Appendix A
Implementation Schedule

Table 1 Implementation Schedule of Air Quality Mitigation Measures

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines Implementation Status
					D	C	O	
Air Quality – Construction Phase								
3.7.1	2.8	In order to minimize the nuisance to the nearby ASRs, it is important to minimize dust emissions from construction activities. In 1997, the *Air Pollution Control (Construction Dust) Regulation* came into effect to control dust emission from construction works. Appropriate dust control measures should be implemented during construction stage in accordance with the requirements in the *Air Pollution Control (Construction Dust) Regulation*. Dust control techniques should be considered to control dust to a level not exceeding the AQOs as well as the 1-hour TSP guideline level of 500 μg/m³. These measures include, but not limited to, as follows: • Adoption of good site practices; • Avoid practices likely to raise dust level; • Frequent cleaning and damping down of stockpiles and dusty areas of the site; • Covering the exposed areas with tarpaulin; • Reducing drop height during material handling; • Provision of wheel-washing facilities for site vehicles leaving the Site; • Regular plant maintenance to minimize exhaust emission; and • Sweep up dust and debris at the end of each shift.	Working site / during construction	All contractors		✓		HKPSG, APCO, EIA-TM, Air Pollution Control (Construction Dust) Regulation
3.7.3	2.8	Watering of site areas with heavy construction operations, and of paved roads, is recommended to minimize construction dust generation as general good site practice during construction. **Table 3.8** shows the calculated dust removal efficiency at different time intervals between watering. Dust removal efficiency of 84.1% can be achieved by watering at 3 hours intervals and 94.7% can be achieved by watering every hour. **Table 3.8 Dust Removal Efficiency for Different Watering Frequencies** **Time Between Watering (hour) / Dust Removal Efficiency (%)** 6 / 68.2 3 / 84.1 1.5 / 92.1 1 / 94.7	Working site / during construction	All contractors		✓		HKPSG, APCO, EIA-TM, Air Pollution Control (Construction Dust) Regulation

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Air Quality – Construction Phase								
3.7.4	2.8	Based on the above, watering frequencies at Siu Ho Wan and Silver Mine Bay WTWs at areas of heavy construction operations and paved roads are recommended as shown below: • Siu Ho Wan: **3** hours intervals for the heavy construction operation areas and **1.5** hour intervals for the paved roads. • Silver Mine Bay: **3** hours intervals for both the heavy construction operation areas and paved roads.	Working site / during construction	All contractors		✓		HKPSG, APCO, EIA-TM, Air Pollution Control (Construction Dust) Regulation
3.7.5	2.8	The maximum daily traffic flow and hourly traffic flow is estimated to be 60 vehicles per day and 10 vehicles per hour respectively (round-trip included). To adopt a conservative approach, the peak hourly daytime traffic rate of 10 vehicles per hour is applied for the dust control efficiency calculation. Based on these assumptions, a minimum 0.5 liters per m^2 of watering application intensity is required to achieve the target dust removal efficiency. Detail calculation is shown in ***Appendix 3.2***.	Working site / during construction	All contractors		✓		HKPSG, APCO, EIA-TM, Air Pollution Control (Construction Dust) Regulation
3.7.6	2.8	All proposed watering frequencies (as stated in paragraph 3.7.4) and minimum water application intensity of 0.5 liters per m^2 at Siu Ho Wan and Silver Mine Bay WTWs during the construction should be clearly stated in the project tender document.	Working site / during construction	All contractors		✓		HKPSG, APCO, EIA-TM, Air Pollution Control (Construction Dust) Regulation

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Table 2 Implementation Schedule of Noise Mitigation Measures

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
					D	C	O	
Noise – Construction Phase								
4.6.1	3.7	Air-borne Construction Noise Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during the construction: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction works; • machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, where possible, be orientated to direct noise away from the NSRs; • mobile plant should be sited as far away from NSRs as possible; and • material stockpiles and other structures should be effectively utilized, where practicable, to screen noise from on-site construction activities.	Working site / during construction	All contractors		✓		NCO, CW-TM, GW-TM, TM-EIA
4.6.3	3.7	Level 1 - Adoption of Quiet PME The Contractor should be requested, as far as possible, to use quiet PME which actual SWL is less than the value specified in the CW-TM. This is one of the most effective measures and is increasingly practicable because of the availability of quiet equipment. Sound power level (SWLs) for specific silenced PME taken from a British Standard, namely *Noise and Vibration Control on Construction and Open Sites, BS 5228: Part 1: 1997*, were used in the assessment and are given in Table 4.10.						
		Level 2 – Use of Temporary Noise Barrier						
4.6.5	3.7	If the construction noise after implementing Level 1 mitigation measures is still insufficient, it is proposed to enhance the noise mitigation by provision of movable noise barrier.	Working site / during construction	All contractors		✓		NCO, CW-TM, GW-TM, TM-EIA
4.6.7	3.7	These noise barriers should be free of gaps and made of materials having a surface mass density of at least 15 kg/m^2. To improve the effectiveness of noise reduction, absorptive lining can be adhered on the inner surface of the barrier. The barrier can be in the form of vertical or bend top barrier with an effective height of 3m or above. Its length should be long enough to cover the length of the PME being protected. It is better to extend both ends of the barrier to exceed the size of the PME by a distance equal to the separation between the barrier and the PME.						

