

1. QUALIFICATIONS AND EXPERIENCE

My name is Jenny Neff. I am Director and Principal Ecologist of Ecological Advisory and Consultancy Services, known as EACS. I am a qualified botanist, vegetation scientist and ecologist with 39 years' experience of working on Irish habitats and species, in academic research; on state and semi-state contracts, and in the private sector. My academic qualifications are:

- Bachelor of Science: Botany (Hons) from the University of Sheffield
- Master of Science in Ecology from University College of North Wales, Bangor
- Diploma in Business Studies from Maynooth College, NUI

1.1 Professional accreditations

In 2007 I was admitted to the Institute of Ecology and Environmental Management as a Fellow (FIEEM), Prior to this I had been a full member since 1992. I am a Chartered Environmentalist (CEnv) through the Society of the Environment (SocEnv).

1.2 Membership of other scientific bodies

I am a full member of:

- The British Ecological Society (BES),
- The Botanical Society of the British Isles (BSBI), and
- The Environmental Sciences Association of Ireland (ESAI)

1.3 Professional experience and knowledge of the area

My specialist areas of expertise, as a vegetation scientist are: coastal habitats; blanket bog / wet heath habitats; and scarce Irish vascular plants. As an ecologist and applied ecologist my experience includes: project management, ecological impact assessment (EclA) for environmental impact assessment (EIA) and strategic environmental assessment (SEA); the implementation and monitoring of mitigation measures. I am familiar with faunal issues (including birds) in the context of populations, habitat potential, impacts and mitigation.

I have undertaken a number of research projects and studies, several of which are relevant to the current project. In particular, as a result of my work on the National Vegetation Survey (on blanket bogs, heaths and coastal habitats), and subsequently as ecologist on the Mayo National Park Feasibility Study Team 1994/95 (for Mayo Co. Co. and the Wildlife Service of the OPW) I became familiar with the habitats of northwest Mayo.

In addition to these, my research on Irish coastal habitats; the study for the Biodiversity Status Report; and the Scarce Plants project also contributed to an accumulated knowledge of the habitats and species in Mayo.

1.4 Other relevant experience

As ecological adviser to Arup Consulting Engineers (Cork) on the Bord Gáis Éireann Mayo to Galway Gas Pipeline from 2001 onwards I was involved in: the preparation of the EIS, pre-construction surveys, input to method statements, consultation with NPWS; and monitoring during construction and post construction monitoring – which is ongoing.

Moving on to the Corrib Gas Project, I have been working on this project since March 2000, almost 10 years, and have:

- provided input to the environmental impact statements for the Bellanaboy Gas Terminal in 2001 and 2003, and the onshore pipeline;
- been Project Ecologist since 2002;
- undertaken (with my team of specialists) habitat, bird and fauna surveys in the wider locality from 2002 to date;
- undertaken monitoring of:
 - vegetation at the Glengad landfall and adjacent habitats;
 - habitat and species surveys, including monitoring at Bellanaboy, pre- and during construction;
- as Project Ecologist been involved with ongoing consultations with NPWS since 2000 at local, regional and national level;
- supervised pre-construction ecological surveys at Srahmore and along the haul road in 2004; and
- provided input to the current EIS for the Srahmore Deposition Site (Volume 3, Chapter 6)

2 SUMMARY OF ASSESSMENT APPROACH

I carried out the ecological assessment for the proposed pipeline development with specialist expert assistance. These specialists are listed in Appendix J1 of the EIS (Volume 2, Book 3 of 5).

Details of the assessment are provided in Chapter 12 (Volume 1) and Appendix J1 of the EIS. Details of relevant legislation and designated sites along the proposed route are provided in the Preface to Section C 'Natural Environment' of the EIS (Volume 1) and in Appendix J1 (Section 4.1) of the EIS.

An assessment of cumulative impacts in respect of terrestrial ecology is provided in Chapter 17 of the EIS (Volume 1, section 17.3.4)

The objectives of the assessment were:

- to carry out an ecological evaluation of the route in terms of habitats and species present;
- to assess the likely impact of the proposed development on habitats and their constituent plant and animal species;
- to recommend suitable and appropriate mitigation measures to ameliorate any negative impacts; and
- to propose any proactive measures to enhance the biodiversity along the route.

The assessment involved a combination of:

- Desk-based review of existing literature relevant to the proposed scheme and the wider area; this included a review of the large body of data accumulated during previous studies in connection with the Corrib Gas project;
- Habitat, vegetation and faunal (non-avian and birds) surveys were undertaken in order to establish a baseline against which potential impacts can be assessed. The methodology used during field surveys is described in Appendix J1 (Section 2); and is outlined in Chapter 12 (section 12.2).
- Consultation with statutory agencies and other relevant environmental bodies.

The assessment was undertaken in accordance with best practice guidelines (EPA, NRA and the Institute of Ecology and Environmental Management); and due regard was paid to the provisions of Article 6 of the EU Habitat's Directive.

In summary, the assessment has shown that no significant impact on habitats and species will result from the construction of the proposed pipeline. No significant impacts are likely to arise on the Natura 2000 sites - the Glenamoy Bog Complex cSAC and the Blacksod Bay/Broadhaven pSPA.

3 The scope of my evidence today will:

- Firstly provide an overview of the proposed pipeline in terms of habitats present and species of interest; their ecological value; and the potential affect of the proposed development.
- Consider any ecological implications of peat deposition at the Srahmore site; and
- Address the specific issues raised by third parties.

4 THE PROPOSED ROUTE (*Slide 1 shows the proposed route*).

4.1 Habitats

The habitats present are described in detail in Appendix J1, and Chapter 12 of the EIS. They are summarised in Appendix J1 (Tables 1 and 2). For clarification, I should point out that the same tables are also in Chapter 12 (Table 12.1 (page 12-14) and on page 12-15 the latter is also numbered 12.1 instead of 12.2).

Habitat mapping is given in Appendix J1 and Chapter 12. Habitat mapping target notes are explained in Appendix J1.

Details of habitat evaluation are given in Appendix J1 (section 4.2.2), and are summarised in general terms in Chapter 12 (including Table 12.3). The results of detailed vegetation surveys are given in Appendix J (Appendices 16 and 17). Impacts on habitats are summarised in Appendix J1 (Table 9).

The chainages referred to in relation to habitats will be approximate because the interface between most habitat types is generally gradual – with one vegetation type merging into another.

4.1.1 Glengad

The pipeline comes ashore at Glengad in the Glenamoy Bog Complex candidate Special Area of Conservation (cSAC 500). The landfall is adjacent to the Blacksod Bay/Broadhaven proposed Special Protection Area (pSPA 4037), and the Blacksod Bay and Broadhaven Ramsar site (844). At the landfall is a low, glacial cliff which was excavated and reinstated in 2002, and again in 2008. As shown in **Slide 2**, prior to 2002 the cliff comprised a vertical stony face, more or less devoid of vegetation. The cliff-top habitat was improved agricultural grassland, but was stripped for landfall construction in 2002, 2005 and 2008; and as it is now in 2009.

I will consider issues relating to the Sand Martin colony at Glengad later in this statement.

(Slide 3, route overview) From the landfall to chainage 83.825 the temporary working area lies within the cSAC and comprises improved agricultural grassland. The landfall valve installation (LVI) will be located in this area.

Between chainage 83.825 and 84.025 there is a mosaic of improved grassland, wet, rushy grassland and *Iris* - dominated marshy areas. Field boundaries are generally wire fences, often on top of low earthen banks. A site compound, launch pit for micro-tunnelling and pipe stringing area will be located here.

Most of the Glengad section will be subject to standard pipeline construction spread techniques, which have been addressed in the separate Statement relating to Construction Methodology. While the agriculturally improved habitats and marshy grassland are commonly occurring and generally of low ecological value (low to moderate in the case of the *Iris* – dominated marsh), their main value is as areas for foraging faunal species (avian and non-avian).

Approximately 630 metres of the Glengad section is within the cSAC. For this reason after top-soil reinstatement, the area will be left to natural regeneration from the existing seed bank and vegetative means (rhizomes, runners etc.), the purpose here being to protect the native gene pool. From reinstatement in 2002, and again in 2005, it has been shown that these areas will revegetate very quickly. Where feasible, some of the *Iris* - dominated marshy area will be turved to facilitate faster vegetation recovery.

EU Annex 1 habitats associated with the sand dune system are located to the north of the temporary working area and include fixed dune grassland. Machair, which I will address later in this statement, is not present at Glengad, neither within nor outside the temporary working area.

No species on the Flora Protection Order of 1999 (and this includes the liverwort *Petalophyllum ralfsii*) are known to occur at Glengad, neither have any been found in any surveys in the area.

With the exception of the footprint of the LVI where there will be localised loss of habitat (improved agricultural grassland), impacts on these habitats will be temporary; and vegetation is expected to quickly re-establish.

4.1.2 The lower crossing and shorelines

Moving further on, at approximate chainage 84.025 the marshy areas merge into a small area of lower salt marsh which lies at the western side of the estuary crossing. In recent years the condition of this salt marsh has deteriorated as a result of rutting from vehicles tracking across it. The intertidal sand and mud flats in the temporary working area have little vegetation, though to the north of the route is an area of accreting sand upon which salt marsh vegetation is becoming established. On the eastern side of the estuary the shore line is rocky and dominated by seaweeds. Higher up the shore salt marsh species are present. The salt marsh is poorly developed, with sparse vegetation cover.

