

## **2.0 PROJECT DESCRIPTION**

### **2.1 Introduction**

2.1.1 The Tuen Mun Sewerage Master Plan Study completed in September 1993, identified 73 unsewered village clusters within the Tuen Mun Master Plan study area. These were divided into seven distinct areas, the Eastern Extension area being one of these. Overall, the villages identified had inadequate levels of treatment, primarily confined to septic tanks and the use of soakaways, resulting in minimal treatment of effluent prior to discharge and overflow of untreated wastewater into the surface water drainage system, with subsequent effects on the water quality of the surrounding water courses.

2.1.2 The Sewerage Master Plan recommended 25 villages for village sewerage. The proposed work was divided into implementation packages, with the Eastern Coastal Sewerage Extension being programmed for implementation under Stage 1 Phase IV and Stage II.

2.1.3 The scope of the work is to provide sewerage to the eastern coastal areas of Tuen Mun, in order to collect and convey generated wastewater to the existing sewerage network leading to the Pillar Point Sewage Treatment Works. A total of six pumping stations will be required together with the associated gravity sewers and pumping mains.

### **2.2 Project Study Area**

2.2.1 In accordance with the Tuen Mun Sewerage Master Plan, the extent of the proposed works includes 4 main packages covering the following areas and work components:

- (i) Eastern Coastal Extension (Part 1) comprising sewerage for Lok Chui Street and a pumping station near Castle Peak Villas;
- (ii) Eastern Coastal Extension (Part 2) comprising the Tai Lam Valley Pumping Station;
- (iii) Village Sewerage - comprising sewerage for the villages of Tai Lam Chung Tsuen, Luen On San Tsuen, Wong Uk and Wu Uk, with pumping stations at Tai Lam Correctional Institution, Luen On San Tsuen and Tai Lam Chung Tsuen; and
- (iv) Village Sewerage - comprising sewerage for the villages of So Kwun Wat Tsuen/San Tsuen, with a pumping station at So Kwun Wat Tsuen.

### **2.3 Design Details and Scope of Work**

#### **Background**

2.3.1 The indicative design details for each of the pumping stations and associated mains are provided below and shown on Drawings 1.1a, 1.1b and 1.1c. Some features are common to all the proposed pumping stations. In all cases, a single storey superstructure will be built on top of the wet well and forced ventilation provided. The wet well will be enclosed and provided with an outlet deodorised by activated carbon, which is also assumed to be located

within the pumping station structure and vented through an external wall.

- 2.3.2 A screening basket will be employed to remove large solids from the sewage flow for all pumping stations. Collected screenings will be stored in plastic containers and removed manually at regular intervals. It is assumed that no dewatering will be required. Exhaust fans will be used during the handling of the screenings and any maintenance operations.

### **Tai Lam Correctional Institution Pumping Station**

- 2.3.3 This pumping station, with an average dry weather flow (ADWF) of 9.8 L/s, is designed to serve the Tai Lam Correctional Institution only and is not designated under the EIAO. One duty plus one standby pump, together with emergency power supply, will be provided but in case of emergency, sewage will be diverted via an emergency by-pass pipe to the Tai Lam Chung Nullah.
- 2.3.4 Incoming sewage will be conveyed via the pumping station to a 200mm diameter rising main and a 300mm diameter gravity sewer which runs along the western edge of the Tai Lam Chung Road to the Tai Lam Chung Tsuen Pumping Station. The pumping station is located on G/IC designated land on the So Kwun Wat Outline Zoning Plan and no planning approval under the Town Planning Ordinance for the implementation of this facility is required.