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
					D	C	O	
Noise – Construction Phase								
		Level 2 – Use of Temporary Noise Barrier	Working site / during construction	All contractors		✓		NCO, CW-TM, GW-TM, TM-EIA
4.6.8	3.7	Movable noise barrier is proposed to be erected at the site facing towards the Lai Chi Yuen Tsuen during the construction of vertical shaft or chamber at the Silver Mine Bay Portal.						
4.6.10	3.8	Ground-borne Construction Noise The ground-borne assessment has shown that there are exceedance of evening-time and night-time criteria at Lai Chi Yuen Tsuen (GNSR1) during the period between 1900 and 0700 of the following day, and exceedance of night-time criteria at Lung Mei Tsuen (GNSR4) during the period between 2300 and 0700 of the followed day. As an effective mitigation measures, it is proposed to restrict the tunnel boring works during 1900 to 2300 for the tunnel section with any NSRs within 35m (slant distance) from the tunnel and during 2300 to 0700 of the following day for the tunnel section with any NSRs within 195m (slant distance) from the tunnel. After reviewing the vertical profile of the tunnel near the Lai Chi Yuen Tsuen (38mPD) and the Lung Mei Tsuen (32mPD), the 35m and 195m slant distance at Lai Chi Yuen Tsuen are equivalent to 20m and 193m horizontal distance from the tunnel alignment and the 195m slant distance at Lung Mei Tsuen is equivalent to 190m horizontal distance from the tunnel alignment. The recommended tunnel sections for prohibition of evening-time and night-time boring work near Lai Chi Yuen Tsuen are shown in **Figure 3.1a** (EM&A manual) for reference. The recommended tunnel section for prohibition of night-time boring work near Lung Mei Tsuen is shown in **Figure 3.1b (**EM&A manual**)**.						
4.6.11	3.8	Furthermore, it is recommended that on-site verification and monitoring of the actual ground-borne noise levels should be carried out to ensure the compliance with the relevant criteria.						

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Table 3 Implementation Schedule of Water Quality Mitigation Measures

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
					D	C	O	
Water Quality – Construction Phase								
5.7.1	4.7 & 4.8	Construction site runoff For construction activities which must be carried out near natural streams, preventative mitigation measures during the construction stage should be followed by the contractor. These are, but not limited to, as follows: • The proposed works site inside or in the proximity of natural streams should be temporarily isolated, by placement of sandbags or silt curtains and properly supported by props, to prevent adverse impacts on the stream water qualities; • The natural bottom and existing flow in the stream should be preserved to avoid disturbance to the stream habitats; • No direct or indirect discharge into the natural stream should be allowed from any construction activities; • Stockpiling of construction material, if any, should be properly covered and located away from any natural streams; • Monitor rain forecast closely and cover any exposed spoils when rainstorms are expected. Debris should be properly disposed of before rainstorms to avoid any being inadvertently washed into the stream; and • Removal of existing vegetation alongside the stream should be avoided. When disturbance to vegetation is unavoidable, all disturbed areas should be hydroseeded or planted with suitable vegetation to blend in with the natural environmental upon completion of construction works.	Working site / during construction	All contractors		✓		WPCO, EIAO-TM, ProPECC PN 1/94
5.7.2	4.7 & 4.8	The contractor should follow good site practices and be responsible for the design, construction, operation, and maintenance of all mitigation measures as specified in *ProPECC PN No. 1/94* on construction site drainage throughout the construction period. These practices include, but not limited to: • Temporary ditches should be provided to facilitate run-off discharge into appropriate watercourses via a silt retention pond. • All drainage facilities and erosion and sediment control structures should be inspected monthly and maintained to ensure proper and efficient operation at all times. • For excavation of soil that cannot be avoided during the wet season, exposed surface or open stockpiles should be covered with tarpaulin or other means. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC PN No. 1/94. • Exposed soil areas should be minimized to reduce potential for increase siltation and contamination of run-off.						

