

SECTION 4: FLORA AND FAUNA

4.1 INTRODUCTION

This chapter of the Environmental Impact Statement has been prepared by Dr Patrick Ashe, B.Sc., Ph.D., F.R.E.S., at the request of SLR Consulting (formerly John Barnett and Associates) on behalf of Roadstone Dublin Ltd. Dr. Ashe is an environmental consultant specialising in ecological studies.

The application site is located in the centre of the townland of Fassaroe, Co. Wicklow, approximately 2km east of the village of Enniskerry, Co. Wicklow and 1.5km west of Bray town. The site has easy access to the National Primary Road and is approximately 1km west of the Fassaroe Interchange on the N11 / M11 Dublin to Wexford dual carriageway.

4.1.1 Baseline Study Methodology

The objective of this ecological study is to identify and assess the significance of the flora and fauna occurring on or in the immediate vicinity of the application site in order to determine the potential ecological impact of the waste recovery facility on the site and the surrounding area.

A field survey of the flora and fauna at the site was undertaken on 1st December 2008. 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.

All vascular plants observed during the survey were identified to species level. Identification and naming of vascular plants used Stace (2001). 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.

Information on sites of conservation importance for Wicklow (National Parks and Wildlife Service) was obtained during the report writing stage.

4.1.2 Relevant Legislation

Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the EU Habitats Directive) and Council Directive 79/409/EEC 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. 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

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 Bern and Bonn Conventions.

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*.

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.

4.2 RECEIVING ENVIRONMENT

4.2.1 Overview of Baseline Study

Practically all of the application area has been disturbed by sand and gravel extraction activities, aggregate processing activities or some form of development in the past and the only natural habitat that remains within the application site is a short section of perimeter hedgerow which forms the northern boundary of the site.

Due to its disturbed nature (from sand and gravel extraction activities) the expected low floral and faunal diversity is confirmed, with 48 plant species and 19 vertebrate species (16 bird species and 3 mammal species) recorded. All the plant and animal species found are common throughout Ireland and in the general area. No protected, rare or other species of particular scientific interest were identified. Common floral and faunal elements because of their widespread distribution, are likely to occur at times, or in the case of some birds and mammals occasionally visit the site. Additional plant and animal species could be added to the inventory of identified species by surveying during the main growing season, but such a survey is considered unnecessary due to the scale of disturbance on the site.

4.2.2 Habitats

The application site under investigation includes

- a worked-out sand and gravel quarry void (which is now occupied by two man-made ponds and silt lagoons)
- a section of hedgerow along the northern perimeter and above the northern face of the worked out quarry;
- a hummocky area dominated by scrub along the eastern boundary;
- part of an arable fields inside the northern boundary and along the eastern boundary;
- an area of hardcore / inert stockpiles (of concrete, soil, stone, etc) at the existing C&D waste recycling area;
- a smaller area of scrub around the south-western corner of the northernmost pond

The locations of these habitats are illustrated in Figure 4.1.

Much of the remainder of the application area has been affected by quarrying and related activities and these sections include the entrance area, site offices and retain centre, parking area, access tracks for trucks, aggregate processing areas, block yards, storage areas and the area of disturbed / sealed ground around the concrete production facility to the west of the site.

Wrapping round the southern and eastern perimeter of the application area is agricultural land which consists of one large field which is now in stubble and was used to produce a cereal crop. Another field northwest of the application area is also used to provide an arable crop.

(a) Hedgerows and Boundaries

The only hedgerow which exists within the application area is that section which occurs along the northern boundary of the worked out gravel quarry. The dominant tree species in the section of perimeter hedgerow is Hawthorn (*Crataegus monogyna*) and shrub species include Bramble (*Rubus fruticosus*) and Dog Rose (*Rosa canina*). This section of hedgerow varies from moderate to poorly developed.

Some areas around the existing quarry void are defined by sections of post and wire fencing, in particular to provide security, most notably around the southern and eastern sides of the southern pond (inside the access track shown on Figure 4.1). There is a further section of post and wire fencing between the northern limit of the scrub area and the eastern end of the section of perimeter hedgerow.

