

SECTION 16

**ECOLOGY AND NATURE CONSERVATION**



## 16 ECOLOGY AND NATURE CONSERVATION

### 16.1 Introduction

16.1.1 The purpose of this assessment is to determine the magnitude and significance of ecological impacts likely to be associated with the proposed Coed Darcy Urban Village. The scope of the assessment is in accordance with Section 4.4 of the Scoping Report <sup>(1)</sup>, and takes full account of the Scoping Opinion received from Neath Port Talbot CBC (and their Consultees) in February 2005.

16.1.2 The importance of ecology and nature conservation was recognised at the outset of the Coed Darcy project, and a programme of detailed ecological surveys was initiated in 1998, with a Stage 1 ecological report <sup>(2, 3)</sup>. This investigated the likely presence of rare or protected species, and built an understanding of the nature conservation value of the site and the 'wider environs'. It also identified features, habitats or species that needed to be considered in the development of the subsequent Masterplan. The results of these surveys were used to produce an Environmental Assessment of the site in November 2002, and this report is presented at Appendix 16.A to this Environmental Statement.

16.1.3 Following the Environmental Assessment study in 2002, the need for further amphibian, bat and invertebrate surveys was identified, as was a supplementary assessment of an area of land to the south of the site associated with the proposed Southern Access. These surveys were undertaken during the 2003 and 2004 survey seasons in order to complete the baseline, and the results of this additional work are presented in Appendix 16.B.

16.1.4 Outputs from the ecological studies have continually informed the Scheme Proposals and the Masterplan, such that areas of the greatest nature conservation importance have been deliberately excluded from the development footprint.

16.1.5 This Chapter summarises the results of all the ecological surveys carried out between March 2001 and October 2004, along with any existing records, and therefore represents an assimilation of all existing ecological data for the site. This information has subsequently been used to inform a detailed assessment of the likely impacts of the proposals on habitats and species.

### 16.2 Assessment Methodology

#### Potential Impacts, Effects and Receptors

16.2.1 The surveys have indicated that the Llandarcy Oil Refinery, and the land along the proposed Southern Access, support a number of habitats and species of high nature conservation value. Several of the habitats are listed as Priority Habitats under the UK Biodiversity Action Plan (UKBAP), including wet woodland, reedbed, and lowland heathland, and the site also supports protected and/or UKBAP Priority Species, including invertebrates, amphibians (particularly the great crested newt (*Triturus cristatus*), reptiles, bats (particularly the lesser horseshoe bat (*Rhinolophus hipposideros*), and birds.

16.2.2 Surveys of the 'wider environs' (see Appendix 16.A) revealed further valuable habitats in the surrounding area, several of them associated with the adjacent Crymlyn Bog Special Area of Conservation (SAC).

16.2.3 The potential therefore exists for the proposed development to lead to the loss or degradation of valuable habitat, and for species of conservation concern to be

affected both directly and indirectly through the demolition, remediation and subsequent construction phase activities (largely involving habitat loss and disturbance effects), as well as during the operational phase of the project (with impacts associated with road traffic, increased proximity of the general public to the protected sites, etc.). Therefore, although the boundary of the outline planning application encompasses only a proportion of the refinery site as a whole (plus a narrow strip of land to the south), the ecological impact assessment extends to all areas of the refinery as well as to other valuable ecological receptors beyond the refinery fence.

- 16.2.4 Although the majority of ecological impacts associated with a development scheme of a scale and magnitude such as this tend to be adverse, the potential also exists for significant beneficial effects associated with the remediation of the site, including the removal of contaminated soils and the creation of new habitats, in particular wetland areas such as ponds, reed beds and other features of nature conservation value.

