

**EIA report on
“Development of Integrated Waste Management Facilities Phase 1”**

**A summary of issues discussed by the EIA Subcommittee
at the meeting on 5 December 2011**

The Environmental Impact Assessment (EIA) Subcommittee discussed the EIA report on “Development of Integrated Waste Management Facilities (IWMF) Phase 1” at its meeting on 5 December 2011. Members agreed that since the Subcommittee already had a long and detailed discussion of the EIA report in March 2011 and given its views to the Advisory Council on the Environment (ACE), the discussion should focus on the key modifications made in the report. The issues discussed were summarized below.

Visual and landscape impacts at SKC site

2. Some Members considered that the design of the proposed incinerator offshore SKC, including the reclamation and breakwater, as well as the building plant and chimney, could not blend in with the natural environment of SKC. There were still rooms for further reducing the visual impacts of the project. The project proponent explained that the two proposed sites now under consideration were selected from a comprehensive site search exercise carried out in 2007/8. The site search exercise covered the whole of Hong Kong and in accordance with the advice of the Advisory Group on Waste Management Facilities, 23 types of areas such as the ecologically sensitive areas were excluded. The two proposed sites which were selected from an initial list of 21 sites were not within any ecologically sensitive areas such as existing or proposed marine parks or reserves. Under the EIA study, a detailed visual impact assessment had been carried out and the present design meeting the basic minimum requirements of the project was proposed. The community would be engaged later with regard to the design theme and outlook of the facilities. The Government would specify in the Design-Build-and-Operate (DBO) contract that the facilities would be designed to be visually pleasing and be acceptable to the local community. In fact, the artificial island near SKC at which the IWMF was to be built would be separated from the SKC by a water channel, thereby conserving the natural shoreline and terrestrial ecology of the area. A series of measures were recommended in the EIA study to minimize the visual impacts of the IWMF on

the environment, which included using boulders of similar colour tone of the SKC rocky shore for the sea wall, designing green rooftop and vertical greening along the building façade, and slanting the cofferdam for compatible outlook with the natural rocky shore of the island. The outlook design of the IW MF would be further developed, taking on board the public comments received. Pictures taken from different viewpoints towards SKC were used to illustrate that the IW MF would not be very noticeable as it would blend in well with the surrounding landscape.

3. On the possibility of applying a wavy/curvy design to the rooftop and breakwater of the facilities, the project proponent explained that the Government was open to the idea and would engage the public on the design theme of the project. The design currently presented in the EIA study was the basic design concept. The detailed design would be developed by the future contractor under the DBO contract. There was flexibility in the design so long as the project works area was within the limits for the project gazetted under the Foreshore and Sea-bed (Reclamations) Ordinance, Cap. 127. One important consideration was to have the smallest scale of reclamation possible so as to minimize the impacts to the seabed and the natural marine habitats.

Site selection

4. Some Members noted that the TTAL site was designated for industrial use while the SKC site was earmarked for leisure tourism and conservation. The proposed setup of the incinerator at SKC would upset the Government's original plan for the island. Besides, reclamation was required for the SKC site but not so for TTAL. Further, the visual impacts brought by the plant were much greater on SKC than in TTAL. On the rationale for preferring SKC over the TTAL option, the project proponent explained that the EIA dimension was only one of the many factors which the Government had to take into account when assessing the acceptability of the two proposed sites for the IW MF project. There were four key strategic considerations in site preference vis-à-vis the overall waste management policy. The artificial island near SKC was opted for the first IW MF based on the following considerations –

- (a) A balanced spatial distribution of strategic waste treatment facilities in Hong Kong, including landfills, sludge treatment facilities, chemical waste treatment centres and refuse transfer stations (RTS). Three landfills were in operation in Tuen Mun, Tseung Kwan O and in northeast New

Territories. There was a large-scale sludge treatment facility (i.e. a sludge incinerator with a design capacity of 2 000 tonnes per day) being built at the site next to TTAL which would be operational by 2013. The chemical waste treatment centre was located in Tsing Yi, and a new organic waste treatment facility was located in Siu Ho Wan, Lantau. The artificial island near SKC was chosen given that it would enable a more balanced distribution of the various strategic waste management facilities in the territory.

