



**KCR**

## East Rail Extensions Tai Wai to Ma On Shan

**Project Profile**  
Oct 1998

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# 1 INTRODUCTION

## 1.1 BACKGROUND

The Tai Wai to Ma On Shan Rail Link (MOS Rail) and KCR Extension to Tsim Sha Tsui (TST Extension) together form one of the three priority projects under the Railway Development Strategy (RDS) in 1994. Following receipt of Kowloon-Canton Railway Corporation (KCRC)'s proposal to implement them as a package, Government has asked KCRC to proceed with detailed planning and design of the two projects.

In drawing up its proposal, KCRC has undertaken the Preliminary Environmental Review (PER) for both rail lines, the findings of which have been issued as three separate volumes:

- *Tsim Sha Tsui Extension - Preliminary Environmental Review;*
- *Tai Wai to Ma On Shan - Preliminary Environmental Review: Volume 1 - Main Report; and*
- *Tai Wai to Ma On Shan - Preliminary Environmental Review: Volume 2 - Technical Annexes.*

This document is a formal Project Profile as defined by Part II of the *ELA Ordinance* and relates to the proposed East Rail Extension between Tai Wai and Ma On Shan. A separate application and associated Project Profile has been submitted for the Tsim Sha Tsui Extension.

## 1.2 TAI WAI TO MA ON SHAN RAIL

The MOS Rail provides a direct rail link to Ma On Shan to meet the transport and development needs of the concerned areas as well as facilitates further development of the Northeast New Territories region. It will provide an improvement in the level of service to local residents and an alternative to bus and private vehicle travel through the congested road tunnel links to Kowloon as well as for internal travel in Shatin.

## 1.3 STRUCTURE OF THE PROJECT PROFILE

The structure of this document conforms to the checklist requirements in Annex 1 to the *Technical Memorandum on ELA Process*.

The remainder of the Project Profile is arranged as follows:

- *Section 2* presents basic information pertaining to the project, including the purpose and nature, location and scale, the history of the site and project proponent contact details;
- *Section 3* outlines programme planning and implementation details;
- *Section 4* outlines the construction processes involved and associated potential environmental impacts, as well as potential operational impacts;
- *Section 5* presents a list of sensitive receivers and other key details of the surrounding environment;

- *Section 6* outlines the mitigation measures to be employed and further impact details; and
- *Section 7* lists the use of previously approved EIA Reports referenced for this project.

## 2 *BASIC INFORMATION*

### 2.1 *PROJECT TITLE*

Tai Wai to Ma On Shan Rail.

### 2.2 *PURPOSE AND NATURE OF THE PROJECT*

To expand the KCRC rail network in order to meet projected population growth and rail ridership demands.

### 2.3 *NAME OF PROJECT PROPONENT*

The Kowloon-Canton Railway Corporation.

### 2.4 *LOCATION AND SCALE OF PROJECT*

The proposed MOS Line project will involve the construction of a railway depot, nine stations and approximately 11.4 km of railway track (see *Figures 2.4a - c*). Major works areas and proposed rectifier stations are also marked on these *Figures*. The MOS Line alignment runs from Tai Wai in the west, where it will interchange with the existing KCR East Rail Station, to Lee On in the east. The alignment will be on viaduct through the predominantly urban areas of Sha Tin and Ma On Shan, with a section at ground level where it runs along the central reservation of the Tate's Cairn Highway.

#### *Alignment and Stations*

The section from the depot (located between Tai Wai and Hin Keng) to Tai Wai Station runs at grade, parallel to the existing KCR East Rail lines which are elevated on an embankment. As it approaches Tai Wai station the MOS Line alignment will rise to the same height as East Rail to facilitate passenger transfer between the two services. The depot, is planned for the area to the south of Tai Wai Station, currently occupied by the Hong Kong School of Motoring and cycling area. The site is bounded on its southern side by Che Kung Miu Road, on its eastern side by Mei Tin Road, on its northern side by the KCR alignment and on its western side by Hin Tin Playground that is located opposite Hin Keng Estate.

