MTR Corporation Limited

South Island Line (East)

Baseline Monitoring Report

August 2011

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12 August 2011

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EXECUTIVE SUMMARY

Background

The proposed South Island Line (East) (SIL(E)) comprises a new medium-capacity railway system with an approximate total route length of 7km from Admiralty (ADM) to South Horizons (SOH), via three intermediate stations at Ocean Park (OCP), Wong Chuk Hang (WCH) and Lei Tung (LET).

Impact Assessment and Baseline Monitoring

With the development of the Environmental Monitoring and Audit (EM&A) Manual and the updated EM&A Manual, baseline monitoring has been conducted for dust, noise and water quality at the designated monitoring locations along the project areas. The monitoring results would establish baseline levels for dust, noise and water quality for the civil construction work of the SIL(E) project.

Results and Conclusions

Baseline monitoring had been carried out in accordance with the recommendations contained in the Technical Memoranda associated with EIAO, Air Pollution Control Ordinance, Noise Control Ordinance and Water Pollution Control Ordinance, where applicable. Results and conclusions of the report were presented in the subsequent sections of the Baseline Monitoring Report.

TABLE OF CONTENT

1 INTRODUCTION

1.1 BACKGROUND

The South Island Line (East) Project

The South Island Line (East) (SIL(E)) is a medium capacity railway that measures a total length of approximately 7km. The route will run from Admiralty (ADM) to South Horizons (SOH), with three intermediate stations at Ocean Park (OCP), Wong Chuk Hang (WCH) and Lei Tung (LET).

The overall plan of the proposed SIL(E) scheme is shown in **Annex A**.

1.1.1 The EIA Report for the proposed SIL(E) Project was approved with conditions in October 2010. The EM&A Manual and the updated EM&A Manual have provided guidelines in the preparation of this baseline monitoring report.

1.1.2 Baseline levels have been established for dust, noise and water quality, by which the performance of the construction contractors may be measured in meeting the required environmental protection standards and requirements during the course of the construction work. These are presented in subsequent sections of this report.

1.1.3 This Baseline Monitoring Report presents the results for the baseline monitoring conducted for dust, noise and water quality at the designated monitoring locations, and establishes the baseline levels of the environmental issues for the civil construction work.

1.2 ORGANISATION OF THE REPORT

Following the introduction, the remainder of this Report is arranged as follows:

- Section 2 Describes the air quality monitoring methodology and analyses the monitoring results;
- Section 3 Describes the noise monitoring methodology and analyses the monitoring results;
- Section 4 Describes the water quality monitoring methodology and analyses the monitoring results;
- Section 5 Revisions for Inclusion in the EM&A Manual
- Section 6 Conclusions

2 AIR QUALITY

2.1 MONITORING METHODOLOGY

Monitoring was undertaken to establish baseline levels for both 1-hour and 24-hour Total Suspended Particulates (TSP) in the vicinity of the works areas along SIL(E), namely the construction sites for viaduct, tunnel, stations, depot and associated structures. This provides data against which any environmental impacts due to construction activities can be compared. In accordance with the EM&A manual, during the construction period, 24-hour TSP monitoring will be conducted for regular impact monitoring. In case of non-compliance with the air quality criteria, 1-hour TSP monitoring will be conducted in following up on exceedances or complaints, in order to provide a more rapid indication of the source of the problem at hand. This additional monitoring should be continued until the excessive dust emission or the deterioration in air quality is rectified.

According to the EM&A Manual, five representative monitoring locations had been identified in the vicinity of the works areas, and are summarized in Table 2.1. The monitoring locations are shown in **Annex A**.

Table 2.1 Construction dust monitoring stations

ID	Description	Works Area
CD1	Wong Chuk Hang San Wai	Nam Fung Portal
CD2	Police College – Police Quarters	Wong Chuk Hang Depot
CD3	San Wui Commercial Society of HK Chan Pak Sha School	Wong Chuk Hang Depot
CD4	Shan On House	Lei Tung Station
CD5*	South Horizons Phase IV – Block 25	South Horizons Station

*Location updated due to site access problem, or as per the agreement with the premises landlord, and agreed with EPD.

1-hour TSP measurements were made three times per day for a period of at least 14 days at the monitoring stations to establish the ambient 1-hour TSP levels.

24-hour TSP measurements were carried out over a period of at least 14 days at the monitoring stations to establish the ambient 24-hour TSP levels.

24-hour samples were collected by High Volume Sampler (Graseby-Andersen) following United Sates Environmental Protection Agency regulations and 1-hour TSP levels were measured by real time dust

monitor, namely MIE – DataRam and HAZ-Dust, and both with the same mechanism on detecting the real time TSP level.

2.2 CALIBRATION REQUIREMENTS

The flow rate of the high volume sampler with mass flow controller will be calibrated using an orifice calibrator. Initial calibration (five points) will be conducted upon installation and prior to commissioning. Calibration will be carried out every six months. Calibration certificate is attached in **Annex B**.

The sensing system of MIE and Haz-Dust are calibrated by clean filtered air passing through the flow-sensing system, providing a controlled check of the zero-concentration condition. Calibration of the MIE and Haz-Dust by certified laboratory or manufacturer shall be carried out every two years and properly documented. Calibration certificate is attached in **Annex B**.

The samplers shall be properly maintained. Prior to dust monitoring commencing, appropriate checks shall be made to ensure that all equipment and necessary power supply are in good working condition.

2.3 MONITORING PROCEDURES

1-Hour TSP Levels Monitoring

TSP is sampled by drawing air into the MIE / Haz-Dust where particulate concentrations are measured instantaneously with an in-built silicon detector sensing light scattered by the particles in the sampled air (optical sensing stage).

24-Hour TSP Levels Monitoring

The sampling procedure follows to that described in the App. B of Pt 50 in 40CFR Ch.1 (U.S. Environmental Protection Agency). TSP is sampled by drawing air through a conditioned, pre-weighed filter paper inside the high volume sampler at a controlled rate. After 24-hour sampling, the filter paper with retained particles shall be collected and returned to the laboratory for drying in a desiccators followed by accurate weighing. TSP levels are calculated from the ratio of the mass of particulate retained on the filter paper to the total volume of air sampled.

2.4 MONITORING RESULTS

2.4.1 1-hour TSP baseline monitoring was conducted at the monitoring stations between February and May 2011. The average 1-hour TSP

baseline levels have been established from the baseline data listed in **Annex C**, and are shown in *Table 2.4a* below.

Weather conditions throughout the monitoring period were mild with light wind, normally from east, north-east and south-east.

Table 2.4a 1-hour TSP Levels

ID	Description	Average 1-hr TSP Level ($\mu g/m^3$)
CD1	Wong Chuk Hang San Wai	100
CD2	Police College – Police Quarters	94
CD3	San Wui Commercial Society of HK Chan Pak Sha School	111
CD4	Shan On House	105
CD5	South Horizons Phase IV – Block 25	132

Note: TSP levels are to the nearest whole number, with values of 0.5 rounded up

It was noted that construction of Singapore International School (SIS) extension along Nam Long Shan Road was underway during the monitoring period. Dust particulates generated from the construction works of SIS contribute to the background TSP levels. Busy road traffic of Aberdeen Tunnel Road, Nam Long Shan Road, Ap Lei Chau Drive and Lee Nam Road contribute to the background TSP levels as well.

Action and Limit Levels

To provide an early indication of any deterioration in the Contractor's environmental performance, Action Levels were derived based on the measured baseline levels. Limit Level is set at 500$\mu g/m^3$ for the 1-hour TSP level as recommended for consideration in the EIAO-TM.

For 1-hour TSP the Action Level for baseline smaller than or equal to 384$\mu g/m^3$ is the average of 130% of the baseline and the Limit Level. For baseline greater than 384$\mu g/m^3$ the Action Level is 500$\mu g/m^3$. The derived level for the monitoring station is shown in *Table 2.4b* below.

Table 2.4b Baseline, Action and Limit Levels for 1-hour TSP

ID	Description	Baseline Level ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
CD1	Wong Chuk Hang San Wai	100	315	500
CD2	Police College – Police Quarters	94	311	500
CD3	San Wui Commercial Society of HK Chan Pak Sha School	111	322	500
CD4	Shan On House	105	318	500

CD5	South Horizons Phase IV – Block 25	132	336	500

Note: 1-hour TSP criterion recommended in the EIAO-TM
TSP levels are to the nearest whole number, with values of 0.5 rounded up

2.4.2 24-hour TSP

24-hour TSP baseline monitoring was conducted at the designated monitoring stations between February and May 2011.

Weather conditions throughout 24hour-TSP monitoring period were mild with light wind.

The averaged 24-hour TSP baseline level has been established from the baseline data listed in **Annex C**, and are shown in *Table 2.4c* below.

Table 2.4c 24-hour TSP Levels

ID	Description	Average 24-hr TSP Level ($\mu g/m^3$)
CD1	Wong Chuk Hang San Wai	66
CD2	Police College – Police Quarters	83
CD3	San Wui Commercial Society of HK Chan Pak Sha School	60
CD4	Shan On House	71
CD5	South Horizons Phase IV – Block 25	60

Note: TSP levels are to the nearest whole number, with values of 0.5 rounded up

As mentioned above, construction of SIS extension was underway during the monitoring period. Dust particulates generated from the construction works of SIS contribute to the background TSP levels. Busy road traffic of Aberdeen Tunnel Road, Nam Long Shan Road, Ap Lei Chau Drive and Lee Nam Road contribute to the background TSP levels as well.

Action and Limit Levels

To provide an early indication of any deterioration in the Contractor's environmental performance, Action Levels were derived based on the measured baseline levels. The Air Quality Objective Limit Level for 24-hour TSP is set at 260$\mu g/m^3$.

For 24-hour TSP the Action Level for baseline smaller than or equal to 200$\mu g/m^3$ is the average of 130% of the baseline and the Limit Level. For baseline greater than 200$\mu g/m^3$ the Action Level is 260$\mu g/m^3$. The derived levels for each monitoring station are shown in *Table 2.4d* below.

Table 2.4d Baseline, Action and Limit Levels for 24-hour TSP

ID	Description	Baseline Level ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
CD1	Wong Chuk Hang San Wai	66	173	260
CD2	Police College – Police Quarters	83	184	260
CD3	San Wui Commercial Society of HK Chan Pak Sha School	60	169	260
CD4	Shan On House	71	176	260
CD5	South Horizons Phase IV – Block 25	60	169	260

Note: TSP levels are to the nearest whole number, with values of 0.5 rounded up

3 NOISE

3.1 MONITORING METHODOLOGY

Monitoring was undertaken to establish noise baseline levels in the vicinity of the SIL(E) project areas, in order to provide data against which any environmental impacts due to construction activities can be compared.

The baseline monitoring stations were established at the following locations and the monitoring locations are shown in **Annex A**.

Table 3.1 Construction Noise Monitoring Locations

ID	Description	Works Area
CN1	San Wui Commercial Society of HK Chan Pak Sha School (Educational Institution)	Wong Chuk Hang Depot
CN2	Holy Spirit Seminary (Education Institution)	Viaduct section along Wong Chuk Hang Nullah (west of Wong Chuk Hang Depot)
CN3*	Shun Fung Building (Residential)	LET Station Entrance A
CN4*	South Horizons Phase IV – Block 25 Dover Court (Residential)	SOH Station
CN5*	TWGHs Jockey Club Rehabilitation Complex Block A (Convalescent Home)	Viaduct section along Wong Chuk Hang Nullah (west of Wong Chuk Hang Depot)

*Location updated due to site access problem, or as per the agreement with the premises landlord, and agreed with EPD.

Consecutive noise measurements were undertaken over a period of at least 14 days to establish the ambient noise levels at representative nearest sensitive receivers. Continuous 5 minute A-weighted noise levels were recorded throughout the daytime and night time on weekdays (Monday to Saturday) and also on Sundays. The noise levels were then averaged (weekdays and Sundays separately) over each 30 minute period to produce the baseline conditions.

Monitoring was conducted using B&K sound analysis equipment – B&K SLM 2250. Microphones were extended 1 meter from building facades and oriented towards the works area.

Weather conditions throughout the monitoring period were mild and with light, normally from east, north-east and south-east.

3.2 CALIBRATION REQUIREMENTS

B&K 2250 sound level meters and B&K 4231 calibrators which complied with the International Electrotechnical Commission Publication 651:1979 (Type 1) and 804:1985 (Type 1), specification as referred to in the Technical Memoranda to the NCO were used for the baseline monitoring. The sound level meters and calibrators are verified by the certified laboratory or manufacturer once every two years to ensure they perform to the same level of accuracy as stated in the manufacturer's specifications. Calibration certificates are attached in **Annex B**.

Immediately prior to and following each set of measurements at any NSR, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. If the calibration levels before and after the measurement differs by more than 1.0dB, the measurement shall be repeated to obtain a reliable result (note: maximum deviation during this initial baseline monitoring period was 0.3dB). Periods of prolonged or repeated overloading of the sound level meter detector were avoided by setting the meter with adequate headroom prior to commencing measurements. Measurements were recorded to the nearest 0.1 dB, with values of 0.05 being rounded up.

3.3 ACTION AND LIMIT LEVELS

The Action and Limit levels defined in the EM&A Manual for airborne construction noise is presented below.

Table 3.3 Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
Daytime (0700-1900), Monday through Saturday excluding Public Holidays	When One document complaint received.	$L_{Aeq\ 30mins}$ 75dB(A)[1][2]
All evenings (1900-2300)		Subject to control under the Noise Control Ordinance
General Holidays (including all Sundays) during the daytime and evening (0700-2300)		Subject to control under the Noise Control Ordinance
All night time periods (2300-0700)		Subject to control under the Noise Control Ordinance

(1) 70dB(A) for schools and 65dB(A) during school examination periods.
(2) Updated prediction of noise levels as contained in the construction noise mitigation measures plan.

3.4 MONITORING RESULTS

Noise baseline monitoring was conducted at the monitoring stations between February and May 2011.

5 minute, "fast" detector response, levels were recorded in the following indices, L_{Aeq}, L_{A10}, L_{A90}. The baseline data was initially downloaded into a spreadsheet, directly from the noise loggers in ASCII format for checking, and then imported into the database. The L_{Aeq}, results for each 30 minute period were averaged and then plotted to obtain a single "smoothed" time history graph. The resultant 24 hour time history graphs display the "smoothed" $L_{Aeq, 30\ min}$ levels as a curved line together with the appropriate Limit Levels. 'Noise Control Period Averaged Baselines' including 'Weekdays Noise Level' and 'Sundays / General Holidays Noise Level' are presented for each monitoring location in **Annex D**.

It was observed that traffic in the locality contribute to the background noise levels. Construction activities of SIS and the hotel foundation works at Ap Lei Chau Main Street (near Shun Fung Building) also contribute to the background noise levels in some of the daytime periods. The vehicular traffic with a considerable portion of buses and trucks was considered as the dominant noise sources for the area. The daytime baseline noise levels at all sensitive receivers were below 75dB(A).

Table 3.4 Noise Levels

ID	Description	Monitoring Result, Leq(30mins), dB(A) Daytime (0700 – 1900)	
CN1	San Wui Commercial Society of HK Chan Pak Sha School	Weekdays Sundays / General Holidays	69.0 67.1
CN2	Holy Spirit Seminary	Weekdays Sundays / General Holidays	63.9 63.9
CN3	Shun Fung Building	Weekdays Sundays / General Holidays	69.1 59.9
CN4	South Horizons Phase IV	Weekdays Sundays / General Holidays	66.3 65.1
CN5	TWGHs Jockey Club Rehabilitation Complex Block A	Weekdays Sundays / General Holidays	65.9 63.0

4 WATER QUALITY MONITORING

4.1 MONITORING LOCATIONS

Baseline water quality monitoring has been conducted at the six designated monitoring locations at Aberdeen Channel (coded WM1 to WM4, CS1 and CS2) for this project according to the EM&A Manual.

Monitoring locations WM1-WM4 cover the Aberdeen West Typhoon Shelter, Wong Chuk Hang Nullah, WSD Brick Hill Seawater intake and Aberdeen South Typhoon Shelter while monitoring location CS1 and CS2 are the control stations. CS1 and CS2 are the upstream control stations for the Ebb and Flood tide conditions respectively.

Monitoring locations are shown in **Annex A** and their coordinates are given below.

Table 4.1 – Coordinates of Water Quality Monitoring Locations

Code	Location	Easting	Northing
WM1	Aberdeen West Typhoon Shelter	833953	811923
WM2	Wong Chuk Hang Nullah	834547	811966
WM3	WSD Brick Hill Seawater Intake	834896	811567
WM4	Aberdeen South Typhoon Shelter	834761	811292
CS1	Control Station	832689	811967
CS2	Control Station	834852	810689

4.2 MONITORING METHODOLOGY AND PARAMETERS

Water quality was monitored in terms of the following parameters: Dissolved Oxygen (DO, mg/L) and Dissolved Oxygen Saturation (DO %), temperature (^{o}C), pH, turbidity (NTU), salinity (ppt), suspended solids (mg/L) and water depth (m) in accordance with the EM&A Manual. All parameters were measured in-situ whereas SS shall be determined by the laboratory.

Water samples were taken with a water sampler, consisting of a transparent PVC cylinder of 2 litres that can be effectively sealed with cups at both ends. The water sampler has a positive latch system to keep it open and prevent premature closure until released by a messenger when the sampler arrives is at the pre-determined depth.

Measurement was taken at 3 water depths, namely, 1m below water surface, mid-depth and 1m above sea bed, except where the water

depth less that 6m, the mid-depth station may be omitted. Should the water depth be less than 3m, only the mid-depth station was monitored.

Duplicate in-situ measurements and samples were collected and analyzed to ensure a robust statistically interpretable dataset.

Where the difference in value between the first and second measurement of DO or turbidity parameters is more than 25% of the value of the first reading, the reading was discarded and further readings were taken.

Water samples for all monitoring parameters were collected, stored, preserved and analyzed according to Standard Methods, APHA 21st ed.

Water samples were stored in high-density polythene bottles, packed in ice and delivered to the laboratory of ALS Technichem (HK) Ltd. a HOKLAS accredited laboratory, details of the accreditation status is given in **Annex B** of this report.

The SS determination work was start within 24 hours after collection of the water samples. The SS analyses followed the standard method APHA 2540D with a detection limit of 1mg/L as described in APHA Standard Methods for the Examination of Water and Wastewater, 21st Edition.

A digital depth detector was employed to determine the water depth at selected stations when flows permit.

4.3 MONITORING EQUIPMENT

The equipment deployed for the on-site measurement of marine water is summarized below:

Table 4.2 Equipment model

Equipment	Model
Depth Meter	Northstar Explorer 443s
Salinity Meter	YSI Multimeter (YSI Professional Plus)
pH Meter	YSI Multimeter (YSI Professional Plus)
Turbidity Meter	Neotek-Ponsel (Odeon Classic)
Dissolved Oxygen Meter	YSI Multimeter (YSI Professional Plus)
Temperature sensor	YSI Multimeter (YSI Professional Plus)
GPS	Carmin etrex Vista HCx

4.4 CALIBRATION REQUIREMENTS

On-site monitoring equipment namely the salinity meter, pH meter, turbidity meter, dissolved oxygen meter and temperature sensor were calibrated before use. The methodologies for the calibration are referred to the instruction manual provided by the manufactures respectively. The calibration records are shown in **Annex B**.

Response of sensors and electrodes was checked with certified standard solutions before each use.

4.5 MONITORING RESULTS

The frequency of baseline monitoring carried out is summarised below. The results of the baseline monitoring is summarised in **Annex E**.

Table 4.3 –Baseline Monitoring Frequency for Water Quality.

Location(s)	Frequency	Duration	Parameters
WM1 – WM4 CS1 - CS2	Once per day for both Ebb and Flood conditions and 3 days per week.	4 weeks	D.O., pH, Salinity, Suspended Solids, Temp., and Turbidity

A summary of monitoring schedule for baseline monitoring works is given below. Throughout the monitoring period, the weather conditions were mild and calm.

