For discussion **PWSC(2004-05)7**
on 5 May 2004

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 709 -WATERWORKS
Water Supplies – Fresh water supplies
329WF – West Col Dam of High Island Reservoir – remedial works

Members are invited to recommend to Finance Committee the upgrading of **329WF** to Category A at an estimated cost of $25 million in money-of-the-day prices for the remedial works to West Col Dam of High Island Reservoir.

PROBLEM

A detailed investigation has indicated that there is water leakage at the West Col Dam of High Island Reservoir leading to gradual erosion of the dam foundation. It is necessary to carry out remedial works as soon as possible to prevent further erosion and to restore integrity of the dam.

PROPOSAL

2. The Director of Water Supplies (DWS), with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade **329WF** to Category A at an estimated cost of $25 million in money-of-the-day (MOD) prices for the remedial works to the West Col Dam of High Island Reservoir.

PROJECT SCOPE AND NATURE

3. The scope of the remedial works under **329WF** comprises –

(a) ground exploratory works to ascertain the leakage paths and to optimise the drilling and grout mixes design for stopping the leaks; and

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(b) remedial works which include grouting in the form of grout curtains to reduce the leakage at the dam.

4. We plan to commence the remedial works in September 2004 for completion in early 2006. A site plan and a typical cross section of the West Col Dam showing the scope of works under **329WF** are at Enclosures 1 and 2 respectively.

JUSTIFICATION

5. The West Col Dam is one of the two subsidiary dams of the High Island Reservoir. The construction of the West Col Dam, which is about 300 metres (m) long and 45 m high, was completed in 1977. There has been a long history of minor leakage at the dam. With investigation on the reservoir leakage and subsequent grouting works in 1980, the situation had remained stable until recently. Dam inspection and leakage flow analyses by an expert in late 2002 indicated that the condition of the dam foundation had deteriorated leading to an increase in the amount of leakage of reservoir water. Though the quantity of leakage is small which does not affect the reliability of water supply and safety of the dam for the time being, the increase in water leakage presents an early warning that remedial works are required so as to prevent further erosion of the foundation and restore the full integrity of the dam. The expert also recommended that the remedial works should be completed before early 2006. Otherwise, the dam condition will deteriorate to such an extent that it will become very costly to repair. If erosion is allowed to continue, it will eventually lead to failure of the dam. The proposed works will be carried out at the top of the dam and will not affect the normal operation of the High Island Reservoir.

FINANCIAL IMPLICATIONS

6. We estimate the capital cost of the proposed works to be $25 million in MOD prices (see paragraph 7 below), made up as follows –

		$ million
(a)	Ground exploratory works	3.2
(b)	Remedial works	20.2
(c)	Environmental mitigation measures	0.2

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(d)	Contingencies		2.4	
		Sub-total	26.0	(in September 2003 prices)
(e)	Provision for price adjustment		(1.0)	
		Total	25.0	(in MOD prices)

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

Year	**$ million (Sept 2003)**	**Price adjustment factor**	**$ million (MOD)**
2004 – 2005	4.0	0.97150	3.9
2005 – 2006	16.0	0.95450	15.3
2006 – 2007	5.0	0.95450	4.8
2007 – 2008	1.0	0.96643	1.0
	26.0		25.0

8. We have derived the MOD estimates on the basis of the Government's latest forecast of trend rate of change in the prices of public sector building and construction output for the period 2004 to 2008. We will tender the works on a remeasurement basis because the works involve extensive underground works, the quantities of which are subject to variation during construction to suit the actual site conditions. The contract will not provide for price adjustment because the contract period will not exceed 21 months.

9. The project will not give rise to additional annual recurrent expenditure.

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10. The project by itself will lead to an increase in production cost of water by 0.01% in real terms by 2008[1].

PUBLIC CONSULTATION

11. We consulted the Sai Kung District Council in March 2004. The Council supported the project.

ENVIRONMENTAL IMPLICATIONS

12. The project will not cause long term environmental impact. We have included $200,000 (in September 2003 prices) in the project estimate to implement suitable mitigation measures to control short term environmental impacts.

13. We will require the contractor to submit a waste management plan (WMP) with appropriate mitigation measures, including the allocation of areas for waste segregation on site to facilitate recovering of recyclable construction and demolition (C&D) waste, for approval. We will ensure that the day-to-day operations on site comply with the approved WMP. We will implement a trip-ticket system to control the proper disposal of C&D materials and will record the recycling and disposal of C&D materials for monitoring purposes.

