

## CONTENTS

|   |    |
|---|----|
| INTRODUCTION .....                          | 1  |
| Methodology – Application Site.....         | 1  |
| Methodology – Designated Nature Sites.....  | 1  |
| Legislation .....                           | 3  |
| Consultations.....                          | 4  |
| Authors.....                                | 4  |
| HABITATS AND VEGETATION .....               | 4  |
| Application Site.....                       | 4  |
| Designated Nature Sites.....                | 7  |
| FAUNA .....                                 | 8  |
| Application Site.....                       | 8  |
| Designated Nature Sites.....                | 9  |
| EVALUATION .....                            | 12 |
| IMPACT OF THE PROPOSED WASTE FACILITY ..... | 12 |
| Application Site.....                       | 13 |
| Designated Nature Sites.....                | 13 |
| Cumulative Impacts.....                     | 15 |
| MITIGATION MEASURES .....                   | 15 |
| CONCLUSION .....                            | 16 |
| REFERENCES .....                            | 17 |

## FIGURES

Figure 4-1 Habitat Map

## TABLES

Table 4-1 Qualifying Interests of the River Slaney Valley cSAC

## APPENDICES

Appendix 4-1 Article 6 Appropriate Assessment : Natura Impact Statement



## INTRODUCTION

- 4.1 This chapter of the Environmental Impact Statement has been prepared by Roger Goodwillie B.Sc., and Ecofact Environmental Consultants under the direction of SLR Consulting Ireland, acting on behalf of Roadstone Wood Ltd.
- 4.2 This Chapter describes habitats around the existing disused quarry at Brownswood, identifies flora and fauna and assesses the level of existing ecological interest. In addition it puts the site in the local context with regard to nearby designated nature sites, specifically the River Slaney Valley candidate Special Area of Conservation (cSAC) immediately west of the application site and Wexford Harbour Special Protection Area (SPA) approximately 30km south, and downstream of, the site.
- 4.3 This Chapter has been prepared taking account of site particulars and the description of the proposed waste recovery facility and waste activities to be undertaken at the former quarry in Brownswood, Co. Wexford provided in Chapters 1 and 2 of this Environmental Impact Statement. It also has regard to the requirement for an Appropriate Assessment / Natura Impact Statement in respect of the River Slaney Valley cSAC identified by Wexford County Council at EIA scoping stage.

## Methodology – Application Site

- 4.4 Terrestrial ecological fieldwork in and around the application site was carried out in August 2010. The application area was inspected systematically by walking along existing boundaries and access tracks, as well as criss-crossing the site, where possible to do so. During this time, a record was made of all flora and fauna and habitat types.
- 4.5 All vascular plants observed during the survey were identified to species level. Bird species were noted whenever encountered or clearly identifiable through calls or song. Signs of mammal activity including tracks and footprints, scats and burrows or other resting places were searched for, as well as looking out for the mammals themselves. Invertebrates (e.g. bees and butterflies) were recorded from flowers or under stones etc. and any unusual species were noted. For the purposes of this chapter, habitats are classified as per Fossitt (2000)

## Methodology – Designated Nature Sites

- 4.6 In light of feedback from Wexford County Council at EIA scoping stage, it was decided to commission a stand-alone Appropriate Assessment / Natura Impact Statement from Ecofact Environmental Consultants to assess the potential impacts of the proposed development on the adjoining River Slaney Valley cSAC. Key elements of the Appropriate Assessment / Nature Impact Assessment are presented in this Chapter of the EIS. The full assessment report, with appendices, is reproduced as Appendix 4-1.

- 4.7 A desktop study was undertaken to identify the location and conservation interests of designated Natura 2000 sites which could potentially be affected by the proposed development / restoration scheme. The desktop study identified the conservation interests of the designated sites with respect to the qualifying interests (habitats and species) relevant to the designated sites within the study area.
- 4.8 Further desk study research included publically available information from statutory bodies such as the National Parks and Wildlife Service (NPWS), the Environmental Protection Agency (EPA) and WFD Ireland. The desk study included data gathering with regard to ecological interests and current and historical water quality and hydrological data within the study area.
- 4.9 Building on the terrestrial ecological surveys previously undertaken for the EIS at and around the application site, additional field survey work was undertaken to characterise the habitats and ecological features within the River Slaney Valley cSAC and the Wexford Harbour SPA, with particular regard to the key qualifying interests of the sites. Annex I habitats for which the cSAC is designated were recorded within the study area, as was any evidence of Annex II species or suitable habitats supporting these species. Key features for which the SPA is designated were also identified.
- 4.10 The River Slaney corridor was surveyed during both March and April 2011 to approximately 1 kilometre upstream and downstream of the quarry site at Brownswood. Walkover surveys and a boat based survey were undertaken to assess the ecological communities of the riparian and aquatic habitats. Macroinvertebrate sampling was undertaken at two locations on the River Slaney adjacent to the bank upstream and downstream of the Brownswood quarry facility. Sampling was carried out using a sweep net, both from the boat and from the shore, where physical conditions in this depositing stretch of the River Slaney were unsuitable for kick-sampling due to depth and soft substrate.
- 4.11 A sampling exercise was also carried out on the body of water in the quarry void during April 2011 to complement existing water quality sampling data and to determine if there were any significant water quality issues in the water body which is to be dewatered to the River Slaney via settlement ponds / mobile silt traps. Using a small inflatable boat, two water samples were taken at each of two reference stations on the quarry void, one subsurface and one hypolimneal. Samples were retrieved using a WaterMark polycarbonate horizontal water sampler. The 4 No. water samples were subsequently analysed for a number of key indicator parameters.
- 4.12 The Natura Impact Statement follows the guidance published by the National Parks and Wildlife Service (NPWS 2009) '*Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities*'. Based on these guidelines, the Appropriate Assessment process followed a two-stage approach described below:
- *Stage One: Screening / Test of Significance* - the process which identifies the likely impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant;

