

## **ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

### **HEAD 709 – WATERWORKS**

#### **Water Supplies – Fresh water supplies**

#### **181WF – In-situ reprovisioning of Sha Tin water treatment works**

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **181WF** to Category A, entitled “In-situ reprovisioning of Sha Tin water treatment works – South Works – design and site investigation”, at an estimated cost of \$149.1 million in money-of-the-day prices, for engaging consultants to carry out design and site investigation for the reprovisioning works; and
- (b) the retention of the remainder of **181WF** in Category B.

### **PROBLEM**

The plant and equipment of the Sha Tin water treatment works (WTW) are approaching the end of their service life. The present operation at the Sha Tin WTW is also not efficient, particularly in treating raw water of variable quality.

**/PROPOSAL .....**

**PROPOSAL**

2. The Director of Water Supplies, with the support of the Secretary for Development, proposes to upgrade part of **181WF** to Category A at an estimated cost of \$149.1 million in money-of-the-day (MOD) prices, for engaging consultants to carry out design and site investigation for the reprovisioning works under **181WF**.

**PROJECT SCOPE AND NATURE**

3. The part of **181WF** that we now propose to upgrade to Category A comprises –

- (a) a consultancy for the in-situ reprovisioning of the South Works of the Sha Tin WTW which includes –
  - (i) impact assessment on environment, hydraulics, and other aspects necessary for completion of the design;
  - (ii) detailed design for the reprovisioning of the South Works to the proposed capacity of 550 000 cubic metres per day (m<sup>3</sup>/day), the associated fresh water pumping station, and common facilities including administration buildings, a laboratory, alum saturation tanks and a chemical house, as well as other associated civil, geotechnical, mechanical and electrical, environmental control and monitoring works; and
  - (iii) supervision of the site investigation works, condition survey and improvement works in (b) and (c) below;
- (b) site investigation works for the in-situ reprovisioning of the South Works; and
- (c) condition survey and improvement works for the North Works to ensure their smooth operation during the reprovisioning of the South Works.

———— The location of the Sha Tin WTW is shown on the plan at Enclosure 1. We will retain the remainder of **181WF** in Category B, which covers the in-situ reprovisioning works for the South Works and the North Works. We will seek

/funding .....

funding for the remaining parts of **181WF** after completion of the detailed design for the reprovisioning of South Works in paragraph 3(a)(ii) above.

4. Subject to the approval of the Finance Committee (FC), we plan to engage consultants in September 2010 to carry out the design and site investigation for the project for completion by July 2012.

## JUSTIFICATION

5. The Sha Tin WTW is the largest WTW in Hong Kong. The South Works were commissioned in 1964 while the subsequent expansions in 1973, 1976 and 1983 formed the North Works. After more than 40 years of services, the Sha Tin WTW has reached a stage of requiring substantial reprovisioning as its plant and equipment are approaching the end of their service life. The present operation at the Sha Tin WTW is also not efficient by modern day standard, particularly in treating raw water of variable quality. A major constraint in the in-situ reprovisioning of the Sha Tin WTW is the difficulties in maintaining the plant in operation during the reprovisioning process. In order to reduce the risk that the supply of treated water would be interrupted by the reprovisioning work, we have formulated a strategy by making use of the reserved capacity of the Tai Po WTW.

6. At present, Sha Tin WTW and Tai Po WTW supply about 1 060 000 m<sup>3</sup>/day (with 700 000 m<sup>3</sup>/day from North Works and 360 000 m<sup>3</sup>/day from South Works) and 250 000 m<sup>3</sup>/day of treated water, respectively. Under the strategy, we will uprate the Tai Po WTW to make up for the reduction in the treatment capacity as a result of the currently proposed reprovisioning of the South Works of Sha Tin WTW. This will enable Tai Po WTW to extend its supply zone to cover part of urban Kowloon, and the entire Hong Kong Central and Western districts, which are currently supplied by Sha Tin WTW.

