

APPENDIX 11.2 DANGANBEG WETLAND ECOLOGICAL REPORT**A.11.2.1 INTRODUCTION**

The wetland is situated along the line of the proposed N9, 2km west of Knocktopher in Co. Kilkenny within the townlands of Danganbeg and Baysrath. Arup Consulting Engineers requested an additional survey of the wetland to describe fully the vegetation and its ecological value and to assess the impact significance of the proposed alignment impacting on part of it.

A11.2.2 METHODOLOGY

The site was visited in August and October 2003. A walk over survey was undertaken to record the main habitats and species within the wetland area. The habitats are classified using Fossitt 2000 and the nomenclature of the species follows Webb et al. (1996).

A11.2.3 GENERAL SITE DESCRIPTION

This wetland is situated in low-lying ground at the base of a small valley. It is 750m in length and up to 400m at its widest point. Groundwater discharges into the wetland through a series of springs and flushes on the eastern side of the wetland and there appears to be upwelling groundwater areas in the centre. Water flows out of the site in two drainage channels in a southerly direction, and discharges eventually into the Little Arrigle River. The wetland is quite diverse in terms of its vegetation. It is comprised of a mosaic of habitats which include springs, flushes, fen, marsh, willow carr, wet grassland, and scrub. Two of the habitats have links with Annex I habitats listed in the EU Habitats Directive These habitats are described in more detail in Section 8 (below) and are shown on EIS Figures 11.18 and 11.19.

A11.2.4 EVALUATION

This is a relatively large wetland site located in a small valley depression. It is comprised of a mosaic of diversity wetland such as springs/seepages fen, marsh, wet grassland and willow carr. Two of the habitats have links with Annex 1 habitats (Alkaline fen and (possibly) petrifying springs with tufa formation, under the EU Habitats Directive (92/43/EEC)). Although it is not a designated conservation area, it is of national ecological importance.

A11.2.5 IMPACTS OF THE PROPOSED ALIGNMENT

The original alignment crossed through the wetland in a north – south direction, impacting on one of the wettest parts at the centre of the wetland. The route alignment has been revised to reduce the overall impact. The final alignment (as described in the main EIS) impacts only on the north-western side of the site. There will be no direct impact on the spring and seepage areas at the eastern side of the site. There may be some impacts on the upwelling/flush areas at the centre of the site and there will be removal of some wet grassland. There will be a major negative residual impact on the site due to the loss of wetland habitat on the western margin of the site. However there will be no hydrological impacts on the calcareous springs (priority Annex I habitat) located on the eastern side of the site, as confirmed by the hydrogeological report carried out by Minerex Environmental Ltd (2004).

A11.2.6 MITIGATION

Given the regional importance of the site, consultation with the NPWS was undertaken to discuss mitigation options. The original alignment traversed the centre of the site. On review of the potential impact on this wetland site, the alignment was moved to the western side of the site, thereby reducing the significance of the impact. In addition, it has been agreed with the NPWS that mitigation in the form of compensatory or restored wetland is included in the development to reduce the significance of the impact as follows:

There are two fields to the east of the mainline (between 25+780 and 25+990 at a distance of between 30m and 90m from mainline), which are situated on low-lying ground on a peaty soil at the same elevation as the fen. Although the grassland fields are intensively managed and have been cut for silage/hay, they are waterlogged and include wetland species as well as abundant rushes, which are recolonising. If this level of management ceased, the vegetation would revert to wet grassland and possibly fen. This would assist in compensating for the loss of the wetland habitats at the northern end of the site.

A11.2.7 DANGANBEG WETLAND HABITAT DESCRIPTIONS**Calcareous springs (FP1)**

There are a series of springs and seepage areas located on the eastern side of the fen, which flow downslope towards the centre of the wetland. Where there is a good head of water with visible upwelling, the water tends to be in open pools over bare mud and often with a lush growth of foals watercress (*Apium nodiflorum*) and flowering sweet-grass (*Glyceria fluitans*). Where the water comes to the surface, as a diffuse seepage area through shallow peat, the vegetation is characterised by tussocks of black bog rush (*Schoenus nigricans*). Between the tussocks there are moss patches, which include *Cratoneuron commutatum* and *Drepanocladus revolvens*. There are patches of calcite deposition on bare peat and stonewort algae (*Chara sp*) may be present. Although this habitat is somewhat diffuse and patchy on the eastern slopes, it has links with the Annex 1 Habitat petrifying springs with tufa formation under the EU Habitats Directive.

Fen (PF)

The fen vegetation is quite diverse and it grades from a more alkaline 'rich fen' (PF1) at the east of the site associated with the springs and flushes to a more acid 'poor fen' (PF2) at the centre of the site.

