

11 SUMMARY CONCLUSION & RECOMMENDATIONS

11.1 Summary Conclusion of Technical Assessments

- 11.1.1 The Project will involve the construction of a permanent helipad at Pak Wan on the northwest coast of Peng Chau to serve the local community in the absence of an existing permanent facility. The helipad is required mainly for emergency use. The Pak Wan site was one of eleven site options for the Helipad considered in detail, and was selected as the optimal location for the Project due to its remoteness from the built environment, while it is still easily accessible from the Peng Chau medical clinic.
- 11.1.2 Based on the construction schedule and plant inventory given, the unmitigated construction noise levels at Sea Crest Villa are found to exceed the daytime noise standards stated in Table 1B, Annex 5 of EIA-TM. However, through implementation of appropriate mitigation measures, including use of silenced equipment and temporary noise barriers, the construction noise impacts can be reduced to an acceptable level. The cumulative noise level with the construction of the Peng Chau STW Upgrade at Tai Lei Island was evaluated and no adverse impacts are anticipated.
- 11.1.3 Through liaison with the Government Flying Service (GFS) the helicopter flight path angle has been reduced to eliminate residual noise impacts from the EC155 B1 during helicopter approach, while an existing natural rocky cliff-face will effectively screen the Sea Crest Villa residential development from helicopter manoeuvring noise impacts. There is a predicted residual helicopter noise impact of 3dB(A) from flight of the Super Puma AS332 L2 type helicopter (worst-case scenario), although it has been calculated that the helicopter noise levels at Sea Crest Villa from the currently used flight path range between 89dB(A) for the 'EC 155B21' type helicopter to 92 dB(A) for the 'Super Puma' type helicopter.
- 11.1.4 It is also noted that the predicted impact duration for the proposed helipad will be very short (less than 10 seconds) as the impact zone only arises when the Super Puma is approximately 30m from helipad landing. Eliminating the residual noise impact from the 'Super Puma' would require moving the proposed helipad another 70m to the east, resulting in more construction work and greater landscape and environmental impact potential. The frequency of the residual helicopter noise impact is predicted to be once every 12 days.
- 11.1.5 Consideration was given to helicopter noise mitigation. However it was found that there are no options for direct mitigation of helicopter noise without creating potentially significant landscape and ecological impacts; while indirect measures such as use of increased window glazing and installation of air conditioners were considered impracticable due to the intermittent / unpredictable helipad use and the short helicopter noise impact duration.
- 11.1.6 Provided that the proposed controls on waste management are implemented, no potential environmental impacts from the construction and operational phases of the Project are anticipated. As regards water quality, only one dredger will be used for the works and predictions are that elevations in suspended solids levels at sensitive receivers will be negligible, and will not exceed the tolerance level of 10.1mg/l even in the very vicinity of the dredger, based on an average water depth of 5.8m in the study area. As such, no significant adverse water quality impacts are anticipated from Project construction. Likewise, there will be no adverse water quality-induced ecological impacts on the nearest coral community at east Tai Lei.
- 11.1.7 There will be a net loss (residual impact) of approximately 0.25 ha of marine benthic habitat and a net gain of some 0.02 ha of inter-tidal habitat, although given the low baseline ecological value of the marine and inter-tidal habitat at Pak Wan, the adverse residual impact is not considered significant. No significant terrestrial ecology impacts are anticipated. No significant ecological impacts are anticipated during the operational phase of the Project and there are no monitoring requirements for the Project. Likewise, no adverse fisheries impacts are anticipated and no fisheries monitoring is required.

- 11.1.8 Two objects were recorded during the marine geophysical survey conducted at Pak Wan to support the marine archaeological / cultural heritage assessment. A dive survey confirmed the objects to be rock and dead coral of no archaeological interest. There were no terrestrial archaeological sites, historic buildings or structures that will be impacted by the Project.

11.2 Key Recommendations

- 11.2.1 Although no construction phase noise exceedance is predicted, noise impact monitoring and audit is recommended during throughout the construction period to ensure noise levels at NSRs are kept within an acceptable limit. The Environmental Monitoring and Audit (EM&A) requirements are detailed in the stand-alone Project EM&A Manual. As regards helicopter noise, all practicable measures have been taken to avoid / minimise impacts, and as the unpredictability of helipad use makes EM&A impracticable, it is not recommended. However, should the need arise, the local community may lodge noise complaints with the Islands District Office.
- 11.2.2 No specific EM&A requirements have been identified for waste management, although it is recommended that regular construction phase site inspections and the supervision of waste management procedures be included as part of the WMP to be prepared by the Contractor. The implementation of additional good practice measures proposed in *Section 3* will ensure there are no construction dust impacts.
- 11.2.3 No adverse water quality impacts are anticipated from Project construction. However, it has been recommended that silt curtains be used around the dredging area as a good practice measure to ensure compliance with water quality criteria. This measure will also ensure no adverse water quality induced ecological impacts on the coral community at east Tai Lei, or on the fisheries area off the Tai Lei bridge that is a popular recreational fishing area.

11.3 Summary of Environmental Outcomes

- 11.3.1 The key environmental outcomes of the Project may be summarised as follows:
- 11.3.2 *Population and environmentally sensitive area protected:* An optimum Project site has been selected that that is relatively distant from the built environs of Peng Chau, but which is also readily accessible from the Peng Chau Clinic. The chosen helipad site offers the local community a significant time saving compared with the existing helipad at Tai Lung Tsuen, while the existing helipad is predicted to generate significant helicopter noise impacts (i.e., > 85 dB(A)) on residents of over 100 village type and medium rise residential buildings, principally in Shan Ting Tsuen, Kam Peng and Tung Wan Villa. In addition, it is predicted that the existing flight path across Sea Crest Villa currently exposes residents to greater noise levels than will be experienced once the proposed new helipad is operational.
- 11.3.3 *Environmentally friendly designs recommended:* Other measures incorporated into the Project design to avoid / minimise environmental impacts include reducing the Project footprint by (i) reducing the elevation of the helipad and EVA as far as practicable, and (ii) reducing the gradient of the sloping boulder seawall from standard design. The construction sequence has been optimised to minimise cumulative construction noise effects with works for the proposed Peng Chau Sewage Treatment Works Upgrade.
- 11.3.4 *Key environmental problems avoided:* As referred under 11.3.2 above, the proposed permanent helipad will significantly improve the accessibility to / from the helipad and greatly reduce the travel time in emergency situations. There will also be a significant reduction in the number of buildings that are adversely affected by helicopter noise. The helipad location makes use of the natural rocky cliff-face between the helipad surface and Sea Crest Villa that will effectively shield the residential development from helicopter manoeuvring noise.

- 11.3.5 Compensation areas included: There will be a net loss of approximately 0.25 ha of marine benthic habitat and a net gain of some 0.02 ha of artificial inter-tidal habitat from seawall construction, although given the low baseline ecological value of the marine and inter-tidal habitat at Pak Wan, the adverse residual impact is not considered significant. The seawall will also benefit local fisheries that favour shallow coastal waters.
- 11.3.6 Environmental benefits of environmental protection measures recommended: Residual helicopter noise impacts associated with helicopter approach / departure of the 'EC 155B1' type helicopter that will be used in most cases have been effectively eliminated through realignment of the helicopter flight path. While there will be a residual helicopter noise impact when the noisier 'Super Puma AS L2' type helicopter) is in use, although GFS will aim to use the quieter 'EC 155B1' type wherever possible.