7. In order to ensure that the North Works will be in smooth operation during the in-situ reprovisioning of South Works, we need to conduct condition survey and carry out improvement works for the existing North Works before the South Works is decommissioned for the proposed reprovisioning works. In particular, the existing common facilities must be in operation and continue to serve the North Works until the respective reprovisioned common facilities are commissioned. The arrangement can effectively reduce the risk of interruption of treated water supply to the public during the reprovisioning of the South Works of the Sha Tin WTW.

/8. ....

8. At present, the uprating works of Tai Po WTW are under construction. We need to timely commence the design and site investigation for the reprovisioning of the South Works of the Sha Tin WTW so that construction could commence following the commissioning of the uprated Tai Po WTW by end 2011.

9. Owing to the lack of in-house resources and expertise to undertake the works described in paragraph 3 above, we propose to engage consultants to carry out the work.

### FINANCIAL IMPLICATIONS

10. We estimate the cost of the proposed design consultancy and site investigation to be \$149.1 million in MOD prices (please see paragraph 11 below), broken down as follows –

	<b>\$ million</b>	
(a) Consultants' fees	105.0	
(i) Impact assessments	19.7	
(ii) Detailed design	78.7	
(iii) Supervision of site investigation works, condition survey and improvement works	6.6	
(b) Site investigation works	7.8	
(c) Condition survey and improvement works	14.5	
(d) Contingencies	12.5	
	139.8	(in September 2009 prices)
(e) Provision for price adjustment	9.3	
	149.1	(in MOD prices)

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

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

Year	\$ million (Sept 2009)	Price Adjustment Factor	\$ million (MOD)
2010 – 2011	34.9	1.02700	35.8
2011 – 2012	69.9	1.06551	74.5
2012 – 2013	35.0	1.10813	38.8
	139.8		149.1

12. We have derived the MOD estimates on the basis of the Government's latest forecast of the trend rate of change in the prices of public sector building and construction output for the period from 2010 to 2013. We will tender the proposed consultancy on a lump sum basis. The site investigation works are subject to remeasurement as there is uncertainty over the underground features and hence the volume of works to be involved. We will provide for price adjustments in the consultancy agreement as the consultancy period will exceed 12 months.

13. The proposed part-upgrading of **181WF** to Category A will not give rise to any recurrent consequences. The proposed design consultancy and site investigation by itself would lead to an increase in the production cost of water by 0.06% in real terms by 2013<sup>1</sup>.

## **PUBLIC CONSULTATION**

14. We consulted the Development and Housing Committee of the Sha Tin District Council on 3 September 2009 in respect of the proposed works at the Sha Tin WTW. Members of the Committee supported the proposed works.

15. We circulated to the Legislative Council Panel on Development an information paper on the proposed design consultancy and site investigation works at the Sha Tin WTW on 18 May 2010. Members raised no objection to the proposal.

**/ENVIRONMENTAL .....**

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<sup>1</sup> The increase in production cost of water is calculated at the present price level and on the assumption that the water demand remains static during the period from 2010 to 2013.

## ENVIRONMENTAL IMPLICATIONS

16. The proposed design consultancy and site investigation are not designated projects under the Environmental Impact Assessment Ordinance (Cap. 499). The proposed design works will not cause any adverse environmental impacts. We shall implement suitable mitigation measures to control short-term environmental impacts from the site investigation works.

17. The proposed design consultancy and site investigation will only generate very little construction waste. We will require the consultants to fully consider measures to minimise the generation of construction waste and to reuse/recycle construction waste as much as possible in the future implementation of the construction projects.

## HERITAGE IMPLICATIONS

18. The proposed design consultancy and site investigation will not affect any heritage sites, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interest and government historic sites identified by Antiquities and Monuments Office.

