

MTR Corporation Limited

West Island Line Project

Environmental Monitoring and Audit Report No.74

(October 2015)

Verified by:  _____

Position: Independent Environmental Checker

Date: 20 October 2015

MTR Corporation Limited

West Island Line Project

Environmental Monitoring and Audit Report No. 74

(October 2015)

Certified by: _____

Position: Environmental Team Leader

Date: 20 OCT 2015

EXECUTIVE SUMMARY

The West Island Line Project commenced on 10 July 2009. The EM&A programme for the West Island Line Project commenced on 10 August 2009, the commencement date of construction of the Project. This is the seventy fourth monthly Environmental Monitoring and Audit (EM&A) Report for West Island Line Project. The Report presents the results of EM&A works and the impact monitoring for the construction works undertaken during the period of 10 September 2015 to 9 October 2015. The major construction activities in the reporting period included reinstatement of Works Areas K, M and N1, adit excavation at Works Area L1 and removal of additional concrete paving at Works Area B.

Impact monitoring for air quality and noise were conducted in accordance with the EM&A Manual in the reporting period, no exceedance was found and there was no breach of Limit Levels for air and noise monitoring.

No environmental notification of summon and prosecution was received in the reporting period. One environmental complaint relating to construction work was received in the reporting period.

Site inspections were conducted by the Environmental Team on a weekly basis to monitor proper implementation of environmental pollution control and mitigation measures for the Project. No non-conformance to the environmental requirements was identified by the Environmental Team in the reporting period.

The Environmental Permit (EP-313/2008/J) issued by EPD on 1 September 2014 is being used for the WIL Project.

In the reporting period, there was no reporting change of circumstances which may affect the compliance with the recommendations of the EIA Report.

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1 INTRODUCTION

1.1 Project Background

MTR Corporation Limited (MTRCL) proposes to build a new railway line, the West Island Line (WIL) which is an extension of the Island Line to the Western District. The route length of the fully underground WIL is approximately 3 km with three new underground stations namely Sai Ying Pun Station (SYP), University Station (UNI) and Kennedy Town Station (KET).

1.2 Project Programme

The West Island Line Project commenced on 10 July 2009. Commencement of construction was on 10 August 2009. The commencement of operation of the Project was on 28 December 2014.

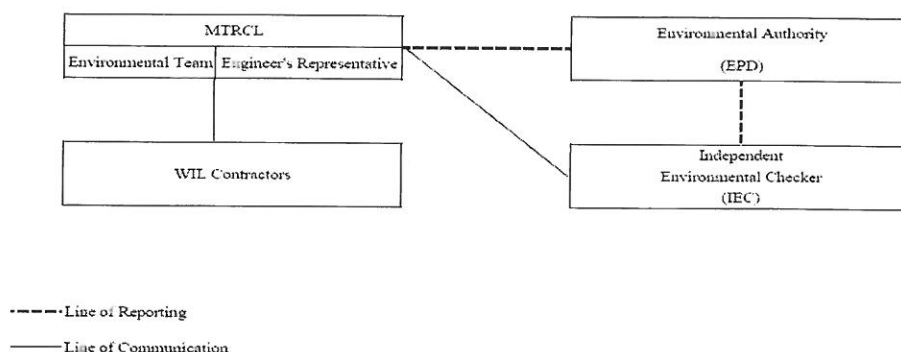
1.3 Coverage of the EM&A Report

The EM&A programme for the West Island Line Project commenced on 10 August 2009. This is the seventy fourth Monthly Environmental Monitoring and Audit (EM&A) Report for the Project. The Report presents the results of EM&A works and the impact monitoring for the construction works undertaken during the period of 10 September 2015 to 9 October 2015.

2 PROJECT INFORMATION

2.1 Project Management Organization and Contact Details

The WIL Project organization chart is presented in Figure 1. Contacts of key environmental personnel of the Project are shown in Tables 1a, 1b and 1c respectively.



PROJECT ORGANIZATION
Figure 1

Table 1a Contact List of Key Personnel for Project Management

Organization	Name	Telephone
Engineer's Representative		
Project Manager – WIL Civil	Mr. Stephen Hamill	3411 9811
Independent Environmental Checker		
Senior Environmental Consultant	Mr. Coleman Ng	2268 3097
Environmental Team		
Environmental Team Leader	Mr. Richard Kwan	2688 1179 / 9819 9027
Contact 704 Contractor		
Project Director	Mr. C.C. Hau	3559 9003
Contact 705 Contractor		
Project Director	Mr. Brian Gowran	9865 0100

Table 1b Contact List of Key Personnel for Emergency Response

Organization	Name	Telephone
Engineer's Representative		
Project Manager – WIL Civil	Mr. Stephen Hamill	3411 9811
Independent Environmental Checker		
Senior Environmental Consultant	Mr. Coleman Ng	2268 3097
Environmental Team		
Environmental Team Leader	Mr. Richard Kwan	2688 1179 / 9819 9027
Contact 704 Contractor		
Project Director	Mr. C.C. Hau	3559 9003
Environmental Manager	Ms. Michelle Tang	2496 6255
Contact 705 Contractor		
Project Director	Mr. Brian Gowran	9865 0100
Environmental Manager	Ms. Michelle Tang	2496 6255

Table 1c Contact List of Environmental Authority

Organization	Name	Telephone
Environmental Protection Department		
Sr Env Protection Offr(Metro Assessment) 3	Mr. Steve Li	2835 1142
Sr Env Protection Offr(Regional S) 1	Mr. Sean Law	2516 1806

2.2 Project Works Areas and Environmental Monitoring Locations

The WIL Project works areas and the locations of environmental monitoring stations are shown in Figures 2 and 3 to 7 respectively. Table 2 shows the details of the active monitoring stations as reported in Sections 3.1 and 3.2 below.

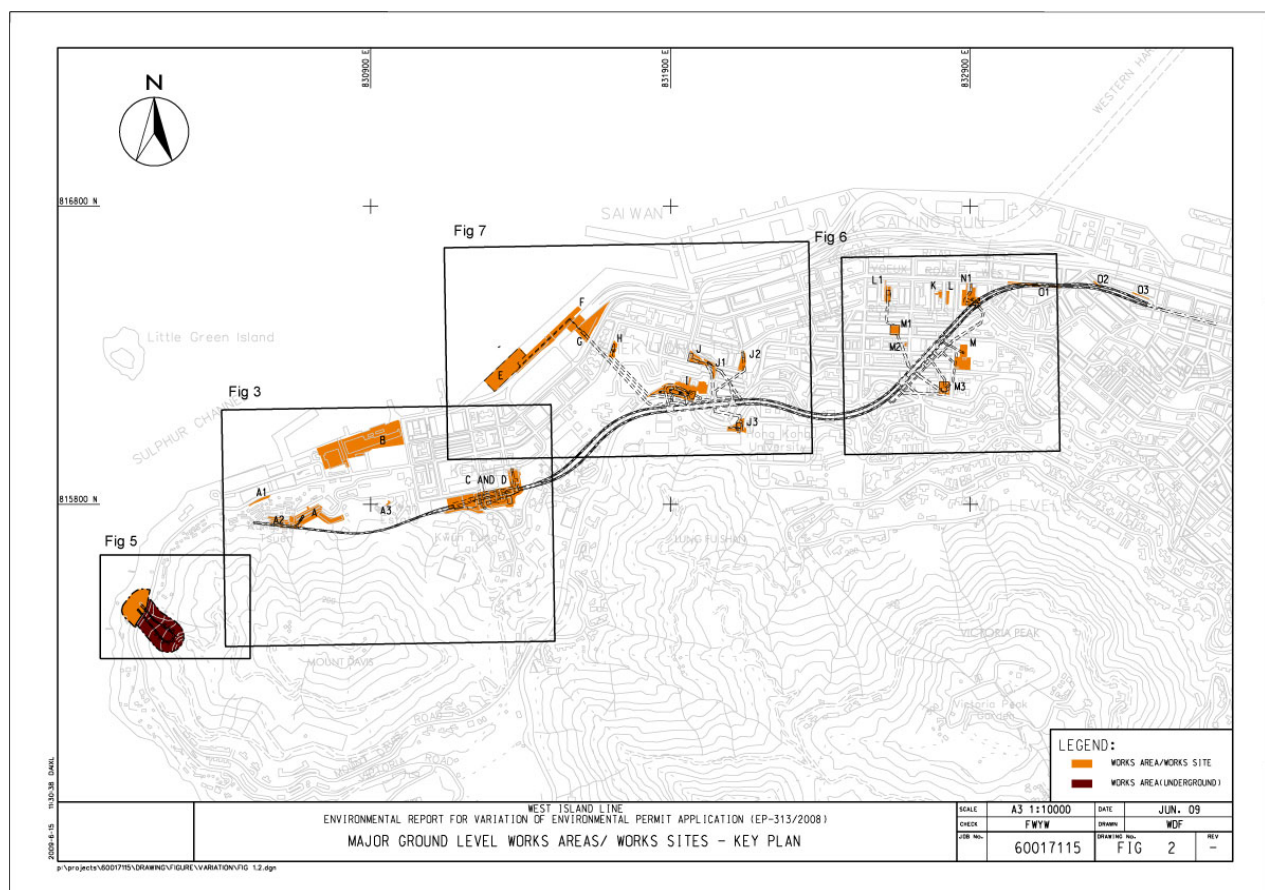


Table 2 Summary of impact air quality and noise monitoring stations

ID	Premise	Monitoring Location (Active)
Air		

ID	Premise	Monitoring Location (Active)
AM1a+	Kwun Lung Lau Block 1	Building facing Works Area C (inactive)
AM2&	Victoria Public Mortuary	Building facing Works Area B
AM3a*	Hong Kong Institute of Vocational Education (Tsing Yi) Kennedy Town Centre	Building facing Works Area A (inactive)
AM4	Chee Sing Kok Social Centre of the Humanity Love (current name for the premise)	Adjacent to building and facing Works Area MA (inactive)
AM5a%	Kennedy Town Fire Station	Building facing Works Area E (inactive)
AM6a*	St. Paul's College Primary School	Building facing Works Area I (inactive)
AM7a*	Hill Court	Building facing Works Area J (inactive)
AM8	Bon-Point	Building facing Works Area M3 (inactive)
AM9a^&	No. 28 Sai Woo Lane	Building facing Works Area N1
AM10&	Western Garden, Ivy Tower	Building facing Works Area M1
Noise		
CN1	Chee Sing Kok Social Centre of the Humanity Love (current name for the premise)	Adjacent to building and facing Works Area MA (inactive)
CN2	Hong Kong Institute of Vocational Education (Tsing Yi) Kennedy Town Centre	Building facing Works Area A (inactive)
CN3&	Lui Ming Choi Primary School	Building facing Works Area B
CN4	Luen Tak Apartments	Building facing Works Area C (inactive)
CN5	Western Court (Block 1)	Building facing Works Area J2 (inactive)
CN6	Yick Fung Garden (Block A)	Building facing Works Area G (inactive)
CN7a#	Bowie Court	Building facing Works Area J3 (inactive)
CN8	St. Paul's College Primary School	Building facing Works Area I (inactive)
CN9	Hill Court	Building facing Works Area J (inactive)
CN11b@	The Belcher's Tower 8	Building facing Works Area H (inactive)
CN12	Wah Po Building	Building facing Works Area E (inactive)
CN13&	No. 18-20 Eastern Street	Building facing Works Area N1
CN14	Bon-Point	Building facing Works Area M3 (inactive)
CN15&	Ivy Tower	Building facing Works Area M1
CN16&	No. 9-11 Ki Ling Lane	Building facing Works Area L1

ID	Premise	Monitoring Location (Active)
CN17	No. 1 Third Street	Building facing Works Area M (inactive)
CN18	Princeton Tower	Building facing Works Area O1 (inactive)
CN20	Ka On Building	Building facing Works Area O3 (inactive)
CN21&	The Merton (Block 2)	Building facing Works Area B

* The alternative air monitoring stations AM3a, AM6a and AM7a were approved by EPD on 10 August 2009

^The alternative air monitoring station AM9a was approved by EPD on 26 November 2009

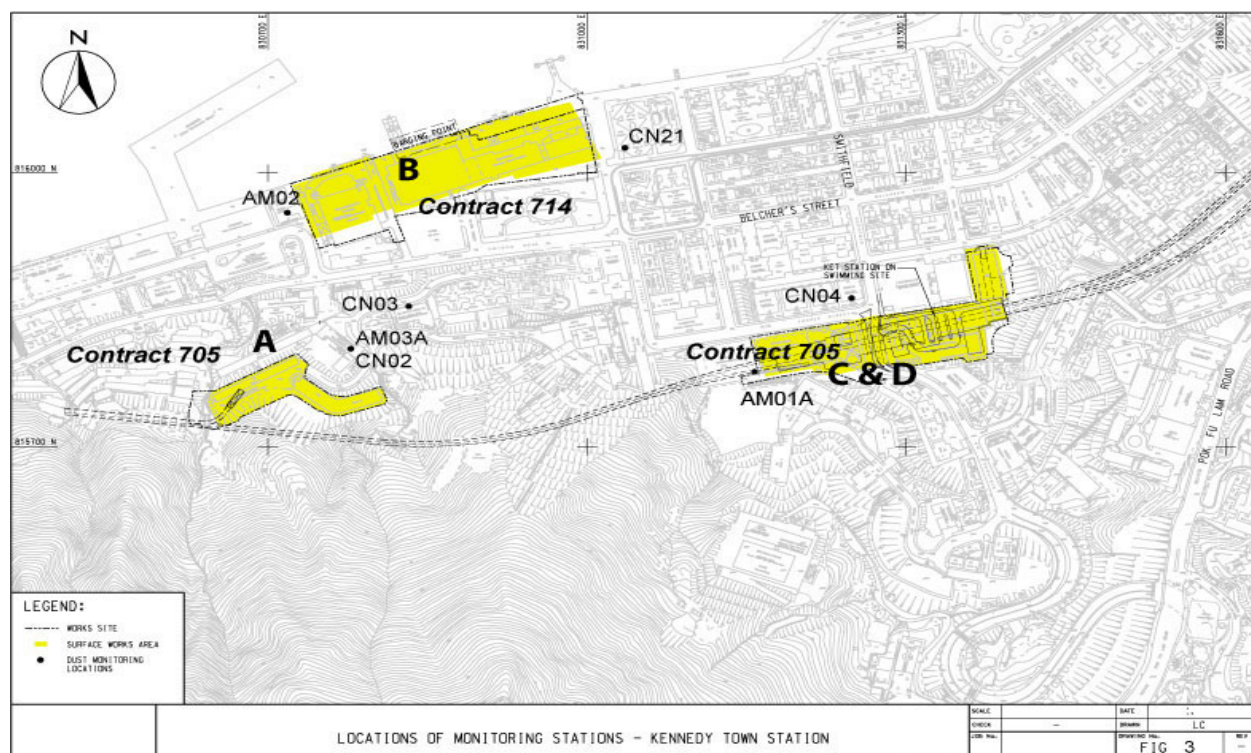
+The alternative air monitoring station AM1a was approved by EPD on 7 September 2010

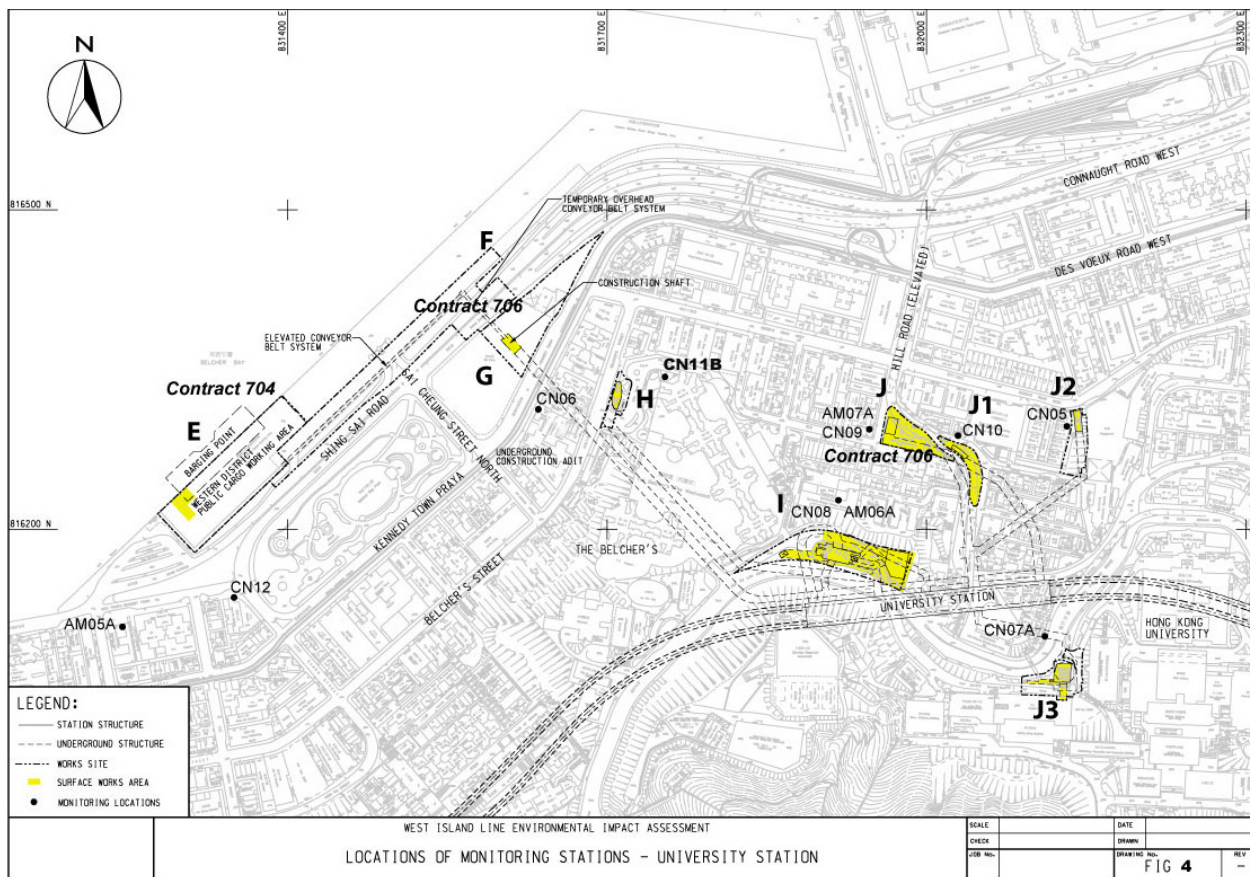
%The alternative air monitoring station AM5a proposal was submitted to EPD on 22 September 2010

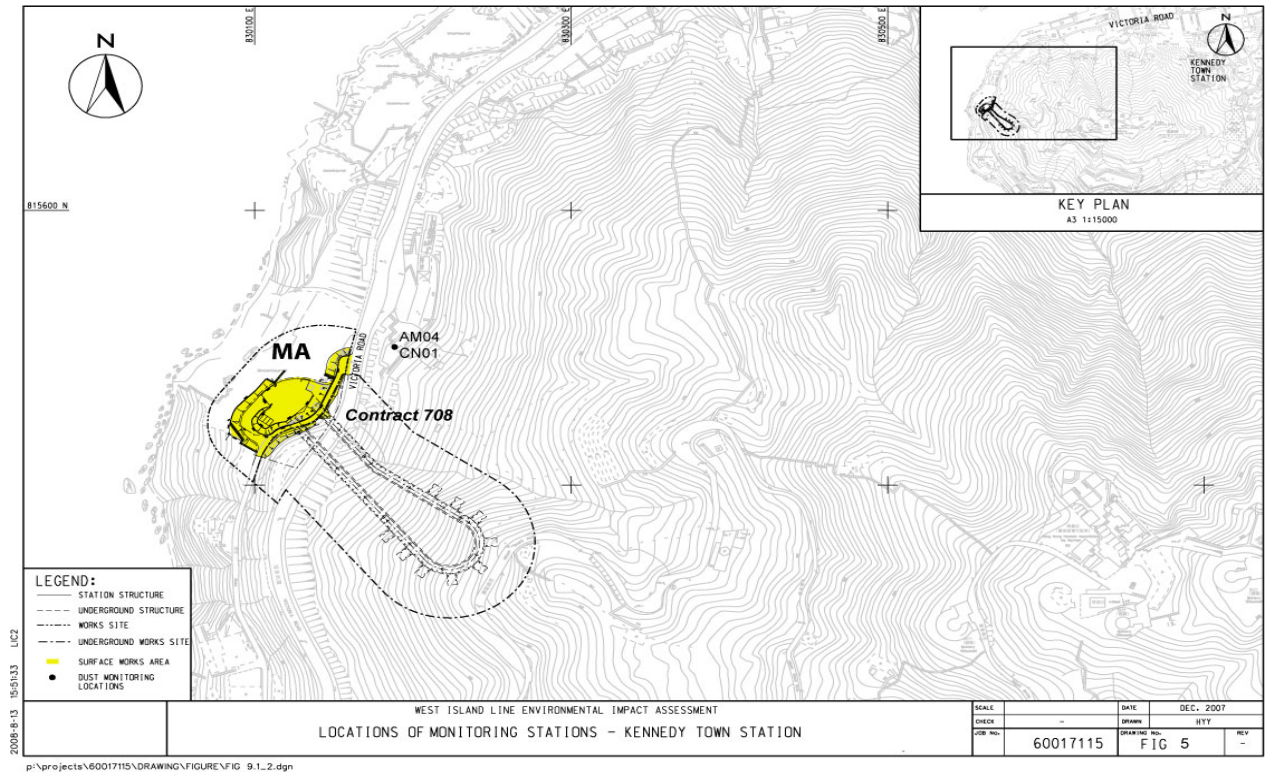
The alternative noise monitoring station CN7a was approved by EPD on 1 September 2010

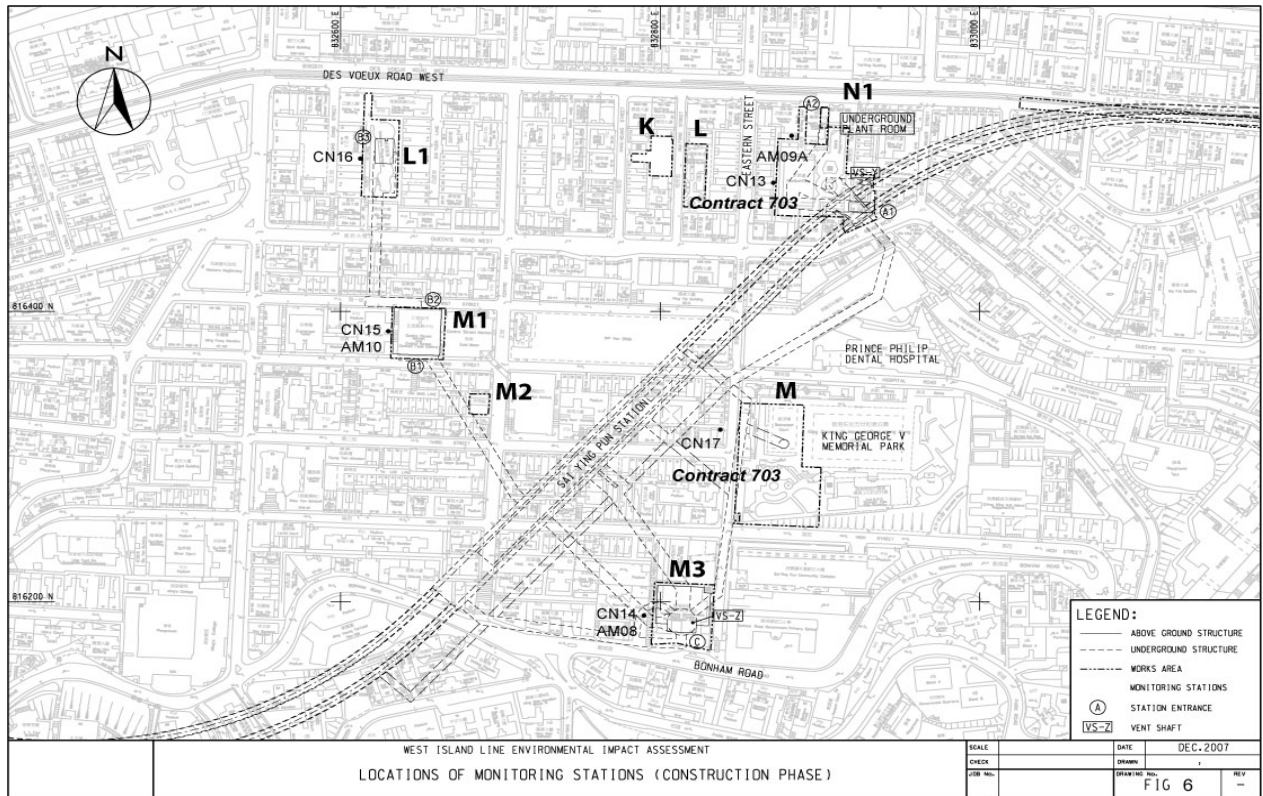
@ The alternative noise monitoring station CN11b was approved by EPD on 14 June 2011

