Project Profile

for

Upgrading of Pillar Point Sewage Treatment Works

Drainage Services Department
The Government of the Hong Kong Special Administrative Region

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1. BASIC INFORMATION

1.1 Project Title

The title of this project is:

"Upgrading of Pillar Point Sewage Treatment Works" hereafter referred to as the "Project".

1.2 Purpose and Nature of the Project

The Project is to expand the sewage treatment capacity and to upgrade the treatment level of the Pillar Point Sewage Treatment Works (PPSTW) in order to cater for the projected ultimate population and planned developments in the Tuen Mun area. This will reduce the pollution loadings to the receiving water, namely the western waters of HKSAR, with a view to contributing to the achievement of water quality objectives set for the receiving waters and to mitigate the adverse impacts of the area's sewage discharges to aquatic environment.

The key elements of the Project are to:

(a) modify and expand the existing aerated grit channels;

(b) construct chemical treatment units;

(c) construct sludge treatment units which may include sludge digestors, sludge dewatering facilities and sludge thickening facilities;

(d) construct disinfection units;

(e) modify and expand the existing septic waste reception facilities as necessary; and

(f) modify and expand the existing ancillary facilities including administration building, workshop, laboratory and landscaping works.

1.3 Name of the Project Proponent

Harbour Area Treatment Scheme Division, Drainage Services Department.

1.4 Location and Scale of the Project

The existing PPSTW is located north of the Tuen Mun River Trade Terminal and bounded to the north by Lung Mun Road. The proposed upgrading works will be located on an adjacent land reserved for the extension of the existing PPSTW as shown on Drawing No. DSS/2004/001.

Upon completion of the Project, the PPSTW can cater for a daily average dry weather flow of 241,000 m^3/d.

1.5 Types of Designated Project Involved

The Project constitutes a single Designated Project under Schedule 2, Part I, F.1 of the Environmental Impact Assessment Ordinance.

1.6 Contact Person

Name	:	Mr. TSANG Kwok-leung
Post	:	Senior Engineer/4, Harbour Area Treatment Scheme Division, Drainage Services Department
Tel	:	2834 9438
Fax	:	2833 9162
Address	:	9/F, Guardian House, 32 Oi Kwan Road, Wan Chai, Hong Kong

2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Project Offices/Divisions

The Harbour Area Treatment Scheme Division of the Drainage Services Department will be responsible for the overall planning and implementation of the Project. Consultants will be engaged to undertake site investigations, environmental impact assessment, reference design and construction supervision of the Project.

Detailed design, construction and operation will be carried out by a Design-Build-Operate (DBO) contractor to be engaged by the Drainage Services Department.

2.2 Project Time Table

The reference design is scheduled to start in 2005. The upgrading works are scheduled to start in 2008 for completion by 2011.

3. POSSIBLE IMPACTS ON THE ENVIRONMENT

3.1 Project Outline and Preliminary Environmental Review

The Project comprises:

(a) expanding the existing PPSTW; and

(b) upgrading the sewage treatment process by the addition of chemical treatment with disinfection facilities.

To this end, additional sewage treatment and sludge treatment process units will be constructed, and parts of the existing units will be modified.

In the Review of Tuen Mun and Tsing Yi Sewerage Master Plans Final Working Paper WP9 - Final Sewage Treatment and Disposal for Tuen Mun, a Preliminary Environmental Review (PER) of the Project has been conducted to identify the possible impacts to the environment. The PER has concluded that no insurmountable environmental impacts are identified from the construction and operation of the proposed works provided that effective mitigation measures are implemented. With the adoption of a DBO procurement arrangement, a comprehensive assessment of the potential environmental impacts is suggested to be carried out during the reference design stage when more information on the proposed works is available. Appropriate requirements will then be stipulated in the DBO contract for the contractor to proceed with the detailed design, construction and operation of the facilities.

3.2 Possible Environmental Impacts during the Construction Stage

3.2.1 Air Quality

Gaseous and odour emission will unlikely arise from construction of the Project.

Dust may be generated from some construction activities, mainly earthwork and demolition works. In view of the modest scale of construction, the potential dust impact can be minimized through good construction practices.

3.2.2 Water Quality

Potential water quality concerns during construction of the Project include site run-off and drainage, and discharge of sewage from the construction workforce.

3.2.3 Noise

The construction activities will generate some noise through the use of conventional construction plant and equipment, like air compressors, breakers, etc.

3.2.4 Generation of Waste

Construction of the project will generate some construction and demolition materials, including: waste spoil from site clearance and excavation works; construction material such as wood, metal scraps and concrete; chemical waste from maintenance of plant and equipment and general waste from construction workforce.

3.2.5 Ecology

All the upgrading works will be conducted on a reclaimed land and therefore the ecological impact is expected to be minimal.

