Appendix L.1

STATUTORY REQUIREMENT

IPPC Licence Application Westland Horticulture Ltd.

Project Ref: OES1182_01

Attachment L.1 contains a copy of:

Appendix L.1.1 Appropriate Assessment Screening Report and Natura Impact Statement

Appendix L.1.2 Clonsura Site Survey

Appendix L.1.1

Appropriate Assessment Screening Report and Natura Impact Statement

Westland Horticulture Ltd.

Peat Harvesting Operations at
Lower Coole, Mayne, Ballinealoe & Clonsura, Near Coole & Fineagh,
County Westmeath, West Meath.

Appropriate Assessment Screening Report and Natura Impact Statement of Peat Harvesting Operations

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Control Sheet

Document Title:	Appropriate Assessment Screening Report	**Revision:**	04
Document No:	1182_01_04	**Issue Date:**	9th February 2011
Prepared By:		**Approved By**	

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Westland Horticulture Ltd.

Lower Coole, Mayne, Ballinealoe & Clonsura, Near Coole & Fineagh, County Westmeath, West Meath.

Report on Appropriate Assessment Screening Report and Natura Impact Statement of Peat Harvesting Operations

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Executive Summary

Westland Horticulture Ltd. are in the process of applying to the Environmental Protection Agency (EPA) for an Integrated Pollution Prevention Control Licence (IPPC) to operate a peat harvesting business, which involves an area exceeding 50 hectares in Lower Coole, Mayne, Ballinealoe & Clonsura, Near Coole & Fineagh, County Westmeath, Westmeath.

As part of the licence application process the EPA have requested that an Appropriate Assessment of the operations be undertaken in accordance with S.I. 272 of 2009.

An Appropriate Assessment (AA) Screening was undertaken by OES of the works on behalf of Westland Horticulture Ltd. to assess the potential impacts, if any, on nearby sites with European Conservation designations (i.e. Natura 2000 sites) in accordance with Article 6 of the Habitats Directive.

The screening was undertaken on all Natura 2000 sites located within a 15km radius of the proposed works. The screening assessment identified one site, Lough Derravaragh, which could potentially be impacted by Westland Horticultures site operations. The AA screening assessment concluded that a Natura Impact Statement (NIS) was required to assess potential impacts from the Westland operations, both on their own and in combination with other plans and projects, on Lough Derravaragh.

The Natura Impact Statement (NIS) focused on water quality, and disturbance associated with dust and noise emissions. The NIS concludes that, given the scale and nature of Westland's operations, they will not have any significant negative impacts on their own, or in combination with other plans and projects on the conservation objectives of Natura 2000 sites, or annexed species, if the proposed control measures are implemented.

1. Introduction

An Appropriate Assessment (AA) Screening Assessment and Natura Impact Assessment was undertaken by OES on behalf of Westland Horticulture Ltd. (hereafter referred to as Westland) to determine the potential impacts, if any, of their peat harvesting operations on nearby sites with European conservation designations (i.e. Natura 2000 sites). The lands were previously used for harvesting since the1950's.

Westland are in the process of applying to the Environmental Protection Agency (EPA) for an Integrated Pollution Prevention Control Licence (IPPC) to operate a peat harvesting business which covers an area exceeding 50 hectares in Lower Coole, Mayne, Ballinealoe & Clonsura, Near Coole & Fineagh, County Westmeath, Westmeath. A site location map is appended as Figure 1 of Attachment A. As part of the licence application process the EPA requested that an Appropriate Assessment of the operations be undertaken in accordance with S.I. 272 of 2009.

1.1 Background

It is understood that peat harvesting operations on site commenced in the late 1950's. The site was commercially drained and developed in 1982 with state funded aid during a time of energy crisis. Westland took over occupation of the site in the mid 1990's with the aim of producing milled peat for use in the horticultural industry.

The peat lands in County Westmeath comprise of 4 separate holdings situated in the town lands of Mayne, Ballinealoe & Lower Coole near the village of Coole and at Clonsura near Fineagh in County Westmeath. These bogs are all managed by the same Peat Harvesting Manager and are operated by the same plant and the same Peat Harvesting operatives.

1.2 The Purpose of this Report

The purpose of the AA Screening Assessment is to determine, the appropriateness, or otherwise, of the peat milling operations and associated site works in the context of the conservation status of Natura 2000 sites located within a 15 km radius of the works.

The report will identify whether the Westland's peat harvesting operations are likely to have a significant effect on a Natura 2000 site. This report will include recommendations, if necessary, to avoid any significant adverse effects associated with their operations.

This Appropriate Assessment Screening Report and Natura Impact Statement has been prepared for submission to the competent authority, in this case, the Environmental Protection Agency. This report will be assessed by the Environmental Protection Agency and

National Parks and Wildlife Service in accordance with recent Guidance on Appropriate Assessment by the Department of Environment Heritage and Local Government.

Having satisfied itself that the Statement is complete and objective the Environmental Protection Agency, will undertake the Appropriate Assessment on the basis of the Statement and any other necessary information.

1.3 Site Operations

Westland's site operations involve milling of peat over approximately 3-4 months of the year. The operation is largely weather dependant. Peat milling operations are only undertaken when the weather is warm and dry. A flow diagram indicating the process is shown in Figure 1.3.1.

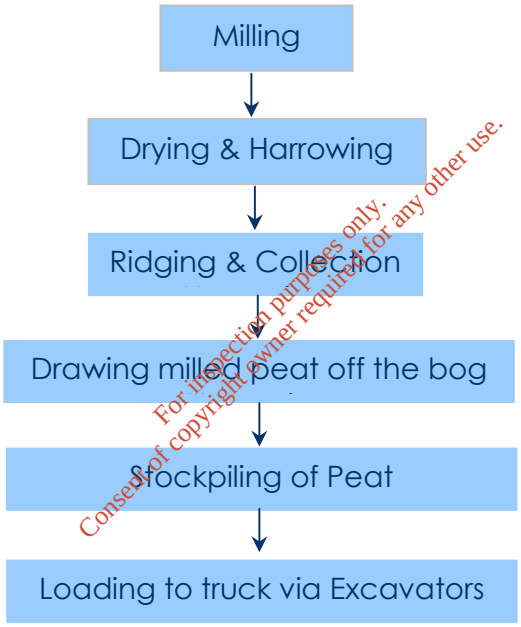


Figure 1.3.1. Flow Chart of Peat Harvesting Operations

The operations of milling, harrowing, ridging and harvesting are repeated for each crop and are collectively described as a cycle.

Generally at least 12mm of evaporation is required to dry a crop to the target moisture content. This normally takes a period of 3 to 4 days. In an average year, 12 crops or production cycles are achieved. However, due to the undependable nature of the Irish summer weather, the number of crops produced varies considerably from year to year.

Milling

Milling is undertaken by a tractor and harrow to cut and loosen up the fresh layer of peat (15mm deep) from the surface. Production of milled peat is carried out on drained bogs, generally during the

months of April through September, in periods of good drying weather. The milled peat is left to air dry over a period of a few days.

Drying and Harrowing
To facilitate even drying of the crop it is rotated mechanically during the drying stage. The number of rotations is dependant on the climatic conditions and moisture in the crop. This is achieved with a machine called a harrow which loosens up the pore structure and exposes a fresh layer of peat to the air. A harrow comprises turning equipment which is towed behind a tractor. The spoons turn down the dry surface of the peat layer and expose the wet peat underneath to the sun and air to assist the drying process.

Ridging
Once the peat has reached the target water content, it is collected into ridges or drills. This is done with a ridger, a machine consisting of a series of blades in the shape of a V that span the full width of the field. The blades are towed by a tractor and push the peat to the centre of the ridge.

Drawing & Stockpiling
The dried fresh peat is removed from the worked areas of the bog to a designated stockpiling area onsite, where it is compacted into layers to prevent dust emissions, and is stored for transportation off the site.

Bog Maintenance Operations
The harvesting operations remove a thin layer of peat thereby slowly lowering the level of the surface. To maintain an effective drainage network the drains have to be deepened, or ditched. This is normally undertaken after production in the autumn and again prior to production in the spring. The ditcher machine is lowered into the drain and removes peat from the bottom and sides of the drain. The peat or spoil removed is transferred in to another field where it dries and hardens. Fields are also shaped with graders or screw levellers to permit run-off of rainwater and good collection of the milled peat layer during production.

1.4 Environmental Management System

Westland has a detailed Environmental Management System (EMS) which is accredited to ISO 14001. This system promotes continual improvement of the EMS and will be updated to implement the requirements of the IPPC Licence.

As part of the EMS, the management and responsibility for the operation and control of all abatement/treatment systems on-site is maintained to reduce impacts on the environment.

Controls are in place for peat harvesting operations, inspection and emptying of silt traps, and emergency procedures have been prepared in the unlikely event that a pollution incident occurs to minimise risk to the bog and nearby watercourses.

2. Appropriate Assessment

2.1 Regulatory Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna better known as "*The Habitats Directive*" provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 of the Directive provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC) (better known as "The Birds Directive").

Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment:

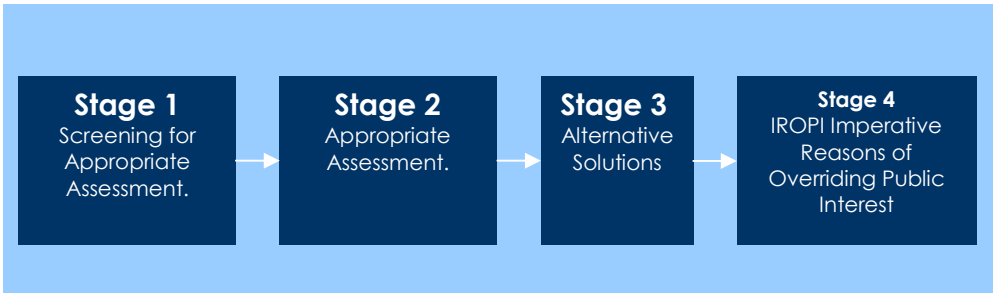
"Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the component national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public".

Articles 6(3) and 6(4) of the Habitats Directive require an Appropriate Assessment of plans to prevent significant adverse effects on European conservation sites, also known as Natura 2000 sites. In this particular case the purpose of Appropriate Assessment is to assess the potential impacts of harvesting activities on the conservation objectives of European sites. The assessment will determine whether the plan would have significant adverse affects upon the integrity of each site in terms of its nature conservation objectives.

The integrity of the site has been defined as "*the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified*" (PPG 9, UK Department of the Environment, October 1994).Where negative effects are identified other options should be thoroughly examined to avoid any potential damaging effects prior to implementing the plan.

AA Process

There are four stages in the process to complete the AA which are outlined below.



The European Commission's Methodological Guidance recommends a 4 stage approach:

Stage 1 Screening
Determining whether the plan 'either alone or in combination with other plans or projects' is likely to have a significant effect on a European site.

Stage 2 Appropriate Assessment
Determining whether, in view of the site's conservation objectives, the plan 'either alone or in combination with other plans or projects' would have an adverse effect (or risk of this) on the integrity of the site. If not, the plan can proceed.

Stage 3: Assessment of Alternative Solutions
Where it has not been proven that measures considered will not avoid or mitigate the adverse affect on the Natura 2000 site, then an assessment of the alternatives will be required; and if none are acceptable then stage 4 is required to be considered.

Stage 4 Assessment where no Alternative Solutions Exist and where Adverse Impacts Remain
This will involve assessment where the Plan is considered to result in adverse impacts on the Natura 2000 site and no alternative solutions remain – the imperative reasons of overriding public interest (IROPI) test must be met before authorisation, permission or adoption of the Plan is agreed. This includes the agreement of compensatory measures. This report covers Stage 1 of Appropriate Assessment - Screening. The outcome of each stage determines whether a further stage in the process is required.

This report comprises Stage 1; in addition to a Natura Impact Assessment which can be considered an intermediary step to assist the Environmental Protection Agency undertake Stage 2 of the Appropriate Assessment.