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
					D	C	O	
Water Quality – Construction Phase								
5.7.2	4.7 & 4.8	• Earthwork final surfaces should be well compacted and subsequent permanent work (turf establishment) should be performed immediately. • The contractor should contain within the site all surface run-off generated from the construction works, concreting works, dust control and vehicle washing, etc. • The contractor should arrange for other measures, such as provision of sand bags or temporary diversion systems, to prevent washing away of soil, silt or debris into any nearby natural streams. Any run-off should be diverted into appropriate sediment traps before discharging to the nearby drainage system. The discharge water quality should comply with the Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters under the WPCO. • The contractor shall apply discharge licence from EPD for discharging effluent from the construction site before the commencement of construction work. • The contractor should observe and comply with the Water Pollution Control Ordinance (WPCO) and its subsidiary regulations by implementing environmental protection measures (such as the use of silt traps) and preventing any point or non-point source of pollution. <u>Runoff from Tunnel Boring Process</u>	Working site / during construction	All contractors		✓		WPCO, EIAO-TM, ProPECC PN 1/94
5.7.3	4.7 & 4.8	The boring tunnel operation has been designed to minimize impacts on water quality. Recycled water will be used at the cutter face for cooling purposes. Silty water pumped out from the tunnel will be collected and discharged to a sedimentation tank or silt removal facilities to remove silt particles from runoff. The temporary works area at Siu Ho Wan is considered to be adequate for the contractor to set up the on-site desilting facilities. The contractor should make reference to ProPECC PN 1/94 – *Construction Site Drainage*, and be responsible for the design, construction, operation and maintenance of the sedimentation tank or silt removal facilities during the TBM operation.						
5.7.4	4.7 & 4.8	Before commencement of the TBM operation, the contractor should submit the Drainage Management Plan with detail design of the sedimentation tank or silt removal facilities, silt removal effectiveness, emergency action plan, mitigation measures, operation regime and maintenance frequency (as part of the method statement) to the Engineer for approval. The proposed silt removal mitigation measures should be certified by the Environmental Team (ET) Leader and verified by the Independent Environmental Checker (IEC) to ensure the provided silt removal facilities are capable to handle and treat the silty water generated to meet the WPCO/TM requirements before water discharge. The report should be submitted to EPD for approval before the commencement of work.						

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
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Water Quality – Construction Phase								
5.7.5	4.7 & 4.8	The desilting removal efficiency depends on, but not limit to, influent water quality, specific package design, type of coagulant use, discharge water quality requirement, operation method and maintenance frequency etc. To ensure the performance of the desilting facility provided on-site is under control manner, it is recommended that the Contractor should provide the performance of the desilting facility to the Engineer for record on regular basis (at least bi-weekly) during the TBM operation. In order to avoid any malfunctioning of the desilting facility during the TBM operation leading to silty runoff from the construction site, discharge from the desilting facility should be stopped at once until the desilting facility was rectified. The details of the emergency plan arrangement shall be included in the Drainage Management Plan. By incorporating the recommended mitigation measures, water quality impact is expected to be insignificant.	Working site / during construction	All contractors		✓		WPCO, EIAO-TM, ProPECC PN 1/94
		<u>General Construction Activities</u>	Working site / during construction	All contractors				
5.7.6	4.7 & 4.8	Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering adjacent watercourse. Stockpiles of construction materials should be kept covered when not being used.						
5.7.7	4.7 & 4.8	Oils and fuels should only be stored/handled in designated areas with pollution prevention facilities. Oil interceptors need to be regularly inspected and cleaned to avoid wash-out of oil during storm conditions.				✓		WDO, WPCO, EIAO-TM, ProPECC PN 1/94
5.7.8	4.7 & 4.8	The contractor should provide a safe storage area for chemicals on site. The contractor is required to register as a chemical waster producer if chemical wastes would be produced from the construction activities.						
5.7.9	4.7 & 4.8	All fuel tanks should be provided with locks and be sited on sealed areas within bunds of capacity equal to 110% of the storage capacity of the largest tank.	Working site / during construction	All contractors		✓		WPCO, EIAO-TM, ProPECC PN 1/94
5.7.10	4.7 & 4.8	Good housekeeping practices and staff training are required to minimize careless spillage and keep the work space in tidy and clean conditions at all times. Accidental spillage of chemicals in the works area would directly affect the aquatic environment. It is recommended that the contractor should develop management procedures for chemical and implement an emergency plan to deal with chemical spillage in case of an accident.						
5.7. 11	4.7 & 4.8	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The chemical waste should be transported to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility at Tsing Yi. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes details the requirements to deal with chemical wastes.						