(b) Scrub Area

The area of scrub along the eastern side of the application area forms a natural barrier restricting access to the eastern side of the silt lagoons and the northern pond. At its southern extremity, the hummocky ground tapers off rather abruptly and becomes grassy on each side of the access

track (shown on Figure 4.1). The northern limit of the scrub area terminates a little beyond the limit of the northern pond.

This area is dominated by Bramble (*Rubus fruticosus*) but there are isolated and occasional pockets of trees and other shrubs. The tree and shrub species present include Hawthorn (*Crataegus monogyna*), Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), Willow (*Salix* sp.), Elder (*Sambucus nigra*), Holly (*Ilex aquifolium*) and Silver Birch (*Betula pendula*). The additional shrub species are Gorse (*Ulex europaeus*), Butterfly-bush (*Buddleja davidii*) and Dog Rose (*Rosa canina*).

In a narrow grassy area between the post and wire fence atop the steep slopes along the side of the former gravel quarry (overlooking the southern pond), some tree and shrub species have been planted and some have colonised naturally. The tree and shrub species include Sessile Oak (*Quercus petraea*), Silver Birch (*Betula pendula*), Ash (*Fraxinus excelsior*), Bramble (*Rubus fruticosus*), Butterfly-bush (*Buddleja davidii*) and Cotoneaster (*Cotoneaster* sp.).

(c) Farmland (Arable)

An arable field occurs along and beyond the eastern and southern edges of the application area. This arable field was in stubble at the time of the ecological survey, indicating that a cereal crop was harvested some months previously.

(d) Quarry Void

The quarry void area includes a number of habitats (i) man-made ponds and silt lagoons, (ii) bare soil area and (iii) waste concrete and rubble area

Ponds and Silt Lagoons

There are two man-made ponds on the floor of the former gravel quarry, one each located at the northern and southern end. Loose silt (a by-product of aggregate processing operations) has been deposited and built up between the two ponds over many years. The silt lagoons comprise flat expanses of fine silt, the waste product from the washing and screening of the sand and gravel at the existing processing plant. The surface of the silt pans is mostly bare of vegetation though in places, it would appear that it is becoming colonised by a few plant species.

Bare Soil Area

An area of mostly bare soil occurs over the lower slopes along the northern and much of the western side of the northern pond. An occasional tree, shrub or herbaceous plant does however occur across this area.

Waste Concrete and Rubble Area

Above the bare soil area, on the upper slopes above the northern pond, the northwestern part of the application site is dominated by hardcore and stockpiles of waste concrete, rubble, soil and tones. This area is entirely devoid of vegetation.

(e) Stockpiles

Stockpiles of sand and gravel are stored in two areas within the central area, close to the southwestern corner of the northern pond. A small area of scrub, located in the south-west corner of this pond divides this area from the waste recovery facility to the north.

4.2.4 Evaluation

The only natural habitat within the boundaries of the application area is the section of perimeter hedgerow along the northern boundary and above the northern face of the former quarry. These hedgerows will be retained as visual screens for the duration of waste recovery activity at the application site. The hummocky areas of scrub along the eastern side of the application area are not natural features but comprise stockpiles of excavated soil which overlay the former sand and gravel deposits. These scrub areas then colonised naturally over time (with various tree, shrub, herbaceous and grass species establishing).

Due to the amount of disturbance there associated with quarrying and related activities (including C&D waste recycling), about 85% of the application site is devoid of vegetation. Quarrying activities within the application area and intensive farming practiced in the adjoining arable fields have had a significant negative effect by ensuring a low floral and faunal diversity.

4.2.5 Designations

There are no designated or proposed Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or proposed Natural Heritage Areas (NHAs) within or contiguous to the application site or Roadstone Dublin's wider landholding. The nearest SACs to the site are the woodland at Ballyman Glen, approximately 600m north of the site (at its nearest point) and Knocksink Wood, approximately 2km west of the application site. The Dargle River Valley, approximately 1km south-east and south of the site and Powerscourt Woodland, approximately 1.5km south-west of the application site (at its nearest point) are both designated as proposed NHAs. The location of these sites is shown in Figure 4.2.

