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**Public Works Subcommittee**

**Meeting on 8 May 2002**

**Background brief on  
Decommissioning of Cheoy Lee Shipyard at Penny's Bay**

**Purpose**

This paper gives a brief account of the discussions on the environmental and financial implications of the decommissioning of Cheoy Lee Shipyard (CLS) at Penny's Bay.

**Background**

2. CLS was located on the north and eastern shores of Penny's Bay with a site area of about 19 hectares. CLS had been in operation for boat manufacture, repair and maintenance from 1964 to April 2001 when the site was returned to the Government on voluntary surrender<sup>note1</sup> in support of the Hong Kong Disneyland (HKD). The CSL site falls within the area designated for the construction of roads, including the Penny's Bay Section of Chok Ko Wan Link and Road P2, leading to the park. As the decommissioning of CLS was a designated project under the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) which required an Environmental Permit, an EIA study on the decommissioning project was commenced in April 2001. The primary objectives of the study were to analyze the conditions of the CLS site and examine all possible environmental impacts.

3. The EIA report was published on 21 February 2002 for public inspection until 22 March 2002. It revealed the existence of hazardous substances, inter alia, dioxins<sup>note2</sup> in the soil at the CLS site. To return the site to a condition suitable for

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<sup>note1</sup> Apart from a land compensation of \$22.7 million, Government also paid out an ex gratia payment of \$1.48 billion in accordance with the zonal compensation rate for Zone A land which was required for essential project with territory-wide significance.

<sup>note2</sup> Dioxins are highly toxic substances that can bioaccumulate in the fatty tissues of animals and humans. They are carcinogenic and will adversely affect immune and reproductive systems.

development, the EIA report recommended a remediation and clean up plan under which the 30 000 m<sup>3</sup> dioxin-contaminated soil will be excavated and treated off-site in a thermal desorption<sup>note3</sup> plant to be set up at To Kau Wan (TKW). About 600 m<sup>3</sup> of organic oily residue will be generated from the process over a period of one or two years. They will be collected and despatched in batches for incineration at the Chemical Waste Treatment Centre (CWTC) in Tsing Yi. The soil after thermal desorption will be solidified by adding cement to immobilize the remaining metals in the soil.

4. The estimated cost of the decommissioning project is \$450 million in money-of-the-day prices. The project mainly comprises demolition and removal of all existing buildings and structures on the CLS site, excavation and treatment of contaminated soil and implementation of appropriate mitigation measures to avoid or minimize any adverse environmental impacts arising from the decommissioning works.

### **Financial implication**

5 The financial arrangements for the decommissioning of CLS was discussed at the meeting of the Economic Services Panel on 20 March 2002. Members are concerned about the substantial rise in the decommissioning cost from \$22 million quoted in November 1999 to \$450 million in the present proposal. While acknowledging that the rise is attributed to the treatment of dioxin-contaminated soil which is very expensive, members consider that the situation could have been avoided if the decommissioning project was included in the original EIA for HKD. They consider that the Administration has allowed the HKD project to proceed in the absence of the EIA for the decommissioning of CLS in order to adhere to the scheduled opening of HKD to achieve maximum economic gains. As a result, the huge decontamination cost had not been considered during the planning stage and now the community has to bear the consequences.

6. According to the Administration, full-scale site investigation for the EIA for the decommissioning of CLS could not be conducted earlier as permission was not given to enter the site before its voluntary surrender. The original estimate of \$22 million was worked out with reference to previous shipyard decommissioning projects and the then available information relating to the land uses and operation of CLS. Resources had not been earmarked for the treatment of dioxins as these should not be generated from normal operation of shipyards.

7. Given that the extent of contamination at the CLS site is much higher than expected, doubt has been cast on whether CLS had been operating under approved conditions. Questions have therefore been raised on whether CLS should be held responsible for the decontamination cost under the polluter-pays principle.

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<sup>note3</sup> Thermal desorption is an enclosed separation process in which indirect heat is applied to the contaminated soil. Upon indirect heating, the contaminants will be evaporated into gaseous phase, trapped and subsequently condensed for further treatment.

According to the Administration, it is premature to say whether the contaminated soil was generated from the operation of CLS. Government lawyers are still considering the possible legal avenues which might be pursued in relation to the contamination of the site. It is therefore not appropriate to disclose further information on the liability issue.

## **Environmental impact**

8. The environmental impacts of the decommissioning of CLS has been discussed by the Panel on Environmental Affairs at a series of meetings. To ascertain the feasibility of the remediation and clean up plan in the EIA report and the availability of alternative treatment options, relevant parties which included experts in the field of dioxin, green groups and district councils were invited to express their views.

9. On *land contamination*, some experts point out that the dioxin-contaminated soil at the CLS site may have been generated from the burning of waste in pits. Other potential sources of dioxins include polychlorinated biphenals used in paints on ships, which are highly contaminated with furans and dioxins. Questions have been raised on the efficacy of the existing legislation to address land contamination. To prevent similar recurrences, consideration should be given to putting in place a separate legislation on land contamination.

