

# Feasibility of Further Water Quality Improvement at Kai Tak Approach Channel and Kwun Tong Typhoon Shelter for Water Sports Activities



# KTD EIA - Water Quality Improvement at KTAC and KTTS

Objective: To improve water quality, mainly bottom dissolved oxygen, at KTAC/KTTS for odour mitigation

## Mitigation Measures under KTD for EIA:

- Rectification of identified expedient connections and interception of polluted discharges from hinterland
- Dredging / bio-remediation treatment of sediments
- Interception and Pumping Scheme (IPS)\* (to replace 600m Opening) – briefed members during KTF meeting in August 2015

Substantially completed by mid 2014

Under Design Stage



\* Remark: The IPS achieves similar performance as the 600m Opening.



# Water Sports Activities at KTAC/KTTS

- A consultancy study to investigate the feasibility of further improving the water quality at KTAC / KTTS for water sports activities

**WQO for the Secondary Contact Recreation Subzones –  
*E. coli* not exceeding 610 count / 100 ml (annual geometric mean )**



Kwun Tong Water Sports Festival 2016 on 26-27 March 2016



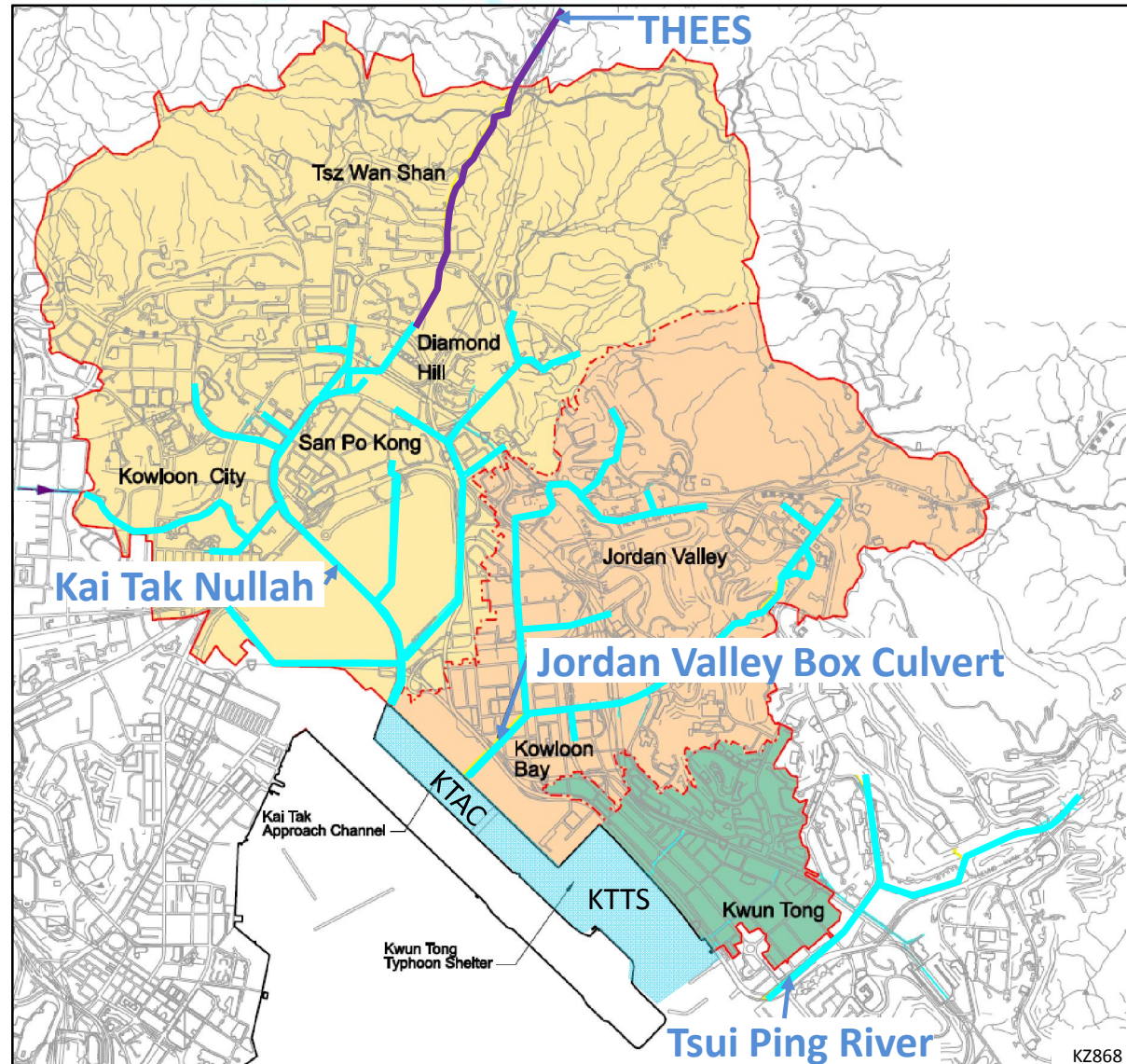
# Sources of *E.coli* to KTAC/KTTS

- THEES
- Pollutants from hinterland
  - Kai Tak Nullah (KTN)
  - Jordan Valley Box Culvert (JVBC)
  - Tsui Ping River

**Total *E.coli* loading to KTAC/KTTS**

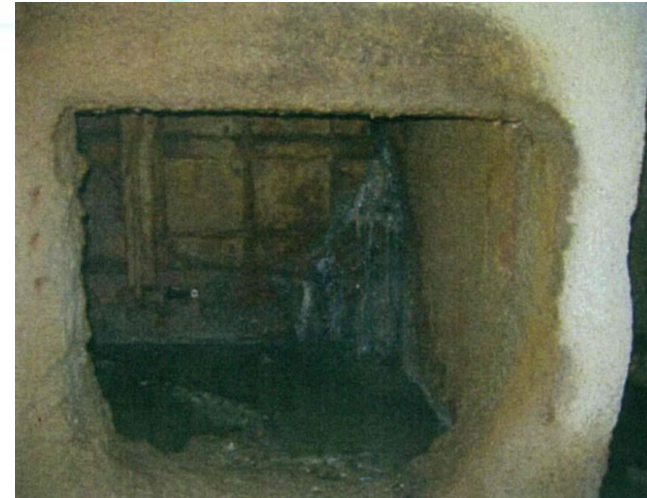
KTN Catchment : about 60%

JVBC Catchment : about 40%



# Sources of Pollution

- From damaged foul sewers into stormwater drainage system
- From mis-connections / expedient connections
- From roadside activities