Ballyman Glen SAC is an east-west oriented valley which is bounded by steeply sloping pasture with gorse and areas of wood and scrub. The site is designated an SAC for its alkaline fen and petrifying spring, both habitats listed on Annex 1 of the EU Habitats Directive (92/43/EEC dated 21 May 1992 on *the Conservation of Natural Habitats and of Wild Fauna and Flora*).

Knocksink Wood SAC is situated in the valley of the Glencullen River. A number of scarce or rare plants occur within the site and it has one of the most diverse woodland invertebrate faunas in Ireland. The woodland incorporates wet woodland organisms threatened elsewhere within the EU. A notable feature of the site is the frequent and extensive springs and seepage areas within the wooded slopes. These petrifying springs are listed as a priority habitat on Annex I of the EU Habitats Directive.

The Dargle River Valley pNHA is located along a section of the River Dargle with steep wooded banks. The site is designated a pNHA as it is a fine example of a long established wooded valley, a habitat that is becoming rare in north County Wicklow. The site is also of considerable geological importance. At one point a well exposed series of Ordovician volcanic rocks are faulted against well-exposed Bray group Cambrian strata.

Powerscourt Woodland pNHA is located south-west of Enniskerry village and is largely contained within the Powerscourt and Charleville demenses. The site includes a 4km stretch of the Dargle River. Mixed woodland covers most of the site and includes native and introduced species. The site includes many exotic plant species and habitats which support an interesting flora. The mix of semi-natural habitats and estate woodland is particularly conducive to macro-fungi.

4.3 IMPACT OF THE SCHEME

4.3.1 Existing / Proposed Development

The area of the application site is approximately 21.4 hectares (51.5 acres). At the present time, the application site includes sections of hedgerow, areas of scrub and some grass, some arable land, two man-made ponds, silt lagoons, waste concrete and rubble, bare soil areas, disturbed ground, sand and gravel stockpiles and sealed concrete surfaces (at concrete production facility). The area beyond the application site includes arable fields to the south, east, north and west.

The application area includes site offices and other structures (predominantly for plant storage and servicing), car parks, a weighbridge, block yards and an aggregate processing area where imported sand and gravel is screened and washed. It is accessed via the Fassaroe Interchange on the M11 National Primary Road and a local public road which leads, via a wide entrance gate and a 900m long private surfaced road, to the site office.

Roadstone Dublin Ltd is the freehold owner of the application area and most of the adjoining lands. The company intends to apply for a waste recovery licence to the Environmental Protection Agency to provide for

- (i) the continued operation of the permitted inert C&D waste recovery facility and
- (ii) backfilling of the worked-out sand and gravel quarry void with imported inert soil and stone.

The inert materials recovered at the existing facility typically comprise concrete, bricks, tiles, and ceramics. Recovered materials are generated by concrete production activity on site and by C&D projects off-site. Site won and imported materials are crushed and screened at the recovery facility and the resulting product exported off-site for re-use as secondary aggregate on

construction projects.

The bulk of the materials used to backfill the existing void will comprise imported soils and stones excavated at construction sites. A minor proportion of the backfill soils (approximately 16%) will come from the soil stockpiles along the eastern side of the former gravel quarry. It is envisaged that as the level of backfilling approaches that of the in-situ or surrounding land, layers of subsoil will be deposited followed by a final layer of topsoil. The topsoil will be seeded with a suitable grass seed mix to produce pasture to stabilise the soil surface and prevent excessive soil runoff after precipitation.

