

An Update on the Harbour Area Treatment Scheme (HATS)

Drainage Services Department

July 2018

Rundown



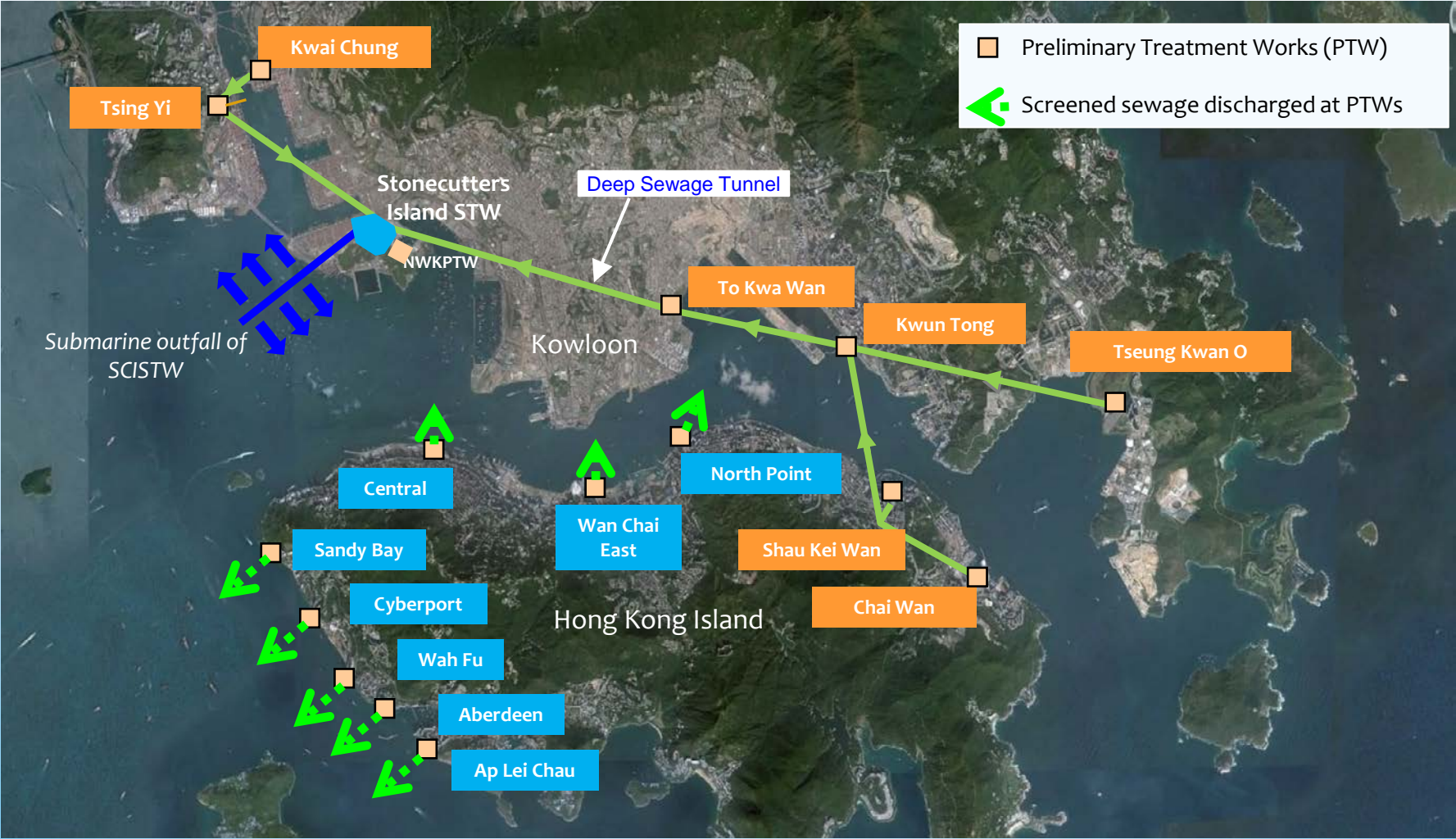
- ◆ The HATS and its Improvements
- ◆ Enhancing System Robustness & Planned Maintenance of HATS Stage 1
- ◆ Further Enhancement of Coastal Water Quality

The HATS and Its Improvements

Pre-HATS (before 2001)



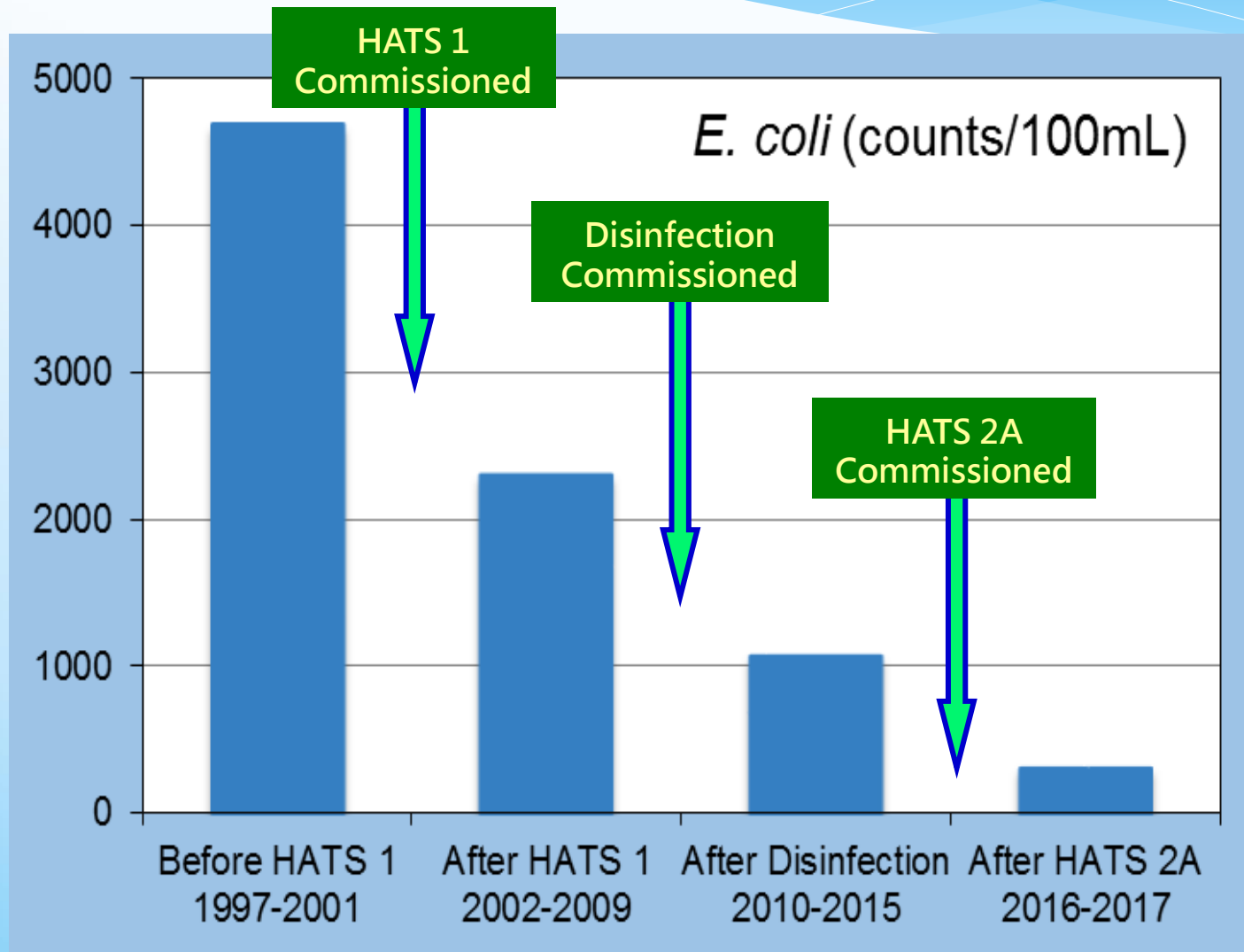
HATS Stage 1 (2001 - 2015)



