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For Advice

Environmental Impact Assessment Ordinance (Cap.499)
Environmental Impact Assessment Report
Proposed Extension of Public Golf Course at Kau Sai Chau, Sai Kung

Purpose

This paper presents the key findings and recommendations of the Environmental Impact Assessment (EIA) report for the proposed extension of public golf course at Kau Sai Chau, Sai Kung (hereafter known as the Project), submitted under section 6(2) of the Environmental Impact Assessment Ordinance (EIAO). Hong Kong Jockey Club (HKJC) is the Applicant for the project and they will make a presentation at the meeting. Comments from the public and the Advisory Council on the Environment will be taken into account by the Director of Environmental Protection when he makes the decision on the approval of the EIA report under the EIAO.

Advice Sought

2. Members' views are sought on the findings and recommendations of the EIA report.

Need for the Project

3. Golf is getting much popular in Hong Kong and the demand for golf course is on the rise. According to HKJC, there is heavy demand on the Kau Sai Chau Golf Course. Almost 100% utilization of tee-times was recorded on weekends/public holidays.

Description of the Project

4. The project is to construct a new 18-hole golf course to the southeast of Kau Sai Chau adjoining the existing golf courses (Fig. 1). The major components include:

- (i) 18 hole golf course (6 holes would be inside the existing golf course area) (Fig. 2);
- (ii) closed low flow drainage system including storage tanks and irrigation lakes/ponds to retain surface runoff from 16 holes;

- (iii) filter system to intercept surface runoff from holes 5 and 6 prior to discharge to the existing man-made wetland;
- (iv) a desalination plant to supplement irrigation water;
- (v) expanded sewage treatment works at the existing golf course site (from 150m³ to 225 m³/d); and
- (vi) temporary barging point during construction.

5. The project comprises the following designated project (DP) elements:

- (i) Item O.1 “An outdoor golf course and all managed turf areas”;
- (ii) Item C.12(a)(v) “A dredging operation which is less than 500m from the nearest boundary of an existing fish culture zone” (the dredging area for submarine intake/outfall pipelines for the desalination plant is about 450m away from the Kai Lung Wan Fish Culture Zone); and
- (iii) Item F.4 “An activity for the re-use of treated sewage effluent from a treatment plant”. Treated effluent from the expanded STW would be re-use for irrigation.

Consideration of Alternative Locations and Avoidance Measures

6. An alternative site outside Kau Sai Chau has not been considered as the Applicant aims to optimize existing facilities instead of duplicating them at other separate sites.

7. Five potential sites (B1, B2, D1, D2 and D3 in Fig. 3) for the two marine components (desalination plant and temporary barging point) were examined with dive surveys. Two locations (D2 and B2) were recommended and the sites with higher ecological value were avoided (i.e. Site D1 with higher coral coverage and site D3 with seagrass beds). Further detailed coral mapping was conducted at these two selected sites.

8. Measures to avoid potential environmental impacts have been incorporated in the golf course design. These include the design of the floating barging point, the consideration of pipeline alignments of the desalination plant to avoid impacts on corals, changing the design of the proposed golf course and establishment of stream buffer zones to protect the shrimp species (*Caridina trifasciata*), and the use of closed low flow drainage system during operation stage to contain surface runoff, etc.

Specific Environmental Aspects to Highlight

9. The key environmental issues identified for the Project include water quality and ecological impacts during both construction and operation phases.

Water Quality Impact

10. The major water quality impact during construction stage is from the dredging activities for the intake/outfall pipelines of the desalination plant near the existing pier. The key sensitive receivers are the corals in the nearby waterbody (Fig. 4). The nearest fish culture zone at Kai Lung Wan is about 450m away from the dredging area, which is much further away from the nearby corals.

11. With the implementation of the following mitigation measures, water quality impact arising from the construction of the project should meet the Water Quality Objectives at the specific sensitive receivers:

- (i) silt curtain around the dredged area;
- (ii) restrict the dredging rate at $45\text{m}^3/\text{d}$ for close-grab dredger and $20\text{m}^3/\text{d}$ for backhoe at shallow water ($<2\text{m}$ depth) area; and
- (iii) corals within the silt curtain area would be transplanted to the bedrock at about 80m south of the existing pier where coral communities are located. Corals found in the dredging area were all common species, small in size, of low coverage and scattered in distribution.

