

Project Profile

for

Effluent Polishing Scheme at Yuen Long 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:-

“Effluent Polishing Scheme at Yuen Long Sewage Treatment Works” hereinafter referred to as the “Project”.

1.2 Purpose and Nature of the Project

Yuen Long Sewage Treatment Works (YLSTW) currently provides treatment to domestic sewage from part of Yuen Long town and industrial sewage from Yuen Long Industrial Estate before discharging into Inner Deep Bay through Shan Pui River.

The Project originates from the recommendations of the “Review Report on Options for Managing Treated Effluent from Yuen Long Sewage Treatment Works (Final Report)” hereinafter referred to as the “Final Review Report” in the Consultancy Agreement No. CE 88/2002 (DS) conducted by the Environmental Protection Department (EPD) in 2008. The Final Review Report recommended that the effluent of Yuen Long Sewage Treatment Works should remain to be discharged into Inner Deep Bay through Shan Pui River after polishing in lieu of being exported to San Wai Sewage Treatment Works for disposal, which was originally proposed in “Review of Yuen Long and Kam Tin Sewerage and Sewage Treatment Requirements”.

As such, the Project aims at reducing the pollution load to Inner Deep Bay by improving the quality of the treated effluent from YLSTW and hence helps protect the water quality of Inner Deep Bay.

Key elements of the Project include:

- (a) upgrading the treatment level of and modifying the existing treatment facilities of YLSTW; and
- (b) providing disinfection facilities.

1.3 Name of the Project Proponent

Sewerage Projects Division, Drainage Services Department (DSD) of the Government of

the Hong Kong Special Administrative Region

1.4 Location and Scale of the Project and History of Site

The Project is mostly implemented at the existing YLSTW, a conventional secondary treatment works at the northern part of Yuen Long Industrial Estate. YLSTW was constructed in mid 1980s on a land that had been reclaimed from fishponds with an installed capacity of 70,000 cubic metre per day (m^3/day). It is currently receiving sewage of about 15,000 m^3/day . With the extension of public sewerage to unsewered areas in San Tin, Kam Tin, Pat Heung areas and population growth in the existing sewerage catchments, it is anticipated that the sewage flow to YLSTW will be on an increasing trend. The Final Review Report recommended a design average dry weather flow (ADWF) of 46,000 m^3/day . Further review on the population projection and sewage flow build-up will be carried out at the design stage of the Project to determine the design ADWF.

YLSTW falls into the Wetland Buffer Area (WBA) near the boundary of Wetland Conservation Area (WCA) as designated in TPB PG 12B “Town Planning Board Guidelines for Application for Developments within Deep Bay Area under Section 16 of the Town Planning Ordinance”.

In the Final Review Report, the use of denitrifying filters and ultra violet disinfection facility was proposed to augment with the existing secondary treatment process for polishing the effluent. Subject to further investigations on the treatment process to be adopted, an additional piece of land may be required to accommodate these new treatment facilities. To avoid disturbance to the wetland habitats and fish ponds in the WCA, a site within the WBA immediately south of YLSTW was identified as a suitable location. This site is currently a public car park in the Yuen Long Industrial Estate and is zoned “Other Specified Uses” in the Outline Zoning Plan.

Locations of YLSTW and the proposed additional site for accommodating new treatment facilities are shown on **Figure 1**.

1.5 Type of Designated Project Involved

The Project is a Designated Project of type F.1 under Part I of Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO), i.e. “sewage treatment works with an installed capacity of more than 15,000 m^3/day ”.

1.6 Name and Telephone Number of Contact Person

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2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Project Planning and Implementation

EPD is the client department and DSD is the works agent. Consultants will be engaged to undertake investigation of sewage treatment technologies and environmental impact assessment. DSD will carry out the detailed design and construction supervision of the Project. DSD will operate and maintain the completed works.

2.2 Project Programme

The construction works are tentatively scheduled to commence in July 2013 for completion in August 2016.

3. POSSIBLE IMPACT ON THE ENVIRONMENT

3.1 Outline Process Involved

The proposed treatment process is designed to provide an enhanced effluent quality for a design ADWF of 46,000 m³/day¹. There are various treatment technologies available for the removal of biochemical oxygen demand, suspended solids and nitrogen and disinfection.

