CONTRACT NO. STW 01/2021

ENVIRONMENTAL TEAM FOR RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS

UNDER ENVIRONMENTAL PERMIT NO. EP-533/2017/A

MONTHLY ENVIRONMENTAL MONITORING & AUDIT REPORT

AUGUST 2022

CLIENTS:

Drainage Services Department

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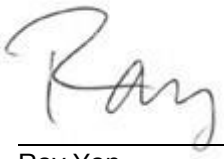

Ray Yan
Environmental Team Leader

DATE:

9 September 2022

Member of the Aurecon Group

Date: 15 September 2022
Your ref:
Our ref: PL-202209034

AECOM Asia Limited
c/o Site Office
21 Hang Tai Road
Ma On Shan
New Territories

Attn: Mr. Peter POON

Dear Mr. Poon,

Re: Contract No. DC/2018/05
Relocation of Sha Tin Sewage Treatment Works to Cavern - Site Preparation and Access Tunnel Construction
Verification of Monthly EM&A Report (August 2022)

Reference is made to the Monthly EM&A Report **(August 2022**) provided by the Environmental Team on 15 September 2022.

Please be informed that we have no adverse comments on the captioned submission. We hereby verify the report in accordance with Condition 3.5 of Environmental Permit No. EP-533/2017/A.

Thank you for your attention.

Yours sincerely,
For and on behalf of
Acuity Sustainability Consulting Limited

Ir Y.H . LAW
Independent Environmental Checker

c.c. Drainage Services Department Attn.: Mr. Simon Poon By e-mail
Lam Environmental Services Limited Attn.: Mr. Ray Yan By e-mail

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

EXECUTIVE SUMMARY

i. This is the Environmental Monitoring and Audit (EM&A) Monthly Report – August 2022 of Relocation of Sha Tin Sewage Treatment Works to Caverns – Site Preparation and Access Tunnel Construction under Environmental Permit no. EP-533/2017/A (Hereafter as "the Project"). This is the 42nd EM&A report presenting the environmental monitoring findings and information recorded during the period of 1 August 2022 to 31 August 2022. The cut-off date of reporting is at the end of each reporting month.

ii. Contract no. DC/2020/05 - Relocation of Sha Tin Sewage Treatment Works to Caverns – Main Caverns Construction

- The contract was commenced on 5 July 2021
- Tree felling
- Hoarding erection
- Construction of temporary drainage system
- Haul road construction
- Slope stabilization works
- Tunneling works
- Rigid barrier construction
- Piling work
- Construction of temporary explosive magazine
- Set up the rock crushing facility

Air Quality Monitoring

iii. 1-hour Total Suspended Particulates (TSP) monitoring would be conducted at six monitoring stations. The sampling frequency is 3 times in every 6 days.

iv. Air quality monitoring for the stations AM1 and AM2 were commenced on 12 April 2019 while

station AM5 was commenced on 18 April 2019. Air quality monitoring for the station AM4 was commenced on 3 May 2019. The proposal for proposed fine adjustment for air and noise monitoring station at Kowloon City Baptist Church Hay Nien Primary School was agreed by EPD on 17 December 2020, therefore, air quality monitoring for the station AM3(B) was commenced on 18 December 2020. Air quality monitoring for the station AM6 was commenced on 2 November 2021 since the demolition of DSD staff quarter and ended on 31 December 2021. Air quality monitoring station ASR51 at WA3 was recommended in the supporting document for application for variation of Environmental Permit (EP-533/2017/A issued on 11 August 2022) and the associated air quality monitoring was commenced on 19 August 2022.

No action or limit level exceedance was determined in the reporting period for the stations of AM1, AM2, AM3(B), AM4, AM5 and ASR51.

Noise Monitoring

v. Noise monitoring would be conducted at eight noise monitoring stations once per week.

vi. Noise monitoring for stations CM4 and CM5 were commenced on 13 April 2019 and 18 April 2019 respectively. Noise monitoring for stations CM1 and CM3 were commenced on 2 May 2019. The proposal for proposed fine adjustment for air and noise monitoring station at Kowloon City Baptist Church Hay Nien Primary School was agreed by EPD on 17 December 2020, therefore, noise monitoring for station CM2(B) was commenced on 18 December 2020. Noise monitoring for stations DM1, DM2 and DM3 were commenced on 2 November 2021 and ended on 31 December 2021.

vii. Additional weekly noise monitoring from 19:00 to 23:00 was carried out at CM4 on 3, 18, 23, and 31 August 2022 with respect to the restricted hour works under CNP GW-RN0371-22, GW-RN0302-22, GW-RN0672-22 and GW-RN0700-22. All the results are within the baseline level range after baseline correction. No noise monitoring was conducted from 8-13 August 2022 due to raining.

viii. Additional weekly night time noise monitoring from 23:00 to 07:00 on next day was carried out at CM4 on 3, 18, 23, and 31 August 2022 with respect to the restricted hour works under CNP GW-RN0371-22, GW-RN0302-22, GW-RN0672-22 and GW-RN0700-22. All the results are within the baseline level range after baseline correction. No noise monitoring was conducted from 8-13 August 2022 due to raining.

ix. No action or limit level exceedance was determined in the reporting period for the stations of CM1, CM2(B), CM3, CM4 and CM5.

Site Inspections and Audit

x. The Environmental Team (ET) conducted weekly site inspections for the Contract on 4, 11, 12, 18, 24 and 26 August 2022. IEC attended the joint site inspection on 12, 24 and 26 August 2022. No non-compliance was found during the site inspection. Bi-weekly landscape site audits were conducted on 4, 18 and 30 August 2022. Monthly ecology site audit was conducted on 30 August 2022.

Complaints, Notifications of Summons and Successful Prosecutions

xi. There was one environmental complaint regarding air quality impact at WA3 received in the reporting period. Upon investigation, the works activities at WA3 did not result in any unacceptable environmental impacts to the surrounding environment as reviewed with the relevant environmental requirements under EP-533/2017/A and the associated application documents for Specified Process License for the Project, and it was considered as non-project related.

xii. No notification of summons and successful prosecutions was received in the reporting month.

Reporting Changes

xiii. The Ecological Monitoring Report is attached in the ***Appendix 1.1***.

Future Key Issues

xiv. In coming reporting months, the scheduled construction activities and the recommended mitigation measures are listed as follows:

Contract No.	Key Construction Works	Recommended Mitigation Measures
DC/2020/05	• Tree felling • Construction of temporary drainage system • Haul road construction • Slope stabilization works • Tunneling works	• Dust control during dust generating works; • Implementation of proper noise pollution control; • Provision of protection to ensure no runoff out of site area or direct discharge into public drainage system; • Direct impact to plant species of conservation importance recorded in the vicinity of the construction sites shall be avoided; • Excavation materials shall be well covered; and

Contract No.	Key Construction Works	Recommended Mitigation Measures
	• Site office construction • Rigid barrier construction • Erection of blast cover • Piling work • Set up the rock crushing facility • Site office construction • Construction of temporary noise barrier	• Mitigation measures to dust and noise control should be provided to construction of noise barrier, bored piling, Installation of noise barrier.

1 Introduction

1.1 Scope of the Report

1.1.1. Lam Environmental Services Limited (LES) has been appointed to work as the Environmental Team (ET) under Environmental Permit (EP) no. EP-533/2017/A to implement the Environmental Monitoring and Audit (EM&A) programme as stipulated in the EM&A Manual of the approved Environmental Impact Assessment (EIA) Report for Relocation of Sha Tin Sewage Treatment Works to Caverns – Site Preparation and Access Tunnel Construction (Register No.: AEIAR-202/2016).

1.1.2. In accordance with Clause 3.5 stated in EP-533/2017/A, 4 hard copies and 3 electronic copies of the Monthly EM&A Report shall be submitted to the Director within 2 weeks after the end of each reporting month throughout the entire construction period.

1.1.3. In accordance with Section 13.4.1.1 of the Project EM&A Manual, the Monthly EM&A Report should be prepared and submitted to the Contractor, the IEC, the ER and EPD within 10 working days at the end of each reporting month, with the first report due the month after construction commences.

1.2 Structure of the Report

Section 1 ***Introduction*** – details the scope and structure of the report.

Section 2 ***Project Background*** – summarizes background and scope of the project, site description, project organization and contact details of key personnel during the reporting period.

Section 3 ***Status of Regulatory Compliance*** – summarizes the status of valid Environmental Permits / Licenses during the reporting period.

Section 4 ***Monitoring Requirements*** – summarizes all monitoring parameters, monitoring methodology and equipment, monitoring locations, monitoring frequency, criteria and respective event and action plan and monitoring programmes.

Section 5 ***Monitoring Results*** – summarizes the monitoring results obtained in the reporting period.

Section 6 **Land Decontamination** – summarizes the status of land decontamination works at the VDC site.

Section 7 **C*ompliance Audit*** – summarizes the auditing of monitoring results, all exceedances environmental parameters.

Section 8 **Environmental Site Audit** – summarizes the findings of weekly site inspections undertaken within the reporting period, with a review of any relevant follow-up actions within the reporting period.

Section 9 ***Complaints, Notification of summons and Prosecution*** – summarizes the cumulative statistics on complaints, notification of summons and prosecution

Section 10 ***Conclusion***

2 Project Background

2.1 Background

2.1.1. The Relocation of Sha Tin Sewage Treatment Works (STSTW) to Caverns (the Project) is implemented so as to release the existing site, of a size about 28 hectares, for other uses.

2.1.2. In May 2012, Drainage Services Department (DSD), the Project Proponent commenced a detailed feasibility study on "Relocation of Sha Tin Sewage Treatment Works to Caverns" (the Feasibility Study). The findings of Feasibility Study affirmed that relocating the STSTW to caverns to be constructed at Nui Po Shan of A Kung Kok is technically feasible and financially viable.

2.1.3. The Project is a Designated Project (DP) under the Environmental Impact Assessment Ordinance (EIAO). An application for an Environmental Impact Assessment (EIA) Study Brief under section 5(1)(a) of the EIAO was submitted on 12 May 2014 with a Project Profile (No. PP-508/2014) for the Project. An EIA Study Brief (No. ESB-273/2014) was issued in June 2014. An EIA for the Project was then undertaken, as part of the Assignment, in accordance with this EIA Study Brief and the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM). The location of the Project is shown ***Figure 2.1***.

2.2 Scope of the Project and Site Description

2.2.1. The Project covers the following DP elements as specified in Schedule 2 of the EIAO (Cap.499), ***Table 2.1*** summarises the DPs under this Project.

Table 2.1 Schedule 2 Designated Projects under this Project

Item	Designated Project	EIAO Reference
DP1	Sewage treatment works with an installed capacity of more than 15,000 m3 per day under Item F.1	Schedule 2, Part I,
DP2	Sewage treatment works under Item F.2 • With an installed capacity of more than 5,000 m3 per day; and • A boundary of which is less than 200m from the nearest boundary of an existing or planned residential area, educational institution and health care institution.	Schedule 2 Part I
DP3	An activity for the reuse of treated sewage effluent from a treatment plant under Item F.4	Schedule 2 Part I

DP4	Underground rock caverns under Item Q.2	Schedule 2 Part I
DP5	An explosives depot in a stand-alone, purpose built building under Item K.10	Schedule 2 Part I;
DP6	Decommissioning of an explosives depot under Item 11	Schedule 2 Part II

2.3 Project Organization and Contact Personnel

2.3.1 Drainage Services Department is the overall project controllers for the Project. For the construction phase of the Project, Project Engineer, Contractor(s), Environmental Team and Independent Environmental Checker are appointed to manage and control environmental issues.

2.3.2 The proposed project organization and lines of communication with respect to environmental protection works are shown in ***Figure 2.2***. Key personnel and contact particulars is summarized in ***Table 2.1***:

Table 2.1 Contact Details of Key Personnel

Party	Role	Post	Name	Contact No.	Contact Fax
AECOM	Engineer's Representative	Chief Resident Engineer	Mr. Peter POON	9861 8654	3914 5888
China State – Alchmex Joint Venture (DC/2020/05)	Contractor	Construction Manager	S. Y. TSZ	9078 0458	3914 5951
		Site Agent	Mr. KONG Ming, Elvis	9186 2081	
		Environmental Officer	Mr. LAM Moon Lin	9489 4641	
		Environmental Supervisor	TSANG Chiu Fat	9137 8733	
Acuity Sustainability Consulting Limited	Independent Environmental Checker (IEC)	Independent Environmental Checker (IEC)	Ir. LAW Yui Hung	2698 6833	2698 9383
Lam Environmental Services Limited	Environmental Team (ET)	Environmental Team Leader (ETL)	Mr. Ray YAN	2882 3939	2882 3331

2.4 Construction Activities

2.4.1 In the reporting month, the principal work activities of individual contracts are included as follow:

Contract no. DC/2020/05 - Relocation of Sha Tin Sewage Treatment Works to Caverns – Main Caverns Construction

- The contract was commenced on 5 July 2021
- Tree felling
- Hoarding erection
- Construction of temporary drainage system
- Haul road construction
- Slope stabilization works
- Tunneling works
- Rigid barrier construction
- Piling work
- Construction of temporary explosive magazine
- Set up the rock crushing facility

2.4.2 In coming reporting months, the scheduled construction activities of individual contracts are listed as follows:

Contract no. DC/2020/05 - Relocation of Sha Tin Sewage Treatment Works to Caverns – Main Caverns Construction

- Tree felling
- Construction of temporary drainage system
- Haul road construction
- Slope stabilization works
- Tunneling works
- Site office construction
- Rigid barrier construction
- Erection of blast cover
- Piling work
- Set up the rock crushing facility
- Site office construction
- Construction of temporary noise barrier

3 Status of Regulatory Compliance

3.1 Status of Environmental Licensing and Permitting under the Project

3.1.1. A summary of the current status on licences and/or permits on environmental protection pertinent to the Project of Contract no. DC/2020/05 is shown in ***Table 3.1***.

Table 3.1 Summary of the current status on licences and/or permits on environmental protection pertinent to the Project of Contract No. DC/2020/05

Permits and/or Licences	**Reference No.**	**Issued Date**	**Valid Period & Expiry Date** (dd-MM-yyyy to dd-MM-yyyy)	**Status**
Notification of Works Under APCO	469268	8/7/2021	N/A	
Notification of Works Under APCO (WA3 in Tsing Yi)	477699	15/3/2022	N/A	
Discharge Licence	WT00040534-2022	27/04/2022	27-04-2022 to 30/04/2027	Valid
Billing account under Waste Disposal Ordinance	7041077	22/7/2021	N/A	
Registration as a Chemical Waste Producer	5117-756-C4617-01	2/8/2021	N/A	
Construction Noise Permit	GW-RN0302-22	14/04/2022	29-04-2022 to 28-08-2022	Expired on 28-08-2022
Construction Noise Permit	GW-RN0371-22	06/05/2022	10-05-2022 to 09-08-2022	Expired on 09-08-2022
Construction Noise Permit	GW-RN0672-22	26/07/2022	10-08-2022 to 09-11-2022	Valid
Construction Noise Permit	GW-RW0486-22	12/08/2022	29-08-2022 to 28-02-2023	Valid
Construction Noise Permit	GW-RW0700-22	12/08/2022	29-08-2022 to 28-01-2023	Valid

3.2 Status of Submission under the EP-533/2017/A

3.2.1. A summary of the current status on submission for Contract no. DC/2018/05 and DC/2020/05 under EP-533/2017/A is shown in ***Table 3.2***.

Table 3.2 Summary of submission status for Contract no. DC/2018/05 and DC/2020/05 under EP-533/2017/A

EP Condition	Submission	Date of Submission
Condition 1.12	Notification of Commencement Date of Works	18 February 2019
Condition 2.1	Notification of EPD of Community Liaison Group	18 April 2019
Condition 2.12	Management Organization of Main Construction Companies	18 April 2019
Condition 2.14	Submission of Detailed Vegetation Survey Report and Protection and Transplantation Proposal	18 April 2019
Condition 2.15	Woodland Compensation Plan	26 August 2021
Condition 2.18	Submission of Landscape & Visual Mitigation and Tree Preservation Plan(s)	18 April 2019
Condition 2.2	Notification of EPD of telephone hotline	18 April 2019
Condition 2.21	Submission of Supplementary Contamination Assessment Plan (CAP)	10 September 2020
Condition 2.21	Submission of Supplementary Contamination Assessment Plan (CAP) for Sha Tin Sewage Treatment Works (For the Areas of Mechanical Workshop, Chemical Waste Area, Scrap Iron Storage Area and Chemical Waste Collection Tank, Dangerous Goods and Chemical Waste Sore, ENV-G04, ENV-G07, ENV-G14 and ENV-G28)	25 November 2021
Condition 2.22	Submission of Measures to Mitigate Traffic Noise from Ma On Shan Road	18 April 2019
Condition 3.1	Proposal for Commencement of Construction Phase Air Quality Monitoring in Phases	17 April 2019
Condition 3.1	Proposal for Alternative Sampling Method for Construction Phase Air Quality Monitoring (1-hr TSP)	16 April 2019
Condition 3.1	Proposal for Proposed Fine Adjustment for Air and Noise Monitoring Stations at Kowloon City Baptist Church Hay Nien Primary School & Updated EM&A Manual	6 March 2020
Condition 3.1	Temporary suspension of EM&A Programme during 29 Jan 2020 to 2 Feb 2020	28 February 2020
Condition 4.2	Dedicated internet website	22 May 2019
Condition 3.4	Baseline Noise Monitoring Report	11 August 2021
Condition 3.4	Baseline Air Quality Monitoring Report for the Rock Processing Plant at Ngau Kok Wan	17 August 2022

4 Monitoring Requirements

4.1 Air Monitoring

AIR QUALITY MONITORING STATIONS

4.1.1. Air monitoring stations AM1 and AM2 were setup and commencement of monitoring on 12 April 2019 while AM5 was setup and commencement of monitoring on 18 April 2019. Air quality monitoring for the station AM4 was commenced on 3 May 2019. The proposal for proposed fine adjustment for air and noise monitoring station at Kowloon City Baptist Church Hay Nien Primary School was agreed by EPD on 17 December 2020, therefore, air quality monitoring for the station AM3(B) was commenced on 18 December 2020.

4.1.2. Based on the Project baseline report, the air quality monitoring station AM3, Ma On Shan Tsung Tsin Secondary School was relocated to AM3(A), Kowloon City Baptist Church Hay Nien Primary School.

4.1.3. A change of the monitoring location in subsequent impact monitoring for AM3(A) - Kowloon City Baptist Church Hay Nien Primary School was identified necessary as access was not granted for setting up the onsite monitoring station. The new monitoring location AM3(B) – ground level of outside A Kung Kok Street Garden for impact air quality monitoring station was proposed based on the criteria as stated in section 2.2.4.2 and 2.2.4.3 of EM&A Manual by ET and approved by ER and verified by IEC and submitted to EPD for agreement on 5 September 2019. The proposal was agreed by EPD on 17 December 2020.

4.1.4. Air quality monitoring for the station AM6 was commenced on 2 November 2021 since the demolition of DSD staff quarter and ended on 31 December 2021. The proposal was verified by IEC and approved by EPD on 9 May 2019.

4.1.5. Air quality monitoring station ASR51 at WA3 was recommended in the supporting document for application for variation of Environmental Permit (EP-533/2017/A issued on 11 August 2022) and the associated air quality monitoring was commenced on 19 August 2022.

4.1.6. The air monitoring stations for the Project are listed and shown in ***Table 4.1*** and ***Figure 4.1***.

Table 4.1 Air Monitoring Station

Monitoring Station ID	Monitoring Location	Level (in terms of no. of floor)
AM1	Ah Kung Kok Fishermen Village	G/F
AM2	Block H, Kam Tai Court	Roof
AM3(B)	Outside A Kung Kok Street Garden	G/F

AM4	Wellborn Kindergarten	G/F
AM5	The Neighbourhood Advice-Action Council Harmony Manor	Roof
AM6	Seaview Villa	Roof
ASR51	The Hong Kong Yaumati Ferry Company Ltd. Administrative Building	G/F

AIR MONITORING PARAMETERS, FREQUENCY AND DURATION

4.1.7. One-hour TSP levels should be measured to indicate the impacts of construction dust on air quality.

4.1.8. The sampling frequency of at least three times in every six-days should be undertaken when the highest dust impact occurs.

4.1.9. Portable direct reading dust meter was proposed to use for 1-hour TSP level instead of HVS to undertaking the air quality monitoring for the project at the stations of AM1, AM2, AM3(A), AM4, AM5, AM6 and ASR51. The proposal was verified by IEC and submitted to EPD, the proposal has approved by EPD on 28 May 2019.

SAMPLING PROCEDURE AND MONITORING EQUIPMENT

4.1.10. Monitoring Procedures

(a) Check the calibration period of portable direct reading dust meter prior to monitoring (The direct reading dust meter was calibrated at 2-years interval and checked with High Volume Sampler (HVS) yearly.)
(b) Record the site condition near / around the monitoring stations.
(c) Install the portable direct reading dust meter to the monitoring location.
(d) Slide the power switch to turn the power on.
(e) Check of portable direct reading dust meter to ensure the equipment operation in normal condition.
(f) Select the period of measurement to 60mins.
(g) Check and set the correct time.
(h) Select the appropriate unit display for the equipment.
(i) Slide the power switch to turn the power off when the monitoring period ended (3 times 1 hour TSP monitoring per day).
(j) Uninstall the portable direct reading dust meter
(k) Collected the sampled data for analysis.
(l) Remark: Procedures (c) to (h) may be different subject to the brands and models of portable direct reading dust meter

4.1.11. Maintenance and Calibration

(a) The direct reading dust meter was calibrated at 2-years interval and checked with High Volume Sampler (HVS) yearly to determine the accuracy and validity of the

results measured.

(b) Checking of direct reading dust meter will be carried out in order to determine the conversion factor between the direct reading dust meter and the standard equipment, HVS. The comparison check is to be considered valid based on correlation coefficient checked by HOKLAS laboratory.

4.1.12. The 1-hour TSP air quality monitoring was performed by using portable direct reading dust meters at each designated monitoring station. The brand and model of the equipment are given in ***Table 4.2***.

Table 4.2 Air Quality Monitoring Equipment

Equipment	Brand and model
Portable direct reading dust meter	Met One BT- 645
	Met One Aerocet 831

4.1.13. The calibration certificates of the air quality monitoring equipment are attached in ***Appendix 4.2.*** The calibration dates in the calibration certificates for portable direct reading dust meter models Met One BT-645 and Met One Aerocet 831 are presented in "month/day/year" format.

WIND DATA

4.1.14. The representative wind data from Sha Tin HKO Automatic Weather Station was obtained covering the 1-hr TSP monitoring periods for stations of AM1, AM2, AM3(A), AM4, AM5 & AM6. And wind data from Tsing Yi HKO Automatic Weather Station was obtained covering the 1-hr TSP monitoring periods for station of ASR51. The wind data were extracted and shown in ***Appendix 4.3***.

EVENT AND ACTION PLAN

4.1.15. The Action and Limit levels for construction air quality are defined in ***Table 4.3*** and ***Appendix 4.1***. Should non-compliance of the air quality criteria occur, action in accordance with the Event and Action Plan in ***Appendix 7.1*** shall be carried out.

Table 4.3 Action and Limit Level for Air Quality Monitoring

Monitoring Locations	1-hour TSP Level in µg/m3	
	Action Level	Limit Level
AM1	294	500
AM2	325	500

AM3(B)	360	500
AM4	297	500
AM5	349	500
AM6	317	500
ASR51	310	500

4.2 Noise Monitoring

NOISE MONITORING STATIONS

4.2.1. Noise monitoring stations CM4 and CM5 were setup and commencement of monitoring on 13 April 2019 and 18 April 2019 respectively. Noise monitoring for stations CM1 and CM3 were commenced on 2 May 2019. The proposal for proposed fine adjustment for air and noise monitoring station at Kowloon City Baptist Church Hay Nien Primary School was agreed by EPD on 17 December 2020, therefore, noise monitoring for station CM2(B) was commenced on 18 December 2020. Noise monitoring for stations DM1, DM2 and DM3 were commenced on 2 November 2021 and ended on 31 December 2021.

4.2.2. Based on the Project baseline report, the noise monitoring station CM2, Ma On Shan Tsung Tsin Secondary School was relocated to CM2(A), Kowloon City Baptist Church Hay Nien Primary School.

4.2.3. A change of the monitoring location in subsequent impact monitoring for CM2(A) - Kowloon City Baptist Church Hay Nien Primary School was identified necessary as access was not granted for setting up the onsite monitoring station. The new monitoring location CM2(B) – ground level of outside A Kung Kok Street Garden for impact air quality monitoring station was proposed based on the criteria as stated in section 2.2.4.2 and 2.2.4.3 of EM&A Manual by ET and approved by ER and verified by IEC and submitted to EPD for agreement on 5 September 2019. The proposal was agreed by EPD on 17 December 2020.

4.2.4. The noise monitoring stations for the Project are listed and shown in ***Table 4.4*** and ***Figure 4.2.***

Table 4.4 Noise Monitoring Station

Monitoring Station ID	Monitoring Location	Measurement Type	Level (in terms of no. of floor)
CM1	Wellborn Kindergarten	Free field	G/F
CM2(B)	Outside A Kung Kok Street Garden	Free field	G/F
CM3	S.K.H. Ma On Shan Holy Spirit Primary School	Façade	Roof

CM4	Ah Kung Kok Fishermen Village	Free field	G/F
CM5	The Neighbourhood Advice-Action Council Harmony Manor	Façade	Roof
DM1	Seaview Villa	Free field	G/F
DM2	Racecourse Gardens	Free field	G/F
DM3	S.K.H. Ma On Shan Holy Spirit Primary School	Façade	Roof

NOISE MONITORING PARAMETERS, FREQUENCY AND DURATION

4.2.5. Noise monitoring shall be carried out at all the designated monitoring stations. The monitoring frequency shall depend on the scale of the construction activities. The following is an initial guide on the regular monitoring frequency for each station on a weekly basis when noise generating activities are underway:

- One set of measurements between 0700-1900 hours on normal weekdays;
- One set of measurements between 1900-2300 hours;
- One set of measurements between 2300-0700 hours of next day; and
- One set of measurements between 0700-2300 hours on holidays (six consecutive Leq/5min readings).

4.2.6. If construction works are extended to include works during the hours of 1900-0700, additional weekly impact monitoring shall be carried out during evening and night-time works for the latter 3 sets of measurements specified in Section 4.2.4 above, one set of measurements shall at least include 6 consecutive Leq (5min) results.

4.2.7. Additional weekly noise monitoring from 19:00 to 23:00 was carried out at CM4 on 3, 18, 23, and 31 August 2022 with respect to the restricted hour works under CNP GW-RN0371-22, GW-RN0302-22, GW-RN0672-22 and GW-RN0700-22. All the results are within the baseline level range after baseline correction. No noise monitoring was conducted from 8-13 August 2022 due to raining.

4.2.8. Additional weekly night time noise monitoring from 23:00 to 07:00 on next day was carried out at CM4 on 3, 18, 23, and 31 August 2022 with respect to the restricted hour works under CNP GW-RN0371-22, GW-RN0302-22, GW-RN0672-22 and GW-RN0700-22. All the results are within the baseline level range after baseline correction. No noise monitoring was conducted from 8-13 August 2022 due to raining.

4.2.9. No action or limit level exceedance was determined in the reporting period for the stations of CM1, CM2(B), CM3, CM4 and CM5.

4.2.10. Supplementary information for data auditing, statistical results such as L10 and L90 shall also be obtained for reference.

4.2.11. If a school exists near the construction activity, noise monitoring shall be carried out at the monitoring stations for the schools during the examination periods. The ET leader shall liaise with the school's personnel and the examination authority to ascertain the exact dates and times of all examination periods during the course of the contract.

MONITORING EQUIPMENT

4.2.12. Noise monitoring was performed using sound level meter at the designated monitoring locations. The sound level meters shall comply with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator shall be deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in ***Table 4.5***.

Table 4.5 Noise Monitoring Equipment

Equipment	Brand and Model
Integrated Sound Level Meter	Nti XL2
Acoustic Calibrator	Larson Davis CAL200

4.2.13. The calibration certificates of the noise monitoring equipment are attached in ***Appendix 4.2***.

SAMPLING PROCEDURE AND MONITORING EQUIPMENT

4.2.14. Monitoring Procedure

(a) The monitoring station shall normally be at a point 1m from the exterior of the sensitive receiver's building façade and be at a position 1.2m above the ground.

(b) Façade measurements were made at the monitoring locations. For free-field measurement, a correction factor of +3 dB (A) would be applied.

(c) The battery condition was checked to ensure the correct functioning of the meter.

(d) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:

(e) Frequency weighting: A, Time weighting: Fast, Measurement time set: continuous 5 mins

(f) Prior and after to the noise measurement, the meter was checked using the acoustic calibrator for 94dB (A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than ±1 dB (A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.

(g) Noise measurements shall not be made in fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

4.2.15. Maintenance and Calibration

(a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.

(b) The sound level meter and calibrator were calibrated at yearly intervals.

EVENT AND ACTION PLAN

4.2.16. Noise Standards for Daytime Construction Activities are specified under EIAO-TM. The Action and Limit levels for construction noise are defined in ***Table 4.6*** and ***Appendix 4.1***. Should non-compliance of the criteria occurs, action in accordance with the Event and Action Plan in ***Appendix 7.1*** shall be carried out.

Table 4.6 Action and Limit Level for Noise Monitoring

Monitoring Station	Action Level	Limit Level (dB(A))		
		0700-1900 hrs on normal weekdays	0700-2300 hrs on holidays (including Sundays); and 1900-2300 hrs on all days [2]	2300-0700 hrs of all days [2]
CM1	When one documented complaint is received	65 / 70 [1]	60 / 65 / 70 [3]	45 / 50 / 55 [3]
CM2(B)		65 / 70 [1]		
CM3		65 / 70 [1]		
CM4		75		
CM5		75		
DM1		75		
DM2		75		
DM3		65 / 70 [1]		

Remark 1: Limit level of CM1, CM2(B), CM3 and DM3 reduce to 65 dB (A) during examination periods if any.

Remark 2: Construction noise during restricted hours is under the control of Noise Control Ordinance Limit Level to be selected based on Area Sensitivity Rating.

Remark 3: Limit Level for restricted hour monitoring shall act as reference level only. Investigation would be conducted on CNP compliance if exceedance recorded during restricted hour noise monitoring period.

5. Monitoring Results

5.0.1 The environmental monitoring will be implemented based on the division of works areas of each designed projects. Overall layout showing work areas and monitoring stations is shown in ***Figure 2.1*** and ***Figure 4.1- 4.2*** respectively**.**

5.0.2 The environment monitoring schedules for reporting month and coming month are presented in ***Appendix 5.1*****.**

5.1 Air Monitoring Results

5.1.1 1-hour TSP monitoring was conducted at AM1, AM2, AM3(B), AM4, AM5 and ASR51 in the reporting month.

5.1.2 No action or limit level exceedance was determined in the reporting period at stations of AM1, AM2, AM3(B), AM4, AM5 and ASR51.

5.1.3 Air quality monitoring results measured in this reporting period for AM1, AM2, AM3(B), AM4, AM5 and ASR51 are reviewed and summarized. Details of air monitoring results and graphical presentation can be referred in ***Appendix 5.2.***

5.2 Noise Monitoring Results

5.2.1 Noise monitoring was conducted at CM1, CM2(B), CM3, CM4 and CM5 in the reporting month.

5.2.2 Additional weekly noise monitoring from 19:00 to 23:00 was carried out at CM4 on 3, 18, 23, and 31 August 2022 with respect to the restricted hour works under CNP GW-RN0371-22, GW-RN0302-22, GW-RN0672-22 and GW-RN0700-22. All the results are within the baseline level range after baseline correction. No noise monitoring was conducted from 8-13 August 2022 due to raining.

5.2.3 Additional weekly night time noise monitoring from 23:00 to 07:00 on next day was carried out at CM4 on 3, 18, 23, and 31 August 2022 with respect to the restricted hour works under CNP GW-RN0371-22, GW-RN0302-22, GW-RN0672-22 and GW-RN0700-22. All the results are within the baseline level range after baseline correction. No noise monitoring was conducted from 8-13 August 2022 due to raining.

5.2.4 No action or limit level exceedance was determined in the reporting period for the stations of CM1, CM2(B), CM3, CM4 and CM5.

5.2.5 Noise monitoring results measured in this reporting period for CM1, CM2(B), CM3, CM4 and CM5 are reviewed and summarized. Details of noise monitoring results and graphical presentation can be referred in ***Appendix 5.3***.

5.3 Waste Management

5.3.1 The quantities of waste for disposal for the Contract no. DC/2020/05 in the Reporting Period are summarized in ***Table 5.1***. The Monthly Summary Waste Flow Table for the Contract DC/2020/05 are shown in ***Appendix 5.5***. Whenever possible, materials were reused on-site as far as practicable.

Table 5.1 Details of Waste Disposal for Contract no. DC/2020/05

Waste Type	**Quantity this month**	**Cumulative Quantity-to-Date**	**Disposal / Dumping Grounds**
Inert C&D materials disposed**, m³**	998	10915	Fill Bank at Tuen Mun Area 38
	22,689	99,395	Lam Tei Quarry (Alternative Disposal Ground)
Inert C&D materials recycled**, m³**	0	664	Fill Bank at Tuen Mun Area 38 (Broken concrete)
Non-inert C&D materials disposed**, tonne**	50.60	608.34	SENT
Non-inert C&D materials recycled**, kg**	350	600	Golden Sino Management Limited (Waste Paper)
	0	230	Golden Sino Management Limited (Plastic)
	0	148,399	Golden Sino Management Limited (Metals)
Chemical waste disposed, **L**	0	0	Collected by licensed chemical collector: Ecospace Limited (Spent Lube Oil)
Asbestos waste disposed, **kg**	0	560	WENT

6. Land Contamination

6.1 Remediation report (RR) for Ex-Sha Tin Vehicle Detention Centre (VDC) was accepted by EPD on 23 April 2021 and placed in the EIAO Register Office for public information.

6.2 The confirmatory sampling for DSD staff quarter at existing STSTW was completed.

6.3 Land decontamination work for the DSD staff quarter at existing STSTW started on 16 June 2021, the Remediation Report was submitted to EPD for approval on 9 September 2021.

6.4 The Remediation Report was accepted by EPD on 8 November 2021.

7. Compliance Audit

7.0.1. The Event Action Plan for construction noise, air quality are presented in ***Appendix 7.1***.

7.0.2. The summary of exceedance is presented in ***Appendix 7.2***.

7.1 Air Monitoring

7.1.1 No action or limit level exceedance was determined in the reporting period at stations of AM1, AM2, AM3(B), AM4, AM5 and ASR51.

7.2 Noise Monitoring

7.2.1 Additional weekly noise monitoring from 19:00 to 23:00 was carried out at CM4 on 3, 18, 23, and 31 August 2022 with respect to the restricted hour works under CNP GW-RN0371-22, GW-RN0302-22, GW-RN0672-22 and GW-RN0700-22. All the results are within the baseline level range after baseline correction. No noise monitoring was conducted from 8-13 August 2022 due to raining.

7.2.2 Additional weekly night time noise monitoring from 23:00 to 07:00 on next day was carried out at CM4 on 3, 18, 23, and 31 August 2022 with respect to the restricted hour works under CNP GW-RN0371-22, GW-RN0302-22, GW-RN0672-22 and GW-RN0700-22. All the results are within the baseline level range after baseline correction. No noise monitoring was conducted from 8-13 August 2022 due to raining.

7.2.3 No action or limit level exceedance was determined in the reporting period for the stations of CM1, CM2(B), CM3, CM4 and CM5.

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

7.3.1 No environmental non-compliance was recorded in the reporting month.

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

7.4.1 There was no particular action taken since no non-compliance was recorded in the reporting period.

8. Environmental Site Audit

8.0.1. The Environmental Team (ET) conducted weekly site inspections for the Contract on 4, 11, 12, 18, 24 and 26 August 2022. IEC attended the joint site inspection on 12, 24 and 26 August 2022.

Table 8.1 Summary of Environmental Inspections for Contract no. STW 01/2021

Item	Date	Reminders/Observations	Action taken by Contractor	Outcome
NIL	04-8-2022	NIL	NIL	NIL
20220811_01Env_C2	11-8-2022	R1: Rubbish should be placed in container. (Portion 6)	Rectified.	Completion as observed on 18 August 2022 during site inspection.
NIL	12-8-2022	NIL	NIL	NIL
20220818_01Env_C2	18-8-2022	Obs 1: Idled stockpile should be properly covered. (Portion 6)	Rectified.	Completion as observed on 26 August 2022 during site inspection.
20220824_01Env_C2 20220824_02Env_C2	24-8-2022	Obs 1: Drip tray should be provide for chemical containers. (WA3) R1: The Contractor was reminded to display the VEP at the site entrance (WA3)	Rectified.	Completion as observed on 1 September 2022 during site inspection.
NIL	26-8-2022	NIL	NIL	NIL

Remark: C2 refers to contract No. DC/2020/05

8.0.2. Within this reporting month, bi-weekly landscape site audits were conducted on 4, 18 and 30 August 2022.

Table 8.2 Summary of Landscape Inspections for Contract no. STW 01/2021

Item	Date	Reminders/Observations	Action taken by Contractor	Outcome
NIL	04-08-2022	NIL	NIL	NIL
NIL	18-08-2022	NIL	NIL	NIL
NIL	30-08-2022	NIL	NIL	NIL

8.0.3. Within this reporting month, monthly ecology site audits were conducted on 30 August 2022.

8.0.4. Table 8.3 Summary of Ecology Inspections for Contract no. STW 01/2021

Item	Date	Reminders/Observations	Action taken by Contractor	Outcome
20220830_01Eco	30-8-2022	300 *Diospyros vaccinioides* seedlings have been planted at "Portion 12: RMZ3 downhill" (germinated at nursery), remaining 2700 nos. will be planted according to stock arrival. Frequent watering is reminded for reducing loss due to heat stress.	Keep regular watering on the DV.	On going

9. Complaints, Notification of Summons and Prosecution

9.0.1. A public complaint suspecting improper operation of mineral works without relevant environmental permits/licenses and dust mitigation measures at WA3 referred by the Contractor was received by ET on 17 August 2022.

9.0.2. The complaint was made via email to the relevant authorities, including Environmental Protection Department (EPD) and Drainage Services Department (DSD), on 16 August 2022, the complainant suspected a mineral site near Tsing Yi North Coastal Road and Ting Kau Bridge was in operation without relevant environmental permits/licenses, the complainant also stated no dust mitigation measures, such as covering and water spraying for dusty stockpile and conveyor belts; and provision of wheel washing facility, were implemented based on his observation.

9.0.3. The location where the complaint refers to is one of the works areas for the Project (i.e. WA3 at Ngau Kok Wan, Tsing Yi) for the proposed rock crushing operation as the location for such operation under the Environmental Permit (EP) (EP-533/2017/A) issued on 11 August 2022, and the Specified Process License (SPL) for the category of mineral works (stone crushing works) under Air Pollution Control (Specified Processes) Regulations for such operation has been applied since April 2022 and the associated application result was pending from EPD at the time of the complaint received.

9.0.4. The works activities at WA3 between 12 and 17 August 2022 were reviewed. As advised by the Contractor, the works activities undertaken during the period mainly included i) assembly and adjustment of the rock crushing machineries; ii) provision of training for workers on the operation of machineries for rock crushing activities; and iii) import of rocks from the main site (i.e. works areas of Cavern at Ma On Shan) on land logistics by dump trucks for construction of a loading platform and temporary storage at WA3. Relevant mitigation measures for air quality impacts were implemented on site during the period including i) water spraying on haul roads; ii) water spraying for the temporary stockpile of dusty materials; iii) covering dusty materials with use of impervious sheeting; and iv) installation of dust enclosure and misting system for conveyor systems, etc. In addition, regular site inspections were carried out by the ET at WA3 on 12 and 17 August 2022, with no particular observations associated with air quality recorded and wheel washing facilities were in place for subsequent use, during the site inspections except a verbal reminder on proper covering for the stockpiles being idle on site was given to the Contractor on 17 August 2022 for improvement.

9.0.5. As referred to the Air Pollution Control Plan (APCP) attached to the application of SPL, the proposed rock crushing operation with maximum output capacity of 1,400 tonnes per hour by two operation lines (i.e. output capacity of 700 tonnes per hour for each) for the rocks being processed as aggregates of about 3M tonnes was mentioned and 12 hours a day (7:00 to

19:00) was assumed for the rock crushing operation taken in the air quality modelling assessment except Sundays and public holidays whereas, as advised by the Contractor, about 2,000 tonnes of rock were processed in the training sessions for the workers during the period (i.e. 12 to 17 August 2022), which is below the allowed maximum output for the rock crushing operation (i.e. 100,800 tonnes) during the period. Moreover, relevant monitoring data in relation to suspended particulates were not available for review as a result of the fact that the application result for SPL is pending from EPD and actual rock crushing operation has not been commenced at the time of the complaint received such that the corresponding total suspended particulates (TSP) and respirable suspended particulates as required by the SPL, and 1-hr TSP as recommended in the Environmental Review Report (ERR) for the application of variation of EP (i.e. EP-533/2017/A), respectively, had not been monitored at the time of the complaint received.

9.0.6. Based on the investigation above, the works activities at WA3 did not result in any unacceptable environmental impacts to the surrounding environment as reviewed with the relevant environmental requirements under EP-533/2017/A and the associated APCP for application of SPL for the Project.

9.0.7. Though works activities at WA3 did not result in any unacceptable environmental impacts to the surrounding environment, the Contractor was reminded to properly maintain the implementation of recommended mitigation measures for air quality impacts as recommended in the approved EIA Report, EP (i.e. EP-533/2017/A), the Updated EM&A Manual and/or ERR/APCP for the Project, and all mitigation measures as stated in the APCP for obtaining the SPL approved by EPD.

9.0.8. An *ad-hoc* site inspection was also carried out by the ET at WA3 on 19 August 2022 noting that fugitive dust emission was observed during breaking of artificial hard material by a backhoe equipped with hydraulic breaker without effective mitigation measures for air quality impacts (e.g. water spraying) implemented properly, and the Contractor was subsequently reminded to follow up on this for improvement. The ET will continue carrying out site inspections on a regular basis to check that appropriate environmental protection and pollution control mitigation measures are properly implemented in accordance with the environmental documents mentioned.

