

Appendix 15.1 Key Assessment Assumptions, Limitations of Assessment Methodologies and Related Prior Agreements

Assessment Methodologies	Key Assessment Assumptions	Limitations of Assessment Methodologies / Assumptions	Prior Agreements with EPD		Proposed Alternative Assessment Tools / Assumptions (if applicable)
			EIA Study Brief Clause Reference	Relevant Documentation	
Air Quality Impact					
<p><u>Construction Phase</u> The air quality impact assessment for the Project follows Annex 4 and Annex 12 of the Technical Memorandum on Environmental Impact Assessment (TM-EIAO) and EIA Study Brief No. ESB-321/2019.</p> <p>The key air quality concern during the construction phase would be the dust emissions. Quantitative assessment was conducted for prediction of the construction dust impacts.</p> <p>AERMOD model was applied to simulate the emissions from the Project, industrial emissions and emissions associated with the vehicles at the existing bus termini, heavy goods vehicle and coach parking sites.</p> <p>Emission rates of vehicles from open roads were estimated using the modeling results of EMFAC-HK v4.3. Air quality impacts from open roads were predicted by CALINE4 model.</p>	<p><u>Emissions from Project Construction</u> Phasing of the Project construction is assumed. Construction in the proposed expansion site is assumed to be carried out prior to the demolition / construction in the existing Tai Po Sewage Treatment Works (TPSTW). Under the focused assessment, 50% active works area was assumed for the expansion site and the development area in existing TPSTW. Since the site is flat, extensive site formation works is not expected. The assumption of 50% active works area has been reviewed to be conservative. Construction working period of 7 days per weeks and 10 operation hours per day was assumed.</p> <p>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 (USEPA AP-42).</p> <p>Watering once per hour on exposed worksites is proposed and assumed in the focused assessment.</p> <p><u>Industrial Emissions</u> The parameters and emission data of industrial sites in the vicinity are extracted from the Specified Process (SP) Licenses. For the non-SP plants, emission rates were estimated with reference to the SP operations. The Combined Heat and Power (CHP) chimney within existing TPSTW was also included in the assessment based on the actual design information.</p> <p><u>Vehicular Emissions</u> The assessment for vehicle emissions from open roads was conducted by applying the vehicle emission factors of the first construction year (i.e. 2025) and the traffic forecast for the last construction year (i.e. 2036). This combination represents the worst-case scenario of vehicular emissions. The emissions associated with the vehicles at the existing bus termini, heavy goods vehicle and coach parking sites were calculated and included in the assessment according to the start emission and running exhaust emission factors predicted by EMFAC-HK model, cold idling emission factors from <i>Calculation of Start Emissions in Air Quality Impact Assessment</i> published by EPD, warm idling emission factors from <i>Road Tunnels: Vehicle Emissions and Air Demand for Ventilation</i> published by World Road Association.</p> <p><u>Background Concentrations</u> Background concentrations adopted were based on the model results of PATH v2.1 for year 2025.</p>	<p>The construction programme is indicative and subject to contractors' actual operation.</p> <p>The air emission inventory was derived based on best available information and may be deviated from actual situations.</p> <p>Conservative assessment assumptions were adopted whenever possible to address the uncertainty.</p>	Section 5(ii) of Appendix B	Prior agreement on specific modeling details was sought through email correspondences with EPD and submission of Working Paper on Odour Impact Assessment and draft Air Quality Impact Assessment to EPD prior to formal submission of the EIA Report.	N/A
<p><u>Operational Phase</u> The air quality impact assessment for the Project follows Annex 4 and Annex 12 of the TM-EIAO and EIA Study Brief No. ESB-321/2019.</p> <p>Odour emissions from treatment processes and flue gas emissions from burning of biogases would be the key concerns. The modelling tools presented above for construction phase were also applied for the operational phase assessment.</p>	<p><u>Emissions from Project Operation</u> Measured odour emission rates in TPSTW were compared with the emission rates measured in other major Sewage Treatment Works (STWs) in Hong Kong. The highest measured emission rates for similar facilities among all STWs including the existing TPSTW were adopted for worst-case assessment. The parameters and flue gas emission rates of the CHP were based on preliminary engineering design of this Project.</p> <p><u>Concurrent Emissions and Background Concentrations</u> Concurrent odour emission from the adjacent Organic Waste Pre-treatment Centre (OWPC) was included based on available design information. The assumptions for other concurrent gaseous emissions are similar to those for the construction phase assessment as presented above except for the vehicular emissions where the worst-case emission factors and traffic forecast of 2051 were adopted. Due to the long-term goals and strategies to further enhance the regional air quality, using the 2025 background data from PATH v2.1 would be a conservative assumption.</p>	<p>The air emission inventory was derived based on best available information and may be deviated from actual situations</p> <p>Conservative assessment assumptions were adopted whenever possible to address the uncertainty.</p>	Section 5(ii) of Appendix B	Same as above	N/A