Nonetheless, the use of denitrifying filters and ultra violet disinfection facility was a preferred option in the Final Review Report. The preferred option involves the following additional facilities:

- denitrifying filters;
- associated pumping station;
- chemical store for methanol; and
- disinfection channels.

A comprehensive review on various treatment technologies would be carried out in parallel with the environmental impact assessment to determine the appropriate sewage treatment process option. Treatment options, such as membrane bioreactors with less amount of land intake would also be included in the comprehensive treatment technology review.

3.2 Construction Phase

3.2.1 Air Quality

Dust emissions would be resulted from construction activities such as earthworks, excavation, construction of concrete structures and demolition of the existing structures.

3.2.2 Noise

Noise would be generated from construction activities through the use of conventional construction plant and equipment.

¹ The existing YLSTW has an installed capacity of 70,000 m³/day. According to the population and sewage flow projection carried out by the consultants under EPD's Consultancy Agreement No. CE 88/2002 (DS) – "Provision of Sewerage to Unsewered Areas / Villages in Northwest New Territories – Feasibility Study", the flow projection for YLSTW would be 46,000 m³/day in year 2030. Nonetheless, a thorough review on the design flow will be carried out.

3.2.3 Water Quality

Runoff from the site during construction may contain sediments and silts arising from earthworks, and oil and lubricants from construction vehicles and plant. Muddy water may also be generated from construction activities such as dust suppression sprays, dewatering during excavation and washing of construction equipment.

3.2.4 Waste Generation

Wastes generated during the construction phase may include:-

- Waste spoil from site clearance, site preparation, excavation and earthworks;
- Waste material such as wood, metal scraps and concrete generated from the construction process and also from demolition of some existing structures;
- General waste from workers; and
- Chemical waste from maintenance of construction plant and equipment such as lubrication oil.

3.2.5 Ecology

As the YLSTW and the proposed additional site fall within WBA near the boundary of the WCA, off-site disturbance to the wetland in the WCA may arise from human activities, dust, noise, intrusive lighting, runoff or discharge of waste effluent from the Project sites during construction. Potential sensitive receivers include nearby habitats such as fish ponds, wetlands, Kam Tin River and Shan Pui River, trees, etc.

3.2.6 Landscape and Visual

Visual impacts resulted from the construction activities, such as construction equipment and stockpiled materials on works site, will be temporary.

3.3.7 Traffic

Traffic generated during the construction phase will be temporary and limited to a small number of vehicles delivering plant and construction materials. Therefore, the traffic impacts during the construction stage will be insignificant.

3.2.8 Cultural Heritage

No impacts on historic monuments or buildings are expected during the construction phase.

3.3 Operation Phase

3.3.1 Air Quality

There is no air sensitive receiver in the vicinity of YLSTW. The potential odour sources are arising from the existing treatment processes of YLSTW such as the primary sedimentation tanks, sludge treatment units and the sludge and screening handling facilities.

The project aims at nitrogen removal and disinfection at the downstream of YLSTW where the sewage has already undergone secondary treatment. The odour generated due to these additional treatment units during operation phase will be minimal.

3.3.2 Noise

Blowers, pumps/motors, ventilation equipment and other machinery are potential noise sources during operation phase of the Project.

3.3.3 Water Quality

The Project would help protect the water quality of Deep Bay. The Project is designed to cater for increasing sewage flow from population growth in the sewerage catchment and committed extension of public sewerage to unsewered areas. Upon commissioning of the Project and extension of the public sewerage, pollution loadings to the Inner Deep Bay from the unsewered areas would be reduced. With inclusion of the proposed nitrogen removal and disinfection facilities under the Project, the effluent quality of YLSTW will be enhanced which would further protect the water quality in Deep Bay.

3.3.4 Waste Generation

Waste generated in the operation phase will principally be gross solids and sludge. Sludge will be thickened in thickeners and then digested. After digestion, the sludge volume will be reduced by sludge dewatering and subsequently conveyed for disposal at

landfill or incineration. Only a small additional amount of sludge will be generated due to the Project.

