The Hong Kong and China Gas Company Limited

Proposed Submarine Gas Pipeline System
from Tuen Mun to Tung Chung and
Associated Offtake and Pigging Station at Chek Lap Kok

Project Profile

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Report Authorized For Issue By : . ..... For and on Behalf of Black and Veatch Hong Kong Limited

Black & Veatch Hong Kong Limited
in associated with
Cinotechnical Consultants Limited

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1 BASIC INFORMATION

1.1 PROJECT TITLE

1.1.1 The title of the project is "*Proposed Submarine Gas Pipeline System from Tuen Mun to Tung Chung and Associated Offtake and Pigging Station at Chek Lap Kok*" (hereafter referred to as the Project).

1.2 PURPOSE AND NATURE OF THE PROJECT

1.2.1 The Hong Kong and China Gas Company Limited (Towngas) is planning to construct a second gas supply pipeline system to Chek Lap Kok (CLK) Island and Tung Chung Town to enhance the security of gas supply to the region.

1.2.2 Gas supplies to Lantau Island and Chek Lap Kok Airport are currently provided by a single 400 mm intermediate pressure pipeline running along the north shoreline of Lantau Island. Towngas have identified that given this single link there is possible risk to the security of the gas supplies to CLK and Tung Chung, and are therefore seeking to provide a second gas supply route. In fact, a loop supply system can be gained by completing this second gas supply from Tuen Mun and so the gas supply to the northwest New Territories can be highly secured.

1.2.3 Towngas have commissioned an Engineering Consultant to carry out a feasibility study for the 500 mm diameter gas pipeline route from Tuen Mun to Chek Lap Kok Airport/Lantau Island in March 2000. The Feasibility Study Report was finalized in June 2003. No in-principle objection has been received on the latest preferred pipeline alignment and the preliminary construction methodology.

1.3 NAME OF THE PROJECT PROPONENT

1.3.1 The Hong Kong and China Gas Company Limited

1.4 LOCATION AND SCALE OF THE PROJECT AND HISTORY OF SITE

Location of the Project

1.4.1 The Project consists of four elements:

1) 500 mm diameter steel gas pipeline from Tuen Mun to Chek Lap Kok Island. The length of submarine part and land part is about 9 km and 0.5 km respectively;

2) an offtake and pigging station at Chek Lap Kok Island;

3) 500 mm diameter steel gas pipeline across Tung Chung Channel. The length of the crossing is about 0.4 km;

4) a fibre optic cable to be placed next to the gas pipeline.

1.4.2 The proposed gas pipeline from Tuen Mun to Chek Lap Kok will be laid within the 200 m wide corridor shown in Figure 1.1. The exact alignment of the pipeline will be determined during the preliminary engineering design and EIA study.

History of Site

1.4.3 The landfall area at Tuen Mun is located to the east of the Butterfly Beach. The proposed works area is to the east of a small outcrop of rock and a former drainage outfall pipe.

1.4.4 The landing site on Chek Lap Kok Island is next to the Airline Headquarters and close to the landside access corridor. There is no seawall because it is on the original CLK coastline.

1.4.5 The landing site at Tung Chung is adjacent to Tung Chung Ferry Pier and close to the seawater intake. The pipeline will pass through the proposed landscape area in Tung Chung Area 52 and a 7.5m pipeline reserve for the gas pipeline has been allocated in the preliminary landscape design along the northern shoreline of the Tung Chung waterfront area.

1.4.6 Urmston Road Channel is one of the main routes for ships into and out of Hong Kong Harbour. Public ferries and other cargo/fishing fleet use the channel as a transportation fairway.

1.5 NUMBER AND TYPES OF DESIGNATED PROJECTS TO BE COVERED BY THE PROJECT PROFILE

1.5.1 There is only one designated project covered in this Project Profile.

1.5.2 The Project involves the construction and operation of two sections of gas submarine pipelines and an offtake and pigging station. Only the submarine gas pipeline component of the Project is a designated project by virtue of H.2 of Part I of Schedule 2, the Environmental Impact Assessment Ordinance (Cap. 499), which specifies that a submarine gas pipeline is a designated project.