The intertidal and estuarine habitats of the lower crossing are located within the pSPA and Ramsar site.

As outlined in the statement on the proposed construction methods, it is anticipated that the proposed construction methodology of micro-tunnelling for the lower crossing will avoid impacting on the salt marsh, shore lines, intertidal zone or the estuary. The launch and receptor pits area will be set well back from the shore lines. In a worst-case scenario, if difficulties arise during tunnelling, then an intervention pit may be required within the estuary. Potential impacts associated with the construction of an intervention pit are addressed in the Statement on the marine environment and I will consider the potential impacts of such a pit on the birds later in this statement.

4.1.3 East of the lower crossing

To the east of the lower crossing, between chainages 84.450 and 85.990, the route passes through agricultural lands - improved and rushy grassland, where a site compound and the receptor pit for the lower crossing will be located. These areas will be subject to standard pipeline construction spread techniques - as described in the Statement on Proposed Construction Methods, including reinstatement in the usual manner. Impacts will be temporary and vegetation will quickly re-establish.

On this section of the route, field boundaries mainly comprise earthen banks, of which two in particular show a greater diversity of plant species typical of heath. These two boundaries will be dismantled before construction and reassembled once construction is complete. Impacts will be temporary and localised. **(Slide 4 shows one of these species-rich earthen boundaries)**

Gorse and willow scrub – both commonly occurring habitats of local value - are present in some of the fields and along some of the field boundaries and above the northern shore of Sruwaddacon Bay. The main impact of loss of scrub is associated with the loss of foraging and refuge for fauna.

4.1.4 Blanket Bog Habitats of the Rossport Commonage (Slide 5 – route overview)

Before describing this section of the route, I will outline the blanket bog habitat types encountered. These are described in detail in Appendix J1 of the EIS (Section, 3.2). Potential impacts associated with construction in blanket bog habitats will be addressed later in this statement.

Lowland blanket bog is one of the most common habitat types occurring in the locality. Intact Blanket Bog is a listed EU Annex 1 habitat under the EU Habitats Directive. The habitat comprises peats which are generally greater than two metres deep. Typical prominent vascular plant species are *Molinia caerulea* (Purple Moor grass), *Schoenus nigricans* (Black bog rush), *Erica tetralix* (Cross – leaved heath) and other less dominant species.

Intact blanket bog has a high moss cover with *Racomitrium lanuginosum*, *Sphagnum capillifolium* and *Sphagnum papillosum* providing the bulk of the cover. Active lowland blanket bog is an EU Priority Annex 1 habitat, and is restricted to small pockets along the proposed route. “Active” is defined as still supporting a significant area of vegetation that is normally peat-forming. While mosses in general are key to peat formation, *Sphagnum* species are particularly important.

Habitats derived from lowland blanket bog include Cutover bog (indicated as PB4 on the habitat mapping provided in Chapter 12 and Appendix J1 of the EIS) and Eroding blanket bog (indicated as PB5 on the habitat mapping). The Heritage Council’s “*A Guide to Habitats in Ireland*” states: “Damage is considered severe if more than 5% of the surface of the peat is exposed or eroding. Areas of bog that are heavily eroded (below the rooting zone of plants) should be considered under eroding blanket bog (PB5)”

- **Cutover blanket bog** is a frequently encountered habitat throughout the area and tends to be most frequent along roads where access for cutting and haulage is easier. It varies greatly, depending upon how recent cutting has been and whether manual or mechanical. The most frequent plant species of cutover areas are generally *Eriophorum angustifolium* (Common cottongrass), *Molinia caerulea* (Purple Moor-grass), *Calluna vulgaris* (Ling) and the moss *Hypnum cupressiforme*. These species can tolerate a degree of habitat drainage and their cover tends to increase as drainage progresses. Vegetation varies as a result, often resulting in a mosaic of species.
- **Eroding**
Eroding blanket bog is characterised by exposed bare peat surface and the increased presence of certain bog plant species, most notably *Trichophorum cespitosum* (*Deegrass*). The habitat appears to be most frequently encountered on areas of blanket bog where there is a history of intensive livestock grazing, often combined with burning, which has resulted in surface vegetation damage and compaction.

A critical effect of compaction is on the roots of the vegetation. Compaction by the hooves of grazing animals causes an oxygen deficit around the roots. This in turn leads to die back and surface vegetation change. With die back, the peat surface is exposed and erosion ensues, often around tussocks, eventually exposing the roots. The combination of heavy grazing, historic burning, and the high annual rainfall experienced in north-west Mayo leads to the further washing away of peat which ultimately results in a very hummocky peat surface, with bare peat and low floristic diversity. As peat is exposed, the surface becomes even more susceptible to erosion,

surface run off and drying which in turn has a further detrimental effect on the vegetation.

In summary, in eroding and eroded blanket bog, the key functions of the bog are impaired by damage to key vegetation elements and the ensuing exposure of the peat surface to erosion and drying.

The hydrological aspects are addressed in the Statement on Hydrology.

Rossport Commonage (Non-designated section)

Between chainages 85.990 and 87.550 the route crosses undesignated blanket bog habitats. There are two intact sections, a short one of approximately 80 metres and another of 230 metres where the pipeline has been routed to avoid a system of small bog pools. These are typically colonised by *Menyanthes trifoliata* (Bog Bean) and *Sphagnum cuspidatum* and are located to the south of the proposed route. No Rhynchosporion habitat was recorded from these. To the north of this pool system, a few small, discrete, surface pools are present along the route, within the temporary working area. These pools do not accord with the Annex I Rhynchosporion habitat either, and are lacking in vegetation other than *Zygogonium* algae and occasional *Menyanthes* (Bog Bean). These pools were dry when the site was surveyed in July 2008, though standing water was noted in August 2008 after an extended period of heavy rain. Cutover, both old and recent, is extensive.

There are large areas of bare peat, as shown in **Slide 6**, associated with mechanised peat cutting and peat spreadfields. It is in such an area that a site compound will be located to the west of RDX2). The vegetation composition was recorded along three transects in the non-designated section (Transects 1, 2 and 5). The results are given in Appendix J1. (Appendix 16).

Rossport Commonage (cSAC section)

To the east of RDX2, the pipeline route crosses blanket bog habitats within the Glenamoy Bog Complex cSAC between chainages 87.550 and 88.350. The route passes close to the boundary of the cSAC through blanket bog habitats which have, for the most part, been affected by past management including grazing, burning, and turf cutting. This section includes mainly old cutover with access tracks (**Slide 7**), peat spreadfields and sections of heavily eroded bog where bare peat is exposed, up to 20% in places, with little *Sphagnum* cover.

Slide 8 shows eroded blanket bog within the cSAC with heavily eroded tussocks.

We have classified section of approximately 150 metres (Chainages 88.000 to 88.150) as intact blanket bog. Following initial walkover surveys, the route was aligned as close as possible to the boundary of the cSAC in order to minimise impact and to avoid the priority habitat further north. As a result, the temporary working area is more or less contiguous with the cSAC boundary along this section. The effect of this alignment was also to avoid habitat fragmentation at this location.

The vegetation composition was recorded along two transects in this section of the cSAC; and the results are given in Appendix J1 (Appendix 16 (Transects 3 and 4)). There is no doubt that, even in this apparently better quality habitat compared with other sections of the route in the cSAC, surface damage, noticeable patches of bare peat, exposed tussocks and active erosion in places has - and is continuing to compromise - the condition of the bog. For this reason it is not considered ascribable to "active" blanket bog.

The hydrological status of the bog is considered in a separate statement.

From approximate chainage 88.150 to 88.250 there is a section of heavily eroding blanket bog, with a high percentage of bare peat. Some of this area has been used as a turf spreadfield, with dried cut peat scattered on the surface over a wide area. The final section of the cSAC to the north of the local road (RDX3) has extensive old cuttings and peat banks.

No species on the Flora Protection Order (FPO 1999) are known to occur on, or adjacent to, the proposed temporary working area at Rossport, neither have any been found in any surveys in the area.

I should like to draw the attention of the Board to the disturbed nature of the blanket bog habitats and the extent of turf cutting and drainage (past and present) along the proposed route through the Commonage. This is clearly shown on the Geomorphological Plans in the EIS (Appendix M (M2-M6), Geomorphological Plans 1 of 3 and 2 of 3).

Slide 9 shows *Geomorphological Plan 2 of 3, which includes the cSAC section, and shows the extent of cutover areas, peat banks and drains.*

Rossport Commonage from RDX3 to the upper crossing

To the south of RDX3, the section from chainage 88.350 to 88.580 is not designated. It comprises heavily cutover bog. The upper crossing reception pit and site compound SC6 will be located along this section.

4.1.5 The Upper crossing

As with lower crossing, the intertidal and estuarine habitats are located within the pSPA and the Ramsar site. Also as referred to previously in this statement, it is anticipated that the proposed construction methodology of micro-tunnelling for the upper crossing will avoid impacting on shore lines, intertidal zone or the estuary.

In a worst-case scenario if difficulties arise during tunnelling, then an intervention pit may be required within the estuary. Potential impacts associated with the construction of an intervention pit are addressed in the Statement on the marine environment.

