For discussion **PWSC(2002-03)25**
on 22 May 2002

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE
Environmental Protection – Sewerage and sewage treatment
61DS – Northwest New Territories development – trunk sewers, sewage pumping stations and rising mains – stage 3

Members are invited to recommend to Finance Committee the upgrading of the remainder of **61DS** to Category A at an estimated cost of $61.3 million in money-of-the-day prices.

PROBLEM

There is no sewerage infrastructure to serve the new developments in Areas 13 and 14 in Yuen Long South.

PROPOSAL

2. The Director of Drainage Services (D of DS), with the support of the Secretary for the Environment and Food, proposes to upgrade the remainder of **61DS** to Category A at an estimated cost of $61.3 million in money-of-the-day (MOD) prices for implementing the Northwest New Territories development – trunk sewers, sewage pumping stations and rising mains – stage 3 works.

PROJECT SCOPE AND NATURE

3. The remainder of **61DS** we now propose to upgrade to Category A covers sewerage works for Areas 13 and 14 located in Yuen Long South. A location plan is at Enclosure 1. The scope of works comprises the construction of –

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(a) about 3 kilometres (km) of trunk sewers, ranging from 300 millimetres (mm) to 750 mm in diameter; and

(b) a sewage pumping station and the associated 630 metres (m) of twin rising mains of 400 mm in diameter.

We plan to start the proposed works in October 2002 for completion in November 2005.

JUSTIFICATION

4. Areas 13 and 14 (the Areas), currently with a population of about 10 000, are located in the southern extension of Yuen Long Town. At present, domestic sewage from the Areas is partially treated by private treatment facilities. Most of these treatment facilities are septic tanks with soakaway systems in village houses.

5. According to the Yuen Long Outline Zoning Plan gazetted in 1995, the Areas are mainly planned for village and residential development. A number of new residential developments are now under construction while two new developments are also under active planning. We estimate that the projected population of the Areas will increase gradually to about 62 000 in 2011 and generate about 17 200 cubic metres (m^3) of sewage per day by then. Hence, there is a need to construct new trunk sewers to meet the increase in demand for sewage services in the Areas.

6. Due to the topography of the site where the proposed sewers would be placed, we will have to construct a sewage pumping station and the associated rising mains to uplift the sewage collected to the proposed trunk sewers and the existing public sewers for treatment in San Wai Sewage Treatment Works. Upon completion of the proposed works, we will be able to give proper treatment to the sewage collected in the Areas before it is discharged into Urmston Road waters, thereby help improve the water quality of Deep Bay.

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7. Part of the proposed sewerage works falls within the works sites of two roadworks projects **27CG**[1] "Yuen Long south eastern extension – site formation, roads and drainage works" and **28CG**[1] "Yuen Long south western extension – site formation, roads and drainage works", which are to be implemented by the Director of Territory Development (DTD). Subject to funding approval by Finance Committee, these roadworks projects will commence in November 2002 for completion in May 2005. To avoid interface problems arising from two contractors working on the same site and minimise public inconvenience arising from road openings, we will entrust part of the proposed sewerage works to DTD for construction under **27CG** and **28CG**. D of DS will invite contracts for implementation of the remaining part of the proposed works.

FINANCIAL IMPLICATIONS

8. We estimate the capital cost of the proposed works to be $61.3 million in MOD prices (see paragraph 9 below), made up as follows –

		$ million
(a)	Trunk sewers and rising mains	26.7
(i)	About 2.96 km of trunk sewers	18.6
(ii)	About 0.04 km of trunk sewers by trenchless method	2.6
(iii)	About 0.62 km of rising mains	4.2

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[1] A related paper, PWSC(2002-03)29, for the upgrading of **27CG** and part of **28CG** under **Head 707** to Category A is submitted for Members' consideration at this meeting.

	(iv) About 0.01 km of rising mains by trenchless method[2]	1.3		
(b)	Sewage pumping station		25.2	
	(i) civil works	15.7		
	(ii) electrical and mechanical works	9.5		
(c)	Environmental mitigation measures		1.2	
(d)	Consultants' fees[3] for		4.8	
	(i) contract administration	0.6		
	(ii) site supervision	4.2		
(e)	Contingencies		4.4	
	Sub-total		62.3	(in September 2001 prices)
(f)	Provision for price adjustment		(1.0)	
	Total		61.3	(in MOD prices)

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[2] Trenchless method refers to the use of micro-tunnelling or boring techniques to construct underground sewers and drain pipes underneath the existing drainage channels or box culverts. Although the trenchless method is about four times more expensive than the conventional open cut method, the former method, if feasible, is preferred as it would not affect the capacity of the existing major drainage channels or box culverts.

