For discussion **PWSC(2000-01)65**
on 22 November 2000

ITEM FOR PUBLIC WORKS SUBCOMMMITTEE OF FINANCE COMMITTEE

HEAD 705 - CIVIL ENGINEERING
Environmental Protection – Pollution Control
51DP – Environmental improvement of Shing Mun River

Members are invited to recommend to Finance Committee -

(a) the upgrading of part of **51DP**, entitled "Environmental improvement of Shing Mun River - Stage 1", to Category A at an estimated cost of $70.0 million in money-of-the-day prices; and

(b) the retention of the remainder of **51DP** in Category B.

PROBLEM

The contaminated sediments accumulated on the riverbed of Shing Mun River (the River) release obnoxious odour and cause environmental problems in both the River and its neighbourhood.

/PROPOSAL .....

PROPOSAL

2. The Director of Civil Engineering, with the support of the Secretary for the Environment and Food, proposes to upgrade part of **51DP** to Category A at an estimated cost of $70.0 million in money-of-the-day (MOD) prices to implement Stage 1 of the environmental improvement works for the River.

PROJECT SCOPE AND NATURE

3. We will carry out the environmental improvement works for the River in two stages. The Stage 1 works under **51DP** which we now propose to upgrade to Category A comprise -

(a) bioremediation of about 16 hectares of polluted riverbed (see paragraph 7 below);

(b) the dredging of about 144 000 cubic metres (m^3) of riverbed sediments;

(c) minor engineering works including improvements to a small portion of the river channel lining;

(d) the implementation of environmental mitigation measures; and

(e) the implementation of environmental monitoring and audit (EM&A) programme for works mentioned in items (a) to (d) above.

A location plan on the Stage 1 works is at Enclosure 1. We intend to start the proposed works in March 2001 for completion in December 2002.

4. The Stage 2 works in the remainder of **51DP** include -

(a) monitoring the long term effectiveness of the bioremediation works and formulating a maintenance programme; and

(b) supplementary dredging and bioremediation of riverbed sediments.

We plan to start this stage of the works in January 2003 for completion by December 2005.

/JUSTIFICATION .....

JUSTIFICATION

5. The River became heavily polluted in the 1980s due to rapid increase in population in Sha Tin and indiscriminate discharges from industrial, commercial, livestock and domestic sources. Following the declaration of the Tolo Harbour and Channel Water Control Zone under the Water Pollution Control Ordinance (WPCO) in 1987, the implementation of the revised Livestock Waste Control Scheme in 1994 and the phased provision of sewerage network for the unsewered villages in the Shing Mun River Catchment under the Tolo Harbour Stage I sewerage scheme, the pollution load discharging into the River has been reduced by 91%. However, the accumulation of sediments heavily contaminated with organic matters on the riverbed over the years continues to adversely affect the water quality, releasing obnoxious odour at times and suppressing the development of a balanced ecology within the estuarine system. The continued use of the River for recreation purposes, including rowing and boating, will also be jeopardized if no treatment is rendered. To ensure further improvement of the water quality of the River, it is necessary to maintain the sewerage connection programme and, at the same time, carry out improvement works to remove the pollutants in the river bed.

6. In 1996, the Environmental Protection Department commissioned a study to formulate the most cost-effective and environmentally-acceptable methods of tackling the contaminated sediments. The study concluded that a combined strategy of bioremediation, dredging and minor engineering works would be the most cost-effective and environmentally-acceptable means of solving the problem.

7. The bioremediation process involves the injection of chemicals into the sediments on the riverbed. Micro-organisms in the River will then utilize the chemicals to convert organic matter within the sediments into harmless natural materials such as carbon dioxide and water. Bioremediation will be applied initially to sections of the River with the most severely polluted sediments and then to other sections in phases. Dredging will also be conducted at selected sections to enhance the effectiveness of bioremediation. Minor engineering works, including the improvement of a small portion of the river channel lining, would also be undertaken to minimize the future accumulation of sediments on the riverbed.

8. We anticipate that upon completion of this project, the odour problem in the area treated will be largely reduced and dissolved oxygen in the water will increase. This will lead to a healthier ecological system in the River and will benefit local residents as well as visitors and spectators taking part in various rowing and boating activities.

/9. .....

9. Bioremediation, which has proved to be effective in tackling contaminated sediment, is a new technology in Hong Kong. Due to the lack of in-house expertise, we propose to employ consultants to provide specialist advice on the implementation of the bioremediation works.

FINANCIAL IMPLICATIONS

10. We estimate the capital cost of the project to be $70.0 million in MOD prices (see paragraph 11 below), made up as follows -

		$ million	
(a)	Bioremediation	39.2	
(b)	Dredging	12.4	
(c)	Minor engineering works	1.4	
(d)	Environmental mitigation measures	1.0	
(e)	EM&A programme	3.8	
(f)	Consultants' fees for bioremediation	3.0	
(g)	Contingencies	6.1	
	Sub-total	66.9	(in September 2000 prices)
(h)	Provision for price adjustment	3.1	
	Total	70.0	(in MOD prices)

A breakdown of the estimate for consultants' fees by man-months is at Enclosure 2.