To the east of Tai Wai Station, the alignment will emerge on a viaduct structure, passing over the area currently occupied by the Happy Dragon Recreation Park. The viaduct will continue along the south side of the Shing Mun River channel to an elevated station on the site of the Temporary Housing Area at Sha Tin Tau, which has now been transformed into a temporary car park area.

The alignment between Sha Tin Tau Station and Sha Kok Street Station runs on viaduct eastwards, over Che Kung Miu Road and Lion Rock Tunnel Road. The alignment then passes over the Tsang Tai Uk Recreation Ground before running parallel to, and immediately to the south of, Sha Kok Street on its way to Sha Kok Street Station.

From Sha Kok Street, the alignment passes over Shui Chuen Au Street towards Sha Tin Wai Road. The alignment heads north-east over a vegetated mound rising further as it passes Wong UK Village, to clear the China Light and Power Substation before crossing Shatin Road to the north and west of the Prince of Wales Hospital. Thereafter, the alignment passes over a bus terminus and a small open space located between the bus-terminus and Ngan Shing Street. City One Station is located on an embankment at the junction of Ngan Shing Street and Chap Wai Kong Street. The site is located in a long linear reserve set aside for the MOS Line development immediately to the west and parallel to Chap Wai Kong Street. It is bounded to the north and west by schools and residential developments (Yue Tin Court and City One) and to the south and east by industrial buildings.

The alignment next passes across an open space and over a nullah before entering an industrial area that is set in a triangle of land located between the nullah, Tate's Cairn Highway and Tai Chung Kiu Road. The alignment then passes parallel to, and immediately to the north-west of, On Ming Street before reaching the site of the proposed Shek Mun Station which is located at the junction of On Ming Street and On Lai Street.

The alignment next swings north over the eastbound lane of the Tate's Cairn Highway, descending to grade in the reserve, approximately 12 m wide, set aside for the MOS Line along the centre of the highway from this point until the track alignment reaches Chevalier Garden Station, also within the central reserve.

After Chevalier Garden, the viaduct continues north, rising to cross out of the highway reserve and into the central reservation of Sai Sha Road from where it continues, north east to Heng On Station, again within the central reserve of Sai Sha Road.

The alignment continues on viaduct, turning east as it approaches the Ma On Shan Town Centre and Ma On Shan Station. The site for Ma On Shan Station is located within a central reserve that was set aside for the MOS Line project within the Sai Sha Road corridor. Thereafter, the track alignment continues along the reserve in an easterly direction towards Lee On Station.

Heading east after crossing over On Chiu Street, the alignment passes on viaduct along the central reserve of Sai Sha Road, through an area of residential properties (Villa Athena to the north and Saddle Ridge Gardens together with the Ma On Shan Health Centre to the south). The track alignment then continues on viaduct over the junction with Kam Ying Road and along the central reserve as it passes to the north of Lee On Estate and south of Wu Kwai Sha New Village. The alignment passes over the Lee On Estate access road, into Lee On Station.

## 2.5

### *HISTORY OF SITE*

A review of historical maps and selected historical aerial photos indicates that the majority of the proposed alignment, stations and depot is to be developed on land which has primarily been heavily developed for residential/ commercial use (ie. from Hin Keng Estate to the Tolo Highway Interchange in Sha Tin), or recently reclaimed land developed for residential uses (ie. from Chevalier Garden to Lee On Estate along the southern Tide Cove shoreline). The rail line is to be constructed on a rail reserve indicated on the relevant OZP's.

**2.6** *NUMBER AND TYPES OF DESIGNATED PROJECTS*

The alignment, stations and depot and ancillary structures are all one designated project categorised as Category A2 under Schedule 2 of the Environmental Impact Assessment Ordinance.

**2.7** *NAME(S) AND TELEPHONE NUMBER(S) OF CONTACT PERSON(S)*

### 3 *PLANNING AND IMPLEMENTATION PROGRAMME*

#### 3.1 *PLANNING AND IMPLEMENTATION*

The whole project will be planned and implemented by KCRC's in-house divisions together with external consultants. Construction will be carried out by contractors.