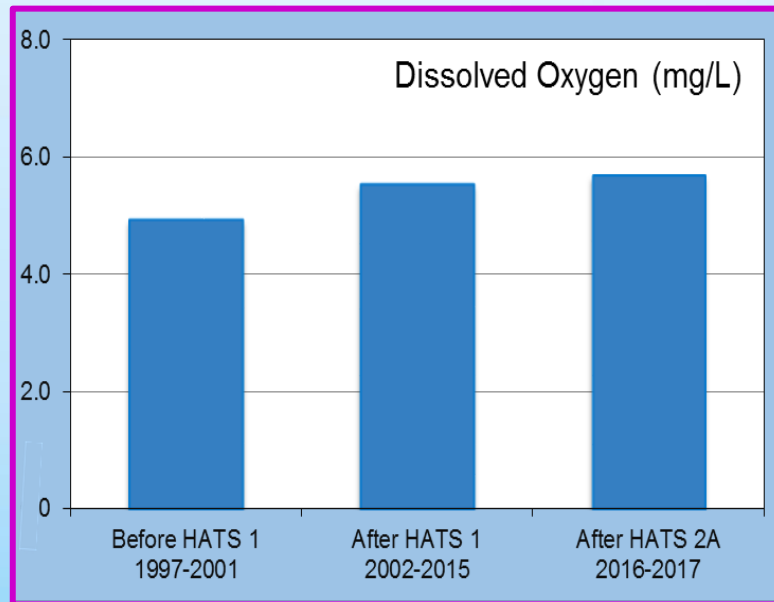
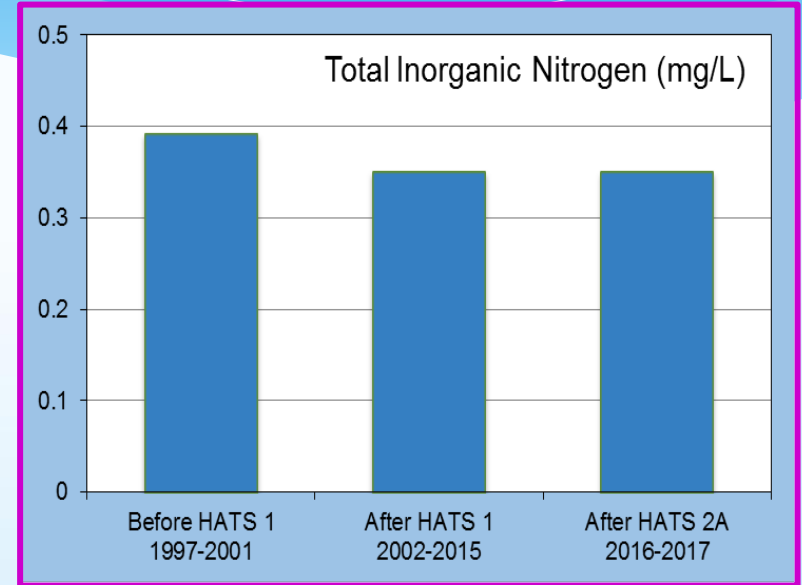
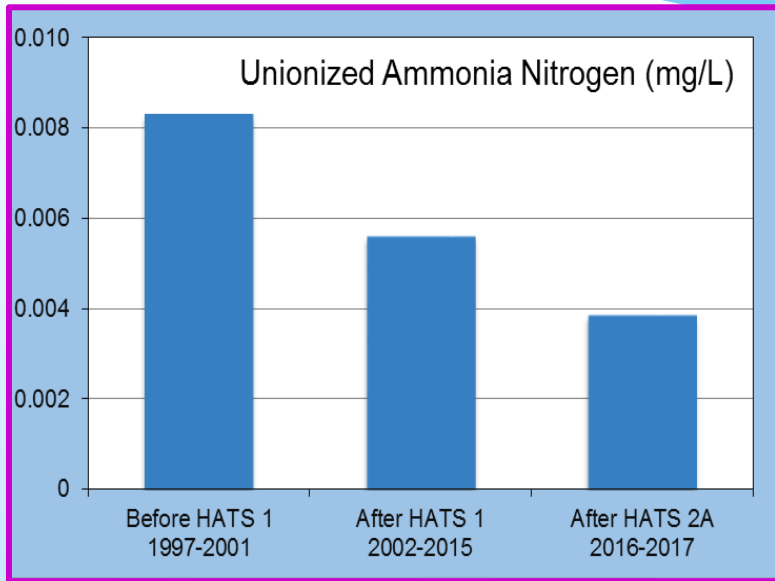
HATS Stage 1 + Stage 2A



Water Quality in Victoria Harbour



Water Quality in Victoria Harbour



Water Quality in Victoria Harbour



2011 – Cross harbour Race revived, after suspension for 33 years

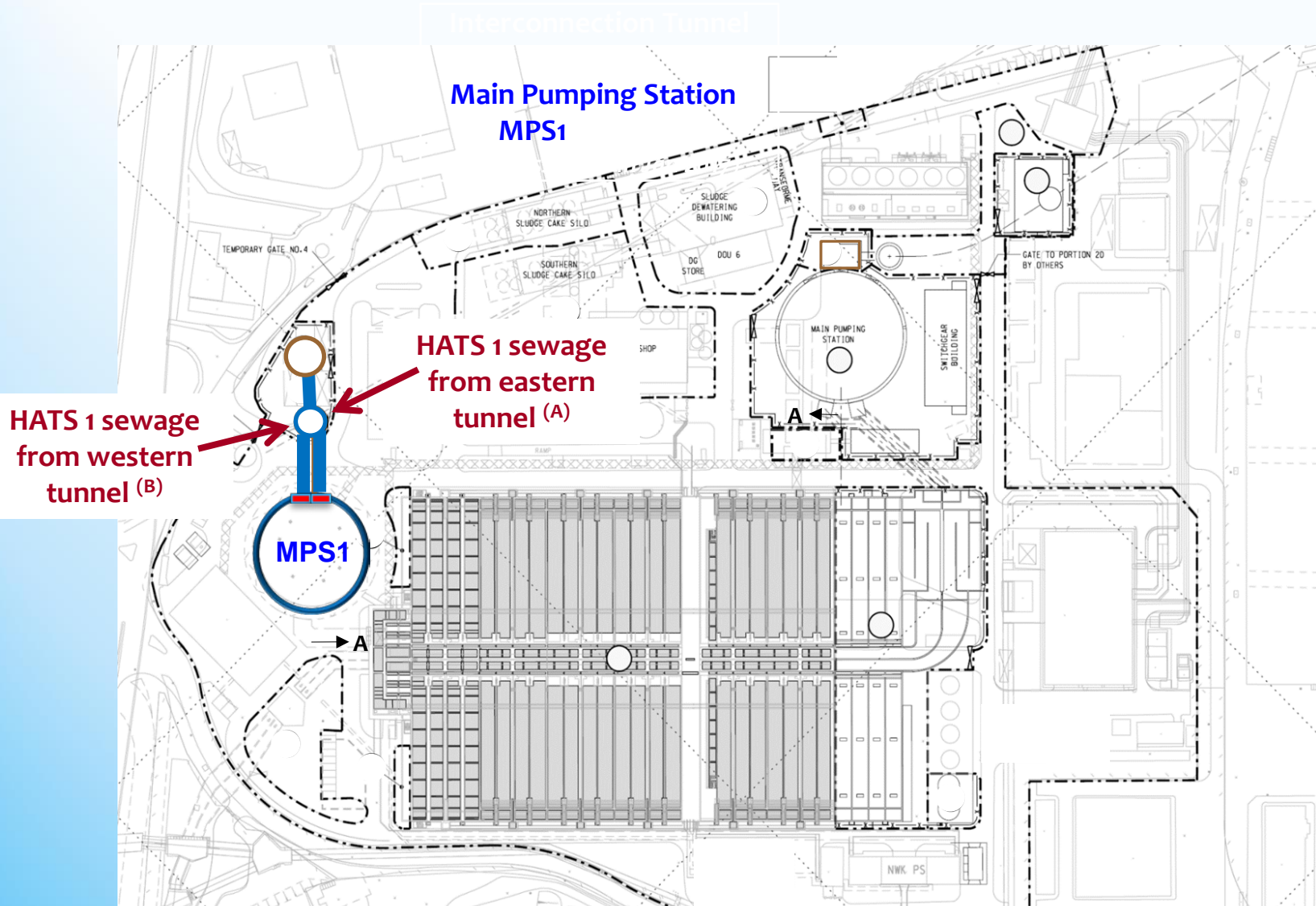
2017 – Race route resumed at central Harbour: Tsim Sha Tsui to Wanchai

