ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE Environmental Protection – Sewerage and sewage treatment 332DS – Lam Tsuen Valley sewerage, stage 2

Members are invited to recommend to Finance Committee the upgrading of **332DS** to Category A at an estimated cost of \$588.3 million in money-of-the-day prices.

PROBLEM

Sewage from unsewered areas in Lam Tsuen Valley is a source of pollution to the streams nearby and the receiving waters of Tolo Harbour.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, proposes to upgrade **332DS** to Category A at an estimated cost of \$588.3 million in money-of-the-day (MOD) prices for implementing sewerage works in 13 unsewered areas in Lam Tsuen Valley.

/**PROJECT**

PROJECT SCOPE AND NATURE

- 3. The scope of **332DS** comprises the construction of
 - (a) about 17.2 kilometres (km) of sewers ranging from 150 millimetres (mm) to 225 mm in diameter for 13 unsewered areas, namely Chai Kek, Ma Po Mei, Ng Tung Chai, Pak Ngau Shek Sheung Tsuen, Pak Ngau Shek Ha Tsuen, Ping Long, San Tong, Sha Pa, She Shan Tsuen, Shui Wo, Tai Mong Che, Tai Om and Wo Liu;
 - (b) four sewage pumping stations (SPSs) at Ma Po Mei, Pak Ngau Shek, Sha Pa and She Shan Tsuen respectively;
 - (c) about 1.0 km of twin rising mains of 150 mm in diameter in association with the construction of the SPSs in (b) above; and
 - (d) ancillary works.

A site plan showing the proposed works is at Enclosure 1.

4. Subject to the funding approval of the Finance Committee, we plan to commence the proposed works in November 2012 for completion in December 2016.

JUSTIFICATION

5. At present, sewage from the 13 unsewered areas mentioned in paragraph 3(a) above is often treated and disposed of by means of private on-site treatment facilities (such as septic tanks and soakaway (STS) systems). These facilities are however often ineffective in removing pollutants due to their proximity to watercourses¹ and inadequate maintenance². This would be detrimental to the water quality of the streams nearby and the receiving waters of Tolo Harbour.

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¹ STS systems operate by allowing the effluent to percolate through gravels whereby pollutants are removed in a natural manner. However, if a STS system is located in an area where the ground water table is high, such as an area in proximity to watercourses, it will not function properly due to ineffective percolation.

² Inadequate maintenance of STS systems would affect their pollutant removal efficiency and might even lead to overflow of effluent.

6. Under the Review of North District and Tolo Harbour Sewerage Master Plan in 2002, the Environmental Protection Department has planned to extend the public sewerage to these 13 unsewered areas as long-term solutions. The proposed works aim to collect the sewage generated from these 13 unsewered areas and convey it to the Tai Po sewage treatment works for treatment before disposal. On completion of the proposed works, the amount of pollutants to be discharged into nearby streams and the receiving waters will be significantly reduced, thereby bringing sustainable improvement to the water quality.

7. Based on the village properties survey results and the potential village house development information within the 13 unsewered areas obtained in December 2008 and May 2012 respectively, the proposed sewerage facilities for the 13 unsewered areas mentioned in paragraph 3 above will be able to serve some 955 village houses comprising about 660 existing houses, 275 planned houses and 20 potential houses³.

FINANCIAL IMPLICATIONS

8. We estimate the cost of the proposed works to be \$588.3 million in MOD prices (please see paragraph 9 below), broken down as follows –

		\$ million	
(a)	Construction of sewers within villages	222.4	
(b)	Construction of four SPSs	134.2	
	(i) civil engineering works	77.1	
	(ii) electrical and mechanical works	57.1	
(c)	Construction of rising mains	19.3	
(d)	Ancillary works	2.0	
			/(e)

³ The 20 potential village houses are houses that may be developed on the vacant lands which are adjacent to the proposed sewer alignment. There is currently no development programme for these houses, which is subject to landowners' will and Lands Department's approval. In the event that some of these potential houses are not built, the abortive cost is not expected to be significant because, according to the designed sewer alignment, the proposed sewers will in any case need to pass by the vacant lands to serve the existing and planned houses.

		\$ mil	lion	
(e)	Environmental mitigation measures		9.7	
(f)	Consultants' fees for		3.0	
	(i) contract administration	1.0		
	(ii) management of resident site staff	2.0		
(g)	Remuneration of resident site staff		59.1	
(h)	Contingencies		42.5	
	Sub-total	4	92.2	(in September 2011 prices)
(i)	Provision for price adjustment		96.1	
	Total	_5	88.3	(in MOD prices)

A breakdown of the estimates for the consultants' fees and resident site staff costs by man-months is at Enclosure 2.

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

Year	\$ million (Sept 2011)	Price adjustment factor	\$ million (MOD)
2012 - 2013	22.0	1.05325	23.2
2013 - 2014	119.9	1.11118	133.2
2014 - 2015	136.7	1.17229	160.3
2015 - 2016	132.9	1.23677	164.4
2016 - 2017	58.3	1.30479	76.1
2017 - 2018	18.8	1.37656	25.9
2018 - 2019	3.6	1.45227	5.2
	492.2		588.3

10. We have derived the MOD estimate on the basis of the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output for the period from 2012 to 2019. We will deliver the works under three contracts, two for civil engineering works and one for electrical and mechanical works. The two civil engineering works contracts will be on a re-measurement basis because of the uncertain underground conditions that may affect the exact quantum of the works required. Both contracts will provide for price adjustments. We will deliver the electrical and mechanical works can be well defined.