[3] The consultants' fees would cover part of the proposed works under **61DS** to be implemented by DTD in roadworks projects **27CG** and **28CG**.

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

9. Subject to approval, we will phase the expenditure as follows –

Year	$ million (Sept 2001)	Price adjustment factor	$ million (MOD)
2002 – 2003	2.5	0.98625	2.5
2003 – 2004	18.4	0.98378	18.1
2004 – 2005	17.6	0.98378	17.3
2005 – 2006	12.7	0.98378	12.5
2006 – 2007	6.2	0.98378	6.1
2007 – 2008	4.9	0.98378	4.8
Total	62.3		61.3

10. We have derived the MOD estimates on the basis of Government's latest forecast of trend labour and construction prices for the period 2002 to 2008. We will entrust part of the proposed civil engineering works to DTD who will tender the works as a standard re-measurement contract. We will tender the remaining civil engineering works as a standard re-measurement contract because of the uncertainties of the existence and location of underground utilities such as electricity cables, telephone cables, and water pipes. The contracts will provide for price adjustments because the contract periods will exceed 21 months. We will tender the proposed electrical and mechanical works on a fixed-price lump-sum basis because we can clearly define the scope of works in advance.

11. We estimate the annual recurrent expenditure for operation and maintenance of the proposed works to be $1.1 million.

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12. Based on the current level of expenditure on operation and maintenance of sewerage facilities, the proposed works by themselves would lead to an increase in the recurrent cost of providing sewage services by about 0.08%. This will need to be taken into account in determining sewage charges.

PUBLIC CONSULTATION

13. We consulted the then Yuen Long Provisional District Board in August 1997 on the proposed stage 3 works under **61DS**. Members supported implementation of the proposed works.

14. We consulted the Legislative Council Panel on Environmental Affairs on the proposed works on 26 November 2001. Members noted that we would submit the project proposal to the Public Works Subcommittee for discussion.

15. We gazetted the proposed works under the Water Pollution Control (Sewerage) Regulation (WPC(S)R) in May 2000. We received five objections, expressing concerns on impact of the proposed works on developments in objectors' private lots. Following our clarification, the objectors agreed to withdraw their objections. We gazetted the amended sewerage scheme in March 2001 to tie in with the revised scheme of DTD's roadwork projects under **27CG** and **28CG** and received no further objection. The Director of Environmental Protection authorised the proposed sewerage works in October 2001.

ENVIRONMENTAL IMPLICATIONS

16. We completed an environmental impact assessment (EIA) study on the proposed works under **61DS**. The EIA concluded that the construction and operation of the works would not give rise to insurmountable environmental impact with implementation of mitigation measures. For short-term impact during construction, we will control noise, dust and site run-off within established standards and guidelines through implementation of mitigation measures, such as the use of temporary noise barriers and silenced construction plants to reduce noise generation, water-spraying to reduce emission of dust, and strict control on diversion of sewage flows in the works contracts.

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17. We estimate the cost of implementing the environmental mitigation measures to be $1.2 million. We have included this in the overall project estimate.

18. At the planning and design stages, we have given due consideration to the need to minimise generation of construction and demolition (C&D) materials when designing the proposed works. We will require the contractor to submit a waste management plan (WMP) for approval. The WMP will include appropriate mitigation measures to avoid, reduce, reuse and recycle C&D materials. We will ensure that the day-to-day operations on site comply with the approved WMP. We will control the disposal of public fill and C&D waste in designated public filling facilities and landfills respectively through a trip-ticket system. We will require the contractor to separate public fill from C&D waste for disposal at appropriate facilities. We will record the disposal, reuse, and recycling of C&D materials for monitoring purposes. We estimate that the project will generate about 8 560 m^3 of C&D materials. Of these, we will reuse about 1 730 m^3 (20%) on site, 6 780 m^3 (79%) as fill in public filling areas[4], and dispose of about 50 m^3 (1%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be $6,250 for this project (based on a notional unit cost[5] of $125/$m^3$).