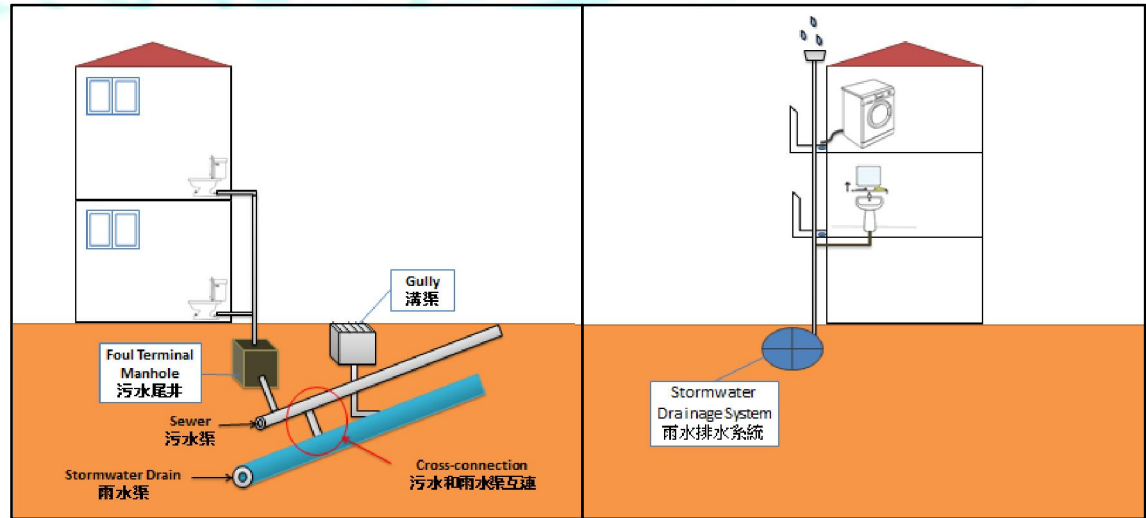


Polluted flow to stormwater drainage system from damaged sewers / sewerage manholes



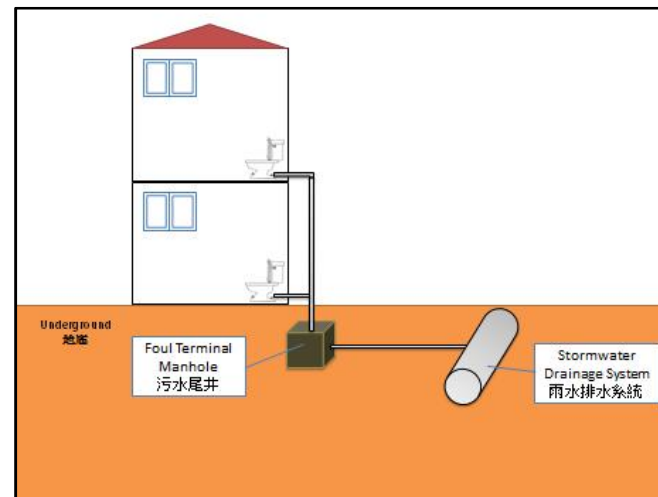
# Sources of Pollution

- From damaged foul sewers into stormwater drainage system
- From mis-connections / expedient connections
- From roadside activities



Mis-connection of public foul and stormwater system

Contaminated flow mis-connected to stormwater system



Foul terminal manhole mis-connected to stormwater system



# Sources of Pollution

- From damaged foul sewers into stormwater drainage system
- From mis-connections / expedient connections
- From roadside activities



Back lane washing activities



Polluted flow from on-street markets to road side gullies



Illegal discharge of polluted flow to road side gullies



# Disinfection Technologies

## By Chlorination

- High suspended solid (S.S.) level of about 600 mg/l
- Substantial amount of NaOCl for disinfection
- Health risk associated with high concentration of residual chlorine

## By Ozonation

- Substantial amount of Ozone dosage for disinfection
- Solubility of ozone in pure water is very low

