Chapter Four
SITE SELECTION, ALTERNATIVES AND SCHEME DEFINITION

INTRODUCTION

4.1 This chapter summarises the process followed by EHL to identify a suitable site for a proposed Enviropark and to define the content of the proposed development. The chapter begins with an explanation of the general operational requirements and the planning and environmental principles and criteria relevant to the locational decision, and then explains the various process and technical options considered by EHL.

GENERAL REQUIREMENTS

4.2 The starting point for the site selection exercise was for EHL to define its essential operational requirements. These can be summarised as follows.

Land availability

4.3 A site reasonable regular in shape and at least seven hectares in area was identified as the minimum area of land required to serve EHL's operational requirements. Given the intention to achieve a close integration of resource recovery and energy recovery technologies, and to support the requirements of a high energy third-party business occupier, split site options were considered to be unsuitable for an Enviroparks development.

4.4 The Enviroparks development has a 25 year design life. As such, the site should be available to EHL for at least this length of time.

Waste streams

4.5 From the outset, EHL wanted to be certain that appropriate 'feedstocks' were likely to become available. Regulations have conventionally classified many materials as waste, which implied that they had no economic value. EHL considers this to be inappropriate, and the purpose of the Enviroparks development is, as explained, to recover and use these resources. For these reasons the company prefers to refer to 'feedstocks' rather than 'waste'. The waste label has resulted in many of these resources incurring a gate fee for their treatment. EHL will process these materials in preference to non-waste materials that do not incur a gate fee. In a general sense, European Commission landfill diversion targets and the UK's landfill tax escalator are rendering landfill progressively less acceptable as a disposal route for waste. As explained in chapter five of this environmental statement and the *Planning Policy Statement* that accompanies EHL's planning application, Welsh

Assembly and local authority planning and waste policy lend strong support for the diversion of waste streams for landfill and for the waste hierarchy.

4.6 Waste collection, treatment and disposal arrangements are subject to a range of contracts. For example, local authorities issue contracts for municipal solid waste management. Their contractors might process all of the waste collected or might sub-contract aspects of the process – such as specialist or segregated waste streams. Industrial wastes, clinical waste from hospitals and other special wastes such as tyres are typically handled by specialist licensed contractors, and some of these materials cannot be recycled. In identifying potential sites for an Enviroparks proposal, EHL thus needed to satisfy itself that there was an acceptable likelihood of appropriate feedstocks being available in suitable volumes.

Transport connections

4.7 An Enviroparks development requires a site that facilitates the collection and delivery of feedstocks from dispersed sources and the export of recovered materials and any other residual materials along with products produced by the high energy user. In view of the proximity principle for waste processing and the localised nature of feedstock sources, the use of rail transport is not practicable. Accordingly, EHL requires a site with good road connections to the strategic highway network.

Grid connection

4.8 The Enviroparks development will provide fuel for an on-site combined heat and power plant with an electricity generating capacity of c. 20 MW. The plant must be designed so that all of the electricity generated can be exported to the local electricity distribution network. The availability of a conveniently located connection point to the distribution network, with the capacity to accept the electricity that EHL will generate, is thus an important locational criterion.

Water supply and drainage

4.9. The development will require a reliable supply of water in the quantities required to support relevant parts of the process such as the separation of waste in the fuel preparation area. It will also require a connection to a local sewerage network.

Planning and environmental status

4.10 EHL's preference is for a site formally allocated in the local development plan for industrial use, energy production or waste recycling use, and that is not subject to constraining environmental designations or prone to flood risk.

Community benefit

4.11 EHL is a company founded and based in South Wales, and wants to ensure that the economic, reputational and educational benefits envisaged for its Enviroparks development can be shared with the host community.

