10. Flora and Fauna

10.1 Introduction

This chapter of the EIS presents an Ecological Impact Assessment (EcIA) of the proposed 100 MW Open Cycle Gas Turbine (OCGT) power plant at Purcellsinch, Kilkenny. Terrestrial ecological surveys were undertaken to identify habitats and species present within the development footprint and an assessment was conducted to ascertain the potential impacts of the construction and operation of the proposed development on terrestrial flora and fauna. A Stage 1 and Stage 2 Appropriate Assessment was also undertaken to determine the potential impacts, if any, on nearby Natura 2000 sites. This chapter is divided into the following sub sections:

10.1 Introduction
10.2 Methodology
10.3 Receiving Environment
10.4 Ecological Assessment
10.5 Construction Phase Impacts
10.6 Operational Phase Impacts
10.7 Mitigation Measures
10.8 Residual Impacts

10.2 Methodology

10.2.1 Legislation and Best Practice Guidance Notes

The ecological assessment was prepared in accordance with legislative requirements including the following:

- Wildlife Act 1976 and Wildlife Amendment Act 2000; and

This assessment was also conducted with reference to the Guidelines on the Information to be contained in Environmental Impact Statements (Environmental Protection Agency, 2002), Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (Environmental Protection Agency, 2003), Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority, 2006, 2009) and the Institute of Ecology and Environmental Management (IEEM) Guidelines for Ecological Impact Assessment.
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The methodology for the assessment was based on the following:

- Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority, 2009);
- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009);
- Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes; (National Roads Authority, 2006);
- Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes (National Roads Authority, 2005);
- Guidelines for the Treatment of Bats During the Construction of National Road Schemes (National Roads Authority, 2005);
- Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (National Roads Authority, 2006);
- Guidelines for Ecological Impact Assessment (Institute of Ecology and Environmental Management, 2006);
- A Guide to Habitats in Ireland (Fossit, 2000);
- Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011); and

10.2.2 Desktop Study

A desktop review was carried out to identify the presence of features of ecological importance within the proposed development site and environs, with regard to the specific surveys being undertaken. A review of the extent of designated conservation sites within the study was carried out by consulting the National Parks and Wildlife Service (NPWS). These sites included Special Areas of Conservation and Special Protection Areas for birds (both internationally important) as well as Natural Heritage Areas (of national importance). Other unpublished information, including records of protected species available on the NPWS website (www.npws.ie) and the National Biodiversity Data Centre (NBDC) was reviewed to establish a list of the protected species and habitats in the study site.

The principle sources of information for the desktop study were:

- NPWS database and map viewer – www.npws.ie;
- National Biodiversity Data Centre - www.biodiversityireland.ie;
- The Wildlife Act 1976;
- The Wildlife (Amendment) Act 2000;
- European (Natural Habitats) Regulations 1997 (as amended in 2005);
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- GIL Power Generation Project, Purcellsinch, Co. Kilkenny - Tree Survey (Brady Shipman Martin, 2011); and
- GIL Power Generation Kilkenny – Stage 1 Screening for Appropriate Assessment (Mott MacDonald Ireland, 2012).

### 10.2.3 Appropriate Assessment

#### 10.2.3.1 Stage 1 Screening for Appropriate Assessment

Under Article 6 (3)(4) of Habitats Directive (92/43/EEC) a Stage 1 Screening Appropriate Assessment was conducted by Mott MacDonald to ascertain if the development is likely to have a significant impact on the Natura 2000 sites within the Zone of Influence of the development. This report is included in this EIS as Appendix N.1.

#### 10.2.3.2 Stage 2 Appropriate Assessment – Natura Impact Statement

Based on the overall findings of the Stage 1 Screening for Appropriate Assessment and the uncertainty in relation to potential impacts on some of the qualifying features of the River Barrow and River Nore SAC it was considered necessary as a precautionary measure to undertake a Stage 2 Appropriate Assessment – Natura Impact Statement. This report is included in this EIS as Appendix N.2.

### 10.2.4 Habitat and Flora Survey

A habitat survey of the study area was conducted during April 2012 following the Heritage Council publication ‘Best Practice Guidance for Habitat Surveying and Mapping’ (Smith et al., 2011). Habitats were classified using habitat descriptions and codes published in the Heritage Council’s ‘A Guide to Habitats in Ireland’ (Fossitt, 2000). Rare and/or protected flora and habitats were noted, if present. Elements from the manual by the Scottish Environmental Protection Agency ‘River Habitat Survey in Britain and Ireland – Field Survey Guidance Manual’ (2003) were also implemented in the habitat survey of the study area along the affected river corridors. The current survey also followed the NRA guidance ‘Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes’ (2009a), as a reference for all ecological surveys undertaken.

As the survey was undertaken during late spring, some plant species were dormant and may not have been recorded. However, it was possible to identify all habitats within the study area to Fossitt (2000) Level 3.

Further details of the habitat survey are contained in Appendix M Ecological Survey Report.

### 10.2.5 Otter Survey

Specific attention was given to searching for otters *Lutra lutra* within the riparian corridors of the study area. This included searches for otter holts along the river banks and in proximity to the river and otter spraints / prints along the stretch of river corridor particularly at the bridge crossing and at the confluence of the Pococke River and the River Nore, following Chanin (2003). The Pococke River corridor was surveyed upstream of the existing tertiary road bridge crossing to approximately 150 metres and downstream from the road bridge to the confluence with the River Nore (approximately 150 metres channel length). The riparian corridor of the River Nore was surveyed to approximately 300 metres upstream of the proposed abstraction point and approximately 600 metres downstream. It is noted that there was no survey undertaken along the bank of the Nore at the existing mill-race due to access restrictions.
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Otter spraints are characteristic insofar as they are frequently found in raised or prominent sites along the banks of rivers, on large rocks or tree stumps on the bank (Bang & Dahlstrom, 2001) therefore sites such as these were checked. The survey was undertaken in April and is considered optimum for otter survey.

