

For discussion  
On 27 June 2005

## **Legislative Council Panel on Environmental Affairs**

### **Implementation Plan for the Harbour Area Treatment Scheme Stage 2**

#### **Purpose**

The Harbour Area Treatment Scheme (HATS) is one of the most important environmental programmes undertaken in Hong Kong to improve the water quality of Victoria Harbour. It involves the implementation of an integrated sewerage system that will collect and treat all of our sewage from both sides of the harbour area in an efficient, effective and environmentally sustainable manner. The purpose of this paper is:

- (i) to provide Members with a comprehensive report on the views collected and the preferences expressed during the public consultation exercise for HATS Stage 2;
- (ii) to seek Members' support of a proposal to seek funding approval for about \$166 million from the Capital Works Reserve Fund to move forward with the time-critical next steps for HATS ; and
- (iii) to respond to some points raised by Members at the Panel meeting on 25 April 2005, when the Government's decision on HATS was reported.

#### **Views Expressed during the Public Consultation for HATS Stage 2**

2. The public consultation exercise for HATS Stage 2 was conducted from June to November in 2004. It is clear from the comments received that:

- (i) the community attaches high importance to cleaning up Victoria Harbour as a matter of priority;
- (ii) most people support the centralization of treatment of all the harbour area sewage at Stonecutters Island;

- (iii) while some would like to see both Stages 2A and 2B implemented in one go, the majority opinion is willing to accept a phased programme given the scale of the project, the financial implications, and uncertainty surrounding the future sewage flow build-up;
  - (iv) there are divergent views on the need for disinfection, and in particular the use of the chlorination-dechlorination process; and
  - (v) the community believes that it is worth paying higher sewage charges if the outcome is a cleaner harbour, though there are some concerns about the possible scale of such increases.
3. A full report on the views expressed during the five-month public consultation is attached at [Annex A](#). The report, and all the views submitted during the public consultation, have been posted on the Cleanharbour website ([www.cleanharbour.gov.hk](http://www.cleanharbour.gov.hk)).

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### **Government's Decision on the Way Forward**

4. After considering the views collected, the Government informed Members at the Panel meeting on 25 April 2005 of the next steps in the implementation of HATS Stage 2. To briefly recapitulate, the Government's decision is:
- (i) Through a phased programme, to centralize the treatment of all the harbour area sewage at or near Stonecutters Island;
  - (ii) To aim to complete the first phase, Stage 2A, in 2013/14; this phase would entail (a) construction of a tunnel conveyance system to transfer the currently untreated sewage from the northern and western shores of Hong Kong Island to Stonecutters Island, (b) expansion of the chemical treatment and other facilities at the existing Stonecutters Island Sewage Treatment Works (SCISTW) to cope with the sewage from Hong Kong Island and with projected future increases in sewage flows, and (c) provision of disinfection facilities;
  - (iii) To aim to provide advance disinfection facilities by 2008/09 (the disinfection facilities will be further upgraded, as part of the Stage 2A works);
  - (iv) For the second phase, Stage 2B, to construct a biological treatment facility at a site adjacent to the SCISTW; and

(v) That construction of Stage 2, including the advance provision of disinfection, should be subject to acceptance by the community that the full recurrent costs of the scheme should be recovered through sewage charges; in the case of Stage 2B, an additional proviso is that the timing would also depend upon a review of trends in sewage flows and in water quality, to be conducted in 2010/11.

5. At the meeting on 25 April 2005, Members' initial reactions were that there was a need to look closely at the actual capacity requirements, given an apparently reduced rate of population increase in recent years, and that the proposals for changes to the sewage charging schemes would have to be considered very carefully. Members were also concerned whether the Government has an overall water management plan to encourage water conservation that would lead to less wastewater being generated. Members' concerns are addressed in the following three sections.