POLICY GUIDANCE AND PRINCIPLES

4.12 The relevant planning, waste and energy policy criteria influencing the site selection process are identified in the following chapter of this ES and considered in greater detail in the Planning Policy Statement that accompanies EHL's planning application. This analysis includes *Technical Advice Note (Wales) 21: Waste*. Para. C36 of TAN21 identifies the range of sites that might be considered for new waste management facilities. These include brownfield sites, minerals sites, industrial areas and redundant sites and buildings. Para. C37 requires locations for waste management facilities to be considered in the context of development plan policy and the Best Practicable Environmental Option (BPEO). Annex H of TAN21 explains the principles of BPEO and sustainable waste management options. EHL had regard to these principles in its site search and project formulation.

4.13 In accordance with TAN21 para. C35, EHL had regard to a comprehensive analysis of potential waste sites undertaken by the South East Wales Regional Waste Group (SEWRWG) on behalf of the Welsh Assembly Government (WAG). This group is led by a steering group of councillors from the eleven local planning authorities in the region with a technical group of officers from local government, the Welsh Assembly Government, Environment Agency Wales and other government bodies, and representatives from the waste industry and environmental groups. The first regional waste plan was approved in 2004, and is now at an advanced state of review. One of the main objectives of this review is to develop a regional waste plan spatial strategy to influence the location of future waste management and resource recovery facilities in south-east Wales.

4.14 In order to address the requirements of the EU Waste Framework Directive and TAN 21 while retaining adequate flexibility for local development plans and developers, the RWP Spatial Strategy contains two elements:

- Estimates of the total land area required for new in-building facilities, an analysis of the potentially available land area for new in-building facilities on *existing* B2 or major industry sites and B2 sites that have already been allocated in development plans, and a list of these sites.

- 'Areas of Search' maps for use in identifying *new* sites for in-building and open-air facilities.

4.15 According to the consultation draft regional waste plan, published by the SEWRWG in October 2007:

11.1.1 Advances in technology and the introduction of new legislation, policies and practices mean that many modern waste management / resource recovery facilities on the outside look no different to any other industrial building and on the inside contain industrial demanufacturing processes or energy generation activities that are no different to many other modern industrial processes in terms of their operation or impact.

11.1.2 For this reason, many existing land use class B2 'general industrial' employment sites, existing major industrial areas[60], and new B2 sites allocated in development plans will be suitable locations for the new generation of in-building waste management facilities this will be required in accordance with the RWP Technology Strategy.

4.16 The draft consultation document ranks 'areas of search' for new waste facilities according to a five-tier hierarchy, reflecting the sites' estimated levels of 'constraint' and 'potential'. Sites and areas of search are identified on a map generated by a geographic information system.

SITE SELECTION

4.17 EHL appraised its operational requirements against a review of the sites identified in the South East Wales Regional Waste Plan consultation draft to draw up a shortlist of potential sites for its first Enviroparks development. The Regional Waste Plan analysis was valuable for this purpose because provided a definitive 'long-list' of sites, identified on the basis of broadly-based assessment criteria that reflect relevant planning and waste policy in Wales.

4.18 EHL's site selection process then followed the following stages.

Stage 1: overview of available sites

4.19 In the first stage of its review, EHL established that a site located conveniently with respect to Rhondda Cynon Taf County Borough (RCT) would be desirable, given that this authority's municipal waste contract was being tendered. Having regard to transport requirements, EHL determined that its preferred site should ideally be easily accessible from the A465(T) Heads of the Valleys road, which offers good connections to north-south routes including the A4061 and A4059. A site in this part of South Wales would also allow waste to be brought in from neighbouring local boroughs and the national park if necessary and desirable.

Stage 2: shortlist of sites within Rhondda Cynon Taf CBC

4.20 EHL then reviewed the sites and areas of search identified by the SEWRWG in its draft Regional Waste Plan review in the RCT area. Of the 26 locations identified within RCT from the draft plan, most were too small to accommodate EHL's requirements. EHL concluded that it should focus on sites in the Hirwaun area.

Stage 3: the provisional choice of a site

4.21 A review of sites in the Hirwaun area was then undertaken, in consultation with landowners. At this time, EHL became increasingly aware that the Tower colliery at Hirwaun was due for closure. Whereas it was decided that sites on the colliery site itself were unsuitable for an Enviroparks development in view of timing issues and the need for a comprehensive decontamination and restoration strategy to be implemented prior to development, the potential of an Enviroparks development to provide new employment in a community suffering economic stress reinforced the attractiveness of the locality to EHL.

4.22 Discussions with WAG representatives steered EHL towards the site on Fifth Avenue in the Hirwaun industrial estate that forms the subject of the current planning application.

Stage 4: site verification

4.23 EHL then assessed the site from the following perspectives, in consultation with the local authorities and organisations such as the Environment Agency Wales, having regard to the following considerations:

i). operational suitability;
ii). effective use of physical resources;
iii). land use planning;
iv). environmental considerations;
v). design and mitigation;
vi). cost, deliverability and risk.

THE FINAL CHOICE OF SITE

4.24 EHL's assessment confirmed the suitability of the Fifth Avenue site as the optimum location for an Enviroparks development for the following reasons.

- **Land availability** – with an area of almost 8.5 hectares, the site is large enough to accommodate all of EHL's requirements, including the high energy user, with room for landscape works and planting around the periphery of the site.

- **Accessibility** – the site has direct access on to Fifth and Ninth Avenues, is close (1.7 km) to the junction between the A465(T) Heads of the Valleys road and the A4059 / A4061 north-south route, and is connected to this junction by roads designed for industrial traffic from the Hirwaun industrial estate.

- **Proximity** – the site is conveniently located with respect to the waste markets it is intended to serve.

- **Development plan policy** – as the following chapter explains, the site is allocated for industrial use in the adopted development plans of both RCT and BBNPA. In this context

it will be recalled that the draft regional waste plan regards sites of this nature as appropriate locations for in-building waste management facilities.

- **Environmental constraints** – there are no designations seeking to protect the site for its natural, historical, cultural or landscape value.

- **Site characteristics** – the site was levelled and prepared for development by the Welsh Development Agency during the 1990s. Being open, level and reasonably well drained, it is physically well suited to EHL's requirements.

- **Site setting** – EHL intends that, through a combination of architecture and landscape architecture, its proposals will present the impression of a business park in external views. The tree and hedge lines on the northern western boundaries will assist EHL in its efforts to achieve a nigh quality environment and to integrate the development into the surrounding landscape. The high reservoir embankment to the north of the site and the prominent industrial buildings occupied by Eden Logistics to the east will contain view of EHL's development.

- **Neighbouring land uses** – the site is on an established industrial estate. The containment of most processes in controlled environments within buildings is intended to protect the amenity of isolated residential properties and hotels in the general vicinity.

- **Utilities connections** – the Fifth Avenue site affords all of EHL's required utilities connections, including a convenient link to the local electricity distribution network for the export of power generated on the site.

- **Local economic benefit** – a development in the Hirwaun area would provide alternative employment for, amongst others, local people made redundant following the closure of the Tower colliery.

4.25 As chapter six of this ES explains, the applicant undertook further consultations with the local planning authorities and other parties during the course of the EIA and prior to the submission of this planning application. Nothing arose from these consultations to cast doubt on the information upon which EHL's site selection decision was based. Having regard to the range of environmental, economic, social, practical / operational and policy compliance considerations summarised in this chapter and elsewhere, EHL concluded that the Fifth Avenue site represented a BPEO solution for its waste recycling and energy recovery aspirations.

PROCESS OPTIONS

4.26 EHL's focus is on efficient resource recovery and reuse. In pursuit of these objectives, the company undertook a review of many technologies used both in the UK, the EU and beyond. In isolation, none of these technologies was found to be wholly applicable to the company's objectives. The solution appeared to be the careful selection of appropriate technologies and their careful integration into an Enviroparks-type development.