Enhancing System Robustness & Planned Maintenance of HATS Stage 1

HATS Stage 1 + Stage 2A

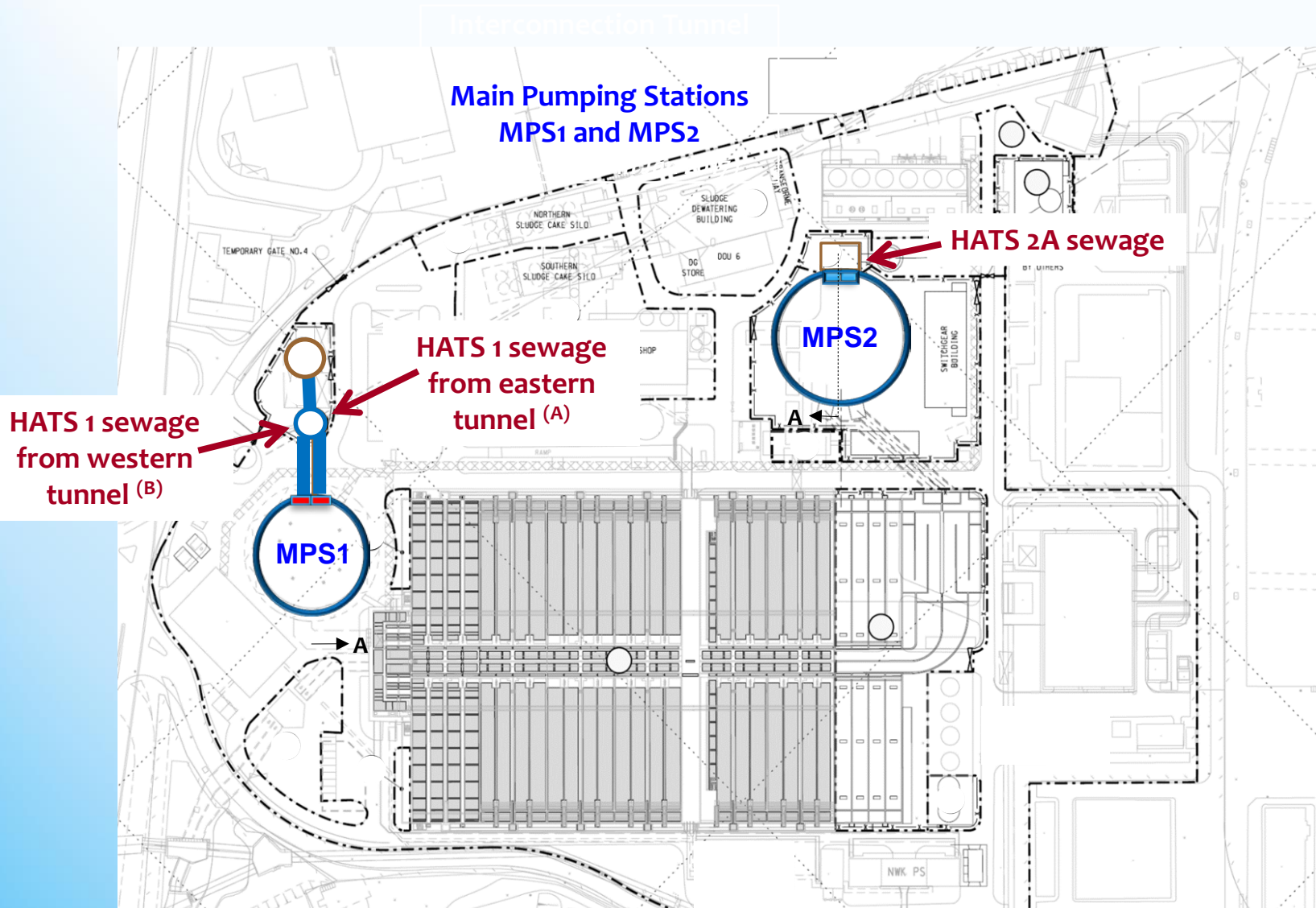


Enhancing System Robustness



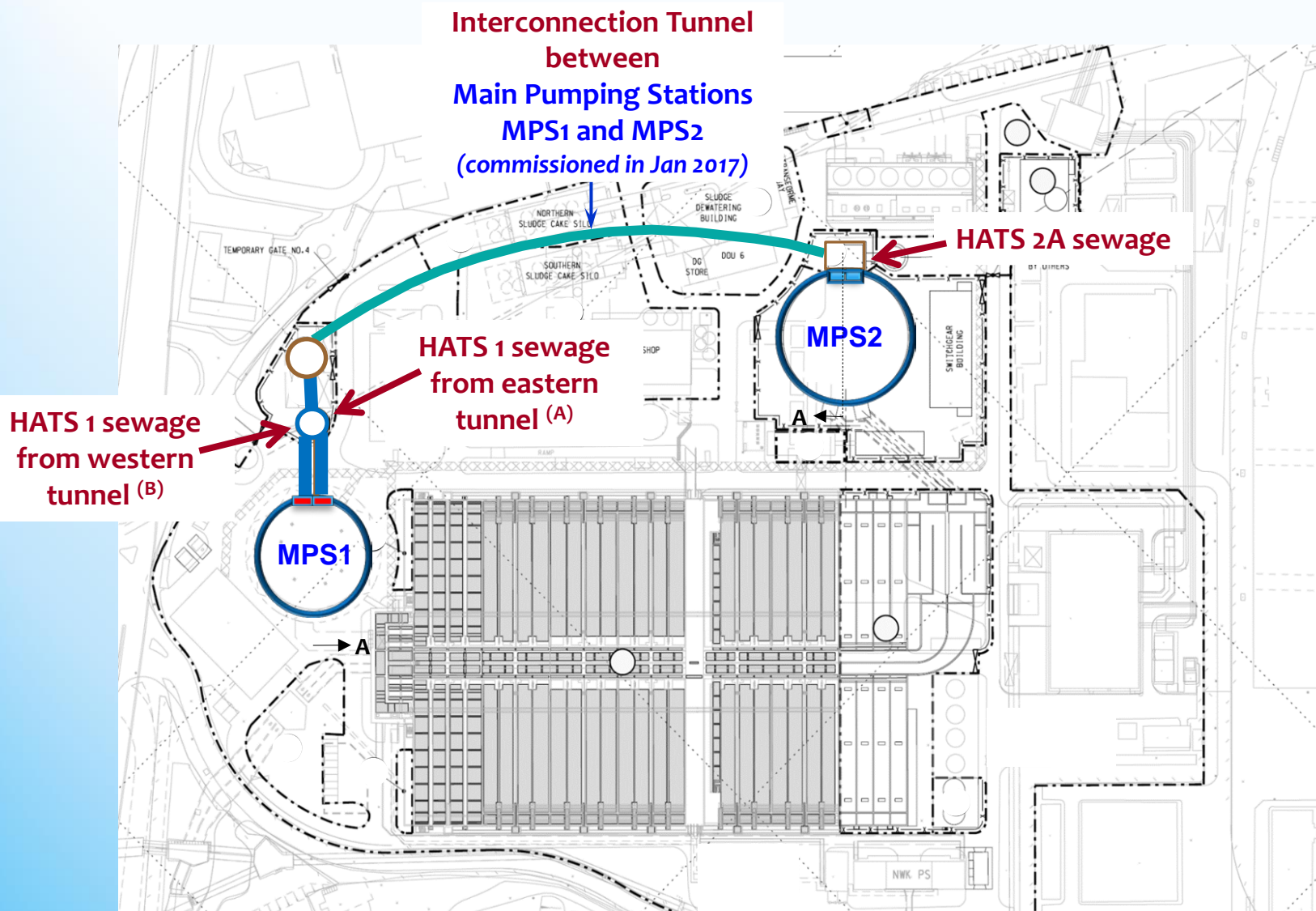
Note: (A) Sewage from Chai Wan PTW, Shau Kei Wan PTW, Tseung Kwan O PTW, Kwun Tong PTW and To Kwa Wan PTW
(B) Sewage from Kwai Chung PTW and Tsing Yi PTW