LAND ACQUISITION

19. The proposed stage 3 works require land resumption of about 0.2 hectares of agricultural land. The land resumption and clearance cost for the project is estimated at $10.0 million and will be charged to **Head 701** – Land Acquisition. All the statutory procedures for resuming the required land have been completed in accordance with the WPC(S)R.

/BACKGROUND .....

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[4] A public filling area is a designated part of a development project that accepts public fill for reclamation purposes. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering.

[5] This estimate has taken into account the cost for developing, operating, and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at $90/$m^3$), nor the cost to provide new landfills (which are likely to be more expensive) when the existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.

BACKGROUND INFORMATION

20. In 1983, we completed a comprehensive study on the land use control, sewerage system and development framework for Northwest New Territories under the "Northwest New Territories Base Strategy Studies". In 1984, we included **61DS** "Northwest New Territories Development – trunk sewers, sewage pumping stations and rising mains" into Category B for implementation of the sewerage works recommended under the study in three stages.

21. In December 1987, we upgraded part of **61DS** to Category A as **87DS** "North West New Territories Development – trunk sewers, sewage pumping stations and rising mains – stage 1" for construction of sewerage in the Hung Shui Kiu and Fui Sha Wai areas. In January 1989, we upgraded part of **61DS** to Category A as **84DS** "North West New Territories Development – trunk sewers, sewage pumping stations and rising mains – stage 1 remainder" to undertake the remaining sewerage works in the Hung Shui Kiu and Fui Sha Wai areas.

22. In May 1989, we upgraded another part of **61DS** to Category A as **89DS** "North West New Territories Development – trunk sewers, sewage pumping stations and rising mains – stage 2" to undertake the construction of Ha Tsuen Sewage Pumping Station and its associated rising mains leading to San Wai Sewage Treatment Works.

23. In 1993, we substantially completed the construction of trunk sewers in Hung Shui Kiu and Fui Sha Wai areas, Ha Tsuen Sewage Pumping Station, and its rising main leading to San Wai Sewage Treatment Works. The remaining works under stage 1 remainder on construction of branch sewers in Ping Ha Road and Tin Ha Road and under stage 2 on improvement works to Ha Tsuen Sewage Pumping Station would be completed in early 2004 and end 2002 respectively.

24. In August 2000, we included an item under block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme" for implementing some upgrading works of the existing sewers in Yuen Long Town in conjunction with the construction of some works under stage 1 remainder. We commenced the works in November 2000 for completion in late 2002.

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25. We completed the detailed design of the proposed stage 3 works in the Areas using in-house resources in March 2002.

26. The proposed stage 3 works will be implemented mainly along the new roads to be constructed under DTD's projects **27CG** and **28CG**. Since no major roads will be affected, we expect the traffic impact on existing roads to be minimal. Therefore, no traffic impact assessment is necessary.

27. We estimate that the project will create some 45 new jobs comprising 10 professional/technical staff and 35 labourers, totalling 1 300 man-months.

Environment and Food Bureau
May 2002

(pwsc61dsfin.doc)

Enclosure 2 to PWSC(2002-03)25

61DS – Northwest New Territories development – trunk sewers, sewage pumping stations and rising mains – stage 3

Breakdown of the consultants' fees

Consultants' staff costs			Estimated man-months	Average MPS* salary point	Multiplier[Note 1]	Estimated fees ($ million)
(a)	Contract administration [Note 2]	Professional	2.5	38	2.4	0.4
		Technical	5.4	14	2.4	0.2
(b)	Site supervision by resident site staff of the consultants [Note 3]	Professional	14.0	38	1.7	1.4
		Technical	84.0	14	1.7	2.8
				Total consultants' staff costs		4.8

* MPS = Master Pay Scale

Notes

1. A multiplier of 2.4 is applied to the average MPS point to estimate the full staff costs including the consultants' overheads and profit, as the staff will be employed in the consultants' offices. A multiplier of 1.7 is applied in the case of resident site staff supplied by the consultants. (As at 1.4.2001, MPS pt. 38 = $60,395 per month and MPS pt. 14 = $19,510 per month.)

2. The consultants' staff cost for contract administration are based on estimates prepared by D of DS. We will only know the actual man-months and actual costs when agreement between DTD and the consultants has been reached.

3. The consultants' staff cost for site supervision is based on estimates prepared by D of DS. We will only know the actual man-months and actual costs after the completion of the construction works.