1 INTRODUCTION

1.1 Background

1.1.1 Atkins China Ltd were appointed by Highways Department of the Hong Kong Special Administrative Region (SAR) to carry out a detailed feasibility study of Route 9 between Tsing Yi and Cheung Sha Wan (The Project).

1.1.2 The Preliminary Environmental Review (PER) of the proposed Project (April 1997) identified the major potential environmental impacts which would require further study at the detailed design stage. The preliminary findings were further developed in the EIA Initial Assessment Report (IAR) issued in December 1997.

1.2 Aims and Objectives

1.2.1 The purpose of the EIA Study is to provide information on the nature and extent of environmental impacts arising from the construction, operation of the Project and all related activities taking place concurrently. The EIA aims to provide information which will contribute to decisions on whether:

(a) the environmental impacts which arise as a result of the Project are within the established standards and guidelines;

(b) mitigating conditions and requirements are necessary for the detailed design, construction and operation, of the Project; and

(c) residual impacts are within the established standards and guidelines after the proposed mitigation measures are implemented.

1.2.2 Some design details may change and therefore the EIA process must continue to run in tandem with other engineering assessments. At this stage however it appears that any further changes are unlikely to have a major effect on the scale of impacts and sufficient data is available to allow this EIA to confirm key environmental issues, quantify the scale of impacts, develop mitigation measures and predict the residual impacts. This is in line with the aims and objectives and the evaluation has been developed as far as is reasonably practical given the available information.

1.2.3 Figure 1.1 confirms that the alignment is predominantly directed through industrial areas and established transport corridors. The number of sensitive receivers is limited and only three main areas are likely to be affected by the works. The choice of the overall route was subject to environmental review at an early stage and prima facie the alignment presents few environmental concerns which are likely to result in fundamental changes to the Project design.

1.2.4 The PER was completed by the Highways Department in April 1997. The results of the earlier environmental assessments for the Project have been developed for further confirmation in this EIA. The IAR findings concluded that key issues for further detailed assessment were the extent to which traffic noise and emissions from vehicles, on open highways and inside the tunnel tubes, would affect the adjacent sensitive receivers. The development of options for mitigation measures to control such impacts is a fundamental concern of this EIA.

1.2.5 The EIA focuses on traffic noise and atmospheric emissions from vehicles as key issues since noise and air quality impacts have remained as the main issues for the

environmental workstream. Potential ecological impacts, resulting from removal of vegetation during construction of the tunnel portals and water quality impacts, in the context of CT9 construction have also been evaluated. Landscape and visual impacts due to the highway structures are dealt with in summary as part of this EIA. A separate dedicated Landscape and Visual Assessment report, based on the most up to date structural designs for the R9 road sections, viaducts, tunnel portals and Stonecutters Bridge has also been compiled.

1.2.6 Certain sections of the R9 alignment are within 1000m of four oil terminals (Shell Oil, Caltex Oil, CRPC Oil and Esso Oil) at Tsing Yi and a Quantitative Risk Assessment (QRA) has been incorporated in the EIA.

1.2.7 Impacts are potentially significant for adjacent sensitive receivers and the objectives of the EIA Study are:

- to confirm and demonstrate the acceptability of the alignment and outline design in terms of environmental performance;
- to contribute to the improvement of design and programme through inclusion of effective environmental improvements;
- to identify and resolve any issues which will impact on construction activities, particularly night time work, marine pollution, ecological impacts & risk assessment;
- to develop effective and practical monitoring proposals;
- to progress the necessary consultation programme efficiently;
- to describe the Project and associated works together with the requirements for carrying out the Project;
- to identify and describe the elements of the community and environment likely to be affected by the Project, including both the natural and man-made environment;
- to identify and quantify emission sources and determine the severity of impacts on sensitive receivers and potential affected uses;
- to identify and quantify any potential losses of or damage to flora, fauna and natural habitats;
- to identify existing landscape & visual quality in the “study area” for the purpose of evaluating the landscape & visual impact of the Project;
- to propose the provision of infrastructure or mitigation measures so as to minimise pollution, environmental disturbance and nuisance during construction and operation of the Project;
- to identify, predict and evaluate the residual (i.e. after practicable mitigation) environmental impacts and cumulative effects expected to arise during the construction and operational phases of the Project in relation to the sensitive receivers and potential affected uses;
- to identify, assess and specify methods, measures and standards, to be included in the detailed design, construction, operation of the Project which are necessary to mitigate impacts and reduce them to acceptable levels;
- to design and specify the environmental monitoring and audit requirements

necessary to ensure the implementation and the effectiveness of the environmental protection and pollution control measures adopted;

- to investigate the extent of side-effects of proposed mitigation measures, particularly construction impact mitigation measures, that may lead to other forms of impacts;
- to identify constraints associated with the mitigation measures recommended in the study; and
- to identify any additional studies necessary to fulfil the objectives of the Environmental Impact Assessment Study.

1.3 Evaluation of Impacts

1.3.1 The Brief states that no approval for the Project will be given unless it can be demonstrated that no adverse environmental impacts will result from the implementation. Clearly any major construction programme will result in a degree of adverse impacts. The evaluation of impacts in terms of severity and acceptability against established standards is an inherent part of the EIA and the recommendations it provides and in this respect it has been agreed with EPD that the use of the term adverse will be interpreted as unacceptable for the purposes of this study.

1.3.2 The requirement that no approval shall be given to the Project unless it can be demonstrated (quantitatively, if possible) that no unacceptable adverse environmental impacts will result from its implementation is therefore interpreted accordingly. Statutory gazettal activities related to the Project shall therefore be carried out after the satisfactory completion of the EIA Study and its subsequent public consultations. The EIA study will therefore include any restoration (and decommissioning) work and any temporary and permanent activities to take place.

1.4 Study Area

1.4.1 The boundary of the "study area" for the purpose of this EIA is 300m either side of the proposed road alignment with the following exceptions. Figure 1.1 shows the alignment and the defined "study area" boundaries.

1.4.2 Landscape impact and air pollution assessments will be based on a study area of 500m from the proposed road alignment. However, all potential visual sensitive receivers are included as part of the visual assessment regardless of their distance from the proposed road alignment.

1.4.3 The study area for noise impact assessment has been reduced accordingly if the first layer of noise sensitive receivers, closer than 300m from the road, provides acoustic shielding to those receivers at further distance from the alignment.

1.4.4 The boundary of the "study area" for the purpose of risk assessment are the sections of the road alignment which fall within the 1,000m radius consultation zone of the each of the potential hazardous installations (i.e. Shell, Caltex, Esso and CRPC Oil Terminals).

1.4.5 The habitat survey area is 500m from the site boundary or the area likely to be impacted by the project.

1.5 Project Description and Representative Sensitive Receivers

1.5.1 Route 9 (R9) will take approximately five years to construct with completion currently planned for 2007. Viaducts will run from Lai Wan Interchange connecting with Route 16 (R16) and the West Kowloon Highway (WKH) near Cheung Sha Wan in the east, across the northern section of the West Kowloon Reclamation (WKR), between Container Terminal 8 (CT8) and Stonecutters Base to the Stonecutters Bridge which will span across the Rambler Channel between CT8 and CT9. Viaducts will link the bridge to CT9 and the main carriageway will continue through Tsing Yi Island via the dual three lane Nam Wan Tunnel (NWT). From the western portal of the NWT, viaducts will link R9 to the Cheung Tsing Highway. The construction methods are summarised in section 7.

1.5.2 The existing and planned uses in the "study area" are identified in Figures 1.2, 1.3, 1.4 and 1.5. The alignment is predominantly directed through industrial areas or established transport corridors and few sensitive receivers (residential, hospital or schools) are likely to be affected by the works. Whereas the alignment presents few environmental concerns, which are likely to result in fundamental changes to the design, there are existing and planned sensitive receivers potentially affected by the Project. The potentially affected land-uses include those described in the EIAO TM. The existing and planned sensitive receivers are reviewed below, working along the alignment from the west (Tsing Yi) to the east (West Kowloon).

1.5.3 The western extremity R9 will dovetail with R3 (Figure 1.2). There are few sensitive receivers (SRs) in close proximity to the works and the nearest residential apartments are at Ching Wah Court, Tsing Chin Street. A school is also located on the junction of Tsing Yi Rd and Ching Hong Rd. All the SRs above are beyond the 300m study area boundaries and whereas the western portal of the Nam Wan Tunnel and some of the construction works for the linking viaducts to R3 would have line of sight to approximately the top six floors of Ching Wah Court (which is included in the visual assessment). The lower floors and school adjacent to the downslope of Tsing Yi Rd are well shielded from the works, as are all other developments on Ching Hong Road.

1.5.4 The Nam Wan Tunnel will convey traffic on R9 to and from the eastern side of Tsing Yi. Ecological impacts at the portals have been considered. Ventilation shafts are not considered to be required. Construction phase impacts would be controlled by the statutory provisions of the noise and air quality control ordinances, regulations and non-statutory guideline controls.

1.5.5 The east end of the Nam Wan Tunnel will emerge through a portal which will be over 1.5km from the Vocational Training Council's Tsing Yi Technical College (TYTC) and Mayfair Gardens (residential, Figure 1.3). Whereas these sensitive receivers are not close to the main alignment of R9 the residential apartments and TYTC are within the 300m study boundary from the proposed R9 to Container Terminal 9 (CT9) link. Therefore whereas these receivers are well away from the R9 main alignment they may be affected by the knock on effects to local roads and the R9 linking roads.

1.5.6 The supporting structures (anchor blocks) for the Stonecutters Bridge are currently planned to be built within CT9 (CT8 is completed in this respect) and hence no additional reclamation is required. The R9 consultants are required to liaise with the CT9 consortium / consultants to determine the detailed requirements for the advance works to enable CT9 reclamation works in the vicinity of the anchor block to proceed in a timely manner. Since no additional reclamation is required water quality impacts would be

confined to any construction site liquid wastes or runoff. The current position (at the time of this EIA) is that CT9 will be completed before this project.

1.5.7 There are no schools, hospitals or domestic sensitive receivers in the vicinity of the viaduct section as it traverses the northern edges of Stonecutters Island but there are several dwellings within the Stonecutters Base compound. These dwellings were formerly used by military forces as weekend retreats and married quarters. At this stage it has not been possible to rule out that these dwellings are used for residential purposes, therefore they are included as SRs in the assessment.

1.5.8 In the vicinity of Lai Wan Interchange (LWI) four ramps linking direct connections between R9/R16 and R9/WKH are expected. The cumulative effects of the composite road network in the context of all other road links in the area is therefore assessed.

1.5.9 Further south at the eastern side of the WKH, West Rail and LAR, several sites in the northern area of the West Kowloon Reclamation have been proposed for residential development. The nearest of these sites have been identified as sites 10 and 6 in the recent Review of Land Use in Northern Part of the West Kowloon Reclamation study by TDD. The link from R9 southbound to the WKH will pass very close to site 10 and nearer to Site 6 than the WKH. The impact of this link and the cumulative effects of the composite road network are also assessed in this EIA.

1.5.10 The overall effect of R9 is designed to attract traffic away from R3, Kwai Chung and the West Kowloon area, hence reducing traffic flows in the hinterland. For the purposes of the noise assessment, any new road or road where the number of lanes is increased by >25% will be considered as a new road, and will be provided with direct mitigation if necessary. Mitigation will not be provided on existing roads as part of the Route 9 project. A figure is provided in Appendix 1 showing the new and existing road as adopted for the assessment.

1.6 Statutory Requirement

1.6.1 The Project is a Designated Project under the EIA Ordinance and an Environmental Permit (EP) is required for its construction and operation. To this end, this EIA Report has been prepared based on a Study Brief lodged on the EIA Ordinance Register. The Report is submitted for approved under EIAO. The Report recommendations will form the basis of the Environmental Permit.

1.7 Report Construction

1.7.1 This EIA Report is structured as follows. Following this introduction, sections 2 to 8 deal with Noise, Air Quality, Water Quality, Landscape and Visual, Ecology, Construction Impacts, Environmental Monitoring & Audit, Risk Assessment and Land Use Impacts. Construction impacts will eventually be used to identify appropriate monitoring locations for the EM&A Manual, which will be produced, following the endorsement of the EIA Final Report. The Study Area has been subdivided along the length of the alignment, broadly as explained in section 1.4.

1.7.2 In each section the following subdivisions each receive treatment:

- Western Portal and Link Roads to North West Tsing Yi Interchange
- Nam Wan Tunnel and ventilation facilities,

- Eastern Portal and viaducts
- CT9 Slip roads,
- Stonecutters Bridge and viaducts at the northern boundary of Stonecutters Base,
- Lai Wan Interchange, Mei Foo and Northern WKR Developments,

1.7.3 These sections have been reviewed in turn in sections 2 to 10. Ecology, Waste Disposal and Water Quality are dealt with, predominantly as construction issues. Section 10 reviews progress with the EIA Risk Assessment. Section 11 concludes with a summary of recommendations for mitigation measures.