 4 of Environmental Permit No. EP-165/2003

** : A maximum of 2 numbers of grab dredgers, each with a grab capacity of no less than 8 m³ is allowed.

Note:

The above maximum daily dredging rates are derived based on 24-hour dredging operations. If the daily workings hours are restricted, the maximum daily dredging rates will have to be reduced proportionally based on the allowable working hours.

Appendix C Action and Limit Levels for Water Quality Monitoring

Table C1 Action / Limit Levels for Dissolved Oxygen (mg/L)

(a) Surface and Middle – Dry Season (November – March)

	SR6	SR7	SR11	SR12	SR14	SR15
Action Level (5%-ile)	5.2*	5.2*				
1%-ile	4.3**	4.6**				
Limit Level	4.0***					

Note:

- * - figure 5.2 mg/L represents 5%-ile of baseline monitoring data and Marine Water Quality (MWQ) in Hong Kong from 1997 to 2001
- ** - figures 4.3 and 4.6 mg/L represent 1%-ile of baseline monitoring data and MWQ in Hong Kong from 1997 to 2001
- *** - WQO for DO in non-FCZ
- All the figures may be subjected to review by EPD as and when necessary.

(b) Surface and Middle – Wet Season (April – October)

	SR6	SR7	SR11	SR12	SR14	SR15
Action Level (5%-ile)	4.2*	4.6*				
1%-ile	3.9**	4.3**				
Limit Level	4.0***					

Note:

- * - figures 4.2 and 4.6 mg/L represent 5%-ile MWQ in Hong Kong from 1997 to 2001
- ** - figures 3.9 and 4.3 mg/L represent 1%-ile of MWQ in Hong Kong from 1997 to 2001
- *** - the WQO for DO in non-FCZ
- All the figures may be subjected to review by EPD as and when necessary.

(c) Bottom – Dry Season (November – March)

	SR6	SR7	SR11	SR12	SR14	SR15
Action Level (5%-ile)	5.5*	5.4*				
1%-ile	4.1**	4.8**				
Limit Level	2.0***					

Note:

- * - figures 5.5 and 5.4 mg/L represent 5%-ile of baseline monitoring data and MWQ in Hong Kong from 1997 to 2001
- ** - figures 4.1 and 4.8 mg/L represent 1%-ile of baseline monitoring data and MWQ in Hong Kong from 1997 to 2001
- *** - WQO for DO in non-FCZ
- All the figures may be subjected to review by EPD as and when necessary.

(d) Bottom – Wet Season (April – October)

	SR6	SR7	SR11	SR12	SR14	SR15
Action Level (5%-ile)	2.7*	3.5*				
1%-ile	2.3**	2.0**				
Limit Level	2.0***					

Note:

- a. * - figures 2.7 and 3.5 mg/L represent 5%-ile of MWQ in Hong Kong from 1997 to 2001
- b. ** - figures 2.3 and 2.0 mg/L represent 1%-ile of MWQ in Hong Kong from 1997 to 2001
- c. *** - WQO for DO in non-FCZ
- d. All the figures may be subjected to review by EPD as and when necessary.

Table C2 Action / Limit Levels for Turbidity (NTU)

(depth-average)

	SR6	SR7	SR11	SR12	SR14	SR15
Action Level (95%-ile)	16.4	15.3	13.5	14.2	16.1	16.1
Limit Level (99%-ile)	17.4	16.1	16.2	16.2	16.5	16.8

Note:

1. 95% ile of baseline data is adopted for setting the Action Level for various SRs according to the EM&A Manual.
2. 99% ile of baseline data is adopted for setting the Limit Level for various SRs according to the EM&A Manual.
3. All the figures may be subjected to review by EPD as and when necessary.

Table C3 Action / Limit Levels for Suspended Solids (mg/L)

(depth-average)

	SR6	SR7	SR10	SR11	SR12	SR14	SR15
95%-ile	16.8	16.4	16.0	16.1	16.8	17.9	16.7
Action Level	16.8	16.4	--	16.1	16.8	17.9	16.7
99%-ile	16.9	16.8	16.2	16.4	17.0	18.8	17.8
Limit Level	16.9	16.8	100	16.4	17.0	18.8	17.8

Note:

1. No Action Level is applied to SR10 according to the EM&A Manual
2. Limit Level of SR10 is 100 mg/L according to the EM&A Manual
3. 95% ile of baseline data is adopted for setting the Action Level for various SRs according to the EM&A Manual.
4. 99% ile of baseline data is adopted for setting the Limit Level for various SRs according to the EM&A Manual.
5. All the figures may be subjected to review by EPD as and when necessary.

Appendix D

Environmental Monitoring Schedule

Navigation Channel Improvement Project - Marine Water Monitoring Schedule

3/2/2004

Feb-2004

No.	Date		Tide	High tide	Low tide	Tentative Start Time
1	17/2/2004	Tue	Mid-ebb	09:29	11:45	09:30
			Mid-flood	18:27	11:45	14:00
2	19/2/2004	Thu	Mid-ebb	10:29	14:02	11:15
			Mid-flood	20:27	14:02	16:00
3	21/2/2004	Sat	Mid-flood	11:17	04:33	08:30
			Mid-ebb	11:17	15:38	12:30
4	23/2/2004	Mon	Mid-flood	11:37	05:28	08:30
			Mid-ebb	11:37	17:06	13:15
5	25/2/2004	Wed	Mid-flood	12:26	06:16	08:30
			Mid-ebb	12:26	18:37	14:30
6	27/2/2004	Fri	Mid-flood	13:01	06:40	08:45
			Mid-ebb	13:01	20:46	16:00

Notes: 1. The time of high tide and low tide is made reference to tidal information at Chi Ma Wan provided by the HKO.

2. Monitoring works will not be arranged during night time period for safety reasons.

3. Monitoring works should be carried out three days per week at mid-flood and mid-ebb.

4. The interval between two sets of monitoring should not be less than 36 hours.

Navigation Channel Improvement Project - Marine Water Monitoring Schedule**Mar-2004**

No.	Date		Tide	High tide	Low tide	Tentative Start Time
1	1/3/2004	Mon	Mid-flood	16:41	01:11	08:30
			Mid-ebb	1/3/2004 16:41	2/3/2004 01:53	16:00
2	4/3/2004	Thu	Mid-ebb	10:02	13:01	10:30
			Mid-flood	19:37	13:01	15:15
3	6/3/2004	Sat	Mid-ebb	10:11	14:45	11:30
			Mid-flood	21:12	14:45	16:00
4	8/3/2004	Mon	Mid-ebb	10:35	16:11	12:30
			Mid-flood	22:41	16:11	16:00
5	10/3/2004	Wed	Mid-flood	11:31	05:33	08:30
			Mid-ebb	11:31	17:42	13:30
6	12/3/2004	Fri	Mid-flood	12:28	06:28	08:30
			Mid-ebb	12:28	19:34	15:00
7	15/3/2004	Mon	Mid-flood	15/3/2004 15:40	14/3/2004 23:07	08:30
			Mid-ebb	15/3/2004 15:40	16/3/2004 00:51	16:00
8	18/3/2004	Thu	Mid-ebb	09:38	13:22	10:30
			Mid-flood	19:44	13:22	15:30
9	20/3/2004	Sat	Mid-ebb	10:15	14:58	11:30
			Mid-flood	21:23	14:58	16:00
10	22/3/2004	Mon	Mid-flood	10:35	04:22	08:30
			Mid-ebb	10:35	16:20	12:30
11	24/3/2004	Wed	Mid-flood	11:17	05:06	08:30
			Mid-ebb	11:17	17:40	13:30
12	26/3/2004	Fri	Mid-flood	11:19	05:34	08:30
			Mid-ebb	11:19	19:11	14:15
13	29/3/2004	Mon	Mid-flood	29/3/2004 12:59	28/3/2004 22:00	08:30
			Mid-ebb	29/3/2004 12:59	30/3/2004 00:10	16:00
14	31/3/2004	Wed	Mid-flood	17:03	01:04	08:30
			Mid-ebb	31/3/2004 17:03	1/4/2004 01:43	16:00

Notes: 1. The time of high tide and low tide is made reference to tidal information at Chi Ma Wan provided by the HKO.

2. Monitoring works will not be arranged during night time period for safety reasons.

3. Monitoring works should be carried out three days per week at mid-flood and mid-ebb.

4. The interval between two sets of monitoring should not be less than 36 hours.

Appendix E
Water Quality Monitoring Results

Date: 23/2/2004
Weather: Overcast
Sea Condition: Moderate
Tide: Mid-Flood

Water Quality Monitoring Result

Location	Time	Depth (m)		Temp. (°C)	Salinity (ppt)	pH	D.O. Sat. (%)	D.O. (mg/L)		Turbidity (NTU)		S.S. (mg/L)	
								Value	DA	Value	DA	Average	DA
SR6	10:43	Surface	1	19.2 19.1	37.3 37.3	8.01 8.01	97.6 97.3	7.25 7.22	7.20	10.6 10.2	10.5	8.1	7.3
		Middle	11.5	19.1 19.1	37.4 37.4	8.02 8.02	96.9 96.2	7.18 7.13		9.4 9.7		9.4	
		Bottom	21.5	19.2 19.2	37.5 37.5	8.03 8.03	92.9 93.4	6.89 6.92		11.5 11.3		4.5	
	Other Observations:				Nil								
SR7	10:32	Surface	1	19.3 19.3	37.3 37.3	8.02 8.03	104.2 104.5	7.69 7.71	7.76	7.9 7.7	8.6	7.6	7.8
		Middle	5	19.7 19.7	37.8 37.8	8.04 8.04	106.4 107.1	7.79 7.84		7.1 7.3		9.7	
		Bottom	8.5	19.9 19.9	37.9 38.0	8.05 8.06	107.8 107.5	7.84 7.82		10.6 10.9		6.1	
	Other Observations:				Nil								
SR10	10:18	Surface	1	20.2 20.2	38.1 38.1	8.09 8.10	98.7 99.2	7.14 7.18	7.23	6.3 6.1	5.0	4.6	5.8
		Middle	4.5	20.2 20.2	38.1 38.1	8.11 8.12	100.9 101.0	7.30 7.31		4.4 4.5		7.7	
		Bottom	7.5	20.2 20.1	38.1 38.1	8.12 8.12	101.0 100.7	7.31 7.29		4.2 4.3		5.2	
	Other Observations:				Nil								
SR11	10:07	Surface	1	20.3 20.2	38.1 38.1	8.12 8.11	102.8 102.4	7.37 7.40	7.45	3.7 3.6	3.9	6.1	6.8
		Middle	4	20.2 20.2	38.1 38.1	8.13 8.13	103.7 104.0	7.50 7.52		2.9 2.8		8.3	
		Bottom	7	20.2 20.2	38.1 38.1	8.13 8.13	102.9 102.5	7.44 7.41		5.1 5.2		5.9	
	Other Observations:				Nil								
SR12	09:56	Surface	1	20.2 20.2	38.1 38.1	8.11 8.10	100.8 101.3	7.30 7.33	7.34	3.7 3.8	4.6	6.3	6.4
		Middle	4.5	20.1 20.1	38.1 38.1	8.12 8.12	102.0 101.4	7.39 7.35		4.2 4.2		6.5	
		Bottom	7.5	20.1 20.1	38.1 38.1	8.13 8.12	100.7 100.1	7.30 7.26		5.6 5.8		6.5	
	Other Observations:				Nil								
SR14	09:44	Surface	1	20.2 20.1	38.1 38.1	8.08 8.09	99.3 100.1	7.19 7.25	7.38	5.3 5.2	6.6	7.6	8.9
		Middle	5	20.1 20.1	38.1 38.1	8.10 8.10	104.1 103.5	7.55 7.51		7.0 6.8		10.7	
		Bottom	8.5	20.1 20.1	38.1 38.1	8.11 8.11	103.0 102.7	7.47 7.45		7.7 7.6		8.4	
	Other Observations:				Nil								
SR15	09:32	Surface	1	19.8 19.8	37.9 37.9	8.05 8.05	94.9 95.4	6.93 6.97	7.00	9.5 9.3	7.3	5.9	7.6
		Middle	11.5	19.7 19.7	37.9 38.0	8.07 8.07	96.8 96.4	7.07 7.04		6.4 6.7		9.2	
		Bottom	21.5	19.7 19.7	38.0 38.0	8.08 8.08	96.7 96.3	7.05 7.02		5.8 5.9		7.8	
	Other Observations:				Nil								
CS1	08:47	Surface	1	18.9 19.0	37.1 37.1	8.00 8.01	93.5 94.7	6.96 7.06	7.04	3.1 3.2	4.2	8.4	5.3
		Middle	5	18.9 18.9	37.2 37.3	8.02 8.02	95.3 94.8	7.09 7.05		4.2 4.1		2.8	
		Bottom	9	19.1 19.1	37.4 37.4	8.03 8.03	95.7 96.0	7.12 7.14		5.3 5.5		4.8	
	Other Observations:				Nil								
CS2	09:01	Surface	1	19.1 19.1	37.3 37.3	8.02 8.02	94.0 94.2	6.97 6.99	7.03	4.3 4.2	4.7	5.4	8.0
		Middle	5	19.1 19.1	37.3 37.4	8.04 8.03	95.3 95.4	7.07 7.10		5.0 5.1		12.5	
		Bottom	9	19.2 19.2	37.5 37.5	8.04 8.04	95.0 94.8	7.05 7.03		4.7 4.6		6.2	
	Other Observations:				Nil								
CS3	09:17	Surface	1	19.6 19.5	37.8 37.8	8.05 8.04	94.6 94.2	6.94 6.91	6.97	6.4 6.3	6.3	7.4	8.3
		Middle	11.5	19.5 19.5	37.8 37.8	8.06 8.07	95.4 95.8	7.00 7.03		6.7 6.8		8.9	
		Bottom	22	19.6 19.6	37.9 37.9	8.07 8.07	96.0 95.7	7.03 7.01		5.9 5.7		8.7	
	Other Observations:				Nil								

* Contains sample results < detection limit but assumed to be at the detection limit for the sake of computation.