4.3.2 Relevant Aspects of Scheme

Backfilling and restoration of the former gravel quarry using naturally occurring inert materials and continuation of waste recovery activities at the former sand and gravel quarry will give rise to the following impacts within the application area:

- Loss of approximately 2.8 hectares of bare ground
- Loss of approximately 1.7 hectares of existing groundwater ponds
- Loss of approximately 2.5 hectares of naturally re-colonised scrub
- Establishment of approximately 7.0 hectares of improved agricultural grasslands

4.3.3 Direct Impacts

The following impacts will arise during the backfilling and restoration work at the application site:

- i. Backfilling of the existing void space will alter the landscape character and result in the loss of any flora and disturbance of any fauna that have colonised these areas, most notably around the south-western corner of the northern pond;
- ii. Removal of existing groundwater ponds at the floor of the former gravel quarry will result in the loss of wetland habitat which may support wintering birds and breeding birds during the summer periods;
- iii. Removal of the scrub and naturally re-colonised ground along the eastern boundary will result in the loss of any flora, and disturbance of any fauna, that have colonised these areas;
- iv. Placement and compaction of inert soils in close proximity to hedgerows may temporarily and locally reduce potential foraging and shelter habitat for both mammals and birds;
- v. As backfilling works are completed, the site will be progressively restored to agricultural pasture lands. This will be in keeping with the surrounding area which is composed predominately of improved agricultural land. This process will result in the former sand and gravel quarry being returned to its original land use.

The hedgerows above the northern face of the former quarry and along the northern perimeter acts as a visual and acoustic barrier and will remain in place for the duration of waste recovery operations at the application site.

The arable farmland which is located within and immediately beyond the boundary of the application site will not be directly affected by the waste recovery activities.

4.3.4 Indirect Impacts

Dust deposition could occur as an indirect impact of the placement, spreading and compaction of the naturally occurring inert materials. This could potentially have a negative impact on flora in the area if foliage were to become covered in excessive levels of dust, potentially reducing the amount of photosynthesis taking place.

4.4 MITIGATION MEASURES

The floral diversity at the application site, at 48 species is quite low, even allowing for the fact that the survey was done on 1st December 2008. All the plant and animal species found are common throughout Ireland and in the general area. No protected, rare or other species of particular scientific interest were identified. Common floral and faunal elements because of their widespread distribution, are likely to occur at times, or in the case of some birds and mammals occasionally visit the site. Additional plant and animal species could be added to the inventory of identified species by surveying during the main growing season, but such a survey is considered unnecessary due to the scale of disturbance on the site.

It is recommended that the following program of mitigation measures be implemented to eliminate and minimise the impact of the development on the flora and fauna of the site over the operational life of the proposed waste recovery facility:

- i. in order to retain landscape connectivity and minimise loss of potential nesting sites for birds, it is recommended that existing boundary hedgerows be retained. Retention of boundary hedgerows will also serve as a noise and visual barrier;
- ii. to ensure the continued survival of boundary hedgerows, backfilling and restoration operations in close proximity to existing hedgerows should also be of minimum duration possible;
- iii. where removal of any shrubs or hedgerows within the site is necessary, these works should take place between the months of September and March to avoid the bird nesting season;
- iv. where practicable, the loss of internal shrubs or hedgerows within the site should be compensated by re-planting following restoration of site to pre-extraction ground levels. Any new planting should comprise a mixture of native tree and shrub species consistent with species readily found in the local area.
- vi. the mitigation measures set out in Chapters 7 and 8 of this Environmental Impact Statement should be implemented. Dust and noise emissions from the application site will comply with the recommended DoEHLG (2004) and EPA (2000) emission limit values. Implementation of these measures shall ensure that there will be minimal adverse indirect noise and dust impacts on flora and fauna arising from backfilling, recycling and restoration operations.
- ix. following the completion of backfilling operations, the application site will be restored to agricultural use. This will ensure that land use at the site is in keeping with the character of the surrounding area.

Provided that all the mitigation measures proposed above are implemented, the overall impact of the proposed development on flora and fauna over the operational phase is classified as a *minor negative* impact. In the longer-term, after completion of backfilling activities, the overall impact of the scheme is considered to be a *neutral to minor positive* impact.

REFERENCES

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Stace, C. (1997) *New Flora of the British Isles*, 2nd edition

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APPENDIX 4.1
INVENTORY OF FLORA AND FAUNA

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Flora and fauna lists from the application area based on a survey undertaken on the 1st December 2008.

