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

Agreement No. CE 67/94

Ting Kau and Sham Tseng Sewerage Scheme, Sewage Treatment and Disposal Facilities

Tsing Lung Tau Pumping Station

Project Profile

May 2006

Checked in accordance with MWH HKL and EML Quality System

Project Manager

MWH

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1. BASIC INFORMATION

1.1 Project Title

The Tsing Lung Tau Pumping Station (TLTPS), under Agreement No. CE 67/94, Ting Kau and Sham Tseng Sewerage Scheme, Sewage Treatment and Disposal Facilities (TKSTSS ST&DF).

1.2 Location of Project

The proposed TLTPS is located to the south of Tsing Lung Tau Village, between the existing and the realigned Castle Peak Road – Tsing Lung Tau, which has been formed by reclamation works under the Castle Peak Road Improvement Project (CPRIP).

1.3 Project Background

The Tsuen Wan, Kwai Chung and Tsing Yi Sewerage Master Plan (October 1992) was developed to reduce pollution loading within the coastal waters along Tsing Lung Tau to the west and Approach Beach to the east and to improve the overall water quality at bathing beaches within this area. As part of this Sewerage Master Plan, TKSTSS was proposed to provide sewerage to villages in the area and to convey the sewage to the Sham Tseng Sewage Treatment Works (STW).

An Environmental Impact Assessment (EIA) Study was undertaken on the TKSTSS under Agreement No. CE 35/94 and was completed and approved by the Hong Kong Government, Environmental Protection Department (EPD) in 1995. As part of the EIA, the TLTPS was one of seven pumping stations required to deliver effluent flows to the treatment works in addition to the other components of the scheme (including the Sham Tseng STW, trunk sewer construction, land reclamation and other improvement works). The scheme was assessed with regard to potential impacts on the environment and the EIA found that the whole of the project could be constructed and operated in an environmentally acceptable manner.

Due to the implementation of the Castle Peak Road Improvement Project (CPRIP) in 1999, the proposed location of the TLTPS site originally assessed in the EIA Study became unavailable and required relocation. An appropriate site was selected for the TLTPS about 450 m east of the original location on government land. The nature and scale of the TLTPS has not changed and the pumping station will be constructed within a similar village environment. However, due to the change in location, a Project Profile is prepared to demonstrate that the construction and operation of the TLTPS project will not result in unacceptable adverse impacts on the environment at its proposed new location. Both the original and the revised locations of TLTPS are shown on a plan (Figure 1) given in Appendix A.

1.4 Project Description

The TLTPS comprises an underground covered wet well with submersible pumps, an underground valve and flow meter chamber, and a single storey building (footprint of approximately 120 m^2) to accommodate the control system, odour control apparatus and the inlet chamber. The average dry weather flow (ADWF) of TLTPS is approximately 4,000 m^3/day with a design peak pumping capacity of about 200 litres per second. The site plan of the proposed TLTPS is shown in Figure 2 in Appendix A.

1.5 Project Timetable

The Consultant of Agreement No. CE67/94, TKSTSS ST&DF is carrying out the design of the TLTPS, programmed to be finalised in mid 2006. The construction of the TLTPS is part of PWP Item No. 126DS – Sham Tseng Sewerage Stage 3. The contract is scheduled to commence in late 2006 for 36 months and to complete in late 2009.

1.6 Nature of the Project and the Proposed Alteration

The proposed alteration is the relocation of the proposed pumping station to a site about 450 m east of the original location to a new area between the existing and the realigned Castle Peak Road formed by the reclamation works under CPRIP near Tsing Lung Tau Village. The original and the revised locations of the TLTPS are shown in Figure 1 in Appendix A. The site was found to be the most suitable site for relocating the TLTPS based on its proximity to the other components of the TKSTS S ST&DE Project, its availability as newly formed government land and also based on engineering and environmental considerations.

1.7 Environmental Impact Assessment Ordinance Status

The TKSTSS is an exempted designated project under the EIA Ordinance by virtue of Section 9(2)(c) and (g) of the EIAO (as it was approved prior to 1 April 1998) and the EIA report (hereinafter referred as the “approved EIA Report”) is placed on the Register under Section 15(1)(f) of the EIAO (EIAO Register Reference: EIA-077/BC).

The proposed TLTPS is classified as a designated project under F.3(b)(i) and F.3(b)(ii) of Part 1, Schedule 2 of the EIAO, as the sewage pumping station has an installed capacity (average dry weather flow) of more than 2,000 m^3 per day and its boundary is less than 150 m from an existing residential area and a place of worship.

Under Section 9(4) of the EIAO, a material change is defined as “a physical addition or alteration to a designated project which results in an adverse environmental impact”. Although the pumping station design has not changed from what was assessed in the EIA, the relocation of the proposed TLTPS 450 m to the east is a physical alteration to a designated project and, as such, requires an environmental permit prior to construction under the EIAO.

The following Project Profile has been prepared to demonstrate the environmental acceptability of the TLTPS Project and to seek permission from the Director of Environmental Protection under Section 5(10) of the EIAO to apply directly for an environmental permit for a material change to an exempted project.

1.8 Name of Project Proponent

Mr. C M Chan, Drainage Services Department, Telephone: 2594 7268.

2. POTENTIAL IMPACTS ON THE ENVIRONMENT

2.1 Major Elements of the Surrounding Environment

The proposed new location of TLTPS is on a newly reclaimed area (formed under CPRIP) between the existing and the realigned Castle Peak Road – Tsing Lung Tau near Tsing Lung Tau Village. The newly formed Castle Peak Road is situated between the proposed TLTPS site and provides a substantial buffer between the TLTPS site and the coastal waters. The site is devoid of vegetation and is not considered sensitive with regard to existing ecology or landscape resources.

The closest sensitive receivers to the revised location of TLTPS are the village houses and Tin Hau Temple at Tsing Lung Tau Village who will have views of the site and have the potential to be affected by it's construction and operation. The relative locations are provided in Appendix A and are summarised in Table 2.1 below.

Table 2.1 : Noise Sensitive Receivers

Ref	Description	Approximate Distance from the nearest site boundary (m)
R1	No. 64-60, Castle Peak Road - Tsing Lung Tau	25 m
R2	No. 66, Castle Peak Road - Tsing Lung Tau	28 m
R3	No. 58-56, Castle Peak Road - Tsing Lung Tau (Tin Hau Temple)	55 m

With reference to Tsuen Wan West Outline Zoning Plan No. S/TWW/15, there are no planned NSRs located near the proposed site and there are no rezoning applications (or Section 16 applications) under the Town Planning Ordinance in the vicinity of the site.

According to the Antiquities and Monuments Office (AMO) records, the Grade III historic buildings that all located in close proximity to the TLTPS site include Tin Hau Temple, Kam Fa Temple and Ching Lit Tsi, which are currently housed within a single building structure located about 50 m to the north-east of the TLTPS, and the Grave of a Qing Dynasty Virgin, which is adjacent to the temples.

