

For information  
on 28 October 1999

**Legislative Council**  
**Panel on Environmental Affairs**  
**Strategic Sewage Disposal Scheme**

**Introduction**

This paper informs Members of the current status of the Strategic Sewage Disposal Scheme (SSDS) in particular progress of the Stage I tunnelling works and the way forward for Stages II, III, and IV.

**Background**

2. The SSDS is an overall sewage collection, treatment and disposal strategy for areas on both sides of Victoria Harbour. It comprises a series of deep tunnels to collect and transfer sewage from the central urban areas of Hong Kong and Kowloon to a centralised treatment works at Stonecutters Island, and then after treatment to a submarine outfall south east of Lamma Island. The schematic design of the Strategy is at Enclosure 1.

**Present Position**

**Stage I**

3. There are altogether seven deep tunnels which have a total length of 25.3 km in the SSDS Stage I. The interim outfall tunnel, which is 1.7 km in length and at a depth of about 100 m below the harbour, has already been completed and is now in operation. The other six sewage collection tunnels comprise two western tunnels from Kwai Chung to Tsing Yi and from Tsing Yi to Stonecutters Island and four eastern tunnels from Tseung Kwan O and Chai Wan to Kwun Tong, from Kwun Tong to To Kwa Wan, and from To Kwa Wan to Stonecutters Island. The depths of these tunnels are up to 150m below ground surface.

4. Works for the six tunnels were originally included in two contracts and scheduled for completion in mid 1997. In mid 1996, the original tunnel contractor responsible for both contracts unilaterally suspended works in all six tunnels, claiming impossibility in complying with the contract specification. This finally

led to the forfeiture of the two contracts in December 1996 and re-tendering of the works. The tunnelling works are now contained in three separate contracts with two tunnels per contract. The contract for completing the western tunnels was awarded in July 1997. The other two contracts for completing the eastern tunnels were awarded in January last year.

***Progress of Tunnelling Work***

5. At present, a total of 14.4 km of tunnels has been excavated; and about 9.2 km of tunnels remains to be excavated. A summary progress chart showing the weekly cumulative percentage completion of the six tunnels from the beginning of the first completion contract (i.e. July 1997) is at Enclosure 2.

6. Progress of excavation works for each of the six sewage collection tunnels up to 18 October 1999 is tabulated as follows :

Tunnel	Total Length (m)	Length excavated by previous contractor before forfeiture		Length excavated by new contractors to date		Total Length excavated to date	
		(m)	(%)	(m)	(%)	(m)	(%)
AB : Chai Wan to Kwun Tong	4830	625	12.9%	1453.6	30.1%	2078.6	43.0%
C : Tseung Kwan O to Kwun Tong	5332	188	3.5%	4638.4	87.0%	4826.4	90.5%
D : Kwun Tong to To Kwa Wan	3572	188.5	5.3%	1632.6	45.7%	1821.1	51.0%
E : To Kwa Wan to Stonecutters Island	5495	123.6	2.2%	2190.5	39.9%	2314.1	42.1%
F : Tsing Yi to Stonecutters Island	3580	481.2	13.4%	2076.9	58.0%	2558.1	71.5%
G : Kwai Chung to Tsing Yi	779	112.5	14.4%	668.3	85.8%	780.8	100%
<b>Total length in metres =</b>	<b>23588</b>	<b>1718.8</b>	<b>7.3%</b>	<b>12660.2</b>	<b>53.7%</b>	<b>14379.1</b>	<b>61.0%</b>

At the last briefing on 4 May 1999, we informed Members that excavation for the six tunnels was about 33% completed. Since then and up to 18 October 1999, another 6.6 km of tunnels have been excavated, bringing the total to 61%.

***Challenges Tackled***

7. The tunnelling works have achieved steady progress this year. A total length of 10.3 km (44%) has been excavated so far. The ground which has been traversed includes the Lead Mine Pass Fault at Tunnel F; the Waterloo Road Fault at Tunnel E; and the Rennie's Mill Fault at Tunnel C. Moreover, the tunnel boring machines have also gone through zones of fractured rocks with rather heavy ground water inflows. The contractors have demonstrated their competence in carrying out tunnelling works under difficult ground conditions. We are aware of the

presence of difficult grounds in the remaining tunnel lengths and therefore the need for undertaking precautionary ground treatment work, where required, ahead of the tunnel boring activities.