Enhancing System Robustness



Note: (A) Sewage from Chai Wan PTW, Shau Kei Wan PTW, Tseung Kwan O PTW, Kwun Tong PTW and To Kwa Wan PTW
(B) Sewage from Kwai Chung PTW and Tsing Yi PTW

Enhancing System Robustness



Note: (A) Sewage from Chai Wan PTW, Shau Kei Wan PTW, Tseung Kwan O PTW, Kwun Tong PTW and To Kwa Wan PTW

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Enhancing System Robustness



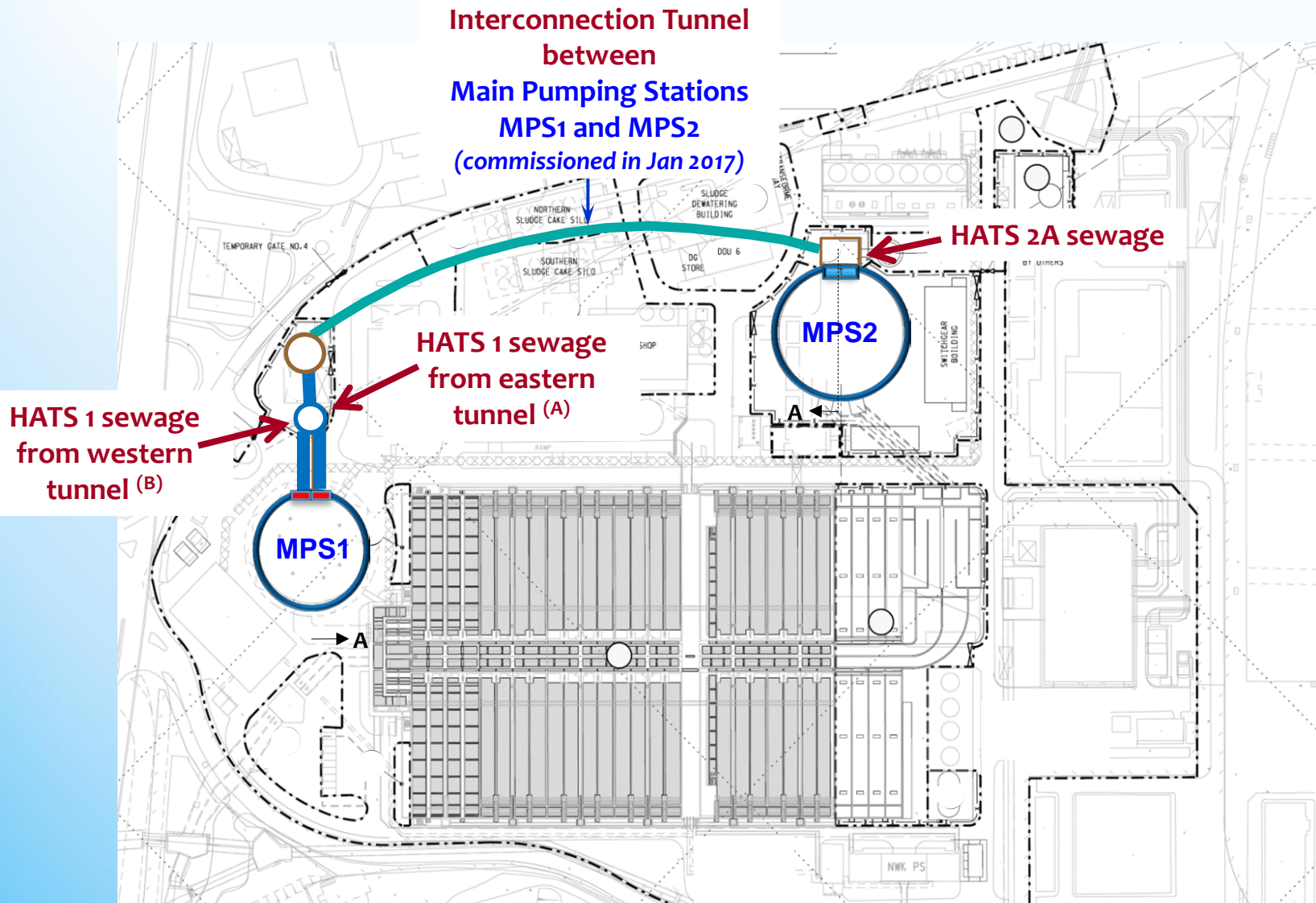
Interconnection Tunnel
between MPS1 and MPS2

