Appendix 13A
Summary of Environmental Impacts

Summary of Environmental Impacts Associated with the Project

Air Quality

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Construction Impact					
Existing ASRs within the 500m assessment area	TSP • Max 1-hr average level: 4738 µg/m³ RSP • 10th highest 24-hr average level: 238 µg/m³ • Annual average level: 92 µg/m³ FSP • 10th highest 24-hr average level: 68 µg/m³ • Annual average level: 30 µg/m³	• Air Quality Objectives • EIAO-TM • 1-hr average TSP level: 500 µg/m³ • 24-hr average RSP level: 100 µg/m³ • Annual average RSP level:50 µg/m³ • 24-hr average FSP level: 75 µg/m³ • Annual average FSP level: 35 µg/m³	TSP • Exceed 1-hr average TSP level: 4238 µg/m³ RSP • Exceed 24-hr average RSP level: 138 µg/m³ • Annual average RSP level: 42 µg/m³ FSP • No exceedance anticipated	• The rock crushing plant is configured as an enclosed system with dust collector. Dust collector will be provided at the exhaust of the rock during rock crushing. Assume typical dust removal efficiency at 95%. • Vehicles would be required to pass through the wheel washing facilities provided at site exit. Watering will be provided once per hour. Assume dust removal efficiency at 91.7%. • A dust filter is installed at the ventilation shaft of the tunnel portal to filter all emissions emitted inside cavern. Assume typical dust removal efficiency at 80%.	No exceedance is predicted at all ASRs. No adverse residual impact is expected
Operation Impact					
Existing ASRs within the 500m assessment area	Not applicable	Not applicable	Not applicable	Not applicable	No operation air quality impact is expected.

Noise

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Construction Impact					
NSRs located within 300m from the project boundary	Predicted construction noise levels would be 70 to 91 dB(A)	• TM-EIAO Annex 5 and Annex 13	Predicted construction noise levels at 24 out of 27 NSRs would exceeded the noise criteria.	• Use of quiet PME • Adoption of noise barriers/enclosures • Scheduling of PME and construction activities • Good construction site practices	No exceedance is predicted at all NSRs. No adverse residual impact is expected.
Operation Impact					
NSRs located within 300m from the ancillary building	As details of the layout and noise specification of the equipment in the ancillary building will be developed by Contractor, the maximum permissible SWL from the ancillary building are determined for future detailed engineering design to ensure compliance with the relevant noise criteria.	• TM-EIAO Annex 5 and Annex 13	Not applicable	• Use of quieter plant • Locating fixed plant, louvres or opening away from NSRs, • Keeping pump room doors and tunnel portal doors closed • Use of silencers, acoustic louvres/doors where necessary	No adverse residual fixed noise impact is expected.

Water Quality

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Construction Impact					
WSRs located within 500m from the project boundary	Potential sources of water quality impact include • Construction site run-off • General construction activities • Sewage generated by construction workforce • Potential accidental spillage of chemicals • Potential groundwater infiltration • Construction works in close proximity of inland watercourses • Cleansing effluent generated from washing of interior of structures	TM-EIAO Annex 6 and Annex 14	Not applicable	• Good site practice and mitigation measures in ProPECC PN 1/94 and ETWB TC(W) No. 5/2005 • Provision of drainage system and sand/silt removal facilities • Groundwater control measures • Proper treatment and discharge of cleaning effluent • Provision of portable chemical toilets	No adverse residual impact is expected
Operation Impact					
WSRs located within 500m from the project boundary	Potential sources of water quality impact include • Effluents from cleaning of service reservoir • Non-point source surface run-off from new impervious areas • Sewage from the development	TM-EIAO Annex 6 and Annex 14	Not applicable	• Proper discharge of sewage and cleansing water • Best management practices to reduce non-point source surface water pollution	No adverse residual impact is expected

Waste Management Implications

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Construction Impact					
Project Area	Estimated quantity of waste generation: • Inert C&D Materials: 286,333 m^3 • Non-inert C&D Materials: 4,879 m^3 • Chemical Waste: 50 litres per month • General Refuse: 65 kg per day	• TM-EIAO Annex 7 and Annex 15	Not applicable	• Proper handling, transporting and disposing waste using approved methods • Good site practices in principle of the avoidance-minimisation-reuse-recycling-disposal hierarchy	No adverse residual impact is expected
Operation Impact					
Relocated DHSRs and Ancillary Building	Small amount of general refuse and chemical waste would be generated	• TM-EIAO Annex 7 and Annex 15	Not applicable	• Proper handling, transporting and disposing waste using approved methods	No adverse residual impact is expected

Land Contamination

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Project Area	No potential land contamination issue has been identified	• TM-EIAO Annex 19 (Section 3.1) • Guidance Note for Contaminated Land Assessment and Remediation • Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management • Practice Guide for Investigation and Remediation of Contaminated Land	Not applicable	Not applicable	No land contamination impact is expected