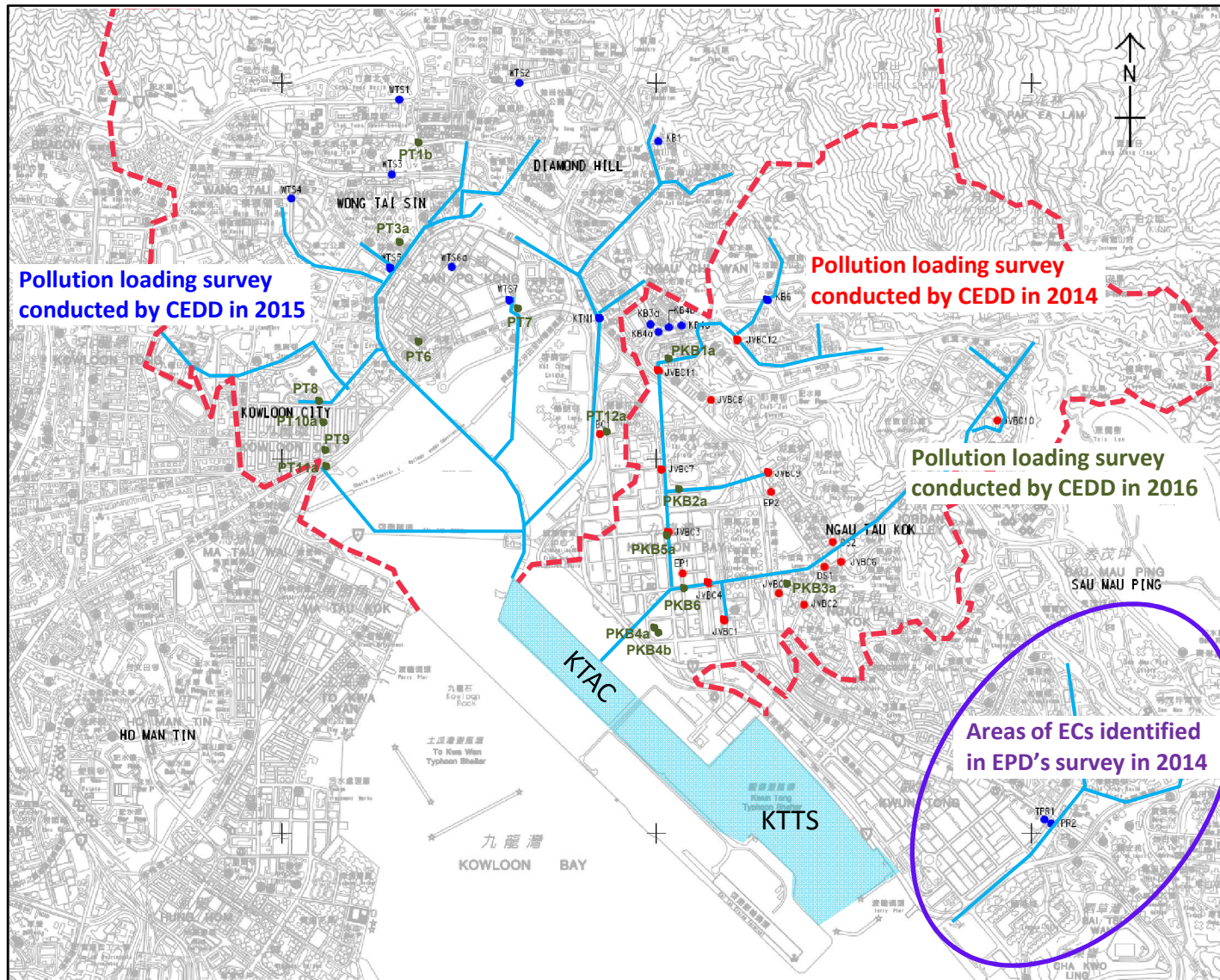
## By UV irradiation

- Poor UV transmittance due to high S.S. level of