The TLTPS site is not considered to be in an area of high visual value and presently has no existing vegetation or landscape features. The key visually sensitive receivers (VSRs) are the residents of Tsing Lung Tau Village facing Castle Peak Road.

Under the CPRIP, a noise barrier (approximately 4 m high) has been erected at the immediate south of the TLTPS site extending to the west. A footbridge has been built under the CPRIP which spans across Castle Peak Road, with an overall height of about 8 m and with an access ramp built to the immediate west of the proposed TLTPS building (refer to Figure 2 and 3 in Appendix A).

2.2 Summary of Potential Environmental Impacts

The potential construction and operational impacts associated with the TLTPS are identified in the approved EIA Report for the TKSTSS ST&DF and are described

below:

- Noise Impact – construction noise and operational noise from the pumping station.
- Air Quality Impacts - from construction dusts and operational odours.
- Water Quality Impacts - from construction works and potential impacts during emergency operations.
- Waste Management Impacts - associated with construction waste and operations waste management.
- Landscape and Visual Impacts - during construction and operation.
- Cultural Heritage Impact - during construction and operation.

The above aspects are addressed in the following Sections.

2.3 Environmental Impacts During Construction Phase

2.3.1 Noise Impacts

The EIA Report identified noise from the pumping stations as a potential noise impact and stated, "the noise impacts from the construction of these facilities will be similar to any building construction which includes piled foundations and civil works". The EIA recommended that a review of the equipment should be undertaken during the detailed design stage.

The noise plant and equipment have been reviewed with regard to the approved EIA Report and similar projects recently undertaken, including the EPD approved EIA study for the upgrading and Expansion of San Wai Sewage Treatment Works and Expansion of the Ha Tsuen Pumping Station EIA (EIAO Ref EIA-086/2002).

The major noise generating activities for the construction of pumping station are provided in Appendix B of this Project Profile and include excavation and backfilling, construction of substructure and superstructure, E&M Installation and finishing works. Due to the small size of the site, it is anticipated that phasing of the TLTPS construction works would be in segments and that the works segments would not overlap.

An assessment of the construction noise impact has been undertaken and is provided in Appendix B. The assessment adopts the standard acoustic principles and methodologies relevant to the *Technical Memoranda* issued under the *Noise Control Ordinance*, primarily the *TM on Noise from Construction Work other than Percussive Piling*. The assumptions for the noise assessment and results in comparison to the maximum acceptable noise level are provided in Table 2.2.

The assumptions included in the noise prediction are as follows:

- It is anticipated that there will be no construction work carried out during the restricted hours (ie. between 7 pm and 7 am and any time during general holidays including Sunday). However, should evening or night time works be required

during the project, a Construction Noise Permit Application will be applied for separately by the Contractor.

- The topographic nature of the area and existing background noise level in the area was not taken into account in the noise prediction.

- No more than one construction activity would be undertaken at any one time (e.g. piling and excavation) and that other related construction works (e.g sewage pipe laying during the construction of the TLTPS) will not occur.

- The boundary of the pumping station was taken as the construction site boundary.

Table 2.2 : Predicted Maximum Construction Noise Level

NSR Location	Scenario	Power Mechanical Equipment (PME)	
		Noise Criteria (Day-time), dB(A)	Noise Level (Maximum), dB(A)
No. 66, Castle Peak Road - Tsing Lung Tau	Unmitigated	75	88
	Mitigated*		73
No. 64-60, Castle Peak Road - Tsing Lung Tau	Unmitigated	75	89
	Mitigated*		74
No. 58-56, Castle Peak Road - Tsing Lung Tau (Tin Hau Temple)	Unmitigated	75	82
	Mitigated*		67

Notes: * Mitigated Scenario – Use of quiet plant with reference to *BS 5228 Part 1: 1997 Noise and Vibration Control on Construction and Open Sites* and provision of movable noise barrier (at least 5 dB(A) noise reduction for PMEs and 10 dB(A) for percussive piling works).

The predicted construction noise levels at the NSRs without mitigation would exceed the construction noise impact of 75 dB(A) however with the implementation of noise mitigation measures (using quiet plant and a temporary barrier) (listed in Section 3.2.1) the predicted construction noise levels at the NSRs would be within the acceptable noise criteria stipulated in Annex 5 of the *Technical Memorandum on EIA Process* (EIAO-TM) and adverse noise impacts would not occur at sensitive receivers during construction works.

In the event that percussive piling adopted during the construction, which will depend upon the ground conditions, construction noise generated from percussive piling activities would be regulated by the Noise Control Ordinance (NCO). The Contractor shall be responsible to apply separately to EPD for a Construction Noise Permit (CNP) in accordance with the requirements of the Technical Memorandum on Noise from Percussive Piling (TM-PP) under the NCO.

2.3.2 Air Quality

Dust may be generated during construction which would have the potential to impact

air quality at sensitive receivers, in particular during excavation works. The approved EIA stated that dust would be generated from excavation and construction activities. Only a small amount of excavation would be required (about 80 m^3). Dust suppression measures were proposed in the approved EIA Report and include measures stipulated in the *Air Pollution Control (Construction Dust) Regulation* which were expected to be effective in controlling dust on site.

These dust suppression measures will be incorporated into the construction contract documents (listed in Section 3.3.1) and with the implementation of the dust suppression measures, dust levels would be controlled within the acceptable air quality criteria stipulated in Annex 4 of the EIAO-TM and adverse air quality impacts will not result at sensitive receivers.

2.3.3 Water Quality

The potential water quality impacts during the construction phase of pumping station as stated in the EIA include surface water runoff contaminated with grouting material, bentonite, concrete, and sediment to discharge into the drainage system and nearby marine environment.

The inclusion of the practices outlined in *ProPECC PN1/94 Construction for Drainage* as well as other good site management practices to avoid site runoff and minimise the potential water pollution are recommended and were included in the EIA Report.

The relevant clauses will be incorporated into the construction contract documents requiring the contractors to comply with the *Water Pollution Control Ordinance* and its subsidiary regulations (listed in Section 3.4.1) and with the implementation of these measures, construction works will be in compliance with the water quality criteria stipulated in Annex 6 of the EIAO-TM and adverse water quality impacts will not result.

2.3.4 Waste Management

There were no significant solid waste impacts associated with the TLTPS identified in the EIA and the change in location will not give rise to any change in the amount of solid waste produced during the construction stage.

Very little waste will be generated from the construction of the TLTPS. The construction and demolition waste material will not be in excess of the exempted quantity of 50 m^3 and construction of the wet well for the pumping station will require the excavation of only a small amount of material (about 80 m^3) that will be suitable for use as public fill and is less than the maximum quantity for exemption from the requirement to dispose of material at a designated public filling facility.

The relevant waste management measures applicable to the pumping station site as well as additional measures are listed in Section 3.5.1 of this report and will be incorporated into the construction contract documents requiring the contractors to comply with the *Waste Disposal Ordinance* and its subsidiary regulations.

