

7.7 Longer Term Schemes

- 7.7.1 A number of potential rail development options have been classified as Longer Term Schemes because their implementation is dependent on longer term developments and planning decisions, or because they will provide longer term relief for sections of the future railway network. Due to their longer term nature, the schemes have, at this stage, only be identified as possible corridors for further network expansion. Therefore, it was not the intention to undertake strategic environmental assessments for these schemes. However, in the case of the South Island Line and the Shenzhen By-pass, some possible alignments have been identified. As these schemes were considered in greater depth than the other Longer Term Schemes, and because indicative preliminary alignments were developed, strategic environmental assessments (commensurate with those discussed above) were undertaken during Stage 3 to advise the Study members of the key potential environmental impacts related to these schemes.
- 7.7.2 This section presents the finding of the strategic environmental assessments that were undertaken in relation to these two schemes. However, it should be borne in mind that neither these nor any of the other longer term schemes are expected to be developed before 2016. Therefore, further alignment and environmental studies will need to be undertaken nearer to the time of their implementation.

South Hong Kong Island Line

Description and Assumed Construction Methodology

- 7.7.3 Two options were proposed for this scheme; either, Option 1, from Admiralty (ADM) to Ap Lei Chau South (ALS), or Option 2, from Sheung Wan (SHW) to ALS. Both schemes would run via Wah Fu (WAF) and Ap Lei Chau West (ALW). The option from SHW could have an interchange at Central West (CEW).
- 7.7.4 It was envisaged that both options would comprise bored tunnel to WAF. However, there were considered to be two possibilities for crossing to onto Ap Lei Chau; either by constructing an Immersed Tube Tunnel (IMT) or a bridge. If the IMT alternative were chosen, it was considered likely that, south of WAF, there would be a short section of rock tunnel prior to the IMT, and then cut and cover construction on Ap Lei Chau through to ALS. Alternatively, if the bridge option is chosen, it was envisaged that, following the short section of rock tunnel south of WAF, a long span viaduct would be constructed to Ap Lei Chau, and then the alignment would continue on viaduct through to ALS.
- 7.7.5 The options for the SIL that have been presented above assumed that there would be reclamation undertaken along the southern coastline of Ap Lei Chau. This reclamation was assumed to be implemented as part of the development of Ap Lei Chau rather than specifically as part of the rail development. If the extent of the reclamation was reduced from that which was envisaged it would be possible to change the alignment such that it served a station at Ap Lei Chau (ALC). For both the 'reclamation' and 'without reclamation' options, a depot was envisaged on Ap Lei Chau.

Key Potential Environmental Impacts

Section North of WAF

- 7.7.6 For both the options, the preliminary design information indicates that this section would be constructed by bored tunnelling. The potential impacts and further work associated with the bored tunnelling would be as described for other bored tunnel sections.

Section from WAF to ALS

- 7.7.7 The adoption of the IMT alternative would result in the following potential impacts:
- The construction phase would have the potential to give rise to water quality impacts, due to the excavation of a trench and the subsequent installation of the IMT. However, it was envisaged that the construction of the IMT could be undertaken without giving rise to any insurmountable impacts. Nevertheless, it was considered that this aspect of the scheme would require further detailed assessment during the later stages of development.
 - The preliminary alignment was assumed to pass within the Consultation Zones of the Gas Holder at Shek Pai Wan and the LPG Transit Depot/Bulk Domestic Supply at Ap Lei Chau (PHI). The Consultation Zones of these PHI's are 150 m and 500 m respectively. The assumed alignment was found to have 300 m and 1,400 m of track and one station (ALW) within the respective Consultation Zones. Both sections of track and the station would be underground within the Consultation Zones. At a strategic level, this was considered to provide an effective form of mitigation, and the potential hazard implications were not envisaged to prevent the further development of this alignment. However, a hazard assessment will be required to accurately evaluate the potential hazard implications from both the construction and operation of the railway. If necessary, appropriate mitigation measures may need to be developed and implemented. With the adoption of such mitigation measures, no insurmountable impacts are anticipated.
 - Operationally, impacts from the underground railway were predicted to be negligible, as only the station entrances and the railway ventilation systems will be above ground. Impacts will, therefore, be limited to possible noise, air quality and potential cooling water impacts from the ventilation system.