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Water Quality – Construction Phase								
5.7.12	4.7 & 4.8	<u>On-Site Sewage Effluents</u> To prevent sewage effluents affecting water courses, the following mitigation measures should be provided by the contractor • Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site to handle sewage from the workforce; • The toilet facilities should be more than 30 m from any watercourse; • Temporary storage tank should be provided to collect wastewater from kitchens or canteen, if any; • A licensed waste collector should be employed to clean the chemical toilets on a regular basis and disposed of at government sewage treatment facilities; • Regular environmental audit on the construction site can provide an effective control of any malpractices and can achieve continual improvement of environmental performance on site; and • Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project.	Working site / during construction	All contractors		✓		WPCO, EIAO-TM, ProPECC PN 1/94
5.7.13 5.7.14	4.7 & 4.8 4.7 & 4.8	<u>Sterilization of Water Mains Prior to Commissioning</u> Effluent from the sterilizated water mains should be dechlorinated before discharge to ensure compliance with the discharge requirements stipulated in the TM-DSS. Adequate temporary storage tanks with sufficient capacity should be provided to allow proper treatment of the effluent prior to discharge. The Contractor is required to submit the details of the chlorination and dechlorination treatment facilities, treatment processes, treatment capacity, discharge volume, methodology, chemicals use, implementation programme, sampling location(s), discharge location(s), monitoring frequency and event and action plan to the Engineer and verified with IEC before commencement of sterilization work. This plan should also be submitted to EPD for approval prior to the commencement of work.	Working site / during construction	All contractors		 ✓		WPCO, EIAO-TM, ProPECC PN 1/94

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
5.7.15	4.7 & 4.8	It is recommended that in-situ testing of total residual chlorine should be conducted every 1 hour (not less than) at the discharge point(s) to ensure the chlorine concentration does not exceed the stipulated maximum level (i.e. undetectable level < 0.2 mg/L) when dechlorinated water is being discharged. If the dechlorinated water exceeds the allowed concentration, discharge must be suspended and the water should be circulated to a standby tank for further dechlorination and testing until the water quality comply with the required discharge standard. The sterilization process (i.e. discharge the dechlorinated water) shall be scheduled in dry season as far as practical.	Working site / during construction	All contractors		✓		WPCO, EIAO-TM, ProPECC PN 1/94

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Table 4 Implementation Schedule of Waste Management Measures

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
					D	C	O	
Waste Management – Construction Phase								
6.5.4	5.1	The Waste Management Plan (WMP) shall be developed and implemented according to a best-practice philosophy of waste management. There are various waste management options, which can be categorized in terms of preference from an environmental viewpoint. The options considered to be more preferable have the least impacts and are more sustainable in a long-term context. Hence, the hierarchy is as follows • Avoidance and minimization, i.e. avoiding or not generating waste through changing or improving practices and design; • Reuse materials, thus avoiding disposal (generally with only limited reprocessing); • Recovery and recycling, thus avoiding disposal (although reprocessing may be required); and • Treatment and disposal, according to relevant laws, guidelines and good practice.	Working site / during construction	All contractors		✓		Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, EPD (1992) WBTC and ETWB TCW.
6.5.5	5.1	The Contractor should consult the Waste Disposal Authority (EPD for landfill and CEDD for public filling facilities) on the disposal sites for the wastes, if any.						
6.5.6	5.1	<u>Training</u> To facilitate adoption of the best-practice philosophy, training shall be provided to all personnel working on site. The training shall promote the concept of general site cleanliness and clearly explain the appropriate waste management procedures defined in the WMP.	Working site / during construction	All contractors		✓		
6.5.7	5.1	<u>Records of Waste Arising and Management</u> The WMP should be kept up to date on a monthly basis with records of the actual quantities of wastes generated, recycled and disposed of off-site, as well as fill imported to site. Quantities shall be determined by weighing each load or other methods agreed to by the Engineer's Representative. Waste shall only be disposed of at licensed sites and the WMP should include procedures to ensure that illegal disposal of wastes does not occur. Only waste hauliers authorized to collect the specific category of waste concerned should be employed and a trip ticket system shall be implemented for off-site disposal of C&D and solid waste at public filling facilities and landfills (in accordance with ETWB TCW No. 31/2004 and 19/2005). Appropriate measures should be employed to minimize windblown litter and dust during transportation by either covering trucks or transporting wastes in enclosed containers.	Working site / during construction	All contractors		✓		ETWB TCW No. 31/2004 and 19/2005