Rich Fen (PF1)

This is a species rich fen vegetation fed by alkaline groundwater. It is comprised of sedge-rich swards, including; Long-stalked yellow-sedge (*Carex viridula* subsp. *Brachyryhyncha*), glaucous sedge (*C. flacca*), carnation sedge (*C. panacea*) and flea sedge (*C. pulicaris*). Rush (*Juncus artic/acuti*) is also present. Other species include Devil's bit scabious (*Succisa pratensis*), bog pimpernel (*Anagallis tenella*), butterwort (*Pinguicula vulgaris*), pennywort (*Hydrocotyle vulgaris*), greater birds-foot-trefoil (*Lotus uliginosus*), ragged robin (*Lychnis flos-cuculi*), grass-of-parnassus (*Parnassia palustris*), marsh marigold (*Caltha palustris*). Spear moss (*Calliargon cuspidatum*) is locally frequent. This habitat is a listed Annex I habitat under the EU Habitats Directive (92/43/EEC). Several snipe were put up from this area during the site visit.

Poor Fen (PF2)

On deeper peat towards the centre of the wetland, the fen vegetation is characteristic of more acid conditions and includes many of the species, which are characteristic of poor fen such as; bottle sedge (*Carex rostrata*), and bog cotton (*Eriophorum angustifolium*). Other species include horsetail (*Equisetum fluviatile*), marsh pennywort (*Hydrocotyle vulgare*), sedge (*Carex disticha*) and where it is wetter; bog bean (*Menyanthes trifoliata*) is frequent. Spear moss is locally abundant. However there is an absence of Sphagnum moss, which indicates that it is mildly acid, but not acid enough to support the Sphagnum mosses.

East of ch. 26+200 is an area of fen dominated by purple moor grass (*Molinia caerulea*) tussocks. Between the tussocks there are frequent rushes (*Juncus articulatus/acutiflorus*) and tormentil (*Potentilla erecta*). There are very localised clumps of black bog rush and fragrant orchid (*Gymnadenia fragrans*). Other species include meadowsweet (*Filipendula ulmaria*), Yorkshire fog (*Holcus lanatus*), angelica (*Angelica sylvestris*) and sweet vernal grass (*Anthoxanthum odoratum*). Towards the northern end of this habitat, it grades into wet grassland with more tall herbs such as meadowsweet and grasses such as false oat grass (*Arrhenatherum elatius*) and tufted hair-grass (*Deschampsia caespitosa*).

Marsh (GM1)/Wet Grassland (GS4)

At the centre of the fen there are wet areas with water at or just above the ground surface. The vegetation is a dense sward of tall herbs, rushes and grasses, that including burr reed (*Sparganium sp.*), willowherbs (*Epilobium hirsutum* and *E. palustre*), meadowsweet, rushes (*Juncus effuses* and *J. inflexus*), grasses, creeping bent (*Agrostis stolonifera*) and Yorkshire fog (*Holcus lanatus*). In places there are quaking areas covered with a green carpet of creeping bent grass. It appears there may be upwelling groundwater beneath these patches. There are large clumps of iris (*Iris pseudacorus*) and water mint (*Mentha aquatica*) is common.

Willow Carr (WN6)

At the central lowest part of the site adjacent to the marsh, there is an area of willow (*Salix cinerea*) dominated scrub woodland in a saturated area with a high water table. The vegetation beneath the canopy on the ground included water horsetail, marsh marigold, bottle sedge and occasional bog bean.

Drainage ditches (FW4)

Two drainage channels have been dug from the low-lying region at the centre of the fen, southwards to beyond the edge of the fen. The channels are typically 0.5m – 1.0m wide at their base and the banks are up to 1m high. The channels contained water in the August 5th site visit, but were almost dry in the October 10th visit. The water arising from this wetland eventually discharges into the Little Arrigle River.

Wet grassland (GS4)

The northern end of the site east of ch. 26+450 – 26+250 is wet grassland on a poorly drained mineral soil, which becomes peatier towards the southern end. The vegetation is dominated by a mixture of rushes, tall herbs and grasses. The rushes include soft rush (*Juncus effuses*), with jointed/sharp-flowered rush (*Juncus artic/acutiflorus*) becoming more frequent in the peatier areas. There is abundant meadowsweet and large localised clumps of iris. Grasses are frequent and the main species are Yorkshire fog creeping bent (*Agrostis stolonifera*), red fescue (*Festuca rubra*) and tussocks of tufted hair-grass. Other herbaceous species present are mint, meadow vetchling (*Lathyrus pratensis*), willowherb (*Epilobium parviflorum*), and marsh horsetail (*Equisetum palustre*).

Rank Grassland (GS2)

Along the western side of the wetland where the ground level rises, the vegetation is damp, rank grassland, which becomes dryer up towards the wetland boundary. This area has not been recently managed. The grass sward includes a mixture of grasses; Yorkshire fog, red fescue, creeping bent grass, Timothy (*Phleum pratense*) and (*Festuca arundinacea*). Other herbaceous species include (*Rumex sp.*), marsh thistle (*Cirsium palustre*), willowherb (*Epilobium hirsutum*), plantain (*Plantago lanceolata*) and silverweed (*Potentilla anserina*).

Scrub (WS1)

There is a thicket of scrub along the upper slopes of the western boundary of the wetland ch.26+180 – ch.26+475. It is comprised of dense hawthorn (*Crataegus monogyma*), blackthorn (*Prunus spinosa*), bramble (*Rubus fruticosus agg.*), with occasional ash (*Fraxinus excelsior*) and sycamore trees (*Acer pseudoplatanus*).

A.11.2.8 REFERENCES

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