- *Stage Two: Appropriate Assessment* - the consideration of the impact of the project or plan on the integrity of the Natura 2000 site, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.

4.13 Full details on the staged approach to Appropriate Assessment are provided in Chapters 2-4 of the Natura Impact Statement reproduced in Appendix 4-1.

## Legislation

4.14 Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the EU Habitats Directive) and Council Directive 2009/147/EC on the conservation of wild birds (the EU Birds Directive) oblige member states to protect habitats and species that are of importance on a Europe-wide scale. Annex I and II of the Habitats Directive and Annex I of the Birds Directive list species and habitats that are of greatest conservation importance on an EU-wide scale and for which conservation areas must be designated.

4.15 These designations are:

- Special Areas of Conservation (SAC) for habitats listed in Annex I of the Habitats Directive and species listed in Annex II. Some of these habitats or species are prioritised for conservation measures (\* Priority Species or Habitats) and
- Special Protection Areas (SPA) for Birds listed in Annex I of the Birds Directive

4.16 A number of other Annexes in both Directives list species that require strict protection but not necessarily require designation of conservation areas. Ireland is also a signatory to a number of conservation-related agreements and conventions such as the Berne and Bonn Conventions.

4.17 The EU Directives have been transposed into Irish law through a number of legal instruments including the *European Communities (Natural Habitats) Regulations 1997-2005 (the 'Habitat Regulations')*, the *Wildlife Acts, 1976-2000*, the *Planning and Development Act, 2000*, and the *Foreshore Acts, 1932-1992*.

4.18 Article 6, paragraph 3 of the EU Habitats Directive, transposed as Regulation 29 of the *European Communities (Natural Habitats) Regulations 1997*, states that:

*6(3) Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site ....., the competent national authorities shall agree to the plan or project only after having ascertained that it will not*

*adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*

- 4.19 Other legal instruments such as the Wildlife Acts (1976 and 2000) and the Flora Protection Order (1999) also provide protection for species of national conservation importance. Proposed Natural Heritage Areas (pNHA) are conservation designated areas that protect species and habitats of regional and national importance. At a more local level, there may be objectives set out in County Biodiversity Action Plans in respect of uncommon or rare species and habitats within the County.

## Consultations

- 4.20 In preparing this chapter, consultation, including the review of publically available material, has been undertaken with the following statutory bodies and competent authorities:
- National Parks and Wildlife Service (NPWS);
  - Inland Fisheries Ireland (IFI);
  - Environmental Protection Agency (EPA);
  - Wexford County Council
  - South Eastern River Basin District (SERBD)

## Authors

- 4.21 The assessment of impacts on terrestrial ecology at the application site was undertaken by Roger Goodwillie, while those on designated nature sites in the vicinity of the site, principally the River Slaney Valley cSAC, was undertaken by Dr. William O' Connor and Daireann McDonnell of Ecofact Environmental Consultants.
- 4.22 Mr Goodwillie is familiar with the application site and the general area, having examined it in connection with other development proposals on Roadstone Wood Ltd.'s landholdings in 2000 and 2001. He had also inspected the nearby River Slaney as part of a flooding study undertaken in 2003.
- 4.23 Ecofact has previously undertaken work in the cSAC, having contributed on ecological aspects to the Route Corridor Selection Report for the N11 / N25 Oilgate to Rosslare upgrade scheme

## HABITATS AND VEGETATION

### Application Site

- 4.24 The quarry has extensive cliffs of exposed siliceous rock (ER1 in Fossitt, 2000) and falls to an artificial pond (FL8) which is deep except at the SE corner. Around the pond, there are areas of spoil and bare ground (ED2), some of it maintained by quarry traffic and other parts result from being covered by inert quarry or returned concrete. Any ground outside these zones is generally recolonising bare ground (ED3). Some disused buildings are included within the application area.