12. During the operation stage, the key water quality concern is the discharge of surface runoff to the open sea. With the following mitigation measures, impact arising from the operation of the project should meet the Water Quality Objectives at the specific sensitive receivers:

- (i) closed low-flow drainage system with storage tanks and irrigation lakes/ponds to retain surface runoff for a 1 in 2 years return period from 16 holes of the new course; first flush for all rainfall events would also be collected by the system;
- (ii) filter system at holes 5 and 6 to intercept surface runoff prior to discharging to the existing man-made wetland;
- (iii) reduce the overall runoff discharge to the existing man-made wetland by collecting existing surface runoff at holes S1, S7 and S9 of the existing golf course, which are currently not collected to the existing reservoir;
- (iv) change the type of turf grass from Bermuda to Seashore Paspalum and reduce usage of fertilizers and pesticides;
- (v) integrated pest management control similar to that adopted in the existing course; and
- (vi) implementation of contingency plan in the turf grass management in the event that the EM&A works found the guideline levels are exceeded.

Ecological Impact

13. The key ecological concern during construction is the potential impacts to the coral communities near the works area including the desalination plant pipelines and the temporary barging point site. The shrimp species (*Caridina trifasciata*) found at streams B and C on the island, (Kau Sai Chau was reported to be the second site that this shrimp species was found), is another concern.

14. For the dredging site near D2, dive surveys found that there are corals near the area and also at about 80m south of the existing pier. Seagrass bed was also noted at about 200m from the dredging area. Options of pipeline alignments were considered to avoid/minimize the potential impacts on the nearby marine ecology. With the recommended mitigation measures indicated in para. 11 above, suspended solid level at the affected coral areas would meet the Water Quality Objectives.

15. For the temporary barging point at B2, corals were found near shore. The impact to the existing corals was avoided with the use of floating pontoon, which requires no piling nor dredging, with anchors either on shore or at deeper water where no coral was found. No impact on corals was anticipated.

16. To protect the shrimp species (*Caridina trifasciata*) at the existing Stream B and C, the design of the golf course has been changed to avoid the streams where this shrimp species was found. During construction stage, buffer zones along these streams would be provided where no construction activities would take place except for laying of underground pipe culverts at sections of lower ecological value. Pre-cast concrete bridges would be used for stream crossings to minimize works required near the streams.

17. During operation, the potential impact would be from the application of fertilizers/pesticides to the managed turf. The integrated turf management system at the existing courses would be extended to the new course. From the monitoring data collected since the opening of the existing course, all of the pesticides concentrations were below the level of detectable limit ($0.5 \mu\text{g/l}$) for all existing freshwater and marine monitoring location. An increase in biodiversity at the existing golf course site was recorded after the opening of the existing courses. The recent field survey also indicated that biodiversity at the existing golf course site is higher than the future golf course site. With similar pest management control and the measures stated in para. 12 above, adverse ecological impact is not envisaged.

Other Environmental Impacts

18. The EIA report also addressed air quality, noise, waste, land contamination, landscape and visual as well as cultural heritage impacts. The report concluded that, with appropriate mitigation measures in place, the environmental impacts are considered acceptable.

Environmental Monitoring and Audit (EM&A)

19. The EIA report has recommended EM&A works during both construction and operation stages of the project. An Environmental Team and an Independent Environmental Checker will be employed and be responsible for carrying out the EM&A activities and to verify the environmental performance of the project. Event and Action Plans have also been produced and to be followed in the event that monitoring results indicated non-compliance with the Action and Limit Levels.

Public Consultation

20. The Applicant has applied the Continuous Public Involvement process and consulted some green groups and the Sai Kung District Council to seek their comments on the project during the preparation of the EIA report. The EIA report, EM&A Manual and Executive Summary are available for the public to comment under the EIAO from 6 September 2005 for 30 days. Members will be briefed about the comments received from the public in due course.

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Environmental Assessment Division

Environmental Protection Department