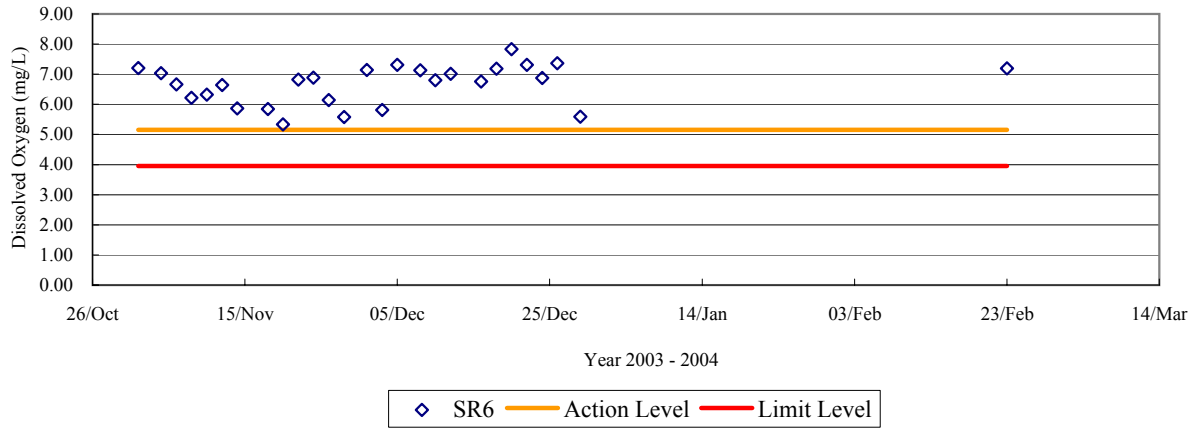
Date: 23/2/2004
Weather: Overcast
Sea Condition: Moderate
Tide: Mid-Ebb

Water Quality Monitoring Result

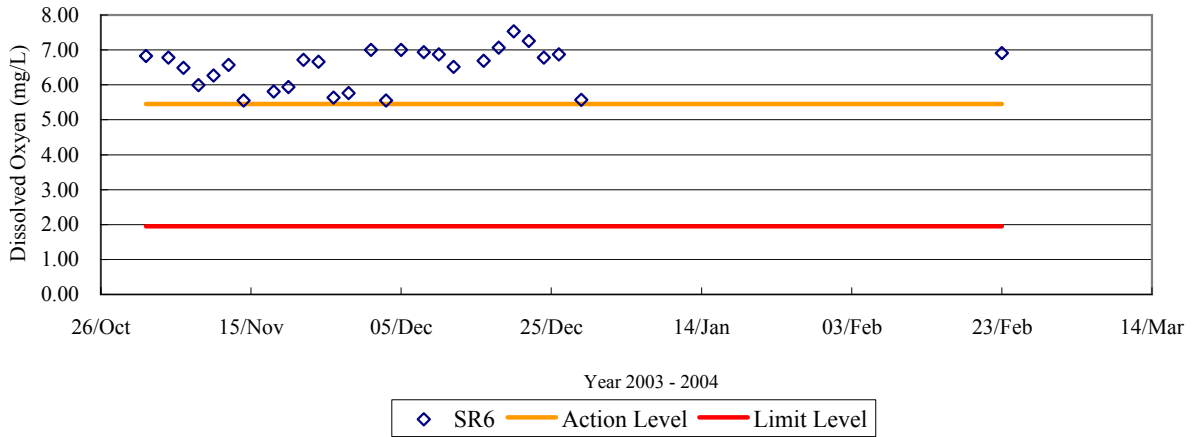
Location	Time	Depth (m)		Temp. (°C)	Salinity (ppt)	pH	D.O. Sat. (%)	D.O. (mg/L)		Turbidity (NTU)		S.S. (mg/L)	
								Value	DA	Value	DA	Average	DA
SR6	15:22	Surface	1	19.6	37.5	8.05	101.3	7.46	7.54	9.7	8.7	5.9	6.4
				19.5	37.5	8.06	101.8	7.49		9.4			
		Middle	11	19.7	37.7	8.07	104.1	7.61		9.0			
	Bottom	20.5	19.9	38.1	8.09	105.8	7.67	7.68	7.5	4.2			
Other Observations:				Nil									
SR7	15:09	Surface	1	19.8	37.7	8.08	107.9	7.89	7.91	7.5	6.1	9.7	7.6
				19.8	37.6	8.07	107.6	7.87		7.3			
		Middle	4.5	19.9	37.8	8.09	109.2	7.93		5.6			
	Bottom	8	19.9	38.0	8.10	109.9	7.98	7.99	5.2	5.2			
Other Observations:				Nil									
SR10	14:56	Surface	1	20.2	38.1	8.10	97.8	7.07	7.19	4.7	4.7	5.5	5.9
				20.2	38.1	8.11	97.6	7.05		4.6			
		Middle	4	20.3	38.1	8.12	101.3	7.32		4.0			
	Bottom	7	20.3	38.1	8.13	101.4	7.33	7.29	5.5	5.3			
Other Observations:				Nil									
SR11	14:45	Surface	1	20.1	38.2	8.12	101.2	7.31	7.51	6.3	6.2	6.0	5.9
				20.1	38.2	8.12	102.5	7.40		6.1			
		Middle	4	20.3	38.1	8.14	105.8	7.65		4.8			
	Bottom	6.5	20.2	38.1	8.15	100.1	7.25	7.22	7.6	7.4			
Other Observations:				Nil									
SR12	14:33	Surface	1	20.2	38.1	8.13	100.6	7.27	7.30	6.8	6.0	6.3	5.7
				20.2	38.1	8.12	100.9	7.30		6.7			
		Middle	4	20.2	38.2	8.14	101.2	7.32		5.9			
	Bottom	7	20.2	38.2	8.14	101.1	7.31	7.29	5.7	5.5			
Other Observations:				Nil									
SR14	14:21	Surface	1	20.2	38.2	8.12	99.4	7.19	7.23	5.6	6.7	6.3	7.6
				20.2	38.2	8.12	99.7	7.21		5.4			
		Middle	4.5	20.2	38.2	8.14	100.5	7.27		5.8			
	Bottom	8	20.2	38.2	8.14	100.2	7.25	7.20	5.9	8.8			
Other Observations:				Nil									
SR15	14:08	Surface	1	20.0	38.1	8.09	96.0	6.97	7.12	8.4	7.3	6.2	7.3
				20.0	38.1	8.10	96.7	7.02		8.2			
		Middle	11	20.1	38.2	8.12	99.9	7.25		7.0			
	Bottom	20.5	20.1	38.2	8.12	99.7	7.23	7.23	6.9	6.5			
Other Observations:				Nil									
CS1	13:25	Surface	1	19.2	37.2	8.04	95.0	7.04	7.08	8.7	7.0	7.3	5.0
				19.2	37.3	8.03	94.7	7.02		8.9			
		Middle	4.5	19.2	37.3	8.04	96.2	7.13		6.8			
	Bottom	8	19.1	37.3	8.04	96.3	7.14	7.10	7.0	5.3			
Other Observations:				Nil									
CS2	13:38	Surface	1	18.8	36.8	8.01	92.6	6.94	6.95	5.5	6.6	3.9	5.8
				18.7	36.8	8.01	92.7	6.95		5.6			
		Middle	5	18.7	36.8	8.01	92.9	6.96		5.7			
	Bottom	8.5	18.7	36.8	8.01	92.5	6.93	7.00	5.7	8.3			
Other Observations:				Nil									
CS3	13:54	Surface	1	20.1	38.1	8.10	98.8	7.16	7.21	6.4	6.5	6.3	7.0
				20.1	38.1	8.11	99.1	7.19		6.5			
		Middle	11	20.1	38.1	8.12	100.0	7.25		5.6			
	Bottom	21	20.1	38.1	8.14	99.7	7.23	7.21	5.8	7.1			
Other Observations:				Nil									

* Contains sample results < detection limit but assumed to be at the detection limit for the sake of computation.

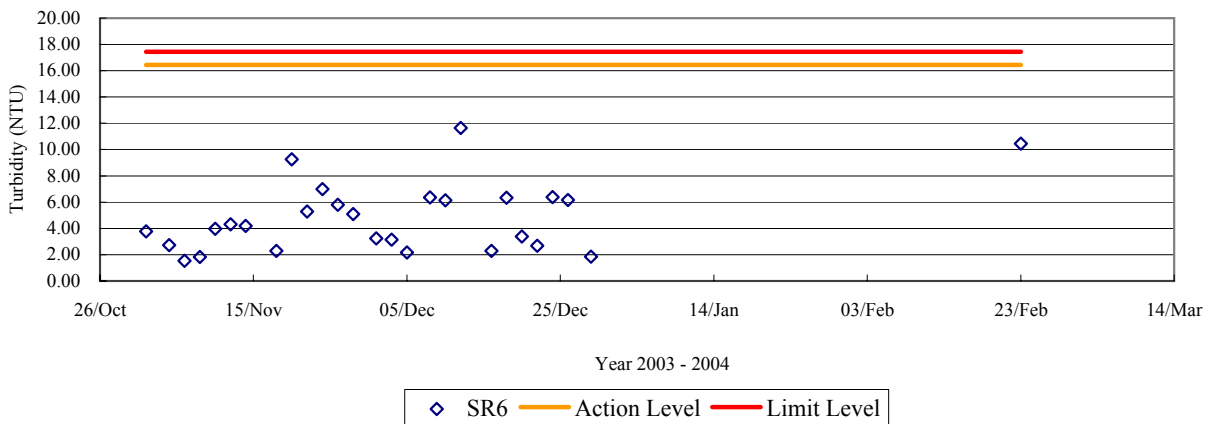
Dissolved Oxygen (Surface & Middle) at Location SR6 for Mid-Flood Tide



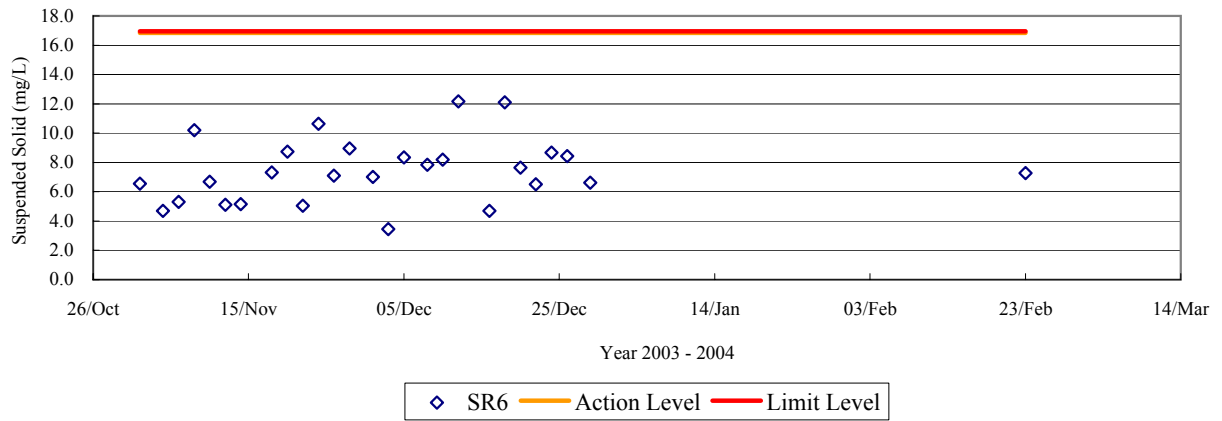
Dissolved Oxygen (Bottom) at Location SR6 for Mid-Flood Tide



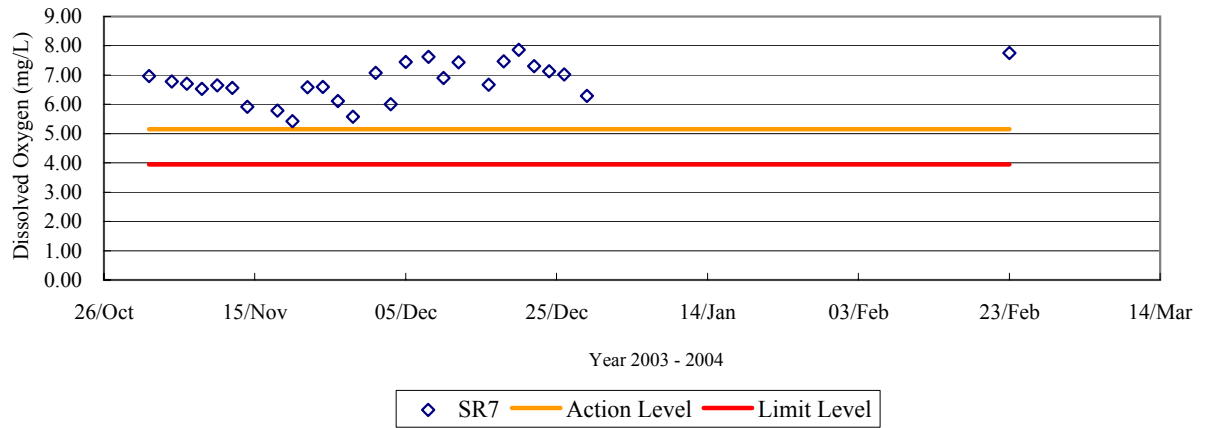
Turbidity (Depth Averaged) at Location SR6 for Mid-Flood Tide



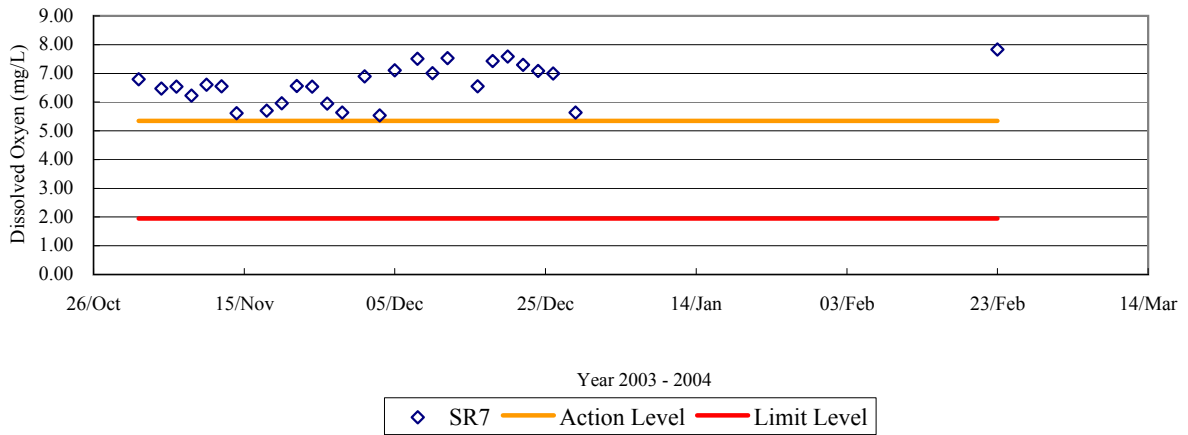
Suspended Solid (Depth Averaged) at Location SR6 for Mid-Flood Tide



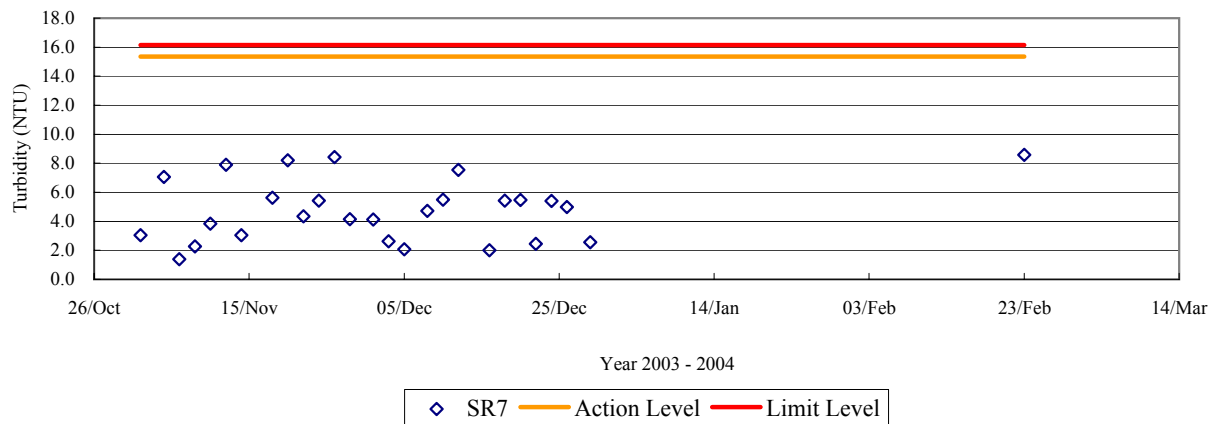
Dissolved Oxygen (Surface & Middle) at Location SR7 for Mid-Flood Tide



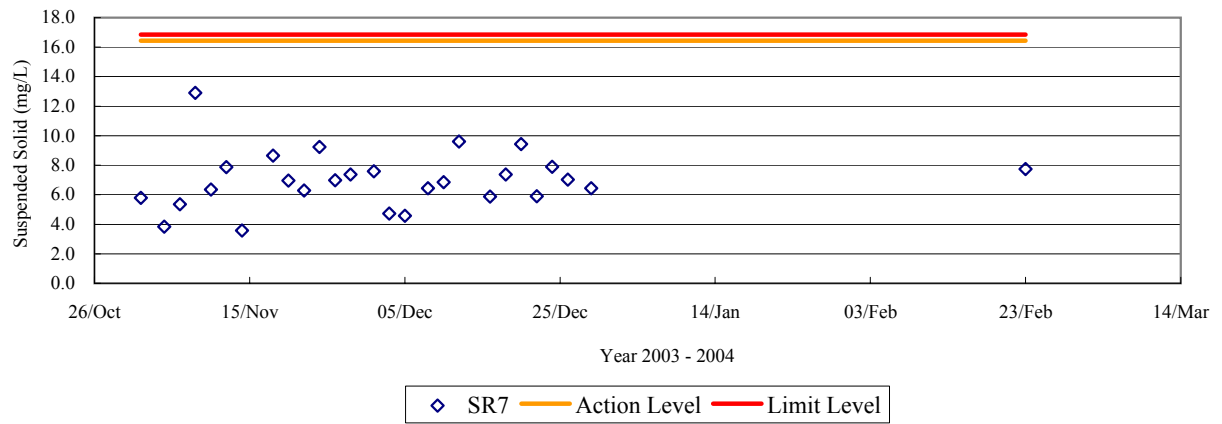
Dissolved Oxygen (Bottom) at Location SR7 for Mid-Flood Tide