## Cliffs and pond

- 4.25 The existing quarry void is surrounded by rough cliffs and ledges which offer some substrate for plant growth. Towards the top there are also soil patches derived from minor rock falls and settlement. The main woody species which are establishing themselves are butterfly bush *Buddleja davidii* and gorse *Ulex europaeus* and they occur with some grey willow *Salix cinerea*, bramble *Rubus fruticosus* and a little field rose *Rosa arvensis* and birch *Betula pubescens*.
- 4.26 In spaces between these, are wall valerian *Centranthus ruber* (mostly white-flowered), foxglove *Digitalis purpurea*, peppercross *Lepidium heterophyllum*, wood sage *Teucrium scorodonia*, sheep's bit *Jasione montana*, rose-bay *Chamerion angustifolium* and shield fern *Polystichum setiferum* with a little silver hair grass *Aira caryophyllea*, catsear *Hypochaeris radicata* and wall pennywort *Umbilicus rupestris*.
- 4.27 The fringes of the pond have a number of willows *Salix cinerea* but no real marginal growth because of its depth.

## Recolonising bare ground

- 4.28 The habitats being re-vegetated are divisible into two types – nutrient-rich and nutrient-poor. The former are derived from topsoil which is located generally on the northern edge of the quarry void but can turn up anywhere. Here agricultural weed species predominate, for example

|                              |                     |
|------------------------------|---------------------|
| <i>Persicaria maculosa</i>   | redshank            |
| <i>Cirsium vulgare</i>       | spear thistle       |
| <i>Chenopodium album</i>     | white goosefoot     |
| <i>Rumex obtusifolius</i>    | broad-leaved dock   |
| <i>Atriplex patula</i>       | orache              |
| <i>Polygonum aviculare</i>   | knotgrass           |
| <i>Arrhenatherum elatius</i> | false oat grass     |
| <i>Anagallis arvensis</i>    | scarlet pimpernel   |
| <i>Sonchus asper</i>         | prickly sow thistle |
| <i>S.arvensis</i>            | field sow thistle   |
| <i>Galeopsis tetrahit</i>    | hemp nettle         |

- 4.29 These grow along with butterfly bush *Buddleja davidii*, probably the commonest plant over the whole area.
- 4.30 The poor soils are more widely found, at the edges of roadways and over much of the levelled areas all around the quarry void. The first stages of plant succession see a few wisps of mosses, hard grass *Catapodium rigidum*, pearlwort *Sagina apetala* or *S.procumbens*.
- 4.31 A suite of typical quarry species then becomes established with tufts of Yorkshire fog *Holcus lanatus* and common bent *Agrostis capillaris* along with willowherbs *Epilobium brunnescens*, *E.parviflorum* and coltsfoot *Tussilago farfara*. Other broad-leaved species include

|                                  |                   |
|----------------------------------|-------------------|
| <i>Centaureum erythraea</i>      | centaury          |
| <i>Lotus corniculatus</i>        | birdsfoot trefoil |
| <i>Buddleja davidii</i>          | butterfly bush    |
| <i>Senecio jacobaea</i>          | ragwort           |
| <i>Prunella vulgaris</i>         | self-heal         |
| <i>Reseda luteola</i>            | dyer's rocket     |
| <i>Picris echioides</i>          | bristly ox tongue |
| <i>Tripleurospermum inodorum</i> | scentless mayweed |
| <i>Daucus carota</i>             | wild carrot       |
| <i>Leucanthemum vulgare</i>      | dog daisy         |

4.32 To the west of the quarry void, an abandoned pathway adds much Bilbao fleabane *Conyza floribunda*, figwort *Scrophularia nodosa*, thyme-leaved speedwell *Veronica serpyllifolia* and tiny plants of musk storksbill *Erodium moschatum*, while to the east an abandoned pathway supports the two St John's Worts *Hypericum humifusum* and *H. pulchrum*,

4.33 On the southern side of the existing quarry void, a discrete area of sand occurs, most likely it is a temporary stockpile sourced from south-east County Wexford. This supports plants out of keeping with the rest of the site and unlikely to spread. There is much hare's foot clover *Trifolium arvense* and white campion *Silene latifolia* as well as

|                             |                         |
|-----------------------------|-------------------------|
| <i>Rumex acetosella</i>     | sheep's sorrel          |
| <i>Achillea millefolium</i> | yarrow                  |
| <i>Trifolium repens</i>     | white clover            |
| <i>Leontodon saxatilis</i>  | small hawkbit           |
| <i>Geranium molle</i>       | soft cranesbill         |
| <i>Verbascum thapsus</i>    | mullein                 |
| <i>Erodium cicutarium</i>   | sea storksbill          |
| <i>Filago vulgaris</i>      | common cudweed          |
| <i>Lotus subbiflorus</i>    | hairy birdsfoot trefoil |
| <i>Carduus nutans</i>       | musk thistle            |

4.34 Away from this area, at the south-east corner of the existing pond there is some Japanese knotweed *Fallopia japonica*.