4.27 The technologies required by EHL fell into three distinct categories.

i). material separation;
ii). bio-energy recovery;
iii). other energy recovery.

Each of these is considered below.

Materials recovery

4.28 The conventional means of separating materials is to use air as the separating medium for the waste feedstocks. Unless there is a well-defined and consistent input, use of these technologies normally results in only a partial separation. This means that multiple stages are needed to achieve the recovery efficiency and decontamination of the recovered materials to which EHL aspires.

4.29 This conclusion was arrived at having visited and inspected several conventional mechanical and biological treatment processes in operation. EHL concluded that the few processes using water as the separating medium were capable of achieving the separation cleanliness and efficiencies required. Examples of this included a process in Israel, various autoclave and thermal processes, in the UK and the '*Dano-Drum*' type processes employed in the USA. Whilst some may regard the latter as not being a 'wet' process, in process engineering terms a combination of moisture and temperature is used to not only clean surfaces but to reduce fibrous materials such as paper to a pulp. It is the easier separation of the pulp from the cleaned materials that gives the process advantage.

4.30 EHL thus decided to pursue a wet process. None of the established processes has actually been replicated in an unmodified way by EHL because, whilst they meet the quality criteria, they fail to meet other requirements such as energy efficiency, minimal plant footprint or costs.

Bio-energy recovery

4.31 Many biological waste streams are already wet when sent for recovery, including food waste. This condition, together with an energy efficiency hierarchy developed by EHL, highlights that anaerobic digestion is the preferred energy process for these materials. As a result EHL first concentrated on the use of this established technology. However, a review of existing plants demonstrated that much of the European industry has failed to modernise its technologies in line with best industrial practice. For example, many conventional anaerobic digestion facilities still employ high retention times as opposed to separate hydrolysis to achieve even a mediocre gas conversion. This fails to meet EHL's needs. EHL's design thus utilises modern industrial anaerobic digestion technology, as used by breweries or distilleries, affording a low residence time with a high gas conversion.

4.32 A further consideration is that modern kerbside collection and separation schemes have directed much of the more highly biodegradable material into the compost market as

opposed to the energy market. As a result much of the bio-energy source material remaining is a complex cellulose fibre that is known not to hydrolyse easily, rendering it inappropriate for anaerobic digestion. EHL's research concluded that pyrolysis is the most appropriate technology for processing this material. Given the quality and cleanliness of the cellulose fibre produced by EHL a longer term ambition is to use this material as a transportable fuel. As a result, a small scale modular design of pyrolyser will be used by EHL.

Other energy recovery

4.33 Anaerobic digestion is inappropriate for non-biological materials. EHL energy hierarchy for such materials starts with pyrolysis and progresses to gasification, in order to optimise the production of energy. Pyrolysis needs to be operated with appropriate fuels and conditions to produce a minimal quantity of 'carbon char' - a by-product that would require further treatment. EHL inspected pyrolysis units in use and development in the UK and the mainland Europe in developing its proposals for this element of the process.

4.34 EHL's specifications for a gasifier included a requirement to deliver total organic destruction to the feedstock. Various gasifier design options exist, including air or oxygen-blown gasifiers, with or without plasma assistance. Of these, air blowing is cheaper, but lower temperatures normally result in lower organic destruction. As a result, EHL has selected a conventional air blown gasifier with a secondary plasma-assisted gas clean up-system. This ensures both the efficiency and effectiveness required by EHL at an acceptable cost. In arriving at this conclusion all types of gasifier were visited at various locations across the UK, mainland Europe, the USA and Canada.

CONCLUSION

4.35 Both in its technological specification and in the identification of a suitable site for the Enviroparks development, EHL pursued a structured process of research and review, informed by consultations with relevant authorities and expertise. This approach is in accordance with relevant policy guidance including TAN21: Waste, and is consistent with BPEO principles.