Further details of the Otter survey are contained in Appendix M Ecological Survey Report.

10.2.6 Kingfisher Survey

Birds present along the river corridor were recorded during a dedicated bird survey undertaken along the river corridors within the study area. In particular activity of dippers and kingfishers were noted within the river corridors, while an assessment of the River Nore SPA and its importance for wild fowl was also undertaken. The survey was undertaken in April, during the bird breeding season and is considered optimum with regard to observing Kingfish activity.

The survey was carried out on both banks of the River Nore; from the bridge 800m upstream to 1200m downstream of the proposed abstraction point. The river bank near the dwelling house to the east of the proposed abstraction point was not surveyed. About 100m of the River Pococke was also surveyed. Both banks, where accessible, were surveyed and the number and location of all waterbirds were recorded. Particular attention was paid to the presence or absence of suitable Kingfisher nesting banks, taking account of the River Nore SPA designation along the corridor of the Nore within the study area. The location of current or former nest holes was noted and photographed where possible.

Further details of the Kingfisher survey are contained in Appendix M Ecological Survey Report.

10.2.7 Ecological Evaluation Criteria

The criteria used in evaluating ecological habitats follow the NRA (2009) and IEEM (2006). Table 10.1 details the site evaluation criteria.

Table 10.1: Site Evaluation Criteria

<table>
<thead>
<tr>
<th>Ecological Valuation</th>
<th>Internationally Important</th>
<th>Nationally Important</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sites designated (or qualifying for designation) as an SAC* or SPA* under the EU Habitats or Birds Directives; Undesignated sites that fulfil criteria for designation as a European Site; Features essential to maintaining the coherence of the Natura 2000 network; Sites containing ‘best examples’ of the habitat types listed in Annex I of the Habitats Directive; Resident or regularly occurring populations of birds listed in Annex I of the Birds Directive and species listed in Annex II and/or Annex IV of the Habitats Directive; Ramsar Site; World Heritage Site; Biosphere Reserve; Site hosting significant species populations under the Bonn Convention; Site hosting significant populations under the Berne Convention; Biogenetic Reserve; European Diploma Site; Salmonid water.</td>
<td></td>
</tr>
</tbody>
</table>

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Ecological Valuation

Areas of Special Amenity;
Area subject to a Tree Preservation Order;
Area of High Amenity, or equivalent, designated under the County Development Plan;
Resident or regularly occurring populations (assessed to be important at the County level) of species of birds listed in Annex I of the Birds Directive, species listed in Annex II and/or IV of the Habitats Directive, species protected under the Wildlife Acts and/or species listed on the relevant Red Data list;
Site containing area(s) of the habitat types listed in Annex I of the Habitats Directive that do not fulfil criteria for valuation as of International or National Importance;
County important populations of species, or viable area of semi-natural habitats or natural heritage features identified in the National of local BAP;
Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county;
Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP;
Resident or regularly occurring populations (assessed to be important at the Local level) of species of birds listed in Annex I of the Birds Directive, species listed in Annex II and/or IV of the Habitats Directive, species protected under the Wildlife Acts and/or species listed in the relevant Red Data list;
Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

10.2.8 Impact Assessment Criteria

Impacts will be assessed and characterised in accordance with the EPA (2002) as detailed in Table 10.2.

Table 10.2: Impact Magnitude Criteria

<table>
<thead>
<tr>
<th>Impact Magnitude</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Change</td>
<td>No discernable effect</td>
</tr>
<tr>
<td>Imperceptible impact</td>
<td>An impact capable of measurement but without noticeable consequences</td>
</tr>
<tr>
<td>Slight impact</td>
<td>An impact which causes noticeable changes in the character of the environment without affecting its sensitivities</td>
</tr>
<tr>
<td>Moderate impact</td>
<td>An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends</td>
</tr>
<tr>
<td>Significant impact</td>
<td>An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment</td>
</tr>
<tr>
<td>Profound impact</td>
<td>An impact which obliterates sensitive characteristics</td>
</tr>
</tbody>
</table>


10.3 Receiving Environment

10.3.1 Site Location and Surrounding Area

The site of the main development occupies an area of approximately 1.35 hectares and is situated 3 kilometres east of Kilkenny city centre in the townland of Purcellsinch.

The main plant development site is currently in agricultural use and was most recently used for livestock (cattle) grazing. The surrounding land use is mixed agricultural and industrial with the site bounded by the IDA Business and Technology Park to the north, the Purcellsinch Wastewater Treatment Plant to the west...
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and agricultural pastureland to the east and south. There is also one residential property immediately to the south of the site (on the opposite side of the Sion Road). The site on which the pumphouse is located is approximately 130 metres to the west of the main development area and has an area of approximately 0.2 hectares. An application for a road opening licence will be submitted to Kilkenny County Council to facilitate pumping river water to the main development site.

The nearest watercourse to the main development site is the River Pococke approximately 90 metres west of its closest site boundary. In addition, the River Nore is located approximately 140 metres south of this boundary. The site on which the pumphouse is located is approximately 30 metres west of the Pococke River and 70 metres north of the River Nore.

### 10.3.2 Designated Conservation Sites

A search of the National Parks and Wildlife Services (NPWS) database was conducted for designated conservation sites within the 10 kilometre zone of influence of the site. A brief description of each of the sites is given below with site synopses presented in Figure 10.1 Designated Conservation Sites illustrates the location of designated conservation sites within a 10 kilometre radius of the site. Figure 1 of Appendix N.1 Stage 1 Screening for Appropriate Assessment illustrates the location of the River Barrow and River Nore SAC and River Nore SPA in the closer vicinity of the proposed development at Purcellsinch.