## Adjacent habitats

4.35 The outer fringes of the quarry have a scrub cover of common gorse *Ulex europaeus*, bramble *Rubus fruticosus* and elder *Sambucus nigra* in most cases and these grow from the top of the existing quarry face back to the property boundary.

4.36 On the southern side, the trees of Brownswood House add both to the visual effect and the vegetation with young beech *Fagus sylvatica*, grey alder *Alnus incana* and birch *Betula pubescens* and relatively old *Buddleja*.

## Designated Nature Sites

### Annex I Habitats

- 4.37 According to the site synopsis for the River Slaney Valley cSAC good examples of wet woodland are found along the banks of the Slaney and within reed swamps on the lower reaches of the river. Grey Willow (*Salix cinerea*) scrub and pockets of wet woodland dominated by Alder (*Alnus glutinosa*) have become established in places. Ash (*Fraxinus excelsior*) and Birch (*Betula pubescens*) are common in the latter and the ground flora is typical of wet woodland with Meadowsweet (*Filipendula ulmaria*), Angelica (*Angelica sylvestris*), Yellow Iris, Horsetail (*Equisetum* spp.) and occasional tussocks of Greater Tussock-sedge (*Carex paniculata*).
- 4.38 These woodlands have been described as two types: one is quite eutrophic, is dominated by Willow and is subject to a tidal influence, as recorded from within the study area. The other is flushed or spring-fed subject to waterlogging but not to flooding and is dominated by Alder and Ash.
- 4.39 The intertidal mud-flat and estuarine habitats do not occur within the vicinity of the application site at Brownswood, where the River Slaney is characterised as a depositing lowland river downstream of Enniscorthy. It is influenced by tidal fluctuations but the macroinvertebrate and botanical communities of the riparian and aquatic habitats indicate that freshwater conditions prevail.
- 4.40 The riparian margins of the Slaney adjacent to the site at Brownswood are dominated by alluvial wet woodland (corresponding to the 91E0 priority Annex I habitat) and wet grassland / marsh habitat within the floodplain. The conservation value of these habitats has been recognised by the designation of this section of the river within the Slaney River Valley cSAC and also the Wexford Harbour and Slobs SPA (with respect to the provision of important bird habitats including these wetland habitats, reedbeds and wet woodlands).
- 4.41 Good examples of alluvial wet woodland have been recorded along the banks of the River Slaney within the study area. Grey Willow (*Salix cinerea*) dominates with willow coppice / scrub and pockets of wet carr woodland dominated by willow species and Alder (*Alnus glutinosa*) were recorded from both sides of the N11 road corridor within the cSAC designation.
- 4.42 Himalayan balsam was found to dominate the understory of this woodland within the alluvial wet woodland along the River Slaney corridor within the Natura 2000 designations (it also occurs at settlement ponds within the application site). Japanese knotweed was also frequently recorded along the N11 road corridor within the cSAC and also within the alluvial wet woodland opposite the Boro River confluence, downstream of the Brownswood Quarry site.
- 4.43 Rare aquatic plant species have been recorded from with the Slaney River Valley cSAC site. Short-leaved Water-starwort (*Callitriche truncata*) is a very rare, small aquatic herb and Opposite-leaved Pondweed (*Groenlandia densa*) is a species that is legally protected under the Flora Protection Order,



1999. Both species occur within the River Slaney main channel and have been recorded from downstream of the study area at Macmine Junction / Edermine Bridge. However, neither of these species was recorded during the recent field study and neither are they listed as qualifying Annex II species for the River Slaney Valley cSAC.

- 4.44 Table 4-1 below presents the qualifying interests of the Slaney River Valley cSAC (ie. habitats and species listed on Annex I and Annex II of the EU Habitats Directive (1992) that occur within the study area):

Table 4-1  
Qualifying Interests of the River Slaney Valley cSAC

|                  | Qualifying Interests  | Potential Occurrence in cSAC (within study area) |
|------------------|---|--|
| Annex I Habitats | Alluvial wet woodlands (91E0)                                     | ✓  |
|                  | Old oak woodland (91A0)   |  |
|                  | Floating river vegetation (3260)                                  |  |
|                  | Estuaries (1130)  |  |
|                  | Upper saltmarsh (1330)  |  |
|                  | Mudflats and sandflats not covered by seawater at low tide (1140) |  |
| Annex II Species | Sea lamprey (1095)  |  |
|                  | River lamprey (1099)  | ✓  |
|                  | Brook lamprey (1096)  | ✓  |
|                  | Freshwater pearl mussel (1029)                                    |  |
|                  | Twaite Shad (1103)  | ✓  |
|                  | Allis Shad (1102)   | ✓  |
|                  | Atlantic salmon (1106)  | ✓  |
|                  | Otter (1355)  | ✓  |

## FAUNA

### Application Site

- 4.45 The only mammal obvious in the quarry is the rabbit which occurs mainly at the southern end, but sparsely throughout the rest of the site. Quarries are often frequented by the Irish hare, but there was no evidence either of this or of the fox. The latter is however likely to feed there at times.
- 4.46 A peregrine has bred on site for several years and the nest was successful in 2010 with a young bird present during the site visit in August 2010. The nest is situated on an inaccessible ledge in the west-facing cliff above the pond. The birds would feed over a wide area and would not depend on prey within the quarry itself.