MPS1

MPS2

Stonecutters Island Sewage
Treatment Works

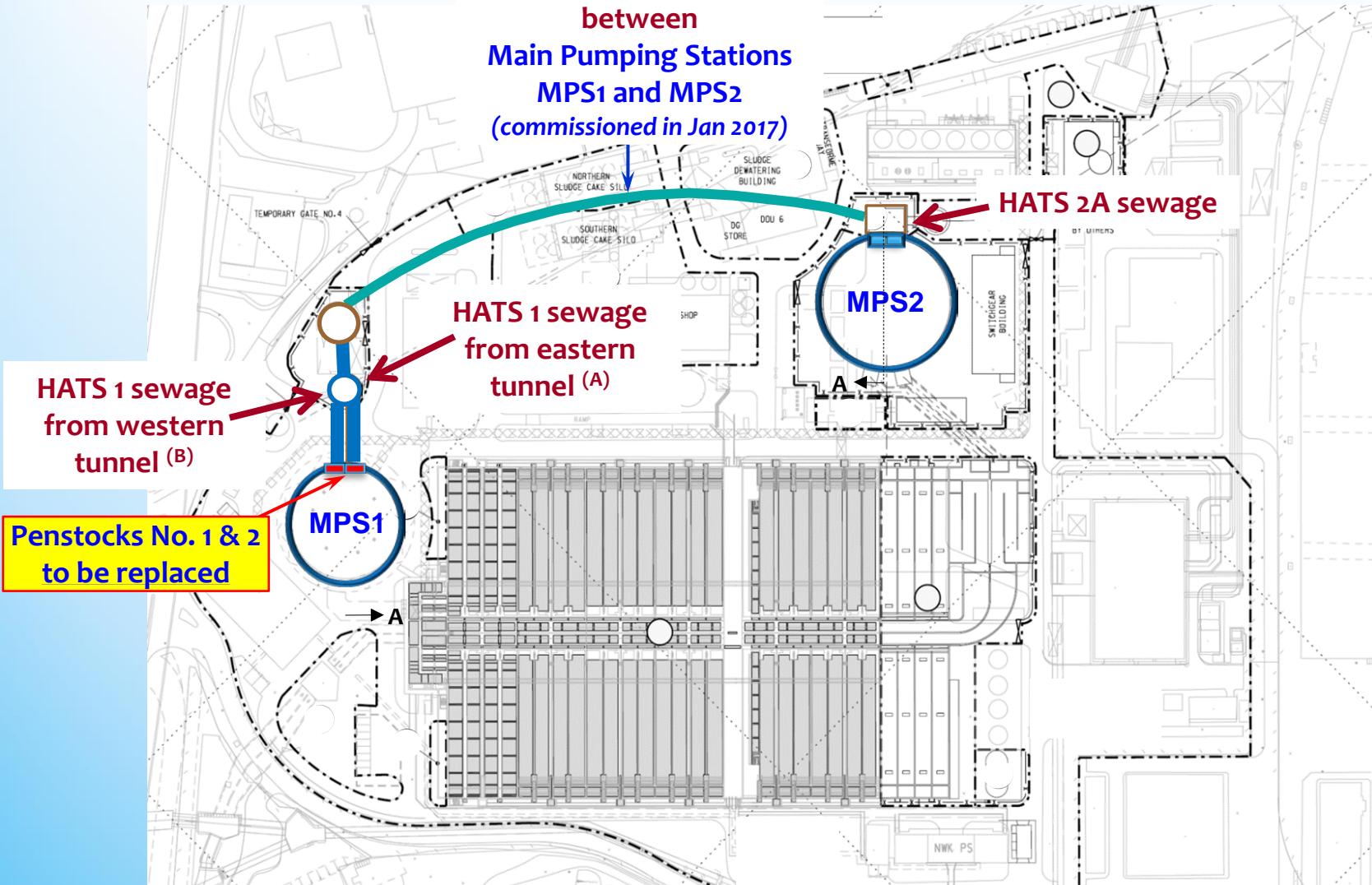
Enhancing System Robustness



Note: (A) Sewage from Chai Wan PTW, Shau Kei Wan PTW, Tseung Kwan O PTW, Kwun Tong PTW and To Kwa Wan PTW
(B) Sewage from Kwai Chung PTW and Tsing Yi PTW

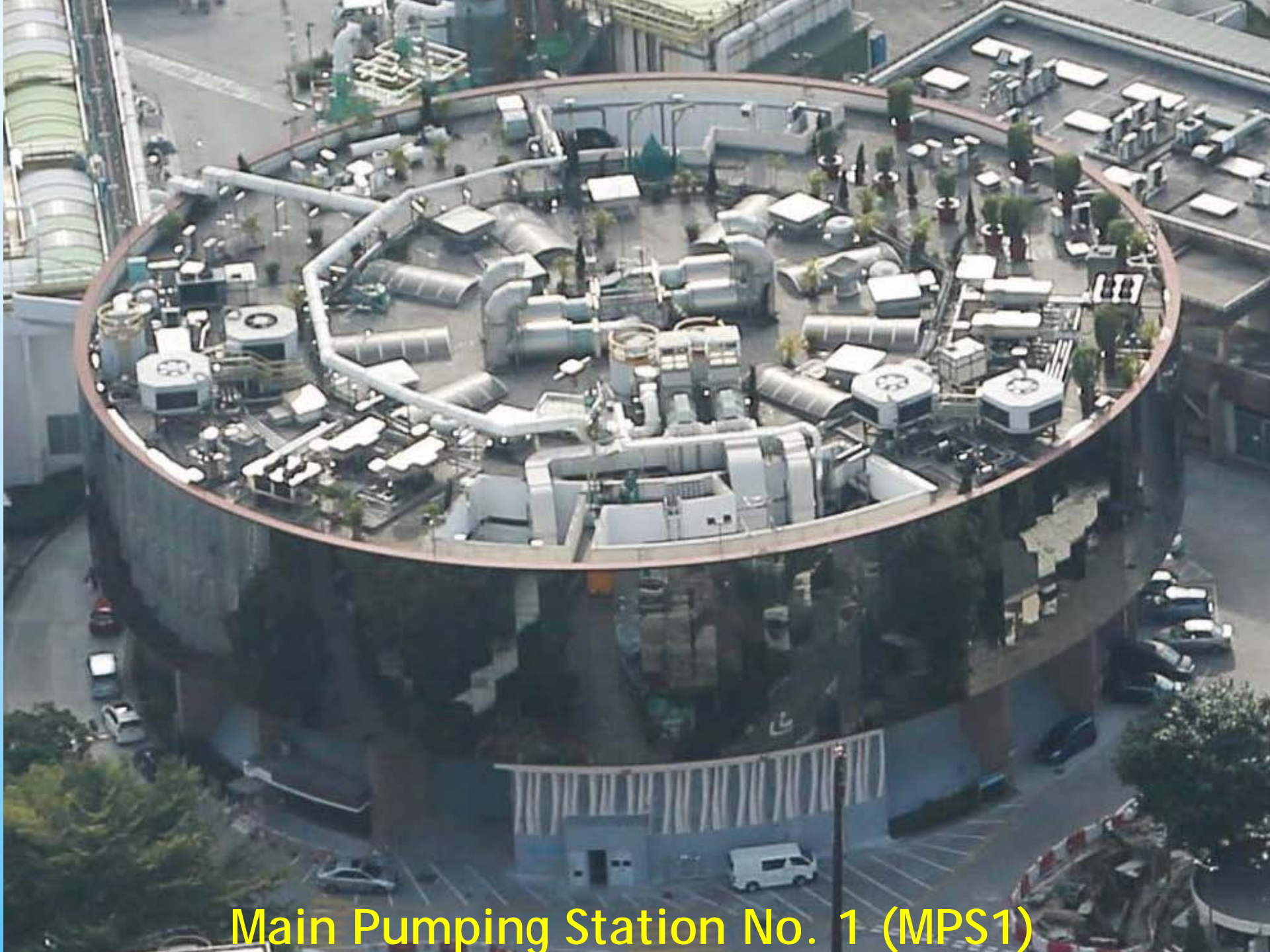
Enhancing System Robustness

**Interconnection Tunnel
between
Main Pumping Stations
MPS1 and MPS2
(commissioned in Jan 2017)**



Note: (A) Sewage from Chai Wan PTW, Shau Kei Wan PTW, Tseung Kwan O PTW, Kwun Tong PTW and To Kwa Wan PTW

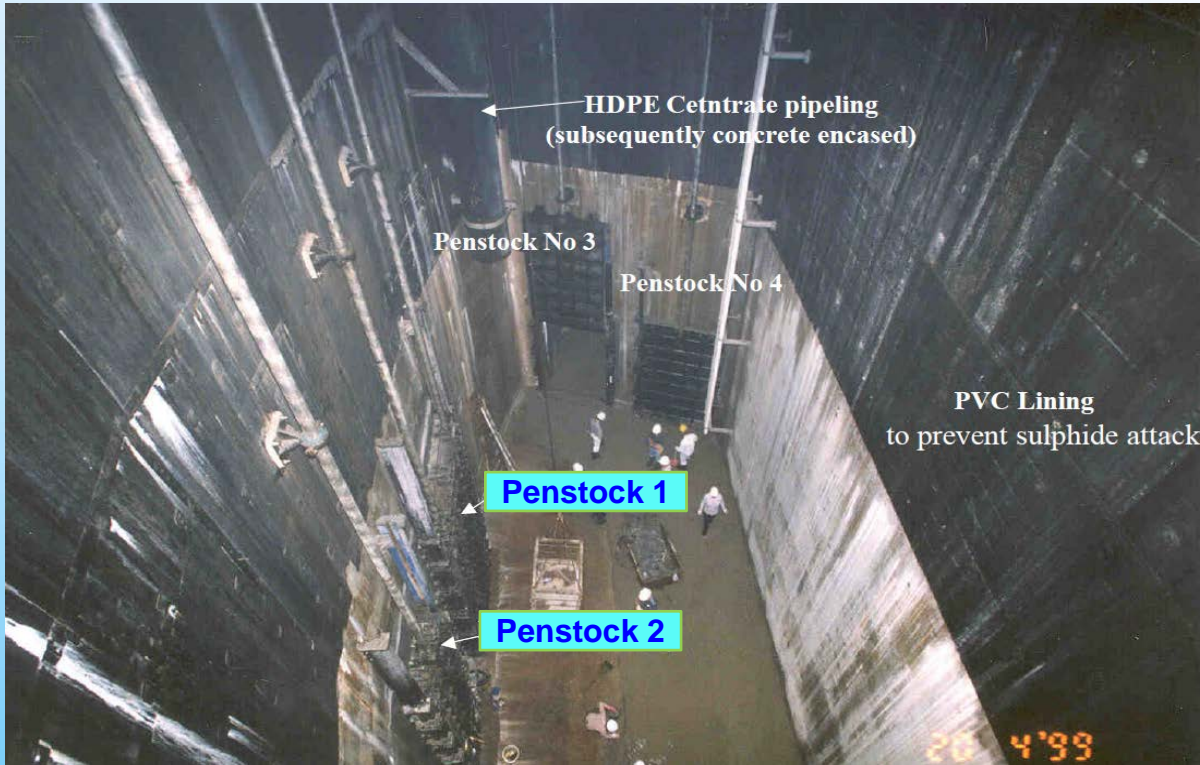
(B) Sewage from Kwai Chung PTW and Tsing Yi PTW



