

Task Force on Kai Tak Harbourfront Development

For discussion
on 18 August 2015

TFKT/06/2015

Kai Tak Development - Kai Tak Approach Channel and Kwun Tong Typhoon Shelter Improvement Works (Phase 2)

PURPOSE

This paper provides an update on the water quality and odour situation at Kai Tak Approach Channel (KTAC) and Kwun Tong Typhoon Shelter (KTTS), and seeks members' views on the way forward for the Phase 2 improvement works at KTAC and KTTS.

BACKGROUND

2. KTAC/KTTS has a large catchment area and receives flow from Kai Tak Nullah (KTN), including treated effluent from Tai Po and Shatin sewage treatment works discharged through Tolo Harbour Effluent Export Scheme (THEES)¹, storm water diverted from Waterloo Road culvert via Kai Tak Transfer Scheme², as well as storm water and surface runoff from Kowloon City, San Po Kong, Kowloon Bay, Jordan Valley and part of Kwun Tong areas as shown in **Annex 1**. Since KTAC/KTTS is embayed by the former airport runway and the breakwaters of KTTS, both water circulation and flushing capacity are poor. Pollutants from land based sources, such as illegal discharges and non-point sources including polluted storm water and surface runoff, cannot be effectively dispersed or assimilated after entering KTAC/KTTS, which eventually caused water and odour problems.

3. As stipulated in the Environmental Impact Assessment (EIA) report for Kai Tak Development (KTD) approved in 2009 under the EIA Ordinance, a three-pronged mitigation approach is recommended to improve the water quality for general amenity at

¹ THEES solves the red-tide problem in Tolo Harbour and provides flushing to the KTN by exporting treated effluent from Tai Po and Shatin sewage treatment works to KTN via a tunnel.

² Kai Tak Transfer Scheme relieves flooding in Mong Kok by intercepting and conveying about two-thirds of the design flow from the Waterloo Road culvert via a drainage tunnel to KTN for discharge.

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KTAC/KTTS as well as tackle the odour problem arising thereat. It comprises :-

- (a) Rectification of expedient connections (EC) and interception of polluted discharges from hinterland into KTAC/KTTS;
- (b) Localised maintenance dredging within KTAC and in-situ bio-remediation treatment of sediments at KTAC/KTTS; and
- (c) Creation of a 600-metre (m) opening at the northern section of the former runway to improve water circulation in KTAC.

4. Environmental Protection Department (EPD), Buildings Department (BD) and Drainage Services Department (DSD) are responsible for the rectification works mentioned in paragraph 3(a) above, while Civil Engineering and Development Department (CEDD) is taking forward the works mentioned in paragraphs 3(b) and 3(c) as Phases 1 and 2 improvement works at KTAC/KTTS respectively.

PROGRESS UPDATE

Works under EPD, DSD and BD

5. EPD completed an EC survey covering part of the catchment of KTAC in 2008, and identified 33 mis-connections. 30 cases have been rectified whereas EPD is collaborating with BD to follow up on the remaining three cases.

6. In parallel, DSD was carrying out improvement works to the existing drainage and sewerage systems in the hinterland of KTD. All improvement works relating to interception of polluted discharges, including rectification of existing sewer overflow pipe to storm water drain, construction of dry weather flow interceptor (DWFI) and refurbishment of DWFI, were substantially completed in end 2013.

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Works under CEDD

7. To prevent the formation of odour due to presence of sulphide in the seabed sediment, CEDD commenced Phase 1 improvement works at KTAC/KTTS in July 2011. The works involved localised maintenance dredging at KTAC to provide sufficient water depth of not less than 3.5 m over the whole of KTAC and KTTS as capping layer for the sediment and the bio-remediation treatment work at KTAC/KTTS to prevent formation of odorous gas in the seabed sediment. Phase 1 improvement works were substantially completed in July 2014. Extent of the dredging works and the bio-remediation treatment works is shown in **Annex 2**.