1.6 NAME AND TELEPHONE NUMBER OF CONTACT PERSONS

Name	Designation	Telephone No.	Fax No.
WONG Yiu-hung	Gas Supply Planning Manager	2963 1300	2516 7979

2 OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 PROJECT PLANNING AND IMPLEMENTATION

2.1.1 Towngas is the Project Proponent with overall responsibility for the planning, design, construction and operation of the Project. The Project Proponent has commissioned an Engineering Consultant to undertake the engineering design work, and an Environmental Consultant to conduct an Environmental Impact Assessment (EIA) Study. The Project will be implemented by Contractor(s) to be appointed by the Project Proponent at a subsequent stage.

2.2 PROJECT TIME-TABLE

2.2.1 Construction works of the submarine pipeline, offtake and pigging station and the optic cables are scheduled to commence in 1st quarter 2005 for completion in 3rd quarter 2006.

2.3 INTERACTIONS WITH OTHER PROJECTS

2.3.1 There are a number of related or concurrent short term and longer term projects in Tuen Mun, Chek Lap Kok Island and Tung Chung Town. These projects include the Permanent Aviation Fuel Facility (PAFF) and Tonggu Channel of Shenzhen Port.

2.3.2 The Airport Authority has planned to construct a Permanent Aviation Fuel Facility (PAFF), which will occupy a site area of 6 hectares in Tuen Mun Area 38 Reclamation, Stage 1. According to the preliminary development programme as presented in the approved EIA report, the PAFF would take 4 years for planning, design and construction, and would commence its operation at the end of 2005.

2.3.3 It is anticipated to commence the construction of Tonggu Channel by the end of 2003 and put the channel in operation by 2005.

3 POSSIBLE IMPACT ON THE ENVIRONMENT

3.1 OUTLINE PROCESSES INVOLVED

Submarine Pipeline Installation

3.1.1 The installation of submarine pipelines and cables shall adopt in combination of the following construction methods:

- Bottom Pull Method
- Lay Barge Method
- Jetting Installation Method
- Pipe Laying with Cofferdam

3.1.2 The installation method of the submarine gas pipeline will be further considered in the detailed design stage.

Construction of Land Section

3.1.3 The works through Butterfly Beach Park in Tuen Mun can be built using open cut trenching, but particular care will be required to minimize the nuisance impacts of such works on public.

3.1.4 Pipelaying on Chek Lap Kok Island can adopt the same trenching technique. Again the work will need to be carefully controlled as it is close to MTRC's Airport Express Line, and crosses over a number of important existing utilities, drainage, water and other infrastructure works.

3.1.5 The proposed offtake and pigging station at Chek Lap Kok is about 32 m by 22.5 m and will receive the submarine pipeline from Tuen Mun. It will be situated on the coastal area between the Airport Expressway and the coast line of Chek Lap Kok.

3.2 WATER QUALITY IMPACT

3.2.1 The key concern of the Project is that it involves dredging close to a gazetted beach as it may potentially generate a sediment plume that could possibly carry suspended solids with the tide to the beach. The impacts to water quality during submarine pipeline laying will occur as a result of disturbance of seabed sediments during dredging of the trench. The impacts to water quality from dredging would be in the form of seabed sediments being suspended into the water column. These suspended sediments would form a dense cloud in the immediate vicinity of the pipe laying operations and, due to the high concentrations and nearness of the release to the seabed, would settle back onto the seabed rapidly.

3.2.2 The potential environmental impact of the submarine pipeline will be mainly related to the release of sediments to the water column during dredging and filling works for the submarine pipeline, as well as potential release of any hitherto bound contaminants and their effect on the water sensitive receivers. The estimated maximum quantity of dredged material is approximately 450,000 cubic metres.