9.0.9. No notification of summons and successful prosecutions was received in the reporting month.

9.0.10. The details of cumulative complaint log and updated summary of complaints are presented in ***Appendix 9.1***.

9.0.11. Cumulative statistic on complaints and successful prosecutions are summarized in ***Table 9.1*** and ***Table 9.2*** respectively.

Table 9.1 Cumulative Statistics on Complaints

Reporting Period	No. of Complaints
August 2022	1
Total	**6**

Table 9.2 Cumulative Statistics on Successful Prosecutions

Environmental Parameters	Cumulative No. Brought Forward	No. of Successful Prosecutions this month (Offence Date)	Cumulative No. Project-to-Date
Air	-	0	0
Noise	-	0	0
Waste	-	0	0
Total	**-**	**0**	**0**

10. Conclusion

10.0.1. The EM&A programme was carried out in accordance with the EM&A Manual requirements, minor alterations to the programme proposed were made in response to changing circumstances.

10.0.2. The scheduled construction activities and the recommended mitigation measures for the coming month are listed in ***Table 10.1***. The construction programmes of the Project are provided in ***Appendix 10.1***.

Table 10.1 Construction Activities and Recommended Mitigation Measures in Coming Reporting Month

Contract No.	Key Construction Works	Recommended Mitigation Measures
DC/2020/05	• Tree felling • Construction of temporary drainage system • Haul road construction • Slope stabilization works • Tunneling works • Site office construction • Rigid barrier construction • Erection of blast cover • Piling work • Set up the rock crushing facility • Site office construction • Construction of temporary noise barrier	• Dust control during dust generating works; • Implementation of proper noise pollution control; • Provision of protection to ensure no runoff out of site area or direct discharge into public drainage system; • Direct impact to plant species of conservation importance recorded in the vicinity of the construction sites shall be avoided; • Excavation materials shall be well covered; and • Mitigation measures to dust and noise control should be provided to construction of noise barrier, bored piling, Installation of noise barrier.

Figure 2.1

Project Layout

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

LEGEND:

- PROJECT BOUNDARY
- EXISTING EMERGENCY SUBMARNIE OUTFALL
- CAVERNS OF RELOCATED SHA TIN SEWAGE TREATMENT WORKS (UNDERGROUND)
- MAIN PORTAL AREA
- SECONDARY PORTAL AREA
- EXISTING SHA TIN SEWAGE TREATMENT WORKS
- TEMPORARY WORKS AREA
- AH KUNG KOK SHAN ROAD SURFACE MAGAZINE SITE WITH ACCESS ROAD

N

838800 E

840000 E

841200 E

830400 N

829200 N

828000 N

SHA TIN HOI

TAI SHUI HANG

NUI PO SHAN

LUK CHAU AU

SHING MUN RIVER CHANNEL

KAU TO HANG

MA ON SHAN ROAD

渡輪碼頭 Ferry Pier

沙田馬場 Sha Tin Racecourse

亞公角漁民新村 Ah Kung Kok Fishermen Village

亞公角 A KUNG KOK

沙田醫院 Shatin Hospital

突破青年村 Breakthrough Youth Village

碧濤花園 Pictorial Garden

香港體育學院 Hong Kong Sports Institute

翠湖花園 Garden Vista

濱景花園 Ravana Garden

彭福公園 Penfold Park

皓朗山莊 Double Haven

Windsor Park

Sewage Treatment Works

Lookout

Oceanaire

Ocean View

La Costa

Sausalito

Mountain Shore

Kam Tai Court

Kam On Court

Yan On Estate

Hang On Estate

Chevalier Garden

Mui Tsz Lam

Water Tunnel

Royal Ascot

Jubilee Garden

Ser Res

AECOM

PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT
業主

渠務署
Drainage Services Department

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
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SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核查

STATUS
階段

SCALE 比例
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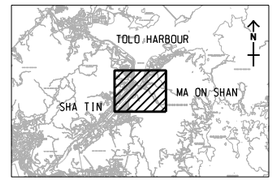
DIMENSION UNIT 尺寸單位
METRES

KEY PLAN 索引圖 A3 1 : 500000



PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE 圖紙名稱
LOCATION PLAN OF THE PROJECT

SHEET NUMBER 圖紙編號
60334056/EM&A/1.01

Plot File by: PENGW 2016/5/24
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ISO A1 594mm x 841mm

Approved: RCYK

Checked: EPCY

Designer: JCWL

Project Management Initials:

25-January-2021

Plot File by: Chanws

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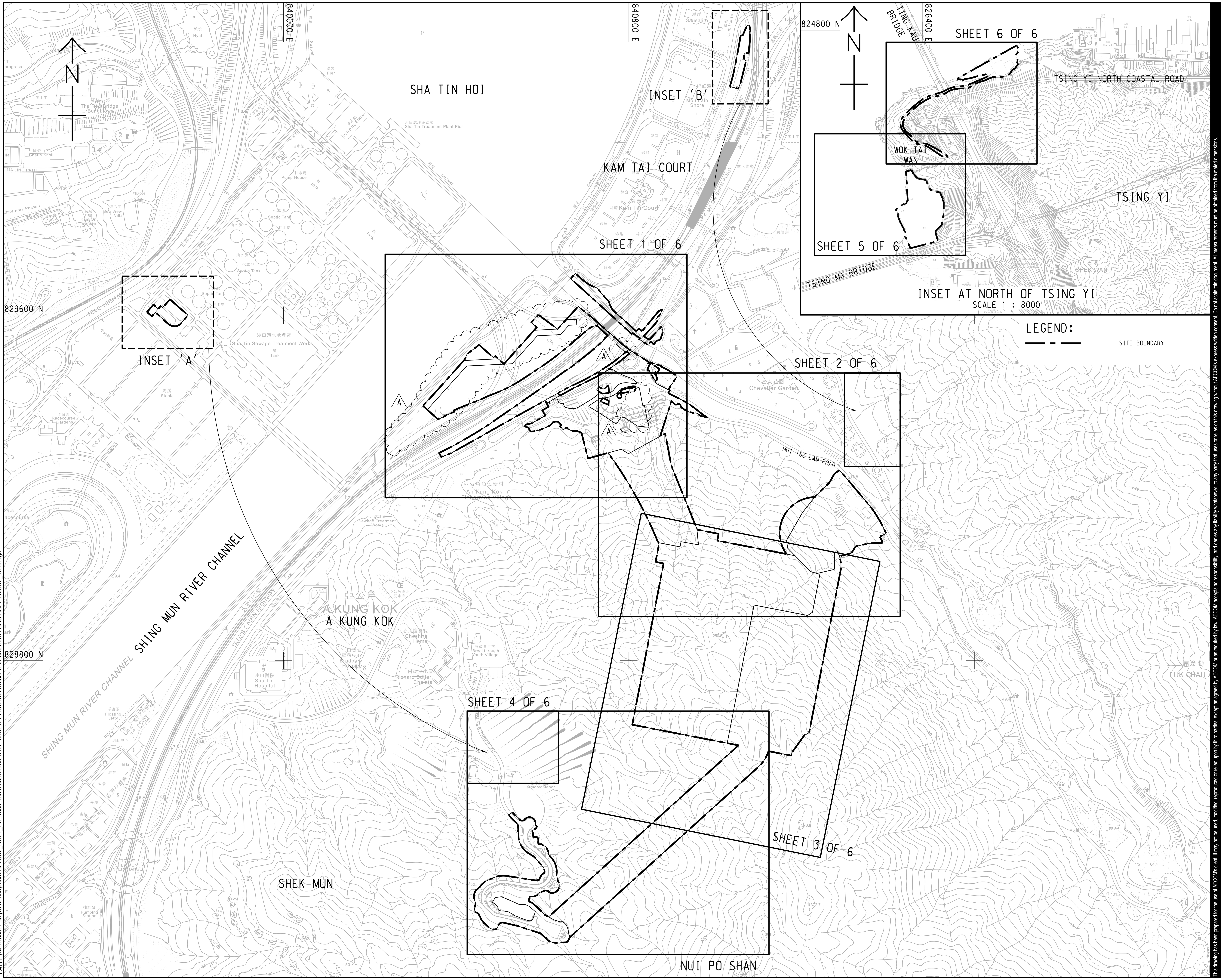

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PROJECT 項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS

CONTRACT TITLE
RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS - MAIN CAVERNS CONSTRUCTION

CLIENT 業主

渠務署
Drainage Services Department

CONSULTANT 工程顧問公司

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ISSUE/REVISION 修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 複核
A	JAN. 21	TENDER ADDENDUM NO. 3	EPCY
-	NOV. 20	TENDER DRAWING	EPCY

STATUS 階段

SCALE 比例 A1 1 : 4000

DIMENSION UNIT 尺寸單位 METRES

KEY PLAN 索引圖

PROJECT NO. 項目編號 60334056

CONTRACT NO. 合約編號 DC/2020/05

SHEET TITLE 圖紙名稱

PORTION OF SITE
- KEY PLAN

SHEET NUMBER 圖紙編號

60334056/C2/1040A

Figure 2.2

Project Organization Chart

Project Organization Chart

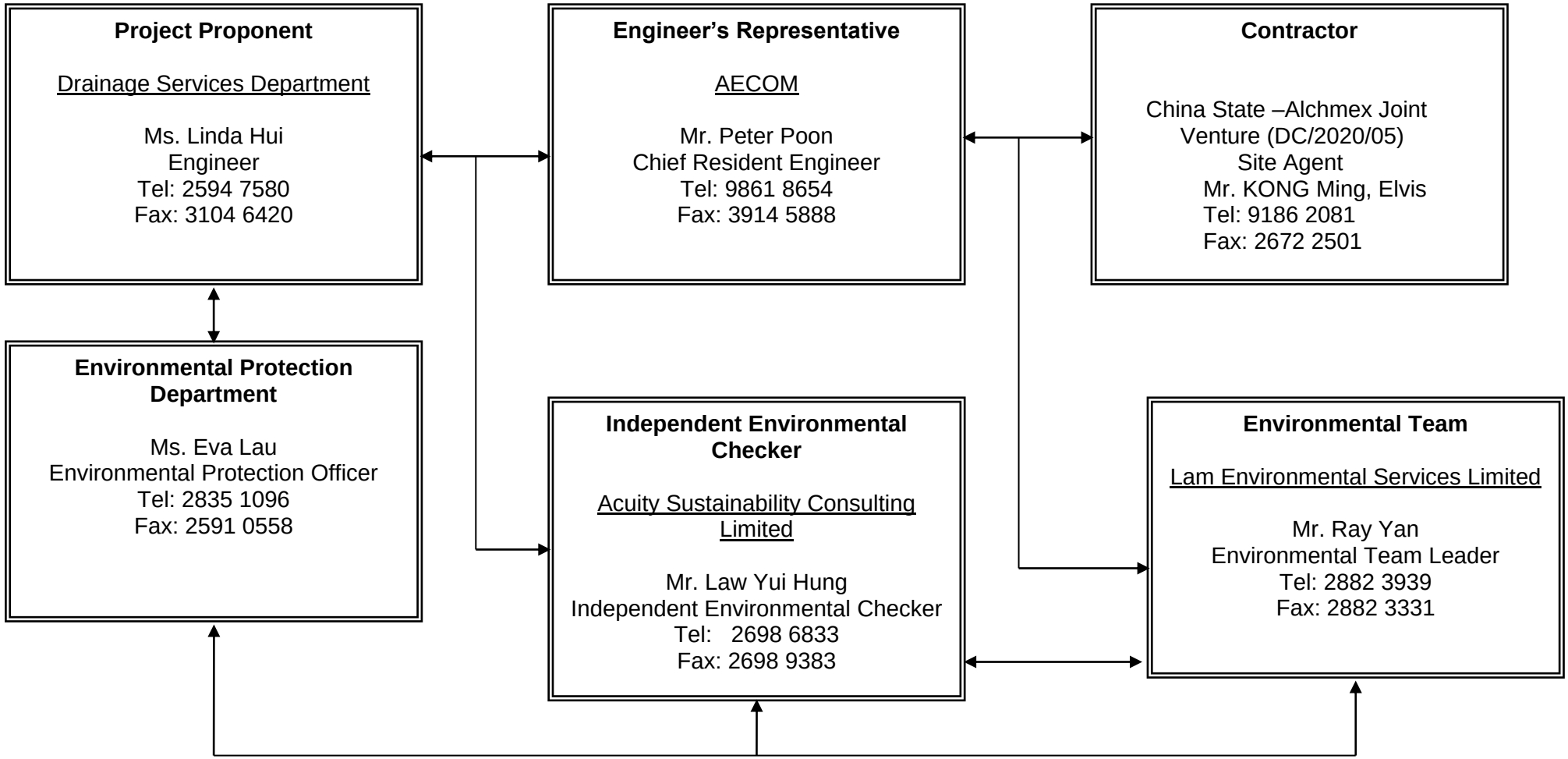
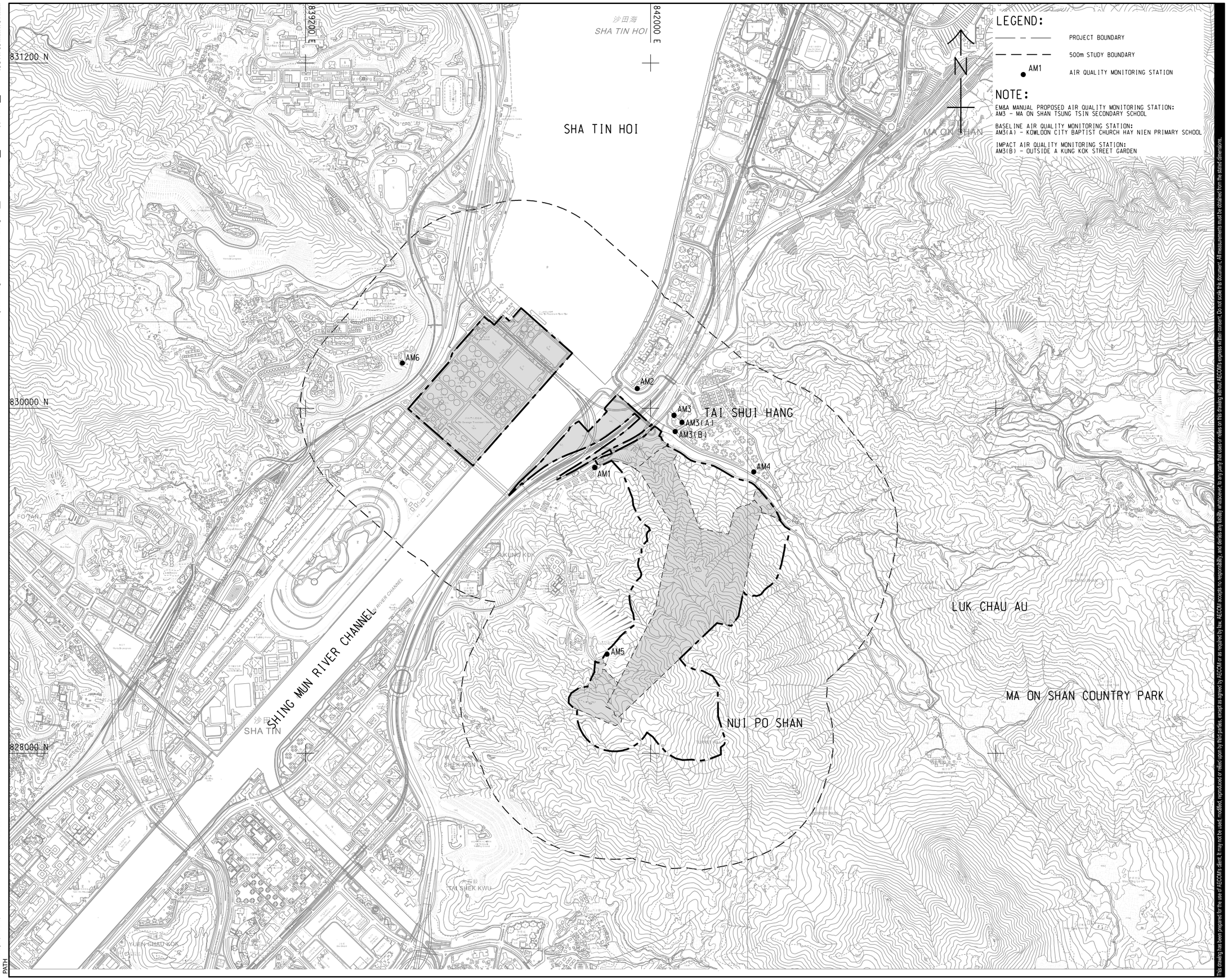


Figure 4.1 to Figure 4.3

Locations of Monitoring Stations



ISO A1 594mm x 841mm

Approved:__

Checked:__

Designer:__

Project Management Initials:

9/2/2020

Plot File by: $USER$
PATH

AECOM

PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT
業主

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Drainage Services Department

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ISSUE/REVISION
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I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 較核

STATUS
階段

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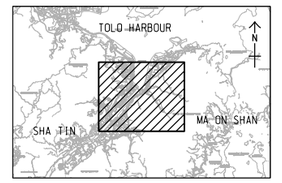
DIMENSION UNIT 尺寸單位
METRES

KEY PLAN A3 1 : 400000
索引圖



PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

LOCATION OF AIR QUALITY MONITORING STATION DURING CONSTRUCTION PHASE

SHEET NUMBER
圖紙編號

60334056/EM&A/2.01

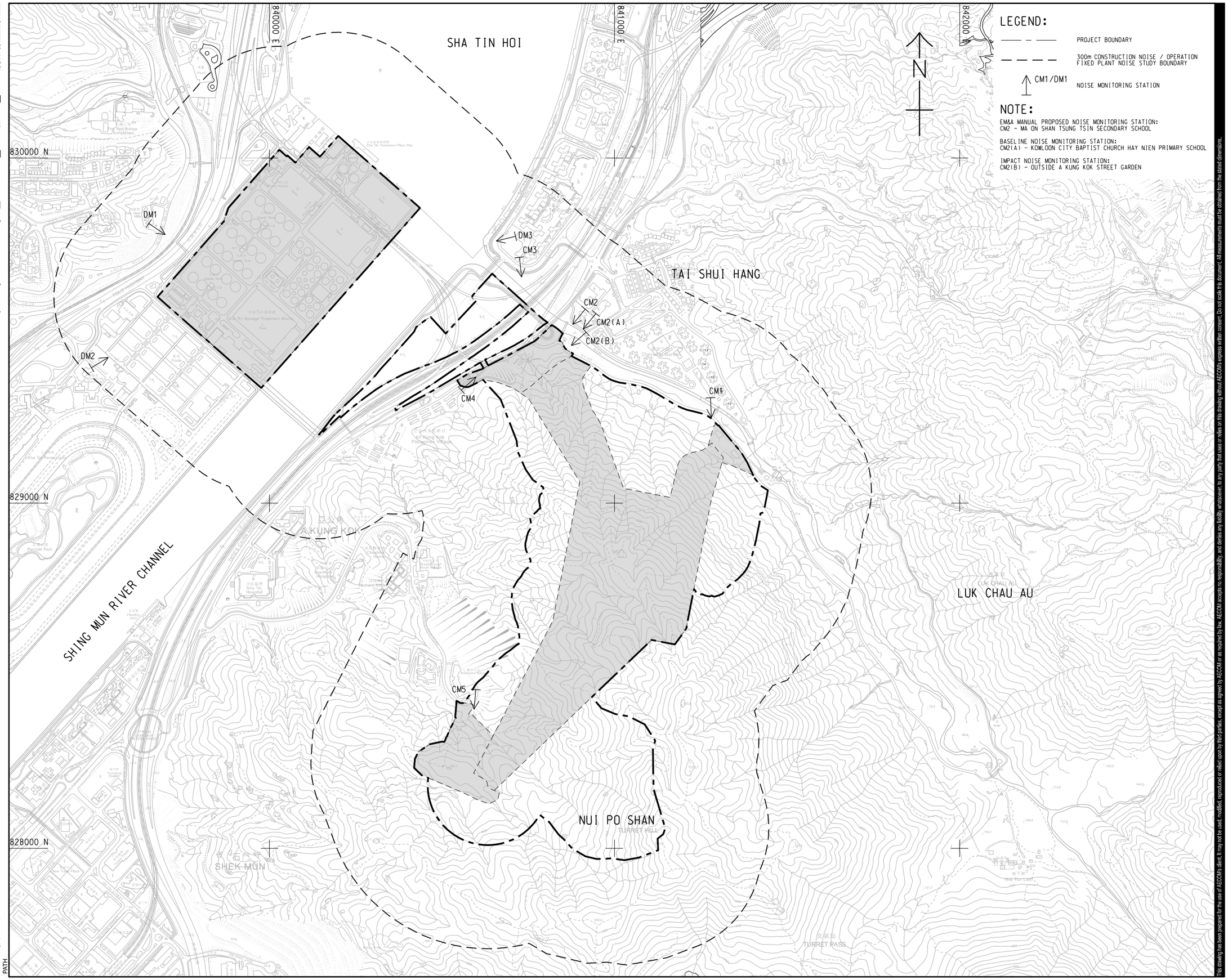
ISO A1 594mm x 841mm

Approved:__

Checked:__

Designer:__

Project Management Initials:



9/2/2020

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AECOM

PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT
業主

渠務署
Drainage Services Department

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ISSUE/REVISION
修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容簡報	CHK. 核准

STATUS
狀況

SCALE 比例
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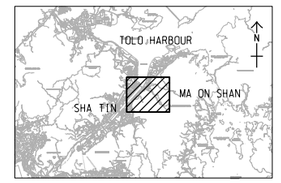
DIMENSION UNIT 尺寸單位
METRES

KEY PLAN 索引圖 A3 1 : 500000



PROJECT NO. 項目編號
60334056

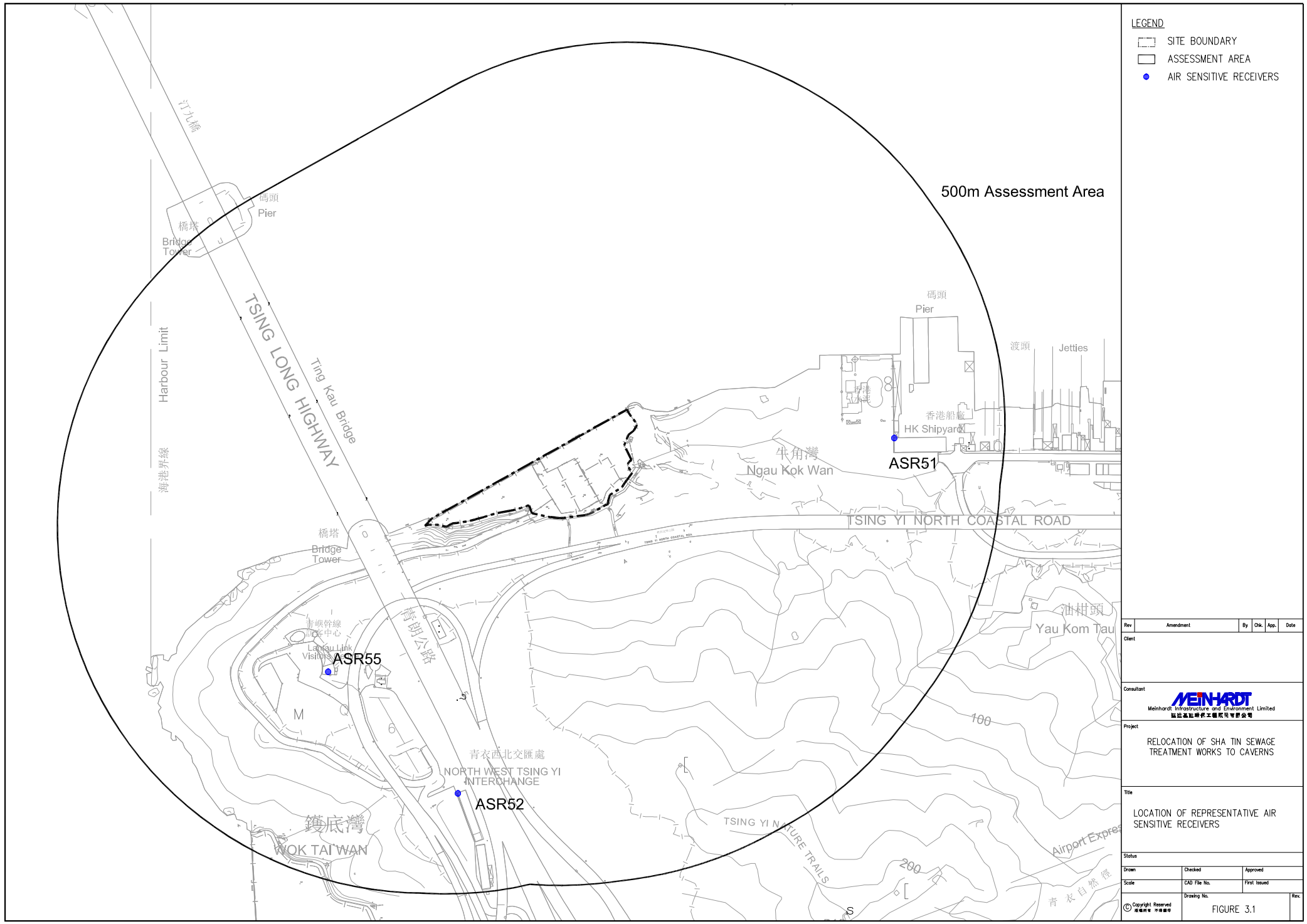
CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

LOCATION OF CONSTRUCTION PHASE TRAFFIC NOISE MONITORING STATION

SHEET NUMBER
圖紙編號

60334056/EM&A/3.01


500m Assessment Area
LEGEND
SITE BOUNDARY
ASSESSMENT AREA
AIR SENSITIVE RECEIVERS
ASR51
ASR52
ASR55
TSING LONG HIGHWAY
Ting Kau Bridge
Harbour Limit
TSING YI NORTH COASTAL ROAD
NORTH WEST TSING YI INTERCHANGE
WOK TAI WAN
Ngau Kok Wan
Yau Kom Tau
HK Shipyard
Pier
Jetties
Bridge Tower
TSING YI NATURE TRAILS
Airport Express
RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS
LOCATION OF REPRESENTATIVE AIR SENSITIVE RECEIVERS
FIGURE 3.1

Appendix 1.1
Ecological Monitoring Report

CONTRACT NO. STW 01/2021

ENVIRONMENTAL TEAM FOR

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS – SITE PREPARATION

AND ACCESS TUNNEL CONSTRUCTION

UNDER ENVIRONMENTAL PERMIT NO. EP-533/2017/A

37th ECOLOGICAL MONITORING REPORT

AUGUST 2022

Contents

1. Recommendation on plant species of conservation importance under approved protection and transplantation proposal

1.1.1. According to the latest approved Protection and Transplantation Proposal (ver. 9.2), four out of six recorded plant species of conservation importance are to be transplanted. The relevant information of the plant species were summarized in **Table 1, Table 2 and figure 1-4**. Base on the ongoing detailed design of the Project, the details of approved Protection and Transplantation Proposal and ecological monitoring will be updated in stages subject to further changes.

Table 1. Recommendations (by Site) on the recorded plant species of conservation importance (Approved Protection and Transplantation Proposal Version 9.2)

Common Name	Species Name	Units	Recommendations				
			Retain	Transplant	Fell	Total (in Project Boundary)	Compensatory Planting in Temporary Works Area
Adopted from previously approved Protection and Transplantation Proposal Version 9.2							
Site 1							
Small Persimmon	*Diospyros vaccinioides*	No.	930	350	4810	6090	Seedlings + Broadcast Seeding
Luofushan Joint-fir	*Gnetum luofuense*	m^2	270	0	1660	1930	Seedlings
Purple Bulb Orchid	*Ania hongkongensis*	No.	4	1	0	5	N/A
Site 2							
Small Persimmon	*Diospyros vaccinioides*	No.	3240	250	4050	7540	Seedlings + Broadcast Seeding
Luofushan Joint-fir	*Gnetum luofuense*	m^2	750	0	3230	3980	Seedlings
Hong Kong Eagle's Claw	*Artabotrys hongkongensis*	No.	0	0	1	1	1 Seedling
Butulang Canthium	*Canthium dicoccum*	No.	6	3	5	14	5 Whip Trees

Common Name	Species Name	Units	Recommendations				
			Retain	Transplant	Fell	Total (in Project Boundary)	Compensatory Planting in Temporary Works Area
Lamb of Tartary	*Cibotium barometz*	No.	860	61	30	951	No suitable habitat for compensatory planting
Buttercup Orchid	*Spathoglottis pubescens*	No.	0	16	1	17	Difficult to propagate from seed & not available in market
Site 3							
Small Persimmon	*Diospyros vaccinioides*	No.	4510	100	8250	12860	Seedlings + Broadcast Seeding
Luofushan Joint-fir	*Gnetum luofuense*	m^2	990	0	1990	2980	Seedlings
Butulang Canthium	*Canthium dicoccum*	No.	0	0	4	4	4 Whip Trees
Lamb of Tartary	*Cibotium barometz*	No.	101	7	50	158	No suitable habitat for compensatory planting
Incense Tree	*Aquilaria sinensis*	No.	0	1	0	1	N/A

Table 2. Recommendations on the recorded plant species of conservation importance (Approved Protection and Transplantation Proposal Version 9.2)

Common Name	Species Name	Units	Recommendations				
			Retain	Transplant	Fell	Total	Compensatory Planting in Temporary Works Area
Adopted from previously approved Protection and Transplantation Proposal Version 9.2							
Small Persimmon	*Diospyros vaccinioides*	No.	8680	700	17110	26490	Seedlings (17,110)
Luofushan Joint-fir	*Gnetum luofuense*	m^2	2010	0	6680	8890	Seedlings (22 locations at 50m interval)
Purple Bulb Orchid	*Ania hongkongensis*	No.	4	1	0	5	N/A
Hong Kong Eagle's Claw	*Artabotrys hongkongensis*	No.	0	0	1	1	1 Seedling
Butulang Canthium	*Canthium dicoccum*	No.	6	3	9	18	9 Whip Trees
Lamb of Tartary	*Cibotium barometz*	No.	961	68	80	1,109	No suitable habitat for compensatory planting
Incense Tree	*Aquilaria sinensis*	No.	0	1	0	1	N/A
Buttercup Orchid	*Spathoglottis pubescens*	No.	0	16	1	17	Difficult to propagate from seed & not available in market

2. Results of Ecological monitoring

2.1. Transplantation monitoring

Pre-construction survey

2.1.1. As per Section 3.1 of the approved Protection and Transplantation Proposal, pre-construction survey shall be carried out by a qualified ecologist which includes: -

1) Desktop study and survey preparation based on the specific area of site clearance as notified by the construction contractor and confirmed with the Resident Site Staff;
2) Schedule and conduct physical site survey to locate the affected species, reconfirm the species condition and record the physical condition before transplantation; and
3) Report site survey results and provide recommendations to contractor on transplantation and post-transplantation maintenance.

2.1.2. No pre-construction survey was conducted in August 2022.

Transplantation

2.1.3. Based on method statement in the approved Protection and Transplantation Proposal, all of the plants affected by project should be transplanted as soon as possible. Where possible, transplantation work is preferably done on the same day of lifting. Otherwise, the plants dug out shall be transported to a nursery before transplanting into their final receptor sites.

2.1.4. No Transplantation was conducted in August 2022.

One-year Establishment Period after Planting (Post-Transplantation Monitoring)

2.1.5. Regular monitoring of health condition of transplanted plants, also called post-transplantation monitoring, should be carried out in monthly basis in the first three months, quarterly afterwards during one-year establishment period after transplanting to receptor site/ nursery as per Section 5.4 and 5.5 of the approved Protection and Transplantation Proposal.

2.1.6. The schedule of the on-going for Post-transplantation monitoring were summarized in **Table 3**.

Table 3 schedule of the on-going for Post-transplantation monitoring

Common Name	Species Name	Nos.	Contract No.	Date of Transplantation (MM/Year)	Post-transplantation monitoring Period																	
					2021							2022										
					Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Small Persimmon	*Diospyros vaccinioides*	530 (DV 001-DV0530)	DC/2018/05	05/2021	x	x	x			x			x			x						
Small Persimmon	*Diospyros vaccinioides*	20 (DV 0531-DV 0550)	DC/2018/05	09/2021					x	x	x			x			x			x		
Small Persimmon	*Diospyros vaccinioides*	150 (ADV 551 - ADV 700)	DC/2020/05	10/2021						x	x	x			x			x			x	
Butulang Canthium	*Canthium dicoccum*	3	DC/2020/05	10/2021						x	x	x			x			x			x	

X: Monitoring schedule

Post-transplantation monitoring findings

2.1.7. No monthly monitoring for the on-going for Post-transplantation was conducted in August according to the schedule in **Table 3.**

Recommendation on post-transplantation monitoring maintenance

2.1.8. According to environmental condition and location of the receptor sites/ nursery, watering frequency was recommended in daily practice for at least the first 3 months as the transplant time is in summer months with strong sunlight and high temperature; except the days with fog and rain. Water frequency may be reduced based on the plant condition after monitoring in the first 3 months.

2.1.9. In contrast, the Landscape Contractor was recommended to check all transplanted plants after heavy rains/ typhoon under safe condition, in order to carry out any stabilization/ maintenance work. Blocked drainage shall be cleared; excessive water shall be pumped or diverged from nursery ground; saturated soil shall be aerated.

2.1.10. Other maintenance works (e.g. weeding, spraying off construction dust, use of approved pesticide and fertilization) shall be determined throughout the monitoring period in agreement with the Supervisor of the Contract and ET.

Summary of the transplantation and recommended after establishment period

2.1.11. The status of the transplantation were shown in **Table 4.**

Table 4 Summary of the transplantation

Common Name	Species Name	Units	Recommendations for Transplant *	Pre-construction survey implementation**	Transplantation Date		Monitoring Status		
					To Nursery (MM/YY)	To Receptor Site (MM/YY)	Started at	Ended at	Status
Site 1									
Small Persimmon	*Diospyros vaccinioides*	No.	228	12/2019	2/2020	5/2021	6/2021	6/2022	**Completed**
			122	7/2020	9/2020	5/2021	6/2021	6/2022	**Completed**
Purple Bulb Orchid	*Ania hongkongensis*	No.	1	NA	-	7/2019	8/2019	7/2020	**Completed**
Site 2									
Small Persimmon	*Diospyros vaccinioides*	No.	40	before transplantation	8/2019	5/2021	6/2021	6/2022	**Completed**
			10	7/2020	9/2020	5/2021	6/2021	6/2022	**Completed**
			50	before transplantation	11/2020	5/2021 & 9/2021	6/2021 & 10/2021	6/2022 & -	On-going
			150	9/2021	-	10/2021	11/2021	-	On-going
Butulang Canthium	*Canthium dicoccum*	No.	3	NA	-	10/2021	11/2021	-	On-going
Lamb of Tartary	*Cibotium barometz*	No.	19	NA		9/2020	10/2020	9/2021	**Completed**
			42	NA	-	-	-	-	Pending
Buttercup Orchid	*Spathoglottis pubescens*	No.	16	NA	-	-	-	-	Pending
Site 3									
Small Persimmon	*Diospyros vaccinioides*	No.	100	7/2020	9/2020	5/2021	6/2021	6/2022	**Completed**
Lamb of Tartary	*Cibotium barometz*	No.	7	NA	-	7/2019	7/2019	6/2020	**Completed**
Incense Tree	*Aquilaria sinensis*	No.	1	NA	-	7/2019	7/2019	6/2020	**Completed**

*Adopted from previously approved Protection and Transplantation Proposal Version 9.2

**Pre-construction survey implementation was conducted on *Diospyros vaccinioides* only

2.1.12. Based on latest conditions of the after-establishment period, regular monitoring is not recommended after establishment period expect replacement planting if found dead (subject to agreement with AFCD).

2.2. Compensatory Planting monitoring

Methodology

2.2.1. The Compensatory planting methods and monitoring should be followed by approved Protection and Transplantation Proposal. The potential of compensatory planting for 17,110 nos. of *Diospyros vaccinioides*, 6,880m^2 *Gnetum luofuense*, 9 nos. of *Canthium dicoccum*, about 80 nos. of *Cibotium barometz* and 1 *Artabotrys hongkongensis*. Base on the ongoing detailed design of the Project, the details of approved Protection and Transplantation Proposal and ecological monitoring will be updated in stages subject to further changes.

Seeds Collection

Diospyros vaccinioides

2.2.2. According to the section 3.8 under approved Protection and Transplantation Proposal, Healthy seedlings will be selected within the fruiting period (October – February). Before the receptor site is available, the collected seeds should be stored in sealed container, with moisture content below 7% and at temperatures of less than 15°C.

2.2.3. No seeds collection were conducted in August 2022.

2.2.4. A total 3000 nos. seeds of *Diospyros vaccinioides* were collected by contractor of Contract no. DC/2020/05 between November and December 2021. Photo records of *Diospyros vaccinioides* illustrated in **Appendix 4a**.

Germination

2.2.5. According to the section 5.8 under approved Protection and Transplantation Proposal, A total 13,600 nos. seedlings of *Diospyros vaccinioides* would be planted on newly formed SIMAR slopes in Sites 1 and 3. In order to fulfill the requirements of seedling planting, a total 3,000nos. Seeds of *Diospyros vaccinioides* were sown on plates in nursery by contractor of Contract no. DC/2020/05 in April 2022. Photo records of *Diospyros vaccinioides* illustrated in **Appendix 4a**.

Broadcast Seeding

2.2.6. According to the section 5.13 under approved Protection and Transplantation Proposal, Seeds of *Diospyros vaccinioides* will be broadcasted in spring.

2.2.7. In order to improve the germination rate of seeds, soaking seeds is recommended by contractor. Seeds of *Diospyros vaccinioides* were soaked by contractor from late February to April 2022.

2.2.8. Soaked seeds of Diospyros vaccinioides were broadcasted in the nursery on 20 April 2022. 300 nos. seedlings of *Diospyros vaccinioides* have been planted on newly formed SIMAR slopes in Sites 1 (Portion 12: RMZ3 downhill) on 30 August 2022. The remaining 2700 nos. seedlings of *Diospyros vaccinioides* will be planted no later than September 2022 before the end of wet season. The contractor was reminded that frequent watering is required in order to reduce loss due to heat stress. Photo records of *Diospyros vaccinioides* are illustrated in **Appendix 1**.

Summary of the transplantation and recommended after establishment period

2.2.9. The status of the Compensatory Planting were shown in **Table 5.**

Table 5 Summary of Compensatory Planting

Common Name	Species Name	Units	Compensatory Planting in Temporary Works Area	Contract No.	Seeds Collection		Broadcast Seeding	Seedling Planting	Monitoring Status		
					Nos. of Seed Collected	Date (MM/YY)	Date (MM/YY)	Date (MM/YY)	Started at	Ended at	Status
Small Persimmon	*Diospyros vaccinioides*	No.	Seedlings (17,110)	DC/2020/05	3000	11/2021-12/2021	20/4/2022	30/8/2022	-	-	-
Luofushan Joint-fir	*Gnetum luofuense*	m^2	Seedlings (22 locations at 50m interval)	Pending	-	-	-	-	-	-	-
Hong Kong Eagle's Claw	*Artabotrys hongkongensis*	No.	1 Seedling	Pending	-	-	-	-	-	-	-
Butulang Canthium	*Canthium dicoccum*	No.	9 Whip Trees	Pending	-	-	-	-	-	-	-

FIGURES

Figure 1 Original location of DV0229-DV0268 and DV0001-DV0228 at Site 1.

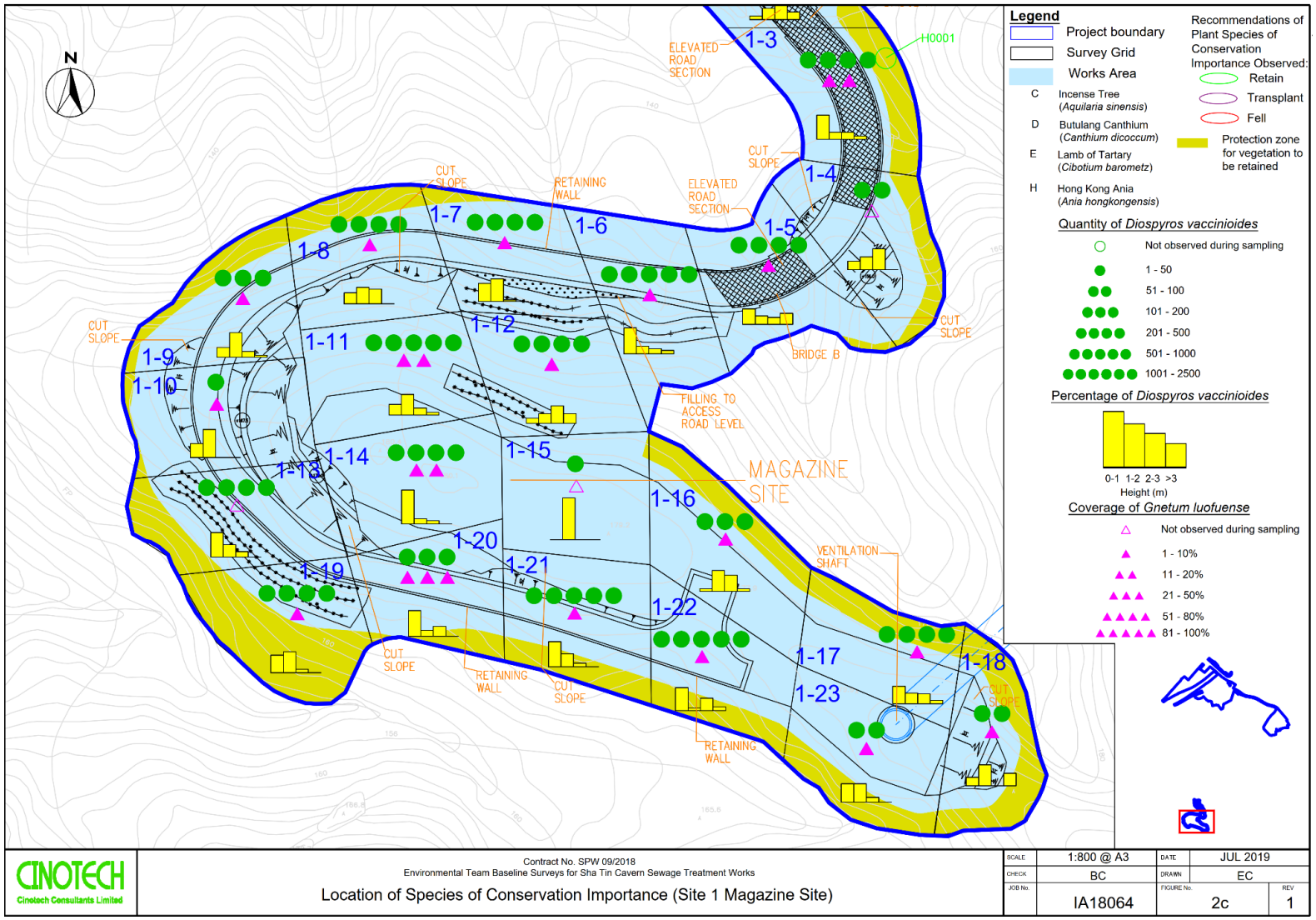


Figure 2. Original location of DV0269-DV0500 and DV0501-DV0550 at Site 2. Nursery site highlighted in red frame for DV0229-DV0268, DV0001-DV0228, DV0269-DV0500 and DV0501-DV0550 at Site 2.