#### 3.2 *PROJECT PROGRAMME*

The current projected programme identifies detailed design being undertaken by Consultants during 1999 with completion in 2000. Construction work will commence in 2000 with completion targeted for 2004. Trial operation will commence immediately following completion of construction with the commencement of the commercial train service following the trial operation period.

#### 3.3 *INTERACTIONS*

Public transport interchanges are proposed at Tai Wai, Sha Tin Tau, Shek Mun, Heng On and Lee On Stations.



**4.1 OUTLINE OF PROCESSES INVOLVED***Batching Plant*

There will be two batching plants in operation at Shek Mun and Lee On Stations in order to supply the concrete required for the construction of the railway.

*Viaduct Construction*

The majority of the alignment will be raised on viaduct in order that there be as little conflict as possible with existing roadways, developments and services. The viaduct has been designed as a segmental precast concrete structure supported by reinforced concrete pier and foundations formed by bored piling. Construction processes will include:

- bored piling;
- pile cap construction;
- formworking;
- superstructure works; and
- concreting.

*Station, Depot and Ancillary Building Construction*

Construction of the stations, depot and ancillary structures will involve a variety of standard construction processes, including:

- excavation;
- bored piling;
- pile cap construction;
- formworking;
- steelworking; and
- concreting.

**4.2 POTENTIAL ENVIRONMENTAL IMPACTS****4.2.1 Construction Phase***Air Quality*

The principal source of potential air quality impacts will result from fugitive dust emissions during site preparation activities, earthworks and station and depot construction. Impacts due to exhaust emissions from trucks and powered mechanical equipment will be minimal. The activities most likely to generate dust are predicted to be demolition and site clearance, excavation, materials handling and transport, and vehicular movement within work sites. The extent of impacts will depend on the distance between work sites and sensitive receivers, the activity being undertaken and the number of mechanical plant and vehicles employed on site.

*Noise*

It has been predicted that the unmitigated construction noise impacts associated with the MOS Line will be high at numerous of the nearby NSRs along the alignment. Particularly noisy activities will include site preparation and clearance, excavation, piling, station and depot construction, site traffic movements and viaduct erection.

### *Water Quality*

Unmitigated construction site runoff from excavation activities may be a potential problem. The extent of water quality impacts associated with the works will depend upon the construction method chosen, the type of land-use that the alignment passes through and the distance from sensitive receivers. Under the *Water Pollution Control Ordinance* however, all sites will be required to obtain a discharge licence and in meeting the discharge requirements, the contractor will prevent adverse impacts to receiving water bodies. Sewage effluent arising from the construction workforce has the potential to cause adverse impacts and therefore should be dealt with in an appropriate manner.

### *Waste Management*

Construction activities will result in the generation of a variety of waste types including:

- excavated inert material (approximately 500,000 m<sup>3</sup>);
- construction and demolition waste (approximately 13,000 m<sup>3</sup>);
- chemical waste (a few litres per month); and
- general refuse (5 - 10 m<sup>3</sup>/day).

### *Ecology*

Potential ecological impacts could arise from land clearance, and construction activities in the vicinity of the *fung shui* woodland (0.5 ha) immediately southwest of Wong Uk Village. However, since the woodland area affected is only small and the periphery of the woodland has already been managed as part of a public garden for aesthetic use, the ecological impact is expected to be low. There may be indirect disturbance from the construction works on the woodland habitat, from uncontrolled dust and noise impacts.

### *Landscape and Visual*

The proposed development will generate high impacts on the physical landscape due to the loss of amenity trees, particularly mature specimens. The proposed above-grade stations, adjacent sections of viaduct and any proposed noise barriers and enclosures will generate high visual impacts on surrounding areas and their populations. Not only will these structures impinge on existing views but development of these stations and viaducts will dramatically change the landscape of the areas in which they are located. Implementation of the proposed landscape and visual impact mitigation measures will reduce predicted impacts to a minimum.

