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11 June 2019

Clerk to Panel on Environmental Affairs
Legislative Council Secretariat
Legislative Council Complex
1 Legislative Council Road
Central, Hong Kong

(Attn.: Ms Mandy Poon)

Dear Ms Poon,

Legislative Council
Panel on Environmental Affairs

4408DS – Yuen Long Effluent Polishing Plant

Supplementary Information

Further to the meeting of the Panel on Environmental Affairs on 27 May 2019, supplementary information regarding the (1) feasibility study and cost-effectiveness analysis on other possible alternative options and (2) overall strategy and related measures for reducing polluted discharges entering Deep Bay as requested by the Panel is provided in **Appendix A** and **Appendix B** respectively.

Yours sincerely,

(CK Chen)

for Director of Environmental Protection

c.c.

SFST

DDS

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4408DS – Yuen Long Effluent Polishing Plant
Feasibility Study and Cost-Effectiveness Analysis on Other Possible Alternative Options

We have considered the feasibility and cost-effectiveness of the following alternative options before adopting the scheme of in-situ reconstruction of Yuen Long Sewage Treatment Works (YLSTW).

Alternative Options	Feasibility and Cost-effectiveness
<p>1 <u>Relocation of the existing YLSTW</u></p> <ul style="list-style-type: none"> ● YLSTW is currently located on a site to the north of Yuen Long Industrial Estate which is far from residential premises and causes minimal disturbance to the surrounding area. However, it is very difficult to identify a similar site around Yuen Long that is suitable for accommodating sewage treatment use; ● If YLSTW is to be relocated to a further location such as Kam Tin, the existing sewerage network that serves YLSTW would need to be extensively re-routed to connect the sewers to the new sewage treatment works (STW); ● Extensive sewer re-routing works would cause significant traffic and environmental impacts as well as inconvenience to the public; ● Extensive re-routing of sewers and relocate of STW would be technically more complicated, need longer construction time and involve higher 	<ul style="list-style-type: none"> ● In view of the difficulties in identifying a new STW site and the significant traffic and environmental impacts associated with extensive sewer re-routing works, the feasibility of this option is low; ● This option is also not cost effective. And if the sewer re-routing works is obstructed by underground utilities during the construction phase, the pipe alignment will need to be re-designed, leading to further increase to construction time and cost, as well as failure to meet the increase in sewage demand and development need of

Alternative Options	Feasibility and Cost-effectiveness
<p style="text-align: center;">construction risk.</p>	<p style="text-align: center;">Yuen Long.</p>
<p>2 <u>Construction of a new sewage treatment works at another location to handle the additional volume of sewage</u></p> <ul style="list-style-type: none"> ● In order to cater for the increase in sewage treatment demand arising from developments and to protect the water quality of Deep Bay, the sewage treatment standard of YLSTW needs to be upgraded to the highest tertiary treatment level; ● If we construct a new STW at another location, while on one hand an additional site of 5 – 6 hectares in size needs to be identified, full-scale upgrading of aging facilities would still need to be carried out at YLSTW. 	<ul style="list-style-type: none"> ● Same as option (1) presented above, the feasibility of a new sewerage network is low. This option would unavoidably increase the construction cost and cause significant traffic and environmental impact, and its cost effectiveness is low; ● The recurrent cost for operating two separate STWs is higher than that for centralised treatment, which further lowers the cost effectiveness of the scheme.
<p>3 <u>Transferring sewage from YLSTW to other sewage treatment works</u></p> <ul style="list-style-type: none"> ● San Wai STW (SWSTW) is the STW nearest to YLSTW. Currently, sewage from some catchment areas of YLSTW is already diverted to SWSTW to facilitate the upgrading works of YLEPP; ● SWSTW is currently being upgraded and needs to handle the sewage from the developments within its catchment area. It does not has capacity to receive further additional sewage from YLSTW. ● Furthermore, the carrying capacities of the existing rising mains and 	<ul style="list-style-type: none"> ● In view of the limited capacities of other sewage conveyance systems and sewage treatment facilities, the feasibility of this option is low.