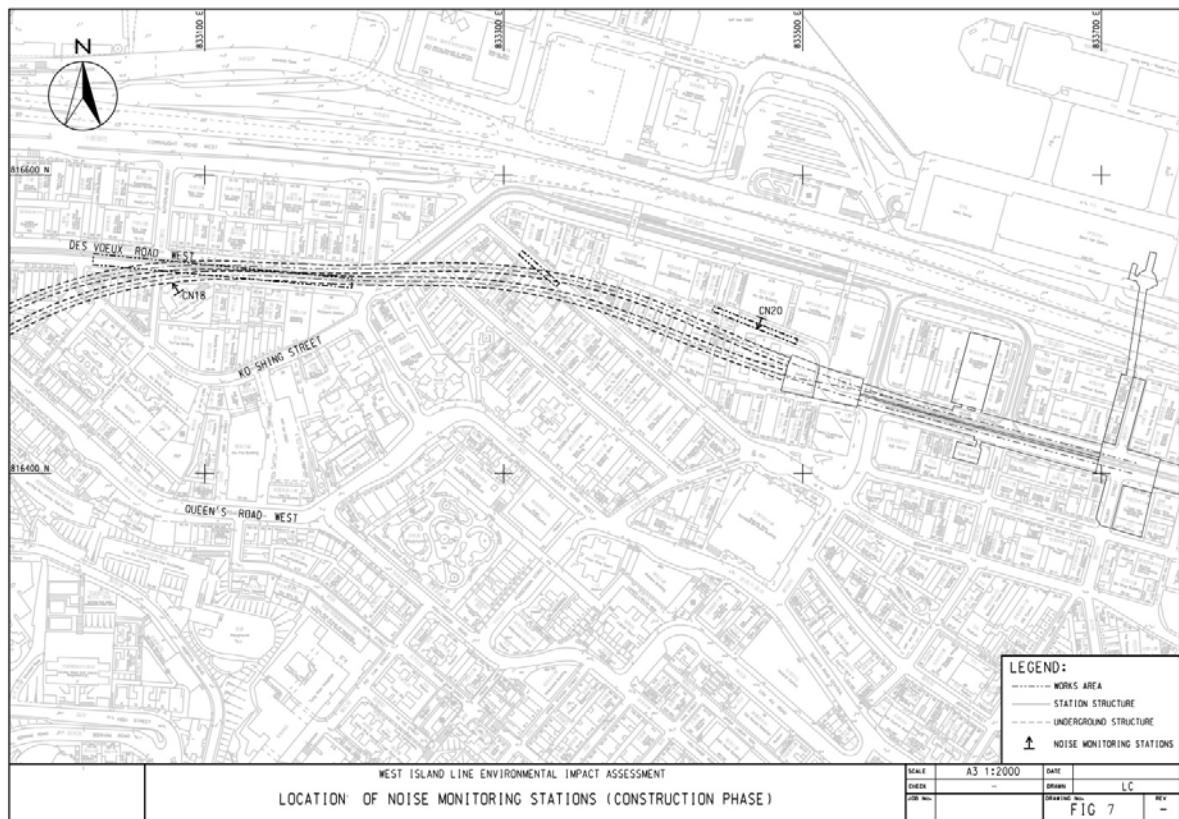
& Final EM&A Report Part 1 approved by EPD on 11 August 2015 to terminate dust and noise monitoring for the WIL Project Works Areas except those for Works Areas B, L1, M1 and N1 after the WIL Operation











2.3 Summary of EM&A Requirements

The EM&A programme requires environmental monitoring for air quality, noise, water quality and waste management as specified in the EM&A Manual.

In the reporting month, 24-hour TSP levels at the air monitoring stations shown in Table 2 were monitored during the construction stage.

In the reporting month, construction noise levels at the noise monitoring stations shown in Table 2 were monitored during the construction stage.

A summary of impact EM&A requirements as applicable to this EM&A Report is presented in Table 3 below.

Table 3 Summary of impact EM&A Requirements

Parameters	Descriptions	Locations	Frequencies	Duration
Air Quality	24-hr TSP	Shown in Table 2	Once every 6 days	During construction stage
Noise	Leq(30min)	Shown in Table 2	Once a week	During construction stage

Parameters	Descriptions	Locations	Frequencies	Duration
Waste	On-Site Audit	Active Works Sites	Monthly	During construction stage
Wastewater	On-Site Audit	Active Works Sites	Monthly	During construction stage
General Site Conditions	Environmental Site Inspection	Active Works Sites	Weekly	During construction stage

Environmental Quality Performance Limits for air quality and noise are shown in Appendix A. The Event Action Plan for air quality and noise are shown in Appendix B.

2.4 Implementation of Environmental Mitigation Measures

The WIL Civil Works Contractors are required to implement the mitigation measures as specified in the EP, EIA Report and EM&A Manual. During the regular environmental site inspections, the Contractors' implementation of mitigation measures were inspected and reviewed. A schedule of the implementation of mitigation measures identified in the WIL EIA is given in Appendix C.

2.5 Construction Activities in the Reporting Month

Major construction activities carried out by the respective WIL Civil Works Contractors during the reporting period include:

Contract 703 - Works Area K/L

- No site work

Contract 703 - Works Area M

- Tunnel excavation inside noise enclosure completed

Contract 703 - Works Area N1

- Down track tunnel excavation by TBM towards SHW completed
- Shaft construction completed
- Entrance construction completed

Contract 703 - Works Areas O1/O2/O3

- Demolition of overrun tunnel completed at Works Area O1
- Road reinstatement completed at Works Area O3
- Site preparation for modification of vent shaft at Ko Shing Street which is a non-EP work completed

Contract 704 - Works Area E

- Operation of barging point completed
- Dismantling of barging point completed
- Dismantling of noise enclosure completed
- Reinstatement completed

Contract 704 - Works Area G

- Construction of UNI adits inside noise enclosure completed
- UNI Station construction completed
- Finishing work completed

Contract 704 - Works Area H

- Adit construction completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Area I

- Shaft construction completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Area J

- Excavation by blasting for Hill Road Entrance adits completed
- Adit construction completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Area J2

- Adit construction under decking completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Areas J3

- Shaft construction completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Area K/L

- Reinstatement completed

Contract 704 - Works Area L1

- Adit excavation

Contract 704 - Works Area M

- Excavation by blasting for SYP adits inside noise enclosure completed
- Construction of SYP adits inside noise enclosure completed
- SYP Station construction completed
- Finishing work completed
- Noise enclosure dismantling completed
- Reinstatement

Contract 704 - Works Area M1

- Bored piling completed

- Decking installation completed
- Shaft excavation completed
- Shaft construction completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Area M2

- Reprovisioning of transformer and public toilet completed

Contract 704 - Works Area M3

- Shaft excavation completed
- Shaft construction completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Area MA

- Management of magazine completed
- Decommissioning completed

Contract 704 - Works Area N1

- Finishing work completed
- Reinstatement

Contract 705 - Works Area A

- Shaft construction completed
- Vent shaft construction completed
- Finishing work completed
- Reinstatement completed

Contract 705 - Works Area B

- Operation of barging point completed
- Dismantling of barging point completed
- Management of Works Area B completed
- Removal of additional concrete paving

Contract 705 - Works Area C

- KET Station construction completed
- Finishing work completed
- Reinstatement completed

Contract 705 - Works Area D

- KET Station construction completed
- Finishing work completed
- Reinstatement completed

Contract 706A - Works Areas A/A1/A2/A3

- Contract completed

Contract 706 - Works Area G/I/I

- Contract completed

Contract 708 - Works Area MA

- Contract completed

Contract 714 - Works Area B

- Contract completed

2.6 Construction Activities for the Coming Month

According to the construction programme for the Civil Works Contracts, the scheduled major construction activities in the next reporting month are as follows:

Contract 703 - Works Areas K/L

- No site work

Contract 703 - Works Area M

- Tunnel excavation inside noise enclosure completed

Contract 703 - Works Area N1

- Down track tunnel excavation by TBM towards SHW completed
- Shaft construction completed
- Entrance construction completed

Contract 703 - Works Areas O1/O2/O3

- Demolition of overrun tunnel completed at Works Area O1
- Road reinstatement completed at Works Area O3
- Site preparation for modification of vent shaft at Ko Shing Street which is a non-EP work completed

Contract 704 - Works Area E

- Operation of barging point completed
- Dismantling of barging point completed
- Dismantling of noise enclosure completed
- Reinstatement completed

Contract 704 - Works Area G

- Construction for UNI adits inside noise enclosure completed
- UNI Station construction completed
- Finishing work completed

Contract 704 - Works Area H

- Adit construction completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Area I

- Shaft construction completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Area J

- Excavation by blasting for Hill Road Entrance adits completed
- Adit construction completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Area J2

- Adit construction under decking completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Areas J3

- Shaft construction completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Area K/L

- Reinstatement completed

Contract 704 - Works Area L1

- Adit excavation

Contract 704 - Works Area M

- Excavation by blasting for SYP adits inside noise enclosure completed
- Construction of SYP adits inside noise enclosure completed
- SYP Station construction completed
- Finishing work completed
- Noise enclosure dismantling completed
- Reinstatement

Contract 704 - Works Area M1

- Bored piling completed
- Decking installation completed
- Shaft excavation completed
- Shaft construction completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Area M2

- Reprovisioning of transformer and public toilet completed

Contract 704 - Works Area M3

- Shaft excavation completed
- Shaft construction completed
- Entrance construction completed
- Finishing work completed
- Reinstatement completed

Contract 704 - Works Area MA

- Management of magazine completed
- Decommissioning completed

Contract 704 - Works Area N1

- Finishing work completed
- Reinstatement

Contract 705 - Works Area A

- Shaft construction completed
- Vent shaft construction completed
- Finishing work completed
- Reinstatement completed

Contract 705 - Works Area B

- Operation of barging point completed
- Dismantling of barging point completed
- Management of Works Area B completed
- Removal of additional concrete paving

Contract 705 - Works Area C

- KET Station construction completed
- Finishing work completed
- Reinstatement completed

Contract 705 - Works Area D

- KET Station construction completed
- Finishing work completed
- Reinstatement completed

Contract 706A - Works Areas A/A1/A2/A3

- Contract completed

Contract 706 - Works Areas G/I/I

- Contract completed

Contract 708 - Works Area MA

- Contract completed

Contract 714 - Works Area B

- Contract completed

3 IMPACT MONITORING

3.1 Air Quality

24-Hour TSP Levels Monitoring

The sampling procedure follows 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 is collected and returned to the laboratory for drying in a desiccator followed by 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.

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

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 certificates are attached in Appendix E.

To examine the construction dust levels, 24-hour TSP monitoring was undertaken according to the EM&A Manual. The dust monitoring locations are shown in the Section 2.2 above. Monitoring results are presented in the following table (see Appendix D for graphical plot). The 24-hour TSP levels when there were construction activities during the monitoring period were within the Action Level. No exceedance was found. This indicates that the construction activities did not have a noticeable adverse effect on the general air quality for the works areas.

Monitoring schedules are shown in Appendix F.

AM2- Victoria Public Mortuary					
Date	TSP (µg/m ³)	Action Level (µg/m ³)	Limit Level (µg/m ³)	Compliance (Yes/No)	Weather Condition
11/09/2015	73.4	155	260	Yes	Fine
17/09/2015	74.0	155	260	Yes	Fine
17/09/2015#	72.5	155	260	Yes	Fine
17/09/2015#	79.3	155	260	Yes	Fine
17/09/2015#	76.4	155	260	Yes	Fine
23/09/2015	89.6	155	260	Yes	Fine
29/09/2015	91.4	155	260	Yes	Fine
05/10/2015	60.6	155	260	Yes	Occasionally raining
AM9a- No.28 Sai Woo Lane^					
11/09/2015	78.9	168	260	Yes	Fine
17/09/2015	82.1	168	260	Yes	Fine
23/09/2015	94.6	168	260	Yes	Fine
29/09/2015	88.0	168	260	Yes	Fine
05/10/2015	67.6	168	260	Yes	Occasionally raining
AM10- Western Garden, Ivy Tower					

11/09/2015	76.9	187	260	Yes	Fine
17/09/2015	78.1	187	260	Yes	Fine
23/09/2015	90.6	187	260	Yes	Fine
29/09/2015	85.9	187	260	Yes	Fine
05/10/2015	67.3	187	260	Yes	Occasionally raining

^The alternative air monitoring station AM9a was approved by EPD on 26 November 2009

@ Baseline Check

Additional 3nos. 1-hr TSP monitoring for the complaint case

3.2 Noise

B&K 2236 sound level meters 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 construction noise impact monitoring. The B&K sound level meters and B&K 4231 calibrator are verified by the certified laboratory or manufacturer on biennial basis and annual basis respectively to ensure they perform to the same level of accuracy as stated in the manufacturer's specifications. Calibration certificates are attached in Appendix E.

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 differ 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.

Impact noise monitoring of $L_{A,eq30}$ was undertaken to measure construction noise levels in accordance with the EM&A Manual. The noise monitoring locations are shown in Section 2.2 above.

Monitoring results are presented in the following table (see Appendix D for graphical plot). No exceedance was found. Monitoring schedules are shown in Appendix F.

CN3- Lui Ming Choi Primary School					
Date	Time	Leq(dBA)	Limit Level (dBA)	Compliance (Yes/No)	Weather Conditions
17/09/2015	09:30	67.1	70	Yes	Fine, wind<2m/s
24/09/2015	09:30	69.1	70	Yes	Fine, wind<2m/s
30/09/2015	10:00	68.5	70	Yes	Fine, wind<2m/s
06/10/2015	10:00	68.7	70	Yes	Fine, wind<2m/s
CN13- No. 18-20 Eastern Street					
17/09/2015	15:55	71.3	75	Yes	Fine, wind<2m/s
24/09/2015	15:50	71.0	75	Yes	Fine, wind<2m/s
30/09/2015	15:40	70.1	75	Yes	Fine, wind<2m/s
06/10/2015	15:45	70.3	75	Yes	Fine, wind<2m/s
CN15- Ivy Tower					
17/09/2015	13:05	70.0	75	Yes	Fine, wind<2m/s
24/09/2015	13:00	70.6	75	Yes	Fine, wind<2m/s
30/09/2015	13:40	70.2	75	Yes	Fine, wind<2m/s
06/10/2015	13:45	71.1	75	Yes	Fine, wind<2m/s
CN16- No.9-11 Ki Ling Lane					
17/09/2015	16:45	72.5	75	Yes	Fine, wind<2m/s
24/09/2015	16:50	71.3	75	Yes	Fine, wind<2m/s
30/09/2015	16:45	71.9	75	Yes	Fine, wind<2m/s
06/10/2015	16:35	71.2	75	Yes	Fine, wind<2m/s
CN21- The Merton (Block 2)					
17/09/2015	11:30	73.1	75	Yes	Fine, wind<2m/s
24/09/2015	10:10	73.7	75	Yes	Fine, wind<2m/s
30/09/2015	11:15	73.2	75	Yes	Fine, wind<2m/s
06/10/2015	11:20	73.5	75	Yes	Fine, wind<2m/s

%Additional monitoring due to complaint as per Noise Event Action Plan

@ Baseline Check

* Monitoring was conducted in non-raining period

3.3 Action taken in Event of Exceedence

There was no exceedance in air quality and noise monitoring parameters recorded in the reporting period, therefore no action was taken.

3.4 Ground-borne Noise for TBM operation

Ground-borne noise measurement had been conducted for TBM tunneling work in accordance with EP condition 6.1(i) and the approved Construction Ground-borne Noise Monitoring Plan submitted as per EM&A Manual Clause 3.1 requirement. No ground-borne noise measurement was carried out in the reporting period. The TBM tunneling work had been completed.

4 LANDSCAPE AND VISUAL

4.1 Monitoring Requirements

Monitoring of the implementation of the landscape and visual mitigation measures during construction phase was conducted in accordance with the requirements as stipulated in the EM&A Manual.

The landscape and visual monitoring and audit will be conducted once a month throughout the construction stage covering the entire project site areas.

4.2 Audit Results

Monthly monitoring and audit was undertaken in accordance with the EM&A Manual.

Tree Felling at Contract 703 Works Area L

15 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 703 Works Area M

11 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 703 Works Area N1

29 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 704 Works Area H

12 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 704 Works Area I

42 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 704 Works Area J2

16 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 704 Works Area J3

6 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 704 Works Area L1

19 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 704 Works Area M1

16 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 704 Works Area M3

8 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 705 Works Areas C and D

77 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 706 Works Area G

4 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 706 Works Area I

16 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 708 Works Area MA

107 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Felling at Contract 714 Works Area B

2 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work.

Tree Transplantation in past reporting periods

7 nos. of trees were transplanted from Works Area J to the Receptor Sites at Sheung Wan Pumping Station site (4nos.), Junction of Shing Sai Road/New Praya (2 nos.) and Shing Sai Road (1 no.) in accordance with the approved Tree Removal Application. In the approved Tree Removal Application, 5nos. of trees were approved to be transplanted in Works Area J, 2 nos. additional trees were transplanted in response to the request made by LCSD with a view to preserving the landscape resources as much as practicable.

In addition, 2nos. of trees from Works Area C and 6nos. of trees from Works Area J3 were transplanted to the Receptor Site at Sheung Wan Pumping Station site in accordance with the approved Tree Removal Application. The tree transplanting works for these two works areas were carried out prior to the construction contracts award.

3 nos. of trees were transplanted from Works Area N1 to the Receptor Sites at Sheung Wan Pumping Station site, road side planter at Shing Sai Road and Connaught Road West. 1 no. of tree

was transplanted from Works Area L to the Receptor Site at road side planter at Connaught Road West. 14 nos. of trees were transplanted within the park area for Works Area M.

11 nos. of trees were transplanted from Works Area C to the Receptor Site at the road side planter at Shing Sai Road.

20 nos. of trees were transplanted from Works Area I to the Receptor Site at Shing Sai Road/Pok Fu Lam Road Playground and CEDD's GMP sites. 17 nos. of trees were transplanted from Works Area L1 to the CEDD's GMP sites. 2 nos. of trees were transplanted from Works Area G to the Receptor Site at Shing Sai Road.

Tree Transplantation in this reporting period

There was no tree transplant carried out in the reporting period. Tree transplantation had been completed.

The Certified Arborist as required by the EP has conducted inspections and audits and found that the transplanting works and the tree protection works being carried out by the civil works and transplanting contractors were in accordance with the EP/EIA, Tree Protection Plan and contract requirements. No non compliance was identified in the reporting period. Monthly inspection record for September 2015 is attached in Appendix G.

Compensatory Tree Planting in past reporting periods

48 nos. trees had been planted for Works Area MA.

115 nos. trees had been planted for Works Areas C and D.

Compensatory Tree Planting in this reporting period

There was no tree planting carried out in the reporting period.

Others

In accordance with EP Condition 2.8, the two individual plants, *Pavetta hongkongensis* located at the Works Area MA shall be transplanted.

It was identified that only one of the plant as mentioned above require transplanting and the other can be retained at its original location.

With consent from AFCD on the proposed method statement for transplanting the plant and protecting the retained plant, the plant was transplanted to a nearby location with similar habitat in September 2009 as agreed by AFCD and supervised by the Certified Arborist. The retained plant was properly protected in accordance with the agreed method.

The existing trees and species of conservation importance (ie the two identified *Artocarpus hypargyreus*) located near the Works Area MA were fenced off and the trunk protected with hessian sacking.

In addition, the tree (no. BT049A) at Pok Fu Lam Road which was originally proposed for transplant was toppled by Typhoon Koppu on 14 September 2009 and was removed by LCSD. Access to this site had not been given to MTR and no work had been carried out to the tree.

The ET had reminded the ER and the civil works contractors to implement appropriate tree protection measures to ensure tree stability. In addition, as there was safety concern for the trees no. BT92 and BT93 at Works Area I, decision was made by the Project Team to fell the trees which posed potential safety risk to the residents of the Hillview Garden. The trees had been felled in the reporting period for October 2010 due to public safety consideration in accordance with Emergency Tree Felling procedures stipulated in LAO practice note 7/2007 Appendix II Section III. The felling of the two trees had been requested and strongly supported by the Incorporated Owners of Hillview Garden in order to mitigate the safety risk to the Hillview Garden residents and the public.

Wall tree No. T04 collapsed at Forbes Street due to Typhoon Vicente on 23 July 2012 and was removed on 24 July 2012. No injury was reported in this incident. The incident had been reported to the concerned Government Departments.