11. Subject to approval, we will phase the expenditure as follows -

Year	**$ million (Sept 2000)**	**Price adjustment factor**	**$ million (MOD)**
2000 – 2001	0.2	1.00000	0.2

/2001 - 2002 .....

Year	$ million (Sept 2000)	Price adjustment factor	$ million (MOD)
2001 – 2002	20.8	1.02550	21.3
2002 – 2003	45.4	1.05627	48.0
2003 – 2004	0.5	1.08795	0.5
	66.9		70.0

12. We have derived the MOD estimate on the basis of the Government's latest forecast of trend labour and construction prices for the period from 2000 to 2004. We will tender the proposed works under a standard remeasurement contract because the extent of the bioremediation and dredging works may vary according to the actual ground conditions. The contract will not provide for inflation adjustments because the contract period will not exceed 21 months. The consultants' fees will be payable on a time-charge basis as advice on bioremediation would only be required on a needs basis.

13. The Stage 1 works will not give rise to any additional recurrent expenditure.

PUBLIC CONSULTATION

14. We consulted the Health and Environment Committee of the then Sha Tin Provisional District Board on 7 May 1998 on the proposed environmental improvements. Members supported the proposed works. They also requested the Government to expedite the proposed works and to allocate more resources to improving the condition of the River.

15. We presented the proposal at a Case Conference of the Legislative Council (LegCo) in September 1999. Members supported the proposed environmental improvements.

16. We briefed the LegCo Panel on Environmental Affairs on the current conditions of the River and consulted them on the proposed improvements on 7 November 2000. Members supported the proposed works and urged the Administration to explore the possibility of expediting the project (see paragraph 22 below).

/ENVIRONMENTAL .....

ENVIRONMENTAL IMPLICATIONS

17. The project is not a designated project under the Environmental Impact Assessment (EIA) Ordinance. We completed an environmental review in 1998. The environmental review concluded and the Director of Environmental Protection agreed that the proposed works would not have long-term adverse environmental impacts. For short-term water quality impact during the implementation of works, we will implement mitigation measures including the use of closed grab dredgers and silt curtains to control the impact to within established guidelines. We will include in the relevant works contract standard pollution control clauses for controlling dust, noise and site run-off nuisance during construction. We estimate the cost of implementing the environmental mitigation measures to be $1.0 million and we have included this in the overall project estimate.

18. No construction and demolition material will be generated from the proposed works. Contaminated riverbed sediment generated by the project will be disposed of at East Sha Chau in an environmentally-acceptable manner.

LAND ACQUISITION

19. The proposed works do not require any land acquisition.

BACKGROUND INFORMATION

20. In January 1996, we commissioned a study to formulate the most cost-effective and environmentally-acceptable methods of tackling the contaminated sediments in the River and charged the cost of $6 million to the former block allocation Subhead 5003CX[1]. The study concluded that a combined strategy of bioremediation, dredging and minor engineering works would be the most cost-effective and environmentally-acceptable means of solving the problem.

21. In April 2000, we engaged consultants to provide specialist advice on the detailed design of bioremediation works in the River and charged the cost of $1.0 million to the block allocation Subhead 5101CX. We completed the design work in September 2000.

/22. .....

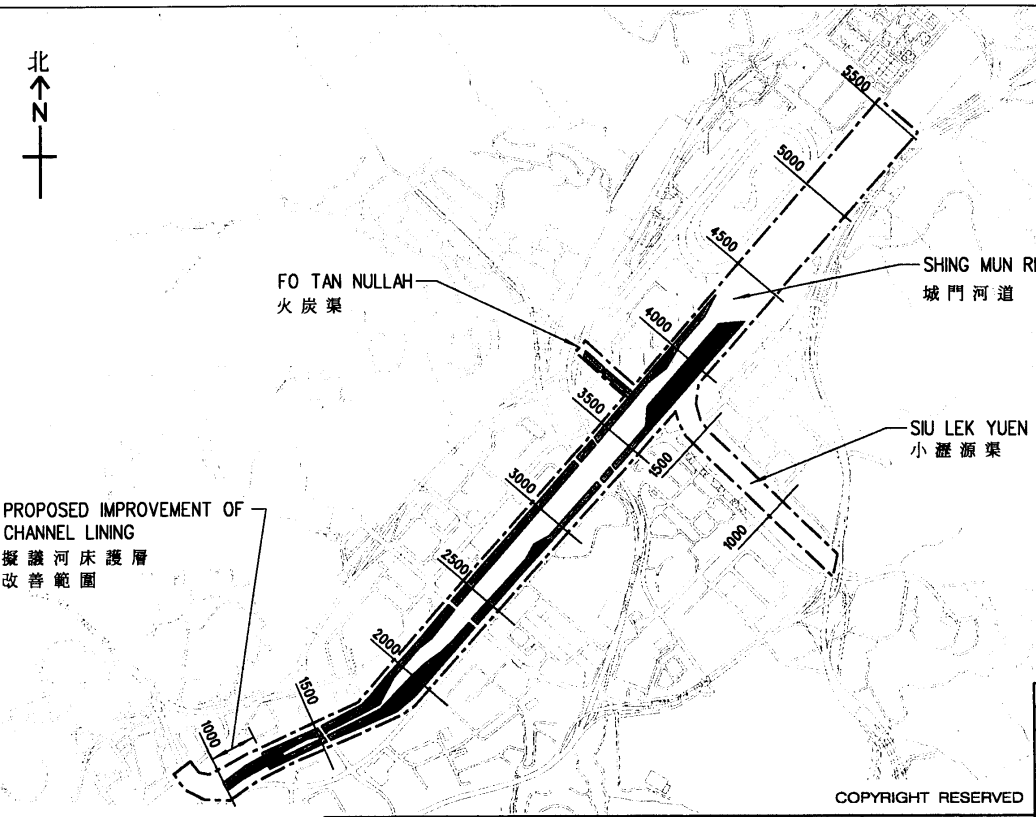
[1] The former block allocation Subhead 5003CX is now replaced by Subhead 5101CX "Civil engineering works, studies and investigations for items in Category D of the Public Works Programme".

