Key Assessment Assumptions and Limitation of Assessment Methodologies

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<tr><td colspan="5">Air Quality Impact</td></tr>
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<tr><td>The air quality impact assessment for the Project follows Annex 4 and Annex 12 of the TM-EIAO. Dust emission will be the major air quality impact. Quantitative assessment was carried out by applying FDM model.</td><td>Construction dust assessment for short-term impact (i.e. 1-hour and 24-hour average) were undertaken by a 2-Tier approach. Tier 1 screening assessment is a theoretical worst case scenario evaluation to identify hot spot areas of construction air quality impact. The identified hot spot areas were further assessed by a more focused Tier 2 assessment to predict the realistic worst case impact by assuming 30% active construction area. Long-term impact (i.e. annual average) were assessed with realistic assumptions of the 6% active construction area for all work sites. Subject to the construction work at night-time and during weekend or holiday, construction working period of 24 days a month and 8 hours a day was assumed.

The prediction of dust emissions is based on the typical values and emission factors obtained from United States Environmental Protection Agency (USEPA) Compilation of Air Pollution Emission Factors, AP-42, 5th Edition.

<table><tr><td>Heavy construction activities including land clearance, site formation, ground excavation, construction of associated facilities etc.</td><td>E = 2.69 Mg/hectare/month of activities</td></tr></table></td><td>The construction programme is indicative and subject to contractors' actual operation. A conservative approach was adopted in the model run. The actual situation may be better than that of the model prediction.</td><td>3.4.4.3(iv)</td><td>-</td></tr>
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	Wind erosion: E = 0.85 Mg/hectare/year Watering once per hour on exposed worksites is proposed to achieve dust removal efficiency of 92.1% with an assumed application intensity of 1.6 L/m2, in accordance with the "Control of Open Fugitive Dust Sources" (USEPA AP-42) as given in Appendix 3-2.			
Operational Phase				-
The air quality impact assessment for the Project follows Annex 4 and Annex 12 of the TM-EIAO. Ambient Air Quality was determinate.	Ambient air quality level was based on annual average of Year 2007 to 2011.	A reducing trend of air pollutant concentration was observed. The adopted ambient air quality level may overestimate the future baseline conditions.	3.4.4.3(ii)	-
Operational Phase (Vehicular Emission)				
The air quality impact assessment for the Project follows Annex 4 and Annex 12 of the TM-EIAO. Vehicular emission impact was due to moving vehicles for Eastern and Western Connection Roads and idling vehicles from LMC BCP.	Vehicular emission factor was based on modeling results of EMFAC. The cumulative air quality impact due to vehicular emission was predicted by Caline4 model.	Worst case traffic impact assessment conditions were adopted in the model. Thus, the assessment may overestimate the vehicular emission impact.	3.4.4.3(v)	-
Operational Phase (Odour Impact)				
The air quality impact assessment for the Project follows Annex 4 and Annex 12 of the TM-EIAO. Cumulative odour impact from the proposed STW was assessed.	Odour emission from Binhe WWTP was based on the measurement results for similar process at Shatin STW.	-	3.4.4.3(v)	-
	Odour emission from Shenzhen River was based on on-site measurement.	Odour removal efficiency for bio-remediation in Shenzhen River is based on AVS removal, which is an odour emission	3.4.4.3(v)	-

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		indicator. Relationship between AVS and Redox potential to odour emission were adopted from previous studies. The actual relationship and odour removal will be further justified in the EM&A programme.		
	Odour removal from on-site STW was 95% for full enclosure according to the proposed mitigation measure.	-	3.4.4.3(v)	
Noise Impact				
Construction Phase				
The noise impact assessment for the Project follows Annex 5 and Annex 13 of the TM-EIAO. In accordance with the EIAO, the methodology outlined in the TM-GW was used for construction noise assessment.	Sound power level (SWL) of the Powered Mechanical Equipment (PME) was based in Table 3 of TM-GW and QPME system adopted by EPD.	The prediction of construction noise impacts are based on TM-GW. The SWL of PME was based in TM-GW and QPME system. The actual situation may be better than that of the prediction.	3.4.5.2 (i) 3.4.5.2 (v)	-
	It is assumed that all PME items required for a particular construction activity will be located at the notional source position of the work areas. The assessment was based on the cumulative SWL of PME likely to be used in each work areas, taking into account the construction period in the vicinity of the receiver location. To predict the construction noise impacts, PME were divided into groups required for individual construction activity. The objective is to identify the worst case scenario representing those items of PME that will be in use concurrently at any given time. The sound pressure level of individual construction activity was calculated, depending on the number of PME and distance from receivers. The noise levels at NSRs were	In carrying out the assessment, worst case assumptions have been assumed in order to provide conservative noise impact assessments such as locating all the PME at the notional source position.		-