11. We estimate the additional annual recurrent expenditure arising from the proposed works to be \$3.1 million. The recurrent expenditure attributable to sewage charges has been taken into account in determining the sewage charges for the years 2008-09 to 2017-18 stipulated in the Sewage Services (Sewage Charge) Regulation (Cap. 463A) and the recurrent expenditure attributable to trade effluent surcharges will be taken into account in reviewing the trade effluent surcharge rates in future.

PUBLIC CONSULTATION

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12. We consulted the Tai Po Rural Committee on 24 July 2007 and the Environment, Housing and Works Committee of the Tai Po District Council on 12 March 2008. Both committees supported the proposed works.

13. We gazetted the proposed works in accordance with the Water Pollution Control (Sewerage) Regulation (Cap. 358AL) under four schemes⁴ between June 2009 and July 2010 and 14 objections to the original schemes were received. We then prepared the first amendment schemes for all the four schemes after considering the objectors' grounds of objections. As a result, 11 of the objections were withdrawn unconditionally whereas two further objections to two of the first amendment schemes were received. We further met with the objectors and prepared the second amendment schemes for the two schemes concerned. The two objections against the first amendment schemes were then withdrawn unconditionally while a further objection to one of the second amendment schemes was received.

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For one of the schemes, only part of the works belongs to **332DS** whereas the rest are being implemented under **373DS** "Lam Tsuen Valley sewerage, stage 1". Figures relating to objections as stated in paragraphs 13 and 14 include only those concerning **332DS**.

14. Since all the objections to three of the four schemes were resolved, the Director of Environmental Protection authorised the proposed works concerned between January 2011 and January 2012. As for the remaining scheme with four objections not withdrawn after the second amendment scheme (three objections against the original scheme and one against its second amendment scheme), a third amendment scheme was prepared. Two of the remaining four objections were in turn withdrawn by the objectors unconditionally and we did not receive any further objection to this third amendment scheme during the statutory objection period. The remaining two objections were interrelated concerning the extent of land resumption of private lots. We have adjusted the extent of land resumption to address the objectors' views as far as possible but the objections remained unresolved. After considering the objections, the Chief Executive in Council authorised the proposed works of the original sewerage scheme as amended by the first, second and third amendment schemes without modification on 5 June 2012.

15. We consulted the Legislative Council Panel on Environmental Affairs on 28 May 2012 on the proposed works. Members raised no objection to the proposed works.

ENVIRONMENTAL IMPLICATIONS

16. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). We completed a Preliminary Environmental Review (PER) in May 2011, which sets out the mitigation measures necessary for the proposed works. With such mitigation measures in place, the proposed works would not have long-term environmental impacts.

17. For short-term environmental impacts during construction, we will control noise, dust and site run-off to levels within established standards and guidelines through implementation of environmental mitigation measures, such as the use of silenced construction equipment and noise barriers to reduce noise, water-spraying to reduce emission of fugitive dust, and proper treatment of site run-off before discharge. We will also carry out regular site inspections to ensure that these recommended mitigation measures and good site practices will be properly implemented. We have included in paragraph 8(e) above a sum of \$9.7 million (in September 2011 prices) in the project estimates for implementing the environmental mitigation measures.

18. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. For example, in addition to the need for meeting the hydraulic and traffic requirements, we have designed the alignment of the proposed sewerage works in such a manner that excavation and demolition of existing structures will be minimised. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste at public fill reception facilities⁵. We will encourage the contractor to maximise the use of recycled/recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

19. At the construction stage, we will require the contractor to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert construction waste and non-inert construction waste at public fill reception facilities and landfills respectively through a trip-ticket system.

20. We estimate that the project will generate in total about 46 775 tonnes of construction waste. Of these, we will reuse about 21 500 tonnes (46%) of inert construction waste on site and deliver 24 600 tonnes (53%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 675 tonnes (1%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be \$748,600 for the proposed works (based on a unit cost of \$27 per tonne for disposal at public fill reception facilities and \$125 per tonne⁶ at landfills).

/HERITAGE

⁵ Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

⁶ 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 per m³), nor the cost to provide new landfills (which is likely to be more expensive), when the existing ones are filled.

HERITAGE IMPLICATIONS

21. The PER has identified that several proposed sewers will be located in the vicinity of some village houses currently situated near to graded buildings or within sites of archaeological interest. Adequate mitigation measures will be implemented in accordance with the recommendations of the PER to ensure no adverse impact on the graded buildings and sites of archaeological interest.

LAND ACQUISITION

22. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We will resume a total of 400 private agricultural lots (about 13 268.1 square metres (m^2)) for carrying out the proposed works. The land resumption and clearance will not affect any households or domestic structures. We will charge the cost of land resumption and clearance estimated at \$52.5 million to **Head 701 – Land Acquisition**. A breakdown of the land resumption and clearance costs is at Enclosure 3.

BACKGROUND INFORMATION

23. In November 2002, we completed the study "Review of North District and Tolo Harbour Sewerage Master Plan" which assessed the adequacy of the existing sewerage in Tai Po to meet future demands as well as to establish a long-term sewerage improvement plan for the Tai Po area. Based on the recommendation of the study, we upgraded **332DS** to Category B in October 2005.

24. In December 2006, we engaged consultants to carry out detailed design and necessary investigation for **332DS** at an estimated cost of \$14.3 million in MOD prices. We charged this amount to block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme".

25. In November 2008, we upgraded part of **332DS** to Category A as **364DS** "Lam Tsuen Valley sewerage – trunk sewers, pumping station and rising mains" at an approved project estimate of \$162.8 million in MOD prices. The construction works commenced in February 2009 for completion in September 2012.

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26. In July 2011, we upgraded part of **332DS** to Category A as **373DS** "Lam Tsuen Valley sewerage, stage 1" at an approved project estimate of \$274.4 million in MOD prices. The construction works commenced in October 2011 for completion in August 2015.

27. We have now substantially completed the detailed design of the proposed works mentioned in paragraph 3 above.

28. The proposed works will involve the felling of two trees. Both trees to be felled are not important trees⁷. We will incorporate planting proposals as part of the project, including an estimated quantity of 22 trees and 8 360 shrubs.

29. We estimate that the proposed works will create about 183 jobs (148 for labourers and another 35 for professional/technical staff), providing a total employment of 6 960 man-months.

Environment Bureau June 2012

"Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

⁽a) trees of 100 years old or above;

⁽b) trees of cultural, historical or memorable significance e.g. Fung Shui trees, trees as landmark of monastery or heritage monument, and trees in memory of important persons or event;

⁽c) trees of precious or rare species;

⁽d) trees of outstanding form (taking account of overall tree sizes, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or

⁽e) trees with trunk diameter equal or exceeding 1.0 m (measured at 1.3 m above ground level), or with height/canopy spread equal or exceeding 25 m.



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332DS – Lam Tsuen Valley sewerage, stage 2

Breakdown of the estimates for consultants' fees and resident site staff costs (in September 2011 prices)

			Estimated man- months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional Technical	-	-	-	0.5 0.5
					Sub-total	1.0
(b)	Resident site staff costs (Note 3)	Professional Technical	215 1 169	38 14	1.6 1.6	21.5 39.6
					Sub-total	61.1
	Comprising –					
	(i) Consultants' fees for management of resident site staff				2.0	
	(ii) Remuneration of resident site staff				59.1	
* MI	PS = Master Pay Scale				Total	62.1

Notes

- 1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of resident site staff supplied by the consultants. (As at now, MPS salary point 38 = \$62,410 per month and MPS salary point 14 = \$21,175 per month.)
- 2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the design and construction of the project. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **332DS** to Category A.
- 3. The actual man-months and actual costs will only be known after completion of the construction works.

Enclosure 3 to PWSC(2012-13)34

332DS – Lam Tsuen Valley sewerage, stage 2

Breakdown of the land resumption and clearance costs

			\$ million	
(I)	Estimated resumption cost		40	5.8
(a)	Agricultural land ex-gratia compensation	46.8		
	400 agricultural lots (with a total area of 13 268.1 m^2) will be resumed			
	13 268.1 m ² x \$3,525 per m ² (see Notes 1 and 2)			
(II)	Estimated clearance cost		0	.9
(a)	Ex-gratia allowance of crop compensation	0.3		
(b)	Ex-gratia allowance for farm structures and miscellaneous permanent improvements to farms	0.3		
(c)	Ex-gratia allowance for "Tun Fu"	0.3		
(III)	Contingency payment		4	.8
(a)	Contingency on the above costs	4.8		
	Total costs		52	2.5

Notes

1. There are four ex-gratia compensation zones, namely Zones A, B, C and D, for land resumption in the New Territories as approved by the Executive Council in 1985 and 1996. The boundaries of these zones are shown on the Zonal Plan for Calculation of Compensation Rates. Part of the land to be resumed in the project **332DS** is agricultural land currently within Zone C, while remaining land is currently within Zone D. The land required is for implementing sewerage works, which are for local improvement. We will seek approval from the Committee on Planning and Land Development¹ to upgrade the ex-gratia compensation rate for the land concerned from Zone D to Zone C.

¹ The Committee on Planning and Land Development is an internal committee chaired by the Secretary for Development and comprising representatives from relevant Bureaux and Departments. One of its functions is to consider and review policies on production, acquisition, use and disposal of land.

2. In accordance with G.N. 2128 dated 16 March 2012 on the revised ex-gratia compensation rates for resumed land, the ex-gratia compensation rate of agricultural land for Zone C is 50% of the Basic Rate at \$655 per square foot (or \$7,050 per m²). Hence the ex-gratia compensation rate used for estimating the resumption cost of the 400 lots affected by **332DS** is \$3,525 per m².