Table 4.4 - Summary of the monitoring schedule

Date		Time	
		Ebb	Flood
Monitoring Day 1	29/3/2011 Tue	08:07-10:57	12:38-16:08
Monitoring Day 2	31/3/2011 Thu	09:11-12:41	14:43-18:13
Monitoring Day 3	2/4/2011 Sat	10:11-13:41	16:09-19:39
Monitoring Day 4	4/4/2011 Mon	11:06-14:36	17:25-20:55
Monitoring Day 5	6/4/2011 Wed	12:05-15:35	05:30-09:00
Monitoring Day 6	8/4/2011 Fri	12:39-16:09	05:34-09:04
Monitoring Day 7	11/4/2011 Mon	15:58-19:28	03:50-07:20
Monitoring Day 8	13/4/2011 Wed	07:09-09:16	11:18-14:48
Monitoring Day 9	15/4/2011 Fri	08:23-11:53	14:14-17:44
Monitoring Day 10	18/4/2011 Mon	10:31-14:01	17:08-20:38
Monitoring Day 11	20/4/2011 Wed	12:00-15:30	15:18-18:48
Monitoring Day 12	26/4/2011 Tue	17:48-21:18	10:19-13:49

4.6 *ACTION AND LIMIT LEVELS*

Baseline monitoring data collected was assessed for DO, Turbidity and SS to establish the appropriate Action and Limit Levels in accordance with the EM&A Manual. The Action and Limit Levels are defined in Table 4.5 below.

Table 4.5 – Determination of Action and Limit Levels for Water Quality

Parameters	Action Level	Limit Level
D.O. in mg/L (Surface, Middle & Bottom)	Surface, Middle and Bottom 5 percentile of baseline data for surface, middle and bottom layer	Surface and Middle 4mg/L or 1 percentile of baseline data for surface and middle layer Bottom 2mg/L or 1 percentile of baseline data for bottom layers
Suspended Solids in mg/L (Depth-averaged)	95 percentile of baseline data or 120% of upstream control station of the same day	99 percentile of baseline or 130% of upstream control station of the same day
Turbidity in NTU (Depth-averaged)	95 percentile of baseline data or 120% of upstream control station of the same day	99 percentile of baseline or 130% of upstream control station of the same day

The Action and Limit Levels as determined for dissolved oxygen (mg/L), suspended solids (mg/L) and turbidity are given below for monitoring locations WM1 to WM4 under Ebb and Flood tide conditions.

Table 4.6 Action and Limit Levels for Ebb Condition

Tide: **Ebb** Location: **WM1**				
Parameters	Action Level		Limit Level	
DO in mg/L	Surface	5.9	Surface	5.5
	Middle	6.0	Middle	5.6
	Bottom	6.0	Bottom	5.7
SS in mg/L (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	
Turbidity in NTU (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	

Tide: **Ebb** Location: **WM2**				
Parameters	Action Level		Limit Level	
DO in mg/L	Surface	5.9	Surface	5.5
	Middle	NA	Middle	NA
	Bottom	6.0	Bottom	5.7
SS in mg/L (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	
Turbidity in NTU (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	
Tide: **Ebb** Location: **WM3**				
Parameters	Action Level		Limit Level	
DO in mg/L	Surface	6.1	Surface	5.7
	Middle	6.1	Middle	5.7
	Bottom	6.3	Bottom	5.9
SS in mg/L (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	
Turbidity in NTU (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	
Tide: **Ebb** Location: **WM4**				
Parameters	Action Level		Limit Level	
DO in mg/L	Surface	6.1	Surface	5.8
	Middle	6.3	Middle	6.0
	Bottom	6.5	Bottom	6.2
SS in mg/L (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	
Turbidity in NTU (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	

Table 4.7 Action and Limit Level for Flood Condition

Tide: **Flood** Location: **WM1**				
Parameters	Action Level		Limit Level	
DO in mg/L	Surface	5.9	Surface	5.6
	Middle	6.1	Middle	5.7
	Bottom	6.2	Bottom	5.8
SS in mg/L (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	
Turbidity in NTU (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	
Tide: **Flood** Location: **WM2**				
Parameters	Action Level		Limit Level	
DO in mg/L	Surface	6.0	Surface	5.7
	Middle	NA	Middle	NA
	Bottom	6.1	Bottom	5.8
SS in mg/L (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	
Turbidity in NTU (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	
Tide: **Flood** Location: **WM3**				
Parameters	Action Level		Limit Level	
DO in mg/L	Surface	6.0	Surface	5.7
	Middle	6.2	Middle	5.8
	Bottom	6.2	Bottom	5.9
SS in mg/L (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	
Turbidity in NTU (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	

Tide: **Flood** Location: **WM4**				
Parameters	Action Level		Limit Level	
DO in mg/L	Surface	6.0	Surface	5.8
	Middle	6.2	Middle	5.8
	Bottom	6.3	Bottom	6.1
SS in mg/L (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	
Turbidity in NTU (depth averaged)	120% of upstream control station of the same day		130% of upstream control station of the same day	

During the course of impact monitoring should an exceedance to the Action and Limit Levels be recorded, actions in accordance with the Event and Plan for Water Quality shall then be followed.

5 Revisions for Inclusion in the EM&A Manual

5.1 The baseline environmental monitoring was conducted according to the EM&A Manual and the updated EM&A Manual for air quality, noise and water. The updated EM&A Manual was submitted to EPD on 16 May 2011.

5.2 The monitoring methodology, parameters monitored and monitoring locations are all in line with the EM&A Manual and updated EM&A Manual.

5.3 Monitoring locations for air and noise were updated due to site access problem, or as per the agreement with the premises landlord, and agreed with EPD.

6 CONCLUSION

6.1 BASELINE LEVEL

6.1.1 Air

1-hour TSP

1-hour TSP baseline monitoring was conducted at various monitoring stations between February and May 2011. Baseline levels were recorded in the range of 94 $\mu g/m^3$ and 132 $\mu g/m^3$.

24-hour TSP

24-hour TSP baseline monitoring was conducted at various monitoring stations between February and May 2011. Baseline levels between 60 $\mu g/m^3$ and 83 $\mu g/m^3$ had been recorded.

6.1.2 Noise

Baseline monitoring was conducted at various monitoring stations between February and May 2011. Baseline levels have been established for both weekday and Sunday periods.

Noise levels between 64 to 69 dB(A) had been consistently recorded for various monitoring stations during normal weekdays, and for Sunday and General holidays, noise levels between 60 to 67 dB(A) had been recorded. The daytime baseline noise levels at all sensitive receivers were below 75dB(A).

6.1.3 Water

Baseline monitoring was conducted at various monitoring stations between March and April 2011. Baseline levels have been established for Dissolved Oxygen (mg/L), Suspended Solids (mg/L) and Turbidity.

6.2 ACTION AND LIMIT LEVELS

6.2.1 Air

1-hour TSP

The 1-hour TSP Action Level have been calculated from baseline levels and presented in Table 2.4b. Limit level is set at 500 μg/m^3 for the 1-hour TSP limit suggested in the EIAO-TM. The 1-hour TSP monitoring is intended to use in following up on complaints or exceedances, in order to provide a more rapid indication of the source of the problem at hand.

24-hour TSP

24-hour TSP Action Levels have been calculated from baseline levels and are presented in Table 2.4d. The Air Quality Objective Limit Level for 24-hour TSP is set at 260 μg/m^3.

6.2.2 Noise

Action Level exceedance occurs when one or more documented complaints are received.

Limit Level is set at $L_{Aeq\ 30mins}75^{(1)(2)}$ for normal working hours (i.e. 0700 – 1900 hours on any day not being a Sunday or general holiday), as suggested in EIAO-TM and the Practice Note for Professional Persons ProPECC PN2/93. For restricted hours (i.e. 1900 – 0700 hours for weekdays and all day on Sundays and general holidays), Limit Level shall be subjected to control under the Noise Control Ordinance (NCO).

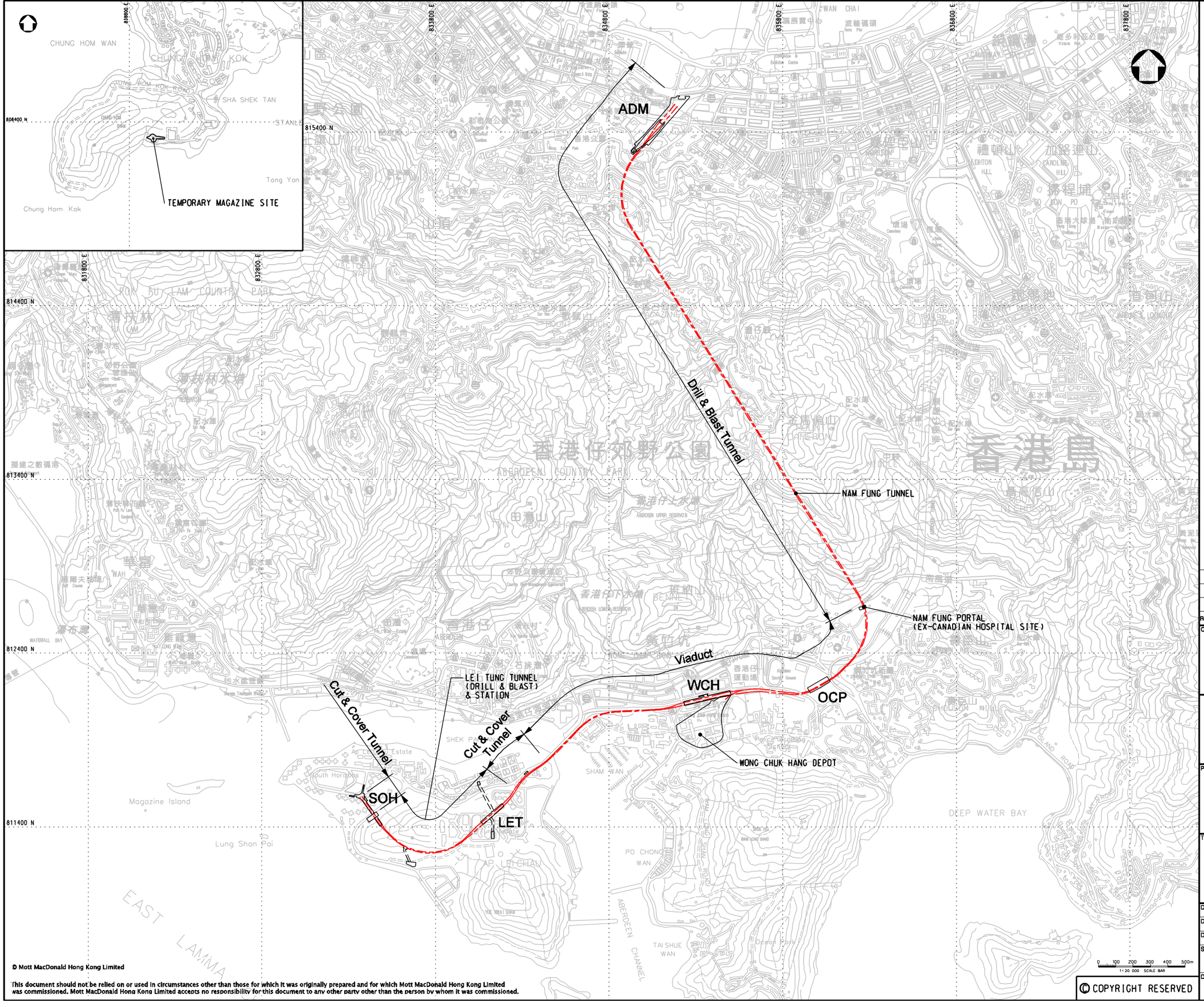
6.2.3 Water

The Action and Limit Levels as determined for Dissolved Oxygen (mg/L), Suspended Solids (mg/L) and Turbidity and the levels are given in Table 4.6 and Table 4.7 for Ebb and Flood tides conditions for monitoring locations WM1 to WM4.

(1) 70dB(A) for schools and 65dB(A) during school examination periods.
(2) Updated prediction of noise levels as contained in the construction noise mitigation measures plan.

ANNEX A

Location Map



LEGEND:

- PREFERRED ALIGNMENT
- SOH — SOH STATION

Rev	Date	Drawn	Description	Ch'k'd	App'd
P3	MAY 10	MING	ISSUE TO MTRC & EPD	FY	AFK
P2	DEC 09	MING	ISSUE TO MTRC & EPD	FY	AFK
P1	NOV 09	MING	ISSUE TO MTRC	BL	AFK

Client

MTR

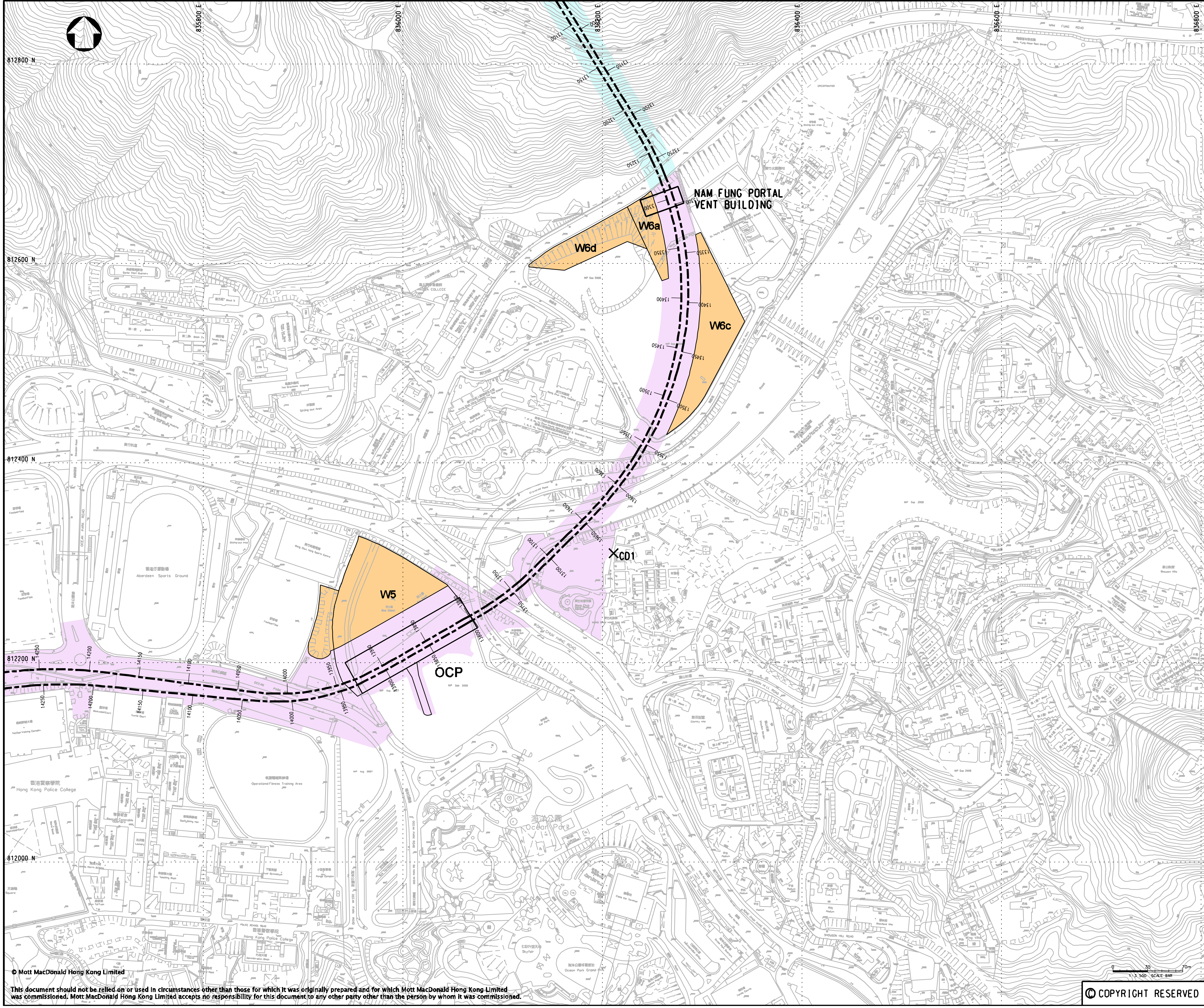
Project

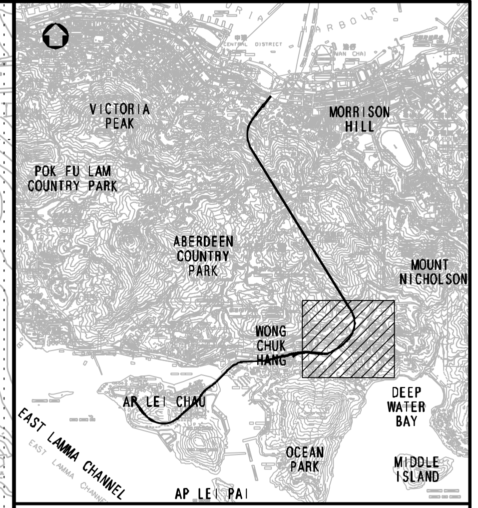
CONSULTANCY AGREEMENT NO. NEX/2301
SOUTH ISLAND LINE (EAST)
ENVIRONMENTAL IMPACT ASSESSMENT

Title

GENERAL LAYOUT PLAN FOR SIL(E)

Designed	BL		Eng.Chk.	FY	
Drawn	MING		Coordination	FY	
Dwg.Chk.	BL		Approved	AFK	
Scale	1:20000@A3	Project	248137	Status	PRE
		CAD File	J:\248137\report\env\emsm\I00523\FIGURE H.dgn		
Drawing No.	FIGURE 1.1			Rev	P3





KEY PLAN

LEGEND:

W5	WORKS AREA
(pink)	PROPOSED WORKS SITE (GROUND LEVEL AND UNDERGROUND)
(cyan)	PROPOSED WORKS SITE (UNDERGROUND)
(orange)	PROPOSED WORKS AREA (GROUND LEVEL)
×	DUST MONITORING STATIONS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P4	AUG 10	MING	ISSUE TO MTRC & EPD	FY	AFK
P3	MAY 10	MING	ISSUE TO MTRC & EPD	FY	AFK
P2	DEC 09	MING	ISSUE TO MTRC & EPD	FY	AFK
P1	NOV 09	MING	ISSUE TO MTRC	BL	AFK