5 WASTE MANAGEMENT

Mitigation measures on waste management have been implemented in accordance with the Waste Management Plans for the respective civil works contracts submitted under the Environmental Permit. The C&D materials are to be disposed of at the public filling reception facilities while C&D wastes are to be disposed of at the landfills. Quantities of wastes disposed in the reporting period are summarized in the following table:

Amount of Construction Wastes Disposed				
Reporting Period	Inert C&D Materials to Public Fill (ton)	Inert C&D Materials Reused (ton)	Non-inert Waste to Landfill (ton)	Chemical Waste to designated treatment facility (litre)
<u>Contract 703 (Contract completed in August 2014)</u>				
Aug – Sept 2009	387.0	0	23.4	0
Oct – Dec 2009	4581.4	0	35.6	0
Jan – Mar 2010	7943.0	0	86.6	0
Apr – Jun 2010	11691.1	0	98.6	0
Jul – Sept 2010	15461.1	0	94.3	2.9m ³ +200kg+800 litres
Oct – Dec 2010	20092.9	0	66.1	800 litres
Jan – Mar 2011	45689.3	0	175.4	200kg+600 litres
Apr – Jun 2011	67312.3	0	128.9	1800 litres
Jul – Sept 2011	32531.4	0	123.5	1600 litres
Oct – Dec 2011	23917.0	0	126.4	200kg+1600 litres
Jan – Mar 2012	38472.3	0	94.9	200 litres
Apr – Jun 2012	11702.3	0	95.0	600 litres
Jul – Sept 2012	20750.7	0	113.2	1200 litres
Oct – Dec 2012	30045.6	0	88.5	2800 litres+150kg
Jan – Mar 2013	6359.2	0	109.8	2000 litres
Apr – Jun 2013	3601.7	0	133.5	0

Jul - Sept 2013	2829.1	0	183.9	0
Oct - Dec 2013	5756.7	0	142.2	1200 litres
Jan - Mar 2014	925.7	0	66.1	0
Apr - Jun 2014	6.3	0	0	0
Jul 2014	0	0	0	0
Cumulative	350056.3	0	1985.8	2.9m3 [^] +750kg+ 15200 litres
<u>Contract 704</u>				
Apr - Jun 2010	3257.8	0	198.5	0
Jul - Sept 2010	4364.2	0	295.4	0
Oct - Dec 2010	17230.6	17216.8	215.9	0
Jan - Mar 2011	5391.6	73638.7	221.2	1400 litres
Apr - Jun 2011	5163.2	108205.3	229.0	3000kg [^] +20kg+ 1000 litres
Jul - Sept 2011	6093.0	210113.8	168.9	7kg+3600 litres
Oct - Dec 2011	2800.5	282756.4	142.2	3200 litres
Jan - Mar 2012	12155.2	252941.7	203.1	4400 litres
Apr - Jun 2012	22093.6	205734.7	367.9	2600 litres
Jul - Sept 2012	4298.5	159985.2	604.1	1027 litres
Oct - Dec 2012	4045.3	57715.1	668.6	1018 litres
Jan - Mar 2013	3730.1	46720.6	880.6	1108 litres
Apr - Jun 2013	1191.6	11378	470.8	3316 litres
Jul - Sept 2013	3110.8	32177.6	2061.1	1404 litres
Oct - Dec 2013	3999.5	43330.1	1549.3	14 litres
Jan - Mar 2014	8215.9	13251.0	2181.0	681 litres
Apr - Jun 2014	5790.5	0	2153.7	1013 litres
Jul - Sept 2014	5526.1	0	3006.4	2439 litres
Oct - Dec 2014	5208.3	960.5	2288.2	1607 litres
Jan - Mar 2015	2481.5	0	1195.8	1016 litres
Apr - Jun 2015	2477.3	0	407.7	0
Jul 2015	1345.4	0	70.2	0
Aug 2015	682.0	0	46.8	0
Sep 2015	1083.8	0	45.4	0
Cumulative	131736.3	1516126	19671.8	3000kg [^] +27kg+ 30845 litres
<u>Contract 705 (Contract substantially completed in December 2014)</u>				
Dec 2009	0	0	0	0
Jan - Mar 2010	291.2	0	22.4	0
Apr - Jun 2010	4840.4	0	65.8	287m3 [^] +400 litres
Jul - Sept 2010	14730.2	0	130.7	400 litres
Oct - Dec 2010	8778.7	4447.3	130.6	390kg [^] +200 litres
Jan - Mar 2011	6829.3	48244.3	101.2	0
Apr - Jun 2011	1154.3	6967.4	131.7	0
Jul - Sept 2011	3022.4	33635.5	170.5	0
Oct - Dec 2011	31687.3	33632	115.4	1000 litres
Jan - Mar 2012	11257.5	58666.5	216.3	0
Apr - Jun 2012	50844.8	12845.9	1493.1	0
Jul - Sept 2012	1081.3	11868	2744.5	0

Oct – Dec 2012	286	2844	1281.7	0
Jan – Mar 2013	99.9	826	670.1	0
Apr – Jun 2013	97.9	4172.0	461.2	2400 litres
Jul - Sept 2013	99.3	1144.0	327.0	0
Oct – Dec 2013	3612.0	1785	284.2	480 litres
Jan – Mar 2014	3742.9	0	261.7	0
Apr – Jun 2014	4276.6	0	151.6	0
Jul - Sept 2014	2009.7	0	445.6	0
Oct – Dec 2014	318.9	0	634.4	0
Jan – Mar 2015	0	0	0	0
Apr – Jun 2015	2384.4	0	316.3	0
Jul 2015	1304.5	0	125.3	0
Aug 2015	1651.8	0	64.7	0
Sep 2015	4518.1	0	41.3	0
Cumulative	158919.4	221077.9	10387.3	287m ³ +390kg ⁺ 4880 litres
<u>Contract 706 (Contract completed in November 2010)</u>				
Jul – Sept 2009	1746.6	0	12.7	0
Oct – Dec 2009	5641.3	0	10.4	200 litres
Jan – Mar 2010	13633.9	0	54.9	0
Apr – Jun 2010	21208.8	0	72.6	0
Jul – Sept 2010	5657.9	0	39.3	0
Oct 2010	742.7	0	2.4	0
Nov 2010	0	0	0	0
Cumulative	48631.2	0	192.3	200 litres
<u>Contract 706A (Contract completed in April 2011)</u>				
Dec 2009	0	0	0	0
Jan – Mar 2010	8238.6	0	96.2	0
Apr – Jun 2010	1054.7	0	1724	0
Jul - Sept 2010	195.7	0	196.6	0
Oct – Dec 2010	1231.5	0	90.6	0
Jan – Mar 2011	1479.2	0	97.4	0
Cumulative	12199.7	0	2204.8	0
<u>Contract 708 (Contract completed in August 2010)</u>				
Jul – Sept 2009	0	0	181	0
Oct - Dec 2009	5698.9	0	12	0
Jan – Mar 2010	9989.6	0	12.5	0
Apr – Jun 2010	2741	0	54.3	0
Jul 2010	1035.4	0	13.3	0
Aug 2010	0	0	0	0
Cumulative	19464.9	0	273.1	0

<u>Contract 714 (Contract completed in April 2010)</u>				
Jul - Sept 2009	0	0	42.1	0
Oct - Dec 2009	271.9	0	161.6	0
Jan - Mar 2010	87.7	0	124.7	0
Apr 2010	0	0	0	0
Cumulative	359.6	0	328.4	0

^ACM disposal from buildings demolition

6 **WATER QUALITY**

Monitoring of the implementation of the water quality mitigation measures during construction phase was conducted in accordance with the requirements as stipulated in the EM&A Manual.

Weekly site inspection will be conducted throughout the construction stage covering the entire project site areas to ensure the recommended mitigation measures are properly implemented.

In the reporting period, the water quality mitigation measures were implemented in accordance with the requirements as stipulated in the EM&A Manual.

Water sample tests were conducted for Works Area L1 in the reporting period. Results were satisfactory and were in compliance with the requirement under the WPCO licence.

Impact on tree walls at Forbes Street due to the potential for groundwater drawdown induced by tunnelling is controlled, as a precautionary measure, through monitoring of groundwater level. Groundwater level monitoring conducted weekly at the monitoring well adjacent to the two tree walls located outside the boundary of Works Area C had been completed.

7 **CULTURAL HERITAGE**

Archaeological Watching Brief monitoring for Works Area J2 had been completed as mentioned in the EM&A Report for June 2012. No archaeological finding was observed.

Archaeological Watching Brief monitoring for Works Area J3 had been completed as mentioned in the EM&A Report for June 2011. No archaeological finding was observed.

Archaeological Watching Brief monitoring for Works Area I had been completed as mentioned in the EM&A Report for May 2011. No archaeological finding was observed.

Archaeological Watching Brief monitoring for Works Areas C and H had been completed as mentioned in the EM&A Report for February 2011. No archaeological finding was observed.

Archaeological Watching Brief monitoring for Works Area J had been completed as mentioned in the EM&A Report for January 2011. No archaeological finding was observed.

Archaeological Watching Brief monitoring for Works Area M had been completed as mentioned in the EM&A Report for July 2010. No archaeological finding was observed.

Archaeological Watching Brief monitoring for Works Area M2 had been completed as mentioned in the EM&A Report for May 2010. No archaeological finding was observed.

Vibration monitoring at the identified vibration sensitive historical buildings within 100m in plan of the blast location in accordance with the requirements stipulated in Chapter 5 of the EM&A Manual had been completed. From the monitoring results obtained in the past reporting periods, the measured PPV were far below the PPV criterion of 25mm/s. As such, it is considered that there was no adverse indirect vibration impact on the vibration sensitive historical buildings due to the use of drill and blast method for the WIL tunnel construction.

8 RECORD OF ENVIRONMENTAL COMPLAINTS

An environmental complaint referred to the ET on 16 Sep 2015 regarding construction dust nuisance at MTR West Island Line, Works area B, Kennedy Town.

Upon investigation, reinstatement works were carried out at the area during the period as mentioned in the complaint. In order to minimize the potential environmental impacts that may be caused by the work, the 705 Contractor regularly sprayed water in the worksite to keep the ground moist and erected tarpaulin sheets to cover the concrete breaking area for dust suppression.

Additional 3nos. 1-hr dust monitoring had been conducted on 17 March 2013. The measured 1-hr TSP levels were 72.5, 79.3 and 76.4 $\mu\text{g}/\text{m}^3$ and no exceedance of Limit Level was recorded for the additional dust monitoring.

A summary of environmental complaints since commencement of construction is shown below:

Reporting Period	Frequency	Cumulative	Nature	Status
10 Aug 2009 – 9 Nov 2009	3	3	3nos.- Noise	Cases closed
10 Nov 2009 – 9 Feb 2010	6	9	3 nos. - Noise/ Air 3 nos. - Noise	Cases closed
10 Feb 2010 – 9 May 2010	10	19	6 nos. - Noise 4 nos. - Dust/Smoke	Cases closed
10 May 2010 – 9 Aug 2010	5	24	1 no. - Dust/Smoke 2 nos - Other 1 no. - Noise 1 no. - Water	Cases closed
10 Aug 2010 – 9 Nov 2010	14	38	7 nos. - Noise 2 nos. - Smoke/Smell 2 nos. - Dust/Noise 2 nos. - Dust 1 no. - Water	Cases closed
10 Nov 2010 – 9 Feb 2011	17	55	12 nos. - Noise 2 nos. - Dust 1 no. - Dust/Noise 2 nos. - Other	Cases closed
10 Feb 2011 – 9 May 2011	24	79	12 nos. - Noise 2 nos. - Dust/Noise 2 nos. - Dust 8 nos. - Other	Cases closed
10 May 2011 – 9 Aug 2011	10	89	5 nos. - Noise 2 nos. - Dust/Smoke/Water 1 no. - Dust/Smell 1 no. - Water 1 no. - Dust	Cases closed
10 Aug 2011 – 9 Nov 2011	6	95	1 no. - Noise 1 no. - Dust 1 no. - Smell 2 nos. - Water 1 no. - Other	Cases closed
10 Nov 2011 – 9 Feb 2012	17	112	12 nos. - Noise 2 nos. - Water 3 nos. - Other	Cases closed
10 Feb 2012 – 9 May 2012	13	125	6 nos. - Noise 2 nos. - Dust 4 nos. - Smell 1 no. - Water	Cases closed
10 May 2012 – 9 Aug 2012	24	149	9 nos. - Noise 2 nos. - Dust 6 nos. - Water 5 nos. - Smell 2 nos. - Other	Cases closed
10 Aug 2012 – 9 Nov 2012	6	155	3 nos. - Noise 1 no. - Dust 1no. - Water 1 no. - Smell	Cases closed

10 Nov 2012 – 9 Feb 2013	7	162	6 nos. – Noise 1 no. – Water	Cases closed
10 Feb 2013 – 9 May 2013	4	166	3 nos. – Noise 1 no. – Dust/Noise	Cases closed
10 May 2013 – 9 Aug 2013	10	176	6 nos. – Noise 1 no. – Dust 2 nos. – Smell 1 no. – Other	Cases closed
10 Aug 2013 – 9 Nov 2013	7	183	7 nos. – Noise	Cases closed
10 Nov 2013 – 9 Feb 2014	7	190	7 nos. – Noise	Cases closed
10 Feb 2014 – 9 May 2014	6	196	1 no. – Water/Smell 5 nos. – Noise	Cases closed
10 May 2014 – 9 Aug 2014	2	198	1 no. – Noise/Dust/Smell 1 no. – Other	Cases closed
10 Aug 2014 – 9 Nov 2014	6	204	4 nos. – Noise 1 no. – Dust 1 no. – Smell	Cases closed
10 Nov 2014 – 9 Feb 2015	5	209	2 nos. – Noise 1 no. – Dust 2 nos. – Water	Cases closed
10 Feb 2015 – 9 May 2015	1	210	1 no. – Water	Case closed
10 May 2015 – 9 Aug 2015	0	210	N/A	N/A
10 Aug 2015 – 9 Oct 2015	1	211	1 no. – Dust	Case closed

9 RECORD OF NON-COMPLIANCES

There was no non-compliance identified in the reporting period.

10 NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

No summon or prosecution related to environmental issue was received or made against the Project in the reporting period.

A summary of environmental prosecution since commencement of construction is shown below:-

Reporting Period	Frequency	Cumulative	Nature	Status
10 Aug – 9 Nov 2009	0	0	N/A	N/A
10 Nov 2009– 9 Feb 2010	0	0	N/A	N/A
10 Feb 2010 – 9 May 2010	1	1	Noise	Summon served
10 May 2010 – 9 Aug 2010	0	1	N/A	N/A
10 Aug 2010 – 9 Nov 2010	0	1	N/A	N/A
10 Nov 2010 – 9 Feb 2011	0	1	N/A	N/A
10 Feb 2011 – 9 May 2011	0	1	N/A	N/A
10 May 2011 – 9 Aug 2011	0	1	N/A	N/A
10 Aug 2011 – 9 Nov 2011	0	1	N/A	N/A
10 Nov 2011 – 9 Feb 2012	0	1	N/A	N/A
10 Feb 2012 – 9 May 2012	0	1	N/A	N/A
10 May 2012 – 9 Aug 2012	0	1	N/A	N/A
10 Aug 2012 – 9 Nov 2012	0	1	N/A	N/A
10 Nov 2012 – 9 Feb 2013	0	1	N/A	N/A
10 Feb 2013 – 9 May 2013	0	1	N/A	N/A
10 May 2013 – 9 Aug 2013	0	1	N/A	N/A
10 Aug 2013 – 9 Nov 2013	0	1	N/A	N/A
10 Nov 2013 – 9 Feb 2014	0	1	N/A	N/A
10 Feb 2014 – 9 May 2014	0	1	N/A	N/A
10 May 2014 – 9 Aug 2014	0	1	N/A	N/A
10 Aug 2014 – 9 Nov 2014	0	1	N/A	N/A
10 Nov 2014 – 9 Feb 2015	0	1	N/A	N/A
10 Feb 2015 – 9 May 2015	0	1	N/A	N/A
10 May 2015 – 9 Aug 2015	0	1	N/A	N/A
10 Aug 2015 – 9 Sep 2015	0	1	N/A	N/A
10 Sep 2015 – 9 Oct 2015	0	1	N/A	N/A

11 STATUS OF STATUTORY SUBMISSIONS

11.1 Submissions required under Environmental Permit

A summary of the status of submissions required under the WIL Environmental Permit as of 9 October 2015 is shown below:

EP-313/2008/D Clause No.	Description		Status
1.11	1	Commencement date of construction	submitted on 10 July 2009
1.14	2	Commencement date of operation	submitted on 16 December 2014
2.1 & 2.2	3	Employment of IEC, ET Leader	submitted on 23 June 2009
2.1	4	Employment of ET Leader	submitted on 19 September 2011
2.3	5	Contractor Management Organization for Civil Works Contracts 706, 708 and 714	submitted on 24 July 2009
2.3	6	Contractor Management Organization for Civil Works Contract 703	submitted on 14 September 2009 and 6 October 2009
2.3	7	Contractor Management Organization for Civil Works Contracts 705 and 706A	submitted on 22 January 2010
2.3	8	Contractor Management Organization for Civil Works Contract 704	submitted on 16 April 2010
2.5 & 2.7	9	Certified Arborist and Tree Protection Plan	submitted on 24 July 2009 and 5 August 2009
2.5 & 2.7	10	Certified Arborist and Tree Protection Plan – Responses to Comments	submitted on 10 September 2009
2.5 & 2.7	11	Certified Arborist and Tree Protection Plan – Certified Arborist	submitted on 3 November 2009
2.5 & 2.7	12	Tree Protection Plan Rev A	submitted on 19 July 2010
2.5 & 2.7	13	Tree Protection Plan Rev B	submitted on 13 October 2010
2.5 & 2.7	14	Tree Protection Plan Rev C	submitted on 11 January 2013
2.5 & 2.7	15	Tree Protection Plan Rev D	submitted on 3 March 2014
2.5 & 2.7	16	Tree Protection Plan Rev E	submitted on 6 October 2014
2.5 & 2.7	17	Tree Protection Plan Rev F (Part 1)	submitted on 11 November 2014
2.5 & 2.7	18	Tree Protection Plan (Complete Set)	submitted on 21 January 2015
2.5 & 2.7	19	Tree Protection Plan (Complete Set)	submitted on 24 April 2015
2.5	20	Certified Arborist	submitted on 22 June 2010
2.6	21	Set up of Community Liaison Groups and designated complaint hotline	submitted on 20 July 2009
2.11.1	22	Archaeological Watching Brief Proposal	submitted on 31 August 2009
2.11.1	23	Revised Archaeological Watching Brief Proposal	submitted on 23 September 2009
2.11.1	24	Revised Archaeological Watching Brief Proposal	submitted on 16 October 2009
2.12	25	Waste Management Plans for Civil Works Contracts 706, 708 and 714	submitted on 24 July 2009
2.12	26	Revised Waste Management Plans for Civil Works Contracts 706, 708 and 714 Rev A	submitted on 7 September 2009
2.12	27	Revised Waste Management Plans for Civil Works Contracts 706, 708 and 714 Rev B	submitted on 16 October 2009
2.12	28	Waste Management Plan for Civil Works Contract 703	submitted on 2 December 2009

2.12	29	Revised Waste Management Plan for Civil Works Contract 703 Rev A	submitted on 14 January 2010
2.12	30	Waste Management Plan for Civil Works Contract 706A	submitted on 22 January 2010
2.12	31	Waste Management Plan for Civil Works Contract 705	submitted on 5 February 2010
2.12	32	Revised Waste Management Plan for Civil Works Contract 705 Rev A	submitted on 2 September 2010
2.12	33	Waste Management Plan for Civil Works Contract 704	submitted on 22 July 2010
2.12	34	Waste Management Plan for Civil Works Contract 704 Rev A	submitted on 14 April 2011
2.12	35	Waste Management Plan for Civil Works Contract 704 Rev B	submitted on 7 October 2011
2.12	36	Waste Management Plan for Civil Works Contract 704 Rev C	submitted on 22 May 2012
3.1.1(a) & 2.4	37	Works Area B programme, site layout plan and drawings of mitigation measures	submitted on 23 June 2009
3.1.1(a)	38	Remediation Report for Works Area B	submitted on 10 June 2009
3.1.2(a) & 3.1.2(b)	39	Appointment of ISC and certification of additional concrete paving for the small western portion of Works Area B occupied by HyD Depot	submitted on 13 July 2009 and 25 August 2009
3.1.2(a) & 3.1.2(b)	41	Appointment of ISC and certification of additional concrete paving for Works Area B for WIL Project	submitted on 30 October 2009
3.3.2(a)	42	Sampling and Testing Proposal	submitted on 14 May 2014
3.3.2(a)	43	Revised Sampling and Testing Proposal	submitted on 4 August 2014
3.3.2(a)	44	Revised Sampling and Testing Proposal	submitted on 6 October 2014
3.3.2(b)	45	Sampling and Testing Report	submitted on 11 December 2014
3.3.2(c)	46	Method Statement for Removal of additional concrete paving	submitted on 25 March 2015
3.3.2	47	Removal Plan	submitted on 13 May 2015
4.1.4	48	As-built Drawing of Track / Trackform / Baseplate	submitted on 13 September 2013
4.1.4	49	As-built Drawings for Operation Ground-borne Noise Mitigation Measures	submitted on 9 January 2014
4.1.5	50	Noise Performance Test Proposal	submitted on 28 February 2014
4.1.5	51	Noise Performance Test Proposal Re-submission	submitted on 6 June 2014
4.1.5	52	Noise Performance Test Report	submitted on 23 July 2014
4.1.5	53	Noise Performance Test Report Re-submission	submitted on 26 August 2014
4.1.5	54	Noise Performance Test Report Re-submission	submitted on 16 October 2014
4.2.1	55	Aesthetic Landscape and Architectural Proposal	submitted on 11 June 2014
4.2.1	56	Aesthetic Landscape and Architectural Proposal Re-submission	submitted on 18 September 2014

4.2.1	57	Aesthetic Landscape and Architectural Proposal Re-submission	submitted on 19 January 2015
4.2.1	58	Aesthetic Landscape and Architectural Proposal Re-submission	submitted on 14 April 2015
4.2.2	59	Audit Report of Tree Protection Plan Implementation (Part 1)	submitted on 11 November 2014
4.2.2	60	Audit Report of Tree Protection Plan Implementation (Part 2)	submitted on 3 February 2015
5.1.1	61	Record of Public Open Space Reprovisioning/Restoration	submitted on 16 December 2014
6.1(i)	62	Construction Ground-borne Noise Monitoring Plan for TBM	submitted on 27 May 2011
6.1(i)	63	Construction Ground-borne Noise Monitoring Plan for TBM Rev A	submitted on 9 September 2011
6.3	64	Baseline Monitoring Report (Part 1) for Works Area B	submitted on 10 July 2009
6.3	65	Baseline Monitoring Report (Part 1) for Works Area B Rev A	submitted on 10 February 2012
6.3	66	Baseline Monitoring Report (Part 2) for Works Area MA	submitted on 12 August 2009
6.3	67	Baseline Monitoring Report (Part 3) for Works Areas G and J	submitted on 28 August 2009
6.3	68	Baseline Monitoring Report (Part 4) for Works Areas M and N1	submitted on 9 October 2009
6.3	69	Baseline Monitoring Report (Part 5) for Works Area I	submitted on 8 December 2009
6.3	70	Baseline Monitoring Report (Part 6) for Works Area C	submitted on 10 February 2010
6.3	71	Baseline Monitoring Report (Part 7) for Works Areas C and D	submitted on 15 April 2010
6.3	72	Baseline Monitoring Report (Part 7) for Works Areas C and D Rev A	submitted on 11 June 2010
6.3	73	Baseline Monitoring Report (Part 8) for Works Area A	submitted on 23 April 2010
6.3	74	Baseline Monitoring Report (Part 8) for Works Area A Rev A	submitted on 15 June 2010
6.3	75	Baseline Monitoring Report (Part 9) for Works Area L1	submitted on 7 July 2010
6.3	76	Baseline Monitoring Report (Part 10) for Works Areas H and J3	submitted on 6 October 2010
6.3	77	Baseline Monitoring Report (Part 11) for Works Areas O1, O2 and O3	submitted on 12 October 2010
6.3	78	Baseline Monitoring Report (Part 12) for Works Area E	submitted on 4 November 2010
6.3	79	Baseline Monitoring Report (Part 12) Rev A for Works Area E	submitted on 17 December 2010
6.3	80	Baseline Monitoring Report (Part 13) for Works Area M1	submitted on 17 January 2011
6.3	81	Baseline Monitoring Report (Part 14) for Works Area J2	submitted on 1 February 2011