#### 10.3.2.1 Proposed Natural Heritage Areas

Natural Heritage Areas are the basic wildlife designation in Ireland. Proposed Natural Heritage Areas were published on a non-statutory basis in 1995 and have not since been statutorily proposed or designated. These sites are of importance for wildlife and habitats and their protection.

**Lough Macasc (Site Code: 001914)**

Lough Macask is a small pond north-west of Kilkenny that fluctuates in size over the year. The vegetation shows that the site is similar in some ways to a turlough. It therefore differs from most other wetlands around Kilkenny and has a certain interest for this reason. In addition it contains Greater Duckweed (*Spirodela polyrhiza*) which is not found elsewhere in the county. This pNHA is located approximately 4.4 kilometres from the site of the main power plant development site.

**Archersgrove (Site Code: 002051)**

Three separate blocks of scrub woodland have been identified as a Natural Heritage Area. The sole interest of the site lies in its significant population of the legally protected plant Nettle-leaved bellflower (*Campanula trachelium*). This is a very rare species in Ireland. This pNHA is located approximately 0.35 kilometres from the site of the main power plant development site.

**Newpark Marsh (Site Code: 000845)**

A small marsh on the outskirts of Kilkenny Town, supports a semi-natural fen vegetation dominated by the large sedge (*Carex elata*) and including the notable Large Water Dock (*Rumex hydrolapalcum*) amongst a suite of more typical species.

The area is used as a feeding site by three protected bat species. Leisler’s Bats (*Nyctalus leisleri*), Long-eared Bat (*Plecotus ausitus*) and the Pipistrelle (*Pipistrellus pipistrellus*). This pNHA is located approximately 2.95 kilometres from the site of the main power plant development site.

**Dunmore Complex (Site Code: 001859)**

A series of natural depressions in the gravels and boulder clays of the northern outskirts of Kilkenny city support an interesting diversity of wetland and woodland and old meadow habitats. Although now much
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affected by development, seven fragments of the former ecological unit have been defined that represent the range of habitats of interest in this locality. In addition, in places the secondary vegetation of abandoned gravel workings is of interest and is included within the site. These seven fragments between them make up the Dunmore Complex.

One of the largest units included in the site is itself a complex including areas of wet Alder (*Alnus glutinosa*) and Willow (*Salix cinerea*) woodland and areas of more nutrient rich and more species rich freshwater marsh.

The smallest block to be designated is a much modified dry embankment and this area's special qualification in the NHA is the common occurrence of the legally protected plant, Basil thyme (*Acinos arvensis*). There are two blocks which are wooded ridges and the rare Red Data Book species, Nettle-leaved bellflower (*Campanula trachelium*) grows commonly in both of these woods. Three further blocks to the south continue the theme of wetlands developing in depressions with some nutrient poor areas.

Although each block is small, overall they form a highly diverse site which supports an impressive array of rare plant species mentioned above, plus a rare liverwort species (*Ricciocarpus fluitans*). This pNHA is located approximately 3.86 kilometres from the site of the main power plant development site.

**Ardaloo Fen (Site Code: 000821)**

Ardaloo Fen is a wetland area beside the Nuenna River about 5 kilometres southeast of Freshford. There is a transition from improved grassland to Common reed (*Phragmites australis*) swamp encompassing a diverse wetland flora. The wetland is in a fairly natural condition and the whole site is valuable for birds. The winter flooded grassland supports wildfowl and waders. The reedbed itself is home to warblers. This pNHA is located approximately 9.63 kilometres from the site of the main power plant development site.

**Red Bog Dungarvan (Site Code: 000846)**

The Red Bog Natural Heritage Area, located 2 kilometres north of Dungarvan in County Kilkenny, is an interesting wetland area surrounded by wet grassland and scrub. Afforestation has reduced the size of this site considerably and it is now bounded on the east and west sides by conifer plantations.

The main habitat is floating fen comprised of emergent vegetation with several small areas of open water. The vegetation is dominated by Bulrush (*Typha latifolia*) and Saw Sedge (*Cladium mariscus*), a plant which is much more common in the west of Ireland. The flora is of local interest and the site supports several species of waterfowl in the winter. This pNHA is located approximately 9.64 kilometres from the site of the main power plant development site.

**10.3.2.2 Special Areas of Conservation**

Special Areas of Conservation are prime wildlife conservation areas in the country, considered to be important on a European as well as Irish level. They are designated under the Habitats Directive for certain habitats or species listed in the Habitats Directive which need protection.

**River Barrow and River Nore (Site Code: 002162)**

This cSAC consists of the freshwater stretches of the Barrow/Nore River catchments as far upstream as the Slieve Bloom Mountains and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. Seventeen Red Data Book plant species have been recorded within the site, most in the recent past.

The site is a candidate SAC selected for alluvial wet woodlands and petrifying springs, priority habitats on Annex I of the E.U. Habitats Directive. The site is also selected as a candidate SAC for old oak woodlands, floating river vegetation, estuary, tidal mudflats, *Salicornia* mudflats, Atlantic salt meadows, Mediterranean...
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salt meadows, dry heath and eutrophic tall herbs, all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive - Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Nore Freshwater Pearl Mussel, Crayfish, Twiate Shad, Atlantic Salmon, Otter, Desmoulin’s Whorl Snail Vertigo moullinsiana and the Killarney Fern.

The site is of ornithological importance for a number of E.U. Birds Directive Annex I species including Greenland White-fronted Goose, Whooper Swan, Bewick’s Swan, Bar-tailed Godwit, Peregrine and Kingfisher. Nationally important numbers of Golden Plover and Bar-tailed Godwit are found during the winter. Wintering flocks of migratory birds are seen in Shanahoe Marsh and the Curragh and Goul Marsh, both in Co. Laois and also along the Barrow Estuary in Waterford Harbour. There is also an extensive autumnal roosting site in the reedbeds of the Barrow Estuary used by Swallows before they leave the country.