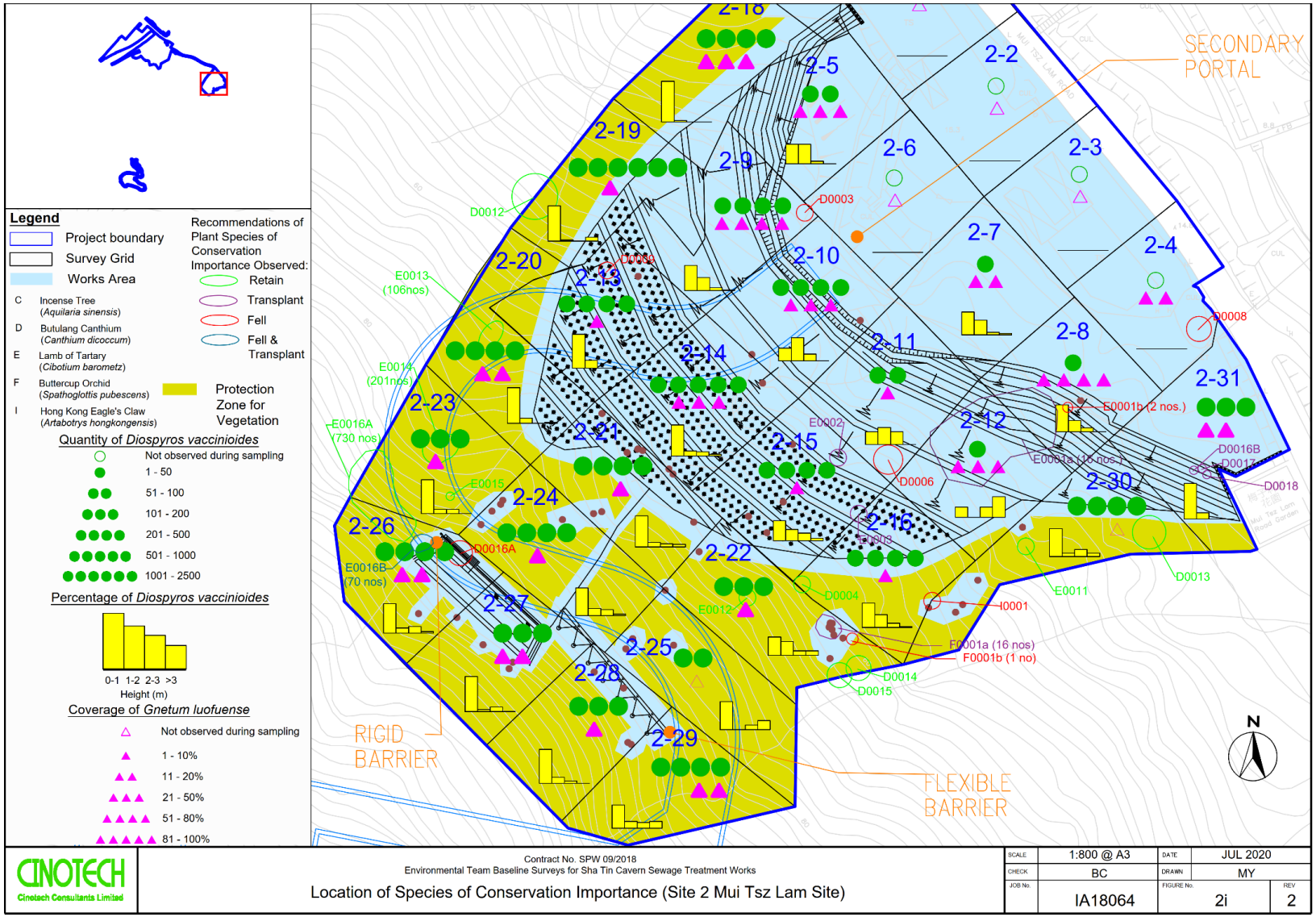


Figure 3. Original location of species of conservation Importance frame and its receptor site.

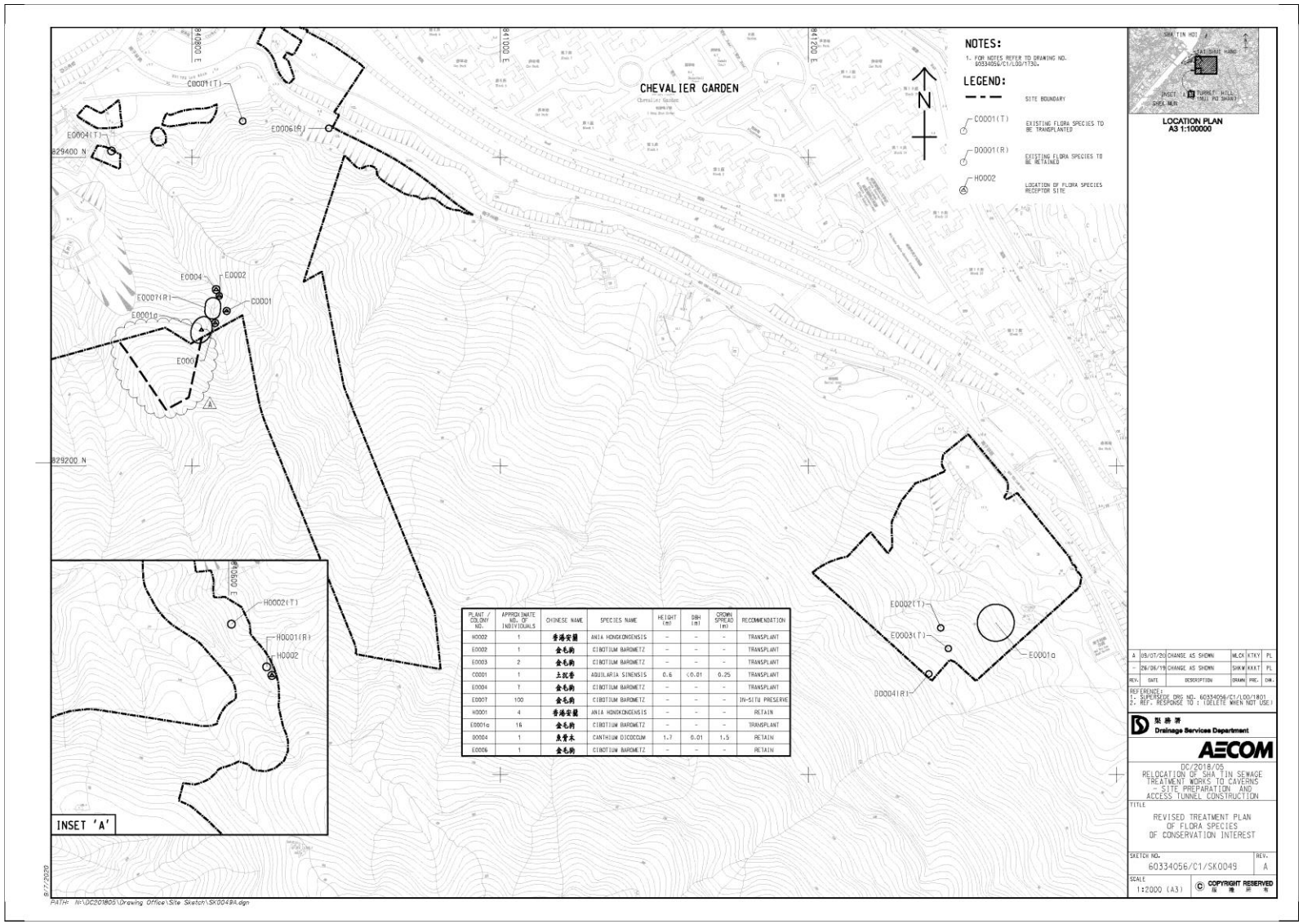


Figure 4. Receptor site for C0001 and E0001a-E0004, the area highlighted in red frame is enlarged.

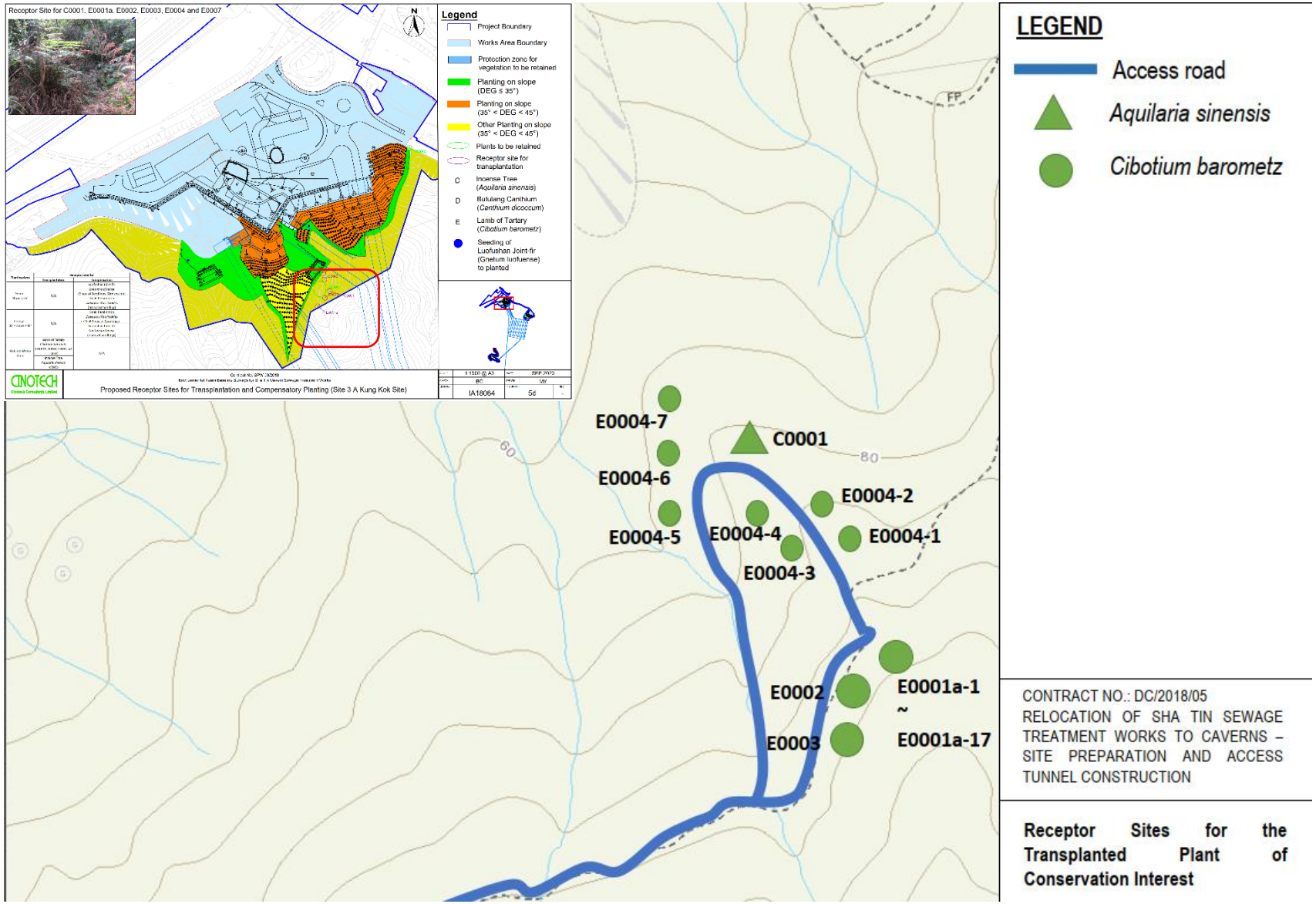
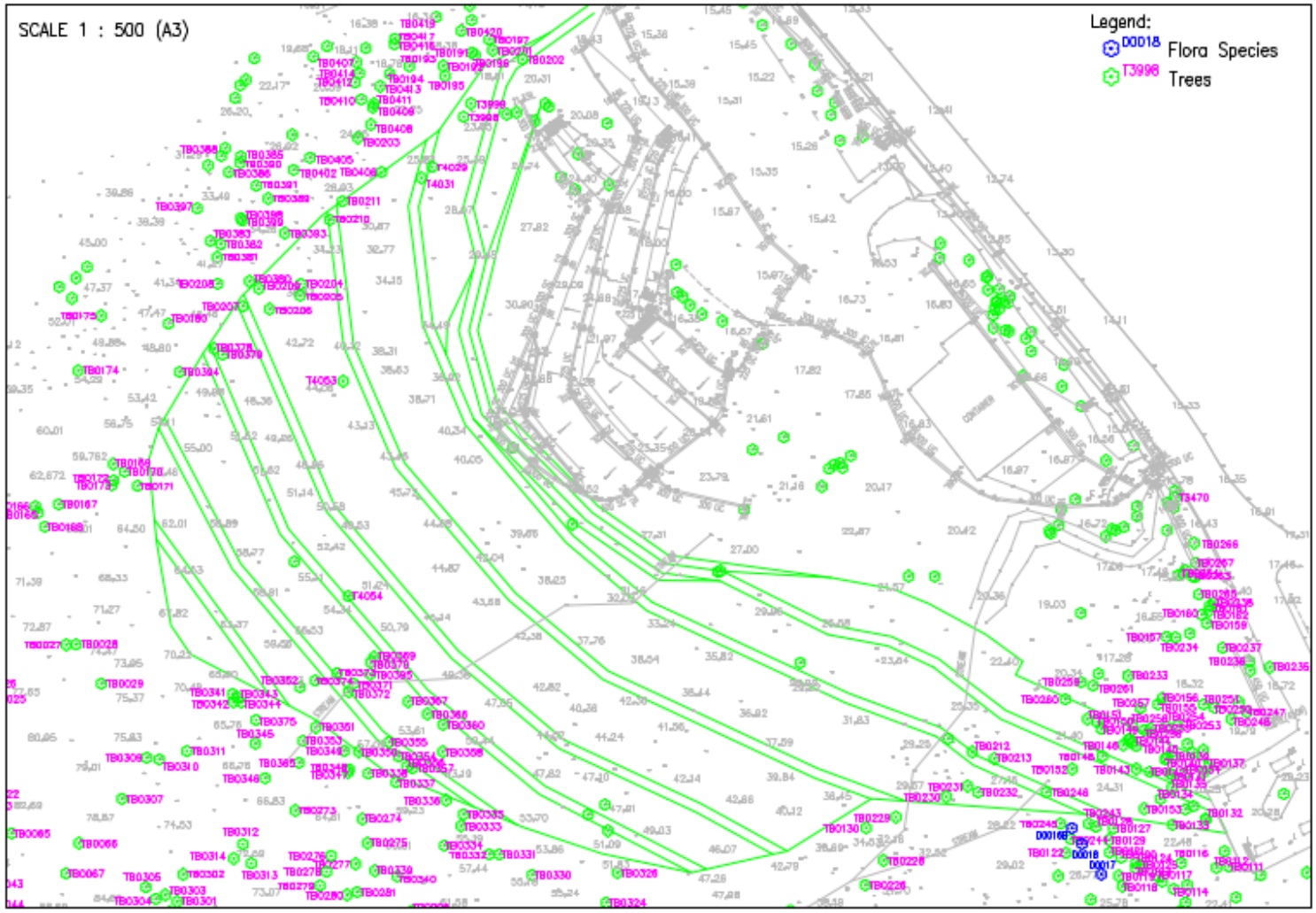


Figure 5. Receptor site for *Canthium dicoccum*



APPENDIX 1

Photos Records for Compensatory Seeds Collection and planting of *Diospyros vaccinioides*

Photos Records for Compensatory Seeds Collection of *Diospyros vaccinioides*

	
Seeds Collection by Contractor	Seeds of *Diospyros vaccinioides*
	
Weight of *Diospyros vaccinioides*	Seeds of *Diospyros vaccinioides* were sown on plates in nursery

	
Seedlings of *Diospyros vaccinioides* in nursery	Seedlings of *Diospyros vaccinioides* planted in receptor site
	
Seedlings of *Diospyros vaccinioides* planted in receptor site	

Appendix 3.1

Environmental Mitigation Implementation Schedule

APPENDIX C IMPLEMENTATION SCHEDULE OF RECOMMENDED MITIGATION MEASURES

C.1 Introduction

C.1.1 This section presents the implementation schedule of mitigation measures for the Project. **Table C.1** summarises the details of the recommended mitigation measures for all works areas. For each recommended mitigation measures, both the location and timing for the measure have clearly been identified as well as the parties responsible for implementing the measure and for maintenance (where applicable).

Table C.1 Implementation Schedule of Recommended Mitigation Measures

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
	Air Quality Impact								
	Construction Phase								
Table 3.5	2.4.1	The rock crushing plant is configured as an enclosed system. Dust collector with dust removal efficiency of 99% will be provided at the exhaust of the rock crusher during rock crushing. Watering will be provided to maintain material in wet condition. Vehicles would be required to pass through the wheel washing facilities provided at site exit.	Rock Crushing Plant / Construction Phase	Contractor	√	√		√	Air Pollution Control Ordinance (APCO)
3.8.1	2.4.1	Watering eight times a day on active works areas, exposed areas and unpaved haul roads to reduce dust emission by 87.5%.	All active works areas, exposed areas and unpaved haul roads	Contractor		√		√	APCO

[1] Des = Design; C = Construction; O = Operation; Dec = Decommissioning

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
3.8.1	2.4.1	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • Use of regular watering 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 area of barging point, and use of water sprinklers at the loading area	Construction Sites	Contractor		√		√	APCO and Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry PFA should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.							

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
	Operation Phase								
3.5.2	-	Sludge tanks with totally enclosed design proven by DSD should be deployed for transporting sludge. With thorough cleaning practice and regular condition test of the sludge tanks, odour emission and leachate leakage during storage and transportation are not anticipated.	Cavern Sewage Treatment Works (CSTW) / Operation Phase	Project Proponent / Operator	√		√		-
3.6.2, 3.7.2	2.4.2	All treatment units with potential odour emission will be covered and the exhausted air will be conveyed to the deodouriser (with 80 – 97% odour removal efficiency) for treatment before discharge to the environment.	CSTW / Operation Phase	Design team / Project Proponent / Operator	√		√		-
3.7.2	2.4.2	The following appropriate odour control measures would be implemented. (i) Adopting the advantage of caverns as natural barriers for odour control; (ii) Covering up of odour sources; (iii) Preventing odour leakage through the access tunnels by applying negative pressure inside caverns; (iv) Installing deodourizing units to clean up the collected foul air; (v) Discharging exhausted air at height to further enhance the dilution effect; and (vi) Enhancing the odour management of the sludge transportation.	CSTW / Operation Phase	Design team / Project Proponent / Operator	√		√		-

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
3.10.2	2.3.1	Odour monitoring at the inlet and outlet of the deodourizing units is proposed to be conducted for first three years of the operation of CSTW, quarterly in the first year, and once every 6 months in the second and third years if monitoring results remain below the limit levels.	CSTW / Operation Phase	Project Proponent / Operator	√		√		-
3.10.2	2.3.2	An Odour Complaint Registration System is also proposed in the EM&A programme to check whether the deodorizing units can fulfill the recommended odour removal performance.	CSTW / Operation Phase	Operator			√		-
3.10.2	-	Any unexpected leakage from tanks could be observed with monitoring equipment. Monitoring equipment would be installed in the CSTW to monitor the concentration of H_2S, CO and CO_2 and methane. Investigation and repair works would be carried out immediately if abrupt increase of these concentrations are reported. Emergency Plan would be established for these upset conditions.	CSTW / Operation Phase	Project Proponent / Operator	√		√		-
	Noise Impact								
	Construction Phase								
4.5.1.6	-	Re-provision of 220m length noise barrier with 10mPD on temporary access haul road to replace the existing 150m length noise barrier with 9.2mPD to 10mPD on Ma On Sha Road. The	Proposed temporary access / Construction Phase	Contractor		√			Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM), Noise Control Ordinance (NCO)

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		location of the relocated noise barrier is shown in **Figure No. 60334056/EIA/4.02** and **Appendix 4.07**. Once the construction work for the CSTW is completed, the temporary access roads would be demolished and the relevant section of Ma On Shan Road and associated noise barrier would be recovered as before.							
4.8.1	3.8.1	The use of quiet plant associated with the construction works is prescribed in British Standard "Code of practice for noise and vibration control on construction and open sites, BS5228" which contains the SWLs for specific quiet PME.	All Construction Work Sites	Contractor		√		√	EIAO-TM, NCO
4.8.1	3.8.1	To alleviate the construction noise impact on the affected NSRs, movable noise barrier for Air Compressor, Bar Bender and Cutter, Breaker, Chisel, Saw, Compactor, Mixers, Pump, Crane, Desander, Drilling Rig, Dump Truck, Excavator, Generator, Grab, Lorry, Paver, Poker and Roller are proposed.	All Construction Work Sites	Contractor		√		√	EIAO-TM, NCO
4.8.1	3.8.1	Provision of noise barrier/acoustic mats for Drilling Jumbo so as to have screening effecting with 10 dB(A) noise attenuation	Drilling Jumbo operate outside the portal and within 20m inside the portal	Contractor		√			EIAO-TM, NCO
4.8.1	3.8.1	To further alleviate the construction noise impact on the Neighbourhood Advice-Action Council Harmony	Construction Site for access road for	Contractor		√		√	EIAO-TM, NCO

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		Manor, it is proposed to limit the number of on-time operating PMEs within 120m of this NSR during construction of access road.	magazine at A Kung Kok Road						
4.9.1	3.8.1	In addition to the above-mentioned mitigation measures, good site practices listed below shall be adopted by all the contractors to further ameliorate the noise impacts. • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program. • Silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program. • Mobile plant, if any, should be sited as far away from NSRs as possible. • Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.	All Construction Work Sites	Contractor		√		√	EIAO-TM, NCO

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		• Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.							
	Operation Phase								
4.7.4	3.8.2	The maximum allowable sound power levels for the ventilation shaft, ventilation buildings at main portal and emergency portal, ventilation fan for chiller plant room and cooling tower at the administration building as presented in Table 4.16 of the EIA Report should be achieved such that the nearest affected NSRs can be in compliance with the noise criteria	Ventilation Shaft, Administration Building and Ventilation Buildings/ Operation Phase	Project Proponent	√		√		EIAO-TM, NCO
4.11.2	3.8.2	Prior to the operational phase of the Project, a commissioning test for the ventilation buildings, the ventilation shaft, ventilation fan for chiller plant room at administration building and cooling tower at the administration building would be conducted to ensure compliance with the relevant allowable maximum sound power levels.	Ventilation Shaft, Administration Building and Ventilation Buildings/ Operation Phase	Contractor			√		EIAO-TM, NCO

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
	Water Quality Impact								
	Construction Phase								
5.7.2	4.10	Water used in ground boring and drilling for site investigation or rock / soil anchoring should as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm drains via silt removal facilities.	Construction Sites / Construction Phase	Contractor		√			Water Pollution Control Ordinance (WPCO), EIAO-TM
5.7.2	4.10	All vehicles and plant should be cleaned before they leave a construction site to minimise the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfill to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	Construction Sites / Construction Phase	Contractor		√			Professional Persons Environmental Consultative Committee (ProPECC) Practice Note (PN) 1/94, WPCO, Waste Disposal Ordinance (WDO)
5.7.2	4.10	Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.	Construction Sites / Construction Phase	Contractor		√			WPCO, EIAO-TM

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
5.7.2	4.10	The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" should be followed where applicable to minimise surface run-off and the chance of erosion.	Construction Sites / Construction Phase	Contractor		√			WPCO, EIAO-TM, ProPECC PN 1/94
5.7.2	4.10	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas should be treated so that it satisfies all the standards listed in the Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS). The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the relevant WPCO licence which is under the ambit of RO of EPD.	Construction Sites / Construction Phase	Contractor		√			WPCO, EIAO-TM, (TM-DSS)
5.7.2	4.10	Contractor must register as a chemical waste producer if chemical wastes would be produced from the	Construction Sites / Construction Phase	Contractor		√			WPCO, EIAO-TM, WDO

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation, should be observed and complied with for control of chemical wastes.							
5.7.2	4.10	Any service shop and maintenance facilities should be located on hard standings within a bonded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	Construction Sites / Construction Phase	Contractor		√			WPCO, EIAO-TM
5.7.2	4.10	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance should be followed to avoid leakage or spillage of chemicals.	Construction Sites / Construction Phase	Contractor		√			WPCO, EIAO-TM, WDO
5.7.2	4.10	Sufficient chemical toilets should be provided in the works areas. A licensed waste collector should be deployed to clean the chemical toilets on a regular basis.	Construction Sites / Construction Phase	Contractor		√			WPCO, EIAO-TM

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					Des	C	O	Dec	
5.7.2	4.10	Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the surrounding environment.	Construction Sites / Construction Phase	Contractor		√			WPCO, EIAO-TM
5.7.2	4.10	The practices outlined in ETWB TC (Works) No. 5/2005 "Protection of natural streams/rivers from adverse impacts arising from construction works" should also be adopted where applicable to minimise the water quality impacts upon any natural streams or surface water systems.	Construction Sites / Construction Phase	Contractor		√			WPCO, EIAO-TM, ETWB TC (Works) No. 5/2005
5.7.2	4.10	Appropriate measures during the construction of the cavern construction should be implemented to minimise the groundwater infiltration.	Construction Sites / Construction Phase	Contractor		√			WPCO, EIAO-TM
5.7.2	4.10	No directly discharge of groundwater from contaminated areas should be adopted. Prior to any excavation works within the potentially contaminated areas at the existing STSTW site, the baseline groundwater quality in these areas should be reviewed based on the relevant SI data and any additional groundwater quality measurements to be performed with reference to *Guidance Note for Contaminated Land Assessment and Remediation* and the review results should be submitted to EPD for examination. If the review results indicated that the groundwater to be generated from the excavation	Construction Sites / Construction Phase	Contractor		√			WPCO, EIAO-TM, Guidance Note for Contaminated Land Assessment and Remediation

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					Des	C	O	Dec	
		works would be contaminated, this contaminated groundwater should be either properly treated or properly recharged into the ground in compliance with the requirements of the TM-DSS. If wastewater treatment is to be deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and should be either discharged into the foul sewers or tankered away for proper disposal.							
5.7.2	4.10	If deployment of wastewater treatment is not feasible for handling the contaminated groundwater, groundwater recharging wells should be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells should be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in section 2.3 of the TM-DSS. The baseline groundwater quality should be determined prior to the selection of the recharge wells, and submit a working plan to EPD for agreement. Pollution	Construction Sites / Construction Phase	Contractor		√			WPCO, EIAO-TM, TM-DSS

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Groundwater monitoring wells should be installed near the recharge points to monitor the effectiveness of the recharge wells and to ensure that no likelihood of increase of groundwater level and transfer of pollutants beyond the site boundary. Prior to recharge, free products should be removed as necessary by installing the petrol interceptor. The Contractor should apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater							
5.7.2	4.10	THEES connection works should be synchronized with the THEES maintenance, for a duration not longer than 4 weeks each outside the algae blooming season (January to May) and frequency of THEES maintenance shall be no more than once per year during the construction phase of the Project.	Tolo Harbour / Construction Phase	Project Proponent / Contractor	√	√			EIAO-TM
	Construction and Operation Phases								
5.10.2	4.10	Shutdown of the THEES for maintenance should be shortened as far as possible. It is recommended that the maintenance of the THEES tunnel should be avoided during the algae blooming season (January to May).	Tolo Harbour / Construction and Operation Phase	Project Proponent		√	√		WPCO, EIAO-TM

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					Des	C	O	Dec	
5.10.2	4.10	Relevant government departments including EPD, WSD, AFCD as well as the key stakeholders for mariculture and fisheries in Tolo Harbour should be informed of the maintenance event prior to any discharge.	Tolo Harbour / Construction and Operation Phase	Project Proponent		√	√		WPCO, EIAO-TM
5.10.3	4.2-4.5	An event and action plan and a water quality monitoring programme (as presented in the EM&A Manual) should be implemented for the THEES maintenance discharge	Tolo Harbour / Construction and Operation Phase	Project Proponent		√	√		WPCO, EIAO-TM
5.10.1	4.10	Silt screen may be installed at the flushing water intakes during the THEES maintenance discharge should it appear necessary. Close communication between DSD and WSD should be maintained to minimize any impact on the flushing water intakes due to THEES maintenance discharge.	WSD flushing water intakes / Construction and Operation Phase	WSD / Project Proponent		√	√		WPCO, EIAO-TM
	Design and Operation Phases								
5.8.3	4.6	In case adverse impact on KTN is identified based on the result of the three-month monitoring programme after commissioning of the project, the operation conditions of the treatment and THEES system should be investigated, and corrective and remedial action should be implemented to improve the effluent discharge from the CSTW. Furthermore, DSD should extend the water quality monitoring	Project site / Design and Operation Phases	Project Proponent			√		WPCO, EIAO-TM

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		programme for at least three months or as agreed by the Director of Environmental Protection.							
5.11.2	4.10	Dual power supply or ring main supply from CLP Power Hong Kong Ltd. CLP should be provided for the CSTW to prevent the occurrence of power failure. In addition, standby facilities for the main treatment units and standby equipment parts / accessories should also be provided in order to minimise the chance of emergency discharge. CLP should be consulted in order to ascertain the power supply for normal plant operation within the caverns. It is recommended that government departments including EPD, WSD and AFCD as well as the key stakeholders for mariculture and fisheries in Tolo Harbour should be informed as soon as possible in case of any emergency discharge so that appropriate actions can be taken.	Project site / Design and Operation Phases	Project Proponent	√		√		WPCO, EIAO-TM
5.11.2	4.10	In case of emergency discharge, the plant operators of CSTW should carry out necessary follow-up actions according to the procedures of the current contingency plan formulated for the existing STSTW to minimise the water quality impact.	Project site / Operation Phase	Project Proponent			√		WPCO, EIAO-TM
5.11.2	4.10	WSD may also consider, should it appear necessary, to shut down the Sha Tin seawater pumping station for a short period of time in case of	Sha Tin seawater pumping station / Operation Phase	WSD / Project Proponent			√		WPCO, EIAO-TM

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					Des	C	O	Dec	
		emergency discharge in order to minimize any adverse impacts.							
5.13.2	4.10	Best Management Practices to reduce storm water and non-point source pollution are also proposed as follows: <u>Design Measures</u> • Exposed surface shall be avoided within the road and portal sites to minimise soil erosion. The access road and the portal areas shall be either hard paved or covered by landscaping area where appropriate. • Streams near the Project site will be retained to maintain the original flow path. The drainage system will be designed to avoid flooding. • Green areas / planting etc. should be introduced alongside the access road and within the portal areas, as far as possible, to minimise runoff pollution. <u>Devices/ Facilities to Control Pollution</u> • Screening facilities such as standard gully grating and trash grille, with spacing which is capable of screening off large substances such as fallen leaves and rubbish should be provided at the inlet of drainage system. • Road gullies with standard design and silt traps should be provided to	Project site / Design and Operation Phase	Project Proponent	√		√		WPCO, ProPECC PN 5/93

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					Des	C	O	Dec	
		remove particles present in stormwater runoff, where appropriate. <u>Administrative Measures</u> • Good management measures such as regular cleaning and sweeping of road surface/ open areas are suggested. The road surface/ open area cleaning should also be carried out prior to occurrence rainstorm. • Manholes, as well as stormwater gullies, ditches provided at the Project site should be regularly inspected and cleaned (e.g. monthly). Additional inspection and cleansing should be carried out before forecast heavy rainfall.							
	Land Contamination								
6.7.1	-	Further site walkover and/or detailed land contamination assessment will be required for sites that are inaccessible or currently in operation / yet to be constructed (i.e. existing STSTW, David Camp and part of existing Sha Tin VDC, and proposed A Kung Kok Shan Road surface magazine site within the Project boundary). The site walkover, detailed land contamination assessment and if necessary, remediation works should be carried out after decommissioning of the sites	Existing STSTW, David Camp and VDC / Construction Phase	Project Proponent / Contractor		√		√ (for existing STSTW)	Guidance Note for Contaminated Land Assessment and Remediation, Practice Guide for Investigation and Remediation of Contaminated Land, Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		but prior to re-development and should include the following: • Prior to the commencement of the SI works, review the CAP to confirm whether the proposed SI works (e.g. sampling locations, testing parameters etc.) are still valid and to confirm the appropriate RBRGs land use scenario for the development; • Submit supplementary CAP(s), presenting the findings of the above review for EPD endorsement. If land contamination issues were identified within David Camp or part of existing VDC / proposed A Kung Kok Shan Road surface magazine site within the Project boundary in the further site walkover, findings of the site walkover and the proposal for SI works should also be presented in the supplementary CAP(s); • Carry out SI works according to the supplementary CAP endorsed by EPD; • Submit CAR(s), detailing findings of the SI works and nature/extent of any soil/groundwater contamination, and, if contaminated identified, RAP(s), discussing the appropriate remedial methods and mitigation							

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					Des	C	O	Dec	
		measures, for the identified contamination, for EPD agreement; and • Carry out soil/groundwater remediation works according to EPD agreed RAP and submit RR(s) afterwards for EPD agreement. The remediation works and agreement of RR should be completed prior to re-development.							
6.7.2	-	If contamination were identified, mitigation measures as recommended in the RAP should be followed and should include the following: • Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety; • Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; • Supply of suitable clean backfill material (or treated soil) after excavation; • Stockpiling site(s) shall be lined with impermeable sheeting and bunded. Stockpiles shall be fully covered by impermeable sheeting to reduce dust emission. If this is not practicable due to frequent	Project Site / Construction Phase	Contractor		√		√ (for existing STS TW)	Guidance Note for Contaminated Land Assessment and Remediation, Practice Guide for Investigation and Remediation of Contaminated Land, Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		usage, regular watering shall be applied. However, watering shall be avoided on stockpiles of contaminated soil to minimise contaminated runoff. • Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions; • Speed control for the trucks carrying contaminated materials shall be enforced; • Vehicle wheel and body washing facilities at the site's exist points shall be established and used; and • Pollution control measures for air emissions (e.g. from biopile blower and handling of cement), noise emissions (e.g. from blower or earthmoving equipment), and water discharges (e.g. runoff control from treatment facility) shall be implemented and complied with relevant regulations and guidelines.							

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					Des	C	O	Dec	
	Hazard to Life								
	Construction Phase								
7.14.1	6.2.2	The following recommendations are justified to be implemented to meet the EIAO-TM requirements: • The truck should be designed to minimise the amount of combustible in the cabin. The fuel carried in the fuel tank should also be minimised to reduce the duration of any fire; • The accident involvement frequency of the explosives delivery truck should be minimised through implementation of several administrative measures, such as providing training programme to the driver, regular "tool box" briefing session, implementing a defensive driving attitude, selecting driver with good safety record, and providing regular medical checks for the driver; • Avoidance of returning unused explosives to the magazine, only the required quantity of explosives for a particular blast should be transported; • Maintain a minimum headway of 10 minutes between two	Explosives dlivery route / Construction Phase	Contractor	√	√			EIAO-TM

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					Des	C	O	Dec	
		consecutive truck convoys whenever practicable; and • The fire involvement frequency should be minimised by carrying better types of fire extinguishers and with bigger capacity onboard of the explosives delivery truck. Emergency plans and trainings could also be provided to make sure that the fire extinguishers are used adequately.							
7.14.2	6.2.3	The magazine should be designed, built, operated and maintained in accordance with Mines Division's guidelines and appropriate industry best practice. In addition, the following recommendations should be implemented: • The security plan should address different alert security level to reduce opportunity for arson or deliberate initiation of explosives; • Emergency plan should be developed to address uncontrolled fire in magazine area, and drill of the emergency plan should be regularly carried out; • Suitable work control system should be set-up, such as an operational manual including Permit-to-Work system, to ensure that work activities undertaken	Magazine Site/ Construction Phase	Contractor	√	√			-

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					Des	C	O	Dec	
		during operation of the magazine are properly controlled; • Good house-keeping within the magazine to ensure no combustible materials are accumulated; • Good house-keeping outside the magazine stores to ensure no combustible materials are accumulated; and • Regular checking of the magazine store to ensure no water seepage through the roof, walls or floor.							
7.14.3	6.2.4	The following recommendations should be implemented: • Emergency plan should be developed to address uncontrolled fire during transport. Case of fire near an explosive delivery truck in jammed traffic should be included in the plan. Activation of fuel and battery isolation switches on vehicle when fire breaks out should also be included in the emergency plan to reduce likelihood of prolonged fire leading to explosion; • Working guideline should be developed to define procedure for explosives transport during adverse weather such as thunderstorm;	To and from Magazine Site / Construction Phase	Contractor	√	√			-

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		• Detonators should be transported separately from other Class 1 explosives. Separation of vehicles should also be maintained through the trip; • Develop procedure to ensure the availability of parking space on site for the explosives delivery truck. Delivery should not be commenced if parking space on site is not secured; • Hot work or other activities should be banned in the vicinity of the explosives offloading or charging activities; • Lining should be provided within the transportation box on the vehicle; • Fire screen should be used between cabin and the load on the vehicle; • Ensure packaging of detonators remains intact until handed over at blasting site; • Ensure that cartridged emulsion packages are not damaged before every trip; and • Use experienced driver with good safety record.							