about 600 mg/l





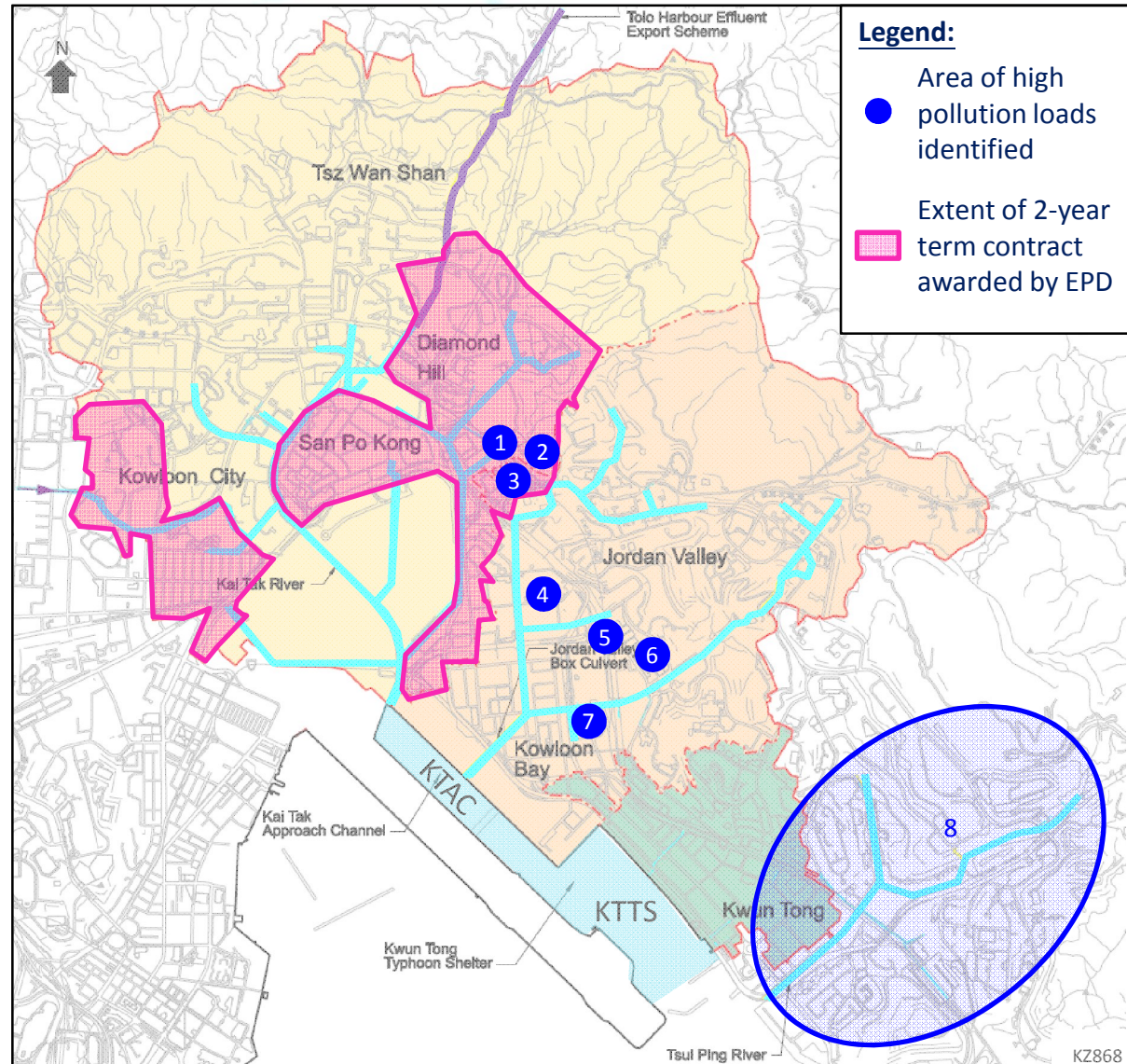
# Identifying and Rectifying Pollution Sources