With proper implementation of the recommended waste management measures, the relevant requirements set out in Annex 7 of the EIAO-TM will be achieved and adverse impact during the construction phase of TLTPS are not expected to occur.

2.3.5 Cultural Heritage

The revised TLTPS pumping station is about 55 m away from the existing Tin Hau Temple, Kam Fa Temple and Ching Lit Tsi. These temples are currently housed within a single building structure located to the north-east of the proposed pumping station. The Antiquities and Monuments Office (AMO) classifies this building structure as a Grade III historic building. In addition, a Grave of a Qing Dynasty Virgin is also located adjacent to the above temples.

The revised pumping station location is closer to the cultural sites than the original location proposed in the approved EIA report. Construction effects such as vibrations and direct disruptions to the various historical building and features have been considered measures to reduce vibration have been incorporated in the finished design of TLTPS (quieter piling techniques, etc.) It is expected that construction vibrations will be minimal and would not cause any impact to these historic building and grave.

As a further precautionary measure, requirements for carrying out condition surveys and monitoring of the existing historical features during the TLTPS construction works will be undertaken and included into the construction contract documentation prior and during the works as described in Section 3.7.1. It is expect that the TLTPS will achieve the requirements set out in Annex 19 of EIAO-TM and impacts to cultural heritage are not expected to occur during construction.

2.3.6 Landscape and Visual

The landscape and visual impacts during the construction phase of the key components of the Ting Kau and Sham Tseng Sewerage Scheme were expected to be minimal, according to the approved EIA Report. The revised location is within a highly disturbed area and the visual impacts during construction phase of the pumping station are expected to be temporary and at a localised level within the overall context of the project area and will not be significant.

It is recommended that hoarding around the pumping station site will be erected as screens for the construction works area, and at the same time to prevent unauthorized entry and to assist in containing construction noise and dust. With the implementation of this measure, the relevant requirements set out in Section 1 of Annex 10 of EIAO-TM can be achieved and no adverse landscape and visual impacts are expected to result during the construction phase of the TLTPS.

2.4 Environmental Impacts During Operational Phase

2.4.1 Noise Impacts

The major noise sources during the operational phase of the proposed TLTPS are the submerged pumps installed inside the pumping station. According to the design, two pumps will be installed in the proposed TLTPS of which one of the pumps will be used as a standby pump and only one pump will be operating at any one time.

A noise assessment was carried out in the approved EIA Report that predicted noise levels generated from the proposed TLTPS would be less than 24 dB(A) and that cumulative noise level at the closest Noise Sensitive Receivers (NSRs) (i.e. SR1) would be about 29 dB(A), which is well below the noise criteria specified in the *Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites* (the applicable noise criteria

determined in the EIA for this project are 60 dB(A) during day time and evening (7a.m. to 11p.m.), and 50 dB(A) for the night time (11p.m. to 7a.m.)).

Operational Noise Impacts were assessed with regard to the revised location of the TLTPS and the noise estimate is presented Appendix B and summarised in Table 2.3.

Table 2.3 : Operational Noise Level of TLTPS at the Closest NSR

Sensitive Receiver	Approx. Distance from the Pumping Station, m	Sound Pressure Level at 1m from the Pump, dB(A)	Noise Level Due to Operation of the Pumping Station, dB(A) at the NSR
No. 66, Castle Peak Road - Tsing Lung Tau	28	51	25
No. 64-60, Castle Peak Road - Tsing Lung Tau	25	51	26
No. 58-56, Castle Peak Road - Tsing Lung Tau (Tin Hau Temple)	55	51	19

The maximum noise levels expected during the operation of the pumping station at the closest NSRs would be about 26 dB(A), which is well within the acceptable noise criteria of (i.e. 60 dB(A) for day time and evening and 50 dB(A) for the night time). It is expect that the TLTPS will achieve the requirements set out in Annex 5 of EIAO-TM and operational noise impacts are not expected to occur.

2.4.2 Air Quality

Odour emission from pumping stations was assessed in the approved EIA report. The wet well would be the major source of odour nuisance for the proposed pumping station. Emission rates of hydrogen sulphide (H_2S) were used for the odour analysis which was based on the H_2S monitoring survey carried out at the wet well of Cheung Sha Wan Sewage Pumping Station.

A deodorization unit using chemically treated activated carbon with a hydrogen sulphide and having a removal efficiency of 99.9% will be installed at the pumping station to minimize the potential odour nuisance. With the deodorisation unit, the odour level at the nearby air sensitive receivers will comply with the 5 odour unit criteria (based on an averaging time of 5 seconds) stipulated in Annex 4 of the EIAO-TM and adverse odour impacts are not predicted to occur at sensitive receivers during operation of the TLTPS.

The location of the exhaust outlet of the odour control facilities of the pumping station has been carefully reviewed in the design. The exhaust outlet of the odour control facilities is now laid towards the southern direction of the site whilst the sensitive receivers are situated at the north and north-eastern sides, therefore, the exhaust outlet is kept away from sensitive receivers as far as practical.

2.4.3 Water Quality

The potential water pollution aspects that could arise during the operational phase of the Ting Kau and Sham Tseng Sewerage Scheme was assessed in the approved EIA

Report and found that no adverse water quality impacts would result during normal operation of the pumping station and that there will be significant beneficial impacts to the water quality in the area from implementation of the TKSTSS Project. However, there is the potential that water pollution impacts could occur in the event of pumping station power failure or equipment breakdown giving rise to uncontrolled discharge of sewage.

The revised location of the pumping station does not alter or increase this potential for impacts to occur during emergency situationsMeasures will be incorporated in the TLTPS to reduce the risk of potential water quality impacts, as listed in Section 3.4.2, including standard emergency discharge and emergency operational considerations. During normal operations, the TLTPS is expected to meet all relevant criteria stipulated in Annex 6 of the EIAO-TM and adverse water quality impacts would not result.

2.4.4 Waste Management

The major solid waste generated during the operational phase of the pumping station will consist of a small amount of screenings and a very small amount of domestic waste. The revised pumping station location will not have any effect on the volume or nature of solid waste produced and all screenings removed will be properly packed and handled within the pumping station structure to avoid odour and hygienic nuisance. The screenings will then be transported to strategic landfills for disposal.

No adverse waste impact are expected to result during the operational phase of TLTPS and waste will be in compliance with the requirement set out in Annex 7 of the EIAO-TM.

2.4.5 Cultural Heritage

During the operational stage, the proposed submersible pumps of TLTPS are not expected to generate ground vibration as the pumps will be contained within the wet well of the pumping station and located several meters below ground level. Further, noise and air quality during operations has been reviewed and impacts will not result to visitors to the cultural heritage features. As such, adverse impacts are not expected to occur to historical buildings and features during operation in accordance with the requirements of the EIAO-TM.

2.4.6 Landscape and Visual

The landscape and visual impact of the pumping station during the operational phase would be minimal within the context of the project area. The following factors and site conditions have been considered during the design of the proposed TLTPS:

- Due to the operational requirements, the above ground components of the pumping station (which include the control panels and odour control facilities) will need to be contained within an adequately sized structure, to provide for a safe means to operate and maintain the pumping station. The design of the pumping station has taken into account the surrounding village type of environment and the TLTPS facade has been designed to be compatible with the other surrounding features in the vicinity.