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					Des	C	O	Dec	
7.14.4	6.2.5	The following recommendations should be implemented for the safe use of explosives: • Blast Charge Weight should be within MIC as specified for the given blast face; • Temporary mitigation measures such as blast doors or heavy duty blast curtains should be installed at the portals or shafts and at suitable locations underground to prevent flyrock and control the air overpressure; • Multiple faces blasting will be carried out for the construction of cavern in this project. Good communication and control will need to be adopted in ensuring that the works are carried out safely; • It is not intended to carry out complete evacuation of the construction areas and secure refuge areas should be identified to workers in the areas; • A Chief Shotfirer and a Blasting Engineer shall be employed in addition to the normal blasting personnel to ensure that the works are safe and coordinated between blasting areas; • Shotfirer to be provided with a lightning detector, and appropriate	CSTW / Construction Phase	Contractor	√	√			-

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					Des	C	O	Dec	
		control measures should be in place; • Speed limit for the diesel vehicle truck and bulk emulsion truck in the access tunnel and cavern should be imposed. The truck may be escorted while underground to ensure route is clear from hazards and obstructions; and • Hot work should be suspended during passage of the diesel vehicle truck and bulk emulsion truck in the access tunnel and cavern. • A boulder survey should be undertaken based on the likely PPV values that would result from the blasting process. Those boulders subject to the vibration higher than the allowable limit should be strengthened, removed, or constructed with boulder fence, prior to the commencement of blasting.							
	Operation Phase								
		Nil							

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					Des	C	O	Dec	
	Ecological Impact (Terrestrial and Marine)								
	Construction Phase								
8.8.2	7.2.1	Construction of access roads and other temporary works should be carefully designed (e.g. elevated road for crossing streams) to avoid / minimise habitat loss and fragmentation.	Project site – areas access road / Pre-Construction Phase	Design team / Project Proponent	√				-
8.8.3	7.2.2	Minimise habitat loss to nearby habitats and associated wildlife by implementing the following mitigation measures: - • confining the works within the site boundary; • controlling access of site staff to avoid damage to the vegetation in surrounding areas; and • placement of equipment or stockpile in the existing disturbed / urbanised land within the site boundary of the Project to minimise disturbance to vegetated areas;	Project site / Construction Phase	Contractor		√			-
8.8.3	7.2.2	Reinstatement planting should be implemented upon the completion of construction works to minimise the ecological impact arising from the temporary habitat loss	Project Site (Main Portal Area / Secondary Portal Area / Access Road / Temporary Works Area) /Construction Phase	Project Proponent	√	√		√	

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					Des	C	O	Dec	
8.8.2, 8.8.3 & 8.10	7.2.2	Detailed Vegetation Survey shall be conducted by a suitably qualified botanist / ecologist within the works area requiring vegetation clearance prior to commencement of works to identify plant species of conservation importance. The potentially affected individuals shall be tagged and fenced off for preservation, and in the case of unavoidable loss, for transplantation to nearby suitable habitat(s).	Proposed works areas (Main Portal, Secondary Portal, Access Road) / Pre-Construction Phase	Project Proponent / Qualified botanist or ecologist		√			
8.8.2, 8.8.3 & 8.10	7.3.1	A Protection and Transplantation Proposal including the subsequent monitoring visit for the affected plant species should be prepared and conducted by a suitably qualified local ecologist. The Proposal should be submitted for approval at least one month before works commencement. To review the performance of the transplantation exercise, monitoring of transplanted flora should be conducted monthly after the transplantation throughout the construction phase. The parameters to be monitored should include the health condition and survival rate of the transplanted flora and presence of weedy species. Any observations and recommendations should be reported in monthly EM&A reports	Recipient Site for transplanted species / Construction Phase	Project Proponent / Qualified botanist or ecologist		√			

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					Des	C	O	Dec	
8.8.3	7.2.2	Mitigation measures should be implemented to control runoff from the construction site, as well as the adopting guidelines and good site practices for handling and disposal of construction discharges in order to minimise the potential indirect impact on the streams (particularly S2) resulting from site runoff. Precautionary measures should also be implemented to minimise indirect impacts to the streams, such as isolating the work site by placing sandbags and silt curtains, covering up construction materials, debris and spoil to avoid being washed into the stream, and properly collecting and treating construction effluent and sewage.	Access Road on Nui Po Shan / Construction Phase	Contractor		√			ETWB TCW No. 5/2005
8.8.3	7.2.2	Implement good site practice to further minimise impacts from disturbance such as noise, air quality and water quality issues, such as: - • the use of quiet plant and EPD's QPME and the availability of British Standards 5228 has been considered; • the use of movable noise barrier; • the use of temporary noise screening structures or purpose-built temporary noise barriers;	Project site / Construction Phase	Contractor		√			-

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					Des	C	O	Dec	
		• install site hoarding as temporary noise barrier where construction works are undertaken; • only well-maintained plant should be operated on site and plant should be serviced regularly during the construction programme; • Mitigation measures stipulated in the ProPECC PN 1/94 "Construction Site Drainage" should be complied to minimise water quality impact; • Installation of stand-by pump, emergency power supply and telemetry system to avoid sewage overflow and surcharge to sewerage system due to power/equipment failure.							
8.8.3	7.2.2	Minimise groundwater infiltration during cavern construction with the following water control strategies:- • Probing Ahead: As a normal practice, the Contractor will undertake rigorous probing of the ground ahead of excavation works to identify zones of significant water inflow. The probe drilling results will be evaluated to determine specific grouting requirements in line with the tunnel / cavern advance. In such zones of significant water inflow that could occur as a result of discrete, permeable features, the intent	Project site / Construction Phase	Contractor		√			-

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					Des	C	O	Dec	
		would be to reduce overall inflow by means of cut-off grouting executed ahead of the tunnel / cavern advance; • Pre-grouting: Where water inflow quantities are excessive, pre-grouting will be required to reduce the water inflow into the tunnel / cavern. The pre-grouting will be achieved via a systematic and carefully specified protocol of grouting; • In principle, the grout pre-treatment would be designed on the basis of probe hole drilling ahead of the tunnel / cavern face; • The installation of waterproof lining would also be adopted after the formation of the tunnels and caverns.							
8.8.3	7.2.2	In the event of excessive infiltration being observed as a result of the tunnelling or excavation works even after incorporation of the water control strategies, post-grouting should be applied as far as practicable as described below: • Post-grouting: Groundwater drawdown will be most likely due to inflows of water into the tunnel / cavern that have not been sufficiently controlled by the pre-grouting measures in high permeability area. Where this	Project site / Construction Phase	Contractor		√			-

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					Des	C	O	Dec	
		occurs post grouting will be undertaken before the lining is installed. Whilst unlikely to be required in significant measure, such a contingency should be allowed for reduction in permeability of the tunnel / cavern surround (by grouting) to limit inflow to acceptable levels. The practical groundwater control measures stated above are proven technologies and have been extensively applied in other past projects. These measures or other similar methods, as approved by the Engineer to suit the works condition shall be applied to minimise the groundwater infiltration.							
8.8.3	7.2.2	In case seepage of groundwater occurs, groundwater should be pumped out from works areas and discharged to the storm system via silt trap. Uncontaminated groundwater from dewatering process should also be discharged to the storm system via silt removal facilities.	Project site / Construction Phase	Contractor		√			-

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
8.8.3	7.2.2	Mitigation measures recommended in the water quality impact assessment for controlling water quality impact will also serve to protect marine ecological resources from indirect impacts and ensure no unacceptable impact on marine ecological resources. Relevant government departments including EPD, WSD and AFCD as well as key stakeholders for mariculture and fisheries in Tolo Harbour should be informed of the THEES maintenance / emergency discharge event prior to any discharge. It is recommended that the temporary effluent bypass event and the THEES maintenance period should be shortened as far as possible.	Tolo Harbour / Construction Phase	Contractor and Operator		√			-
	Construction and Operation Phase								
8.8.3	7.2.2	Overall reduction of glare during both construction and operation phase should be considered. A balance between lighting for safety, and avoiding excessive lighting can be achieved through the use of directional lighting to avoid light spill into sensitive areas, and control/timing of lighting periods of some facilities, particularly at the secondary portal which lies approximately 200 m northwest of Ma On Shan Country Park.	Project site / Construction and Operation Phase	Contractor and Operator		√	√		-

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
8.8.3	7.2.2	During the decommissioning and demolition of the existing STSTW, the direction and lighting periods should be controlled during ardeid breeding season (March to August) to minimise the potential indirect impact on Penfold Park Egretry and the ardeids flying over the existing STSTW.	Existing STSTW / Decommissioning / March to August	Contractor				√	-
8.10	7.3	It is anticipated that the construction of rock caverns would not have adverse impacts on groundwater in Nui Po Shan. Nonetheless, surface water level or groundwater level near the caverns will be closely monitored during the construction and operation stage.	Project site / Construction and Operation Phase	Contractor and Operator		√	√		-
	Compensatory Planting								
8.8.4& 8.10.1	7.2.3	Compensatory planting would be provided at main and secondary portal areas, and along the access road.	Main portal, secondary portal, and along access road	Project Proponent	√	√			DEVB TC(W) No. 7/2015
8.8.4 & 8.10.1	7.2.3	To facilitate successful planting, a detailed Woodland Compensation Plan should be prepared by local ecologists with at least 10 years relevant experience to form the basis of the proposed compensatory planting. The Woodland Compensation Plan should include implementation details, management requirement, as well as monitoring requirements (e.g. frequency and parameters) of the	Compensatory planting area (Main portal, secondary portal, and along access road) / pre-construction	Project Proponent	√	√			

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		compensatory planting area. Approval of the Plan should be obtained from EPD at least three months before the prior to commencement of compensatory woodland planting.							
8.8.4 & 8.10.1	7.2.3	Upon the completion of planting, monitoring of the woodland compensation areas should be implemented, with maintenance works (e.g. irrigation, weeding, pruning, control of pests and diseases, replacement planting, repair of damage, etc.) conducted as necessary.	Compensatory planting area (Main portal, secondary portal, and along access road) / Operation	Project Proponent / CSTW Operator			√		
	Fisheries Impact								
9.6	8.2	Potential impacts on fisheries resources and fishing operations arising from the Project have been avoided and minimised by construction of a connection pipes to the existing emergency outfall of STSTW by trenchless method underneath Shing Mun River with the least water quality impact. In addition, the temporary effluent bypass event for THEES connection work would be synchronized within regular THEES maintenance. Therefore, additional water quality impact and fisheries impact from changes of water quality have been avoided. Furthermore, the THEES maintenance discharge would avoid the blooming season of algae (i.e. January to May) to minimise the potential water quality impacts. It is	Tolo Harbour /Construction and Operation Phase	Project Proponent / Contractor	√	√			-

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		recommended that any THEES maintenance period should be shortened as far as possible.							
9.6	8.2	Mitigation measures recommended in the water quality impact assessment for controlling water quality impact will also serve to protect fisheries from indirect impacts and ensure no unacceptable impact on fisheries resources and operations. For more detailed mitigation measures regarding water quality refer to Sections 5.7.2 and 5.13.2 of the EIA Report.	Construction and Operation Phase	Contractor and Operator		√	√		-
9.6	8.2	Relevant government departments including EPD, WSD and AFCD as well as key stakeholders for mariculture and fisheries in Tolo Harbour should be informed prior to the THEES maintenance / emergency discharge events.	Tolo Harbour / Construction and Operation Phase	Project Proponent		√	√		
	Landscape and Visual Impact								
Table 10.10	-	CM1 - Preservation of Existing Vegetation	Construction Sites/ Construction Phase	Project Proponent	√	√		√	DEVB TCW No. 7/2015 and latest Guidelines on Tree Preservation during Development issued by GLTM Section of DEVB
Table 10.10	-	CM2 - Transplanting of Affected Trees	Construction Sites/ Construction Phase	Project Proponent	√	√		√	DEVB TCW No. 7/2015 and the latest Guidelines on Tree Transplanting issued by GLTM Section of DEVB

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
Table 10.10	-	CM3 - Compensatory Tree Planting	Construction Sites/ Construction Phase	Project Proponent	√	√		√	DEVB TCW No. 7/2015
Table 10.10	-	CM4 - Control of Night-time Lighting Glare	Construction Sites/ Construction Phase	Project Proponent	√	√		√	
Table 10.10	-	CM5 - Erection of Decorative Screen Hoarding	Construction Sites/ Construction Phase	Project Proponent	√	√		√	
Table 10.10	-	CM6 - Management of Construction Activities and Facilities	Construction Sites/ Construction Phase	Project Proponent	√	√		√	
Table 10.10	-	CM7 - Reinstatement of Temporarily Disturbed Landscape Areas	Construction Sites/ Construction Phase	Project Proponent	√	√		√	
Table 10.11	-	OM1 - Tree and Shrub Planting at the Temporary Project Magazine Site after Completion of Engineering Works	Temporary Project Magazine Site / Operation Phase	Project Proponent	√	√	√		
Table 10.11	-	OM2 - Aesthetically pleasing design of Aboveground Structures	Tunnel Portals, Administration Building, Ventilation Buildings, Electrical Substations and Ventilation Shaft / Operation Phase	Project Proponent	√	√	√		

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
Table 10.11	-	OM3 - Aesthetically pleasing design of Highways Structures	Access Road to Ventilation Shaft / Operation Phase	Highways Department	√	√	√		
Table 10.11	-	OM4 - Reprovision of Cycle Track	Cycle track / Operation Phase	Highways Department	√	√	√		
Table 10.11	-	OM5 - Provision of Green Roof	Administration Building and Ventilation Buildings / Operation Phase	Project Proponent	√	√	√		
Table 10.11	-	OM6 - Provision of Buffer Planting	Main and Secondary Portal Areas / Operation Phase	Project Proponent	√	√	√		
Table 10.11	-	OM7 - Hydroseeding on the disturbed ground surface after demolition works prior to future redevelopment of the existing STSTW	Existing STSTW / Operation Phase	Lands Department (LandsD) or future development agent in existing STSTW	√	√	√		
Table 10.11	-	OM8 - Woodland Mix Planting on Soil Slopes	Soil Slopes / Operation Phase	Project Proponent	√	√	√		

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
	Cultural Heritage Impact								
11.5.1.1	10.1.1	No potential direct or indirect impact to cultural heritage resource is anticipated, and therefore no mitigation measures are required.	N/A	N/A					EIAO EIAO-TM Antiquities and Monuments Ordinance Guidelines for Cultural Heritage Impact Assessment
	Wastes Management Implications								
12.6.2	11.2.2	Appropriate waste handling, transportation and disposal methods for all waste arising generated during the construction works for the Project should be implemented to ensure that construction wastes do not enter the nearby streams or drainage channel. It is anticipated that adverse impacts would not arise on the construction site, provided that good site practices are strictly followed. Recommendations for good site practices during the construction activities include: • Nomination of approved personnel, such as a site manager, to be responsible for good site practices, and making arrangements for collection of all wastes generated at the site and effective disposal to an appropriate facility.	Project Site Area / Construction Phase	Contractor		√		√	Waste Disposal Ordinance

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		• Training of site personnel in proper waste management and chemical waste handling procedures. • Provision of sufficient waste reception/ disposal points, of a suitable vermin-proof design that minimises windblown litter. • Arrangement for regular collection of waste for transport off-site and final disposal. • 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. • A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be proposed. • A Waste Management Plan should be prepared and should be submitted to the Engineer for approval. One may make reference to ETWB TCW No. 19/2005 for details. In order to monitor the disposal of C&D material at landfills and public filling areas, as appropriate, and to control fly tipping, a trip-ticket system should be included as one of the contractual								

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		requirements to be implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. One may make reference to DEVB TCW No.6/2010 for details.							
12.6.3	11.2.3	Good management and control of construction site activities / processes can minimise the generation of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include: • Segregate and store different types of construction related waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal. • Provide separate labelled bins to segregate recyclable waste such as aluminium cans from other general refuse generated by the work force, and to encourage collection by individual collectors. • Any unused chemicals or those with remaining functional capacity shall be recycled. • Maximising the use of reusable steel formwork to reduce the amount of C&D material. • Prior to disposal of C&D waste, it is recommended that wood, steel	Project Site Area / Construction Phase	Contractor		√		√	Waste Disposal Ordinance

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		and other metals shall be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill. • On-site crushing and sorting facilities are being considered to reduce the rock size to fulfill the size requirements from relevant waste collection / transfer / disposal facilities; • Adopt proper storage and site practices to minimise the potential for damage to, or contamination of, construction materials. • Plan the delivery and stock of construction materials carefully to minimise the amount of surplus waste generated. • Adopt pre-cast construction method instead of cast-in-situ method for construction of concrete structures as much as possible; and • Minimise over ordering of concrete, mortars and cement grout by doing careful check before ordering. In addition to the above measures, other specific mitigation measures are recommended below to minimise environmental impacts during handling, transportation and disposal of wastes.							

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
12.6.4	11.2.4	Storage of materials on site may induce adverse environmental impacts if not properly managed, recommendations to minimise the impacts include: • Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimising the potential of pollution; • Maintain and clean storage areas routinely; • Stockpiling area should be provided with covers as much as practicable and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations should be designated to stockpile each material to enhance reuse.	Project Site Area / Construction Phase	Contractor		√		√	-
12.6.4	11.2.4	Licensed waste haulers should be employed for the collection and transportation of waste generated. The following measures should be enforced to minimise the potential adverse impacts: • Remove waste in timely manner; • Waste collectors should only collect wastes prescribed by their permits; • Impacts during transportation, such as dust and odour, should be	Project Site Area / Construction Phase	Contractor		√		√	Waste Disposal Ordinance Waste Disposal (Charges for Disposal of Construction Waste) Regulation Land (Miscellaneous Provisions) Ordinance

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		mitigated by the use of covered trucks or in enclosed containers; • Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28); • Waste should be disposed of at licensed waste disposal facilities; and • Maintain records of quantities of waste generated, recycled and disposed.							
12.6.4	11.2.4	Land transport will be used for transportation of excavated and stockpile materials. It is expected there will be 1260 vehicles per day for transporting waste during peak construction phase. The tentative transportation routings for the disposal of various types of wastes are shown in Table 12.4. The transportation routing may be changed subject to the traffic conditions. Nevertheless, it is anticipated that there is no adverse impact from the waste during transportation with the implementation of appropriated measures (e.g. using water-tight containers and covered trucks).	Transportation Route of Waste / Construction Phase	Contractor		√			-

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
12.6.4	11.2.4	In order to monitor the disposal of C&D materials at PFRFs and landfills and to control fly-tipping, a trip-ticket system should be established in accordance with DEVB TCW No. 6/2010. A recording system for the amount of waste generated, recycled and disposed, including the disposal sites, should also be set up. Warning signs should be put up to remind the designated disposal sites. Close-circuited television should be installed at the vehicular entrance and exit of the site as additional measures to prevent fly-tipping.	Project Site Area / Construction Phase	Contractor		√		√	DEVB TCW No. 6/2010
12.6.4	11.2.5	In addition to the above general measures, other specific mitigation measures on handling the C&D materials and materials generated from site formation and demolition work are recommended below, which should form the basis of the WMP to be prepared by the contractor(s) in construction phase.	Project Site Area / Construction Phase	Contractor		√		√	Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site
12.6.5	11.2.5	In order to minimise the impact resulting from collection and transportation of C&D materials for off-site disposal, the excavated material arising from site formation and foundation works should be reused on-site as backfilling material and for landscaping works as far as practicable. Other mitigation requirements are listed below:	Project Site Area / Construction Phase	Contractor		√		√	Waste Disposal Ordinance ETWB TCW No.19/2005 DEVB TCW No. 6/2010

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		• A WMP, which becomes part of the EMP, should be prepared in accordance with ETWB TCW No.19/2005; • A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be adopted for easy tracking; and • In order to monitor the disposal of C&D materials at public filling facilities and landfills and to control fly-tipping, a trip-ticket system should be adopted (refer to DEVB TCW No. 6/2010). It is recommended that specific areas should be provided by the Contractors for sorting and to provide temporary storage areas (if required) for the sorted materials.							
12.6.5	11.2.5	The Contactor should prepare and implement an EMP in accordance with ETWB TCW No.19/2005, which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from construction activities. Such a management plan should incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP should	Project Site Area / Construction Phase	Contractor		√			ETWB TCW No.19/2005

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		be submitted to the Engineer for approval. The Contractor should implement waste management practices in the EMP throughout the construction stage of the Project. The EMP should be reviewed regularly and updated by the Contractor, preferably on a monthly basis.							
12.6.5	11.2.5	All surplus C&D materials arising from or in connection with construction works should become the property of the Contractor when it is removed unless otherwise stated. The Contractor would be responsible for devising a system to work for on-site sorting of C&D materials and promptly removing all sorted and process materials arising from the construction activities to minimise temporary stockpiling on-site. The system should be included in the EMP identifying the source of generation, estimated quantity, arrangement for on-site sorting, collection, temporary storage areas and frequency of collection by recycling Contractors or frequency of removal off-site.	Project Site Area / Construction Phase	Contractor		√		√	-
12.6.6	11.2.6	The practices of good housekeeping for CSTW listed below should be followed to ameliorate any odour impact from handling, collection, transportation and disposal of sludge:	Operation Phases	Operator			√		Waste Disposal Ordinance

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		• Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge should be transported to the STF by water-tight containers to avoid Hydrogen Sulphide (H_2S)/odour emission and ingress of water into the containers which would lower the sludge dryness during transportation • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly							

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		• Sludge trucks and containers should be washed thoroughly before leaving the CSTW to avoid any odour nuisance during transportation							
12.6.6	11.2.6	In addition, all wastewater generated from the sludge dewatering process and all contaminated water from the cleaning operations recommended for odour control will be diverted to the relocated STSTW for proper treatment.	Operation Phases	Operator			√		Waste Disposal Ordinance
12.6.7	11.2.7	If chemical wastes are produced at the construction site or during operation, the Contractor during construction or the operator during operation will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidising, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to the licensed Chemical Waste Treatment Centre, or other	Construction and Operation Phases	Contractor / Operator		√	√		Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		licensed facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.							
12.6.8	11.2.8	Recycling of waste paper, aluminium cans and plastic bottles should be encouraged, it is recommended to place clearly labelled recycling bins at designated locations which could be accessed conveniently. Other general refuse should be separated from chemical and industrial waste by providing separated bins for storage to maximise the recyclable volume.	Construction and Operation Phases	Contractor / Operator		√	√		Public Health and Municipal Services Ordinance (Cap.132)
12.6.8	11.2.8	A reputable licensed waste collector should be employed to remove general refuse on a daily basis to minimise odour, pest and litter impacts.	Construction and Operation Phases	Contractor / Operator		√	√		Public Health and Municipal Services Ordinance (Cap. 132)
	Health Impact								
-	-	Not applicable.							

Appendix 4.1

Action and Limit Level

Action and Limit Level

Action and Limit Level for Noise Monitoring

Monitoring Station	Action Level	Limit Level (dB(A))		
		0700-1900 hrs on normal weekdays	0700-2300 hrs on holidays (including Sundays); and 1900-2300 hrs on all days [2]	2300-0700 hrs of all days [2]
CM1	When one documented complaint is received	65 / 70 [1]	60 / 65 / 70 [3]	45 / 50 / 55 [3]
CM2(A)		65 / 70 [1]		
CM3		65 / 70 [1]		
CM4		75		
CM5		75		
DM1		75		
DM2		75		
DM3		65 / 70 [1]		

Remark 1: Limit level of CM1, CM2(A), CM3 and DM3 reduce to 65 dB (A) during examination periods if any.

Remark 2: Construction noise during restricted hours is under the control of Noise Control Ordinance Limit Level to be selected based on Area Sensitivity Rating.

Remark 3: Limit Level for restricted hour monitoring shall act as reference level only. Investigation would be conducted on CNP compliance if exceedance recorded during restricted hour noise monitoring period.

Action and Limit Level for Air Quality Monitoring

Monitoring Locations	1-hour TSP Level in µg/m3	
	Action Level	Limit Level
AM1	294	500
AM2	325	500
AM3(A)	360	500
AM4	297	500
AM5	349	500
AM6	312	500
ASR51	310	500

Appendix 4.2

Copies of Calibration Certificates

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港新界葵涌永基路22-24號好爸爸創科大廈
Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong
Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 22CA0224 04-02 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone	Preamp
Manufacturer:	Nti	,	Nti Andio	Nti Andio
Type/Model No.:	XL2	,	MC230A	MA220
Serial/Equipment No.:	A2A-15269-EO	,	A16673	8034
Adaptors used:	-	,		

Item submitted by

Customer Name:	Lam Environmental Services Limited.
Address of Customer:	-
Request No.:	-
Date of receipt:	24-Feb-2022

Date of test: 01-Mar-2022

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2022	CIGISMEC
Signal generator	DS 360	33873	27-May-2022	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1010 ± 5 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 SMTP004-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 ±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 responsess 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: Feng Junqi **Date:** 02-Mar-2022 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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. The results apply to the item as received.

綜合試驗有限公司
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 22CA0224 04-02 **Page** 2 **of** 2

1, Electrical Tests

The electrical tests were perfomed 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	Pass	0.3	
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.

- End -

Calibrated by: Fung Chi Yip **Date:** 01-Mar-2022

Checked by: Chan Yuk Yiu **Date:** 02-Mar-2022

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.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong
Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com

SMECLab

Sound level meter type:	XL2	Serial No.	A2A-15269-EO	Date	01-Mar-2022
Microphone type:	MC230A	Serial No.	A16673		
				Report:	22CA0224 04-02

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	11.0	dB
Noise level in C weighting	14.5	dB
Noise level in Lin	20.9	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
115.0	115.0	115.0	0.7	0.0	0.0
116.0	116.0	116.0	0.7	0.0	0.0
117.0	117.0	117.0	0.7	0.0	0.0
118.0	118.0	118.0	0.7	0.0	0.0
119.0	119.0	119.0	0.7	0.0	0.0
120.0	120.0	120.0	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	49.1	49.1	0.7	0.1	0.1
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	34.1	34.1	0.7	0.1	0.1
33.0	33.1	33.1	0.7	0.1	0.1

Test Data for Sound Level Meter

Sound level meter type: XL2 Serial No. A2A-15269-EO Date 01-Mar-2022
Microphone type: MC230A Serial No. A16673
Report: 22CA0224 04-02

32.0	32.2	32.2	0.7	0.2	0.2
31.0	31.2	31.2	0.7	0.2	0.2
30.0	30.3	30.3	0.7	0.3	0.3

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
40-140	94.0	94.0	0.7	0.0
20-120	94.0	94.0	0.7	0.0
0-100	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
40-140	51.0	51.7	0.7	0.7
	138.0	138.0	0.7	0.0
20-120	30.0	30.3	0.7	0.3
	118.0	118.0	0.7	0.0
0-100	30.0	30.0	0.7	0.0
	98.0	98.0	0.7	0.0

FREQUENCY WEIGHTING TEST

The frequency response of the weighting netwoks 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	54.4	1.5	1.5	-0.2
63.1	94.0	67.8	67.7	1.5	1.5	-0.1
125.9	94.0	77.9	77.8	1.0	1.0	-0.1
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	95.1	1.0	1.0	-0.1
3981.0	94.0	95.0	94.9	1.0	1.0	-0.1
7943.0	94.0	92.9	92.9	1.5	3.0	0.0
12590.0	94.0	89.7	89.5	3.0	6.0	-0.2

Frequency weighting C:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
Hz	dB	dB	dB	+	-	dB

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SMECLab

Sound level meter type: XL2 Serial No. A2A-15269-EO Date 01-Mar-2022
Microphone type: MC230A Serial No. A16673
Report: 22CA0224 04-02

1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	90.8	1.5	1.5	-0.2
63.1	94.0	93.2	93.1	1.5	1.5	-0.1
125.9	94.0	93.8	93.8	1.0	1.0	0.0
251.2	94.0	94.0	93.9	1.0	1.0	-0.1
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	93.1	1.0	1.0	-0.1
7943.0	94.0	91.0	91.0	1.5	3.0	0.0
12590.0	94.0	87.8	87.6	3.0	6.0	-0.2

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	93.8	1.5	1.5	-0.2
63.1	94.0	94.0	93.9	1.5	1.5	-0.1
125.9	94.0	94.0	93.9	1.0	1.0	-0.1
251.2	94.0	94.0	93.9	1.0	1.0	-0.1
501.2	94.0	94.0	93.9	1.0	1.0	-0.1
1995.0	94.0	94.0	93.9	1.0	1.0	-0.1
3981.0	94.0	94.0	93.9	1.0	1.0	-0.1
7943.0	94.0	94.0	94.0	1.5	3.0	0.0
12590.0	94.0	94.0	93.9	3.0	6.0	-0.1

Note: No corrections for the frequency response of the microphone, instrument case and windshield are made to the sound level meter.

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	114.9	1.0	1.0	-0.1

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

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Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com

SMECLab

Sound level meter type: XL2 Serial No. A2A-15269-EO Date 01-Mar-2022
Microphone type: MC230A Serial No. A16673
Report: 22CA0224 04-02

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

Positive polarities: (Weighting Z, set the generator signal to single, Lzpeak)

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	119.3	2.0	0.3

Negative polarities:

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	119.3	2.0	0.3

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)

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time wighting	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 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	117.1	1.0	-0.2

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

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SMECLab

Sound level meter type: XL2 Serial No. A2A-15269-EO Date 01-Mar-2022
Microphone type: MC230A Serial No. A16673
Report: 22CA0224 04-02

msec	dB	dB	dB	+/- dB	dB	
1000	90.0	90.0	90.0	1.0	0.0	60s integ.
10000	80.0	80.0	80.0	1.0	0.0	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	88.0	58.0	58.0	1.7	0.0

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	88.0	68.0	68.0	1.7	0.0

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
121.6	120.6	117.6	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 following:
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
127.7	126.7	86.7	86.7	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

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SMECLab

Sound level meter type: XL2 Serial No. A2A-15269-EO Date 01-Mar-2022

Microphone type: MC230A Serial No. A16673

Report: 22CA0224 04-02

1000	94.0	94.0	0.0	0.0	0.0
125	77.9	77.9	1.0	1.0	0.0
8000	92.9	93.3	1.5	3.0	0.4

----------END---------

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CERTIFICATE OF CALIBRATION

Certificate No.: 21CA1222 02-02 **Page:** 1 **of** 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	Larson Davis
Type/Model No.:	CAL200
Serial/Equipment No.:	13437
Adaptors used:	-

Item submitted by

Curstomer:	Lam Environmental Services Ltd.
Address of Customer:	-
Request No.:	-
Date of receipt:	22-Dec-2021

Date of test: 29-Dec-2021

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	04-May-2022	SCL
Preamplifier	B&K 2673	2239857	31-May-2022	CEPREI
Measuring amplifier	B&K 2610	2346941	01-Jun-2022	CEPREI
Signal generator	DS 360	33873	27-May-2022	CEPREI
Digital multi-meter	34401A	US36087050	27-May-2022	CEPREI
Audio analyzer	8903B	GB41300350	28-May-2022	CEPREI
Universal counter	53132A	MY40003662	02-Jun-2022	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1005 ± 5 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

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

SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Approved Signatory: Feng Junqi **Date:** 03-Jan-2022 **Company Chop:**

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

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 21CA1222 02-02 **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 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	93.63	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 = 0.016 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 = 1000.0 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 = 0.6%**

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.

- End -

Calibrated by: Fung Chi Yip **Date:** 29-Dec-2021

Checked by: Chan Yuk Yiu **Date:** 03-Jan-2022

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.

Met One Instruments, Inc.
1600 NW Washington Blvd, Grants Pass, OR
TEL (541) 471-7111 Fax (541) 471-7116

Certificate of Calibration

BT-645

Particulate Monitor

Recommended calibration interval is 24 months from first day of use.

Unit Info

Model:	*BT-645*	**81865 Firmware Rev:**	*1.3.0*
Serial Number:	*C15621*	**81113**	*0.2.4*
Calibrated By:	*J. Walker* AT28	**Cal. Date:**	*07/07/2022*
Quality Inspector:		**Date:**	*07/07/2022*
Calibration Hz/µg/m³:	*7.02*		

Final Test

Flow (2.0 L/M): Pass

Ambient T (C) *23.8*

RH, % *38.7*

Serial Communication: Pass

BT-645 Conc.: *412.3* Standard Conc: *414.4*

Calibration Standards

Standards	Manufacturer	Model	SN	Cal Due
RMS Multimeter	Fluke	189 Multimeter	94060816	11/08/2022
RH &TEMPERATURE	Met One Instruments	083E-1-35	GP-679	05/17/2023
Primary Flow Meter	TSI	4040	40401945009	01/31/2023
Digital Dust Indicator	SIBATA	LD-3	476795	08/23/2022

The standards used for this calibration have accuracy equal to or greater than the instrument tested. These standards are on record and traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated, all instruments are calibrated to meet the manufacturer's published specifications.

CE

DECLARATION OF CONFORMITY

Manufacturer: Met One Instruments, Inc.
1600 Washington Blvd.
Grants Pass, OR 97526

Model Name: BT-645
Type of Equipment Nephelometer

We declare under our sole responsibility that the equipment referenced above is in conformity with the following Directives and Standards.

Applicable Directives:

EMC	2014/30/EU Electromagnetic Compatibility
RoHS	2011/65/EU Restriction on the Use of Certain Hazardous Substances

Standards of Conformity:

EMC Emissions:	EN 61326-1:2013 Class A (Industrial)
EMC Immunity:	EN 61326-1:2013 Industrial
RoHS Requirements:	EN 50581:2012

Test Methods:

Radiated Emissions	CISPR 11:2015
Conducted Emissions	CISPR 11:2015
ESD	EN 61000-4-2:2009
Radiated Immunity	EN 61000-4-3:2006
EFT	EN 61000-4-4:2012
Surge	EN 61000-4-5:2014
Conducted Immunity	EN 61000-4-6:2014
Magnetic Field Immunity	EN 61000-4-8:2010
Voltage Interrupts / Dips	EN 61000-4-11:2004

Date of Issue: June 23, 2020

Signed: _____

Thomas L. Pottberg
President

Met One Instruments, Inc.
1600 Washington Blvd., Grants Pass, OR 97526
Tel: 541.471.7111 | **Fax:** 541.471.7116
www.metone.com

Lam Environmental Services Limited

Portable Dust Meter Performance Check Record

Portable Dust Meter

Type	:	Particulare Monitor
Manufacturer	:	MET ONE INSTRUMENTS
Model Number	:	BT-645
Serial Number	:	C15621
Performance Check Date	:	20-Jul-22

Standard Equipment

Type	:	High Volume Sampler
Manufacturer	:	TISCH
Model Number	:	TE-5170
Equipment Number	:	HVS018 (S/N:2656)
Last Calibration Date	:	29-Jun-22

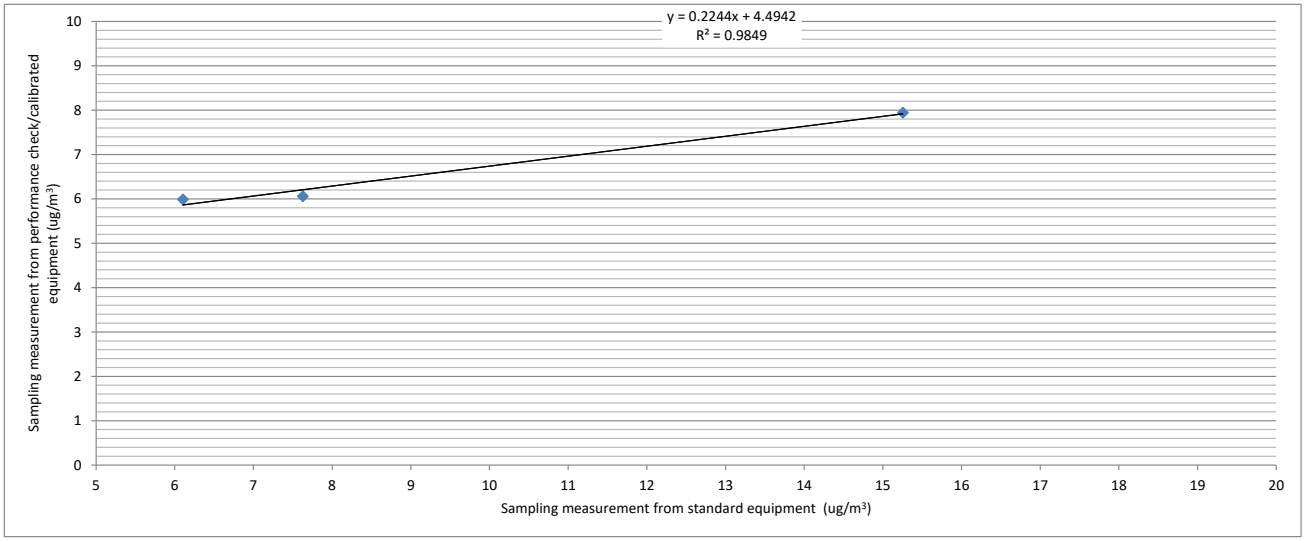
Portable Dust Meter Performance Check Results

Trial no. in 1-hr period	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration in ug/m^3 (Standard equipment) (Y - Axis)	Concentration in ug/m^3 (Performance Check / Calibrated equipment) (X - Axis)
1	20/7/22 09:30	31	1010	15	8
2	20/7/22 10:32	31	1010	6	6
3	20/7/22 13:00	31	1010	8	6

* Filter paper weighting was conducted by HOKLAS accredited laboratory.

Linear Regression of Y on X

Slope (K- factor)	:	4.4000
Correlation Coefficient	:	0.9924
Validity of Performance Check / Calibration Record	:	20/7/2023



Operator:	Alan Ng	Date:	23/7/2022
Checked by:	Derek Lo	Date:	23/7/2022

Met One Instruments, Inc.
1600 NW Washington Blvd, Grants Pass, OR
TEL (541) 471-7111 Fax (541) 471-7116

Certificate of Calibration

BT-645

Particulate Monitor

Recommended calibration interval is 24 months from first day of use.

Unit Info

Model:	*BT-645*	**81865 Firmware Rev:**	*1.3.0*
Serial Number:	*B17940*	**81113**	*0.2.4*
Calibrated By:	*B. Wentowski* AT4	**Cal. Date:**	*10/07/2021*
Quality Inspector:		**Date:**	10-7-2021
Calibration Hz/µg/m³:	*5.18*		

Final Test

Flow (2.0 L/M): Pass

Ambient T (C) *23*

RH, % *30*

Serial Communication: Pass

BT-645 Conc.: *406.54* Standard Conc: *405.82*

Calibration Standards

Standards	Manufacturer	Model	SN	Cal Due
RMS Multimeter	Fluke	189 Multimeter	94060816	10/20/2021
RH &TEMPERATURE	Met One Instruments	G3120	G3120	02/02/2022
Primary Flow Meter	TSI	4040	40401945009	01/13/2022
Digital Dust Indicator	SIBATA	LD-3	6X7759	03/12/2022

The standards used for this calibration have accuracy equal to or greater than the instrument tested. These standards are on record and traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated, all instruments are calibrated to meet the manufacturer's published specifications.

Lam Environmental Services Limited

Portable Dust Meter Performance Check Record

Portable Dust Meter

Type	:	Particulare Monitor
Manufacturer	:	MET ONE INSTRUMENTS
Model Number	:	BT-645
Serial Number	:	B17940
Performance Check Date	:	02-Nov-21, 03-Nov-21

Standard Equipment

Type	:	High Volume Sampler
Manufacturer	:	TISCH
Model Number	:	TE-5170
Equipment Number	:	HVS002
Last Calibration Date	:	28-Oct-21

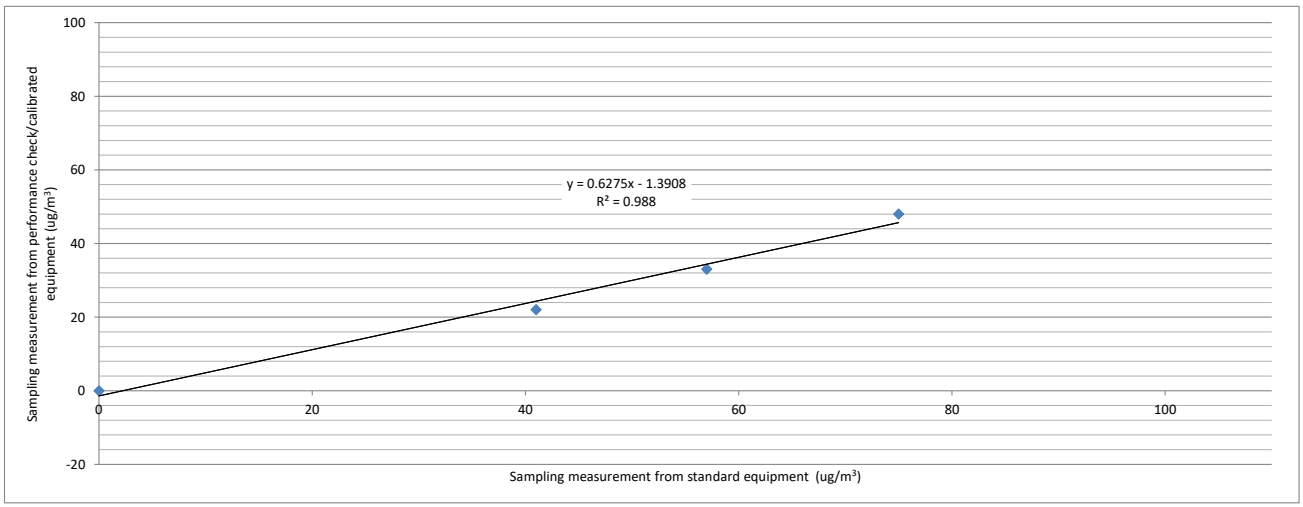
Portable Dust Meter Performance Check Results

Trial no. in 1-hr period	Time	Mean Pressure (hPa)	Mean Temp (˚C)	Concentration in ug/m^3 (Standard equipment) (X - Axis)	Concentration in ug/m^3 (Performance Check / Calibrated equipment) (Y - Axis)
Zero Check	02-11-21	1015	27	0	0
1	2-11-21 08:33	1016	24	41	22
2	2-11-21 10:37	1016	24	57	33
3	2-11-21 09:32	1018	22	75	48

* Filter paper weighting was conducted by HOKLAS accredited laboratory.

Linear Regression of Y on X

Slope (K- factor)	:	1.6000
Correlation Coefficient	:	0.9940
Validity of Performance Check / Calibration Record	:	2-11-2022



Operator:	Garry Yu	Date:	02-Nov-21
Checked by:	Derek Lo	Date:	02-Nov-21

Met One Instruments, Inc.
1600 NW Washington Blvd, Grants Pass, OR
TEL (541) 471-7111 Fax (541) 471-7116

Certificate of Calibration

BT-645

Particulate Monitor

Recommended calibration interval is 24 months from first day of use.

Unit Info

Model:	*BT-645*	**81865 Firmware Rev:**	*1.3.0*
Serial Number:	*B17942*	**81113**	*0.2.4*
Calibrated By:	*B. Wentowski* AT4	**Cal. Date:**	*10/07/2021*
Quality Inspector:		**Date:**	10-7-2021
Calibration Hz/µg/m³:	*5.4*		

Final Test

Flow (2.0 L/M): Pass

Ambient T (C) *23*

RH, % *30*

Serial Communication: Pass

BT-645 Conc.: *414.22* Standard Conc: *405.82*

Calibration Standards

Standards	Manufacturer	Model	SN	Cal Due
RMS Multimeter	Fluke	189 Multimeter	94060816	10/20/2021
RH &TEMPERATURE	Met One Instruments	G3120	G3120	02/02/2022
Primary Flow Meter	TSI	4040	40401945009	01/13/2022
Digital Dust Indicator	SIBATA	LD-3	6X7759	03/12/2022

The standards used for this calibration have accuracy equal to or greater than the instrument tested. These standards are on record and traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated, all instruments are calibrated to meet the manufacturer's published specifications.

Lam Environmental Services Limited

Portable Dust Meter Performance Check Record

Portable Dust Meter

Type	:	Particulare Monitor
Manufacturer	:	MET ONE INSTRUMENTS
Model Number	:	BT-645
Serial Number	:	B17942
Performance Check Date	:	22-Nov-21, 3-Nov-21

Standard Equipment

Type	:	High Volume Sampler
Manufacturer	:	TISCH
Model Number	:	TE-5170
Equipment Number	:	HVS002
Last Calibration Date	:	28-Oct-21

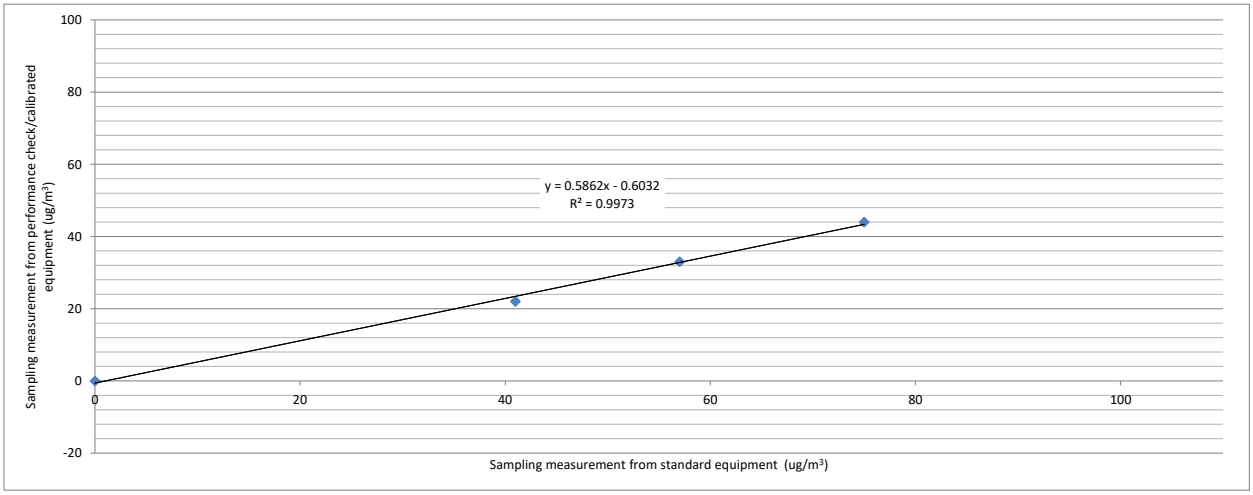
Portable Dust Meter Performance Check Results

Trial no. in 1-hr period	Time	Mean Pressure (hPa)	Mean Temp (˚C)	Concentration in ug/m^3 (Standard equipment) (X - Axis)	Concentration in ug/m^3 (Performance Check / Calibrated equipment) (Y - Axis)
Zero Check	2/11/2021	1015	27	0	0
1	2/11/21 08:33	1016	24	41	22
2	2/11/21 10:37	1016	24	57	33
3	2/11/21 09:32	1018	22	75	44

* Filter paper weighting was conducted by HOKLAS accredited laboratory.

