

For Information

**A NOTE FOR LEGISLATIVE COUNCIL
PANEL ON DEVELOPMENT**

**Kai Tak Development
Environmental Improvement to Kai Tak Approach Channel**

Introduction

In considering the paper referenced CB(1)1125/08-09(04) on “Implementation of Kai Tak Development – Infrastructure and Environmental Improvement to Kai Tak Approach Channel” on 31 March 2009, some members had expressed concern about the proposed three-pronged approach in tackling the odour problems at Kai Tak Approach Channel (KTAC) and asked whether there were plans to deal with other odour hotspots at waterfront areas, such as, Belcher Bay in Kennedy Town, Yaumatei Typhoon Shelter and To Kwa Wan Typhoon Shelter.

The Administration’s Response

(A) *The odour problem at KTAC*

2. KTAC is a semi-enclosed water body within the boundaries of Victoria Harbour and its odour problem has long been a concern of the community. In accordance with the judgment by the Court of Final Appeal in early 2004 on the interpretation of the Protection of Harbour Ordinance (Cap. 531), any reclamation of KTAC has to be justified by an “overriding public need” based on cogent and convincing evidence that there is no other reasonable alternative.

3. On the above basis, we embarked on the Kai Tak Planning Review in 2004 with a “no reclamation” approach as the starting point. The Kai Tak Outline Zoning Plan (Plan No. S/K/22), formulated on the basis of this approach was subsequently approved by the Chief Executive in Council in November 2007 under the Town Planning Ordinance (Cap. 131). The environmental acceptability of this “no reclamation” plan including a

three-pronged approach to tackle the odour problem at KTAC was later confirmed by the statutory approval of the Environmental Impact Assessment (EIA) report of Kai Tak Development (KTD) in March 2009 under the EIA Ordinance (Cap. 499). This means that the proposed three-pronged approach to deal with the odour problem at KTAC has been accepted as a feasible method and there is no need to resort to reclamation.

Three-pronged approach to tackle the odour problem at KTAC

4. The three-pronged approach was based on a comprehensive study including site surveys, pilot field trials and laboratory analyses, and in consultation with independent experts in local universities. It comprises (i) interception of polluted discharges from the hinterland into KTAC; (ii) in-situ bioremediation treatment of sediments; and (iii) creation of a 600-metre opening at the former runway to enhance tidal flushing effect.

Interception of polluted discharges from the hinterland into KTAC

5. The crux of environmental problems at KTAC is the continuous discharge of polluted water from various drainage outfalls into the channel. Reducing pollution discharges into KTAC is an essential step to permanently remove the odour. Based on recommendations of the Central and East Kowloon sewerage master plans, improvement works to the existing drainage and sewerage systems in the hinterland of KTD together with additional sewage facilities to intercept and transfer polluted discharges will commence in phases from early 2009 for completion in 2013/2014. Overseas experience shows that similar interception arrangements adopted in river pollution improvement projects is the most effective means to tackle the pollution problem.

In-situ bioremediation treatment of sediments

6. Degradation of organic pollutants in sediments under anaerobic marine environment has resulted in generation of odourous sulphides, in particular the obnoxious hydrogen sulphide. Given the large quantity of sediments in KTAC (about 1 million m³), complete removal of all contaminated sediments by dredging is not feasible because of the limited disposal grounds and potential release of pollutants into the marine waters. We have, instead, tried out different in-situ sediment treatment options, which

are also more sustainable alternatives. A comparison of the different in-situ treatment options is at **Enclosure 1**. Having regard to the pros and cons of each treatment option, in-situ bioremediation treatment by injection of calcium nitrate solution into sediments is considered the most appropriate option. This method has been proven to be effective in resolving the odour problems at Shing Mun River Channel and Sam Ka Tsuen Typhoon Shelter. We had further confirmed the feasibility of this method by field trials at a 4.5 hectares site at KTAC in 2006 and 2008. The field test findings were endorsed by an independent expert, Professor Herbert H P FANG, Chair of Environmental Engineering, the University of Hong Kong.

Creation of a 600-metre opening at the former runway

7. In view of the poor tidal flushing of KTAC, the approved EIA report recommended to create a 600-metre opening at the former runway near the dead end of KTAC to improve water circulation. In this way, the daily tidal flows from Victoria Harbour would improve the water quality in KTAC. A detailed assessment with the aid of a computer model¹ conducted under the EIA study has ascertained the effectiveness of the proposed 600-metre opening. We had carried out extensive field measurements on different water quality and flow parameters in 2005 and 2006 in KTAC, To Kwa Wan and Victoria Harbour for calibration and validation of the model. As part of the EIA process, the Advisory Council on the Environment endorsed and the Environmental Protection Department approved this assessment method. We will continue to monitor the water quality in the channel. We will again consult the relevant district councils and local groups before the construction of the proposed 600-metre opening.

