

**For discussion  
on 26 May 2003**

**Legislative Council Panel on Environmental Affairs**

**PWP Item 45DR - Restoration of Pillar Point Valley Landfill**

**Purpose**

This paper briefs Members of the Administration's proposal to submit PWP Item **45DR** "Restoration of Pillar Point Valley Landfill" to the Public Works Subcommittee for upgrading to Category A for the restoration works at the Pillar Point Valley Landfill (PPVL) at an estimated cost of \$463.2 million in money-of-the-day (MOD) prices.

**Background**

2. All landfills produce landfill gas and leachate<sup>1</sup>. Landfill gas, which is a product of refuse decomposition, is malodorous and potentially asphyxiating, flammable and explosive. Leachate is highly polluting and, if not properly controlled, may result in serious contamination of water bodies.

3. Municipal solid waste, when disposed of at landfills, does not exhibit homogenous geotechnical properties, as it is subject to a continuing biological degradation process. This results in differential settlement of the landfill's surface and may lead to slope instability problems. We therefore need to monitor and improve slope stability at landfills. We also need to stabilize the natural slopes adjacent to the top platform of landfills to prevent possible boulder falls or soil debris flows.

4. To reduce infiltration of rain water into the waste mass thereby reducing the amount of leachate to be treated, we need to construct a capping layer on top of the surface of landfills. We also need to build a system of surface drains.

5. The PPVL is located in Tuen Mun. A site plan is at Annex. It commenced operation in 1983 and has become derelict since its closure in 1996. It is the last of the 13 closed landfills in Hong Kong that has yet to be fully restored. After completion of landfilling activities, the landfill has only been provided with a temporary soil capping and a surface drainage system. It does not have proper landfill gas and leachate management systems. Hence,

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<sup>1</sup> "Leachate" is a term used to describe water which has permeated through the waste mass.

currently, its landfill gas merely escapes into the atmosphere, while its leachate is discharged into the public foul sewer without prior treatment. We have been monitoring landfill gas migration and leachate pollution to minimize any possible environmental problems.

## **Proposal**

6. As in the case of all other closed landfills, we propose to fully restore the PPVL so as to minimize the adverse environmental impacts and to put the land to productive use in future. We are exploring possible options for afteruse and will ensure that the design of the restoration works will not conflict with that of the afteruse works. It must, however, be noted that due to ground settlement problems, the site would only be suitable for passive recreational uses, and any proposal involving building of heavy superstructures, imposing heavy loading or modifying the existing landform would not be technically viable. The site would only be available for afteruse after the restoration works have been completed by 2006.

7. The scope of the proposed restoration works comprises -

- (a) design and construction of a landfill gas management system to control gas emission and to prevent off-site gas migration;
- (b) design and construction of a leachate management system to control surface and groundwater infiltration into the landfills and to extract, collect, treat and dispose of the landfill leachate;
- (c) design and construction of an engineered capping layer (with low permeability) and a surface water drainage system; and
- (d) improvements to the slope stability, landscaping of the landfill and other ancillary engineering works.

We plan to start the works in March 2004 for completion in February 2006.

8. After the commissioning<sup>2</sup> of the restoration works, it would still be necessary to monitor the progress of restoration, mainly in regard to landfill gas migration and leachate pollution. New facilities, including a landfill gas management system and a leachate management system, will be in operation

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<sup>2</sup> The word "commissioning" in this context means the carrying out of certain performance tests to verify that the landfill facilities meet the performance requirements in the contract.

during this period and require regular environmental control and maintenance. Such post-commissioning works also form part of the proposed works. While this operation and maintenance period may last more than two decades (could be up to 30 years in some cases), we intend to carry out a review every five years, starting from the commissioning of the restoration works, to determine if the landfill is completely restored and whether further post-commissioning works would be necessary. We will draw up the contract such that it can last up to 30 years, but we have the right to terminate it or amend its coverage provided we give the contractor sufficient advance notice. This will allow us sufficient time to carry out a review after the first five years, and if necessary, give the contractor 12 months' notice to terminate the contract.

### Financial Implications

9. Our initial estimate is that the capital cost of the proposed works would be \$463.2 million in MOD prices<sup>3</sup>, made up as follows –

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(a) Landfill gas management systems	63.2	
(b) Leachate management systems	100.0	
(c) Capping	45.0	
(d) Drainage systems	35.0	
(e) Slope stabilisation, landscaping & ancillary works	97.3	
(f) Post-commissioning works for 7 years	104.1	
(g) Consultants' fees during construction	3.2	
(h) Independent assessor's fees	5.0	
(i) Contingencies	45.0	
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Sub-total	497.8	(in Sept 02 price)
(j) Provision for price adjustment	(34.6)	
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Total	463.2	(in MOD prices)

<sup>3</sup> The detailed costing is subject to further examination and refinement before submission to the PWSC.

10. We estimate that the annual recurrent expenditure arising from this project is about \$1.1 million.

11. We estimate that the project would create about 87 jobs (22 professional/technical staff and 65 labourers) during the design and build stage, and 21 jobs (7 professional/technical staff and 14 labourers) during the operation stage.

### **Public Consultation**

12. We consulted the Environment, Hygiene and District Development Committee of the Tuen Mun District Council on 22 November 2002 on the proposed restoration works at PPVL. The Committee supported the proposal.

### **Environmental Implications**

13. We completed in April 1995 an initial Environmental Impact Assessment (EIA) study as part of the feasibility study for restoration of Northwest New Territories landfills, including the PPVL. The study indicated that the proposed restoration works would ensure proper control of the emission and off-site migration of landfill gas and leachate. This will ameliorate the environmental conditions of the site and enable it to be put to beneficial use.

14. We also conducted an environmental review in September 2000 for restoration of the PPVL. The review confirmed that no unacceptable environmental impacts would be caused by the proposed restoration works.

15. The future contractor will carry out a detailed EIA study for the restoration of the landfill. During the Design and Build part of the contract, we will require the contractor to appoint an independent third party to ensure that the facilities comply with the contract requirements. During the Build and Operation part of the contract, we will withhold payments to the contractor if there is any non-compliance with the required environmental standards.

16. In addition, we will control dust, noise and site run-off nuisances during construction to within established standards and guidelines through the implementation of mitigation measures in the relevant works contract.

17. We have given due consideration to the need to minimize the generation of construction and demolition (C&D) materials in the project. We will make use of the excavated materials as filling materials on site, thereby

eliminating the need for disposing of any public fill. We will require the contractor to submit a waste management plan<sup>4</sup> and ensure that the day-to-day operation on site comply with the plan. We will also encourage the contractor to use non-timber formwork and recyclable materials for temporary works. We estimate that about 136 000 m<sup>3</sup> of C&D materials will be generated by the project. About 131 000 m<sup>3</sup> (96%) will be reused on site and only 5 000 m<sup>3</sup> (4%), most of which is non-inert waste, will be disposed of at landfills.

### **Advice Sought**

18. Members are invited to note our proposal of upgrading **45DR** for consideration by the Public Works Subcommittee in June 2003 with a view to seeking funding approval by the Finance Committee in July 2003.

Environment, Transport and Works Bureau  
Environmental Protection Department  
May 2003

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<sup>4</sup> The Waste Management Plan would include appropriate mitigation measures, including the allocation of areas for waste segregation on-site to facilitate reuse/recycling of C&D materials.