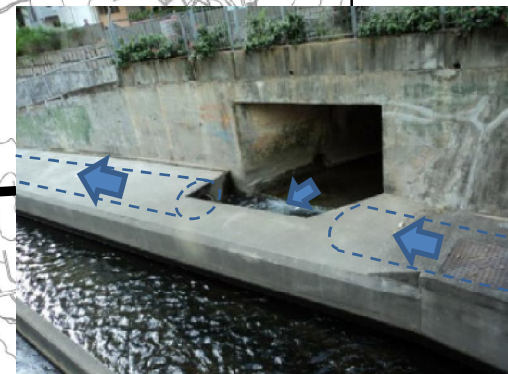
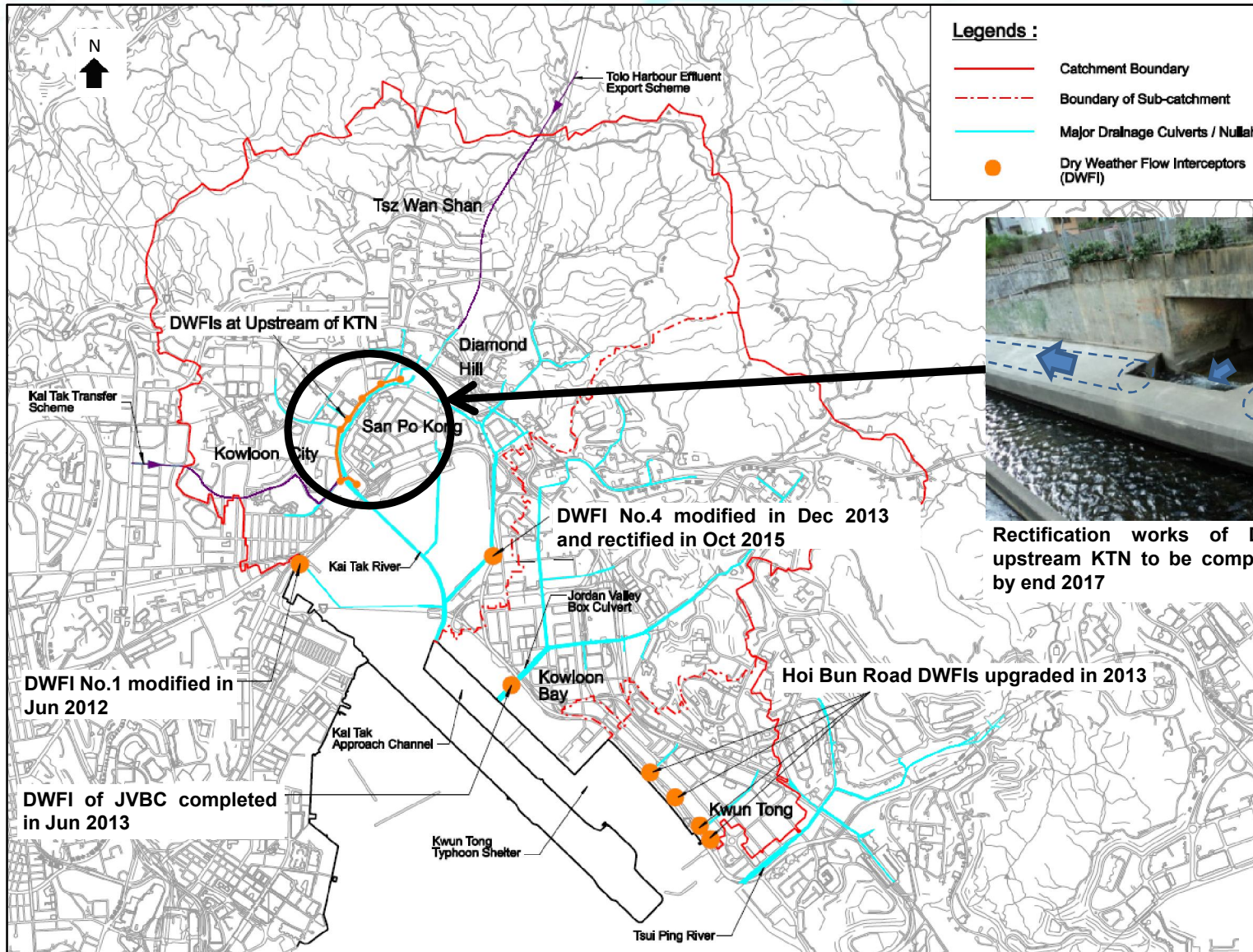
# Identifying and Rectifying Pollution Sources

## Location of pollution sources identified:

1. Misconnection at Lung Cheung Road
2. Unsewered area at Ngau Chi Wan Village
3. Misconnections at Lung Cheung Road near Ngau Chi Wan Market
4. EC from an existing cooked food stall at Kai Yip Estate
5. Misconnection from Amoycan Industrial Centre
6. Misconnection near Maryknoll Secondary School
7. Misconnection at Siu Yip Street
8. 30 ECs/misconnections at Tsui Ping River



# Enhancement of DWFIs to Upstream of KTAC/KTTS



Rectification works of DWFIs along upstream KTN to be completed by DSD by end 2017