### **Total Water Management**

6. To conserve our precious water resources and reduce pollution, the Government has been promoting a number of water conservation initiatives in the territory. Since 2000, the Government has permitted the use of valve-type toilet flushing apparatuses, including the dual-flushing system which can accommodate either a "full-flush" or a "half-flush" of the toilet depending on the need. The permitted maximum flushing volume was also reduced by 50% from 15 liters to 7.5 liters. The decision and the guidelines on how suppliers can apply for the pre-installation test records for their flushing systems was announced in October 2000. With experience accumulated over the years, the Government has incorporated the guidelines for the use of such systems into the Hong Kong Waterworks Standard Requirements. So far, over 40 valve-type flushing apparatuses have been found to be in compliance with test requirements. The comprehensive list of flushing systems that have passed our tests, as well as the relevant circulars and guidelines, have been uploaded to the WSD Homepage at [http://www.wsd.gov.hk/en/plumbing\\_and\\_engineering/index.html](http://www.wsd.gov.hk/en/plumbing_and_engineering/index.html) for easy reference by the general public and professionals.

7. Apart from promoting the new dual-flushing systems, the Government has been exploring alternative water resources such as reuse of treated effluent. The Ngong Ping Sewage Treatment Works, to be completed by August 2005, is the first tertiary sewage treatment plant in Hong Kong. The treated effluent would be used for both toilet flushing and controlled irrigation in the Ngong Ping area. We are also planning to carry out an effluent reuse demonstration scheme in the North District with a view to supplying treated effluent from the Shek Wu Hui Sewage Treatment Plant to some local residents, schools and communities for various uses including toilet flushing, unrestricted irrigation and water

features. With the benefit of first-hand information from these pilot projects, the WSD is making preparations for a study to be commenced later this year aiming to map out a coherent engineering strategy on Total Water Management for Hong Kong.

8. Public education is one of the key elements in Total Water Management, and a new public education programme on water conservation has been launched since January this year.

### **Polluter-Pays Principle - Sewage Service Charges**

9. The sewage service charging scheme was established in 1995. The Government's policy at the time, and since then, has been to subsidize the capital cost of providing sewage treatment services and to recover the operating cost in accordance with the polluter-pays principle.

10. The charges currently levied for provision of sewage services take the form of a Sewage Charge (SC) at the uniform rate of \$1.2 per cubic metre, which applies to all dischargers, and a Trade Effluent Surcharge (TES) which applies to 30 more polluting trades, including restaurants, laundries, and textiles manufacture. For domestic accounts, the SC for the first 12 cubic metres usage in the 4-month billing period is exempted. The unit rate of TES varies according to the strength of the effluent of the affected trades.

11. The SC and TES unit rates, currently aiming to recover 50% of the SC-related operational costs and 100% of the TES-related costs, have never been adjusted since the implementation of the scheme in 1995. In 2003/04, the Government recovered from SC payers \$405 million, equivalent to a recurrent cost recovery rate of 44%. The revenue from TES amounted to \$173 million, representing a recovery rate of 69%.

12. According to the response from the public on their willingness to pay for sewage services in order to have a clean harbour, the Government decided to embark on a sewage strategy which aims at the objective that in the long term the operating costs of providing sewage services shall be fully recovered. For illustrative purposes, if we assume that full cost recovery would have to be achieved at the time of commissioning HATS Stage 2A in 2013/14, then the average household monthly sewage charge bill would have to rise from \$11 now, to about \$26 over the next eight years (at current prices).

13. The rough estimation above has taken into account all committed sewerage improvement works (both HATS and non-HATS). Despite the anticipated increase, the sewage service charge in Hong Kong would continue to be one of the lowest among the

major cities worldwide and would continue to be so even after the completion HATS Stages 2A and 2B.

14. The existing policy target of recovering 100% of the costs of treating effluents of polluting trades is to be maintained. However we intend to conduct a review of the operation of the scheme to address the concerns of the trades, including whether the generic COD values are still appropriate now, and whether the procedure of reassessment can be simplified and the validity period lengthened. The review may affect the quantum of charges to be recovered. Thus it is not possible at this stage to project future increases in the rates of the TES in the same way as we have done for SC. It should be noted however, that since the recovery rate for TES is higher, being 69% in 2003/04 (as against 44% for the SC) the proportionate increase needed to achieve 100% recovery will not be as large as for SC.