Client

MTR

Project

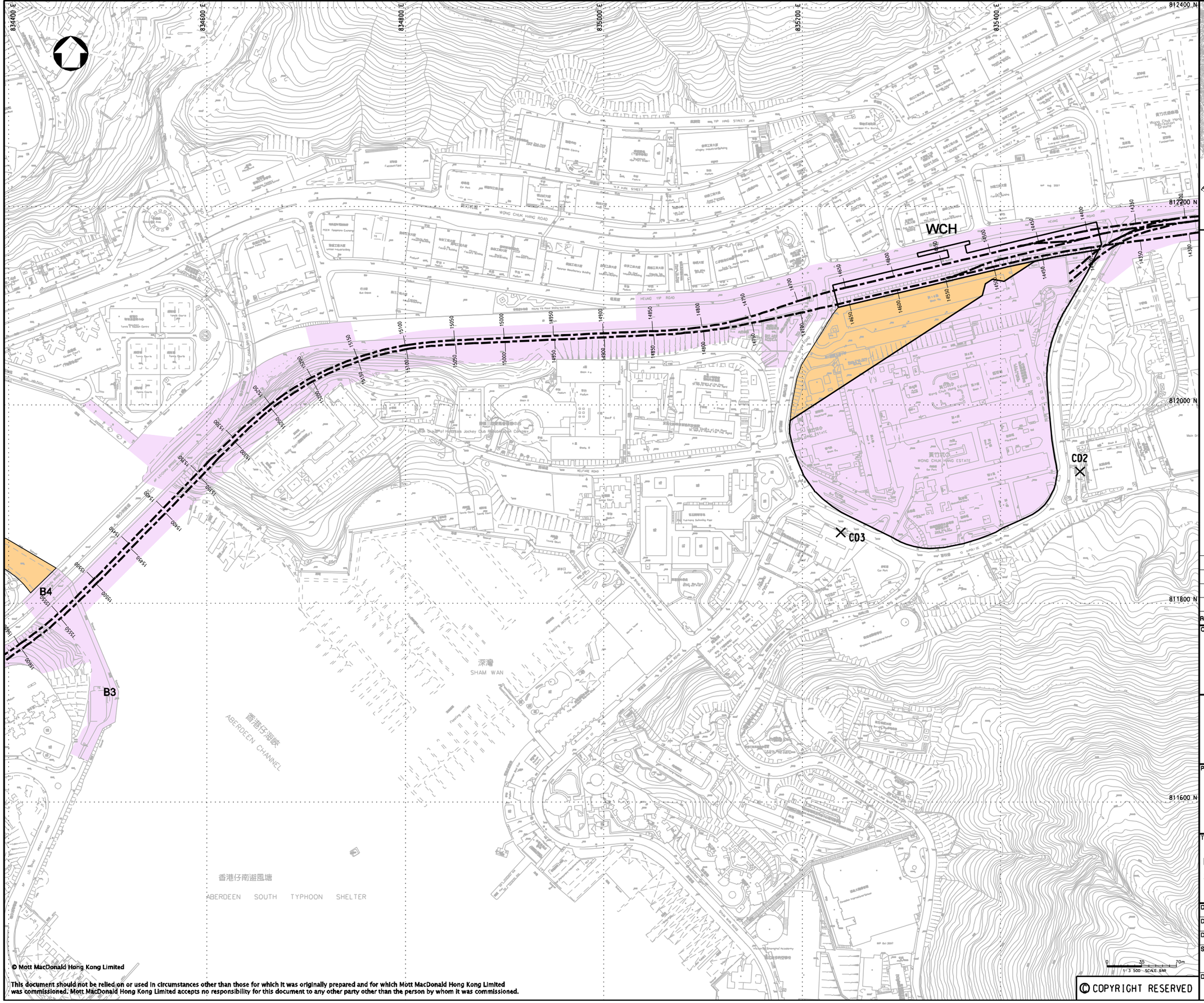
CONSULTANCY AGREEMENT NO. NEX/2301
SOUTH ISLAND LINE (EAST)
ENVIRONMENTAL IMPACT ASSESSMENT

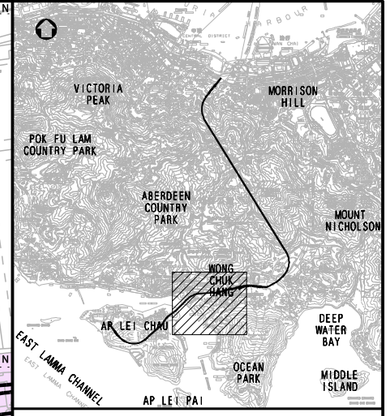
Title

PROPOSED LOCATION OF CONSTRUCTION
AIR QUALITY MONITORING STATIONS

Designed	EH	Eng.Chk.	FY
Drawn	MING	Coordination	FY
Dwg.Chk.	EH	Approved	AFK

Scale: 1:3500@A3	Project: 248137	Status: PRE
	CAD File: J:\248137\REPORT\ENV\EMAM\XX0804\FIGURE 9-1.dgn	
Drawing No.	FIGURE 9.1.1	Rev: P4





KEY PLAN

LEGEND:

- PROPOSED WORKS SITE (GROUND LEVEL AND UNDERGROUND)
- PROPOSED WORKS AREA (GROUND LEVEL)
- × DUST MONITORING STATIONS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P4	AUG 10	MING	ISSUE TO MTRC & EPD	FY	AFK
P3	MAY 10	MING	ISSUE TO MTRC & EPD	FY	AFK
P2	DEC 09	MING	ISSUE TO MTRC & EPD	FY	AFK
P1	NOV 09	MING	ISSUE TO MTRC	BL	AFK

Client: MTR

Project:
CONSULTANCY AGREEMENT NO. NEX/2301
SOUTH ISLAND LINE (EAST)
ENVIRONMENTAL IMPACT ASSESSMENT

Title:
PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

Designed	EH		Eng.Chk.	FY	
Drawn	MING		Coordination	FY	
Dwg.Chk.	EH		Approved	AFK	

Scale: 1:3500@A3
Project: 248137
Status: PRE
CAD File: j:\248137\report\env\emom\100804\FIGURE 9-1-2.dgn
Drawing No.: FIGURE 9.1.2
Rev: P4

812000 N
811800 N
811600 N
811400 N
811200 N
834000 E
834200 E
834400 E
834600 E
834800 E
835000 E

香港仔灣
ABERDEEN HARBOUR

B8
B4
B3
CD4
LET
LET STATION VENT SHAFT

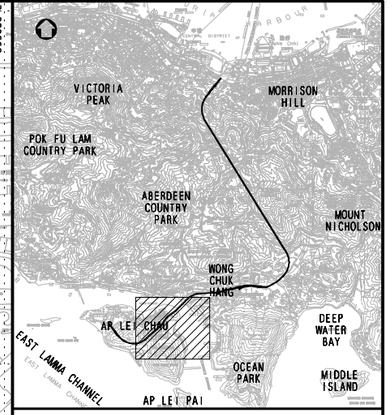
香港仔海峽
ABERDEEN CHANNEL

深灣
SHAM WAN

香港仔南避風塘
ABERDEEN SOUTH TYPHOON SHELTER

香港仔海峽
ABERDEEN CHANNEL

0 35 70m
1:3 500 SCALE BAR



KEY PLAN

LEGEND:

- PROPOSED WORKS SITE (GROUND LEVEL AND UNDERGROUND)
- PROPOSED WORKS SITE (UNDERGROUND)
- PROPOSED WORKS AREA (GROUND LEVEL)
- × DUST MONITORING STATIONS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P4	AUG 10	MING	ISSUE TO MTRC & EPD	FY	AFK
P3	MAY 10	MING	ISSUE TO MTRC & EPD	FY	AFK
P2	DEC 09	MING	ISSUE TO MTRC & EPD	FY	AFK
P1	NOV 09	MING	ISSUE TO MTRC	BL	AFK

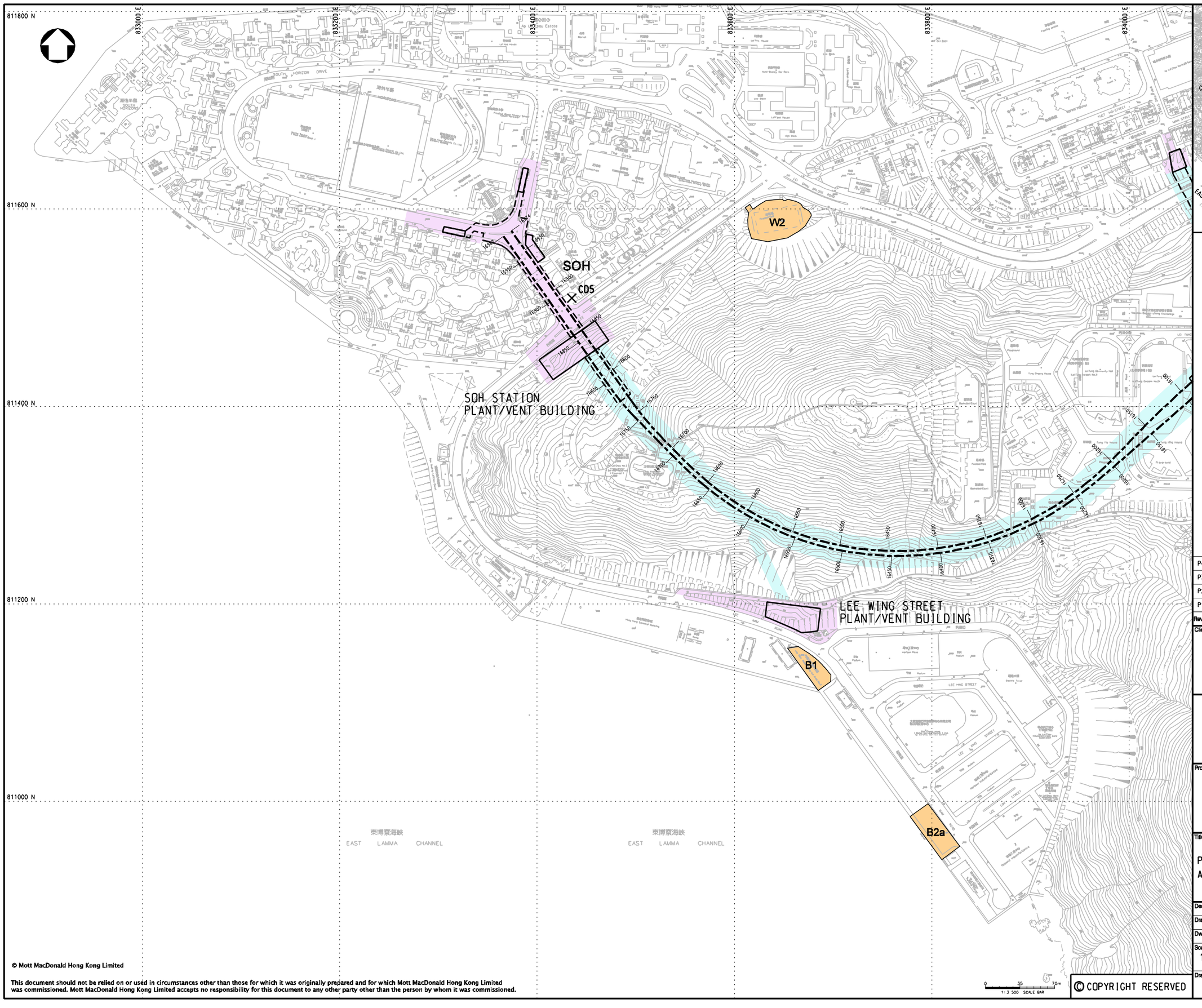
Client: MTR

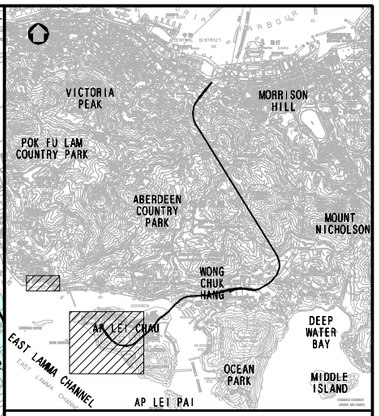
Project:
CONSULTANCY AGREEMENT NO. NEX/2301
SOUTH ISLAND LINE (EAST)
ENVIRONMENTAL IMPACT ASSESSMENT

Title:
PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

Designed	EH		Eng.Chk.	FY	
Drawn	MING		Coordination	FY	
Dwg.Chk.	EH		Approved	AFK	

Scale: 1:3500@A3
Project: 248137
CAD File: J:\248137\report\env\emam\100804\FIGURE 9-1.3.dgn
Status: PRE
Drawing No.: FIGURE 9.1.3
Rev: P4





KEY PLAN

LEGEND:

B1	BARGING AREA
W2	WORKS AREA
	PROPOSED WORKS SITE (GROUND LEVEL AND UNDERGROUND)
	PROPOSED WORKS SITE (UNDERGROUND)
	PROPOSED WORKS AREA (GROUND LEVEL)
×	DUST MONITORING STATIONS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P4	AUG 10	MING	ISSUE TO MTRC & EPD	FY	AFK
P3	MAY 10	MING	ISSUE TO MTRC & EPD	FY	AFK
P2	DEC 09	MING	ISSUE TO MTRC & EPD	FY	AFK
P1	NOV 09	MING	ISSUE TO MTRC	BL	AFK

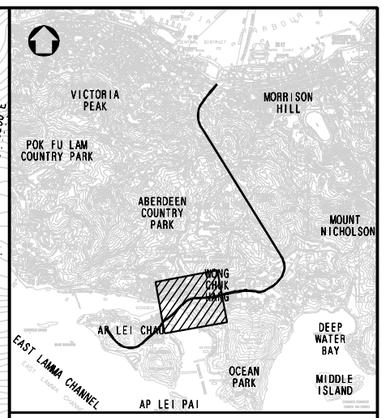
Client: MTR

Project:
CONSULTANCY AGREEMENT NO. NEX/2301
SOUTH ISLAND LINE (EAST)
ENVIRONMENTAL IMPACT ASSESSMENT

Title:
PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

Designed	EH		Eng.Chk.	FY	
Drawn	MING		Coordination	FY	
Dwg.Chk.	EH		Approved	AFK	

Scale: 1:3500@A3
Project: 248137
CAD File: J:\248137\REPORT\ENV\ENAM\I00804\FIGURE 9\L41MTRL.dgn
Status: PRE
Drawing No.: FIGURE 9.1.4
Rev: P4



KEY PLAN

LEGEND:

- NOISE MONITORING STATION
- PROPOSED WORKS SITE (GROUND LEVEL AND UNDERGROUND)
- PROPOSED WORKS AREA (GROUND LEVEL)

Rev	Date	Drawn	Description	Ch'k'd	App'd
P3	MAY 10	MING	ISSUE TO MTRC & EPD	FY	AFK
P2	DEC 09	MING	ISSUE TO MTRC & EPD	CWK	AFK
P1	NOV 09	MING	ISSUE TO MTRC	CWK	AFK

Client

MTR

Project

CONSULTANCY AGREEMENT NO. NEX/2301
SOUTH ISLAND LINE (EAST)
ENVIRONMENTAL IMPACT ASSESSMENT

Title

PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS
(SHEET 1 OF 2)

Designed	CWK		Eng.Chk.	FY	
Drawn	MING		Coordination	FY	
Dwg.Chk.	CWK		Approved	AFK	

Scale: 1:1500@A1

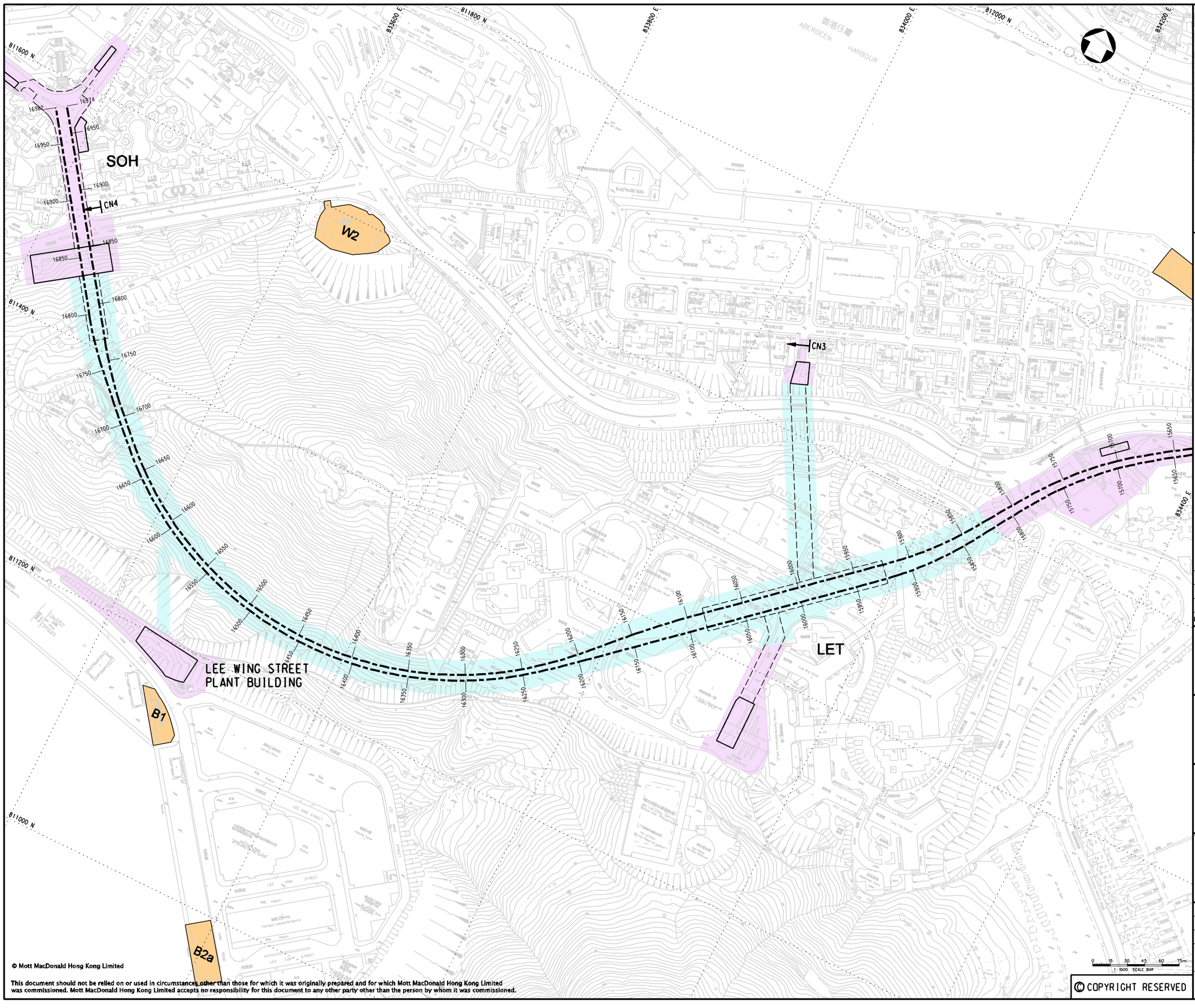
Project: 248137

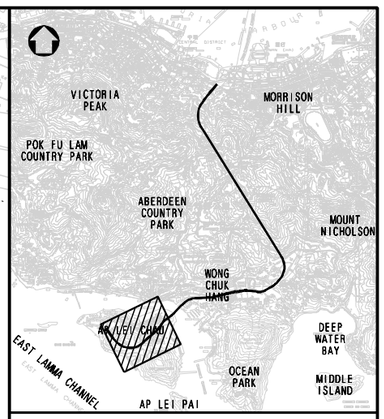
Status: PRE

CAD File: J:\248137\REPORT\ENV\ENAM\I00804\FIGURE 2-UIMTRI.dgn

Drawing No.: FIGURE 2.1.1

Rev: P3





KEY PLAN

LEGEND:

B1	BARGING AREA
W2	WORKS AREA
CN	NOISE MONITORING STATION
	PROPOSED WORKS SITE (GROUND LEVEL AND UNDERGROUND)
	PROPOSED WORKS SITE (UNDERGROUND)
	PROPOSED WORKS AREA (GROUND LEVEL)

Rev	Date	Drawn	Description	Ch'k'd	App'd
P3	MAY 10	MING	ISSUE TO MTRC & EPD	FY	AFK
P2	DEC 09	MING	ISSUE TO MTRC & EPD	FY	AFK
P1	NOV 09	MING	ISSUE TO MTRC	CWK	AFK

Client

MTR

Project

CONSULTANCY AGREEMENT NO. NEX/2301
SOUTH ISLAND LINE (EAST)
ENVIRONMENTAL IMPACT ASSESSMENT

Title

PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS
(SHEET 2 OF 2)

Designed	CWK		Eng.Chk.	FY	
Drawn	MING		Coordination	FY	
Dwg.Chk.	CWK		Approved	AFK	

Scale 1:1500@A1	Project 248137	Status PRE
	CAD File J:\248137\REPORT\ENV\EMAM\00804\FIGURE 2-L2MTR.dgn	
Drawing No. FIGURE 2.1.2		Rev P3

LEGEND:

X WATER QUALITY MONITORING STATIONS

CONTROL STATIONS

TYPE	CO-ORDINATE	
	EASTING	NORTHING
WM1	833953	811923
WM2	834514	811930
WM3	834896	811567
WM4	834761	811292
CS1	832689	811967
CS2	834852	810689

Rev	Date	Drawn	Description	Ch'k'd	App'd
P3	APR 10	MING	ISSUE TO MTRC & EPD	FY	AFK
P2	DEC 09	MING	ISSUE TO MTRC & EPD	FY	AFK
P1	NOV 09	MING	ISSUE TO MTRC	BL	AFK

Client

MTR

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Project

CONSULTANCY AGREEMENT NO. NEX/2301
SOUTH ISLAND LINE (EAST)
ENVIRONMENTAL IMPACT ASSESSMENT

Title

PROPOSED LOCATIONS OF WATER QUALITY MONITORING STATIONS

Designed	BL		Eng.Chk.	FY	
Drawn	MING		Coordination	FY	
Dwg.Chk.	BL		Approved	AFK	

Scale	Project	Status
1:5000@A1	248137	PRE
	CAD File: J:\248137\report\env\emam\100523\FIGURE 4-1.dgn	

Drawing No. FIGURE 4.1 Rev P3

ANNEX B

Calibration Certificates for Monitoring Equipment

MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	25th January, 2011	***Certificate Number***	MLCN110186S

Customer Information

Company Name	MTR Corporation Limited
Address	MTR Tower, Telford Plaza, 33 Wai Yip St., Kowloon Bay, Kowloon, Hong Kong

Unit Under Test (UUT)

Description	Handheld Analyzer
Manufacturer	Brüel & Kjær
Model Number	Type 2250
Serial Number	2551244
Equipment Number	-

Calibration Result

* The exact manufacturer's specification is not available from the customer.
* Calibration data are detailed on the attached sheet(s).