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	then predicted by the sum of SWLs of all concurrent construction activities with their respective distance correction.			
	A positive 3dB(A) facade correction was added to the predicted noise levels in order to account for the facade effect at each NSR.			-
	On-time percentages for PMEs were reasonably assumed by Engineer.			-
	It is advised by the engineer that during advanced works for LMC Loop, there were an additional 20 construction vehicles per hour travelling along LMC Road and Ha Wan Tsuen Road at Year 2016. In addition, it is also advised that during site formation for LMC Loop, there were an additional 60 construction vehicles per hour travelling along Sai Kwo Road, LMC Road and Ha Wan Tsuen Road at Year 2020. 0.8m to 5m high temporary reflective noise barrier will be proposed along section of Ha Wan Tsuen Road and LMC Road to mitigate the construction access road traffic noise.	Construction access road traffic noise levels were predicted based on free flow condition. Traffic congestion and hence reduced traffic speed were not taken into account in the noise model. Quantitative uncertainties in the assessment of impacts should be considered when drawing conclusions from the assessment. In carrying out the assessment, realistic worst case assumptions have been made in order to provide a conservative assessment of noise impacts. For the assessment of road traffic noise impact, peak hourly traffic flows representing the worst case scenario were adopted.		-
Operational Phase (Road Traffic Noise)				
The noise impact assessment for the Project follows Annex 5 and Annex 13 of the TM-EIAO. Traffic noise was predicted using the methodology provided in the UK Department of Transport calculation of Road Traffic Noise	The roads proposed under the Project are scheduled to open in 2027. Therefore, the traffic data for year 2042 was adopted for the assessment. The existing noise screening structures and mitigation measures on LMC Road and Fanling highway were taken into account in	Traffic noise levels were predicted based on free flow condition. Traffic congestion and hence reduced traffic speed were not taken into account in the noise model. Quantitative uncertainties in the assessment of impacts should be considered when drawing conclusions	3.4.5.2 (i) 3.4.5.2(vi)(b)	-

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(CRTN) 1988. The assessment was based on projected peak hour flows for the worst year within 15 years after opening of the road.	the assessment. • Low noise surfacing on the existing Lok Ma Chau Road and Fanling Highway • Existing 0.8m parapet along LMC Road and Fanling Highway Mitigation measures proposed include the followings: • 0.8m, 3m and 5m high reflective noise barriers along LMC Road and Ha Wan Tsuen Road; • 0.8m reflective noise barriers along Eastern Connection Road; and • Provision of central air conditioning for the first layer of noise sensitive receivers facing Road M1.	from the assessment. In carrying out the assessment, realistic worst case assumptions have been made in order to provide a conservative assessment of noise impacts. For the assessment of road traffic noise impact, peak hourly traffic flows from the worst case traffic impact assessment were adopted.		
Operational Phase (Fixed Noise Sources)				
The noise impact assessment for the Project follows Annex 5 and Annex 13 of the TM-EIAO.	Maximum allowable Sound Power levels (SWL) as the compliance criteria for fixed noise sources (i.e. District Cooling System and Sewage Treatment Works) have been determined.	Silencer and enclosure installation may be refined in detailed design.	3.4.5.2 (i) 3.4.5.2(vi)(a)	-
Operational Phase (Helicopter Noise)				
The noise impact assessment for the Project follows Annex 5 and Annex 13 of the TM-EIAO.	The helicopter is located at more than 500m from LMC Loop. There will be no designated approach route and take-off route for the helipad.	-	3.4.5.2 (i) 3.4.5.2(vi)(d)	-
Operational Phase (Railway Noise)				
The noise impact assessment for the Project follows Annex 5 and	NOL will be subject to statutory approval under the EIAO process and will comply	-	3.4.5.2 (i) 3.4.5.2(vi)(c)	-

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Annex 13 of the TM-EIAO.	with TM-EIAO.			
Water Quality Impact / Sewerage and Sewage Treatment Implications				
Assessment of water quality impact in both construction and operational phase refers the methodology in Annex 14 of the TM-EIAO.	The sewerage amount was based on the proposed population and land use and the total sewage flow from the development is 14,689m^3/day. The calculations of no net increase in pollution loading did not consider the TSE reuse which is in a conservative side.	The design capacity of on-site STW is 18,000 m^3/day for safety factors to cater 14,689 m^3/day of daily sewage.	3.4.6, 3.4.7	-
Waste Management Implication				
-	-		3.4.8	
Land Contamination Impact				
The land contamination assessment for the Project follows 1. Annex 19 of the Technical Memorandum on Environmental Impact Assessment Process (TM-EIA), Guidelines for Assessment of Impact On Sites of Cultural Heritage and Other Impacts (Section 3 : Potential Contaminated Land Issues), EPD, 1997; 2. Guidance Manual for Use of Risk-Based Remediation Goals (RBRGs) for Contaminated Land Management, EPD, 2007; 3. Guidance Notes for Contaminated Land Assessment and Remediation, EPD, 2007; 4. Practice Guide for Investigation and Remediation of Contaminated Land, EPD, 2011	-	No environmental site investigation was conducted for Area B due to the private land ownership.	3.4.9.4	CAP for LMC Loop and CAP for Contamination Assessment Area for the Associated Infrastructure outside LMC Loop
	-	-	3.4.9.5	CAR & RAP for LMC Loop