3. Screening for Appropriate Assessment

In accordance with the Department of Environment Heritage and Local Government (DoEHLG) Guidelines screening is the process that addresses two tests of Article 6(3) of the Habitats Directive:

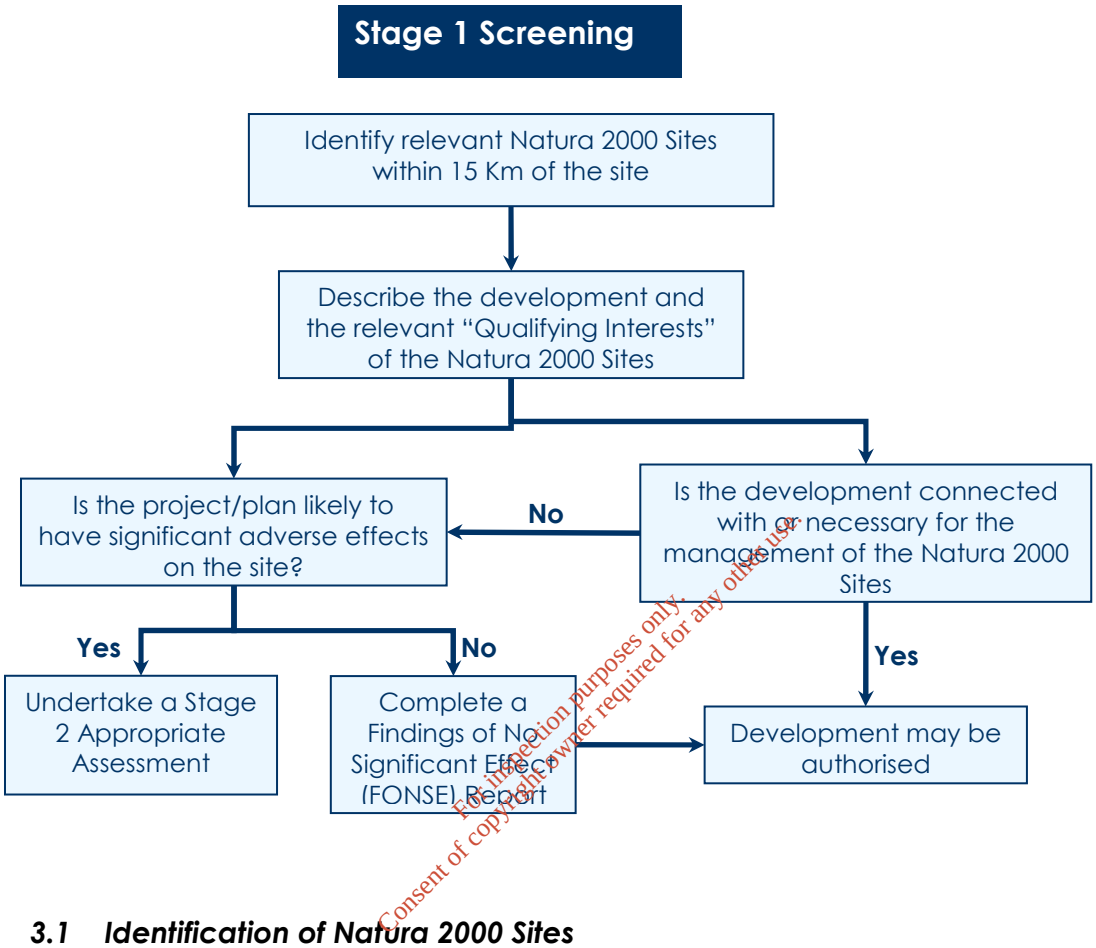
i) whether a plan or project is directly connected to or necessary for the management of the site, and
ii) whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives.

If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2. The screening assessment for the peat harvesting operations follows the following steps in accordance with the DoEHLG guidelines:

1. Description of plan or project, and local site or plan area characteristics.
2. Identification of relevant Natura 2000 sites, and compilation of information on their qualifying interests and conservation objectives.
3. Assessment of likely effects – direct, indirect and cumulative – undertaken on the basis of available information as a desk study or field survey or primary research as necessary.
4. Screening statement with conclusions.

Stages of the Appropriate Assessment

A flow diagram illustrating Stage 1 of the Appropriate Assessment is outlined below:



3.1 Identification of Natura 2000 Sites

In accordance with the European Commission Methodological Guidance (EC2001), a list of Natura 2000 Sites that can be potentially affected by the proposed project has been complied. Adopting the precautionary principle in identifying these sites, it has been decided to include all cSAC's and SPAs/Ramsar site within a 15km radius of Westland's harvesting operations with specific attention to areas downstream of any watercourses present in the area. A map showing the Natura sites located within a 15km radius of Westland's harvesting operations is appended as Figure 1 of Attachment A.

A summary of the key features, sensitivities, and qualifying interests of designated sites within 15km of the peat harvesting operations is provided in Table 3.1.

Table 3.1: Designated Sites located within 15 km of the Peat Milling Operations

Name & Site Code	Key Features	Distance & direction from site
Lough Derravaragh (004043)	Lough Derravaragh is of major ornithological importance as it regularly supports nationally important populations of five species, and at times is used by the internationally important population of Greenland White-fronted Goose which is based in the region. Also of note is that three of the species which occur at the site (Greenland White-fronted Goose, Whooper Swan, Golden Plover) are listed on Annex I of the E.U. Birds Directive.	1.2 Km South of Coole
Garriskil Bog (SAC) (000679)	Garriskil has one of the best developed pool systems of any remaining raised bog in the country and the site is of unique conservation value.. This habitat is increasingly under threat in Ireland.	3.8 Km South West of Coole
Ardagullion Bog SAC (002341)	Ardagullion bog supports a good diversity of raised bog microhabitats, including hummocks and pools. Active raised bog is listed as a priority habitat on Annex I of the E.U. Habitats Directive. Priority status is given to habitats and species that are threatened throughout the E.U.	7.5 Km East of Coole 9Km East of Clonsura
Glen Lough SPA (004045)	Whilst this site attracts a range of wintering waterfowl, the principal interest is the internationally important Whooper Swan population that is based in the area. It is listed on Annex I of the E.U. Birds Directive. Greenland White-fronted Goose, nowadays an occasional visitor to the site, is also listed on Annex I of this Directive.	11.3 Km South West of Coole
Iver Boyne & River Blackwater SAC (002299)	The site supports populations of several species listed on Annex II of the EU Habitats Directive, and habitats listed on Annex I of this directive, as well as examples of other important habitats. Although the wet woodland areas appear small there are few similar examples of this type of alluvial wet woodland remaining in the country, particularly in the north-east.	14.6 Km South East of Coole
Lough Bane and Lough Glass SAC (002120)	Despite being surrounded by mostly improved pasture, the quality of the water appears good and Lough Bane has been classified as a very oligotrophic system. However, as it is a small waterbody and situated in a valley, it is vulnerable to water pollution. A further threat comes from afforestation within the catchment – should there be an increase in the areas under commercial forestry, the quality of the water could be affected.	12.5 Km East of Coole

Name & Site Code	Key Features	Distance & direction from site
	Overall, this is a fine example of a hard water marl lake system with good Chara communities. Such systems are becoming scarce in Europe.	
Lough Iron SPA (004046)	Lough Iron SPA is of high ornithological importance primarily as it supports an Internationally Important population of Greenland White-fronted Geese, with both feeding and roosting areas available to the birds. An Internationally Important population of Whooper Swans sometimes occurs. Of particular importance is that three of the species which occur are listed on Annex I of the E.U. Birds Directive (Greenland White-fronted Goose, Whooper Swan and Golden Plover).	7.9 Km South West of Coole
Lough Kinale and Derragh Lough SPA (004061)	Whilst relatively small in area and subject to a number of damaging activities, this site retains national importance for two duck species. With an improvement in the environmental conditions pertaining at the site, higher numbers of some species would undoubtedly occur.	1.9 Km North of Clonsura
Lough Lene SAC (02121)	Lough Lene had a notable population of Freshwater Crayfish, a species that is listed on Annex II of the E.U. Habitats Directive, but this species disappeared from the site in 1987 following an outbreak of crayfish fungus plague. The species was since reintroduced to the site and breeding was recorded in 1995; however, since then a further outbreak of crayfish fungus plague has led to the disappearance of the species at the site.	8.4 Km East of Coole
Lough Owel SAC (000688)	Lough Owel the second best example of a large, spring-fed calcareous lake in the country. The site is of major conservation significance, containing, as it does, three habitats that are listed on Annex I of the EU Habitats Directive, i.e. alkaline fens, transition mires and hard water lakes. Additionally, the site supports bird populations of conservation significance.	8.6 Km South of Coole
Lough Owel SPA (004047)	Lough Owel has very significant populations of two species, Shoveler and Coot. It is also a notable site as it is used on occasions by the internationally important Midlands Greenland Whitefronted Goose flock.	8.6 Km South of Coole
Lough Sheelin SPA (004065)	Lough Sheelin is a nationally important site for four species of wintering wildfowl and is one of the main Midlands lakes sites for wintering birds. An improvement in water quality would probably result in higher numbers of birds frequenting the site.	3.9 Km North of Clonsura
Moneybeg and	The site is of considerable conservation significance, comprising two raised bogs with semi-natural lake	3 Km North of

Name & Site Code	Key Features	Distance & direction from site
Clareisland Bogs SAC (002340)	margins. The site supports a diversity of raised bog habitats including, hummock/hollows and pools. Active raised bog is listed as a priority habitat on Annex I of the E.U. Habitats Directive. Priority status is given to habitats and species that are threatened throughout the E.U. Ireland has a high proportion of the total E.U. resource of this type (over 60%) and so has a special responsibility for its conservation at an international level.	Clonsura
White Lough Ben Loughs & Lough Doo (001810)	This site is of considerable conservation significance for its hard water lakes and for the occurrence of White-clawed Crayfish. The variety of habitats within this valley and the contrasting vegetation types add further to its interest.	10.6 Km East of Coole
Garriskil Bog SPA (00412)	This raised bog site lies 3 km west of Lough Derravaragh and 3 km east of Rathowen. It is bounded to the southeast and southwest by the rivers Inny and Riffey.	3.8 Km South West of Coole
Scragh Bog (SAC Site Code 00412)	Scragh Bog lies approximately 10 km northwest of Mullingar, Co. Westmeath. This site comprises a wet transition fen with a floating root mat which has developed in a small oval-shaped depression. The fen is fed by weak surface springs and drains by an artificially defined outlet.	10.5 Km South of Coole

Maps showing designated Special Areas of Conservation and Special Protection Sites within 15 Km of Westland are appended as Figures 1, and 2 of Attachment A. Full details of National Parks and Wildlife site synopsis for the Natura sites are appended as Attachment B of the report.

3.3 Consultation and Site Visit

The Department of Environmental Heritage and Local Government (DoEHLG) issued a circular letter (NPW 1/10 & PSSP 2/10) which states that: "*The National Parks and Wildlife Service (NPWS) of the Department has a formal consultation role (through the Development Applications Unit (DAU)) as part of the screening and assessment process.*"

The following bodies were consulted in relation to the assessment and offered an opportunity to comment on the operations at Westland, in addition to notifying whether they were aware of any projects, plans or permissions that may act in-combination with Westland:

- Shannon Regional Fisheries Board;
- Westmeath County Council;
- National Parks and Wildlife Service (NPWS) of Department of Environmental Heritage and Local Government
- Office of Public Works (OPW) (Engineering Section);

At the time of completion of this report, responses have been received from the Shannon Regional Fisheries Board and the National Parks and Wildlife Service. A copy of the correspondence received is appended as Attachment C of the report.

A site visit was undertaken on the 16th of November 2010 and water samples were taken along the River Inny both upstream and downstream of Westland's Operations.

4 Assessment of likely effects

Only those features of the development that have the potential to impact on features and conservation objectives of the identified Natura sites are considered. A number of factors were examined at this stage and dismissed or carried forward for appropriate assessment as relevant.

The following areas were examined in relation to potential impacts from the operation of Westland's peat harvesting operations on Natura 2000 sites in the area:

1. Alteration of water chemistry discharged from the site
   - Increase in the amount of suspended and total solids released from the site
   - Alteration of water flow and levels
   - Alteration to the ph of the water
2. Reduction in air quality owing to dust emissions
3. Noise from peat harvesting machinery

4.1 Water Quality

The proposed peat harvesting operations are not located within any SAC, or site watercourse designated under Natura 2000 site.

Westland's peat harvesting sites are located along the River Inny which flows into Lough Derravaragh SPA (Site Code 4043) which is also a proposed Ramsar site.

The operation of the peat harvesting involves the use of a range of machinery and fluids. These include fuels and lubricants used for harvesting machinery which if spilled, has the potential to give rise to contamination of ground and surface waters.

Suspended Solids

Should the site be managed incorrectly, and the sedimentation basins be neglected, there could be a potential for increased levels of suspended solids to enter watercourses as fines which are washed away during periods of rain.

As levels of suspended solids increase, a water body begins to lose its ability to support a diversity of aquatic life. Suspended solids absorb heat from sunlight, which increases water temperature and subsequently decreases levels of dissolved oxygen (warmer water holds less oxygen than cooler water). Some cold water species, such as trout and stoneflies, are especially sensitive to changes in dissolved oxygen.

Photosynthesis also decreases, since less light penetrates the water. As less oxygen is produced by plants and algae, there is a further drop in dissolved oxygen levels. Suspended solids can also destroy

fish habitat because suspended solids settle to the bottom and can eventually blanket the river bed. Suspended solids can smother the eggs of fish and aquatic insects, and can suffocate newly-hatched insect larvae. Suspended solids can also harm fish directly by clogging gills, reducing growth rates, and lowering resistance to disease. Changes to the aquatic environment may result in a diminished food source, and increased difficulties in finding food. Natural movements and migrations of aquatic populations may be disrupted.

Such substances would include suspended solids, run-off, oils, etc. If such substances were to enter the rivers and streams in the vicinity of the proposed works in significant quantities the Annex I habitats may be adversely impacted.

This may affect impair various Annexed species, including, otter, whooper swan, Greenland White-fronted Goose, white-clawed crayfish and freshwater pearl mussels etc.

Alteration of water flow and levels

Removal of the peat cover and alterations to drainage patterns post harvesting may influence groundwater and surface water interactions in the area. Peat harvesting involves drainage and the removal of vegetation which can have a damaging effect on adjacent waterbodies including lakes and rivers.

The impact on groundwater and surface water has occurred since the bog was commercially drained in 1980's.