Linear Regression of Y on X

Slope (K- factor)	:	1.8000
Correlation Coefficient	:	0.9987
Validity of Performance Check / Calibration Record	:	12/11/2022



Operator:	Garry Yu	Date:	12-Nov-21
Checked by:	Derek Lo	Date:	12-Nov-21

Met One Instruments
1600 Washington Blvd
Grants Pass, OR 97526
(541) 471-7111
(541) 471-7116 (Fax)
Service@metone.com

Calibration Certificate

The calibration results on this report certify that this instrument complies with the product specifications at the time of calibration. Calibration was performed according to accepted industry methods using equipment, procedures, and standards that are traceable to NIST and ISO.

Recommended calibration interval is 12 months from the first day of use.

Instrument Model# *Aerocet 831* **Instrument Serial#** *B19128*

Date of Calibration *10/13/2021* **Sensor #** *3251*

Brittney Wentowski AT4
Calibration Technician

Quality Check

Temperature *24* °C **Relative Humidity** *30* %

Test Procedure: *Aerocet 831-6100*

PSL Size (µm)	Test Results	Test Spec.	Lot# NIST	Expiration
0.3	Pass	± 10%	223077	04/30/2023
0.5	Pass	± 10%	219480	11/30/2022
1.0	Pass	± 10%	229294	8/31/2023
2.5	Pass	± 10%	MF032	09/08/2022
4.0	Pass	± 10%	REF	NA
5.0	Pass	± 10%	214115	07/31/2022
7.0	Pass	± 10%	REF	NA
10.0	Pass	± 10%	230028	09/30/2023

Standards	Model	SN	Cal Due
Particle Counter	GT-526	M1762	1/30/2022
FLOWMETER	4040	40401945009	1/13/2022
DMM	189 Multimeter	94060816	10/20/2021
RH/TEMP SENSOR	G3120	G4587	2/2/2022

CE

DECLARATION OF CONFORMITY

Manufacturer:	Met One Instruments, Inc. 1600 Washington Blvd. Grants Pass, OR 97526
Model Name:	Aerocet-831
Type of Equipment	Handheld Dust Monitor

We declare under our sole responsibility that the equipment referenced above is in conformity with the following Directives and Standards.

Applicable Directives:

EMC	2014/30/EU Electromagnetic Compatibility
RoHS	2011/65/EU Restriction on the Use of Certain Hazardous Substances

Standards of Conformity:

EMC Emissions:	EN 61326-1:2013 Class B
EMC Immunity:	EN 61326-1:2013 Industrial
RoHS Requirements:	EN 50581:2012

Test Methods:

Radiated Emissions	CISPR 11:2009 (Amended by A1:2010)
Conducted Emissions	CISPR 11:2009 (Amended by A1:2010)
ESD	IEC 61000-4-2:2008
Radiated Immunity	IEC 61000-4-3:2010
EFT	IEC 61000-4-4:2012
Surge	IEC 61000-4-5:2005
Conducted Immunity	IEC 61000-4-6:2008
Magnetic Field Immunity	IEC 61000-4-8:2009
Voltage Interrupts / Dips	IEC 61000-4-11:2004

Date of Issue: October 18, 2018

Signed: _____

Thomas L. Pottberg
President

Met One Instruments, Inc.
1600 Washington Blvd., Grants Pass, OR 97526
Tel: 541 471 7111 | Fax: 541 471 7116
www.metone.com

Lam Environmental Services Limited

Portable Dust Meter Performance Check Record

Portable Dust Meter

Type : Particulare Monitor

Manufacturer : MET ONE INSTRUMENTS

Model Number : AEROCET831

Serial Number : B19129

Performance Check Date : 22-Nov-21, 3-Nov-21

Standard Equipment

Type : High Volume Sampler

Manufacturer : TISCH

Model Number : TE-5170

Equipment Number : HVS002

Last Calibration Date : 28-Oct-21

Portable Dust Meter Performance Check Results

Trial no. in 1-hr period	Time	Mean Pressure (hPa)	Mean Temp (˚C)	Concentration in ug/m^3 (Standard equipment) (X - Axis)	Concentration in ug/m^3 (Performance Check / Calibrated equipment) (Y - Axis)
Zero Check	2/11/2021	1015	27	0	0
1	2/11/21 08:33	1016	24	41	106
2	2/11/21 10:37	1016	24	57	168
3	3/11/21 09:31	1018	22	75	212

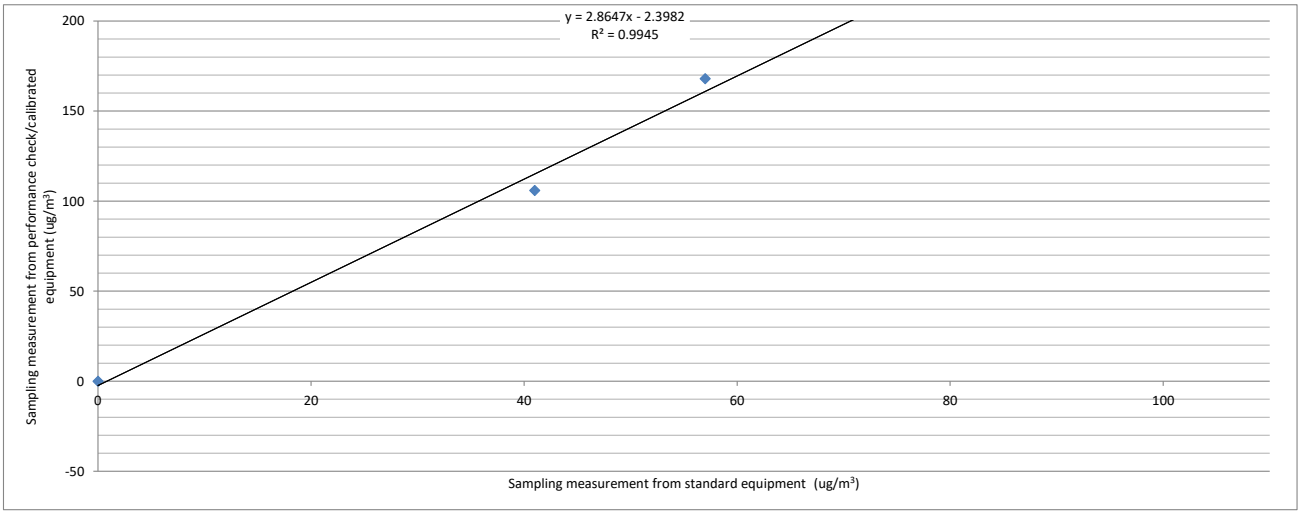
* Filter paper weighting was conducted by HOKLAS accredited laboratory.

Linear Regression of Y on X

Slope (K- factor) : 0.4000

Correlation Coefficient : 0.9973

Validity of Performance Check / Calibration Record : 12/11/2022



Operator: Garry Yu Date: 12-Nov-21

Checked by: Derek Lo Date: 12-Nov-21

Met One Instruments
1600 Washington Blvd
Grants Pass, OR 97526
(541) 471-7111
(541) 471-7116 (Fax)
Service@metone.com

Calibration Certificate

The calibration results on this report certify that this instrument complies with the product specifications at the time of calibration. Calibration was performed according to accepted industry methods using equipment, procedures, and standards that are traceable to NIST and ISO.

Recommended calibration interval is 12 months from the first day of use.

Instrument Model# Aerocet 831 **Instrument Serial#** B19129

Date of Calibration 10/13/2021 **Sensor #** 3252

Brittney Wentowski AT4
Calibration Technician

Quality Check

Temperature 24 °C **Relative Humidity** 30 %

Test Procedure: Aerocet 831-6100

PSL Size (µm)	Test Results	Test Spec.	Lot# NIST	Expiration
0.3	Pass	± 10%	223077	04/30/2023
0.5	Pass	± 10%	219480	11/30/2022
1.0	Pass	± 10%	229294	8/31/2023
2.5	Pass	± 10%	MF032	09/08/2022
4.0	Pass	± 10%	REF	NA
5.0	Pass	± 10%	214115	07/31/2022
7.0	Pass	± 10%	REF	NA
10.0	Pass	± 10%	230028	09/30/2023

Standards	Model	SN	Cal Due
Particle Counter	GT-526	M1762	1/30/2022
FLOWMETER	4040	40401945009	1/13/2022
DMM	189 Multimeter	94060816	10/20/2021
RH/TEMP SENSOR	G3120	G4587	2/2/2022

CE

DECLARATION OF CONFORMITY

Manufacturer: Met One Instruments, Inc.
1600 Washington Blvd.
Grants Pass, OR 97526

Model Name: Aerocet-831
Type of Equipment Handheld Dust Monitor

We declare under our sole responsibility that the equipment referenced above is in conformity with the following Directives and Standards.

Applicable Directives:

EMC	2014/30/EU Electromagnetic Compatibility
RoHS	2011/65/EU Restriction on the Use of Certain Hazardous Substances

Standards of Conformity:

EMC Emissions:	EN 61326-1:2013 Class B
EMC Immunity:	EN 61326-1:2013 Industrial
RoHS Requirements:	EN 50581:2012

Test Methods:

Radiated Emissions	CISPR 11:2009 (Amended by A1:2010)
Conducted Emissions	CISPR 11:2009 (Amended by A1:2010)
ESD	IEC 61000-4-2:2008
Radiated Immunity	IEC 61000-4-3:2010
EFT	IEC 61000-4-4:2012
Surge	IEC 61000-4-5:2005
Conducted Immunity	IEC 61000-4-6:2008
Magnetic Field Immunity	IEC 61000-4-8:2009
Voltage Interrupts / Dips	IEC 61000-4-11:2004

Date of Issue: October 18, 2018

Signed: _____

Thomas L. Pottberg
President

Met One Instruments, Inc.
1600 Washington Blvd., Grants Pass, OR 97526
Tel: 541 471 7111 | Fax: 541 471 7116
www.metone.com

Lam Environmental Services Limited

Portable Dust Meter Performance Check Record

Portable Dust Meter

Type : Particulare Monitor

Manufacturer : MET ONE INSTRUMENTS

Model Number : AEROCET831

Serial Number : B19129

Performance Check Date : 22-Nov-21, 3-Nov-21

Standard Equipment

Type : High Volume Sampler

Manufacturer : TISCH

Model Number : TE-5170

Equipment Number : HVS002

Last Calibration Date : 28-Oct-21

Portable Dust Meter Performance Check Results

Trial no. in 1-hr period	Time	Mean Pressure (hPa)	Mean Temp (˚C)	Concentration in ug/m^3 (Standard equipment) (X - Axis)	Concentration in ug/m^3 (Performance Check / Calibrated equipment) (Y - Axis)
Zero Check	2/11/2021	1015	27	0	0
1	2/11/21 08:33	1016	24	41	92
2	2/11/21 10:37	1016	24	57	123
3	3/11/21 09:31	1018	22	107	163

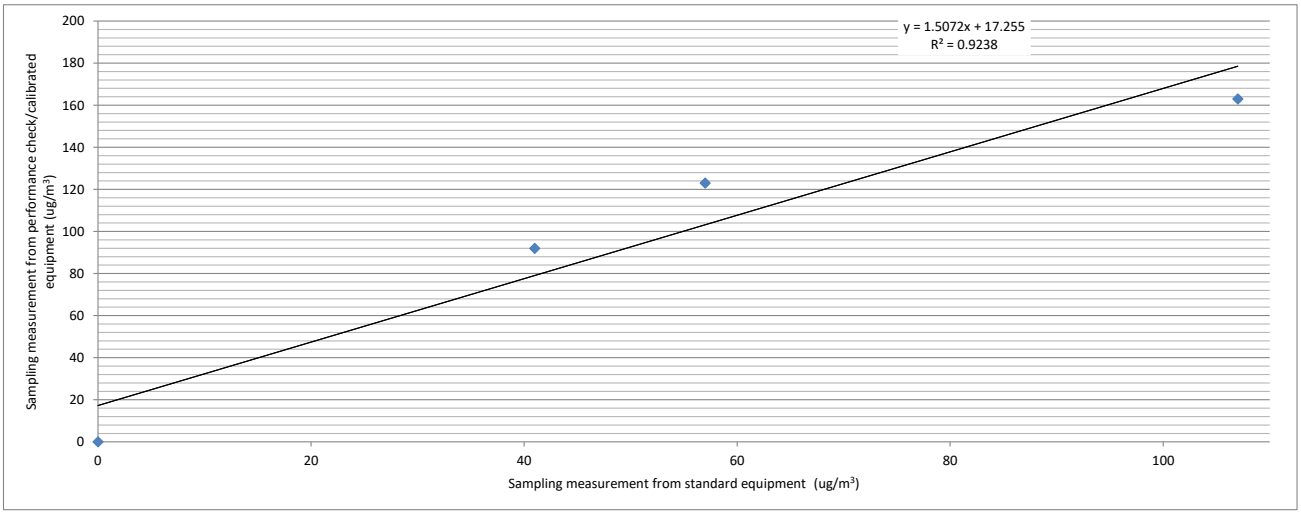
* Filter paper weighting was conducted by HOKLAS accredited laboratory.

Linear Regression of Y on X

Slope (K- factor) : 0.7000

Correlation Coefficient : 0.9612

Validity of Performance Check / Calibration Record : 12/11/2022



Operator: Garry Yu Date: 12-Nov-21

Checked by: Derek Lo Date: 12-Nov-21

Hong Kong Calibration Ltd.
香 港 校 正 有限公司

Calibration Certificate

Certificate No. 200341 Page 1 of 2 Pages

Customer : Lam Environmental Services Ltd

Address : 19/F, Remex Centre, 42 Wong Chuk Hang Road, Hong Kong

Order No. : Q14456 **Date of receipt :** 12-Jan-22

Item Tested

Description : Aerosol Mass Monitor

Manufacturer : Met One **I.D.** : --

Model : Aerocet 831 **Serial No.** : Y23160

Test Conditions

Date of Test : 24-Jan-22 **Supply Voltage** : --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Calibration procedure : Manufacturer recommended method (gravimetric), Z28.

Test Results

All results were within the tolerance(s) after adjustment.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S136B	Stop Watch	102964	SCL-HKSAR
S238	Micro Balance	108228	NIM-PRC
S201	Std. Test Dust	61291	NIST
S207B	Std. Flowmeter	LL-2104002489	NIM-PRC

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : Kin Wong

Approved by : Steve Kwan

Date: 24-Jan-22

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel. 2425 8801 Fax. 2425 8646

Calibration Certificate

Results :

1. General

Internal Filters : checked and found clean.

2. Flow Meter

UUT Nominal Value (LPM)	Measured Value (LPM)		Tolerance (LPM)
	Before Adjust	After Adjust	
2.83	*2.60	2.85	± 0.15

Uncertainty : ± 0.05 LPM

3. Timer

Reference Value	UUT Reading	Tolerance	Uncertainty
10′ 00″ 07	10 min	± 2 sec/hr	± 0.5 sec/hr

4. Dust Particle (PM_{10})

Applied Value ($\mu g/m^3$)	UUT Reading ($\mu g/m^3$) K Factor : 0.24	Tolerance	Uncertainty
597	604	± 20 %	± 10 %

Remark : 1. UUT: Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. ISO 12103-1 A1 respirable standard test dust was used for the calibration.
4. The K Factor to be adjusted by the customer from 0.9 to 0.24.
5. *Out of tolerance.

---------- END ----------

Lam Environmental Services Limited

Portable Dust Meter Performance Check Record

Portable Dust Meter

Type	:	Particulare Monitor
Manufacturer	:	MET ONE INSTRUMENTS
Model Number	:	AEROCET831
Serial Number	:	Y23160
Performance Check Date	:	11-Feb-22

Standard Equipment

Type	:	High Volume Sampler
Manufacturer	:	TISCH
Model Number	:	TE-5170
Equipment Number	:	HVS018 (S/N:2656)
Last Calibration Date	:	30-Dec-21

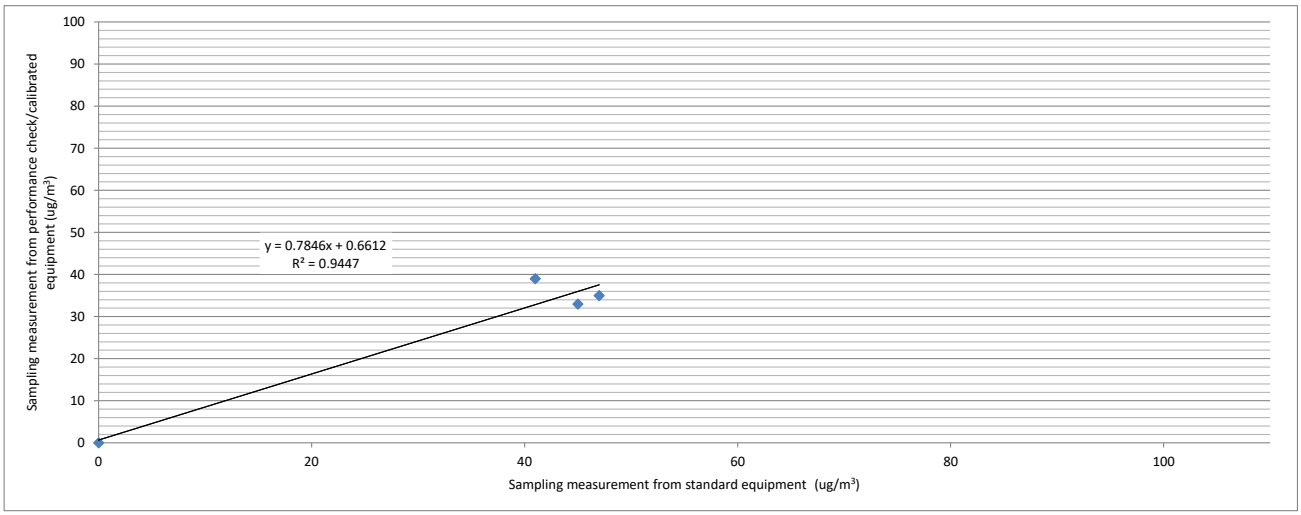
Portable Dust Meter Performance Check Results

Trial no. in 1-hr period	Time	Mean Pressure (hPa)	Mean Temp (˚C)	Concentration in ug/m^3 (Standard equipment) (X - Axis)	Concentration in ug/m^3 (Performance Check / Calibrated equipment) (Y - Axis)
Zero Check	11/2/2022	1017	19	0	0
1	11/2/22 08:04	1017	19	45	33
2	11/2/22 09:04	1017	19	41	39
3	11/2/22 10:04	1017	19	47	35

* Filter paper weighting was conducted by HOKLAS accredited laboratory.

Linear Regression of Y on X

Slope (K- factor)	:	1.3000
Correlation Coefficient	:	0.9720
Validity of Performance Check / Calibration Record	:	19/2/2023

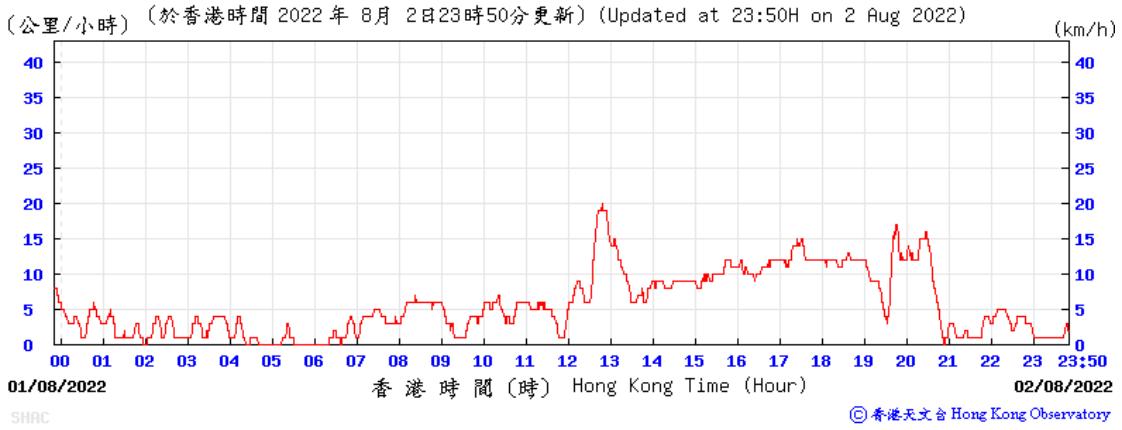


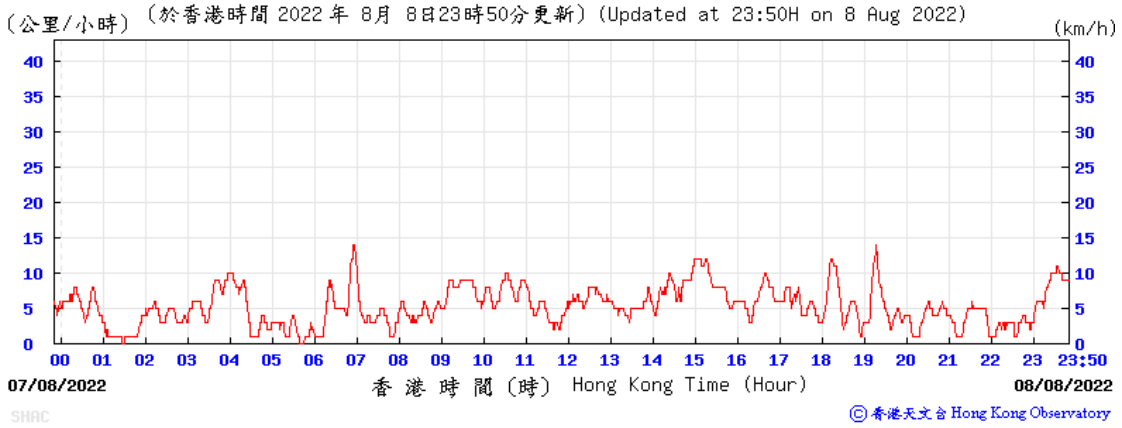
Operator:	Alan Ng	Date:	19-Feb-22
Checked by:	Derek Lo	Date:	19-Feb-22

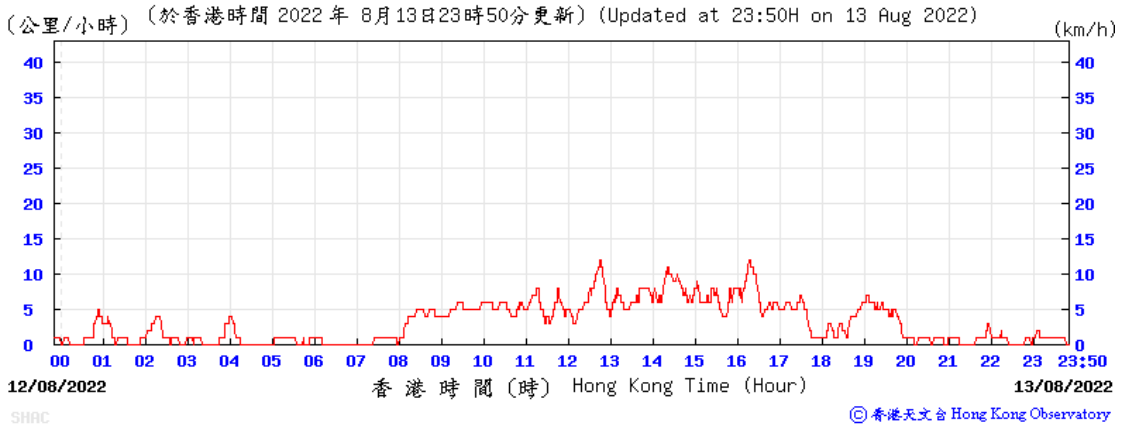
Appendix 4.3

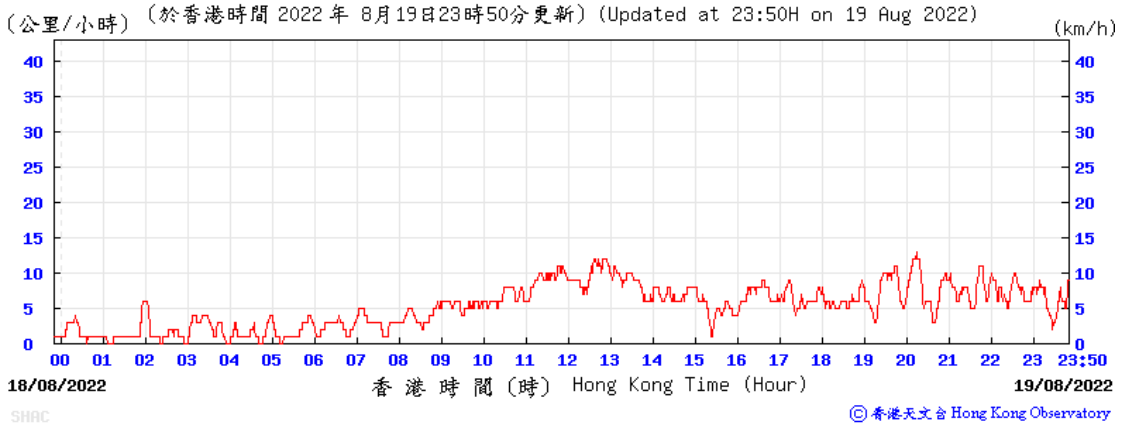
Wind data extracted from Sha Tin and Tsing Yi HKO Automatic Weather Stations

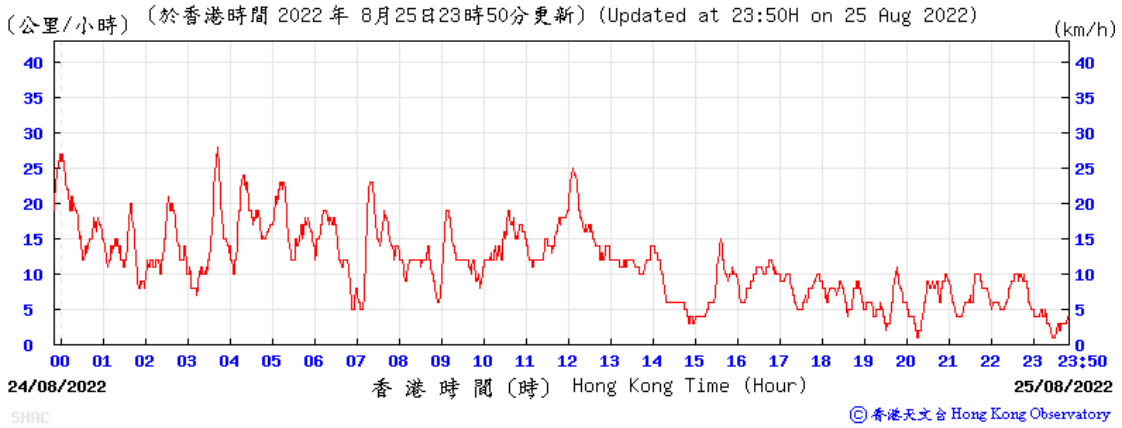
Wind data extracted from Sha Tin HKO Automatic Weather Stations








(公里/小時) (於香港時間 2022 年 8月19日23時50分更新) (Updated at 23:50H on 19 Aug 2022)
(km/h)
40 35 30 25 20 15 10 5 0
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 23:50
18/08/2022
香 港 時 間 (時) Hong Kong Time (Hour)
19/08/2022
SHAC
© 香港天文台 Hong Kong Observatory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(km/h)
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00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 23:50
24/08/2022
香 港 時 間 (時) Hong Kong Time (Hour)
25/08/2022
SHAC
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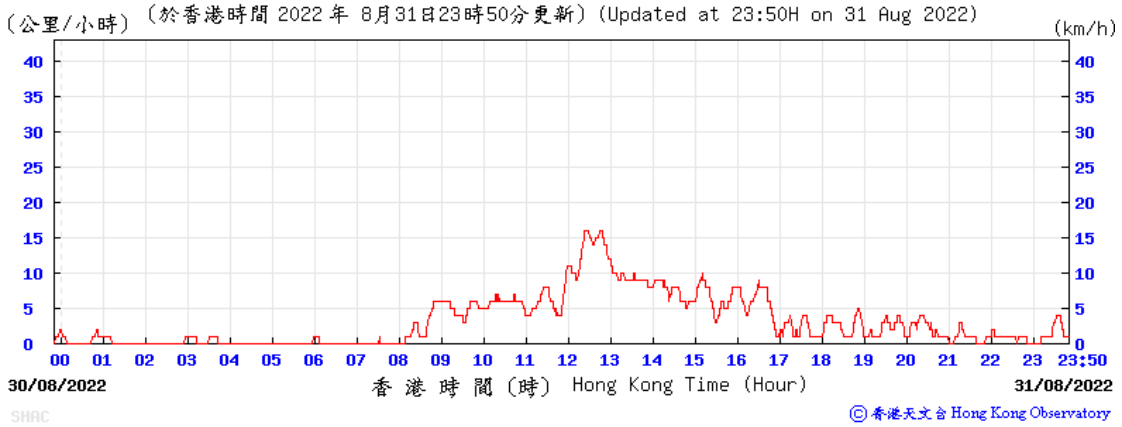
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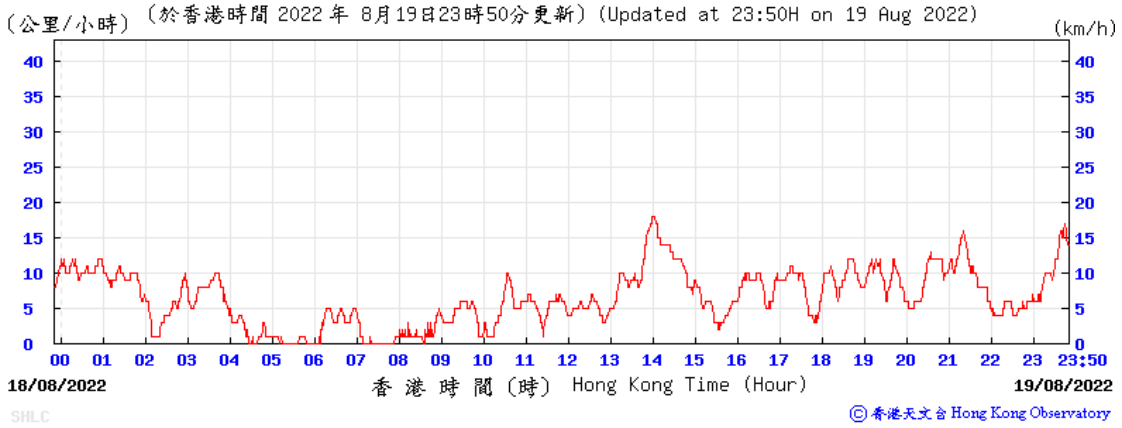
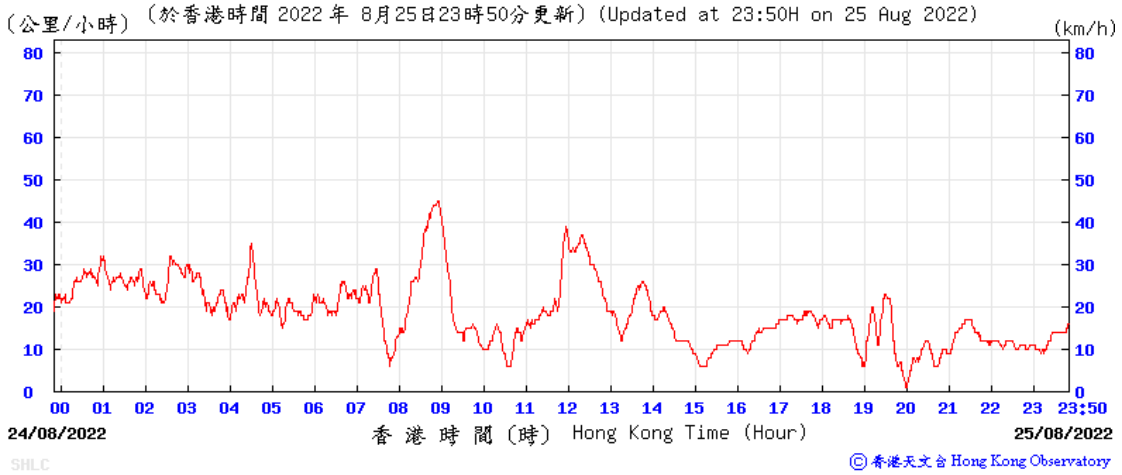
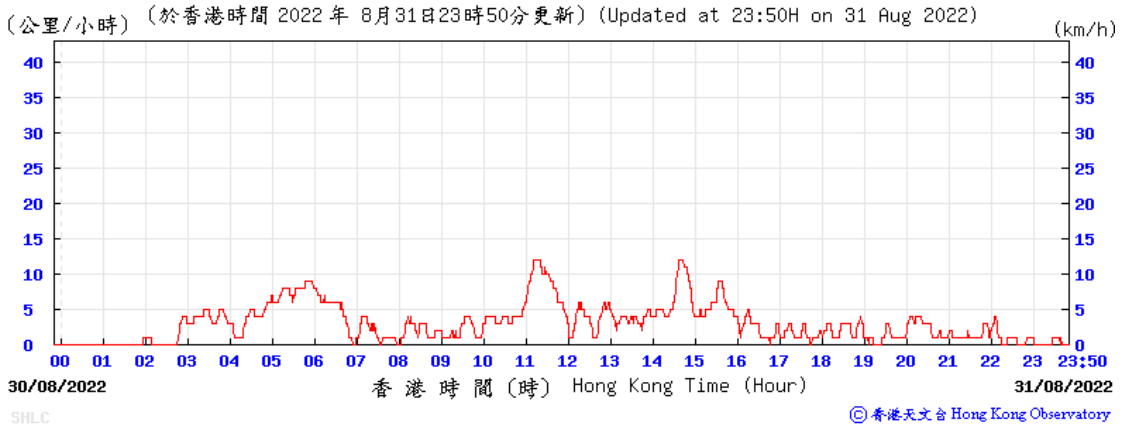
(km/h)
40 35 30 25 20 15 10 5 0
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 23:50
30/08/2022
香 港 時 間 (時) Hong Kong Time (Hour)
31/08/2022
SHAC
© 香港天文台 Hong Kong Observatory

Wind data extracted from Tsing Yi HKO Automatic Weather Stations







香港天文台 HONG KONG OBSERVATORY

每日數據摘錄

二零二二年八月每日數據摘錄

返回 年 2022 月 8 前往

日	天文台								京士柏	橫瀾島^	
	平均氣壓(百帕斯卡)	氣溫			平均露點溫度(攝氏度)	平均相對濕度(%)	平均雲量(%)	總雨量(毫米)	總日照(小時)	盛行風向(度)	平均風速(公里/小時)
		絕對最高(攝氏度)	平均(攝氏度)	絕對最低(攝氏度)							
01	1005.9	35.7	31.4	29.1	25.0	69	47	0.0	11.5	***	***
02	1007.1	35.2	31.1	28.0	24.9	70	63	0.2	10.3	***	***
03	1006.7	30.8	28.2	25.6	24.7	82	85	34.9	0.8	***	***
04	1004.5	28.4	27.1	25.9	24.6	86	83	14.9	0.2	***	***
05	1007.6	28.6	26.1	24.5	25.1	94	89	165.5	1.3	***	***
06	1007.6	30.9	27.9	26.1	25.9	89	81	5.5	5.3	***	***
07	1006.7	32.6	29.6	27.6	26.1	82	71	2.8	9.0	***	***
08	1006.3	30.9	28.3	26.2	25.8	87	86	33.3	1.9	***	***
09	1003.6	28.5	26.7	25.4	24.5	88	88	72.0	0.3	***	***
10	1004.1	29.6	27.4	25.8	25.6	90	90	49.7	0.9	***	***
11	1007.8	28.8	26.7	25.5	25.0	90	88	12.4	1.2	***	***
12	1008.8	27.1	26.1	24.9	24.8	93	84	76.0	0.1	***	***
13	1008.0	32.6	28.7	25.8	25.1	81	57	0.0	5.3	***	***
14	1007.2	33.3	29.5	26.9	25.1	78	27	0.0	10.0	***	***
15	1006.2	33.6	30.0	28.1	25.6	78	57	0.0	7.6	***	***
16	1005.6	33.2	29.4	26.2	25.9	82	72	9.1	6.5	***	***
17	1005.8	32.3	28.2	26.2	25.6	86	84	29.8	4.1	***	***
18	1005.5	30.4	28.1	26.2	25.6	87	84	22.1	1.8	***	***
19	1004.9	32.0	28.3	26.4	25.5	85	87	4.8	3.5	***	***
20	1007.5	31.9	28.2	26.5	25.0	83	74	8.4	6.2	***	***
21	1008.3	32.9	29.0	26.6	25.9	84	71	1.9	5.9	***	***
22	1006.9	32.9	30.1	28.2	25.5	77	41	0.0	10.6	***	***
23	1005.0	34.5	31.1	28.6	26.4	77	28	0.0	10.1	***	***
24	1002.3	34.9	30.8	26.4	25.2	73	69	5.5	6.3	***	***

25	1006.3	29.8	27.2	25.0	24.4	85	87	48.1	1.8	***	***
26	1010.6	32.9	29.4	27.5	25.6	80	66	0.1	7.7	***	***
27	1009.2	33.0	29.7	27.4	25.4	78	60	0.0	10.8	***	***
28	1008.4	34.4	30.5	28.3	26.7	80	57	0.0	10.9	***	***
29	1010.2	34.6	30.1	28.6	25.9	78	81	0.0	3.2	***	***
30	1008.8	32.3	29.5	27.9	25.7	80	65	13.1	6.6	***	***
31	1006.7	31.7	29.7	28.1	25.8	80	70	4.7	6.0	***	***
平均/總值	1006.8	31.9	28.8	26.8	25.4	82	71	614.8	167.7	***	***
氣候平均值§	1005.2	31.3	28.7	26.7	25.1	81	70	453.2	182.1	230	18.8

*** *沒有數據*

^ *自1989年8月開始,橫瀾島的風向和風速資料基於自動氣象站數據*

微量表示少於 0.05 毫米

§ *1991-2020 氣候平均值 (除特別列明外)*

Appendix 5.1

Monitoring Schedules for Reporting Month and Next Month

Contract No. STW 01/2021
Environmental Team for Relocation of Sha Tin Sewage Treatment Works to Caverns –Site Preparation and Access Tunnel Construction
Impact Air Quality and Noise Monitoring Schedule
Aug 2022

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31-Jul	1-Aug	2-Aug AQM NM (CM3, CM5)	3-Aug NM (CM1, CM2 (B), CM4) NM (CM4)_Evening Time (1900-2300 hrs) NM (CM4)_Night Time (2300-0700 hrs on next day)	4-Aug	05 Aug	06 Aug
07 Aug	08 Aug AQM	09 Aug	10 Aug	11 Aug	12 Aug	13 Aug AQM
14 Aug	15 Aug	16 Aug NM (CM1, CM2 (B), CM5)	17 Aug	18 Aug NM (CM3, CM4) NM (CM4)_Evening Time (1900-2300 hrs) NM (CM4)_Night Time (2300-0700 hrs on next day)	19 Aug AQM	20 Aug
21 Aug	22 Aug NM (CM3, CM5)	23 Aug NM (CM1, CM2 (B), CM4) NM (CM4)_Evening Time (1900-2300 hrs) NM (CM4)_Night Time (2300-0700 hrs on next day)	24 Aug	25 Aug AQM	26 Aug	27 Aug
28 Aug	29 Aug	30 Aug NM (CM1, CM5)	31 Aug AQM NM (CM2 (B), CM3, CM4) NM (CM4)_Evening Time (1900-2300 hrs) NM (CM4)_Night Time (2300-0700 hrs on next day)	1-Sep	2-Sep	3-Sep

Remark:

1. AQM: Air Quality Monitoring
   NM: Noise Monitoring
2. Air Quality Monitoring for ASR51 was commenced on 19 Aug 2022
3. No noise monitoring was conducted from 8-13 August 2022 due to raining

Contract No. STW 01/2021
Environmental Team for Relocation of Sha Tin Sewage Treatment Works to Caverns –Site Preparation and Access Tunnel Construction
Tentative Impact Air Quality and Noise Monitoring Schedule
Sep 2022

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				01 Sep	02 Sep	03 Sep
04 Sep	05 Sep	06 Sep AQM NM	07 Sep	08 Sep	09 Sep	10 Sep AQM
11 Sep	12 Sep	13 Sep	14 Sep	15 Sep	16 Sep AQM NM	17 Sep
18 Sep	19 Sep	20 Sep	21 Sep	22 Sep AQM NM	23 Sep	24 Sep
25 Sep	26 Sep	27 Sep	28 Sep AQM NM	29 Sep	30 Sep	

Remark:

1. AQM: Air Quality Monitoring
   NM: Noise Monitoring, the monitoring dates are tentative and subject to change

Appendix 5.2

Air Quality Monitoring Results and Graphical Presentations

Report on 1-hour TSP monitoring at AM1 - Ah Kung Kok Fishermen Village

Action Level (μg/m3) - 294
Limit Level (μg/m3) - 500

Date	Weather Condition	Time	Mass Concentration (μg/m3)
2-Aug-22	Fine	8:43	14
2-Aug-22	Fine	9:44	12
2-Aug-22	Fine	10:46	14
8-Aug-22	Drizzle	8:40	85
8-Aug-22	Drizzle	9:40	42
8-Aug-22	Drizzle	10:41	39
13-Aug-22	Fine	8:45	17
13-Aug-22	Fine	9:46	12
13-Aug-22	Fine	10:47	10
19-Aug-22	Drizzle	8:25	23
19-Aug-22	Drizzle	9:26	9
19-Aug-22	Drizzle	10:27	4
25-Aug-22	Drizzle	13:00	18
25-Aug-22	Drizzle	14:01	18
25-Aug-22	Drizzle	15:02	20
31-Aug-22	Fine	8:53	111
31-Aug-22	Fine	9:54	72
31-Aug-22	Fine	10:55	47