3.2.6 Visual Impacts

Visual impacts resulted from the construction activities will be temporary. The presence of construction equipment and stockpiled materials on works site may be a source of visual impacts to nearby sensitive receivers.

3.2.7 Traffic Disruption

The construction of the proposed works may result in impacts on nearby traffic, particularly Lung Mun Road and the entrance to the River Trade Terminal site. As the scale of construction works related to the upgrading works is not large, it is anticipated that the impacts on traffic will be minimal.

3.3 Possible Environmental Impacts during the Operation Stage

3.3.1 Air Quality

The potential odour sources in the PPSTW are the sludge treatment units and the sludge and screenings handling facilities. Moreover, prolonged storage of the screenings and grit in the storage skips of the screening compactors and degritting facilities may also create odour problem.

3.3.2 Water Quality

The existing PPSTW is a preliminary treatment works and can cater for a daily average dry weather flow of 215,000 m^3/d. The existing daily average flow is about 170,000 m^3/d. The upgrading works propose to extend the PPSTW to cope with increased daily average dry weather flow to 241,000 m^3/d and to provide a higher level of treatment. The upgraded PPSTW will provide chemical treatment plus disinfection, which will decrease the suspended solids, biochemical oxygen demand and E. coli concentrations in the treated effluent by a minimum of 70%, 55% and 99.9%, respectively. As a result of a higher level of treatment, the total

loads of pollutants to the receiving waters will therefore be reduced.

3.3.3 Noise

The sewage/sludge pumps and the ventilation fans of ventilation systems are potential noise sources during operation of the PPSTW.

3.3.4 Generation of Waste

The provision of chemical treatment at the upgraded PPSTW will generate more sludge than is presently the case. The PPSTW currently generates approximately 3-4 m^3/d of sludge from the coarse and fines screening and grit removal. At the upgraded PPSTW, sludge will be thickened and dewatered (with anaerobic digestion if found necessary) to reduce the volumes of sludge produced, where the total sludge volume produced is estimated at 91 m^3/d, which is a considerable increase over that currently generated. It is therefore considered that the potential impact related to handling, transportation and disposal of the waste during operational phase would be a concern.

3.3.5 Ecology

By the same reason as mentioned in paragraph 3.3.2, it is expected that the project will lead to an improvement of water quality and marine ecology in the receiving water body due to the reduction of pollution loading. Adverse impact on marine ecology would be unlikely through careful design of the treatment system.

3.3.6 Visual Impact

The project is located within a developed area with no residential establishments in the close proximity of the site .

3.3.7 Storage, Use, Handling, Transport and Disposal of Disinfection Material

The Project will explore various disinfection methods to improve the bacterial concentration of the effluent before the effluent is discharged to the receiving waters. There is a potential impact due to storage, use, handling, transport and disposal of the disinfection material.

3.3.8 Risk of Accidents Resulting in Pollution

The accidental leakage of the submarine outfall and the emergency breakdown of the PPSTW could potentially pollute the receiving water body.

3.3.9 Cumulative Impacts

The existing San Wai Sewage Treatment Works is planned to be expanded and upgraded but the programme is under review. There is potential cumulative impact as the effluent from both the San Wai Sewage Treatment Works and the PPSTW are discharged into the Urmston Road.

4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

The following is to outline those existing and planned sensitive receivers and the sensitive parts of the natural environment which may be affected by the Project. The locations of the sensitive receivers in concern are shown on the Drawing No. DSS/2004/002.

4.1 Residential Developments

The PPSTW is located at the southern coast of the western New Territories. The area surrounding the PPSTW is largely unpopulated, and the proposed site of the Project is located within a reserved area next to the existing compounds, surrounding areas belong to various government agencies. Tuen Mun Town Centre is located approximately 15 km north-east of the PPSTW and the closest residential developments, being Butterfly Estate and other residential estates, are located approximately 2 km north-east of the Project site.

4.2 Industries

The China Light & Power Tap Chek Kok Power Station is located approximately 2 km west of the PPSTW.

4.3 Navigation Channel

The Urmston Road, which is the major marine navigation channel from Hong Kong waters to the Pearl River, is located at the south-western part of the PPSTW.

4.4 Beaches

The nearest gazetted beach is Butterfly Beach which is located approximately 1 km east of the PPSTW. Other gazetted beaches in the area include : Castle Peak Beach, Kadoorie Beach, Cafeteria New Beach and Cafeteria Old Beach which are all located east of Butterfly Beach. Lung Kwu Upper Beach and Lung Kwu Lower Beach, which are non-gazetted beaches, are located about 2.5 km north-west of the PPSTW.

4.5 Marine Park

Sha Chau and Lung Kwu Chau Marine Park is located appropriate 4 km west of the PPSTW.

5. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN OF THE PROJECT

5.1 During the Construction Stage

5.1.1 Air Quality

Air quality impacts during construction, which arises mainly from dusts will be minimised by the adoption of proper working methods of dust suppression, including: wetting of structures to be broken down before the demolition works; water spraying; covering of scaffolding with plastic sheet cover; controlling dropping heights of excavated materials; wetting and covering of materials for transportation by trucks; shielding of stockpile materials; and installation of wheel washing facilities. Relevant clauses for the construction of the Project will be incorporated into the DBO contract.

5.1.2 Water Quality

The DBO contract will incorporate provisions for removal of sand and debris from site run-off before the run-off can be discharged outside the Project site during construction. Contractors will also be required, under the contract specifications, to ensure that site management is optimised and that the deposit of any solid materials, litter or wastes (solid and liquid) does not occur in drainage channels and all fuel tanks and store areas are provided with locks and are located within secondary containment.

In cases sewerage connections to existing sewers are not available, portable toilets will be provided to collect sewage generated from the construction workforce and arrangements will be made with a licensed contractor for proper disposal of night soil.

5.1.3 Noise

The contractors for the works will have to comply with the provisions of the Noise Control Ordinance.

5.1.4 Generation of Waste

Although the quantity of the waste to be generated during the construction phase is expected to be small, provisions in line with the prevailing policy will be made in

the DBO contract for the contractor to reuse, recycle construction waste materials and to minimize the generation of them. Good waste management practices will be implemented to ensure proper handling and disposal of waste.

5.1.5 Ecology

Pollution control measures will be implemented to alleviate the ecological impacts arising from dust and noise generated by the construction activities.

5.1.6 Visual Impact

Hoarding will be erected at the site boundary to minimize the visual impact due to construction activities.

5.1.7 Traffic Disruption

Temporary traffic arrangement measures including management of transportation of materials and equipment will be undertaken to minimise traffic impacts.

5.2 During the Operation Stage

5.2.1 Air Quality

Odour impact assessment will be conducted as part of the environmental impact assessment (EIA) study during the reference design of the Project to identify the impacts to sensitive receivers in the Project setting. Where necessary, mitigation measures such as enclosure of odour sources and odour removal units, or equivalent, will be stipulated in the DBO contract as part of the upgrading works. Air from the pump sumps, sludge dewatering building and the sludge thickeners will be directed to the odour removal unit for treatment.

5.2.2 Water Quality

Water quality assessment will be conducted as part of the EIA study during the reference design of the Project to analyze the impacts to the nearby sensitive receivers due to the additional discharge from PPSTW into the Urmston Road. Nevertheless, the Project will result in a higher standard of the treated effluent. Therefore, the long-term water quality of the Urmston Road will be improved after the Project is commissioned.

5.2.3 Noise

Noise impact assessment will be conducted as part of the EIA study during the

reference design of the Project to identify the impacts to sensitive receivers in the Project setting. The location of noise sources such as ventilation opening will be located away from noise sensitive receivers where possible. It is also proposed that as part of the upgrading works, air-cooled noise enclosures or internal building sound proofing measures, or equivalent, will be stipulated in the DBO contract to reduce noise generated from facilities such as the blower house and the pump motor houses.

5.2.4 Generation of Waste

The screening and sludge handling facilities will be expanded and constructed as part of the Project to handle the increased amount of solid wastes generated from the sewage treatment processes. Disposal options for the increased quantities of sludge will be explored during the detailed EIA so that off-site impacts are minimised.

5.2.5 Ecology

Ecological impact assessment will be conducted as part of the EIA study during the reference design of the Project to analyze the impacts to the marine ecology, in particular the Chinese White Dolphins due to the additional discharge from PPSTW into the Urmston Road. Nevertheless, the Project will result in a higher standard of the treated effluent. Therefore, the long-term ecology of the Urmston Road will be improved after the Project is commissioned.

5.2.6 Visual Impact

Aesthetic consideration will be input in the Project reference design to enhance the appearance of new constructions and landscape planning will be undertaken to enhance the general outlook of the PPSTW.

5.2.7 Storage, Use, Handling, Transport and Disposal of Disinfection Material

The pollution concern is one of the major factors in selecting the disinfection methods in the EIA study. Procedures and practices controlling the storage, use, handling, transport and disposal of the material will be formulated in the EIA study.

5.2.8 Risk of Accidents Resulting in Pollution

Routine monitoring and maintenance of the pipeline would be carried out. Measures such as dual power supply and standby generators will be explored and emergency action plan will be formulated during the EIA study in the event of a breakdown leading to emergency discharge of the incoming sewage.

5.2.9 Cumulative Impacts

All the environmental protection measures as described in Sections 5.2.1 to 5.2.8 will be assessed taking due consideration of the cumulative impacts due to the operation of the San Wai Sewage Treatment Works.

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