4.2 Reduction in Air Quality owing to Dust Emissions

Dust emission, dispersion patterns and impacts are difficult to predict due to the wide range of activities on the site that may give rise to dust, and the lack of reliable knowledge of the dust-generation capacities for these activities, together with the influence of local meteorology and topography (ODPM, 2005a).

Dispersal is affected by the size of the particles emitted, wind speed, shape and density. Smaller dust particles remain airborne for longer, dispersing widely and depositing more slowly over a wider area. Large dust particles (greater than 30 µm) will largely deposit within 100 m of sources. Intermediate-sized particles (10-30 µm) are likely to travel up to 200-500 m and smaller particles (less than 10 µm; PM10) are deposited slowly, but may travel 1000 m (1 km) or more. Concentrations decrease rapidly on moving away from the source, due to dispersion and dilution (ODPM, 2005a).

Dust particles from peat harvesting operations are not considered to be a significant emission. To date there have been no dust complaints for the site.

There are Bergerhoff gauges on site to monitor dust emissions from the site. To date it has not been possible to obtain a representative result of dust deposition for the site as the Bergerhoffs gauges have been interfered with.

4.3 Noise associated with Peat Harvesting Operations

Noise disturbance associated with peat harvesting operations are not considered to be a significant emission. To date there has been no noise complaints for the site.

The nearest Natura 2000 site to the harvesting operations is Lough Derravaragh (Site Code 4043) which is 1.2 Km to south of Westland's peat harvesting operations.

4.4 Assessment of Significance

This section examines the list of Natura 2000 sites with reference to the potential implications identified in Sections 4.1-4.3. Where appropriate sites are excluded from further assessment on the basis that it can be demonstrated that the proposed works will have no adverse effects on the integrity of the site as defined by their status and conservation objectives.

An assessment of Table 4.4.1.on the Natura 2000 sites are provided in Table 4.4.1.

Table 4.4.1. Screening Assessment of Westland's Harvesting Operations on Natura 2000 Sites

Site	Distance from Site	Conservation Interests	Assessment
Lough Kinale and Derragh Lough SPA (004061)	1.9Km North of Clonsura	To maintain the special conservation interests for this SPA at favorable conservation status: Pochard, Tufted Duck, and Wetland & Waterbirds.	Located upstream of Westland operations which are not anticipated to have a direct or indirect negative impact on the site.
Moneybeg and Clareisland Bogs SAC (002340)	3 Km North of Clonsura	1. To maintain the Annex I habitats for which the cSAC has been selected at favorable conservation status: Active raised bogs; Degraded raised bogs still capable of natural regeneration; Depressions on peat substrates of the Rhynchosporion. 2. To maintain the extent, species richness and biodiversity of the entire site. 3. To establish effective liaison and co-operation with landowners, legal users and relevant authorities.	Located 3 Km from Westland's operations. Based on the nature of their operations it is not anticipated that they will have a direct or indirect negative impact on the site.
Garriskil Bog (SAC) (000679)	3.8Km South West of Coole	1. Active raised bogs 1. Degraded raised bogs still capable of natural regeneration	This site is located 4 Km from Westland's operations which are not anticipated to have a direct or indirect negative impact on the site.
Garriskil Bog SPA (00412	3.8 km South West of Coole	2. Greenland 3. White-fronted Geese.	This site is located 4 Km from Westland's operations which are not anticipated to have a direct or indirect negative impact on the site.
Lough Sheelin SPA (004065)	3.9km North of Clonsura	To maintain the special conservation interests for this SPA at favorable conservation status: Pochard, Goldeneye, Great Crested Grebe, Tufted Duck, and Wetland & Waterbirds.	This site is located 4 Km upstream of Westland's operations and it is not anticipated to have a direct or indirect negative impact on the site.
Ardagullion Bog SAC (002341)	7.5 Km East of Coole	1. To maintain the Annex I habitats for which the cSAC has been selected at favorable conservation status: Active raised bogs; Degraded raised bogs still capable of natural regeneration; Depressions on peat substrates of the Rhynchosporion.	Located 7.5 Km from the site. Westland's operations are not anticipated to have a direct or indirect negative impact on the site.

Site	Distance from Site	Conservation Interests	Assessment
		2. To maintain the extent, species richness and biodiversity of the entire site. 3. To establish effective liaison and co-operation with landowners, legal users and relevant authorities.	
Lough Iron SPA (004046)	7.9 Km South West of Coole	To maintain the special conservation interests for this SPA at favorable conservation status: Whooper Swan, Greenland White-fronted Goose, Shoveler, Wigeon, Teal, Coot, Golden Plover, and Wetland & Waterbirds.	Located 8Km from the site. Westland's operations are not anticipated to have a direct or indirect negative impact on the site.
Lough Lene SAC (02121)	8.4 Km East of Coole	1. To maintain the Annex I habitat for which the cSAC has been selected at favorable conservation status: Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. 2. To maintain the Annex II species for which the cSAC has been selected at favorable conservation status: Austropotamobius pallipes. 3. To maintain the extent, species richness and biodiversity of the entire site. 4. To establish effective liaison and co-operation with landowners, legal users and relevant authorities.	Westland's operations are not anticipated to have a direct or indirect negative impact on the site.
Lough Owel SAC (000688)	8.6 Km South of Coole	1. To maintain the Annex I habitats for which the cSAC has been selected at Favourable conservation status: Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.; Transition mires and quaking bogs; Alkaline fens. 2. To maintain the extent, species richness and biodiversity of the entire site. 3. To establish effective liaison and co-operation with landowners, legal users and relevant authorities.	This site is a considerable distance from Westland's operations and it is not anticipated to have a direct or indirect negative impact on the site.
Lough Owel SPA (004047)	8.6 Km South of Coole	To maintain the special conservation interests for this SPA at favorable conservation status: Whooper Swan, Greenland White-fronted Goose, Shoveler, Wigeon, Teal, Coot, Golden Plover, Wetland & Waterbirds.	This site is a considerable distance from Westland's operations and it is not anticipated to have a direct or indirect negative impact on the site.
Glen Lough SPA (004045)	9Km East of	To maintain the special conservation interests for this SPA at favorable conservation status: Whooper Swan, Wetland and Waterbirds.	This site is a considerable distance from Westland's operations and it is

Site	Distance from Site	Conservation Interests	Assessment
	Clonsura		not anticipated to have a direct or indirect negative impact on the site
Scragh Bog (SAC Site Code 00412)	10.5Km South of Coole	Scragh Bog contains excellent examples of two habitats listed on Annex I of the EU Habitats Directive - alkaline fen and transition mire. These habitats support a number of rare plants, notably Drepanocladus vernicosus, and also play host to a well developed invertebrate fauna.	This site is a considerable distance from Westland's operations and it is not anticipated to have a direct or indirect negative impact on the site
White Lough Ben Loughs & Lough Doo (001810)	10.6Km East of Coole	1. To maintain Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. 2. To maintain the Annex II species for which the cSAC has been selected at favorable conservation status: Austropotamobius pallipes. 3. To maintain the extent, species richness and biodiversity of the entire site. 4. To establish effective liaison and co-operation with landowners, legal users and relevant authorities	This site is a considerable distance from Westland's operations and it is not anticipated to have a direct or indirect negative impact on the site.
Glen Lough SPA (004045)	11.3 Km South West of Coole	Whooper Swan population that is based in the area. Greenland White - fronted Goose and Shoveler.	This site is a considerable distance from Westland's operations and it is not anticipated to have a direct or indirect negative impact on the site.
Lough Bane and Lough Glass SAC (002120)	12.5 Km East of Coole	1. To maintain the Annex I habitat for which the cSAC has been selected at favorable conservation status: 2. Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. 3. To maintain the Annex II species for which the cSAC has been selected at favorable conservation status: Austropotamobius pallipes. 4. To maintain the extent, species richness and biodiversity of the entire site. 5. To establish effective liaison and co-operation with landowners, legal users and relevant authorities.	This site is a considerable distance from Westland's operations and it is not anticipated to have a direct or indirect negative impact on the site.
Iver Boyne & River Blackwater SAC	14.6 Km South East of Coole	1. To maintain the Annex I habitats for which the cSAC has been selected at favorable conservation status: Alkaline fens; Alluvial forests with Alnus glutinosa 2. To maintain the Annex II species for which the cSAC has been	This site is a considerable distance from Westland's operations and it is not anticipated to have a direct or indirect negative impact on the site

Site	Distance from Site	Conservation Interests	Assessment
(002299)		selected at favorable conservation status: Lampetra fluviatilis, Salmo salar, Lutra lutra. 3. To maintain the extent, species richness and biodiversity of the entire site. 4. To establish effective liaison and co-operation with landowners, legal users and relevant authorities.	
Lough Derravaragh (004043)	1.2 Km South	The conservation objectives for the site are to maintain the special conservation interests for this SPA at favorable conservation status: Pochard, Tufted Duck, Coot, Whooper Swan, Wetland & Waterbirds.	As a result of the proximity of Westland's harvesting operations to Lough Derravaragh and its position down stream of their operations it is considered that a Stage two Natura Impact Assessment would be require to assess potential impacts on the site.

As can be seen from Table 4.4.1. with the exception of Lough Derravaragh it is not considered that Westland's operations will have any direct of indirect impacts on the above Natura 2000 sites and their conservation interests.

As a result of the proximity of Westland's harvesting operations to Lough Derravaragh and its position down stream of harvesting operations, a Stage two Natura Impact Assessment will be require to assess potential impacts on the site. The Natura Impact is presented in Section 6 of the report.

5 Screening Statement Conclusions

Westland is within 15 km of 17 Natura 2000 sites. It has been determined during the screening process that 16 of these sites will not be impacted by site operations. One site may potentially be indirectly impacted as a result of the site operations.

The main concerns to be examined as part of a Natura Impact Statement are identified as follows:

- Risk to the Lough Derravaragh and associated qualifying interests as a result of a reduction in water quality.
- Risk to qualifying species of interest associated with the SPA which include Pochard, Tufted Duck and Coot. Species of additional interest include Whooper Swan.

A Natura Impact Assessment will be undertaken to assess the potential impacts from Westland's harvesting operations on Lough Derravaragh to determine whether they pose a significant risk to Lough Derravaragh and the qualifying conservation interests.

6 Natura Impact Statement

Based on the results of the screening assessment (Section 5) a Natura Impact Statement (NIS) will be required to assist the Environmental Protection Agency undertake an Appropriate Assessment. This NIS concludes the findings of a Natura Impact Assessment.

6.1 Stages of Natura Impact Assessment

The stages of the Natura Impact Assessment are broadly in line with those required for an Appropriate Assessment in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the '*Habitats*' Directive 92/43/EEC (EC 2001) and the European Commission Guidance '*Managing Natura 2000 Sites*'.

In complying with the obligations under Article 6 and following the above Guidelines, this NIA has been structured in a stage by stage approach outlined in Table 6.1.1.

Table 6.1.1 Stages of Natura Impact Assessment

Stages of the Natura Impact Assessment	Description of Requirements in accordance with Article 6
Stages 1 & 2	Identification of the location and compilation of the information required regarding the Natura 2000 sites and the qualifying interests and conservation objectives for the sites.
Stage 3	Undertake an assessment of likely significant effects. As part of Stage 3 it is required to provide the following: o Description of the project. o Identification of the main features of the proposed project, (scale and size, physical changes that will result from the project).
Stage 4	Assessment of '*in combination effects*'. These include *ex situ* and *in situ* projects/developments.
Stage 5	Conclusion as to whether or not the project may give rise to significant effects.

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. First the project should aim to avoid any negative impacts on European sites by identifying possible impacts early in the planning stage, and designing the project in order to avoid such impacts. Second, mitigation measures should be applied, if necessary, during the NIA process to the point, where no adverse impacts on the site(s) remain. If the project is still likely to result in adverse effects, and no

further practicable mitigation is possible, then it is rejected. If no alternative solutions are identified and the project is required for imperative reasons of overriding public interest (IROPI test) under Article 6 (4) of the Habitats Directive, then compensation measures are required for any remaining adverse effect.

6.2 Stages 1 & 2 of Natural Impact Assessment

This stage of the NIA identifies and provides information regarding the one Natura site, Lough Derravaragh SPA, selected for the NIA and the qualifying interests and conservation objectives for the sites.

6.2.1 Characteristics of the Designated Sites

The National Parks and Wildlife Service Site Synopsis notes that Lough Derravaragh SPA

"It is a medium- to large-sized lake of relatively shallow water (maximum depth 23 m). The lake extends along a south-east/north-west axis for approximately 8 km. The Inny River, a tributary of the River Shannon, is the main inflowing and outflowing river. It is a typical limestone lake with water of high hardness and alkaline pH, and is classified as a mesotrophic system.

A notable feature is the range of charophytes that occur in the lake (eight species have been recorded, including the rare, Red Data Book species Chara denudata and C. tomentosa). It has a good diversity of marginal habitats. At the western end of the lake are extensive areas of swamp dominated by Common Reed (Phragmites australis). Elsewhere along the shore there is freshwater marsh vegetation dominated by sedges (Carex spp.) and tussock-forming grasses such as Tufted Hair-grass (Deschampsia cespitosa) and fescues (Festuca spp.), with a range of flowering herbs including Nodding Bur-Marigold (Bidens cernua) and Trifid Bur-Marigold (Bidens tripartita). The lakeshore is a mineral-rich substrate and several plant species of poor fen habitats occur in abundance, such as Black Bog-rush (Schoenus nigricans) and Long-stalked Yellow-sedge (Carex lepidocarpa). Deciduous woodland fringes the lake in some areas.