Approved By

Laboratory Manager

* Calibration equipment used for this calibration are traceable to national / international standards.
* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the UUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the UUT.
*

萬儀校正中心有限公司
MaxLab Calibration Centre Limited
Unit B2, 9/F., Boldwin Industrial Bldg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong. Tel: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk
香港新界葵涌華星街 16-18 號保盈工業大廈 9 樓 B2 室 電話：(852) 2116 1380 傳真：(852) 2264 6480 電郵：info@maxlab.com.hk

MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	25th January, 2011	*Certificate Number*	MLCN110186S

Calibration Status

Date of Calibration			25th January, 2011
Calibration Equipment Used			4231 (MLTE008)/ C1002184/ 8th Mar 2012
Calibration Procedure			MLCG00 & MLCG15.
Calibration Uncertainty			±0.2 dB
Calibration Condition	*Lab*	*Temperature*	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	UUT	*Stabilizing Time*	Over 3 hours
		Warm-up Time	10 minutes
		Supply Voltage	Internal Battery

Calibration Data

UUT Setting				UUT Rdg	Std Rdg	UUT Error
Frequency Weighted	Parameter	Response	Range (dB)			
A (1 kHz Input)	SPL	F	Auto	93.8 dB	94 dB	-0.2 dB
		S		93.8 dB	94 dB	-0.2 dB
		I		93.8 dB	94 dB	-0.2 dB
C (1 kHz Input)		F		93.8 dB	94 dB	-0.2 dB
		S		93.8 dB	94 dB	-0.2 dB
		I		93.8 dB	94 dB	-0.2 dB
A (1 kHz Input)		F		113.8 dB	114 dB	-0.2 dB
		S		113.8 dB	114 dB	-0.2 dB
		I		113.8 dB	114 dB	-0.2 dB
C (1 kHz Input)		F		113.8 dB	114 dB	-0.2 dB
		S		113.8 dB	114 dB	-0.2 dB
		I		113.8 dB	114 dB	-0.2 dB

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香港新界葵涌華星街 16-18 號保盈工業大廈 9 樓 B2 室 電話：(852) 2116 1380 傳真：(852) 2264 6480 電郵：info@maxlab.com.hk

MANUFACTURER'S CERTIFICATE OF CONFORMANCE

We certify that Brüel & Kjær **-2250-L--** Serial No. **2741137** has been tested and passed all production tests, confirming compliance with the manufacturer's published specification at the date of the test.

The final test has been performed using calibrated equipment, traceable to National or International Standards or by ratio measurements.

Brüel & Kjær is certified under ISO 9001:2008 assuring that all test data is retained on file and is available for inspection upon request.

Nærum 21-jan-2011

Torben Bjørn
Vice President, Operations

Please note that this document is not a calibration certificate.
For information on our calibration services please contact your nearest Brüel & Kjær office.

BA 0238 – 17

HEADQUARTERS: Brüel & Kjær Sound & Vibration Measurement A/S · DK-2850 Nærum · Denmark
Telephone: +45 7741 2000 · Fax: +45 4580 1405 · www.bksv.com · info@bksv.com
Local representatives and service organisations worldwide

Brüel & Kjær
Incorporating LDS and Lochard

MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	25th May, 2009	*Certificate Number*	MLCN090443S

Customer Information

Company Name	MTR Corporation Limited
Address	MTR Tower, Telford Plaza, 33 Wai Yip St., Kowloon Bay, Kowloon, Hong Kong

Unit Under Test (UUT)

Description	Sound Level Calibrator
Manufacturer	Brüel & Kjær
Model Number	4231
Serial Number	2272042
Equipment Number	-

Calibration Result

* All calibration results within the manufacturer's specification.
* Calibration data are detailed on the attached sheet(s).

Approved By

Laboratory Manager

* Calibration equipment used for this calibration are traceable to national / international standards.
* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the UUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the UUT.
*

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MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	25th May, 2009	*Certificate Number*	MLCN090443S

Calibration Status

Date of Calibration			23rd May, 2009
Calibration Equipment Used			4231 (Spec) (MLTE008)/ CA0801167/ 24th Feb 2010 1351 (MLTE049)/ MLEC08/06/02/ 14th Jun 2009
Calibration Procedure			MLCG00 & MLCG15.
Calibration Uncertainty			± 0.1 dB
Calibration Condition	*Lab*	*Temperature*	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	UUT	*Stabilizing Time*	24 hours
		Warm-up Time	Not applicable
		Supply Voltage	Not applicable

Calibration Data

UUT Setting	STD Rdg	UUT Error from Setting	UUT Error Limit
94 dB	93.8 dB	-0.2 dB	0.2 dB
114 dB	113.9 dB	-0.1 dB	0.2 dB

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香港新界葵涌華星街16–18號保盈工業大廈 9 樓 B2 室 電話：(852) 2116 1380 傳真：(852) 2264 6480 電郵：info@maxlab.com.hk

MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	25th May, 2009	*Certificate Number*	MLCN090442S

Customer Information

Company Name	MTR Corporation Limited
Address	MTR Tower, Telford Plaza, 33 Wai Yip St., Kowloon Bay, Kowloon, Hong Kong

Unit Under Test (UUT)

Description	Sound Level Calibrator
Manufacturer	Brüel & Kjær
Model Number	4231
Serial Number	2309393
Equipment Number	-

Calibration Result

* All calibration results within the manufacturer's specification.
* Calibration data are detailed on the attached sheet(s).

Approved By

Laboratory Manager

* Calibration equipment used for this calibration are traceable to national / international standards.
* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the UUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the UUT.
* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.

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MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	25th May, 2009	*Certificate Number*	MLCN090442S

Calibration Status

Date of Calibration			23rd May, 2009
Calibration Equipment Used			4231 (Spec) (MLTE008)/ CA0801167/ 24th Feb 2010 1351 (MLTE049)/ MLEC08/06/02/ 14th Jun 2009
Calibration Procedure			MLCG00 & MLCG15.
Calibration Uncertainty			± 0.1 dB
Calibration Condition	*Lab*	*Temperature*	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	UUT	*Stabilizing Time*	24 hours
		Warm-up Time	Not applicable
		Supply Voltage	Not applicable

Calibration Data

UUT Setting	STD Rdg	UUT Error from Setting	UUT Error Limit
94 dB	94.0 dB	0.0 dB	0.2 dB
114 dB	114.1 dB	0.1 dB	0.2 dB

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香港新界葵涌華星街16–18號保盈工業大厦 9 樓 B2 室 電話：(852) 2116 1380 傳真：(852) 2264 6480 電郵：info@maxlab.com.hk

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC SITE

Location -> Police College- Police Quart Date -> 8-Feb-11

Sampler -> 694-0661 Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1007	Sampler Elevation	(feet)	60
Sea Level Pressure	(in Hg)	29.74	Corrected Pressure	(mm Hg)	753.73
Temperature	(deg C)	23.5	Temperature	(deg K)	296.50
Seasonal SL Pressure	(in Hg)	29.74	Corrected Seasonal	(mm Hg)	753.73
Seasonal Temperature	(deg C)	23.50	Seasonal Temperature	(deg K)	296.50

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc. Qstd Slope -> 1.99

Model -> 25A Qstd Intercept -> -0.014012

Serial# -> 5303 Date Certified ->

CALIBRATION

	Plate or Test #	H_2O (in)	Qstd (M^3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION	
1	18	14.7	1.931	67	66.892	Slope =	36.5750
2	13	11.9	1.738	62	61.900	Intercept =	-2.6461
3	10	9.1	1.520	53	52.914	Corr. Coeff. =	0.9974
4	7	5.8	1.215	43	42.931		
5	5	3.5	0.946	31	30.950		

Calculations

$Qstd = 1/m [Sqrt (H_2O (Pa/Pstd) (Tstd/Ta)) - b]$

$IC = I [Sqrt (Pa/Pstd) (Tstd/Ta)]$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

1/m ((I) [Sqrt (298/Tav) (Pav/760)] - b)

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC SITE

Location -> Chan Pak Sha School Date -> 8-Feb-11

Sampler -> 894-0833 Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1011	Sampler Elevation	(feet)	60
Sea Level Pressure	(in Hg)	29.85	Corrected Pressure	(mm Hg)	756.73
Temperature	(deg C)	22	Temperature	(deg K)	295.00
Seasonal SL Pressure	(in Hg)	29.85	Corrected Seasonal	(mm Hg)	756.73
Seasonal Temperature	(deg C)	22.00	Seasonal Temperature	(deg K)	295.00

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc. Qstd Slope -> 1.99

Model -> 25A Qstd Intercept -> -0.014012

Serial# -> 5303 Date Certified ->

CALIBRATION

	Plate or Test #	H_2O (in)	Qstd (M^3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION	
1	18	13	1.824	60	60.175	Slope =	29.0331
2	13	10.5	1.640	55	55.160	Intercept =	7.5836
3	10	8.1	1.441	50	50.146	Corr. Coeff. =	0.9992
4	7	5.2	1.156	41	41.119		
5	5	3.3	0.923	34	34.099		

Calculations

Qstd = 1/m [Sqrt (H_2O (Pa/Pstd) (Tstd/Ta)) - b]

IC = I [Sqrt (Pa/Pstd) (Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

1/m ((I) [Sqrt (298/Tav) (Pav/760)] - b)

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC SITE

Location -> Shan On House (YOC) Date -> 8-Feb-11

Sampler -> 994-0878 Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1007	Sampler Elevation	(feet)	60
Sea Level Pressure	(in Hg)	29.74	Corrected Pressure	(mm Hg)	753.73
Temperature	(deg C)	23.5	Temperature	(deg K)	296.50
Seasonal SL Pressure	(in Hg)	29.74	Corrected Seasonal	(mm Hg)	753.73
Seasonal Temperature	(deg C)	23.50	Seasonal Temperature	(deg K)	296.50

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc. Qstd Slope -> 1.99

Model -> 25A Qstd Intercept -> -0.014012

Serial# -> 5303 Date Certified ->

CALIBRATION

	Plate or Test #	H_2O (in)	Qstd (M^3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION	
1	18	14.8	1.937	68	67.890	Slope =	36.8221
2	13	12	1.745	63	62.898	Intercept =	-2.3479
3	10	9.2	1.529	54	53.913	Corr. Coeff. =	0.9973
4	7	5.9	1.226	44	43.929		
5	5	3.6	0.959	32	31.948		

Calculations

Qstd = 1/m [Sqrt (H_2O (Pa/Pstd) (Tstd/Ta)) - b]

IC = I [Sqrt (Pa/Pstd) (Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

1/m ((I) [Sqrt (298/Tav) (Pav/760)] - b)

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC SITE

Location -> South Horizons Date -> 16-May-11

Sampler -> 1294-1104 Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1010	Sampler Elevation	(feet)	90
Sea Level Pressure	(in Hg)	29.83	Corrected Pressure	(mm Hg)	755.23
Temperature	(deg C)	26	Temperature	(deg K)	299.00
Seasonal SL Pressure	(in Hg)	29.83	Corrected Seasonal	(mm Hg)	755.23
Seasonal Temperature	(deg C)	26.00	Seasonal Temperature	(deg K)	299.00

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc. Qstd Slope -> 2.0075

Model -> G25A Qstd Intercept -> -0.038138

Serial# -> 1436 Date Certified ->

CALIBRATION

	Plate or Test #	H_2O (in)	Qstd (M^3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION	
1	18	12.3	1.758	60	59.711	Slope =	31.4600
2	13	10	1.587	54	53.740	Intercept =	4.2370
3	10	7.8	1.404	49	48.764	Corr. Coeff. =	0.9996
4	7	5.1	1.139	40	39.807		
5	5	3.2	0.906	33	32.841		

Calculations

Qstd = 1/m [Sqrt (H_2O (Pa/Pstd) (Tstd/Ta)) - b]

IC = I [Sqrt (Pa/Pstd) (Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

1/m ((I) [Sqrt (298/Tav) (Pav/760)] - b)

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC SITE

Location -> Wong Chuk Hang San Wai Date -> 8-Feb-11

Sampler -> 1294-1111 Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1007	Sampler Elevation	(feet)	60
Sea Level Pressure	(in Hg)	29.74	Corrected Pressure	(mm Hg)	753.73
Temperature	(deg C)	23	Temperature	(deg K)	296.00
Seasonal SL Pressure	(in Hg)	29.74	Corrected Seasonal	(mm Hg)	753.73
Seasonal Temperature	(deg C)	23.00	Seasonal Temperature	(deg K)	296.00

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc. Qstd Slope -> 1.99

Model -> 25A Qstd Intercept -> -0.014012

Serial# -> 5303 Date Certified ->

CALIBRATION

	Plate or Test #	H_2O (in)	Qstd (M^3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION	
1	18	14.8	1.939	64	63.951	Slope =	29.7514
2	13	11.9	1.739	59	58.954	Intercept =	6.2347
3	10	9.3	1.538	51	50.961	Corr. Coeff. =	0.9970
4	7	5.9	1.227	42	41.968		
5	5	3.7	0.973	36	35.972		

Calculations

Qstd = 1/m [Sqrt (H_2O (Pa/Pstd) (Tstd/Ta)) - b]

IC = I [Sqrt (Pa/Pstd) (Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

1/m ((I) [Sqrt (298/Tav) (Pav/760)] - b)

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

ThermoFisher
SCIENTIFIC
27 FORGE PARKWAY
FRANKLIN MA 02038
TOLL FREE: 866-282-0430
TEL: 508-553-6949
FAX: 508-541-8366
www.thermo.com/aqi

DR2000 CALIBRATION CERTIFICATE

This calibration is traceable to the National Institute of Standards and Testing

SERIAL NUMBER:	2004
CALIBRATION RATIO:	1
AVG. DR CONCENTRATION:	2.45 mg/m3
MASTER AVG CONCENTRATION:	1.93 mg/m3
PDR BACKROUND CONCENTRATION:	0.566 mg/m3

TEMPERATURE:	73 F
RH:	39 %

CALIBRATION MASTER: D187
LAST CALIBRATED: 5/1/2009

TECHNICIAN: KL DATE: 5/29/2009

Certificate of Calibration

Certificate Number: EDCQP200-4.11.5

Environmental Devices Corporation certifies the Haz-Dust Particulate Monitors are calibrated gravimetrically against the specifications and protocols set forth in NIOSH method 0600 & 0500 and are NIST traceable and conforms to original specifications of +/- 10%.

Calibration Dust Specifications using NIST traceable Coulter Mutisizer II e. ISO12103 –1 A2 Fine Test Dust.
NIST primary Flow Standard: LFE774300.
Quality system standard to meet the requirements of ANSI/ASQC standard Q9000-1994 (ISO 9001), MIL-STD 45662A, and customer's specification if required.

Particulate Cumulative Volume Numeric Data

Micron Size	% Less Than
1	2.9
2	11.0
3	19.6
4	27.7
5	34.6
7	43.6
10	52.1
20	70.7
40	89.2
80	99.8
120	100.0

Temperature = 22°C
Relative Humidity = 30%
Atmospheric Pressure = 760 mmHg
Measurement Uncertainty Estimated @ 95% Confidence Level (k=2)

Technician	Model	Serial Number	Date
M B.	E-Ram-200	01113294	Jan 27 2011

Checked By _____ Next Calibration Due Date Jan 27 2012

Calibration Span Accessory K= 10.9 mg/m³ Model: CS-105

Environmental Devices Corporation
4 Wilder Drive Building #15
Plaistow, NH 03865
ISO-9001 Certified

ALS Technichem (HK) Pty Ltd

CERTIFICATE OF ANALYSIS

CONTACT:	MR THOMAS WONG	**WORK ORDER:**	HK1101810
CLIENT:	ENOVATIVE ENVIRONMENTAL TECHNOLOGY COMPANY	**AMENDMENT:**	1
ADDRESS:	RM 3704, SIK MAN HOUSE, HOMANTIN ESTATE, KOWLOON, HONG KONG.	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	20/01/2011
		DATE OF ISSUE:	22/01/2011
		SAMPLE TYPE:	EQUIPMENT
ORDER No.:		**No. of SAMPLES:**	2

COMMENTS

The calibration procedure used for the analysis has been applied for the calibration of the above instrument.