10.3.2.3 Special Protection Area

River Nore (Site Code: 0042330)

The River Nore SPA is a long, linear site that includes the following river sections: the River Nore from the bridge at Townparks, (north-west of Borris in Ossory) to Coolnamuck (approximately 3 km south of Inistioge) in Co. Kilkenny; the Delour River from its junction with the River Nore to Derrynaseera bridge (west of Castletown) in Co. Laois; the Erkina River from its junction with the River Nore at Durrow Mills to Boston Bridge in Co. Laois; a 1.5 km stretch of the River Goul upstream of its junction with the Erkina River; the Kings River from its junction with the River Nore to a bridge at Mill Island, Co. Kilkenny. The site includes the river channel and marginal vegetation.

For a large part of its course the River Nore traverses Carboniferous limestone plains; it passes over a narrow band of Old Red Sandstone rocks below Thomastown.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive of special conservation interest for the following species: Kingfisher.

10.3.3 Appropriate Assessment

10.3.3.1 Stage 1 Screening Appropriate Assessment Synopsis

This report found that significant environmental effects were not expected on a number of the qualifying features of the River Barrow and River Nore SAC or on the River Nore SPA. These finding was based on consideration of the following:

- The main development site is outside the boundaries of the SAC or the SPA;
- Effects to air quality and potential increase in noise levels within the SAC and SPA boundaries are considered negligible;
- Water quality in the River Nore and River Pococke will not be affected as surface water run-off and waste water from site activities will be discharged to the IDA sewer system and ultimately treated at the Purcellsinch WWTP. This WWTP was recently the object of a Stage 1 Screening for Appropriate Assessment which found no likely significant effects from the operation of this plant; and
- The proposed water abstraction required of 90m3/hr is insignificant in terms of the overall flow in the river and has been demonstrated to have No significant effect on water quality of the River Nore.
However there are some qualifying features where the potential for significant environmental effects is uncertain. It may be necessary to undertake a localised refurbishment of the existing river intake chamber on the site of the pumphouse. In addition, site clearance works on the site of the pumphouse may include agricultural grassland and areas of hedgerow, gorse and bramble scrub to be removed from the main development site. These types of activity has the potential to cause the release of silt / sediment into the watercourse which can have the impact of blocking fish gill and smothering macrophytes downstream. In the event that localised refurbishment or vegetation removal is required then a Method Statement for same will be agreed in consultation with the NPWS which will include a Ministerial Order, as required.

Similarly, it may be necessary to intermittently remove vegetation from the vicinity of the abstraction inlet during the operation of the power plant. Fine screens and barriers will be used as necessary on such occasions to prevent the movement of sediment downstream and the maintenance should be carried out outside of the spawning and migratory season.

Based on the overall findings of the Stage 1 Screening for Appropriate Assessment and the uncertainty in relation to potential impacts on qualifying features of the SAC and SPA resulting from localised refurbishment works, it is considered that a Stage 2 Appropriate Assessment was required from a precautionary perspective.

10.3.3.2 Stage 2 appropriate Assessment – Natura Impact Statement

A Natura Impact Statement was undertaken which concluded that potential impacts on the qualifying features of the Natura 2000 sites were not anticipated.

- Effects to air quality and potential increase in noise levels within the SAC and SPA boundaries are considered negligible;
- Water quality in the River Nore and River Pococke will not be affected as surface water run-off and waste water from site activities will be discharged to the IDA sewer system and ultimately treated at the Purcellsinch WWTP which is operated under EPA licence; and
- The proposed water abstraction 90m$^3$/hr is insignificant in terms of the overall flow in the river and has been demonstrated to have no significant effect on water quality of the River Nore;
- Proposals are in place to agree suitable Method Statements with the NPWS and other statutory consultees, as required, for any activities which involve works in the vicinity of the SAC and SPA.

No direct impacts on the Natura 2000 sites from the construction, operation, or decommissioning of the development are likely to occur.

10.3.3.3 Protected Species Recorded in the Area

Within the 10 kilometre grid in which the site is located, the NPWS records for protected species are as follows:

- *Colchium autumnale* – Autumn crocus;
- *Erinaceus europaeus* – Hedgehog;
- *Lutra lutra* – Otter;
- *Mustela erminea* – Stoat;
- *Pseudorchis albida* – Small-white orchid; and
- *Sciurus vulgaris* – Red squirrel.
10.4 Ecological Assessment

10.4.1 Habitats and flora survey

The habitat survey was undertaken following the Heritage Council guidelines (Smith et al., 2011), with habitats recorded evaluated according to the NRA guidelines (2009b). The habitat types recorded from within the study area were classified according to Fossitt (2000) and were mapped according to their extents. The characteristic and dominant flora recorded from within each habitat is also presented. A summary list of habitats recorded from within the proposed development site and environs are presented in Table 10.3 and are described individually.

A habitat map for the lands within the proposed development site and its environs has been compiled and is presented in Figure 10.2.

Table 10.3 List of Habitat Types recorded from within the proposed development site and its environs (according to Fossitt, 2000). The ecological importance of each habitat is also presented (from NRA, 2009b).