8. For the Phase 2 improvement works, i.e. the proposed 600 m opening as in **Annex 2**, we have undertaken further detailed studies and examined possible alternative measures upon completion of the mitigation measures mentioned in paragraphs 3(a) and 3(b) above. Recent field survey data revealed that there should be room to review the scope of the 600 m opening, as well as feasible alternative options in lieu of creating an opening.

EFFECTIVENESS OF COMPLETED MITIGATION MEASURES

Water Quality

9. For water quality, the benefit of on-going rectification of ECs and refurbishment of DWFIs was obvious. Recent monitoring data indicate that the water quality at KTAC/KTTS is generally improved but the bottom dissolved oxygen³ (DO) at KTAC as shown in **Table 1** is still unable to meet the requirement of 2 mg/l or above for 90% of the sampling occasions under the EIA for KTD for odour mitigation. Water sampling locations are shown in **Figure 1**.

³ Dissolved Oxygen (DO) refers to the level of free, non-compound oxygen present in water. It is an important parameter in assessing water quality because of its influence on marine organisms. In general, a higher DO represents a better water quality of the water body.

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Year	KTAC		KTTS
	AC1	AC2	KT1
2014	0.6	0.7	2.0

Table 1: Bottom DO Level at KTAC/KTTS (Unit: mg/l)



Figure 1: Sampling Locations in KTAC/KTTS

Odour

10. The odour problem at KTAC and KTTS is generally under control. According to the odour patrols conducted in 2014,

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most of the monitoring results indicated an odour intensity ⁴ of “0” (i.e. no odour detected) at Kai Tak Development area and its vicinity, with only a few monitoring results at an odour intensity of “1”.

REVIEW ON 600M OPENING AND STUDY ON ALTERNATIVE MITIGATION MEASURES

11. The principle of the three-pronged approach as recommended under the approved EIA for KTD is to reduce pollutants from entering KTAC/KTTS and to improve water circulation of KTAC/KTTS with the Victoria Harbour.

12. With the latest survey data, we have conducted a comprehensive review to re-visit the proposed 600 m opening under the Phase 2 improvement works and study alternative options in lieu of the opening. The review concluded that an Interception and Pumping (IP) Scheme could effectively reduce the polluted flow from entering KTAC/KTTS and improve the water circulation there, eventually suppressing the formation of odour at KTAC/KTTS.

13. The proposed IP Scheme, as presented in **Annex 3**, involves the construction of a new pumping station and the utilisation of existing seawater pump house under District Cooling System (DCS) with arrangement as follows:

- (a) A new pumping station is proposed near the outlet of KTN to intercept flow from KTN and discharge outside To Kwa Wan typhoon shelter, thereby reducing flows from being discharged into KTAC/KTTS; and
- (b) The seawater intake of DCS seawater pump house is to be relocated to extract seawater from KTAC instead of Victoria

⁴ The odour intensity was determined at 5 different levels according to the criteria below:
0– Not detected. No odour perceived or an odour so weak that it cannot be easily characterized or described;
1– Slight identifiable odour, and slight chance to have odour nuisance;
2– Moderate identifiable odour, and moderate chance to have odour nuisance;
3– Strong identifiable odour, likely to have odour nuisance;
4– Extreme severe odour, and unacceptable odour level.

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Harbour to enhance the water circulation of KTAC.

14. The comprehensive review concluded that the proposed IP Scheme could achieve similar environmental performance as the originally proposed 600 m opening at former runway and meet the requirement for water quality improvement and odour control under the EIA for KTD. As compared with the originally proposed 600 m opening, the proposed IP Scheme is more cost effective with much reduced capital and life cycle costs and will not impose constraints on the development of the Metro Park in terms of design and implementation programme. Besides, the discharge point will be farther away from To Kwa Wan waterfront and the water quality there will not be adversely affected.

WAY FORWARD

15. In view of the above, it is recommended that the proposed IP Scheme be adopted as Phase 2 improvement works at KTAC/KTTS in lieu of the 600 m opening at former runway. Subject to the outcome of public consultation, we will commence the detailed design of the proposed IP Scheme.