### *Historic and Cultural Resources*

The area adjacent to the small knoll to the east of Sha Tin Wat Road is considered to have low-medium archaeological potential and the impacts associated with the construction of pier supports are, subject to the findings of the EIA process, likely to require archaeological evaluation prior to construction.

The length of alignment between Ma On Shan Station and Lee On is considered to have low-medium archaeological potential and further evaluation of the extent of prior disturbance is recommended during the EIA process with a view to identifying specific areas that may warrant field evaluation.

Other historic or cultural features identified as being in the vicinity of the alignment will not be subject to significant direct or indirect impacts.

#### *Land Contamination*

There has been very little industrial usage of land along the alignment and hence, overall contamination concerns are considered to be limited. The main areas of potential concern relate to the presence of two longstanding petrol service stations near the intersection of Kong Pui Street and Yuen Chau Kok Road to the west of the proposed City One Station, and one recently built petrol station located on Lok Shing Street immediately west of the Nullah between City One Station and the Shek Mun Station. All three petrol stations lie outside the boundary of the scheme and therefore contamination concerns would only arise if any leakages or spillages have migrated through to areas where works might interphase with the soil.

#### *Hazard Assessment*

There is an LPG storage facility at Carado Garden in Tai Wai, four petrol filling stations in Sha Tin and Towngas pipelines from Tai Po Gas Production Plant delivering high pressure gas to Ma On Shan, which could pose a low level hazard risk during the construction of the railway.

#### *Night-Time Operations*

Construction activities are not proposed during night-time hours, however, if they were to be implemented, the Contractor would need to apply to the EPD for a noise control permit and abide by the stricter night-time criteria set out in the *Noise Control Ordinance*.

#### *Traffic Generation*

The main generation of extra traffic loading will arise from vehicles removing excavated spoil.

### **4.2.2**

#### ***Operational Phase***

##### *Air Quality*

As the rolling stock to be utilised on the MOS Line will be electrically powered, no air quality impacts during the normal operation of the railway have been identified. Impacts will be limited to the station ventilation systems and the air quality inside the bus termini within related development structures, however, these impacts are expected to be minimal.

### *Noise*

During the operational phase, airborne train rolling noise, noise emissions from rolling stock air-conditioning systems and structurally radiated noise from viaducts could lead to adverse noise impacts on nearby NSRs. The extent of impacts will depend on the speed of the trains, the choice of trackform components, structural design of the viaducts, and the distance to the surrounding sensitive uses. Impacts will be most severe during restricted hours (2300 to 0700) when noise criteria are strictest.

There may also be some impacts from station air conditioning plant, traction substations and the Depot. Again impacts will be most severe during restricted hours.

### *Water Quality*

Potential water quality impacts during the operational phase may arise from:

- cooling water discharge;
- runoff from rail tracks ;
- station runoff;
- wastewater from train cleaning, and heavy cleansing and maintenance facilities;
- operational drainage; and
- sewage generation at the Depot, stations and related developments.

### *Waste Management*

Waste arising during the operational phase will typically consist of general refuse, industrial waste and chemical waste, although some construction wastes may arise from renovation or modification works. General refuse will be generated by the public and commercial retailers and by the MOS offices, canteens and staff within each of the new stations. Industrial waste will be generated from the maintenance activities in the depot and the maintenance and upkeep of the building services of the new stations. Chemical waste is likely generated from maintenance of all aspects of the MOS Line.

### *Ecology*

Operational impacts on ecological resources will be minimal, given the existing developed nature of the surrounding area.

### *Landscape and Visual*

Landscape and visual impacts will result from all of the railway alignment, stations and depot and ancillary facilities.

### *Historic and Cultural Resources*

The historic and cultural features identified as being in the vicinity of the alignment will not be subject to significant direct or indirect impacts during the operation of the new railway.

### *Land Contamination*

No land contamination impacts are expected during the operation of the railway.

### *Hazard Assessment*

There is an LPG storage facility at Carado Garden in Tai Wai, four petrol filling stations in Sha Tin and Towngas pipelines from Tai Po Gas Production Plant delivering high pressure gas to Ma On Shan, which could pose a hazard risk during the operation of the railway. From a preliminary qualitative risk assessment of these facilities the hazard risk is not considered to be significant.