<table>
<thead>
<tr>
<th>Habitat Code</th>
<th>Habitat name</th>
<th>Ecological evaluation</th>
<th>Within or in proximity to the development site</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA1</td>
<td>Improved agricultural grassland</td>
<td>Low local importance</td>
<td>Within the site</td>
</tr>
<tr>
<td>GA2</td>
<td>Amenity grassland</td>
<td>Low local importance</td>
<td>Within the site</td>
</tr>
<tr>
<td>GS4</td>
<td>Wet grassland</td>
<td>Low local importance</td>
<td>Within the site</td>
</tr>
<tr>
<td>WS1</td>
<td>Scrub</td>
<td>High local importance</td>
<td>Within the site</td>
</tr>
<tr>
<td>WL1</td>
<td>Hedgerows</td>
<td>High local importance</td>
<td>Within the site</td>
</tr>
<tr>
<td>WL2</td>
<td>Treelines</td>
<td>High local importance</td>
<td>Within the site</td>
</tr>
<tr>
<td>BL3</td>
<td>Buildings and artificial surfaces</td>
<td>Low local importance</td>
<td>Within the site</td>
</tr>
<tr>
<td>FW1</td>
<td>Eroding / upland watercourse</td>
<td>International importance</td>
<td>Crossed by the proposed pipeline route</td>
</tr>
<tr>
<td>FW2</td>
<td>Depositing / lowland watercourse</td>
<td>International importance</td>
<td>River Nore at the proposed abstraction point within the site</td>
</tr>
<tr>
<td>WN5</td>
<td>Riparian woodland</td>
<td>International importance</td>
<td>Alluvial wet woodland outside of the site footprint</td>
</tr>
<tr>
<td>WD1</td>
<td>Mixed broadleaved woodland</td>
<td>High local importance</td>
<td>Outside of the site footprint</td>
</tr>
</tbody>
</table>

10.4.1.1 Improved agricultural grassland (GA1)

The proposed development site adjacent to the existing Purcellsinch Wastewater Treatment Plant is characterised as improved agricultural grassland, as is the majority of the proposed abstraction location. This habitat type within the study area was found to be dominated by Yorkshire fog (*Holcus lanatus*), perennial ryegrass (*Lolium perenne*) and timothy (*Phleum pratense*). Other herbaceous species present include thistles (*Cirsium* spp.), creeping buttercup (*Ranunculus repens*), nettle (*Urtica dioica*), dock (*Rumex* sp.), Cowslip (*Primula veris*), Yarrow (*Achillea millefolium*), White clover (*Trifolium repens*), and ribwort plantain (*Plantago lanceolata*). This habitat is of low ecological value and impacts on this habitat are limited to the local context.

10.4.1.2 Amenity grassland (GA2)

Landscaped grassland habitat to the north of the proposed development site within the existing industrial estate is classified as Amenity grassland (GA2) habitat. This habitat is of low ecological value and any impacts are limited to the local context.
10.4.1.3 Wet grassland (GS4)

Wet grassland habitat was recorded from the eastern portion of the proposed abstraction location extending to the bank of the Pococke River corridor at the confluence with the River Nore. This habitat was found to be of low diversity, being a feature of inundation and damp ground conditions within an improved agricultural grassland field. This habitat was dominated by Soft rush (Juncus effusus).

10.4.1.4 Scrub (WS1)

Bramble (Rubus fruticosus) and gorse (Ulex europaeus) scrub (WS1) was recorded within the main portion of the proposed development site. Additional scrub habitat within the study area was recorded from the riparian corridor of the Pococke River due north of the proposed development. This habitat within the proposed development site is identified as being of low ecological importance and impacts are limited to the local context. The scrub habitat along the Pococke River corridor is designated within the River Barrow and River Nore cSAC (as site of international importance) and is evaluated as being of high local importance in its own right; however, no element of the proposed development will affect this habitat.

10.4.1.5 Hedgerows (WL1)

A short section of degraded hedgerow was recorded along the southern boundary of the proposed development site adjacent to the tertiary road corridor; this habitat was dominated by hawthorn (Crataegus monogyna) and evaluated as being of low ecological importance, with any impacts limited to the local context.

10.4.1.6 Treelines (WL2)

Along the western boundary of the site are mature poplar trees (Populus sp.) trees. The southern boundary of the site is also dominated by tree species including hawthorn (Crataegus monogyna) and young ash (Fraxinus excelsior) and beech (Fagus sylvatica) trees. The south eastern field boundary consists of the remains of a stone wall in places with a treeline of ash, hawthorn and occasional oak (Quercus sp.). Treeline habitats within the study area were found to be of low local importance, with any impacts limited to the local context.

10.4.1.7 Buildings and artificial surfaces (BL3)

Existing built structures and road corridors within the proposed development site and environs are classified within this habitat type. The road corridor connecting the proposed development site to the abstraction location, i.e. the route of the proposed abstraction pipeline, contains a very narrow grassy verge (GS2) characterised by Bent grass (Agrostis spp.), Cock’s foot grass (Dactylis glomerata), Herb Robert (Geranium robertianum), Dandelion (Taraxacum spp. agg.), Creeping cinquefoil (Potentilla reptans), Ragwort (Senecio jacobea), Sow-thistle (Sonchus sp.), Bramble (Rubus fruticosus spp. agg.), Ivy (Hedera helix), Cleavers (Galium aparine), Ribwort plantain (Plantago lanceolata), Hogweed (Heracleum sphondylium), Polypody fern (Polypodium spp. agg.) and Maidenhair spleenwort (Asplenium trichomanes).

The built environment habitats within the study area are evaluated as of low ecological importance and any impacts are limited to the local context.

10.4.1.8 Eroding / upland watercourses (FW1)

The Pococke River within the study area was found to be characterised by eroding conditions upstream of the tertiary road bridge crossing along the route of the proposed abstraction pipeline. Instream vegetation was dominated by water moss Fontinalis sp. with occasional plants of lesser water-parsnip Berula erecta and water-crowfoot Ranunculus spp. Small areas of deposited silts along the margins supported occasional marsh ragwort Senecio aquaticus, opposite-leaved golden saxifrage Chrysosplenium oppositifolium, lesser celandine Ranunculus ficaria, lady’s smock Cardamine pratensis and hairy bittercress Cardamine hirsuta.
This watercourse is designated within the River Barrow and River Nore cSAC and is evaluated as being of international importance.

