

16. ConclusionS and recommendations

Introduction

16.1 Kau Sai Chau has an area of about 700 ha and is located approximately 5km east of Sai Kung in the South East New Territories. It is the fifth largest island in Hong Kong being about 4km long in a north-south orientation, and 2km across at its widest point. The Island forms a dominant feature of the area due to its mountain peaks.

16.2 Historically Kau Sai Chau was used as a military firing range and within the Project site there is still visible evidence of this former activity on the hillside where the thin scrubland cover has been exposed and there has been extensive washout of soil from the hillside during rainfall. There are also a number of graves scattered around the north end of the island. Some of them scattered around the proposed third golf course area.

16.3 A public golf course consisting of 36-hole North and South courses as well as associated supporting facilities (clubhouse, administration and maintenance buildings, etc.) was proposed in the northern part of Kau Sai Chau. The first public golf course in Hong Kong was opened to the public in 1995. A daily record of 1,200 visitors comprising golfers, golf students, driving range users and general visitors, visit the island at the weekend.

Proposed project

16.4 The location of the proposed 18-hole third Golf Course is on the east side of Kau Sai Chau immediately south of the existing public golf course.

16.5 The proposed golf course will be 7,000 yards in play length and players will use electric golf carts to drive along dedicated cart paths along the fairways of the 18 holes. Unlike the first two courses the proposed course will be turfed with *Seashore Paspalum*. In order to provide supplementary irrigation to the course during dry periods, a desalination plant will be incorporated into the scheme.

16.6 Certain elements of infrastructure support are already available in the existing golf course facilities (administration building, maintenance building, sewage treatment works and water supply) and will be shared or extended to provide additional capacity for the proposed third golf course.

Air Quality

16.7 Construction dust impact has been assessed and evaluated. With the implementation of the appropriate dust suppression measures such as regular watering and covering the exposed stockpiles with tarpaulin, construction dust impacts will be reduced to acceptable levels. No significant construction and operational dust impact is expected at any of the air sensitive receivers in the vicinity of the study area.

Noise

16.8 Representative noise sensitive receivers have been identified. Noise impacts from construction activities have been assessed and evaluated. During the construction phase, the construction noise predicted at the representative noise sensitive receivers will not exceed the standard due to natural topographic shielding and remoteness from the construction site. No noise impact is expected during the operational phase of Project.

Water Quality

Construction Phase

16.9 During the construction phase, it has been determined that minor water quality impacts to water bodies could arise from land-based construction works. These works relate to earthwork excavation of the proposed third golf course. No direct construction runoff is expected. Impacts can be controlled to comply with WPCO standards by implementing the recommended mitigation measures, which should provide good site management options to minimise the impact of stormwater runoff. For the construction of intake and discharge pipelines for the proposed desalination plant located near to the existing pier at Kau Sai Chau, impacts on water quality are acceptable if recommended mitigation measures are implemented.

Operational Phase

16.10 The closed drainage system has been implemented. The water quality of the limited discharge from the land drainage system has been assessed. With the closed low flow drainage system collection runoff from the proposed third golf course, and the lower fertilizer and pesticide requirements of *Seashore Paspalum*, no operational water quality impact is expected. Predicted overflow water quality from new lakes and the existing reservoir is shown to satisfy the Water Quality Objectives of Port Shelter. Operation of the desalination plant was modelled and assessed throughout the dry season. The modelling results indicate that the predicted concentrations of salinity and suspended solids comply with the Water Quality Objectives (WQOs) ambient water quality for all identified ecological sensitive sites including seagrass and fish culture zones.

Waste Management

16.11 The construction work will involve site formation and earthwork excavation which will necessitate the removal of spoil. There will be no net import or export of material due earthworks operations and ground-shaping. All cut material will be used within the works site as fill material.

16.12 A small quantity of demolition waste, non-inert waste generated from site formation, municipal waste generated by site staff and chemical waste will be generated during the construction phase. Provided that identified wastes are handled, transported and disposed of using approved methods, and that recommended good site practices are adhered to, adverse

environmental impacts are not be expected during construction. The recommended mitigation measures should form the basis of the site Waste Management Plan to be developed by the Contractor at the commencement of the construction phase.

Terrestrial Ecology

16.13 The proposed project will cause a permanent loss of 56.1 ha of shrubland, 32.7 ha of which would be in the golf course extension area while 23.4 ha will be in the southeast sector of the existing golf course that adjoins the new extension area. Plant species to be impacted are all common and typically found in this habitat type. Impacts to plant species of conservation concern are considered minimal as these species and their ravine habitats will be preserved from site formation. Trees of conservation concern will be retained on site.

16.14 The ecological importance of the area of shrubland habitat to be lost is considered to be low. Fauna abundance and species richness in the Project Area shrublands are very low. Shrubland will be converted to golf course, which will provide replacement habitat for wildlife as it has on the existing golf course over the last 10 years. The golf course extension would extend the fire-break effect over a larger area, providing greater protection to more of the remaining natural areas on the island. This will encourage natural succession of shrublands and other unaffected habitats.