- (b) The distance of transfer of waste from the RTS to the proposed IWWMF site. At present, there were two RTS on Hong Kong Island and one in west Kowloon. Three marine vessels were deployed to deliver sealed containers with waste from these RTS to the landfills. The artificial island near SKC was chosen in view of the savings in marine transport distance by about one-fourth as compared with the TTAL site. This could help reduce the impact and carbon dioxide emission.
- (c) Prevailing wind direction and major pollution sources. Wind direction in Hong Kong was predominantly from northeast to southwest. Emission from the proposed IWWMF at the artificial island site would be blown over the sea in the southwestern part most of the time. Given this meteorological phenomenon and that there were much less air pollution sources near SKC than in TTAL, the cumulative air quality impact with the artificial island site would be lower.
- (d) Potential of economic synergy. The IWWMF project would include community and education facilities. This together with ferry service provisions from Cheung Chau to the IWWMF near SKC would generate economic synergy potential with the neighbouring islands such as eco-tourism and leisure fishing.

5. Some Members noted that it was estimated that the three landfills would be filled up by early to mid 2018, but that the construction of the IWWMF at the site near SKC would be completed only by 2018-2019, whereas that for the TTAL site would be by 2017. Regarding the measures which the Government had in mind in handling the refuse generated during that one-year gap, the project proponent explained that, as promulgated earlier this year, the Government had adopted a three-pronged approach on waste management, including enhancing measures on waste reduction and recycling; introducing

modern waste treatment facilities and extending the landfills. Specifically the new initiatives such as the proposed extension of the plastic bag levy, the proposed WEEE scheme, the coming consultation on the proposed waste charging scheme, the setting up of community recycling networks, the Environment and Conservation Fund (ECF) scheme for food waste reduction and recycling in private housing estates, and the development of organic waste treatment facilities, etc. would all help extend the operational lifespan of the landfills.

6. A Member was concerned of the limited handling capacity of the food waste treatment plant in Siu Ho Wan in face of the overall food waste generated in Hong Kong per day. He enquired about the estimation of the total volume of food waste that could be reduced/recycled by the proposed measures vis-à-vis the pressure to be released from the landfills. The Government was also urged to spearhead measures on waste reduction and recycling and not to plan for building another incinerator following the proposed IWMF model. It was pointed out that there was already an existing site in Tuen Mun for cement production which could be developed as an eco-co-combustion plant which could be developed as an alternative for waste treatment with even higher processing capacity and lower setup and running costs than the proposed incinerator at SKC.

7. The project proponent explained that with the support of the community, Hong Kong had achieved a waste recovery rate of 52%. The government would continue to vigorously promote waste reduction at source and waste recycling through behavioural change brought about by education, partnership with non-government organizations (NGOs) and various subsidy schemes. Regarding the Green Island Cement's proposed eco-co-combustion plant, it had actually been considered in the technology review carried out in 2009 under the IWMF engineering study and was found to be not suitable for the first IWMF. A pilot plant trial of the proposed eco-co-combustion system for waste treatment had been launched by the private company for two months in 2005. The daily processing capacity was only a few tonnes and there was no further development to demonstrate the applicability of this technology. During the study for this project, there were no sound examples of the eco-co-combustion system with similar installations in other countries for comparison. With no proven track record, it was considered too risky for the Government to adopt such technology for the IWMF of the present scale.

8. Some Members considered that the construction of an artificial island through reclamation would not minimize the impacts on the overall environment in SKC. Rather, it would just shift the impacts from the land habitats to the marine ecology. The project proponent explained that during the site selection process, all existing marine parks and the potential sites for marine parks with important conservation status had been excluded. The proposed artificial island would lie in a stretch of water which was not an existing/proposed marine park/reserve. The selection of IWWMF site had avoided the area around Soko Islands which was the only marine habitat in Hong Kong with frequent sighting of both Finless Porpoise and Chinese White Dolphins. It was pointed out that Finless Porpoise had a very wide activity range outside the SKC area. Besides, the IWWMF design had taken measures to minimize the potential environmental impacts of the project, for example the size of reclamation had been reduced by 40% by using vertical cofferdam whereas dredging volume had been reduced by over 2 million m³ through the choice of better dredging method. These would significantly reduce the impact on the habitat of Finless Porpoise and have only minimal impact on the marine ecology nearby.

9. A Member raised disagreement to developing the IWWMF on the artificial island near SKC in view of the visual impacts of the development on the natural landscape of the island, in parallel with the permanent damage to the marine ecology and loss of marine habitats thereat. He also raised disagreement on the Government's efforts in implementing the IWWMF project and on its assessment on the need for further development of similar facilities and the way forward. The meeting agreed to refine the wordings of the relevant condition to reflect the concern.