Alternative Options	Feasibility and Cost-effectiveness
<p>pumping stations deployed for sewage diversion have already been fully utilised.</p>	
<p>4 <u>Transferring treated effluent from YLSTW to other receiving waters</u></p> <ul style="list-style-type: none"> ● Effluent from SWSTW, located in Ha Tsuen of Yuen Long, is currently being discharged to Urmston Road via the Northwest New Territories Sewage Tunnel (NWNTST); ● As YLSTW is further away from Urmston Road and NWNTST, the following major works are required for discharging the effluent from YLSTW to Urmston Road through the NWNTST at SWSTW: <ul style="list-style-type: none"> (i) Construction of a 6 km long deep sewer/tunnel with associated pumping stations between Yuen Long and San Wai; (ii) Construction of an additional 9 km long sewage tunnel for connecting SWSTW to Lung Kwu Tan; and (iii) Upgrading of the submarine outfall at the Urmston Road, which is a navigation channel with heavy marine traffic. ● The works in item (i) above would involve excavation of deep sewer/tunnels to avoid carrying out construction works on existing roads. However, the complex ground conditions in northwest New Territories would increase the construction cost due to the existence of underground marble cavities. 	<ul style="list-style-type: none"> ● The overall construction cost of transferring effluent from YLSTW to Urmston Road is estimated to be twice the cost of the current proposal, and would need an additional construction period of 10 years. ● From operational perspective, although the effluent standards for discharging to Urmston Road (i.e. North Western Water Control Zone) are lower than those for Deep Bay and some treatment cost at YLSTW could be saved, additional recurrent cost is required for operating pumping stations to convey effluent to Urmston Road which is 20 km away. On balance, the overall recurrent cost of the two options would be comparable;

Appendix A

Alternative Options	Feasibility and Cost-effectiveness
	<ul style="list-style-type: none">● The overall cost effectiveness of this option is low and it is not able to meet the increase in sewage treatment demand and development needs.

4408DS – Yuen Long Effluent Polishing Plant
Overall Strategy and Related Measures for Reducing Polluted
Discharges Entering Deep Bay

Overall Strategy on Reducing Polluted Discharges Entering Deep Bay

To improve the water quality of Deep Bay, the Shenzhen and Hong Kong Governments jointly formulated the “Deep Bay (Shenzhen Bay) Water Pollution Control Joint Implementation Programme” (JIP) in 2000 to set out the pollution control measures to be undertaken by both governments for progressive reduction of pollution load on Deep Bay. Since the formulation of JIP, the Hong Kong Government has implemented various measures to reduce the discharge of pollutants into Deep Bay, including enhancing the sewage treatment level of sewage treatment works within Deep Bay catchment area, discharging part of the effluent to waters outside Deep Bay, implementing voluntary schemes for surrender of poultry and pig farm licences and provision of sewerage system to villages within Deep Bay catchment area. As a result of these measures, the current water quality of Deep Bay is better than it was in the mid-2000s.

Progress of Village Sewerage System in Yuen Long Area

In view of the extensiveness of Yuen Long area and the large number of scattered villages, provision of the trunk sewer is one of the pre-requisites for providing village sewerage system to convey sewage to downstream STWs for further treatment.

In the past 20 years, the Government has devoted much effort to construct trunk sewers in Yuen Long and Kam Tin area. At present, the trunk sewers for Shap Pat Heung, Lau Fau Shan and Ha Tsuen and part of the trunk sewers for Ping Shan and Kam Tin have been completed. The sewerage system for villages within the catchment areas of completed trunk sewers are being progressively planned and constructed, with the system for 16 villages already completed.

However, the trunk sewers for some areas (San Tin and Pat Heung) could not be proceeded with as the local communities have not reached consensus on the proposed works. As such, the village sewerage system in these areas could not be implemented. The details of the relevant projects are listed below.

Appendix B

Current Situation of Village Sewerage System in Yuen Long

Area	Trunk Sewer	Number of villages			
		Completed	Included in the public works programme		Under preliminary planning
			Under planning	Could not be implemented due to objections by local communities	
Shap Pat Heung	Completed	6	0	9	29
Lau Fau Shan	Completed	0	0	0	8
Ha Tsuen	Completed	1	6	0	12
Ping Shan	Partly completed	9	0	12	20
Kam Tin	Partly completed	0	1	0	16
San Tin	Not yet constructed (local communities have not reached consensus on the proposed works)	0	0	0	34
Pat Heung		0	0	0	41
Total		16	7	21	160