## 4.3

### *Advanced Works*

To facilitate construction of the rail project in 2000 it is proposed that advanced works in the form of substantial utilities re-provisioning will be required at numerous locations prior to the rail project construction commencement date.

#### *Depot Site*

The sewer which runs through the current sports ground and playground areas at the site of the proposed depot will need to be relayed in a straight line down Che Kung Miu Road.

The pipe culvert from Chik Wan Street across to Che Kung Miu Road will need diversion down Chik Wan Street and Mei Tin Road before entering the multi cell box culvert in Che Kung Miu Road to avoid conflict with the Depot foundations.

#### *Viaduct from Tai Wai to Sha Tin Tau*

The numerous utilities under the footpath/bicycle track between Shing Mun River and Che Kung Miu Road will need to be relocated to the carriageway to facilitate foundation works for viaduct piers.

#### *Sports Facilities at Tsang Tai Uk Recreation Ground and Sha Kok Street*

It is proposed that part of the sports facilities at these locations be temporarily closed or relocated to provide the Contractor a clear site.

#### *Lowering Tate's Cairn Highway*

South of the Shek Mun interchange, Tate's Cairn Highway will need lowering by 2 m in order to accommodate the long span viaduct. Alternative options to this are being investigated.

#### *Relocating Utilities to Facilitate Viaduct Foundations*

There are a number of locations along the alignment where viaduct foundations will conflict with existing utilities and drains, which will need relocation. These include:

- the intersection of Che Kung Miu and Lion Rock Tunnel Roads;
- the footpath on the south side of Sha Kok Street;
- the footpaths on either side Sha Tin Wai Road;

- the medians at the Ma On Shan / Sai Sha Road Interchange;
- Sai Sha median adjacent to the Lee On Estate;
- the reserve between Shing Mun River and Che Kung Miu Road; and
- Tate's Cairn Highway median strip.

## 5.1 EXISTING AND PLANNED SENSITIVE RECEIVERS

*(See Figures 5.1a - 5.1r - Air & noise Sensitive Receivers during Construction Phase and Figures 5.1a1 - 5.1r1 - Operational Noise Sensitive Receivers)*

*Air Quality*

A large number of potential Air Sensitive Receivers (ASR) have been identified along the alignment under the *Technical Memorandum on Environmental Impact Assessment* (TMEIA). Representative ASRs where most severe impacts are predicted include:

*Tai Wai to Sha Tin Tau*

- Hin Tin Swimming Pool.

*Sha Tin Tau to Sha Kok Street*

- Lei Uk Tsuen nos. 12-15; and
- Tsang Tai Uk Recreation Ground.

*Sha Kok Street to City One Shatin*

- Pok Tai House;
- Sha Kok Estate food stalls;
- Sha Tin Wai Playground; and
- Pamela Youde Child Assessment Centre/School Dental Clinic.

*City One Shatin to Shek Mun*

- Yue Sui House;
- Yue Kwan House;
- Yow Kam Yuen Prevocational School; and
- Yuen Chau Kok THA (Cleared).

*Chevalier Garden to Heng On*

- Residential Development in the south of Area 77;
- G/IC site to the south of Vista Paradise;
- Po On House; and
- Chinese YMCA College.

*Heng On to Ma On Shan*

- Sun Shine City Block M;
- Bayshore Towers Shopping Centre;
- Bay Shore Towers Block 2;
- Ma On Shan Centre Block 1;
- Sun Shine City Block E; and

- Fu Fai Garden Block 1.

*Ma On Shan to Lee On*

- Lee On Estate - Lee Wing House;
- Lok Wo Sha nos. 29-30; and
- Symphony Bay.

*Noise*

A large number of potential Noise Sensitive Receivers (NSR) have been identified along the alignment under the TMEIA. Representative NSRs where most severe impacts are predicted include:

*Hin Keng to Tai Wai*

- No. 29 Keng Hau Road; and
- Hin Yau House.