### **Tai Lam Chung Tsuen Pumping Station**

- 2.3.5 This pumping station, with an ADWF of 46.1 L/s, will serve a catchment covering the eastern side of the Tai Lam Chung Nullah and ultimately direct sewage from Tai Lam Correctional Institution, Tai Lam Chung Tsuen, Luen On San Tsuen, Wu Uk and Wong Uk across the proposed pipe bridge to the Tai Lam Valley Pumping Station. One duty plus one standby pump, together with emergency power supply, will be provided but in case of emergency, sewage will be diverted via an emergency by-pass pipe to the nearby stormwater drain leading to the Tai Lam Chung Nullah. The pumping station is located on the western edge of the Tai Lam Chung Road, just north of Tai Lam Chung Tsuen adjacent to the nullah. The pumping station is located in 'Village' designated land on the So Kwun Wat Outline Zoning Plan and planning approval under the Town Planning Ordinance for the implementation of this facility has been obtained.
- 2.3.6 Sewage will be collected from Tai Lam Chung Tsuen and properties either side of the Tai Lam Chung Road by means of a 225mm and 375mm diameter gravity sewer network and be pumped via a 350mm rising main across a proposed pipe bridge and along the western edge of the nullah to the Tai Lam Valley Pumping Station.

### **Luen On San Tsuen Pumping Station**

- 2.3.7 The pumping station, with an ADWF 29.4 L/s will be located within the village opposite the Customs and Excise Training School. Sewage from Luen On San Tsuen, Wu Uk and Wong Uk will be collected via a 225mm gravity sewer and pumped via the Luen On San Tsuen Pumping Station and a 350mm diameter rising main and 375mm and 525mm diameter gravity sewer up the Tai Lam Chung Road to the Tai Lam Chung Tsuen Pumping Station. One duty

plus one standby pump will be provided, together with emergency power supply, but in case of emergency, sewage will be diverted via an emergency by-pass pipe to the nearby stormwater drain leading to the Tai Lam Chung Nullah. The pumping station is located in 'Village' designated land on the So Kwun Wat Outline Zoning Plan and planning approval for the implementation of this facility has been obtained.

### **Tai Lam Valley Pumping Station**

- 2.3.8 This pumping station, with an ADWF of 72.1 L/s, is located just off Castle Peak Road. The pumping station is located on 'Green Belt' designated land on the So Kwun Wat Outline Zoning Plan and planning approval under the Town Planning Ordinance for the implementation of this facility has been obtained. Two duty plus one standby pump will be provided, together with emergency power supply, but in case of emergency, sewage will be diverted via an emergency by-pass pipe to the nearby stormwater drain leading to the Tai Lam Chung Nullah.
- 2.3.9 A 300mm diameter gravity sewer will collect sewage from the west along Hong Fai Road and Castle Peak Road and convey it to the pumping station which will also receive sewage from the gravity sewer serving the rest of the study area. The pumping station will lift the sewage to a 350mm diameter rising main which is proposed to pass along Castle Peak Road, Hong Fai Road, through the new housing development adjacent to Tuen Mun Road, under Tuen Mun Road by trenchless method and connect to the existing rising main in Castle Peak Road.

### **Castle Peak Villas Pumping Station**

- 2.3.10 The pumping station, with an ADWF of 109 L/s is designed to lift incoming sewage from the gravity sewers collected from the Tai Lam Chung Valley to the existing sewerage network via a rising main. Two duty and one standby pumps are included, together with emergency power supply, but in case of emergency, sewage will be diverted to a nearby box culvert leading to the non-gazetted beach.
- 2.3.11 A 450mm diameter gravity main is proposed to run from Castle Peak Road, down the east access of Lok Chui Street and connect to the pumping station. This gravity sewer will be connected to the existing pipeline which will convey sewage from the Tai Lam Valley Pumping Station. A 375mm diameter gravity sewer is proposed to run from Castle Peak Road, down Lok Yi Street to the west access of Lok Chui Street and connect to the pumping station located opposite Castle Peak Villas. A 500mm diameter rising main will then be provided to convey the sewage up to the existing network on Castle Peak Road and subsequently to the Pillar Point Sewage Treatment Works. The pumping station is located on 'Residential (B)' designated land on the Tuen Mun Outline Zoning Plan and planning approval under the Town Planning Ordinance for the implementation of this facility has been obtained.

### **So Kwun Wat Tsuen Pumping Station**

- 2.3.12 This pumping station, with an ADWF of 12.7 L/s, serves the So Kwun Wat area and is not designated under the EIAO. The pumping station is located in 'Village' designated land on the So Kwun Wat Outline Zoning Plan and planning approval for the implementation of this facility under the Town Planning Ordinance will be obtained shortly. One duty plus one standby pump

will be provided but in case of emergency, sewage will be diverted via an emergency by-pass pipe to the nearby open channel.