Lough Derravaragh is one of the most important midland lakes for wintering waterfowl. It supports nationally important populations of Little Grebe (42), Mute Swan (159), Pochard (3,129), Tufted Duck (1,073) and Coot (1,358) - all counts are average maxima over the five winters 1995/96 to 1999/00. The Pochard population is of particular note as it represents over 6% of the national total, and at times has exceeded the threshold for International Importance (i.e. 3,500). The lake is a traditional haunt for the internationally important Midland lakes Greenland Whitefronted Goose flock (which also uses Loughs Iron, Owel and Ennell). This flock, whose

numbers usually range between 300 and 400 birds, use the lake mainly for roosting purposes. A regionally important population of Whooper Swan (102) occurs, along with a range of other species including Great Crested Grebe (34), Cormorant (34), Wigeon (207), Teal (52), Mallard (195), Pintail (6), Shoveler (12), Goldeneye (46), Golden Plover (158) and Lapwing (1,079).

Enrichment of the lake, mainly by agricultural run-off, is a threat and could affect the bird populations and especially the diving ducks. An increase in recreational and wildfowling activities could cause disturbance to the birds though this is not considered to be a major threat. Lough Derravaragh is of major ornithological importance as it regularly supports nationally important populations of five species, and at times is used by the internationally important population of Greenland White-fronted Goose which is based in the region. Also of note is that three of the species which occur at the site (Greenland White-fronted Goose, Whooper Swan, Golden Plover) are listed on Annex I of the E.U. Birds Directive. (13.8.2004)."

6.2.2 Qualifying Interests in Natura 2000 Sites

The "*qualifying interests*" which are the reasons for designation of each Natura 2000 site being assessed is outlined below.

The qualifying interests of the site include Pochard, Tufted Duck, and Coot. Additional interests at the site include Whooper Swan.

The conservation objectives for the site are to maintain *the special conservation interests for this SPA at favorable conservation status: Pochard, Tufted Duck, Coot, Whooper Swan, and Wetland & Waterbirds.*

7 Stage 3 of Natura Impact Assessment

In this section of the NIA the likely significant effects on the conservation interests of the Lough Derravaragh Natura site are described. All the potential impacts resulting from Westland are discussed in relation to the conservation objectives of this site.

7.1 Potential Impacts

The principal potential impacts on the Natura 2000 sites from the Westland's harvesting operations include:

1. Risk to Lough Derravaragh SPA (Site Code 4043) and protected bird species through a reduction in water quality via:
    - Alteration of water chemistry discharged from the site
    - Increase in the amount of suspended and total solids released from the site
    - Alteration of water flow and levels
    - Alteration to the ph of the water
2. Risk to Lough Derravaragh SPA via reduction in air quality owing to dust emissions.
3. Risk to Lough Derravaragh SPA via noise from peat harvesting machinery.

7.2 Potential Impacts on Water Quality

During the operation of Westland there is potential for harmful substances to enter the River Inny which flows into Lough Derravaragh SPA and proposed Ramsar Site.

The site operations use a range of machinery and fluids. These include fuels and lubricants used for construction machinery, which if spilled, has the potential to give rise to contamination of ground and surface waters.

Arising from the operation activities, there is a potential for increased levels of suspended solids and nutrients to enter watercourses as the fines are washed away during periods of rain.

Such substances could include suspended solids, phosphorous, nitrogen lubricants, oils, etc. If such substances were to enter the River Inny in significant quantities the water quality of the River Inny and Lough Derravaragh may be adversely impacted.

The macro-invertebrates which inhabit the area could be directly affected by such pollutants. In turn, the birds which feed on these

organisms could be affected by a reduced food supply or by directly ingesting oil residues etc.

Impaired water quality could also affect various Annexed species such as lampreys, brown trout, salmon, otter, white-clawed crayfish and kingfisher.

7.3 Reduction in air quality owing to dust emissions

Dust from peat harvesting operations is not considered to be a significant emission. The likelihood for this to have impact during operations on Lough Derravaragh will be assessed.

7.4 Disturbance during Operation to protected Flora & Fauna

Disturbance, within or adjoining a Natura site, can potentially result in loss of bird numbers using a site. Lough Derravaragh (Site Code 4043) is located 1.2 Km to south of Westland's peat harvesting operations. An assessment of the disturbance to flora and fauna is undertaken in Section 8 of the report.

8 Assessment of Impacts

8.1 Water Quality Assessment

Surface water drains, constructed with state aided funding in the early 1980's for the commercialisation of peat resources at Coole and Clonsura are maintained by Westland to facilitate the peat harvesting process as described in section 1.3.

The surface water drains on peat land banks are required to lower the moisture content on upper surfaces of the peat. The volume of water entering the drainage ditches is directly related to precipitation.

In order to ensure the least possible impact on the receiving watercourses (R. Glore & R. Inny), Westland have installed a comprehensive treatment system for flow attenuation and treatment of surface waters prior to discharge. All discharges from the site are in accordance with a water discharge Licence issued by Westmeath County Council.

An outline of the treatment system installed at the site and an assessment of the impact of Westland operations on the receiving watercourses is presented below.

As part of the water quality assessment, the following was undertaken;

- Review of Surface Water Treatment System.
- Surface Water Retention.
- Potential Water Quality Impact arising from Suspended Solids.
- Potential Impact of Hydraulic load on Receiving Water.
- Potential Impact of Chemical Load on Receiving Water.
- Biological Water Quality.

Surface Runoff Water Treatment

Westland maintains surface water drainage ditches every 12 meters (approximately) to provide adequate conditions for peat harvesting. Surface and soil pore water collected from the peat fields is treated prior to discharge to adjacent watercourses.

Water collected in each of the drainage ditches is conveyed to a headland drain trap, from where it flows into a large perimeter drain and onto the sedimentation basins for further treatment. The headland drain trap removes large particles by daming water up into the drainage ditches causing suspended particles to settle to the bottom of the ditches and into sludge traps in the headland drainage traps.

Westland has 5 No. sedimentation basins installed at the harvesting site at Clonsura which all discharge to the River Glore 500m upstream of the River Inny and 7 No. sedimentation basins at Coole which discharge directly to the River Inny. Sedimentation basins are a commonly used,

well established, internationally used method of removing suspended solids from peatland runoff (Klove, 1997).

All of the sedimentation basins installed and operated by Westland have been designed with due regard to the 'Draft BATNEEC Guidance Note for the Extraction of Peat' and to Agency accepted standards on IPPC peat harvesting sites throughout Ireland.

In accordance with accepted standards, Westland has designed all of their sedimentation basins so that each basin has a capacity of 50m^3 per drained hectare and a maximum velocity of less than 0.1m/s. On the basis of the physical dimensions of the sediment basins, all ponds at Westland demonstrate compliance with this criterion.

In addition to Agency requirements on sedimentation basin design, the basins at Westland have been compared against more detailed Finnish design guidelines developed from a study commissioned by the '*Central Finland Regional Environment Centre'* between 2002-2004 on 'Furthering of Implementation of New Methods Developed for Water Treatment at Peat Harvesting Areas'.

With the use of Met Eireann weather data, the basin design was evaluated on the basis of a 20 year return period storm of 24 hour duration occurring during the peat harvesting season. The run off rate arising from the 24 hour was determined using the 'Rational Method' (Q=CIA), where Q=Flow, C=Runoff Coefficient and A=Catchment Area (Kiely,1997).

In order to be conservative with our assessment a runoff coefficient of 0.9 has been used, owing to the extremely porous nature of peat and natural shallow gradients (slope <1%) at the site, the runoff rate from the peat is likely to be far lower (Klove & Bengtsson, 1999). A review of the design of the sedimentation ponds at Westland has found, all of the sedimentation ponds to meet the following additional criterion

- Mass surface loading rate 1.0m^3 m^{-2} h^{-1}
- Minimum sludge capacity of 4m^3
- Pond length is determined by design specific runoff
- Drainage Area, max. 30-50Ha

Provision of sedimentation ponds of adequate size, significantly reduces the potential impact of the discharge from Westland on the receiving water.

Surface Water Retention

The retention time provided by the settlement basins at the Clonsura and Coole peat harvesting sites is at a minimum, capable of removing solids from surface water arising from a 20 year return period storm of 24 hour duration.

It is noted that the discharges from the sedimentation ponds at the Westland facility can be controlled by an adjustable weir. This allows the facility to limit or stop all discharges from the site. Once the silt ponds reach capacity, water will start to back up in the perimeter drains, drainage ditches and peat harvesting land banks and in effect this gives Westland the potential to retain water within the site for long periods if required.

Owing to the storage capacity of drained peatlands, once off large volume discharges during summer months are unlikely as the storage capacity of the peatlands increase the lag time and peak discharge rate after significant rainfall events (Klove & Bengtsson, 1999). The increased lag time permits the operators at the facility to adjust the weir to an appropriate position so that the surface water retention time can be adjusted to ensure adequate treatment before discharge.

The sedimentation ponds at Westland are adequately sized to treat surface water which arises after lower intensity rain events on successive days.

Potential Water Quality Impact arising from Suspended Solids

Suspended material predominantly becomes entrained in the surface water as it seeps across exposed peat land banks. Windblown peat particles are another source of suspended and floating material in peatland drainage water.

Larger particles are carried along the bases of the drainage ditches and settle out in the peat field ditches, headland ditch traps and the perimeter channel in advance of the sedimentation basin (Klove & Bengtsson, 1999). It is noted that the natural slopes across the site drainage ditches is less than 1% which results in low water velocities and facilitates sedimentation of suspended material in drains in advance of the sedimentation ponds. It also reduces the volume of suspended material in the water column arising from erosion of land peat land banks and drains.

Settlement of suspended peat particles in drainage ditches, headland ditch traps and perimeter drains ensure that the concentration of suspended solids in water discharged from the peat harvesting sites does not have an adverse impact on the receiving water.

Management and Operational procedures put in place as part of the facilities Environmental Management Structure (EMS) ensure that the sedimentation ponds are operating to their design specification, which has been determined to be adequate for treatment of runoff from the facility.

The incidence of wind blown peat particles entering the main river channel is reduced by the set back distances (all storage areas are at a minimum of 75m-200m from any watercourse) adhered to when

stockpiling peat. Water monitoring undertaken on 24 hour composite samples has demonstrated that all of the sedimentation ponds at Westland's remove suspended material to levels below the permitted emission limit values set out the Westmeath County Council water discharge licence.

Potential Impact of Hydraulic Load on Receiving Water

In order to demonstrate a potential hydraulic and suspended solids and nutrient mass emission to the receiving water the hydraulic, phosphate and ammonia emission from the facility has been determined. The potential emission rates have been extremely conservative by assuming a number of day's consecutive rainfall giving rise to a continuous discharge from both facilities.

Using the Francis equation (calculate flow over a rectangular weir) to determine the flow over the weirs, it was determined that a total 2090 m^3 would be discharged from the Westland facility in 24 hours.

If the receiving water (Inny) was at 95%ile flow during this period, the additional flow of surface water from Westland at would increase the hydraulic flow by approximately 1.3% at Clonsura and 2.5% at Coole. This is an extremely conservative estimate, as it is highly unlikely that the receiving water would remain at 95%ile flow conditions if consecutive rainfall events giving rise to a continuous discharge from the Westland facility were to occur.

The additional flow to the River Inny during a flood was also assessed, however the contribution of water to the main channel would not be highly significant as the drainage area at Westland comprises less than 0.7% of the total area for the River Inny. Also, it is important to note that once the water level of the Inny reaches the level at the discharge point, all of the drainage ditches at the site would dam up and flood waters would be retained on the site.

It is clear from these results that the impact from surface waters draining to the River Inny has a negligible impact on the overall flow within the channel.

Potential Impact of Chemical Load on Receiving Water

Current water quality Regulations have been used together with chemical monitoring data from the site as bench mark for assessing have been used to assess the impact on the water quality in the River Inny.

Monitoring results for pH from surface water arising from the peatlands at Westland range between 6.6 and 7.9, this is within the acidification status for River Water Bodies as set out in the European Communities Environmental Objectives (Surface Waters) Regulations 2009, S.I. No. 272

of 2009 and hence there is no adverse impact likely to occur on the acidification status of the receiving water.

Westland discharge surface water to the River Inny from sites at Clonsura and Coole, both of which are upstream of Lough Derravaragh. The assimilative capacity of the River Inny was calculated upstream of each site. The assimilative capacity at each location was calculated based on 95%ile flows, 95%ile background chemical quality data from Lough Kinale (No river water quality data available upstream of Clonsura) together with the concentration standards for a '*Good*' status river as set out in the European Communities Environmental Objectives (Surface Waters) Regulations 2009, S.I. No. 272 of 2009.

The daily mass emission for nutrients and suspended solids from the Westland sites was determined on the basis of measured water quality data from silt pond discharges, and the typical hydraulic load likely to be discharged from the facility was calculated using the dimensions of the weirs and the Francis equation.