- 7.7.8 The adoption of the bridge alternative would result in the following potential impacts:

- The construction of the viaduct across Aberdeen Harbour would have the potential to give rise to water quality impacts. However, it was envisaged that such impacts could be successfully mitigated against through the implementation of appropriate mitigation measures.
- The construction of the viaducts would have the potential to give rise to noise and dust impacts. The choice of construction methodology (eg the use of pre-cast elements versus in-situ construction) would influence the magnitude and duration of any potential impacts. However, it is envisaged that such impacts could be successfully mitigated against through the implementation of appropriate mitigation measures.

- Whilst the provision of a viaduct structure would have a greater visual impact than an immersed tube tunnel, it was considered that with adequate attention to the sensitive design of the structure, and wherever practicable, the provision of landscaping features, this structure should not result in any insurmountable strategic impacts. The detailed assessment of landscape and visual impacts would need to be undertaken during the EIA stage.
- The preliminary alignment was envisaged to pass within the Consultation Zones of the Gas Holder at Shek Pai Wan and the LPG Transit Depot/Bulk Domestic Supply at Ap Lei Chau (PHI). The Consultation Zones of these PHIs are 150 m and 500 m respectively. With the currently assumed alignment, 300 m and 1,400 m of above ground alignment and one underground station (ALW) would be within the respective Consultation Zones. A hazard assessment will be required to accurately evaluate the potential hazard implications from both the construction and operation of the railway. If necessary, appropriate mitigation measures may need to be developed and implemented. With the adoption of such mitigation measures, no insurmountable impacts are anticipated.
- Operationally, there was predicted to be the potential for the above ground trains to give rise to noise impacts. However, as it was envisaged that this scheme would comprise of a 'shuttle system' with 4-car trains operating at frequencies reduced from those used on conventional KCRC/MTRC lines, it is not envisaged that there would be any insurmountable operational noise impacts.

SIL Depot

7.7.9 In order to stable and maintain the trains operating on the SIL, it was envisaged that a depot would be sited on the southern side of Ap Lei Chau. An evaluation of the potential environmental impacts that may be associated with the construction and operation of the depot is presented below.

- The method by which the depot will be constructed was not fully determined; however, it was envisaged that the works would have the potential to give rise to construction related impacts; particularly noise and dust. The number of potential sensitive receivers that may be affected by the works will be related to the extent of reclamation that is implemented at Ap Lei Chau, the timing of the depot's construction in relation to the occupation of premises constructed on the reclamation. It is currently envisaged that the premises will not be occupied when the depot is under construction. Consequently, with the development and implementation of suitable mitigation measures, it is envisaged that the noise and dust impacts can be controlled, and as such, these factors such not result in any insurmountable impacts.

- The depot would be likely to be used for both general and heavy maintenance of the trains. As a consequence, there was considered to be the potential for noise impacts to arise. However, it was envisaged that the depot would be totally enclosed, and as such, the operational noise impacts were expected to be minimal. Whilst noise impacts could arise from the air conditioning plant, previous experience suggests that such impacts can be controlled through the careful design and planning of the air conditioning outlets (eg locating and angling them away from sensitive receivers), and the defining and enforcement of appropriate noise specifications for the air conditioning plant.
- If the depot were to include a train wash, there would be the potential for water quality impacts if the waste water was not adequately treated. However, experience from other depots suggests that through appropriate mitigation measures (such as the use of bio-degradable detergents) and the recycling and treatment of the waste water, such impacts could be controlled and the water quality standards achieved.
- Waste materials (eg oils, grease, packaging waste etc) would be produced as a result of the depot's operations. However, with the adoption of suitable waste management practices (eg waste avoidance practices, waste minimisation and recycling, and the proper disposal of waste) it was not envisaged that this would result in any insurmountable impacts.
- If the area above the depot were to be used for residential developments, there may be the potential for operational noise and/or vibration impacts to these sensitive receivers. Consideration would need to be given to this matter during the design of the depot and possible residential developments. However, with the use of mitigation measures (eg trackform and barriers etc) it was not envisaged that this matter would result in any insurmountable impacts.

Housing Developments

- 7.7.10 The construction and operation of a new railway line and depot would have the potential to give rise to impacts. The scope of the key potential strategic impacts associated with the SIL are highlighted in the preceding text. At the strategic level, it is not practicable, nor the intention, to identify all the potentially sensitive receiver locations that may be affected by the project, nor is it the intention to determine the magnitude of the potential impacts at these locations. However, it is noted that existing and proposed public housing may be located in the vicinity of the currently assumed scheme and therefore, to assist with any further environmental studies that may be undertaken during the future development of the line, the locations of these public housing sites have been reviewed and details of housing sites that may be in the vicinity of the rail scheme are presented below. It is noted that the currently assumed alignments are still under development and may be subject to alteration. Therefore, the following should not be taken as a definitive list, and it should be reviewed and updated as part of any further environmental assessments. In compiling this list, reference has been made to the 1999 edition of the 'Location of Housing Authority Estates', the latest version of the Public Housing Development Programme and Control List.

- Existing Public Housing Estates:
 - Wah Fu Estate
 - Wah Kwai Estate
 - Ap Lei Chau Estate
 - Lei Tung Estate
 - Ka Lung Court
 - Yue On Court

Shenzhen By-pass

- 7.7.11 This section of the alignment was envisaged as including both tunnelled and at grade sections. The scheme was envisaged to include above ground sections near Fanling and the proposed SGAs at Ping Che and Ta Kwu Ling. Whilst the exact construction methodology was not defined, it was envisaged that construction impacts would occur. However, with careful consideration of the chosen construction methodology together with the adoption of appropriate mitigation measures, it was considered that such impacts could be controlled to within acceptable criteria.
- 7.7.12 Although the exact details of the above ground section have still to be developed (e.g. the definition of those sections on viaduct), it was considered that there was the potential for operational noise impacts near Fanling and the proposed SGAs at Ping Che and Ta Kwu Ling. Consequently, appropriate mitigation measures may be required at key locations. Such measures could include the incorporation of noise enclosure, floating track slab or the Multi-plenum System. Such design elements would need to be considered during any future design developments, and during the EIA Stage. Experience from other recent rail schemes (e.g. West rail and the Ma On Shan Line) suggests that noise can be controlled to meet the required noise criteria.
- 7.7.13 The currently assumed route includes above ground sections near Fanling and the proposed SGAs at Ping Che and Ta Kwu Ling. As such, the proposed railway could result in construction and operational phase visual impacts. The magnitude and extent of these potential impacts can not be evaluated in detail until the exact alignment and those sections that will be either at grade or on viaduct has been defined. However, it was considered that sensitive design and landscaping features could be incorporated into the development of the scheme, and therefore, in strategic landscape and visual terms, the proposed corridor should not present any insurmountable strategic impacts. However, the potential landscape and visual impacts would need to be given further consideration, and be fully evaluated as during the EIA stage, in order to ensure the development of appropriate mitigatory measures.
- 7.7.14 As the currently assumed scheme includes above ground sections, it has the potential to give rise to ecological impacts. Assuming that, to enable construction, the landtake requirements along the above ground sections of alignment will comprise a corridor 40 m wide, whilst for stations, the width of the landtake will be 100 m, it is predicted that the following ecological habitats would be affected. However, it should be noted that as the alignment is still subject to change and the width of the 'construction corridor' may alter as the construction methodology is developed, the figures presented are only intended to provide an indication of the potential ecological impacts.
- 1.18 ha of plantation woodland (0.01% of total plantation woodland area in Hong Kong),

- 0.36 ha of other wetland (0.11% of total other wetland area in Hong Kong),
- 0.09 ha of inland water (0.002% of total inland water area in Hong Kong),
- 2.35 ha of low shrub (0.03% of total low shrub area in Hong Kong),
- 1.86 ha of cultivation (0.02% of total cultivation area in Hong Kong),
- 0.24 ha of abandoned cultivation (0.007% of total abandoned cultivation area in Hong Kong).

7.7.15 Overall, the potential ecological impact from this alignment is expected to be low. However, to avoid impacting upon important habitats, such as natural woodlands, consideration should be given to minimising the potential ecological impacts during the further development/refinement of the alignment, and during the EIA stage.