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
					D	C	O	
Waste Management – Construction Phase								
6.5.8	5.1	Site Planning The Work site shall be arranged and managed to facilitate the proper management of wastes and materials. The WMP shall include plans indicating specific areas designated the storage of particular types of waste, reusable and recyclable materials as well as areas and management proposals for any stockpiling areas. Waste storage areas should be well maintained and cleaned regularly. Specific provisions for different types of material are outlined below. In general, these areas should be designed to avoid cross contamination of material as well as pollution of the surrounding environment.	Working site / during construction	All contractors		✓		
6.5.9	5.1	Construction and Demolition Waste In order to minimize waste arising and keep environmental impacts within acceptable levels, the mitigation measures are shown as follows: • Careful design, planning and good site management can minimize over ordering and generation of surplus materials such as concrete, mortars and cement grouts; • Concrete, brick or aggregates should be broken up into suitable size for general fill material; • Dry concrete waste should be sorted out from other wastes and recycled at recycling plant to form aggregates for forming sub-base; • The design of formwork should maximize the use of standard wooden panels so that high reuse can be achieved. Good condition timber should be reused several times. Remaining reusable wooden material should be sorted and used at other construction sites by the same contractor or sold to other construction site. Alternatives such as steel formwork or plastic facing should be considered to increase the potential for reuse; • Paper or cardboard, metal, plastic, foam board, etc should be collected and delivered to local recycling factories; and • C&D materials should be segregated on site into different waste and material types. This will increase the feasibility of certain components of the waste stream being recycled by specialized contractors. The Contractor should clearly demonstrate in the WMP how he intends to maximize the reuse of C&D material on-site. Where reuse of materials on site is not feasible, the Contractor should explore opportunities for recycling materials off-site. Inert C&D materials shall be reused on site as much as possible or recycled with the remaining non-inert materials which cannot be reused or recycled being disposed of to landfill.	Working site / during construction	All contractors		✓		WBTC and ETWB TCW

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
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Waste Management – Construction Phase								
6.5.10 & 6.5.11	5.1	Chemical Waste For those processes which generate chemical waste, it may be possible to find alternatives which generate reduced quantities or even no chemical waste, or less dangerous types of chemical waste. Moreover, the Contractor should register with EPD as a Chemical Waste Producer.	Working site / during construction	All contractors		✓		WBTC and ETWB TCW
6.5.11	5.1	Chemical waste that is produced should be handled in accordance with the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes* as follows: • Containers used for the storage of chemical waste should: - Be suitable for the substance they are holding, resistant to corrosion, maintained in good condition, and securely closed; - Have a capacity of less than 450 litres unless the specifications have been approved by the EPD; and; - Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulation • The storage area for chemical waste should: - Be clearly labelled and used solely for the storage of chemical waste; - Be enclosed on at least 3 sides; - Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; - Have adequate ventilation; - Be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste if necessary); and - Be arranged so that incompatible materials are adequately separated. • Disposal of chemical waste should: - Be via a licensed waste collector; and - Be a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility which also offers a chemical waste collection service and can supply the necessary storage containers; or - Be to a re-user of the waste, under approval from the EPD.						

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					D	C	O	
Waste Management – Construction Phase								
		General Refuse						
6.5.12	5.1	General refuse should be stored in enclosed bins or compaction units separate from chemical wastes. A reputable waste collector should be employed by the contractor to remove general refuse from the site, on a daily or every second day basis to minimize odour, pest and litter impacts. The burning of refuse on construction sites is prohibited by law.	Working site / during construction	All contractors		✓		WBTC and ETWB TCW
6.5.13	5.1	General refuse is generated largely by food service activities on site, so reusable rather than disposable dishware should be used if feasible. Aluminum cans are often recovered from the waste stream by individual collectors if they are segregated or easily accessible, so separate, labelled bins for their deposit should be provided if feasible.						
6.5.14	5.1	Office waste can be reduced through recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered if one is available						

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Table 5 Implementation Schedule of Ecological Impact Measures