3.2.3 With respect to the operation of the submarine gas pipeline, no adverse operational water quality impact is envisaged.

3.3 WASTE MANAGEMENT

3.3.1 The main construction waste for the submarine pipeline will be the disposal of marine mud. Sediment testing and investigation for this Project is required to establish the nature, degree and quantity for appropriate handling and disposal. The quantity and classification of dredged mud will need to be assessed in detail during the EIA study.

3.3.2 Based on the sediment sampling and analysis for the Sediment Quality Report (SQR), the sediment quality will be characterized, and nature, level and extent of chemical and/or biological contamination established, to determine the appropriate disposal methods and locations such as disposal of contaminated sediments at East Sha Chau mud pits, or "clean" mud for open sea disposal to existing gazetted disposal grounds, which would be decided upon following a submission to the Marine Fill Committee, following WBTC No.34/2002 requirements.

3.3.3 With respect to the operation of the gas pipeline supply system, no waste generation is anticipated.

3.4 MARINE ECOLOGY/FISHERIES

3.4.1 Marine ecology is another key concern in this Project. Sha Chau and Lung Kwu Chau Marine Parks are identified within the North Western Water Control Zone and also there is a fish culture zone at Ma Wan. The area to be worked on is frequented by Chinese White Dolphins and crustaceans and the impact on these marine mammals must be carefully addressed. Field survey data are required and any possible impacts on the marine ecological and fishery resources will need to be assessed. Mitigation measures should be recommended if necessary.

3.5 AIR QUALITY IMPACT

3.5.1 For the land base construction, the dust generating activities that will occur at the project site are the construction works at the landing sites. The construction works are considered to be small in scale and short term. Therefore, it is expected that the construction dust impact would be acceptable to the nearby air sensitive receivers (ASRs) with the implementation of the dust control measures stipulated under *Air Pollution Control (Construction Dust) Regulation*.

3.5.2 The likely air quality impacts associated with the construction activities of the Project are gaseous emissions from the required marine vessels such as grab/trailer dredger, hopper barge or injection barge. However, the few number of vessel would have negligible impact on the background air quality

3.5.3 Emissions of pollutants are not expected from the normal operation of the proposed submarine pipeline and the offtake and pigging station. Therefore no adverse air quality impact is anticipated due to the operation of the Project.

3.6 NOISE IMPACT

3.6.1 For construction of the landing point at Tune Mun, the nearest noise sensitive receiver (NSR) is Melody Garden, which is about 90m from the landfall area. The construction activities will involve the use of Powered Mechanical Equipment (PME) during the daytime and evening periods. All construction works at the landing point will be carried out during the non-restricted hours (i.e. 7:00 a.m. to 7:00 p.m. on weekdays other than general holidays). Construction activities during the construction works at the landing point may cause noise impacts on the nearby NSRs. Noise mitigation measures will be recommended when exceedances of daytime construction noise guideline occur.

3.6.2 The potential construction noise impacts during the laying of the submarine pipeline would be related to the noise emitted from the barges and the marine pipeline vessels. The number of vessels will be kept to a minimum to ensure the least noise nuisance to the nearby NSRs. In addition, the noise generated from the marine vessels during the submarine pipeline installation will be minimal. Therefore, no unacceptable construction noise impacts upon the nearest NSR will result from the Project.

3.6.3 Noise impacts are not expected from the operation of the proposed submarine pipeline and the offtake and pigging station.

3.7 CULTURAL HERITAGE/MARINE ARCHAEOLOGICAL INVESTIGATION

3.7.1 The routing corridor of the submarine gas pipeline will run across the Urmston Road Channel. A Marine Archaeological Investigation (MAI) will need to be conducted to ascertain if any marine archaeological deposit would be affected by the pipeline alignment. The key objective of the MAI will be to identify and assess the significance of any underwater archaeological material within the Project area including the area to be dredged. In accordance with the Antiquities Monuments Office (AMO) guidelines, a desktop study will first be undertaken to establish if there are records of shipwrecks occurring within the Project area and its immediate vicinity. This will include Hong Kong archives, reports held by the AMO, and examination of old navigation charts. A MAI and a geophysical survey may be required and interpretation will be made of the archaeological profile of the Project area, defining sites of archaeological interest.