10.4.1.9 Depositing lowland watercourses (FW2)

The lower reaches of the Pococke River below the tertiary road bridge to the confluence with the River Nore is characterised as depositing. This stretch lies to the east of the proposed abstraction location site. Instream vegetation was limited within this stretch of the watercourse, with evidence of water quality issues where flow rates decreased upstream of the confluence. The Pococke River is within the River Barrow and River Nore cSAC and is evaluated as being of high local ecological importance in its own right.

The main channel of the River Nore is a depositing watercourse within the study area, both upstream and downstream of the proposed abstraction location. The river corridor and floodplain within the study area is designated within the River Barrow and River Nore cSAC. Instream vegetation within the river corridor includes branched bur-reed *Sparganium erectum*, common clubrush *Schoenoplectus lacustris* and reed canary-grass *Phalaris arundinacea*. Marginal vegetation comprised canary reed-grass, branched bur reed *Sparganium erectum*, creeping bent *Agrostis stolonifera* with occasional marsh marigold *Caltha palustris*, watermint *Mentha aquatica*, lady’s smock *Cardamine pratensis*, meadowsweet *Filipendula ulmaria* and marsh ragwort *Senecio aquaticus*. The River Nore is evaluated as being of international ecological importance.

10.4.1.10 Riparian woodland (WN5)

The riparian margin of the Nore at the proposed abstraction location comprises an open bank; however downstream of the works site an area broadly corresponding to the priority Annex I habitat type ‘Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0]’, listed as a qualifying interest of the cSAC. This habitat is limited in extent and is dominated by willow *Salix* sp. with some ash *Fraxinus excelsior*. The non-native invasive species Himalayan balsam *Impatiens glandulifera* was found to be abundant and likely to be spreading along the riparian corridor at this location. Trees on the weir island on the River Nore, downstream of the proposed abstraction location, included ash *Fraxinus excelsior*, alder *Alnus glutinosa*, sycamore *Acer pseudoplatanus* and osier *Salix viminalis*; while blackthorn *Prunus spinosa* and elder *Sambucus nigra* were found as scattered shrubs.

Riparian woodland within along the river corridor of the River Nore within the River Barrow and River Nore cSAC broadly corresponds to the priority Annex I habitat and is of international importance.

10.4.1.11 Mixed broadleaved woodland (WD1)

An area of mixed broadleaved woodland was recorded along the river corridor of the Pococke River from the existing tertiary road bridge crossing upstream, species recorded included Hazel *Corylus avellana*, sycamore *Acer pseudoplatanus*, beech *Fagus sylvatica*, hawthorn *Crataegus monogyna* and ash *Fraxinus excelsior*. This habitat does not occur within the footprint of the proposed development site. Mixed broadleaved woodland within Pococke River corridor is designated within the River Barrow and River Nore cSAC (as site of international importance) and is evaluated as being of high local importance in its own right; however, no element of the proposed development will affect this habitat.

10.4.1.12 Protected flora

The National Parks and Wildlife Service ‘online map viewer’ was referenced to establish the potential for protected species occurring in the study site based on records of species recorded from within the 10km grid square (S55). From the NPWS dataset two plant species were recorded; Autumn crocus *Colchium autumnale* and Small-white orchid *Pseudorchis albida*, neither of which have been recently recorded with records dating from the last century.
GIL Power Generation Kilkenny

The Autumn crocus (*Colchium autumnale*) is listed on the Flora Protection Order (1999) and is typically found in damp meadows and river banks. Wet grassland habitat within the proposed development site was found to be species poor; however it is considered possible that this species may occur along the riparian margins of the River Nore within the study area. This plant flowers late in August and was not recorded during the botanical survey (April, 2012).

The Small-white orchid is recorded from upland heaths and sand-dune habitats. Suitable habitat for this species was not recorded from within the study area and this species was not identified within the proposed development site.

In addition to the two Flora Protection Order (1999) species listed above, the Nettle-leaved bellflower (*Campanula trachelium*) has been recorded from with the Archersgrove woodland (pNHA) on the south bank of the River Nore, approximately 200m from the proposed development site. This species was previously protected under the Flora (Protection) Order 1987, but was removed under the 1999 Order, it is now recognised as a rare and endangered species on the Red Data list. This species has not been recorded from the proposed development site and suitable woodland habitat for this species does not occur within the footprint of the proposed development.

10.4.1.13 Invasive non-native flora

The proposed main development site and the pumphouse site including the proposed abstraction location and water pipeline route were searched for the presence of non-native invasive species. None were found within the footprint of the development site; however, Himalayan balsam was recorded from the riparian corridor of the River Nore downstream of the proposed abstraction location.

10.4.2 Kingfisher Survey

The breeding bird survey was carried out over two days during early April 2012 and was focussed on identifying Kingfisher activity within the study area. Water levels were low following a month of low rainfall in March 2012, so all suitable nesting banks were visible. The study area was searched thoroughly on foot and all riparian species using the site were recorded. Figure 10.3 presents a map of the survey area and includes target notes of bird species recorded.

The Kingfisher *Alcedo atthis* is listed on Annex I of the EU Birds Directive (2009) and is the sole conservation interest (NPWS, 2011) of the River Nore SPA (site code 004233), a recently designated Natura 2000 site for the conservation of this species. It is noted that the SPA site boundary includes the River Nore and its immediate riparian corridor but does not include the floodplain lands or the Pococke River corridor which are designated within the River Barrow and River Nore cSAC. Kingfishers are also listed as an Amber species in the ‘Birds of Conservation Concern in Ireland’ (BOCCI) status report (Lynas *et al*., 2009).