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
					D	C	O	
Ecological Impact – Construction Phase								
7.8.2		The proposed water transfer tunnel would be constructed by TBM method and the two portals are located outside the Country Parks, therefore has completely avoided impacts on recognised sites of conservation importance.	Working site / during construction	All contractors	✓			Forests and Countryside Ordinance (Cap. 96) and its subsidiary legislation, the Forestry Regulations; Town Planning Ordinance (Cap. 131); Wild Animals Protection Ordinance (Cap. 170); Country Parks Ordinance (Cap. 208) and its subsidiary legislation; and Environmental Impact Assessment Ordinance ("the EIAO", Cap. 499) and the associated TM (TM-EIAO).
7.8.3		Selection of the alternative alignment and location of tunnel shaft at Siu Ho Wan has avoided loss of plantation and associated trees by relocating the shaft to a concrete engineering slope.	Working site / during construction	All contractors	✓			
7.8.4		Selection of proposed alignment and location of tunnel shaft at Silver Mine Bay has minimized loss of woodland. The original proposed tunnel portal at Silver Mine Bay and a 160m long aboveground section of water transfer pipes would encroach the young woodland habitat, while the selected tunnel shaft will be located on the fringe of the young woodland habitat and the underground section of the water transfer pipes will completely avoid the encroachment of young woodland habitat (**Figure 7.4**). In addition, loss of trees will be made up with compensatory planting, and all disturbed areas will be reinstated with planting as appropriate.	Working site / during construction and operation	All contractors	✓	✓	✓	
7.8.5		Good site practice should be implemented during the construction phase in order to avoid encroachment onto the nearby natural habitats and minimize potential disturbance to wildlife and surrounding environment. These measures include: • Construction activities should be restricted to the works area that should be clearly demarcated; • Surface run-off generated from construction sties should be passed through adequately designed silt removal facilities such as sand traps, silt traps and sediment basins. The Contractor should provide details of the mitigation measures to be implemented during the construction stage as part of their working method statement to the Engineer for approval. This should be reviewed by the Environmental Team Leader and implemented before commencement of work; • Open stockpiles susceptible to erosion should be covered with tarpaulin or similar fabric and provided with containment such as bunds, sand bag barriers or equivalent measures, especially during wet season or when heavy rainstorm is predicted; • Adequate temporary drainage management system should be implemented in order to prevent contaminated silty runoff entering the nearby water bodies; • Construction effluent, site run-off and sewage should be properly collected, treated and disposed; and • Supervisory staff of the contract should be stationed on site to closely	Working site / during construction	All contractors	✓	✓		

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		supervise and monitor the construction works. All workers should be regularly briefed to avoid disturbing the flora and fauna near the works area.						
Ecological Impact – Operational Phase								
7.8.6		Due to minor ecological impact of the project, no mitigation is required. All areas disturbed during the works will be reinstated with planting as appropriate, and compensatory planting will be provided for the loss of trees (as Chapter 8).	-	-				
7.9		Ecological Monitoring and Audits						
7.9.1		Given the limited sizes of the works areas, the ecological value of the habitats affected by the works areas, and the low disturbing construction method used for the tunnel construction, no specific ecological monitoring programme is needed. The compensatory planting should be maintained and monitored under the landscape contract to ensure the survival and successfulness of the mitigation measures.	Working site / during construction	All contractors	✓	✓		

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Table 6 Implementation Schedule of Landscape and Visual Impact

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
					D	C	O	
Table 12.1	MC 1	Site offices and construction yards: • Site offices shall have olive green roof and façade coating or colour matches with existing environment; and • Site offices and the construction yard shall be decommissioned after construction.	All site offices	Contractor		✓		EIAO Guidance Note No. 8/2002
Table 12.1	MC 2	Height of site offices: • The height of site offices, including the rooftop shall not exceed 10m; and • Building services equipment such as antennas may exceed 10m and should be coated in black.	All site offices	Contractor		✓		EIAO Guidance Note No. 8/2002
Table 12.1	MC 3	Hoarding shall have olive green coating or colour matches with existing environment	All site offices and construction yards	Contractor		✓		EIAO Guidance Note No. 8/2002
Table 12.1	MC 4	Construction plant and building material: • Shall be orderly and carefully stored in order to appear neat and avoid visibility from outside where practical; • Excess materials shall be removed from site as soon as practical; and • All construction plants shall be removed from site upon completion of construction works.	All construction yards	Contractor		✓		EIAO Guidance Note No. 8/2002
Table 12.1	MC 5	Construction light: • To be oriented away from the viewing location of VSRs; and • All lighting facing sensitive receiver shall have frosted diffusers and reflective covers.	All construction lights	Contractor		✓		EIAO Guidance Note No. 8/2002
Table 12.1	MC 6	Vegetation: No plant or building materials shall be stored under the dripline of retained trees and no vehicle movement or other construction activities like washing, concrete mixing etc shall be carried out under the dripline of trees.	All construction yards	Contractor		✓		LAO Practice Note No. 8/2002 EIAO Guidance Note No. 8/2002
Table 12.1	MC 7	Construction effluent, site runoff and sewage should be properly collected and/or treated	All construction yards	Contractor		✓		EIAO Guidance Note No. 8/2002
Table 12.1	MT 1	Compensation for losses: In case of tree felling, the tree compensation to tree loss ratio shall be at least 1:1 in term of quantity.	Within Siu Ho Wan and Silvermine Bay WTWs	Contractor		✓	✓	LAO Practice Note No. 8/2002 EIAO Guidance Note No. 8/2002