- 4.47 Other birds seen were jackdaws, herring gull and large numbers of swallows and house martins which were feeding in the sheltered conditions. In marginal scrub there were willow warbler, robin, dunnock, chaffinch and linnet. The stonechat is also a likely species. Mallard (3) were present on the pond but in view of its depth are unlikely to breed there. There were no other aquatic species.
- 4.48 The butterflies seen in late summer were meadow brown, small tortoiseshell, peacock, red admiral, small white and large white. Conditions would also suit the wall brown, small copper and common blue and these could be expected (Butterfly Ireland website).

## Designated Nature Sites

### Annex II Species

#### *Freshwater Pearl Mussel*

- 4.49 The Pearl Mussel is listed under Annex II and V of the Habitats Directive (92/43/EEC). It is legally protected in Ireland under Schedule 1 of the Wildlife Act (1976 (Protection of Wild Animals) (Statutory Instrument No. 112, 1990) and the European Communities (Natural Habitats) Regulations (Statutory Instrument No. 94, 1997). This species is listed as one of the conservation interests of the River Slaney Valley cSAC; however, it occurs at a significant distance upstream of the study area within the Derreen River, a tributary of the Slaney, and will not be impacted by the proposed development.
- 4.50 The duck mussel (*Anadonta anatina*) belongs to the same family as the freshwater pearl mussel (Unionidae) and has been recorded from the River Slaney within the current study area. However, this species is not listed under Annex II of the EU Habitats Directive (1992) and is not considered further in this assessment.

#### *Brook, River and Sea Lampreys*

- 4.51 The brook lamprey is the smallest of the three lamprey species native to Ireland and it is the only one of the three species that is non-parasitic and spends all its life in freshwater (Maitland & Campbell 1992). The River lamprey is larger in size than the brook lamprey and exhibits an anadromous life cycle (i.e. where anadromous fish spend most of their adult lives in salt water, and migrate to freshwater rivers and lakes to reproduce).
- 4.52 The sea lamprey is the largest of the Irish lampreys. Brook lamprey and sea lamprey are listed in Appendix II, while river lamprey is listed in both Appendices II and IV of the Habitats Directive (92:43:EEC). All three species are listed in Appendix III of the Berne Convention. All three species have been recorded from the River Slaney (Kurtz and Costello, 1999).
- 4.53 An extensive sampling programme for lamprey and shad was undertaken in the Slaney cSAC, including the estuary by staff of the Southern and Eastern Regional Fisheries Boards (King and Linnane, 2004). The project was undertaken between April 2003 and March 2004. Juvenile river/brook lamprey were found to be widespread in the Slaney cSAC upstream of Enniscorthy.

4.54 Juvenile sea lamprey were also recorded in the Slaney with spawning of adult sea lamprey recorded in the main channel of the Slaney cSAC in low numbers, indicating cause for concern on the status of sea lamprey in the Slaney cSAC. Lamprey spawning was found to occur upstream of the study area, in the freshwater stretches of the River Slaney upstream of Enniscorthy.

4.55 No spawning habitat for lamprey species was recorded from within the study area; however, anadromous sea and river lamprey will occur within the study area as they migrate to spawn upstream. Juvenile River / Brook lamprey were recorded from extensive, suitable silt deposits along the River Slaney corridor within the study area during the sweep-net sampling exercise.

### *Atlantic Salmon*

4.56 The Atlantic salmon is listed under Annexes II and V of the EU Habitats Directive and Appendix III of the Berne Convention. Salmon are listed as one of the key conservation objectives of the Slaney River Valley SAC.

4.57 Salmon spawning and nursery areas are present throughout the upper reaches of the River; however, these do not occur within the lower depositing reaches of the study area at Brownswood. Important salmonid (salmon and trout) spawning tributaries of the River Slaney such as the Boro River have been identified directly downstream of the study area.

### *Shad*

4.58 Twaite Shad (*Alosa fallax*) and Allis Shad (*Alosa alosa*) are among the rarest species of fish breeding in Irish freshwaters and are listed under Annexes II and V of the EU Habitats Directive (1992). Both species are also listed in Appendix III of the Bern Convention. Shad have an anadromous life cycle and both species have been recorded from the Lower Slaney. Both species are likely to occur within the study area. The status of both shad species is considered to be very vulnerable in the Slaney River cSAC.