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Hazard to Life				
The impact assessment on hazard to life follows Annex 20 of the TM-EIAO.	-	-	3.4.10.1	-
Impact on Site of cultural Heritage				
Construction Phase (Built Heritage)				
The impact assessment on built heritage follows Annexes 10 and 19 of the TM-EIAO.	-	-	3.4.11.3, 3.4.11.4	Heritage Baseline Desktop Study Report
Construction Phase (Archaeology)				
The impact assessment on archaeology follows Annexes 10 and 19 of the TM-EIAO.	-	-	3.4.11.3, 3.4.11.4	Archaeological Survey Report, Heritage Baseline Desktop Study Report
Operational Phase (Built Heritage)				
The impact assessment on built heritage follows Annexes 10 and 19 of the TM-EIAO.	-	-	3.4.11.3, 3.4.11.4	Heritage Baseline Desktop Study Report
Operational Phase (Archaeology)				
The impact assessment on archaeology follows Annexes 10 and 19 of the TM-EIAO.	-	-	3.4.11.3, 3.4.11.4	Archaeological Survey Report, Heritage Baseline Desktop Study Report
Landscape and Visual Impact				
Operational Phase (Landscape and Visual)				

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The landscape and visual impact assessment follows Annexes 10 and 18 of the TM-EIAO.	In this preliminary stage, based on the project information available at this stage, the future management / maintenance of the proposed new trees will be handed over to the project proposer in accordance to ETWB TCW No. 3/2006, 'Tree Preservation'.	Individual tree impact as a result of the proposed developments is subject to further review at detailed design phase of the project in accordance with ETWB TCW No. 3/2006, 'Tree Preservation'.	3.4.12.4	-
	The selected ten vantage points looking from key VSRs at the east, south and west directions to the LMC Loop and associated infrastructure and utilities works outside the Loop for the demonstration of change of visual amenity as a result of the proposed developments.		3.4.12.9	-
Ecological Impact				
The ecological impact assessment follows Annexes 8 and 16 of the TM-EIAO.	Assumptions made in the assessment are based on latest RODP, footprints and preliminary design scheme.	Assessment of ecological baseline is based on habitat, flora and fauna surveys and literature review. Surveys were taken of representative locations and transect routes in and near the vicinity of the study area. Baseline descriptions are therefore unlikely to be entirely comprehensive, though they are considered sufficiently representative to allow subsequent assessments to be made.	3.4.13	-
Fisheries Impact				
The fisheries impact assessment follows Annexes 9 and 17 of the TM-EIAO.	Assumptions made in the assessment are based on latest RODP, footprints and preliminary design scheme.	Assessment of fisheries baseline is based on field surveys and literature review. Assessment as to whether fish ponds are active, inactive or abandoned are sometimes difficult, and differences between ponds managed at low intensity and those inactive may not be apparent.	3.4.14	-

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Landfill Gas Hazard				
Construction & Operational Phase	-	-	3.4.15	-
The landfill gas hazard assessment follows Annexes 7 and 19 of the TM-EIAO and the Landfill Gas Hazard Assessment Guidance Note (1997) (EPD/TR8/97)	-	-	3.4.15	-
Food Safety				
Estimation of contaminant in fish is based on the transportation pathway of contaminants from soil to fish (and to human ultimately)	Assumptions made in the assessment are: - Emission of contaminants from soil occurs mainly excavation works, such as de-contamination of soil in land contaminated areas and excavation for creation of Ecological Area - Concentration of contaminants in soil is assumed to be the maximum concentration in the respective borehole. - Active working area percentage is assumed to be 6% which is provided by the Engineer - Area of concerned fish ponds is assumed to be active and inactive fish ponds - 100% of the concentrations of contaminants in soil are carried to the fish pond - Pond fish production in the ponds under concerned in this study is assumed to be the product in the territory in (1975 kg/ha/yr) based on AFCD annual report	- Concentration of contaminants in soil conservative as the maximum value is adopted - The 6% of active working area percentage is the annual-average value. During a specific period, this percentage may vary - It is conservatively assuming 100% ingestion of contaminated fugitive dust by pond fish - Pond fish production from the ponds in this study is assumed to be a product of Hong Kong territory. The actual product from ponds may vary	3.2.2 (vi)	-