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd

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1-3 Wing Yip Street
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Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsenviro.com

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

Abbreviations: *% SPK REC denotes percentage spike recovery*
CHK denotes duplicate check sample
LOR denotes limit of reporting
LCS % REC denotes Laboratory Control Sample percentage recovery

ADDRESS 11/F, Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong PHONE +852 2610 1044 FAX +852 2610 2021
ALS TECHNICHEM (HK) PTY LTD Part of the ALS Laboratory Group A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

Work Order: HK1101810
Date of Issue: 22/01/2011
Client: ENOVATIVE ENVIRONMENTAL TECHNOLOGY COMPANY
Client Reference:

Calibration of Mulitimeter

Item :	YSI Multimeter	Serial No.:	10D101566
Model No.:	YSI Professional Plus	Equipment No.:	N/A
ALS Lab ID:	HK1101810 -001	Date of Calibration:	20 January, 2011

Testing Results :

Salinity

Expected Reading	Recording Reading
10.0 g/L	10.1 g/L
20.0 g/L	20.4 g/L
30.0 g/L	30.5 g/L
Allowing Deviation	± 10%

Testing Method:

APHA (20th edition), 2520 A and B

Dissolved Oxygen

Expected Reading	Recording Reading
0.0 mg/L	<0.1 mg/L
3.2 mg/L	3.1 mg/L
6.6 mg/L	6.6 mg/L
9.6 mg/L	9.8 mg/L
Allowing Deviation	± 0.2 mg/L

Testing Method:

APHA (20th edition), 4500-OC & G

pH

Expected Reading	Recording Reading
4.00	4.00
7.00	7.10
10.0	10.0
Allowing Deviation	± 0.2 unit

Testing Method:

APHA (20th edition), 4500-H^+B

Temperature

Expected Reading	Recording Reading
9.0 °C	8.8 °C
18.7 °C	18.8 °C
Allowing Deviation	±2.0 °C

Testing Method:

In House Method

Mr Chan Kwok Fai, Godfrey
Laboratory Manager – Hong Kong

CERTIFICATE OF ANALYSIS

Work Order: HK1101810
Date of Issue: 22/01/2011
Client: ENOVATIVE ENVIRONMENTAL TECHNOLOGY COMPANY
Client Reference:

Calibration of Mulitimeter

Item :	YSI Multimeter	Serial No.:	10D101565
Model No.:	YSI Professional Plus	Equipment No.:	N/A
ALS Lab ID:	HK1101810 -002	Date of Calibration:	20 January, 2011

Testing Results :

Salinity

Expected Reading	Recording Reading
10.0 g/L	10.1 g/L
20.0 g/L	20.2 g/L
30.0 g/L	30.3 g/L
Allowing Deviation	± 10%

Testing Method:

APHA (20th edition), 2520 A and B

Dissolved Oxygen

Expected Reading	Recording Reading
0.0 mg/L	0.1 mg/L
3.2 mg/L	3.3 mg/L
6.6 mg/L	6.5 mg/L
9.6 mg/L	9.5 mg/L
Allowing Deviation	± 0.2 mg/L

Testing Method:

APHA (20th edition), 4500-OC & G

pH

Expected Reading	Recording Reading
4.00	3.90
7.00	7.00
10.0	10.0
Allowing Deviation	± 0.2 unit

Testing Method:

APHA (20th edition), 4500-H^+B

Temperature

Expected Reading	Recording Reading
9.0 °C	9.0 °C
18.7 °C	18.7 °C
Allowing Deviation	±2.0 °C

Testing Method:

In House Method

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR THOMAS WONG	**WORK ORDER:**	HK1109124
CLIENT:	ENOVATIVE ENVIRONMENTAL TECHNOLOGY COMPANY	**LABORATORY:**	HONG KONG
ADDRESS:	RM 3704, SIK MAN HOUSE, HOMANTIN ESTATE, KOWLOON, HONG KONG.	**DATE RECEIVED:**	20/04/2011
		DATE OF ISSUE:	27/04/2011
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Temperature, Salinity, pH and Dissolved Oxygen
Description:	YSI Multimeter
Brand Name:	YSI
Model No.:	YSI Professional Plus
Serial No.:	09K100735
Equipment No.:	--
Date of Calibration:	20 April, 2011

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd

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1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
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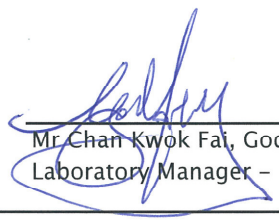

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1109124
Date of Issue: 27/04/2011
Client: ENOVATIVE ENVIRONMENTAL TECHNOLOGY COMPANY

Description: YSI Multimeter
Brand Name: YSI
Model No.: YSI Professional Plus
Serial No.: 09K100735
Equipment No.: --
Date of Calibration: 20 April, 2011 Date of next Calibration: 20 July, 2011

Parameters:

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
13.7	13.9	0.2
22.7	22.4	-0.3
	Tolerance Limit (°C)	2.0

pH Value

Method Ref: ALPHA (21st edition), 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.00	4.0	0.00
7.00	7.1	0.10
10.0	9.9	-0.10
	Tolerance Limit (±unit)	0.20

Dissolved Oxygen

Method Ref: APHA (21st edition), 4500O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
0.00	0.1	0.10
2.43	2.5	0.07
6.67	6.5	-0.17
8.98	8.8	-0.18
	Tolerance Limit (±mg/L)	0.20

Salinity

Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
10.0	9.89	-1.1
20.0	19.78	-1.1
30.0	29.72	-0.9
	Tolerance Limit (±%)	10.0

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR THOMAS WONG	**WORK ORDER:**	HK1107235
CLIENT:	ENOVATIVE ENVIRONMENTAL TECHNOLOGY COMPANY	**LABORATORY:**	HONG KONG
ADDRESS:	RM 3704, SIK MAN HOUSE, HOMANTIN ESTATE, KOWLOON, HONG KONG.	**DATE RECEIVED:**	01/03/2011
		DATE OF ISSUE:	29/03/2011
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Turbidity
Description:	Turbidity Meter
Brand Name:	Neotek-Ponsel
Model No.:	Odeon Classic
Serial No.:	SN-PNEPA-0168
Equipment No.:	--
Date of Calibration:	01 March, 2011

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

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Email: hongkong@alsglobal.com

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1107235
Date of Issue: 29/03/2011
Client: ENOVATIVE ENVIRONMENTAL TECHNOLOGY COMPANY

Description: Turbidity Meter
Brand Name: Neotek-Ponsel
Model No.: Odeon Classic
Serial No.: SN-PNEPA-0168
Equipment No.: --
Date of Calibration: 01 March, 2011 Date of next Calibration: 01 June, 2011

Parameters:

Turbidity **Method Ref: ALPHA 21st Ed. 2130B**

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
4.00	3.76	-6.0%
16.0	15.5	-3.1%
40.0	38.8	-3.0%
160	159	-0.6%
400	397	-0.8%
	Tolerance Limit (±%)	10.0

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ANNEX C

TSP Baseline Measurements

Project South Island Line (East)

1-hr TSP Monitoring Log Sheet

Monitoring Location Wong Chuk Hang San Wai (NFP6)

Baseline period 10 Mar - 23 Mar

Date	Start Time	Measured TSP Level ($\mu g/m^3$)
10-Mar-11	10:00 AM	99
11-Mar-11	10:00 AM	136
12-Mar-11	12:00 PM	111
13-Mar-11	1:40 PM	144
14-Mar-11	11:35 AM	111
15-Mar-11	1:30 PM	190
16-Mar-11	1:25 PM	84
17-Mar-11	1:45 PM	66
18-Mar-11	1:30 PM	100
19-Mar-11	11:00 AM	68
20-Mar-11	2:45 PM	70
21-Mar-11	1:50 PM	35
22-Mar-11	2:20 PM	101
23-Mar-11	1:10 PM	82

Project South Island Line (East)

24-hr TSP Monitoring Log Sheet

Monitoring Location Wong Chuk Hang San Wai (NFP6)

Baseline period 10 Mar - 23 Mar

Date	Start Time	Measured TSP Level ($\mu g/m^3$)
10-Mar-11	12:08 PM	85
11-Mar-11	12:11 PM	80
12-Mar-11	1:07 PM	90
13-Mar-11	1:30 PM	52
14-Mar-11	1:35 PM	56
15-Mar-11	1:37 PM	95
16-Mar-11	1:39 PM	95
17-Mar-11	1:42 PM	94
18-Mar-11	1:45 PM	36
19-Mar-11	1:56 PM	28
20-Mar-11	1:58 PM	30
21-Mar-11	2:00 PM	38
22-Mar-11	2:03 PM	62
23-Mar-11	2:13 PM	79

Project South Island Line (East)

1-hr TSP Monitoring Log Sheet

Monitoring Location Police Staff Quarter (WCH2)

Baseline preiod 2 Apr - 16 Apr

Date	Start Time	Measured TSP Level ($\mu g/m^3$)
02-Apr-11	9:45 AM	91
04-Apr-11	12:30 PM	128
05-Apr-11	11:40 AM	69
06-Apr-11	10:30 AM	62
07-Apr-11	10:00 AM	96
08-Apr-11	10:40 AM	97
09-Apr-11	10:05 AM	93
10-Apr-11	1:15 PM	94
11-Apr-11	12:05 PM	119
12-Apr-11	12:30 PM	143
13-Apr-11	2:10 PM	86
14-Apr-11	3:40 PM	73
15-Apr-11	3:15 PM	87
16-Apr-11	4:00 PM	84

* No data for 3 Apr due to electricity failure

Project South Island Line (East)

24-hr TSP Monitoring Log Sheet

Monitoring Location Police Staff Quarter (WCH2)

Baseline period 2 Apr - 16 Apr

Date	Start Time	Measured TSP Level ($\mu g/m^3$)
02-Apr-11	11:36 AM	57
04-Apr-11	12:09 PM	53
05-Apr-11	11:34 AM	59
06-Apr-11	11:36 AM	50
07-Apr-11	11:44 AM	48
08-Apr-11	11:47 AM	46
09-Apr-11	11:55 AM	46
10-Apr-11	12:05 PM	51
11-Apr-11	12:08 PM	81
12-Apr-11	12:30 PM	69
13-Apr-11	2:05 PM	52
14-Apr-11	3:33 PM	46
15-Apr-11	2:55 PM	46
16-Apr-11	2:55 PM	60

* No data for 3 Apr due to electricity failure

Project South Island Line (East)

1-hr TSP Monitoring Log Sheet

Monitoring Location San Wui Commercial Society of HK Chan Pak Sha School (WCH3)

Baseline period 9 Feb - 22 Feb

Date	Start Time	Measured TSP Level ($\mu g/m^3$)
09-Feb-11	10:00 AM	91
10-Feb-11	10:00 AM	163
11-Feb-11	10:20 AM	92
12-Feb-11	10:30 AM	111
13-Feb-11	11:45 AM	165
14-Feb-11	9:30 AM	101
15-Feb-11	11:30 AM	149
16-Feb-11	11:15 AM	132
17-Feb-11	11:45 AM	209
18-Feb-11	1:45 PM	56
19-Feb-11	11:45 AM	46
20-Feb-11	11:00 AM	89
21-Feb-11	12:45 PM	73
22-Feb-11	12:00 PM	75

Project South Island Line (East)

24-hr TSP Monitoring Log Sheet

Monitoring Location San Wui Commercial Society of HK Chan Pak Sha School (WCH3)

Baseline period 9 Feb - 22 Feb

Date	Start Time	Measured TSP Level ($\mu g/m^3$)
09-Feb-11	9:30 AM	94
10-Feb-11	9:54 AM	83
11-Feb-11	10:02 AM	68
12-Feb-11	10:38 AM	108
13-Feb-11	11:27 AM	36
14-Feb-11	11:41 AM	50
15-Feb-11	11:48 AM	50
16-Feb-11	11:53 AM	12
17-Feb-11	11:57 AM	71
18-Feb-11	12:01 PM	37
19-Feb-11	12:33 PM	35
20-Feb-11	12:50 PM	53
21-Feb-11	12:53 PM	74
22-Feb-11	12:57 PM	75

Project South Island Line (East)

1-hr TSP Monitoring Log Sheet

Monitoring Location Shan On House (LET5)

Baseline period 29 Mar - 11 Apr

Date	Start Time	Measured TSP Level ($\mu g/m^3$)
29-Mar-11	9:45 AM	114
30-Mar-11	9:50 AM	99
31-Mar-11	10:10 AM	61
01-Apr-11	10:15 AM	102
02-Apr-11	10:20 AM	119
03-Apr-11	10:45 AM	143
04-Apr-11	12:00 PM	119
05-Apr-11	10:05 AM	111
06-Apr-11	10:20 AM	68
07-Apr-11	11:10 AM	89
08-Apr-11	10:30 AM	108
09-Apr-11	11:30 AM	102
10-Apr-11	11:50 AM	107
11-Apr-11	11:45 AM	126

Project South Island Line (East)

24-hr TSP Monitoring Log Sheet

Monitoring Location Shan On House (LET5)

Baseline period 29 Mar - 11 Apr

Date	Start Time	Measured TSP Level ($\mu g/m^3$)
29-Mar-11	9:45 AM	95
30-Mar-11	9:48 AM	101
31-Mar-11	9:51 AM	61
01-Apr-11	10:10 AM	68
02-Apr-11	10:50 AM	65
03-Apr-11	11:10 AM	59
04-Apr-11	11:34 AM	68
05-Apr-11	10:58 AM	64
06-Apr-11	11:00 AM	58
07-Apr-11	11:02 AM	59
08-Apr-11	11:04 AM	51
09-Apr-11	11:30 AM	63
10-Apr-11	11:45 AM	67
11-Apr-11	11:45 AM	111

Project South Island Line (East)

24-hr TSP Monitoring Log Sheet

Monitoring Location South Horizons Phase IV - Block 25 (SOH2)

Baseline period 18 May - 31 May

Date	Start Time	Measured TSP Level ($\mu g/m^3$)
18-May-11	9:27 AM	53
19-May-11	9:30 AM	32
20-May-11	12:05 PM	34
21-May-11	11:22 AM	27
22-May-11	12:26 PM	38
23-May-11	11:43 AM	77
24-May-11	10:50 AM	36
25-May-11	10:22 AM	55
26-May-11	9:45 AM	53
27-May-11	9:53 AM	85
28-May-11	9:57 AM	147
29-May-11	10:20 AM	81
30-May-11	10:16 AM	59
31-May-11	10:21 AM	61

Project South Island Line (East)

1-hr TSP Monitoring Log Sheet

Monitoring Location South Horizons Phase IV - Block 25 (SOH2)

Baseline period 18 May - 31 May

Date	Start Time	Measured TSP Level ($\mu g/m^3$)
18-May-11	10:30 AM	65
19-May-11	9:30 AM	181
20-May-11	12:00 PM	233
21-May-11	11:05 AM	383
22-May-11	12:20 PM	55
23-May-11	11:30 AM	103
24-May-11	10:50 AM	83
25-May-11	10:20 AM	56
26-May-11	10:00 AM	73
27-May-11	9:30 AM	99
28-May-11	10:00 AM	179
29-May-11	10:30 AM	188
30-May-11	10:15 AM	73
31-May-11	10:20 AM	75

ANNEX D

Noise Baseline Measurements

Noise Baseline Report

Project: South Island Line
Report for Location: San Wui Commercial Society of HK Chan Pak Sha School (CPS)
Baseline period 17 Mar - 30 Mar

Report date: May-11

Parameter: Leq

Time Slot Averaged Baselines

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 07:30	68.1	71.0	62.7
07:30 - 08:00	68.6	71.4	63.4
08:00 - 08:30	68.9	71.6	64.1
08:30 - 09:00	68.0	70.9	63.1
09:00 - 09:30	68.3	71.0	63.5
09:30 - 10:00	68.4	71.2	63.6
10:00 - 10:30	68.2	71.1	63.4
10:30 - 11:00	71.6	70.6	63.5
11:00 - 11:30	68.3	70.9	64.2
11:30 - 12:00	69.4	72.6	64.3
12:00 - 12:30	67.5	70.2	62.9
12:30 - 13:00	67.9	70.7	63.0
13:00 - 13:30	67.8	70.3	63.5
13:30 - 14:00	68.2	70.7	63.7
14:00 - 14:30	68.5	71.1	64.0
14:30 - 15:00	68.9	71.5	64.7
15:00 - 15:30	69.1	71.9	64.2
15:30 - 16:00	68.7	71.2	64.4
16:00 - 16:30	69.2	71.8	64.8
16:30 - 17:00	68.9	71.7	64.4
17:00 - 17:30	68.7	71.5	63.9
17:30 - 18:00	68.2	71.1	62.9
18:00 - 18:30	71.7	70.6	62.5
18:30 - 19:00	67.4	70.5	61.9

Noise Control Period Average Baselines
Weekdays Noise Levels, dB(A)

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 19:00	69.0	71.3	63.9

Sundays / General Holidays Noise Levels, dB(A)

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 19:00	67.1	70.1	61.3

Logarithmic Averaging is being used.

Noise Baseline Report

Project: South Island Line
Report for Location: Holy Spirit Seminary (HSS2)
Baseline period 17 Feb - 4 Mar *19 - 20 Feb excluded due to heavy rain

Report date: May-11

Parameter: Leq

Time Slot Averaged Baselines

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 07:30	63.0	64.3	61.0
07:30 - 08:00	63.2	64.6	61.3
08:00 - 08:30	63.0	64.0	61.3
08:30 - 09:00	63.6	64.7	61.7
09:00 - 09:30	64.0	65.3	62.1
09:30 - 10:00	64.6	65.9	62.7
10:00 - 10:30	65.2	66.4	63.4
10:30 - 11:00	65.2	66.4	63.3
11:00 - 11:30	65.0	66.0	63.0
11:30 - 12:00	64.7	65.8	63.0
12:00 - 12:30	63.9	65.2	62.1
12:30 - 13:00	63.6	65.1	61.5
13:00 - 13:30	63.2	64.3	61.5
13:30 - 14:00	64.4	65.5	62.5
14:00 - 14:30	64.3	65.6	62.4
14:30 - 15:00	64.3	65.5	62.4
15:00 - 15:30	64.1	65.2	62.3
15:30 - 16:00	64.2	65.4	62.4
16:00 - 16:30	64.3	65.6	62.5
16:30 - 17:00	63.9	65.0	62.1
17:00 - 17:30	63.5	64.6	61.6
17:30 - 18:00	62.9	64.0	61.1
18:00 - 18:30	62.5	63.7	60.6
18:30 - 19:00	62.1	63.2	60.2

Noise Control Period Average Baselines
Weekdays Noise Levels, dB(A)

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 19:00	63.9	65.1	62.1

Sundays / General Holidays Noise Levels, dB(A)

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 19:00	63.9	65.0	62.2

Logarithmic Averaging is being used.

Noise Baseline Report

Project: South Island Line
Report for Location: Shun Fung Building, Ap Lei Chau Main Street (SFB)
Baseline period 21 Feb - 6 Mar

Report date: May-11

Parameter: Leq

Time Slot Averaged Baselines

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 07:30	60.9	63.0	57.5
07:30 - 08:00	61.5	63.8	57.6
08:00 - 08:30	64.5	67.4	59.6
08:30 - 09:00	72.1	75.5	61.1
09:00 - 09:30	72.8	76.2	61.6
09:30 - 10:00	71.4	75.2	61.7
10:00 - 10:30	72.1	75.5	61.5
10:30 - 11:00	68.4	71.7	62.3
11:00 - 11:30	69.2	72.9	61.9
11:30 - 12:00	66.0	68.5	60.7
12:00 - 12:30	61.6	63.6	58.3
12:30 - 13:00	61.7	63.5	58.4
13:00 - 13:30	70.0	73.9	61.3
13:30 - 14:00	70.9	74.7	61.5
14:00 - 14:30	69.5	74.1	61.2
14:30 - 15:00	67.9	71.8	60.9
15:00 - 15:30	69.9	73.9	60.7
15:30 - 16:00	69.5	73.4	61.7
16:00 - 16:30	69.9	73.5	61.0
16:30 - 17:00	68.4	71.3	61.0
17:00 - 17:30	64.0	66.4	59.9
17:30 - 18:00	62.2	64.3	58.5
18:00 - 18:30	61.0	63.0	57.7
18:30 - 19:00	59.8	61.9	56.4

Noise Control Period Average Baselines
Weekdays Noise Levels, dB(A)

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 19:00	69.1	72.7	60.9

Sundays / General Holidays Noise Levels, dB(A)

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 19:00	59.9	62.2	56.2

Logarithmic Averaging is being used.

Noise Baseline Report

Project: South Island Line
Report for Location: South Horizons Phase IV - Block 25 (SOH8)
Baseline period 17 May - 1 Jun *21 - 22 May excluded due to heavy rain

Report date:

Parameter: Leq

Time Slot Averaged Baselines

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 07:30	65.6	68.2	61.6
07:30 - 08:00	66.5	69.3	62.3
08:00 - 08:30	66.6	69.2	62.5
08:30 - 09:00	66.1	68.5	62.2
09:00 - 09:30	66.0	68.6	62.3
09:30 - 10:00	66.2	68.7	62.5
10:00 - 10:30	66.0	68.2	62.5
10:30 - 11:00	66.3	68.7	62.7
11:00 - 11:30	66.2	68.4	62.5
11:30 - 12:00	66.0	68.4	62.3
12:00 - 12:30	66.6	69.2	62.3
12:30 - 13:00	66.5	68.8	62.3
13:00 - 13:30	66.5	68.6	62.4
13:30 - 14:00	66.2	68.7	62.5
14:00 - 14:30	66.3	68.6	62.6
14:30 - 15:00	66.4	68.6	62.6
15:00 - 15:30	66.5	68.8	62.7
15:30 - 16:00	66.6	69.1	62.6
16:00 - 16:30	66.7	69.2	62.5
16:30 - 17:00	66.1	68.4	62.4
17:00 - 17:30	66.3	68.7	62.5
17:30 - 18:00	65.9	68.3	62.4
18:00 - 18:30	65.4	67.6	62.1
18:30 - 19:00	65.3	67.5	62.0

Noise Control Period Average Baselines
Weekdays Noise Level, dB(A)

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 19:00	66.3	68.7	62.4

Sundays / General Holidays Noise Levels, dB(A)

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 19:00	65.1	66.8	62.5

Logarithmic Averaging is being used.