Report on 1-hour TSP monitoring at AM2 - Block H, Kam Tai Court

Action Level (μg/m3) - 325
Limit Level (μg/m3) - 500

Date	Weather Condition	Time	Mass Concentration (μg/m3)
2-Aug-22	Fine	9:02	8
2-Aug-22	Fine	10:03	9
2-Aug-22	Fine	11:04	13
8-Aug-22	Drizzle	8:09	29
8-Aug-22	Drizzle	9:10	39
8-Aug-22	Drizzle	10:11	33
13-Aug-22	Fine	8:27	45
13-Aug-22	Fine	9:28	33
13-Aug-22	Fine	10:29	31
19-Aug-22	Drizzle	8:12	20
19-Aug-22	Drizzle	9:13	14
19-Aug-22	Drizzle	10:14	4
25-Aug-22	Drizzle	13:00	13
25-Aug-22	Drizzle	14:01	22
25-Aug-22	Drizzle	15:02	29
31-Aug-22	Fine	8:45	58
31-Aug-22	Fine	9:46	53
31-Aug-22	Fine	10:47	43

Report on 1-hour TSP monitoring at AM3(B) - Outside A Kung Kok Street Garden

Action Level (μg/m3) - 360
Limit Level (μg/m3) - 500

Date	Weather Condition	Time	Mass Concentration (μg/m3)
2-Aug-22	Fine	8:39	10
2-Aug-22	Fine	9:40	7
2-Aug-22	Fine	10:41	13
8-Aug-22	Drizzle	8:15	24
8-Aug-22	Drizzle	9:16	23
8-Aug-22	Drizzle	10:17	18
13-Aug-22	Fine	8:41	23
13-Aug-22	Fine	9:42	17
13-Aug-22	Fine	10:43	11
19-Aug-22	Drizzle	8:21	22
19-Aug-22	Drizzle	9:22	11
19-Aug-22	Drizzle	10:23	4
25-Aug-22	Drizzle	13:00	11
25-Aug-22	Drizzle	14:01	17
25-Aug-22	Drizzle	15:02	24
31-Aug-22	Fine	9:01	52
31-Aug-22	Fine	10:02	39
31-Aug-22	Fine	11:03	31

Report on 1-hour TSP monitoring at AM4 - Wellborn Kindergarten

Action Level (μg/m3) - 297
Limit Level (μg/m3) - 500

Date	Weather Condition	Time	Mass Concentration (μg/m3)
2-Aug-22	Fine	8:28	11
2-Aug-22	Fine	9:29	13
2-Aug-22	Fine	10:29	9
8-Aug-22	Drizzle	8:31	28
8-Aug-22	Drizzle	9:32	22
8-Aug-22	Drizzle	10:34	28
13-Aug-22	Fine	8:33	14
13-Aug-22	Fine	9:34	12
13-Aug-22	Fine	10:35	8
19-Aug-22	Drizzle	8:17	13
19-Aug-22	Drizzle	9:19	5
19-Aug-22	Drizzle	10:20	3
25-Aug-22	Drizzle	13:00	9
25-Aug-22	Drizzle	14:01	11
25-Aug-22	Drizzle	15:02	14
31-Aug-22	Fine	8:53	95
31-Aug-22	Fine	9:53	50
31-Aug-22	Fine	10:54	32

Report on 1-hour TSP monitoring at AM5 - The NAAC Harmony Manor

Action Level (μg/m3) - 349
Limit Level (μg/m3) - 500

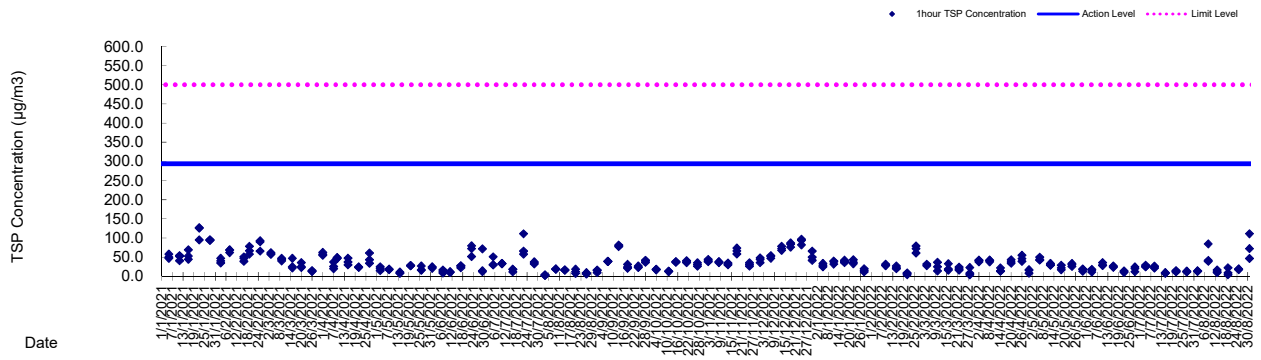
Date	Weather Condition	Time	Mass Concentration (μg/m3)
2-Aug-22	Fine	8:52	12
2-Aug-22	Fine	9:53	12
2-Aug-22	Fine	10:54	19
8-Aug-22	Drizzle	8:32	108
8-Aug-22	Drizzle	9:33	139
8-Aug-22	Drizzle	10:34	87
13-Aug-22	Fine	8:53	28
13-Aug-22	Fine	9:54	22
13-Aug-22	Fine	10:55	13
19-Aug-22	Drizzle	8:31	16
19-Aug-22	Drizzle	9:32	8
19-Aug-22	Drizzle	10:33	3
25-Aug-22	Drizzle	13:00	21
25-Aug-22	Drizzle	14:01	30
25-Aug-22	Drizzle	15:02	38
31-Aug-22	Fine	8:45	34
31-Aug-22	Fine	9:46	24
31-Aug-22	Fine	10:47	21

Report on 1-hour TSP monitoring at ASR51 - The Hong Kong Yaumati Ferry Company Ltd. Administrative Building
Action Level (μg/m3) - 310
Limit Level (μg/m3) - 500

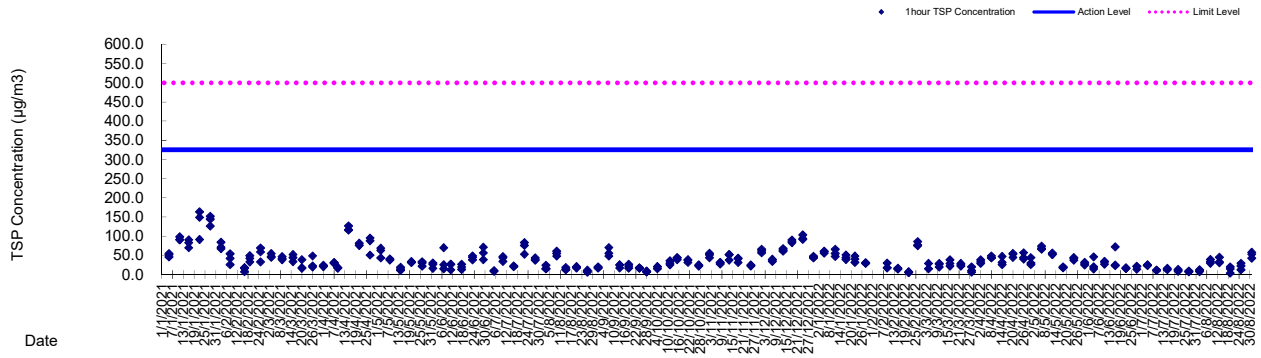
Date	Weather Condition	Time	Mass Concentration (μg/m3)
19-Aug-22	Cloudy	13:44	14
19-Aug-22	Cloudy	14:44	8
19-Aug-22	Cloudy	15:45	6
25-Aug-22	Drizzle	13:00	17
25-Aug-22	Drizzle	14:00	23
25-Aug-22	Drizzle	15:01	25
31-Aug-22	Fine	13:10	83
31-Aug-22	Fine	14:11	59
31-Aug-22	Fine	15:12	25

Graphic Presentation of TSP Result

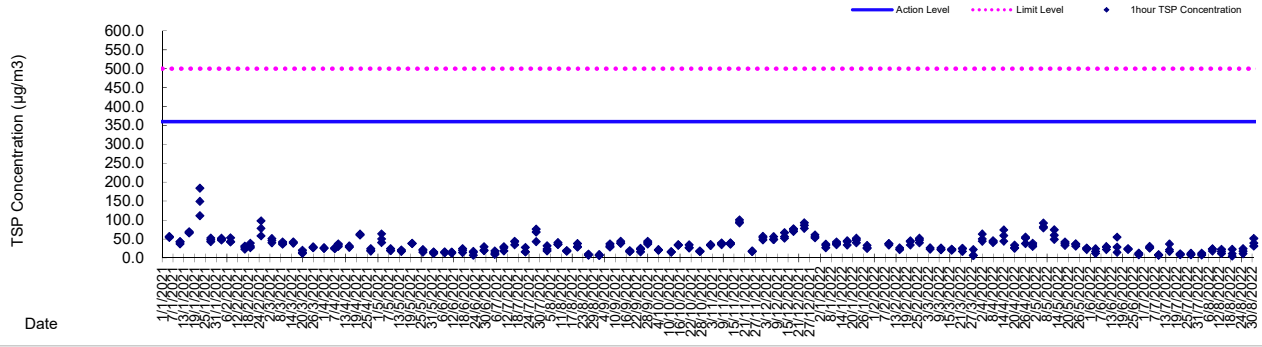
AM1 - Ah Kung kok Fishermen Village



AM2 - Block H, Kam Tai Court

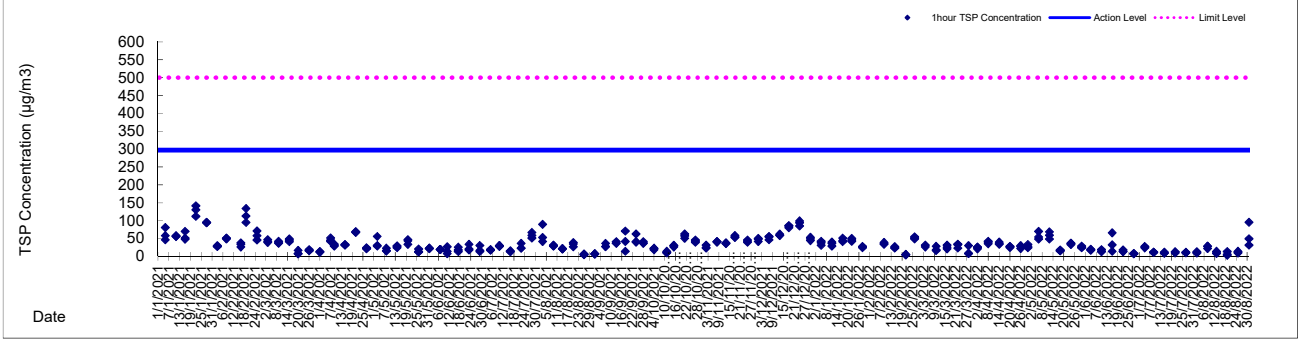


AM3(B) - Outside A Kung Kok Street Garden

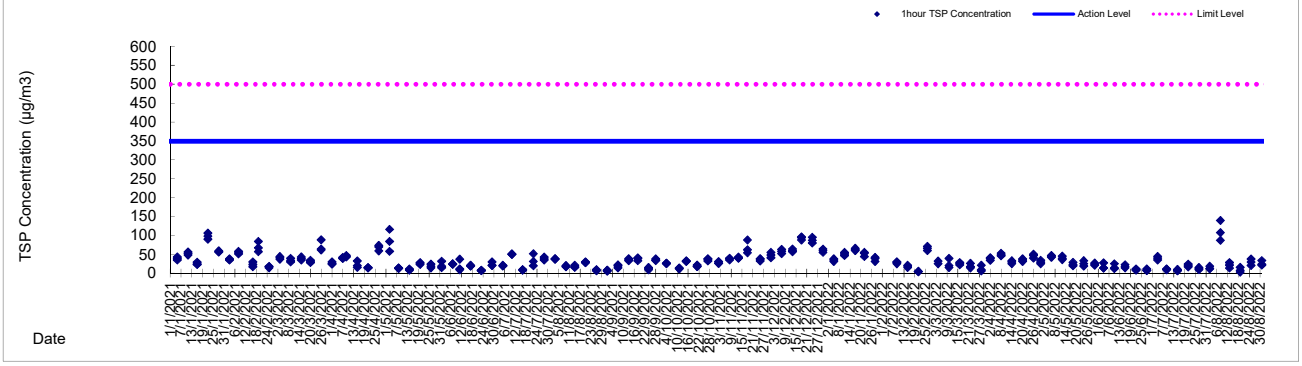


Graphic Presentation of TSP Result

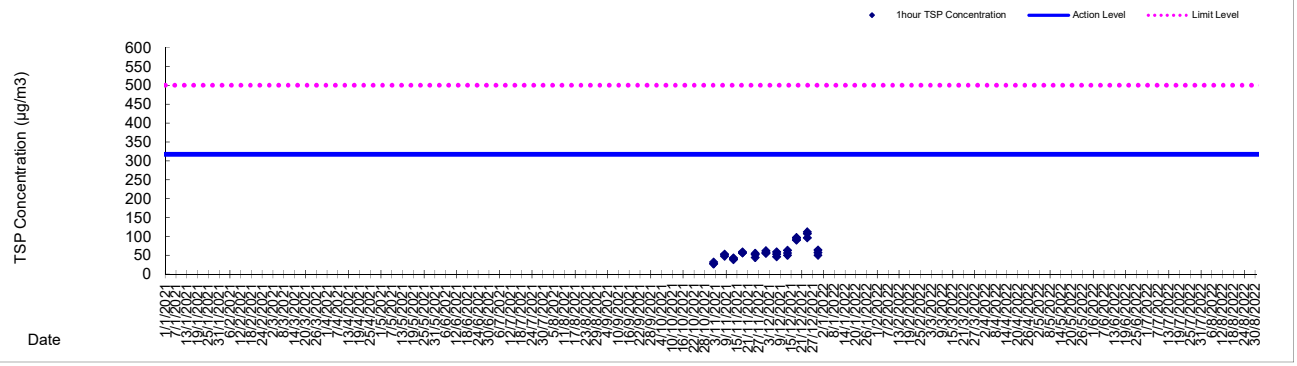
AM4 - Wellborn Kindergarten



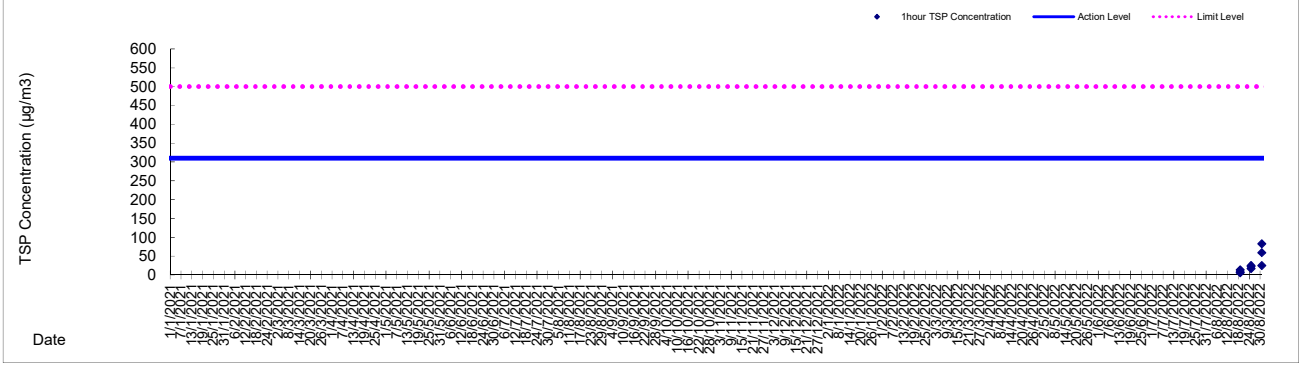
AM5 - The NAAC Harmony Manor



AM6 - Seaview Villa



ASR51 - The Hong Kong Yaumati Ferry Company Ltd. Administrative Building



Appendix 5.3

Noise Quality Monitoring Results and Graphical Presentations

Noise Monitoring Result

Day Time (0700 - 1900hrs on weekday)

Location: CM1 - G/F, Wellborn Kindergarten

Date	Time	Weather	Wind Speed (m/s)	Measurement Noise Level Leq	L10	L90	Limit Level Leq
				Unit: dB(A), (30min)			
03/08/2022	13:54	Drizzle	0.0	60.1	59.2	49.9	70
16/08/2022	15:53	Fine	0.0	56.5	55.6	49.4	70
23/08/2022	15:05	Sunny	0.0	59.3	59.2	50.3	70
30/08/2022	13:18	Fine	0.0	56.9	56.0	47.1	70

* Limit level of noise monitoring station CM1 was adjusted to 65dB(A) during examination period.

Location: CM2(B) - G/F, Outside A Kung Kok Street Garden

Date	Time	Weather	Wind Speed (m/s)	Measurement Noise Level Leq	L10	L90	Limit Level Leq
				Unit: dB(A), (30-min)			
03/08/2022	13:16	Drizzle	0.0	67.5	66.7	59.9	70
16/08/2022	15:59	Fine	0.0	65.2	63.5	55.2	70
23/08/2022	14:28	Sunny	0.8	60.5	59.8	53.9	70
31/08/2022	15:58	Fine	0.0	61.8	60.2	54.6	70

* Limit level of noise monitoring station CM2(A) was adjusted to 65dB(A) during examination period.

Location: CM3 - R/F, S.K.H. Ma On Shan Holy Spirit Primary School

Date	Time	Weather	Wind Speed (m/s)	Measurement Noise Level Leq	L10	L90	Limit Level Leq
				Unit: dB(A), (30min)			
02/08/2022	9:16	Fine	0.0	65.2	66.7	60.0	70
18/08/2022	17:40	Fine	1.1	65.5	67.6	57.6	70
22/08/2022	15:50	Sunny	0.0	67.8	70.7	58.7	70
31/08/2022	11:15	Fine	0.0	62.5	65.6	56.3	70

* Limit level of noise monitoring station CM3 was adjusted to 65dB(A) during examination period.

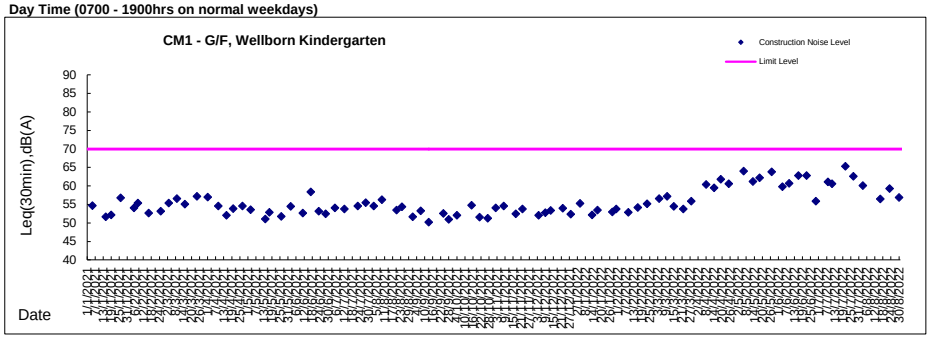
Location: CM4 - G/F, Ah Kung Kok Fishermen Village

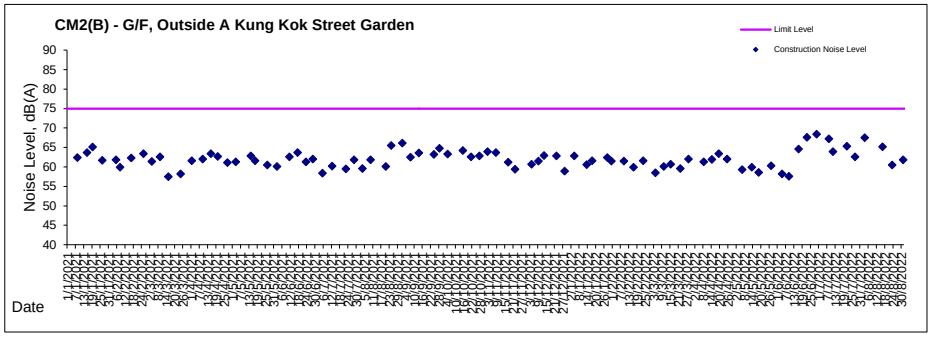
Date	Time	Weather	Wind Speed (m/s)	Measurement Noise Level Leq	L10	L90	Limit Level Leq
				Unit: dB(A), (30min)			
03/08/2022	10:00	Cloudy	0.0	59.3	60.9	54.8	75
18/08/2022	17:35	Fine	0.0	57.9	59.6	55.5	75
23/08/2022	18:00	Sunny	0.0	56.4	58.4	53.7	75
31/08/2022	16:15	Fine	0.0	58.5	59.8	55.9	75

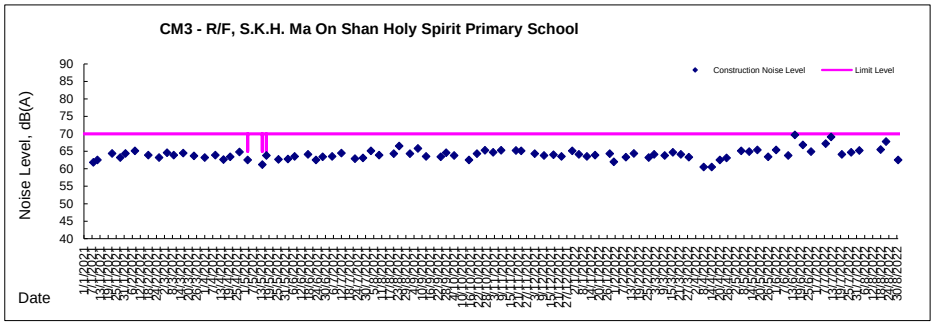
Location: CM5 - R/F, The Neighbourhood Advice-Action Council Harmony Manor

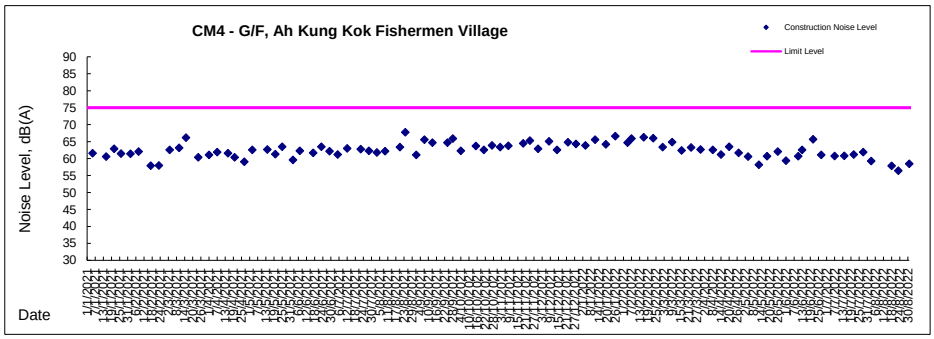
Date	Time	Weather	Wind Speed (m/s)	Measurement Noise Level Leq	L10	L90	Limit Level Leq
				Unit: dB(A), (30min)			
02/08/2022	10:46	Fine	0.0	62.7	60.8	52.5	75
16/08/2022	16:10	Fine	0.0	59.2	58.0	47.3	75
22/08/2022	15:05	Sunny	0.1	63.2	62.5	53.4	75
30/08/2022	13:35	Fine	0.0	64.2	61.4	53.3	75

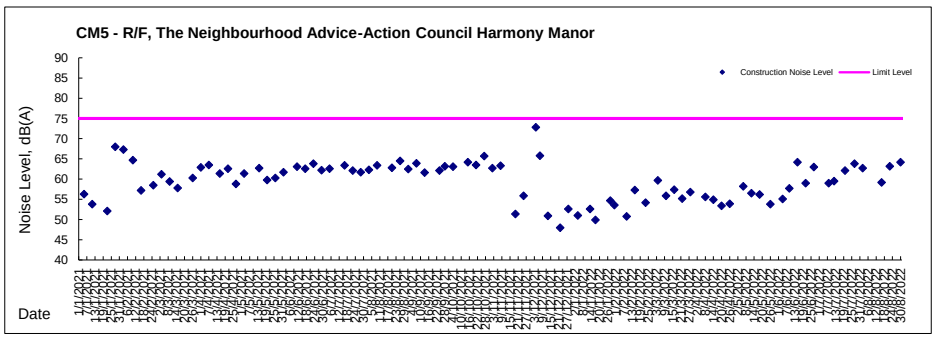
Graphic Presentation of Noise Monitoring Result
Day Time (0700 - 1900hrs on normal weekdays)



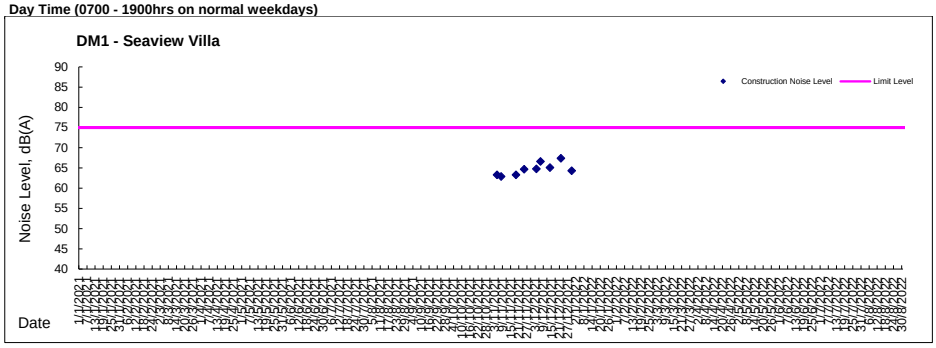


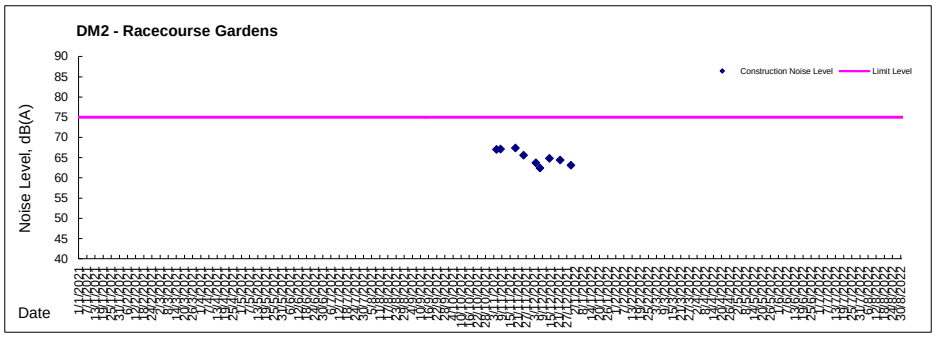


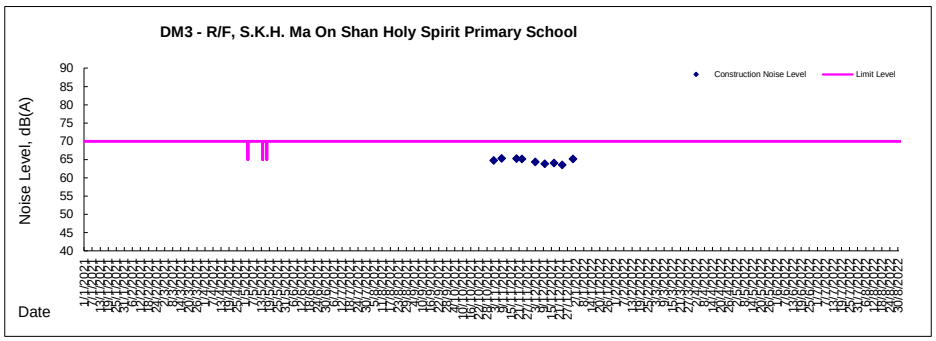




Graphic Presentation of Noise Monitoring Result
Day Time (0700 - 1900hrs on normal weekdays)







Noise Monitoring Result

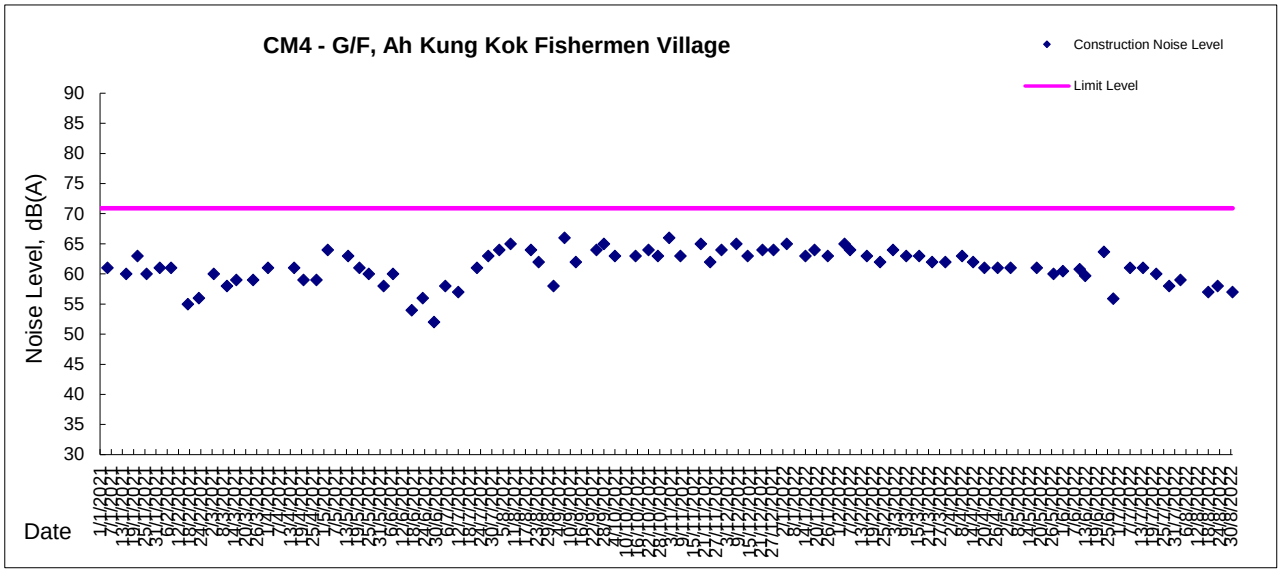
Evening Time (1900 - 2300hrs)

Location: CM4 - G/F, Ah Kung Kok Fishermen Village

Date	Weather	Time	Measurement Noise Level			Mean Noise Level	Baseline Level Range (mean level)	Construction Noise Level (baseline correction)	Major Construction Noise Source(s)	Other Noise Source(s)
			Leq	L10	L90	Leq (5min)	Leq	Leq		
			dB(A), (5-min)			Unit: dB(A), (5-min)				
3/8/2022	Cloudy	19:00	57.2	58.6	53.8	59	53.5-70.9 (mean 56.7)	54	nil	Traffic
		19:05	61.1	62.6	58.5					
		19:10	61.4	61.9	60.9					
		19:15	60.1	61.1	58.4					
		19:20	56.2	58.0	53.4					
		19:25	55.0	56.8	52.5					
18/8/2022	Fine	19:00	57.0	58.8	54.9	57	53.5-70.9 (mean 56.7)	46	nil	Traffic
		19:05	58.3	59.4	56.6					
		19:10	57.6	59.3	55.7					
		19:15	57.6	59.0	55.2					
		19:20	55.8	57.3	53.7					
		19:25	56.2	57.8	54.0					
23/8/2022	Fine	19:00	60.2	61.3	58.3	58	53.5-70.9 (mean 56.7)	50	nil	Traffic
		19:05	58.9	60.8	55.9					
		19:10	56.4	58.2	53.8					
		19:15	57.1	59.1	54.4					
		19:20	56.4	58.1	54.0					
		19:25	56.4	58.2	53.4					
31/8/2022	Fine	19:00	56.9	58.5	55.1	57	53.5-70.9 (mean 56.7)	46	nil	Traffic
		19:05	56.6	58.0	54.9					
		19:10	57.1	58.7	55.1					
		19:15	57.3	58.9	55.3					
		19:20	56.9	58.5	55.2					
		19:25	57.2	58.8	55.3					

Graphic Presentation of Noise Monitoring Result

Evening Time (1900 - 2300hrs on normal weekdays)



Noise Monitoring Result

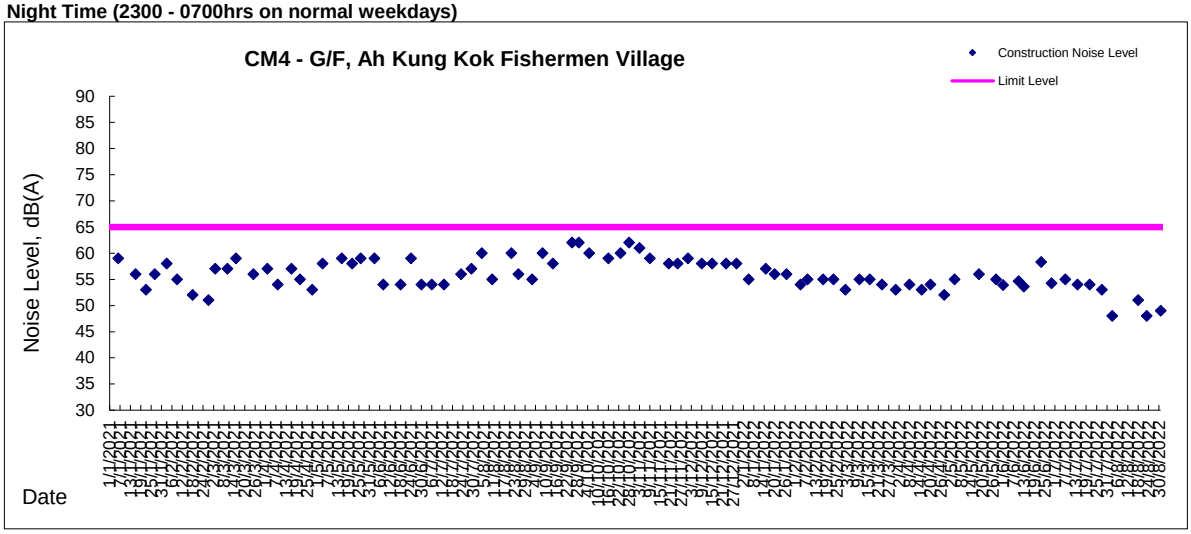
Night Time (2300 - 0700hrs on next day)

Location: CM4 - G/F, Ah Kung Kok Fishermen Village

Date	Weather	Time	Measurement Noise Level			Mean Noise Level	Baseline Level Range (mean level)	Construction Noise Level (baseline correction)	Major Construction Noise Source(s)	Other Noise Source(s)
			Leq	L10	L90	Leq (5min)	Leq	Leq		
			dB(A), (5-min)			Unit: dB(A), (5-min)				
3/8/2022	Cloudy	23:00	53.7	55.4	51.0	54	45.6-63.2 (mean 52.8)	48	nil	Traffic
		23:05	54.4	56.3	51.5					
		23:10	53.8	55.9	51.2					
		23:15	54.1	56.2	51.0					
		23:20	53.8	55.8	51.1					
		23:25	55.0	57.3	51.9					
18/8/2022	Fine	23:00	55.1	56.8	52.0	55	45.6-63.2 (mean 52.8)	51	nil	Traffic
		23:05	54.0	55.9	51.0					
		23:10	54.8	57.0	51.9					
		23:15	55.2	57.2	51.5					
		23:20	54.4	56.3	52.0					
		23:25	55.5	57.2	52.4					
23/8/2022	Fine	23:00	54.2	56.5	51.3	54	45.6-63.2 (mean 52.8)	48	nil	Traffic
		23:05	53.9	56.2	50.0					
		23:10	54.2	56.3	50.5					
		23:15	54.1	55.9	51.1					
		23:20	54.8	56.9	51.7					
		23:25	53.7	55.6	50.4					
31/8/2022	Fine	23:00	54.1	56.4	51.3	54	45.6-63.2 (mean 52.8)	49	nil	Traffic
		23:05	54.5	56.3	50.8					
		23:10	53.9	56.3	50.6					
		23:15	53.6	55.4	50.8					
		23:20	55.3	57.8	51.2					
		23:25	54.2	55.9	51.6					

Graphic Presentation of Noise Monitoring Result

Night Time (2300 - 0700hrs on normal weekdays)



Appendix 5.4

Monthly Summary Waste Flow Table

Monthly Summary Waste Flow Table

Name of Department: Drainage Services Department **Contract No.: DC/2020/05**

Monthly Summary Waste Flow Table for December 2021 [to be submitted not later than the 15th day of each month following reporting month]

(All quantities shall be rounded off to 3 decimal places.)

Month	Actual Quantities of Inert C&D Materials Generated Monthly					Actual Quantities of C&D Wastes Generated Monthly				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Broken Concrete (see Note 3)	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed as Public Fill	(f) Metals	(g) Paper/cardboard packaging	(h) Plastics (see Note 2)	(i) Chemical Waste	(j) Others, e.g. general refuse disposed at Landfill
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in tonne)
Jan-21	-	-	-	-	-	-	-	-	-	-
Feb-21	-	-	-	-	-	-	-	-	-	-
Mar-21	-	-	-	-	-	-	-	-	-	-
Apr-21	-	-	-	-	-	-	-	-	-	-
May-21	-	-	-	-	-	-	-	-	-	-
Jun-21	-	-	-	-	-	-	-	-	-	-
Sub-total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jul-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Aug-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Sep-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
Oct-21	0.026	0.000	0.000	0.000	0.026	0.000	0.000	0.000	0.560	11.92
Nov-21	0.761	0.164	0.030	0.000	0.567	75.270	0.000	0.000	0.000	0.000
Dec-21	1.456	0.146	0.025	0.000	1.286	0.000	0.000	0.000	0.000	20.210
Total	2.243	0.309	0.055	0.000	1.879	75.270	0.000	0.000	0.560	32.130

Notes:

(1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(2) Plastics refer to plastics bottles/containers, plastic sheets/foam from packaging material.

(3) Broken concrete for recycling into aggregates.

(4) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 5 m^3 by volume.

(5) Conversion factors for reporting purpose:

Excavated: rock = 2.0 tonnes/m^3, soil = 1.8 tonnes/m^3, broken concrete and bitumen = 2.4 tonnes/m^3, Slurry = 2.8 tonnes/m^3

Monthly Summary Waste Flow Table

Name of Department: Drainage Services Department **Contract No.: DC/2020/05**

Monthly Summary Waste Flow Table for August 2022 [to be submitted not later than the 15th day of each month following reporting month]

(All quantities shall be rounded off to 3 decimal places.)

Month	Actual Quantities of Inert C&D Materials Generated Monthly					Actual Quantities of C&D Wastes Generated Monthly				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Broken Concrete (see Note 3)	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed as Public Fill	(f) Metals	(g) Paper/cardboard packaging	(h) Plastics (see Note 2)	(i) Chemical Waste	(j) Others, e.g. general refuse disposed at Landfill
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in tonne)
Jan-22	0.141	0.061	0.000	0.000	0.080	0.000	0.000	0.000	0.000	302.470
Feb-22	4.756	0.077	0.000	0.035	4.645	0.000	0.000	0.000	0.000	23.610
Mar-22	0.177	0.006	0.000	0.042	0.128	0.000	0.000	0.000	0.000	121.970
Apr-22	9.583	0.015	0.000	8.967	0.601	0.000	0.000	0.000	0.000	35.340
May-22	21.701	0.024	1.000	19.299	1.378	73.129	0.250	0.000	0.000	0.000
Jun-22	32.443	0.085	3.920	28.098	0.339	0.000	0.000	0.230	0.000	30.060
Sub-total	68.801	0.268	4.920	56.441	7.172	73.129	0.250	0.230	0.000	513.450
Jul-22	28.361	0.027	7.202	20.265	0.867	0.000	0.000	0.000	0.000	12.16
Aug-22	23.687	0.000	0.000	22.689	0.998	0.000	0.350	0.000	0.000	50.60
Total	120.849	0.294	12.122	99.395	9.037	73.129	0.600	0.230	0.000	576.210

Notes:

(1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(2) Plastics refer to plastics bottles/containers, plastic sheets/foam from packaging material.

(3) Broken concrete for recycling into aggregates.

(4) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 5 m^3 by volume.

(5) Conversion factors for reporting purpose:

Excavated: rock = 2.0 tonnes/m^3, soil = 1.8 tonnes/m^3, broken concrete and bitumen = 2.4 tonnes/m^3, Slurry = 2.8 tonnes/m^3

Appendix 7.1

Event Action Plans

Event and Action Plan for Construction Air Quality

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
ACTION LEVEL				
1. Action level being exceedance by one sampling	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform Contractor, IEC and ER; 3. Repeat measurement to confirm finding; and 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; and 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Notify Contractor.	1. Identify source(s), investigate the causes of exceedance and propose remedial measures; 2. Implement remedial measures; and 3. Amend working methods agreed with the ER as appropriate
2. Action level being exceeded by two or more consecutive sampling	1. Identify source; 2. Inform Contractor, IEC and ER; 3. Advise the Contractor and 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 Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with Contractor, 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, ER and Contractor on possible remedial measures; 4. Advise the ET and ER on the effectiveness of the proposed remedial measures; and 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 4. 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. Identify source and investigate the causes of exceedance; 2. Submit proposals for remedial measures to the ER with a copy to ET and IEC within three working days of notification; 3. Implement the agreed proposals; and 4. Amend proposal as appropriate.