10. On *the recommended treatment for dioxin-contaminated soil*, it is noted that the use of thermal desorption is considered feasible as the first stage in separating and concentrating the dioxin from the contaminated soil. However, there are divergent views on the use of incineration to treat the residue from thermal desorption. Green groups, Greenpeace in particular, point out that the Stockholm Convention<sup>note4</sup> has identified, among other things, incineration as the primary source of dioxins and other persistent organic pollutants (POPs). As such, non-incineration technologies such as Base Catalytic Dechlorination (BCD) and Gas Phase Chemical Reduction should be used to treat the contaminated soil. Two experts on the other hand caution that BCD will generate a more toxic form of dioxin in the event of incomplete dechlorination. Besides, the need to import and test the feasibility of BCD technology, which is not readily available in Hong Kong, will be time-consuming and costly and will in turn delay the remediation plan for the CLS site. They also support the use of incineration to treat the oily residue as this is a well-proven treatment technology with a higher efficiency rate of 99.9999% than that of 99.999% for BCD.

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<sup>note4</sup> Stockholm Convention (SC) is the first global and legally binding agreement on the elimination of the production and the use of persistent organic pollutants (POPs), including dioxin. Signatories to SC have the obligation to continually minimize and ultimately eliminate all anthropogenic sources of POPs.

11. According to the Administration, the use of chemical dechlorination for treatment of residue from thermal desorption will generate five times more by-product which required further treatment, this will result in double-handling and potentially more secondary environmental impacts. Moreover, dechlorination is highly dependent on the characteristics of the feed waste material and a treatability test is therefore required to determine the design parameters for the dechlorination plant. Taking into account the cost and timing implications of setting up a chemical dechlorination plant and conducting the treatability test as well as the fact CWTC can handle incineration of the residue, chemical dechlorination is considered neither necessary nor practicable.

12. Apart from the treatment methods referred to in the preceding paragraphs, members are also briefed on other alternative treatment methods which include on-site direct incineration and Plasma Waste Converter (PWC) System. The latter is a new waste treatment technology using a non-incineration distraction process which makes use of high temperature ionized gas to convert waste to a vitrified substance.

13. Doubt has been cast on the adoption of the off-site treatment option in view of the risk involved in multiple handling and transport of the dioxin-contaminated soil from CLS and TKW for thermal desorption and of the oily residue from TKW to CWTC at Tsing Yi for incineration. According to the Administration, the organic residue from thermal desorption will have to be transported to CWTC for treatment irrespective of the choice of option, be it on-site treatment at CLS site or off-site treatment at TKW. To lower the risk of contamination, the 30 000 m<sup>3</sup> dioxin-contaminated soil will be transported from CLS to TKW via a dedicated non-public haul road by top-sealable roll-off trucks under speed control and the escort of two other vehicles (one in the front and one at the back). The health risk in relation to inhalation of dioxin in case of transportation accident is much lower than the acceptable health risk. The 600 m<sup>3</sup> of oily residue generated will be collected and transported to CWTC by batches in sealed drums. The inherent risk arising from transportation of the oily residue is also very low given the non-volatile, insoluble and low inflammability nature of the contaminants as well as the adoption of safety measures. A contingency plan will also be drawn up and a site emergency response centre will be set up to manage the effective implementation of the contingency plan.

14. On *the capability of CWTC in handling dioxin-contaminated material*, the Administration's explanation is that the incinerator at CWTC is required to meet a minimum destructive and removal efficiency of 99.9999% for polychlorinated biphenyls, dioxins and furans, polychlorophenols and polychlorobenzenes. There is regular monitoring of dioxin emission from CWTC from the stack and ashes. According to the monitoring results in 2001, the average dioxin concentration is 0.008 ng I-TEQ/m<sup>3</sup> in the flue gas, 0.006 parts per billion (ppb) in the bottom ash and 0.021 ppb in the fly ash, which are all well below the most stringent international emission standard of 0.1 ng I-TEQ/m<sup>3</sup> and the United States Environmental Protection Agency's recommended clean-up level of 1 ppb for soil of residential exposures.

15. Members find the Administration's explanation not convincing. Given the past unpleasant experience with the use of old-type incinerator at Kennedy Town and the strong opposition from residents in Tsing Yi, the Administration should look into other alternative treatment options and should seriously consider treating the dioxin-contaminated soil on site, thereby reducing the transportation risk and dispensing with the need for incineration at CWTC. They stress that public health and safety should not be compromised in order to expedite the HKD project. In response to the Panel's request, the Administration has undertaken to consider other alternatives, which are proven to be more cost-effective, conform to the technical and programming requirements of the project and comply with the statutory requirements under the EIA Ordinance, for treatment of dioxin-contaminated soil as may be proposed by the tenderers.

### **Health impact**

16. Concern has been raised on the occupational safety of workers handling dioxin-contaminated materials. According to the Administration, the thermal desorption plant to be set up at TKW will be an enclosed structure equipped with an air pollution control system to minimize dioxin emission. The dioxin-contaminated soil will be stored in enclosed sheds before treatment. No personnel will be allowed to enter the control zone of the plant without completing proper safety training and wearing protective apparel, gloves and boots. The operation of the plant will be governed by the Factories and Industrial Undertakings Ordinance (Cap. 59). Regular inspection will be conducted by the Labour Department to ensure compliance with the legislative requirements.

17. There is also call for recalling former workers of CLS for medical examination in view of the discovery of dioxins at the shipyard site. According to the Administration, these former workers are unlikely to have been exposed to high airborne concentrations of dioxin in a continuous manner since the average level of contamination at the CLS site is low as compared to the acceptable standard of 1 ppb TEQ. In response to the Panel's concern, the Administration has undertaken to re-consider the subject.

Legislative Council Secretariat

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