4.1.6 South of Sruwaddacon Bay

From the upper crossing of Sruwaddacon Bay the pipeline route travels in a south/south-easterly direction through lands at Aghoos which are dominated by areas of eroding blanket bog, old, largely re-vegetated cutover, and heavily eroding lowland blanket bog. This is the location for a large compound, launch pit and pipe stringing area. Erosion is particularly severe between chainage 89.790 and 89.950, with 50% to 70% bare peat surface exposed in places. The surface is very fragmented and uneven, with deep erosion channels. Vegetation is dominated by grass species such as *Nardus stricta* (Matt grass), a species which is characteristic of heavily overgrazed areas on acid substrates. **Slide 10** shows this area. It is to the south of the temporary working area in this section that planting of pockets of willow scrub is proposed for biodiversity enhancement as referred to in Appendix P (EIS Volume 2 of 3, Book 5 of 5, section 2.5.2).

The route then crosses the Leenamore River, a small tidal inlet with an intact fringe salt marsh on its eastern shore as can be seen in **Slide 11**. The salt marsh comprises small areas of upper and lower salt -marsh vegetation. Salt marsh is an EU Annex 1 listed habitat. I will consider this salt marsh later in this Statement.

Wet rushy grassland habitat dominates two small sloping fields on either side of the Leenamore inlet. (**Slide 12 – route overview**) Progressing eastwards, the route crosses approximately 190 metres of eroding intact, non-designated blanket bog. This area of blanket bog (approximately 7 hectares) is recovering from past overgrazing, and will be managed to enable this recovery process to continue.

The route then enters a coniferous plantation before crossing the L1202 at RDX 4, skirts a small area of non-designated blanket bog before passing through conifer plantation to the Bellanaboy Bridge Gas Terminal.

4.1.7 The proposed construction methodology in blanket bog habitats (No slide)

This is considered in detail in the EIS in Chapters 5 and 12, Appendix J1 (sections 5, 6 and 7). It has also been addressed in the Statement on Construction Methodology and I do not propose to reiterate this, but rather draw the Board's attention to a few key issues.

Construction methodology in non-designated areas of cutover bog will include the installation of a stone road, but without the removal of the vegetation layer as turves. In other blanket bog habitats (intact, eroded/eroding and designated cutover) the proposed methodology includes the installation of a stone road and the requirement for turving.

Turving involves removal of the upper active vegetation layer in the form of large turves. At the end of construction the bog surface will be carefully reinstated with these turves. Details of the proposed methodology are provided in Chapter 5 of the EIS. The mitigation measures are summarised in Chapter 12 (Section 12.5.1) of the EIS, and are set out in detail and discussed in Appendix J1 (Section 6.2.1.2). A review of construction methodology and reinstatement is also set out in this section of Appendix J1.

I should like to draw the Board's attention to some **key differences** from an ecological perspective between the BGE Mayo to Galway Gas Pipeline at Upper Glencullin, and the proposed Corrib onshore pipeline.

At Upper Glencullin:

- The pipeline traverses an approximately 800 metres long section of Annex 1 Priority habitat blanket bog in the Carrowmore Lake Complex cSAC. It effectively bisects that part of the cSAC crossing a side slope.
- The stone road and gas pipeline were installed downslope of a significant and extensive pool system (perched water table) which includes large and small pools as well as a large number of linear pools which lie perpendicular to the slope of the site. The extent of the pool system is clearly visible in the aerial photograph in Appendix A of the Minerex report (Appendix J3).
- In addition, the pipeline lies immediately up slope of two flushed vegetation features which appear to be groundwater fed.

In contrast, the proposed route for the ***Corrib onshore pipeline*** in the cSAC section of the Rossport commonage is very close to the south western boundary of the cSAC where, except for a short section of relatively intact blanket bog (c.150m), drainage and turf cutting have already impacted upon the site, no doubt resulting in impaired function. There are no

groundwater-fed flushed areas in close proximity to the pipeline route. This is considered in Chapter 15 of the EIS and is addressed later in the Statement on Hydrology. It should be noted though, that there are “poor flushes” to the north and northeast to which I will refer later.

In the context of mitigation for the proposed route, it was appropriate to critically review the practices carried out at Upper Glencullin (Carrowmore Lake Complex cSAC) in order to learn from the experience (Appendix J1 of the EIS. 6.2.1.2). *I should like to draw the Board's attention to the key issues which are:*

- Width of working area was reduced at Upper Glencullin. This constraint **will not** apply to the Corrib onshore pipeline where the working width will be 40m.
- Storage of turves: the narrowing of the working width at Upper Glencullin (at the request of NPWS) imposed a serious constraint, resulting in turves being stored in up to 3 layers, (with subsequent loss of vegetation from those stored in the lower layers) and some being damaged beyond use. ***This constraint will not apply to the current project.***
- Reinstatement of turves; from experience at Upper Glencullin, it is clear that there needs to be a **manual** element to turf replacement in addition to mechanical. Any gaps will be filled. Not only will this result in a reduction in surface run off pathways (addressed in the Geotechnical Statement), but it will also prevent edges drying on reinstated turves.

From the experience of Upper Glencullin, it is possible to address these issues to ensure that reinstatement on the Corrib Onshore pipeline is carried out according to best practice.

From the vegetation viewpoint, this methodology offers the best opportunity for recovery of the blanket bog surface with blanket bog vegetation. If standard spread techniques were applied then recovery would take many years, if at all, and with little chance of blanket bog vegetation becoming re-established. In this context, the vegetation growth of the well-reinstated turved areas with those turves which were in the top layer during storage at Upper Glencullin is encouraging; as is the lack of measurable vegetation change immediately adjacent to the area of impact - including the adjacent flushed area downslope. It should be remembered that recovery at Upper Glencullin is in its infancy, being just two and a half years after reinstatement, with a vegetation monitoring programme in place for 15 years.

Potential impacts resulting from the proposed construction methodologies on intact blanket bog vegetation traversed by the proposed route (designated and undesignated) are expected to be direct, localised and moderate and temporary.

4.1.8 Salt marsh at the Leenamore River crossing

As has been stated, salt marsh is an EU Annex 1 habitat, and so demands special treatment during construction. The proposed construction methodology at the Leenamore inlet will not only enable habitat reinstatement, but will conserve the flora and invertebrate fauna species on and in the turves. (**Slide 13**)

This is a habitat subject to constant erosion on the seaward and inlet edge from the river water and the tides. Because of the harsh intertidal environment, where it is subject to fluctuations in salinity (being washed by fresh and sea water) salt marsh species are extremely robust. Many are opportunist, colonising species, so even if some turf is lost as a result of fragmentation during removal or reinstatement, it is considered that they will re-establish on any disturbed substrate. This is evidenced by the range of ground conditions which they can tolerate, ie. from stony shores (as in many parts of Sruwaddacon Bay), on peat and sand, even on new blown sand where a new salt marsh is developing at the eastern side of the dunes at Glengad. Trafficking and surface damage such as wheel ruts is far more damaging – as seen at the western side of the estuary (lower) crossing where the small area of salt marsh has been colonised by rushes as a result of such surface damage.

The potential impact level on those areas of salt marsh affected during construction is expected to be direct, temporary, localised and moderate.

4.1.9 Monitoring (No slide)

Regular vegetation monitoring is vital, particularly in the early stages post reinstatement, so that any adverse indicators can be picked up and any remedial action taken. Generally, the initial response to such adverse indications would be to consult with NPWS in the case of a designated site or Annex habitat. The situation would then be assessed in order to devise and implement a recovery programme. Such a scenario can only be dealt with on a case by case basis and cannot be prescriptive. To give an example, if natural regeneration of vegetation at were slower than expected, then it might be necessary to seed an area with locally collected seed. In a cSAC situation this could only be done with the approval of NPWS, and - depending upon the vegetation type - an appropriate method for seed collection devised and agreed.

A monitoring programme for habitats and fauna will be drawn up in consultation with NPWS.

4.2 Fauna

4.2.1 Non-avian vertebrate fauna

The non-avian faunal assessment are summarised in Chapter 12, and described in detail in Appendix J1 (Sections 3.3, 4.3, 5.2.2, 6.3, and 7.2).

Faunal studies have been undertaken since 2002 in the wider area of Sruwaddacon Bay and along the proposed route. The most recent surveys were conducted between August and October 2007; in February and December 2008, and at Aghoos in May 2009. .

The vertebrate fauna of the area can be summarised as being typical of the habitats present, with a good representation of common and ubiquitous species. Of the mammals, the otter is of particular note (an Annex II and Annex IV species under the EU Habitats Directive, also a Red Data Book species) and is known to be present along all coastal habitats and also inland. Otters and other mammals can be relatively tolerant of disturbance, but will undoubtedly be affected by the construction of the pipeline scheme in the short term. Many potential otter resting places/holts were located within the study area and several of these are situated directly within the temporary working area on both sides of the bay. But no breeding holts were identified during any of the surveys, including targeted otter surveys.

Badger activity was noted within the survey area and was particularly evident on the southern side of Sruwaddacon Bay. Pine martens are present and have been observed in the area, as have Irish hares. Hedgehog, wood mouse, pygmy shrew and Irish stoat are certain to be present. American mink are known to occur in this part of Co. Mayo but none were observed in the Bay area. Signs of brown rat were noted and foxes are common throughout.

The habitats present, together with the lack of mature deciduous trees, offer few roosting sites and do not provide good foraging areas for bat species. All bats are protected species. A minor bat roost was identified in a semi-derelict house adjacent to the route at Rossport, upon which no impact is anticipated. Impacts on bats are considered to be Negligible (neutral).