3.7.2 If anomalies were found on the sea bottom by the MAI, such findings will be reported to the AMO of the Leisure and Cultural Services Department (LCSD) for their further investigation. In any event, the submarine gas pipeline will not be placed on top or within 10m of any detected bottom anomaly. As such, no adverse impact on any possible underwater antiquity is expected.

3.8 LANDSCAPE AND VISUAL IMPACTS

3.8.1 Landscape and visual impact arising from the proposed Offtake and Pigging Station at Chek Lap Kok Island will be a concern of the Airport Authority (AA). The issue should be addressed and appropriate mitigation measures should be recommended in order to fulfill the requirements of AA.

3.8.2 Also, the coordination of the landfall areas at Tuen Mun and Tung Chung Area 52 with the proposed landscape area will be addressed. However, the construction works are considered to be small in scale and short term. Therefore, the visual impacts on the nearby visual sensitive receivers (VSRs) are short term and acceptable.

3.9 HAZARD TO LIFE

3.9.1 The potential risk associated with the operation of the submarine pipelines will be required to be quantified. Appropriate mitigation measures to reduce the predicted risks to the acceptable levels will be recommended once the acceptability of the estimated risks has been evaluated against criteria laid down in the *Technical Memorandum on Environmental Impact Assessment Process* (EIA-TM).

4 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

4.1.1 There are various major elements of the area surrounding the site.

Gazetted Bathing Beach – Butterfly Beach

4.1.2 The proposed landfall location at Tuen Mun is on the edge of the gazetted bathing beach, Butterfly Beach. The potential impact will relate to dredging, release of sediment to the water column and to aesthetics.

Marine Park – Sha Chau and Lung Kwu Chau Marine Park

4.1.3 Sha Chau and Lung Kwu Chau Marine Park is relative far away (over 6 km) from the gas pipeline corridor. It was designated in 1996 to protect the coastal habitat around these islands including for the Chinese White Dolphin.

Typhoon Shelter – Tuen Mun Typhoon Shelter

4.1.4 Tuen Mun Typhoon Shelter Area is situated in approximately 1.5 km away from the far east of the Butterfly Beach. Similarly released sediments may migrate towards the typhoon shelter causing visual impacts and possibly increase deposition rates.

Contaminated Mud Disposal Area

4.1.5 The East Sha Chau Contaminated Mud Disposal Area is situated about 1.2 km from the proposed pipeline alignment.

Seawater Intakes

4.1.6 The pipeline corridor falls within 1.5 km radius of the seawater intakes at CLK Airport. During dredging and pipeline installation, levels of suspended solids (SS) may vary and mathematical modeling will be required to ensure that the levels of SS are acceptable, or indeed if mitigation measures need to be implemented to allow the work to proceed.

5 ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATION

5.1 DESCRIBE MEASURES TO MINIMISE ENVIRONMENTAL IMPACTS

Water Quality

5.1.1 The principle mitigation measures is the adherence to good operational practice for the dredging of marine mud. An example would be the controlled loading of barges and hoppers to prevent any spillage of dredged material to the surrounding water. Additionally, dredging rates should be controlled to minimize sediment release to the water column. Silt curtains may need to be installed around the seawater intakes if unacceptable elevations in SS are predicted using the mathematical models.

5.1.2 For the land base construction, the guidelines for handling and disposal of construction site discharges as detailed in EPD's ProPECC Note PN1/94 "*Construction Site Drainage*" shall be followed.

5.1.3 Together with good operational practice, it is recommended that a water quality monitoring programme be established during the works to detect any deterioration in water quality.