Choice of technology

10. The project proponent confirmed that the technology used for the plant was the best available technology with proven track records. On the plasma gasification technology which, according to some public comments, was the latest technology that some European countries were using and would entail a shorter construction time and at a lower cost, the project proponent explained that the plasma gasification technology was not considered because it was mainly used for treating industrial waste or hazardous waste on a small scale and had only limited applications for treating municipal solid waste (MSW). The plasma gasification technology had been reviewed in 2009 and the assessment results remained that it was not suitable for the IWWMF. The moving grate

incineration technology was recommended as the core technology for the IWMF in view of its well-proven effectiveness in terms of processing capacity and reliability.

11. The project proponent confirmed that the present technology was the best one as advised by an advisory group comprising representatives from different green groups, professionals and academics. The advisory group had reviewed waste treatment technologies submissions by local and overseas companies and concluded in 2005 that incineration technology be recommended as the core technology for the proposed IWMF. The Administration had commissioned the consultant for the IWMF engineering and EIA studies and also conducted a review on different technologies and presented the findings to the ACE in 2009 which came to the same conclusion. Discussions had been made with the major suppliers and experts overseas during the review of the technology. Tetronics UK had a number of installations for hazardous waste treatment and but just one plant for treatment of MSW together with refuse-derived-fuel and biomass waste.

Logistics arrangements for the IWMF plant to be set up in the SKC site

12. On the volume of vessel traffic transferring MSW to the IWMF and its impact on the Finless Porpoises, the project proponent explained that there were altogether only three return trips for MSW transportation vessels daily. Besides, the vessels would be required to slow down when they came close to the sites where Finless Porpoises were frequently spotted, hence the impact on them due to marine traffic should be relatively small. Regarding how the construction and operation of the incineration plant might affect fish yield as well as the Government's fisheries enhancement measures, the project proponent explained that the affected area near SKC was of relatively low production area with about 100-200 kilograms per hectare, and the area of 31 hectares affected by the proposed reclamation would be relatively insignificant as compared to the overall fishing ground in Hong Kong. As such, the impact on fisheries should correspondingly be small. As regard the enhancement measures, the Government had proposed to designate a 700-hectare marine park to the east of Soko Islands, and to implement measures such as release of fish fry and deployment of artificial reefs in the area to enhance marine ecology including fish yield in and around the proposed marine park. The Administration would seek to complete the designation of the marine park before the commissioning of the IWMF facilities at the artificial site near SKC.

13. On concerns expressed by some public comments that the marine park might deprive the fishermen of their area of operation and thereby would affect their livelihood, the project proponent explained that the Administration would introduce well-proven enhancement measures to enhance fisheries resources in and around the marine park area. They would also adopt very stringent control measures during reclamation works to reduce the release of suspended solid to the marine environment which might affect fisheries.

14. On the time required for the marine park to take effect in restoring/enhancing fish yield as well as the progress of the fisheries enhancement programme, including eco-tourism and recreational fishing, as recommended by the ACE in April 2011, the project proponent said that findings on the beneficial effects of the fisheries enhancement programme conducted by the Agriculture, Fisheries and Conservation Department (AFCD) had been positive. With the funding application and submission to the Legislative Council already in the pipeline, the Administration would soon commission a study to determine the detailed requirements of the proposed marine park in parallel with the IWMP planning and design works. Regarding the promotion of eco-tourism, the Administration had stepped up its liaison with fishermen's associations on how fishing industry might contribute to eco-tourism. Previous experience in Sai Kung had been encouraging. The Government and AFCD had been working closely with the Tourism Board and fishermen's organizations in promoting the concept of eco-tourism and would make reference to the valuable experience gained with the opening of the Hong Kong Global Geopark of China (Geopark).

15. On the proposed completion time for the marine park to be designated in the waters between SKC and Soko Islands, AFCD explained that, according to the condition set out in the last meeting, designation of the marine park would immediately follow the completion of the project construction works. It would take some 26 months to complete the designation processes as required under the Marine Parks Ordinance, which included approval from the Executive Council and conduct of public consultations at various levels before putting the plan for consideration/endorsement by the Legislative Council. To better synchronize with the construction schedule of the IWMP project, which was expected to be functional in 2018-2019, the designation work should start in around 2015 the latest. Although it was preferable and appeared feasible to designate the marine park before the commissioning of the IWMP facilities at the SKC site, in order to allow flexibility for both projects to proceed smoothly in parallel, the meeting agreed to make a recommendation to the EIA report that endeavours should be

made to complete the designation of the marine park before the IWMP project became operational.