- The TLTPS is located as close to the highways structures as practical to minimise visual impacts. The TLTPS structure will be slightly higher than the noise barrier,

but significantly lower than the deck of the footbridge, and also will not be much higher than the existing top surface of the boundary wall of House No. 60-64. In addition, the TLTPS will not be located in the direct line of sight of the existing temples (about 45° to the south-west of the temples).

In view of the future highways structures proposed in the immediate vicinity of the TLTPS, and the design considerations that have been taken into account for the TLTPS, significant adverse residual landscape and visual impacts are not anticipated to occur during operations and the TLTPS is expected to be acceptable under the criteria listed in Section 1.1 of Annex 10 of the EIAO-TM.

Figure 3 in Appendix A shows the elevation of TLTPS whilst Figure 4 is a photomontage of the site showing before and after construction of the TLTPS.

3. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPACTS

3.1 General

Construction clauses will be included in the works contract to ensure the prevention and control of pollution related to water quality, noise nuisance, air quality and waste management. In addition, the following will be implemented.

3.2 Noise

3.2.1 Construction Phase

The approved EIA report recommended various standard measures to reduce construction noise that are applicable for this project, including the use of silenced equipment and construction programming to reduce impacts. The following measures have incorporated these recommendations and have also include further measures to reduce noise levels to within the acceptable level:

- No concurrent construction works on the sewer will occur during the pumping station construction unless it is demonstrated through a detailed noise assessment that impacts will not result to sensitive receivers in the area and noise levels will be within the acceptable criteria;

- The work shall be scheduled to avoid several sets of powered mechanical equipment operating at the same time and will be set out by work task unless it is demonstrated through a detailed noise assessment that impacts will not result to sensitive receivers in the area and noise levels will be within the acceptable criteria;

- The construction equipment will be sited as far as practicable from sensitive receivers;

- Silenced equipment will be used on site, as assessed in Appendix B, or similar, based on the availability of the equipment and a temporary noise barrier shall be placed close to the noise source to screen the sensitive receiver to reduce noise levels to within the acceptable criteria; and

- The details of the noise barrier (height, width, composition and attenuation) shall be provided to EPD prior to construction along with a detailed noise assessment demonstrating compliance with the acceptable criteria, once all plant details (availability) and the programme of works have been confirmed with the Contractors.

The construction noise level at the nearby noise sensitive receivers will comply with the 75dB(A) criteria stipulated in Annex 5 of the EIAO-TM with the implementation of the recommended noise reduction measures. As such, adverse residual noise impact during the construction phase of the TLTPS are not expected to result from this Project

3.2.2 Operational Phase

With regard to the revised TLTPS location, noise generated from the pumping station during the operational stage would be well within the acceptable noise criteria and

would not result in impacts to noise sensitive receivers. As such, mitigation measures were not required in the approved EIA report and are not required during the operational phase for the revised location.

3.3 Air Quality

3.3.1 Construction Phase

The approved EIA report recommended watering the site to reduce dust levels during construction. Watering of the site to reduce dust is recommended along with the following air quality measures to be implemented during construction of the Project.

- The Contractor must comply with the control measures stipulated in the Air Pollution Control (Construction Dust) Regulation and implement all the required mitigation measures. In accordance with the requirements of the Regulation, sufficient dust control measures shall be implemented by the Contractor to ensure full protection of nearby Air Sensitive Receivers (including watering of the site, treating stockpiled materials and dust control measures on vehicles transporting materials as specified in the Regulation).

- Construction plant shall also be regularly maintained and kept in good working order to minimise gaseous and particulate emissions. Where possible, plant should be electrically rather than diesel powered.

3.3.2 Operational Phase

With regard to the revised TLTPS location, odour generated from the pumping station during the operational stage would be well within the acceptable criteria with the implementation of a deodorization unit using chemically treated activated carbon with a hydrogen sulphide as recommended in the approved EIA report. The removal efficiency will be 99.9% and with the implementation of this the TLTPS would not result in impacts to sensitive receivers.

3.4 Water Quality

3.4.1 Construction Phase

The Contractor shall fully comply with the Water Pollution Control Ordinance and during construction works and the best practice site drainage measures (e.g. ProPECC PN 1/94) shall be implemented at the work sites. In particular, the following shall be undertaken:

- Temporary drainage shall be provided around the site to ensure that all run-off and ground water seepage is collected and passed though well-maintained sediment removal facilities and achieves the discharge limits before being discharged.

- During construction all C&D materials will be properly stockpiled and covered / contained to ensure that sediment-loaded surface runoff does not result from this material.

- Any discharges from toilets or site offices provided will need to be connected to the foul sewerage.

- Alternatively, chemical toilets will be provided and will be regularly emptied and

serviced by a licensed operator.

3.4.2 Operation Phase

The following measures will be applied to the TLTPS to reduce the risk of potential water quality impacts:

- Standby pumps and motors have been included in the scheme to facilitate maintenance or repair of equipment;
- Routine maintenance is to be scheduled to be carried out during the dry season;
- There will be back-up power in the form of dual power supply at the TLTPS;
- Installation of telemetric warning system to warn operators of failure;
- Provision of screen to prevent discharge of floating solids in case emergency discharge is unavoidable; and
- The emergency discharge has been located to below the low water marks to minimize nuisance and is at least 100 m away from the boundaries of any gazetted beach and 100 m away from any seawater intake point.

With proper implementation of the recommended mitigation measures, the residual operational phase water quality impacts will achieve the relevant criteria stipulated in Annex 6 of the EIAO-TM.

3.5 Waste Management

3.5.1 Construction Phase

The following waste management measures have been incorporated into the project and will be implemented during construction:

- Excavated materials and other wastes will be segregated, re-used or recycled as far as possible;
- Fill material will be retained for backfilling at the works sites and will be re-used as aggregate, used on other projects or disposed of at designated public fill areas or public filling facilities for disposal as a last resort;
- Disposal of the C&D Materials will be managed through the trip-ticket system following the guideline stipulated by the Environmental, Transport and Works Bureau Technical Circular (Works) No 31/2004 “Trip Ticket System for Disposal of Construction & Demolition Materials”;
- Disposal site of the surplus inert C&D materials will be identifed and agreed with the Public Fill Committee and Waste Facilities Group of EPD prior to disposed; and
- All Chemical Wastes from plant maintenance will be handled, stored and disposed of in accordance with the requirements of the Waste Disposal (Chemical Waste) Regulations.

- In accordance with the approved EIA report, any fuel storage or maintenance area bunds to be provided should have a dedicated drainage system installed to contain and allow pretreatment of any spillage prior to their appropriate disposal

3.5.2 Operation Phase

No adverse waste impacts are expected to result during the operational phase of TLTPS and waste will be managed in accordance with requirements set out in Annex 7 of the EIAO-TM and will be deposited at an appropriate fill area or fillingl facility in accordance with the approved EIA Report.. As such, no further mitigation measures are required during operation.