# Existing Water Quality at KTAC/KTTS

*E.coli* Counts / 100ml (annual geometric mean):

| Year | KTAC                      |                           |                           |                           |                           |                           |                         | KTTS                  |
|------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|-------------------------|-----------------------|
|      | AC1                       | AC2                       | AC3                       | AC4                       | AC5                       | AC6                       | AC7                     | KT1                   |
| 2013 | 7,800<br>(5,000 - 25,000) | 7,200<br>(2,300 - 24,000) | 5,100<br>(2,600 - 10,000) | 9,700<br>(3,300 - 36,000) | 4,800<br>(2,800 - 12,000) | 5,900<br>(3,200 - 11,000) | 2,700<br>(1200 - 7,000) | 700<br>(100 - 4,000)  |
| 2014 | 7,900<br>(300 - 120,000)  | 6,600<br>(200 - 137,000)  | 4,200<br>(200 - 126,000)  | 4,500<br>(200 - 125,000)  | 2,800<br>(100 - 105,000)  | 2,600<br>(50 - 105,000)   | 1,800<br>(50 - 125,000) | 600<br>(50 - 109,000) |
| 2015 | 5,500<br>(100 - 45,000)   | 2,200<br>(500 - 14,000)   | 2,500<br>(800 - 9,000)    | 1,500<br>(200 - 12,000)   | 1,200<br>(400 - 14,000)   | 1,000<br>(200 - 11,000)   | 610<br>(100 - 12,000)   | <600<br>(50 - 29,000) |

Note: Data in brackets indicate the ranges

Water Quality Target for Water Sports:  
*E.coli* ≤ 610 counts/100 ml (annual geometric mean)

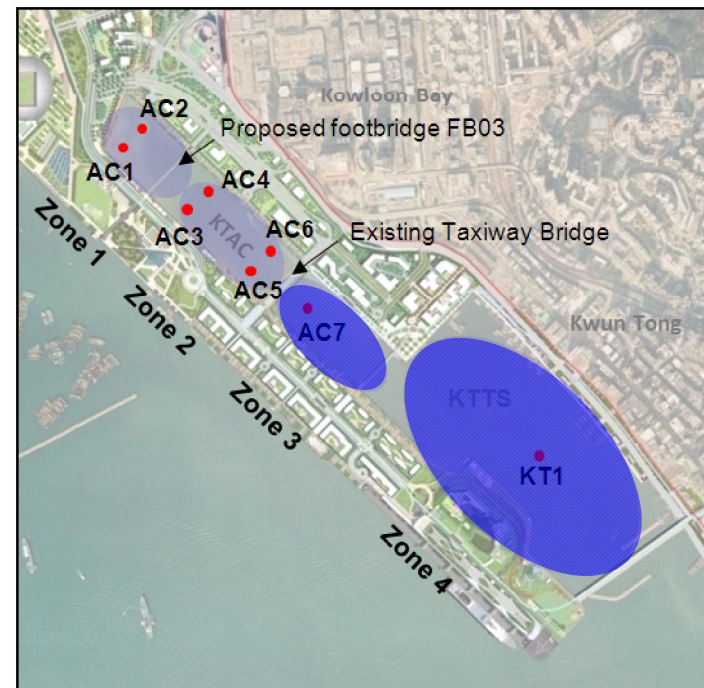


# Predicted Water Quality at KTAC/KTTS

*E.coli* Counts / 100ml (annual geometric mean):

| KTAC          |     |           |     |     |     |        | KTTS   |
|---------------|-----|-----------|-----|-----|-----|--------|--------|
| Zone 1        |     | Zone 2    |     |     |     | Zone 3 | Zone 4 |
| AC1           | AC2 | AC3       | AC4 | AC5 | AC6 | AC7    | KT1    |
| 1,500 - 2,000 |     | About 800 |     |     |     | <600   | <400   |

Water Quality Target for Water Sports:  
*E.coli* ≤ 610 counts/100 ml (annual geometric mean)



# Way Forward

## Improvement/Enhancement in the Pipeline

### Further Enhancement of Water Quality

- Collaborating with relevant departments to further rectify identified pollution sources as far as practicable and upgrade DWFIs to intercept pollutants, so as to achieve the water quality requirement for water sports activities, initially at KTTS and then the southern part of KTAC



### Further Monitoring of Water Quality

- To continue monitoring the water quality of KTAC / KTTS



**Thank You**