Ecological Impact

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Construction Impact					
The works area and its adjacent areas	• Habitat loss – about 0.004ha stream, 0.082ha woodland, 0.791ha plantation and 3.082ha developed area. • Two species of conservation importance, freshwater crab and Lesser Spiny Frog in the stream near the emergency portal exit will be affected. • The Lion Rock Country Park encroachment.	• TM-EIAO Annex 8 and Annex 16	• Not applicable	• Avoidance of the Recognized Site of Conservation Importance (i.e. Lion Rock Country Park) by carefully planning of the location of the cavern and the alignment of access tunnel. • Avoidance of the encroachment of watercourses by eliminating of emergency exit tunnel and portal. • Avoidance of the encroachment of woodland by an emergency exit portal adjacent to Fat Jong Temple • Avoidance of direct impacts on species of conservation interest (e.g. *Aquilaria sinensis*, Lesser Spiny Frog, etc) • Reinstating and enhancing of the temporarily affected habitats. • Minimizing disturbance from construction activities. • Control of site runoff.	With implementation of the mitigation measures, no adverse residual impact to ecology is anticipated.

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				• Control of groundwater infiltration with pre-grouting and post-grouting measures.	
Operation Impact					
The works area and its adjacent areas	Not applicable	TM-EIAO Annex 8 and Annex 16	Not applicable	Control of groundwater infiltration by installing the waterproof lining.	No residual impact anticipated

Landscape and Visual Impact

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Construction Impact					
Existing Trees, Landscape Resources (LRs) and Landscape Character Areas (LCAs) and Visually Sensitive Receivers (VSRs) within the assessment area	• Source of impact include the construction of tunnel portal, ancillary facilities, access road, water mains laying work and loss of existing trees. • Approximate 260 no. of existing trees but not more than 300 no. of trees will be affected. • The landscape impacts of LRs and LCAs within the footprint of the tunnel portal, ancillary facilities and temporary construction storage are considered to be **Moderate.** • The overall landscape impacts of LRs and LCAs along the footprint of the proposed water mains are considered to be **Slight.** • The overall visual impacts on the VSRs who can partially see the construction site of the proposed portal and the ancillary buildings (i.e. residents of Tin Ma Court (R01) and the Palace (R02)) are considered to be **Moderate**. • The Project is considered to have **Slight**	• EIAO TM Annexes 10 and 18 • EIAO Guidance Note No. 8/2010 on Preparation of Landscape and Visual Impact Assessment under the EIAO • DEVB (GLTM) – Guidelines on Tree Preservation during Development • DEVB (GLTM) – Guidelines on Tree Transplanting • HyD Guidelines HQ/GN/13 – Interim Guidelines for Tree Transplanting Works under Highways Department's Vegetation Maintenance Ambit • DEVB TCW No. 4/2020 – Tree Preservation	• Not applicable	• Careful Site Planning and Management • Careful Design of Slope Works • Tree Preservation • Tree Transplanting/ Compensatory Tree Planting • Inspection of Tree Works • Minimisation of Light Impact • Erection of Decorative Site Hoarding • Reinstatement of Temporarily Disturbed Areas	• No significantly adverse residual landscape and visual impacts are anticipated.

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	visual impacts on another two VSRs (the recreational users in Lion Rock Park (L03), Occupants in Lion Rock Park Transit Nursery (F07) and travellers along Lion Rock Road (T02)) who can have a glimpse view of the construction site of the proposed portal/ ancillary buildings. • The proposed water mains laying works will only result in **Slight** visual impacts on the local VSRs during the construction phase.				
Operation Impact					
Existing Trees, Landscape Resources (LRs) and Landscape Character Areas (LCAs) and Visually Sensitive Receivers (VSRs) within the assessment area	• The landscape impacts of LRs and LCAs (i.e. LR1.2 Engineered Slope (Vegetated), LR1.5 Lion Rock Park Transit Nursery and LCA2 Upland Hillside Landscape at Lion Rock) within the footprint of the tunnel portal, ancillary facilities and temporary construction storage are considered to be **Moderate.** • The overall landscape impacts of LRs and LCAs along the footprint of the proposed water mains (i.e. LR1.1 Roadside vegetation, LR2.1 Urban development	• Same as those for construction phase.	• Not applicable	• Landscape Planting • Rooftop Greening • Vertical Greening • Careful Design of Ancillary Facilities	• No significantly adverse residual landscape and visual impacts are anticipated.

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	and LCA4 Wong Tai Sin Residential Urban Landscape) are considered to be **Slight to Insubstantial**. • The Project will result in **Moderate** visual impacts on the residents of Tin Ma Court (R01) and the Palace (R02). • **Slight** impacts on the other three VSRs (L03, F07 and T02) who can glimpse the portal site and the ancillary buildings. • The rest of the VSRs who can see the temporary road works for water mains laying works will only experience **insubstantial** visual impacts.				

Hazard to Life

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Construction Impact					
Project Area	Explosives will be used for the tunnel/caverns construction but no overnight storage of explosives will be involved for the Project.	TM-EIAO Annex 4 (Section 2) •	Not applicable	The contractor is required to destroy any unused explosives before nightfall.	No adverse residual impact is expected
Operation Impact					
Project Area	Small amount of diesel oil (1,500L) will be stored inside storage tank within ancillary building	TM-EIAO Annex 4 (Section 2) •	Not applicable	Proper storage of diesel oil	No adverse residual impact is expected