It is important to note that the sedimentation basins at Westland's have been designed with reference to their respective drainage areas, which permits water to be stored in the basin prior to discharge over the weir. The weirs installed at the site permit Westland to regulate the flow from the site and allows capability to operate the ponds outside of 'steady state' where the rate at which water which flows into the basin can be greater than that discharged over the weir.

Table 8.1.1 & 8.1.2 present the available mass emission and a typical mass emission during site operation.

Table 8.1.1 Typical Mass Emissions from Surface Waters at Clonsura

Parameter	Available (kg/d)	Discharged (kg/d)	Balance (kg/d)
BOD	11.31	7.38	3.93
Suspended Solids	690.04	3.27	686.77
Ortho-Phosphate	2.64	0.03	2.61
Ammonia	2.88	2.17	0.71

It is clear from the data presented in Table 8.1.1 that the typical additional load of suspended material to the River Inny would be less than 1% of its total assimilative capacity during a 95%ile flow period. Based on our calculations, the background nutrient conditions are adequate to assimilate the additional nutrient loading which would arise from surface waters discharging to the River Inny from the Westland site at Clonsura during a 95%ile flow conditions. It is important to note that the discharge from the Westland site would be negligible at 95%ile flow in the receiving water, as both are a function of precipitation.

Table 8.1.2 Typical Mass Emissions from Surface Waters at Coole

Parameter	Available (kg/d)	Discharged (kg/d)	Balance (kg/d)
BOD	13.64	8.59	7.45
Suspended Solids	832.11	10.71	821.4
Ortho-Phosphate	3.77	0.13	3.64
Ammonia	3.26	2.34	0.92

Table 8.1.2 sets out the typical discharge from Westland and the remaining assimilative capacity in the river after the discharges from the Coole sites.

The results of surface water quality monitoring undertaken at points upstream and downstream of the discharges from Westland facilities to the River Inny demonstrates that the surface water chemistry is indicative of a '*Good Status*' river. The background BOD levels recorded along the River Inny in line with the levels expected in a 'Good Status' river channel as set out in the European Communities Environmental Objectives (Surface Waters) Regulations 2009, S.I. No. 272 of 2009.

On the basis of a typical daily mass emission, the quality of the water downstream of both Westland sites has additional assimilative capacity at 95%ile flow conditions.

It is noted that our calculations are conservative, as one would not expect a discharge of any significance from Westland during 95%ile flow condition in the receiving water, as surface water flow in the Inny and surface runoff from Westland are both dependent on rainfall.

Stockpiles of milled peat are stored a minimum of 75-200 meters from the River Inny Channel to prevent the ingress of wind blown peat to the water body.

Biological Water Quality

There is only one biological water monitoring point currently in use by the Environmental Protection Agency between Lough Kinale & Lough Derravaragh, which is downstream of both Westland Facilities (Ref. 26I010700-Bridge at Shrubbywood). A second point at Camagh Bridge between the Clonsura and Coole sites has not been use since 2005.

The most recent monitoring undertaken at the operational monitoring point was carried out in 2008 and returned a score of Q3 (doubtful water quality). However the nutrient conditions at this point are mostly in line with the mean and 95%ile values as set out in Table 8.1.3.

Table 8.1.3 Nutrient Conditions at Bridge at Shrubbywood for 'Good' Status.

Parameter	Requirement (mg/l)	Actual (mg/l)
Total Ammonia	Mean ≤0.065	0.066
	95%ile ≤0.140	0.112
Orthophosphate	Mean ≤0.035	0.011
	95%ile ≤0.075	0.026

The nutrient conditions support a good status watercourse, which suggests that the nutrient loading from Westland is not causing an impact on the downstream water quality.

The oxygenation conditions were also assessed against the European Communities Environmental Objectives (Surface Waters) Regulations 2009 and it was determined that the oxygenation conditions are marginally below the oxygenation limit at 95%ile rates (78%vs.>80%). However, mean oxygenation conditions are 93% saturation.

The section of the river channel at the bridge at Shrubbywood is described as deep and slow moving, giving rise to rise to non favorable conditions for dissolution of oxygen in the water column. Deep slow moving water is a natural attribute of the river, however widening and dredging of the river channel can further reduce the velocity of water and the macro invertebrate species richness which is used to develop the Q rating.

Conclusions

Water discharged from Westland arises from surface runoff and interflow (seepage from top layers of peat). Westland does not undertake any activity which generates waste water. The water discharged from both sites, is purely a function of surface water run off, interflow and potentially groundwater.

The nutrient concentration in the surface runoff arises from dissolution of ammonia and orthophosphate from the peat. Removal of suspended material from runoff in settlement ponds also reduces the nutrient concentration in surface water from the peatlands. It is also noted that peat itself can also remove nutrients in solution in the water column (Kercek & Haigh, 2003).

The sedimentation ponds at Westland have been designed with respect to industry standards and guidance from the local authority and the Environmental Protection Agency. A standard 50m^3 capacity is available in the sedimentation ponds for each hectare of ground in the drainage areas and Finnish guidelines for sedimentation basins have also been used to asses the adequacy of design of sediment basins at Westland's. Monitoring results obtained from 24 hour composite samples have demonstrated compliance with the current local authority permit emission limit values at all sedimentation basins for all measurements.

The additional capacity for storage and settlement of suspended materials provided by drainage ditches has not been included in the present capacity of the sedimentation ponds. It is noted that the storage capacity of the dried peat increases the lag phase of surface water entering the River Inny, the buffering capacity of the peat lands reduces the peak flow in the receiving water, and helps prevent against flooding during short intensive rain events (Kercek & Haigh, 2003).

Westland's can control the outfall from the Sedimentation ponds by adjusting a weir at the outfall to the River Inny. Cleaning and inspection of the ponds is undertaken in accordance with company procedures. Monitoring results from the discharges have demonstrated the adequacy of the sedimentation basin ability to remove suspended solids.

The low result of biological quality monitoring at Shrubbywood indicates poor water quality, however background dissolved oxygen concentrations suggest that this may be attributable to the low score. It is noted that Lough Derravaragh is currently at good status (2009) and OPW personnel undertaking dredging works on the River Inny in 2010 commented on the absence of peat deposits in dredged material in comparison to other years.

8.2 Special Protection Unit Report on Lough Derravaragh

A report was undertaken by the Special Protection Unit of the National Parks and Wildlife Service on Lough Derravaragh to verify if there was firm evidence that the relevant birds were not being adversely affected by peat harvesting operations.

The report notes that the species listed as conservation interest for the site included Pochard, Coot, Tufted Duck, and Whooper Swan. A review of bird counts for four wintering seasons was undertaken by the bird analysis unit and compared against the baseline. A table illustrating the comparison is presented in Table 8.2.1.

Table 8.2.1 Review of Conservation Ranger Counts

Name	4 year mean Peak 2004/2005	5 year mean Peak 1995/6-1999/2000	Percentage Change +/- from baseline	All-Ireland population estimates percentage change to 1994/95-1998/99to 1999/200 2003/04
Whooper Swan	49	102	-52%	29%
Pochard	914	3,129	-71%	-23%
Tufted Duck	250	1,073	-77%	-12%
Coot	1066	1,358	-22%	17%

The report notes that that the declines in the site estimates of all of the species of special conservation interest range from 22 to 77% which are *clearly not in line with national trends*. The results indicate *possible pressure form one or more source impacting the waterbirds* however *an insufficiency of bird data to accurately quantify the water bird populations of the site.*

A review was undertaken of the mean peak five year I-WeBS dataset for the bird species in question. The comparison notes that with the exception of Coot, the results show *strong recorded declines in Pochard and Tufted Duck and to a lesser degree Whooper Swan, remain.* The results of the comparison with the I-WeBS dataset is shown in Table 8.3.2.

Table 8.3.2 Analysis of I-WeBS data

Name	5 year mean Peak 2003/04-2007/08	5 year mean Peak 1995/96-1999/2000	Percentage Change +/- from baseline	All-Ireland population estimates percentage change to 1994/95-1998/99to 1999/200 2003/04
Whooper Swan	47	102	-54%	29%
Pochard	931	3,129	-70%	-23%
Tufted Duck	207	1,073	-81%	-12%
Coot	1277	1,358	-6%	17%

Source: NPWS Special Protection Unit

The report noted that the Whooper Swan could *well use parts of the Lough for feeding purposes but it is also possible that the main use of the site would be as a roosting site*. Therefore it is possible that the recent water bird counts may be *conducted when the majority of the Whooper Swans are away thus the reported decline may not reflect the true site use.*

The Pochard and Tufted Duck are the *two main representatives of the feeding guild known as diving ducks* who forage in open water by diving to the lake bottom to search for prey. The report notes the decline seen in these species is not inkeeping with that of other ducks Mallard, Teal, Wigeon and Goldeneye. The report notes that the diet and diving behavior of the Coot overlaps to some degree with the Pochard and Tufted Duck.

The report concludes by noting that based on the data reviewed the overall assessment is one of *unfavorable conservation status* for each of the bird species listed as conservation interest of the Lough.

The declines in Coot were not as severe as initially calculated, and more targeted work would help to confirm the status of the Whooper Swan. The declines of the Pochard, and Tufted Duck were reported to be of notable *concern*.

The report notes that it is *impossible to reliably attribute such declines in record numbers to a single causal factor*, and the *declines of the diving ducks are contrasted by significant increases in recorded abundances of Teal and Little Grebe*.

The report concludes that changes in bird populations can be *multifactorial.* Potential factors for the include: *a change in the overall ecology of the wetland system due to natural succession, eutrophication or other forms of pollution; recreational disturbance impacting on a broad scale or targeted to specific areas of the lake; hunting pressure on game species; or even changes in waterbird survey emphasis and /or effort.*

The report notes that based on the information there is *no firm evidence in the water bird dataset that can directly link the adjacent peat extraction activities with waterbird declines.*

The report recommends that further work should be undertaken to explain population trends as noted below:

1. Increase the waterbird survey effort and targeted surveys for those birds that may only use the SPA for roosting purposes.
2. To examine the population changes at the site in relation to waterbird data collected at adjacent wetland sites.
3. To compile available data on current ecology of wetland habitat of Lough Derravaragh SPA including EPA and fisheries monitoring data
4. To identify the sources and intensity of disturbance that waterbirds of this site are exposed to.

8.3 Annex I or Annex II species

Otter and Kingfisher

Kingfishers and otters that may inhabit the stretch of the River Inny adjacent to Westland could be affected by pollution incidents during the harvesting operations. In addition noise disturbance may also interfere with their activity along the River Inny.

The harvesting operations are limited in duration and occur between March and September when the weather is suitable. These operations do not interfere with any potential otter or kingfisher habitat nor involve the removal or destruction of any suitable substrate or vegetation used for shelter and/or foraging by these species.

The extent of the noise disturbance is limited to those times when harvesting is undertaken and given the hours of operation it is considered to be of low significance. The presence of a buffer of circa 30 meters between the River Inny and the peatlands which serves to reduce potential disturbance associated with noise and physical activities at Westland.

Furthermore otters are most active at dawn and dusk and as harvesting activities occur during full daylight hours this would suggest that noise disturbance would not be a factor during the hours when otters are foraging which is the most important time of the otter's day.

Westland's Environmental Management Plan has ensured that preventative maintenance is undertaken on all of their machinery, and in the unlikely event of a leak spill kits are available. No fuel is stored onsite and machinery is refueled by a mobile tanker at a designated location away from the River Inny.

Given the nature of Westland operations it is not anticipated that there will not be any significant impact on otter of kingfisher species.

Salmon and Brown Trout

There currently are no salmon present within the River Inny. Consultation received from the Inland Fisheries Board noted that as part of the Shannon Salmon Restoration Project sustainable stocks of salmon will be released to the River Inny.

The River Inny currently is described as a mixed fishery, and holds good stocks of wild brown trout and provides good spawning and nursery habitat. The spawning behavior of brown trout is similar to that of the closely related Atlantic salmon. Therefore based on similar spawning habitat requirements and good trout stocks within the River Inny it can be inferred that the River Inny would also support suitable habitat for salmon.

Westland's operations will not interfere with any potential brown trout or future salmon habitat nor involve the removal or destruction of any suitable substrate or vegetation used for shelter and/or spawning by the species. Discharges from the site will be controlled through the use of silt ponds. Further details in relation to the impact on water quality can be seen in section 8.1 of the report.

The harvesting operations will not interfere with the River Inny and hence it is not anticipated that the habitat for either of these species will be impacted.

Lamprey and Crayfish

The River Inny supports Lamprey and Crayfish both of which are protected under Annex II of the EU Habitats Directive.

A survey of White-clawed Crayfish *(Austropotamobius pallipes) distribution as part of arterial drainage maintenance work by the OPW* noted that sediments within the River Inny catchment varied significantly (Lordan *et al* ,2008). Of the three sites surveyed it is noted that the substratum varied from each site. Site 1 comprised of soft muddy base with cobbles and some in stream vegetation of

Sparganium erectum, Ranunculus and *Apium*. Site 2 comprised of gravel and cobble on a silt bed, and Site 3 comprised of sandy sediment with gravel and stones.

Westland's Environmental Management Plan has ensured that preventative maintenance is undertaken on all of their machinery, and in the unlikely event of a leak spill kits are available. All vehicles are serviced off site to ensure they are in good working order. No fuel is stored onsite and machinery are refueled by a mobile tanker at a designated hard standing location away from the River Inny.