Event and Action Plan for Construction Air Quality (Con't)

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
LIMIT LEVEL				
1. Limit level exceedance by one sampling	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform Contractor, IEC, ER, and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; and 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. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 3. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; and 4. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to ER with a copy to ET and IEC within three working days of notification; 4. Implement the agreed proposals; and 5. Amend proposal if appropriate.
2. Limit level exceedance by two or more consecutive sampling	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; and 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 3. Review Contractor' s remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 4. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; and 4. 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. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with a copy to the IEC and ET within three working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; and 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Event and Action Plan for Construction Noise

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action Level	1. Notify IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; and 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; and 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 analyzed noise problem; and 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC; and 2. Implement noise mitigation proposals.
Limit Level	1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements 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 and 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; and 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 properly implemented; and 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 IEC and ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposal if problem still not under control; and 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix 7.2

Summary for Notification of Exceedance

Ref no.	Date	Location	Parameters (Unit)	Measured	Action Level	Limit Level	Follow-up action
-	-	-	-	-	-	-	-

Appendix 9.1

Complaint Log

Environmental Complaints Log

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
190808	29 July 2019	DSD	Construction site area Portion 6	Exposed slope surface without any covering was observed at Portion 6	A public complaint regarding construction dust received by DSD on 29 July 2019 was subsequently referred to ET on 6 August 2019. The complainant reported that exposed slope surface without any covering at Portion 6. Based on the information provided by the Contractor, the concerned area was under slope cutting and filling works for temporary haul road construction. Based on the observation on 6 August 2019 and weekly site inspection on 7 August 2019, the concerned slope was observed covered with the tarpaulin sheets to alleviate the potential dust impact to the surroundings. Upon review on the monitoring data, no exceedances were recorded at the air quality monitoring stations AM2 - Block H, Kam Tai Court and AM4 - Wellborn Kindergarten (located nearest to the concerned slope) during the 1hr TSP monitoring on 23 July 2019 and 29 July 2019 respectively. Follow up site inspection was conducted by the Environmental Team on 07 August 2019 and it was observed that the slope at Portion 6 was properly covered. Nevertheless, in view of the public concern, the Contractor of DC/2018/05 was reminded to enhance the dust suppression measure by providing adequate watering to any exposed surface during cutting slope and fill works to avoid potential dust impact to the surroundings.	Interim investigation report was issue on 16 August 2019
201112	12 November 2020	DSD	Outside site boundary of Portion 11	water contamination / ecological impact	A letter from Kadoorie Farm and Botanic Garden (KFBG) regarding water contamination / ecological impact received by DSD on 12 November 2020 was subsequently referred to ET on 12 November 2020. The KFBG alleged that: - Extracting water directly from the stream, - Surface run-off silt smothering forest understorey and silting the stream, - Cement has been disposed into the forest understorey and the stream , and - Diesel fuel leaking from pumps and generators at Portion 11.	Interim investigation report was issue on 14 December 2020

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					The concerned area is natural stream near slope cutting and filling works for temporary haul road construction, outside of the DC/2018/05 construction site boundary. **The Contractor, RSS conducted walk-through survey on 17 November 2020 starting from around the tree tag T9511/ T9512 and ending at the pool of the natural stream near Portion 11 of DC/2018/05.** **Additional site inspection with EPD, DSD, RSS, ET and the Contractor was conducted on 17 November 2020, additional site inspection with KFBG, DSD, RSS, ET and the Contractor was conducted on 19 November 2020.** **No Pollutants were observed being discharged to the stream, the natural stream was clean with running water during above inspections. However, few spots were found with cement and silt on the bedding of the stream.** **According to the Contractor, the water pumps were the emergency pumps and it had been removed away from the natural stream. No pump was observed during above inspections.** **There was no sign of any diesel fuel leaking from pumps or generators. The nearest generator for the construction work has been located far away from the concerned location. By the walk-through survey along the natural stream, there was no oil-strain or diesel likes contamination being observed.** **By the walk-through survey, various locations were found with silting / sand. The sources of the silt were not necessary from the construction site of DC/2018/05. It could also be contributed by the natural erosion from both sides of the stream.** **Nevertheless, in view of the public concern, the Contractor of DC/2018/05 was willing to clean up the stream to address the concerns from KFBG to protect the environment. The Contractor also reminded to keep review the performance of mitigation measures including well cover slope / area with exposed soil with tarpaulin sheets to prevent surface runoff, using cellular confinement system to prevent soil erosion.**	
210127	**27 January 2021**	**DSD**	**Construction Area at Portion 6 (Tunnel)**	**Air Quality**	**A public complaint regarding construction dust referred by DSD on 27 January 2021 was subsequently received by ET on 27 January 2021. The complainant reported that:**	**Interim investigation report was**

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					- **Construction dust emission arising from blasting works in tunnel was observed near Block 6, Chevalier Garden.** **Blasting in the tunnel was carried out under Contract DC/2018/05 at the concerned area** **According to the relevant site information provided by the Contractor of DC/2018/05, there are total of 13nos. of blasting works was carried out in January 2021 in the tunnel.** **The blasting works was carried out in the tunnel. Dust screen, mist curtain, sprinkler system and mist cannon were installed / operated when blasting, the blast door was tightly closed during blasting.** **Based on review on air quality monitoring data, no exceedances were recorded at the air quality monitoring stations AM3(B) - Outside A Kung Kok Street Garden and AM4 - Wellborn Kindergarten (located nearest to the concerned area) during the scheduled 1hr TSP monitoring in January 2021.** **Ad-hoc TSP monitoring and inspection was carried out on 29 January and 1 February 2021 during blasting, no exceedances were recorded at the air quality monitoring stations AM3(B) - Outside A Kung Kok Street Garden and AM4 - Wellborn Kindergarten.** **Based on the site inspection on 28 January 2021, 2nos. mist cannons have been installed and operated on the top of blast door during / after the blast door opened to reduce fumes / mists emission.** **The Contractor of DC/2018/05 was reminded to enhance the dust suppression measure by providing adequate watering after the blast door opened. Contractor is requested to**	**issue on 7 February 2021**

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					consider extend the time to open the blast door after blasting in order to the fumes and rock dust have been settled in the tunnel. **Also, the Contractor of DC/2018/05 was reminded that the ventilation system in the tunnel should be maintained in good condition.**	
20211201	**1 December 2021**	**AECOM**	**Construction Area at Portion 12 (The Neighbourhood Advice-Action Council Harmony Manor)**	**Noise**	**A public complaint regarding construction noise referred by AECOM on 3 December 2021 was subsequently received by ET on 3 December 2021.** **The complainant reported to 1823 online dated on 1 December 2021 that the construction noise (heavy vehicle and drilling works) generated from the construction site at A Kung Lok Shan Road was causing noise nuisance to complainant's son.** **According to the relevant site information provided by the Contractor of DC/2020/05, preparation works for sheet pile driving, which included machinery and materials mobilization, were carried out on 1 December 2021. Sheet pile work was commenced on 2 December 2021.** **Based on review on noise monitoring data, no exceedances were recorded at the noise monitoring station CM5 - R/F, The Neighbourhood Advice-Action Council Harmony Manor (located nearest to the concerned area) during the scheduled Leq30 min noise monitoring in November 2021. ET conducted regular noise monitoring on 3 December 2021, no exceedances was record at the noise monitoring stations CM5 - R/F, The Neighbourhood Advice-Action Council Harmony Manor. Weekly noise monitoring was conducted on 7 December 2021, no exceedances was recorded at the noise monitoring station CM5 - R/F, The Neighbourhood Advice-Action Council Harmony Manor. Site inspection was conducted on 8 December 2021, it is observed that breaking /drilling works by other contractor was conducted next to The Neighbourhood Advice-Action Council Harmony Manor. No heavy vehicles passing by A**	**Interim investigation report was issue on 10 December 2021**

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					Kung Lok Shan Road during noise monitoring. **After receiving the complaint, additional noise mitigation measures, including wrapping up the breaker tip with acoustic mat and deploying of temporary noise barrier have been implemented by the Contractor of DC/2020/05.** **The Contractor of DC/2020/05 was reminded to enhance the noise mitigation measures by providing sufficient temporary noise barrier. Contractor is advised to make good communication with The Neighbourhood Advice-Action Council Harmony Manor and consider scheduling the time of sheet pilling and machinery / materials mobilization in order to avoid further complaint.**	
20220506	**6 May 2022**	**Contractor**	**Construction Area at Portion 10 (Next to the Chevalier Garden)**	**Noise**	**A public complaint regarding construction noise referred by the Contractor was received by ET on 12 May 2022.** **The complainant reported to 1823 Call Centre (ICC) dated on 6 May 2022 that the construction noise (rock-breaking and excavation) generated from the construction site of Portion 10 at Mui Tsz Lam Road was causing noise nuisance to complainant.** **According to the relevant site information provided by the Contractor of DC/2020/05, rock-breaking and excavation works were conducted during the concerned period.** **Based on review on noise monitoring data, no exceedances were recorded at the noise monitoring stations CM1 - G/F, Wellborn Kindergarten and CM2(B) - G/F, Outside A Kung Kok Street Garden (located within the Chevalier Garden) during the scheduled Leq30 min noise monitoring in April 2022. ET conducted regular noise monitoring on 6 May 2022, no exceedances were recorded at the noise monitoring stations CM1 - G/F, Wellborn Kindergarten and CM2(B) - G/F, Outside A Kung Kok Street Garden. Site inspection was conducted on 5 &12 May 2022, it is observed that rock-breaking was conducted at the**	**Interim investigation report was issue on 13 May 2022**

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					construction site of Portion 10. Ad-hoc noise monitoring at CM1 - G/F, Wellborn Kindergarten and CM2(B) - G/F, Outside A Kung Kok Street Garden on 13 May 2022, no exceedances were recorded. **During execution of rock breaking works, below noise mitigation measures had been implemented by the Contractor of DC/2020/05** • **Erection of 8m height noise barrier** • **Wrapping up the breaker tip with acoustic material** • **Upgrade the existing hoarding to perform as noise barrier by affixing a layer of sound absorption material to the hoarding surface** • **Voluntary to late start of rock breaking work at 0900hrs instead of 0700hrs, which is allowed under the Regulation.** **Contractor of DC/2020/05 also carried out self-noise monitor for the rock-breaking works on 4, 5 & 6 May 2022, All results show the construction noise levels are below the 75dB(A).** **ET would continue to monitor the adequacy of mitigation measures and review the monitoring data of the monitoring stations of CM1 - G/F, Wellborn Kindergarten and CM2(B) - G/F, Outside A Kung Kok Street Garden.** **The Contractor is recommend to review the construction operation to erect the temporary noise barriers, if feasible and ensure all idled PME are shut down to minimize potential noise emanation at the concerned works area to avoid potential nuisance.**	
20220816	**16 August 2022**	**Contractor**	**WA3 (Ngau Kok Wan, Tsing Yi)**	**Air Quality**	**A public complaint suspecting improper operation of mineral works without relevant environmental permits/licenses and dust mitigation measures at WA3 referred by the Contractor was received by ET on 17 August 2022.**	**Interim investigation report was issue on 31 August 2022**

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					The complaint was made via email to the relevant authorities, including Environmental Protection Department (EPD) and Drainage Services Department (DSD), on 16 August 2022, the complainant suspected a mineral site near Tsing Yi North Coastal Road and Ting Kau Bridge was in operation without relevant environmental permits/licenses, the complainant also stated no dust mitigation measures, such as covering and water spraying for dusty stockpile and conveyor belts; and provision of wheel washing facility, were implemented based on his observation. **The location where the complaint refers to is one of the works areas for the Project (i.e. WA3 at Ngau Kok Wan, Tsing Yi) for the proposed rock crushing operation as the location for such operation under the Environmental Permit (EP) (EP-533/2017/A) issued on 11 August 2022, and the Specified Process License (SPL) for the category of mineral works (stone crushing works) under Air Pollution Control (Specified Processes) Regulations for such operation has been applied since April 2022 and the associated application result was pending from EPD at the time of the complaint received.** **The works activities at WA3 between 12 and 17 August 2022 were reviewed. As advised by the Contractor, the works activities undertaken during the period mainly included i) assembly and adjustment of the rock crushing machineries; ii) provision of training for workers on the operation of machineries for rock crushing activities; and iii) import of rocks from the main site (i.e. works areas of Cavern at Ma On Shan) on land logistics by dump trucks for construction of a loading platform and temporary storage at WA3. Relevant mitigation measures for air quality impacts were implemented on site during the period including i) water spraying on haul roads; ii) water spraying for the temporary stockpile of dusty materials; iii) covering dusty materials with use of impervious sheeting; and iv) installation of dust enclosure and misting system for conveyor systems, etc. In addition, regular site inspections were carried out by the ET at WA3 on 12 and 17 August 2022, with no particular observations associated with air quality recorded and wheel washing facilities were in place for subsequent use, during the site inspections**	

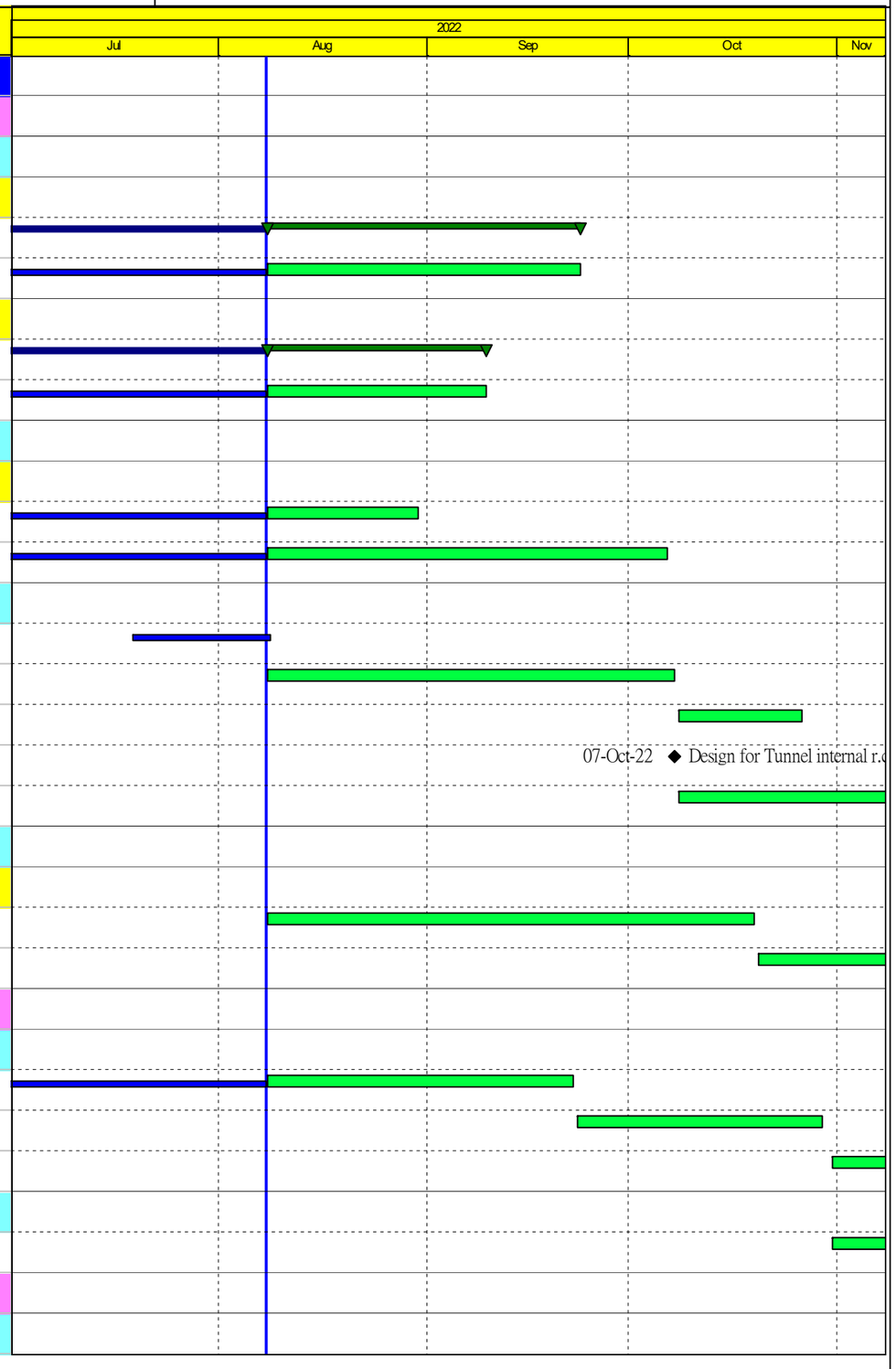
Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					except a verbal reminder on proper covering for the stockpiles being idle on site was given to the Contractor on 17 August 2022 for improvement. **As referred to the Air Pollution Control Plan (APCP) attached to the application of SPL, the proposed rock crushing operation with maximum output capacity of 1,400 tonnes per hour by two operation lines (i.e. output capacity of 700 tonnes per hour for each) for the rocks being processed as aggregates of about 3M tonnes was mentioned and 12 hours a day (7:00 to 19:00) was assumed for the rock crushing operation taken in the air quality modelling assessment except Sundays and public holidays whereas, as advised by the Contractor, about 2,000 tonnes of rock were processed in the training sessions for the workers during the period (i.e. 12 to 17 August 2022), which is below the allowed maximum output for the rock crushing operation (i.e. 100,800 tonnes) during the period. Moreover, relevant monitoring data in relation to suspended particulates were not available for review as a result of the fact that the application result for SPL is pending from EPD and actual rock crushing operation has not been commenced at the time of the complaint received such that the corresponding total suspended particulates (TSP) and respirable suspended particulates as required by the SPL, and 1-hr TSP as recommended in the Environmental Review Report (ERR) for the application of variation of EP (i.e. EP-533/2017/A), respectively, had not been monitored at the time of the complaint received.** **Based on the investigation above, the works activities at WA3 did not result in any unacceptable environmental impacts to the surrounding environment as reviewed with the relevant environmental requirements under EP-533/2017/A and the associated APCP for application of SPL for the Project.** **Though works activities at WA3 did not result in any unacceptable environmental impacts to the surrounding environment, the Contractor was reminded to properly maintain the implementation of recommended mitigation measures for air quality impacts as recommended in the approved EIA Report, EP (i.e. EP-533/2017/A), the Updated EM&A Manual and/or ERR/APCP for the Project, and all**	

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
					mitigation measures as stated in the APCP for obtaining the SPL approved by EPD. **An ad-hoc site inspection was also carried out by the ET at WA3 on 19 August 2022 noting that fugitive dust emission was observed during breaking of artificial hard material by a backhoe equipped with hydraulic breaker without effective mitigation measures for air quality impacts (e.g. water spraying) implemented properly, and the Contractor was subsequently reminded to follow up on this for improvement. The ET will continue carrying out site inspections on a regular basis to check that appropriate environmental protection and pollution control mitigation measures are properly implemented in accordance with the environmental documents mentioned.**	

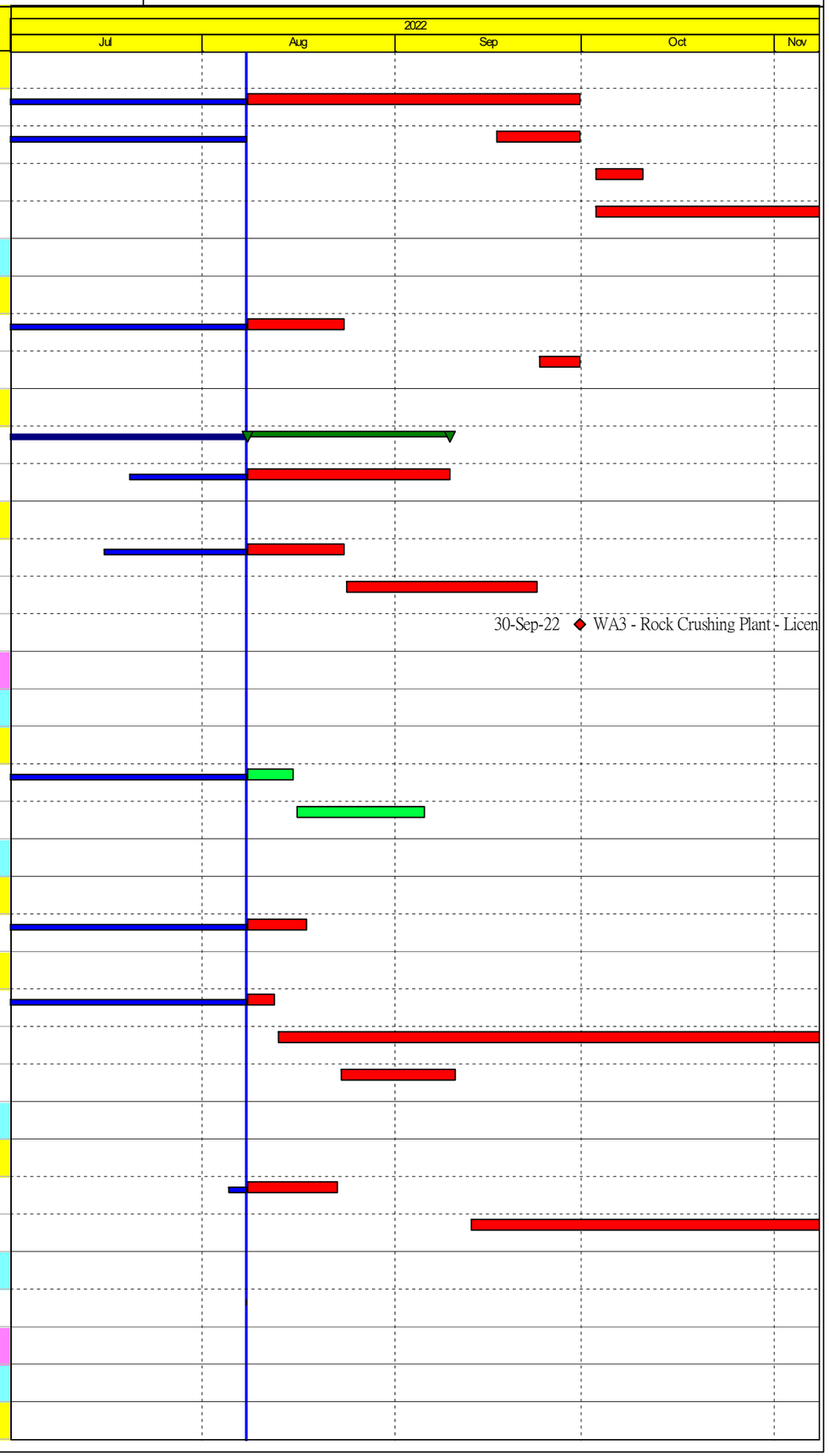
Appendix 10.1

Construction Programme of Individual Contracts

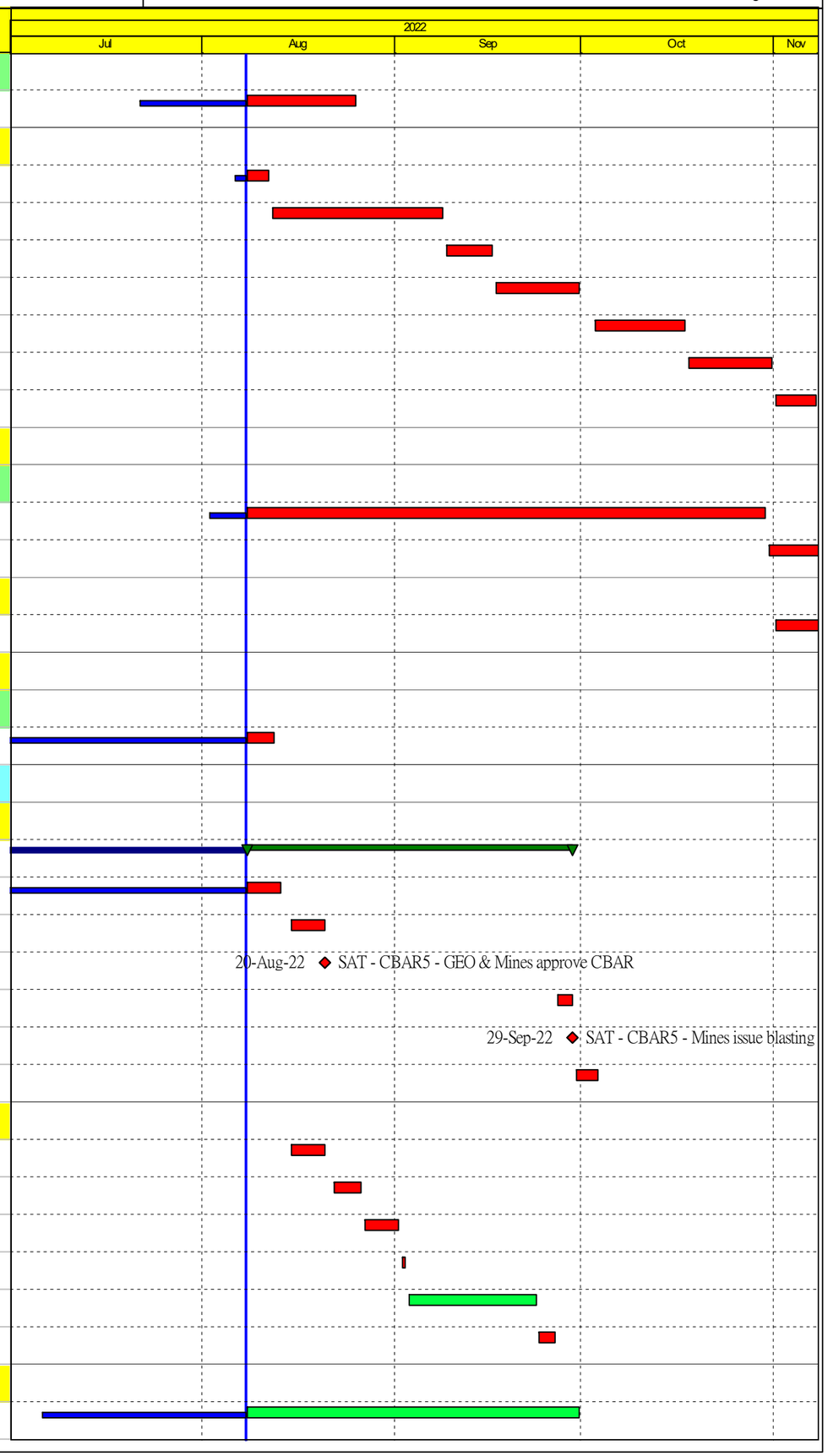
Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Total Float	Late Start	Late Finish
DC/2020/05, Relocation of STST to Caverns - Main Caverns Construction								
Preliminary Works & Preparation Works								
Subletting and Procurement								
2nd Batch								
C1031	[Summary] Sub-letting & procurement for the 2nd batch sub-contract (other minor packages)	87.92%	40	10-Aug-21 A	23-Sep-22	221	29-Jun-23	29-Jun-23
C1031-RP38	Sub-letting 2nd batch - Portion 10 - piling works (Soldier Pile wall)	87.92%	40	10-Aug-21 A	23-Sep-22	221	12-May-23	29-Jun-23
3rd Batch								
C1032	[Summary] Sub-letting & procurement for the 3rd batch sub-contract	90.37%	29	01-Sep-21 A	09-Sep-22	795	02-Jun-25	02-Jun-25
C1032-RP40	Sub-letting 3rd batch - Blasting Works (4) - Ventilation Shaft VS	89.45%	29	04-Oct-21 A	09-Sep-22	795	26-Apr-25	02-Jun-25
Procurement of Major Construction Plant								
Procurement of Tunneling Equipment								
A20332	Procurement of Drill Jumbo (2nd) (for CBAR2, 1 no.) - order and delivery	90.5%	23	01-Jan-22 A	30-Aug-22	1621	15-Jan-27	06-Feb-27
A21102	Procurement of Wheel Loader - order and delivery	50.82%	60	07-Jun-22 A	06-Oct-22	1584	09-Dec-26	06-Feb-27
Design for Overhead Ventilation Duct (OHVD)								
A25010	Design for Tunnel internal r.c. structure - PM 1st comment scheme design	100%	0	19-Jul-22 A	08-Aug-22 A			
A25020	Design for Tunnel internal r.c. structure - Review and re-submit scheme design	0%	50	08-Aug-22	07-Oct-22	308	25-Aug-23	25-Oct-23
A25030	Design for Tunnel internal r.c. structure - PM final comment and approve scheme design	0%	16	08-Oct-22	26-Oct-22	449	23-Apr-24	11-May-24
A25050	Design for Tunnel internal r.c. structure - Start detail design process	0%	0		07-Oct-22	308		25-Oct-23
A25060	Design for Tunnel internal r.c. structure - Prepare and submit detail design review	0%	97	08-Oct-22	08-Feb-23	308	26-Oct-23	26-Feb-24
Off-Site Fabrication for Cavern Complex								
Off-site Fabrication of Lining Shutter for Cavern Complex								
A20340	Lining Shutter - Design preparation, review and accept by PM	0%	60	08-Aug-22	19-Oct-22	268	10-Jul-23	16-Sep-23
A20350	Lining Shutter - Place Order, Factory Fabrication and Delivery	0%	32	20-Oct-22	25-Nov-22	268	18-Sep-23	27-Oct-23
BIM Management [PS App 29.1]								
BIM Training								
A24880	BIM Training - Liaise with CIC for schedule of training courses	63.89%	39	17-May-22 A	22-Sep-22	580	31-Jul-24	13-Sep-24
A24890	BIM Training - prepare and submit training schedule with proposed staff attendants to PM	0%	30	23-Sep-22	29-Oct-22	580	14-Sep-24	22-Oct-24
A24900	BIM Training - PM review training schedule and proposed attendants and accept the schedule	0%	18	31-Oct-22	19-Nov-22	580	23-Oct-24	12-Nov-24
Proposal of Asset Information Requirements								
A24830	BIM - Proposal of Asset Information Requirement - prepare and submit to PM	0%	23	31-Oct-22	25-Nov-22	580	23-Oct-24	18-Nov-24
General Site Preparation Works								
Site Office at WA2								



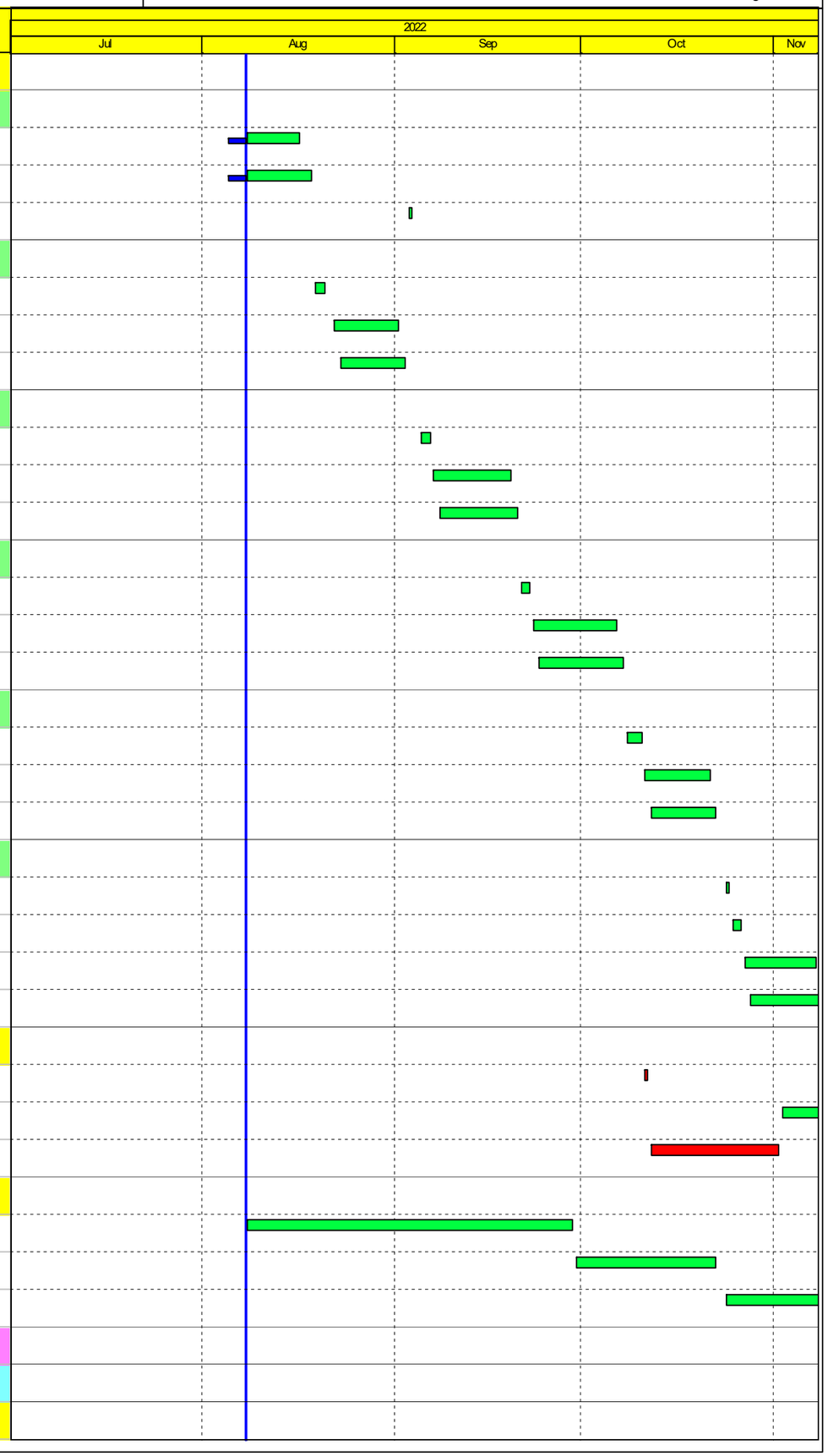
Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Total Float	Late Start	Late Finish
Site Office Erection at WA2								
A10495	WA2 Handed over to Dept of Health (30-3 to 30-9)	70.81%	54	30-Mar-22 A	30-Sep-22	81	28-Oct-22	20-Dec-22
A10500	WA2 Site office - off-site fabrication	94.17%	12	17-Jan-22 A	30-Sep-22	67	07-Dec-22	20-Dec-22
A10510	WA2 Site office - unit delivery to site	0%	6	03-Oct-22	10-Oct-22	67	21-Dec-22	29-Dec-22
A10520	WA2 Site office - Erection & installation	0%	50	03-Oct-22	30-Nov-22	67	21-Dec-22	27-Feb-23
WA3 Rock Crushing Plant Design, Procurement and Installation								
WA3 Rock Crushing Plant - Application of Specific Process License								
A21030	WA3 - Rock Crushing Plant - EPD grant Specific Process License	86.79%	14	14-Apr-22 A	23-Aug-22	195	11-Apr-23	26-Apr-23
A21040	WA3 - Rock Crushing Plant - submit report to EPD	0%	6	24-Sep-22	30-Sep-22	195	30-May-23	05-Jun-23
WA3 Rock Crushing Plant - Application of Variation of Environmental Permit (VEP)								
A20480	[Summary] VEP & Specified Process under APCO - Prepare and make application to EPD	89.82%	29	20-Sep-21 A	09-Sep-22	212	05-Jun-23	05-Jun-23
A21140	WA3 - Rock Crushing Plant - VEP - EPD grant VEP	35.56%	29	20-Jul-22 A	09-Sep-22	212	02-May-23	05-Jun-23
WA3 Rock Crushing Plan - Installation of Rock Crushing Plant								
A21060	WA3 - Rock Crushing Plant - installation	57.58%	14	16-Jul-22 A	23-Aug-22	195	11-Apr-23	26-Apr-23
A21070	WA3 - Rock Crushing Plant - Plant commissioning trial	0%	26	24-Aug-22	23-Sep-22	195	27-Apr-23	29-May-23
A21080	WA3 - Rock Crushing Plant - License and VEP issued, ready for operation	0%	0		30-Sep-22	195		05-Jun-23
Main Portal Area and Main Access Tunnel (MAT, MATE, MATW)								
Provision of P2 Access and P4 Access								
Construction of P2 Access								
A10140	P2 access - construct Ingress and egress	89.86%	7	25-May-22 A	15-Aug-22	1274	07-Dec-26	14-Dec-26
A10150	P2 access - connection to Ma On Shan Road	0%	18	16-Aug-22	05-Sep-22	1274	15-Dec-26	07-Jan-27
Main Portal Area - Site Formation for Main Portal								
Main Portal Area - Instrumentation and Monitoring								
A11620	Main Portion West include RMP7 - Settlement marker	89.53%	9	06-May-22 A	17-Aug-22	147	09-Feb-23	18-Feb-23
Main Portal Area - Retaining Wall RMP7								
A10584	Sub-letting for earthwork for RMP7	92.96%	5	20-May-22 A	12-Aug-22	97	02-Dec-22	07-Dec-22
A10585	Fill access road for RMP7 and SMP5	0%	90	13-Aug-22	29-Nov-22	97	08-Dec-22	01-Apr-23
A10588	Temp piling platform for PL1-9	0%	17	23-Aug-22	10-Sep-22	69	15-Nov-22	03-Dec-22
Effluent Pipelines and Connection Chamber								
Effluent Pipeline - Chamber Retaining Wall RWC2								
A10415	ELS works for RWC2 - pipe pile (15nos)	13.33%	13	05-Aug-22 A	22-Aug-22	69	31-Oct-22	14-Nov-22
A10420	ELS works for RWC2 - Prebored H pile (17nos)	0%	57	13-Sep-22	19-Nov-22	69	05-Dec-22	18-Feb-23
Demolition of Ex-David Camp								
A24980	Demolition of Ex-David Camp - site clearance	100%	0	08-Aug-22 A	08-Aug-22 A			
Secondary Portal Area and Secondary Access Tunnel (SAT)								
Secondary Portal Area - Site Formation & Landscaping for Secondary Portal								
Secondary Portal Area - Instrumentation and Monitoring								



Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Total Float	Late Start	Late Finish
Secondary Portal Area - Borehole for Groundwater Monitoring								
A24930	Slope SSP1 - construct borehole (BH-01to BH08) [8 nos.]	50%	16	22-Jul-22 A	25-Aug-22	191	01-Apr-23	24-Apr-23
Secondary Portal Area - Rigid Barrier RB1								
A11384	Erect platform for boulder removal	20%	4	06-Aug-22 A	11-Aug-22	-22	13-Jul-22	16-Jul-22
A11385	Remove Hazard Boulder for RB1 construction	0%	24	12-Aug-22	08-Sep-22	-22	18-Jul-22	13-Aug-22
A11390	Rigid Barrier RB1 - Excavation (78.5- 75mpd) - RB1	0%	6	09-Sep-22	16-Sep-22	-22	15-Aug-22	20-Aug-22
A11400	Rigid Barrier RB1 - Soil Nail at 77.5mpd (F1-23)- 23nos - RB1	0%	12	17-Sep-22	30-Sep-22	-22	22-Aug-22	03-Sep-22
A11410	Rigid Barrier RB1 - Soil Nail at 76.5mpd (E1-24)- 24nos - RB1	0%	12	03-Oct-22	17-Oct-22	-22	05-Sep-22	19-Sep-22
A11420	Rigid Barrier RB1 - Soil Nail at 75.5mpd (D1-23)- 23nos - RB1	0%	12	18-Oct-22	31-Oct-22	-22	20-Sep-22	05-Oct-22
A11430	Rigid Barrier RB1 - Excavation (75- 72mpd) - RB1	0%	6	01-Nov-22	07-Nov-22	-22	06-Oct-22	12-Oct-22
Secondary Portal Area - Flexible Barrier								
Secondary Portal Area - Flexible Barrier - Construction and Installation								
A11580	Flexible Barrier - Material ordering period	6.67%	84	02-Aug-22 A	30-Oct-22	49	26-Sep-22	18-Dec-22
A11582	Flexible Barrier material testing	0%	21	31-Oct-22	23-Nov-22	42	19-Dec-22	14-Jan-23
Secondary Portal Area - Soldier Pile Wall SP1								
A11200	Soldier Pile Wall SP1 - Prebored H-pile - Mobilization	0%	12	01-Nov-22	14-Nov-22	191	30-Jun-23	14-Jul-23
Secondary Portal Area - Slope SSP1 - Cut Slope and Soil Nail (+76mPD to +13.5mPD)								
Secondary Portal Area - Trees at Slope SSP1								
A11570	SSP1 - Tree felling	92.31%	5	27-May-22 A	12-Aug-22	202	19-Apr-23	24-Apr-23
Secondary Access Tunnel (SAT)								
SAT - CBAR5 Blasting Permit								
A20050	SAT - CBAR5 - [Summary] Blasting Permit application	80.18%	45	18-Dec-21 A	29-Sep-22	209	20-Jun-23	20-Jun-23
A20110	SAT - CBAR5 - CBAR review by GEO & Mines Division	91.18%	6	07-Jun-22 A	13-Aug-22	151	06-Jan-23	11-Jan-23
A20120	SAT - CBAR5 - response to GEO & Mines comment via PM	0%	6	15-Aug-22	20-Aug-22	123	12-Jan-23	18-Jan-23
A20122	SAT - CBAR5 - GEO & Mines approve CBAR	0%	0		20-Aug-22	123		18-Jan-23
A20132	SAT - CBAR5 - pre-licencing inspection, preparation works, interview by Mines	0%	3	27-Sep-22	29-Sep-22	209	17-Jun-23	20-Jun-23
A20160	SAT - CBAR5 - Mines issue blasting permit	0%	0		29-Sep-22	209		20-Jun-23
A23030	SAT - CBAR5 - order explosive	0%	2	30-Sep-22	03-Oct-22	209	21-Jun-23	23-Jun-23
SAT - CBAR5 Blasting Method Statement								
A20060	SAT - CBAR5 - BMS - prepare and submit to PM	0%	6	15-Aug-22	20-Aug-22	209	05-May-23	11-May-23
A22980	SAT - CBAR5 - BMS - PM review and comment	0%	5	22-Aug-22	26-Aug-22	209	12-May-23	17-May-23
A22990	SAT - CBAR5 - BMS - response to PM's comments	0%	5	27-Aug-22	01-Sep-22	209	18-May-23	23-May-23
A23000	SAT - CBAR5 - BMS - formal submit to Mines Division	0%	1	02-Sep-22	02-Sep-22	209	24-May-23	24-May-23
A23010	SAT - CBAR5 - BMS - Mines review and comment	0%	21	03-Sep-22	23-Sep-22	264	25-May-23	14-Jun-23
A23020	SAT - CBAR5 - BMS - response Mines comments	0%	2	24-Sep-22	26-Sep-22	209	15-Jun-23	16-Jun-23
SAT - CBAR5 Blast Door Design and Installation								
A20082	SAT - CBAR5 - Blast Door fabrication	37.84%	46	06-Jul-22 A	30-Sep-22	441	03-Feb-24	08-Apr-24