The common frog (a Red Data Book species) is present, and a number of confirmed frog breeding sites will be directly impacted by the proposed development. The common newt is not expected in the area and no suitable ponds or pools were found. Although not observed during surveys, the common lizard is known to occur in the locality.

In order to ameliorate impacts on certain species, specific mitigation measures are recommended and summarised in Appendix J1 (Table 10), in particular in relation to otters, badgers and frogs in the area. These include monitoring of vegetation clearance in areas

where a thorough search for fauna was not possible because of the density of the vegetation - dense Gorse scrub and conifer plantation.

4.2.2 Birds

Birds (avian fauna) are summarised in Chapter 12, and described in Appendix J1 of the EIS (Sections 3.4, 4.4, 5.2.3, 6.4, and 7.3).

Some 46 bird species have been recorded by aquatic studies in the pSPA in the vicinity of the proposed route. None of the waterbird species recorded by the post breeding study exceeded the threshold of nationally important numbers (i.e. 1% of the estimated National Population). In recent winters peak counts of over-wintering Brent Geese have on occasion exceeded internationally important numbers (>200 individuals). It should be noted that recent apparent increases in Brent Goose numbers in Ireland indicate that the threshold for internationally important numbers may increase from 200 to 400 (1% of the International Population). The Brent Goose is considered in more detail later in this statement.

Overall, bird diversity and abundance is considered relatively low. A total of 47 species have been recorded in terrestrial based studies in the area of the proposed route. The open landscape and in particular the lack of mature 'woody' deciduous vegetation characterises the coastal and blanket bog habitats in the study area. It also explains the lack or scarcity of many nationally common terrestrial bird species.

Several species of high conservation concern (i.e. Annex I and/or Red - listed species) were recorded during surveys in the vicinity of the route; Bar-tailed Godwit, Chough, Curlew, Common /Arctic Tern, Golden Plover, Great-northern Diver, Hen Harrier, Little Tern, Red-throated Diver, Sandwich Tern, Little Egret, Black-headed Gull, Herring Gull and Redshank. Most of these species normally occurred in very low numbers (less than 10) and then only from time to time. Of all the high priority species, only Curlew and Black-headed Gull are present in any significant numbers throughout the year. Both species can be found widely both in the aquatic and adjoining terrestrial habitats throughout the year with peak numbers typically occurring in the winter.

Potential disturbance and displacement will largely be associated with the temporary working area but these effects will decrease with increasing distance from the pipeline route. Given the habitats present in the wider environment, affected birds will be able to avoid the disturbance by moving to other locations in the wider area. It is considered likely that any negative impacts would be temporary, highly localised and slight.

Given the narrow width of the temporary working area, the proposed mitigation measures and the availability of similar habitats to those that will be directly affected, it is unlikely that there

will be any significant effects on the wider local avian community.

Potential impacts on birds in the pSPA

The most likely impact from construction works will be disturbance. In the case of birds it is an established fact that they quickly habituate to the noise of machinery - including for example farm machinery. Sudden noise will cause them to move away from the noise source. Human presence (on foot, especially with dogs) disturbs them. The launch and reception pits are set back from the high water mark and the noise dispersal is such that only minor disturbance to birds might be expected.

As a result of the proposed use of trenchless construction methods for the crossings of the Bay, it is anticipated that there will be no impact on food resources for waterbirds and waders.

In the event of the worst case scenario and the need for an intervention pit, there will be some temporary disturbance to birds. However, other suitable feeding areas for birds are available throughout the wider pSPA and it is anticipated that birds would temporarily move away from the point of disturbance. No significant or long term impact on birds is expected from the construction of an interception pit because of the dynamic nature of the intertidal habitats and ability for self repair. Details of potential impacts on the intertidal sediments of an intervention pit are provided in the Statement on the Marine environment.

Light-bellied Brent Goose

As a result of recorded numbers in recent years, the Brent Goose is regarded as a special conservation interest for the Blacksod Bay/Broadhaven pSPA. It is a winter visitor to Ireland, returning to the Canadian high arctic to breed. 95% of Light-bellied Brent Geese from eastern Canada overwinter in Ireland. It is Amber listed on the list of Birds of Conservation Concern in Ireland, that is to say it is of medium conservation concern.

The Brent Goose flock associated with Broadhaven Bay formerly fed more or less exclusively on *Zostera* (Eelgrass), but in recent years they have tended to feed increasingly on the extensive algal beds (*Enteromorpha* and *Ulva*) to the north of Glengad (as shown in **Slide 14**) - this area was referred to as Sandy Point in some winter bird reports - and at Rinroe. **Slide 15** shows the location of these two areas.

Reports from winter bird surveys, including species-specific Brent Goose surveys, are given in Appendix J2; and the preliminary findings from 2008/2009 overwintering season are discussed in Appendix J1 (Section 3.4.2.3).

In 2007/2008 Brent Goose numbers in Ireland rose to 40,000. This led to a change in feeding patterns, first noted in the east of the country where flocks have moved inland onto sports

fields to feed, presumably because of pressure of numbers on available food supply. In the greater Dublin area they are known to feed undeterred in suburban situations subject to noise and human presence, for example in Tallaght. They habitually feed alongside the railway line at Booterstown where they are subject to sudden noise from both the DART and mainline trains, and train hooters at the Merrion Gates level crossing.

Brent geese are known to quickly habituate to noise, movement of vehicles and presence of humans on foot (and even dogs) if they move predictably, for example along a footpath. The Killala Bay/ Enniscrone flock is known to feed on the golf course at Enniscrone among the golfers. This ability to habituate quickly to noise and activity was borne out by observations in 2008 when a small flock of Brent Geese were recorded feeding and behaving normally within full sight of, and just a short distance (less than 200m) from, the works at Glengad in October 2008 - during the dismantling of the causeway and landfall reinstatement.

From the evidence available at present there is no reason to suggest that works activities at the landfall, either onshore or in the intertidal area will disturb feeding Brent Geese.

The Broadhaven Bay flock are not known to feed on grassland in the Glengad/Sruwaddacon Bay area, but move further afield at times. It is important to remember that, in addition to the algal beds to the north of Glengad, the Broadhaven Bay flock have a number of alternative feeding areas available to them, including Rinroe, North Rossport Bay, Tra Kirtaun. They have also been noted on Kid Island.

No impacts on the Brent Goose population or their feeding grounds are anticipated.

Sand Martin colony at Glengad

The Sand Martin is a migratory species which comes to Ireland from Africa in the spring. It is Amber listed on the Birds of Conservation Concern in Ireland (2007), as being of medium conservation concern. Monitoring was conducted during the 2008 breeding season. Reports on earlier studies are included in Appendix J2 of the EIS.

Sand Martins nest in colonies of excavated tunnels, in exposed vertical sand and fine gravel embankments, cliffs etc. Suitable breeding sites are generally used for many years, and as old burrows collapse new ones are built. Eggs are usually laid in early May, and hatch approximately two weeks later. The young stay in the nest for about three weeks. A second brood is not uncommon. Sand Martins depart from Ireland again around the end of August.

Located in a narrow sandy seam in the cliff to the north of the landfall, the Glengad Sand Martin colony was first recorded for the Corrib project in 2002. No burrows were present in the cliff prior to excavation in 2002, neither was there a suitable seam of sandy material. The only

burrow recorded on the west facing cliff (just north of the cliff-cut) has appeared oval in shape since before construction activities commenced in 2002 and none of the surveys then or subsequently have recorded it as being occupied.

Burrow occupancy is a useful indicator of behaviour and normal activity. The colonies at Glengad were monitored closely throughout the 2008 breeding season. In total 48 active Sand Martin burrows were recorded at Glengad in 2008. These burrows were located in two separate sub-colonies as shown in **Slide 16**, with 33 active burrows in the “original” Colony A; and 15 active burrows located some two hundred metres southwest of the proposed landfall in Colony B.

Colony A was active from early May and Colony B from early June. Surveys carried out in the 2004 and 2005 recorded 34 and 37 respectively apparently occupied nests. These active burrows were located in the “original” colony (A). Breeding activity in the colony at Glengad in 2008 was within the normal range of activity for this area. From observations of behaviour and activity at the burrows, it was judged that at least 30 - 50% of active burrows may have had second brood in 2008. All birds had left on migration by the end of August.

(Slide 17 shows the numbering system used for burrows in 2004, red being occupied and blue unoccupied.)

Colony B appears to be a relatively newly established colony and represents an increase in Sand Martin breeding activity at Glengad from previously known levels. A new colony is also known to have been established in 2008 at Rinroe in an area where coastal works had been recently completed. This colony was not included in the monitoring survey. Taking the Glengad and Rinroe colonies into consideration, then it appears that there has been a significant local expansion in population size.

Construction activities in the vicinity of the colonies had no apparent impact on breeding activity in either 2008 or 2002. This was confirmed by NPWS Conservation Rangers, who visited the site on number of occasions during the construction period and observed Sand Martin activity, including fledging of young.

Monitoring of the colonies re-commenced in April 2009. From our experience to date, there is nothing to suggest that any future construction activities associated with the landfall, onshore pipeline, and the landfall valve installation will interfere with Sand Martin breeding at Glengad. It must be remembered that this species nests in quarries so it is able to quickly habituate to noise and movement of machinery.

Detailed mitigation measures for the protection of the Sand Martin Colony are set out in Appendix J1 (Section 6.5).