### **Capacity Requirements of HATS**

15. The most crucial next step for HATS is to transfer the Hong Kong Island sewage to Stonecutters Island for treatment, so that the continuing unacceptable pollution in the core central area of Victoria Harbour can be alleviated. This will entail constructing new deep tunnels similar to those employed for HATS Stage 1 as shown in [Annex B](#). As the tunnels will be found at great depths up to about 130 m below sea level and fully submerged with continuous sewage flows, it will be impossible to enlarge them once they have been constructed to take additional flows if they are found to have been undersized. Given these facts it is necessary and prudent to take a long-term perspective on likely future growth in population. We will face higher risk of capacity constraints in future if the design capacity is to be trimmed down just because, at this moment in time, the population is growing more slowly than has hitherto been the case. Rather it is more prudent to design for the ultimate population that the HATS service area might accommodate. This is the approach that was taken for the HATS Environmental and Engineering Feasibility Studies (EEFS) which assumed a maximum development scenario accommodating a maximum population of about 6.3 million people. Furthermore it is worth noting that because of the nature of the deep tunnelling works under HATS which will have to be carried out in very congested space already, further reduction in the size of the tunnels would add difficulties to the construction and therefore would not result in any significant reduction in capital cost.

16. In addition to the tunnels it is necessary to consider the need to expand capacity at the SCISTW. The existing facilities at Stonecutters Island have been designed to cope with a flow of 1.7 million cubic metres per day. The combined flows in the HATS service area at the moment (i.e. Stages 1 and 2) amount to 1.85 million cubic metres a day. Thus the capacity is already insufficient. Our plan is to have Stage 2A completed in 2013/14 and,

even with a low rate of projected population growth, a treatment capacity of 2.22 million cubic metres per day for a population of 5.3 million would be required by then. It should be noted that the population projections, flow projections and design capacity will be reviewed in the detailed design stage of the scheme.

### **Immediate Next Steps**

17. In engineering terms, the main constraint on the completion of Stage 2A in 2013 is the construction of the deep tunnel system. Therefore we propose within this year to seek funding approval from the Public Works Sub-Committee (PWSC) of Finance Committee for allocation of about \$166 million (at September 2004 price level) to allow us to proceed with the most time-critical elements. These include the Stage 2A environmental impact assessment and design of the tunnel system, and the extensive ground investigations needed to ensure the design is optimized. The current implementation programme for HATS Stage 2A, which is dependent on the funding allocation and approval, and favourable outcome of the sewage charge review exercise, is shown in [Annex C](#).

18. Whilst the environmental feasibility of the HATS Stage 2A project has already been confirmed in previous studies, it is essential that an environmental impact assessment be conducted to examine in detail the potential environmental impacts that may arise during the construction and operation of the project and to propose appropriate mitigation measures to minimize any such impacts to acceptable levels. We plan to start the EIA study in March 2006 for completion in September 2007, concurrently with the site investigations and other planning and design work.

19. The HATS Stage 2A includes about 20 km of sewage conveyance tunnels to be constructed at great depths. Expert input is required for the planning and design of the tunnels. Besides, there is little existing information about the ground conditions at this depth. It is necessary to carry out an extensive programme of ground investigation at the early stage of the project to provide suitable information for the planning, design, tendering and construction of the tunnel works. Engineering consultants with suitable experience and expertise will be appointed to undertake the planning and design works as well as to advise on the ground investigation works. Early appointment of the consultants will allow sufficient time for carrying out the very complicated and interactive process of investigation, planning and design of the tunnel works. It is our plan to appoint the consultants by early 2006 to enable the commencement of construction by early 2009.

20. The breakdown of the funds requested is as follows:

EIA study	\$ 7 million
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Site investigations	\$ 94 million
Design of the tunnel conveyance system	\$ 53 million
Contingencies	\$ 12 million
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Total	\$166 million

21. If funding approval for these time-critical items is not granted within this year it will not be possible to meet the committed time frame for the project.

**Advice sought**

22. Members are invited to:

- (i) note the results of the community consultation for HATS Stage 2, and the supplementary information provided in paragraphs six to sixteen above; and
- (ii) support the proposal to seek approval from the PWSC for the allocation of about \$166 million to allow the most time-critical elements of the project to proceed as soon as possible.

*Environmental Protection Department*  
*June 2005*