CONTENTS

Introduction 5-1
'No Development' Alternative 5-2
Site Suitability and Alternative Sites 5-2
Alternative Technologies 5-3
Alternative Designs 5-6
Summary and Conclusions 5-6

INTRODUCTION

5.1 Schedule 4, Parts 1 (2) and 2 (4) of the EIA Regulations states that an Environmental Statement (ES) should include:

"An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for the choice made, taking into account the environmental effect"

5.2 The EIA Regulations do not expressly require the Applicant to study alternatives; however the nature of certain developments and their location may make the consideration of alternative sites a material consideration. Moreover, recent case law indicates that the EIA regulations do not require an assessment of alternatives. From the Arsenal Football Case it was noted:

"What needs to be covered in the Environmental Statement are the alternatives which the developer has considered. The Regulations do not require alternatives which have not been considered by the developer to be covered, even though the local planning authority might consider that they ought to have been considered"

5.3 Further to this, the Inspector presiding over the "Ince Marshes" appeal comments at paragraph 11.9 of his report:

"I also do not accept that there is a requirement under the Environmental Impact Assessment regulations that the proponents of these schemes should have presented a fuller assessment of alternative sites within the Environmental Statement. The question of whether that is required by planning policy is a matter that will be looked at later within this report but there is no express requirement in the Directive and the Regulations that a developer study alternative sites. Paragraph 2 of Part 1 of Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 requires the developer to include in the Environmental Statement an outline of the main alternatives studied and an indication of the main reasons for his choice"

5.4 The following sections describe the main alternatives to the propose Development. In accordance with best practice guidance, consideration has also been given to, and commentary is provided, to provide an outline of any alternatives or options considered by the Applicant:

- The 'No Development' alternative;
- Alternative Sites;
- Alternative Technologies; and
- Alternative Designs.

'NO DEVELOPMENT' ALTERNATIVE

5.5 Guidance on the preparation of ESs, suggests that it is good practice to consider the evolution of a site in the absence of specific proposals, *i.e*. the 'do-nothing' or 'No Development' alternative.

5.6 The 'No Development' option refers to leaving the application site in its current state, and continuing with the current methods for the disposal of waste. The implications of the 'No Development' option are summarised below:

- waste would continue to be sent to landfill, which the government acknowledges is "*clearly wrong*", and would result in significant carbon emissions;
- the national and regional aspirations on strategic waste management such as the 'waste hierarchy' and diverting waste from landfill would not be met;
- the opportunity would be lost to provide a renewable source of energy;
- the identified job opportunities as a result of the proposed Development would not be created; and
- the existing site would continue to be underutilised and would be a disused brownfield site;

SITE SUITABILITY AND ALTERNATIVE SITES

5.7 Network Rail Limited has undertaken a review their land portfolio and has identified a number of sites throughout the UK which are no longer required for operational purposes and could therefore be used for redevelopment.

5.8 As part of this review, the application site was identified as being suitable for redevelopment. As such, the applicant has not considered alternative sites for the development and alternative sites will not be given consideration in the ES.

5.9 The applicant is considering the use of Advanced Conversion Technology (ACT) on a number of Network Rail sites across the UK. In searching for sites suitable, the applicant has referred to paragraph 21 of Planning Policy Statement 10 (PPS10) which states:

"In deciding which sites and areas to identify for waste management facilities, waste planning authorities should:

- assess their suitability for development against each of the following criteria:
  - the extent to which they support the policies in this PPS;
  - the physical and environmental constraints on development, including existing and proposed neighbouring land uses (see Annex E);
  - the cumulative effect of previous waste disposal facilities on the well-being of the local community, including any significant adverse impacts on environmental quality, social cohesion and inclusion or economic potential; and

- the capacity of existing and potential transport infrastructure to support the sustainable movement of waste, and products arising from resource recovery, seeking when practicable and beneficial to use modes other than road transport.

- give priority to the re-use of previously-developed land, and redundant agricultural and forestry buildings and their curtilages."

5.10 The application site was previously used as part of a rail freight yard and rail head. Land immediately adjoining the application site is identified in the Draft Hampshire Minerals and Waste Plan as potentially suitable for use as an aggregate rail depot and as having some potential for waste uses.

5.11 The nearest residential property is Western Farm at 80m to the southeast, with a small settlement at Micheldever Station at 530m south of the site. There are other properties along the north side of A303 (including Coxford Farm, The Boundary, Holinshea, The Beeches, Woodlands, The Pines and Cobley Wood House), although mature vegetation exists along the roadside. The largest settlement within the 5km study area is the village of Micheldever, which is located approximately 4km south of the application site.

5.12 As set out in Chapter 6 below, the application site has good access by road and the presence of the adjacent railway line offers the future potential for rail transport to and/or from the application site.

5.13 The application site and surrounds do not contain any designated heritage features, landscapes or views.

5.14 The applicant identified the need for the facility in this area and selected the application site as a potential suitable site for such a facility. It is considered that the development of the facility accords with the criteria contained within PPS10 (as outlined above). As such, the applicant did not consider alternative site locations for this particular facility in Hampshire.

ALTERNATIVE TECHNOLOGIES

5.15 The Applicant is considering introducing a range of facilities across the UK. To meet this aspiration, a critical review of available waste technologies was undertaken strategically at an early stage of the programme. Although there are a number of potentially suitable other technologies which are capable of treating residual source segregated or mixed non hazardous wastes, many have been rejected based on the potential environmental impact, operational cost or efficiency. Furthermore, consideration has also been given to technologies that are operational in the UK and are considered a long-term viable option for the treatment of non hazardous waste. A review of available technologies was undertaken by the applicant's Waste Technical Advisor during the design of the Development and is summarised below.

5.16 There were a number of potentially suitable technologies which have been considered for the site. Although all of the technologies reviewed are capable

of treating source segregated or mixed/non hazardous wastes, a majority have been rejected on ground of environmental impact, operational cost or efficiency.

5.17 Advanced conversion through pyrolysis with upstream autoclave conditioning has been selected for the following reasons:

- the autoclave process will create produce segregated sterile recyclates which are suitable for off site processing and reuse;
- the pyrolysis process used by the installation creates a very clean synthesis gas which is ideal for the combustion in gas engines;
- the pyrolysis plant does not create any waste materials that cannot be otherwise reused, re-pyrolysed or recycled;
- the upstream fuel conditioning, pyrolyisation process and gas use of gas engines does not require the same level of flue gas cleaning equipment as conventional mass burn incinerators or other gasification process; and
- beyond the requirements for dust abatement (ceramic filtration), there is no requirements for acid scrubbing plant, carbon injection system or electrostatic precipitators.

5.18 Due to the fact that the plant removes all potential chlorine containing materials for the waste stream prior to the combustion of the gas, there is no potential for dioxins to be present within the plant emissions.

5.19 The footprint and capital expenditure of the plant is significantly less than conventional waste to energy (mass burn or gasification systems).

5.20 The capital cost per unit of energy produced by the plant is less than conventional alternatives.

5.21 The anaerobic digestion portion of the site can be used for the treatment and processing of liquid slurry wastes and pure biomass.

5.22 Advanced conversion technologies have only emerged in recent years and have little negative perception associated with their installation. The plants constructed to date have been small scale (typically less than 10MWe) and have not created a significant public impact, due largely to their perceived environmental benefit and relatively small plant footprints. One of the key advantages of the technology is that it is not regarded as being Incineration and therefore does not receive the same level of negative publicity.

5.23 All technology would be housed within one single zone building that has been optimally sized to ensure that sufficient contingency capacity exists.

5.24 Typically, sorting, shredding and/or autoclaving and pyrolysis obtains an approximate input waste volume reduction of 93%, with much of the remaining by-products recovered for agricultural / or construction purposes.

5.25 Following the review of available technologies, conventional mass burn or moving grate incineration was discounted based on the following:

- there are relatively low rates of recyclate recovery;
- the technology requires high levels of land take; and
- the technology receives negative public perception.

5.26 In addition, Plasma Arc Gasification was discounted as although it is considered to have great potential, there is a current lack of any proven reference sites. Given that the applicant is to use the chosen technology across the UK, it is considered that the use of this technology is a risk.

5.27 Gasification/Pyrolysis is considered the most appropriate technology as it has proven sites in the UK capable of treating MSW and can be coupled to a gas engine CHP plant which has significant efficiency benefits. Furthermore, compared to other technologies Gasification/Pyrolysis plants have a small footprint and do not receive the same level of negative publicity.

5.28 The final primary technology for the proposed development includes advanced conversion through pyrolysis with upstream autoclave solution.

5.29 This technology has been selected for the following reasons:

- the technology creates a very clean synthesis gas which can be combusted in the gas engines;
- the plant does not create any waste materials that cannot be otherwise reused, re-pyrolysed or recycled;
- the upstream fuel conditioning, pyrolisation process and emissions from the gas engines does not require the same level of flue gas cleaning as conventional mass burn incinerators or gasification processes (e.g. there is no requirements for acid scrubbing plant, carbon injection system or electrostatic precipitators);
- as the plant removes all potential chlorine containing materials from the waste stream, prior to the combustion of the gas, there is no potential for dioxins to be present within the plant emissions to air; and
- the footprint and massing of the plant is significantly less than conventional EfW facilities.

5.30 As well as the primary technology of advanced thermal conversion through pyrolysis (as above), the applicant has considered the inclusion of an anaerobic digestion (AD) plant.

5.31 The proposed development includes the use of AD based on the following:

- available feedstock was identified within the vicinity of the site for use in the AD plant;
- the use of AD allows a greater selection and receipt of waste at the site;
- the AD and pyrolysis plant could work symbiotically with the biogas produced from the AD plant being able to be used within the engines and the digestate also being able to used within the pyrolysis plant;
- there are no odour sensitive receptors within close proximity to the AD plant; and
- the AD with the pyrolysis plant offers a commercial opportunity for the applicant.

ALTERNATIVE DESIGNS

5.32 The design of the proposed development has been an iterative process, taking account of a number of constraints and technical considerations. In summary:

- the initial site design submitted at the Scoping Report stage located the AD tanks on the higher of the two levels on the application site and sought to provide two new access points to the application site;
- assessment work confirmed that the lower level on the site was less sensitive from a visual, archaeological and ecological point of view so the site layout was varied to place the built development at the lower level;
- the proposed new northern access to the application site was dropped as site levels did not allow for a suitable gradient to be achieved (this is considered further in Chapter 6); and
- a green roof has been introduced to provide ecological mitigation for the habitat to be lost as part of the proposed development.

5.33 The building has been designed in linear zones to ensure the building follows the systematic treatment of waste, and as such all technology can be housed zones. Each zone has been created with a consideration of the longevity of the plant and flexibility of layout.

5.34 In addition, the proposed configuration of the various items of plant has been optimised to provide the most efficient layout in terms of installation of the infrastructure. For example, by locating in a linear 'head-to-head' formation, the length of ducts, cabling, etc is minimised, reducing the overall installation costs of the project;

5.35 Detailed air quality dispersion modelling has determined the lowest practicable stack height of 20m that can be achieved.

SUMMARY AND CONCLUSIONS

5.36 The proposed development has evolved over a number of design iterations, responding to local authority planning and development aspirations and taking account of the applicant's development objectives, design aspirations and prevailing environmental constraints.

5.37 The evolution of the proposed development has therefore responded to a variety of design and environmental issues as described above and the resultant proposals are considered to offer the most advantageous design solution.