List of Plant Species, Entire Application Area (48 species)

Sycamore	Acer pseudoplatanus
Yarrow	Achillea millefolium
Kidney Vetch	Anthyllis vulneraria
Daisy	Bellis perennis
Silver Birch	Betula pendula
Mustard	Brassica sp.
Butterfly-bush	Buddleja davidii
Carline Thistle	Carlina vulgaris
Rosebay Willowherb	Chamerion angustifolium
Creeping Thistle	Cirsium arvense
Spear Thistle	Cirsium vulgare
Cotoneaster	Cotoneaster sp.
Hawthorn	Crataegus monogyna
Teasel	Dipsacus fullonum
Great Willowherb	Epilobium hirsutum
Field Horsetail	Equisetum arvense
Ash	Fraxinus excelsior
Common Cleavers	Galium aparine
Ground Ivy	Glechoma hederacea
Ivy	Hedera helix
Hogweed	Heracleum sphondylium
Hawkweed	Hieracium sp. (aggregate)
Slender St. John's-wort	Hypericum pulchrum
Holly	Ilex aquifolium
Compact Rush	Juncus conglomeratus
Nipplewort	Lapsana communis
Winter Heliotrope	Petasites fragrans
Ribwort Plantain	Plantago lanceolata
Creeping Cinquefoil	Potentilla reptans
Selfheal	Prunella vulgaris
Sessile Oak	Quercus petraea
Meadow Buttercup	Ranunculus acris
Creeping Buttercup	Ranunculus repens
Dog-rose	Rosa canina
Bramble	Rubus fruticosus
Common Sorrel	Rumex acetosa
Willow	Salix sp.
Elder	Sambucus nigra
Common Ragwort	Senecio jacobaea
Common Chickweed	Stellaria media
Dandelion	Taraxacum sp. (aggregate)
Red Clover	Trifolium pratense
White Clover	Trifolium repens
Colt's-foot	Tussilage farfara
Gorse	Ulex europaeus
Common Nettle	Urtica dioica
Germander Speedwell	Veronica chamaedrys
Tufted Vetch	Vicia cracca

Aviformes (Birds)

A total of 16 bird species were recorded from the entire application site. Some other common species of bird species could be expected to occur at times on the site.

The following species of birds were recorded on the site and their status in Ireland is indicated as follows:- R = resident, B = breeding, M = migratory.

Entire Application Area (16 species)

Blackbird	Tudus merula	R & B
Blue Tit	Parus caeruleus	R & B
Duncock	Prunella modularis	R & B
Great Tit	Parus major	R & B
Grey Crow	Corvus corone cornix	R & B
Jackdaw	Corvus monedula	R & B
Magpie	Pica pica	R & B
Meadow Pipit	Anthus pratensis	R & B
Mistle Thrush	Turdus viscivorus	R & B
Pied Wagtail	Motacilla alba	R & B
Redwing	Turdus iliacus	WV
Robin	Erithacus rubecula	R & B
Rook	Corvus frugilegus	R & B
Starling	Sturnus vulgaris	R & B
Wood Pigeon	Columba palumbus	R & B
Wren	Troglodytes troglodytes	R & B

Mammals









The only mammal species seen was the Rabbit (*Oryctolagus cuniculus*) but signs of Fox (*Vulpes vulpes*) were observed. Deer have been seen within the boundaries of the application area and this is assumed to be Sika Deer (*Cervus nippon*) which is known to occur in the general vicinity.