Legislation and Policy Framework

- 16.2.5 The following legislation, policy and guidance documents have been used to underpin this impact assessment:

- ❖ The Habitats Directive (92/43/EEC)
- ❖ The Conservation (Natural Habitats and c.) Regulations 1994
- ❖ The Bern Convention (on the Conservation of European Wildlife & Natural Habitats)
- ❖ The Wildlife and Countryside Act (1981, and subsequent amendments)
- ❖ Protection of Badgers Act (1992)
- ❖ The Biodiversity UK Action Plan
- ❖ Planning Policy Wales (PPW)
- ❖ Technical Advice Note (Wales) 5: Nature Conservation and Planning (1996)
- ❖ Neath Port Talbot County Borough Council Unitary Development Plan – Draft Deposit (January 2003).
- ❖ Neath Port Talbot County Borough Suggested Changes to the Deposit Plan, December 2004.

Study Area

- 16.2.6 For the purposes of this impact assessment, the important areas are determined by the outline planning application boundary and the development footprint/land take. These areas are clearly indicated on Figure 16.1, with a black line, and a dashed black line, respectively. However, the boundaries for the surveys undertaken during the original ecological assessment (which provided the majority of the baseline information) were based on the refinery fence and the wider BP/Welsh Development Agency land ownership boundary or 'wider environs' (indicated on Figure 16.1 with a dashed red line, and a full red line, respectively). Much of the baseline information therefore refers to areas within the 'refinery fence' or in the 'wider environs'. However, in order to be compatible with other chapters, the impact assessment section

concentrates on impacts within the 'outline planning application boundary' (i.e. the area within the refinery fence plus the Southern Access route corridor). Nevertheless, the potential exists for remote/ indirect effects on the habitats and species in this wider area of interest. Therefore, in addition to the assessment of areas within the application boundary, a more strategic assessment of areas outside this boundary (but within the study area set out in the development brief) has also been undertaken.

### 16.3 Baseline Environment Study Methodology

#### General Approach

16.3.1 The Ecological Assessment of the site undertaken since 1998 has provided a considerable amount of data. The detailed results of the survey work undertaken in 1998 are presented elsewhere (Cresswell Associates, 1998a, b), while the results of survey work carried out since 2001, are presented in Appendix 16.A (2001-2002) and Appendix 16.B (2003-2004). The baseline conditions used to underpin this impact assessment represent an assimilation of this information.

16.3.2 The following paragraphs present a summary of the methodologies used in the establishment of the ecological baseline for the impact assessment.

#### Desk Study and Consultation

16.3.3 A desk study was carried out to obtain any other existing ecological data relating to the site and its surroundings (as delineated by the survey boundary for the wider environs assessment). This included data requests from, and/or consultations with, the following organisations:

- ❖ Countryside Council For Wales
- ❖ Environment Agency
- ❖ Glamorgan Wildlife Trust
- ❖ Glamorgan Bird Club
- ❖ Glamorgan Badger Group
- ❖ Glamorgan Bat Group
- ❖ Butterfly Conservation
- ❖ Glamorgan Fungi Group
- ❖ Vincent Wildlife Trust

#### Field Surveys

16.3.4 Detailed ecological surveys have been carried out in all areas within the application boundary (as well as other areas within the refinery fence), and these are described in the section below. In addition, a more strategic level of assessment has been applied to the wider environs in order to identify the context of the site within the local area and to provide baseline information for the assessment of remote effects.

*Area within the Application Boundary*

Phase I Habitat Survey

- 16.3.5 Extended Phase 1 Habitat and Protected Species surveys of the area within the refinery fence (using standard CCW Phase 1 methodology) were undertaken in summer 2001; these were used to produce a detailed habitat map (see Figure 16.2a and Appendix 16.A). A subsequent survey of the Southern Access area was carried out in September 2003 (see Figure 16.2b).

Phase 2 Botanical Survey

- 16.3.6 More detailed botanical surveys were undertaken during summer 2001 (within the refinery fence) and July 2004 (Southern Access area). However, the areas of grassland within the refinery fence comprised pioneer plant communities that did not conform to the more natural habitats described in the NVC (National Vegetation Classification). Although it was possible to assign NVC communities, none of the other habitats within the refinery fence were deemed appropriate for detailed quadrat-based survey and NVC analysis, as they were either too small or insufficiently diverse to reliably assign sub-communities using quadrat sampling.