3.6 Landscape and Visual

3.6.1 Construction Phase

During construction, attractive site hoardings shall be installed around the sites and the works areas shall be kept tidy and construction waste shall be properly managed to reduce the visual impact of the construction sites to a minimum, which is also specified in the approved EIA report.

3.6.2 Operation Phase

No adverse impacts are expected to result during the operational phase of TLTPS. As such, no mitigation measures are required.

3.7 Cultural Heritage

3.7.1 Construction Phase

A condition surveys will be undertaken and monitoring will be undertaken during construction to ensure that condition of cultural heritage features are understood prior to construction activities and so that any changes or impacts to these structures can be identified early and addressed during construction. The following measures will be implemented:

- An appraisal will be undertaken of the state of the existing historic features including location and conditions of all cracks (including suitably referenced and catalogued photographs);

- Their various types of construction, including foundations will be documented;

- AMO will be notified with regard to the working methods that will be used on site, including trench support systems, to be adopted by the Contractor to protect the condition of the existing historic buildings/features;

- The structures will be reviewed on a monthly basis during the earthworks and underground works activities to document changes (through visual inspection, or other approved methods such as settlement markers).

3.7.2 Operation Phase

No adverse impacts are expected to result during the operational phase of TLTPS. As such, no mitigation measures are required.

4. USE OF PREVIOUS APPROVED EIA

The approved EIA Report for the TKSTSS ST&DF (Agreement No. CE 35/94), which was completed in 1995 and approved prior to the commencement of the EIA Ordinance (EIAO) in 1 April 1998 has been used as referenced (EIAO Ref EIA-077/BC). The issue areas that were assessed and are applicable to the TLTPS have been covered in the previous sections of this Project Profile along with the EIA findings with regard to the environmental impacts. Measures that were recommended specific to the TLTPS that were recommended in the approved EIA along with further site specific measures are specified in Section 3 of this Project Profile.

The EIA study for the upgrading and Expansion of San Wai Sewage Treatment Works and Expansion of the Ha Tsuen Pumping Station EIA (EIAO Ref EIA-086/2002 has also been referenced with regard to this Project Profile.

Other similar Direct Applications for Sewage Pumping Station that have been reviewed are shown below in Table 4.1.

Table 4.1 : Previous Direct Applications under the EIAO for Pumping Stations

EIAO Reference	Name	Pumping Station Capacity m3/day	Closest Sensitive Receiver
DIR 026/1999	Au Tau Pumping Station	12,200m^3	village houses 40m and hospital 120m
DIR 024/1999	Yuen Long Southern SPS	36,300m^3	village houses 70m
DIR 020/1999	SPS at Tung Tau IA Yuen Long	5,260m^3	village house 35m
DIR-019/1999	PWP Item 4272DS - Port Shelter Sewerage - Village Sewerage at Wong Chuk Wan & Environs to Sai Kung	730m^3	village houses <150m
DIR-017/1999	PWP Item 4273DS - Port Shelter Sewerage, Stage 3 Tseng Lan Shue Sewerage	3000m^3	village houses <150m
DIR-015/1999	Outlying Islands Sewerage Stage 1 Phase II - Peng Chau Village Sewerage Phase 1 - Peng Chau Sewage Pumping Station Replacement	2,800m^3	village houses <150m

EIAO Reference	Name	Pumping Station Capacity m3/day	Closest Sensitive Receiver
DIR-040/2000	Au Tau Sewage Pumping Station (relocation)	12,200m	<80m from village houses, <100 m from hospital
DIR-060/2001	Tung Tsz Road Sewage Pumping Station	920m^3	village houses <150m
DIR-057/2001	Sai Kung Area 4 Sewage Pumping Station	7,500m^3	34m hotel and 80 m from residents
DIR-067/2002	Lam Tsuen Valley Sewage Pumping Station	5,600m^3	village houses <150m
DIR-115/2005	Upgrading of Ting Kok Road Pumping Station No.5	11,500m^3	village houses 60m

5. CONCLUSION

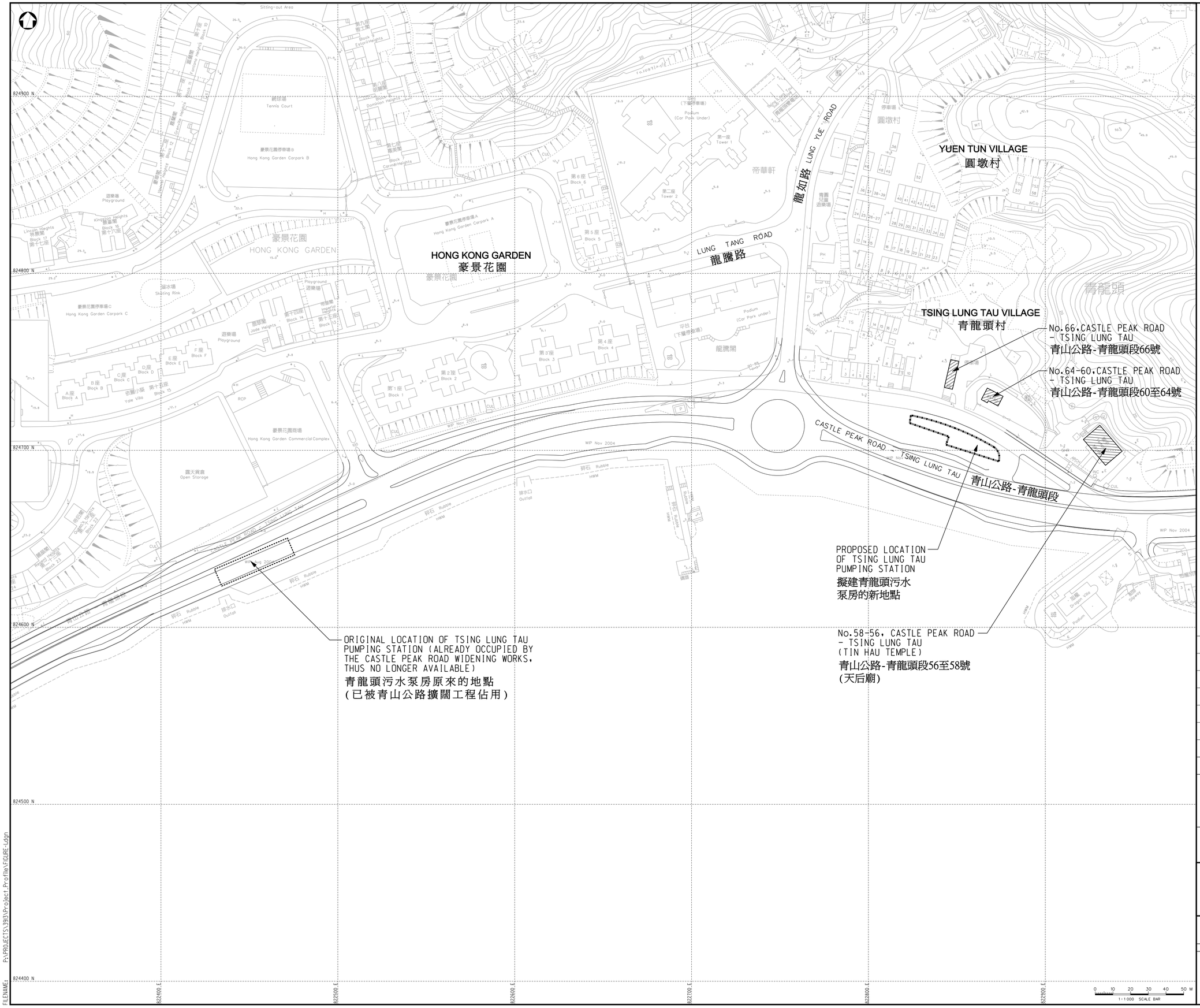
Based on the findings of this Project Profile, the change in the project location will not result in additional adverse impacts as those previously addressed in the approved EIA Report. The TLTPS will fully comply with the requirements of the EIAO-TM and adverse environmental impacts resulting from the construction and operation of the TLTPS are not expected to occur with the incorporation of the measures listed in Section 3 and no adverse residual environmental impacts are anticipated.