14. We estimate that the project will generate about 150 m^3 of C&D materials. Of these, we will reuse about 70 m^3 (46.7%) as fill in public filling areas[2] and dispose of 80 m^3 (53.3%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be $10,000 for this project (based on a notional unit cost[3] of $125/$m^3$).

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1 The increase in production cost of water is calculated on the assumption that the demand remains static during the period from 2004 to 2008 and the amount of government subsidy to the waterworks operations is to be contained at the present level.

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

3 The 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.

LAND ACQUISITION

15. The proposed works do not require land acquisition.

BACKGROUND INFORMATION

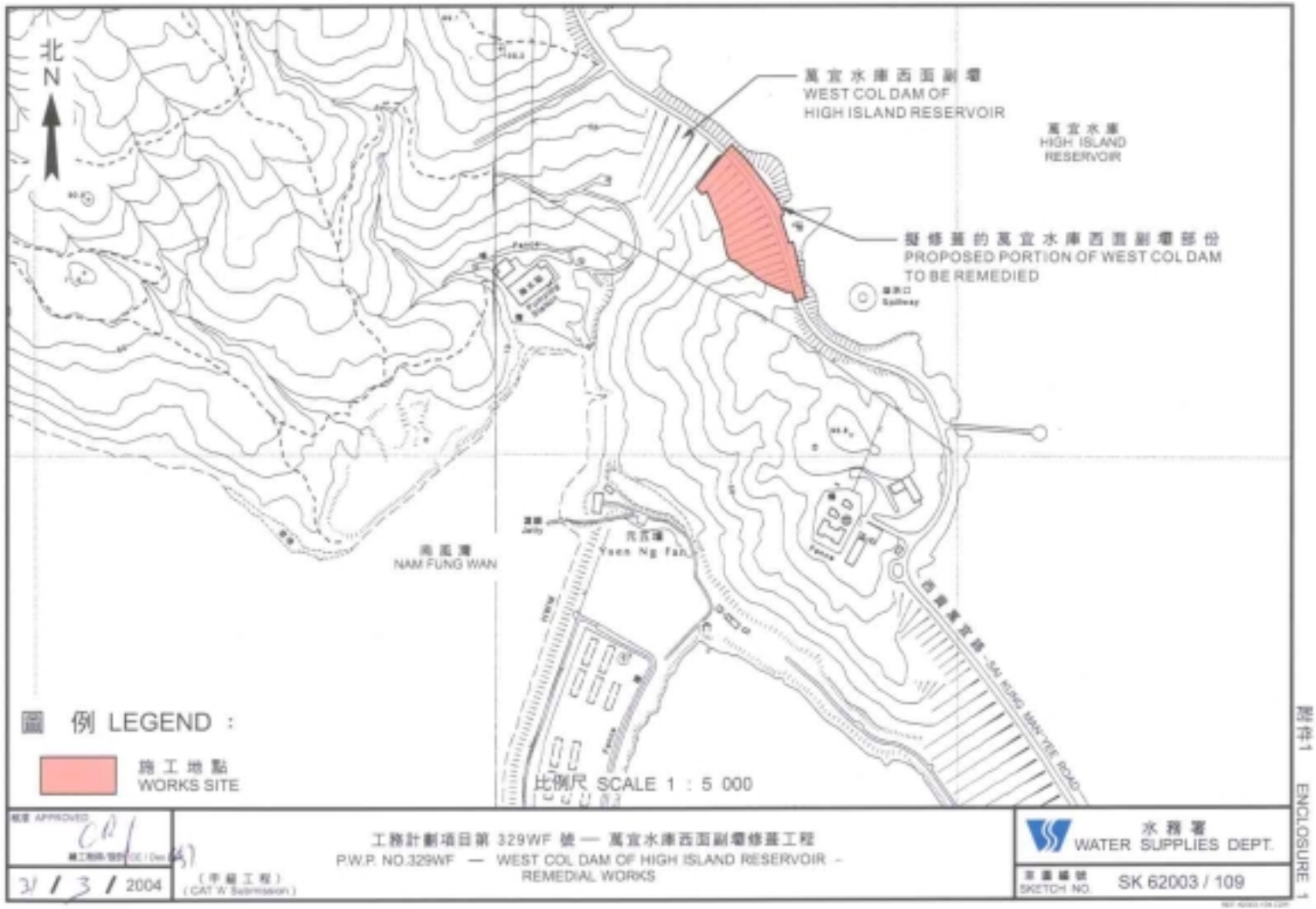
16. In October 2003, we upgraded **329WF** to Category B.

17. We have substantially completed the detailed design for the proposed works using in-house resources.

18. The proposed remedial works will not involve any tree removal or planting proposals.

19. We estimate that the proposed works will create 75 jobs (65 for labourers and another 10 for professional/technical staff) providing a total employment of 1 000 man-months.

Environment, Transport and Works Bureau
April 2004



附件1 ENCLOSURE 1

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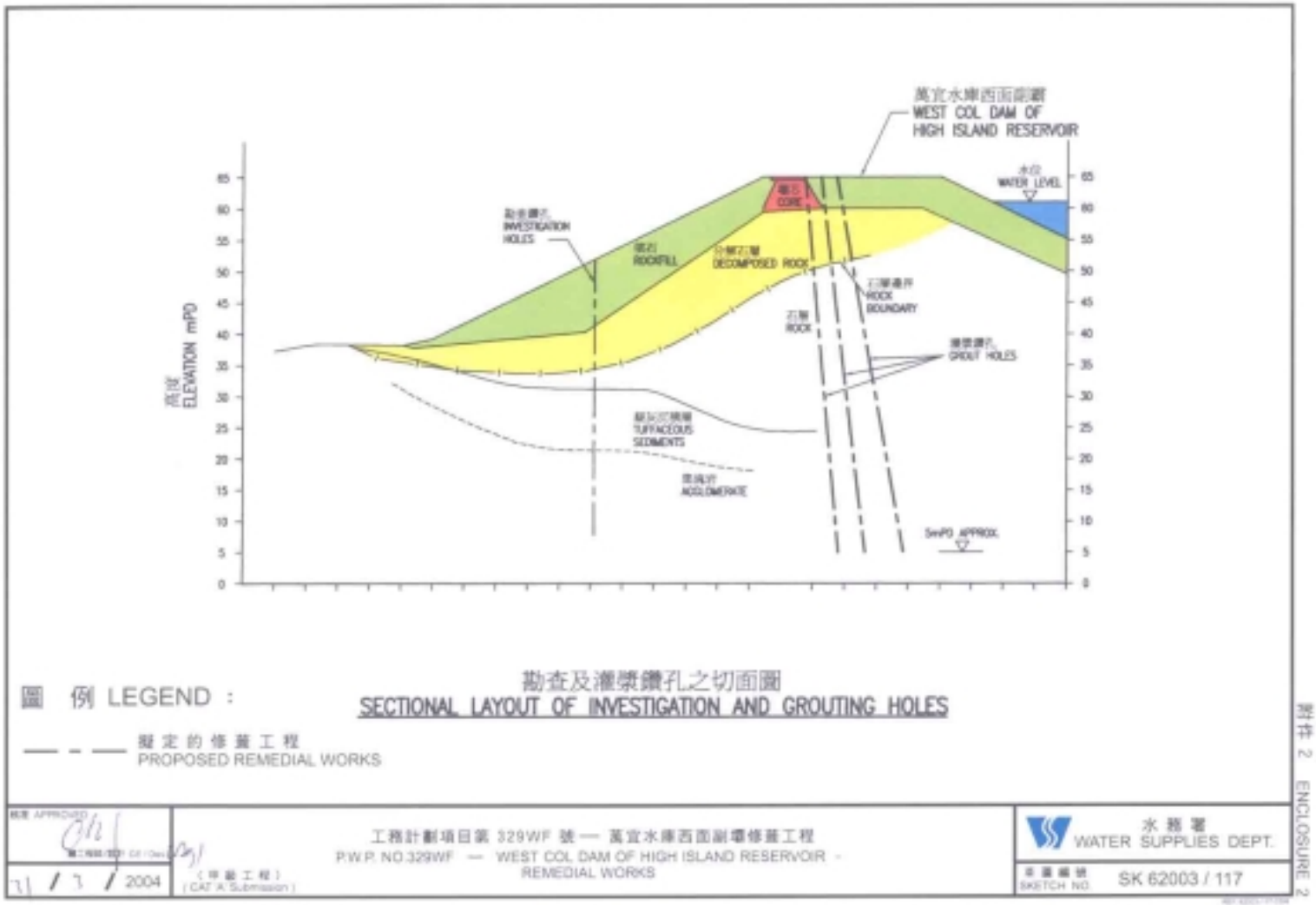

附件 2 ENCLOSURE 2