6.3	82	Baseline Monitoring Report (Part 15) for Works Area M3	submitted on 22 July 2011
6.3	83	Baseline Monitoring Report (Part 15) for Works Area M3 Rev A	submitted on 20 October 2011
6.3	84	Baseline Monitoring Report (Part 15) for Works Area M3 Rev B	submitted on 9 December 2011
6.4	85	EM&A Report for September 2009	submitted on 23 September 2009
6.4	86	EM&A Report for October 2009	submitted on 23 October 2009
6.4	87	EM&A Report for November 2009	submitted on 23 November 2009
6.4	88	EM&A Report for December 2009	submitted on 23 December 2009
6.4	89	EM&A Report for January 2010	submitted on 22 January 2010
6.4	90	EM&A Report for February 2010	submitted on 25 February 2010
6.4	91	EM&A Report for March 2010	submitted on 23 March 2010
6.4	92	EM&A Report for April 2010	submitted on 23 April 2010
6.4	93	EM&A Report for May 2010	submitted on 24 May 2010
6.4	94	EM&A Report for June 2010	submitted on 24 June 2010
6.4	95	EM&A Report for July 2010	submitted on 23 July 2010
6.4	96	EM&A Report for August 2010	submitted on 23 August 2010
6.4	97	EM&A Report for September 2010	submitted on 24 September 2010
6.4	98	EM&A Report for October 2010	submitted on 25 October 2010
6.4	99	EM&A Report for November 2010	submitted on 23 November 2010
6.4	100	EM&A Report for December 2010	submitted on 23 December 2010
6.4	101	EM&A Report for January 2011	submitted on 24 January 2011
6.4	102	EM&A Report for February 2011	submitted on 25 February 2011
6.4	103	EM&A Report for March 2011	submitted on 23 March 2011
6.4	104	EM&A Report for April 2011	submitted on 27 April 2011
6.4	105	EM&A Report for May 2011	submitted on 23 May 2011
6.4	106	EM&A Report for June 2011	submitted on 24 June 2011
6.4	107	EM&A Report for July 2011	submitted on 26 July 2011
6.4	108	EM&A Report for August 2011	submitted on 23 August 2011
6.4	109	EM&A Report for September 2011	submitted on 23 September 2011
6.4	110	EM&A Report for October 2011	submitted on 21 October 2011
6.4	111	EM&A Report for November 2011	submitted on 23 November 2011
6.4	112	EM&A Report for December 2011	submitted on 23 December 2011
6.4	113	EM&A Report for January 2012	submitted on 20 January 2012
6.4	114	EM&A Report for February 2012	submitted on 23 February 2012
6.4	115	EM&A Report for March 2012	submitted on 23 March 2012
6.4	116	EM&A Report for April 2012	submitted on 23 April 2012
6.4	117	EM&A Report for May 2012	submitted on 23 May 2012
6.4	118	EM&A Report for June 2012	submitted on 22 June 2012

6.4	119	EM&A Report for July 2012	submitted on 23 July 2012
6.4	120	EM&A Report for August 2012	submitted on 23 August 2012
6.4	121	EM&A Report for September 2012	submitted on 21 September 2012
6.4	122	EM&A Report for October 2012	submitted on 22 October 2012
6.1	123	EM&A Report for November 2012	submitted on 23 November 2010
6.1	124	EM&A Report for December 2012	submitted on 21 December 2010
6.1	125	EM&A Report for January 2013	submitted on 23 January 2013
6.1	126	EM&A Report for February 2013	submitted on 27 February 2013
6.1	127	EM&A Report for March 2013	submitted on 22 March 2013
6.1	128	EM&A Report for April 2013	submitted on 23 April 2013
6.1	129	EM&A Report for May 2013	submitted on 24 May 2013
6.1	130	EM&A Report for June 2013	submitted on 24 June 2013
6.1	131	EM&A Report for July 2013	submitted on 23 July 2013
6.1	132	EM&A Report for August 2013	submitted on 23 August 2013
6.1	133	EM&A Report for September 2013	submitted on 24 September 2013
6.1	134	EM&A Report for October 2013	submitted on 23 October 2013
6.1	135	EM&A Report for November 2013	submitted on 22 November 2013
6.1	136	EM&A Report for December 2013	submitted on 23 December 2013
6.1	137	EM&A Report for January 2014	submitted on 23 January 2014
6.1	138	EM&A Report for February 2014	submitted on 21 February 2014
6.1	139	EM&A Report for March 2014	submitted on 23 March 2014
6.1	140	EM&A Report for April 2014	submitted on 25 April 2014
6.1	141	EM&A Report for May 2014	submitted on 23 May 2014
6.1	142	EM&A Report for June 2014	submitted on 23 June 2014
6.1	143	EM&A Report for July 2014	submitted on 23 July 2014
6.1	144	EM&A Report for August 2014	submitted on 23 August 2014
6.1	145	EM&A Report for September 2014	submitted on 23 September 2014
6.1	146	EM&A Report for October 2014	submitted on 23 October 2014
6.1	147	EM&A Report for November 2014	submitted on 23 November 2014
6.1	148	EM&A Report for December 2014	submitted on 23 December 2014
6.1	149	EM&A Report for January 2015	submitted on 23 January 2015
6.1	150	EM&A Report for February 2015	submitted on 25 February 2015
6.1	151	EM&A Report for March 2015	submitted on 23 March 2015
6.1	152	EM&A Report for April 2015	submitted on 23 April 2015
6.1	153	EM&A Report for May 2015	submitted on 23 May 2015
6.1	154	EM&A Report for June 2015	submitted on 23 June 2015
6.1	155	EM&A Report for July 2015	submitted on 23 July 2015
6.1	156	EM&A Report for August 2015	submitted on 21 August 2015
6.1	157	Final EM&A Report for Works Area MA	submitted on 29 December 2010

6.1	158	Final EM&A Report for Works Area MA Rev A	submitted on 16 January 2012
6.1	159	Final EM&A Report Part 1 for WIL Project	submitted on 25 February 2015
6.1	160	Revised Final EM&A Report Part 1 for WIL Project	submitted on 8 July 2015
7.2	161	Internet address of web site for environmental monitoring and project data	submitted on 23 September 2009

11.2 Statutory Permits and Licenses

A summary of the status of all relevant environmental permits and licenses as of 9 October 2015 is shown below:

Description	Status
Environmental Permit for West Island Line Project (EP-313/2008)	Issued on 12 January 2009 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/A)	Issued on 26 June 2009 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/B)	Issued on 22 July 2009 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/C)	Issued on 31 August 2009 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/D)	Issued on 19 January 2011 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/E)	Issued on 1 August 2012 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/F)	Issued on 5 October 2012 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/G)	Issued on 16 May 2013 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/H)	Issued on 16 December 2013 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/I)	Issued on 26 March 2014 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/J)	Issued on 1 September 2014
Contract 703 (Contract Completed)	
Wastewater Discharge License	WT00005106-2009 (surrendered), WT00005108-2009 (surrendered), WT00008394-2011 (surrendered), WT00006066-2010 (surrendered), WT00007598-2010 (surrendered), WT00012684-2012 (surrendered)
Registration as a Chemical Waste Producer	Approved on 2 September 2009 Permit no. 5213-113-D2422-01 (surrendered), Permit no. 5213-113-D2422-03 (surrendered), Permit no. 5213-113-D2422-02 (surrendered)

Disposal of Construction Waste	Billing Account no. 7009262 activated on 21 August 2009
Construction Noise Permit	GW-RS0867-09 (expired), GW-RS0025-10 (expired), GW-RS0086-10 (expired), GW-RS0176-10 (expired), GW-RS0297-10 (expired), GW-RS0367-10 (surrendered), GW-RS0448-10 (expired), GW-RS0467-10 (surrendered), GW-RS0606-10 (surrendered), GW-RS0673-10 (expired), GW-RS0849-10 (expired), GW-RS0876-10 (expired), GW-RS1052-10 (expired), GW-RS1145-10 (expired), GW-RS0159-11 (expired), GW-RS0237-11 (expired), GW-RS0242-11 (expired), GW-RS0284-11 (surrendered), GW-RS0386-11 (expired), GW-RS0425-11 (surrendered), GW-RS0437-11 (expired), GW-RS0587-11 (expired), GW-RS0639-11 (expired), GW-RS0641-11 (expired), GW-RS0802-11 (surrendered), GW-RS1007-11 (expired), GW-RS1015-11 (expired), GW-RS1017-11 (expired), GW-RS1037-11 (expired), GW-RS1121-11 (expired), GW-RS0058-12 (expired), GW-RS0159-12 (expired), GW-RS0176-12 (expired), GW-RS0310-12 (expired), GW-RS0688-12 (surrendered), GW-RS0863-12 (expired), GW-RS0869-12 (expired), GW-RS1379-12 (expired), GW-RS0669-13 (surrendered), GW-RS0679-13 (surrendered), GW-RS1016-13 (expired), GW-RS1194-13 (surrendered), GW-RS1398-13 (expired)
<u>Contract 704</u>	
Wastewater Discharge License	WT00006664-2010, WT00006925-2010, WT00006958-2010, WT00006961-2010, WT00006962-2010, WT00007021-2010, WT00007998-2010, WT00009469-2011, WT00010128-2011, WT00012385-2012, WT00012577-2012, WT00018075-2013, WT00007939-2010 (surrendered)
Registration as a Chemical Waste Producer	Approved on 2 June 2010 Permit no. 5214-111-G2260-03 Approved on 12 November 2010 Permit no. 5213-112-G2525-02 Approved on 26 November 2010 Permit no. 5213-111-G2525-01 Approved on 25 May 2011 Permit no. 5213-112-G2525-03 Approved on 20 September 2011 Permit no. 5213-113-G2525-04 Permit no. 5213-116-G2260-04 (surrendered)
Disposal of Construction Waste	Billing Account no. 7010555 activated on 8 April 2010, Billing Account no. 7011159 (by vessel) activated on 10 September 2010
Construction Noise Permit	GW-RS0413-10 (expired), GW-RS0552-10 (expired), GW-RS0572-10 (expired), GW-RS0738-10 (surrendered), GW-RS0836-10 (surrendered), GW-RS0838-10 (surrendered), GW-RS0918-10 (expired), GW-RS1015-10 (surrendered), GW-RS1167-10 (expired), GW-RS0034-11 (expired), GW-RS0112-11 (expired),

	GW-RS0213-11 (expired), GW-RS0229-11 (expired), GW-RS0238-11 (expired), GW-RS0262-11 (expired), GW-RS0327-11 (expired), GW-RS0360-11 (expired), GW-RS0497-11 (expired), GW-RS0505-11 (expired), GW-RS0537-11 (expired), GW-RS0563-11 (expired), GW-RS0575-11 (expired), GW-RS0701-11 (expired), GW-RS0790-11 (expired), GW-RS0837-11 (surrendered) GW-RS0876-11 (expired), GW-RS0888-11 (expired), GW-RS0928-11 (expired), GW-RS0958-11 (expired), GW-RS0980-11 (expired), GW-RS1060-11 (expired), GW-RS1082-11 (surrendered), GW-RS1126-11 (expired), GW-RS1136-11 (expired), GW-RS1142-11 (expired), GW-RS1197-11 (expired), GW-RS1219-11 (expired), GW-RS0078-12 (expired), GW-RS0119-12 (expired), GW-RS0144-12 (expired), GW-RS0171-12 (surrendered), GW-RS0177-12 (expired), GW-RS0217-12 (surrendered), GW-RS0254-12 (expired), GW-RS0300-12 (expired), GW-RS0305-12 (surrendered), GW-RS0306-12 (expired), GW-RS0349-12 (surrendered), GW-RS0354-12 (expired), GW-RS0364-12 (expired), GW-RS0379-12 (surrendered), GW-RS0407-12 (surrendered), GW-RS0431-12 (surrendered), GW-RS0450-12 (expired), GW-RS0480-12 (surrendered), GW-RS0527-12 (surrendered), GW-RS0592-12 (expired), GW-RS0608-12 (expired), GW-RS0717-12 (surrendered), GW-RS0723-12 (expired), GW-RS0735-12 (expired), GW-RS0757-12 (expired), GW-RS0805-12 (expired), GW-RS0825-12 (surrendered), GW-RS0876-12 (expired), GW-RS0890-12 (surrendered), GW-RS0901-12 (expired), GW-RS0921-12 (expired), GW-RS0981-12 (expired), GW-RS1012-12 (expired), GW-RS1028-12 (surrendered), GW-RS1041-12 (expired), GW-RS1053-12 (surrendered), GW-RS1098-12 (surrendered), GW-RS1119-12 (expired), GW-RS1183-12 (surrendered), GW-RS1198-12 (surrendered), GW-RS1242-12 (expired), GW-RS1324-12 (expired), GW-RS1349-12 (expired), GW-RS1351-12 (surrendered), GW-RS1389-12 (expired), GW-RS0096-13 (surrendered), GW-RS0110-13 (expired), GW-RS0195-13 (expired), GW-RS0218-13 (expired), GW-RS0422-13 (expired), GW-RS0031-13 (surrendered), GW-RS0111-13 (surrendered), GW-RS0168-13 (surrendered), GW-RS0313-13 (expired), GW-RS0333-13 (surrendered), GW-RS0406-13 (surrendered), GW-RS0407-13 (surrendered), GW-RS0671-13 (expired), GW-RS0138-13 (expired), GW-RS0347-13 (expired), GW-RS0491-13 (expired), GW-RS0574-13 (surrendered) GW-RS0603-13 (surrendered), GW-RS0608-13 (surrendered), GW-RS0723-13 (surrendered), GW-RS0729-13 (expired), GW-RS0837-13 (surrendered), GW-RS0866-13 (expired),
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	GW-RS0934-13 (surrendered), GW-RS0944-13 (surrendered), GW-RS0985-13 (expired), GW-RS1006-13 (expired), GW-RS1030-13 (surrendered), GW-RS1069-13 (expired), GW-RS1098-13 (surrendered), GW-RS1293-13 (expired), GW-RS1317-13 (surrendered), GW-RS1350-13 (expired), GW-RS1424-13 (expired), GW-RS1446-13 (expired), GW-RS1465-13 (surrendered), GW-RS1472-13 (expired), GW-RS0086-14 (surrendered), GW-RS0114-14 (surrendered), GW-RS0037-14 (expired), GW-RS0056-14 (expired), GW-RS0146-14 (expired), GW-RS0207-14 (expired), GW-RS0273-14 (expired), GW-RS0274-14 (expired), GW-RS0310-14 (surrendered), GW-RS0320-14 (surrendered), GW-RS0337-14 (expired), GW-RS0382-14 (expired), GW-RS0423-14 (expired), GW-RS0484-14 (surrendered), GW-RS0574-14 (expired), GW-RS0628-14 (expired), GW-RS0657-14 (surrendered), GW-RS0704-14 (expired), GW-RS0714-14 (expired), GW-RS0798-14 (expired), GW-RS0857-14 (expired), GW-RS0938-14 (expired), GW-RS0976-14 (expired), GW-RS0977-14 (expired), GW-RS1021-14 (expired), GW-RS0555-14 (expired), GW-RS0696-14 (expired), GW-RS1127-14 (expired), GW-RS1195-14 (expired), GW-RS1411-14 (expired), GW-RS1464-14 (expired), GW-RS1200-14 (expired), GW-RS1102-14 (surrendered), GW-RS1341-14 (expired), GW-RS1347-14 (expired), GW-RS1369-14 (expired), GW-RS1376-14 (expired), GW-RS0093-15 (expired), GW-RS0155-15 (expired), GW-RS0218-15 (surrendered), GW-RS0479-15 (surrendered), GW-RS0807-15 (surrendered) GW-RS0688-15 (19 Jun 15– 12 Dec 15), GW-RS0805-15 (22 Jul 15– 20 Jan 16), GW-RS0928-15 (28 Aug 15– 26 Feb 16) GW-RS1087-15 (12 Oct 15- 12 Dec 15) GW-RS0589-11 for using PME for general construction works at Works Area J was cancelled by EPD on 31 October 2011, GW-RS0097-12 for using PME for general construction works at Works Area M was cancelled by EPD on 23 February 2012
SP License	L-11-048(1) (returned)
<u>Contract 705</u>	
Wastewater Discharge License	WT00006145-2010(superseded), WT00007226-2010(superseded), WT00006686-2010(superseded), WT00008683-2011(superseded), WT00006685-2010, WT00011927-2012, WT00007225-2010 and WT00012686-2012
Registration as a Chemical Waste Producer	Approved on 8 February 2010 Permit no. 5213-111-G2347-17
Disposal of Construction Waste	Billing Account no. 7009116 activated on 8 January 2010

	Billing Account no. 7010026 (by vessel) activated on 30 November 2010- expired Billing Account no. 7011896 (by vessel) activated on 3 November 2011
Construction Noise Permit	GW-RS0661-10 (expired), GW-RS0703-10 (surrendered), GW-RS0873-10 (expired), GW-RS0222-11 (expired), GW-RS0454-11 (expired), GW-RS0601-11 (expired), GW-RS0606-11 (surrendered), GW-RS0629-11 (surrendered), GW-RS0706-11 (expired), GW-RS0821-11 (expired), GW-RS0914-11 (surrendered), GW-RS0973-11 (expired), GW-RS1179-11 (surrendered), GW-RS1194-11 (expired), GW-RS0137-12 (expired), GW-RS0246-12 (surrendered), GW-RS0352-12 (surrendered), GW-RS0373-12 (surrendered), GW-RS0635-12 (expired), GW-RS0740-12 (expired), GW-RS0967-12 (surrendered), GW-RS1218-12 (expired), GW-RS1288-12 (surrendered), GW-RS0330-13 (surrendered), GW-RS0436-13 (expired), GW-RS0515-13 (surrendered), GW-RS0645-13 (expired), GW-RS0946-13 (surrendered), GW-RS1336-13 (surrendered), GW-RS1438-13 (expired), GW-RS0530-14 (expired) GW-RS0653-11 for using PME for general construction works at Works Area C was cancelled by EPD on 15 September 2011
<u>Contract 706 (Contract Completed)</u>	
Wastewater Discharge License	WT00004519-2009, WT00004526-2009, WT00005600-2009
Registration as a Chemical Waste Producer	Approved on 6 October 2009 Permit no. 5213-116-P2781-16
Disposal of Construction Waste	Billing Account no. 7009056 activated on 16 July 2009
Construction Noise Permit	GW-RS0703-09 for using PME for general construction works at Kennedy Town Praya works site was cancelled by EPD on 18 November 2009, GW-RS0174-10 for using PME for general construction works at Kennedy Town Praya works site was cancelled by EPD on 19 May 2010
<u>Contract 706A (Contract Completed)</u>	
Wastewater Discharge License	WT00005647-2009
Registration as a Chemical Waste Producer	Approved on 17 December 2009 Permit no. 5213-111-F2541-02
Disposal of Construction Waste	Billing Account no. 7009743 activated on 17 November 2009
<u>Contract 708 (Contract Completed)</u>	
Wastewater Discharge License	WT00004902-2009
Registration as a Chemical Waste Producer	Approved on 7 September 2009 Permit no. 5213-111-G2347-08

Disposal of Construction Waste	Billing Account no. 7009116 activated on 12 August 2009
Construction Noise Permit	GW-RS0938-09 (expired), GW-RS0283-10 (expired)
<u>Contract 714 (Contract Completed)</u>	
Wastewater Discharge License	WT00004893-2009
Registration as a Chemical Waste Producer	Approved on 21 September 2009 Permit no. 5213-111-S3305-02
Disposal of Construction Waste	Billing Account no. 7009127 activated on 14 August 2009

12 SITE INSPECTIONS

12.1 Observations

Regular site inspections were undertaken by the ET in accordance with the EM&A Manual. The contractors' performance on environmental matters were assessed. The inspection findings and the associated recommendations on improvement to the environmental protection and pollution control works were raised to the contractors for reference and/ or action.

In addition, the ET carried out night time inspection to Works Area B in the reporting period in order to check for compliance with the NCO, the results were in general satisfactory with no construction work was observed.

Observations against the implementation of the mitigation measures recommended in the EP/EIA are summarized as follows:

Item	Description	Follow-up Status
	<u>Contract 703</u>	
1	Contract completed	N/A
	<u>Contract 704</u>	
1	The contractor was reminded to clear stagnant water inside surface channels to avoid mosquito bleeding	Ongoing
2	The contractor was reminded to properly implement wastes sorting	Ongoing
3	The contractor was reminded to provide sufficient movable noise barriers/acoustic fabric to minimize noise nuisance to nearby residents	Ongoing
4	Water sample tests were conducted in the reporting month for Works Area L1, results were satisfactory	N/A
5	An ad-hoc inspection on the recent site record for use of Ultra-low Sulphur Diesel in Contract 704 was conducted in the reporting period, the result was satisfactory and the ULSD being used complied with the statutory requirements. Relevant site record was attached in Appendix H of EM&A Report for October 2012	N/A
	<u>Contract 705</u>	
1	Contract substantially completed	N/A
	<u>Contract 706</u>	
1	Contract completed	N/A
	<u>Contract 706A</u>	
1	Contract completed	N/A
	<u>Contract 708</u>	
1	Contract completed	N/A
	<u>Contract 714</u>	
1	Contract completed	N/A

12.2 Other Notable Events

WIL Operation on 28 December 2014

As the WIL was in operation on 28 December 2014, Sai Ying Pun Station had been opened to public on 29 March 2015. The WIL construction works were substantially completed for the SYP/HKU/KET Stations and the majority of the station entrances except the entrances in Works Areas L1, M1 and N1. The ET Leader had proposed to stop the regular construction dust and noise monitoring at these monitoring stations except those for Works Areas L1, M1 and N1 after the WIL Operation. A Final EM&A Report for the Works Areas proposed to terminate the construction stage air and noise monitoring together with the regular site inspections had been submitted on 25 February 2015.

Final EM&A Part 1 for WIL Project

The Final EM&A Report Part 1 for WIL Project had been approved by EPD on 11 August 2015 to terminate the dust and noise monitoring for the WIL Project Works Areas except those for Works Areas B, L1, M1 and N1 after the WIL Operation.

IEC Site Inspections

The IEC conducted site inspections for Works Areas B, L1, M and N1 on 22 September 2015, minor irregularities were observed during the site inspections and the respective civil works contractors had followed up and satisfactorily rectified the issues as identified in the site inspections promptly.

Works Area B

The small western portion of Works Area B had been occupied by Highways Department as a depot upon the completion of the additional concrete paving and certification of the paving design by ISC in accordance with the EP requirements. Monthly inspections on the condition of the additional paving, site drainage and foul sewerage systems had been carried out in accordance with EP Condition 3.2.2. No new crack was found in the reporting period, the surface cracks identified previously had been satisfactorily sealed such that the structural integrity of the additional concrete paving can be maintained.

Regular soil monitoring had been conducted at 3-month intervals in accordance with EP Condition 3.2.8 in order to monitor any possible migration of contaminants beneath and across the additional concrete paving in Works Area B. From the monitoring results obtained, there was no evidence of any possible migration of contaminants beneath and across the additional concrete paving in Works Area B.

Removal of additional concrete paving is being carried out in accordance with the approved method statement for removal of additional concrete paving under EP Condition 3.3.2(c). Regular site inspections were undertaken by the ET in accordance with the EM&A Manual and the results were in general satisfactory. All work are expected to be completed in October 2015.

Works Area MA

As the construction of the WIL magazine had completed and a portion of land at Works Area MA had been handed over to Lands Department. The concerned plants (2nos. Hong Kong Pavetta and 2nos. Silver-back Artocarpus) as mentioned in WIL EP Condition 2.8 are located in the land area which had been handed over to Lands Department. As these plants falls outside the revised Works Area MA, the regular inspection to these plants by the ET/Certified Arborist had stopped in the reporting period for October 2010. In addition, as there will be no construction activities carried out in Works Area MA, the regular construction dust and noise monitoring at the monitoring stations AM4 and CN1 for Works Area MA had stopped in the reporting period for October 2010.

The magazine had been decommissioned and handed over to the Government in end May 2014.