16.15 Ravine habitats of perennial streams in the Project Area will be preserved and protected by buffer zones. Construction works at the desalination plant and barging point will only affect small areas of coastal habitats, which account for a small proportion of the daily home range of fauna of conservation concern in the coastal areas. Bird abundance along the shoreline of Kau Sai Chau was low. The ecological importance of the coastal area around the ferry pier as habitat for birds and other fauna is low. The impact to fauna in coastal areas is considered minimal.

16.16 The operational impact to habitat and flora is considered positive due to protection of habitats from fire. This will accelerate natural succession and will ultimately lead to a greater numbers of trees and more complex habitats, and moreover, will to support wildlife species and population numbers. Creation of additional freshwater ponds will also benefit waterbirds and herpetofauna.

Marine Ecology

16.17 The Project has no insurmountable impacts on marine ecology during construction and operational phases. The marine benthic communities in the waters around Kau Sai Chau were not of special conservation concern, and the intertidal zone was basically natural and typical. The construction of the desalination plant and temporary barging point will result in minor losses of intertidal (40m² temporary at the barging point, 130m² permanently at the desalination plant) and subtidal (1,500 m² temporary at the dredging area) habitats. However, the sizes of these losses are small and the durations are short (about one year for barging point and about three months for dredging area). These losses are not expected to have a negative impact on marine ecology. In the

site for the desalination plant, 79 small and common coral colonies were found and would be transplanted. Water quality mitigation and precautionary measures will be provided for the construction and operation phases. The residual impacts are acceptable. A well-planned programme of site practices and coral transplantation should be able to contain the impacts within acceptable levels.

Fisheries

16.18 The construction of the desalination plant and temporary barging point will result in minor temporary losses of fishing grounds, but it is not expected to be a significant negative impact on capture fisheries. A well-planned programme of site practices and the water quality monitoring should be able to prevent construction phase impacts on fisheries. Though operation phase impacts are not anticipated, there are also water quality precautionary measures to further protect the fisheries resources. No residual impacts on capture fisheries and fish culture operations are anticipated.

Land Contamination

16.19 Due to its former use as an artillery range, the site is considered as having potential for contaminated hotspots of lead and sulfur. Further investigation for land contamination will be required prior to commencement of excavation works. If the initial Contamination Assessment Report (CAR) indicates contamination and a Remediation Action Plan (RAP) would be prepared and submitted to EPD for approval.

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potential sources of contamination during the operation phase, monitoring and mitigation measures have been identified and proposed. The likelihood of uncontrolled leakage of fertilizers and pesticides giving rise to land contamination is low when mitigation measures are implemented.

Landscape and Visual Assessment

16.21 In general, the Project will cause slight to moderate adverse visual impact in the construction phase and negligible to slight adverse visual impact in the operation phase before the implementation of mitigation measures.

16.22 With the proposed mitigation measures, the impact on landscape resources is considered to be acceptable. Beneficial impacts on landscape resources will result from the partial restoration of eroded slopes. All affected areas will be covered with golf course turf or hydroseeding. The hydroseeding areas will be managed to allow for the reestablishment of tall shrubland and shrubland. A hydroseeding mix, which will comprise native shrubs with grass seeds, will encourage this process.

16.23 Impacts on visually sensitive receivers are acceptable. The majority of visual sensitive receiver groups are located at distances greater than 1 km away from the development. Golf players of the existing golf course will be the nearest sensitive receiver and will mostly be affected during construction phase. Beneficial impacts will result from the partial restoration of eroded slopes.

Cultural Heritage

16.24 The archaeological impact assessment for the extension of the golf course identified that the bay at Wan Chai as an archaeological site. The site was excavated and it was determined that some potential for archaeological material remains. A watching brief is recommended to fully record this site.

16.25 For built heritage impact assessment, an excellent example of a Late Qing Dynasty grave which has high preservation value will be kept in-situ by adjusting the golf course layout. By providing a three metres buffer zone during construction, no impact is expected.

Environmental Monitoring and Audit (EM&A)

16.26 During construction and operation of the Project, environmental monitoring will be necessary to assess the effectiveness of mitigation measures implemented to mitigate air quality, water quality, terrestrial ecology, marine ecology, cultural heritage and land contamination impacts. Regular environmental auditing is recommended to ensure that potential impacts are adequately addressed through the implementation of mitigation measures defined in this EIA report.

Overall Conclusions

16.27 The EIA has critically assessed the overall acceptability of any environmental impacts likely to arise as a result of the construction and operation of the proposed third golf course. Where necessary and practicable, the EIA has specified the conditions and requirements for the detailed design, construction and operation of the Project in order to mitigate environmental impacts to acceptable levels.

16.28 With the recommended mitigation measures applied, the Project should be environmentally acceptable and no unacceptable residual impacts are anticipated. The schedule of implementation of the recommended mitigation measures has been provided in Appendix A15 - Implementation Schedule. Monitoring requirements have also been specified in a separate EM&A Manual to ensure proper implementation of the recommended mitigation measures.