Bryophyte Survey

- 16.3.7 Targeted surveys for bryophytes (mosses and liverworts) were undertaken in November and December 2001, within the refinery fence. During the Phase 1 habitat surveys, areas were identified in advance in order to focus on the habitats and features most likely to be valuable for bryophytes. A total of 15 sites were surveyed; details of the survey locations for these surveys (and the lichen surveys) are provided in Appendix 16.A. At each site, the occurrence of bryophytes was noted during a general inspection of the area, and a more detailed search was made, and species list compiled at locations with significant bryophyte assemblages. In the case of smaller species, samples were collected for microscopic identification.

Lichens

- 16.3.8 The general value of the site for lichens was assessed, and targeted surveys were undertaken following a similar approach as for the bryophyte assemblages. The purpose of the surveys was to investigate the diversity of lichen communities across the site, to evaluate the site in terms of the current levels of atmospheric pollution, and to assess the potential future value of the site for lichen diversity. Further details of the survey technique employed are provided in Appendix 16.A.

Invertebrates

- 16.3.9 A comprehensive suite of invertebrate surveys was undertaken on land within the EIA boundary; land within the refinery fence was surveyed over the course of summer 2001, while that of the Southern Access and extension area was surveyed during the summer of 2004. The aims of the surveys were to investigate the presence of rare, protected or Biodiversity Action Plan (BAP) species, and to give an indication of the likely value for invertebrates of the different habitats and features present.

Terrestrial Invertebrates

- 16.3.10 A number of different sampling locations were identified within the refinery fence during the initial Phase 1 habitat survey, encompassing a range of different habitats and areas selected to be representative of the site as a whole. In order to sample

invertebrates effectively from a variety of microhabitats, a number of different sampling techniques were used. These included pitfall traps, sweep netting, flight interception traps/pan traps and moth surveys. The detailed methodologies for each of these techniques, as well as the locations of the survey areas, are provided in Appendix 16.A. Sampling was carried out on three occasions over the course of the summer in order to take account of seasonal variation in the emergence and activity of different species.

- 16.3.11 Such a detailed level of survey was not triggered for the habitats within the Southern Access route corridor during the Phase 1 habitat survey in 2003, owing to the limited nature conservation value of the improved and semi-improved grassland present. However, it was considered possible that a valuable moth fauna could be supported by the areas of marshy grassland to the west of the proposed route, and that these communities could potentially be affected by the proposals. A combination of field observation and moth trapping was used to assess the nature conservation value of the invertebrates of these habitats, and these surveys were undertaken during summer and autumn 2004 (see Appendix 16.B for details).

#### Aquatic Invertebrates

- 16.3.12 Aquatic invertebrate sampling was undertaken in the South Site Reservoir and the Triangular Pond during 2001 (see boxes 2 and 8, respectively, on Figure 16.2a). No other water bodies within the site were considered likely to support any more than a very limited aquatic invertebrate fauna, generally because of very apparent contamination and/or an absence of any plants or habitat features likely to provide shelter. The two water bodies were sampled with a standard Freshwater Biological Association pond net using the methodology employed for the National Pond Survey<sup>(5)</sup>. This consisted of a 3-minute kick-and sweep-sample covering all habitats and a 30-minute hand search. After collection, the samples were preserved on-site in 100% Industrial Methylated Spirit (IMS) and returned for identification. Further details of the methodologies used are provided in Appendix 16.A.