Proposed Alternative Construction Method for Tunnel Works from KGV to Sai Woo Lane(SWL)

The Contract 703 Contractor proposed an alternative construction method for tunnel works from KGV to SWL instead of from SWL to KGV. The proposed change in tunnel works will shorten the

overall adit and tunnel construction by around seven months. Environmental Review was conducted and concluded that the proposed alternative method for tunnel construction from KGV to SWL will not constitute a material change to the WIL Project. No adverse environmental impacts are anticipated from the proposed changes and the environmental performance requirements set out in the WIL EIA Report will not be exceeded. It is believed that there will be a societal benefit from the proposed alternative construction method with shortened construction period and the associated environmental nuisances. The Contract 703 Contractor commenced the captioned tunnel works in November 2010.

Proposed Alternative Construction Method for Shaft Excavation at Sai Woo Lane(SWL)

The Contract 703 Contractor proposed an alternative construction method for shaft excavation by blasting at SWL works site. The proposed change will shorten the construction period for the shaft at SWL. Environmental Review was conducted and concluded that the proposed alternative method for shaft construction will not constitute a material change to the WIL Project. No adverse environmental impacts are anticipated from the proposed changes and the environmental performance requirements set out in the WIL EIA Report will not be exceeded. It is believed that there will be a societal benefit from the proposed alternative construction method with shortened construction period and the associated environmental nuisances.

Proposed Alternative Arrangement in the Magazine

There is a proposal regarding alternative arrangement in the magazine for the Detonator Niche. The Hazard to Life assessments for the Detonator Niche are the same as all the other Niches which is NEQ of 300kg, hence the NEQ for the Detonator Niche can be increased to 300kg with actual Detonator numbers subject to FSD/Mines/HKPF approval. Environmental Review was conducted which concluded that there will not be any significant risk caused by the proposed change. The proposal regarding alternative arrangement in the magazine for the Detonator Niche had been submitted to CEDD/Mines for approval.

Proposed Alternative Delivery Arrangement to Works Area A

There is a proposal regarding alternative delivery arrangement to Works Area A for AM and PM delivery with the total delivery trips and the maximum load per trip maintaining the same as detailed in the WIL EIA Hazard to Life assessments and the Technical Note of Re-examination of the WIL Hazard to Life reported in the Monthly EM&A report for July 2010. Environmental Review was conducted which concluded that there will not be any significant risk caused by the proposed change and the overall risk is still within the acceptable region. The proposed modification of the delivery schedule to Works Area A is negligible in terms of the Potential Loss of Life (PLL) and F-N curve. The proposal regarding the alternative delivery arrangement to Works Area A had been submitted to CEDD/Mines for approval.

Proposed Alternative Noise Mitigation Measure for Works Area J2

The Contract 704 Contractor proposed an alternative noise mitigation measure for Works Area J2 by using noise decking to cover the excavation area. This alternative noise mitigation measure is proposed to replace the full enclosure as specified in the WIL EP condition 2.10.1. In accordance with the requirement stipulated in the WIL EP condition 2.10.1, the proposed alternative noise mitigation measure had been discussed and agreed at the CLG meeting held on 12 January 2012. The presentation material for the proposed noise decking and the extract of the eleventh CLG meeting minutes (item 2 on the proposed noise decking) are shown in Appendix H of EM&A Report for February 2012.

Odour Emission from Works Area M

A Notice to Abate Air Pollution Pursuant to Section 10 of the Air Pollution Control Ordinance (Cap.311) was issued by EPD on 10 August 2012 regarding the emission of air pollutant in the form of objectionable odour produced from the construction of underground tunnels was causing air pollution as revealed in the EPD inspection to Works Area M on 19 July 2012. The Contract 704 Contractor was required to reduce the emission of the air pollutant to such an extent that the emission does not cause or contribute to objectionable odour or irritation to the nearby general public. According to the abatement notice, GNJV was required to rectify the odour disturbance before 18 Nov 12. The ET/ER had worked with GNJV to take steps to abate the emission of air pollutants from KGV enclosure causing/contributing to air pollution as required in the abatement notice. A consultant was commissioned by GNJV to review the existing site practices and the improvement measures for preventing potential odour disturbance from Works Area M. A report on the improvement measures implementation had been prepared.

The following site practices and improvement measures were identified:-

1. Most of the exhaust air from WIL underground tunnel work site pass through the de-duster and watering facilities via the ducts and discharge from the ventilation outlet to the atmosphere.
2. The ventilation outlet is located away from the nearby residential developments.
3. The man-access entrance always keeps closed as far as possible. The vehicular entrance of the acoustic enclosure is always closed except the need of trucks moving in/out avoiding the leakage of dust/odour emission inside the acoustic enclosure.
4. There is no opening on the acoustic enclosure except the ventilation inlet and exhaust locations, vehicular and man-access entrances. The limited openings would prevent the potential odour emissions from the tunnel shaft directly discharging to the atmosphere.
5. A blower is installed at the vehicular entrance.
6. A misting system is installed at the vehicular entrance of the acoustic enclosure for masking the odour if any.
7. 3 small size and 1 large size activated carbon filters have been installed inside the acoustic enclosure and are well operated. These filters are to remove potential odour emission from the tunnel shaft and mucking out area. The removal efficiency is 80-90% in accordance with the specification.

Upon the implementation of the above improvement measures for preventing odour disturbance to the surrounding air sensitive receivers, odour patrols were conducted from October 2012 to early November 2012, no odour was detected along the site boundary. Therefore, the odour improvement measures are considered effective in preventing odour disturbance to the air sensitive receivers in the vicinity of Works Area M.

In addition, the IEC had noted the implementation of the above odour improvement measures during the site inspection conducted in October 2012.

Community Liaison Groups

The Community Liaison Groups were established on 10 July 2009 in accordance with the EP Condition 2.6. Three CLGs, namely, Sai Ying Pun, University and Kennedy Town have been set up to provide direct communication channel for the local communities to MTR during the construction stage of the Project on the project matters including enquiries and complaints handling on all environmental issues. Members of CLGs include the Central & Western District

Councillors, Chairmen of Area Committees, representatives of local groups and government departments. Property management office, schools, and other local committees will be invited to participate in the CLGs. The first CLG meetings had been held in July 2009. The eighteenth CLG meeting had been held in June 2014.

In addition, a MTR Project hotline at 2993 3333 is in operation for public enquiries on the WIL Project and it also serves as the complaint hotline during the construction stage of the Project.

13 FUTURE KEY ISSUES

13.1 Key Issues for the Coming Month

Future key issues envisaged in the coming month include the followings:-

- Disposal of C&D waste;
- Dust generation from site activities;
- Noise impact from operating equipment;
- Site water discharge;
- Chemical wastes;
- Tree protection.

13.2 Solid and Liquid Waste Management Status

Base on the findings of the weekly site inspections, the Contractors' performance in solid and liquid waste management were acceptable and compliance with the EIA requirements were demonstrated. Solid wastes and liquid waste were properly disposed of. The current management standard should be maintained.

13.3 Effectiveness and Efficiency of Mitigation Measures

Based on the environmental monitoring results, the effectiveness and efficiency of the mitigation measures implemented were found to be satisfactory. The current practice should be maintained.

14 CONCLUSIONS

The Report presents the results of EM&A works and the impact monitoring for the construction works undertaken during the period of 10 September 2015 to 9 October 2015. The major construction activities in the reporting period included reinstatement of Works Areas L, M and N1, adit excavation at Works Area L1 and removal of additional concrete paving at Works Area B.

Impact monitoring for air quality and noise were conducted in accordance with the EM&A Manual in the reporting period, no exceedance was found and there was no breach of Limit Levels for air and noise monitoring.

No environmental notification of summon and prosecution was received in the reporting period. One environmental complaint relating to construction work was received in the reporting period.

Site inspections were conducted by the Environmental Team on a weekly basis to monitor proper implementation of environmental pollution control and mitigation measures for the Project. No non-conformance to the environmental requirements was identified by the Environmental Team in the reporting period.

The Environmental Permit (EP-313/2008/J) issued by EPD on 1 September 2014 is being used for the WIL Project.

In the reporting period, there was no reporting change of circumstances which may affect the compliance with the recommendations of the EIA Report.

It is concluded from the environmental monitoring and audit works for the West Island Line Project that the construction works were undertaken in an appropriately environmentally sensitive manner in the reporting period. The environmental protection and pollution control measures provided by the contractors were generally acceptable apart from some minor irregularities which were rectified timely by the respective civil works contractors.

The ET will continue the implementation of the environmental monitoring and audit programme in accordance to the EM&A Manual and to a level consistent with MTRCL's Corporate Sustainability Policy.

Appendix A

Environmental Quality Performance Limits

Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level (µg/m ³)	Limit Level (µg/m ³)
AM1a	170	260
AM2	155	260
AM3a	155	260
AM4	158	260
AM5a	178	260
AM6a	157	260
AM7a	151	260
AM8	181	260
AM9a	168	260
AM10	187	260

Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level (dB(A)), Leq(30min)
0700-1900 hr on normal weekdays	When one documented complaint is received	75*
0700-2300 hr on holidays including Sundays and 1900-2300 hr on all other days		Subject to requirements stipulated in Construction Noise Permits
2300-0700 hr of next day		

* Limit for school is 70 dB(A) and 65 dB(A) during school examination periods.

Appendix B
Event Action Plans

Table 2.4 Event and Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	1. Notify IEC and ER 2. Carry out investigation 3. Report the results of investigation to the IEC and ER 4. Discuss jointly with the ER and Contractor and formulate remedial measures 5. Increase monitoring frequency to check mitigation effectiveness	1. Review the analysed results submitted by the ET 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly 3. Supervise the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented	1. Submit noise mitigation proposals to ER with copy to IEC 2. Implement noise mitigation proposals
Limit Level	1. Notify IEC, ER, EPD and Contractor 2. Identify source 3. Repeat measurement to confirm findings 4. Increase monitoring frequency 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented 6. Inform IEC, ER, EPD the causes and actions taken for the exceedances 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results 8. If exceedance stops, cease additional monitoring	1. Discuss amongst ER, ET and Contractor on the potential remedial actions 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly 3. Supervise the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to ER with copy to IEC 3. Implement the agreed proposals 4. Revise and resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Table 9.4 Event and Action Plan for Ambient Air Quality Monitoring (Construction)

EVENT	ACTION			ER	CONTRACTOR
ACTION LEVEL					
1. Exceedance for one sample	1. Identify source, investigate the causes of complaint and propose remedial measures; Inform IEC and ER; 2. Repeat measurement to confirm finding; 3. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.	
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and ER (together with the Contractor) on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and ER (together with the Contractor) on possible remedial measures; 4. Advise the ET/ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.	
LIMIT LEVEL					
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC, ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and ER (together with the Contractor) on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER with a copy to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.	
2. Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER with a copy to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Revise and resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.	

Appendix C

Implementation of Environmental Mitigation Measures

Appendix C

Implementation of Environmental Mitigation Measures

Table C1 Project Implementation Schedule for All Works Areas (Status as of 9 August 2015)

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
Airborne Noise Impact (Construction Phase)							
S 3.55	S 2.23	The following good site practices shall be implemented: - Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program - Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program - Mobile plant, if any, shall be sited as far from NSRs as possible - Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum - Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs - Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	To reduce construction noise impact	MTRC / Contractor	All works areas	Construction phase	Being implemented
S 3.56-3.57, Table 3.10	S 2.23	Quieter plant shall be used for the following PME: - Truck - Crane/ Mobile Crane - Backhoe/Excavator/Wheel Loader/ Front-end-loader - Breaker - Concrete Mixer Truck - Pokers, vibratory, hand held - Pile Extractor - Roller, vibratory - Asphalt Paver - Hydraulic Breaker	To reduce construction noise impacts	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		- Pile Rig - Crawler Crane - Sheet Piling Machine/ Piling, Hydraulic					
S 3.58-3.59	S 2.23	Movable noise barrier shall be used for the following PME where practicable: - Breaker - Mini Backhoe - Generator, super silenced - Backhoe - Crane - Poker, vibratory, hand-held - Hydraulic Breaker - Wheel Loader - Crusher - Hand Held Breaker - Compressor - Grout Plant - Grout Mixer - Concrete Pump - Excavator - Lorry Crane - Mobile Crane - Crawler Crane	To reduce construction noise impacts	MTRC / Contractor	Works areas A, C, D, H, I, J, J1, L1, M1, N1, M3, O1, O2 and O3.	Construction phase	Being implemented
S 3.60	S 2.23	Noise enclosure/acoustic shed shall be used for the following PME where practicable: - Air Compressor - Concrete Pump - Shotcrete Pump - Hand Held Breaker - Grout Pump - Concrete Corer	To reduce construction noise impacts	MTRC / Contractor	All works areas	Construction phase	Being implemented
S 3.61	S 2.23	Acoustic Enclosure shall be used for enclosing the rock drill as fully as possible.	To reduce construction noise	MTRC / Contractor	Works areas H,	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
			impacts		N1 and M		
S 3.62	S 2.23	Noise insulating cover shall be used to cover the following PME: - Breaker - Backhoe - Water pump, submersible (electric) - Crawler mounted rock drill trucks - Rock drill - Air compressor - Electric Winch - Concrete pump - Poker, vibratory, hand-held - Hand Held Breaker - Crane - Shotcrete pump	To reduce construction noise impacts	MTRC / Contractor	Works areas J1, N1, M1 and M3	Construction phase	Being implemented
S 3.63	S 2.23	Silencer shall be used for the ventilation fan	To reduce construction noise impacts	MTRC / Contractor	Works areas MA, A, C, D, G, H, I, J, J1, J2, J3, L1, M, M1, M3, N1, O1, O2 and O3.	Construction phase	Being implemented
S 3.64	S 2.23	Noise insulating fabric shall be applied where practicable to cover the following PME: - Pile Rig - Drill rig - Pile Extractor - Power Rammer - Piling, earth auger - Piling, hydraulic	To reduce construction noise impacts	MTRC / Contractor	Works areas MA, C, D, G, H, I, J, J1, J2, J3, L1, M, M1, M3, N1, O1, O2 and O3.	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		- Sheet Piling Machine					
S 3.65	S 2.23	Use of “Noise Control Curtain” - a noise insulating fabric to be mounted on the steel scaffold erected on the buildings to be demolished to an extent such that the line of sight between the noise source and NSR would be blocked	To reduce construction noise impacts	MTRC / Contractor	Works area A	Construction Phase – during the demolition of Block A & C of Kennedy Town Ex-Police Quarter	Implemented
S 3.67-3.70, Figure 3.17 and 3.18.	S 2.23	Temporary noise barriers shall be erected at the works areas of West of KET Station and SYP Entrance A1 & A2.	To reduce construction noise impacts	MTRC / Contractor	Works areas C and N1	Construction phase	Implemented
S 3.71	S 2.23	Decking over would be provided to cover the excavation area.	To reduce construction noise impacts	MTRC / Contractor	Works areas J, J3, G and L1	Construction phase	Implemented
S3.72	S 2.23	Full enclosure of entire works area	To reduce construction noise impacts	MTRC / Contractor	Works area J2	Construction Phase (after piling is completed)	Alternative noise mitigation measure implemented
S3.73 – 3.74	S 2.23	Use of concrete crusher instead of hydraulic breaker	To reduce construction noise	MTRC / Contractor	Works area J2, M1 and	Construction Phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
			impacts		M3		
Airborne Noise Impact (Operation Phase)							
S 3.50-3.51, Table 3.9	Appendix B	The maximum permissible sound power levels (Max SWLs) for the fixed plant shall be complied with during the selection of equipment and mitigation measures.	To comply with the noise criteria of Noise Control Ordinance	MTRC / Contractor	Vent shafts and chiller plants at KET Station, UNI Entrance C1 and SYP Entrance C, and vent shafts at KET Ex-Police Quarter, UNI Vent Shaft-Y and SYP Entrance A1&A2.	Design and operation phases	To be implemented in operation phase
S 3.77	Appendix A	The following shall be considered as far as possible in the detailed design of fixed plant: - Choose quieter plant such as those which have been effectively silenced. - Include noise levels specification when ordering new plant (including chiller and E/M equipment).	To comply with the noise criteria of Noise Control Ordinance	MTRC / Contractor	Vent shafts and chiller plants at KET Station, UNI Entrance	Design and operation phases	To be implemented in operation phase

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		- Locate fixed plant/louver away from any NSRs as far as practicable. - Locate fixed plant in walled plant rooms or in specially designed enclosures. - Locate noisy machines in a basement or a completely separate building. - Install direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosure where necessary.			C1 and SYP Entrance C, and vent shafts at KET Ex-Police Quarter, UNI Vent Shaft-Y and SYP Entrance A1&A2.		
Groundborne Noise Impact							
S4.91	S3.1	Ground-borne construction noise monitoring shall be conducted. The measurement locations shall be above the cutting face of the TBM, and shall be located as close to the cutting face as practicable.	To comply with the noise criteria of Noise Control Ordinance	MTRC / Contractor	Works areas of tunneling by TBM	Construction phase	Implemented
S 4.88 & Table 4.10	S 3.2	Type 1a Trackform – Resilient Baseplate with stiffness of about 25 KN/mm shall be installed at both the west- and east-bounds starting from turnout in proximity of Hongway Garden towards the Sai Ying Pun Station and also the alignment under Po Shu Lau to Sai Wan Estate. A commissioning test shall be included in the Contract document in order to ensure compliance of the operational ground-borne noise criteria.	To comply with the noise criteria of Noise Control Ordinance	MTRC	Tunnel alignment	Operation phase	Implemented
Landscape and Visual Impact (Construction Phase)							
Table 5.4	Table 4.2	Re-use of Existing Soil Existing topsoil shall be re-used where possible for new planting areas within the project. The construction program shall consider	To reduce the volume of soil for disposal	MTRC / Contractor	All Works areas	Construction phase	Being Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		using the soil removed from one phase for backfilling another. Suitable storage ground, gathering ground and mixing ground may be set up on-site as necessary. ▪					
Table 5.4	Table 4.2	No-intrusion Zone To maximize protection to existing trees, ground vegetation and the associated understory habitats, construction contracts may designate "No-intrusion Zone" to various areas within the site boundary with rigid and durable fencing for each individual no-intrusion zone. The contractor should close monitor and restrict the site working staff not to enter the "no-intrusion zone", even for non-direct construction activities and storage of equipment.	To protect the existing trees, ground vegetation and the associated understory habitats.	MTRC / Contractor	All Works areas	Construction phase	Being Implemented
Table 5.4	Table 4.2	Decorative Hoarding Erection of decorative screen hoarding should be designed to be compatible with the existing urban context.	To reduce visual impact due to construction	MTRC / Contractor	All Works areas	Construction phase	Being Implemented
Table 5.4	Table 4.2	Minimize light pollution and control of night-time glare All security floodlights for construction sites shall be equipped with adjustable shield, frosted diffusers and reflective covers, and be carefully controlled to minimize light pollution and night-time glare to nearby residences and GIC users. The Contractor shall consider other security measures which shall minimize the visual impacts.	To minimize the visual impacts.	MTRC / Contractor	All Works areas	Construction phase	Being Implemented
Table 5.4	Table 4.2	Aesthetic design of the conveyor belt system The removal of excavated material requires installation of a conveyor and a barging point. The conveyor will be covered, except the portion where it meets the barging point. The aim of covering or	To minimize the visual intrusion as well as the air and noise quality issues	MTRC / Contractor	Works areas E & F	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		enclosing the conveyor is to avoid noise and air quality issues; however, the conveyor where above-ground should be adequately screened and /or constructed of suitable materials and in colours/tones that minimize visual intrusion.					
Table 5.4	Table 4.2	Protection of Retained Trees All retained trees should be recorded photographically at the commencement of the Contract, and carefully protected during the construction period. Detailed tree protection specification shall be allowed and included in the Contract Specification, which specifying the tree protection requirement, submission and approval system, and the tree monitoring system. In addition, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas. All implementation of tree protection works and tree preservation measures shall be supervised by a landscape specialist on site.	To protect the retained trees within the site boundary	MTRC / Contractor	All Works areas	Construction phase	Being Implemented
Table 5.4	Table 4.2	Protection of Registered Old and Valuable Trees Detailed tree protection measures as stipulated in WBTC No. 29/2004 – Registration of Old and Valuable Trees, and Guidelines for their Preservation, shall be allowed and included in the Contract Specification. All implementation of OVT protection measures shall be supervised by a landscape specialist on site.	To protect the OVT within the site boundary	MTRC / Contractor	All Works areas	Construction phase	Being Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
Table 5.4	Table 4.2	Protection of Old Stone Wall-cum-trees Detailed tree protection specification shall be allowed and included in the Contract Specification, which specifying the tree protection requirement, submission and approval system, and the tree monitoring system. All implementation of Old stone wall-cum-trees protection measures shall be supervised by a landscape specialist on site.	To protect the existing trees-cum-wall	MTRC / Contractor	All Works areas	Construction phase	Being Implemented
Landscape and Visual Impact (Operation Phase)							
Table 5.5	Table 4.3	Tree Transplanting Trees of high to medium survival rate after transplanting to be affected by the works shall be transplanted where possible and practicable. Tree transplanting proposal including final location for transplanted trees will be submitted separately to seek relevant government department's approval.	Tree preservation	MTRC / Contractor	All Works areas	Detail design and operation phase	Implemented
Table 5.5	Table 4.3	Compensation Tree Planting Compensatory tree planting should be provided to compensate for felled trees. Compensatory tree planting proposal including location of compensation will be submitted separately to seek relevant government department's approval.	To reduce impact to existing trees.	MTRC / Contractor	All Works areas	Detail design and operation phase	To be implemented as per construction programme
Table 5.5	Table 4.3	Aesthetic landscape and architectural treatment on Station / Entrance / vent shaft All station entrances, vent shafts and all above ground structures shall be sensitively designed to ensure the element with colour, texture and tonal quality being compatible to the existing urban context, which shall include tree planting where space permits, to minimize the potential adverse landscape and visual impacts. For	To ensure the elements are compatible to the existing urban context and minimize the landscape and	MTRC / Contractor	Stations / Entrances / Vent Shafts	Detail design and operation phase	To be implemented as per construction programme