### *Eurasian Otter*

4.59 The otter *Lutra lutra* is listed under Annex II of the EU Habitats Directive and under Annex II of the Berne Convention it is also a legally protected species under the Wildlife Act, 1976 (and Wildlife (Amendment) Act, 2000). This species is listed as one of the qualifying interests of the Slaney Valley cSAC designation. Otter are found throughout Ireland and tend to occupy linear territories along watercourses and are rarely found far away from water.

4.60 Otters utilise the entire study area within the River Slaney corridor and more than one territory may be associated with the stretch of the river within the study area. No otter holts were identified within the study area during the walkover survey; however evidence of otter activity including spraints and prints were recorded along the river bank.

### *Wintering Birds*

4.61 Wintering birds are the key conservation interest of the Wexford Harbour and Slobs SPA and are also listed as a conservation interest of the Slaney River Valley SAC. The Draft Main conservation objectives for this site are to

maintain the conservation interests for this SPA at favourable conservation status: Cormorant; Bewick's Swan; Whooper Swan; Greenland White-fronted Goose; Light-bellied Brent Goose; Shelduck; Teal; Scaup; Red-breasted Merganser; Oystercatcher; Golden Plover; Grey Plover; Lapwing; Sanderling; Black-tailed Godwit; Bar-tailed Godwit; Curlew; Black-headed Gull; Little Tern; 20,000 wintering waterbirds; Little Grebe; Great Crested Grebe; Grey Heron; Mallard; Wigeon; Pintail; Goldeneye; Hen Harrier; Coot; Knot; Dunlin; Redshank; Lesser Black-backed Gull; Wetland and Waterbirds.

- 4.62 A detailed wintering bird survey was undertaken during the 2009 / 2010 survey period by Ecofact (2010) to contribute to the Route Selection Report for N11 / N25 Oilgate to Rosslare Road Improvement scheme. The wintering bird species recorded (and listed in the conservation objectives) were associated with a number of important wintering bird habitats recorded from the River Slaney corridor within the study area, downstream of the quarry at Brownswood. These were primarily; open intertidal mudflats associated with lower reaches of the river, extensive reed bed habitat and limited intertidal mudflats along upper reaches of the estuary near Oilgate.

### *Macroinvertebrates*

- 4.63 Macroinvertebrate sampling in the Slaney Estuary was undertaken by Ecofact during 2009 downstream of the quarry site at Brownswood (Ecofact, 2010). These sampling stations were located approximately 1km downstream of Kings Island at Ballyhoge and at Deep's Bridge, i.e. approximately 4.5km and 9km downstream of the Brownswood Quarry site respectively.
- 4.64 For the purposes of this study, additional macroinvertebrate sampling was undertaken by Ecofact during April 2011 at two stations on the River Slaney upstream (Site 1: reference) and downstream (Site 2: receptor) of the application site at Brownswood.
- 4.65 Sweep net sampling was undertaken at both locations from the river bank margins and using a boat. Due to the prevailing uniform, featureless silt substrate, macroinvertebrate community diversity was found to be low with 15 taxa recorded from Site 1 upstream and 12 taxa recorded from Site 2 downstream.
- 4.66 The depositing habitat with soft, unstable silt substrates at both sampling stations rendered the standard EPA kick sampling methodology unsuitable within the study area; the Q-value biotic index was also considered inappropriate with regard to the habitat conditions, where riffled or well-oxygenated instream habitat with potential to support pollution sensitive macroinvertebrate species was not present.
- 4.67 From observations during the sampling exercise, it is considered that the lower diversity recorded at Site 2, downstream of Brownswood, is more likely representative of poor habitat diversity, as opposed to direct water quality deterioration between the two sampling stations. A detailed list of the taxa recorded at the sampling stations and information on their relative abundance is provided in the Natura Impact Assessment in Appendix 4-1.

## EVALUATION

- 4.68 The application site contains many of the typical features of an abandoned quarry in that it is being colonised by vegetation native to its rock type and also by introduced species. Buddleja is the main one in this site but the Bilbao fleabane may also spread to all parts.
- 4.69 The only interest in the flora is itself an artificial one and is derived from a load of sand most likely obtained in the Curracloe part of Wexford and stockpiled on the southern side of the pond. It contains one listed species (Flora Protection Order 1999) – the hairy birdsfoot trefoil *Lotus subbiflorus* - as well as several others characteristic of the Screen Hills.
- 4.70 The peregrine is the most notable feature of the fauna on-site. It is included in Annex I of the Birds Directive, though since the issuing of this, it has become relatively widespread in Ireland nesting in many quarries as well as on mountain and sea-cliffs. As a species it is still increasing.
- 4.71 Brownswood is situated beside the Slaney Estuary, a site designated as a candidate SAC (Slaney River Valley, Code 0781) and SPA (the upper part of Wexford Harbour and Slobs, Code 4076). At this point it is valuable as a migration route for several annexed fish (salmon, sea and river lamprey, Twaite shad) and also for supporting floating river vegetation, alluvial wet woodlands and mudflats / estuaries. Although the rare water starwort *Callitriche truncata* and opposite leaved pondweed *Groenlandia densa* have been recorded within the River Slaney, they were not recorded by the recent field study.