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
					D	C	O	
Table 12.1	MT 2	Where practical, trees that require removal shall be transplanted on Site.	General	Contractor		✓	✓	LAO Practice Note No. 8/2002 EIAO Guidance Note No. 8/2002
Table 12.1	MT 3	Amenity planting: • Planting works shall be carried out under the supervision of a specialist landscape sub-contractor; and • New trees, shrubs mix and groundcover shall be carefully selected and designed to homogenize with the environment.	As shown on mitigation measure plan	Contractor		✓	✓	LAO Practice Note No. 8/2002 EIAO Guidance Note No. 8/2002
Table 12.1	MT 4	Preservation: • No tree shall be transplanted or felled without prior approval by relevant Government departments; • All trees that are marked for retention shall be fenced off with a 1.2m high fence around the dripline of trees or larger area as far as feasible; • Transplant preparation works shall be carried as soon as possible after commencement of construction. Over-pruning such as hard pruning of tree crown, pollarding or topping shall be avoided. Rootball and crown pruning shall be carried out over at least 3 months; and • Existing shrub and ground cover planting areas that will not be removed will be maintained in good condition and enhanced where practical.	General	Contractor		✓	✓	LAO Practice Note No. 8/2002 EIAO Guidance Note No. 8/2002
Table 12.1	ME 1	Screening: • Tunnel Portal, Tunnel Shaft and the access road shall be screened by tree and shrub planting; and • Retaining wall and retaining structure under the access road shall be covered with climber plants.	Tunnel portal and tunnel shaft	Contractor		✓	✓	EIAO Guidance Note No. 8/2002
Table 12.1	ME 2	Tunnel Portal shall be surfaced with stone of volcanic origin with a colour and texture similar to that of rock in the surrounding landscape;	Tunnel portal	Contractor		✓	✓	EIAO Guidance Note No. 8/2002
Table 12.1	ME 3	Above-ground covers of tunnel shaft shall have an olive green coating;	Tunnel shaft	Contractor		✓	✓	EIAO Guidance Note No. 8/2002
Table 12.1	ME 4	Architectural design and colour scheme of infrastructures will be compatible with the nearby environment.	Tunnel portal and tunnel shaft	Contractor		✓	✓	EIAO Guidance Note No. 8/2002

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Table 7 Implementation Schedule of Hazard to Life Measures

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
					D	C	O	
Hazard to Life – Construction Phase								
9.10.2	Sec7.3 Table 7.1	For those mitigation measures which represent good practice for the construction work of the Project, it is usually sufficient to justify the measure without the need for further cost based justification. The recommended mitigation measures to avoid occurrence of deviations as good practice and management for the Project to avoid occurrence of deviations for the proposed construction work are shown in **Table 7.1**.	Working site / during construction	All contractors		✓		EIAO
Table 9.11	Sec7.3 Table 7.1	**Monitoring and Inspection** • Monitor the excavation activity to avoid excavation to the wrong depth (too much excavation) • Conduct monitoring to ensure the stability of building during construction phase • Inspect and supervise to ensure proper operation of equipment	Working site / during construction	All contractors		✓		EIAO
Table 9.11	Sec7.3 Table 7.1	**Construction Management** *Waste Management* • Ensure good C&D waste management • Provide on-site sorting of debris to avoid excessive debris accumulation • Provide temporary storage for debris at appropriate locations • Ensure flammable waste is stored at appropriate/designated locations	Working site / during construction	All contractors		✓		EIAO
Table 9.11	Sec7.3 Table 7.1	*Traffic Management* • Maintain access roads as a freeway • Provide sufficient maintenance of the vehicle/generator/equipment • Set a speed limit for site vehicles • Propose a designated route for site vehicles, avoid site vehicles using the route of the Chlorine Delivery Truck • Provide adequate fire fighting equipment at the storage area • Provide clear road signs for site vehicles • Install hump on the access roads to reduce the speed of site vehicles where appropriate • Provide crash barrier to protect the Chlorine Building and the Chemical Storage Building where appropriate • No parking on access road, or proper parking area designated for dump trucks	Working site / during construction	All contractors		✓		EIAO
Table 9.11	Sec7.3 Table 7.1	*Management for the Chlorine Delivery* • Propose a communication system between operator of the WTWs and the Contractor on the date of chlorine delivery to the WTW • Reinstate of the access road before the Chorine delivery • Suspension of the work during Chlorine delivery	Working site / during construction	WSD/All contractors		✓		EIAO