Appendix A

附錄 A

Figures

圖則



LEGEND 圖例

ORIGINAL LOCATION
原來的地點

REVISED LOCATION
經修訂後的地點

NEAREST ASR AND NSR TO THE REVISED LOCATION OF TLTPS
最接近青龍頭污水泵房(經修訂後)之空氣污染敏感受體及噪音敏感受體

DATE	DESIGNED	DRAWN	CHECKED	APPROVED	ISSUE	REVISION DESCRIPTION
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The Government of The Hong Kong Special Administrative Region
香港政府特別行政區

Ting Kau and Sham Tseng Sewerage Scheme, Sewage Treatment and Disposal Facilities
汀九深井污水收集、處理和排放設施

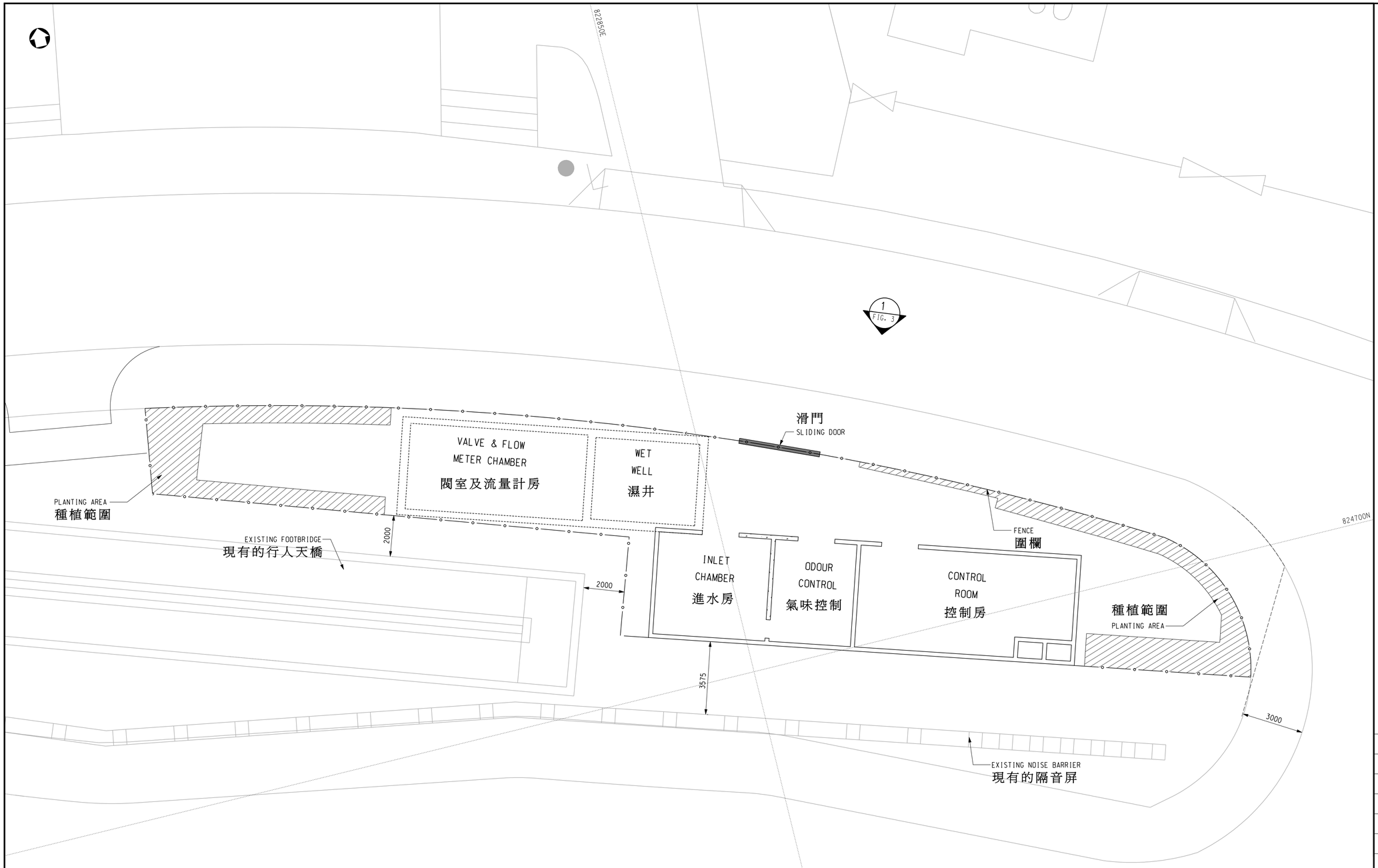
TSING LUNG TAU PUMPING STATION LOCATION PLAN
青龍頭污水泵房位置圖

顧問合約編號 AGREEMENT No. CE 67/94

圖則 FIGURE 1 ISSUE 1

MWH 美華集團

PRINTED BY: chimon.kwan 3/5/2006 9:17:47
FILENAME: P:\PROJECTS\3993\Project Profile\FIGURE.ldgn



CASTLE PEAK ROAD – TSING LUNG TAU

青山公路-青龍頭段

0 1 2 3 4 5 M
1:100 SCALE BAR

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TSING LUNG TAU PUMPING STATION SITE PLAN
青龍頭污水泵房地盤平面圖