#### Amphibians

- 16.3.13 The likely value for breeding amphibians of all potentially suitable water bodies within the EIA area and within 500m of its boundary was assessed. During March 2001 a survey for frogs and toads, comprising a daylight search for spawn and a nocturnal torchlight survey, was undertaken at four water bodies (see Appendix 16.A). Following this, torchlight surveys of the triangular pond were undertaken in April and May in order to investigate the presence of, and subsequently assess the size of, the great crested newt population.
- 16.3.14 Further surveys for great crested newts were carried out between March and May 2003, and May and June 2004, with the intention of confirming (as far as reasonably possible) the presence or absence of this species elsewhere within the planning application boundary and the wider environs (see Appendix 16.B for details). A total of three suitable water bodies within the refinery fence and two suitable water bodies within 500m of the proposed Southern Access were identified; the locations of these water bodies are indicated in Appendix 16.B.
- 16.3.15 The surveys were undertaken as follows:
- ❖ four survey visits were conducted during the period mid-March to mid-June with at least two of the survey visits conducted between mid-April and mid-May;

- ❖ the surveys were conducted in suitable weather conditions (night-time air temp. >5°C, little/no wind, no rain); and
- ❖ the surveys employed three methods, as appropriate: egg searches, torching and bottle-trapping (details of these methods are provided in Appendix 16.B).

#### Reptiles

- 16.3.16 During a survey undertaken in 1998, reptiles (primarily common lizards) had been recorded in large numbers across the refinery site <sup>(2, 3)</sup>. During the scoping for the EIA, it was considered that the entire area within the planning application boundary was likely to be of value to reptiles, and that a detailed assessment of population sizes would be both impractical (given the considerable size of the area involved) and unnecessary (as detailed information on population structure would be unlikely to further inform mitigation, given that a precautionary approach to reptiles was considered appropriate from an early stage).
- 16.3.17 A walkover survey of the site was carried out during 2001, however, in order to assess which of the remaining areas were most likely to be of value to reptiles, and a map of the site was produced illustrating the most valuable habitat areas for reptiles (see Figure 5, Appendix 16.A).
- 16.3.18 The suitability of habitats along the proposed Southern Access route for reptiles was assessed during the extended Phase 1 habitat and protected species survey in 2004, and, following the identification of suitable habitat, a targeted reptile survey was undertaken. A total of 100 artificial refuges (pieces of roofing felt) were placed in areas suitable for reptiles, focussing on the areas of marshy grassland, the edge of the swamp habitat, along the interface between the bracken and the grassland, and in the area around the farm buildings and the associated pond. The refuges were checked for reptiles on eight separate occasions between June and August, in suitable weather conditions (see Appendix 16.B for details) in parallel with careful searches for basking animals elsewhere.

#### Birds

- 16.3.19 Comprehensive bird surveys within the refinery fence were undertaken on four separate occasions during the summer (early-May, mid-June, mid-July and late-August, 2001), and once during the winter (January 2002) in order to take account of seasonal variation in the arrival and activity of different species. The survey visits were made in order to assess the importance of the breeding bird assemblage within the survey areas and to enable the impacts of the proposed development to be assessed. A series of transects was established throughout the areas within the planning application boundary. These transects were walked slowly, shortly after dawn, on each separate occasion, and all birds seen or heard were recorded. Evidence of breeding, including singing, nest-building and provisioning of young, was also noted, wherever applicable (see Appendix 16.A for details). Subsequently, bird surveys were also undertaken along the proposed Southern Access during spring and summer 2004 (late-March, late-April, late-May and early-July; see Appendix 16.B).
- 16.3.20 During the wider environs surveys (see below) it became clear that there was the potential for birds in these areas to be indirectly affected by the proposed development. Although these species spend the majority of their time outside the planning application boundary (particularly within the habitats of the SAC), it was considered possible that some may use the habitats within the refinery fence as supplementary foraging areas, and that any loss of habitats could have an indirect

affect on their populations by reducing the feeding resources available to them over the winter. Additional winter surveys were carried out to investigate the level of use of the site by these species; two surveys were therefore undertaken, in February and March 2002, during which the four main water bodies on the site were visited along with six areas of habitat considered most likely to represent winter foraging habitat for birds known to breed in the SAC (see Figure 6b, see Appendix 16.A).