Westland's operations do not involve in stream works nor involve the removal or destruction of any suitable substrate or vegetation used for shelter and/or spawning by the species. Discharges from the site will be controlled through the use of silt ponds. Further details in relation to the impact on water quality can be seen in Section 8.1 of the report. Therefore there will not be any significant impact on either of these species.

8.4 Air Quality

There are no significant point source emissions to atmosphere from the site. The principal fugitive emissions to atmosphere are dust from harvesting and transportation of peat.

Peat stocks are kept as far away (75-200meters) as possible from the River Inny and other water bodies to reduce the risk of pollution.

While there are no monitoring results for dust it is considered that dust emissions can be minimised by good site management, and good working practices. Dust monitoring will be undertaken as part of the IPPC Licence to ensure that the site is within emission limit values.

8.5 Noise Disturbance

The most dominant noise source associated with Westland's operations arises from the harvesting operations. It is considered that the peat harvesting operations are of a similar nature to agricultural activities in the area and are restricted to dry periods between March-September.

As part of their operations Westland will monitor and control their operations to ensure that they are compliance with guidelines (daytime 55 LAeq dBA and night time 45 LAeq dBA) at noise sensitive locations. Future noise monitoring of the area should assist to demonstrate the ambient change in noise levels at sensitive receptors as a result of harvesting operations.

Westland have been in operation for the past 15 years and indeed peat harvesting activities in the area have been operational since the early 1950's a long time before declines in the bird species of Lough

Derravaragh were noted. This demonstrates that noise from the activity is not a causal factor in the species decline.

It is envisaged that noise levels resulting from activities at the sites are unlikely to have any significant impact on qualifying species at Lough Derravaragh as a result distance from the site (>1.2 km) and from evidence to date which demonstrates harvesting operations which have been operational since 1950's have not affected the bird species.

9 Stage 4 In Combination effects of Plans and Projects Natura Impact Assessment

The potential effects for Westland in combination with other plans and projects could potentially impact on Natura 2000 sites. Cumulative impacts refer to a series of individually modest impacts that may in combination produce a significant impact. The underlying intention of this in combination provision is to take account of cumulative impacts from existing or proposed plans and projects and these will often only occur over time. It may be appropriate to consider the effects of already completed plans and projects if they have continuing effects on the site and point to a pattern of progressive loss of site integrity. Where there is a series of small, but potentially adverse impacts occurring within or adjacent to a Natura 2000 site, consideration of their cumulative impacts should be considered.

The potential for Westland to indirectly impact Lough Derravaragh is assessed in this report . Indirect impacts do not have a straight-line route between cause and effect and as a result are more challenging to ensure that all the possible indirect impacts in combination with other plans and projects have been established.

Cumulative Impacts

A series of individually modest impacts may in combination produce a significant impact. An integrated mechanism is required to assess the cumulative impacts of these issues arising from development within all the counties affecting change within Lough Derravaragh. This would be vital in gathering data, establishing acceptable levels of impacts and defining or providing guidance on the significance of cumulative impacts within these sites in relation to water quality.

Alteration to water quality or quantity - Deterioration in water quality can occur as an indirect consequence of development through point source or diffuse pollution, which in turn changes the aquatic environment and reduces its capacity to support certain plants and animals. Alteration to water quantity can arise when, for example, a development alters the hydrology of a catchment area, through increased hard standing or alteration to flow patterns, which in turn affects the movement of surface or groundwater to a site. This leads to potential negative consequences for the qualifying interests that rely on the maintenance of water levels within the Natura 2000 site.

9.1 River Inny Hydrology & Hydro morphology

The River Inny is part of the River Shannon Catchment and flows through the counties, Meath, Cavan, Westmeath and Longford before draining into Lough Ree and the River Shannon, North of Athlone town.

It rises in County Meath near the town of Oldcastle and in total drains a catchment area of 1197Km^2. The river channel meanders through County Meath and into County Cavan where it discharges at Lough Sheelin, one of four lakes which the Inny flows through. The river is described as being fast flowing and shallow between Oldcastle and Lough Sheelin. From Lough Sheelin, the Inny flows the short distance to Lough Kinale and then meanders slowly through a deep wide channel to Lough Derravaragh.

The Inny river system has been adapted through anthropogenic influence of the water budget within the drained area. Drainage works undertaken by agriculture, silvaculture and peat harvesting activity in the River Inny has altered the natural flow regime of the main channel. Manmade channels diverting groundwater and surface water directly to the main river channel increases Peak River flows and sediment transfer.

Abstraction of water from lakes for anthropogenic use also has an impact on the river system. In addition, point discharges from wastewater treatment plants can potentially have an adverse impact on the river system during dry weather flow.

Dredging works undertaken along the River Inny to widen channels and remove obstructions has the potential to have a negative impact on the structure and substrate of the river channel and can cause velocities to decrease and consequently dissolved oxygen concentration to reduce.

Peatlands are an important part of the Inny river system as they absorb and retain surface and groundwater and release it slowly, which helps to maintain river flow during dry periods.

9.3 Biological Quality

Recent biological quality monitoring undertaken by the EPA along the River Inny using the 'Q' rating methodology suggests that water quality is Q3 (doubtful) between, Lough Kinale and Lough Derravaragh. However, the chemical characteristics of the water in the Inny at a minimum are in compliance with levels expected for a 'good' status river as set out in the European Communities Environmental Objectives (Surface Water) Regulations 2009.

Notwithstanding the chemical characteristics of a '*good*' status river, it is noted that the status of Lough Derravaragh is 'Good' while Lough Kinale is of moderate status. It is stated in the 2009 Water Quality report for Lough Derravaragh that the water quality has improved over recent years, it is also noted that a minimum of three sampling events were undertaken in 2009 to determine the lakes quality status.

Owing to the background chemical concentrations in the River Inny and the chemical characteristics of peatland runoff, it is not clear that surface runoff from peatlands in the area are having a significant impact on water quality.

9.2. Hydrochemical Quality

The Inny river system has been subject to water quality monitoring at specific points by the respective local authorities over the past decades. The Water Framework Directive (WFD) which requires river water quality to be at least good status by 2015, has seen the rationalisation of monitoring stations along the Inny and consequently some monitoring points have been discontinued since 2007.

The results of monitoring points along the Inny between Lough Kinale and Lough Derravaragh, under the WFD compliance program, were assessed to determine the current quality and identify any quality trends over the past 4 years. The water quality monitoring stations assessed were 0600 Camagh Bridge and 0700 Bridge near Shrubbywood. The locations of the monitoring points are included on Figure 5 through 9 of Attachment A.

Unfortunately, water monitoring for determining compliance with the WFD has not taken account of the suspended solids concentration in the water column. However, available suspended solids results from historical water monitoring undertaken along the River Inny, while all current peat harvesting activities were in operation, can demonstrate that the background levels are significantly below 25mg/l value set out in the European Communities (Quality of Salmonid Water) Regulations, 1988 while peat harvesting activities have been undertaken in the area.

Biological Oxygen Demand

The Biological Oxygen Demand (BOD) at the two monitoring locations along the River are presented in Table 1 below and are compared against the oxygenation conditions supporting biological elements used to determine water quality as set out in the European Communities Environmental Objectives (Surface Water) Regulations 2009.

Table 8.1.4. Biological Oxygen Demand-River Inny

Sample Location	Mean (mg/l)	BOD (mg/l)*
0600-Camagh Bridge	1.56	1.5
0700-Bridge Near Shrubby Wood	1.58	

* Mean Oxygenation for 'Good Status' River

It is apparent from the mean BOD values presented in Table 8.1.4 above, that the River Inny shows no definitive deterioration in BOD

along the Inny river channel between Lough Kinale and Lough Derravaragh and the oxygenation conditions are broadly in line with those specified in the surface water quality objectives.

All of the value points over the past 4 years, used to determine the mean values in Table 8.1.4 are presented on Figure 5 of Attachment A.

Nutrient Loading

Nutrient loading conditions have been compared against the physico-chemical quality elements which are required to be taken into account when calculating ecological status of river water quality, as set out in European Communities Environmental Objectives (Surface Water) Regulations 2009.

The nutrient conditions (Total Ammonia and Orthophosphate) are presented in Table 8.1.5 & 8.1.6 below. A graph showing all of the value points over the past 4 years, used to determine the mean values in Table 8.1.5 are presented on Figures 6 & 7 of Attachment A

Table 8.1.5. Orthophosphate-River Inny

Sample Location	Mean (mg/l)	Orthophosphate(mg/l)*
0600-Camagh Bridge	0.009	0.035
0700-Bridge Near Shrubby Wood	0.011	

* Mean Orthophosphate for 'Good Status' River

The mean orthophosphate concentration found in the River Inny over the past 4 years is well within the level associated with a good status water body.

Table 8.1.5. Total Ammonia-River Inny

Sample Location	Mean (mg/l)	Ammonia (mg/l)*
0600-Camagh Bridge	0.054	0.065
0700-Bridge Near Shrubby Wood	0.066	

* Mean Total Ammonia for 'Good Status' River

The mean total ammonia level recorded in the River Inny over the past 4 years at monitoring points between Lough Kinale and Lough Derravaragh is broadly in line with that required by a good status river channel.

Notwithstanding the fact that the mean total ammonia concentration increases as the Inny flows between Lough Kinale and Lough Derravaragh, it is important to note that there is a clear relationship between upstream and downstream values over the dataset from both monitoring locations, which suggests that

upstream sources of nutrients have a significant influence on the background nutrient levels in the River Inny. For reference, both Orthophosphate and Total Ammonia are compared on a graph appended as Figure 8 of Attachment A.

9.2 Westmeath County Council Lough Derravaragh Water Quality Report 2009

Westmeath County Council undertook a water quality monitoring of Lough Derravaragh in 2009. The monitoring was undertaken a five locations around the lake as shown in Figure 9.2.1. Chemical results for the lake are presented in Table 9.2.1.

Figure 9.2.1 Lough Derravaragh Sampling Sites

Table 9.2.1 Summary of Chemical Analysis for Lough Derravaragh

Sampling Date	Conductivity	Alkalinity	pH	Colour Hazen Units	Silica Mg/Si	Transparency	Temperature
20/05/09	417-488 (460)	196-231 (218)	8.10-8.58 (8.43)	35-94 (45)	0.872-2.530 (1.678)	5.2-5.7 (5.5)	10.9-13.0 (12.5)
22/07/09	382-431 (415)	181-202 (195)	8.38-8.44 (8.41)	28-36 (30)	0.637-1.239 (0.975)	4.8-5.5 (5.2)	17.8-18.3 (17.9)
19/10/09	410-426 (421)	187-199 (195)	8.23-8.31 (8.27)	32-56 (35)	1.027-1.558 (1.429)	4.9-5.0 (5.0)	12.0-13.1 (12.8)
Range over 3 months (Mean over 3 months)	382-488 (433)	181-231 (230)	8.10-8.58 (8.37)	28-94 (437)	0.637-2.530 (1.379)	4.8-5.7 (5.2)	10.9-18..3 (14.3)

Table 9.2.2 Summary of Chemical Analysis for Lough Derravaragh (Continued)

Sampling Date	Total Phosphorous	Ortho P	Oxidised Nitrogen	Ammonia	Chlorophyll	Dissolved Oxygen
20/05/09	0.013-0.030 (0.018)	0.00-0.012 (0.006)	0.591-1.148 (0.913)	0.012-0.104 (0.031)	0.95-2.05 (1.43)	80-99 (92)
22/07/09	0.011-0.018 (0.013)	0.000-0.001 (0.001)	0.211-0.547 (0.442)	0.007-0.023 (0.017)	3.00-5.92 (4.65)	88-94 (92)
19/10/09	0.011-0.040 (0.018)	0.002-0.008 (0.003)	0.315-0.450 (0.407)	0.017-0.041 (0.025)	1.18-3.71 (2.04)	82-94 (92)
Range over 3 months (Mean over 3 months)	0.011-0.040 (0.016)	0.000-0.012 (0.003)	0.211-1.148 (0.600)	0.007-0.104 (0.025)	0.95-5.92 (2.71)	80-99 (90)

The report notes that there was marked thermal stratification in July. The minimum dissolved oxygen (38%) was recorded near the bottom of bottom Site 1.

Lough Derravaragh was microscopically assessed for phytoplankton as the results of which can be seen in Table 9.2.3.

Table 9.1.3 Phytoplankton cell volumes (mm3/L) for Lough Derravaragh and Killinure sampled during 2009.

Month	L. Derravaragh (mm3/L)	L. Killinure (mm3/L)
May	0.016	0.069
July	**0.525***	-
August	-	**1.040***
October	0.022	0.40
Average	**0.188***	**0.383***

*the peak monthly biomass value for each lough in is **bold** type.

Lough Derravaragh has been microscopically assessed for phytoplankton since 2003. The results since 2003 consistently returned the lowest phytoplankton concentrations. The report notes that the average total biomass value (0.188mm³/ml) derived from the three single samples was again the lowest record for all the loughs sampled in 2009 (Table 8.3.2) .This value reflects an approximate 50% increase from 2008 (0.122mm³/ml) and a threefold increase in 2007 (0.062 mm³/ml) but is well below of the level reached in 2006 (~0.5mm³/ml).