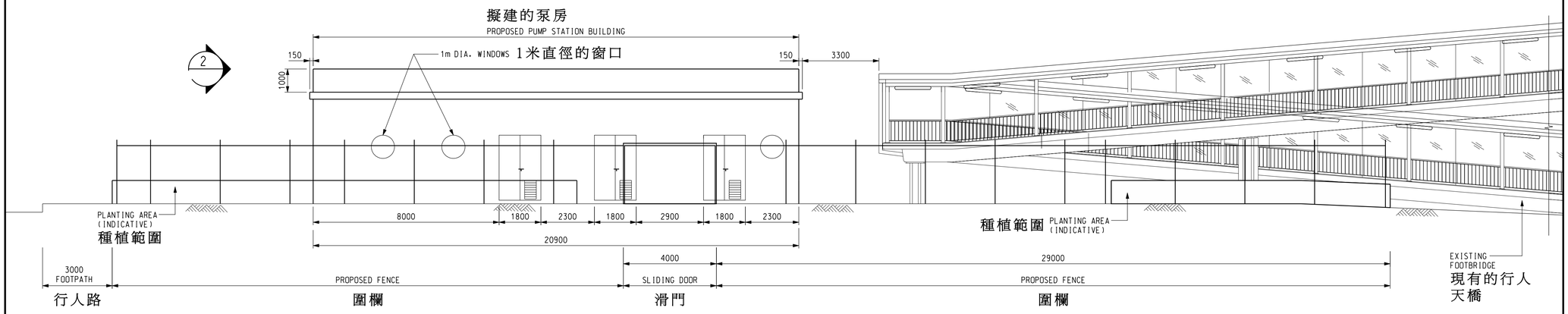
D S D

顧問合約編號 AGREEMENT No. CE 67/94

圖則 FIGURE 2 ISSUE 1

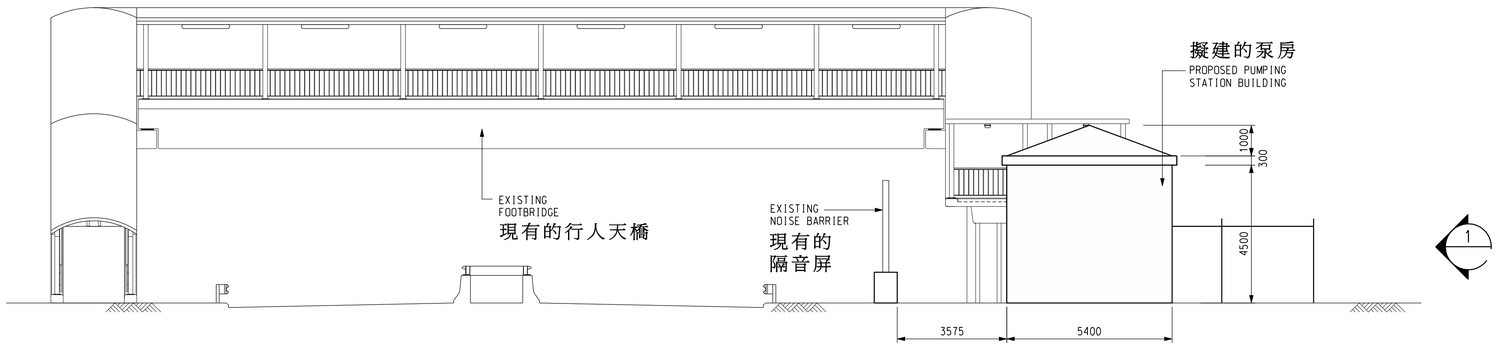
MWH 美華集團

PRINTED BY: chiman.kwan 3/5/2006 9:17:57
FILENAME: p:\projects\393\project_profile\FIGURE 2.dgn



ELEVATION 1 立面圖1

SCALE 1:100



ELEVATION 2 立面圖2

SCALE 1:100

0 1 2 3 4 5 M

1:100 SCALE BAR

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TSING LUNG TAU PUMPING STATION
ELEVATION
青龍頭污水泵房立面圖

D S D

顧問合約編號 AGREEMENT No. CE 67/94

圖則 FIGURE 3 ISSUE 1

MWH 美華集團

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FILENAME: p:\projects\3913\project profile\FIGURE-3.dgn

BEFORE
施工前

AFTER
施工後

APR06	SK	CSL			1	FIRST ISSUE
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香港政府特別行政區

Ting Kau and Sham Tseng Sewerage Scheme, Sewage Treatment and Disposal Facilities
汀九深井污水收集、處理和排放設施

EXPECTED VIEW OF TLTPS
BEFORE & AFTER CONSTRUCTION
青龍頭污水泵房建成前現狀
及建成後的預期外貌

顧問合約編號 AGREEMENT No. CE 67/94			
圖則 FIGURE 4		ISSUE	1

MWH 美華集團

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FILENAME: p:\projects\3913\project_profile\FIGURE-4.dgn

Appendix B

附錄 B

Noise Impact Assessment Calculations

噪音影響評估的計算資料

Appendix B - Inventory of Powered Mechanical Equipment 機動設備單

		沒有緩解方案Unmitigated Option			緩解方案1(低噪聲設備) Mitigation Option 1 (Quiet Plant)		
施工活動 Construction Activity	機動設備 Powered Mechanical Equipment (PME)	數量 No. of PME	技術備忘錄/ 其他參考 TM Ref. / Other Reference	聲功率級分貝(A) SWL*	數量 No. of PME	技術備忘錄/ 其他參考 TM Ref. / Other Reference **	聲功率級分貝(A) SWL*
Excavation挖掘	Excavator挖土機	2	CNP 081	112	2	BS5228 - table C3 ref. No. 35	106
	Trucks 貨車	2	CNP 067	117	2	BS5228 - table C9 ref. No. 39	103
			總聲功率級分貝(A) Total SWL, dB(A):	**121**		總聲功率級分貝(A) Total SWL, dB(A):	**111**
Substructure	Crane起重機	1	CNP 048	112	1	BS5228 - table C7, ref no. 112	102
建造地下結構	Concrete Lorries 混凝土貨車	1	CNP 044	109	1	BS5228 - table C6, ref. No. 36	106
	Concrete Vibrators 混凝土震動機	1	CNP 170	113	1	BS5228 - table C6, ref. No. 40	98
			總聲功率級分貝(A) Total SWL, dB(A):	**116**		總聲功率級分貝(A) Total SWL, dB(A):	**108**
Backfilling and Extraction of Piles	Roller 道路滾壓機	1	CNP 186	108	1	BS5228 - table C8, ref. No. 29	105
回填及打樁	Hand compactor 手提壓縮機	1	CNP 050	105	1	CNP 050	105
	Truck貨車	2	CNP 067	117	2	BS5228 - table C9 ref. No. 39	103
	Excavator挖土機	1	CNP 081	112	1	BS5228 - table C3 ref. No. 35	106
	Crane起重機	1	CNP 048	112	1	BS5228 - table C7, ref no. 112	102
	Vibrating sheet pile extractor震動式板樁拔取機	1	CNP 163	90	1	CNP 163	90
			總聲功率級分貝(A) Total SWL, dB(A):	**122**		總聲功率級分貝(A) Total SWL, dB(A):	**112**
Superstructure	Crane起重機	1	CNP 048	112	1	BS5228 - table C7, ref no. 112	102
建造地面結構	Concrete Lorries 混凝土貨車	1	CNP 044	109	1	BS5228 - table C6, ref. No. 36	106
	Concrete Vibrators 混凝土震動機	1	CNP 170	113	1	BS5228 - table C6, ref. No. 40	98
			總聲功率級分貝(A) Total SWL, dB(A):	**116**		總聲功率級分貝(A) Total SWL, dB(A):	**108**
E&M Installations	Crane起重機	1	CNP 048	112	1	BS5228 - table C7, ref no. 112	102
裝置機電工程							
			總聲功率級分貝(A) Total SWL, dB(A):	**112**		總聲功率級分貝(A) Total SWL, dB(A):	**102**
Finishing Work	Excavator挖土機	1	CNP 081	112	1	BS5228 - table C3 ref. No. 35	106
完成工程	Bulldozer推土機	1	CNP 030	115	1	BS5228 - table C9 ref. No. 2	104
	Concrete Lorries 混凝土貨車	1	CNP 044	109	1	BS5228 - table C6, ref. No. 36	106
	Vibrators 震動機	1	CNP 170	113	1	BS5228 - table C6, ref. No. 40	98
			總聲功率級分貝(A) Total SWL, dB(A):	**119**		總聲功率級分貝(A) Total SWL, dB(A):	**110**
備註Remark:							
* SWL - Sound Power Level, dB(A)聲功率級分貝(A)							