22. We intend to start the proposed works in March 2001 for completion in December 2002. Taking into account the views expressed by Members of the LegCo Panel on Environmental Affairs on 7 November 2000, we have critically reviewed the construction programme and are satisfied that it is a reasonable estimate since bioremediation is a new technology in Hong Kong and there are physical constraints on working in the River. However, we shall specify in the construction contract the need for the more seriously polluted areas to be treated first. We aim to complete works in these areas some nine months ahead of the remainder of the project.

23. The Stage 2 works will involve monitoring the long term effectiveness of the Stage 1 works and formulating a maintenance programme for the whole estuarine system. Subject to the results of the monitoring programme, we will undertake supplementary bioremediation and/or dredging where necessary.

24. We estimate that the Stage 1 works will create some 25 jobs comprising five professional/technical staff and 20 labourers, totalling 475 man-months.

Environment and Food Bureau
November 2000



LEGEND 圖例:

SITE BOUNDARY 工地範圍

AREA OF DREDGING 疏浚範圍

no.	date	description	checked	approved
D	19.10.00	MINOR AMENDMENT	SIGNED	SIGNED
C	3.10.00	MINOR AMENDMENT	SIGNED	SIGNED
B	20.9.00	CHINESE TRANSLATION ADDED	SIGNED	SIGNED
A	20.9.00	SITE BOUNDARY ADDED	SIGNED	SIGNED

NOTES :

1. EXTENT OF BIOREMEDIATION
   淤泥生化處理範圍
   (i) SHING MUN RIVER CHANNEL - CH1200-5500
   城門河道 - 丈量長度 1200-5500
   (ii) FO TAN NULLAH - CH1000-1400
   火炭渠 - 丈量長度 1000-1400
   (iii) SIU LEK YUEN NULLAH - WHOLE
   小瀝源渠 - 全段

title 名稱
PWP ITEM No. 51DP
ENVIRONMENTAL IMPROVEMENT OF SHING MUN RIVER - IMPROVEMENT REQUIREMENTS
工務計劃項目第 51DP 號
城門河環境改善工程 - 改善範圍

	name	initial	date
drawn	M F YUEN	SIGNED	7-12-98
checked	T S TSUI	SIGNED	7-12-98
approved	K M LEUNG	SIGNED	7-12-98

office TECHNICAL SERVICES DIVISION 工程技術部
CIVIL ENGINEERING OFFICE 土木工程處

drawing no. 圖則編號 TS 1302D

scale 比例 1:25 000

CIVIL ENGINEERING DEPARTMENT
HONG KONG 土木工程署

A4 210 x 297

Enclosure 2 to PWSC(2000-01)65

5051DP - Environmental improvement of Shing Mun River

Breakdown of estimate for consultants' fees

Consultants' staff costs			Estimated man-months	Average MPS* salary point	Multiplier factor	Estimated fee ($ million)
(a)	Specialist advice for bioremediation during the tender and construction stage	Professional	14.0	38	2.4	1.9
		Technical	25.0	14	2.4	1.1
				Total consultants' staff costs		3.0

* MPS = Master Pay Scale

Notes

1. A multiplier factor of 2.4 is applied to the average MPS point to arrive at the full staff costs including the consultants' overheads and profits, as the staff will be employed in the consultants' offices. (At 1.4.2000, MPS pt. 38 = $57,525 p.m. and MPS pt. 14 = $19,055 p.m.)

2. The figures given above are based on estimates prepared by the Director of Civil Engineering. We will only know the actual man-months and fees when we have selected the consultants through the usual competitive bid system.

[DP51-04.DOC]