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Water Quality Impact					
<p>The water quality impact assessment for the Project follows Annexes 6 and 14 of the EIAO-TM as well as the requirements given in EIA Study Brief (No. ESB-321/2019).</p> <p>To assess the potential water quality impacts due to the Project, the sources and natures of water pollution to be generated have been identified and mitigation measures have been proposed to minimize the impacts.</p> <p>Impacts due to treated effluent discharge from the Project under normal operation and Tolo Harbour Effluent Export Scheme (THEES) maintenance as well as emergency discharge from the Project have been quantified using Delft3D-FLOW model for hydrodynamics simulations and Def3D-WAQ model for water quality simulations.</p> <p>Qualitative assessment was conducted for other operational activities and the land-based construction works.</p>	<p>Effluent loading of the Project and other Sewage Treatment Works (STWs) used in the modelling was based on the measured effluent quality of the existing plant or design discharge standards as well as the design flow capacities of the STWs.</p> <p>The background storm pollution loading to Kai Tak Approach Channel (KTAC) where the Project effluent is discharged under normal operation was based on actual measurements in 2018. Continuous reduction of storm pollution in KTAC is expected due to the on-going drainage and sewerage improvement and rectifications of expedient connections. Using the 2018 storm loading would be conservative.</p> <p>Other background storm pollution loading in Victoria Harbour, Tolo Harbour and Tolo Channel was calculated theoretically. The total pollution load generated in the catchments was conservatively derived from a 10% extrapolation of the projected population for 2041 and by applying the proven per capita load factors derived from past approved studies. It is assumed that 5% of the total pollution load would be lost to the storm system.</p> <p>The models adopted including their setup and parameters were fully calibrated and verified against the field measurements.</p> <p>Coastline configurations were based on available information from existing and planned coastal development projects.</p> <p>Details of the land-based operational Project activities and construction activities were based on preliminary engineering and construction design of the Project.</p>	<p>The pollution loading inventory was derived based on best available information at the time of conducting the modelling work and may be deviated from actual situations</p> <p>Conservative assessment assumptions were adopted whenever possible to address the uncertainty.</p>	<p>Item 1 of "Model details - Calibration & Validation", Items 3 to 5 of "Model details - Simulation" and Items 3 and 6 of "Modeling assessment" of Appendix C-1 (Item 2 of "Model details - Simulation" of Appendix C-1 is not relevant as no marine works are proposed)</p>	<p>Prior agreement on the Water Quality Modelling Plan and modelling details was sought via email correspondences with EPD and submission of Working Paper on Water Quality Impact Assessment and draft Water Quality Impact Assessment to EPD prior to formal submission of the EIA Report.</p>	N/A
Ecological Impact					
<p>The ecological impact assessment for the Project follows Annexes 8 and 16 of the EIAO-TM, and the requirements of the EIA Study Brief (No. ESB-321/2019) and other relevant EIAO Guidance Notes.</p>	<p>The assessment and evaluation of ecological impact was undertaken based on the results of literature review and ecological field survey as well as the preliminary design of the Project. The marine ecological impact assessment was also based on the water quality impact assessment results.</p>	N/A	N/A	N/A	N/A
Fisheries Impact					
<p>The fisheries impact assessment for the Project follows Annexes 9 and 17 of the EIAO-TM as well as the requirements given in EIA Study Brief (No. ESB-321/2019).</p>	<p>The assessment and evaluation of fisheries impact was undertaken based on the results of literature review, the preliminary design of the Project and the water quality impact assessment results.</p>	N/A	N/A	N/A	N/A
Landscape and Visual Impact					
<p>The landscape and visual impact assessment follows Annexes 10 and 18 of the EIAO-TM, the EIAO Guidance Note No. 8/2010 as well as the requirements given in EIA Study Brief (No. ESB-321/2019).</p>	<p>The baseline studies were based on literature review, site visits, Broad Brush Tree Survey (BBTS) and latest information including the relevant Outline Zoning Plans (OZPs), government survey maps and aerial photographs. The BBTS was based on the topographical survey conducted prior to the tree survey, and site visits to accessible areas as well as supplemented by the review of aerial photos and making reference to the Ecological Impact Assessment of the Project.</p>	<p>The baseline studies including the BBTS were limited by inaccessible areas (e.g. private properties). The portion of inaccessible area is</p>	N/A	N/A	N/A

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	Impact assessment was conducted with reference to the preliminary design scheme of the Project. Building heights are assumed to be the maximum permissible height as stipulated in the OZPs.	<p>however small. The uncertainty was addressed by review of aerial photographs.</p> <p>Individual tree impact as a result of the proposed Project is subject to further review at detailed design stage in accordance with Development Bureau Technical Circular (Works) (DEVB TCW) No. 4/2020 – Tree Preservation.</p>			
Hazard to Life					
<p>The risk assessment for the Project follows Annex 4 of the EIAO-TM as well as the requirements given in EIA Study Brief (No. ESB-321/2019).</p> <p>Quantitative Risk Assessment (QRA) has been conducted to evaluate hazardous scenarios associated with the biogas facilities within the Project site and other hazardous facilities in the surroundings including Tai Po Gas Production Plant (TPGPP), Liquefied Petroleum Gas (LPG) storage facility at Apex Print Limited, LPG storage facility at Zama Industries Limited, and Dangerous Goods (DGs) storage at Linde HKO Limited.</p> <p>Previously approved QRA studies have been referenced when developing the QRA for this EIA.</p>	<p>The hazard scenarios, design and operational parameters of this Project were based on preliminary design of this Project. The hazard scenarios, design and operational parameters of TPGPP, LPG and DG installations were derived from the consultation with their respective operators.</p> <p>Latest meteorological data from Tai Po Kau Weather Station of the Hong Kong Observatory has been collected and adopted in the consequence model.</p> <p>The off-site population data are based on desktop review and consultation with project proponents of other existing / planned developments while the population data in the Project site were based on the preliminary design of the Project.</p>	<p>Hazardous event frequencies were derived from historical databases. They have been modified with reference to site-specific features and Project activities to increase their robustness.</p> <p>Specific risk mitigation measures for the Project construction and operation are subject to risk and safety assessment to be carried at the detailed design stage to ascertain the hazard to life impact of the Project.</p>	Section 4 of Appendix F	The need of QRA for TPGPP was confirmed through email correspondences with EMSD.	N/A
Landfill Gas Hazard					
The landfill gas hazard assessment follows Annexes 7 and 19 of the EIAO-TM, Landfill Gas Hazard Assessment Guidance Note (1997) (EPD/TR8/97) as well as the requirements given in EIA Study Brief (No. ESB-321/2019).	<p>The likely quantities/concentrations of Landfill Gas (LFG) was based on the design information of Shuen Wan Restored Landfill (SWRL) and the past LFG monitoring data. As SWRL has been closed, increases in the LFG quantities/concentrations in the future as compared to the available LFG monitoring results are not expected.</p> <p>Review of the ground and groundwater conditions including the groundwater movement and the presence of any natural fault line was based on the Ground Investigation (GI) data. The presence of man-made pathways was determined from the results of utilities surveys and available utility records.</p>	N/A	N/A	N/A	N/A

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	The targets of LFG hazard were determined based on the scope of this Project.				
Waste Management Implications					
The assessment of waste management implications for the Project follows Annexes 7 and 15 of the EIAO-TM as well as the requirements given in EIA Study Brief (No. ESB-321/2019).	The waste quantities to be generated from the Project during construction and operational phases were estimated based on preliminary engineering design.	Waste quantities and detailed waste management measures are subject to the Waste Management Plan and construction design to be developed at the detailed design stage. The sediment quality and disposal requirement are subject to further review to be conducted prior to the sediment excavation works in accordance with the requirements of the ETWB TCW No. 34/2002.	Section 3(i) of Appendix H	The Sediment Sampling and Testing Methodology Paper was agreed by EPD through email correspondences.	N/A
Land Contamination					
The land contamination assessment for the Project follows Annex 19 of the EIAO-TM, requirements given in EIA Study Brief (No. ESB-321/2019) as well as the Guidance Note for Contaminated Land Assessment and Remediation, Practice Guide for Investigation and Remediation of Contaminated Land and Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management issued by EPD.	The assessment was undertaken based on historical land use and site reconnaissance.	The presence and extent of land contamination in the Project site as well as the soil remediation requirements are subject to site re-appraisal and site investigation to be carried out after decommissioning of the existing facilities in the Project site and before commencement of the construction works.	Section 3 of Appendix I	The relevant submissions will be prepared after the EIA stage and before commencement of construction for EPD's endorsement	
Noise Impact					
The noise impact assessment for the Project follows Annex 5 and Annex 13 of the EIAO-TM, the requirement in the EIA Study Brief (ESB-321/2019). The potential noise sources of the Project have been identified and their impacts have been qualitatively assessed.	No Noise Sensitive Receiver (NSR) was identified within 300m from the Project site based on the review of relevant OZPs, Development Permission area Plans, Outline Development Plans and Layout Plans published by Lands Department and the land use and development applications approved by the Town Planning Board. Site survey has also been conducted to confirm the findings of desktop review.	N/A	Sections 2.2.1, and 3.2.1 of Appendix J (Section 2.3.1 of Appendix J is not relevant as no NSR is identified)	Prior agreement on the assessment area and NSR has been sought from EPD through email correspondences.	N/A

Note: N/A - Not applicable