*Sha Tin Tau to Sha Kok Street*

- Sha Tin Tau no. 3;
- Pok Man House; and
- Tin Ka Ping Salvation Army Primary School.

*Sha Kok Street to City One Shatin*

- Ashley Garden;
- Iris Garden;
- Wong Uk Village nos. 17-18; and
- Pamela Youde Child Assessment Centre/School Dental Clinic.

*City One Shatin to Shek Mun*

- Yow Kam Yuen Prevocational School; and
- Lam Kau Mow Secondary School.

*Chevalier Garden to Heng On*

- Chinese YMCA college; and
- Toi Shan Association Wong Tat To Memorial School.

*Heng On to Ma On Shan*

- Sun Shine City Blocks E and M;
- Ma On Shan Centre Block 1;

*Ma On Shan to Lee On*

- Villa Athena Block 5;
- Skill Opportunity School in Ma On Shan Area 103;
- Kam Lung Court - Lung Sing House;
- Wu Kwai Sha New Village nos. 1-12; and
- Lee On Estate - Lee Wing House.



### *Water Quality*

Potential Water Sensitive Receivers (WSR) have been identified under the TMEIA. Nearby WSRs include Tolo Harbour, the Shing Mun River and several nullahs in Shatin.

### *Ecology*

The only potential ecological sensitive receiver identified is a *Fung shui* woodland near Wong Uk in Shatin.

### *Landscape and Visual Resources*

Due to the elevated nature of the majority of the alignment there will be visually sensitive receivers along the entire length of the alignment. However, the many high rise residential and commercial blocks close to the alignment will restrict the middle and long distance views of the route to within the urban areas.

### *Historic and Cultural Resource*

Historic and Cultural resources in the vicinity of the alignment include:

- Che Kung Temple, located to the south of the MOS alignment on the southern side of Che Kung Miu Road. The temple is a Grade 2 listed building (AMO Ref: 860371).
- The wooded mound between Sha Tin Tau & Sha Kok Street Stations is thought to be of *fung shui* significance. The High Rock Christian Camp at 102 Sha Tin Tau Village is located on the top of the mound; the Camp dates from 1924 and is a Grade 3 listed building (AMO Ref: 930525).
- The small knoll to the east of Sha Tin Wat Road is thought to be of *fung shui* significance.
- The historic walled village of Tsang Tai Uk (Shan Ha Wai) is located some 100 metres to the south of the alignment. Originally called "Shan Ha Wai", the village dates from 1850 and is considered among the best preserved of the New Territories' walled villages. It was built by the Tsang clan as a single-clan village and reputedly owes its change of name (to Tsang's Big House) due to its hospitality to post-Second World War refugees. It is unlikely that there will be any impacts to these premises.
- The historic Tsz Tong building or Ancestral Hall is located within Wong Uk Village and is a Grade 2 listed building located some 500 metres to the north-west of the alignment. It is very unlikely that there will be any impacts to this premises.

## **5.2**

### ***OTHER KEY FACTORS IN THE SURROUNDING ENVIRONMENT***

The major source of pollution in the vicinity of the alignment comes from the numerous road networks between Tai Wai and Ma On Shan. The alignment also passes near two industrial areas, namely, Shatin Industrial Centre and Shek Mun Industrial Area.

The majority of the proposed alignment, depot and stations is to be developed on land which has primarily been heavily developed for residential/ commercial use (ie. from Hin Keng Estate to the Tolo Highway Interchange in Sha Tin), or recently reclaimed land developed for residential uses (ie. from Chevalier Garden to Lee On Estate along the southern Tide Cove shoreline).

Hazardous installations in the vicinity of the alignment include:

- two LPG storage facilities at Carado Garden and Holford Garden in Tai Wai;
- four petrol filling stations in Sha Tin; at 231 and 232 Kong Pui Street, Lok Shing Street and On Ping Street; and
- Towngas pipelines alongside Tate's Cairn highway and Sai Sha Road.

Shatin Sewage Treatment Works is situated on the other side of the Shing Mun River Channel just before the alignment reaches Chevalier Garden.