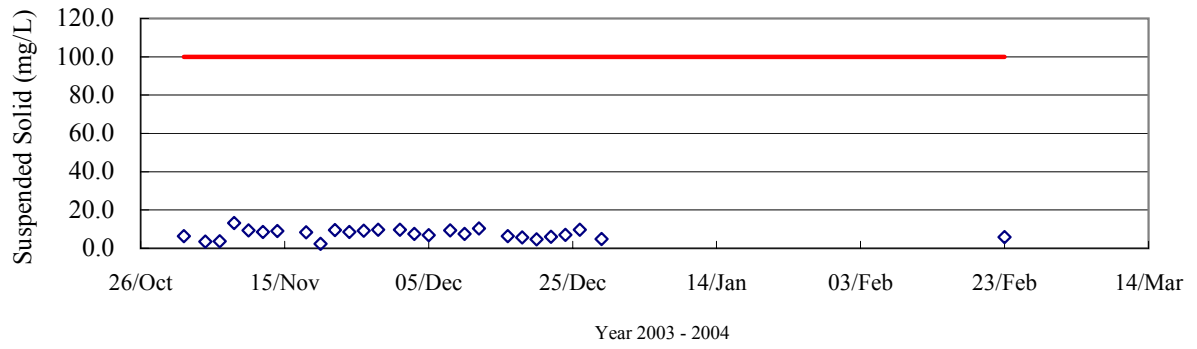
Turbidity (Depth Averaged) at Location SR7 for Mid-Flood Tide



Suspended Solid (Depth Averaged) at Location SR7 for Mid-Flood Tide

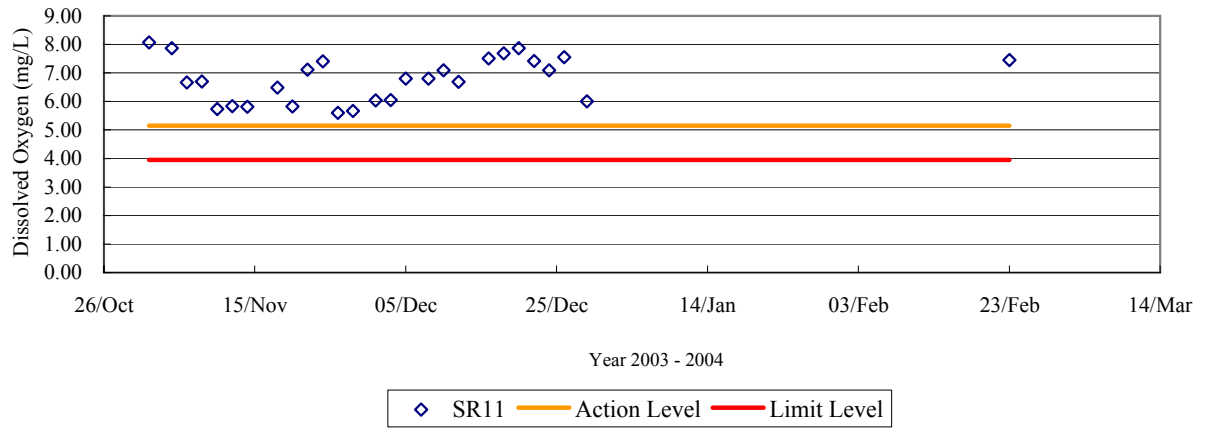


Suspended Solid (Depth Averaged) at Location SR10 for Mid-Flood Tide

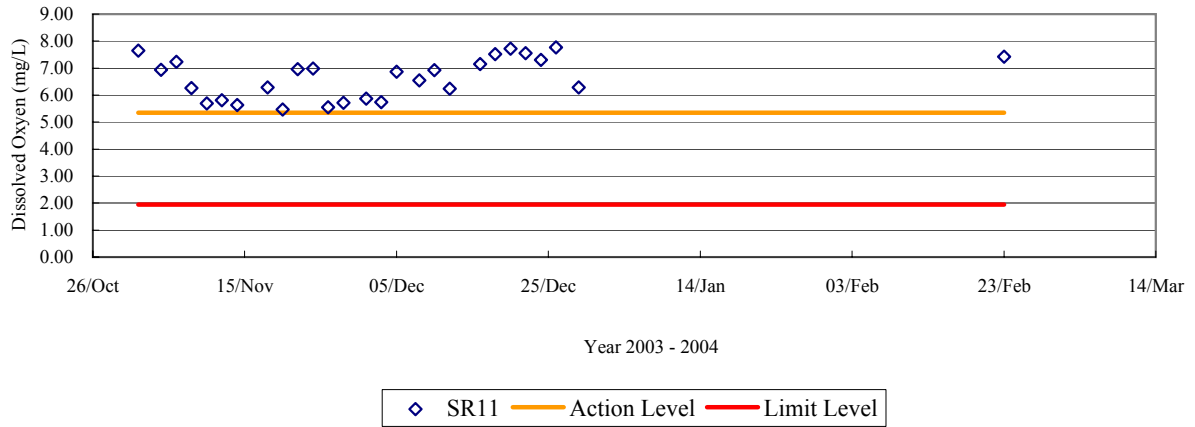


◆ SR10 — Limit Level

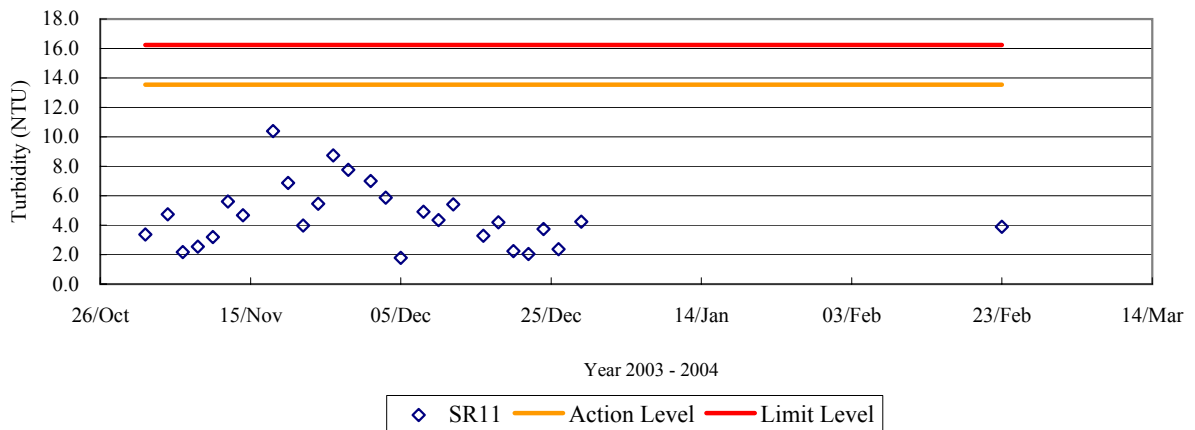
Dissolved Oxygen (Surface & Middle) at Location SR11 for Mid-Flood Tide



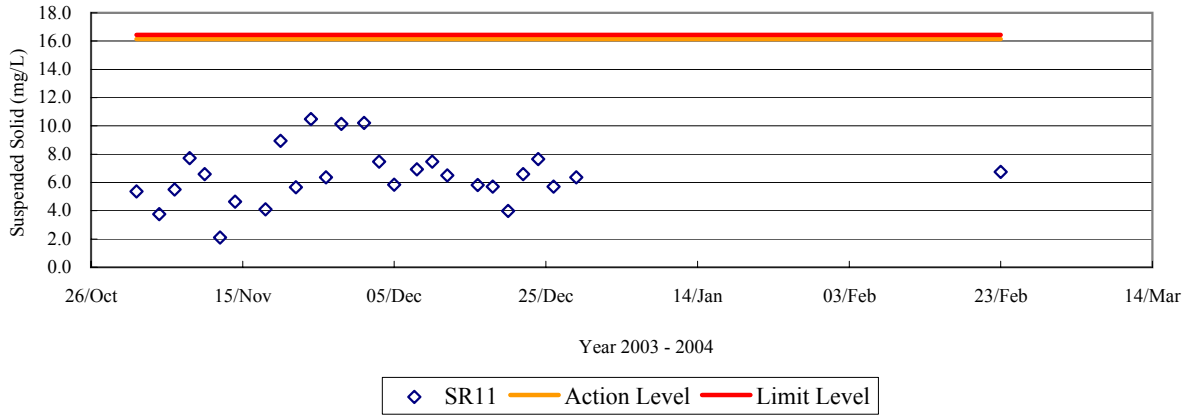
Dissolved Oxygen (Bottom) at Location SR11 for Mid-Flood Tide



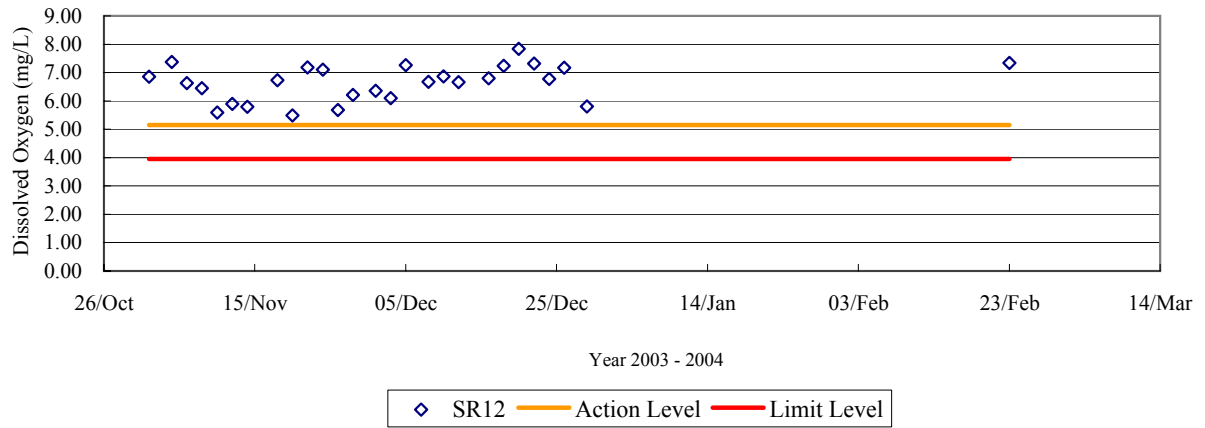
Turbidity (Depth Averaged) at Location SR11 for Mid-Flood Tide



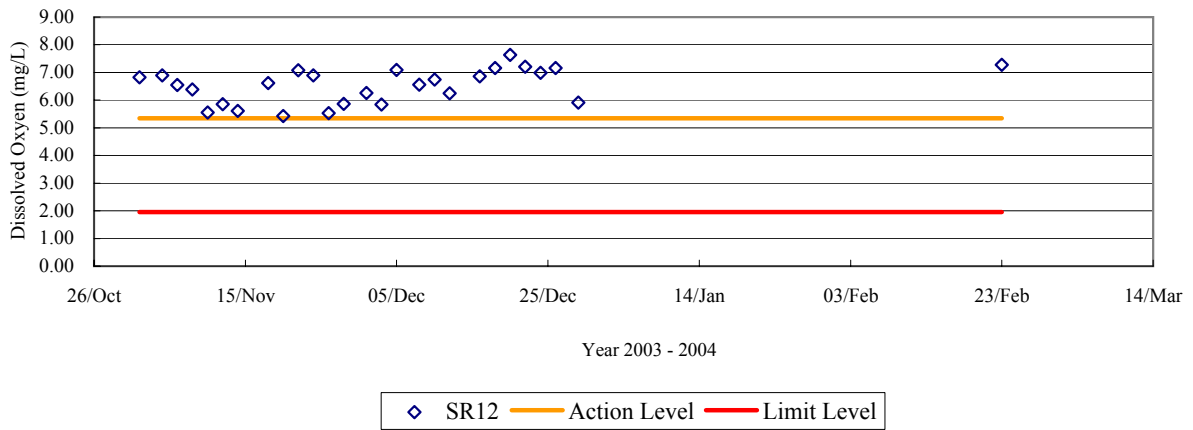
Suspended Solid (Depth Averaged) at Location SR11 for Mid-Flood Tide



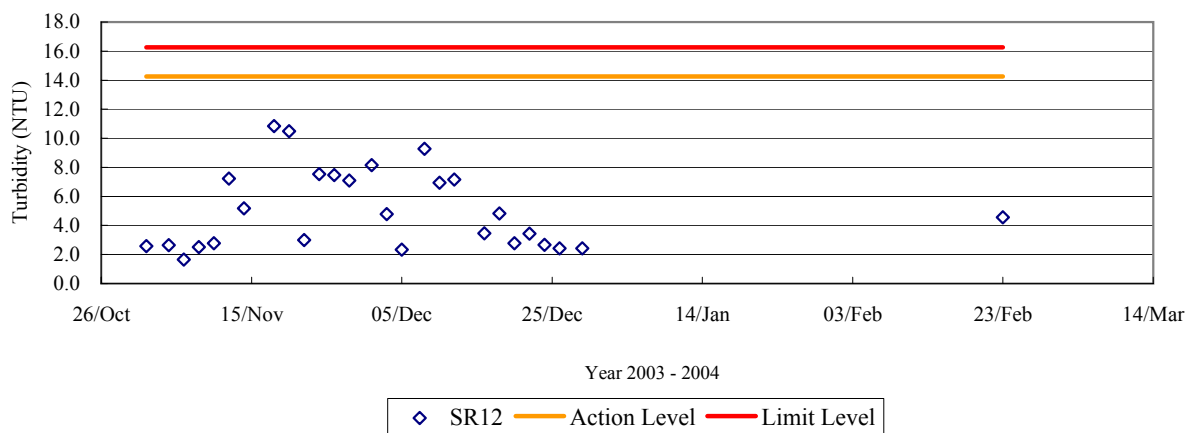
Dissolved Oxygen (Surface & Middle) at Location SR12 for Mid-Flood Tide



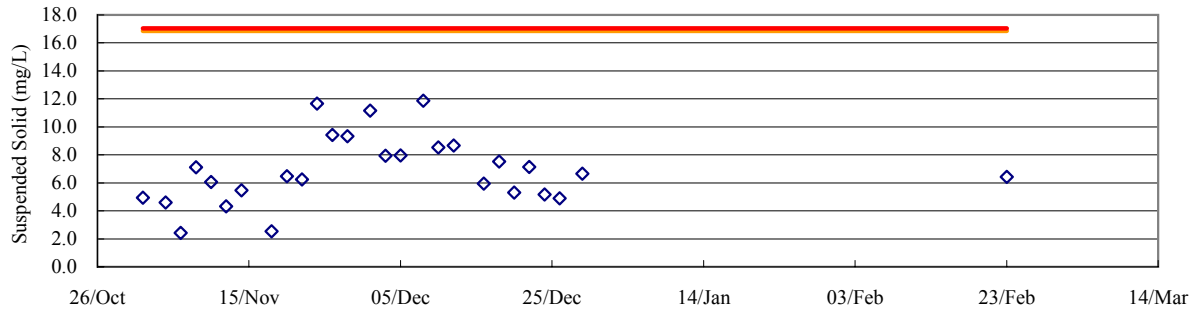
Dissolved Oxygen (Bottom) at Location SR12 for Mid-Flood Tide



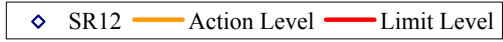
Turbidity (Depth Averaged) at Location SR12 for Mid-Flood Tide



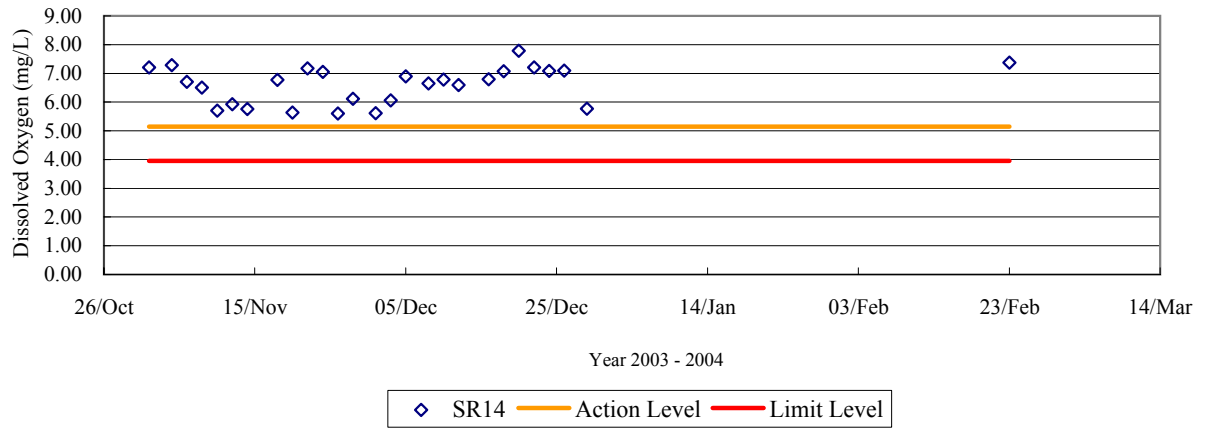
Suspended Solid (Depth Averaged) at Location SR12 for Mid-Flood Tide