## LAND ACQUISITION

19. The proposed design consultancy and site investigation do not require any land acquisition.

## BACKGROUND INFORMATION

20. After the promulgation of the two-stage reprovisioning strategy in 2007, FC approved the upgrading of part of **334WF** to Category A in May 2009 as **339WF** at an approved project estimate of \$43.4 million in MOD price, entitled “Expansion of Tai Po water treatment works and ancillary raw water and fresh water transfer facilities – design and site investigation” for engaging consultants to carry out design and site investigation for the works. Upon completion of the design of the works in the first phase, FC approved the upgrading of the second part of **334WF** to Category A in February 2010 as **343WF** at an approved project estimate of \$259.9 million in MOD price, entitled “Expansion of Tai Po water treatment works and ancillary raw water and fresh water transfer facilities – part 1 works”, for upgrading the treatment capacity of the Tai Po WTW from 250 000 m<sup>3</sup>/day to 400 000 m<sup>3</sup>/day. Works for upgrading the treatment capacity of the Tai Po WTW from 400 000 m<sup>3</sup>/day to 800 000 m<sup>3</sup>/day have been included in the remainder of **334WF** in Category B.

21. The in-situ reprovisioning of the Sha Tin WTW is the second stage of the reprovisioning strategy. We upgraded **181WF** to Category B in February 2002. In January 2003, we engaged consultants to carry out the investigation study for the proposed works under **181WF** at a cost of \$10.2 million charged under block allocation **Subhead 9100WX** "Waterworks, studies and investigations for items in Category D of the Public Works Programme".

22. The investigation study for the in-situ reprovisioning of the Sha Tin WTW was completed in September 2004. It recommended an outline design scheme for reprovisioning of the Sha Tin WTW which would be used as the basis for further design development of the proposed works.

23. The proposed design consultancy and site investigation will not involve any tree removal in the natural terrain or planting proposals. We will require the consultants to take into consideration the need for tree preservation during the design stage of the project. We will also incorporate tree planting proposals, where possible, in the construction phase in the future.

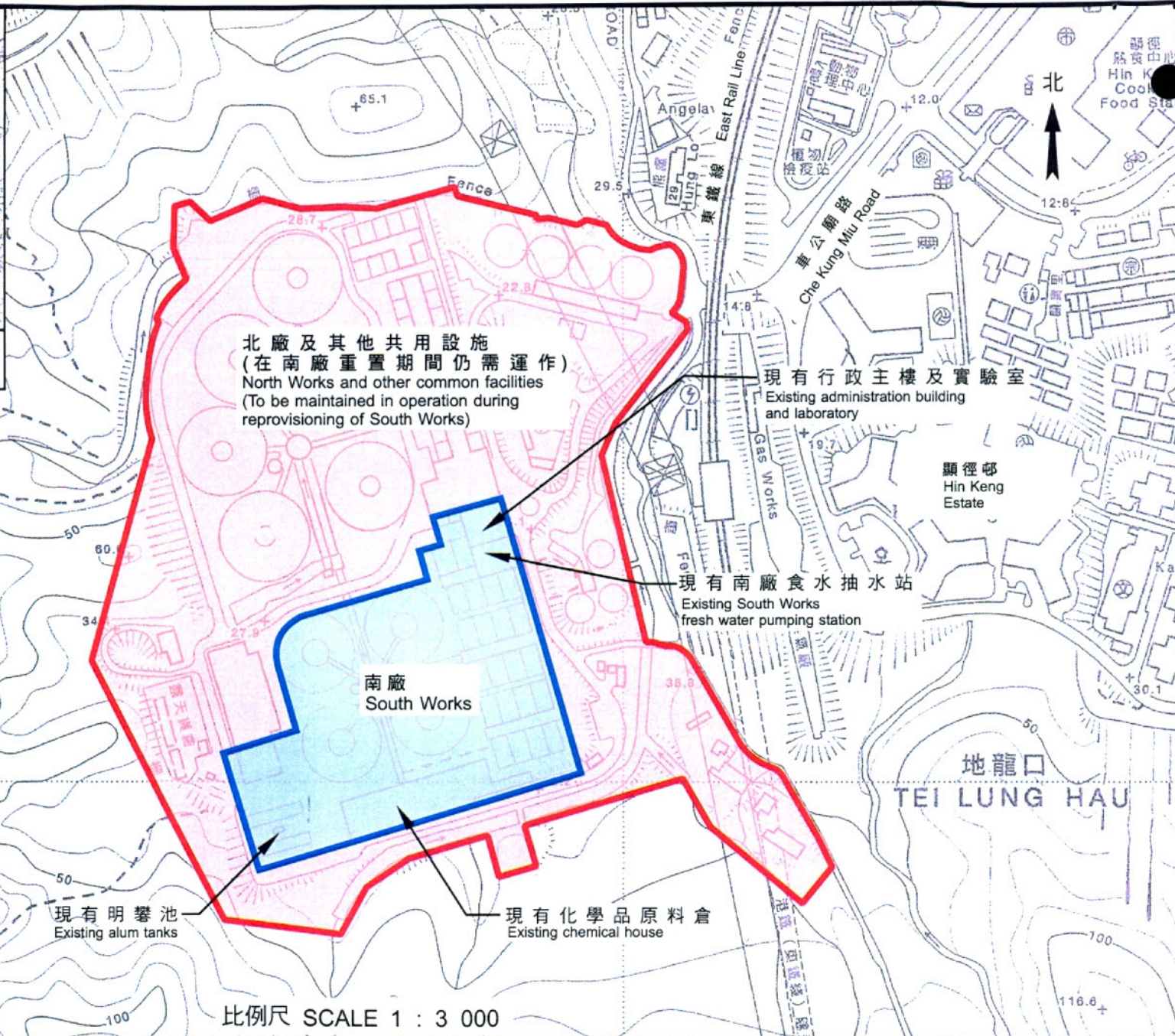
24. During the in-situ reprovisioning of the South Works, the operation of the North Works will continue.