## IMPACT OF THE PROPOSED WASTE FACILITY

- 4.72 The proposed development will result in the gradual backfilling of the quarry void and the covering of the lower parts of the cliffs. Before filling, the pond will be pumped dry and maintained so by one or more sumps at the lowest point. The contained water will be discharged via settlements ponds / mobile silt trap and a hydrocarbon separator to a large water holding tank. The hydrocarbon separator is provided as a precaution against accidental fuel spills.
- 4.73 Water from the holding tank will then be either recycled for concrete production purposes or discharged through pre-existing pipework and settlement ponds in use at the site and will ultimately be released to the River Slaney via existing drains and channels.
- 4.74 Only a small section of pond will be retained in the south-east corner to achieve settlement and attenuation of the run-off from the backfilled / restored area. Marginal vegetation will establish naturally here through the agency of wind and waterbirds.
- 4.75 Downslope parts of the site will continue to drain through the ground and all vehicles will travel through a wheel wash – as at present.

## Application Site

- 4.76 The impacts of the proposed recovery facility / restoration scheme at the application site will be minor, as a good section of the cliffs will remain in place on the eastern side. Peregrines breed in many active quarries and it is quite possible that the birds will continue to nest during the backfilling operations and thereafter. Alternatively they may re-locate to the adjoining quarry (Murphy's Quarry) or further afield. The peregrine population is most likely limited by territory size and bird behaviour rather than nesting sites.
- 4.77 On the opposite side, the existing cliff will be much reduced by backfilling but there is nothing of ecological interest on it as far as is known. In unmodified areas, a continuation of vegetation development will occur as more scrub, and eventually trees, germinate and develop a soil from organic remains.
- 4.78 The existing vegetation contains many introduced species in the form of Buddleja, valerian and Bilbao fleabane. There is also some Japanese knotweed in the south-east corner which could gradually spread over the surroundings as they become wetter (beside the small pond). This would eliminate much of the other flora and fauna and is the greater threat to habitat development.

## Designated Nature Sites

### Direct impacts

- 4.79 The proposed restoration of the quarry at Brownswood and the operation of an inert waste recovery facility at the site will not be immediately adjacent to the site boundary of either the River Slaney Valley cSAC or the Wexford Harbour and Slobs SPA. However, the discharge from the proposed development, via a network of new settlement ponds / mobile silt trap and existing settlement ponds within the existing landholding at the quarry site, will be directly to the cSAC.
- 4.80 Data provided in the water chapter of this EIS and results of groundwater monitoring undertaken within the quarry void indicates that the existing quarry void currently provides storage for groundwater passing through the groundwater body to the River Slaney and that the water quality of the proposed discharge from the quarry site reflects to a greater degree the groundwater quality entering the River Slaney via groundwater flow.
- 4.81 There is therefore a pathway for direct impacts to the cSAC via the discharge from the proposed development, taking cognisance of the potential for water quality impacts which would have the potential to affect sensitive, Annex II aquatic species within the cSAC. There are no direct impacts identified which may affect the Annex I habitats of the cSAC or the wetland habitats or avifauna interests of the SPA adjacent to the development site.
- 4.82 There is no historical monitoring data for the discharge from Brownswood Quarry to the River Slaney. However, the current proposal makes provision for additional levels of treatment to the groundwater from this void prior to

discharge to the River Slaney. A Waste Assimilation Capacity Assessment undertaken for the purposes of the Natura Impact Statement (reproduced in Appendix 4-1) to assess the assimilation capacity of the River Slaney for the discharge (without treatment) indicates there are no impacts affecting the chemical water quality status of the river downstream of the proposed discharge.

- 4.83 It is important to note that the groundwater to be discharged from the quarry void will be treated via settlement ponds / mobile silt trap constructed adjacent to the existing settlement ponds within the Brownswood quarry site. The groundwater flows to the River Slaney which have been impeded within the quarry void will therefore be treated via two sets of settlement ponds prior to being discharged to the River Slaney Valley cSAC.
- 4.84 It is noted that the River Slaney adjacent to the Brownswood Quarry site is characterised as a depositing stretch of river, with extensive siltation deposits along the river margins and a deeper thalweg (centre channel) where deposition is less pronounced. Despite these conditions, suspended solids within the watercourse are relatively low according to EPA water quality monitoring. Sensitive Annex II fish species within the watercourse are considered to be potentially adversely affected were elevated suspended solids to arise from any discharge from the proposed development.