- 16.3.21 More details of the bird survey techniques employed are provided in Appendix 16.A and Appendix 16.B.

#### Bats

- 16.3.22 The value of the area within the application boundary for roosting and foraging bats was assessed through internal/external inspections and emergence/activity surveys, respectively.

#### *Internal/external Inspections*

- 16.3.23 Buildings were carefully searched to assess their likely occupancy by roosting or hibernating bats. All buildings, particularly those due to be demolished, were searched by experienced, licensed bat workers in order to locate evidence of current or past bat roosts, in the form of bats, droppings, staining, feeding signs, and/or remains of bats. Where safety considerations prevented access into parts of some buildings, these areas were scrutinised with binoculars to assess their likely occupancy by roosting or hibernating bats. The outsides of the buildings were searched for access points, and any evidence of their use by bats. The surveys of suitable buildings within the refinery fence were undertaken during 2001 and March 2003, while those along the Southern Access were undertaken during September 2003.

- 16.3.24 All mature trees and other suitable structures were also carefully scrutinised with binoculars to assess their likely occupancy by roosting or hibernating bats. Where the crowns were low and access into the trees was relatively straightforward, the trees were climbed in order to investigate any potentially suitable holes or crevices. The likely value of the various habitat features for commuting or foraging bats was also critically assessed with a view to informing activity surveys (see below).

#### *Emergence/activity Surveys*

##### a) Within the Refinery Fence

- 16.3.25 The mosaic of species-rich grassland, scrub, woodland, wetland and heathland across the site suggests that it may be of considerable value for foraging bats. A series of surveys throughout summer 2003/2004 was therefore undertaken in order to assess the relative importance of different parts of the site. Three bat activity surveys were undertaken in 2003 during the months of July, September and October in order to identify foraging areas and commuting routes for bats. An additional bat activity survey was undertaken in June 2004, in order to investigate bat activity during the earlier part of their active season. The site was divided into five compartments, with one transect established within each compartment. Each transect passed through a representative sample of the habitats in that compartment focussing on those identified as being of particular value to foraging and commuting bats.
- 16.3.26 Surveys commenced before sunset, and continued for up to three hours. During each activity survey, five surveyors observed bat activity along the five transects; echolocation calls were recorded using Pettersson D240 bat detectors and Minidisc

players, to enable subsequent analysis of calls and identification of the species present, using Batsound™ software. Where possible, surveyors noted the behaviour and direction of flight of the bats observed, in order to identify commuting routes and areas of particular importance for foraging.

b) Proposed Southern Access

16.3.27 Bat emergence and activity surveys along the route of the proposed Southern Access were undertaken at monthly intervals between June and July 2004. The emergence surveys focussed on the complex of farm buildings comprising Penyscoed Farm (see yellow Target Note 7 on Figure 1, Appendix 16.B) and the two mature oaks to the west of the track leading down towards the Tennent Canal (yellow Target Notes 12 and 13). These surveys attempted to determine the presence or absence of roosting sites, the numbers and species of bats using any roosting sites on each occasion, and the commuting routes used by bats across the site to and from these roosting sites. The potential roost sites were observed, from the outside, from sunset for a period of at least one and a half hours; surveyors were positioned so as to cover all potential access points effectively.

16.3.28 Following each emergence survey, an activity survey along the proposed route of the Southern Access was carried out. Two surveyors walked in a northerly direction along the access track towards the refinery fence and two in a southerly direction on the track towards the Tennent Canal. Bat activity was observed/recorded using the same methodology as that for the activity surveys undertaken within the refinery fence (described above).