5 ASSESSMENT UNDER ARTICLE 6 OF EU HABITATS DIRECTIVE

For clarification, and for the Board's information, it is necessary to draw attention to the following. During consultations with NPWS in December 2007, it was made clear that while they (NPWS) would not be able to engage in any discussion or consultation relating to the routing of the pipeline, they were however able to advise on the manner in which Article 6 should be dealt with within the EIS. Thus, in accordance with advice received from NPWS at the time, the EIS constitutes the required assessment report which formed the basis for the screening process. Appendix P describes the screening process.

Appendix P of the EIS summarises the results of the impact assessments and serves to provide the screening process required in order to establish whether or not the proposed development will have a significant impact on the Natura 2000 site traversed by the route.

This screening process was carried out in accordance with the requirements of Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC) as set out in the guidance documentation:

- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (2007);
- Assessment of plans and projects significantly affecting Natura 2000 sites Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (Nov. 2001); and
- Managing Natura 2000 Sites The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (2000)).

The two Natura 2000 sites traversed by the proposed pipeline are: the Glenamoy Bog Complex candidate Special Area of Conservation (cSAC Site code 500); and the Blacksod Bay/Broadhaven proposed Special Protection Areas (pSPA Site Code 4037).

The Glenamoy Bog Complex cSAC 500

This is a large and extensive site which covers 12,901.8 hectares (129 sq.km). It is described in the EIS (Preface to Section C and Appendix J1) and the site synopsis is provided in Appendix J. There is no published management plan for this site. The qualifying habitats and species, as listed on the Natura 2000 Data Sheet, are set out in Appendix P (Table P1)

Slide 18 shows the proposed pipeline route in the overall context of the Glenamoy Bog Complex cSAC, and is expanded from Figure C3 in the EIS (Preface to the Natural Environment).

The proposed route crosses this site at the following locations:

- Glengad where approximately 630m of the route traverses improved agricultural grassland, wet grassland, *Iris*-dominated marsh and lower salt marsh (approximate chainage 83.4 to 84.0). The LVI will be constructed in this section in an area of improved agricultural grassland. Salt marsh is an EU Annex 1 listed habitat, but is not a qualifying habitat for the cSAC. The proposed methodology for the lower crossing will not impact on the salt marsh here.
- The lower crossing comprises approximately 430m of Sruwaddacon Bay (approximate chainage 84.05 to 84.50) - estuary and intertidal habitats; both EU Annex 1 habitats but not listed as qualifying habitats for the cSAC. This section is also in the Blacksod Bay/Broadhaven pSPA.
- Rossport where approximately 800m of blanket bog habitats (cutover- 230m, eroded 350m, and intact 150m) are traversed close to the southern boundary of the cSAC at this location. Blanket Bog is an Annex 1 habitat, which, if active, is a Priority habitat. Blanket bog is a qualifying habitat for the Glenamoy Bog Complex cSAC.
- The upper crossing of Sruwaddacon Bay: which comprises approximately 1000m of estuarine and intertidal habitats, both EU Annex 1 habitats but not listed as qualifying habitats for the cSAC. This section is also in the Blacksod Bay/Broadhaven pSPA.
- At the Leenamoy River crossing (approximate chainage 90.70 to 91.10) approximately 40m of the route is through estuarine and salt marsh habitat, both Annex 1 listed, but neither are listed as qualifying habitats for the cSAC.

Blacksod Bay/Broadhaven pSPA 4037

The site extends over approximately 7,394 ha (74 sq. km), is described in the EIS (Preface to Section C and Appendix J1) the site synopsis provided in Appendix J.

Unlike more recently designated SPAs there is no formal site citation – i.e. the ‘Intention to designate’ notice which lists the species for which the site was designated. However, the site synopsis lists species for the site as a whole and includes numbers of birds of international and national importance. From consultations with NPWS it is understood this site is to be redesignated shortly

Slide 19 is Figure C2 from the EIS (Preface to Section C the Natural Environment) and shows the pipeline route in relation to the Broadhaven Bay section of the pSPA

The proposed route crosses the pSPA as described already for the cSAC, ie. at the lower and upper crossings and at the Leenamoy River inlet.

The use of micro-tunnelling, a trenchless technology, to construct both crossings of Sruwaddacon Bay will prevent surface disturbance except in a worst case scenario when an intervention pit would be required (Appendix S of the EIS). The installation of a stone road along the part of the pipeline route that traverses the blanket bog will minimise the area impacted by construction and allow the reinstatement of the vegetation layer (acrotelm) of the bog. It will also ensure that the constructed pipeline is stable. This is addressed in the Geotechnical Statement.

The construction details for the proposed route within the Natura sites, the likely changes to those sections, and the associated mitigation measures are outlined in Appendix P (Table P3).

Slide 20 (Geomorphological Plan 2 of 3) May I draw the attention of the Board again to the disturbed nature of the blanket bog habitats in the cSAC at Rossport, and to the position of the route - close to and in parts contiguous with the boundary of the cSAC.

Slide 21 (Overview of the cSAC showing the pipeline route)

It is my informed and considered opinion, along with that of my expert colleagues, in light of surveys and our familiarity with the site, that the proposed development will **not** have a significant impact on the qualifying habitats and species for which the site is designated. Similarly, I have no doubt that the proposed development will not affect the integrity of the Glenamoy Bog Complex cSAC.

Turning to the Blacksod Bay/Broadhaven pSPA, the proposed development will **not** have a significant impact on the qualifying habitats and species for which the site is designated; and I have no doubt that the proposed development will not affect the integrity of the Blacksod Bay/Broadhaven pSPA.

6 ISSUES RAISED BY THIRD PARTIES NOT ALREADY ADDRESSED ABOVE

6.1 Mayo County Council

The absence of walkover ecological surveys at Aghoos, between approximate chainages 89.500 and 89.800 was recorded as a constraint in EIS (Chapter 12 and Appendix J), although vantage point surveys from the public road and adjacent lands had been possible and were used in the assessment in the EIS. These lands were subsequently fully surveyed by vegetation and faunal specialists in May 2009 and the results have been presented in the EIS Addendum Report (Appendix B). No seasonal or access constraints applied to these surveys. This being the case, it is clear that the baseline survey element of condition 27 (as

suggested by Mayo County Council) has been fulfilled and is no longer necessary. However, monitoring will be required during vegetation clearance in the areas of dense scrub and coniferous plantation referred to under faunal mitigation in the EIS (Chapter 12 and Appendix J1, section 6.3). So it is suggested that condition 27 be amended to read as follows:

“Areas of dense vegetation affected by the development which could not be thoroughly searched shall be monitored by appropriate experts during vegetation clearance.

Reason: In order to provide necessary faunal monitoring”.

6.2 Department of the Environment, Heritage and Local Government (DoEHLG)

This submission comprises 12 pages. So, for ease of reference I will refer to the page and paragraph number in each case.

6.2.1 Page 3, paragraph 3: Change in methodology at Upper Glencullin

There were incidents of heavy plant sinking in deep peat on the Bord Gáis Éireann Mayo to Galway Gas Pipeline (for example at Cunnagher North and at Bellacorick); also during preliminary earthworks at the Bellanaboy Gas Terminal. In each case the machine had to be recovered from the bog which involved additional machinery having to be brought in to enable the stricken plant to be excavated from the peat. In some cases this required the construction of an access road to take the weight of lifting gear (sheet piling was required in at least one case). This resulted in a wider impact and was particularly evident at Cunnagher North pNHA where a much larger area was impacted upon than would have been the case had the methodology subsequently used at Upper Glencullin been used. Had such an event occurred at Upper Glencullin then a wide area of blanket bog would have been impacted upon - and vegetation reinstatement of the impacted area would not have been possible.

In summary therefore, the risk of such an event happening at Upper Glencullin could not be contemplated so the stone road method - which had been used in non designated sections in Co. Mayo - was adapted and the turving method introduced (in full consultation with NPWS) to facilitate vegetation reinstatement.

In light of the damage resulting from such an incident, it is considered that the risk of such a serious potential impact of this nature at Upper Glencullin was avoided by the use of the stone road method. Similarly, it is considered that the risk of wider impact resulting from such an incident will be avoided by using the stone road methodology and vegetation turve reinstatement as proposed on the Corrib onshore pipeline.

6.2.2 Page 3, paragraph 6: Drainage impacts outside the working area

From experience at Upper Glencullin, there has been no measurable change in vegetation adjacent to the working width, including both blanket bog vegetation and flush vegetation composition.

However, in order to protect the area of “poor flush”, located to the north of the proposed route, mitigation measures will be put in place to prevent any interruption to water supply to the flush. (EIS Addendum Report, Appendix B) I refer the Board to the Geotechnical and Hydrology Statements also.

6.2.3 Page 3, paragraph 7: Blanket bog requires protection

Degraded blanket bog is considered to be an Annex 1 habitat, in that by inference it is not active. (Degraded raised bog is listed under a separate annexed habitat) It is noted that “A Guide to Habitats in Ireland (Fossitt, Heritage Council, 2000), considers damage to blanket bog habitat to be severe if more than 5% of the bog surface is bare or eroding.

Furthermore, in “A Guide to Habitats in Ireland (Fossitt, Heritage Council, 2000), Appendix 1 (pages 107 to 108) habitats are shown along with their relationships with EU Annex 1 habitats.

- PB4 (Cutover bog) is linked to Depressions on peat substrates of the Rhynchosporion (7150) only, and not to Blanket Bog (7130)
- PB5 (Eroded blanket bog) is not shown as being linked to any Annex 1 habitat.