### *Indirect impacts*

- 4.85 Indirect impacts potentially affecting the designated nature sites arise from ground disturbance during construction of new settlement ponds, remediation of existing settlement ponds and general construction and operational impacts relating to heavy traffic entering and exiting the site adjacent to the cSAC and SPA site boundary. It is considered that the significance of these impacts is low, relative to the ongoing, background disturbance and influence exerted by the existing N11 road corridor separating the site from the River Slaney corridor. Furthermore these activities will occur within the existing quarry site, outside cSAC / SPA site boundaries.
- 4.86 Invasive, non-native species have been identified within the existing quarry and within existing settlement ponds. Both Himalayan balsam and Japanese knotweed occur on the site, with Himalayan balsam dominating the understory within the existing settlement ponds. The priority Annex I alluvial wet woodland along the River Slaney flood plain adjacent to the site was found to be significantly affected by Himalayan balsam in the understory and also within the open marsh habitat of the floodplain. This species occurs both upstream and downstream of the Brownswood Quarry site and there is no evidence that the quarry has been responsible for the introduction of this species at this location.
- 4.87 However, the presence of this species at the existing settlement ponds at the quarry site provides a reservoir for this species, where discharge to the River Slaney acts as a vector for the spread of this species within the cSAC. Equally, Japanese knotweed occurs frequently along the N11 road corridor adjacent to the quarry and less frequently within the River Slaney river corridor within the Natura 2000 designations.

- 4.88 It is therefore considered that the proposed quarry restoration works, requiring the large-scale importation of fill material to the site, with associated movement of traffic, and surface water discharges from the site have the potential to increase the spread of non-native, invasive species within the River Slaney corridor.

### Cumulative Impacts

- 4.89 Cumulative impacts affecting the application site and the Natura 2000 network as a result of the proposed quarry restoration scheme have been identified as being limited to in-combination water quality impacts.
- 4.90 There is potential for cumulative impacts arising where the discharge from the proposed development, comprising both the dewatering of the quarry void in combination with the existing surface water discharge from the ancillary works at the quarry site, may result in a short term increase in the discharge volume from Roadstone Wood Ltd.'s landholding during the period of dewatering of the void, prior to infilling.
- 4.91 With regard to potential water quality impacts arising from the proposed development, in combination with background water quality pressures in the River Slaney downstream of Enniscorthy, the Waste Assimilation Capacity modelling exercise indicated no impact on the chemical water quality of the River Slaney.
- 4.92 The N1/N25 Oilgate to Rosslare Harbour Road Improvement scheme is currently at planning stage and will most likely require a crossing of the River Slaney corridor. This has the potential to directly affect both the conservation interests of the Natura 2000 sites on the River Slaney, as well as water quality. However, there is no interaction expected between the current proposal and this scheme, given its location at a considerable distance downstream of the application site and the absence of a scheduled date for its construction.

### MITIGATION MEASURES

- 4.93 Backfilling the area directly under the peregrine nesting site should be avoided in early spring (March/April) when the birds are setting up territory and laying eggs. Filling at that time should occur on the western side of the apron.
- 4.94 The timing of the proposed quarry restoration works is not identified as an important factor with regard to the potential impacts affecting the conservation interests of the adjoining cSAC. No specific mitigation measures are required for individual Annex I habitats, Annex II species or bird species listed on Annex I of the EU Birds Directive (2009), as there are no specific impacts identified which may affect these species.
- 4.95 The key pathway for impacts affecting the designated Natura 2000 sites within the study area is via the discharge from the site which may act as a



vector for water quality impacts to the River Slaney as well as for the spread of non-native, invasive species into the cSAC / SPA. The proposed mitigation measures are considered to ameliorate impacts within both Natura 2000 designations.

- 4.96 A Management Plan for the eradication of non-native species within the Brownswood Quarry site, which currently includes both Japanese knotweed and Himalayan balsam; in combination with effective management protocols for traffic movement and importation of material into the site would significantly avoid the risk of spread of these species into the cSAC. An outline Invasive Species Management Plan for the application site is provided in the Natura Impact Statement, reproduced in Appendix 4-1.
- 4.97 A Method Statement for the proposed importation of material for the quarry restoration works has been drawn up for the protection of water quality and the avoidance of importation of non-native invasive species to the site. These measures will be followed during the entire restoration phase to mitigate potential impacts to the cSAC. This Method Statement is also provided in the Natura Impact Statement, reproduced in Appendix 4-1.

### CONCLUSION

- 4.98 Given the effective implementation of mitigation measures, the proposed quarry restoration / inert waste recovery facility will not have significant ecological effects either locally at the application site or on the nearby Natura site. The conservation objectives for this area will not therefore be compromised.

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## FIGURES

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**APPENDIX 4-1**  
**NATURA IMPACT STATEMENT**

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