## 6 ENVIRONMENTAL PROTECTION MEASURES AND FURTHER ENVIRONMENTAL IMPLICATIONS

### 6.1 POTENTIAL MEASURES WHICH MAY BE INCORPORATED TO MINIMISE ENVIRONMENTAL IMPACTS

The *Tai Wai to Ma On Shan Preliminary Environmental Review* has proposed various mitigation measures which aim to minimise environmental impacts ; these are outlined in *Sections 6.1.1 and 6.1.2* below. It should be noted however, that these mitigation measures may be further refined during the later stages of the EIA process.

#### 6.1.1 Construction Phase

##### *Air Quality*

Standard dust suppression measures, as set out in the *Air Pollution Control (Construction Dust) Regulations*, should be adopted as standard procedures. These include:

- on site vehicle speed restrictions and vehicle washing before leaving the site;
- careful handling and the containment or damping of dusty materials; and
- frequent watering or covering of exposed areas of ground and prompt site restoration.

These measures should be used as general good practice on all construction sites to ensure that potential dust emissions are controlled and impacts upon sensitive receivers minimised.

##### *Noise*

A package of mitigation measures has been designed to control construction noise impacts. Whilst not sufficient to fully resolve the predicted noise impacts, general good site practices will help to control noise impacts. These include:

- care in the placement and orientation of noisy plant away from sensitive receivers;
- the use and correct fitting of silencers, mufflers and acoustic shields; and
- regular maintenance of plant and equipment.

A series of further mitigation measures have been identified, including the use of quiet plant, noise barriers and reducing the number of plant in use at one time which should be sufficient to control day-time noise impacts to within the established limit at most NSRs.

At the NSRs where residual noise exceedances remain, impacts can be brought to within acceptable levels through refinement of the construction programme, use of noise enclosures and further restrictions on plant numbers and on-time.

### *Water Quality*

To meet the discharge requirements, mitigation measures should include:

- appropriate drainage facilities to control site runoff;
- proper site management to prevent debris and harmful materials from reaching drainage facilities of water bodies; and
- the provision of adequate toilet facilities and proper disposal of sewage by a recognised waste disposal company.

### *Waste Management*

In order to control waste issues mitigation measures will include:

- general good housekeeping practices;
- sorting and segregation of wastes for reuse and disposal;
- observing the requirements of the disposal permits; and
- meeting the requirements of the *Waste Disposal Ordinance*.

### *Ecology*

The few ornamental trees and shrubs in the vicinity of the alignment and the *fung shui* woodland at Wong Uk should be protected by:

- restricting construction works to within the identified site boundaries, with regular checking to ensure that no damage is being caused to the surrounding areas; and
- the maintenance of good housekeeping and dust control measures to protect trees and shrubs adjacent to work sites; and

### *Landscape and Visual Impacts*

Reinstatement of visually amenable features and revegetation shall commence upon completion of the construction works.

In addition, boundary fences shall be erected around construction sites before the commencement of works to reduce the potential visual impacts of the proposed works and to prevent tipping, vehicle movements and egress of personnel off site, and all work sites, particularly those where vegetation has been removed, shall be reinstated to a standard as good as, or better than the original state, at the earliest opportunity.

### *Historic and Cultural Resources*

It is recommended that further investigations be conducted at a later stage of the EIA process in order to evaluate the potential of any buried archaeological resources along the alignment.

### *Land Contamination*

Potential exposure to contaminated materials can be limited by minimising construction workers' direct contact with soils, wearing of protective clothing, providing adequate hygiene and washing facilities and preventing smoking and eating during soil interface activities.

Only licensed waste hauliers should be used to collect and transport contaminated materials for disposal and vehicles should be suitably covered to limit dust emissions or contaminated wastewater run-off, and truck bodies and tailgates sealed to prevent any discharge during transport or during wet conditions.

#### *Hazardous Installations*

The Towngas pipelines should be protected.

#### *Environmental Monitoring and Audit*

An Environmental Monitoring and Audit (EM&A) programme has been identified for Environmental issues. This will help identify any problematic issues as they arise and speed their resolution.