8. The general progress of works in Tunnels D and E has more recently been affected by machinery breakdowns. The drive shaft of the tunnel boring machine in Tunnel D was found to be seriously damaged in early June this year. Repair work is being carried out and this major failure is expected to cause about 5 months' delay to the works in this tunnel.

### ***Looking Ahead***

9. Based upon experience to date, we believe that a more realistic assessment of completion dates ought to take account of time lost due to unplanned equipment breakdowns and the possibility of having to undertake additional precautionary ground treatment work in some locations of the remaining tunnel lengths. Allowing for these matters and the progress achieved so far, we believe that it is realistic to expect completion of the works in all tunnels in the second half of year 2001.

### **Stages II, III, and IV**

10. SSDS Stages II, III, and IV comprise the construction of collection tunnels on Hong Kong Island and a tunnel from Hong Kong Island to the treatment plant on Stonecutters Island, upgrading the treatment system to include disinfection, and building a longer tunnel that will discharge treated sewage outside the harbour area. As the Chief Executive pointed out in his Policy Address this year, while the general strategy for collecting and treating sewage from the main urban area remains sound, experience with Stage I suggests that we need to review the completion dates and the cost estimates of the later stages of SSDS to see if any amendment is required. To this end, we will invite experts to form an International Review Panel (IRP) within the next few months to examine whether the present plans remain the most cost-effective and environmentally friendly means for handling the sewage from Hong Kong Island.

11. The IRP will also consider whether there are alternative strategies to Stages II, III, and IV which might be preferable in terms of cost, programme, engineering feasibility and environmental factors. To facilitate the process, Environmental Protection Department (EPD) and Drainage Services Department (DSD) will prepare information including sewage quantity and quality as well as potential treatment levels. This information will be made available both to the IRP and to any interested parties. As well as EPD and DSD presenting their proposals to the IRP, interested parties will be invited to submit alternative strategies for consideration, drawing on the data made available. Should the IRP recommend