25. We estimate that the proposed design consultancy and site investigation will create about 95 jobs (28 for labourers and another 67 for professional/technical staff) providing a total employment of 1680 man-months.

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Development Bureau  
June 2010



位置圖  
Location Plan



- 圖例：
- 現有濾水廠地界  
Existing water treatment works land allocation boundary
  - 現擬重置南廠範圍  
Existing South Works to be Re-provisioned

核准 APPROVED  
  
 總工程師/工程管理 CE / PM

1915 / 2010

工務工程計劃第 9181WF 號 — 沙田濾水廠原地重置工程 - 南廠位置圖  
 P.W.P. Item No. 9181 WF — In-situ re-provisioning of Sha Tin water treatment works - South Works Location Plan  
 (甲級工程)  
 (CAT 'A' Submission)

 水務署  
 WATER SUPPLIES DEPARTMENT  
 草圖編號 SK 62009 / 099A  
 SKETCH NO.

**Enclosure 2 to PWSC(2010-11)15**

**181WF – In-situ reprovisioning of Sha Tin water treatment works**

**Breakdown of the estimates for consultants' fees (in September 2009 prices)**

<b>Consultants' staff costs</b> <sup>(Note 2)</sup>		<b>Estimated man-months</b>	<b>Average MPS* salary point</b>	<b>Multiplier</b> <sub>(Note 1)</sub>	<b>Estimated fee (\$ million)</b>
(a)	Impact assessments Professional	100	38	2.0	11.5
	Technical	206	14	2.0	8.2
(b)	Detailed design Professional	400	38	2.0	45.8
	Technical	829	14	2.0	32.9
(c)	Supervision of Professional	34	38	2.0	3.9
	condition survey and improvement works as well as site investigation works Technical	68	14	2.0	2.7
<b>Total</b>					<b>105.0</b>

\* MPS = Master Pay Scale (As at now, MPS point 38 = \$57,280 per month and MPS point 14 = \$19,835 per month.)

**Notes**

1. A multiplier of 2.0 is applied to the average MPS point to arrive at the full staff costs including the consultants' overheads and profit, as the staff will be employed in the consultants' office.
2. The figures given above are only estimates prepared by the Director of Water Supplies. The actual man-months and actual fees will only be known after we have selected the consultants through the usual competitive lump sum fee bidding system.