Kingfishers require relatively shallow and slow-moving freshwater, with thriving populations of small fish on which to feed and vertical banks of fairly soft material where they can excavate their nesting burrows (Gibbons *et al*., 1993). All of these requirements are found on the River Nore. In a recent national study, the River Nore was found to support the highest numbers of Kingfishers, nests and territories (Crowe *et al*., 2010). Kingfishers are shy creatures and are easily disturbed with human disturbance of nesting birds identified as a serious problem frequently leading to brood failure (RSPB web-site).

On the River Nore, starting about 400 metres downstream of the existing abstraction point, there is an abundance of vertical banks with perches nearby. This is where most of the Kingfisher activity was recorded. The area at the rear of the dwelling house near the existing abstraction point has several channels or old mill races which were not surveyed. The river immediately downstream of the existing abstraction point, below the weir, is fast moving and consists of gravel banks. The nearest suitable nesting banks are about 500 metres downstream. There is considerably less disturbance in this area. Single Kingfishers were seen on three occasions and a pair was recorded at a suitable bank approximately 800
Results of the bird survey for the proposed GIL Power Generation Project, Kilkenny

Bird Survey Codes:
CA = Cormorant
DI = Dipper
H = Grey Heron
GL = Grey Wagtail
KF = Kingfisher
MA = Mallard
SN = Snipe

Figure 10.3  Date: 17/04/2012

Results of the bird survey for the proposed GIL Power Generation Project, Kilkenny
metres downstream of the proposed development site. At about 500 metres downstream of the existing abstraction point there were suitable nesting banks identified with one old and two new nest-tunnels.

There were virtually no suitable nesting banks upstream of the existing abstraction point. These banks were either too low, or sloped, or were faced with stone. This area was used heavily by recreational walkers and joggers and people with dogs. The recreational use decreased further downstream from Kilkenny City.

The bird survey undertaken along the banks of the Pococke River and the River Nore recorded riparian species including Dipper *Cinclus cinclus*, Grey Wagtail *Motacilla cinerea*, Grey Heron *Ardea cinerea*, Cormorant *Phalacrocorax carbo*, Snipe *Gallinago gallinago*, Mallard *Anas platyrhynchos*, Kingfisher *Alcedo atthis* and Reed Bunting *Emberiza schoeniclus*. A pair of Dippers and a pair of Grey Wagtails were found to be nesting on the bridge over the River Pococke. A heronry with 6 active nests was located on the south bank of the River Nore at the Archersgrove woodland, due south of the proposed development. During the survey a single Cormorant was recorded flying downstream but this bird would not be breeding in the area. One Snipe flew up from a drainage ditch near the existing water abstraction point and it may be a late winter migrant. The proposed development site does not contain suitable habitat for wintering water birds.

### 10.4.3 Otter Survey

The otter is a legally protected species under the *Wildlife Act, 1976 (and Wildlife (Amendment) Act, 2000)*. According to Marnell *et al.* (2009) the otter is listed as ‘Near threatened’ on the most recent Red Data list for mammals, taking account of its ‘Near threatened’ status at a European and Global scale. This species is listed under Annex II and IV of the EU Habitats Directive and under Annex II* of the Berne Convention. It is listed as a qualifying interest of the River Barrow and River Nore cSAC.

An extensive search of the study area concentrated on the riparian corridors of the River Nore and Pococke River, and including the lands within the proposed development site was carried out during April 2012. No signs of otter activity i.e. otter holts, spraints, tracks or slides were recorded during the current survey, despite optimal conditions for survey. It is considered inevitable that otter will utilise the river corridors of the River Nore and Pococke River within the study area for foraging and commuting, with good fish stocks presenting adequate foraging within both watercourses; however, otters may only pass through the lower reaches of the Pococke River due to water quality issues which limit foraging potential. The current assessment considers that although no signs were recorded, otter do occur within the study area.

### 10.4.4 Other Species

It is likely that hedgehogs are present within the site, although none were observed on the day of survey (Habitat Survey undertaken by Mott MacDonald in March 2011). Signs of stoat and red squirrel were not observed from within the main development site and they are unlikely to use the site as there are no field drains or streams within the site or dense woodland which would support these species.

No badger setts were noted within the site on the day of survey, however rabbit burrows are present within the scrub in the main development site.

There were no mature trees identified from within the site which may support bat species, due to the lack of crevices in the trees that are present on the western boundary of the site and also the lack of ivy on the trees.

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10.5 Construction Phase Impacts

The construction of the development will result in the loss of the agricultural grassland from the site and the removal of areas of gorse and bramble scrub. As these habitats are of low ecological value it is considered that the development will have a slight negative impact on flora and fauna.

During construction there is also potential for an increase in scavenging species such as brown rat to occur at the site.

During construction, dust has the potential to impact on adjacent vegetation and construction noise is likely to result in birds and small mammals avoiding the area.

During construction there is the potential for fuel leakages from heavy plant machinery on site which may impact on the soils, groundwater and the adjacent River Pococke. In addition, there is potential for surface water runoff to impact on the nearby River Pococke.

10.6 Operational Phase Impacts

It is proposed, as per consultation with Inland Fisheries Ireland (IFI), that the intake chamber for the river abstraction on the pumphouse site will be screened so as to preclude entry of juvenile and adult salmonids and cyprinids. Further details are contained in Chapter 11 Water.

Based on air quality modelling conducted as part of this assessment (refer to Chapter 9 Air Quality), impacts of NOx during the operational phase of the development will be imperceptible on designated conservation sites within the 10 kilometre air quality study area radius of the site. The predicted concentrations of NOx are less than 1% of the air quality standard at all designated conservation sites within a 10 kilometre radius of the site including the River Barrow and River Nore SAC and the River Nore SPA.

The storage of fuel and oils on site during the operation of the development has the potential to impact on soils, groundwater and the adjacent River Pococke in the event that a leakage occurred.