Marine Ecology/Fisheries

5.1.4 Again, appropriate dredging methods should be selected to reduce the amount of sediment resuspension. Scheduling the dredging activities to avoid peak reproductive periods (generally occurring in Spring or Autumn) would also be beneficial.

5.1.5 An important mitigation measures would be the comprehensive detailing of the presence of dolphins and fish in the area, so that the Contractor(s) can take this into account when determining the construction methods.

Waste Management

5.1.6 The Contractor(s) would need to ensure that the dredging and disposal methods comply with the guidelines of Works Branch Technical Circular (WBTC) No. 34/2002 "*Management of Dredged/Excavated Sediment*".

5.1.7 As the volume of mud to be disposed of is less than 500,000 m^3, the application for marine disposal will be determined by the EPD, and this would need to include the definition of contamination, the location of the dredging and the proposed programme.

Construction Dust

5.1.8 Air pollution control clauses for construction contracts should be implemented and good site practices maintained for the full duration of the construction works. Minimizing the time period of the land section will also be a useful mitigation technique. The dust control measures required under the *Air Pollution Control (Construction Dust) Regulation* should be implemented during the laying of the land based gas pipeline.

Construction Noise

5.1.9 Noise nuisance from construction activities should be minimized through good site practice, electing quieter equipment, adopting quieter working methods and restricting the use of noisy equipment on site, if possible. Noise management measures are recommended to be implemented by the Contractor(s) during the installation of the gas pipeline.

Landscape and Visual Impacts

5.1.10 A 1 metre strip landscape clearance around the perimeter of the proposed offtake and pigging station will be reserved for planting to provide a visual screening to the station facility.

5.2 POSSIBLE SEVERITY, DISTRIBUTION AND DURATION OF ENVIRONMENTAL EFFECTS

5.2.1 Potential environmental impacts identified will mainly be associated with the construction period (approximately 17 months). As such the effects are considered to be temporary and short term. With the implementation of appropriate mitigation measures, no insurmountable impacts are expected.

5.3 COMMENT ON FURTHER IMPLICATIONS

History of Similar Projects

5.3.1 Towngas just completed an EIA process for a similar project of "*Proposed Submarine Gas Pipeline from Cheng Tou Jiao Liquefied Natural Gas Receiving Terminal, Shenzhen to Tai Po Gas Production Plant, Hong Kong*". The EIA Report was approved without conditions on 23 April 2003.

5.3.2 Hutchison Global Crossing Limited (HGC) submitted a Project Profile for application for permission to apply directly for an Environmental Permit for the Project "*Submarine Cable Landing Installation at Tuen Mun for HGC Optical Fibre Submarine Cable System between*

Tuen Mun and Chek Lap Kok" in April 2001. The submarine optical fibre cables were laid in 2002 parallel to and 50 m to the west of the proposed Towngas's submarine gas pipeline.

5.3.3 The Airport Authority completed an EIA process for a similar project of "*Permanent Aviation Fuel Facility for the Hong Kong International Airport*". The EIA report was approved on 2 August 2002.