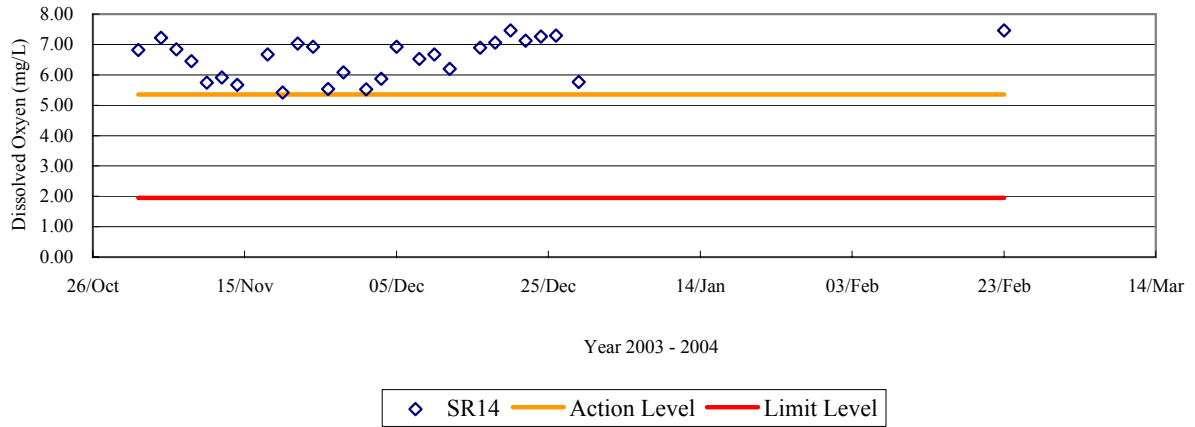
Year 2003 - 2004



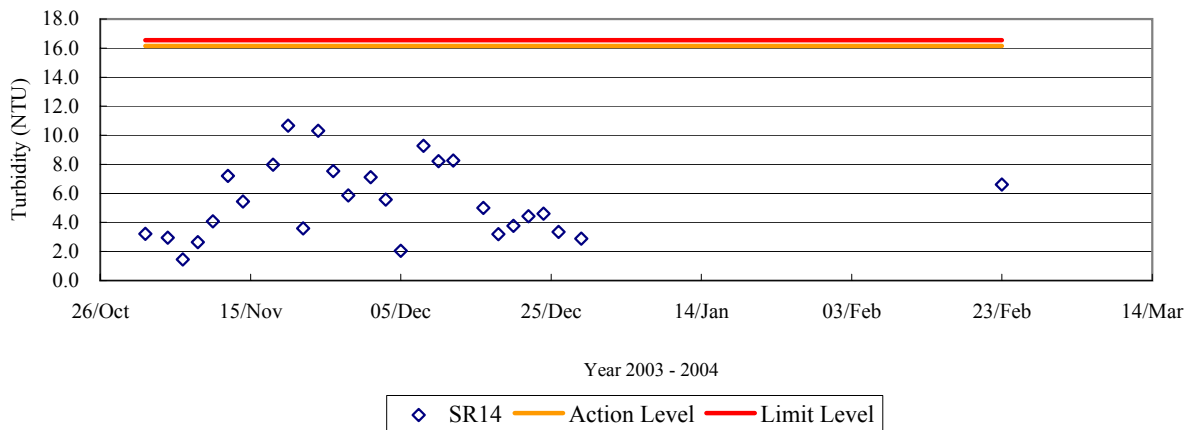
Dissolved Oxygen (Surface & Middle) at Location SR14 for Mid-Flood Tide



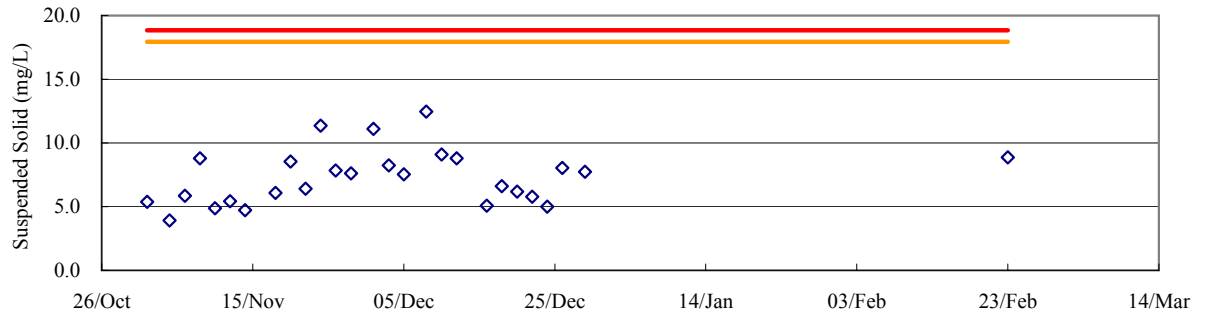
Dissolved Oxygen (Bottom) at Location SR14 for Mid-Flood Tide



Turbidity (Depth Averaged) at Location SR14 for Mid-Flood Tide

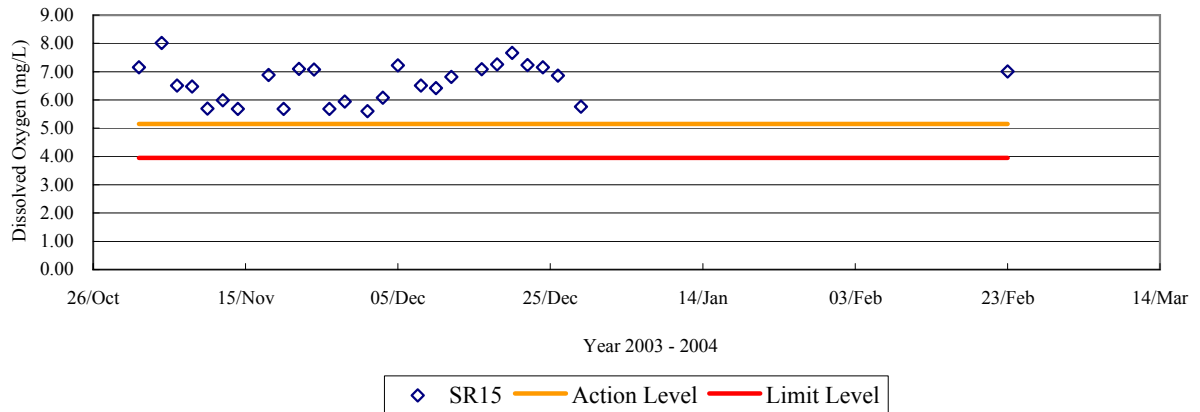


Suspended Solid (Depth Averaged) at Location SR14 for Mid-Flood Tide

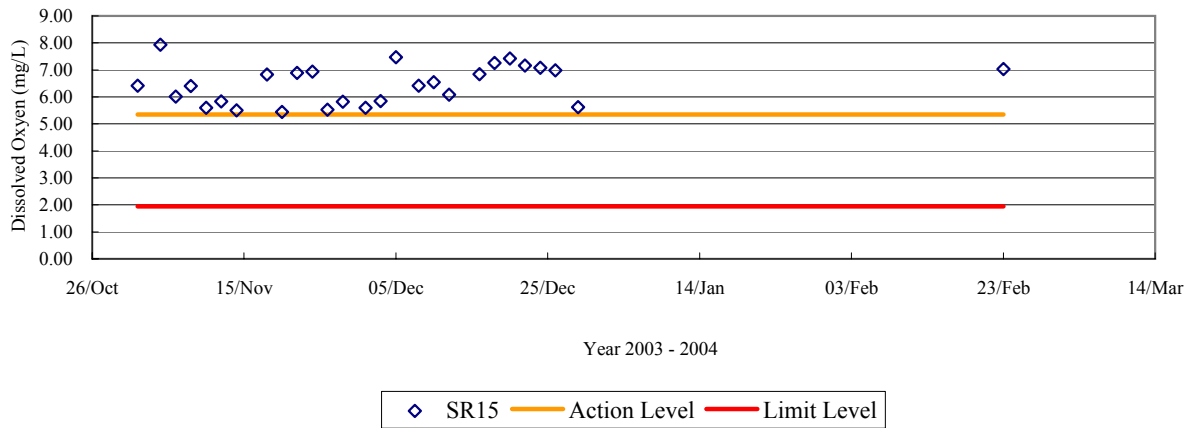


◆ SR14 — Action Level — Limit Level

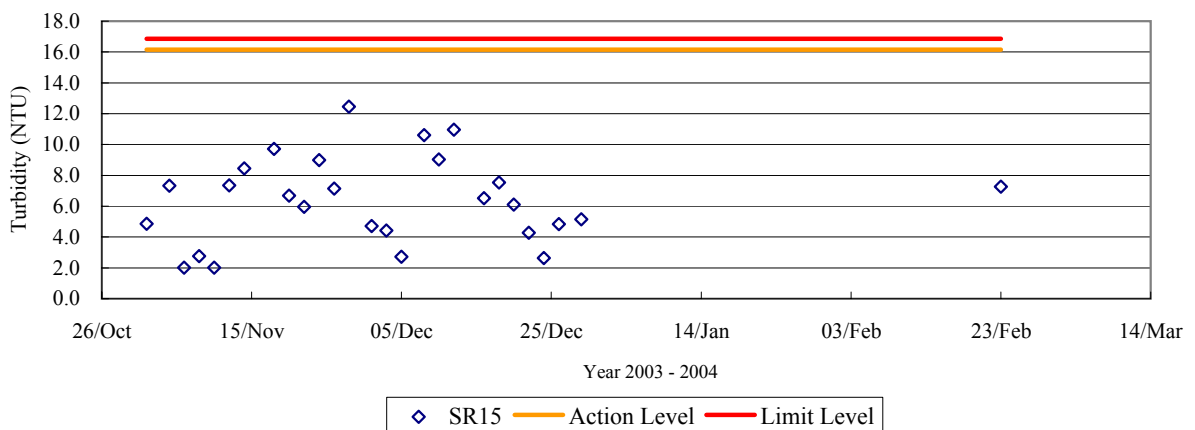
Dissolved Oxygen (Surface & Middle) at Location SR15 for Mid-Flood Tide



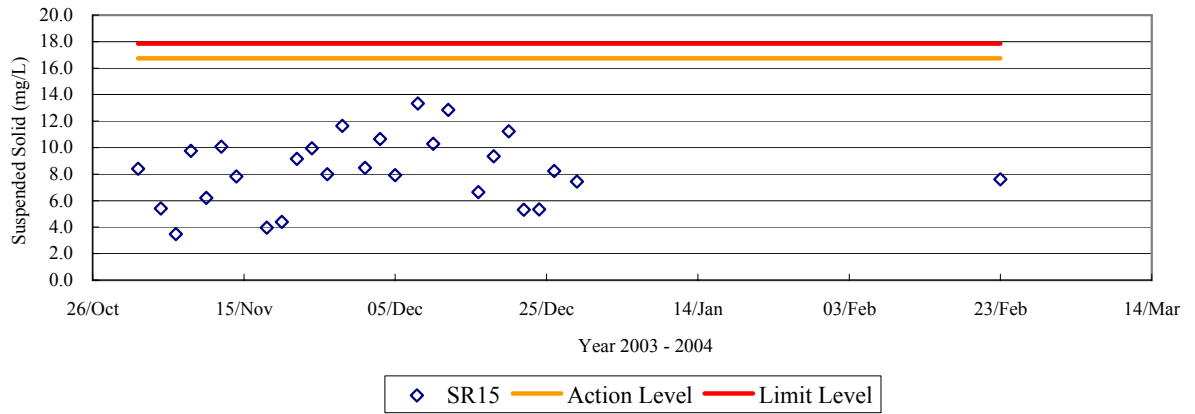
Dissolved Oxygen (Bottom) at Location SR15 for Mid-Flood Tide



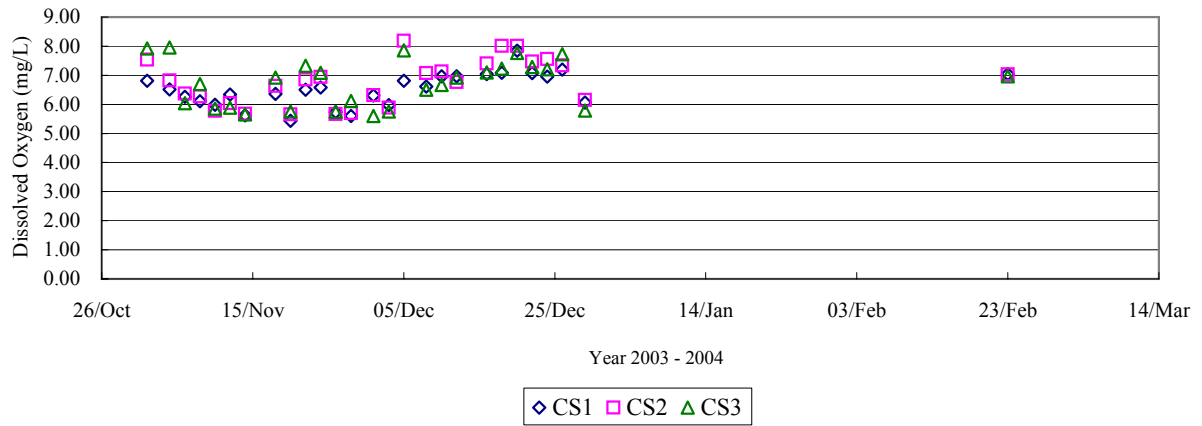
Turbidity (Depth Averaged) at Location SR15 for Mid-Flood Tide



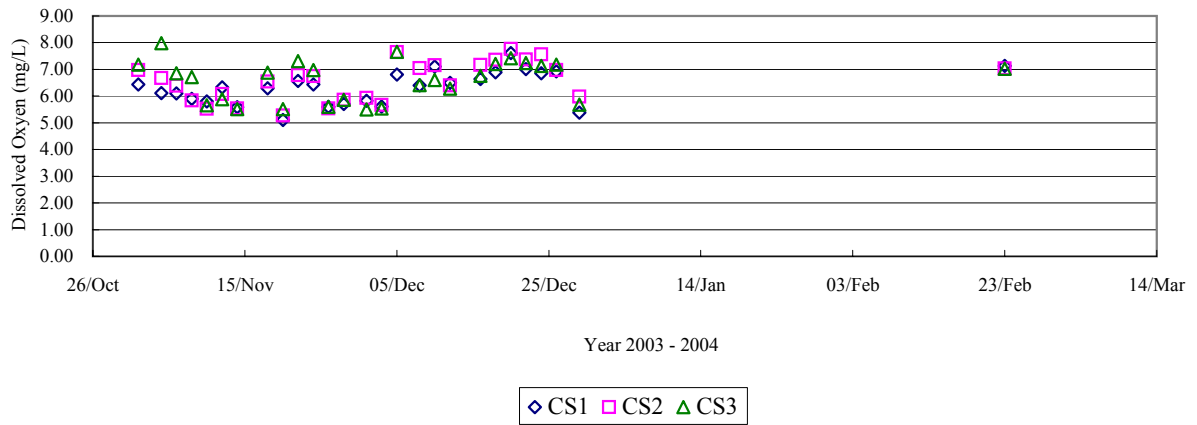
Suspended Solid (Depth Averaged) at Location SR15 for Mid-Flood Tide