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		example, roof greening and vertical greening would be applied where possible subject to technical operational and maintenance constraints.	visual impacts.				
Table 5.5	Table 4.3	Re-instatement of excavated Area All excavated area and disturbed area for utilities diversion, temporary road diversion, and pipeline works shall be reinstated to former conditions or even better, to the satisfaction of the relevant Government departments.	To minimize the visual impacts.	MTRC / Contractor	All Works areas	Operation phase	Being implemented
Table 5.5	Table 4.3	Re-provision of public open space Every effort should be made to so that no public open space would be unnecessarily affected by the Project and if affected, they should be reprovided as far as possible and practicable. Sensitive design and re-provision of the affected Public Open Space (Forbes Street Playground, Hill Road Rest Garden, Ki Ling Lane Children's Playground, Mui Fong Street Children Playground, Sai Woo Lane Playground, Centre Street Market Sitting-out Area, King George V Memorial Park) incorporating replacement facilities for those provided at present, using materials of quality suitable for long term use and acceptable to relevant Government authority. Relevant government departments including LCSD and PlanD should be consulted on the design of the re-provisioned public open spaces at the early stage of the design process.	Re-provision of landscape amenity area and facilities	Contractor	All Works areas	Operation phase	To be implemented as per construction programme
Cultural Heritage Impact (Construction Phase)							
S6.45, S6.51-6.55	S 5.4 – 5.11	The construction vibration control limits shall be followed. Compliance monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme The location and installation of the monitoring stations should be	To minimize vibration impacts on the identified vibration sensitive	MTRC / Contractor	All Works Areas	Detail design, construction and operational	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		discussed and agreed with AMO before installation.	historical buildings.			phase	
S6.46	S5.3	Hoardings or boundary fencing shall be designed in a manner that responds to the existing urban context.	To minimize visual impacts	MTRC / Contractor	All Works Area	Detailed design and operational phase	Implemented
S6.44	S5.12-5.14	Archaeological watching brief shall be conducted for the identification of any historical finds in the directly impacted works areas which might have a potential for finds and remains of archaeological interest to be found. Details of the frequency of inspection shall be provided to AMO for review and comment once the detailed construction programme has been finalized. The inspection should be carried out by the qualified archaeologist who have applied to the Antiquities Authority for a License	To identify any historical finds in the works areas	MTRC / Qualified Archaeologist	Works Area C, H, I, J, J1, J2, J3, M and M2	Construction phase	Implemented
Cultural Heritage Impact (Operation Phase)							
Table 6.2	5.3	Aboveground structures shall be designed in a manner that responds to the existing urban context.	To minimize visual impacts	MTRC / Contractor	Stations / Entrances / Vent Shafts	Detail design and operation phase	To be implemented as per construction programme
S6.60	S 5.15	Recommended measures for mitigating operational phase landscape and visual impacts shall be implemented.	To minimize potential visual impact on heritage sites	MTRC / Contractor	Stations / Entrances / Vent Shafts	Detail design and operational phase	To be implemented as per construction programme
Waste Management Implications (Construction Phase)							
S7.30	S 6.5	Good site practices - Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all	To reduce waste management impacts	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		wastes generated at the site - Training of site personnel in proper waste management and chemical handling procedures - Provision of sufficient waste disposal points and regular collection of waste - Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. - Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Centre.					
S7.31 & S7.32	S 6.6 – S 6.7	Waste reduction measures - Sort C&D waste from demolition of existing facilities to recover recyclable portions such as metals - Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal - Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force - Proper storage and site practices to minimise the potential for damage or contamination of construction materials	To achieve waste reduction	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		- Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. - A recording system for the amount of wastes generated, recycled and disposed (including disposal sites) should be proposed - Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle. - A Waste Management Plan shall be prepared by the Contractor prior to the commencement of construction work to provide an overall framework for waste management and reduction.					
S7.34 & S7.35	S 6.9 & S6.10	C&D Material - In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the excavated materials arising from station and tunnel construction shall be reused on-site as backfilling material and for landscaping works as far as practicable. - Surplus rock generated from the tunnelling works, shafts/adits construction and the stations cavern construction should be reused in reclamation and site formation projects either in the Mainland or Macau, or disposed of at a PFRF, as agreed with the Secretary of the Public Fill Committee, for other beneficial uses. - C&D waste generated site clearance from the proposed works areas would require disposal to the designated landfill site.	To minimize environmental impacts during the handling, transportation and disposal of C&D material	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		- In order to monitor the disposal of inert C&D material and C&D waste at PFRFs and landfills, respectively, and to control fly-tipping, a trip-ticket system shall be established in accordance with ETWB TCW No. 31/2004. - Material delivered to PFRFs should be of size less than 250mm or other sizes as agreed with the Secretary of the Public Fill Committee.					
S7.36	S 6.11	General refuse - General refuse shall be stored in enclosed bins or compaction units separate from C&D material and chemical wastes. - A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D material and chemical wastes. Preferably an enclosed and covered area shall be provided to reduce the occurrence of 'wind blown' light material.	To minimize environmental impacts during the handling, transportation and disposal of general refuse	MTRC / Contractor	All works areas	Construction phase	Being implemented
S7.37	S 6.12	Chemical waste - Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i>. - Good quality containers compatible with the chemical wastes shall be used, and incompatible chemicals shall be stored separately. - Appropriate labels shall be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc.	To minimize environmental impacts during the handling, transportation and disposal of chemical refuse	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, either to the approved Chemical Waste Treatment Centre, or another licensed facility, in accordance with the <i>Waste Disposal (Chemical Waste) (General) Regulation</i>.					
Waste Management Implications (Operation Phase)							
S7.39	S 6.11	General Refuse and Industrial Waste A reputable waste collector should be employed to remove general refuse and industrial wastes from the stations on a daily basis to minimise odour, pest and litter impacts.	Storage and handling of waste	MTRC	Stations and entrances	Operational stage	To be implemented in operation phase
S7.40	S 6.12	Chemical Waste - The requirements given in the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i> should be followed in handling of these chemical wastes. - A trip-ticket system should be operated in accordance with the <i>Waste Disposal (Chemical Waste) (General) Regulation</i> to monitor all movements of chemical wastes which would be collected by a licensed collector to a licensed facility for final treatment and disposal. - The guidelines covered under the construction phase mitigation of chemical wastes should be referred.	Storage and handling of the chemical waste to avoid environmental and health hazard	MTRC	Stations and entrances	Operational stage	To be implemented in operation phase
Water Quality Impact (Construction Phase)							

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
S9.31	S 8.4	Construction Site Run-off and Drainage The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area i.e. WSD flushing water intakes along the harbour front, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts: - At the start of site establishment (including the barging facilities), perimeter cut-off drains to direct off-site water around the site shall be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers shall be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system would be undertaken by the contractor prior to the commencement of construction. - The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a site/sediment trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates - Sand/silt removal facilities such as sand/silt traps and sediment basins shall be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities shall be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps shall be 5	To minimize water quality impacts	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		minutes under maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flowrate of 0.1m³/s a sedimentation basin of 30m³ would be required and for a flow rate of 0.5 m³/s the basin would be 150m³. The detailed design of the sand/silt traps shall be undertaken by the contractor prior to the commencement of construction. - All drainage facilities and erosion and sediment control structures shall be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit shall be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. - Measures shall be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations shall be discharged into storm drains via silt removal facilities. - If surface excavation works cannot be avoided during the wet season (April to September), temporarily exposed slope/soil surfaces shall be covered by a tarpaulin or other means, as far as practicable, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Interception channels shall be provided (e.g. along the crest/ edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC PN 1/94. - The overall slope of the site should be kept to a minimum to					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		reduce the erosive potential of surface water flows, and all trafficked areas and access roads protected by coarse stone ballast. An additional advantage accruing from the use of crushed stone is the positive traction gained during prolonged periods of inclement weather and the reduction of surface sheet flows - All vehicles and plant shall be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility shall be provided at every construction site exit where practicable. Wash-water shall have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road shall be paved with sufficient backfill toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. - Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. - Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers. - Precautions be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94.					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes. - Bentonite slurries used in diaphragm wall construction shall be reconditioned and reused wherever practicable. Temporary enclosed storage locations shall be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC PN 1/94 shall be adhered to in the handling and disposal of bentonite slurries.					
S9.32 & S9.33	S 8.5 & S 8.6	General Construction Activities - Construction solid waste, debris and refuse generated on-site shall be collected, handled and disposed of properly to avoid entering any nearby stormwater drain. Stockpiles of cement and other construction materials shall be kept covered when not being used. Requirements of the solid waste management are described in Section 7 of this EIA Report. - Oils and fuels shall only be used and stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to nearby stormwater drain, all fuel tanks and storage areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund shall be drained of rainwater after a rain event.	To minimize water quality impacts	MTRC / Contractor	All works areas	Construction phase	Being implemented
S9.34	S 8.7	Sewage from Construction Workforce - Temporary sanitary facilities, such as portable chemical toilets, shall be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and would be responsible for appropriate disposal of waste matter and	To minimize water quality impacts	MTRC / Contractor	All works areas with on-site sanitary facilities	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		maintenance of these facilities.					
S9.35	S 8.8	Tunnelling Wastewater Discharge Wastewater with a high level of suspended solids should be treated before discharge by settlement in tanks with sufficient retention time. Oil interceptors would also be required to remove the oil, lubricants and grease from the wastewater. In case of very high levels of suspended solids, an on-site pre-packaged treatment plant may be required with the addition of flocculants to improve the settlement of solids. A discharge licence under the WPCO would be required for discharge to the stormwater drain. It may be a stipulation of the WPCO licence to require the Contractor to monitor the quality / quantity of the discharge to show compliance with the conditions of the licence.	To minimize water quality impacts	MTRC / Contractor	All works areas with tunneling works	Construction phase	Implemented
S9.36	S8.9	Groundwater Monitoring Monitoring of groundwater table shall be conducted on a weekly basis and recharge wells will be installed.	To control the potential impact on tree walls at Forbes Street due to groundwater drawdown induced by tunneling	MTRC / Contractor	Works Areas C & D	Construction phase	Implemented
Water Quality Impact (Operation Phase)							
S9.27	S8.10-S8.11	Runoff from Rail Track and operational tunnel drainage - The tunnel wall would be equipped with water-tight liner and designed for no seepage. - Standard designed silt trap or grease trap (if necessary) and oil interceptor would be provided to remove the oil, lubricants, grease, silt and grit from the tunnel runoff before discharge into	To control runoff from rail track and tunnel seepage	MTRC	Tunnels and rail tracks	Operation phase	To be implemented in operation phase

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
S9.37	S8.12-S8.14	stormwater drainage. - Track drainage channels discharge should pass through oil/grit interceptors/chambers to remove oil, grease and sediment before being pumped to the public stormwater drainage system. - The silt traps and oil interceptors should be cleaned and maintained regularly. - Oily contents of the oil interceptors should be transferred to an appropriate disposal facility, or to be collected for reuse, if possible.					
S9.27	S8.15-S8.16	Sewage from Station - Sewage and wastewater effluents generated from the staff at stations and food and beverage outlets, if any, would be connected to the existing foul sewerage system. - Runoff from cleaning activities at the stations which would enter floor drains would also be connected to the foul sewer.	To control sewage from stations	MTRC	WIL Stations	Operation phase	To be implemented in operation phase
Hazard to Life							
S10	S10.1	Blasting activities regarding transport, storage and use of explosives should be supervised and audited by competent site staff to ensure strict compliance with the blasting permit conditions.	To ensure that the risks from the proposed explosives storage, handling and transport would be acceptable	MTRC / Contractor	Works areas at which explosives would be stored and/or used.	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
S10	S10.1	Delivery vehicles shall not be permitted to remain unattended within the magazine. In addition, they shall not be allowed to park overnight, or when not in use, within the magazine and its audits	To reduce the risk of fire within the magazine	MTRC / Contractor	Explosive Magazine	Operational phase	Implemented
S10	S10.1	Blast doors or heavy duty blast curtains should be installed at the access adits and shafts to prevent flyrock, and control the air over-pressure	To reduce the risk of injury due to flyrock during the WIL construction	MTRC / Contractor	At suitable locations, access adits and shafts	Construction phase	Implemented
S10	S10.1	Detonators shall not be transported in the same vehicle with other Class 1 explosives	To reduce the risk of explosion during the transport of cartridged emulsion	MTRC / Contractor	-	Construction phase	Implemented
Air Quality (Construction Phase)							
Table 11.6	Table 9.5	Rock Crushing Plants The unloading process would be undertaken within enclosed rock crushing facility. Water spraying would be provided at the unloading point. The crushing process is the secondary crushing. The rock crushing plant is enclosed and water spraying system would be installed. Dust extraction and collection system with 80% dust removal efficiency would be provided. The crushed stone/rock would be screened by the screening and sorting facility before transporting to the temporary stockpile via enclosed conveyor. Water spraying system would be installed. Dust extraction and collection system with 80% dust removal efficiency would be provided.	To minimize dust impacts	MTRC / Contractor	Rock crushing plants at works areas B and E	Construction phase	Implemented at Works Area E
Table 11.7	Table 9.6	Temporary Stockpiles Kennedy Town Abattoir Site:	To minimize dust impacts	MTRC / Contractor	Temporary stockpiles at works	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		Loading point – Loading of crushed materials from rock crushing facility onto stockpile - The transportation would be via an enclosed conveyor belt system and water spraying and flexible dust curtains would be provided at the loading point to suppress the dust impact. Storage of materials - Active area for loading & unloading materials - The active area would be minimized to 20% of the total area of the stock piles. The 80% inactive area would be well covered with impervious sheeting. Water spraying system would be applied on the active area and watering with complete coverage of active area four times a day would be required. Transportation of materials to Barging Point 1 - Wheel wash facilities provided at the site exit. The vehicles would be washed before leaving the stockpiles. The spoils would also be well covered before leaving the site in order to minimise generation of dusty materials. - The haul roads within the site would be all paved and water spraying would be provided to keep the wet condition. Western PCWA: Loading point – Loading of crushed materials from rock crushing facility onto stockpile - The transportation would be via an enclosed conveyor belt system and water spraying and flexible dust curtains would be provided at the loading point to suppress the dust impact. Storage of materials - Active area for loading & unloading materials - Water spraying system would be applied on the active area and watering with complete of active area four times a day would be required.			areas B and E		

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		Transportation of materials to Barging Point 2 - The vehicles would be washed before leaving the stockpiles. The spoils would also be well covered before leaving the site in order to minimise generation of dusty materials. - The haul road would be paved and water spraying would be provided to keep the wet condition					
Table 11.8	Table 9.7	Barging Facilities Kennedy Town Abattoir Site Transportation of spoils to Barging Point 1 - All road surfaces within the barging facilities would be paved and water spraying would be provided to keep the wet condition. Unloading of spoil materials - The unloading process would be undertaken within enclosed tipping hall. Flexible dust curtains and water spraying would be provided at the discharge point for dust suppression. Vehicles leaving the barging facility - Vehicle wheel washing facilities provided at site exit Western PCWA Transportation of spoils to Barging Point 2 - All road surfaces within the barging facilities would be paved and water spraying would be provided to keep the wet condition. Unloading of spoil materials from trucks to Barging Point 2 - The unloading process should be undertaken within the enclosed tipping hall. Flexible dust curtains and water spraying would be provided at the discharge point for dust suppression. Unloading of spoil materials from enclosed tipping hall to Barging	To minimize dust impacts	MTRC / Contractor	Barging points at works areas B and E	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		Point 3 - The tipping hall would be enclosed structure. The conveyor from tipping hall to the Barging Point 3 would be enclosed. Water spraying and flexible dust curtains would be provided at the receiving point of the tipping hall. Flexible dust curtains and water spraying would be provided at the discharge point of barging facilities for dust suppression. Vehicles leaving the barging facility - Vehicle wheel washing facilities provided at site exit					
Table 11.9	S 9.26	Rock Crushing Plant at Kennedy Town Abattoir Site Dust extraction and collection system (80% dust removal efficiency) should be installed at the rock crushing facility and the discharge point is located at least 39m away from the west boundary of the rock crushing facility under the preliminary design	To minimize dust impacts	MTRC / Contractor	Rock Crushing Plant at works area B - Kennedy Town Abattoir Site	Construction phase	N/A
Table 11.10	S 9.27	Works areas at KET station construction site Active operating area of 50% Watering four times a day with complete coverage of active construction area	To minimize dust impacts	MTRC / Contractor	Works area A, C and D	Construction phase	Implemented
Table 11.10	S9.27	Open work areas at temporary magazine site Active operating area of 50% Watering two times a day with complete coverage of active construction area	To minimize dust impacts	MTRC / Contractor	Open works area at magazine site	Construction phase	Implemented
S 11.42	S 9.28	For both rock crushing plants, the requirements and mitigation measures stipulated in the <i>Guidance Note on the Best Practicable</i>	To minimize dust impacts	MTRC / Contractor	Rock crushing	Construction phase	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<i>Means for Mineral Works (Stone Crushing Plants) BPM 11/1 should be followed and implemented.</i>			plants		
S 11.42	S 9.28	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: - Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs. - Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. - Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. - Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. - Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. - Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading points, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. - Imposition of speed controls for vehicles on unpaved site roads. 8 kilometers per hour is the recommended limit. - Where possible, routing of vehicles and positioning of	To minimize dust impacts	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		construction plant shall be at the maximum possible distance from ASRs. - Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. - Cement or dry PFA delivered in bulk shall be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed. - Loading, unloading, transfer, handling or storage of bulk cement or dry PFA shall be carried out in a totally enclosed system or facility, and any vent or exhaust shall be fitted with an effective fabric filter or equivalent air pollution control system.					

**Table C2 Implementation Schedule Specific for Works Area MA - Underground Magazine Site
(Status as of 9 August 2015)**

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Reference
Ecological Impact (Construction Phase)							
App.2.3 – S. 6.1		Proposed works shall be designed to avoid or minimize direct impacts to natural habitats in the works area wherever possible.	To protect the natural habitats in the works area	MTRC / Contractor	Works Area MA	Design and construction of the magazine site	Implemented
App.2.3 – S. 6.2		Planting of vegetation shall be provided to compensate for the unavoidable loss of tall shrubland and woodland habitats. It shall be provided to re-vegetate the areas which would be 1m beyond the security fencing and temporarily affected by the construction works (e.g. slope works, erecting security fence) after the construction phase. The plant species selected for re-vegetation shall make reference to the existing habitats.	To compensate for the ecological impacts associated with the loss of vegetation	MTRC / Contractor	Works Area MA	Construction phase of the magazine site	Implemented
App.2.3 – S. 6.2		Suitable plants, preferably with native species, shall be planted within the boundary of the completed magazine site to compensate for unavoidable loss of understorey vegetation resulting from the proposed works on-site after the decommissioning of the magazine site. The compensatory planting shall make use of native plant species with flowers/fruits to attract wildlife.	To compensate for the ecological impacts associated with the loss of vegetation	MTRC / Contractor	Works Area MA	After completing the construction of the magazine site	Implemented
App.2.3 – S. 6.3		The two individuals of Hong Kong Pavetta (<i>Pavetta hongkongensis</i>) located within the footprint of the proposed tunnel portal and access entrance shall be transplanted to a suitable nearby tall shrubland or woodland habitats. Transplantation shall be supervised by a suitably qualified ecologist/horticulturalist	To protect the 2 species from the proposed works within the works area	MTRC / Contractor	Works Area MA	Prior to the construction phase of the magazine site	Implemented
App.2.3 – S. 6.4		The trees located within the works area shall be preserved as far as practicable. If tree felling is unavoidable, feasibility of tree transplantation and compensatory planting shall be explored shall be implemented.	To protect the existing trees within the works area	MTRC / Contractor	Works Area MA	Prior to the construction phase of the	Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Reference
						magazine site	
App.2.3 – S. 6.5		All the existing trees and species of conservation importance (i.e. the two identified Silver-back <i>Artocarpus</i> , <i>Artocarpus hypargyreus</i>) located near the proposed works site shall be fenced off and the trunk shall be protected with hessian sacking as far as possible.	To protect the existing trees and the species of conservation importance near the works area	MTRC / Contractor	Works Area MA	Construction and operation phase of the magazine site	Implemented
App.2.3 – S. 6.6		Noise control measures including the use of quiet excavation methods, quiet construction plant and temporary noise barriers shall be implemented	To minimize the noise disturbance to the wildlife near the works area	MTRC / Contractor	Works Area MA	Construction and operation phase of the magazine site	Implemented
App.2.3 – S. 6.7		Standard good site practice measures shall be implemented, including • Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats. • Construction activities should be restricted to work areas that would be clearly demarcated. The work areas should be reinstated after completion of the works. • Waste skips should be provided to collect general refuse and construction wastes. The wastes would be disposed of timely and properly off-site. • General drainage arrangements should include sediment and oil traps to collect and control construction site run-off. • Open burning on works sites is illegal, and should be strictly prohibited.	To minimize ecological impacts	MTRC / Contractor	Works Area MA	Construction and operation phase of the magazine site	Implemented

**Table C3 Implementation Schedule Specific for Works Area B – Kennedy Town Abattoir and Incinerator Area
(Status as of 9 August 2015)**

Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Reference
The existing ground slab/pavement within the works area shall be kept intact.	To minimize human health risk associated with the contaminated soil and groundwater in the works area.	MTRC / Contractor	Works Area B	Construction phase	Implemented
A reinforced concrete paving of no less than 200mm thick for the cleared site shall be provided after the demolition and clearance works. A debonding layer shall be placed between the existing and new concrete slabs to allow the latter to be removed prior to the former.	To minimize human health risk associated with the contaminated soil and groundwater in the works area.	MTRC / Contractor	Works Area B	Construction phase	Implemented
Monthly site inspection shall be conducted to ensure the integrity of the existing and/or the new paving layer. Any surface cracks identified shall be filled out such that underneath soil would not be exposed.	To minimize human health risk associated with the contaminated soil and groundwater in the works area.	MTRC / Contractor	Works Area B	Construction phase	Being implemented
A clear void between the structure slab of the site office and the ground surface shall be created, i.e. the site office is a raised structure.	To allow ventilation by natural air movements to dilute the contaminant vapour released from the soil and groundwater.	MTRC / Contractor	Works Area B	During the construction of the site offices	Implemented
Incorporate gas-resistant membranes into the raised floor of the site office.	To prevent contaminant vapour under the floor slab from entering the site office to protect the staff working in the site office.	MTRC / Contractor	Works Area B	During the construction of the site offices	Implemented
Site hoardings shall be erected around the works area, and they shall be properly maintained to restrict access of trespassers.	To protect the trespassers from the contaminated soil and groundwater in the works area.	MTRC / Contractor	Works Area B	Construction phase	Implemented

