

# Yuen Long Barrage Scheme

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## Environmental Impact Assessment Report –

### Executive Summary

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Binnies Hong Kong Limited  
43/F, AIA Kowloon Tower,  
100 How Ming Street,  
Kwun Tong,  
Hong Kong

Drainage Services Department  
Project Management Division  
42/F, Revenue Tower  
5 Gloucester Road,  
Wan Chai, Hong Kong

March 2021

**CONTENTS**

**1. INTRODUCTION.....3**

    1.1 General..... 3

    1.2 Project Background.....3

    1.3 EIA Study Brief .....4

**2. PROJECT DESCRIPTION .....5**

    2.1 Project Objectives .....5

    2.2 Project Scope .....5

    2.3 Need of the Project.....6

    2.4 Benefit of the Project ..... 7

    2.5 Without Project Scenario .....8

    2.6 With Project Scenario .....8

    2.7 Implementation Programme.....9

**3. SUMMARY OF ENVIRONMENTAL IMPACT ASSESSMENT..... 10**

    3.1 Air Quality ..... 10

    3.2 Noise ..... 10

    3.3 Water Quality..... 10

    3.4 Waste Management and Land Contamination..... 11

    3.5 Ecology ..... 12

    3.6 Fisheries ..... 14

    3.7 Cultural Heritage..... 14

    3.8 Landscape and Visual Impact ..... 14

**4. ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REQUIREMENT .18**

**5. OVERALL CONCLUSION..... 19**

**END OF TEXT**

**LIST OF TABLES**

Table 2.1 Summary of Project Scope

**APPENDIX**

<a href="#">Appendix 1.1</a>	Engineering Drawings	
	400171/B&V/LAY/001	Location Plan
	400171/B&V/LAY/002	Layout Plan of Proposed Barrage

**FIGURES**

Figure 3.1	Photomontage of VP5 during Operational Phase
Figure 3.2	Photomontage of VP6 during Operational Phase
Figure 3.3	Photomontage of VP7 during Operational Phase
Figure 3.4	Photomontage of VP10 during Operational Phase

## **1. INTRODUCTION**

### **1.1 General**

1.1.1 This Executive Summary summarises the results of the Environmental Impact Assessment (EIA) for Yuen Long Barrage Scheme – Investigation, Design and Construction (the Project). The EIA has been prepared in accordance with the requirements set out in the EIA Study Brief (ESB-307/2018) and the Technical Memorandum on EIA Process (EIAO-TM).

### **1.2 Project Background**

1.2.1 The Drainage Master Plan Studies for the Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai Drainage Basin (YLDMP) were completed in 1998 respectively. The majority of the improvement works in Yuen Long and Kam Tin recommended under the YLDMP Study have been completed. Since completion of the DMP Studies, there were changes in developments within the areas and new development proposals and town planning studies were commissioned. In addition, some new flooding complaints were received on the upstream areas of the drainage basins, indicating that further improvement to the drainage systems were required.

1.2.2 Drainage Services Department (DSD) commissioned the “Review of Drainage Master Plans in Yuen Long and North Districts – Feasibility Study” (the DMP Review Study) in 2008 so that the new development scenarios could be incorporated and the effectiveness of the previously recommended works could also be assessed.

1.2.3 The Review Study completed in end 2011 identified that some areas in Yuen Long District could not meet the required flood protection level according to the latest land use changes and future developments taking into account various factors, including sedimentation at the downstream main channels, mangrove growth at river estuaries, updated extreme sea level statistics at Tsim Bei Tsui and projected Climate Change impacts in the hydraulics analysis. To account for the severity and extent of possible flooding and the works implementation time, the Review Study proposed drainage improvement works in Yuen Long District.

1.2.4 In August 2016, the Development Bureau signed out a Project Definition Statement (PDS) to justify and define the scope of the “Yuen Long Barrage Scheme” (YLBS). The Technical Feasibility Study (TFS) completed by DSD that confirms the feasibility of the Project and was approved by DEVB in September 2016 and the Project was subsequently included in Cat B under PWP Item No. 4178D in October 2017.

1.2.5 Black & Veatch (BV) was commissioned by DSD to carry out the Investigation, Design and Construction of the Project “Yuen Long Barrage Scheme” in September 2018. The general location plan of the Project is shown in [Drawing No. 400171/B&V/LAY/001](#).

### **1.3 EIA Study Brief**

- 1.3.1 A Project Profile (No. PP-564/2018) was submitted to the Environmental Protection Department (EPD) on 25 January 2018 for application of an EIA Study Brief under Section 5(1)(a) of the Environmental Impact Assessment Ordinance (EIAO) and the EIA Study Brief No. ESB-307/2018 for the Project was issued on 9 March 2018 under the EIAO.
- 1.3.2 The Project consists of the following designated projects under the following items of Part I, Schedule 2 of the EIAO:
- a) Item C.12(a)(viii) - A dredging operation which is less than 500m from the nearest boundary of an existing conservation area;
  - b) Item I.1(b) - A drainage channel or river training and diversion works which discharges or discharge into an area which is less than 300m from the nearest boundary of an existing or planned (i) site of special scientific interest; (ii) site of cultural heritage; (iii) marine park or marine reserve; (iv) fish cultural zone; (v) wild animal protection area; (vi) coastal protection area; or (vii) conservation area; and
  - c) Item Q.1 - All projects including new access roads, railways, sewers, sewage treatment facilities, earthworks, dredging works and other building works partly or wholly in an existing or gazetted proposed country park or special area, a conservation area, an existing or gazetted proposed marine park or marine reserve, a site of cultural heritage, and a site of special scientific interest.

## 2. PROJECT DESCRIPTION

### 2.1 Project Objectives

2.1.1 The objectives of the Project are to enhance the flood protection level of the existing Yuen Long Nullah (YLN) and Kam Tin River (KTR) and minimise the flooding risk in accordance with DSD’s Stormwater Drainage Manual (SDM), accounting for future development and climate change.

2.1.2 The proposed revitalisation works under the Project would enhance the social connectivity of YLN and its surroundings into an aesthetically-pleasing environment. The aim is to promote water-friendliness, ecological enhancements, biodiversity and beautification of YLN, taking into consideration of their effects on hydraulic performance.

### 2.2 Project Scope

2.2.1 The scope of the Project includes the construction and operation of the flood protection facilities. In retaining the technical feasibility and resilience towards climate change, the flood protection scheme also comprises revitalisation of the nullah in tandem with blue-green infrastructures. The proposed works are summarised in **Table 2.1**. The proposed layout of the YLBS is provided in [Drawing No. 400171/B&V/LAY/002](#).

**Table 2.1 - Summary of Project Scope**

Proposed Works	Description and Scale of Works
Construction and operation of Pumping Station	A pumping station, housing in two structures, are located at the western and eastern banks of the downstream YLN. With a total footprint of approx. 3,300 m <sup>2</sup> , the pumping station is also equipped with low flow pumps to be operated during dry season.
Construction and operation of Tidal Barrier	The tidal barrier would be divided into bays, whereby each segment can be opened at various angles at the operator’s discretion. Upon completion, the gates would span across YLN at a width of approx. 50 m.
Construction and operation of E&M Control Room	The E&M control room, with a footprint of approx. 1,300 m <sup>2</sup> , houses all the E&M apparatus & facilities for public enjoyment among other ground level open areas.
Construction of Link Bridge	The link bridge provides an access for maintenance personnel between Wang Lok Street and Shan Pui Ho East Road and utility crossings. With intermediate piers, the bridge would be situated downstream of the pumping station, which spans approx. 110 m across the nullah.
Local Widening and Deepening of YLN	The proposed works at YLN would widen the nullah by 10 m on each side and deepen its bottom to facilitate flow intake to the pumping station. Inflow-guiding structures

<b>Proposed Works</b>	<b>Description and Scale of Works</b>
	would be constructed to direct flow towards the pumping station.
Construction & Modification of Parapet Walls	An additional height of approx. 200 mm at the top of the existing parapet walls along KTR and additional parapet walls along YLN and Sham Chung River (SCR) would be constructed. The extent of works is approx. 3,000 m in total for both banks of KTR and approx. 800 m in total for both banks at YLN & SCR.
Refinements to the existing intersection of YLN & Yuen Long Bypass Floodway (YLBFB)	The proposed works will involve minor excavation and concreting works at the existing concrete diversion structure, resulting in the diversion of additional flow to YLBFB for the barrage's operation at the downstream.
Revitalisation Works of YLN	Revitalisation works within YLN by applying the concept of revitalising water bodies to enhance the local environmental quality. Vegetation & landscape components would be introduced to enhance the nullah's biodiversity and social connectivity.
Decommissioning of the Existing Low Flow Pumping Station & Inflatable Dam	The function of the existing Kau Hui Low Flow Pumping Station and the associated existing inflatable dam that spans approx. 75 m across YLN would be replaced by the tidal barrier of the barrage, thus would be decommissioned.

2.2.2 The modification of parapet wall at Yuen Long Bypass Floodway had been taken up by Mainland North Division of DSD, which would not be implemented under the YLBS.

### **2.3 Need of the Project**

2.3.1 The topography of Yuen Long town is generally flat with ground levels ranging between +4.0 mPD to +4.7 mPD. With reference to the SDM, given the tide level under a 50-year return period (with consideration of the mid-21st century climate change) is +4.32 mPD, there exists a risk of flooding in Yuen Long town even with the absence of rainfall event.

2.3.2 With reference to the tidal level of previous Super Typhoons Hato (+4.71mPD) and Mangkhut (+4.28mPD) in August 2017 and September 2018 respectively, Yuen Long is susceptible to flooding.

2.3.3 In view of the public safety, there is a need to provide a robust flood protection scheme that is both climate resilient and cost effective.

#### ***Existing Drainage Conditions***

- 2.3.4 According to the DMP Review Study, low-lying areas in the Yuen Long District could not meet the required flood protection level upon catering for future developments, sedimentation at the downstream main channels, mangrove growth at river estuaries, updated extreme sea level statistics at Tsim Bei Tsui and climate change.
- 2.3.5 The existing drainage network is unable to cater for the design rainstorm and tidal scenarios. Flooding is anticipated covering a vast area of Yuen Long town center. A number of flooding incidents from previous wet seasons corroborated with the findings of the Study.

#### ***Current and Predicted Flooding Susceptibility***

- 2.3.6 On 23 August 2017, at the hoisting of Typhoon Signal No. 10 during the passage of Typhoon Hato, the sea level at Deep Bay hit a record high in Tsim Bei Tsui Tide Station and reached +4.71mPD, flooding had been recorded with significant impacts to traffic and local businesses across Yuen Long town.
- 2.3.7 The high magnitude of sea level had wide impacts on coastal areas as well as inland areas in Yuen Long (e.g. Wang Chau Tseung Tau Tsuen, Hong Lok Road near LRT station, Pau Cheung Square, Tai Fung Street, Tai Cheung Street, Tung Tai Street, Shui Che Kwun Street, Shan Pui Tsuen, Shui Pin Tsuen, Tung Shing Lei, Sha Po, Pak Wai Tsuen, Shui Tau, Shui Mei, Kam Hing Wai, Tai Tseng Wai, Lut Chau).
- 2.3.8 As a result, the YLBS emerges as the more pronounced solution among other options in mitigating the impacts of extreme tidal level.

## **2.4 Benefit of the Project**

- 2.4.1 The implementation of YLBS embodies a comprehensive solution in providing adequate drainage performance & flood resilience to Yuen Long.
- 2.4.2 Through the operation of tidal barriers, it also addresses the long-standing complaints on odour issues due to the backwater from Deep Bay.
- 2.4.3 The existing inflatable dam at the Kau Hui Low Flow Pumping Station in YLN would no longer be necessary after the construction of YLBS and would be decommissioned after the implementation of YLBS to achieve energy efficiency.
- 2.4.4 With reference to the 2019 Policy Address, the Chief Executive has proposed to develop and take forward the concept of “Rivers in the City”, emphasizing the aim to enhance public enjoyment of river facilities, experience the multiple values of water bodies, treasure water bodies and create a better living environment.
- 2.4.5 The increased flood protection provided by YLBS would facilitate the concept of “Rivers in the City” via nullah revitalisation and aesthetic enhancement works to be

constructed under the Project. Subsequently, the ecological connectivity can be promoted between Deep Bay and the YLN under non-critical operations.

- 2.4.6 Vegetation & landscape components would be introduced to enhance the nullah's biodiversity and social connectivity for the revitalisation works within YLN.
- 2.4.7 In addition to proposed green roofs and vertical greening, the use of solar panels will be explored and adopted as far as possible. The applicability and extent of solar energy on the building façade or roof areas of the pumping stations and E&M control room will be evaluated during the detailed design stage.

## **2.5 Without Project Scenario**

- 2.5.1 Without the Project, the flood risk would persist and extent of flooding would continue to increase in Yuen Long town under extreme weather events and increasing sea-level due to climate change.
- 2.5.2 In accordance with the SDM, a vast area in Yuen Long town centre would be flooded with maximum flood depths in excess of 1 m. Moreover, the existing concrete-lined YLN would be maintained to preserve the drainage capacity, negating the opportunity to revitalise YLN.

## **2.6 With Project Scenario**

- 2.6.1 With the Project, the extent of flooding will be significantly reduced with residual flooding remains in local low-lying areas.
- 2.6.2 The proposed revitalisation works along the existing concrete-lined YLN under the Project would provide an opportunity to implement scenic public spaces for leisure activities and enjoyment and reduces the heat island effect during hot climates. Thus, showcasing the concept of Rivers in the City.
- 2.6.3 The revitalisation schemes are subject to further development in the Detailed Design Stage. Nonetheless, investigation is being conducted to retain the existing habitat downstream of the existing inflatable dam, as much as possible. Meanwhile, the feasibility of new habitats along YLN would be explored to enhance the existing ecology.
- 2.6.4 Given the preliminary design and site investigation works are ongoing at the time of preparation of this report, the location and layout of the YLBS may subject to further slight adjustment upstream to surpass site constraints. Within the indicated boundary of the pumping station and tidal barriers (in yellow) as shown in [\*Drawing No. 400171/B&V/LAY/001\*](#), all Chapters in this EIA report has taken into account the most conservative case for assessment.

## **2.7 Implementation Programme**

- 2.7.1 The construction works of the pumping stations and tidal barrier is anticipated to commence in Q4 of 2022 for completion by Q3 of 2027, with concurrent construction & modification of the parapet walls along Kung Um Road, Kiu Hing Road and KTR. Upon completion of the above works, the existing inflatable dam and low flow pumping station would be decommissioned and the revitalisation works along YLN would take place until Q3 of 2029.

### **3. SUMMARY OF ENVIRONMENTAL IMPACT ASSESSMENT**

#### **3.1 Air Quality**

- 3.1.1 The potential sources of air quality impacts associated with the construction and operation of the Project have been identified and the potential impacts were evaluated.
- 3.1.2 Potential impacts of dust, gaseous and odour emissions from construction activities have been considered. With implementation of standard construction practices and mitigation measures, no unacceptable impact on air sensitive receivers (ASR) is anticipated. Potential odour nuisance arising from screened debris / materials will be removed on demand basis to maintain the function of the pumping station as well as to preclude any potential odour impact during operation. As such no unacceptable residual air quality impacts are envisaged from the construction and operation of the Project.
- 3.1.3 Cumulative air quality impacts associated with concurrent projects within the Study Area have been considered, no unacceptable impacts are anticipated.

#### **3.2 Noise**

- 3.2.1 A construction noise assessment has been undertaken to predict the noise levels at the representative noise sensitive receivers (NSRs) due to the construction of the Project. Practicable mitigation measures, including good construction site practices, use of quiet construction plant, movable noise barriers, noise insulation sheet and scheduling of construction activities, have been recommended. With the implementation of the recommended mitigation measures, the predicted construction noise levels at all NSRs comply with the noise criteria during the daytime period. Therefore, no unacceptable noise impact is expected to arise from the construction activities. Also, no unacceptable cumulative impact or residual impact is anticipated.
- 3.2.2 Potential noise impact from the operation of the proposed pumping stations has been assessed. The predicted fixed plant noise levels at the representative NSRs due to the operation of the proposed Barrage Scheme comply with the day-time and night-time noise criteria. No unacceptable residual impact is anticipated. Attenuation measures, if required, will be provided to the fixed plant items for achieving the compliance of EIAO-TM noise criteria during the Detailed Design Stage.

#### **3.3 Water Quality**

- 3.3.1 The potential sources of water quality impacts associated with the construction and operation of the Project have been identified and the potential impacts were evaluated.
- 3.3.2 Potential impacts arising from the proposed construction works are predicted to be largely confined to the specific works areas. With proper implementation of the recommended mitigation measures, in particular the establishment of dry condition for excavation works within the existing nullah and adoption of good construction site practices as recommended in relevant regulatory guidelines, unacceptable water quality

impacts are not expected at the identified water sensitive receivers (WSRs) including the Deep Bay Wetland Conservation Area and Mai Po Inner Deep Bay Ramsar Site.

- 3.3.3 During the operation phase, the existing tidal condition will be shifted downstream from the existing inflatable dam to the proposed barrage. The water quality at the upstream of the barrage is expected to be improved. Practicable designs including energy dissipators or refinements of the orientations of the pump outlets will be optimised in the detailed design stage to dissipate excess energy of flowing water downstream such that the hydraulic performance of the downstream will be as similar to the existing condition as possible. Therefore, the potential sediment erosion impact or increases in suspended solids to nearby waters, mangroves, ponds and ultimately Deep Bay, due to the operation of the barrage are not anticipated. With regular maintenance works to remove excessive sediments, it is anticipated that the Project will not lead to any unacceptable water quality impacts. Unacceptable water quality impacts are also not expected to occur at any identified WSRs due to the small-scale and infrequent maintenance works.
- 3.3.4 With proper implementation of the recommended mitigation measures, no unacceptable residual water quality impacts are envisaged from the construction and operation of the Project. Nevertheless, a monitoring programme is recommended during the construction phase to verify the predictions of the EIA and ensure compliance with the assessment criteria.
- 3.3.5 Cumulative water quality impacts associated with concurrent projects within the Study Area have been considered with no unacceptable impact anticipated.

### **3.4 Waste Management and Land Contamination**

- 3.4.1 Wastes generated by the construction activities are likely to include construction and demolition (C&D) materials, excavated sediment and floating refuse from the construction works, general refuse from the workforce and chemical waste from any maintenance of construction plant and equipment. Provided that these identified wastes arisen are handled, transported and disposed of using approved methods and that the recommended good site practices are strictly followed in terms of the avoidance-minimisation-reuse-recycling-disposal hierarchy, unacceptable environmental impacts are not anticipated during construction of the Project.
- 3.4.2 The recommended measures can be enforced by incorporating them into the waste management requirements in the Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP). Environmental site audit would be necessary to ensure the implementation of proper waste management practices during construction.
- 3.4.3 For the operation phase, trash and sediment are expected to be produced by maintenance works of the tidal barrier. Such waste will be removed by manual means and disposed of to landfill after the clearance works. Small amount of screenings and chemical waste

will be generated and collected during operation and routine maintenance of the pumping stations. No unacceptable environmental impacts are anticipated with proper waste management practices.

- 3.4.4 A review of past and present land uses of the project site was conducted. Based on desk-top review and site walkover, the presence of contaminated land is not expected.

### **3.5 Ecology**

- 3.5.1 A literature review and ecological field surveys have been conducted. A total of 14 habitat types, including channelised watercourse, semi-natural watercourse, pond, abandoned wet agricultural land/freshwater marsh, tidal marsh, mangrove, reedbed, mitigation wetland, shrubland, agricultural land, mixed woodland, plantation and wasteland and developed area, were recorded within the 500m assessment area, with channelised watercourse, plantation and developed area being the habitats recorded within the Project Site. The ecological values of the wetland associated habitats including channelised watercourse (only YLN Section 4 (S4)<sup>a</sup>, Shan Pui River (SPR), KTR), semi-natural watercourse, pond, abandoned wet agricultural land/freshwater marsh, tidal marsh, mangrove, reedbed and mitigation wetland are at least low to middle, middle or middle to high. The other habitats, except shrubland, plantation in Nam Sang Wai, which are of low to middle ecological value, are considered of low or very low ecological value. Species of conservation importance recorded within the 500m assessment area included 2 flora, 3 mammals, 51 avifauna, 5 herpetofauna, 9 butterflies, 3 odonates, 1 aquatic fauna and the endemic Mai Po Bent-winged Firefly. Only 14 avifauna and 1 fish species of conservation importance were recorded within the Project Site.
- 3.5.2 Potential direct impacts on natural habitats and recognised sites of conservation importance within the assessment area except Wetland Buffer Area (WBA) inside Project Site have been avoided through confinement of construction works within the proposed works area. Only 0.29 ha of plantation of low ecological value will be lost permanently, while net wetland loss will not occur due to the decommissioning of the existing inflatable dam to release some space and the deepening of the bed of the watercourse together with the operation of tidal barrier can allow waters from Deep Bay flush in 50m beyond the location of the existing inflatable dam to offset the wetland loss (i.e. 0.26ha watercourse) due to the permanent structures at the channelised watercourse.
- 3.5.3 Major indirect impacts due to construction noise disturbances from demolition works using excavator mounted breakers and piling works on key wetland habitats within the assessment area and in close proximity to the Project Site as well as migratory/overwintering waterbirds have been avoided through scheduling of such

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<sup>a</sup> YLN Section 4 (S4) is the section of YLN from the existing inflatable dam to the barrage site.

- noisy construction works outside dry season (i.e. November to March, which is the peak overwintering period of waterbirds).
- 3.5.4 As the YLN S4 will be enhanced ecologically, with the design of the tidal barrier to allow brackish waters flushing in the YLN, no negative ecological impacts due to habitat loss are predicted. On the other hand, the flight-line of waterbirds to-and-fro the YLN S4 and SPR were limited, with the manoeuvrability of waterbirds and the unlikely feeding and roosting grounds in the upstream of YLN, potential impacts to flight-line of waterbirds due to the barrage is considered minor.
- 3.5.5 Hydrodynamics at the Old Kam Tin River as well as SPR will not be changed significantly due to the large waterbody of Deep Bay. While the scouring effects to the exposed mudflat during low tide can be minimised by good discharging design. As there will be no strong artificial lighting, with the proposed mitigation measure in place, potential impacts from light to nocturnal life including Mai Po Bent-winged Firefly are considered minor.
- 3.5.6 Mitigation measures have been proposed during construction stage. According to the ecological survey data from present study, Shan Pui River recorded a relatively higher abundance of waterbirds in dry season. In order to minimise the construction noise disturbance on the nearby wetland habitats and the associated disturbance-sensitive overwintering/migratory waterbirds, which are most abundant during the dry season months, the comparatively disturbing construction works i.e. percussive piling works and demolition using breakers mounted on excavators, would therefore be scheduled outside the dry season (i.e. November to March, which is the peak overwintering period of waterbirds). In addition, a pre-construction survey is recommended for areas within 100m from the Project boundary to confirm the location and status of the night roost. Ardeid night roost was recorded at a site along Kam Tin River. No construction works should be undertaken within 100m from any night roost confirmed by the pre-construction survey after 17:00 from February to September and 16:30 from October to January to avoid disturbance to ardeid night roost. Within YLN Section 4 of the Project Site, fish species of conservation importance i.e. *Gobiopterus macrolepis* was recorded. Direct impact to this species is likely in the works area of the tidal barrier during construction phase, and translocation of this species is recommended. Capture-and-translocation of this fish species will be implemented in the works area of the tidal barrier and pumping station prior to construction works to minimise the impacts on this species of conservation importance.
- 3.5.7 With the implementation of the recommended mitigation measures (e.g. avoidance of noisy construction works and use of alternative quieter construction method during peak overwintering period within dry season; provision of noise barriers around Project Site, provision of movable noise barrier/acoustic mat for piling plants and breakers; use of enclosure for construction plant, use of quality powered mechanical equipment (QPME); restriction of construction hours of construction activities within specified months, etc.), no unacceptable adverse residual impacts would be expected during construction and operational phases.

### **3.6 Fisheries**

- 3.6.1 A study based on existing information on pond culture fisheries resources and activities within the assessment area has been undertaken, following the criteria and guidelines for evaluating and assessing fisheries impact as stated in Annexes 9 and 17 of the EIAO-TM.
- 3.6.2 The proposed construction works will be conducted within the proposed project boundary. No loss of active or inactive fishponds are anticipated within the assessment area. There would be no loss of oyster culture area or fishing ground near Deep Bay. With the implementation of mitigation measures recommended for controlling water quality impact, the Project would not cause any unacceptable water quality impact to adjacent fishponds or oyster culture area and fishing ground near Deep Bay during construction and operational phases.

### **3.7 Cultural Heritage**

- 3.7.1 It is recommended that the moderate archaeological potential of this area as mentioned in Agreement No. CB20120293 Planning and Engineering Study for the Public Housing Site and Yuen Long Industrial Estate Extension at Wang Chau Final Technical Report No. 3G (TR-3G) Preferred Option and Technical Assessment – Environmental Impact Assessment Report (Arup 2014) should be reviewed if this area is affected by any proposed works under this Project in future.
- 3.7.2 The desk-based review and Built Heritage Survey recorded five Graded historic buildings, a Nil-Grade and thirty-two not-graded buildings, three villages with Fung Shui Woodlands alongside five major festivals. The assessment concluded the Graded Historic buildings will not be affected by the Project."
- 3.7.3 Assessment also concluded four not-graded built heritage items may be affected during the construction phase: HB-17 and HB-18, village houses in Ma Tin Tsuen, and HB-30, a Village God Shrine and HB-31, a Buddhist Stone Tablet. Mitigation measures such as condition survey (prior to construction phase) with vibration monitoring during construction is recommended for the village houses (HB-17-18) and shrine (HB-30). In addition, buffer zones to safeguard the physical safety of the heritage structures and measures to ensure safe public access during construction phase is recommended for the four heritage structures (HB-17, HB-18, HB-30 and HB-31).

### **3.8 Landscape and Visual Impact**

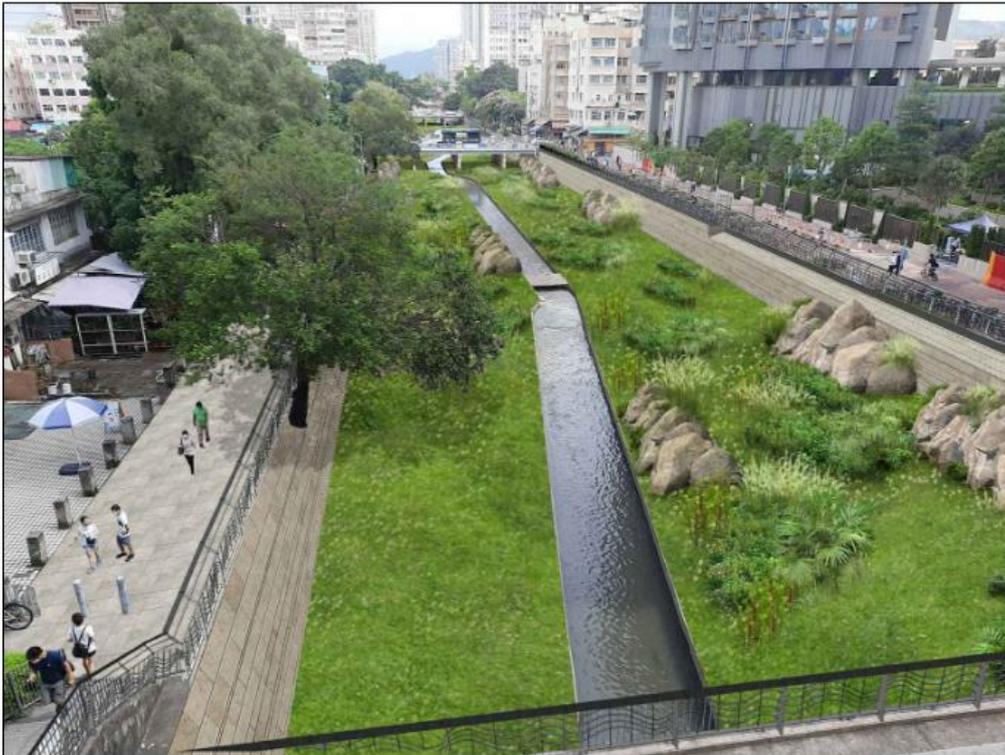
#### *Yuen Long Barrage Scheme*

- 3.8.1 Temporary adverse visual impacts will be observed during the construction phase, however beneficial landscape and visual impacts will be observed during the operation phase due to the enhancement of the nullah channel and the integration of the nullah barrage with the landscape.
- 3.8.2 In accordance with Annex 10 of the EIAO-TM, it is considered that, with the landscape and visual enhancement brought by this project such as revitalisation works proposed

in this project and the mitigation measures proposed, the proposed development will result in overall beneficial landscape and visual impacts as it will complement the landscapes and visual character of its setting, follow the planning objectives and will improve the overall landscape and visual quality.

3.8.3 Photomontages at the representative viewpoints (VP5, VP6, VP7 and VP10) during operational stage are shown in **Figure 3.1** to **3.4**.

3.8.4 **VP5 – Viewpoint from Long Ping MTR Exit D (Figure 3.1)** The viewpoint is located at the MTR Exit D, looking south, towards the town centre portion of the development area.



**Figure 3.1 Photomontage of VP5 during Operational Phase**

3.8.5 **VP6 – Viewpoint of Proposed Barrage (Figure 3.2)** The viewpoint is located from Long Ping Station, looking North towards the nullah and Wang Lok Street.



**Figure 3.2 Photomontage of VP6 during Operation Phase**

3.8.6 **VP7 – Viewpoint from Fu Yip Street Bridge (Figure 3.3)** The viewpoint is located at Fu Yip Street Bridge, looking south, towards Long Ping MTR Station.



**Figure 3.3 Photomontage of VP7 during Operation Phase**

- 3.8.7 **VP10 – Viewpoint from Shan Pui Ho East Road (Figure 3.4)** The viewpoint is located from Shan Pui Ho East Road, looking towards the proposed E&M control building.



**Figure 3.4 Photomontage of VP10 during Operation Phase**

***Kam Tin River Parapet Modification***

- 3.8.8 In accordance with Annex 10 of the EIAO-TM, it is considered that the parapet modification works will in overall terms be acceptable, that is there will be no significant effects on the landscape and no significant visual effects or interference with key views.

***Modification of Parapet Walls along Yuen Long Nullah, Yuen Long Bypass Floodway, and Sham Chung River***

- 3.8.9 In accordance with Annex 10 of the EIAO-TM, it is considered that the parapet modification works will in overall terms be acceptable, that is there will be no significant effects on the landscape and no significant visual effects or interference with key views.

**4. ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REQUIREMENT**

- 4.1.1 Monitoring has been recommended at designated sensitive receivers during the construction phase of the Project. Environmental site audit should be conducted weekly throughout the construction phase to ensure that the proposed mitigation measures are implemented.

## **5. OVERALL CONCLUSION**

- 5.1.1 The Project is proposed to enhance the flood protection level of the existing Yuen Long Nullah (YLN) and Kam Tin River (KTR) and minimise the flooding risk in accordance with DSD's Stormwater Drainage Manual (SDM), accounting for future development and climate change. The construction works under the Project is anticipated to commence in Q4 of 2022 for completion by Q3 of 2029.
- 5.1.2 The proposed revitalisation works under the Project would enhance the social connectivity of YLN and its surroundings into an aesthetically-pleasing environment. The aim is to promote water-friendliness, ecological enhancements, biodiversity and beautification of YLN, taking into consideration of their effects on hydraulic performance.
- 5.1.3 The EIA has identified and assessed the potential environmental impacts during the construction and operation of the Project in accordance with the requirements set out in the EIA Study Brief (ESB-307/2018) and the EIAO-TM. The EIA has concluded that with the implementation of the recommended mitigation measures, no unacceptable environmental impacts are envisaged as a result of the construction and operation of the Project and the Project would be in compliance with the applicable environmental legislation and standards.

**END OF TEXT**