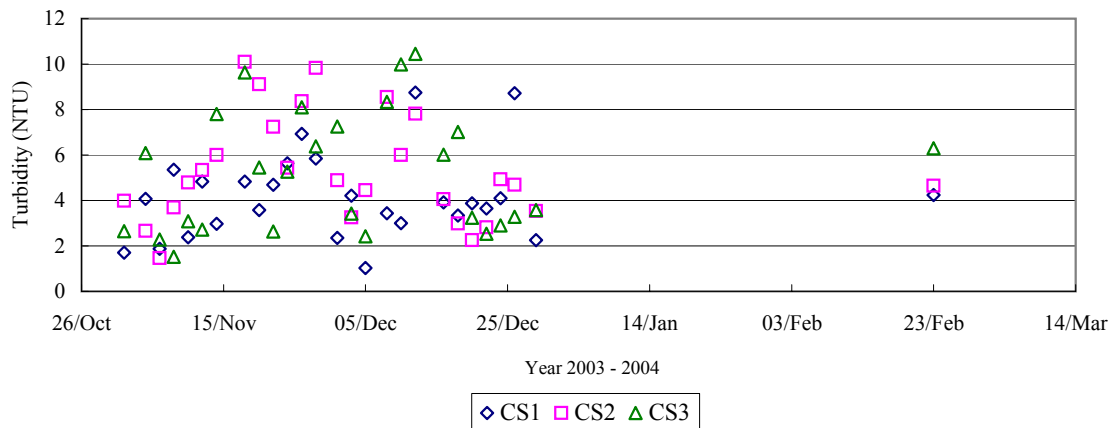
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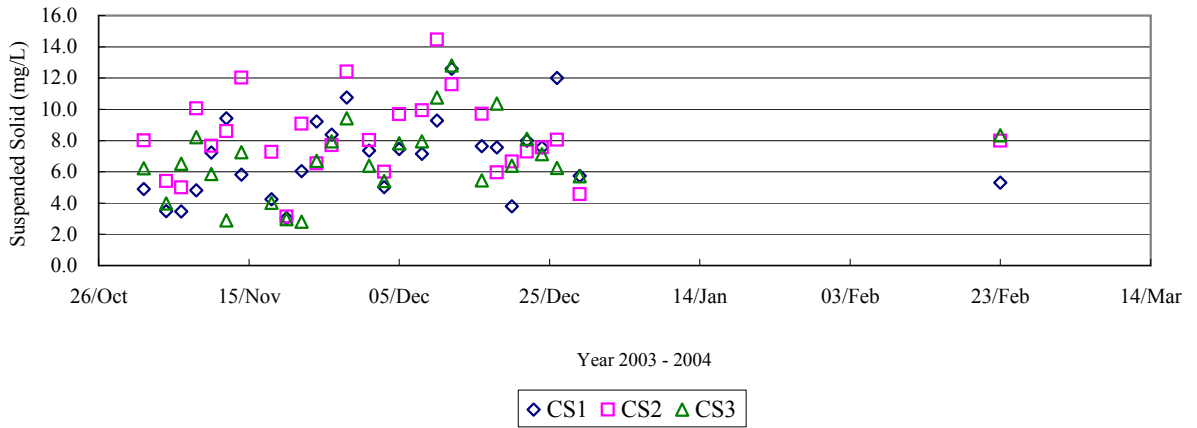
Dissolved Oxygen (Bottom) from CS1 to CS3 for Mid-Flood Tide



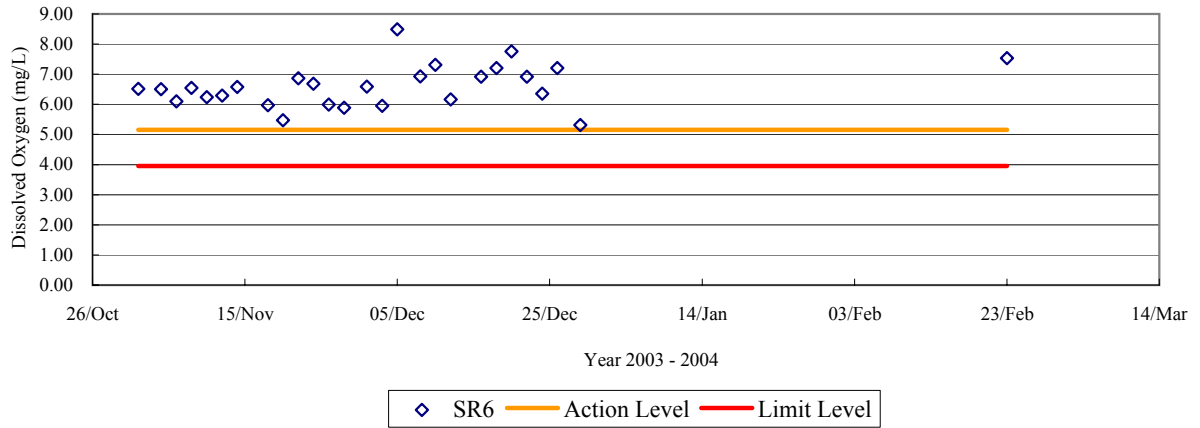
Turbidity (Depth Averaged) from CS1 to CS3 for Mid-Flood Tide



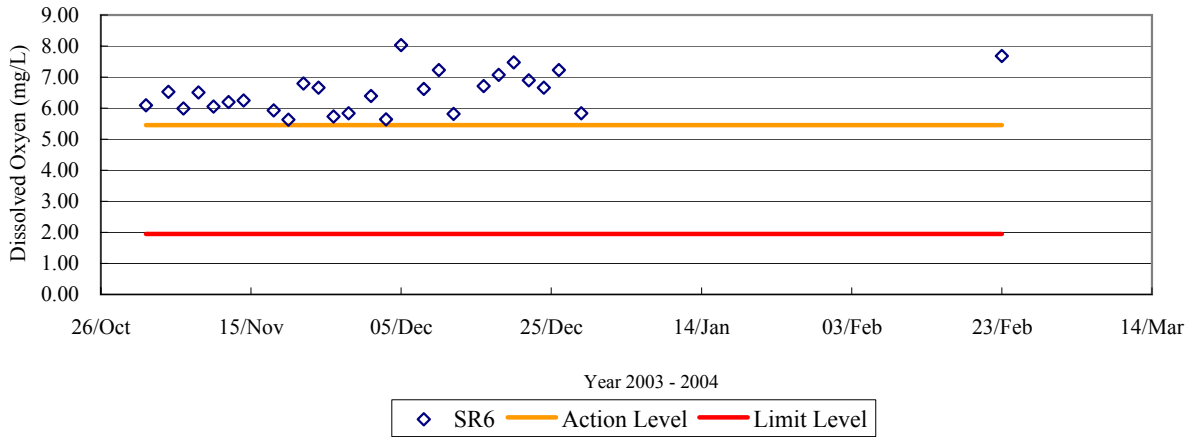
Suspended Solid (Depth Averaged) from CS1 to CS3 for Mid-Flood Tide



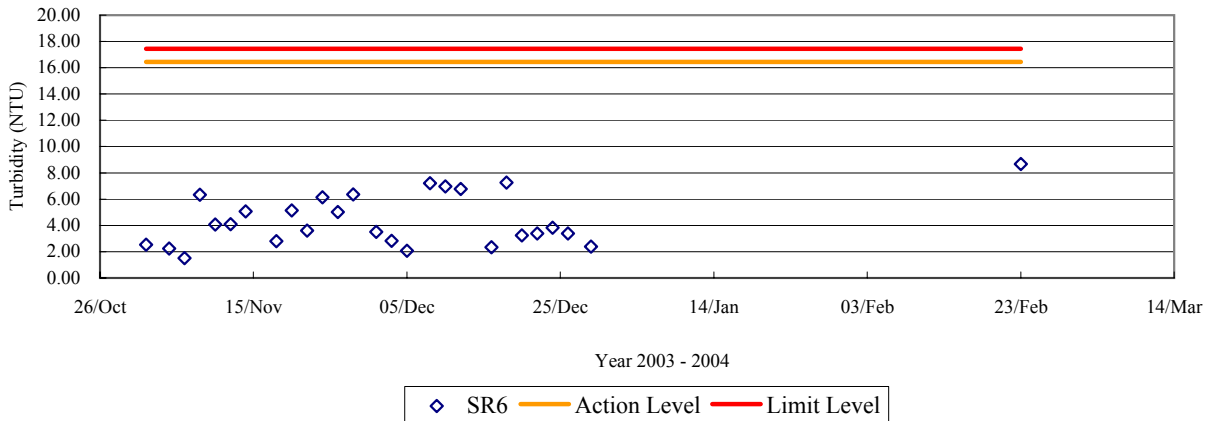
Dissolved Oxygen (Surface & Middle) at Location SR6 for Mid-Ebb Tide



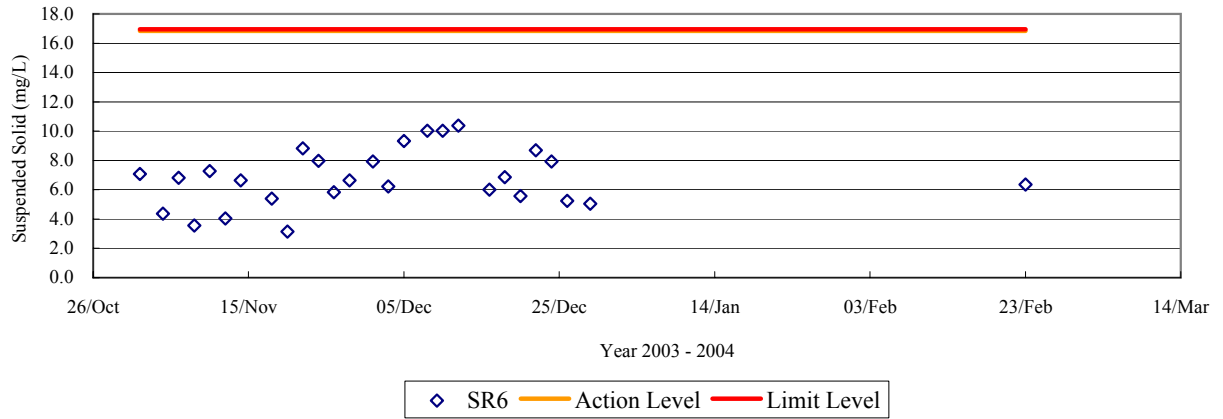
Dissolved Oxygen (Bottom) at Location SR6 for Mid-Ebb Tide



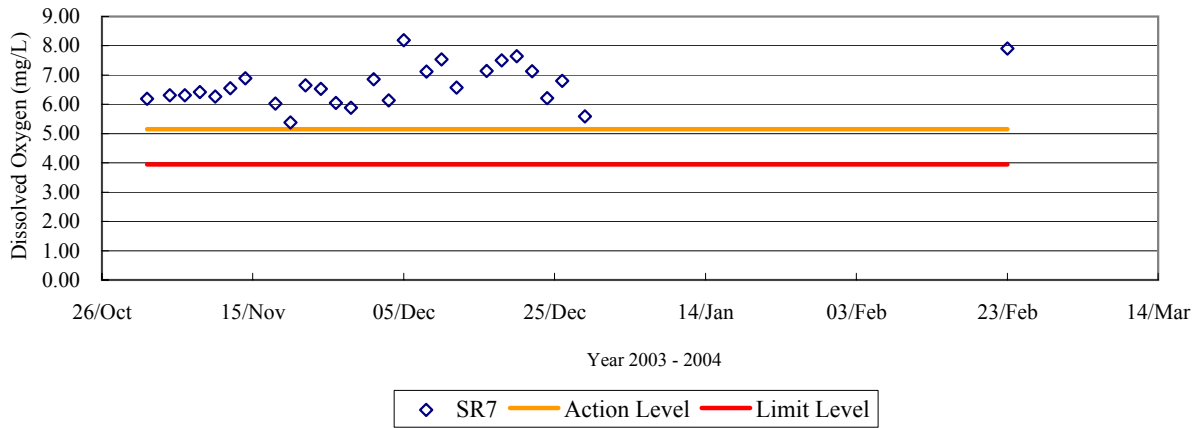
Turbidity (Depth Averaged) at Location SR6 for Mid-Ebb Tide



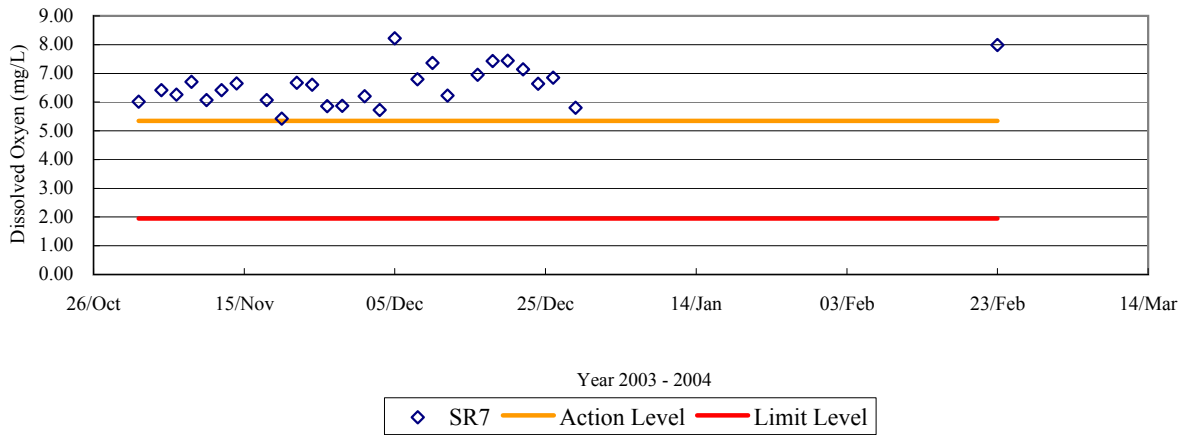
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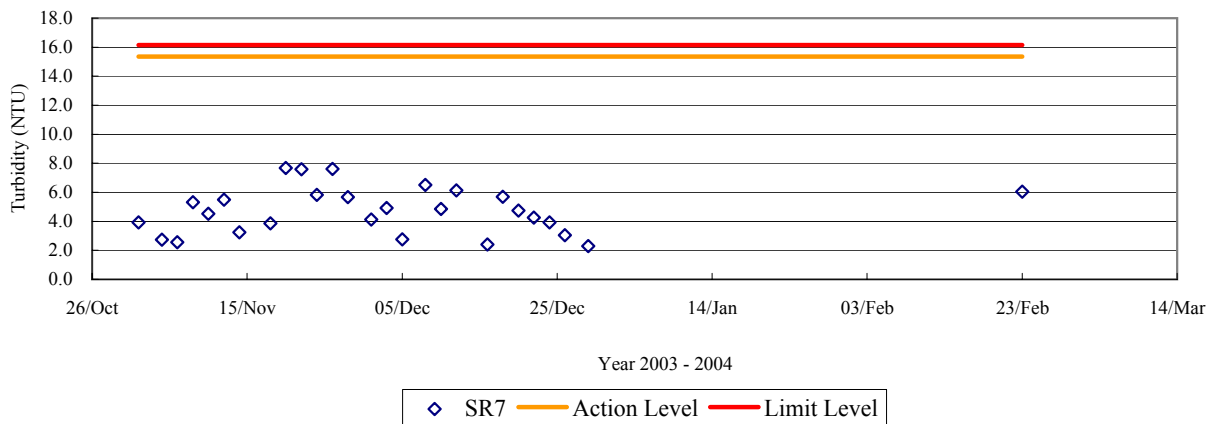
Dissolved Oxygen (Surface & Middle) at Location SR7 for Mid-Ebb Tide



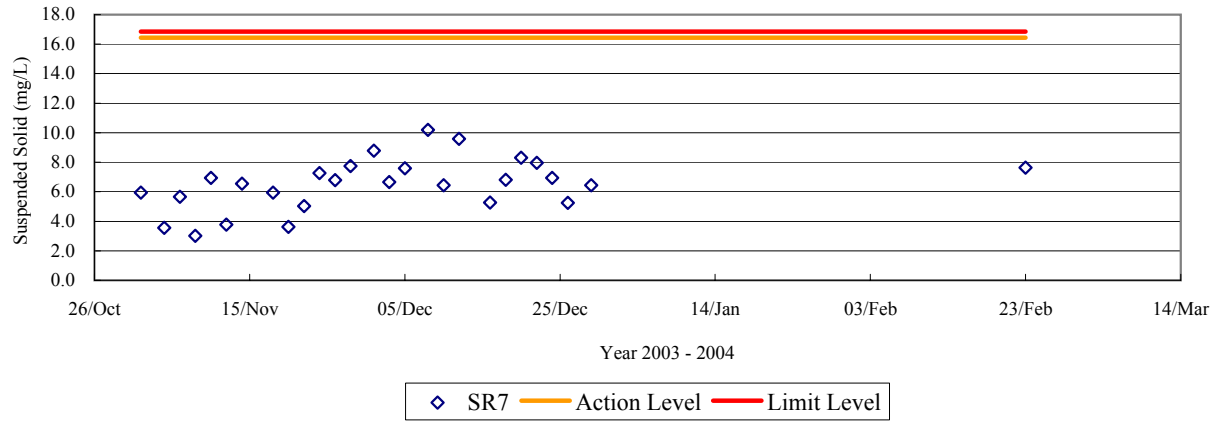
Dissolved Oxygen (Bottom) at Location SR7 for Mid-Ebb Tide