Badgers

16.3.29 Surveys of the site for signs of badger activity, including setts, dung pits, latrines and paths, were undertaken throughout the area within the planning application boundary. The area within the refinery fence was surveyed in early March 2002 (see Appendix 16.A), and the Southern Access route was surveyed in September 2003. Any badger sett identified was classified according to recognised definitions of both sett size and importance (e.g. 'main sett', 'annex', 'outlier' etc) and current level of activity of each sett entrance hole (i.e. 'well-used', 'partially-used', 'disused').

Otters and Water Voles

16.3.30 A survey for otter and water vole activity along the Tennant Canal, to either side of the pipe tracks, and within the two areas of marshy grassland in the vicinity of Penisa'r-coed Farm, was undertaken during September 2004. The survey involved searching for characteristic otter signs (including holts, spraints, footprints, lying up sites and slides), and searching suitable habitat within the survey area for water vole latrines, feeding signs and other remote indicators. In addition, the likely value of the different habitats for otters and water voles was critically assessed.

*Wider Environs Surveys*

16.3.31 An assessment of the habitats and species outside the refinery fence (but within the study area boundary set out in the development brief) was undertaken in December 2001. The survey area extended beyond Jersey Marine to the south and Skewen to the north, and as far as Crymlyn Bog to the west and the railway line to the east (see 'wider environs' boundary illustrated on Figure 16.1). Surveys were not undertaken within Crymlyn Bog since a substantial amount of background information is available for this site.

16.3.32 The survey comprised a general walkover of this large area (using CCW Phase I habitat maps as a guide) to underpin the development of a sensitivity/constraints plan of the of the refinery's surroundings. Areas were mapped according to their relative nature conservation value, and target notes were compiled to provide further details. This information was subsequently used to produce constraints maps, in which areas are classified as either of major constraint (red), moderate constraint (orange), minor constraint (yellow) or no constraint (green) based on designated status, habitat type etc. Further details on these assessment criteria are provided in Appendix 16.A. The surveys were used to identify further surveys required in order to investigate potential remote impacts associated with the re-development (including winter bird surveys and wider surveys for great crested newts, see above).

#### 16.4 Assessment Criteria

16.4.1 The assessment has been carried out using a three-step process as set out below. The measures of receptor importance/sensitivity, impact magnitude and residual impact significance have been developed with reference to the Institute of Ecology and Environmental Management's (IEEM) draft *Guidelines for Ecological Impact Assessment*.

16.4.2 The first step in the impact assessment process has been to classify the importance and/or sensitivity of the various ecological receptors using the approach set out in Table 16.1.

**Table 16.1 Importance/Sensitivity of the Receptor**

| Receptor Importance/Sensitivity            | Examples                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>International = 'Very high'</b>         | <p>An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC, Ramsar site, Biogenetic Reserve).</p> <p>A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of a larger whole.</p> <p>Any regularly occurring population of an internationally important species, that is threatened or rare in the UK (i.e. it is listed as occurring in 15 or fewer 10km squares in the UK).</p> <p>A regularly occurring, nationally significant population of any internationally important species.</p>                                                                                                                                                                                                                                                                        |
| <b>National = 'High'</b>                   | <p>A nationally designated site (SSSI, NNR, Marine Nature Reserve, etc.), or a discrete area which the country conservation agency has determined meets the published selection criteria for national designation (e.g. SSSI selection guidelines) irrespective of whether or not it has yet been notified.</p> <p>A viable area of a priority habitat identified in the UKBAP, or smaller areas of such habitat which are essential to maintain the viability of a larger whole (this could include networks of ancient and/or species-rich hedges or even small groups of ancient trees).</p> <p>Any regularly occurring population of a nationally important species (for example, identified as a priority species in the UKBAP, or a species of principal importance for Welsh biodiversity under Section 74 of the CRoW Act (2000)) that is threatened or rare in the region or county.</p> |
| <b>County/Unitary Authority = 'Medium'</b> | <p>County/Unitary Authority designated sites and other sites that the designating authority has determined meet the published ecological selection criteria for designation (including SINCs, Local Nature Reserves and Wildlife Trust sites).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |