

## Appendix 13B Summary of Environmental Impacts







Conclusions | FinaL - Issue 1

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Key Sensitive Receivers / Assessment Points	Results of Impact Predictions	Key Relevant Legislations, Standards or Criteria	Extents of Exceedances Predicted	Key Impact Avoidance Measures Considered and Mitigation Measures Proposed	Residual Impacts (After Mitigation)
Air Quality Impact					
<ul> <li>Offices of government facilities and industrial establishment in Tsang Tsui</li> <li>Residential uses at Ha Pak Nai, Sheung Pak Nai and Nim Wan Road</li> <li>Lau Ancestral (place of worship) in Lung Kwu Sheung Tan</li> </ul>	The predicted air quality impact complied with the relevant standards or criteria at all representative air sensitive receivers during Project operation.  Air quality impact from construction works could be mitigated by air quality control measures.  No adverse air quality impact is predicted.	<ul> <li>Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) Annexes 4 and 12</li> <li>Air Pollution Control Ordinance (Cap. 311) and Hong Kong Air Quality Objectives (HKAQOs)</li> <li>Air Pollution Control (Construction Dust) Regulation (Cap. 311R)</li> <li>Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (Cap. 311Z)</li> <li>Air Pollution Control (Fuel Restriction) Regulation (Cap. 311I)</li> <li>Air Pollution Control (Fuel Restriction) Regulation (Cap. 311I)</li> <li>Air Pollution Control (Fuel for Vessels) Regulation (Cap. 311AB)</li> <li>Air Pollution Control (Marine Light Diesel) Regulation (Cap. 311Y)</li> <li>GB 18485-2014 Standard for pollution control on the municipal solid waste incineration</li> <li>SZDB/Z 233-2017 Shenzhen standard and guiding technical document for operational specifications for municipal solid waste treatment facilities</li> <li>Best available techniques (BAT) reference document for waste incineration in the European Union (EU)</li> <li>Guidance Note on the Best Practicable Means for Incinerators (Municipal Waste Incineration) BPM 12/1 (2024)</li> <li>Guidance Note on the Best Practicable Means for Mineral Works (Stone Crushing Plant) BPM 11/1 (95)</li> <li>Recommended Pollution Control Clauses for Construction Contracts</li> <li>Environmental, Transport and Works Bureau Technical Circular (Works) (ETWB TCW) No. 19/2005 – Environmental Management on Construction Sites</li> <li>Development Bureau Technical Circular (Works) (DEVB TCW) No. 13/2020 – Timely Application of Temporary Electricity and Water Supply for Public Works Contracts and Wider Use of Electric Vehicles in Public Works Contracts</li> <li>DEVB TCW No. 1/2015 – Emissions Control of NRMM in Capital Works Contracts of Public Works</li> </ul>	No exceedance is predicted.	<ul> <li>Implement dust suppression measures and good site practices during construction phase.</li> <li>During operation, the waste shall be thoroughly combusted at high temperature above 850°C with sufficient air supply under high turbulent condition for at least two seconds to ensure effective destruction of organic pollutants including dioxin.</li> <li>Adopt advanced air pollution control system and carry out continuous flue gas emission monitoring at stack to ensure compliance with the target air emission levels.</li> <li>The air pollution control system shall include a combination of the following techniques:         <ul> <li>Selective non-catalytic reduction (SNCR) and selective catalytic reduction (SCR) to reduce NOx emissions;</li> <li>Dry alkaline sorbent (sodium bicarbonate or lime) injection(s) combined with bag filter(s), semidry absorber and/or wet scrubber to reduce acidic gases such as HCl, HF and SO2;</li> <li>Dry sorbent (activated carbon) injection combined with bag filter to reduce dioxin and metals; and</li> <li>Bag filter(s) to reduce particulates.</li> </ul> </li> <li>Adopt enclosed design for wastewater treatment facility, waste reception hall, waste storage areas and waste feed system and maintain at negative pressure to avoid spillage of odour.</li> <li>Odorous air shall be drawn into the combustion chamber of the incinerator for combustion. Odour control system with odour removal efficiency of more than 95% shall be provided for treatment of odorous air before discharging into open atmosphere during a shut-down or under the circumstances that the odorous air cannot be withdrawn into the combustion chamber of the incinerator for combustion.</li> <li>Carry out odour patrol to ensure that there would be no adverse odour impact arising from the Project.</li> </ul>	No unacceptable residual air quality impact.



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Noise Impact					
No noise sensitive receiver (NSR) is identified in the assessment area	No NSR within 300m from the Project boundary. Adverse noise impacts from the I-PARK2 site are not anticipated during both construction and operation phases.	<ul> <li>EIAO-TM Annexes 5 and 13</li> <li>EIAO Guidance Note No. 9/2023</li> <li>Noise Control Ordinance (NCO) (Cap. 400)</li> <li>Technical Memoranda under NCO</li> <li>Recommended Pollution Control Clauses for Construction Contracts</li> <li>Professional Persons Environmental Consultative Committee Practice Note (ProPECC) PN 1/24 "Minimizing Noise from Construction Activities"</li> <li>"Good Practices on the Control of Noise from Electrical &amp; Mechanical Systems"</li> </ul>	No NSR within 300m from the Project boundary. No adverse noise impact is anticipated.	<ul> <li>Adopt quieter construction methods/ equipment and good construction site practices.</li> <li>Adopt noise control techniques such as selection of quiet equipment, use of enclosure or silencer with a view to minimising noise from fixed noise sources such as fan units.</li> <li>Transport MSW to I-PARK2 mainly by sea. The number of waste collection vehicles collecting MSW from local districts e.g. Tuen Mun and Lung Kwu Tan passing through the existing Lung Kwu Tan Road will be similar to the prevailing scenario of MSW delivery to WENT Landfill.</li> <li>Traffic generated by the Project would not fall within night time or early morning (i.e. between 11pm and 7am) under normal operation.</li> </ul>	No unacceptable residual noise impact.
Water Quality Impact					
<ul> <li>Seawater intakes, marine ecological and fisheries sensitive receivers such as Pak Nai Site of Special Scientific Interest (SSSI) and oyster production area in Deep Bay</li> </ul>	The predicted water quality complied with the relevant standards or criteria at all representative water sensitive receivers (WSRs) during Project construction and operation.	<ul> <li>EIAO-TM Annexes 6 and 14</li> <li>Water Pollution Control Ordinance (WPCO) (Cap. 358)</li> <li>Water Quality Objectives (WQOs) stipulated under WPCO</li> <li>Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS) (Cap. 358AK)</li> <li>ProPECC PN 2/23 "Construction Site Drainage"</li> <li>ProPECC PN 1/23 "Drainage Plans subject to Comment by the Environmental Protection Department"</li> <li>Sediment deposition criterion for benthic ecology</li> <li>The United States Environmental Protection Agency (USEPA) criterion for Total Residual Chlorine (TRC)</li> <li>Seawater intake water quality criteria from intake operators.</li> </ul>	No exceedance is predicted.	<ul> <li>Construction Phase</li> <li>Follow good practices outlined in ProPECC PN 2/23.</li> <li>Implement good site practices and proper refuse collection, storage and disposal measures.</li> <li>Implement proper chemical handling, storage and disposal measures.</li> <li>Provide sufficient chemical toilets in works areas.</li> <li>Adopt suitable design and mitigation measures for marine construction including the use of non-dredged method and associated water pollution control measures e.g. deployment of silt curtains.</li> <li>Implement good site practices for construction vessels.</li> <li>Operational Phase</li> <li>Proper treatment of wastewater arising from operation of the Project for reuse within I·PARK2 or discharge into the existing Urmston Road Submarine Outfall in the North Western Water Control Zone outside Deep Bay after meeting relevant standards.</li> <li>Follow good practices outlined in ProPECC PN 1/23.</li> <li>Adopt best management practices for non-point sources surface runoff</li> </ul>	No unacceptable residual water quality impact.





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N/A	The Project construction would generate Construction and Demolition (C&D) materials, chemical waste and general refuse.  The Project operation would generate incineration by-products, dewatered sludge, chemical waste and general refuse.  Potential environmental impacts could be minimised by proper design and planning of the Project, as well as proper handling, storage and disposal of all wastes.	<ul> <li>EIAO-TM Annexes 7 and 15</li> <li>Waste Disposal Ordinance (Cap. 354)</li> <li>Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C)</li> <li>Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)</li> <li>Land (Miscellaneous Provisions) Ordinance (Cap. 28)</li> <li>Public Health and Municipal Services Ordinance (Cap. 132) - Public Cleansing and Prevention of Nuisances Regulation (Cap. 132BK)</li> <li>ETWB TC(W) No. 19/2005 – Environmental Management on Construction Site</li> <li>DEVB TCW No. 6/2010 – Trip Ticket System for Disposal of Construction &amp; Demolition Materials</li> </ul>	With proper design and planning of the Project, as well as proper handling, storage and disposal of all wastes, no adverse environmental impact due to waste management.	<ul> <li>Construction Phase</li> <li>Adopt construction waste management strategy to avoid, minimise, reuse, recycle and finally dispose of waste with the desirability in descending order.</li> <li>Reuse excavated PFA for backfilling on-site and covered by at least 1m thick general fill without off-site disposal of PFA.</li> <li>Develop a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with ETWB TC(W) No. 19/2005 for the Engineer's approval before commencement of Project construction.</li> <li>Follow EMP and best management practices for waste management.</li> <li>Implement Trip Ticket System to track the disposal of C&amp;D materials through the use of Disposal Delivery Form in accordance with DEVB TCW No. 6/2010.</li> <li>Monitor the transportation of construction waste by means of dump trucks equipped with real-time tracking and monitoring devices.</li> <li>Operational Phase</li> <li>Transport MSW to I-PARK2 mainly by sea. The number of waste collection vehicles collecting MSW from local districts e.g. Tuen Mun and Lung Kwu Tan passing through the existing Lung Kwu Tan Road will be similar to the prevailing scenario of MSW delivery to WENT Landfill.</li> <li>The MSW and ashes shall be fully enclosed in sealed containers or covered entirely to ensure that the MSW do not leak from vessels or vehicles during transportation or disposal.</li> <li>The MSW container vessels shall be equipped with GPS trackers to provide real time vessel location, which serves as an effective surveillance measure to avoid waste dumping at sea.</li> <li>The bottom ash shall be treated by screening, crushing, sieving and extracting metal removal for off-site beneficial uses. Disposal of bottom ash at landfill would be the last resort if all possible options of the beneficial uses/outlet are exhausted.</li> <li>Fly ash / air pollution control residues shall be treated by cement solidification or chemical stabilization to ensure compliance with</li></ul>	No unacceptable residual environmental impact due to waste management.



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				leachate parameters set out for landfills in Hong Kong prior to landfill disposal.	
<b>Ecological Impact</b>					
Terrestrial Ecology	T				1
Direct habitat loss	The land-based Project area is about 24.2 ha and the affected habitats include wasteland, developed area and ash lagoon with generally low ecological value. The ash lagoon would become developed area before commencement of construction of the Project. Hence, the ecological impact arising from direct habitat loss due to the Project is considered as low.	<ul> <li>EIAO-TM Annexes 8 and 16</li> <li>EIAO Guidance Note No. 6/2010</li> <li>EIAO Guidance Note No. 7/2023</li> <li>EIAO Guidance Note No. 10/2023</li> <li>Forests and Countryside Ordinance (Cap. 96)</li> <li>Wild Animals Protection Ordinance (Cap. 170)</li> <li>Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586)</li> </ul>	No adverse ecological impact arising from direct habitat loss.	N/A	No unacceptable residual ecological impact arising from direct habitat loss.
Direct impact to wildlife	The fauna diversity and abundance recorded within the Project site are generally low and the recorded species are highly mobile. Hence, the ecological impact arising from direct injury or mortality of wildlife due to the Project is considered as low.		No adverse ecological impact arising from direct injury or mortality of wildlife.	As a precautionary measure, site check by qualified ecologist before commencement of construction is recommended to confirm there is no breeding activity of avifauna species of conservation importance within the Project site	No unacceptable residual ecological impact arising from direct injury or mortality of wildlife.
Indirect disturbance impact to wildlife during construction and operational phases of the Project	The habitat quality, fauna diversity and abundance recorded within the assessment area are generally low. With proper implementation of the recommended good site practices and mitigation measures during construction and operational phases, the ecological impact arising from indirect disturbance to wildlife due to the Project is considered as low, taking into account the ability of fauna to move away from source of disturbance and availability of alternative habitats nearby).		With proper implementation of the recommended good site practices and mitigation measures during construction and operational phases, no adverse ecological impact arising from indirect disturbance to wildlife.	<ul> <li>Construction Phase</li> <li>Promote environmental awareness of all construction site personnel particularly on the requirements for protection of ecological resources in nearby areas.</li> <li>Provide clear delineation and fencing of works areas strictly prohibit construction outside the works areas.</li> <li>Adopt quieter (non-percussive) piling method, quality powered mechanical equipment and good site practices to reduce noise disturbances.</li> <li>Implement proper construction site drainage and measures to control construction site runoff and site discharges.</li> <li>Implement appropriate dust reduction measures.</li> <li>Implement light nuisance control measures.</li> <li>Operational Phase</li> <li>Adopt noise control techniques such as selection of quiet equipment, use of enclosure or silencer with a</li> </ul>	No unacceptable residual ecological impact arising from indirect disturbance to wildlife.

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				view to minimising noise from fixed noise sources such as fan units. Adopt air emission control measures.  Implement landscape planting to screen the visual interface.  Implement best management practices to control non-point source surface runoff.  Adopt suitable light nuisance control measures.	
Habitat fragmentation and isolation	The habitats affected by the Project include wasteland, developed area and ash lagoon with generally low ecological value. The ash lagoon would become developed area before commencement of construction of the Project. The Project area has generally low abundance and distribution of wildlife. No habitat fragmentation and isolation are expected.		No adverse ecological impact arising from habitat fragmentation and isolation.	N/A	No unacceptable residual ecological impact arising from habitat fragmentation and isolation.
Impact on ecological carrying capacity	The habitats affected by the Project include wasteland, developed area and ash lagoon with generally low ecological value. The ash lagoon would become developed area before commencement of construction of the Project. No impact on ecological carrying capacity is expected.		No adverse impact on ecological carrying capacity.	N/A	No unacceptable residual impact on ecological carrying capacity.
Marine Ecology					
Direct loss of marine habitat	and construction of berthing facility along the middle ash lagoon and west ash lagoon will affect about 4.4 ha marine habitat (including 2.6	<ul> <li>EIAO-TM Annexes 8 and 16</li> <li>EIAO Guidance Note No. 6/2010</li> <li>EIAO Guidance Note No. 7/2023</li> <li>EIAO Guidance Note No. 11/2023</li> <li>Wild Animals Protection Ordinance (Cap. 170)</li> <li>Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586)</li> </ul>	No adverse ecological impact arising from direct loss of marine habitat.	N/A	No unacceptable residual ecological impact arising from direct loss of marine habitat.



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	ecological impact arising from direct loss of marine habitat due to the Project are considered as low.				
Indirect disturbance impact to marine ecological and sensitive receivers such as Pak Nai SSSI, mudflat, seagrass, horseshoe crab, and Sha Chau and Lung Kwu Chau Marine Park	The predicted water quality complied with the relevant standards or criteria at representative marine ecological sensitive receivers during Project construction and operation.		Representative marine ecological sensitive receivers are considered in the water quality impact assessment. No exceedance is predicted.	Mitigation measures recommended in the water quality impact assessment would also serve to protect marine ecological resources.	No unacceptable residual ecological impact arising from indirect disturbance to representative marine ecological sensitive receivers.
Fisheries Impact					
Oyster culture activities in Deep Bay, important spawning ground of commercial fisheries resources in North Lantau, and artificial reefs in Sha Chau and Lung Kwu Chau Marine Park	The proposed seawall modification and construction of berthing facility along the middle ash lagoon and west ash lagoon will affect about 4.4 ha fisheries habitat (including 2.6 ha of temporary habitat loss during construction and 1.8 ha of permanent habitat loss). There is neither important spawning nor nursery ground nor site of fisheries importance for the affected fisheries habitat and the level of fisheries production is low. Hence the fisheries impact arising from direct loss of fisheries habitat due to the Project are considered as minor.  The predicted water quality	<ul> <li>EIAO-TM Annexes 9 and 17</li> <li>Fisheries Protection Ordinance (Cap. 171)</li> <li>Marine Fish Culture Ordinance (Cap. 353)</li> </ul>	No adverse fisheries impact arising from direct loss of fisheries habitat and fishing ground.  Representative fisheries sensitive receivers are considered in the water quality impact assessment. No exceedance is predicted.	<ul> <li>Mitigation measures recommended in the water quality impact assessment would also serve to protect fisheries resources.</li> <li>For the spent seawater cooling effluent discharge, alternative seawall outfall locations have been considered at west ash lagoon which are located further away from the oyster culture activities in Deep Bay.</li> </ul>	No unacceptable residual fisheries impact.
	complied with the relevant standards or criteria at representative fisheries sensitive receivers during Project construction and operation. The fisheries impact arising from indirect disturbance to fisheries resources (including water quality impact and impingement and entrainment of fisheries resources				



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	at seawater intake) during construction and operational phases of the Project is considered as low				
Visual Impact					
Public Viewing Points (VPs) including travellers and visitors	There will be some adverse visual effects during operational phase of the Project, but these can be reduced or moderated to a certain extent by design / mitigation measures.	<ul> <li>EIAO-TM Annexes 10 and 18</li> <li>EIAO Guidance Note No. 8/2023</li> <li>DEVB TCW No. 3/2012 – Site Coverage of Greenery for Government Building Projects</li> <li>ETWB TCW No. 8/2005 – Aesthetic Design of Ancillary Buildings in Engineering Projects</li> </ul>	Based on the findings of the qualitative assessment, no adverse visual impact is anticipated with proper implementation of the recommended design / mitigation measures.	including aesthetic design of buildings, tree planting, green roof and vertical greening.	No unacceptable residual visual impact.
Health Impact					
<ul> <li>Offices of government facilities and industrial establishment in Tsang Tsui</li> <li>Residential uses at Ha Pak Nai, Sheung Pak Nai and Nim Wan Road</li> <li>Lau Ancestral (place of worship) in Lung Kwu Sheung Tan</li> </ul>	Inhalation is identified as the major route for aerial emissions arising from operation of the Project while other indirect exposure pathways such as direct dermal contact are negligible. No significant carcinogenic health risk or adverse chronic and acute non-carcinogenic health impacts arising from the aerial emissions of I-PARK2.	<ul> <li>Air Pollution Control Ordinance (Cap. 311) and HKAQOS</li> <li>EIAO-TM Annex 4</li> <li>Standards or criteria and risk management guidance adopted by the World Health Organization, the United States Environmental Protection Agency and other recognized international organizations.</li> <li>ProPECC PN 1/99 "Control of Radon Concentraton in New Buildings"</li> </ul>	The representative health sensitive receivers are considered in the air quality impact assessment. No exceedance is predicted.	<ul> <li>Measures recommended in the air quality impact assessment would also serve to ensure no adverse health impact due to aerial emissions arising from construction and operational phases of the Project.</li> <li>Develop and implement emergency response / contingency plan to handle potential accidental events during construction and operation of the Project with a view to minimising the health impacts associated with the potential accidental events.</li> <li>Construction Phase</li> <li>Excavated PFA shall be reused for backfilling on-site and covered by at least 1m thick general fill. No offsite disposal of PFA will be required.</li> <li>Provide personal protective equipment including suitable dust masks to the workers, observe relevant requirements promulgated by the Labour Department in respect of occupational safety and health and comply with relevant statutory requirements.</li> <li>Operational Phase</li> <li>Follow the measures for control of radon concentration in new buildings outlined in ProPECC PN 1/99.</li> <li>The MSW and ashes will be fully enclosed in sealed containers or covered entirely to ensure that the</li> </ul>	No unacceptable residual health impact.



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				<ul> <li>MSW do not leak from vessels or vehicles during transportation or disposal.</li> <li>Adopt enclosed design for storage and handling of waste and ashes and maintain at negative pressure, with air drawn into the combustion chamber of the incinerator for combustion or discharged into open atmosphere through dust exhaust with bag filter of no less than 99% dust removal efficiency, and install misting system as fugitive emission control.</li> </ul>	
Landfill Gas Hazard					
Construction workers, I-PARK2 operators and visitors	The landfill gas hazard is low and medium during construction and operational phases respectively, but the potential hazard can be reduced by suitable precautionary / protection measures.	<ul> <li>EIAO-TM Annexes 7 and 19</li> <li>Landfill Gas Hazard Assessment Guidance Note (EPD/TR8/97)</li> <li>ProPECC PN 3/96</li> </ul>	Based on the findings of the qualitative assessment, no adverse impact due to landfill gas hazard is anticipated with proper implementation of the recommended precautionary / protection measures to reduce the potential landfill gas hazard.	<ul> <li>Follow the requirements outlined in ProPECC PN 3/96 and Landfill Gas Hazard Assessment Guidance Note (EPD/TR8/97).</li> <li>Construction Phase</li> <li>Implement safety / precautionary measures during construction phase and carry out landfill gas monitoring by safety officer.</li> <li>Operational Phase</li> <li>Install monitoring wells to monitor landfill gas concentration during operational phase and ensure the effectiveness of the landfill gas cut-off trench barrier built along the WENTX landfill site boundary under the WENTX project to prevent landfill gas migration to the Project site.</li> <li>Incorporate landfill gas protection measures e.g. passive / semi-active control measures and gas</li> </ul>	No unacceptable residual impact due to landfill gal hazard.