During the operational phase of the development there will be artificial lighting in place on the site of the main development (not the pumphouse site) which may deter fauna from the site. However, as no protected fauna species were identified from within the site, this is impact will not be significant.

10.7 Mitigation Measures

10.7.1 Construction Phase Mitigation Measures

Prior to construction, it will be necessary to clear the site of bramble and gorse scrub. While no signs of protected fauna such as badger were evident on the day of survey, rabbits were observed entering burrows within the areas of scrub. The removal of scrub from the site shall take place outside of the bird nesting season (1st March to 31st August inclusive) to avoid impacts on nesting birds. Care shall be taken during the removal of scrub vegetation so that rabbits are not injured. Prior to the removal of burrows, the ground adjacent to the burrow shall be disturbed in order that the rabbits are encouraged to leave the area.

In relation to landscaping measures a Beech hedge will be planted along the northern boundary. Some internal tree planting comprising semi-mature Beech trees and young pine will be planted within the southern boundary. Other internal planting will include woodland planting to the North West corner of the site. Existing Poplar trees in the North West and south west corner will be retained and protected during the works by fencing to avoid disturbance to the roots in accordance with BS 5837: 2005 Trees in Relation to Construction – Recommendations. A Beech tree and a Grand Fir to the north and outside the site boundary will also be protected during the construction of a new access road into the site and changes of
level and service cabling in this area will be avoided. Protective fencing will be erected along the line of the existing post and wire fence line should it be a requirement to remove the existing fence.

Dust control measures shall be put in place to minimise the escape of dust from the site and to minimise impacts on vegetation adjacent to the site and the existing trees and hedgerow along the site boundary such as washing of vehicles, wheel washes, covering of loads entering and exiting the site and stockpiles of materials will be kept for the shortest time possible and sheeted to prevent the escape of dust.

Best practice construction measures shall be put in place to prevent pollutants entering the groundwater and impacting on the nearby River Pococke as described in Chapter 11 Water and Chapter 12 Soils, Geology and Hydrogeology.

Pre-construction, the site access roads and footprint of the proposed works area will be cordoned and no plant movement or tree damage will take place outside of these areas. Buffer zone fencing will be constructed in a continuous line on each side of the development to prevent access outside of the site, taking particular account of the sensitivity of the riparian margin and aquatic environments of the River Nore and the Pococke River.

The presence of the non-native, invasive Himalayan balsam was recorded downstream of the proposed abstraction location along the riparian corridor of the River Nore. It is recommended that the works area restricted to within the proposed site footprint and no tracking of machinery or earthworks are undertaken within the affected area where this species occurs. All appropriate measures will be taken to ensure that machinery does not facilitate the establishment and spread of non-native species into or from the works area. Machinery which has been previously working along roadsides or in watercourses affected by invasive species will require appropriate cleaning and decontamination prior to entering the site. A wide scale management plan for the control of Himalayan balsam along the River Nore corridor is beyond the remit of the current proposal.

A supplementary pre-construction ecology survey will be undertaken as outlined in the Preliminary Construction Environmental Management Plan to confirm the absence of protected flora and fauna. This mitigation measure has been proposed to cater for a scenario where there is a significant period of time between the final planning decision and the commencement of on site construction activities.

While there is apparently no Kingfisher pair breeding in the footprint or direct vicinity of the proposed abstraction point it is considered that immature Kingfishers from neighbouring territories will start to disperse in August and September. All works requiring clearance of reed habitat and scrub within the abstraction location should be completed outside the bird breeding season to avoid disturbance.

The pipelaying works connecting the abstraction point to the proposed development site will require works on the existing road bridge over the Pococke River. The barrel of this bridge should not be closed at any time to facilitate passage of Kingfisher and riparian birds along the river corridor.

 Passage of otter will be maintained through the bridge over the Pococke River at all times.

10.7.2 Operational Phase Mitigation Measures

Mott MacDonald Ireland consulted with Inland Fisheries Ireland (IFI) regarding proposals for the use of a water abstraction from the River Nore. It is proposed, as per confirmation from the IFI that the intake chamber for the river abstraction will be screened so as to preclude entry of juvenile and adult salmonids and cyprinids. The detailed design of this screen will be set out outlined in a Method Statement to be agreed in consultation with the IFI and the NPWS.
GIL Power Generation Kilkenny

In the case of items of plant and equipment liable to come into contact with the River Nore and the River Pococke, such plant and equipment will be thoroughly cleaned and washed using high pressure steam cleaning before delivery to the works site, so as to prevent the spread of hazardous aquatic invasive species and pathogens.

Lighting on site will be kept to a minimum and lighting with cowled or directional lighting to minimise risks of nuisance whilst ensuring minimum standards for health and safety will be adhered to;

Surface water will be collected and discharged to the IDA Business and Technology Park surface water drainage system and therefore effects from water run-off from the site will be negligible.

All water discharges (foul water and process water) from the development will be discharged to sewer and treated in the adjacent Wastewater Treatment Plant in Purcellsinch and therefore no water quality impacts on the River Pococke and the River Nore are anticipated, provided that the waste water discharge limits as specified by the Environmental Protection Agency (EPA) through the Integrated Pollution Prevention and Control (IPPC) Licensing regime are complied with.

10.8 Residual Impacts

Overall, the land on which the proposed development is located is of low ecological value. It is considered that following the implementation of mitigation measures, the impact of the proposed development on flora and fauna is deemed to be slightly negative as there will be a change in land use. The Stage 2 Appropriate Assessment – Natura Impact Statement (Appendix N.2) concluded that there would not be a significant impact on the River Barrow and River Nore SAC or River Nore SPA. In addition it should be noted that air, noise and wastewater emissions will all be regulated by the Environmental Protection Agency (EPA) under the Integrated Pollution Prevention and Control (IPPC) licensing regime.