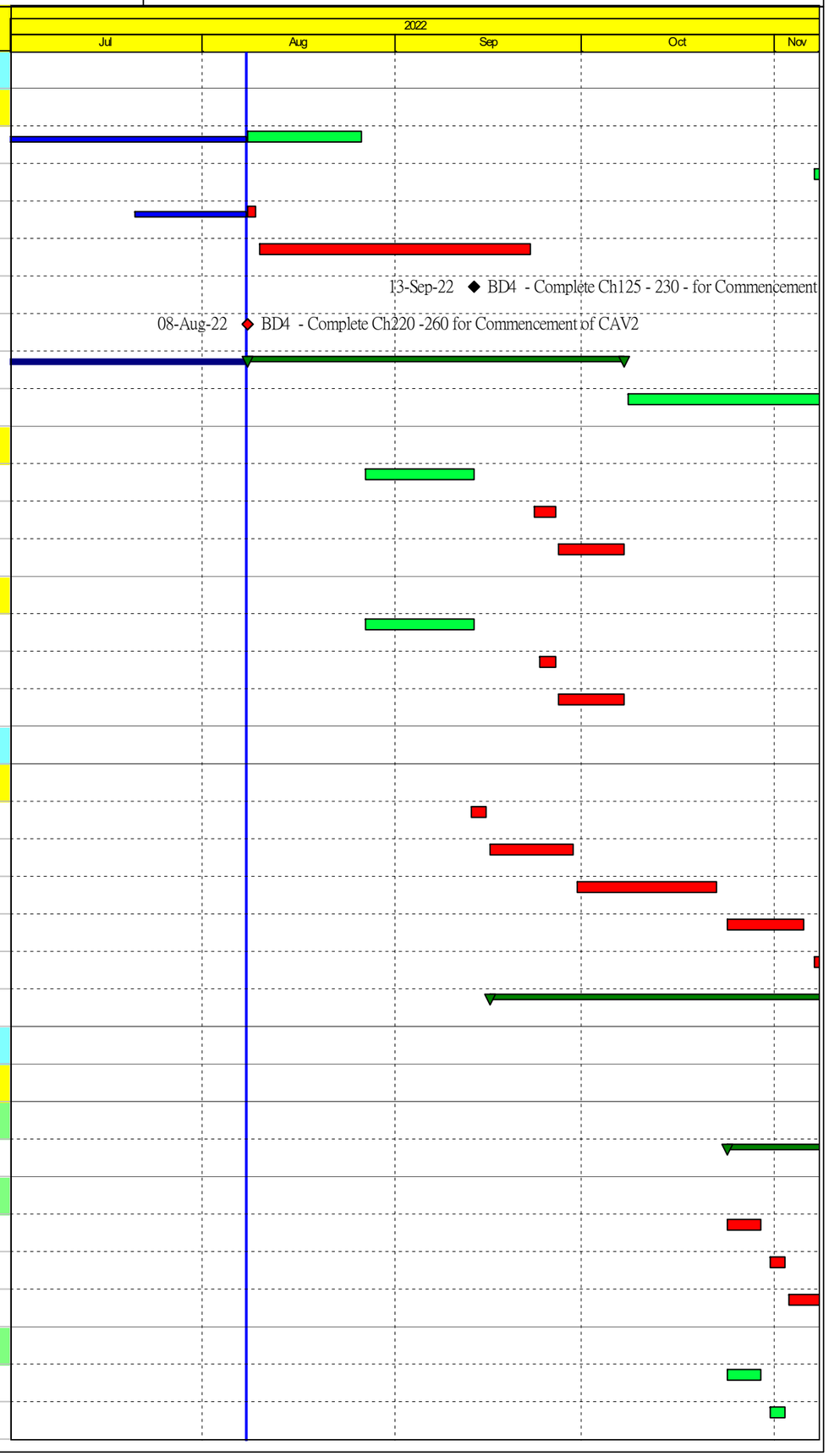


Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Total Float	Late Start	Late Finish
SAT - Soft Ground Excavation (Drill & Break)								
SAT - Excavation (Ch144 - Ch148)								
A11770	SAT - Tunnel excavation (Ch144 - 148)	20%	8	05-Aug-22 A	16-Aug-22	272	14-Jul-23	22-Jul-23
A11780	SAT - Steel rib & Shortcrete installation (Ch144 - 148)	16.67%	10	05-Aug-22 A	18-Aug-22	271	13-Jul-23	24-Jul-23
A11815	SAT - Probing and PEG (4nos.,30m)	0%	1	03-Sep-22	03-Sep-22	271	09-Aug-23	09-Aug-23
SAT - Excavation (Ch148 - Ch152)								
A11790	SAT - Long Canopy Tube (Ch148 - 152)	0%	2	19-Aug-22	20-Aug-22	271	25-Jul-23	26-Jul-23
A11800	SAT - Tunnel excavation (Ch148- 152)	0%	10	22-Aug-22	01-Sep-22	271	27-Jul-23	07-Aug-23
A11810	SAT - Steel rib & Shortcrete installation (Ch148 - 152)	0%	10	23-Aug-22	02-Sep-22	271	28-Jul-23	08-Aug-23
SAT - Excavation (Ch152 - Ch156)								
A11820	SAT - Long Canopy Tube (Ch152 - 156)	0%	2	05-Sep-22	06-Sep-22	271	10-Aug-23	11-Aug-23
A11830	SAT - Tunnel excavation (Ch152 - 156)	0%	10	07-Sep-22	19-Sep-22	271	12-Aug-23	23-Aug-23
A11840	SAT - Steel rib & Shortcrete installation (Ch152 - 156)	0%	10	08-Sep-22	20-Sep-22	271	14-Aug-23	24-Aug-23
SAT - Excavation (Ch156 - Ch160)								
A11850	SAT - Long Canopy Tube (Ch156 -160)	0%	2	21-Sep-22	22-Sep-22	271	25-Aug-23	26-Aug-23
A11860	SAT - Tunnel excavation (Ch156 -160)	0%	10	23-Sep-22	06-Oct-22	271	28-Aug-23	07-Sep-23
A11870	SAT - Steel rib & Shortcrete installation (Ch156 -160)	0%	10	24-Sep-22	07-Oct-22	271	29-Aug-23	08-Sep-23
SAT - Excavation (Ch160 - Ch164)								
A19820	SAT - Long Canopy Tube (Ch160 - 164)	0%	2	08-Oct-22	10-Oct-22	271	09-Sep-23	11-Sep-23
A19830	SAT - Tunnel excavation (Ch160 - 164)	0%	10	11-Oct-22	21-Oct-22	271	12-Sep-23	22-Sep-23
A19840	SAT - Steel rib & Shortcrete installation (Ch160 - 164)	0%	10	12-Oct-22	22-Oct-22	271	13-Sep-23	23-Sep-23
SAT - Excavation (Ch164 - Ch168)								
A19850	SAT - Probing and PEG (4nos.,30m)	0%	1	24-Oct-22	24-Oct-22	271	25-Sep-23	25-Sep-23
A19860	SAT - Long Canopy Tube (Ch164 - 168)	0%	2	25-Oct-22	26-Oct-22	271	26-Sep-23	27-Sep-23
A19870	SAT - Tunnel excavation (Ch164 - 168)	0%	10	27-Oct-22	07-Nov-22	271	28-Sep-23	11-Oct-23
A19880	SAT - Steel rib & Shortcrete installation (Ch164 - 168)	0%	10	28-Oct-22	08-Nov-22	271	29-Sep-23	12-Oct-23
SAT - Hard Rock Excavation (Drill & Blast) (Ch187 - 388) - Top Heading								
B10000	SAT - Trial Blast (initial blast)	0%	1	11-Oct-22	11-Oct-22	204	24-Jun-23	24-Jun-23
B10030	SAT - Top heading (Ch268 - 328, 60m, 14 nos. blast)	0%	16	02-Nov-22	19-Nov-22	390	05-Mar-24	22-Mar-24
B10040	SAT - Top heading (Ch328 - 388, 60m, 14 nos. blast)	0%	18	12-Oct-22	01-Nov-22	204	26-Jun-23	17-Jul-23
SAT - Permanent Lining								
A12202	SAT - Design submission of permanent lining formwork	0%	45	08-Aug-22	29-Sep-22	304	21-Aug-23	13-Oct-23
A12204	SAT - Design approval of permanent lining formwork	0%	18	30-Sep-22	22-Oct-22	304	14-Oct-23	04-Nov-23
A12206	SAT - Permanent lining formwork fabrication and delivery	0%	30	24-Oct-22	26-Nov-22	304	06-Nov-23	09-Dec-23
Cavern Complex								
Cavern Complex - Preparation Works								
Cavern Complex - Conveyor Belt System								

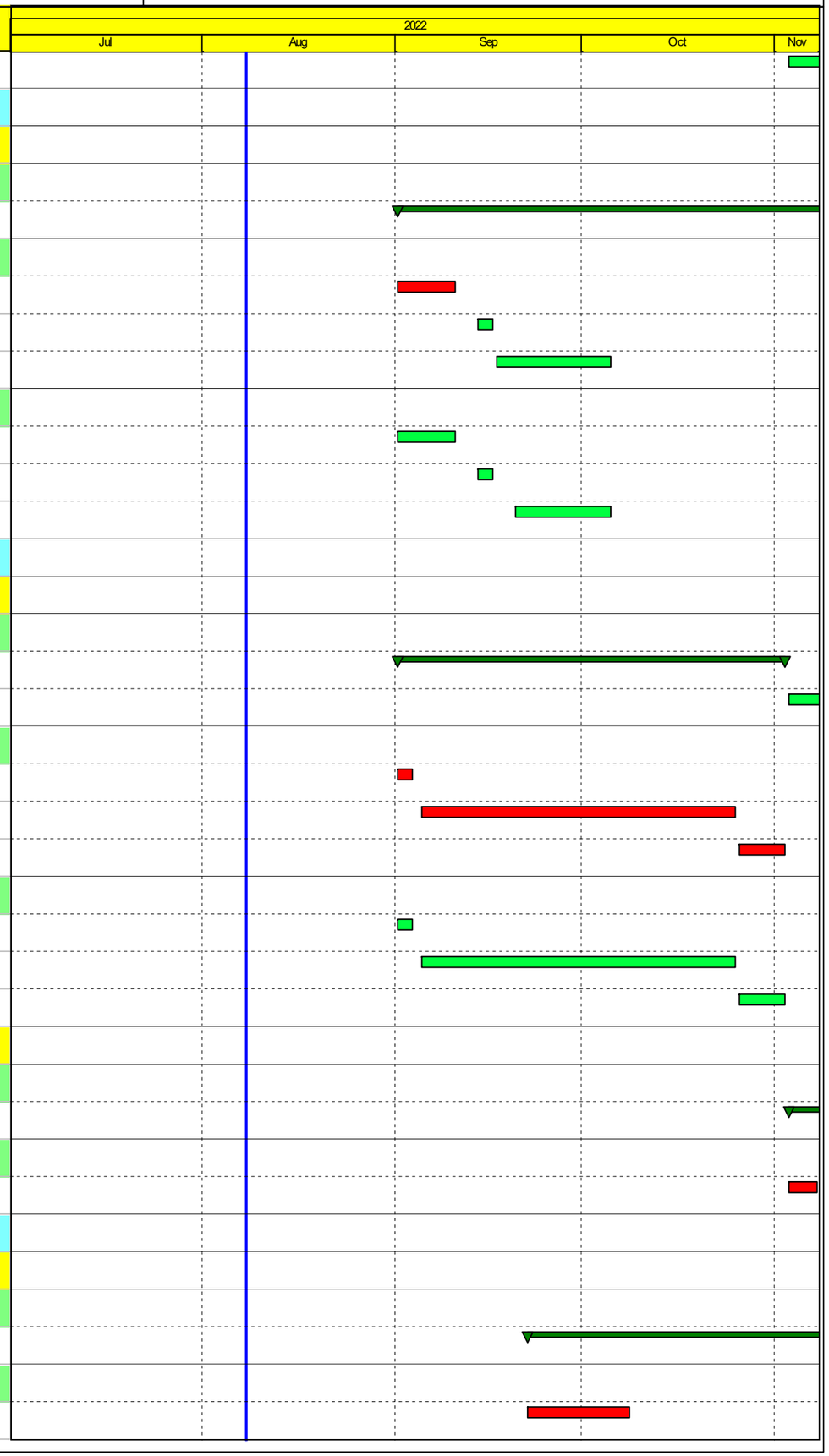


Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Total Float	Late Start	Late Finish
A12610	Prepare detail method statement for Conveyor belt system erection	0%	30	08-Aug-22	10-Sep-22	247	13-Jun-23	19-Jul-23
A12620	PM approval	0%	21	13-Sep-22	08-Oct-22	247	20-Jul-23	12-Aug-23
A12640	Submit application and obtain consent from HyD, TD consent for bridge over across Mui Tsz Lam road	0%	180	13-Sep-22	27-Apr-23	247	20-Jul-23	28-Feb-24
A12645	Submit application and obtain consent from EPD	0%	90	13-Sep-22	30-Dec-22	337	06-Nov-23	28-Feb-24
A12650	Submit application and obtain consent from MTRC	0%	180	13-Sep-22	27-Apr-23	247	20-Jul-23	28-Feb-24
A12655	Submit application and obtain consent from DSD for Sea wall modification	0%	180	13-Sep-22	27-Apr-23	247	20-Jul-23	28-Feb-24
A12660	Coordinate with Utility company for cable diversion under MOS rail	0%	60	13-Sep-22	23-Nov-22	367	11-Dec-23	28-Feb-24
Cavern Complex - CBAR2 Blasting Permit								
A25400	CBAR2B Blasting Permit - GEO & Mines review CBAR2B	83.87%	5	08-Jul-22 A	12-Aug-22	93	28-Nov-22	02-Dec-22
A25410	CBAR2B Blasting Permit - response GEO & Mines comments via PM	0%	4	13-Aug-22	17-Aug-22	93	03-Dec-22	07-Dec-22
A25420	CBAR2B Blasting Permit - CBar2B approval from GEO & Mines	0%	0		17-Aug-22	93		07-Dec-22
Cavern Complex - CBAR2 Blasting Method Statement								
A25440	CBAR2B Blasting Permit - BMS comment from Mines	0%	6	18-Aug-22	24-Aug-22	93	08-Dec-22	14-Dec-22
A25450	CBAR2B Blasting Permit - BMS response to Mines comment	0%	2	25-Aug-22	26-Aug-22	93	15-Dec-22	16-Dec-22
A25460	CBAR2B Blasting Permit - BMS mines approval	0%	0		26-Aug-22	93		16-Dec-22
A25470	CBAR2B Blasting Permit - pre-licencing inspection, preparation and issue Permit	0%	2	27-Aug-22	29-Aug-22	93	17-Dec-22	19-Dec-22
A25480	CBAR2B Blasting Permit - order explosive (2 days before blasting)	0%	2	30-Aug-22	31-Aug-22	93	20-Dec-22	21-Dec-22
Cavern Complex - Temporary Ventilation System								
Cavern Complex - Temp Ventilation (For Stages after CBAR1)								
A20210	Cavern Complex - Temp tunnel ventilation design (Stage 2) approval	80.2%	20	30-Apr-22 A	30-Aug-22	1304	14-Jan-27	05-Feb-27
A20230	Cavern Complex - Temp tunnel ventilation and Temp fire & smoke extraction system (Stage 2) installation	55.56%	44	02-Jun-22 A	28-Sep-22	506	02-May-24	24-Jun-24
A20240	Cavern Complex - Temp tunnel ventilation system complete	0%	0		28-Sep-22	506		24-Jun-24
Cavern Complex - Fully Enclosure to Tunnel Entrance								
A12590	Erect Fully Enclosured Stockpile Area Structural works	0%	90	08-Aug-22	23-Nov-22	1234	21-Oct-26	05-Feb-27
Main Access Tunnel, MAT (ch288 - 297)								
MAT - Hard Rock Excavation (Drill & Blast) - Top Heading								
PA14401	MAT - Top Permanent Support - (R103, Ch288 - 297) - Bolt and spray concrete [8m]- stage 2	0%	12	08-Aug-22	20-Aug-22	411	29-Dec-23	12-Jan-24
Main Driveway MD								
Main Driveway MD - Zone 1 (ch123 - 213)								
MD - Zone 1 - Hard Rock Excavation (Drill & Blast) - Top Heading								
P10325-20	MD - Junction 4 - Top Heading - (R105, Ch100 - 123) - remaining work	0%	15	14-Sep-22	30-Sep-22	646	25-Nov-24	11-Dec-24
PA14502	MD - Zone 1 - Top Permanent Support - (MD, ch123 - 213) - Bolt and spray concrete [114.7m] - Stage 2	0%	62	08-Aug-22	21-Oct-22	373	13-Nov-23	26-Jan-24
Main Driveway MD - Zone 2 (ch226 - 392)								
MD - Zone 2 - Hard Rock Excavation (Drill & Blast) - Top Heading								
P12380-05	MD - Zone 2 - Top Heading - (R105, Ch239 to 277) - 38m, 7 nos of blast @5.5m Pull length, 1059m3 each	85.19%	4	12-Jul-22 A	11-Aug-22	105	12-Dec-22	15-Dec-22
P12380-11	MD - Zone 2 - Top Heading - (R105, Ch277 to 300) - 23m, 10 nos of blast @3.5m Pull length,	0%	28	12-Aug-22	14-Sep-22	105	16-Dec-22	20-Jan-23
P12380-20	MD - Zone 2 - Top Heading - (R105, Ch300 to 350) - 50m, 36 nos of blast @2.7m Pull length	0%	72	15-Sep-22	09-Dec-22	105	28-Jan-23	26-Apr-23

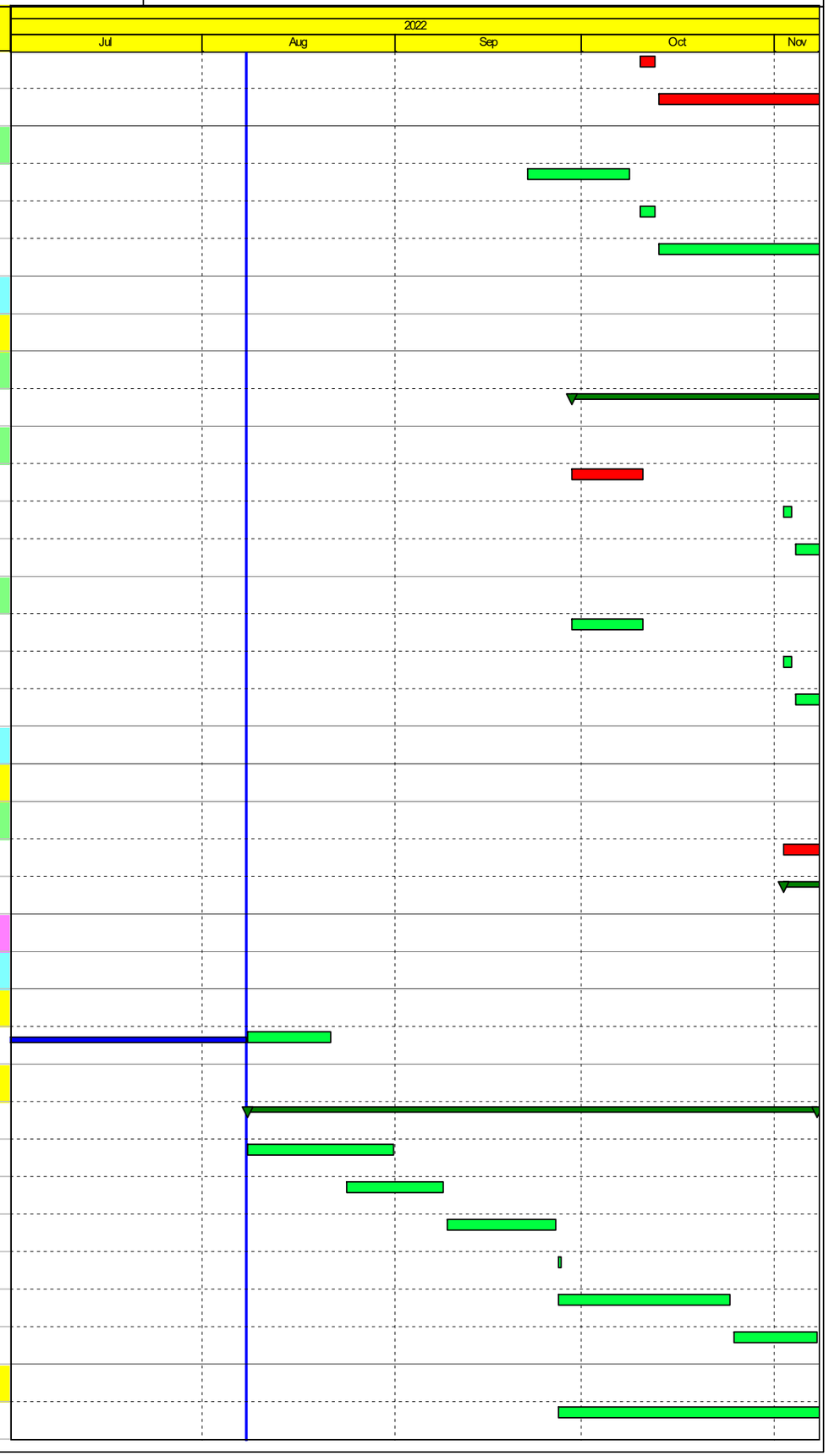
Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Total Float	Late Start	Late Finish
Branch Driveway BD4								
BD4 - Hard Rock Excavation (Drill & Blast) - Top Heading								
P12520	BD4 - Top Heading - (Ch220 to 150) - 70m, 13 nos. Blasts @5.5m Pull Length, 616m3 each	66.67%	17	28-Jun-22 A	26-Aug-22	227	19-May-23	08-Jun-23
P12525-1b	BD4 - Top Heading - (Ch245 to 260) - 15m, 3 nos. Blasts @5.5m Pull Length	0%	2	07-Nov-22	08-Nov-22	247	11-Sep-23	12-Sep-23
P12525-2	BD4 - Top Heading - (Ch260.0 to 292) - 32m, 6 nos. Blasts @5.5m Pull Length	88.24%	2	21-Jul-22 A	09-Aug-22	104	10-Dec-22	12-Dec-22
P12525-3	BD4 - Top Heading - (Ch292.0 to 420) - 128m, 23 nos. Blasts @5.5m Pull Length, 616m3 each	0%	37	10-Aug-22	22-Sep-22	104	13-Dec-22	03-Feb-23
P12550	BD4 - Complete Ch125 - 230 - for Commencement of CAV1	0%	0		13-Sep-22	363		06-Dec-23
P13180	BD4 - Complete Ch220 -260 for Commencement of CAV2	0%	0		08-Aug-22	190		30-Mar-23
PA14420	BD4 - Top Permanent Support - Bolt and spray concrete - Stage 1	40.48%	50	28-Jun-22 A	07-Oct-22	206	23-Jun-23	23-Jun-23
PA14420-10	BD4 - Top Permanent Support - Bolt and spray concrete (Part 1 of 3) [106m] - Stage 2	0%	53	08-Oct-22	08-Dec-22	236	31-Jul-23	29-Sep-23
BD4 - Hard Rock Excavation (Drill & Blast) - Top Heading (1st Half)								
P12510	BD4 - Side Heading 1 - (Ch125.0 to 150.0) - 25.0m, 9 nos. Blasts @3m Pull Length, 539m each	0%	14	27-Aug-22	13-Sep-22	227	09-Jun-23	26-Jun-23
P12530	BD4 - Side Heading 1 - (Ch419.9 to 430.0) - 10.1m, 3 nos. Blasts @3m Pull Length, 480m3 each	0%	3	23-Sep-22	26-Sep-22	204	08-Jun-23	10-Jun-23
P12540	BD4 - Side Heading 1 - (Ch430.0 to 443.5) - 13.5m, 7 nos. Blasts @2m Pull Length, 460m3 each	0%	8	27-Sep-22	07-Oct-22	204	12-Jun-23	20-Jun-23
BD4 - Hard Rock Excavation (Drill & Blast) - Top Heading (2nd Half)								
P12620	BD4 - Side Heading 2 - (Ch125.0 to 150.0) - 25.0m, 9 nos. Blasts @3m Pull Length, 359m3 each	0%	14	27-Aug-22	13-Sep-22	227	09-Jun-23	26-Jun-23
P12630	BD4 - Side Heading 2 - (Ch419.9 to 430.0) - 10.1m, 3 nos. Blasts @3m Pull Length, 480m3 each	0%	2	24-Sep-22	26-Sep-22	206	12-Jun-23	13-Jun-23
P12640	BD4 - Side Heading 2 - (Ch430.0 to 443.5) - 13.5m, 7 nos. Blasts @2m Pull Length, 184m3 each	0%	8	27-Sep-22	07-Oct-22	206	14-Jun-23	23-Jun-23
Branch Driveway BD3								
BD3 - Hard Rock Excavation (Drill & Blast) - Top Heading								
P12200	BD3 - Top Head - (Ch124.0 - 127.5) - 3.5m, 1 no. Blast @5.5m Pull length, 708m3 each	0%	3	13-Sep-22	15-Sep-22	169	15-Apr-23	18-Apr-23
P12210-1	BD3 - Top Head - (Ch127.5 - 150) - 22.5m	0%	12	16-Sep-22	29-Sep-22	169	19-Apr-23	03-May-23
P12210-2	BD3 - Top Head - (Ch150 - 180) - - 30x11m, 6 nos blasts (Junction at CAV1)	0%	18	30-Sep-22	22-Oct-22	169	04-May-23	24-May-23
P12210-3	BD3 - Top Head - (Ch180 - 205) - 25m	0%	12	24-Oct-22	05-Nov-22	169	25-May-23	08-Jun-23
P12210-4	BD3 - Top Head - (Ch205 - 235) - 30x11m, 6 nos blasts (Junction at CAV2)	0%	18	07-Nov-22	26-Nov-22	169	09-Jun-23	30-Jun-23
PA14440	BD3 - Top Permanent Support - Bolt and spray concrete - Stage 1	0%	147	16-Sep-22	18-Mar-23	145	19-Apr-23	13-Sep-23
Cavern 1 - DAF1, MBBR1, PST1								
Cavern 1 - MBBR1								
Cavern 1 - MBBR1 - Hard Rock Excavation (Drill & Blast) - Top Heading								
PA14580	CAV1 - MBBR1 - Top Permanent Support - Bolt and spray concrete - stage 1	0%	114	24-Oct-22	15-Mar-23	263	18-Jul-23	01-Feb-24
Cavern 1 - MBBR1 - Hard Rock Excavation (Drill & Blast) - Top Heading (1st Half)								
P10420	CAV1 - MBBR1 - Side Heading 1 - (MBBR1, Ch272.2 to 261.5) - 10.7m, 2 nos. Blasts @5.5m Pull length, 1168m3 each	0%	6	24-Oct-22	29-Oct-22	212	18-Jul-23	24-Jul-23
P10430	CAV1 - MBBR1 - Side Heading 1 - (MBBR1, Ch261.5 to 259.2) - 2.3m, 1 no. Blast @5.5m Pull length, 1168m3 each	0%	3	31-Oct-22	02-Nov-22	212	25-Jul-23	27-Jul-23
P10440	CAV1 - MBBR1 - Side Heading 1 - (MBBR1, Ch259.2 to 206.4) - 52.9m, 10 nos. Blasts @5.5m Pull length, 1168m3 each	0%	36	03-Nov-22	14-Dec-22	212	28-Jul-23	07-Sep-23
Cavern 1 - MBBR1 - Hard Rock Excavation (Drill & Blast) - Top Heading (2nd Half)								
P12690	CAV1 - MBBR1 - Side Heading 2 - (MBBR1, Ch272.2 to 261.5) - 10.7m, 2 nos. Blasts @5.5m Pull length, 779m3 each	0%	6	24-Oct-22	29-Oct-22	263	15-Sep-23	21-Sep-23
P12700	CAV1 - MBBR1 - Side Heading 2 - (MBBR1, Ch261.5 to 259.2) - 2.3m, 1 no. Blast @5.5m Pull length, 779m3 each	0%	3	31-Oct-22	02-Nov-22	263	22-Sep-23	25-Sep-23



Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Total Float	Late Start	Late Finish
P12710	CAV1 - MBBR1 - Side Heading 2 - (MBBR1, Ch259.2 to 206.4) - 52.9m, 10 nos. Blasts @5.5m Pull length, 779m3 each	0%	36	03-Nov-22	14-Dec-22	263	26-Sep-23	09-Nov-23
Cavern 2 - DAF2, MBBR2, PST2								
Cavern 2 - DAF2								
Cavern 2 - DAF2 - Hard Rock Excavation (Drill & Blast) - Top Heading								
PA14620	CAV2 - DAF2 - Top Permanent Support - Bolt and spray concrete - Stage 1	0%	118	01-Sep-22	30-Jan-23	300	31-Mar-23	31-Jan-24
Cavern 2 - DAF2 - Hard Rock Excavation (Drill & Blast) - Top Heading (1st Half)								
P10520	CAV2 - DAF2 - Side Heading 1 - (DAF2, Ch190.2 to 177.2) - 13m, 3 nos. Blasts @5.5m Pull length, 912m3 each	0%	9	01-Sep-22	10-Sep-22	169	31-Mar-23	14-Apr-23
P10530	CAV2 - DAF2 - Side Heading 1 - (DAF2, Ch177.21 to 171.51) - 5.7m, 1 nos. Blasts @5.5m Pull length, 912m3 each	0%	3	14-Sep-22	16-Sep-22	227	27-Jun-23	29-Jun-23
P10541	CAV2 - DAF2 - Side Heading 1 - (DAF2, Ch171.51 to 149.0) - 22.5m, 4 nos. Blasts @4.5m Pull length	0%	14	17-Sep-22	05-Oct-22	227	30-Jun-23	17-Jul-23
Cavern 2 - DAF2 - Hard Rock Excavation (Drill & Blast) - Top Heading (2nd Half)								
P13200	CAV2 - DAF2 - Side Heading 2 - (DAF2, Ch190.2 to 177.2) - 13m, 4 nos. Blasts @5.5m Pull length, 608m3 each	0%	9	01-Sep-22	10-Sep-22	372	06-Dec-23	15-Dec-23
P13210	CAV2 - DAF2 - Side Heading 2 - (DAF2, Ch177.21 to 171.51) - 5.7m, 1 nos. Blasts @5.5m Pull length, 608m3 each	0%	3	14-Sep-22	16-Sep-22	371	16-Dec-23	19-Dec-23
P13221	CAV2 - DAF2 - Side Heading 2 - (DAF2, Ch171.51 to 149.0) - 22.5m, 4 nos. Blasts @4.5m Pull length	0%	12	20-Sep-22	05-Oct-22	387	13-Jan-24	26-Jan-24
Cavern 3 - ELC2, STC, ELC1								
Cavern 3 - ELC2								
Cavern 3 - ELC2 - Hard Rock Excavation (Drill & Blast) - Top Heading								
PA14680	CAV3 - ELC2 - Top Permanent Support - Bolt and spray concrete- Stage 1	0%	51	01-Sep-22	02-Nov-22	285	22-Dec-22	24-Oct-23
PA14680-10	CAV3 - ELC2 - Top Permanent Support - Bolt and spray concrete (Part 1 of 4) [22.6m]- Stage 2	0%	12	03-Nov-22	16-Nov-22	392	08-Mar-24	21-Mar-24
Cavern 3 - ELC2 - Hard Rock Excavation (Drill & Blast) - Top Heading (1st Half)								
P12760	CAV3 - ELC2 - Side Heading 1 - (ELC2, Ch190.2 to 184.5) - 5.7m, 1 nos. Blasts @5.5 Pull length, 861m3 each	0%	3	01-Sep-22	03-Sep-22	93	22-Dec-22	24-Dec-22
P12770	CAV3 - ELC2 - Side Heading 1 - (ELC2, Ch184.5 to 113.0) - 71.5m, 13 nos. Blasts @5.5 Pull length, 861m3 each	0%	41	05-Sep-22	25-Oct-22	93	28-Dec-22	21-Feb-23
P12780	CAV3 - ELC2 - Side Heading 1 - (ELC2, Ch113.0 to 100.0) - 13.0m, 3 nos. Blasts @5.5 Pull length, 861m3 each	0%	7	26-Oct-22	02-Nov-22	93	22-Feb-23	01-Mar-23
Cavern 3 - ELC2 - Hard Rock Excavation (Drill & Blast) - Top Heading (2nd Half)								
P12790	CAV3 - ELC2 - Side Heading 2 - (ELC2, Ch190.2 to 184.5) - 5.7m, 1 nos. Blasts @5.5 Pull length, 574m3 each	0%	3	01-Sep-22	03-Sep-22	285	23-Aug-23	25-Aug-23
P12800	CAV3 - ELC2 - Side Heading 2 - (ELC2, Ch184.5 to 113.0) - 71.5m, 13 nos. Blasts @5.5 Pull length, 574m3 each	0%	41	05-Sep-22	25-Oct-22	285	26-Aug-23	14-Oct-23
P12810	CAV3 - ELC2 - Side Heading 2 - (ELC2, Ch113.0 to 100.0) - 13.0m, 3 nos. Blasts @5.5 Pull length, 574m3 each	0%	7	26-Oct-22	02-Nov-22	285	16-Oct-23	24-Oct-23
Cavern 3 - STC								
Cavern 3 - STC - Hard Rock Excavation (Drill & Blast) - Top Heading								
PA14700	CAV3 - STC - Top Permanent Support - Bolt and spray concrete - Stage 1	0%	152	03-Nov-22	15-May-23	209	02-Mar-23	24-Jan-24
Cavern 3 - STC - Hard Rock Excavation (Drill & Blast) - Top Heading (1st Half)								
P12830	CAV3 - STC - Side Heading 1 - (STC, Ch292.2 to 282.2) - 10.0m, 2 nos. Blasts @5.5 Pull length	0%	4	03-Nov-22	07-Nov-22	93	02-Mar-23	06-Mar-23
Cavern 4 - DAF3, MBBR3, PST3								
Cavern 4 - DAF3								
Cavern 4 - DAF3 - Hard Rock Excavation (Drill & Blast) - Top Heading								
PA14740	CAV4 - DAF3 - Top Permanent Support - Bolt and spray concrete - Stage 1	0%	47	22-Sep-22	17-Nov-22	400	28-Jan-23	05-Apr-24
Cavern 4 - DAF3 - Hard Rock Excavation (Drill & Blast) - Top Heading (1st Half)								
P10660	CAV4 - DAF3 - Side Heading 1 - (DAF3, Ch190.2 to 177.2) - 13m, 4 nos. Blasts @5.5m Pull length, 912m3 each	0%	13	22-Sep-22	08-Oct-22	99	28-Jan-23	11-Feb-23



Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Total Float	Late Start	Late Finish
P10670	CAV4 - DAF3 - Side Heading 1 - (DAF3, Ch177.21 to 171.51) - 5.7m, 1 nos. Blasts @5.5m Pull length, 912m3 each	0%	3	10-Oct-22	12-Oct-22	99	13-Feb-23	15-Feb-23
P10680	CAV4 - DAF3 - Side Heading 1 - (DAF3, Ch171.51 to 113.0) - 58.5m, 11 nos. Blasts @5.5m Pull length, 912m3 each	0%	27	13-Oct-22	12-Nov-22	99	16-Feb-23	18-Mar-23
Cavern 4 - DAF3 - Hard Rock Excavation (Drill & Blast) - Top Heading (2nd Half)								
P13730	CAV4 - DAF3 - Side Heading 2 - (DAF3, Ch190.2 to 177.2) - 13m, 4 nos. Blasts @5.5m Pull length, 608m3 each	0%	13	22-Sep-22	08-Oct-22	400	31-Jan-24	21-Feb-24
P13740	CAV4 - DAF3 - Side Heading 2 - (DAF3, Ch177.21 to 171.51) - 5.7m, 1 nos. Blasts @5.5m Pull length, 608m3 each	0%	3	10-Oct-22	12-Oct-22	400	22-Feb-24	24-Feb-24
P13750	CAV4 - DAF3 - Side Heading 2 - (DAF3, Ch171.51 to 113.0) - 58.5m, 11 nos. Blasts @5.5m Pull length, 608m3 each	0%	27	13-Oct-22	12-Nov-22	400	26-Feb-24	27-Mar-24
Cavern 5 - DAF4, MBBR4, PST4								
Cavern 5 - DAF4								
Cavern 5 - DAF4 - Hard Rock Excavation (Drill & Blast) - Top Heading								
PA14800	CAV5 - DAF4 - Top Permanent Support - Bolt and spray concrete - Stage 1	0%	55	29-Sep-22	03-Dec-22	363	14-Jun-23	05-Mar-24
Cavern 5 - DAF4 - Hard Rock Excavation (Drill & Blast) - Top Heading (1st Half)								
P10800	CAV5 - DAF4 - Side Heading 1 - (DAF4, Ch190.2 to 177.2) - 13m, 4 nos. Blasts @5.5m Pull length, 912m3 each	0%	8	29-Sep-22	10-Oct-22	204	14-Jun-23	23-Jun-23
P10810	CAV5 - DAF4 - Side Heading 1 - (DAF4, Ch177.21 to 171.51) - 5.7m, 1 nos. Blasts @5.5m Pull length, 912m3 each	0%	2	02-Nov-22	03-Nov-22	354	16-Jan-24	17-Jan-24
P10820	CAV5 - DAF4 - Side Heading 1 - (DAF4, Ch171.51 to 113.0) - 58.5m, 11 nos. Blasts @5.5m Pull length, 912m3 each	0%	22	04-Nov-22	29-Nov-22	354	18-Jan-24	19-Feb-24
Cavern 5 - DAF4 - Hard Rock Excavation (Drill & Blast) - Top Heading (2nd Half)								
P13530	CAV5 - DAF4 - Side Heading 2 - (DAF4, Ch190.2 to 177.2) - 13m, 4 nos. Blasts @5.5m Pull length, 608m3 each	0%	8	29-Sep-22	10-Oct-22	382	17-Jan-24	25-Jan-24
P13540	CAV5 - DAF4 - Side Heading 2 - (DAF4, Ch177.21 to 171.51) - 5.7m, 1 nos. Blasts @5.5m Pull length, 608m3 each	0%	2	02-Nov-22	03-Nov-22	363	26-Jan-24	27-Jan-24
P13550	CAV5 - DAF4 - Side Heading 2 - (DAF4, Ch171.51 to 113.0) - 58.5m, 11 nos. Blasts @5.5m Pull length, 608m3 each	0%	22	04-Nov-22	29-Nov-22	363	29-Jan-24	29-Feb-24
Secondary Driveway (SD)								
Secondary Driveway (SD) - Zone 1 (ch418 - 488)								
SD - Zone 1 - Hard Rock Excavation (Drill & Blast) - Top Heading								
P11550	SD - Zone 1 - Top Heading - (SD, Ch417.6 to 433.5) - 15.9m, 4 nos. Blasts @4m Pull length, 555m3 each	0%	8	02-Nov-22	10-Nov-22	204	18-Jul-23	26-Jul-23
PA14860	SD - Zone 1 - Top Permanent Support - (SD ch418 - 488) - Bolt and spray concrete [70.6m] - Stage 1	0%	36	02-Nov-22	13-Dec-22	204	18-Jul-23	28-Aug-23
Ventilation Shaft and Ventilation Adit								
Ventilation Shaft (VS)								
VS - CBAR3 Blasting Permit								
A23108	VS - CBAR3 Blasting Permit - closing out GEO & Mines comments	93.61%	14	15-Jan-22 A	21-Aug-22	982	16-Apr-25	29-Apr-25
VS - CBAR3 Blasting Method Statement								
A18580	[Summary] VS - CBAR3 Method statement for Blasting Works	0%	76	08-Aug-22	07-Nov-22	722	22-Jan-25	29-Apr-25
A23090	VS - CBAR3 Blasting Method Statement (BMS) - Prepare & submit to PM	0%	21	08-Aug-22	31-Aug-22	724	22-Jan-25	21-Feb-25
A23092	VS - CBAR3 Blasting Method Statement (BMS) - PM review and comment	0%	14	24-Aug-22	08-Sep-22	724	14-Feb-25	01-Mar-25
A23102	VS - CBAR3 Blasting Method Statement (BMS) - response to PM's comments	0%	14	09-Sep-22	26-Sep-22	724	03-Mar-25	18-Mar-25
A23202	VS - CBAR3 Blasting Method Statement (BMS) - Formal submit BMS to Mines	0%	1	27-Sep-22	27-Sep-22	724	19-Mar-25	19-Mar-25
A23302	VS - CBAR3 Blasting Method Statement (BMS) - Mines review BMS	0%	28	27-Sep-22	24-Oct-22	904	19-Mar-25	15-Apr-25
A24402	VS - CBAR3 Blasting Method Statement (BMS) - close out Mines comments and Mines approve	0%	14	25-Oct-22	07-Nov-22	904	16-Apr-25	29-Apr-25
VS - Off-site Fabrication of Travelling Formworks for Ventilation Shaft								
A20370	Travelling Formwork - Design preparation, review and accept by PM	0%	40	27-Sep-22	14-Nov-22	737	03-Apr-25	26-May-25



Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Total Float	Late Start	Late Finish
VS - Erect Noise Barrier								
A18563	VS - Noise Barrier - subletting period	0%	18	08-Aug-22	27-Aug-22	686	05-Dec-24	27-Dec-24
A18564	VS - Noise Barrier - construct footing	0%	24	29-Aug-22	26-Sep-22	686	28-Dec-24	25-Jan-25
A18570	VS - Noise Barrier - construct structural frame	0%	26	27-Sep-22	28-Oct-22	686	27-Jan-25	04-Mar-25
A24580	VS - Noise Barrier - install wall and roof panels	0%	18	29-Oct-22	18-Nov-22	686	05-Mar-25	25-Mar-25
VS - Erect Blast Cover								
A24610	VS - Blast Cover - Fabrication	0%	48	29-Aug-22	26-Oct-22	718	12-Feb-25	09-Apr-25
A24620	VS - Blast Cover - assembling and install cover	0%	14	27-Oct-22	11-Nov-22	718	10-Apr-25	29-Apr-25
Ventilation Adit (VA)								
VA - CBAR4 Blasting Permit								
A23150	VA - CBAR4 Blasting Permit - prepare and submit draft CBAR4 to PM	0%	24	22-Aug-22	19-Sep-22	123	19-Jan-23	22-Feb-23
A23170	VA - CBAR4 Blasting Permit - PM review and comment	0%	26	20-Sep-22	21-Oct-22	123	23-Feb-23	24-Mar-23
A23175	VA - CBAR4 Blasting Permit - response to PM's comment	0%	18	22-Oct-22	11-Nov-22	123	25-Mar-23	19-Apr-23
A23200	CBAR4 - Summary of Blasting Permit Application	0%	178	20-Sep-22	03-May-23	123	23-Feb-23	27-Sep-23