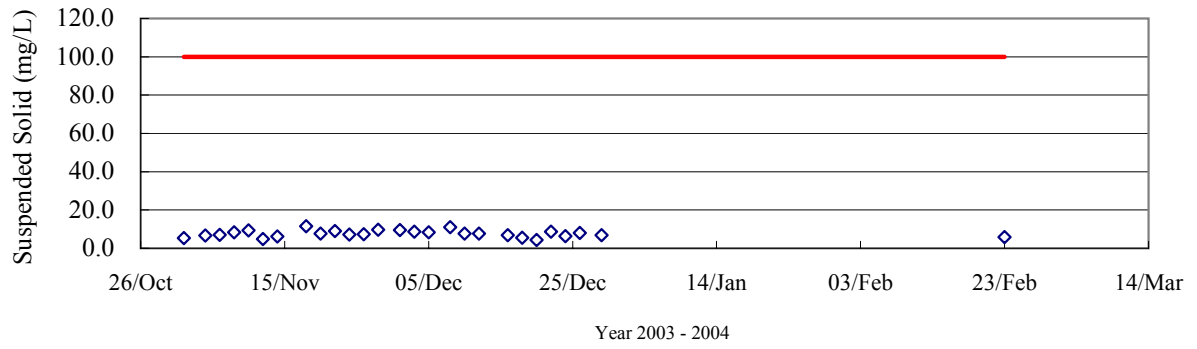
Turbidity (Depth Averaged) at Location SR7 for Mid-Ebb Tide



Suspended Solid (Depth Averaged) at Location SR7 for Mid-Ebb Tide

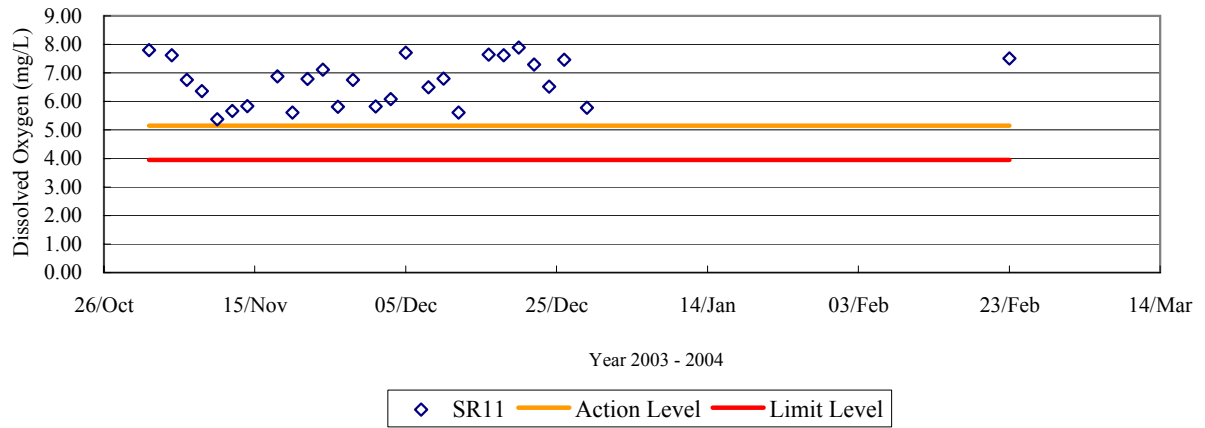


Suspended Solid (Depth Averaged) at Location SR10 for Mid-Ebb Tide

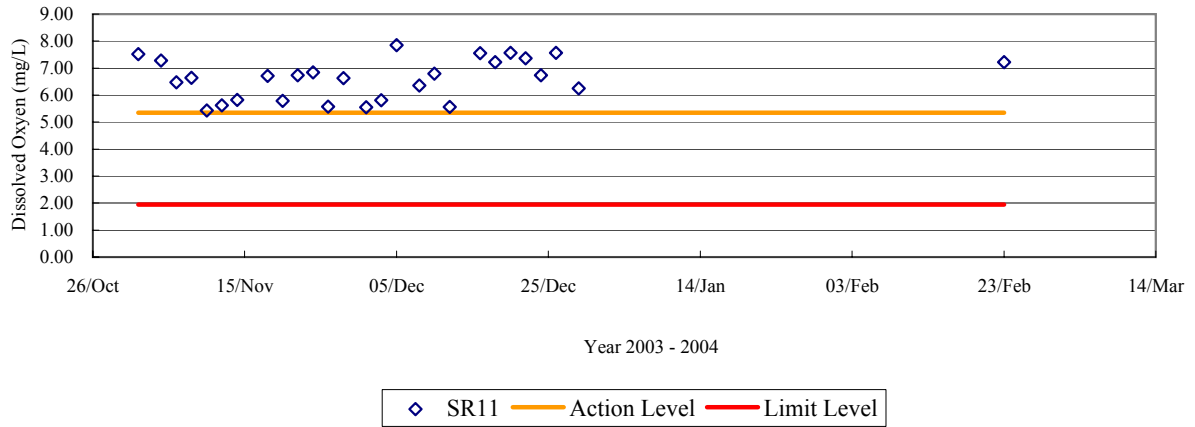


◆ SR10 — Limit Level

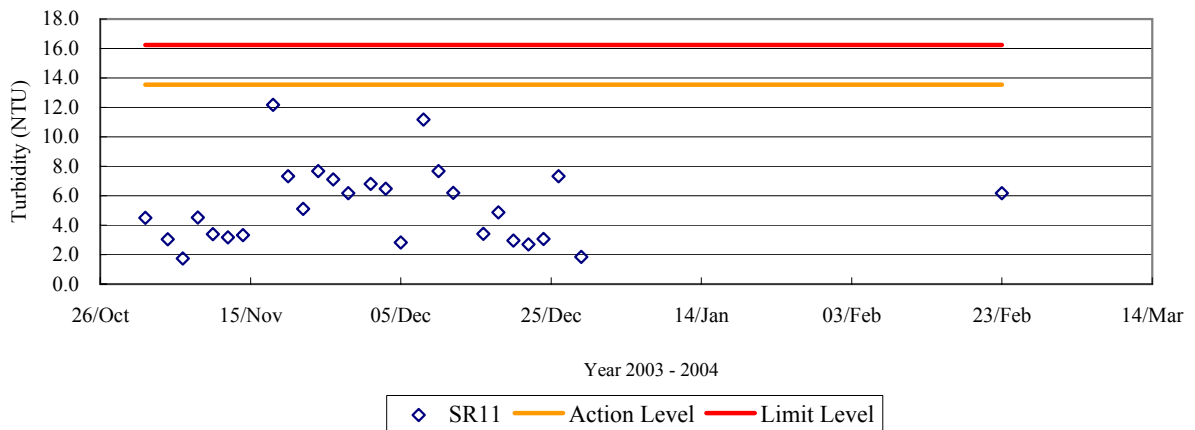
Dissolved Oxygen (Surface & Middle) at Location SR11 for Mid-Ebb Tide



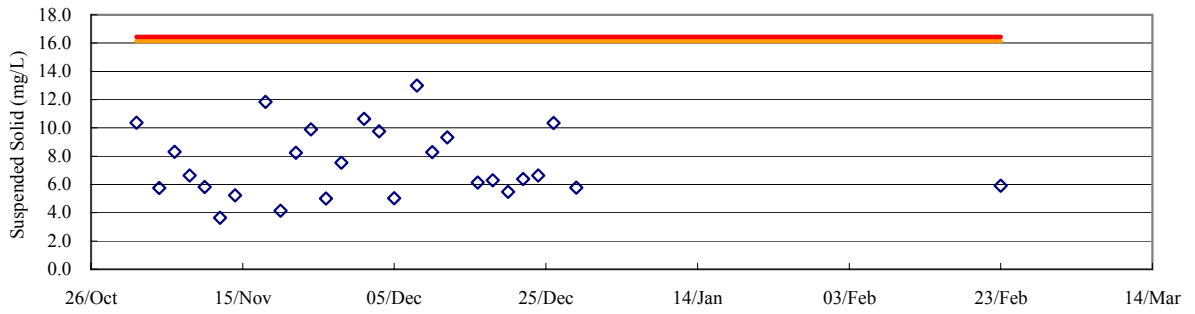
Dissolved Oxygen (Bottom) at Location SR11 for Mid-Ebb Tide



Turbidity (Depth Averaged) at Location SR11 for Mid-Ebb Tide



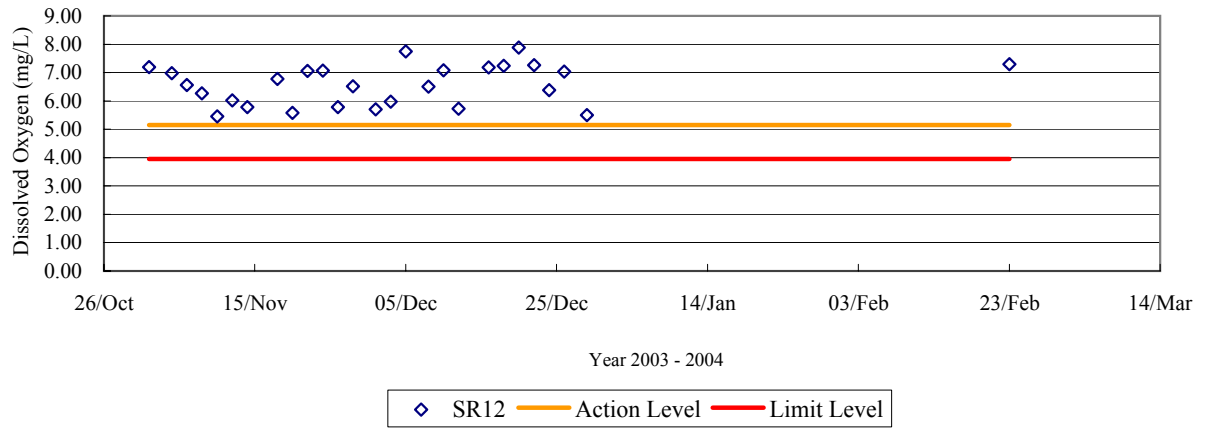
Suspended Solid (Depth Averaged) at Location SR11 for Mid-Ebb Tide



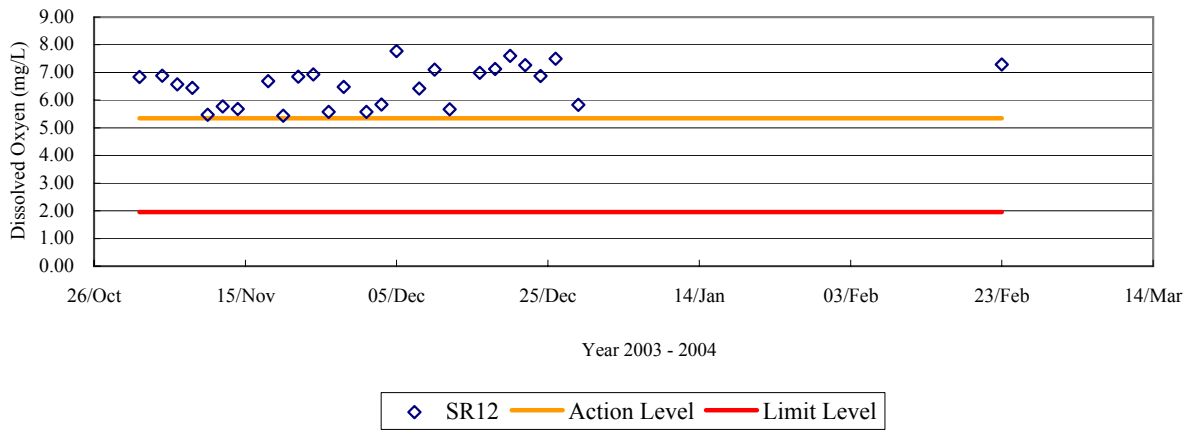
Year 2003 - 2004

◆ SR11 — Action Level — Limit Level

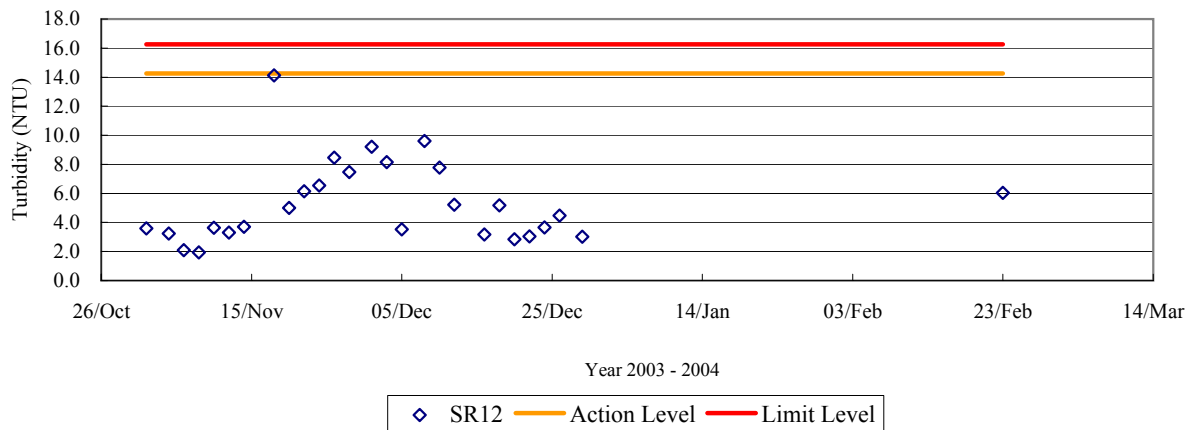
Dissolved Oxygen (Surface & Middle) at Location SR12 for Mid-Ebb Tide



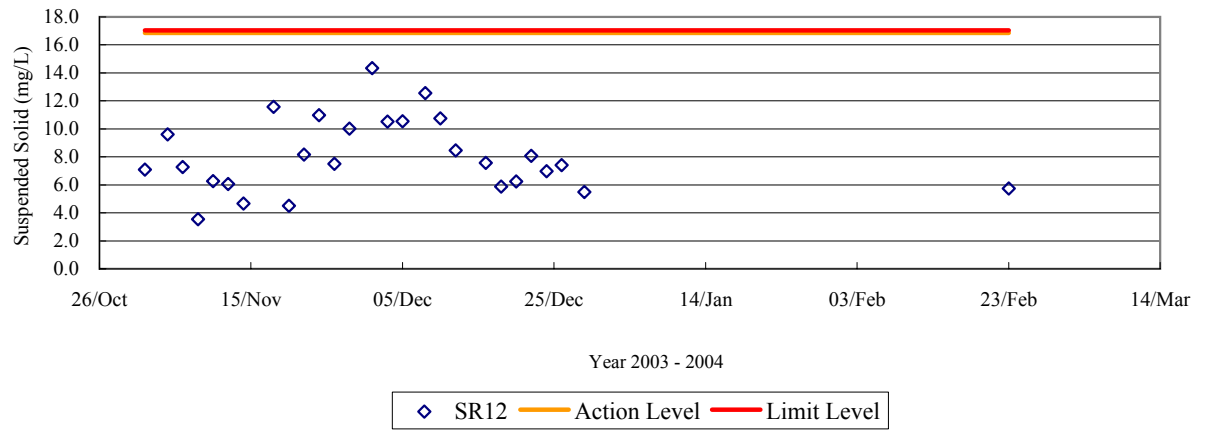
Dissolved Oxygen (Bottom) at Location SR12 for Mid-Ebb Tide