Noise Baseline Report

Project: South Island Line
Report for Location: TWGHs Jockey Club Rehabilitation Complex Block A (TWGH 1)
Baseline period 29 Mar - 11 Apr

Report date: May-11

Parameter: Leq

Time Slot Averaged Baselines

	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 07:30	63.4	65.0	61.4
07:30 - 08:00	64.3	65.9	62.4
08:00 - 08:30	65.8	67.7	63.4
08:30 - 09:00	65.5	67.3	63.2
09:00 - 09:30	66.1	68.0	63.7
09:30 - 10:00	65.9	67.5	64.0
10:00 - 10:30	66.3	68.0	64.0
10:30 - 11:00	66.5	68.4	64.0
11:00 - 11:30	67.1	69.1	64.1
11:30 - 12:00	66.5	68.9	63.7
12:00 - 12:30	64.7	66.1	62.9
12:30 - 13:00	64.4	65.9	62.8
13:00 - 13:30	65.2	66.8	63.4
13:30 - 14:00	65.2	66.7	63.5
14:00 - 14:30	65.4	66.8	63.7
14:30 - 15:00	65.8	67.5	63.9
15:00 - 15:30	65.9	67.6	63.8
15:30 - 16:00	65.8	67.5	63.9
16:00 - 16:30	65.6	67.1	63.9
16:30 - 17:00	65.1	66.6	63.5
17:00 - 17:30	64.7	66.3	63.0
17:30 - 18:00	64.2	65.7	62.3
18:00 - 18:30	64.1	65.4	61.7
18:30 - 19:00	64.5	64.8	61.0

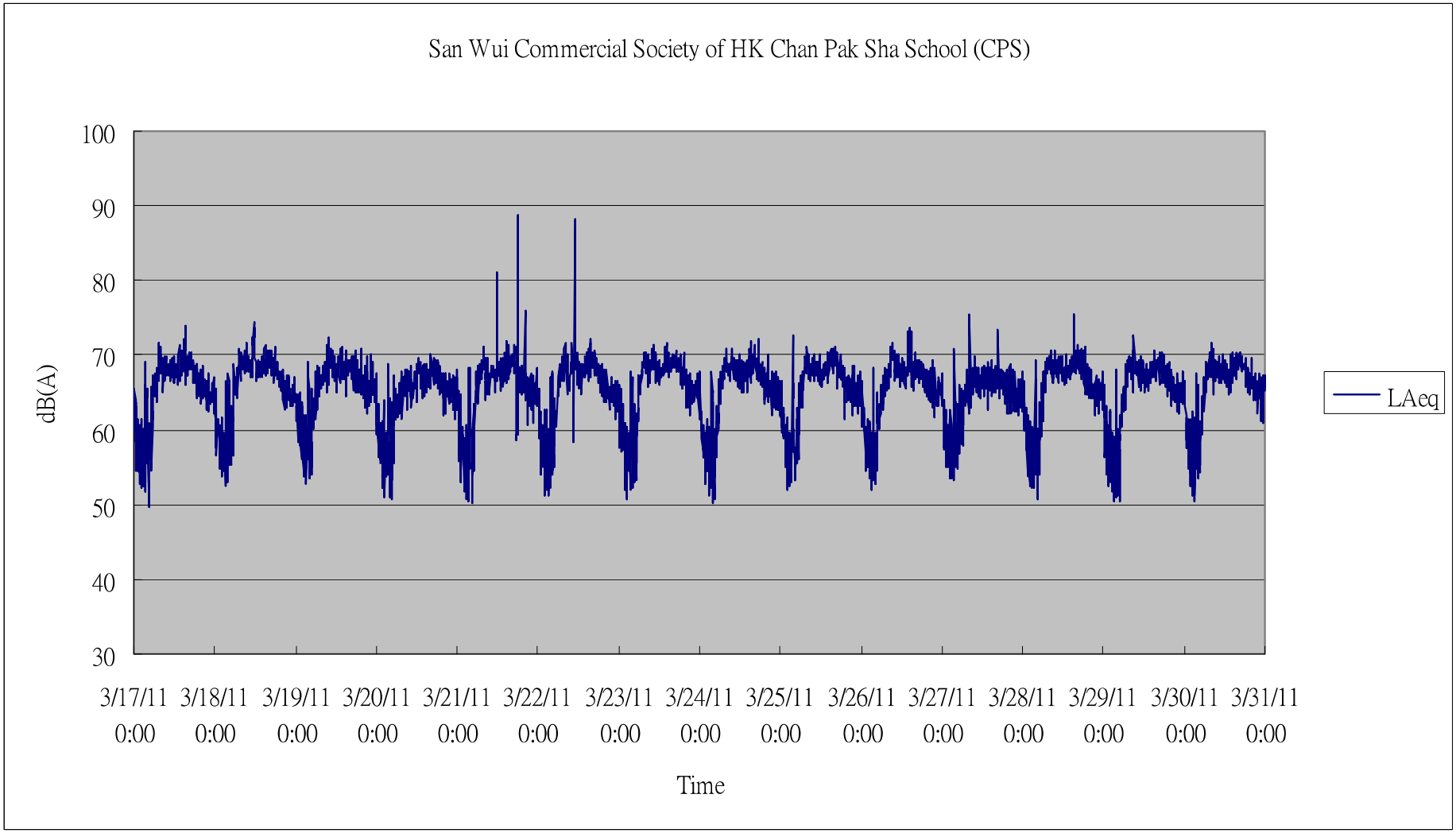
Noise Control Period Average Baselines
Weekdays Noise Levels, dB(A)

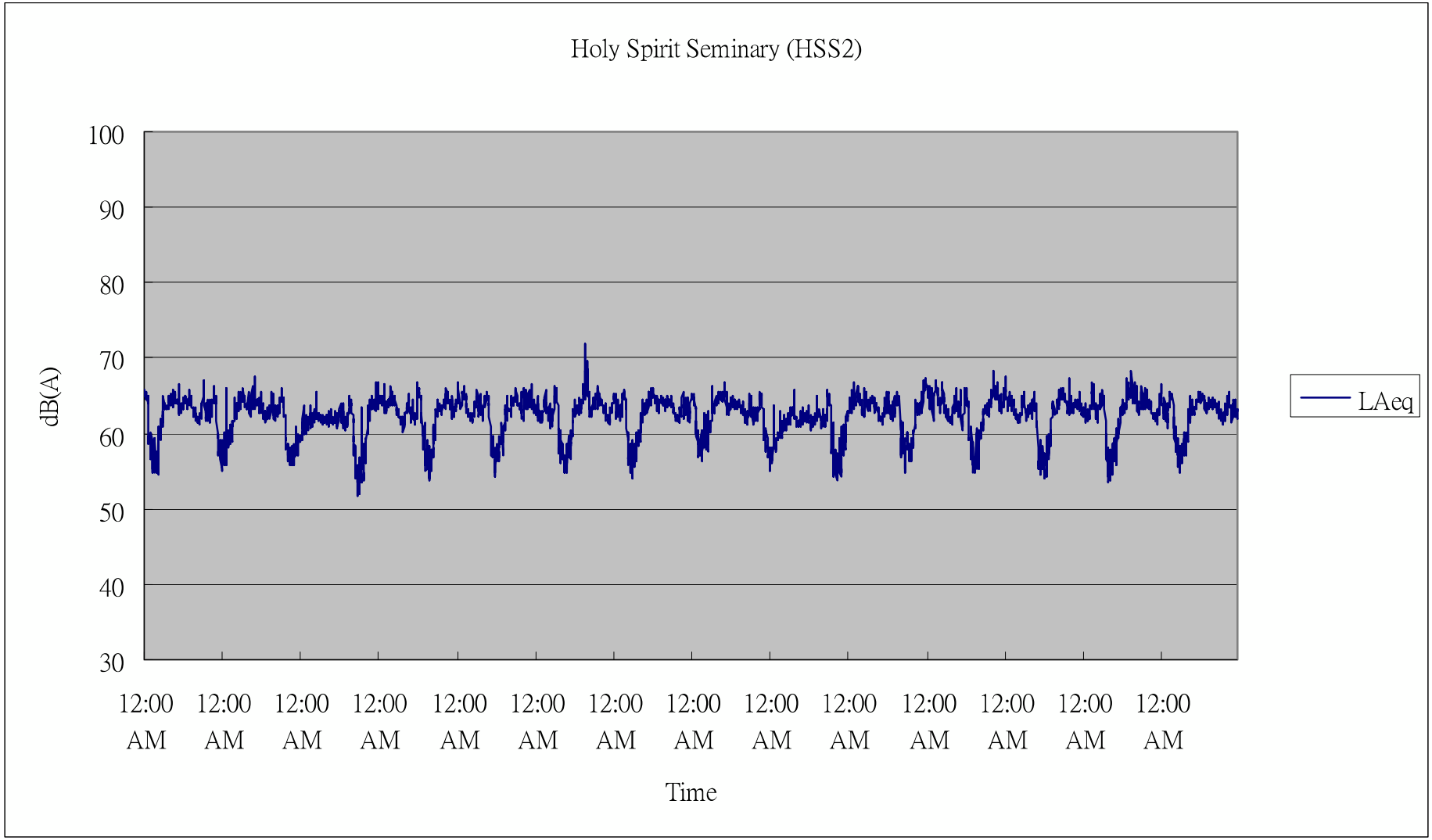
	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 19:00	65.9	67.6	63.7

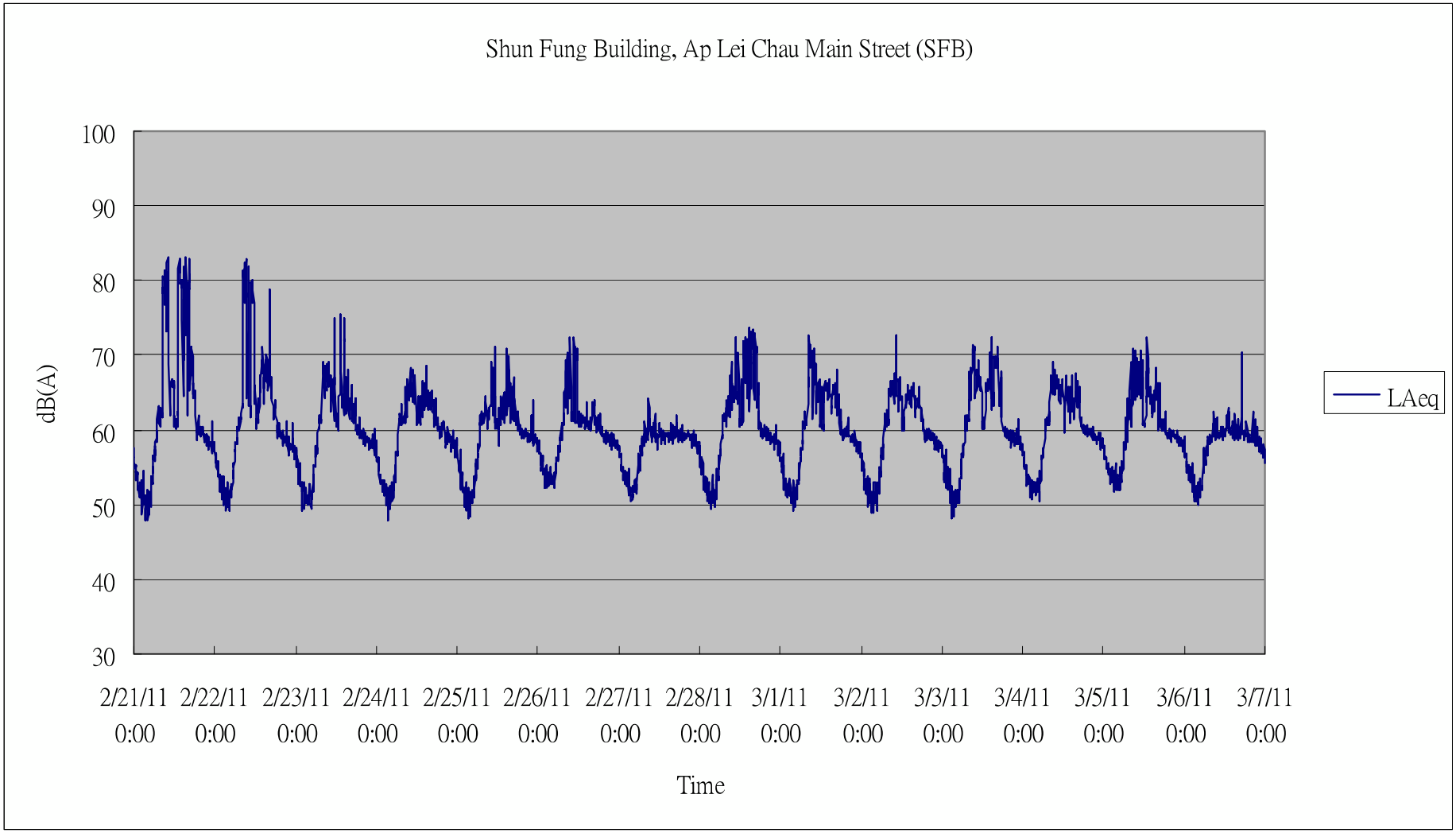
Sundays / General Holidays Noise Levels, dB(A)

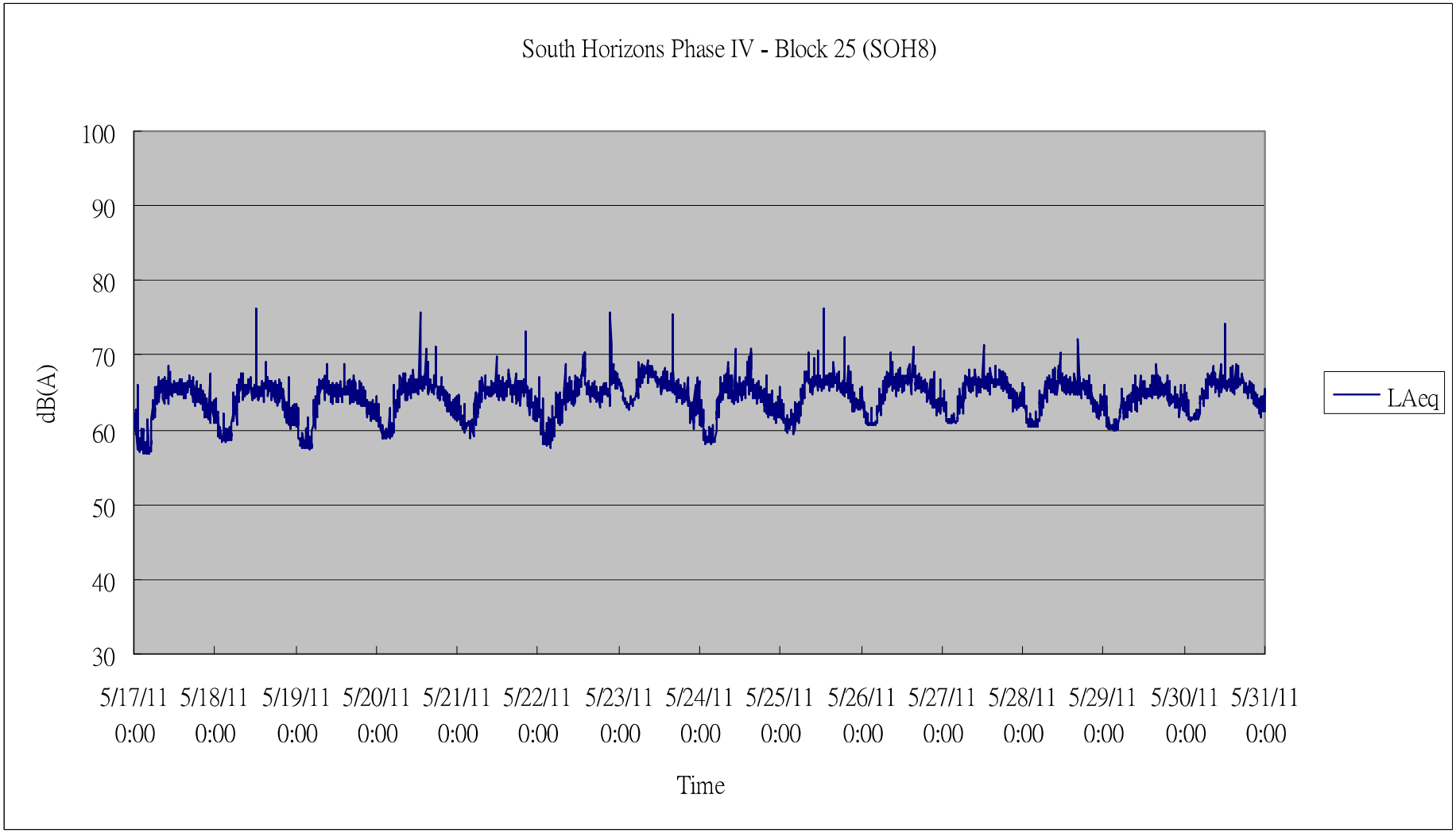
	LAeq(30min)	LAF10(30min)	LAF90(30min)
07:00 - 19:00	63.0	64.4	61.2

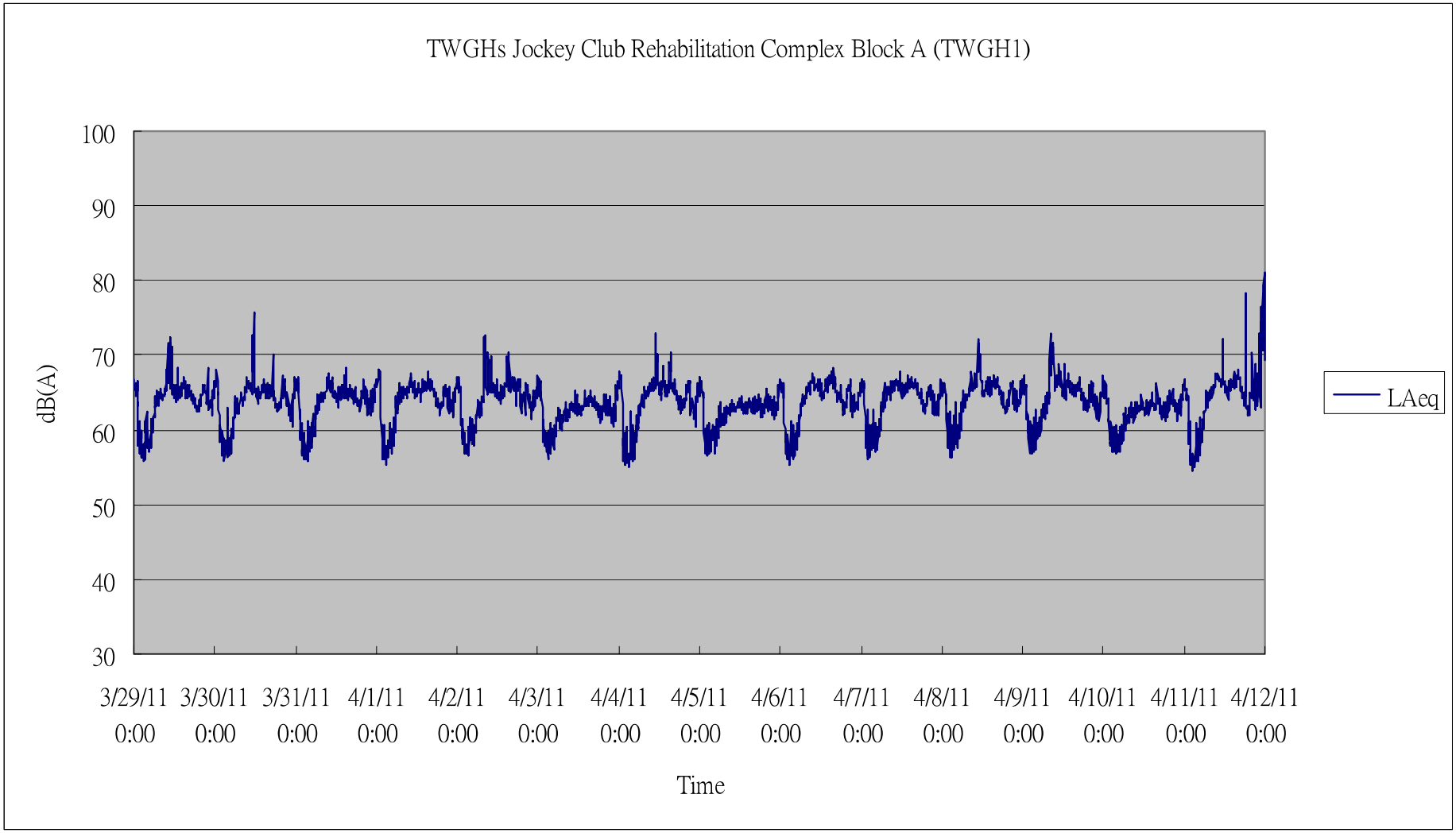
Logarithmic Averaging is being used.