16. On the suggestion to impose a condition to formulate a fisheries enhancement programme rather than as a recommendation as at present to address the fishermen's concern, it was pointed out that part (b) of the recommendation of the last meeting in respect of the SKC site had two elements, namely to formulate a fisheries enhancement programme and to promote related activities such as eco-tourism and recreational fishing. While the project proponent could formulate a fisheries enhancement programme as requested, the implementation of eco-tourism and recreational fishing would depend on factors such as commercial viability and willingness of the fisherman groups, etc, which were beyond the control of the project proponent. Members agreed that the part on fisheries enhancement programme should be set as a condition for endorsement, and the latter element could be retained as a recommendation to the EIA report.

17. Members noted that the project proponent should endeavour to formulate the fisheries enhancement programme in consultation with AFCD, and wherever appropriate with dialogues and consultations with the fishing community. AFCD had to be satisfied with the enhancement programme before submitting it to the Director of Environmental Protection (DEP) for approval. This had to be done before the commencement of the project construction works.

18. On the use of public fill materials for reclamation, the project proponent clarified that, comparing with the previous EIA report, the total volume of filling materials used for the reclamation remained basically the same, but that there would be more use of public fill whilst the release of suspended solid to the marine water during the reclamation process would be kept to a minimal level such that the impact on the nearby marine ecology would be environmentally acceptable.

Air quality monitoring

19. On the possibility of making dioxin monitoring a continuous rather than an intermittent process as currently proposed in the report in order to address the public concern over the health risk posed by dioxin, the project proponent explained that there was at present no well-recognized and reliable method for instantaneous monitoring of dioxin. Dioxin monitoring was normally performed

in an intermittent manner by stack sampling of the exhaust from chimney and the sample would then be sent to the laboratory for analysis. The EIA proposal had followed the best practices in Hong Kong and the European Union that stipulated that, the minimum requirements for intermittent monitoring was quarterly monitoring for the first 12 months and at half-yearly intervals thereafter. The feasibility of increasing the frequency of monitoring could be reviewed having regard to other comparable facilities in Hong Kong.

20. On the measurement of dioxin level in or near Cheung Chau, Members were advised that a baseline dioxin level had been provided in the EIA report. As the proposed incineration facilities were not yet in operation and there was no other major source of dioxin in Hong Kong, the baseline data in the report could reflect the current dioxin level in the territory. The location for collecting samples of dioxin level should depend on the actual location of the project. As set out in the Environmental Monitoring and Audit (EM&A) Manual, the project proponent was required to submit an air quality monitoring programme which should include measuring the baseline dioxin level before the project was to commence operation. Some Members commented that the measurement of the ambient dioxin level should take place at the height of the chimney(s) of the incinerator rather than by any ground level air quality monitoring station as was the general practice.

21. On the distribution of air quality monitoring stations, the project proponent replied that an air monitoring station would be set up in Cheung Chau if the artificial island site near SKC was chosen. The same arrangement would be made in Tuen Mun should the TTAL site was selected. The meeting agreed that the comprehensive monitoring requirements should be developed at the detailed design stage.

22. On the number of air quality monitoring station(s) to be set up in relation to the project, Members were advised that a main function of the air quality monitoring station was to verify the results of the modeling assessment of the EIA. The location of the new air quality monitoring station should be determined according to the location of the incineration facility but from the technical perspective, it might not be necessary to set up multiple air quality monitoring stations within close proximity. There were already 14 functional air quality monitoring stations evenly distributed over the territory. The data so collected should be representative of the air quality (including dioxin level) nearby. There was also the cost effectiveness dimension which had to be taken

into consideration for setting up new air quality monitoring station(s). The number and location of the air quality monitoring stations needed could be considered in the air quality monitoring programme to be submitted.

23. Suggestions were made by some Members that the monitoring station(s) should be located in proximity to the populated and heavily visited areas so as to help dispel the worries and misconception of the community that the project would lead to the deterioration of the air quality and the environment nearby the incineration facilities. It was also agreed that a clear requirement on air quality monitoring should be incorporated as an improved condition in the report.

Conclusion

24. After discussion, the Subcommittee agreed to recommend to the full Council that the EIA report could be endorsed with some proposed conditions. It had also made some recommendations. The Subcommittee agreed that there was no need to invite the project proponent to attend the full Council meeting.

**EIA Subcommittee Secretariat
December 2011**