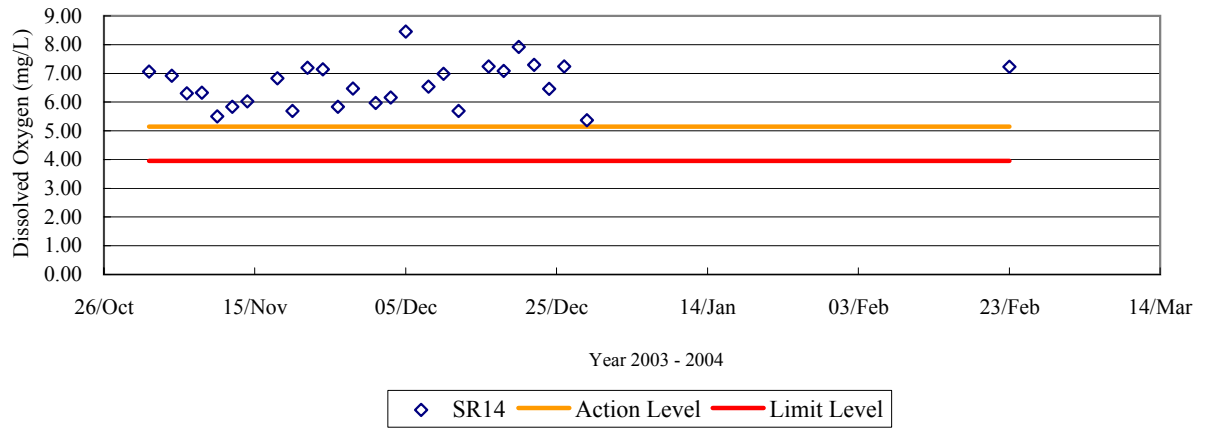
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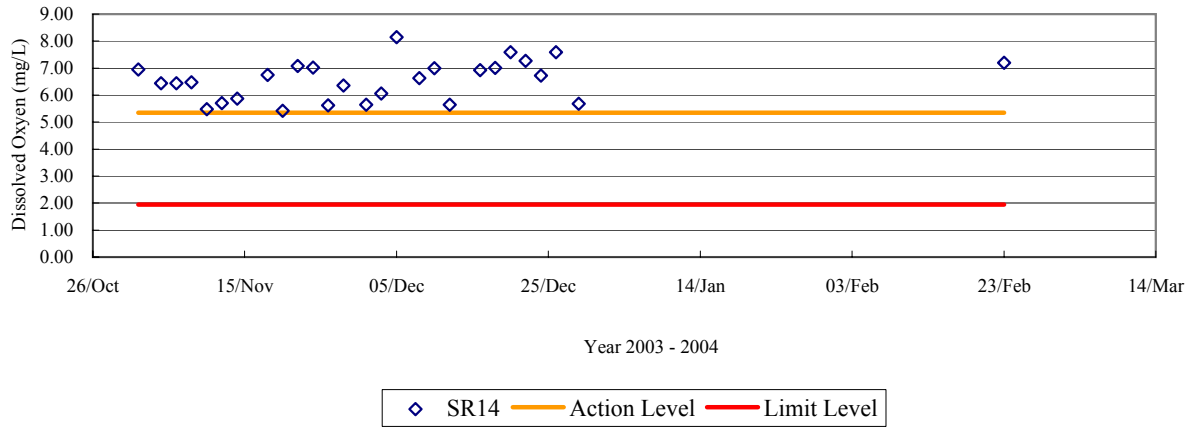
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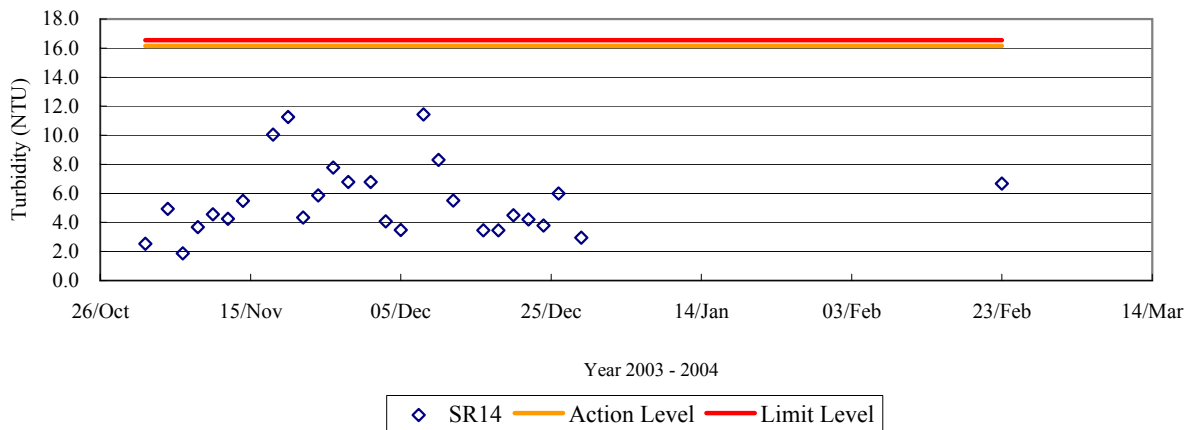
Dissolved Oxygen (Surface & Middle) at Location SR14 for Mid-Ebb Tide



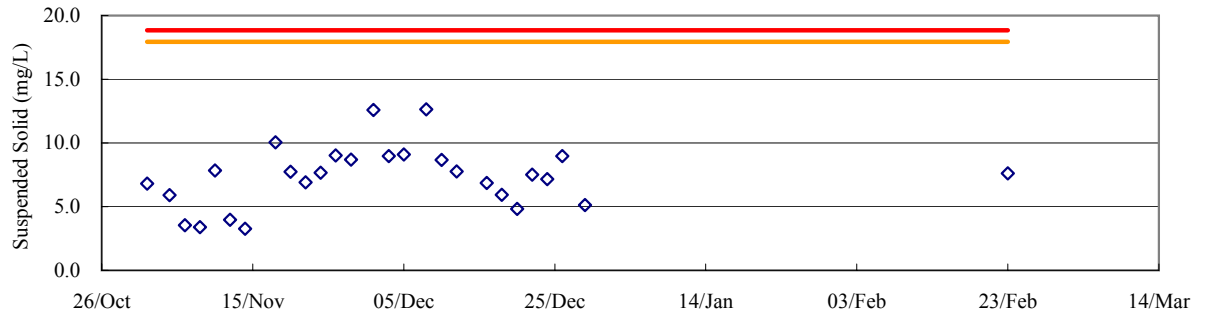
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Turbidity (Depth Averaged) at Location SR14 for Mid-Ebb Tide



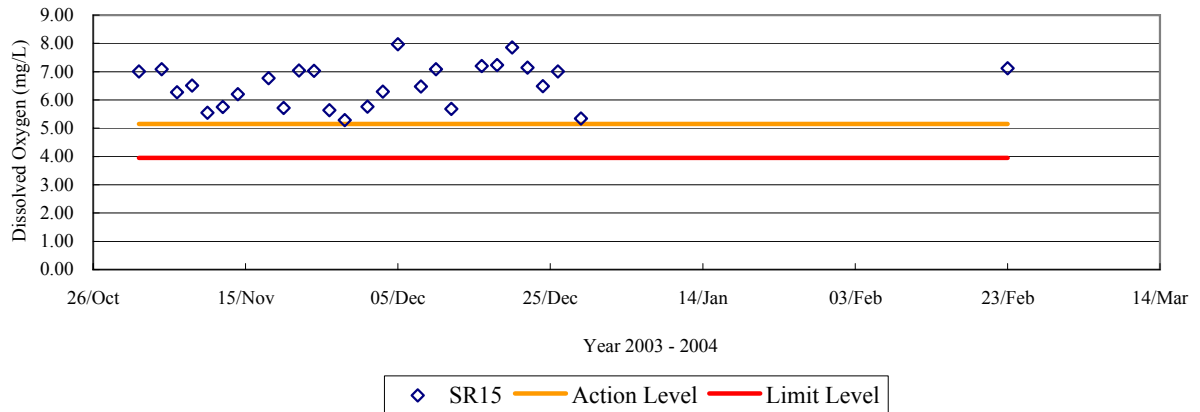
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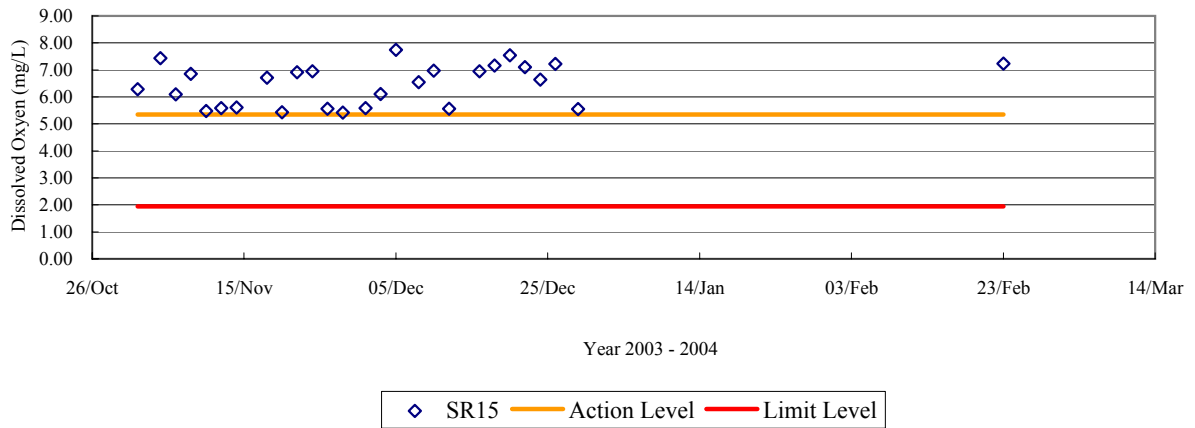
Year 2003 - 2004

◆ SR14 — Action Level — Limit Level

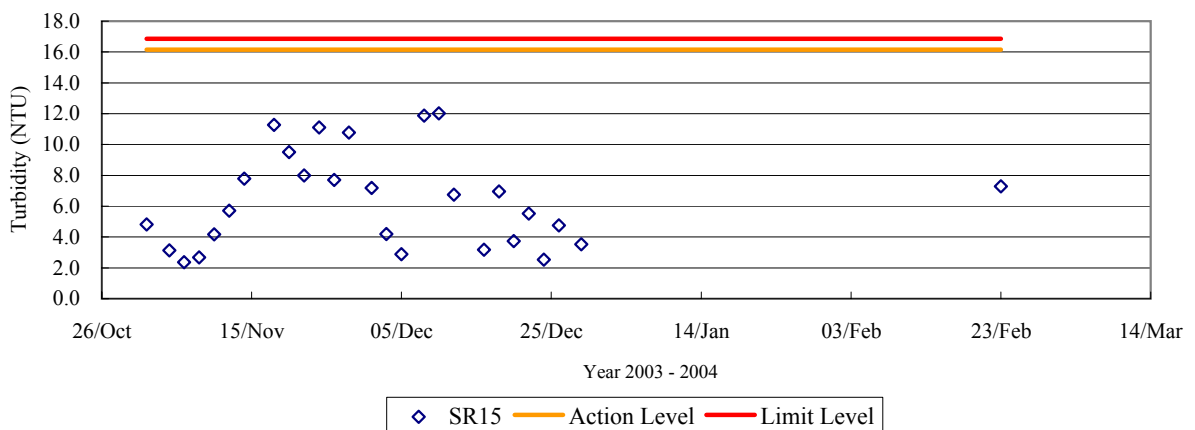
Dissolved Oxygen (Surface & Middle) at Location SR15 for Mid-Ebb Tide



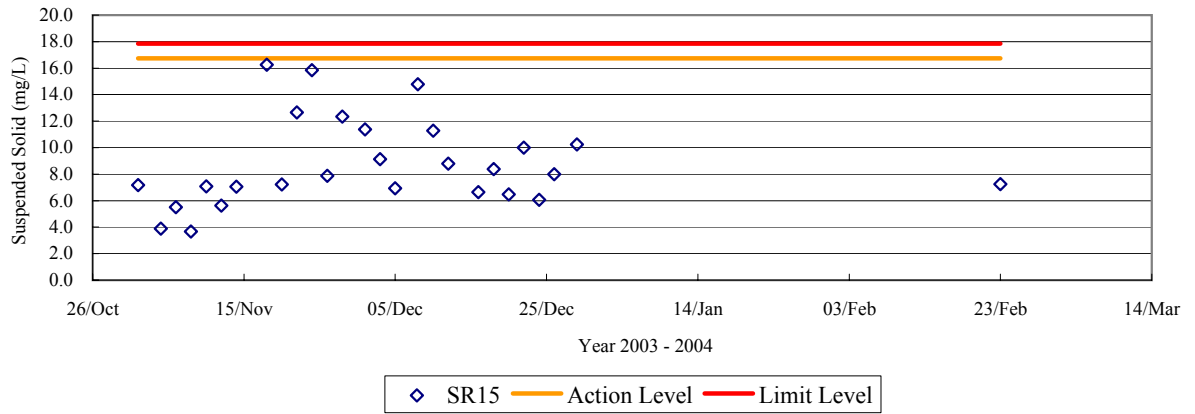
Dissolved Oxygen (Bottom) at Location SR15 for Mid-Ebb Tide



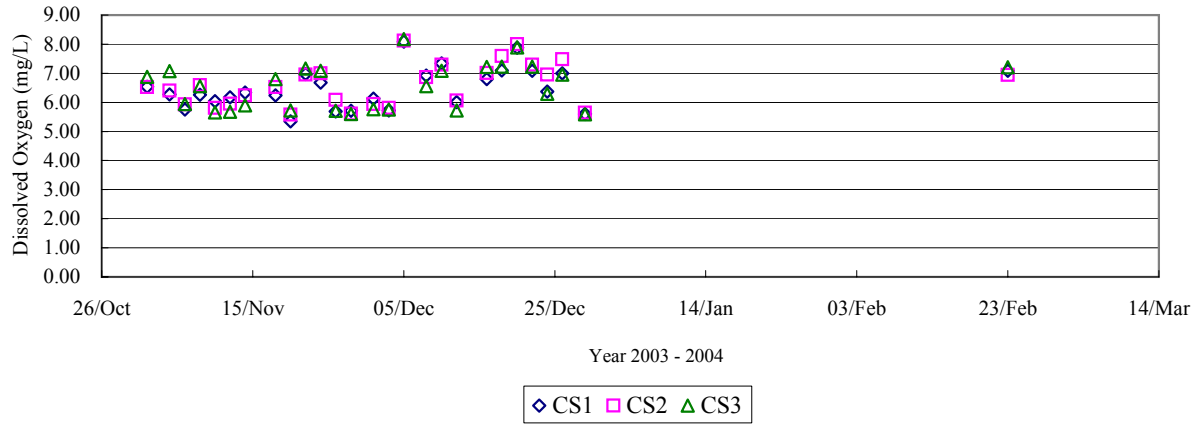
Turbidity (Depth Averaged) at Location SR15 for Mid-Ebb Tide



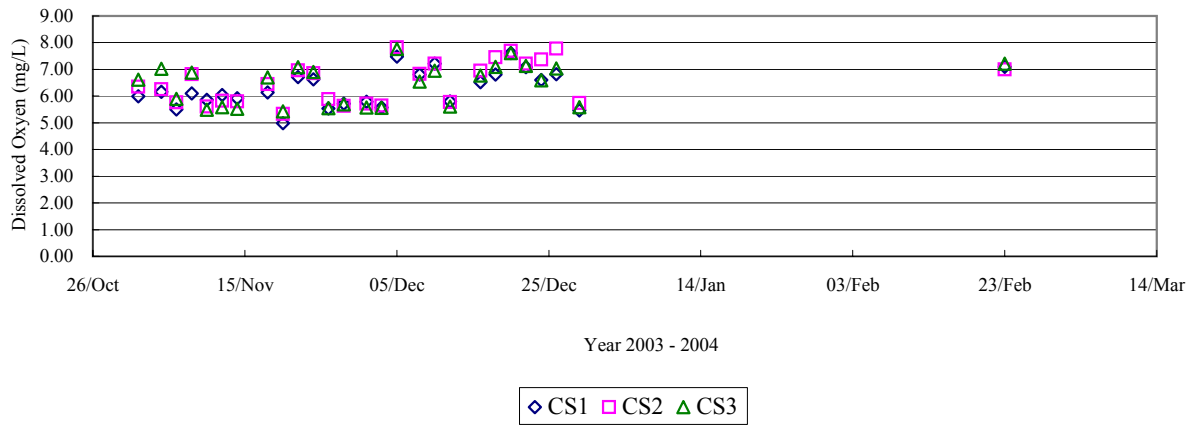
Suspended Solid (Depth Averaged) at Location SR15 for Mid-Ebb Tide