Table 9.2.4 Mean and total number, and total biovolume (uL) of main rotifer taxa per cubic metre per sampling date, in Lough Derravaragh.

Date	Keratella cochlearis	Keratella quadrata	Kellicottia longispina	Polyarthra Spp.	Sybcgaeta (big)
May 20	0	188	0	251	0
July 22	42	0	42	2377	334
Oct. 19	1973	0	0	0	0

Table 9.2.5 Mean and total number, and total biovolume (uL) of main rotifer taxa per cubic metre per sampling date, in Lough Derravaragh (Continued)

Date	Synchaeta (small)	Trichocerca pusilla	Total numbers	Total volume
May 20	251	0	689	0.2
July 22	2377	42	5212	2.1
Oct. 19	0	0	1973	0.2

Table 9.2.6 Mean and total number and biovolume of main crustacean taxa per cubic metre per sampling date, in Lough Derravaragh.

Date	Daphnia sp.		Copepod nauplii		Calanoida copepodites & adults		Total numbers	Total volume
	(nos)	(uL)	(nos)	(uL)	(nos)	(uL)	(nos)	(uL)
May 20	0	0.0	752	1.3	188	3.8	940	5.1
July 22	83	14.0	83	0.1	0	0.0	167	14.2
Oct. 19	0	0.0	0	0.0	0	0.0	0	0.0

The dominant species recorded in the Lough Derravaragh samples remain very similiar to those observed in previous sampling seasons. The diatoms *Asterionella sp*, and *Melosira sp*, and chrysophytes *Cryptomonas sp, and Chroomonas sp* maintained their prominent status, albeit in low total concentrations (<140 cells/ml). The potential toxic blue-green alga, A.circinalis and *Microcytis aeruginosa* were not observed in any of the three samples collected from the lake in 2009.

Seven rotifer taxa noted in the lake with *Polyarthra* spp., and *Synchaeta cf. oblonga* as similarly noted in the 2008 report (Table 8.3.2). Two crustacean were noted cladoceran *Daphnia* copepod Calanoida.

The report concluded that there was a slight improvement in lake water quality compared to the previous year (2008) in terms of total phosphorous, mean chlorophyll a and mean transparency. The trophic status of the lake was found to be mesotrophic with respect to the levels of mean total phosphorous, mean chlorophyll a and mean transparency, and oligotrophic with respect to minimum transparency and maximum chlorophyll a.

The report concludes that based on the results there is a trend of *improving water quality* which emerged in 2001. The nutrient level Phytoplankton and zoo plankton data also support the findings that Lough Derravaragh remained in *oligo-mesotrpohic* category in 2009.

Westmeath County Council undertook water quality monitoring and reporting for Lough Derravaragh in 2009. The results show that the nutrient conditions within the lake are equivalent to a lake body of *High* status as per European Communities Environmental Objectives (Surface Waters) Regulations 2009. Lough Derravaragh is currently a lake body of *Good* status as defined under the Water Framework Directive.

9.3 Plans and Projects

The potential *in combination* effects of Westland operations in conjunction with the following conservation plans has been undertaken:

- *Water Framework Directive*
- *Shannon River Basin Management Plan*
- *Westmeath County Development Plan (2008-2014)*

Water Framework Directive

The Water Framework Directive is a European Union directive which commits European Union member states to achieve good qualitative and quantitative status of all water bodies (including marine waters up to kilometer from shore) by 2015. It is a framework in the sense that it prescribes steps to reach the common goal rather than adopting the more traditional limit value approach.

The directive defines '*surface water status*' as the general expression of the status of a body of surface water, determined by the poorer of its ecological status and its chemical status. Thus, to achieve 'good surface water status' both the ecological status and the chemical status of a surface water body need to be at least '*good*'.

Good ecological status is defined locally as being lower than a theoretical reference point of pristine conditions, i.e. in the absence of anthropogenic influence. Article 14 of the directive requires member states "*to encourage the active involvement of interested parties*" in the implementation of the directive.

Water Framework Directive

The Water Framework Directive (2000/60/EC) requires a review of the impact of human activity on the status of surface and ground waters. The review should be an assessment of the like hood of water bodies that may fail to meet environmental standards. A four category risk classification scheme has been adopted by Risk Assessment Working Group in Ireland. Risk classification categories are shown in Table 9.3.1.

Table 9.3.1 Irish equivalent reporting scores for Water Risk Categories

EU Commissions reporting risk categories for water bodies	Irish equivalent reporting categories for water bodies
Water bodies for which it is already clear without the need for further characterisation or additional monitoring data, that the objectives	**Ia – Water Body at significant risk** on the basis of available information for which

will be failed;	confidence in the available information being comprehensive and reliable is high
Water bodies for which it is possible that the objectives of the Directive will be achieved but, because of inadequate data, further characterisation and operational monitoring are considered necessary to be sufficiently confident that this is the case;	**Ib – Water Body probably at significant risk** but for which further information will be needed to confirm that this view is correct
Ib – Water Body probably at significant risk but for which further information will be needed to confirm that this view is correct Water bodies for which it is possible that the objectives of the Directive will not be achieved but, because of inadequate data, further characterisation and operational monitoring are considered necessary to be sufficiently confident that this is the case;	**2a – Water Body probably not at significant risk** on the basis of available information for which confidence in the available information being comprehensive and reliable is lower
Water bodies for which it is already clear, without the need for further characterisation or additional monitoring data, that the achievement of the objectives are not at risk,	**2b – Water Body not at risk** on the basis of available information for which confidence in the available information being comprehensive and reliable is high

One of the first tasks of the Water Framework Directive in Ireland was to establish River Basin Districts in order to generate a detailed summary of the state of the waters in each respective district. The River Inny falls within the Shannon River Basin District. One of the main functions of the River Basin Districts is the formulation of River Basin Plans.

***Shannon River Basin Management Plan* (2009-2015)**

In order to provide background information on the "*In Combination Impacts*", the Shannon River Basin Management Plan was examined. Eight River Basin Districts were established in Ireland arising out of the legal requirements of the Water Framework Directive. The River Inny forms part of the Shannon River Basin District.

The mechanism to address water quality issues is through the implementation of the Shannon River Basin Management Plan. This provides an integrated mechanism for setting standards and

achieving objectives for water quality in relation to the Natura 2000 sites.

Areas upstream can contribute to inputs to surface water in the River Inny, which ultimately arrive into Lough Derravaragh. The principal nutrient contributions arise from agriculture (74%) and unsewered properties.

The SRBMP notes that peat harvesting *is an important industry in the Shannon District*. The plan identifies Bord na Móna as the main commercial organisation, but notes many private businesses are also involved. Bord na Móna sites operate under Integrated Pollution Prevention Control Licences but smaller private operators are not licensed. The report notes that *peat extraction can give rise to localised water problems including silt and nutrient release from milled areas.*

The plan notes that:

"*Peat excavation can impact on water quality through release of nutrients (particularly phosphorus) contributing to eutrophication and through peat silt entering river systems and impacting on aquatic life. Peat harvesting is one of the pressures contributing to the loss of high quality and protected areas.*

All excavation of peat in areas above 50 hectares must be licensed under the IPPC regime and private peat producers falling into this category, that are not already licensed, will be brought into the IPPC system by the EPA…..

…..It should be noted that, in respect of discharges from smaller private enterprises, local authorities have the option to licence activity under the Water Pollution Acts and this option should be exercised on a risk-assessment basis, in pursuit of WFD water quality objectives".

Westland currently holds a consent to discharge licence with Westmeath county council and has is fully compliant with the conditions of the licence.

The Shannon Action Programme notes that in relation to peat harvesting: that it is their aim to enforce licensing controls and rehabilitation plans at district level through the EPA, and local authorities between 2009 and 2015.

Assessment: Westland is currently in the process of applying for an IPPC Licence as noted in the Shannon River Basin Management Plan and therefore is compliant with the objectives of the plan.

The report states that peat harvesting is one of the pressures on nutrient levels in the Inny river system, however, water monitoring

stations along the River Inny demonstrate that changes in the background nutrient levels are consistent at individual monitoring stations along the river channel. A graph of these results is presented in Figure 8 of attachment A.

EPA Risk Score for the River Inny

There are three water monitoring points along the River Inny which are located upstream, mid stream, and downstream of Westland. The Environmental Protection Agency has undertaken a risk score of the River Inny based on the potential risk associated with diffuse (forestry, septic tanks) and point sources (waste water treatment plants). This score is shown in Table 9.3.2.

Table 9.3.2 EPA Risk Score for Point and Diffuse Sources of Pollution at Relevant Monitoring Locations along the River Inny

Location and River Code	OM 1 - Point Source Risk	OM 2 - Diffuse Risk	R_TYPE - River Typology	RD1 - General Diffuse	RD2A - Roads soluble copper	RD2B - Roads total zinc risk	RD2C - roads total hydrocarbons	RD3 - Rail Pollution risk	RD4A - forest acidification risk	RD4B - forest SS risk	RD4C - Forest - eutrophication risk	RD5 - Unsewered Areas	RD6A - Arable/tillage	RD6B Sheep Dip Risk	RD6C - Dangerous Substances	RD_OVERALL - Diffuse risk overall	RP1 - WWTP	RP2 - CSO	RP3 - IPPC	RP4 - Section 4 Discharge	RP5 - WTP	RP_OVERALL	RM5 - Intensive landuse	R_OVERALL - Overall Risk
Finnea Br 26I010500			31	1b	2b	2b	2b	2b	2b	2b	2b	2a	2b	2b	2b	1b	2b	2b	2b	1b	2b	1b	2b	1a
Camagh Bridge 26I010600		**1**	31	1b	2b	2b	2b	2b	2b	2b	2b	2a	2b	2b	2b	1b	2b	2b	2b	2b	1b	1b	1b	1a
Bridge near Shrubbywood 26I010700	**1**		31	1b	2b	2b	2b	2b	2b	2b	2b	2a	2b	2b	2b	1b	2b	2b	2b	2b	1b	1b	1b	1a

As can be seen from Table 9.3.2 the River Inny has an overall risk category under the Water Frame Work Directive of **1a**, *water body at significant risk* of failing to meet good status by 2015. This status was calculated in 2005 and revised in 2006.

Inny Water Management Unit Action (2009-2015)

The River Inny is over 55 miles long, rises near Oldcastle, Co. Meath and flows west to join Lough Ree. The Shannon River Basin Management Plan has prepared a Water Management Unit Action Programme.

The Water Management Unit Action identifies a number of pressure and risks which may influence the water quality of the River Inny as shown in Table 9.3.3.

Table 9.3.3 Inny Water Management Unit Action Pressures and Risks

Sources of Pollution	Pressures and Risks
Nutrient sources	Most total phosphorus load is diffuse (93%) main sources are agriculture (74%) and unsewered properties (9%)
Point pressures	WWTPs: Ballyjamesduff, Ballymahon, Edgeworthstown, Legan, Oldcastle, Ballymore, Ballynacarrigy, Castlepollard, Ballinacard, Donal O'Neill Housing, and Mountemple Housing Collection Systems. 21 combined storm overflows. 3 WTPs: Ballyjamesduff, Ballymahon, and Granard. 13 IPPC Facilities: 1 Peat Extraction (1 in Longford and 2 in Westmeath), Automotive Industry (Westmeath), 9xPig farms (7 in Cavan, 1 in Westmeath, 1 in Longford), Woodcraft (Oldcastle), Meat Processing (Cavan). 16 Local Authority Section 4 licenses: *Industrial discharges*: Poultry Farm; 4 Quarries; Car Sales Outlet; Peat Production for Horticulture; Fish Farm; Cut Stone Production. *Wastewater Discharges from Collection Systems*: Rathcoranin Housing Scheme; Ballinacard Housing Scheme; O'Neil Housing Scheme, Secondary School; O'Neil Housing Scheme; Mountemple Housing Scheme; Larry Kiernan Holiday Homes.
Wastewater Treatment Plants (WWTP) and Industrial Discharges	The following WWTPs are at risk: Castlepollard WWTP Ballyjamesduff WWTP Ballymore Ballynacarrigy WWTP Castlepollard WWTP Collinstown Edgeworthstown WWTP Legan WWTP Multyfarnham WWTP Oldcastle WWTP The following industries are at risk: Meat Plant, Food Farm, Quarry, Concrete Company, 2 private companies.
Quarries, Mines & Landfills	3 waterbodies at risk. Landfill at SH_26_883, Landfill and Quarry at SH_26_1371, Waste facility and landfill at SH_26_2264 (Ballydonagh, Coole and Castlepollard Landfills).
Agriculture	48 waterbodies at risk; SH_26_2767, SH_26_2264, SH_26_2906, SH_26_3870, SH_26_1091, SH_26_3091,

Sources of Pollution	Pressures and Risks
	SH_26_2530, SH_26_2351, SH_26_1167, SH_26_1001, SH_26_2718, SH_26_883, SH_26_3006, SH_26_982, SH_26_984, SH_26_1224, SH_26_3719, SH_26_997, SH_26_1509, SH_26_2664, SH_26_2938, SH_26_2431, SH_26_983, SH_26_291, SH_26_2393, SH_26_2984, SH_26_2833, SH_26_2742, SH_26_2660, SH_26_1371, SH_26_1443, SH_26_2060, SH_26_2171, SH_26_3546, SH_26_2976, SH_26_2773, SH_26_2922, SH_26_2926, SH_26_2705, SH_26_2531, SH_26_2515, SH_26_2933, SH_26_3738, SH_26_2915, SH_26_3085, SH_26_3975, SH_26_1458, and SH_26_4098.
On-site systems	There are 14349 septic tanks within this WMU, 4703 of these are located in areas of very high or extreme risk.
Forestry	None at risk
Dangerous substances	None at risk
Morphology	41 river waterbodies at risk; SH_26_1091, SH_26_3091, SH_26_2530, SH_26_3563, SH_26_1167, SH_26_844, SH_26_883, SH_26_3006, SH_26_984, SH_26_3921, SH_26_1224, SH_26_3719, SH_26_997, SH_26_2767SH_26_2664, SH_26_2938, SH_26_2431, SH_26_609, SH_26_983, SH_26_2833, SH_26_1371 , SH_26_1443, SH_26_2060, SH_26_3546, SH_26_2455, SH_26_2525, SH_26_2976, SH_26_2773, SH_26_2906, SH_26_2926, SH_26_2705, SH_26_2531, SH_26_2515, SH_26_830, SH_26_1321, SH_26_3738, SH_26_2915, SH_26_3870, SH_26_3975, SH_26_1198, SH_26_4098.
Abstractions	3 waterbodies at risk; SH_26_2264, SH_26_2742, SH_26_1443.