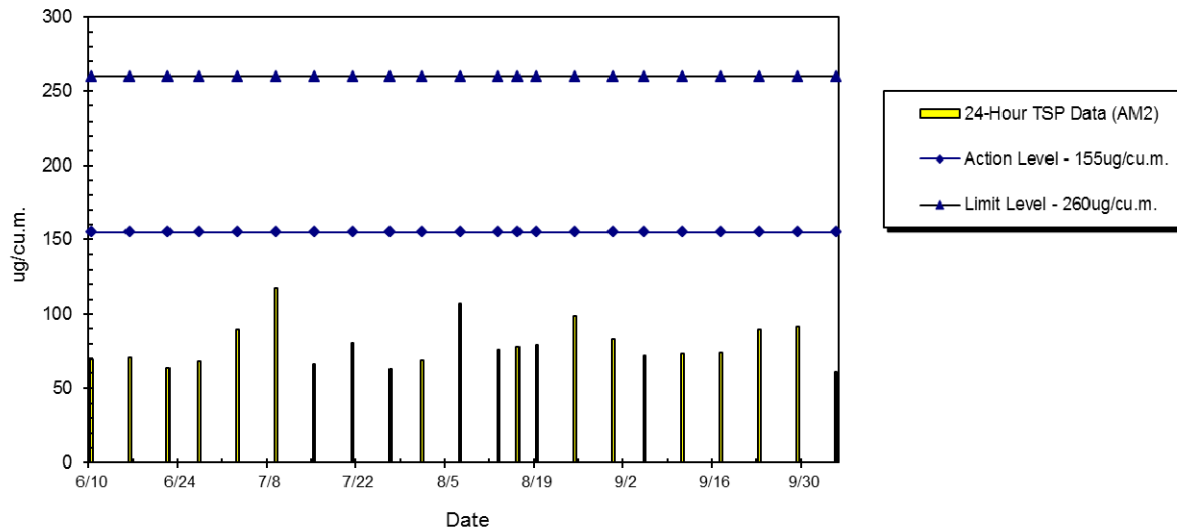
Appendix D

Impact Monitoring Graphical Plots

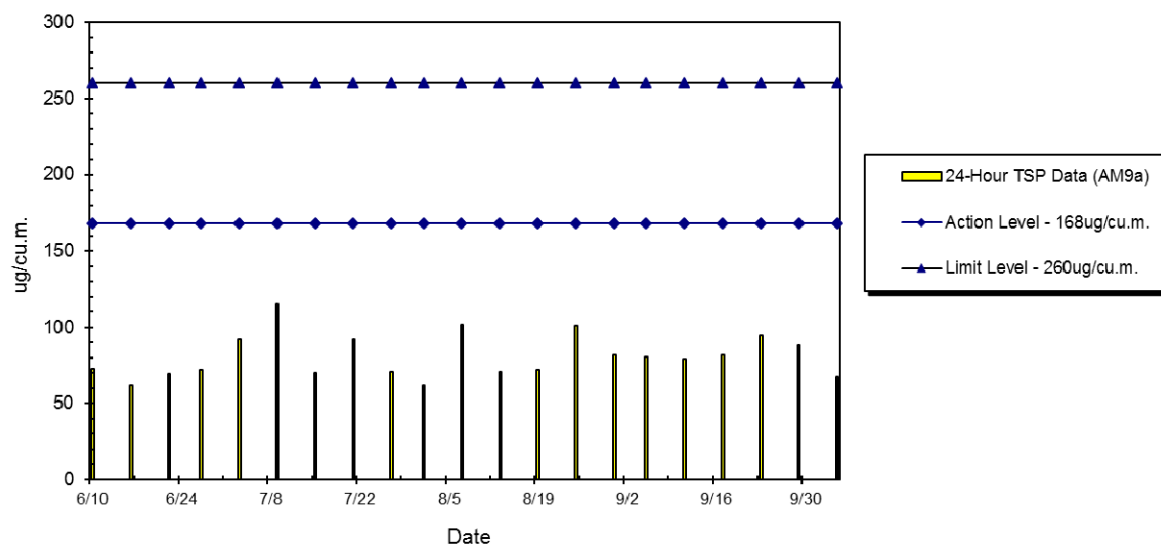
Appendix D

Impact Monitoring Graphical Plots

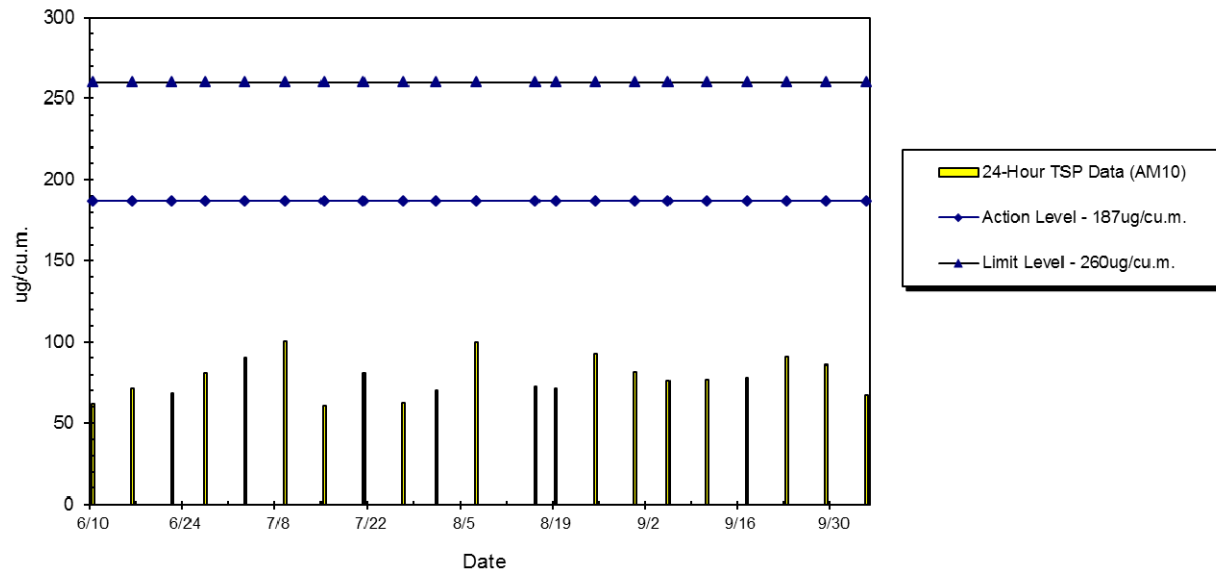
WIL-AM2 24hr TSP Level at Victoria Public Mortuary (Jun 2015 - Oct 2015)



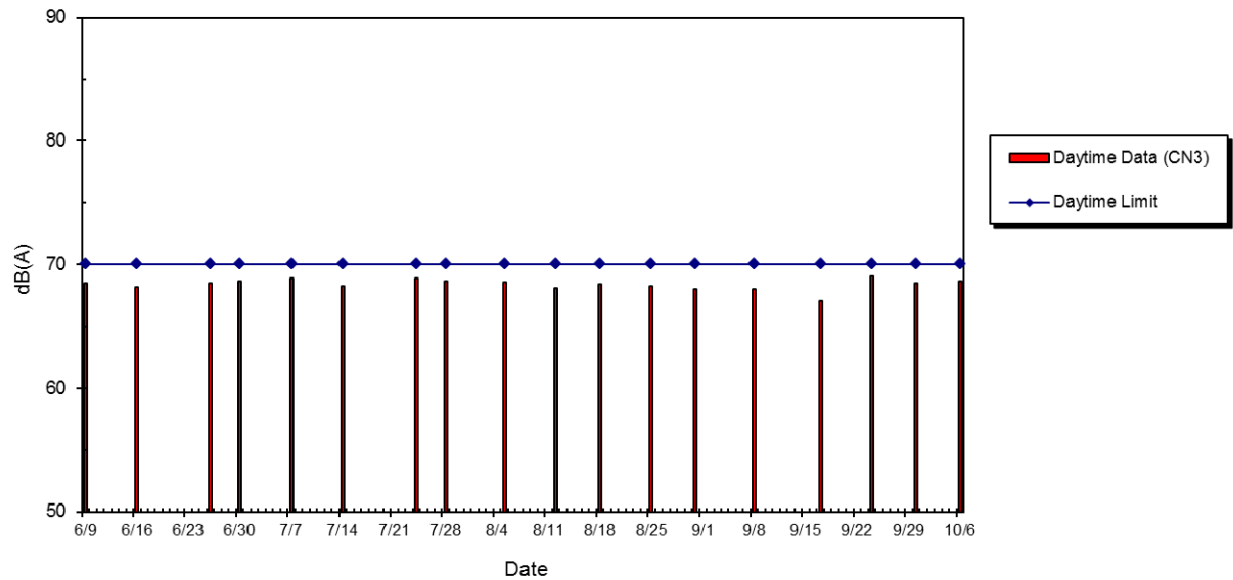
WIL-AM9a 24hr TSP Level at No. 28 Sai Woo Lane (Jun 2015 - Oct 2015)



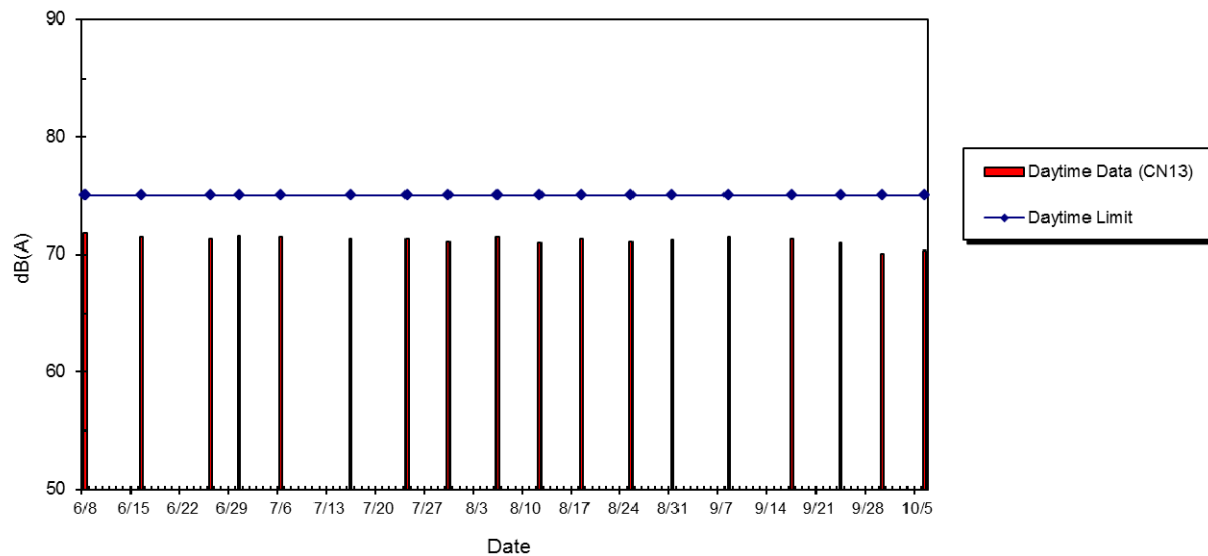
WIL-AM10 24hr TSP Level at Western Court, Ivy Tower (Jun 2015 - Oct 2015)

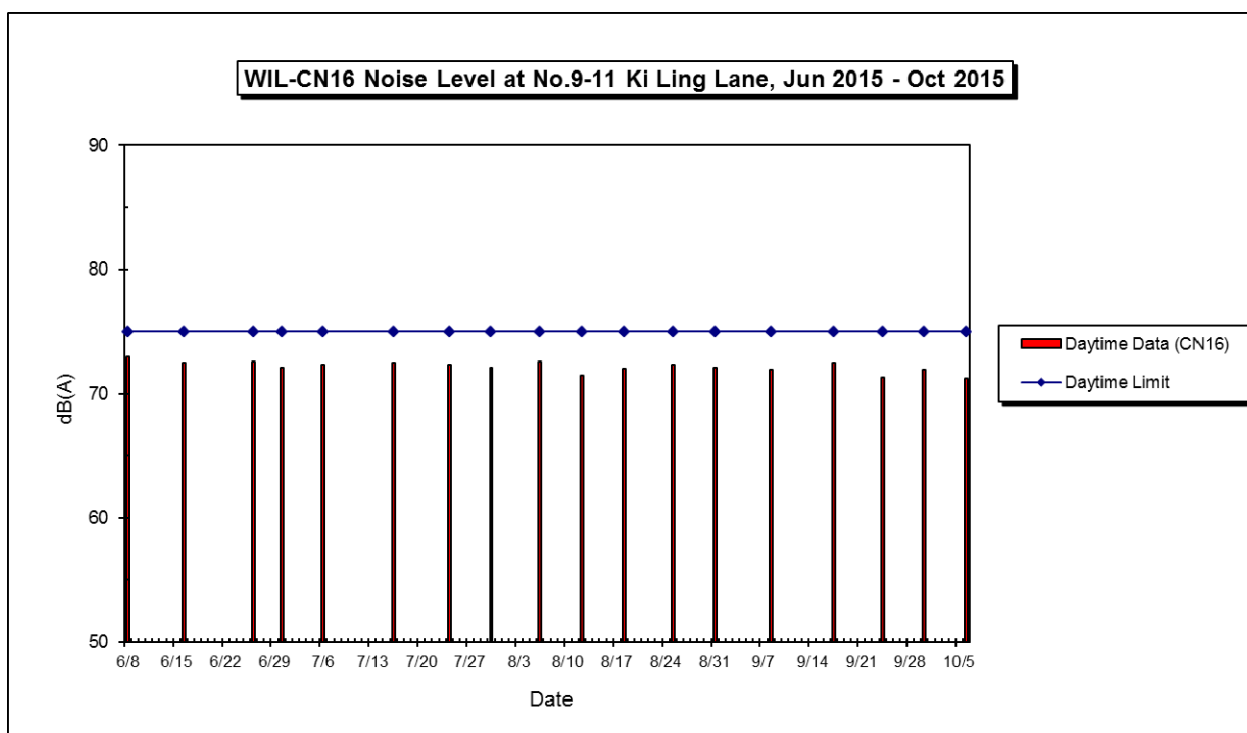
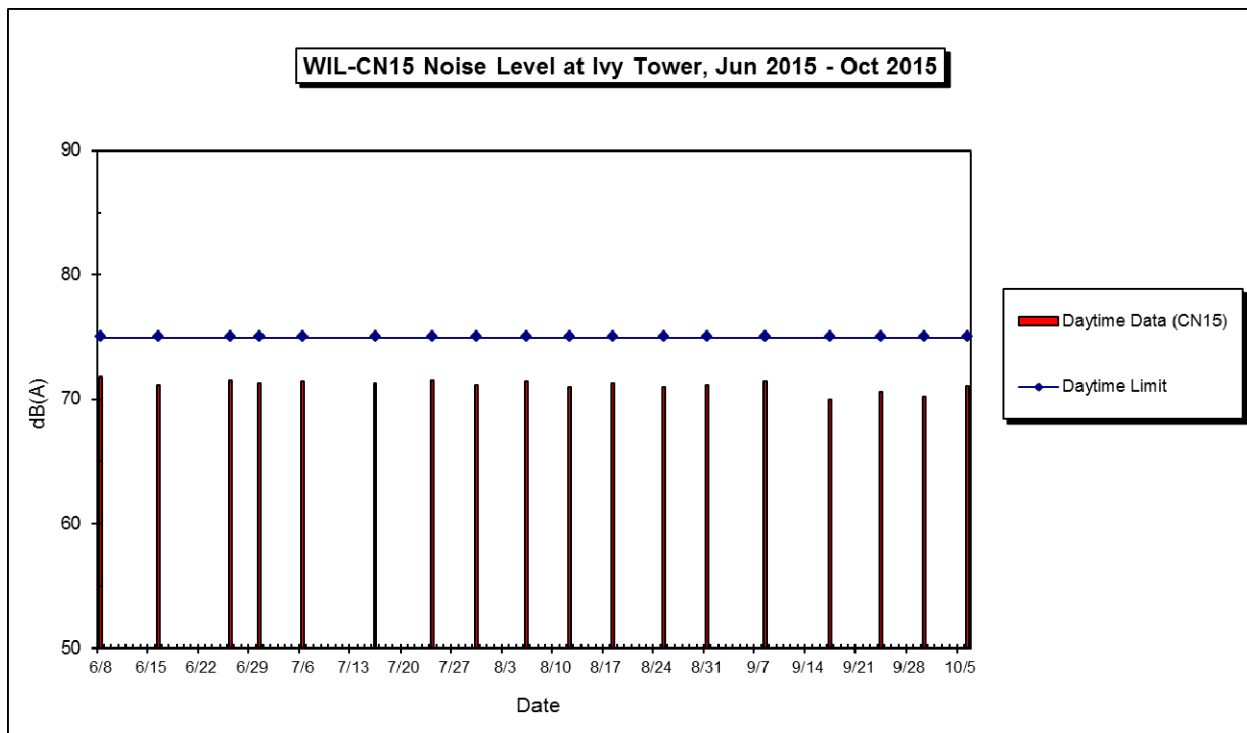


WIL-CN3 Noise Level at Lui Ming Choi Primary School, Jun 2015 - Oct 2015

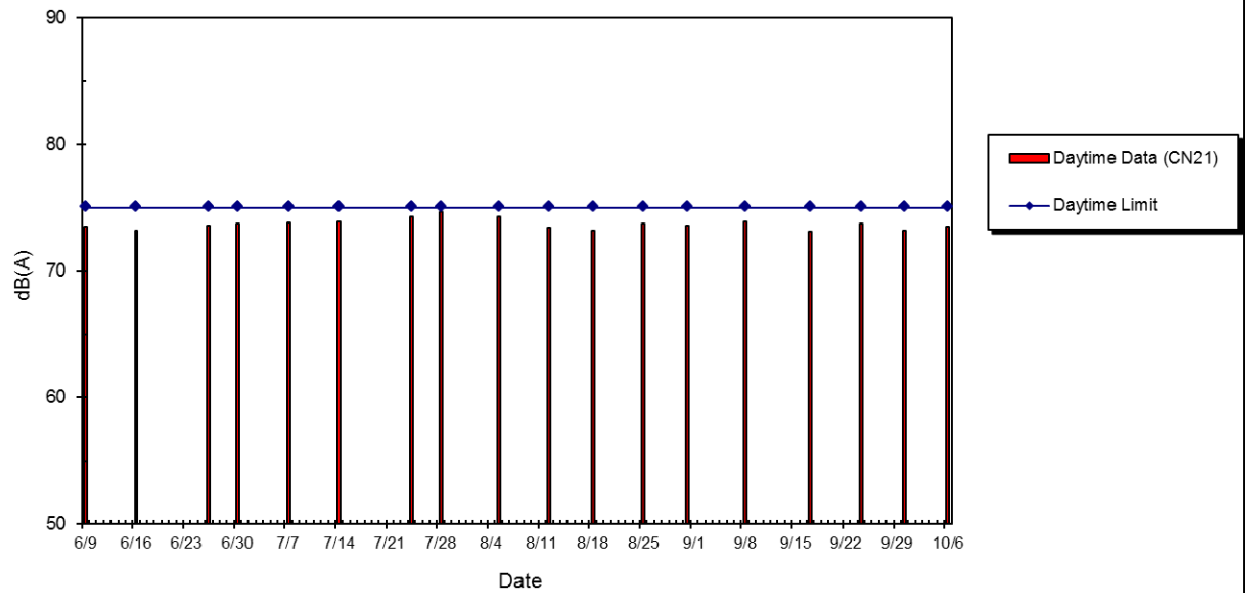


WIL-CN13 Noise Level at No.18-20 Eastern Street, Jun 2015 - Oct 2015





WIL-CN21 Noise Level at The Merton (Block 2), Jun 2015 - Oct 2015



Appendix E

Calibration Details

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC	SITE	Certificate -> 20150608
Location -> Kwun Lung Lau Block 1		Date -> 27-May-15
Sampler -> 994-0879		Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1008	Sampler Elevation	(feet)	100
Sea Level Pressure	(in Hg)	29.77	Corrected Pressure	(mm Hg)	753.47
Temperature	(deg C)	30	Temperature	(deg K)	303.00
Seasonal SL Pressure	(in Hg)	29.77	Corrected Seasonal	(mm Hg)	753.47
Seasonal Temperature	(deg C)	30.00	Seasonal Temperature	(deg K)	303.00

CALIBRATION ORIFICE

Make -> TISCH	Qstd Slope -> 2.02363
Model -> TE-5025A	Qstd Intercept -> 0.03075
Serial# -> 2821	Date Certified -> 19-Sep-14

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION
1	18	12.1	1.682	61	60.234	Slope = 35.4736
2	13	9.9	1.520	55	54.310	Intercept = 0.8094
3	10	6.9	1.267	48	47.398	Corr. Coeff. = 0.9967
4	7	5.1	1.087	39	38.510	
5	5	3.1	0.844	31	30.611	

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	Certificate -> 20150606
Location -> Victoria Public Mortuary		Date -> 27-May-15
Sampler -> 994-0871		Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1008	Sampler Elevation	(feet)	30
Sea Level Pressure	(in Hg)	29.77	Corrected Pressure	(mm Hg)	755.24
Temperature	(deg C)	30	Temperature	(deg K)	303.00
Seasonal SL Pressure	(in Hg)	29.77	Corrected Seasonal	(mm Hg)	755.24
Seasonal Temperature	(deg C)	30.00	Seasonal Temperature	(deg K)	303.00

CALIBRATION ORIFICE

Make -> TISCH	Qstd Slope ->	2.02363
Model -> TE-5025A	Qstd Intercept ->	0.03075
Serial# -> 2821	Date Certified ->	19-Sep-14

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR	
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION	
1	18	11.9	1.670	60	59.316	Slope =	35.8323
2	13	9.5	1.491	54	53.385	Intercept =	-0.0837
3	10	7.4	1.314	48	47.453	Corr. Coeff. =	0.9993
4	7	4.9	1.066	39	38.556		
5	5	2.9	0.817	29	28.670		

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

Certificate -> 20150607

Location -> HK IVE (TSING YI) KENNEDY TOWN CENTRE

Date -> 27-May-15

Sampler -> 994-0875

Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1008	Sampler Elevation	(feet)	100
Sea Level Pressure	(in Hg)	29.77	Corrected Pressure	(mm Hg)	753.47
Temperature	(deg C)	30	Temperature	(deg K)	303.00
Seasonal SL Pressure	(in Hg)	29.77	Corrected Seasonal	(mm Hg)	753.47
Seasonal Temperature	(deg C)	30.00	Seasonal Temperature	(deg K)	303.00

CALIBRATION ORIFICE

Make -> TISCH

Qstd Slope -> 2.02363

Model -> TE-5025A

Qstd Intercept -> 0.03075

Serial# -> 2821

Date Certified -> 19-Sep-14

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION
1	18	12	1.675	60	59.247	Slope = 33.8056
2	13	9.5	1.489	52	51.347	Intercept = 2.0001
3	10	7.2	1.294	46	45.423	Corr. Coeff. = 0.9971
4	7	5	1.076	40	39.498	
5	5	3	0.830	30	29.623	

Calculations

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

$IC = I [\text{Sqrt} (Pa/Pstd) (Tstd/Ta)]$

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:

$1/m ((I) [\text{Sqrt} (298/Tav) (Pav/760)] - b)$

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	Certificate -> 20150601
Location -> Kennedy Town FSD		Date -> 27-May-15
Sampler -> 294-0406		Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1008	Sampler Elevation	(feet)	100
Sea Level Pressure	(in Hg)	29.77	Corrected Pressure	(mm Hg)	753.47
Temperature	(deg C)	30	Temperature	(deg K)	303.00
Seasonal SL Pressure	(in Hg)	29.77	Corrected Seasonal	(mm Hg)	753.47
Seasonal Temperature	(deg C)	30.00	Seasonal Temperature	(deg K)	303.00

CALIBRATION ORIFICE

Make ->	TISCH	Qstd Slope ->	2.02363
Model ->	TE-5025A	Qstd Intercept ->	0.03075
Serial# ->	2821	Date Certified ->	19-Sep-14

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION
1	18	12.3	1.696	62	61.222	Slope = 38.4768
2	13	9.4	1.481	55	54.310	Intercept = -3.3460
3	10	6.5	1.229	44	43.448	Corr. Coeff. = 0.9970
4	7	5	1.076	40	39.498	
5	5	3	0.830	28	27.649	

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



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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	Certificate -> 20150602
Location -> St' Paul's College Primary		Date -> 27-May-15
Sampler -> 1294-1113		Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1008	Sampler Elevation	(feet)	300
Sea Level Pressure	(in Hg)	29.77	Corrected Pressure	(mm Hg)	748.42
Temperature	(deg C)	30	Temperature	(deg K)	303.00
Seasonal SL Pressure	(in Hg)	29.77	Corrected Seasonal	(mm Hg)	748.42
Seasonal Temperature	(deg C)	30.00	Seasonal Temperature	(deg K)	303.00

CALIBRATION ORIFICE

Make ->	TISCH	Qstd Slope ->	2.02363
Model ->	TE-5025A	Qstd Intercept ->	0.03075
Serial# ->	2821	Date Certified ->	19-Sep-14

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION
1	18	12.2	1.683	59	58.064	Slope = 32.4461
2	13	9.9	1.515	54	53.143	Intercept = 3.7110
3	10	6.9	1.262	45	44.286	Corr. Coeff. = 0.9987
4	7	5	1.072	40	39.365	
5	5	3.1	0.841	31	30.508	

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	Certificate -> 20150603
Location -> Hill Court		Date -> 27-May-15
Sampler -> 694-0662		Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1008	Sampler Elevation	(feet)	400
Sea Level Pressure	(in Hg)	29.77	Corrected Pressure	(mm Hg)	745.90
Temperature	(deg C)	30	Temperature	(deg K)	303.00
Seasonal SL Pressure	(in Hg)	29.77	Corrected Seas	13-Jun-14	745.90
Seasonal Temperature	(deg C)	30.00	Seasonal Temperature	(deg K)	303.00