Main Pumping Station No. 1 (MPS1)

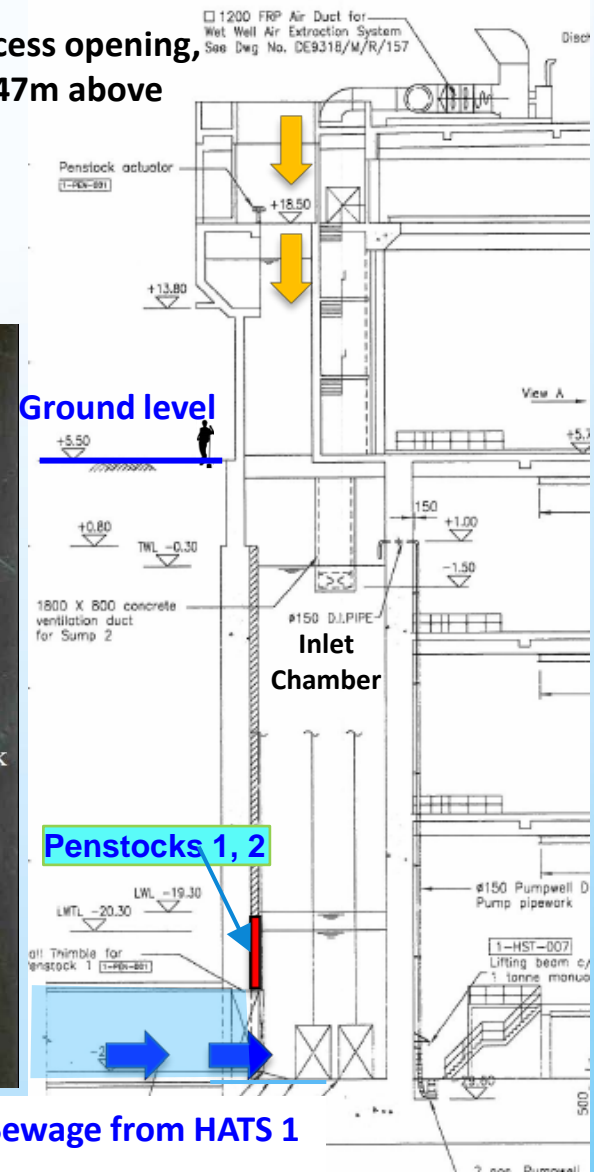
Inlet Chamber of MPS1

- **Deep location**
- **34m below ground level**
- **Safety Precautions**
- **Confined Space**
- **Hazardous sewerage environment**



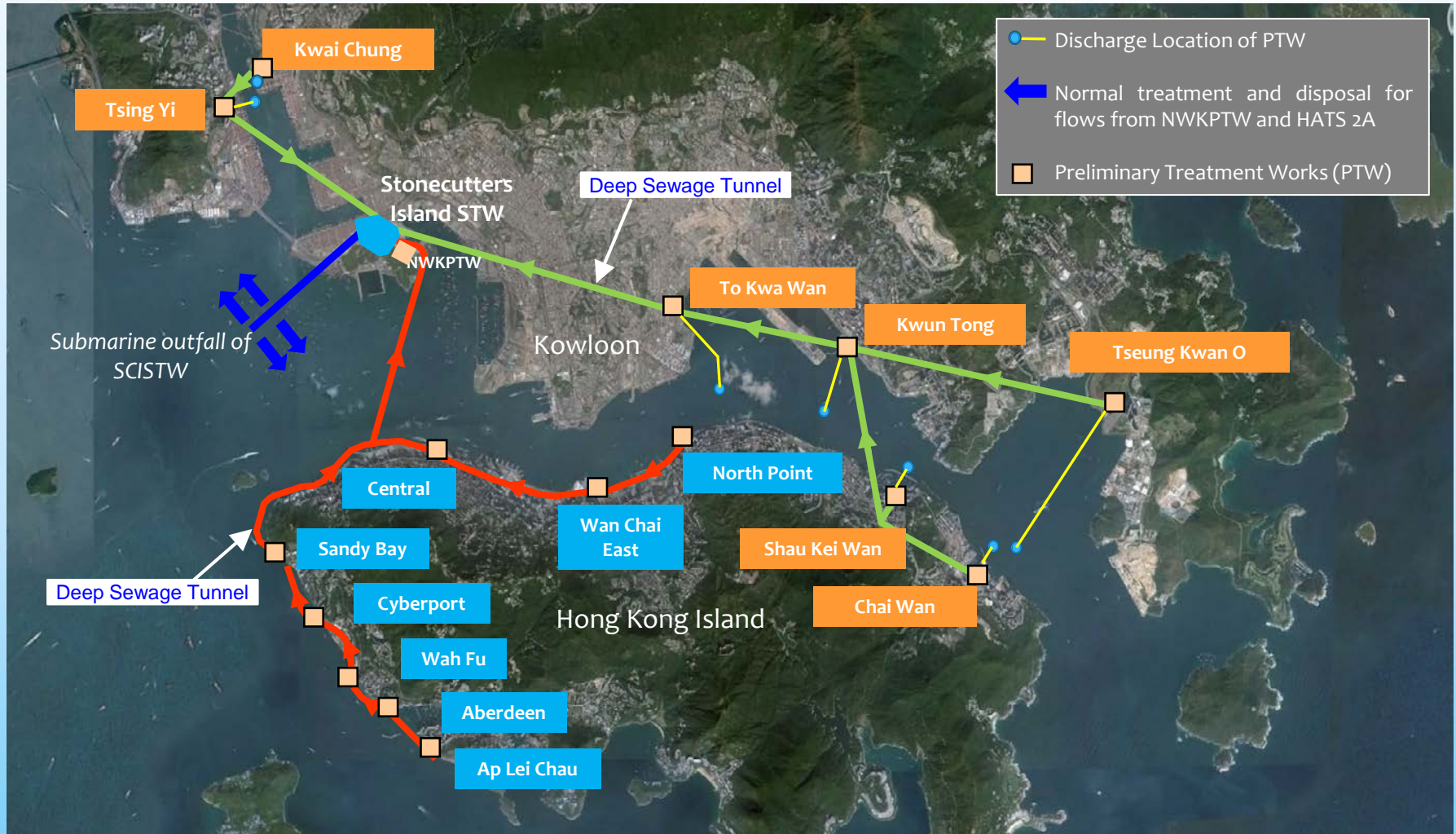
Inlet Chamber of MPS1

Access opening,
47m above



Timeline of Works Sequence and Sewage Bypass

Temporary Bypass at 7 PTWs of HATS 1



HATS 1 Penstocks Replacement

- 17 years of unceasing operation since 2001
- Temporary sewage bypass (in non-bathing season, 5 episodes each not exceeding 2 weeks)
- Water Quality Modelling – potential impact low and transient
- Consultation with the ACE and the LegCo EA Panel
- Inter-departmental working group
- First bypass completed (20 Feb – 4 Mar 2018)