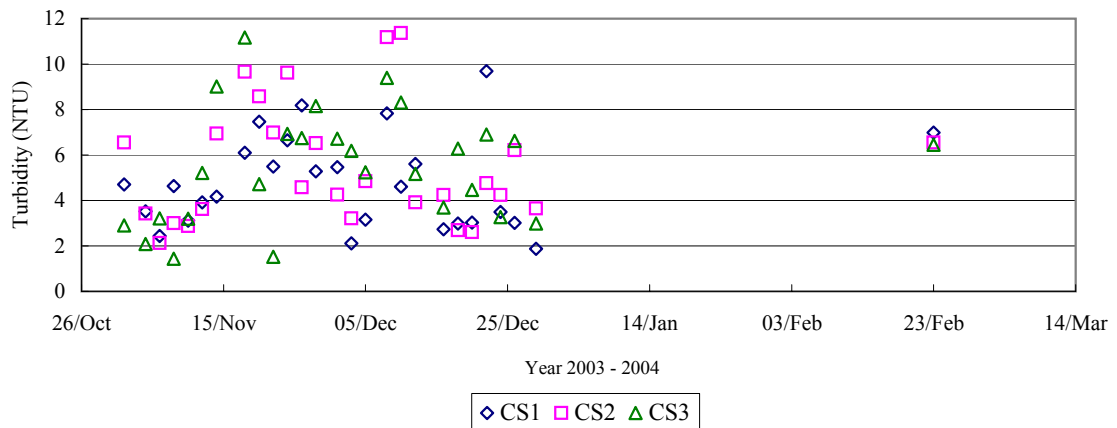
Dissolved Oxygen (Surface & Middle) from CS1 to CS3 for Mid-Ebb Tide



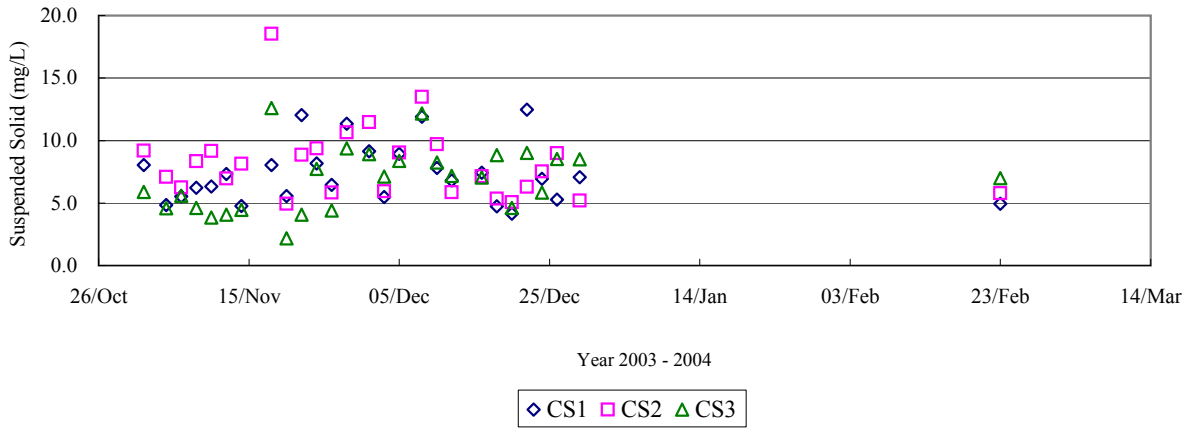
Dissolved Oxygen (Bottom) from CS1 to CS3 for Mid-Ebb Tide



Turbidity (Depth Averaged) from CS1 to CS3 for Mid-Ebb Tide



Suspended Solid (Depth Averaged) from CS1 to CS3 for Mid-Ebb Tide



Appendix F

Calibration Records and Laboratory QA/QC Results

Equipment Calibration Record

Equipment No.	YSI-6P20-1	Equipment Description	YSI 6P20 monitor
Calibration method reference	Ysi Calibration Manual	Calibration equipment used (if any)	-

	pH	DO	Turbidity
Use of reference material (if any)	pH 7.00 & pH 10.00 Duffer Hach Std.	-	0 NTU & 100 NTU Fomagic Turbidity Std.
Permissible tolerance of calibration	± 0.12 pH	± 5 %	± 5 %

Calibration Result

Date	Standard	pH		DO	Turbidity		Calibrated by
		7.00	10.00	100 %	0	100	
23/2/04	Before	7.02	10.01	100.7	0.6	100.1	Jim
	After	7.01	10.00	101.2	-0.4	99.8	Jim
25/2/04	Before	6.98	10.00	99.7	-0.1	101.4	KH Tran
	After	6.99	9.98	100.3	0.5	100.7	KH Tran
27/2/04	Before	6.97	9.99	99.4	0.8	98.8	Wanda
	After	6.99	9.99	99.1	-0.2	99.6	Wanda
	Before						
	After						
	Before						
	After						
	Before						
	After						
	Before						
	After						
	Before						
	After						
	Before						
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	Before						
	After						
	Before						
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	After						
	Before						
	After						
	Before						
	After						
	Before						
	After						

Approved by: K.H. Cherry

Date: 2/3/2004

SUMMARY OF QUALITY CONTROL DATA – QC SAMPLES RESULTS

Parameter	Control Limit	QC ID	Measured Value	QC ID	Measured Value	QC ID	Measured Value	QC ID	Measured Value	QC ID	Measured Value	QC ID	Measured Value	QC ID	Measured Value		
Suspended Solids mg/L	89 – 103%	P0402A14	95	P0402A28	89	P0402A41	94	P0402A56	92	P0402A70	91	P0402A83	99				

Total:6

SUMMARY OF QUALITY CONTROL DATA – BLANK RESULTS

Parameter	Control Limit	Blank ID	Measured Value	Blank ID	Measured Value	Blank ID	Measured Value	Blank ID	Measured Value	Blank ID	Measured Value	Blank ID	Measured Value	Blank ID	Measured Value
Suspended Solids mg/L	<1	P0402A15	<1	P0402A29	<1	P0402A42	<1	P0402A57	<1	P0402A71	<1	P0402A84	<1		

Total:6

SUMMARY OF QUALITY CONTROL DATA – DUPLICATE RESULTS

Parameter	Control Limit	Sample ID	Measured Value	Sample ID	Measured Value	Sample ID	Measured Value	Sample ID	Measured Value	Sample ID	Measured Value	Sample ID	Measured Value	Sample ID	Measured Value	
Suspended Solids mg/L	Exceed 20%	P0402A13	9.4	P0402A27	6.2	P0402A40	8.1	P0402A55	9.2	P0402A69	6.7	P0402A82	7.8			
			8.5		6.0		7.1		9.6		5.7		8.4			

Total:6

Appendix G Event/Action Plans

Exceedance	ET Leader	IEC	Engineer	Contractor
Action level exceeded on one sampling day	Verbally inform the Contractor, and IEC. Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, Engineer and Contractor; Repeat measurement on next day of exceedance.	Provide feedback to the Engineer on the remedial actions proposed by the ET / Contractor Advise Engineer on the effectiveness of the proposed remedial measures Verify the implementation of the remedial measures	Discuss with Contractor the proposed mitigation measures; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures.	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Propose and discuss mitigation measures with Engineer; Implement the agreed mitigation measures.
Action level exceeded on more than one consecutive sampling day	Repeat in-situ measurements to confirm findings; Identify source(s) of impact; Inform Contractor and IEC; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measure with IEC, Engineer and Contractor; Ensure mitigation measures are implemented; Prepare to increase the monitoring frequency to daily; Repeat measurement on next day of exceedance.	Provide feedback to the Engineer on the remedial actions proposed by the ET / Contractor Advise Engineer on the effectiveness of the proposed remedial measures Verify the implementation of the remedial measures	Discuss with ET and Contractor on the proposed mitigation measures; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures.	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Propose mitigation measures to Engineer within 3 working days and discuss with ET and Engineer; Implement the agreed mitigation measures.

Exceedance	ET Leader	IEC	Engineer	Contractor
Limit level exceeded on one sampling day	Verbally inform the Contractor, IEC and the EPD of the exceedance; Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measure with IEC, Engineer and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level.	Provide feedback to the Engineer on the remedial actions proposed by the ET / Contractor Advise Engineer on the effectiveness of the proposed remedial measures Verify the implementation of the remedial measures	Discuss with Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures.	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Propose mitigation measures to Engineer within 3 working days and discuss with Engineer; Implement the agreed mitigation measures.
Limit level exceeded by more than one consecutive sampling day	Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Inform Contractor, IEC and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measure with IEC, Engineer and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	Provide feedback to the Engineer on the remedial actions proposed by the ET / Contractor Advise Engineer on the effectiveness of the proposed remedial measures Verify the implementation of the remedial measures	Discuss with Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures; Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine works until no exceedance of the Limit Level.	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Propose mitigation measures to Engineer within 3 working days and discuss with Engineer; Implement the agreed mitigation measures.. As directed by the Engineer, to slow down or to stop all or part of the marine work

Appendix H

Site Audit Summary

The Hongkong Electric Co. Ltd.
Lamma Power Station Navigation Channel Improvement Project
Weekly Site Inspection Checklist

Inspection date 21/2/04 Time 10:00 Inspected By ET: Larry Wong
 Contractor: P.K. Ho
 Site LPS - Navigation Channel Improvement

Weather

Condition Sunny Fine Overcast Hazy Drizzle Rain Storm
 Temperature 26°C Humidity High Moderate Low
 Wind Calm Light Breeze Strong

GENERAL

Ref.	Checklist Condition	N/A	Yes	No	Unk	Remarks
EP 1.3	Is a copy of Environmental Permit together with all documents referred to in the permit kept in Engineers' and Contractors' offices for inspection at all sites/offices covered in the permit?		/			
EP 1.5	Is a copy of the most up-to-date Environmental Permit displayed at on the construction site at a convenient location for public information?		/			

WASTE MANAGEMENT

Ref	Checklist Condition	N/A	Yes	No	Unk	Remarks
Dredged Materials						
EM&A: 5.4	Does the contractor possess valid dumping permits for dredged marine mud and have them available for inspection?		/			
EM&A: 5.4	Has the contractor kept a complete set of dumping records/ticketing system and made them available for inspection?		/			
EM&A: 3.2.5	Are wastes disposed of at designated marine dumping sites approved by the Marine Fill Committee of the Civil Engineering Department?		/			

WATER QUALITY & MARINE ECOLOGY

Ref	Checklist Condition	N/A	Yes	No	Unk	Remarks
EP: 3.2 EM&A: A1	Is dredging work prohibited at Working Zone BCs from February to April to protect Finless Porpoise during calving seasons?		/			

Ref	Checklist Condition	N/A	Yes	No	Unk	Remarks
EP: 3.3 EM&A: A2	Do marine vessels avoid the Finless Porpoise habitat area when moving from and to disposal sites?		/			
EM&A: A2	Is marine vessel speed subject to a maximum limit of 10 knots in southern Lamma waters?		/			
EP: 3.4 EM&A: A4	Are grab dredger option and TSHD option prohibited to operate concurrently?		/			
EP: 3.5 EM&A: C1	Is dredging work carried out in phases in accordance with the latest dredging schedule?		/			
EP:3.5 EM&A: C2	Does each of the deployed grab dredgers have a grab capacity of no less than 8m ³ ?		/			
EP:3.5 EM&A: C3	Are cage-type silt curtains deployed for grab dredgers?		/			
EP:3.5 EM&A: C3	Are the silt curtains maintained properly throughout the dredging operation?		/			
EP: 3.5 EM&A: C4	Is it prohibited to operate more than 5 grab dredgers concurrently at anytime?		/			
EM&A: D1	Is daily dredging volume spread as evenly as possible over the 24 hour period whenever practical?		/			
EM&A: D1	Is special care taken during lowering and lifting grabs to minimize unnecessary disturbance to the seabed?		/			
EM&A: D1	Do vessels have adequate clearance to the seabed?		/			
EM&A: D1	Are barges fitted with tight fitting seals to their bottom openings to prevent leakage of material during loading and transportation?		/			
EM&A: D1	Are grabs closed tightly to minimize loss of sediment during dredging		/			
EM&A: D1	Is the descent speed of hoist controlled suitably low?		/			
EM&A: D1	Are barges filled to a level, which ensures that materials do not spill over during loading and transportation?		/			
EM&A: D1	Are large objects removed from the grab to avoid losses from partially closed grabs?	/				
EM&A: D2	Have the vessel operators been fully briefed on the following: a) Possible presence of dolphins and porpoises in the vicinity of the Study Area and along routes to the Project Area; b) Rules for safe vessel operation around cetaceans; c) Slowing to 10 knots in the presence of cetaceans within the area marked on Figure B3 (Annex B of EM&A Manual); and d) The dumping of chemicals, rubbish, oils etc into the waters is strictly prohibited and enforced.		/			

NOISE

Ref	Checklist Condition	N/A	Yes	No	Unk	Remarks
NCO	Are valid construction noise permits, if required, available for inspection?		/			
EM&A: A3	Is the number of dredgers and operation conditions strictly followed as specified in the CNP.		/			
NCO	Are conditions of construction noise permits, if any, for the relevant part(s) of the works implemented accordingly?		/			

Abbreviation

EP: Environmental Permit (Environmental Permit No. EP-165/2003)
 EM&A: EM&A Manual (Construction Phase)
 NCO: Noise Control Ordinance
 Unk: Unknown

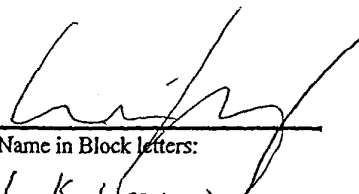
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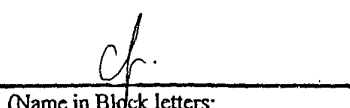
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Signatures

ET Member

Contractor's Representative


 (Name in Block letters:
L.K. Wong)


 (Name in Block letters:
CHEUNG KWONG KIEN)

Appendix I: Summary of EMIS

Mitigation Measures and their Implementation

EM&A Log Ref.	Mitigation Measures	Implementation Status
	MITIGATION MEASURES FOR BOTH GRAB DREDGER AND TSHD OPTIONS	
A1	No dredging should be carried out at Working Zone BCs from February to April.	C
A2	Vessel route between the dredging site and the disposal sites should avoid the Finless Porpoise habitat area and be subject to a maximum speed limit of 10 knots in southern Lamma waters as indicated in Figure B3 (Annex B of EM&A Manual).	C
A3	The number of dredgers and operation conditions specified in the applicable CNPs should be strictly followed. In applying for the CNPs, it should be ensured that the number of dredgers and operation conditions are compatible with the recommendations of this EIA.	C
A4	The grab dredger option and TSHD option should not be operated concurrently.	C
	MITIGATION MEASURES FOR TSHD OPTION ONLY	
B1	Dredging works should be carried out in phases in accordance with the programme, number of dredgers and maximum dredging rates specified in Table B4 (Annex B of EM&A Manual).	C
B2	There should not be more than one TSHD operating concurrently at any time.	N/A
	MITIGATION MEASURES FOR GRAB DREDGER OPTION ONLY	
C1	Dredging works should be carried out in phases in accordance with the programme, number of dredgers and maximum dredging rates specified in the latest dredging schedule.	C
C2	Each grab dredger to be deployed should have a grab capacity of no less than 8 m ³ .	C
C3	Cage-type silt curtains as illustrated in Figure B1 (Annex B of EM&A Manual) should be deployed for grab dredgers. The silt curtains should be properly maintained during the dredging period.	C
C4	There should be no more than 5 grab dredgers operating concurrently at any time.	C
	GOOD SITE PRACTICE	
D1	Daily dredging volume should be spread as evenly as possible over the 24 hour period whenever practical. Special care should be taken during lowering and lifting grabs to minimize unnecessary disturbance to the seabed.	C
	Vessels used should have adequate clearance of the seabed.	C
	Barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material.	C
	Grabs should be tightly closed and hoist speed is suitably low.	C
	Barges should not be filled to a level which will cause overflow of materials during loading and transportation.	C

EM&A Log Ref.	Mitigation Measures	Implementation Status
D2	<p>The vessel operators should be fully briefed on the following:</p> <ul style="list-style-type: none"> • Possible presence of dolphins and porpoises in the vicinity of the Study Area and along routes to the Project Area; • Rules for safe vessel operation around cetaceans; • Slowing to 10 knots in the presence of cetaceans within the area marked on Figure B3 (Annex B of EM&A Manual); and • The dumping of chemicals, rubbish, oils etc into the waters 	C

Remarks:

- C - Compliance with mitigation measure
NC - Non-compliance with mitigation measure
N/A - Not Applicable