3.3.5 Ecology

Most modification and upgrading works involved in the Project would be carried out within the existing YLSTW and the proposed additional site, subject to findings in the investigation of sewage treatment processes. Since YLSTW and the proposed additional site situate outside the WCA, direct disturbance to the wetland in the WCA, Inner Deep Bay Site of Special Scientific Interest (SSSI), Mai Po SSSI, Tsim Bei Tsui Egrettry SSSI, Mai Po Marshes Nature Reserve and Mai Po Inner Deep Bay Ramsar Site in operation phase will be insignificant.

The off-site impact on ecology due to the additional noise and odour during the operation phase is considered to be minimal. Since the capacity of YLSTW will not be increased after completion of the Project, there would be no additional hydrodynamic impact on Shan Pui River. Upon commissioning of the Project and extension of public sewerage, pollution loadings to the Inner Deep Bay from the unsewered areas would be reduced. Apart from this, with inclusion of the proposed nitrogen removal and disinfection facilities under the Project, the effluent quality of YLSTW will be enhanced which would help protect the wetland habitats and nearby fishponds in the above mentioned SSSIs.

3.3.6 Landscape and Visual

The additional above-ground treatment units and structures may induce visual impacts to the surroundings.

3.3.7 Traffic

The impact on traffic during the operation phase of the Project is considered to be insignificant.

3.3.8 Cultural Heritage

No impact on historic monuments or buildings is expected during the operation phase.

4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

The existing environment of the Project and its surroundings were reviewed and sensitive receivers were identified in accordance with the guidelines of the Technical Memorandum on Environmental Impact Assessment Process.

The Site, adjacent to the Shan Pui River, is within the Deep Bay Water Control Zone according to Water Pollution Control Ordinance. EPD's policy proposes no net increase of pollution loadings into Deep Bay Water Control Zone to protect the environmental resources of the Deep Bay catchment and the downstream water quality in Deep Bay.

Recognized sites of conservation importance near the project site include Inner Deep Bay SSSI, Mai Po Marshes SSSI, Mai Po Marshes Nature Reserve and Mai Po Inner Deep Bay Ramsar Site, nearby fishponds and mangrove/mudflat along the embankments and at the confluence of Shan Pui River and Kam Tin Main Drainage Channel.

The Site is located at the northern part of the Yuen Long Industrial Estate. The nearest identified noise and air sensitive receivers are village-type residential premises including Green Garden, Leon Court and Ng Uk Tsuen located within 500m to the southwest of the Site. But these are mostly screened by industrial premises between the Site and the environmental sensitive receivers.

There is no planned noise and air sensitive receiver in the vicinity of the Project.

Subject to the treatment process to be selected, the potential environmental impacts will be addressed in the Environmental Impact Assessment (EIA) study.

5. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED INTO THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS

This section describes those measures likely to be incorporated in the design to minimize environmental impacts arising from both construction and operation phases of the Project.

5.1 Construction Phase

5.1.1 Air Quality

The extent of dust generation from the construction works is expected to be insignificant with the implementation of dust suppression measures as stipulated in the Air Pollution Control (Construction Dust) Regulation of Air Pollution Control Ordinance (APCO). These measures would be incorporated into the specifications for the works contract.

5.1.2 Noise

Mitigation measures including temporary noise barriers, quiet construction plant and scheduling of works will be recommended and the guidelines stipulated in EPD's Practice Note for Professional Persons, Noise from Construction Activities - Non-statutory (ProPECC PN2/93) will be followed to reduce impacts of construction noise to habitats adjacent to works areas.

5.1.3 Water Quality

The construction activities in the Project would include excavation, earthworks, general concrete building works and/or demolition of existing structures. Necessary silt removal facilities will be provided to remove any silt before the discharge of site runoff into the nearby stormwater drains. The design of temporary on-site drainage and silt removal facilities will comply with the guidelines stipulated in EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). The above mitigation measures will be incorporated into the specifications of the works contract and be provided prior to the commencement of earthworks. With the adoption of such mitigation measures, no significant adverse impacts on water quality are expected during construction phase.