Conditions during the 1st bypass



Tsuen Wan Promenade

Conditions during the 1st bypass



Hung Hom Promenade

Conditions during the 1st bypass



Siu Sai Wan Promenade

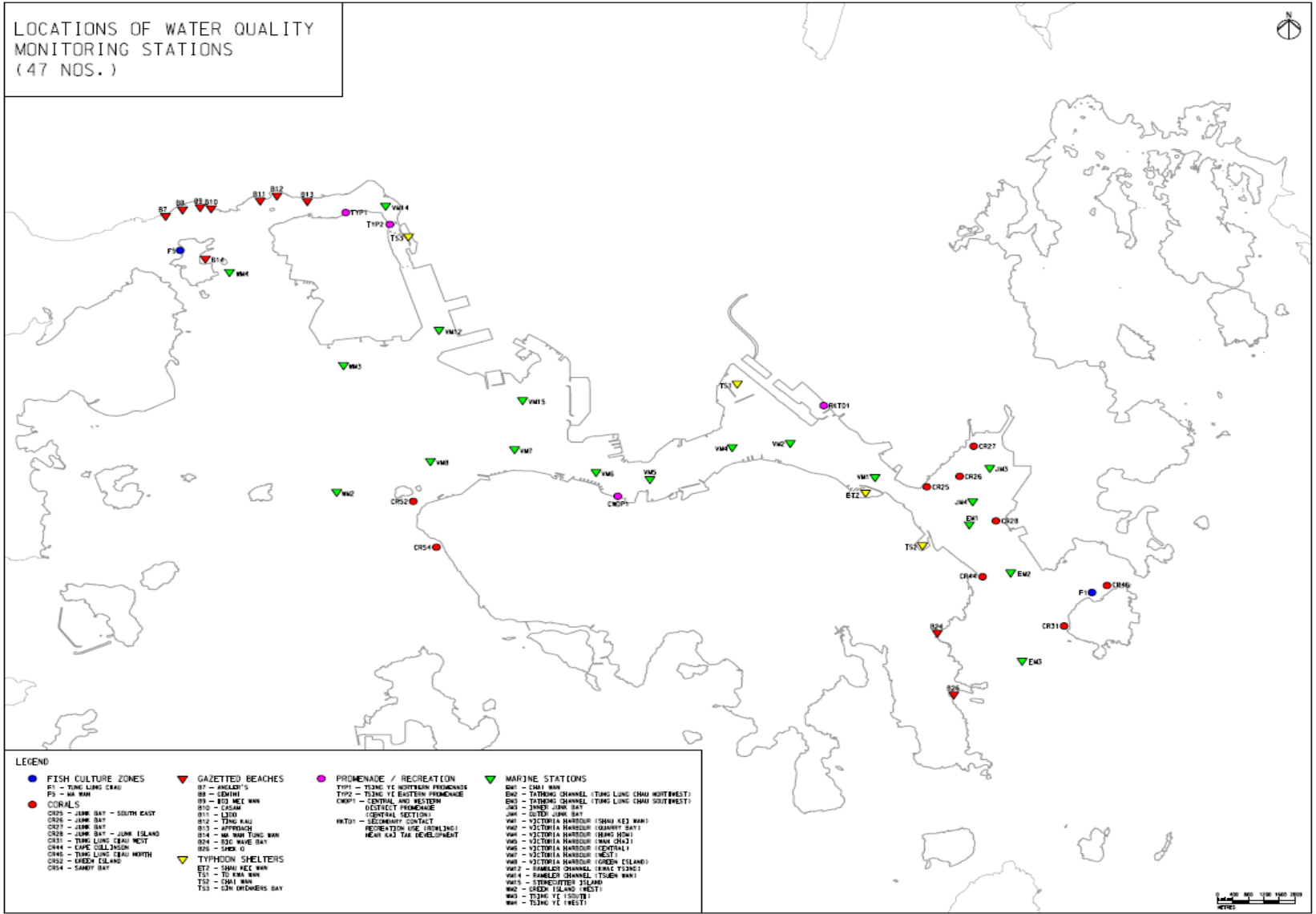
Conditions during the 1st bypass



Aldrich Bay Promenade

Water Quality Monitoring

LOCATIONS OF WATER QUALITY MONITORING STATIONS (47 NOS.)



Water Quality Monitoring Results (1st bypass)

Beaches

			Baseline	Bypass														Post-bypass							
			泳灘 Reaches																						
Parameter 參數	監測站 Station	位置 Location	Baseline 基線			During Temporary Sewage Bypass 臨時繞流期間														After Temporary Sewage Bypass 臨時繞流後					
			Dec 2017 十二月	Jan 2018 一月	Feb 2018 二月	20.02.18	21.02.18	22.02.18	23.02.18	24.02.18	25.02.18	26.02.18	27.02.18	28.02.18	01.03.18	02.03.18	03.03.18	04.03.18	05.03.18	06.03.18	07.03.18	08.03.18			
大腸桿菌 <i>E. coli</i>	B7	釣魚灣 Anglers' Beach	Green	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue		
	B8	雙仙灣 Gemini Beach	Green	Blue	Blue	Green	Green	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	
	B9	海美灣 Hoi Mei Wan Beach	Green	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	
	B10	更生灣 Casam Beach	Blue	Blue	Blue	Green	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	
	B11	麗都灣 Lido Beach	Blue	Blue	Blue	Green	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	
	B12	汀九灣 Ting Kau Beach	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	
	B13	近水灣 Approach Beach	Green	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	
	B14	馬灣東灣 Ma Wan Beach	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
	B24	大浪灣 Big Wave Bay Beach	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
	B26	石澳 Shek O Beach	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue

圖例 Legend

大腸桿菌 (每100毫升含有的細菌菌落總數) <i>E. coli</i> (cfu/100mL)	≤ 180	180 to 610	610 to 1,600	> 1,600
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Water Quality Monitoring Results (1st bypass)

Fish Culture Zones

Parameter 參數	Monitoring Station 監測站	Location 位置	Baseline 基線			During Temporary Sewage Bypass 臨時繞流期間										After Temporary Sewage Bypass 臨時繞流後							
			Dec 2017 十二月	Jan 2018 一月	Feb 2018 二月	20.02.18	21.02.18	22.02.18	23.02.18	24.02.18	25.02.18	26.02.18	27.02.18	28.02.18	01.03.18	02.03.18	03.03.18	04.03.18	05.03.18	06.03.18	07.03.18	08.03.18	
大腸桿菌 <i>E.coli</i>	F1	東龍洲 Tung Lung Chau																					
	F5	馬灣 Ma Wan																					

圖例 Legend				
大腸桿菌 (每100毫升含有的細菌菌落總數) <i>E.coli</i> (cfu/100mL)	≤180	180 to 610	610 to 1,600	>1,600

Parameter 參數	Monitoring Station 監測站	Description 描述	Baseline 基線			During Temporary Sewage Bypass 臨時繞流期間										After Temporary Sewage Bypass 臨時繞流後							
			Dec 2017 十二月	Jan 2018 一月	Feb 2018 二月	20.02.18	21.02.18	22.02.18	23.02.18	24.02.18	25.02.18	26.02.18	27.02.18	28.02.18	01.03.18	02.03.18	03.03.18	04.03.18	05.03.18	06.03.18	07.03.18	08.03.18	
溶解氧量 (水深平均值) Dissolved Oxygen	F1	東龍洲 Tung Lung Chau																					
	F5	馬灣 Ma Wan																					

圖例 Legend			
溶解氧量(水深平均值) (毫克/升) Dissolved Oxygen (Depth-averaged) (mg/L)	≥5	≥4 to <5	<4

Water Quality Monitoring Results (1st bypass)

Promenades

海濱公園
Promenades

Parameter 參數	監測站 Station	位置 Location	Baseline 基線			During Temporary Sewage Bypass 臨時繞流期間										After Temporary Sewage Bypass 臨時繞流後								
			Dec 2017 十二月	Jan 2018 一月	Feb 2018 二月	20.02.18	21.02.18	22.02.18	23.02.18	24.02.18	25.02.18	26.02.18	27.02.18	28.02.18	01.03.18	02.03.18	03.03.18	04.03.18	05.03.18	06.03.18	07.03.18	08.03.18	09.03.18	
			大腸桿菌 <i>E.coli</i>	TYP1	青衣北海濱公園 Tsing Yi Northern Promenade																			
TYP2	青衣東海濱公園 Tsing Yi Eastern Promenade																							
CWDPI	中西區海濱長廊(中環段) (Central and Western District Promenade (Central Section))																							
RKTD1	觀塘海濱公園 Kwun Tong Promenade																							