### 6.1.2 *Operational Phase*

#### *Air Quality*

No specific mitigation measures will be required

#### *Noise*

Based on the package of mitigation measures developed for West Rail, application of the Multi-plenum System to the MOS Line will ensure there will be no exceedances of the noise criteria. Noise enclosures over various crossover points along the alignment may be required, subject to the findings of the full EIA results and detail design.

#### *Water Quality*

Silt traps and oil interceptors are recommended for the station to treat potentially contaminated runoff and as any operational discharges will be required to comply with the *Water Pollution Control Ordinance*, no adverse impacts will occur.

#### *Waste Management*

Implementation of good housekeeping practices and the observation of the requirements of the Waste Disposal Ordinance will prevent the adverse impacts of the expected chemical and industrial wastes.

#### *Ecology*

No ecological impacts are anticipated during the operation of the railway, therefore no mitigation will be required.

#### *Landscape and Visual Impacts*

The proposed above-grade stations, railway viaducts and noise control structures will generate major visual impacts on surrounding areas and their populations. Not only will these structures affect existing views, but also development of the stations and viaducts will alter the landscape of surrounding areas.

The external appearance of all above-ground structures should be carefully detailed in

terms of form, colour and finish so that they are visually integrated, as much as possible, into the surrounding landscape. Stations, viaduct and noise mitigation measures will be the most visually dominant elements, in particular the form and surface detailing, therefore it is recommended that:

- the width and bulk of viaduct sides and the supporting columns should be minimised as far as possible
- the impact of noise barriers and enclosures should be reduced through the use of clear or translucent upper sections wherever practicable; and
- the visual appearance of the railway structures should be softened through screen planting wherever possible.

#### *Historic and Cultural Resources*

No historic and cultural impacts are expected during the operation of the railway; therefore no mitigation measures will be required.

#### *Land Contamination*

No land contamination impacts are expected during the operation of the railway; therefore no mitigation measures will be required.

#### *Hazardous Installations*

There are four petrol filling stations close to the alignment in Sha Tin; at 231 and 232 Kong Pui Street, Lok Shing Street and On Ping Street. Neither of the stations on Lok Shing Street and On Ping Street are considered to present a significant hazard as they are located more than 35 metres from the alignment. Whilst this does not necessitate realignment of the railway, mitigation measures may need to be considered for both the railway and the petrol stations. This will be determined by undertaking a more detailed risk assessment in accordance with Fire Services Department Requirements.

## 6.2

### *POTENTIAL SEVERITY, DISTRIBUTION AND DURATION OF KEY ENVIRONMENTAL IMPACTS*

Air, noise, water quality, waste and visual impacts will be an issue for the duration of construction (early 2000 to mid 2004). Their severity and distribution is outlined in *Sections 4 and 5*.

Air quality impacts will be most severe during earthworks and excavation activities. Noise impacts will be most severe during excavation, piling and concreting.

Information concerning the impact of cumulative effects in the area of the alignment is currently limited due to the lack of definitive timetabling of other developments, to that end this study cannot take it into consideration.

***FURTHER IMPLICATIONS***

Public interest is likely to be moderate as the alignment will pass through sections of dense residential and commercial districts, and will be highly visible as it is mostly on viaduct. The rail line however is for the benefit of the public; creating jobs, promoting businesses and creating new services for otherwise neglected areas.

**USE OF PREVIOUSLY APPROVED EIA REPORTS**

The *Railway Development Study Phase II (Part 1) Feasibility Study for Tai Wai to Ma On Shan and KCR Extension to Tsim Sha Tsui*, Maunsell et al, December 1997 has been endorsed without conditions by the Advisory Council on the Environment (ACE). This Report presents the findings of the initial assessment conducted for the MOS Line.

The *West Rail EIA Final Assessment Report - West Kowloon to Tuen Mun Centre*, ERM et al, February 1998 has been endorsed with conditions by the ACE and has been used with reference to the performance of the Multi-plenum noise attenuation system.