CALIBRATION ORIFICE

Make ->	TISCH	Qstd Slope ->	2.02363
Model ->	TE-5025A	Qstd Intercept ->	0.03075
Serial# ->	2821	Date Certified ->	19-Sep-14

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION
1	18	12.2	1.681	60	58.948	Slope = 33.8030
2	13	8	1.358	49	48.141	Intercept = 2.4603
3	10	6.2	1.194	44	43.229	Corr. Coeff. = 0.9977
4	7	4.9	1.060	40	39.299	
5	5	3	0.826	30	29.474	

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	Certificate -> 20150609
Location -> Monitoring Station AM8		Date -> 27-May-15
Sampler -> 3283		Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1008	Sampler Elevation	(feet)	100
Sea Level Pressure	(in Hg)	29.77	Corrected Pressure	(mm Hg)	753.47
Temperature	(deg C)	30	Temperature	(deg K)	303.00
Seasonal SL Pressure	(in Hg)	29.77	Corrected Seasonal	(mm Hg)	753.47
Seasonal Temperature	(deg C)	30.00	Seasonal Temperature	(deg K)	303.00

CALIBRATION ORIFICE

Make -> TISCH	Qstd Slope -> 2.02363
Model -> TE-5025A	Qstd Intercept -> 0.03075
Serial# -> 2821	Date Certified -> 19-Sep-14

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION
1	18	12.3	1.696	64	63.197	Slope = 39.4515
2	13	9.7	1.505	57	56.285	Intercept = -3.5866
3	10	7.2	1.294	48	47.398	Corr. Coeff. = 0.9992
4	7	5.1	1.087	39	38.510	
5	5	3	0.830	30	29.623	

Calculations

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

$IC = I [\text{Sqrt} (Pa/Pstd) (Tstd/Ta)]$

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:

$1/m ((I) [\text{Sqrt} (298/Tav) (Pav/760)] - b)$

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	Certificate -> 20150604
Location -> No.28 Sai Woo Lane		Date -> 27-May-15
Sampler -> 894-0834		Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1008	Sampler Elevation	(feet)	30
Sea Level Pressure	(in Hg)	29.77	Corrected Pressure	(mm Hg)	755.24
Temperature	(deg C)	30	Temperature	(deg K)	303.00
Seasonal SL Pressure	(in Hg)	29.77	Corrected Seasonal	(mm Hg)	755.24
Seasonal Temperature	(deg C)	30.00	Seasonal Temperature	(deg K)	303.00

CALIBRATION ORIFICE

Make ->	TISCH	Qstd Slope ->	2.02363
Model ->	TE-5025A	Qstd Intercept ->	0.03075
Serial# ->	2821	Date Certified ->	19-Sep-14

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION
1	18	12.1	1.684	59	58.328	Slope = 31.9777
2	13	9.8	1.514	53	52.396	Intercept = 4.6465
3	10	7.5	1.323	49	48.442	Corr. Coeff. = 0.9969
4	7	5	1.077	39	38.556	
5	5	2.9	0.817	31	30.647	

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	Certificate -> 20150605
Location -> IVY Tower		Date -> 27-May-15
Sampler -> 894-0832		Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1008	Sampler Elevation	(feet)	400
Sea Level Pressure	(in Hg)	29.77	Corrected Pressure	(mm Hg)	745.90
Temperature	(deg C)	30	Temperature	(deg K)	303.00
Seasonal SL Pressure	(in Hg)	29.77	Corrected Seasonal	(mm Hg)	745.90
Seasonal Temperature	(deg C)	30.00	Seasonal Temperature	(deg K)	303.00

CALIBRATION ORIFICE

Make ->	TISCH	Qstd Slope ->	2.02363
Model ->	TE-5025A	Qstd Intercept ->	0.03075
Serial# ->	2821	Date Certified ->	19-Sep-14

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR	
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION	
1	18	12.2	1.681	59	57.966	Slope =	33.4314
2	13	9.8	1.505	53	52.071	Intercept =	1.8069
3	10	7.4	1.306	46	45.194	Corr. Coeff. =	0.9992
4	7	5	1.070	39	38.316		
5	5	3.1	0.840	30	29.474		

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.

Balance Calibration Report
Tested to MTRC Method WI/707M/01

Laboratory Equipment Identification Number			BA011		
Manufacturer	Sartorius	Model	A200S-**DIB	Serial No.	1065989
Capacity	120g	Discrimination	0.1mg	Type	Top Loading
Location	Concrete Testing Area		Temperature	24°C	

Reference Mass Set Used (Equip. ID. No.)		RM001, RM002, RM003	
Manufacturer	Troemner	OIML Classification	F1
Last Calibration Date	26/09/2012, 08/10/2012 11/10/2012	Calibrated By	South China National Centre of Metrology

(1) Repeatability of Reading

Reference Mass (g)	Standard Deviation of Balance Reading (g)	Maximum Difference Between Successive Readings (g)
10	0.0000949	0.0002
60	0.0000823	0.0002
120	0.0000949	0.0002

Standard Deviation of the Balance = 0.0000949 g

(2) Departure from Nominal Value

Reading (g)	Correction (g)	Uncertainty (g)
9.9998	0.00024	±0.000270
19.9998	0.00037	
29.9998	0.00041	
39.9997	0.00051	
49.9998	0.00010	
59.9997	0.00024	
69.9997	0.00037	
79.9996	0.00056	
89.9997	0.00046	
99.9995	0.00018	

Maximum Correction = 0.00056 g

(3) Off-Centre Loading

A mass of approximately ⁶⁰10000g was moved to various position on the balance pan. The balance readings obtained at different position are given in the table.

Centre	Front	Back	Left	Right
59.9995	59.9994	59.9988	59.9995	59.9997

Maximum Difference = 0.0009 g

(4) Hysteresis

Load (g)	Hysteresis (g)
50	0.000233

(5) Limit of Performance of the Balance = ± 0.000845 g

Checked by : NH Loo Certified by : Je
Date : 09/02/2013 Date : 9/2/2013

Notes:

1.The balance has been tested according to the specifications laid down in Chapter 6 of the CSIRO Publication "The Calibration of Balances - by David B. Prowse".

2.Uncertainties quoted in this report have been estimated on the basis of there being not more than one chance in one hundred that any value differs from the true value by more than the stated uncertainty.

3.The Limit of Performance is the tolerance band within which all readings of the balance will fall.



CERTIFICATE OF CALIBRATION

Certificate No.: 14CA1016 01-01

Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone
Manufacturer:	B & K	B & K
Type/Model No.:	2250	4189
Serial/Equipment No.:	2551244	2550229
Adaptors used:	-	-

Item submitted by

Customer Name: MTR Corporation Limited
Address of Customer: -
Request No.: -
Date of receipt: 16-Oct-2014

Date of test: 17-Oct-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	20-Jun-2015	CIGISMEC
Signal generator	DS 360	33873	09-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1000 ± 10 hPa

Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTPO04-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of $\pm 20\%$.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

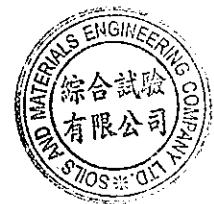
Actual Measurement data are documented on worksheets.

Approved Signatory:


Huang Jian Min/Feng Jun Qi

Date: 18-Oct-2014

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 14CA1016 01-01

Page 2 of 2

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	2.1
	C	Pass	0.8	
	Lin	Pass	1.6	
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	2.2
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100µs rectangular pulse	N/A	N/A	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by:

Date:

Fung Chi Yip

17-Oct-2014

- End -

Checked by:

Date:

Lam Tze Wai

18-Oct-2014

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



Test Data for Sound Level Meter

Page 1 of 5

Sound level meter type: 2250
Microphone type: 4189

Serial No. 2551244
Serial No. 2550229

Date 17-Oct-2014

Report: 14CA1016 01-01

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting	12.2	dB
Noise level in C weighting	13.7	dB
Noise level in Lin	19.5	dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals. (SLM set to LEQ/SPL)

Reference/Expected level	Actual level		Tolerance	Deviation	
	non-integrated	integrated		non-integrated	integrated
dB	dB	dB	+/- dB	dB	dB
94.0	94.0	94.0	0.7	0.0	0.0
99.0	99.0	99.0	0.7	0.0	0.0
104.0	104.0	104.0	0.7	0.0	0.0
109.0	109.0	109.0	0.7	0.0	0.0
114.0	114.0	114.0	0.7	0.0	0.0
119.0	119.0	119.0	0.7	0.0	0.0
124.0	124.0	124.0	0.7	0.0	0.0
129.0	129.0	129.0	0.7	0.0	0.0
134.0	134.0	134.0	0.7	0.0	0.0
135.0	135.0	135.0	0.7	0.0	0.0
136.0	136.0	136.0	0.7	0.0	0.0
137.0	137.0	137.0	0.7	0.0	0.0
138.0	138.0	138.0	0.7	0.0	0.0
139.0	139.0	139.0	0.7	0.0	0.0
140.0	140.0	140.0	0.7	0.0	0.0
89.0	89.0	89.0	0.7	0.0	0.0
84.0	84.0	84.0	0.7	0.0	0.0
79.0	79.0	79.0	0.7	0.0	0.0
74.0	74.0	74.0	0.7	0.0	0.0
69.0	69.0	69.0	0.7	0.0	0.0
64.0	64.0	64.0	0.7	0.0	0.0
59.0	59.0	59.0	0.7	0.0	0.0
54.0	53.9	53.9	0.7	-0.1	-0.1
49.0	49.0	49.0	0.7	0.0	0.0



Test Data for Sound Level Meter

Page 2 of 5

Sound level meter type: 2250
Microphone type: 4189

Serial No. 2551244
Serial No. 2550229

Date 17-Oct-2014

Report: 14CA1016 01-01

44.0	43.9	43.9	0.7	-0.1	-0.1
39.0	39.0	39.0	0.7	0.0	0.0
34.0	33.9	33.9	0.7	-0.1	-0.1
33.0	33.0	33.0	0.7	0.0	0.0
32.0	32.0	32.0	0.7	0.0	0.0
31.0	31.0	31.0	0.7	0.0	0.0
30.0	30.0	30.0	0.7	0.0	0.0

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	94.0	94.0	0.7	0.0

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	30.0	30.0	0.7	0.0
	138.0	138.0	0.7	0.0

FREQUENCY WEIGHTING TEST

The frequency response of the weighting networks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	54.5	1.5	1.5	-0.1
63.1	94.0	67.8	67.7	1.5	1.5	-0.1
125.9	94.0	77.9	77.9	1.0	1.0	0.0
251.2	94.0	85.4	85.3	1.0	1.0	-0.1
501.2	94.0	90.8	90.7	1.0	1.0	-0.1
1995.0	94.0	95.2	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	95.0	1.0	1.0	0.0
7943.0	94.0	92.9	92.9	1.5	3.0	0.0
12590.0	94.0	89.7	89.2	3.0	6.0	-0.5

Frequency weighting C:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	91.0	1.5	1.5	0.0



Test Data for Sound Level Meter

Page 3 of 5

Sound level meter type: 2250
Microphone type: 4189

Serial No. 2551244
Serial No. 2550229

Date 17-Oct-2014

Report: 14CA1016 01-01

63.1	94.0	93.2	93.2	1.5	1.5	0.0
125.9	94.0	93.8	93.8	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	93.2	1.0	1.0	0.0
7943.0	94.0	91.0	91.0	1.5	3.0	0.0
12590.0	94.0	87.8	87.3	3.0	6.0	-0.5

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	94.0	1.5	1.5	0.0
63.1	94.0	94.0	94.0	1.5	1.5	0.0
125.9	94.0	94.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	94.0	1.0	1.0	0.0
7943.0	94.0	94.0	94.0	1.5	3.0	0.0
12590.0	94.0	94.0	93.5	3.0	6.0	-0.5

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	115.0	115.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	111.9	111.9	1.0	1.0	0.0

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)



Test Data for Sound Level Meter

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Sound level meter type: 2250
Microphone type: 4189

Serial No. 2551244
Serial No. 2550229

Date 17-Oct-2014

Report: 14CA1016 01-01

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time weighting	dB	dB	indication(dB)	+/- dB	dB
Slow	118.0+6.6	118.0	118.0	0.5	0.0

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)

Test frequency: 2000 Hz

Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	111.2	111.1	2.0	-0.1

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	117.3	117.2	1.0	-0.1

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz

Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	110.0	110.0	109.9	1.0	-0.1	60s integ.
10000	100.0	100.0	99.9	1.0	-0.1	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range

Test frequency: 4000 Hz

Integration time: 10 sec

The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	120.0	90.0	89.9	1.7	-0.1

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	120.0	100.0	99.9	1.7	-0.1



Test Data for Sound Level Meter

Page 5 of 5

Sound level meter type: 2250
Microphone type: 4189

Serial No. 2551244
Serial No. 2550229

Date 17-Oct-2014

Report: 14CA1016 01-01

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
134.6	133.6	130.6	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as follow
The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range

Test frequency: 4000 Hz
Integration time: 10 sec
Single burst duration: 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
141.6	140.6	100.6	100.5	2.2	-0.1

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
Hz	dB	Measured (dB)	+	-	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	77.7	1.0	1.0	-0.2
8000	92.9	94.2	1.5	3.0	1.3

-----END-----



CERTIFICATE OF CALIBRATION

Certificate No.: 14CA1120 03-01

Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone
Manufacturer:	B & K	B & K
Type/Model No.:	2250	4189
Serial/Equipment No.:	2749852	2695393
Adaptors used:	-	-

Item submitted by

Customer Name: MTR Corporation Limited
Address of Customer: -
Request No.: -
Date of receipt: 20-Nov-2014

Date of test: 21-Nov-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	20-Jun-2015	CIGISMEC
Signal generator	DS 360	33873	09-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1010 ± 10 hPa

Test specifications

1. The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTPO04-CA-152.
2. The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of $\pm 20\%$.
3. The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responses of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

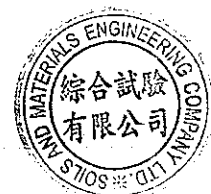
Actual Measurement data are documented on worksheets.

Approved Signatory:


Huang Jian Min/Feng Jun Qi

Date: 22-Nov-2014

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 14CA1120 03-01

Page 2 of 2

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	2.1
	Lin	Pass	1.6	2.2
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Frequency weightings			
	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100µs rectangular pulse	N/A	N/A	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

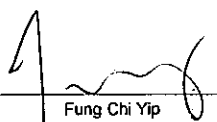
The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

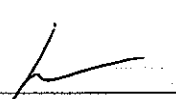
3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by: 
Date: 21-Nov-2014

- End -

Checked by: 
Date: 22-Nov-2014

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



Test Data for Sound Level Meter

Page 1 of 5

Sound level meter type: 2250
Microphone type: 4189

Serial No. 2749852
Serial No. 2695393

Date 21-Nov-2014

Report: 14CA1120 03-01

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting	11.9	dB
Noise level in C weighting	14.0	dB
Noise level in Lin	20.0	dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals. (SLM set to LEQ/SPL)

Reference/Expected level	Actual level		Tolerance	Deviation	
	non-integrated	integrated		non-integrated	integrated
dB	dB	dB	+/- dB	dB	dB
94.0	94.0	94.0	0.7	0.0	0.0
99.0	99.0	99.0	0.7	0.0	0.0
104.0	104.0	104.0	0.7	0.0	0.0
109.0	109.0	109.0	0.7	0.0	0.0
114.0	114.0	114.0	0.7	0.0	0.0
119.0	119.0	119.0	0.7	0.0	0.0
124.0	124.0	124.0	0.7	0.0	0.0
129.0	129.0	129.0	0.7	0.0	0.0
134.0	134.0	134.0	0.7	0.0	0.0
135.0	135.0	135.0	0.7	0.0	0.0
136.0	136.0	136.0	0.7	0.0	0.0
137.0	137.0	137.0	0.7	0.0	0.0
138.0	138.0	138.0	0.7	0.0	0.0
139.0	139.0	139.0	0.7	0.0	0.0
140.0	140.0	140.0	0.7	0.0	0.0
89.0	89.0	89.0	0.7	0.0	0.0
84.0	84.0	84.0	0.7	0.0	0.0
79.0	79.0	79.0	0.7	0.0	0.0
74.0	74.0	74.0	0.7	0.0	0.0
69.0	69.0	69.0	0.7	0.0	0.0
64.0	64.0	64.0	0.7	0.0	0.0
59.0	59.0	59.0	0.7	0.0	0.0
54.0	54.0	54.0	0.7	0.0	0.0
49.0	49.0	49.0	0.7	0.0	0.0



Test Data for Sound Level Meter

Page 2 of 5

Sound level meter type: 2250 Serial No. 2749852 Date 21-Nov-2014
Microphone type: 4189 Serial No. 2695393
Report: 14CA1120 03-01

44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0
34.0	34.0	34.0	0.7	0.0	0.0
33.0	32.9	32.9	0.7	-0.1	-0.1
32.0	31.9	31.9	0.7	-0.1	-0.1
31.0	30.9	30.9	0.7	-0.1	-0.1
30.0	30.0	30.0	0.7	0.0	0.0

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	94.0	94.0	0.7	0.0

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
20-140	30.0	30.0	0.7	0.0
	138.0	138.0	0.7	0.0

FREQUENCY WEIGHTING TEST

The frequency response of the weighting networks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	54.6	1.5	1.5	0.0
63.1	94.0	67.8	67.8	1.5	1.5	0.0
125.9	94.0	77.9	77.9	1.0	1.0	0.0
251.2	94.0	85.4	85.4	1.0	1.0	0.0
501.2	94.0	90.8	90.8	1.0	1.0	0.0
1995.0	94.0	95.2	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	95.0	1.0	1.0	0.0
7943.0	94.0	92.9	92.9	1.5	3.0	0.0
12590.0	94.0	89.7	89.2	3.0	6.0	-0.5

Frequency weighting C:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	91.0	1.5	1.5	0.0



Test Data for Sound Level Meter

Page 3 of 5

Sound level meter type: 2250 Serial No. 2749852 Date 21-Nov-2014
Microphone type: 4189 Serial No. 2695393
Report: 14CA1120 03-01

63.1	94.0	93.2	93.2	1.5	1.5	0.0
125.9	94.0	93.8	93.8	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	93.2	1.0	1.0	0.0
7943.0	94.0	91.0	91.0	1.5	3.0	0.0
12590.0	94.0	87.8	87.3	3.0	6.0	-0.5

Frequency weighting Lin:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	94.1	1.5	1.5	0.1
63.1	94.0	94.0	94.0	1.5	1.5	0.0
125.9	94.0	94.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	94.0	1.0	1.0	0.0
7943.0	94.0	94.0	94.0	1.5	3.0	0.0
12590.0	94.0	94.0	93.5	3.0	6.0	-0.5

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	115.0	115.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
dB	dB	dB	+	-	dB
116.0	111.9	111.9	1.0	1.0	0.0

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)



Test Data for Sound Level Meter

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Sound level meter type: 2250 Serial No. 2749852 Date 21-Nov-2014
Microphone type: 4189 Serial No. 2695393

Report: 14CA1120 03-01

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time weighting	dB	dB	indication(dB)	+/- dB	dB
Slow	118.0+6.6	118.0	117.9	0.5	-0.1

TIME WEIGHTING IMPULSE TEST

Time weighting l is tested on the reference range (Set the SLM to LAImax)

Test frequency: 2000 Hz

Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	111.2	111.1	2.0	-0.1

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	117.3	117.2	1.0	-0.1

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz

Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	110.0	110.0	109.9	1.0	-0.1	60s integ.
10000	100.0	100.0	99.9	1.0	-0.1	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference rar

Test frequency: 4000 Hz

Integration time: 10 sec

The integrating sound level meter set to Leq:

Duration	Rms level of tone burst	Expected	Actual	Tolerance	Deviation
msec	(dB)	dB	dB	+/- dB	dB
10	120.0	90.0	90.0	1.7	0.0

The integrating sound level meter set to SEL:

Duration	Rms level of tone burst	Expected	Actual	Tolerance	Deviation
msec	(dB)	dB	dB	+/- dB	dB
10.0	120.0	100.0	100.0	1.7	0.0



Test Data for Sound Level Meter

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Sound level meter type: 2250
Microphone type: 4189

Serial No. 2749852
Serial No. 2695393

Date 21-Nov-2014

Report: 14CA1120 03-01

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
134.3	133.3	130.3	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as follow
The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range
Test frequency: 4000 Hz
Integration time: 10 sec
Single burst duration: 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
140.9	139.9	99.9	99.9	2.2	0.0

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
Hz	dB	Measured (dB)	+	-	dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	77.8	1.0	1.0	-0.1
8000	92.9	93.2	1.5	3.0	0.3

-----END-----



CERTIFICATE OF CALIBRATION

Certificate No.: 14CA1120 03-03

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: B & K
Type/Model No.: 4231
Serial/Equipment No.: 1795386
Adaptors used: -

Item submitted by

Customer: MTR Corporation Limited
Address of Customer: -
Request No.: -
Date of receipt: 20-Nov-2014

Date of test: 21-Nov-2014

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	13-May-2015	SCL
Preamplifier	B&K 2673	2743150	10-Apr-2015	CEPREI
Measuring amplifier	B&K 2610	2346941	08-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI
Digital multi-meter	34401A	US36087050	17-Dec-2014	CEPREI
Audio analyzer	8903B	GB41300350	07-Apr-2015	CEPREI
Universal counter	53132A	MY40003662	11-Apr-2015	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 60 ± 10 %
Air pressure: 1010 ± 10 hPa

Test specifications

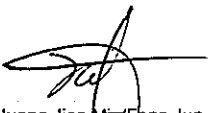
- 1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- 2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- 3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

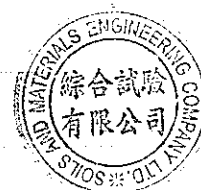
Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:


Huang Jien Ming/Feng Jun Qi

Date: 22-Nov-2014

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 14CA1120 03-03

Page: 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μ Pa)			
Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	93.88	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz STF = 0.002 dB

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz Actual Frequency = 999.8 Hz

Estimated expanded uncertainty 0.1 Hz Coverage factor $k = 2.2$

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz TND = 0.4 %

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by:

Date:

Fung Chi Yip
21-Nov-2014

- End -

Checked by:

Date:

Lam Tze Wai
22-Nov-2014

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

Appendix F
Monitoring Schedules

Air Impact Monitoring

1. The air impact monitoring schedule for the present reporting period is shown in Section 3.1.
2. The air impact monitoring schedule for the next reporting period will commence on 10 October 2015 and will be conducted at a sampling frequency of at least once in every six days.

Noise Impact Monitoring

1. The noise impact monitoring schedule for the present reporting period is shown in Section 3.2.
2. The noise impact monitoring schedule for the next reporting period will commence on 10 October 2015 and will be conducted at a frequency of once a week when construction activities are underway.

Appendix G

Certified Arborist Monthly Inspection Record for
September 2015

WEST ISLAND LINE

Consultancy Agreement No. : C735F - Arborist for Tree Protection

Consultant : Muni Arborist Limited

Name : Mike Leung (Certified Arborist)

Monthly Inspection Record for Jul 2015

Date	Activity Description	Purpose
15/9/2015	Regular Inspection for Sep	Monitor the conditions of retained trees
15/9/2015	Audit Insepction	Site auditing for the compensation trees of HKU Station (Exit A, C1 and C2)

Signed by Muni Arborist Limited

: 
Date: 1 Oct 2015

The Transplant and protection works were carried out in accordance with requirement of the Tree Protection Plan in general