VIEWS SOUGHT

16. Members' views on the project are welcome.

**Kowloon Development Office
Civil Engineering and Development Department
August 2015**

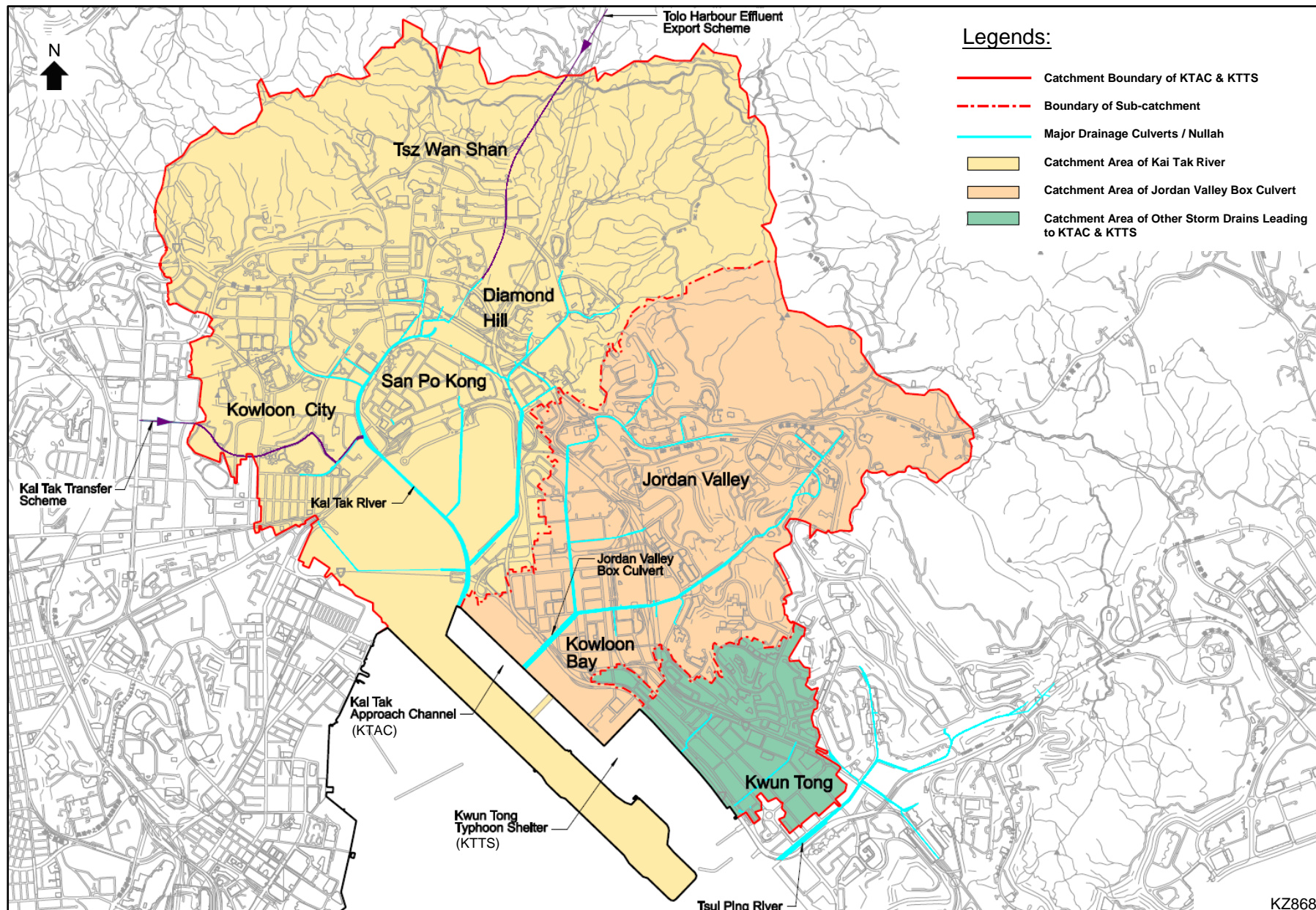
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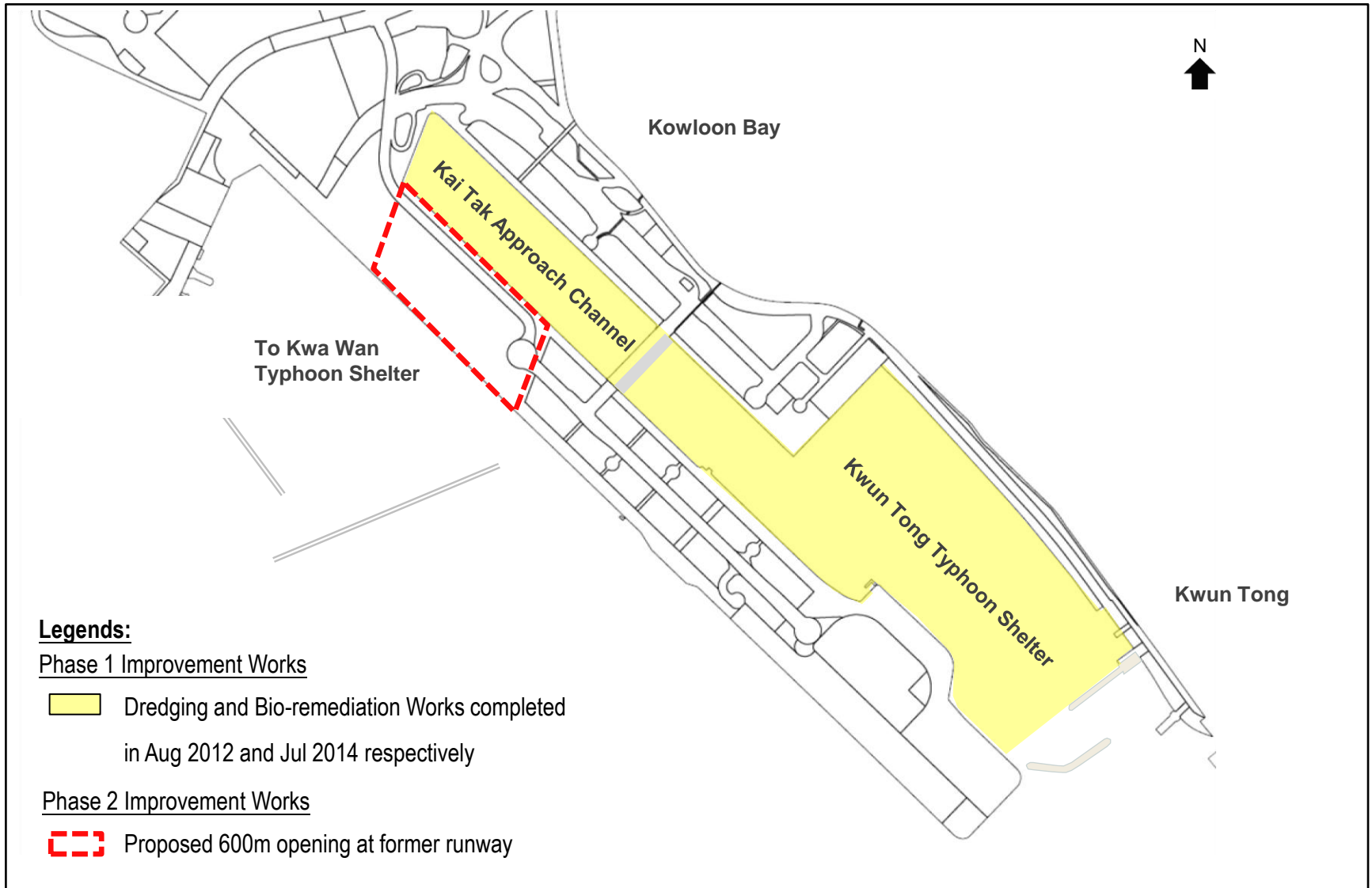
ATTACHMENTS

- Annex 1 Catchment Area of KTAC and KTTS
- Annex 2 Works Performed/ to be Performed by CEDD
- Annex 3 Proposed Interception and Pumping Scheme

Catchment Area of KTAC and KTTS



Works Performed / to be Performed by CEDD



Proposed Interception and Pumping Scheme