** In determining the SWL of quiet plants, reference was made to "*BS5228 Part 1 : 1997 Noise and Vibration Control on Construction and Open Sites*" and EPD approved "*Upgrading and Expansion of San Wai Sewage Treatment Works and Expansion of Ha Tsuen Pumping Station, Environmental Impact Assessment Report, MWH, January 2003*".
低噪音設備的聲功率級是參考《英國標準5228:第1部:1997》以及環保署批准的新圍污水處理廠改善和擴建工程及夏村泵房擴建工程的環境影響評估研究

Appendix B - Construction Noise Assessment of TLTPS 建築噪音評估

噪音感應強的地方參考號 NSR Ref. No.	噪音感應強的位置 NSR Location	噪音感應強的地方與擬建的泵房的水平距離(米) Horizontal distance between NSR and proposed pumping station, m	距離衰減作件用(一般施工)分貝(A) Distance attenuation (general construction work), dB(A) *	距離衰減作用(撞擊或打樁)分貝(A) Distance attenuation (percussive piling), dB(A) **	聲音反射的修正系統分貝(A) Façade Correction, dB(A)
N1	No. 66, Castle Peak Road - Tsing Lung Tau 青山公路-青龍頭段66號	28	37	39	3
N2	Road - Tsing Lung Tau 青山公路-青龍頭段60-64號	25	36	38	3
N3	Road - Tsing Lung Tau 青山公路-青龍頭段56-58號	55	43	46	3
Predicted Construction Noise of the Proposed Pumping Station 擬建泵房的預計施工噪音：					
施工活動 **Construction Activity**	緩解水平 **Level of Mitigation**	總聲功率級 **Total SWL, dB(A)**	**N1**	**N2**	**N3**
Excavation 挖掘	Unmitigated 沒有緩解	121	87	88	81
	Mitigation 1 緩解方案1	111	77	78	71
	Mitigation 2 緩解方案2	111	72	73	66
Substructure	Unmitigated 沒有緩解	116	82	83	76
	Mitigation 1 緩解方案1	108	74	75	68
	Mitigation 2 緩解方案2	108	69	70	63
Backfilling and Extraction of Piles	Unmitigated 沒有緩解	122	88	89	82
回填與抽出	Mitigation 1 緩解方案1	112	78	79	72
	Mitigation 2 緩解方案2	112	73	74	67
Superstructure	Unmitigated 沒有緩解	116	82	83	76
	Mitigation 1 緩解方案1	108	74	75	68
	Mitigation 2 緩解方案2	108	69	70	63
E&M Installations	Unmitigated 沒有緩解	112	78	79	72
電工安裝	Mitigation 1 緩解方案1	102	68	69	62
	Mitigation 2 緩解方案2	N/A	N/A	N/A	N/A
Finishing Work	Unmitigated 沒有緩解	119	85	86	79
	Mitigation 1 緩解方案1	110	76	77	70
	Mitigation 2 緩解方案2	110	71	72	65
Predicted max. noise level, dB(A)	**Unmitigated**		**88**	**89**	**82**
預計最高聲功率級	**Mitigation 1**		**78**	**79**	**72**
	Mitigation 2		**73**	**74**	**67**
備註Remark:					
Mitigation 1 - Using quiet plant with reference to BS5228 Part 1: 1997低噪音設備是參考《英國標準5228:第1部:1997》					
Mitigation 2 - Using quiet plant (BS5228 refers) + movable noise barrier (assuming a noise reduction of 5 dB(A) for PMEs and a reduction of 10 dB(A) for percussive piling work). 低噪音設備可動隔音屏障(預算可消減機動設備的噪音5分貝(A)，和撞擊式打樁的噪音10分貝(A)					
N/A - Not applicable.不適用					
* With reference to Table 5 of *TM on Noise from Construction Work Other Than Percussive Piling* **參考《管制建築工程噪音(撞擊式打樁除外)技術備忘錄》內表5*					
** With reference to Table 4 of *TM on Noise from Percussive Piling*					
**參考《管制撞擊式打樁工程噪音技術備忘錄》內表4					

Appendix B - Operational Noise Assessment of TLTPS運作噪音評估

Tsing Lung Tau Pumping Station (PS1) - Operational Noise青龍頭污水泵房 - 運作噪音:						
編號 **NSR Ref. No.**	噪音感應強的地方 **NSR Location**	噪音感應強的地方與PS1最短平面距離(米) **Shortest horizontal distance between NSR and PS1, (m)**	距離泵1米時的聲壓級分貝(A) **SPL at 1m from the pump *, dB(A)**	距離衰減作用分貝(A) **Distance attenuation, dB(A)**	聲音反射的修正系數分貝(A) **Façade Corr., dB(A)**	PS1運作時噪音聲級分貝(A) **Noise level due to PS1 operation, dB(A)**
N1	No. 66, Castle Peak Road - Tsing Lung Tau 青山公路-青龍頭段66號	28	51	29	3	25
N2	No. 60-64, Castle Peak Road - Tsing Lung Tau 青山公路-青龍頭段60-64號	25	51	28	3	26
N3	- Tsing Lung Tau 青山公路-青龍頭段56-58號	55	51	35	3	19
備註Remark:						

According to Table 9.6 of the approved EIA report, two pumps will be installed at the proposed pumping station. However, only one of the pumps will operate at any one time.
根據已批准的環境報告表內9.6，擬建泵房會裝置2部水泵，但在任何時間都只會有一部進行運作。

* Based on Sound Pressure Level (SPL) given in Table 9.8 of the approved EIA report.
*聲壓級是根據已經批准的環境評估報告表內9.8。