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
					D	C	O	
Hazard to Life – Construction Phase								
Table 9.11	Sec7.3 Table 7.1	*Construction Activity/personnel Management* **Personnel** Provide clear indication of rooms accommodating Chlorine-related facilities and their hazards **Activity** • Prepare a safety plan to avoid any electricity supply facilities located inside/adjacent to the Chlorine Building • Large equipment/plant movement should be controlled by "Permit-to-move" system • Contractor provides WSD a list indicating the number and type of equipment/plant to be mobilized, equipment/plant movement route and mobilization methodology. • A risk assessment is conducted by Safety Officer (Contractor) • No equipment/plant movement should be allowed before approval from WSD/Safety Officer is obtained • The "Permit" shall restrict the time period that equipment/plant can be mobilized • Supervision of permitted work by Safety Representatives from Contractor • Follow "Permit-to-work" System for extended chlorine pipework connection • No connection work can commence before approval from WSD is obtained • Supervision of permitted works by the Contractor's Safety Representative • No blasting operation on site is allowed • Define restricted zone for the equipment (i.e. keep the equipment from the Chlorine Building at a safe distance). The extent of the restricted zone would be determined by the size of the equipment • Limit the reach of the tower crane used • Ensure all construction equipment is placed at a safe distance from Chlorine Building • Provide indication/sign for chlorine pipework • No welding work is allowed before approval from WSD is obtained	Working site / during construction	WSD/All contractors/Safety Officer		✓		EIAO
Table 9.11	Sec7.3 Table 7.1	*Communication* The construction site officer should establish a communication channel with the WTW operation personnel during the construction stage. In case of any hazardous incidents in the treatment works, operation personnel of WTW should advise the site officer to evacuate the construction workers.	Working site / during construction	WSD/All contractors/Safety Officer		✓		EIAO

EIA Ref.	EM&A Ref.	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stage**			Relevant Legislation and Guidelines
					D	C	O	
Hazard to Life – Construction Phase								
		Investigation • Investigate the utilities underground before conducting any excavation work • Locate chlorine pipeworks before execute excavation						
Table 9.11	Sec7.3 Table 7.1	*Training* • Provide adequate training to equipment operator; implement a license system that only competent persons could operate the equipment • Provide adequate training to construction workers working inside the WTW. • Provide adequate training to construction workers on the nature and hazards of chlorine, safety precautions, and emergency measures for leakage of chlorine from drums, piping or installations e.g. use of toxic refuge.	Working site / during construction	WSD/All contractors/Safety Officer		✓		EIAO
9.10.3	Sec7.3	To avoid and/or minimize chlorine risks during construction of the Project, risk mitigation measures are proposed in **Table 7.2**. All these practicable mitigation measures will involve relatively low costs, thus, they will be adopted to reduce chlorine risks during construction of the Project.	Working site / during construction	All contractors		✓		EIAO
Table 9.12	Sec7.3 Table 7.2	*Mitigation Measures* 1. Fully reinstated the road surface of the chlorine deliveries route and use of construction vehicle/plant suspended prior to the chlorine delivery 2. Locate the construction site office at or near property boundary away from the chlorine store as far as possible 3. Provide audible chlorine release alarm 4. Interconnect tunnel ventilation system with WTW chlorine alarm system such that the tunnel ventilation system will be turned off in the event of a chlorine release, and provide respiratory safety equipment for the workers inside the tunnel 5. Maintain the number of workers on site to the minimum 6. Impose speed limit for chlorine delivery trucks inside the water treatment works 7. Stop construction work and require construction workers to move off-site or stay indoors during chlorine delivery 8. Provide toxic refuge and safety training for the construction workers 9. Erect solid fence wall between the works area and the WTWs 10. Reduce the Chlorine drum stock during period of construction without keeping unnecessary Chlorine on site 11. Establish defined communication channels between the contractor's site officer and the WTWs operation personnel.	Working site / during construction	All contractors		✓		EIAO

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