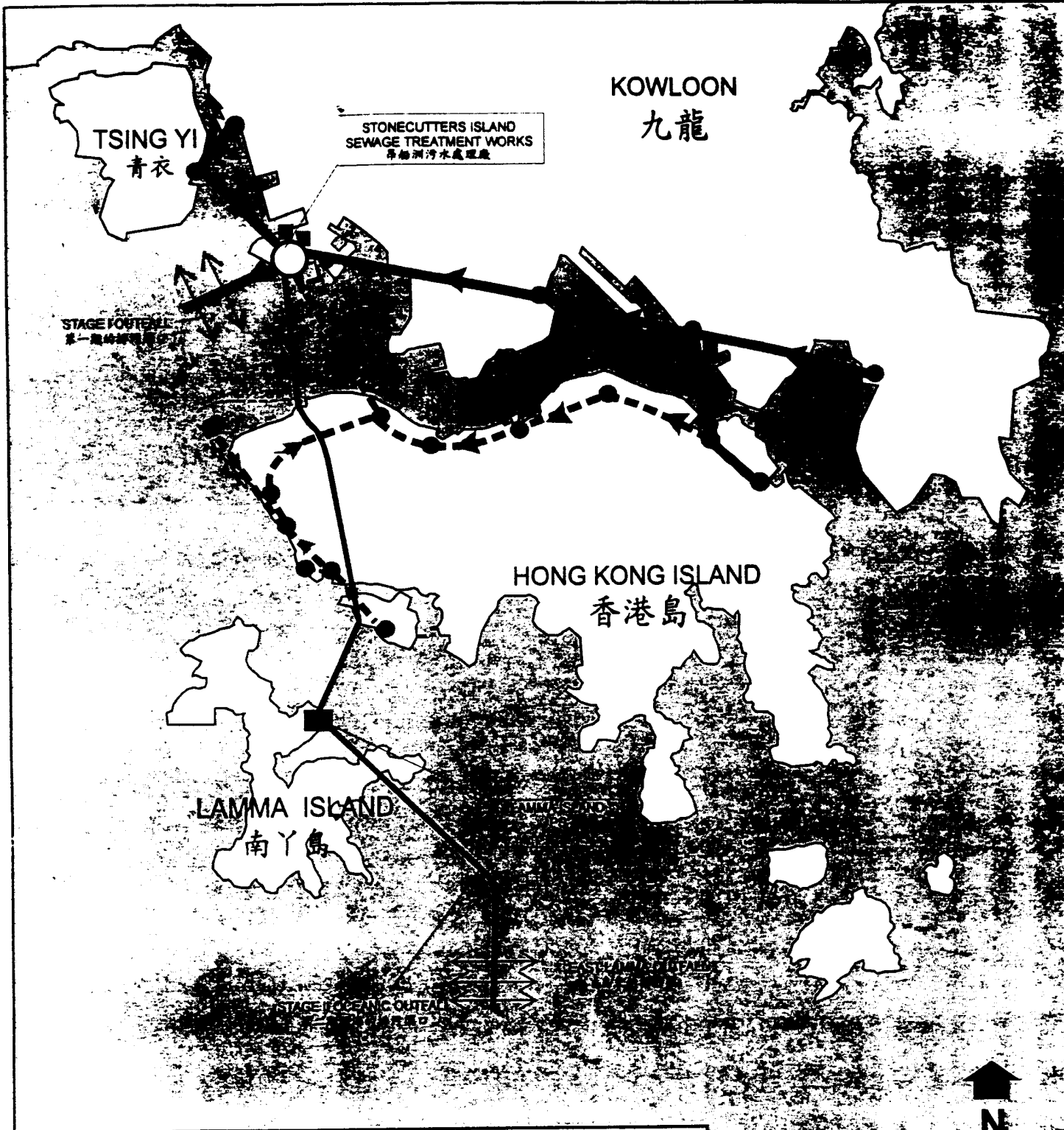
that any one or more of the alternatives proposed have significant merit in terms of cost, programme, engineering feasibility and environmental benefit, these will be investigated further.

12. It is intended that the IRP should consist of five experts: none of whom may have a vested interest in the outcome of the review. Selection of members of the IRP is now underway. In order to tap on experience and to expedite the review, we will seek to make use of the service of the members of the 1994/95 IRP who are familiar with the background to the project (i.e. the three experts from the Mainland, USA, and Denmark). The original IRP members this time will be joined by an international renowned tunnelling expert whose role will be to review the engineering feasibility of deep tunnels for subsequent stages of SSDS with particular attention to cost and programme. We also intend to invite the Hong Kong Institution of Engineers to nominate a member to bring in local perspective to the issue.

13. The formation and appointment of the IRP is expected to take three months. The review itself is likely to take about nine months but this will depend upon how the process develops and the number of alternatives proposed. We expect that the IRP will meet with various parties such as this panel, the Advisory Council on the Environment, professional institutions, academics, and green groups before preparing its recommendations.

## **Conclusion**

14. We have tackled different technical obstacles since resumption of the tunnelling works in SSDS Stage I. This has provided us valuable experience for excavating the remaining tunnel lengths. We will continue to work hard to achieve our objective of completing the tunnels safely, professionally and at the earliest possible date. At the same time, through the IRP, we will examine which is the most effective strategy in terms of cost, programme, and the environment for the remaining stages.



LEGEND 圖例:

- |       |                         |   |                          |
|-------|-------------------------|---|--------------------------|
| —     | STAGE I<br>第一期          | ● | SCREENING PLANT<br>污水隔濾廠 |
| - - - | STAGE II<br>第二期         | ■ | PUMPING STATION<br>抽水站   |
| · · · | STAGE III / IV<br>第三/四期 |   |                          |

SCHEMATIC DIAGRAM OF STRATEGIC  
SEWAGE DISPOSAL SCHEME

策略性污水排放計劃示意圖



香港特別行政區政府  
環境保護署  
GOVERNMENT OF THE HKSAR  
ENVIRONMENTAL  
PROTECTION DEPARTMENT

Enclosure 1 附件一

**Completion Contractors' Tunnel Excavation Progress - Overall % Completion**