Areas of the Rosspoint Commonage, including sections within the SAC, have been classified as eroded blanket bog because of the level of erosion where the erosion has resulted in the sides of tussocks (and their roots) being exposed thus it is considered that they do not equate to any Annex 1 habitat.

6.2.4 Page 4 paragraph 2: Impacts

The Interpretation Manual of EU Habitats (2007) states: “The term “active” must be taken to mean still supporting a significant area of vegetation that is normally peat forming”. Whether any significant proportion of the classified “intact” section can be considered as “active” is highly questionable. Given the low cover of bryophytes, (except in small, confined areas), surface damage and the presence of bare peat (in excess of 5% in most parts) it is our considered opinion that does not conform to the accepted description of “active” blanket bog.

The scale of existing disturbance, turf cutting, historic drainage etc. is clearly visible in the Geomorphological Plans (2 of 3) in Appendix M2 of the EIS as shown in Slides 9 and 21).

The real question here is whether the vegetation will recover or continue to be eroded leading to floristic change as a result of further drying. The hydrological assessment has shown that

the key functions of this part of the cSAC have already been severely impaired. This is also addressed in the Statement on Hydrology. It is considered that the resulting condition, as seen at present, is unlikely to improve, with continuing erosion and drying leading to ultimate vegetation change.

The proposed vegetation reinstatement and associated mitigation measures *will* result in vegetation reinstatement and offers the best opportunity for habitat recovery. In taking the mitigation measures into consideration, including those for protection of the poor flush to the north of the route, it is considered that such construction impacts on the blanket bog habitats will be temporary.

6.2.5 Page 4 paragraph 3: *Rhynchosporion depressions*

Nearly all *Rhynchosporion* habitats were selected for Raised Bogs, with blanket bog being added subsequently. "A Guide to Habitats in Ireland (Fossitt, Heritage Council, 2000) states: "*Links with Annex I: The annexed habitat, 'depressions on peat substrates of the Rhynchosporion (7150)' can occur in pockets on cutover bog, mostly in association with areas of cutover raised bog*".

The EU Annex I habitat *Depressions on peat substrates of the Rhynchosporion* comprises a mat or lawn of *R. alba* (White-beaked sedge) as the dominant species with *Sphagnum cuspidatum* at the edge of pools. On raised bogs *R. fusca* is significant.

No *Rhynchosporion* depressions, as defined, are present along the route, either in the cutover or on the surface of the bog (cSAC & non-cSAC). *Rhynchospora alba* is present as an occasional constituent species of the vegetation only, but no *Rhynchosporion* lawns are present, either in the cutover or otherwise.

The small, discrete, surface pools present in the non – cSAC are lacking in vegetation other than *Zygonium* algae and occasional *Menyanthes*. Thus they do not accord with the Annex I *Rhynchosporion* habitat. These pools were dry at the time of the July 2008, though standing water was noted during the autumn and winter months. No such pools are present on the route in the cSAC.

As described above, the pool system avoided by the realignment in the non-cSAC do not have the vegetation characteristics associated with the *Rhynchosporion* annexed habitat. The cutover areas in the cSAC (except for drains at the footings of the deep cuttings) are generally very dry. *Rhynchospora alba* is present in cutover areas as an occasional species only.

It is our opinion, having walked the route on a number of occasions, and having surveyed the vegetation in detail along transects using accepted vegetation survey methodology, that this Annex 1 habitat is not present in the areas to be affected by the proposed development.

6.2.6 Page 4 paragraph 4: Juniper

It is noted that Juniper (*Juniperus communis subsp nana*) is of biodiversity interest, but it is not listed as protected species (FPO 1999), it is not a Red Data Book species nor is it a scarce species. It is known to occur scattered in blanket bog in the north west – including Mayo.

A few individual, scattered, depauperate plants of *Juniperus communis subsp nana* were found on the non-designated Commonage along the northern edge of the proposed route. They were growing in amongst blanket bog vegetation, alongside character blanket bog species (*Schoenus nigricans*, *Molinia caerulea* etc). The vegetation does not accord with either of the referenced Juniper formations as set out in the *Interpretation Manual of EU Habitats* (2007) or the Heritage Council's "A Guide to Habitats in Ireland".

The Annex I Habitat (5130 *Juniperus communis* formations on heaths or calcareous grasslands) is listed as a qualifying habitat for the Glenamoy Bog Complex; but the presence of individuals of a single species does not necessarily confer a particular habitat status, unless the character species occurs in association with other character species of that habitat. Juniper does not occur in such associations here.

Furthermore, there is no link between the EU Juniper formation habitats and blanket bog habitats in Appendix I of *A Guide to Habitats in Ireland*.

6.2.7 Page 4 paragraph 4/5: Impacts on Rhynchosporion and Juniper habitats not considered in EIS

Annex I Rhynchosporion and Juniper habitats do not occur along or adjacent to the proposed route. For this reason they were not considered in the EIS.

6.2.8 Page 4 paragraph 6: Flushes (to the north and north east of the proposed route)

The poor flushes to the north and north east of the route in the cSAC were examined, and a report on their vegetation status is provided in the EIS Addendum Report. To summarise:

- The plant species recorded from both of these flush systems indicate the presence of low pH and low nutrient conditions.
- When compared with the habitat classification scheme outlined in "A Guide to Habitats in Ireland" this vegetation is best classified in the category poor fen and flush (PF2). Such development of species-poor flush vegetation, dominated by *Juncus effusus* and *Sphagnum* sp., along natural drainage channels is a frequent feature of blanket bog landscapes in the west of Ireland.
- Plant species which would indicate the presence of conditions influenced by base-rich groundwaters, (e.g. *Campyllum stellatum*, *Drepanocladus revolvens*, *Eriophorum latifolium* and *Juncus subnodulosus*) were not recorded from the flushed areas.

Mitigation measures will be put in place during and post-construction for the protection of the flush.

6.2.9 Page 4 paragraph 7/8: Impacts

No measurable change in vegetation or loss of biodiversity adjacent to wayleave in Upper Glencullin has been recorded in vegetation monitoring surveys (2007 and 2008), the reports for which have been issued to NPWS. Neither has any significant change to vegetation of reinstated “top layer” turves been noted - only a minor reduction of soft herbaceous species such as *Polygala serpyllifolia* (Milkwort) has been noted in the vegetation on the top layer turves. No measurable change in vegetation of flushes areas at Upper Glencullin has been recorded during monitoring surveys in 2007 and 2008.

6.2.9 Page 5 paragraph 3: Article 6

This has been addressed previously in this statement at section 5.

The condition and quality of the cSAC blanket bog habitats on the Commonage, as observed and recorded during the many surveys, were taken into consideration when making our assessment. In addition, we also considered the ability of the site to recover (or not) from past damage. As has been referred to previously, this section of blanket bog has historically been subject to land practices including: turf cutting, adjacent drainage along boundaries from land reclamation; and the effect of grazing with associated burning (even prior to designation as noted from the SAC mapping site notes of 1993).

We also considered the location of the proposed route in relation to the site as a whole. The proposed route is located at the southern boundary of the cSAC and, on the 150m section of “intact” bog the edge of the proposed temporary working area is more or less contiguous with the SAC boundary. It was routed here in order to minimise impact and to avoid the priority habitat located further to the north. The additional effect of this was to avoid habitat fragmentation as far as was feasibly possible – the alignment of the route north of RDX3 being dictated by the required alignment for the trenchless upper crossing of the Bay.

The area of qualifying Annex 1 habitat which will be subject to impact during construction represents a tiny fraction of the 12,901.8 hectares of the Glenamoy Bog Complex cSAC as a whole.

6.2.10 Page 5, paragraph 6: cSAC areas adjacent to the proposed pipeline route

Habitat mapping is shown as is standard for any narrow linear development such as a pipeline. A 100m “corridor” has been mapped. Within this corridor a 40m working area will be placed. The adjacent habitats were assessed and, for example, this information was key in defining the two minor realignments at Rosspoint Commonage.

The vegetation features to which the DoEHLG submission refers (flush, pools, Rhynchosporion and Juniper habitats) are addressed above.

As was referred to previously, vegetation surveys at Upper Glencullin have shown that there has been no measureable impact on the vegetation of any surface water-fed blanket bog feature including blanket bog vegetation and pools outside the working width.

6.2.11 Page 5, paragraph 7: Peat spoil

The proposed peat deposition will result in the creation of peatland habitat, in addition to that already being established as a result of the deposition of peat from Bellanaboy. It will benefit species in the area which will have the opportunity to expand into these newly created habitats, thus increasing the overall potential biodiversity of the area.

Stabilisation and rehabilitation of the peat is a product of revegetation and settling of the peat, as outlined in the Rehabilitation Plan (2005). It is outlined in the *Rehabilitation Plan*, that following a 5 year stabilisation period for the deposited peat, there will be an assessment as to assess the scope for rewetting and/or *other* long-term rehabilitation measures proposed by the licensee and the consultees as detailed in Chapter 6 of the *Srahmore Peat Deposition Site Development EIS* (December 2003). Annual assessments of the revegetation have been submitted to the EPA and annual updates of the condition of the site submitted to the Project EMG. An assessment of potential options to enhance the biodiversity value of the peat deposition area will be carried out in 2010.