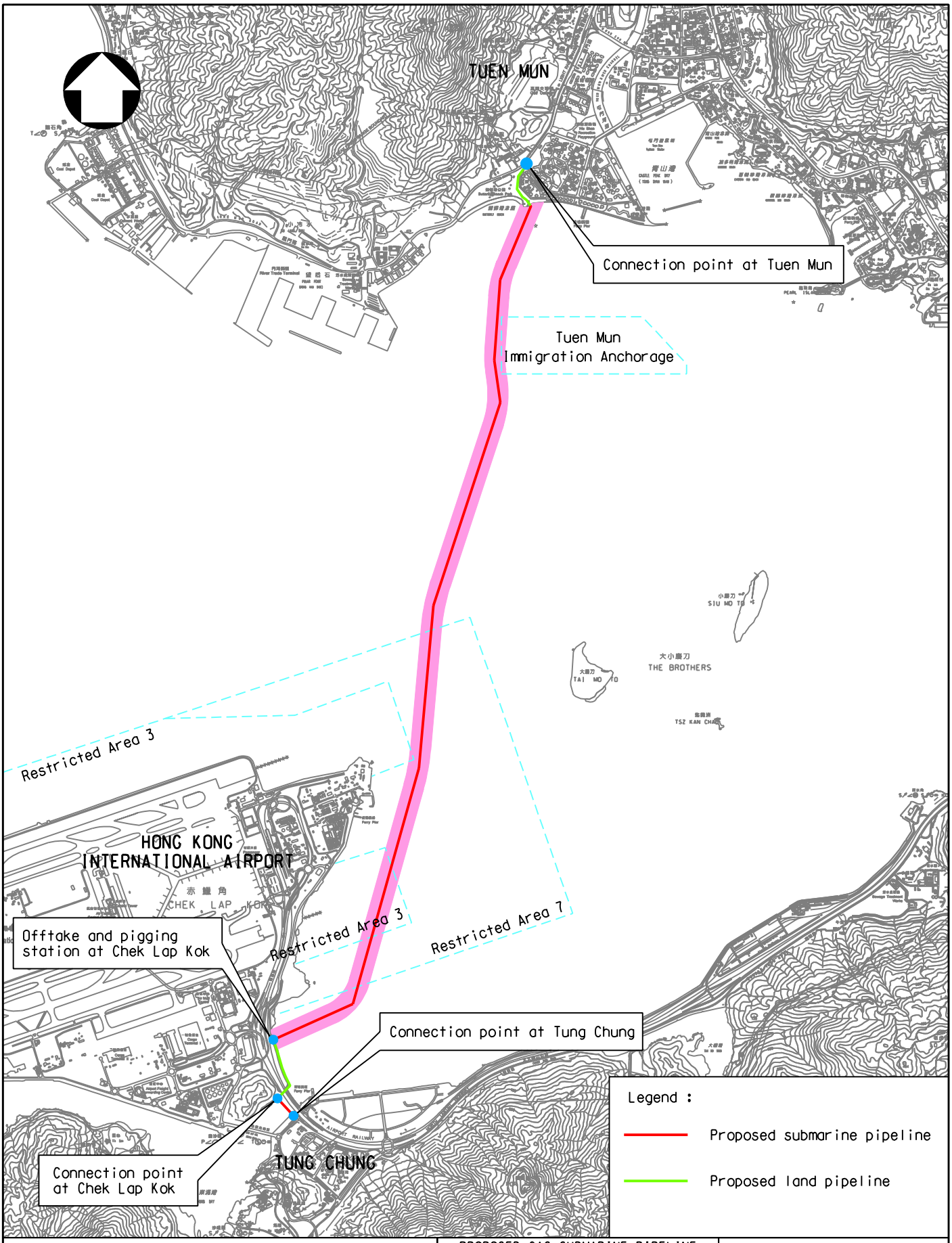
6 USE OF PREVIOUSLY APPROVED EIA REPORTS

6.1.1 No previous EIA Report has been approved or submitted for the subject Project.

7 PUBLIC CONSULTATION

7.1.1 During the Feasibility Study of the Project, the alignment options were circulated to all relevant Government Departments. Initial consultations with Government Departments indicated that there is no objection to the proposed project. The initial consultations did not unearth any unknown factors that would rule out the scheme.

Figure



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Title	PROPOSED GAS SUBMARINE PIPELINE SYSTEM FROM TUEN MUN TO TUNG CHUNG AND OFFTAKE AND PIGGING STATION AT CHEK LAP KOK	Figure no. 1.1
LOCATION PLAN	煤氣 Towngas	Prepared KKW / Checked LHL
	BLACK & VEATCH HONG KONG LIMITED 博威工程顧問有限公司	Date 09/03 / Scale 1 : 50000

Plot date : 11 SEP 2003 Time : 13:47:15 User : won80111