圖例 Legend

大腸桿菌 (每100毫升含有的細菌菌落總數) <i>E.coli</i> (cfu/100mL)	≤1000	>1,000 to ≤10,000	>10,000 to ≤50,000	>50,000
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Parameter 參數	監測站 Station	位置 Location	Baseline 基線			During Temporary Sewage Bypass 臨時繞流期間										After Temporary Sewage Bypass 臨時繞流後								
			Dec 2017 十二月	Jan 2018 一月	Feb 2018 二月	20.02.18	21.02.18	22.02.18	23.02.18	24.02.18	25.02.18	26.02.18	27.02.18	28.02.18	01.03.18	02.03.18	03.03.18	04.03.18	05.03.18	06.03.18	07.03.18	08.03.18	09.03.18	
			溶解氧量(水深平均值) Dissolved Oxygen (Depth-averaged)	TYP1	青衣北海濱公園 Tsing Yi Northern Promenade																			
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圖例 Legend

溶解氧量(水深平均值) (毫克/升) Dissolved Oxygen (Depth-averaged) (mg/L)	≥4	<4
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Marine Stations

Parameter 參數	監測站 Station	位置 Location	Baseline 基線			During Temporary Sewage Bypass 臨時繞流期間					After Temporary Sewage Bypass 臨時繞流後			
			Dec 2017 十二月	Jan 2018 一月	Feb 2018 二月	21.02.18	23.02.18	25.02.18	27.02.18	01.03.18	04.03.18	06.03.18	08.03.18	09.03.18
			大腸桿菌 <i>E.coli</i>	VM1	維多利亞港 (窩箕灣) Victoria Harbour (Shau Kei Wan)									
	VM2	維多利亞港 (鯪魚涌) Victoria Harbour (Quarry Bay)												
	VM4	維多利亞港 (紅磡) Victoria Harbour (Hung Hom)												
	VM5	維多利亞港 (灣仔) Victoria Harbour (Wan Chai)												
	VM6	維多利亞港 (中環) Victoria Harbour (Central)												
	VM7	維多利亞港 (西面) Victoria Harbour (West)												
	VM8	維多利亞港 (青洲) Victoria Harbour (Green Island)												
	VM12	藍巴勒海峽(葵青) Rambler Channel (Kwai Tsing)												
	VM14	藍巴勒海峽(荃灣) Rambler Channel (Tsuen Wan)												
	VM15	昂船洲 Stonecutter Island												
	JM3	將軍澳(內灣) Inner Junk Bay												
	JM4	將軍澳(外灣) Outer Junk Bay												
	EM1	柴灣 Chai Wan												
	EM2	藍塘海峽(東龍洲西北面) Tathong Channel (Tung Lung Chau Northwest)												
	EM3	藍塘海峽(東龍洲西南面) Tathong Channel (Tung Lung Chau Southwest)												
	WM2	青洲(西面) Green Island (West)												
	WM3	青衣(南面) Tsing Yi (South)												
	WM4	青衣(西面) Tsing Yi (West)												



圖例 Legend				
大腸桿菌 (每100毫升含有的細菌菌落總數) <i>E.coli</i> (cfu/100mL)	≤ 1000	> 1,000 to ≤ 10,000	> 10,000 to ≤ 50,000	> 50,000

Marine Stations



圖例 Legend		
溶解氧量(水深平均值) (毫克/升) Dissolved Oxygen (Depth-averaged) (mg/L)	≥4	<4

Parameter 參數	監測站 Station	位置 Location	Baseline 基線			During Temporary Sewage Bypass 臨時繞流期間					After Temporary Sewage Bypass 臨時繞流後							
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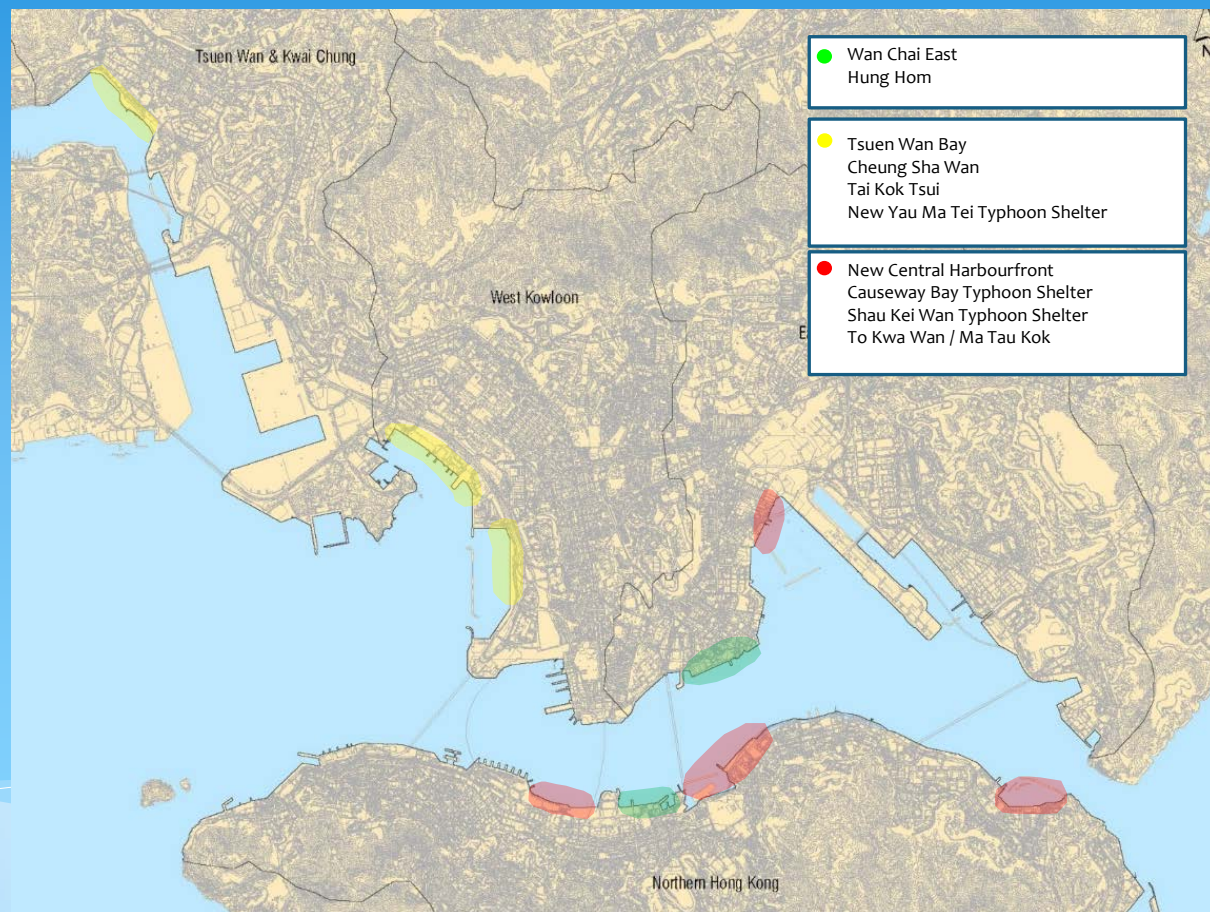
HATS 1 Penstocks Replacement

- 17 years of unceasing operation since 2001
- Temporary sewage bypass (in non-bathing season, 5 episodes each not exceeding 2 weeks)
- Water Quality Modelling – potential impact low and transient
- Consultation with the ACE and the LegCo EA Panel
- Inter-departmental working group
- First bypass completed (20 Feb – 4 Mar 2018)
 - Water quality in line with the model prediction
 - Water quality monitoring results uploaded to DSD website
- Next bypass episodes (early Nov 2018 and early Mar 2019)
 - Manufacturing of new penstocks underway.
- Further enhancing the robustness and reliability of HATS system

Further Enhancement of Coastal Water Quality

Further Enhancement of Coastal Water Quality

- Dry Weather Flow Interceptors
- Territorial wide sewer rehabilitation
- Odour reduction measures in stormwater networks



Thank You