6.2.12 Page 6 paragraph 1: Appendix P and impact magnitude

This has already been addressed in this statement at section 5, but for clarification: in making the assessment, the following were taken into consideration:

- Lessons learned from experience at Upper Glencullin,
- Key differences between the two sites
- Proposed working practices,
- Reinstatement of the vegetation, the implementation of mitigation measures to protect the water regime which supports the vegetation

Given the above, and the full implementation of mitigation measures no permanent impact on the cSAC is anticipated.

6.2.13 Page 6 paragraph 2: Annex 1 habitat outside the SAC

To reiterate: the small, surface pools present in the non – SAC, including those along the route, are lacking in vegetation other than *Zygodonium* algae and occasional *Menyanthes*. No water was in these pools in July 2008, though standing water was noted during the autumn and winter months.

A small system of bog pools typically colonised by *Menyanthes trifoliata* and *Sphagnum cuspidatum* are present to the south of the proposed route but no Rhynchosporion habitat was recorded from these either.

As has been stated above, *Rhynchospora alba* is present as an occasional constituent species of the vegetation only.

Annex 1 Blanket bog outside the cSAC will be treated as though it were designated, which is why the same construction methodology is proposed for these two non-SAC sections.

6.2.14 Page 6, paragraph 4/5: Upper Glencullin

Upper Glencullin has been addressed in the EIS and previously in this statement, however it is useful to summarise as follows:

- No measureable change in vegetation adjacent to wayleave in Upper Glencullin has been recorded. Neither has any significant change to vegetation of “top layer stored” turves been noted.
- A minor loss of soft herbaceous species such as *Polygala* (Milkwort) has been noted from some of the turves.
- No measureable change in vegetation of flushes areas at Upper Glencullin has been recorded.
- During a site inspection in April 2009, fresh growth of *Carex* spp and bryophytes was noted on the areas which had been covered by the bogmats (on which the 3 layers of turves had been stored).
- The reinstatement at Upper Glencullin is at a very early stage, less than three years post construction. A post-construction monitoring programme of up to 15 years is in place at the request of NPWS.

6.2.14 Page 7, paragraph 1: Upper Glencullin turves

A critical review of practices, and lessons learnt from Upper Glencullin is given in an ecological context in Appendix J1 of the EIS. (6.2.1.2) and dealt with: the storage of turves, width of the working area, reinstatement of turves and depth of turves. Attention is also drawn in that section of the EIS to site-specific issues at Upper Glencullin which do not apply to the Corrib Onshore Pipeline route. These were also discussed earlier in this statement.

Statements on Geotechnical aspects and Hydrology also address the Upper Glencullin issues.

6.2.14 Page 7, paragraph 2: Conservation objectives

This has been discussed at Section 5 above, so to reiterate: As part of the EIS process, information on management plans for the Natura sites was sought from NPWS. It was noted that no management plan was available for either cSAC 500, or for pSPA 4037. In the absence of such plans and site - specific conservation objectives, the qualifying habitats and species as listed on the Natura 2000 Data Sheet (in the case of cSAC 500); and in the site synopsis (in the case of pSPA 4037) were taken into consideration.

In addition, with regard to the pSPA 4037, it was noted from consultations with NPWS – also from the DoEHLG submission to ABP in 2008 - that the pSPA was to be re-designated. Information received from NPWS regarding the pSPA and species of interest was taken into consideration when preparing the EIS.

6.2.14 Page 7, paragraph 3: Compensation habitat

It is noted that compensatory measures are required only if it is considered there will be a significant impact on the integrity of the Natura 2000 site (Appendix P (2.5.1)).

However, as shown in Appendix P, there is an opportunity at Aghoos to implement measures which will enhance biodiversity in the area for the long term.

- To the east of the Leenamore River at, and adjacent to, approximate chainages 90.2 to 90.4 there is an area of blanket bog which was subject to heavy grazing in the past. Some of this area may be classified as intact, though the section through which the route passes is eroded, though much now shows signs of recovery. This area approximately 7 hectares is now owned by Shell E & P Ireland Ltd. It will be set aside and managed to enable the habitat recovery to continue. It is useful to note that this area is contiguous with the cSAC at the shore of the Bay.
- A proposed area of native scrub to be planted on parts of the heavy eroded section to the west of the Leenamore River.

6.2.15 Birds Page 7, paragraph 4 onwards:*Scour & Ringed Plover*

The probability of scour, and scour-related features occurring is unlikely to be significant for most areas of the proposed route outside of the immediate channel area due to the low currents encountered on the banks. Consequently, the area where an intervention pit may cause a problem is greatly reduced. A “Worst Case” scenario may only occur when several factors combine and the mitigation factors fail. The likely result of this would be a subtle and gradual alteration to the channel’s course, already a natural long term process within the estuary, rather than a loss in the inter-tidal habitat on which the population of Ringed Plover forage. Overall, the integrity of the habitat type (i.e. that of inter-tidal sand flats) will not

change. The important mixed sediment habitats recorded high up on the inter-tidal shoreline will remain unaffected.

The Department's concern with regard to Ringed Plover appears to be based largely on a number of particularly high counts of this species made by Arnold (2004a) and a distribution map in Woodrow (2006). A thorough review of bird count data across the Corrib bird reports indicates that high numbers of Ringed Plover within Sruwaddacon Bay are the exception rather than the rule. In general numbers are low and well below any threshold level for the species.

The entire pSPA may hold important numbers, but the importance of Sruwaddacon Bay within this complex is *not* borne out by the available data. It is more representative to say that Ringed Plover are present throughout the winter months within the Bay and in recent years their numbers have been relatively low. Occasional small flocks have been recorded but these have been infrequent and it would be incorrect to place much emphasis on the distribution patterns based on such few observations. The detailed surveys of recent winters do not indicate that the estuary is an important area for this species.

The strong tidal flows have influenced the sediments around the channel along most of the bay. This, combined with the significant periods of exposure and influence from the freshwater, has created a difficult habitat for the marine invertebrates. Consequently the biological abundance and diversity throughout the estuary is low.

As an important food source for the bird population, these invertebrate were low in number and small in size, recording a very small biomass throughout the estuary. For biomass, the largest animal recorded within the sediments was the edible cockle (*Cerastoderma edule*) contributing about 75% of the total biomass recorded. The biomass of the large deep-dwelling lugworm could not be fully estimated although distribution of this species was assessed using surface counts, and not thought to be significant at either of the proposed crossing corridors. Furthermore, the deep nature of this species precludes it as a viable food source for most wading birds (i.e. Golden Plover, Godwit etc). The marine environment in relation to invertebrate fauna and physical conditions is addressed in a separate Statement.

Inishderry

Inishderry is addressed in relation to the proposed development in the 2009 EIS at sections 4.4.2 and 5.2.3 in relation to Annex I bird species and the pSPA. Appendix J1 (5.2.3.1) states: "It is considered that there will be no likely significant short term or long term impact on tern species. There will be no impacts on Inishderry from the construction of the pipeline, neither can it be considered to be within the zone of influence. This was confirmed in consultations with NPWS in August 2008".

Brent geese

Brent geese have been addressed previously in this statement (section 4.2.2), and also in the EIS, Appendix J1

Comments on the EIS

The submission does not appear to take into consideration more recent bird data given in the EIS as follows:

- Appendix J1, 3.4.2 Additional Bird survey data 2007 to 2008
- Appendix J1, 3.4.2.4 Preliminary results from Brent Goose monitoring - autumn 2008)
- Appendix J1, 3.4.2.2 Sand Martin monitoring 2008

Bird count areas

The submission appears not to have taken cognisance of verbal clarification requested by NPWS during consultation with regard to the location of Sandy Point in some winter bird reports which equates to the feeding ground north of Glengad and not the area at the lower crossing.

Also, at Appendix J1,(paragraph 5.2.3.1), where it states in relation to Brent Geese and the lower crossing: "With regard to the area to the north of the lower crossing, the usage is entirely predictable in that Brent geese use it for occasional roosting in bad weather ie. westerlies, or north westerlies as it is sheltered from the west. During surveys over the winter of 2007/2008 Brent Geese were not observed feeding in this area while sheltering. Indeed owing to the accretion of sediments over the last few years the former feeding ground's algal beds have significantly reduced in size resulting in little available food for the geese in terms of algae with little *Zostera* now present".

Location of Launch & Reception Pits

The proposed launch and reception pits are not located immediately above the high water mark. As shown on Alignments Sheets 1 of 6 and 4 of 6 (in Appendix A1 of the EIS), the launch and reception pits will not intersect the upper shores of the bay as they are located at the following distances from the high water mark:

Lower crossing: L1 - Glengad: 125m. L 2 Rossport: 30m.

Upper crossing: L3 – Rossport: 80m L4 Aghoos – 50m

Impacts of Intervention Pit on pSPA

The likelihood of an intervention pit within the crossings is very low due to the options for manned intervention at the tunnel head during micro-tunnelling. However, should an intervention pit be unavoidable then the site location will be assessed and the appropriate level of mitigation applied to remove any residual impact to the pSPA. NPWS and NWRFB

will be fully appraised as to the location and timing for an intervention pit, should one be required during the construction at either crossing. Mitigation as outlined in EIS relating to the preservation of habitats and the birds in the pSPA will be implemented. This is also addressed in the Statement on Marine Ecology.