(B) Approach in dealing with other odour hotspots at waterfront areas

8. There were occasions complaints from the public in the past about odour at different waterfront areas in the territory. We had conducted a detailed investigation to identify the cause of the problem. We had adopted a number of site-specific odour abatement measures to tackle the problem at each of these hotspots.

¹ Delft3D is a computer modeling suite developed by the WL/Delft Hydraulics, an independent research institute and specialist consultant based in the Netherlands

9. Specifically, as regards the odour problems at Belcher Bay in Kennedy Town, Yaumatei Typhoon Shelter in West Kowloon and To Kwa Wan Typhoon Shelter, concerned government departments have been working together to tackle the problems. The following summarizes the actions either implemented or are in hand :-

(a) Belcher Bay in Kennedy Town

Investigations revealed that the malodour was most likely due to the polluted sediments accumulated in roadside gullies and inside drainage pipes/culverts. In collaboration with the Central and Western District Council (C&WDC), we have initiated the following to alleviate the odour problem :-

- improvement to the sewerage system in the area
- controlling illegal discharges through enforcement
- maintenance programmes with CCTV inspections
- regular desilting and cleansing the inside of box culverts, roadside gullies and drains

We will step up the improvement measures by installing additional gully inlet traps to cover a wider area and to carry out more frequent cleansing. We will monitor the effectiveness of these additional measures and will report to C&WDC at regular intervals.

(b) Yaumatei Typhoon Shelter in West Kowloon

We have undertaken the measures below :-

- rectification of misconnections and expedient connections
- regular maintenance to the drainage and sewerage systems
- desilting of the drainage systems at locations near the culvert outfalls
- dredging of marine sediments

We will enhance the above measures. We plan to implement upgrading and improvements works to the drainage and sewerage systems based on the findings of the current review on the West Kowloon sewerage master plans to intercept polluted flows into

the drainage systems.

(c) To Kwa Wan Typhoon Shelter

We have set up an inter-departmental working group comprising Civil Engineering Development Department, Drainage Services Department and Environmental Protection Department to oversee the odour problem in this area. It will work closely with the Kowloon City District Council on necessary follow-up actions. Plans already in hand include improvement to the existing drainage and sewerage systems under the Central and East Kowloon sewerage master plans, which is targeted to commence in 2009 for completion in phases by 2013/2014. Meanwhile, we will step up regular maintenance desilting and cleansing of the drainage systems. In parallel, the relevant departments will continue to take enforcement actions against illegal discharges. We will rectify expedient connections and misconnections found on site. In addition, we aim to implement maintenance dredging of sediments by end 2009 which will help alleviate the odour problem in this area.

10. In summary, the Administration has identified the cause of the odour problems at Belcher Bay in Kennedy Town, Yaumatei Typhoon Shelter and To Kwa Wan Typhoon Shelter, and has taken measures to tackle them. We will continue with our efforts so that there will be progressive improvement to this environmental issue in our waterfront.

**Development Bureau
April 2009**

Comparison of In-situ Sediment Treatment Options for Kai Tak Approach Channel (KTAC)

Treatment Option	Time for Completion	Technical Considerations	Environmental Impacts	Previous Applications
Bioremediation	2 to 3 years	<ul style="list-style-type: none"> - Over 95% removal of odourous acid volatile sulphides - Re-injection of nitrate solution possible in case of persistence of anaerobic marine environment or revival of pollution in sediment 	<ul style="list-style-type: none"> - Acceptable 	<ul style="list-style-type: none"> - Proven application in Shing Mun River Channel and Sam Ka Tsuen Typhoon Shelter - Successful pilot field trials at KTAC
Cement Stabilization and Solidification	2 to 3 years	<ul style="list-style-type: none"> - More commonly use for sediment contaminated with heavy metals 	<ul style="list-style-type: none"> - Potential release of pollutants into marine water due to disturbance to the sediment - Require extensive temporary works to control environmental impacts - Short term impacts on local marine ecosystem anticipated 	<ul style="list-style-type: none"> - Method yet to be tried out in Hong Kong conditions
Capping	3 to 5 years	<ul style="list-style-type: none"> - Uncertainty in effectiveness in blocking odour generation from sediment underneath 	<ul style="list-style-type: none"> - Reduced water depths after capping pose further restriction on water flows 	<ul style="list-style-type: none"> - More appropriate in open waters with sufficient water depths, e.g. contaminated mud pits at East Sha Chau

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