San Wui Commercial Society of HK Chan Pak Sha School (CPS)
100
90
80
70
60
50
40
30
dB(A)
3/17/11 0:00
3/18/11 0:00
3/19/11 0:00
3/20/11 0:00
3/21/11 0:00
3/22/11 0:00
3/23/11 0:00
3/24/11 0:00
3/25/11 0:00
3/26/11 0:00
3/27/11 0:00
3/28/11 0:00
3/29/11 0:00
3/30/11 0:00
3/31/11 0:00
Time
LAeq


Holy Spirit Seminary (HSS2)
100
90
80
70
60
50
40
30
dB(A)
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
12:00 AM
Time
LAeq


Shun Fung Building, Ap Lei Chau Main Street (SFB)
100
90
80
70
60
50
40
30
dB(A)
2/21/11 0:00
2/22/11 0:00
2/23/11 0:00
2/24/11 0:00
2/25/11 0:00
2/26/11 0:00
2/27/11 0:00
2/28/11 0:00
3/1/11 0:00
3/2/11 0:00
3/3/11 0:00
3/4/11 0:00
3/5/11 0:00
3/6/11 0:00
3/7/11 0:00
Time
LAeq


South Horizons Phase IV - Block 25 (SOH8)
100
90
80
70
60
50
40
30
dB(A)
5/17/11 0:00
5/18/11 0:00
5/19/11 0:00
5/20/11 0:00
5/21/11 0:00
5/22/11 0:00
5/23/11 0:00
5/24/11 0:00
5/25/11 0:00
5/26/11 0:00
5/27/11 0:00
5/28/11 0:00
5/29/11 0:00
5/30/11 0:00
5/31/11 0:00
Time
LAeq


TWGHs Jockey Club Rehabilitation Complex Block A (TWGH1)
100
90
80
70
60
50
40
30
dB(A)
3/29/11 0:00
3/30/11 0:00
3/31/11 0:00
4/1/11 0:00
4/2/11 0:00
4/3/11 0:00
4/4/11 0:00
4/5/11 0:00
4/6/11 0:00
4/7/11 0:00
4/8/11 0:00
4/9/11 0:00
4/10/11 0:00
4/11/11 0:00
4/12/11 0:00
Time
LAeq

ANNEX E

Water Baseline Measurements

Summary of Baseline Monitoring Results for **Ebb** Condition

Monitoring Location		Temperature (°C)	Salinity (ppt)	DO (mg/L)	DOS (%)	Turbidity (NTU)	pH	TSS (mg/)
CS1(surface)	Average	20.1	32.4	7.2	96.1	5.1	8.3	11.8
	Minimum	17.7	31.6	6.4	90.0	1.0	8.1	6.5
	Maximum	23.7	33.1	8.1	107.5	10.2	8.4	17.5
CS1(middle)	Average	20.0	32.4	7.2	96.3	4.5	8.3	11.9
	Minimum	17.8	31.8	6.4	89.4	1.1	8.1	8.0
	Maximum	23.6	33.1	7.8	105.5	8.6	8.4	24.5
CS1(bottom)	Average	20.0	32.5	7.2	96.2	4.7	8.3	11.4
	Minimum	17.8	32.1	6.6	88.8	1.0	8.1	6.0
	Maximum	23.6	33.1	7.9	105.4	8.2	8.4	19.0

Monitoring Location		Temperature (°C)	Salinity (ppt)	DO (mg/L)	DOS (%)	Turbidity (NTU)	pH	TSS (mg/)
WM1 (surface)	Average	20.0	32.4	6.7	88.8	2.6	8.3	10.8
	Minimum	17.5	31.75	5.45	77.45	1	8.1	5
	Maximum	23.7	33.0	7.3	96.6	6.1	8.4	22.0
WM1(middle)	Average	20.1	32.4	6.8	89.8	2.6	8.3	8.8
	Minimum	17.7	32.0	5.6	78.8	1.3	8.0	4.0
	Maximum	23.6	33.0	7.3	95.8	5.7	8.4	14.5
WM1(bottom)	Average	20.0	32.4	6.7	89.5	2.6	8.3	10.0
	Minimum	17.7	31.7	5.7	79.7	1.4	8.0	5.5
	Maximum	23.6	33.0	7.3	95.6	4.5	8.4	14.0

Monitoring Location		Temperature (°C)	Salinity (ppt)	DO (mg/L)	DOS (%)	Turbidity (NTU)	pH	TSS (mg/)
WM2(surface)	Average	20.0	32.4	6.8	89.7	2.1	8.3	9.0
	Minimum	17.7	31.7	5.5	77.2	1.1	8.0	6.0
	Maximum	23.5	33.1	7.4	98.2	3.2	8.4	12.5
WM2(bottom)	Average	20.1	32.4	6.8	90.6	3.1	8.3	10.3
	Minimum	17.8	31.7	5.6	78.9	1.0	8.0	5.5
	Maximum	23.5	33.1	7.3	96.5	11.6	8.4	19.0
WM2(middle)	Average	NA	NA	NA	NA	NA	NA	NA
	Minimum	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA

Monitoring Location		Temperature (°C)	Salinity (ppt)	DO (mg/L)	DOS (%)	Turbidity (NTU)	pH	TSS (mg/)
WM3 (surface)	Average	20.1	32.4	6.8	89.8	2.2	8.3	11.5
	Minimum	17.7	31.9	5.6	79.2	1.0	8.1	6.0
	Maximum	23.7	33.0	7.3	94.6	3.6	8.4	22.0
WM3(middle)	Average	20.0	32.5	6.8	90.9	2.2	8.3	9.1
	Minimum	17.8	31.9	5.6	79.2	1.0	8.1	5.5
	Maximum	23.7	33.1	7.3	96.2	3.8	8.4	16.5
WM3(bottom)	Average	20.0	32.6	6.9	92.1	2.2	8.3	8.0
	Minimum	17.8	32.1	5.8	81.8	1.2	8.1	5.5
	Maximum	23.6	33.1	7.4	97.0	4.3	8.4	11.0

Monitoring Location		Temperature (°C)	Salinity (ppt)	DO (mg/L)	DOS (%)	Turbidity (NTU)	pH	TSS (mg/)
WM4 (surface)	Average	20.1	32.4	6.8	90.4	1.9	8.3	9.6
	Minimum	17.7	31.9	5.8	81.4	1.0	8.1	3.5
	Maximum	23.8	33.0	7.2	96.1	2.7	8.4	20.5
WM4(middle)	Average	20.1	32.5	6.9	91.9	1.9	8.3	9.2
	Minimum	17.8	32.1	5.9	83.8	1.1	8.1	5.0
	Maximum	23.7	33.0	7.3	99.8	3.5	8.4	18.5
WM4(bottom)	Average	20.0	32.6	7.1	94.0	2.1	8.3	8.4
	Minimum	17.8	32.2	6.2	87.5	1.0	8.1	5.0
	Maximum	23.6	33.1	7.6	101.8	3.6	8.4	13.5

Monitoring Location		Temperature (°C)	Salinity (ppt)	DO (mg/L)	DOS (%)	Turbidity (NTU)	pH	TSS (mg/)
CS2 (surface)	Average	20.1	32.6	7.3	97.1	2.1	8.3	9.3
	Minimum	17.6	32.1	6.7	89.5	1.0	8.2	5.5
	Maximum	23.6	33.2	7.9	106.6	3.6	8.4	17.5
CS2(middle)	Average	20.0	32.6	7.4	98.0	2.1	8.4	8.8
	Minimum	17.7	32.2	6.7	91.3	1.0	8.2	5.5
	Maximum	23.5	33.2	7.9	107.5	4.1	8.5	18.5
CS2(bottom)	Average	19.9	32.7	7.4	98.7	2.2	8.3	8.8
	Minimum	17.7	32.2	6.7	92.1	1.0	8.1	5.5
	Maximum	23.5	33.2	7.9	106.7	4.3	8.5	15.5

Summary of Baseline Monitoring Results for **Flood** Condition

Monitoring Location		Temperature (°C)	Salinity (ppt)	DO (mg/L)	DOS (%)	Turbidity (NTU)	pH	TSS (mg/)
CS1(surface)	Average	20.1	32.4	7.1	94.9	5.8	8.3	11.8
	Minimum	17.8	31.6	6.3	88.7	1.1	8.2	6.5
	Maximum	23.0	32.9	8.0	107.7	9.8	8.4	17.5
CS1(middle)	Average	19.7	32.5	7.2	95.9	4.7	8.4	11.9
	Minimum	16.7	31.9	6.4	89.3	1.1	8.3	8.0
	Maximum	22.8	33.0	7.7	103.8	8.4	8.5	18.5
CS1(bottom)	Average	20.0	32.6	7.3	96.7	4.7	8.4	11.3
	Minimum	17.9	32.0	6.6	91.3	1.1	8.3	6.5
	Maximum	22.5	33.0	7.9	103.9	8.6	8.5	15.5

Monitoring Location		Temperature (°C)	Salinity (ppt)	DO (mg/L)	DOS (%)	Turbidity (NTU)	pH	TSS (mg/)
WM1 (surface)	Average	20.1	32.4	6.6	88.1	2.6	8.3	9.7
	Minimum	17.9	31.7	5.5	77.6	1	8.1	5.5
	Maximum	22.9	33.0	7.4	96.6	4.6	8.4	16.5
WM1(middle)	Average	20.1	32.5	6.7	89.4	2.6	8.3	9.3
	Minimum	17.9	31.7	5.7	79.3	1.0	8.2	5.5
	Maximum	22.8	33.0	7.4	96.5	4.5	8.4	14.0
WM1(bottom)	Average	20.0	32.5	6.8	90.5	2.4	8.3	9.2
	Minimum	18.0	32.0	5.7	80.0	1.0	8.3	6.0
	Maximum	22.8	33.0	7.4	97.2	3.7	8.4	12.5

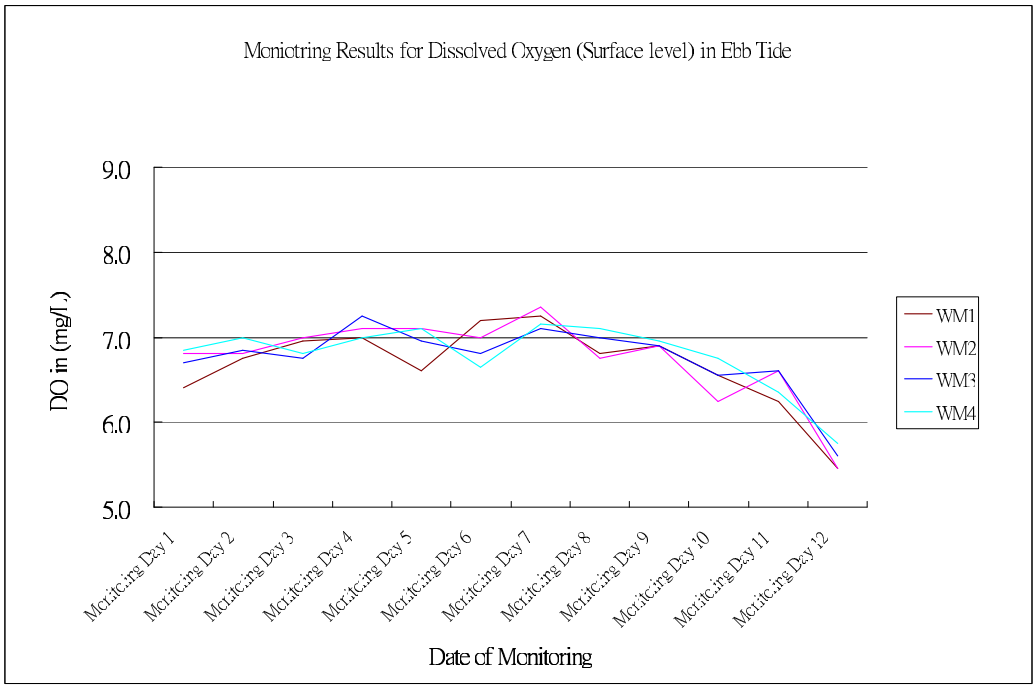
Monitoring Location		Temperature (°C)	Salinity (ppt)	DO (mg/L)	DOS (%)	Turbidity (NTU)	pH	TSS (mg/)
WM2(surface)	Average	20.1	32.4	6.7	89.5	2.2	8.3	9.2
	Minimum	17.9	31.8	5.7	79.3	1.0	8.2	4.5
	Maximum	22.8	33.0	7.4	97.0	3.4	8.4	14.5
WM2(bottom)	Average	20.0	32.5	6.7	89.6	2.5	8.3	10.3
	Minimum	17.9	31.9	5.7	79.8	1.0	8.3	7.0
	Maximum	22.7	33.1	7.5	97.8	4.7	8.4	13.0
WM2(middle)	Average	NA	NA	NA	NA	NA	NA	NA
	Minimum	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA

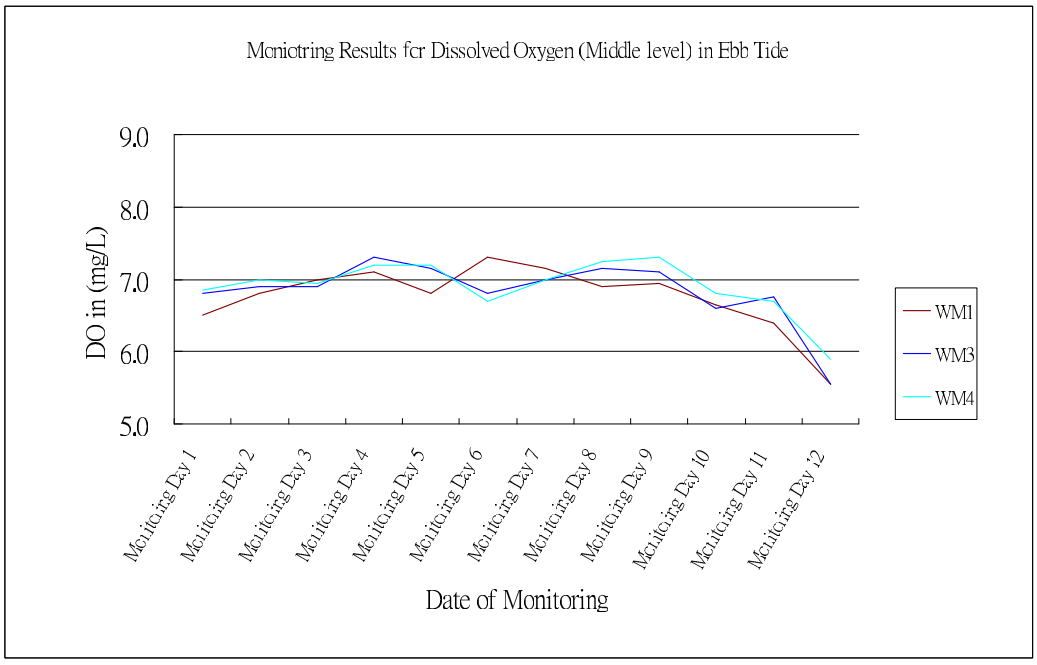
Monitoring Location		Temperature (°C)	Salinity (ppt)	DO (mg/L)	DOS (%)	Turbidity (NTU)	pH	TSS (mg/)
WM3 (surface)	Average	20.1	32.5	6.6	88.4	1.8	8.3	9.1
	Minimum	18.0	31.9	5.6	78.5	1.0	8.2	7.0
	Maximum	22.7	33.1	7.1	94.2	3.8	8.4	11.0
WM3(middle)	Average	20.0	32.6	6.8	90.4	2.4	8.3	9.9
	Minimum	18.0	32.0	5.8	80.7	1.0	8.3	5.5
	Maximum	22.7	33.1	7.2	94.9	3.5	8.4	14.0
WM3(bottom)	Average	20.0	32.6	6.9	92.0	2.3	8.4	8.9
	Minimum	17.9	32.2	5.8	81.4	1.0	8.3	6.5
	Maximum	22.6	33.1	7.4	98.3	3.8	8.4	11.0

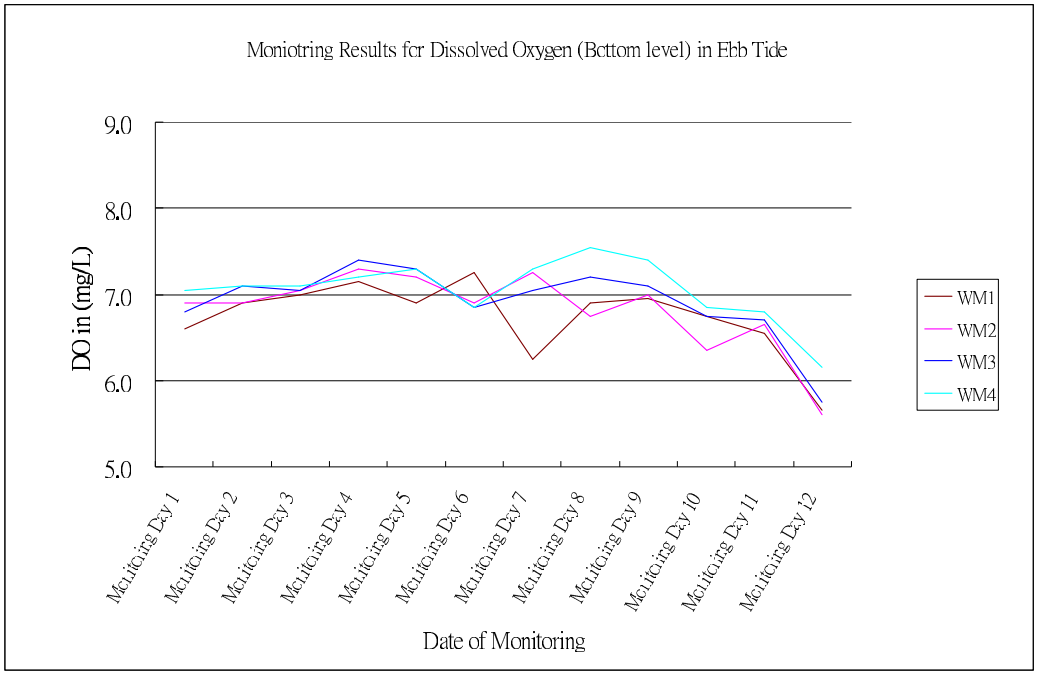
Monitoring Location		Temperature (°C)	Salinity (ppt)	DO (mg/L)	DOS (%)	Turbidity (NTU)	pH	TSS (mg/)
WM4 (surface)	Average	20.1	32.5	6.7	89.0	1.7	8.3	9.1
	Minimum	17.9	32.0	5.8	81.1	1.0	8.2	5.0
	Maximum	23.0	33.0	7.2	96.5	2.7	8.4	15.5
WM4(middle)	Average	20.1	32.6	6.8	90.6	2.2	8.4	10.3
	Minimum	17.9	32.1	5.8	80.9	1.0	8.3	5.5
	Maximum	22.8	33.1	7.3	98.6	3.3	8.4	25.0
WM4(bottom)	Average	20.0	32.6	7.0	92.8	2.1	8.4	8.4
	Minimum	17.9	32.2	6.1	84.7	1.0	8.3	5.5
	Maximum	22.7	33.1	7.5	101.4	3.4	8.4	11.0

Monitoring Location		Temperature (°C)	Salinity (ppt)	DO (mg/L)	DOS (%)	Turbidity (NTU)	pH	TSS (mg/)
CS2 (surface)	Average	20.1	32.7	7.3	97.7	1.9	8.4	9.8
	Minimum	18.0	32.2	6.8	90.2	1.0	8.3	4.5
	Maximum	22.8	33.1	7.9	106.6	5.3	8.4	20.0
CS2(middle)	Average	20.0	32.7	7.4	98.5	2.0	8.4	9.5
	Minimum	18.0	32.3	6.8	91.2	1.0	8.3	5.0
	Maximum	22.7	33.1	7.9	107.6	4.1	8.5	15.5
CS2(bottom)	Average	19.9	32.7	7.4	98.3	2.2	8.4	10.3
	Minimum	17.9	32.3	6.6	91.8	1.0	8.3	6.0
	Maximum	22.4	33.2	7.8	106.7	3.9	8.5	18.0