- 2.3.13 A network of 225mm diameter gravity sewers and a 200mm rising main will collect sewage from the village properties in the area and direct them to the pumping station, which will be located on So Kwun Wat Road.

### **Construction Activities**

- 2.3.14 The sewer layout has made full use of the road and footpath network between and within the villages for the sewer main installations. The installation of the main sewers will be carried out by open trenching and within the villages, small trenches will be constructed along village alleyways and pathways.

- 2.3.15 The construction of the village and main sewers will require the following activities:

- C concrete breaking, where existing paved surfaces need to be broken;
- C excavation of soil material;
- C compaction of earth and bedding material;
- C installation of pipeline;
- C backfilling of soil materials; and
- C repaving.

- 2.3.16 The construction of the pumping stations will require similar activities as the sewer network, with the addition of constructing a small structure above ground to house the monitoring and electrical equipment. Sheet piling may be required at some of the proposed stations to support the excavations.

- 2.3.17 The equipment that will be required for the construction of the village sewerage project will generally include hand-held or pneumatic breakers; air compressor; excavator; truck; compactor; crane; lorry; and an asphalt paver. Further details on the noise implications of such equipment is provided in Section 5.0.

- 2.3.18 It is anticipated that the majority of the construction and excavation works in the villages will be carried out using hand-held tools due to the limited space in the alleyways and the uncertainty of the location of many of the existing utility services. However, equipment will be required for removal of the pavement surfacing. The construction of the main sewers will use powered mechanical equipment.

### **Construction Programme**

- 2.3.19 The duration of the complete works will be approximately 24 months, with each pumping station taking some 12 months to complete. A tentative implementation programme is provided in Drawing 2.1.

## **2.4 Benefits of the Project**

- 2.4.1 Overall, the streams and nullahs in the area are affected by discharges of untreated or partially treated sewage. There is no routine water quality monitoring data for the streams, but EPD marine water quality monitoring data regarding the marine water quality in Tuen Mun Bay and the Urmston Road from the programme show that marine water quality standards for the North Western Water Control Zone are broadly complied with, although occasionally the bathing areas at Cafeteria Beach fail to meet the Bathing Beach standards. The stresses on these water bodies would be anticipated to increase in future, as major residential developments, either on-going or planned for this area, will produce larger quantities of sewage in need of disposal.
- 2.4.2 At present, inadequate levels of treatment, primarily confined to septic tanks and the use of soakaways, exist resulting in minimal treatment of effluent prior to discharge and overflow of untreated wastewater into the surface water drainage system, with subsequent effects on the water quality of the surrounding water courses.
- 2.4.3 The proposed sewer network will serve to collect the sewage from the existing villages and allow connection by the future developments, by a series of pumping stations which will transfer the sewage to the trunk sewer which passes along the existing Castle Peak Road. This will achieve the effect of eliminating the untreated or partially treated sewage discharges to surface water courses along this part of the coast and so improve stream water quality and reduce the bacterial counts at the bathing beaches in the area which fail to meet the Bathing Beach Quality Standards. This represents a significant benefit of the scheme, not only in respect of improvements to water quality and associated aquatic flora and fauna but also to the local environment in the residential areas by controlling unhealthy, malodorous and potentially visually unpleasant discharges and leakages from septic tanks.
- 2.4.4 In respect of other environmental parameters, such as air, noise and waste, sensitive receivers in the study area are villages which are mostly rural in nature, being either within or surrounded by agriculture or open space, with no major sources of air or noise pollution. Some receivers closer to major roads may, however, be subject to dust, vehicle emissions and traffic noise and all will have domestic waste storage and collection. Implementation of the project will give rise to additional impacts, but these impacts will be short-term only, being confined to the construction stage, and can be controlled using suitable mitigation measures. In addition, conditions are expected to return to their existing state once the scheme is operational. Pumping stations are required by the scheme and, therefore, there will be permanent new structures in the study area. However, no areas of high ecological or landscape and visual importance are affected and based upon sensitive design of the pumping station facades and the incorporation of screen planting, the intrusion of the new structures will be minimised. Thus, in this respect the implementation of the scheme is not predicted to adversely affect existing environmental conditions.