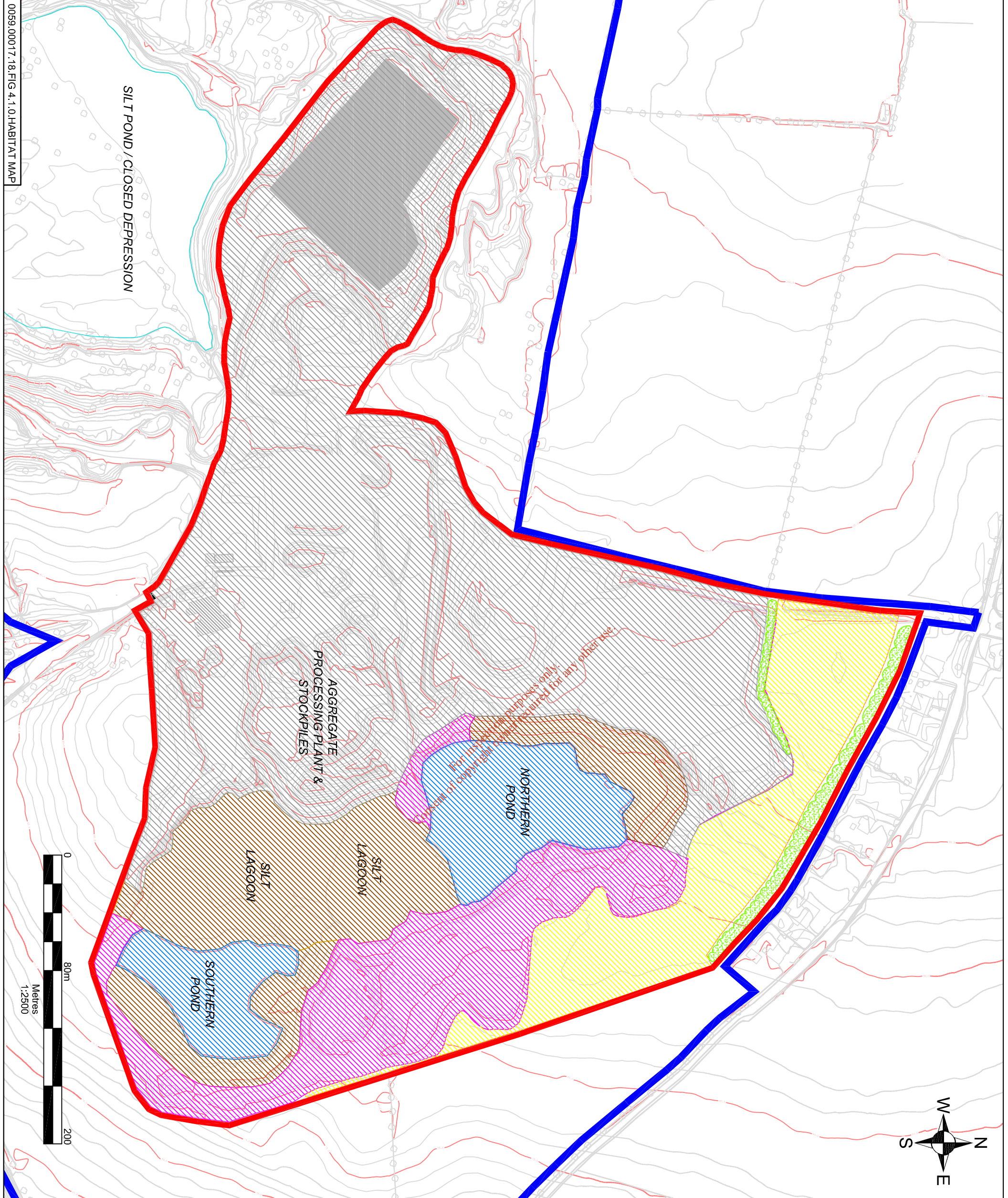
Sika Deer	<i>Cervus nippon</i>
Fox	<i>Vulpes vulpes</i>
Rabbit	<i>Oryctolagus cuniculus</i>

NOTES

1. Based on OSI 6inch sheet no. 21
2. Ordnance Survey Ireland Licence no. SU 0000709
(c) Ordnance Survey of Ireland & Government of Ireland

LEGEND

	Applicant's Land Interest (c. 65.1 ha)
	Waste Licence Application Area (c. 21.4 ha)
	Pond
	Arable Land
	Scrub Area
	Hedgerow
	Bare Soil (Silt Lagoon)
	Hardcore / Sealed Ground