5.1.4 Waste Management

Consideration will be taken during the design phase to minimize the generation of construction and demolition (C&D) materials by maximizing its re-use on site. The inert C&D materials such as concrete arising from the construction of the Project will be sorted on-site. The Contractor will be required to sort all C&D materials and waste into different categories for re-use on site and disposal at public filling, landfills, or recycling facilities as appropriate.

5.1.5 Ecology

Construction works areas will be planned to avoid the loss of ponds and tree felling wherever possible. It is important that measures to control construction runoff and drainage are fully implemented to minimize impacts on the water quality of the surrounding fish ponds and streams including Shan Pui River and Kam Tin River, and thereby minimizing the potential for resulting ecological impacts. Pollution control measures will also be undertaken to alleviate the ecological impacts arising from dust and noise generated by the construction activities.

Avoidance of any identified sensitive site will be the preferred mitigation measure. In view of this, a piece of Government land at the south of YLSTW in Yuen Long Industrial Estate will be considered to accommodate the proposed sewage treatment facilities. This land parcel is now being used as a public car park.

On the other hand, further investigation on different treatment technologies such as the use of membrane bioreactors with less land intake will be considered. Therefore, the requirement of an additional land will be subject to the findings of the above investigations. Other modification works to the existing treatment facilities will be carried out within the existing YLSTW, an already built-up sewage treatment works compound.

Subject to the treatment process selected, a detailed ecological impact assessment will be carried out, with necessary mitigation measures such as measures to reduce off-site disturbance, wetland compensation, etc. be recommended, to demonstrate that the proposed upgrading will not result in a net loss in wetland function and adverse residual ecological impact.

5.1.6 Landscape and Visual

Visual impacts from construction activities will be of very short durations. Proper control over site cleanliness and the stockpiling of materials will be exercised to alleviate visual intrusion.

5.1.7 Traffic

Insignificant traffic impact is expected during the construction phase, and therefore no mitigation measure is necessary.

5.1.8 Cultural Heritage

No cultural heritage impact is expected during the construction phase, and therefore no mitigation measure is necessary.

5.2 Operation Phase

5.2.1 Air Quality

Most of the odour sources are arising from the operation at the upstream facilities of YLSTW as described in Section 3.3.1, which are not affected by the Project. The odour generated by the additional or modified treatment facilities at the downstream is expected to be insignificant.

5.2.2 Noise

All pumps, motors, blowers and other mechanical equipment will be enclosed in structures or located underground in the dry/wet well. Therefore, any potential noise generation can be readily mitigated.

5.2.3 Water Quality

The Project is designed to upgrade the existing treatment level of YLSTW with nitrogen removal and disinfection. As such, the Project will result in a higher standard of treated effluent with lower nitrogen content and amount of bacteria. Furthermore, the Project is designed to cater for increasing sewage flow from population growth in the sewerage catchment and committed extension of sewerage to unsewered areas. Upon

commissioning of the Project and extension of public sewerage, pollution loadings contributed by the unsewered areas would be reduced. As a result, the Project will help further protect the water quality of Shan Pui River and Deep Bay.

5.2.4 Waste Management

Waste generated in the operation phase will comprise gross solids and sludge from the YLSTW. Sludge will be thickened in thickeners and then digested. After digestion, the sludge volume will be reduced by dewatering and subsequently transferred for disposal at landfill or incineration. Additional quantities contributed by the Project will be very small compared to the total quantities of sludge generated from the existing YLSTW, and could be comfortably allowed for in the overall waste disposal plans.

5.2.5 Ecology

The upgraded YLSTW will incorporate treatment process with a higher degree of suspended solids and nitrogen removal. Nutrient concentrations of the effluent will be much lowered which would help to protect the aquatic life. As the water quality of the receiving waterbody will be protected, no significant ecological impact on the nearby habitats by the effluent discharge of YLSTW is expected during operation phase.

The Project may cause changes of ecological environment in the area. An ecological impact assessment including comprehensive ecological survey will be carried out to assess the impacts if necessary. In order to preserve the ecological function of the wetlands and fishponds, the following mitigation measures will be implemented subject to the recommendations of the ecological impact assessment :-

- Avoiding or minimizing disturbance to the nearby fishponds as far as possible and compensating for such disturbance that cannot be avoided or minimized;
- Avoiding or minimizing activities with strong light and high levels of unpredictable noise near the sensitive area; and
- Avoiding treatment units and structures in/near the flight path of waterbirds or minimizing the height of these facilities to reduce the impacts to waterbirds.