Graphical Plots of Parameters for Water Monitoring in **Ebb** Tide Condition:






Moniotring Results fcr Dissolved Oxygen (Bcttom level) in Ebb Tide
9.0
8.0
7.0
6.0
5.0
DO in (mg/L)
WM1
WM2
WM3
WM4
Mcr.itc.irg Dcy 1
Mcr.itc.irg Dcy 2
Mcr.itc.irg Dcy 3
Mcr.itc.irg Dcy 4
Mcr.itc.irg Dcy 5
Mcr.itc.irg Dcy 6
Mcr.itc.irg Dcy 7
Mcr.itc.irg Dcy 8
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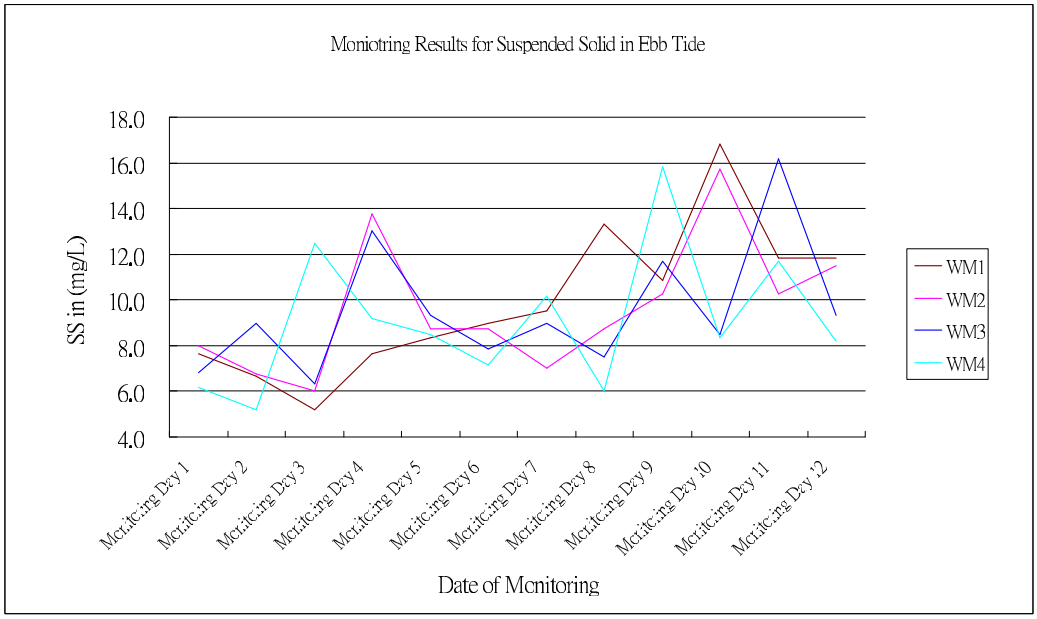
Mcr.itc.irg Dcy 11
Mcr.itc.irg Dcy 12
Date of Monitoring


Moniotring Results for Suspended Solid in Ebb Tide
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
SS in (mg/L)
WM1
WM2
WM3
WM4
Mcr.itc.irg Dcy 1
Mcr.itc.irg Dcy 2
Mcr.itc.irg Dcy 3
Mcr.itc.irg Dcy 4
Mcr.itc.irg Dcy 5
Mcr.itc.irg Dcy 6
Mcr.itc.irg Dcy 7
Mcr.itc.irg Dcy 8
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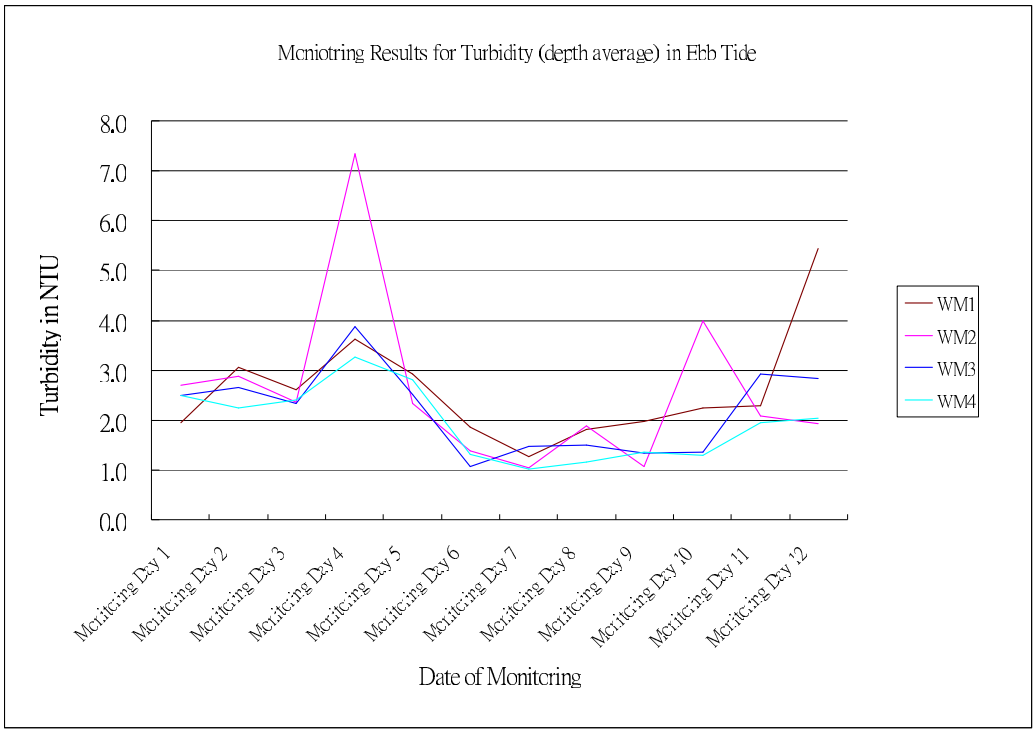
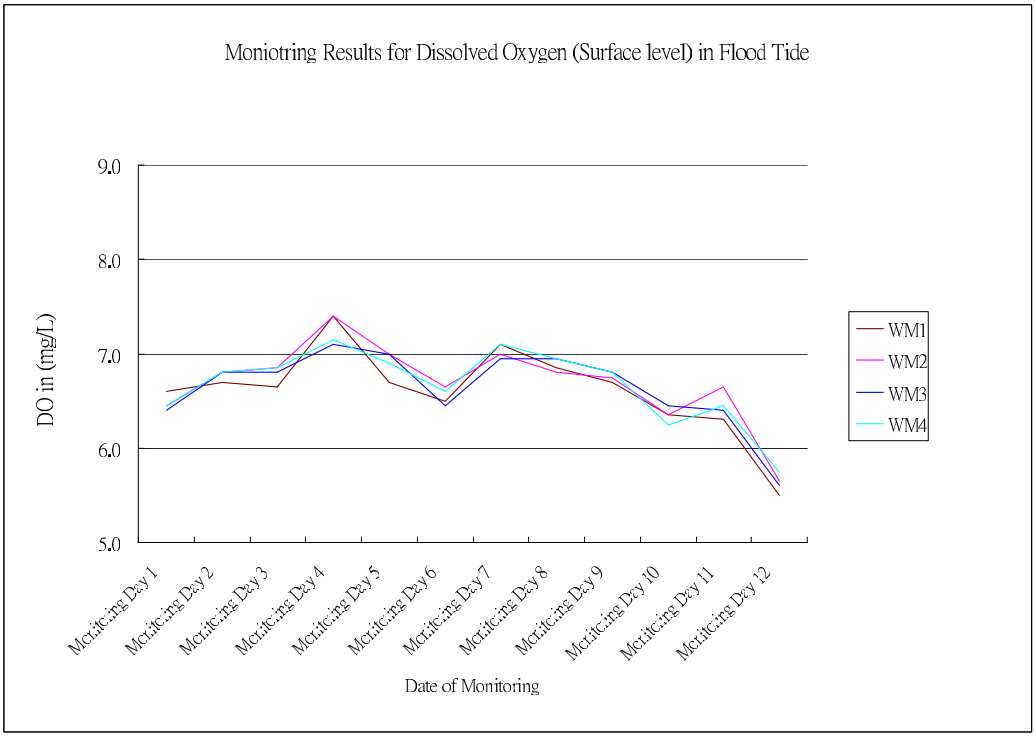
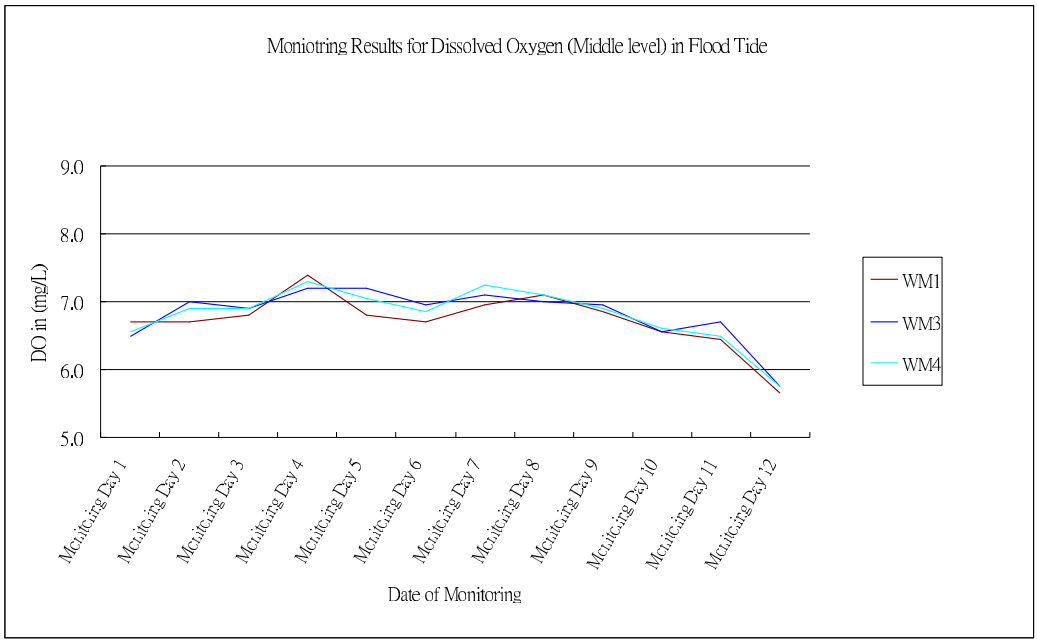
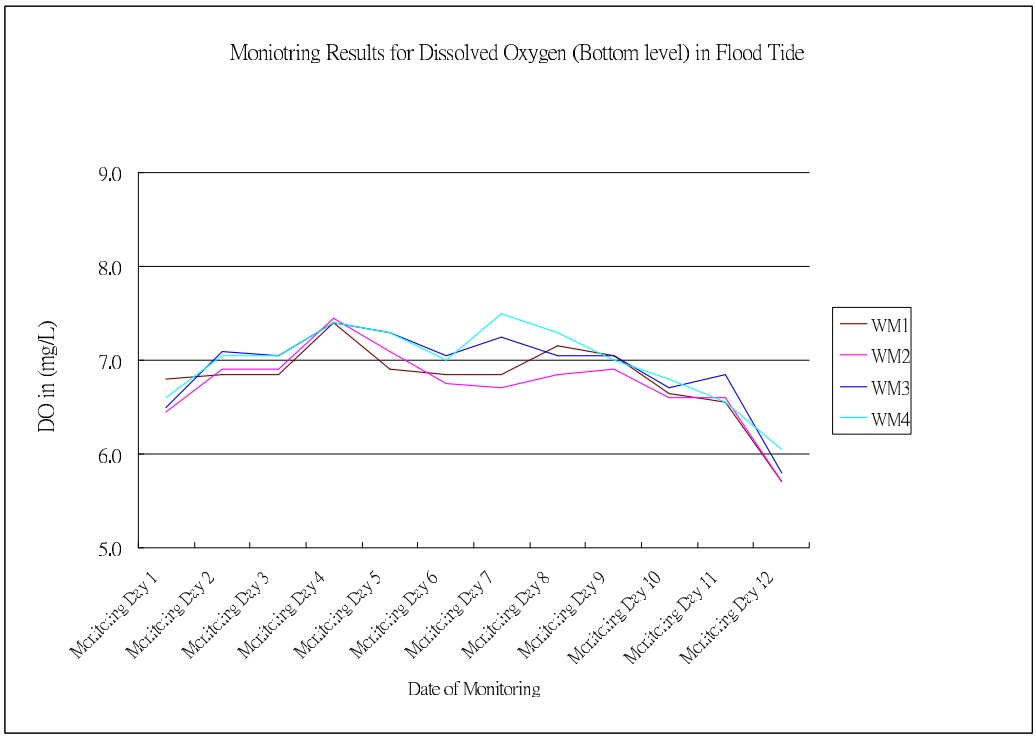
Mcr.itc.irg Dcy 10
Mcr.itc.irg Dcy 11
Mcr.itc.irg Dcy 12
Date of Mcnitoring

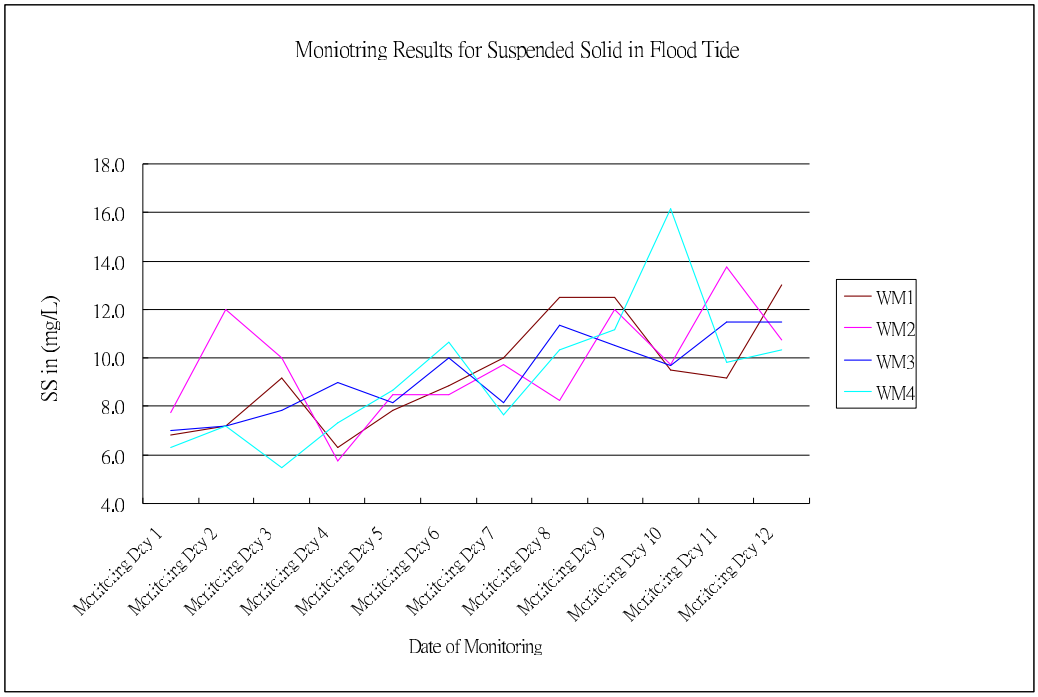


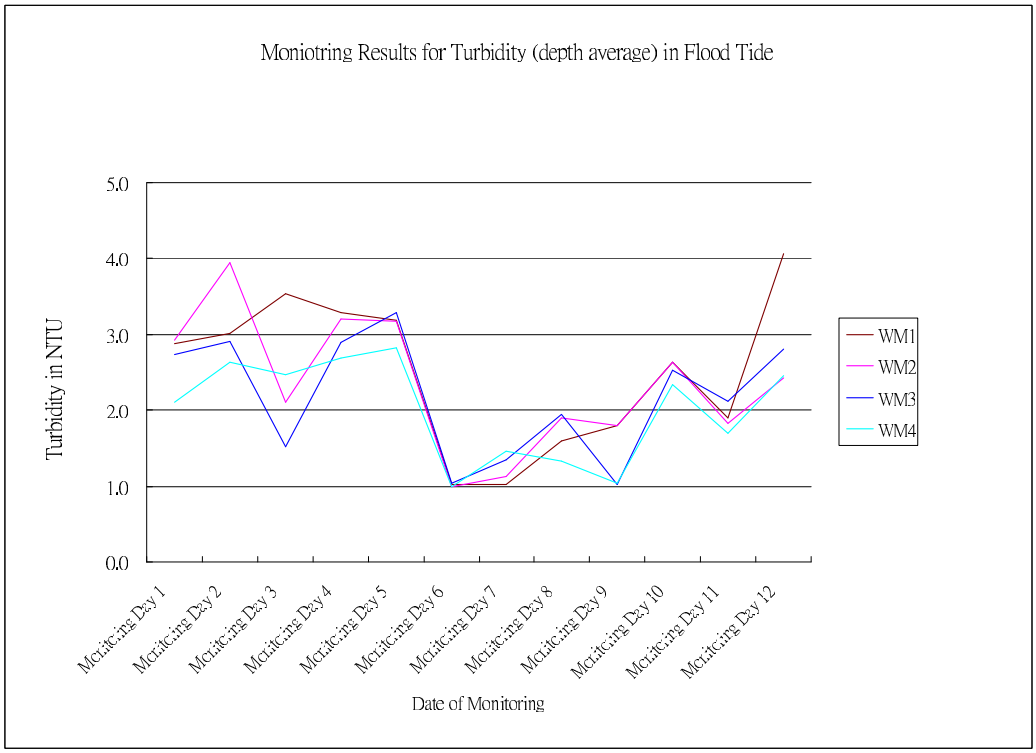
Graphical Plots of Parameters for Water Monitoring in **Flood** Condition:




Moniotring Results for Dissolved Oxygen (Middle level) in Flood Tide
9.0
8.0
7.0
6.0
5.0
DO in (mg/L)
WM1
WM3
WM4
Monitoring Day 1
Monitoring Day 2
Monitoring Day 3
Monitoring Day 4
Monitoring Day 5
Monitoring Day 6
Monitoring Day 7
Monitoring Day 8
Monitoring Day 9
Monitoring Day 10
Monitoring Day 11
Monitoring Day 12
Date of Monitoring


Moniotring Results for Dissolved Oxygen (Bottom level) in Flood Tide
9.0
8.0
7.0
6.0
5.0
DO in (mg/L)
WM1
WM2
WM3
WM4
Monitoring Day 1
Monitoring Day 2
Monitoring Day 3
Monitoring Day 4
Monitoring Day 5
Monitoring Day 6
Monitoring Day 7
Monitoring Day 8
Monitoring Day 9
Monitoring Day 10
Monitoring Day 11
Monitoring Day 12
Date of Monitoring


Moniotring Results for Suspended Solid in Flood Tide
SS in (mg/L)
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
Monitoring Day 1
Monitoring Day 2
Monitoring Day 3
Monitoring Day 4
Monitoring Day 5
Monitoring Day 6
Monitoring Day 7
Monitoring Day 8
Monitoring Day 9
Monitoring Day 10
Monitoring Day 11
Monitoring Day 12
Date of Monitoring
WM1
WM2
WM3
WM4


Moniotring Results for Turbidity (depth average) in Flood Tide
Turbidity in NTU
5.0
4.0
3.0
2.0
1.0
0.0
Monitoring Day 1
Monitoring Day 2
Monitoring Day 3
Monitoring Day 4
Monitoring Day 5
Monitoring Day 6
Monitoring Day 7
Monitoring Day 8
Monitoring Day 9
Monitoring Day 10
Monitoring Day 11
Monitoring Day 12
Date of Monitoring
WM1
WM2
WM3
WM4