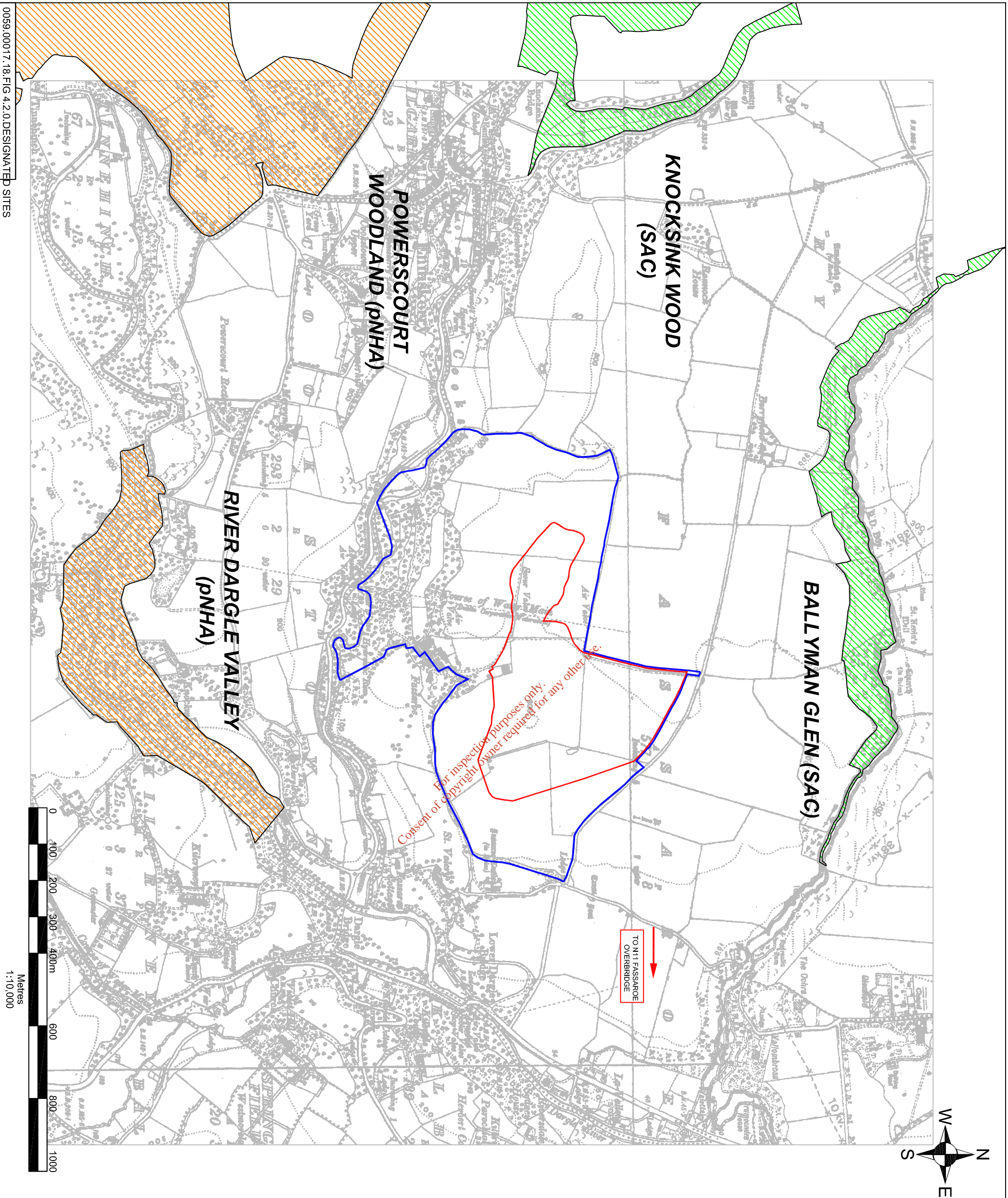
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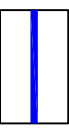



FIGURE 4.1
HABITAT MAP



NOTES

1. Based on OSI 6inch Sheet No. 21
2. Ordnance Survey of Ireland Licence No. SU 0000709 (c) Ordnance Survey of Ireland & Government of Ireland

LEGEND

-  Applicant's Land Interest (c. 65.1 ha)
-  Waste Licence Application Area (c. 21.4 ha)
-  Special Area of Conservation (SAC)
-  Natural Heritage Area (NHA)

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 DESIGNATED SITES

FIGURE 4.2