5.2.6 Landscape and Visual

Aesthetic consideration will be taken into account in the design of the Project, such as enhancing the appearance of new buildings. Landscaping works may be undertaken to enhance the general outlook of the existing YLSTW.

5.2.7 Traffic

Minimal traffic impact is expected during the operation phase.

5.2.8 Cultural Heritage

No cultural heritage impact is expected during the operation phase.

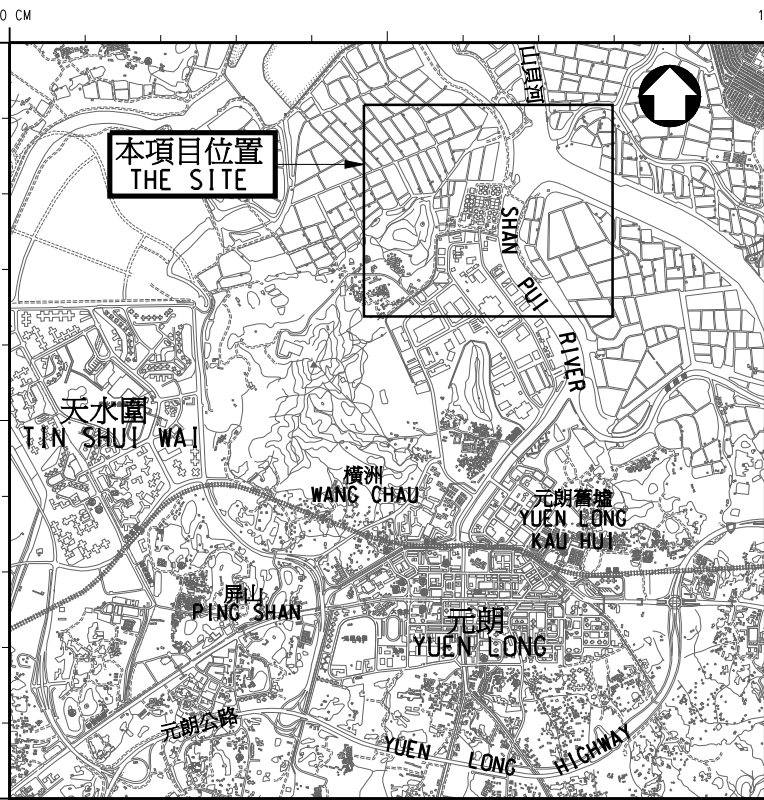
6. USE OF PREVIOUSLY APPROVED EIA REPORTS

No previous approved EIA report exists for the proposed Project. However, reference may have been made to the following previously approved EIA reports related to the Project:

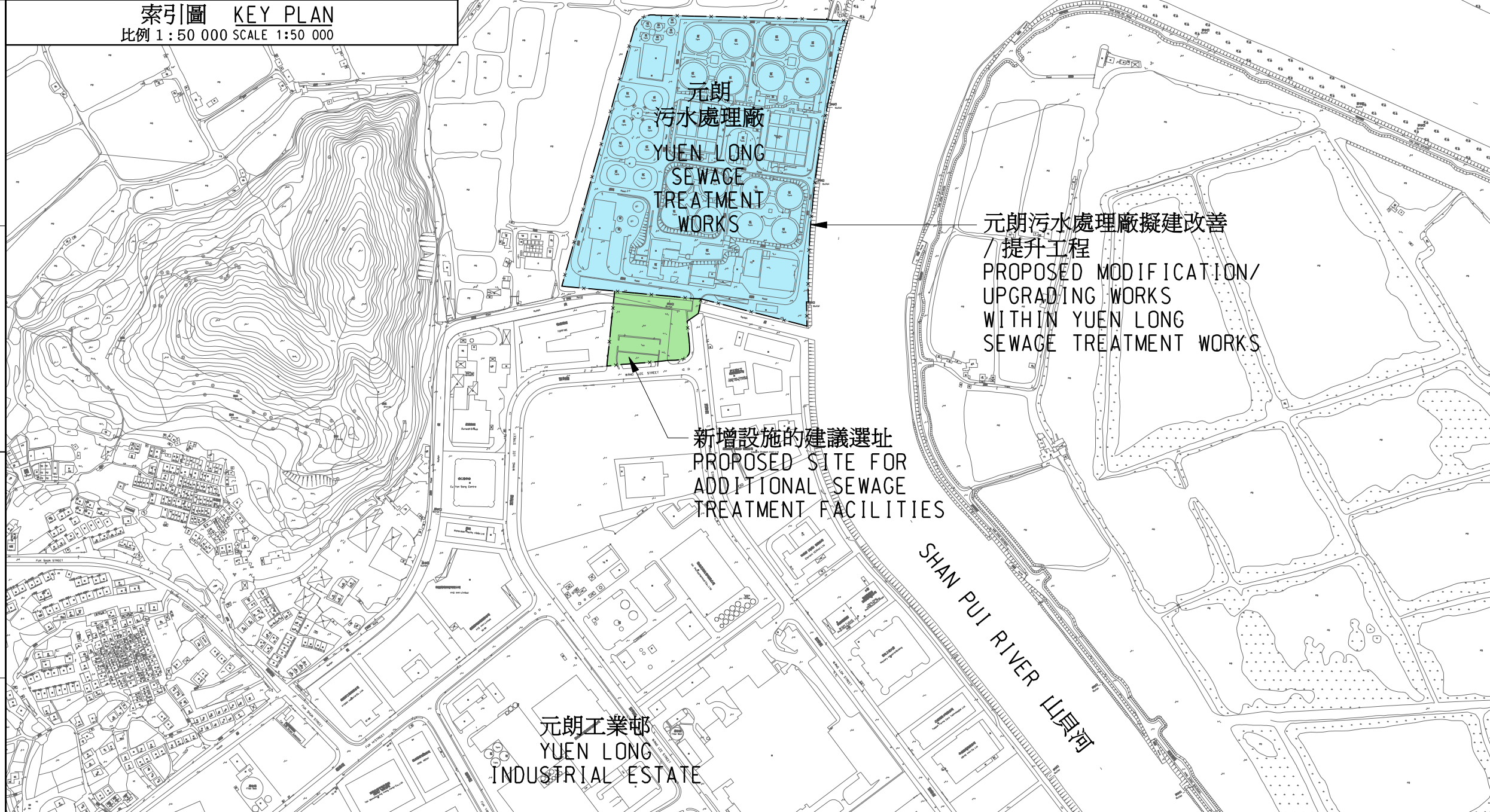
Register No.

AEIAR-078/2004

Project TitleYuen Long and Kam Tin Sewerage and Sewage
Disposal Stage 2



索引圖 KEY PLAN
比例 1 : 50 000 SCALE 1:50 000



元朗
污水處理廠
YUEN LONG
SEWAGE
TREATMENT
WORKS

元朗污水處理廠擬建改善
/ 提升工程
PROPOSED MODIFICATION/
UPGRADING WORKS
WITHIN YUEN LONG
SEWAGE TREATMENT WORKS

新增設施的建議選址
PROPOSED SITE FOR
ADDITIONAL SEWAGE
TREATMENT FACILITIES

元朗工業邨
YUEN LONG
INDUSTRIAL ESTATE

SHAN PUJI RIVER 山貝河

註 NOTES :

圖例 LEGEND :

— x — 工作範圍
SITE BOUNDARY

版 no.	日期 date	修改項目 description	簡簽 initial
修訂 REVISION			
		姓名 name	日期 date
繪畫 drawn			
核對 checked			
批核 approved			
合約編號 contract no.			
檔案編號 file no.			
工程編號 project no.			
合約名稱 contract			

PROVISIONAL
SUBJECT TO AMENDMENT

圖則名稱 drawing title
元朗污水處理廠加強處理工程
EFFLUENT POLISHING SCHEME AT
YUEN LONG SEWAGE TREATMENT WORKS
建議選址位置圖
LOCATION OF PROPOSED SITE

圖則編號 drawing no. 比例 scale
1 : 5000
OR
AS SHOWN

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