(END SLIDE – TITLE SLIDE)

6.3 Issues raised by other third parties, not already addressed

6.3.1 Machair

In order to clarify this for the Board, I will briefly summarise what constitutes machair and compare this with the habitat at Glengad. The key defining characteristic elements of machair in this context are:

- A significant proportion of shell fragments in the sand producing a lime-rich soil;
- Grassland vegetation with a low frequency of sand-binding species;
- A cool oceanic climate; A wetland element

In contrast, at Glengad:

- a. There is no significant proportion of shell fragments in the soil and an examination of it under a lens shows it to consist mostly of rounded, quartz grains rather than flattened pieces of calcareous shell sand. The soil tests showed that the pH of these sands was in the range of 6.88 - 7.04. These are low in comparison to the range of pH values recorded in national machair surveys which, on the basis of 25 sites and 34 samples, gave a mean of 7.79.
- b. A mean value of 23% for calcium carbonate during the national machair surveys whilst the result confirmed by the laboratory for Glengad samples gave percentages of 1.208 and 1.104. These are very low values and well below the mean found on machair in Ireland.
- c. In contrast, the percentage of silica is very high, lying between 97.82 - 98.13%, which is a reflection of the nature and type of sand present on the site. These high levels are a confirmation of what may be observed by a physical examination of the soil under a hand lens; the sand is siliceous, consisting of grains of quartzite and not of shell fragments of calcium carbonate.

Neither the improved agricultural grassland (nor indeed the dune grassland to the north of the pipeline temporary working area) at Glengad conform to machair habitat. Significantly, the presence of siliceous sands rather than sands derived from shells; the low pH; the very low calcium carbonate levels; the absence of a wetland element, and the presence of a significant humic layer in the profiles; demonstrate that it is cannot be classified as machair.

6.3.2 Sand Martins

- No burrows were present in the section of the cliff that was excavated in 2002, the cliff face being of stony nature (*as shown in slide number 2*) without the “seam” of silty material present to the north of the excavation. This fact was also verified at the time by NPWS personnel. With the exception of the oval unoccupied burrow, the colony is located on the north facing cliff. As referred to previously in this statement, another active colony also exists, to the southwest, where the burrows are also north facing.
- *Unoccupied squashed burrow on the west – facing cliff*
This burrow has been observed and monitored since May 2002. It has been unoccupied throughout that period, indeed the flattened oval shape of the burrow precludes its use.
The type of substrate in which Sand Martins burrow is such that it is subject to erosion and also to plant roots growing through them which can disturb the burrow roof and walls, often resulting in the natural loss of burrows. Burrow number 2 (2004) is an example of natural loss, photographed as changing shape to oval in 2004 it was not present in 2005.
- *Use of netting as a mitigation measure*
Following excavation and reinstatement in 2002, and after consultation with NPWS, specialist advice was that the reinstated section should be covered to deter returning Sand Martins from nesting in this part of the cliff. In 2003 only the reinstated section was netted. In 2004 specialist advice indicated that the netting should be extended to include the squashed, oval-shaped burrow beside the reinstated section, in case of any nesting attempts close to the landfall. The 2004 and 2005 report recommendations were in accordance with more recent expert advice received in early 2008 which noted that unoccupied burrow (Numbered 46 in the earlier reports) is very close to the landfall position of the pipeline, and that this was covered by netting to prevent Sand Martins attempting to reactivate the burrow and be subjected to disturbance by pipeline excavation works. This precautionary measure was considered appropriate. Soil stock piles have also been netted in accordance with best practice advice. Works are currently underway at Glengad and monitoring to date indicates a normal level of feeding behaviour and burrow occupancy
- *Photographed Dead Sand Martin (June 2007)*: The photograph was examined by expert ornithologists who concluded that it was probably a juvenile bird, but that the level of detail discernible on the photo was very low and this made it difficult to see to

what extent the bird was entangled. It is entirely possible for most species of bird to get entangled in natural and man-made materials in their environment.

6.3.3 Wildlife damage

Unlike larger mammals such as badgers and otters, it is not possible to put mitigation measures in place for the smaller mammals such as hedgehogs and pygmy shrews. Every effort is made to avoid wildlife impact, but it is not always possible. This applies not only to pipelines, but also to any type of activity involving machinery – including construction, farming and gardening etc.

7 EIS ADDENDUM REPORT (MAY 2009) APPENDIX B

Two terrestrial ecological reports are presented in Appendix B and I will briefly summarise them.

7.1 The results of ecological surveys South of Sruwaddacon Bay at Aghoos Between approximate chainages 89.500 to 89.800

This report details the findings of ecological surveys (habitat, bird and non-avian vertebrate fauna) carried out at Aghoos in May 2009 in an area where access had not been possible prior to the completion of the EIS in February 2009. The findings may be summarised as follows:

- The habitats comprise modified lowland blanket bog – cutover, eroded and eroding.
- No rare or protected plant species were recorded, nor are any known to occur at this location; Pool systems or wet *Sphagnum* lawns, which are characteristic of deep peat areas, are absent.
- The area is poor in terms of non-avian fauna, a reflection of the lack of faunal potential of the habitats present. No badger setts or otter holts were found during a search of the study area. Signs of fox and Irish hare were noted.
- The area is also poor in terms of birds with only three bird species recorded over three parallel transects, these were: Meadow Pipit (*Anthus pratensis*), Skylark (*Alauda arvensis*) and Snipe. Meadow Pipit was the most abundant species with six individuals recorded, three Skylarks were observed and a single Snipe was flushed from within the site. Given the habitats present on site, it is unlikely that this area is of particular importance to waders or wildfowl. In accordance with earlier assessments, it is concluded that there is generally poor bird species diversity and abundance at this site.

It was concluded that the ecological assessment of the study area in May 2009 confirmed the assessment as set out in the EIS (Chapter 12 and Appendix J1).

7.2 An assessment of flush vegetation to the north of the proposed pipeline route in the Glenamoy Bog Complex cSAC at Rossport, Co. Mayo

Two flush systems are located in the Glenamoy Bog Complex cSAC 500 to the north and north-east of the proposed route for the Corrib Onshore Pipeline route. The flushes have been addressed previously in this statement at section 6.2.8 above. The hydrology of the flushes is addressed in the Statement on Hydrology.

The findings of the vegetation assessment may be summarised as follows:

The plant species recorded from both of these flush systems indicate the presence of low pH and low nutrient conditions. Plant species which would indicate the presence of conditions influenced by base-rich groundwater were not recorded from the flushed areas. When compared with the habitat classification scheme outlined in “*A Guide to Habitats in Ireland*” this vegetation is best classified in the category poor fen and flush (PF2). Such development of species-poor flush vegetation, dominated by *Juncus effusus* and *Sphagnum* sp., along natural drainage channels is a frequent feature of blanket bog landscapes in the west of Ireland. This habitat type is not linked to any EU Annex 1 listed habitat.

The report concludes that: “Provided run-off and pollution mitigation, together with measures to protect the integrity of the flush and its water supply, are fully implemented - with appropriate back systems in place - then there should be no impacts on the Flush 1 - either during or post construction. No impact on Flush 2 is anticipated because of its separation from the propose pipeline by the local catchment divide”.

8 PEAT DEPOSITION AT SRAHMORE (EIS reference – Volume 3 of 3, Chapter 6)

The proposed peat deposition will result in the creation of peatland habitat, in addition to that already being established as a result of the deposition of peat from Bellanaboy. It will benefit species in the area which will have the opportunity to expand into these newly created habitats, thus increasing the overall potential biodiversity of the area.

The main habitat present on the site is cutover bog which has low local ecological value, and which is commonly occurring in the locality. In the short term, the temporary impact will be neutral, in that peat will be deposited upon bare peat. In the medium term, the peat deposition site will have revegetated and the impact will be positive. This will continue into the long term

temporary impact scale, as successional development will allow the area to develop a range of micro-habitats and contribute to biodiversity and habitat value at the local level.

There will be no negative permanent impact on faunal activity in the area. The establishment of poor fen or wet grassland will improve the foraging and refuge opportunities for non-avian and avian fauna, aspects within the development site that were previously lacking.

The development site will blend into the surrounding landscape over time. This is already in process as a result of the regeneration of vegetation on those areas of peat spread from previous peat deposition. The vegetation succession will lead to a more varied habitat than exists at present, contributing to local biodiversity and complementing the ecological significance of adjacent rehabilitated cutover areas. Over time the habitats will blend with the existing fringe habitats that currently border the development site. The long term prospect is considered to be positive, with permanent beneficial impacts on the development site.

Designated areas in the wider locality will not be impacted upon by the proposed development at Srahmore.

8 ONSHORE PIPELINE - SUMMARY AND CONCLUSIONS

From my extensive knowledge of the area in terms of habitats and species, and long involvement with this project, I am satisfied that sufficient information has been gathered to enable an assessment of the potential impacts associated with the proposed development. I stand over the professional opinions expressed by my team in the EIS (Chapter 12 and Appendix J1) with regard to ecological evaluation, impact assessment and recommendations for mitigation measures.

The pipeline will be buried for its length, so with the exception of the footprint of the landfall valve installation, habitats will be reinstated. Some, as in the case of blanket bog habitats and salt marsh require specialised methodology to achieve this. There will be temporary impacts associated with construction, and some habitats will take longer to recover than others.

The assessment has shown that no significant impact on habitats and species will result from the construction of the proposed Corrib Onshore Pipeline. No significant impacts are likely to arise on the Natura 2000 sites - the Glenamoy Bog Complex cSAC and the Blacksod Bay/Broadhaven pSPA.