As can be seen from Table 9.3.3 there are a number of Environmental pressures that are listed as being present in the Inny Catchment. These include:

- Diffuse sources
- Point sources
- Physical alterations
- Waste Disposal
- Water Abstraction

Nutrient (Phosphorous and Nitrate) enrichment influencing the River Inny are mostly diffuse (93%). The main sources are agriculture (74%) and unsewered properties (9%). An increase in nutrients can cause an increased algal growth leading to eutrophication and a possible fall in dissolved oxygen levels.

In relation to the River Inny which is in "*statue*" that the possible impacts on water quality include *widespread eutrophication, excessive siltation, low dissolved oxygen concentrations, enhanced weed and algal production.*

The Water Management Unit Action has also established an Action Programme in response to sources of pollution as outlined in Table 9.3.4.

Table 9.3.4 River Inny Management Unit Action Programme

Sources of Pollution	Action Programme
Point Sources	WWTP upgrades & licensing to be implemented where required. Examine the terms of discharge authorisation to determine whether they require review for the purpose of compliance with water body objectives including protected area objectives and environmental quality standards.
Diffuse Sources	Good Agricultural Practice regulations inspections/enforcement. Septic Tanks: At Risk septic tanks are to be prioritised for inspections. Subsequent upgrade or connection to municipal systems depends on inspection and economic tests. Other diffuse sources may need recommendations.
Other	Morphological pressures in the Inny WMU require 41 channelisation investigations to establish if supplementary measures are required to address water quality issues associated with morphology. Abstractions - Future abstractions licensing programme and assessment.

Future Pressures And developments	*Throughout the river basin management cycle future pressures and developments will need to be managed to ensure compliance with the objectives of the Water Framework Directive and the Programme of Measures will need to be developed to ensure issues associated with these new pressures are addressed.*

Assessment: There are numerous potential sources of pollution to the River Inny which puts this River at Significant Risk of failing to meet good status. The above action programme for the River Inny will drive improvements through stricter controls via licensing, inspections and careful management of future plans.

A review of other plans and projects and there potential positive and negative impacts are assessed in Table 9.3.5.

Table 9.3.5 Plans and Projects and Associated Positive and Negative Impacts

Name of Plan/Project	Key Policies/Issues/Objectivities Directly Related to Lough Derravaragh SPA/NHA	Impact on Lough Derravaragh and the qualifying features of the designated area.
	Land Use Plans	
Westmeath County Council Development Plan 2008-2014	**Water Quality and Groundwater Protection** **P-EH1** It is the policy of the Council to support the implementation of the Water Framework Directive and the Shannon & Eastern District River Basin Management Plans for the County. **P-EH2** The Council will take steps to ensure the quality of surface and ground waters and will implement the overriding principle that '*the polluter pays*' in respect of breaches of environmental laws. **Natural Heritage** **O-EH2** To protect, manage and enhance the natural heritage, biodiversity, landscape and environment of County Westmeath in recognition of its importance as a non-renewable resource, unique identifier and character of the county and as a natural resource asset. **O-EH3** It is a key objective to ensure as far as possible that development does not impact adversely on wildlife habitats and species. In the interests of sustainability, biodiversity should be conserved for the benefit of future generations. **O-EH4** The "*polluter pays*" and the "*precautionary principles*" are integral components of planning policies for environment and heritage. If uncertainty exists regarding the potential impact of a proposed development full account will be taken of the precautionary principle and the proposed development will be resisted unless or until its effects are more clearly understood.	Positive Impact

	Special Protected Areas (SPA) and Special Areas of Conservation (SAC) **P-EH7** To protect and conserve wild bird species and their habitats, especially rare or vulnerable species and regularly occurring migratory species. **P-EH8** To protect and conserve proposed candidate Special Areas of Conservation. **P-EH9** To protect plant, animal, species and habitats which have been identified by the Habitats Directive, Birds Directive, Wildlife Act (1976) and (Amendment Act) 2000, and the Flora **P-EH10** To require appropriate environmental assessment such as EIA (Environmental Impact Assessment) or ecological appraisal for developments not directly connected with or necessary to the management of a European site, or a proposed European Site and which are likely to have significant effects on the site individually or cumulatively. **P-EH11** To consult with appropriate prescribed bodies and Government agencies when assessing development proposals affecting designated sites of European importance. **Wetlands and Watercourses** **P-EH22** The Council shall ensure that the County's floodplains, wetlands and watercourses are retained for their biodiversity and flood protection values. **O-EH36** To consult Fisheries Board and the National Parks and Wildlife Service on any development proposal concerning riparian areas and watercourses and to take account of the requirements for the protection of fisheries habitat during construction and development works at river sites.	Positive Impact

	O-EH37 To maintain good ecological status of wetlands and watercourses in support of the provisions of the Water Framework Directive and Ramsar Convention. **Water Quality** **P-EH55** The Council shall adhere to the implementation of provisions of the Shannon River Basin Management Plan to assist the process of achieving good water status for the river catchment and ensure that future development within this LCA will adhere to the principles of this plan. **Preservation of Habitat Value** **P-EH56** The Council will ensure that development will not impact on the significant conservation value of this area. The Council will conserve and enhance the high nature conservation value of the area and seek to maintain the interconnectivity or eco-networks linking these sites such as small woods, wetlands and hedgerows.	Positive Impact
Strategic Environmental Assessment Environmental Report for Westmeath County Council Development Plan (2008- 2014)	W1: Promote water conservation and sustainable water use based on long-term projections of available water resources. W2: Protect the quality of surface and ground waters as sources of drinking water and as valuable assets for amenity and recreation. W3: Achieve and maintain required water quality standards and reduce discharges of pollutants or contaminants to waters.	Positive Impact
Conservation Management Plans		
NPWS Conservation Management Plans	There is currently no completed conservation management plan for Lough Derravaragh SPA	Negative Impact
Shannon River Basin	This River Basin Management Plan for the Shannon International River Basin District, covering the period 2009 to 2015, aims to protect all waters within the district and, where necessary, improve waters and achieve sustainable water use. Waters include rivers, canals, lakes, reservoirs, groundwater's, protected	Positive Impact

	areas (including wetlands and other water-dependent ecosystems), estuaries (transitional) and coastal waters.	
IPPC Licences	An IPPC licence is granted for Bord Na Mona (P0502-01) adjacent to the site for The extraction of peat in the course of business which involves an area exceeding 50 hectares. Other peat extraction/milling operations in the immediate vicinity of the designated site do not currently have Licences. An IPPC licence exists for a pig farm located close to the river Inny Licence Reg: P0538-01 is located upstream.	Potentially a negative impact if conditions of any IPPC upstream are not met. No impact if conditions are adhered to.
Urban Waste Water Discharges	The Waste Water Discharge (Authorisation) Regulations, 2007 introduced for the first time an authorisation system for all local authority waste water discharges. The EPA is now the competent authority for assessing discharge licence applications and granting authorisations setting out specific conditions to prevent and control water pollution.	Potentially a negative impact if conditions of any IPPC upstream are not met. No impact if conditions are adhered to.
Unsewered waste Water Discharges	The introduction of the Code of Practice (wastewater treatment and disposal systems serving single houses) has introduced guidance on the provision and maintenance of wastewater treatment for single houses.	No impact if CoP is adhered to. Potentially a negative impact if CoP is not followed during and after installation.

10 Mitigation

Mitigation measures are recommended in relation to Westlands operations to reduce the potential for adverse impacts on the environment. These mitigation measures have considered recommendations noted in consultation responses from National Parks and Wildlife Service, and the Shannon Fisheries Board and where relevant incorporated these into the report.

1. Habitat Rehabilitation plan

A Habitat Rehabilitation plan will be developed from the overall site which will be undertaken in consultation with National Parks and Wildlife Service, and the Shannon Regional Fisheries Board.

2. Wetland Plants

It is recommended that wetland plants are used to improve the settlement and treatment of surface water from peat harvesting areas. Native plants as recommended by the Irish Peatland Conservation Council IPCC as outlined in the Table 2 should be planted by a suitably qualified contractor at suitable locations within the settlement ponds. The wetland plants will assist to treat waters from the sediment ponds prior to discharging to receiving. These plants should be controlled and managed in accordance with the Environmental Management Plan.

Table 2 Native Wetland Plants Recommended for Sediment Basins

Plant Name Latin	Plant Name English
Typha angustifolia	Bulrush
Typha latifolia	Lesser Bulrush
Iris pseudacorus	Yellow Flag Iris
Lemna minor	Duckweed
Potamogeton species	Pondweeds
Caltha palustris	Marsh Marigold
Nuphar lutea	Yellow Water Lily
Nymphaea alba	White Water Lily
Phragmites australis	Common Reed
Sparganium erectum	Branched Bur Reed

3. Site Operative Training

It is recommended that training and guidance to prevent a deterioration to water quality is communicated to all site operatives with respect to the used of herbicides near watercourses as part of the Environmental Management Plan.

4. Sedimentation Basin

The silt ponds at Westland are suitably sized for the volume of runoff arising from each of the catchments at the site. Consideration should be given to installing a weir in the main perimeter drain leading to each of the sedimentation ponds, which permit site operators to gain greater control during periods of high runoff.

Consideration should also be given to using a handheld turbidity /suspended solids meter for instant assessment of the sedimentation performance in the field.

5. River Inny Management Unit Action Programme

It is considered that the River Inny Unit Action Programme and its objectives to improve water quality within the River Inny river to *Good* status will assist to ensure that the water quality of the River is not compromised and hence remove any potential negative impacts on Lough Derravaragh.

6. IPPC Licence

Westland are in the process of obtaining an IPPC Licence from the Environmental Protection Agency which will set emission limit values to control water emissions from the site and ensure there is control and monitoring programme in place for emissions to water, air, and noise from the site.

It is recommended that the licence conditions and limit values are incorporated into the Environmental Management Plan, and where relevant new procedures and records are developed.

7. Dust

A dust monitoring and control programme should be developed to monitoring dust emissions at dust sensitive locations to ensure compliance with EPA limit values (350mg/m^2/day). Procedures to ensure that fugitive dust emissions from harvesting operations are avoided and contained as far as practicable.

8. Noise

It is recommended that noise measurements are taken at Lough Derravaragh prior the peat harvesting operations, and also during peat harvesting operations to assess the ambient increase in noise levels.

11 Stage 5 Conclusion of Natura Impact Assessment

The potential for Westland's peat harvesting operations both on its own, and in combination with other plans and projects to negatively impact bird species of qualifying interest in Lough Derravaragh and other Annexed species has been assessed.

11.1 Conclusion of Impacts from Westland's Operations

As part of the assessment the following may be concluded:

1. The potential for Westland to have a negative impact on the integrity of Lough Derravaragh and its qualifying interests by negatively impacting the water quality from the River Inny which flows into the Lough is complex in nature.

2. The sedimentation ponds at Westland have been designed with respect to industry standards and guidance from the local authority and the Environmental Protection Agency. A standard 50m^3 capacity is available in the sedimentation ponds for each hectare of ground in the drainage areas and Finnish guidelines for sedimentation basins have also been used to assess the adequacy of design of sediment basins at Westland. The sediment basins have assessed and the design has been consistent with accepted design specifications.

   The nutrient load which arises from surface water discharged to the River Inny has been determined based on a typical daily discharge into the receiving water during 95%ile flow conditions. The probability of a discharge of significance from Westland arising during 95%ile flow conditions is very low as flows across the peat landbanks and in the River Inny are both a function of rainfall. Nonetheless, it was demonstrated that River Inny was capable of assimilating the daily mass emission.

   Downstream chemistry was shown to still be in line with a *good* status river, however, the Q rating is considered to be doubtful. The river channel between Lough Kinale and Lough Derravaragh is deep and slow moving and is likely to have a significant impact on dissolved oxygen, a critical parameter in river beds of rich macro invertebrate species.

3. There has a significant decrease in the qualifying interests of Lough Derravaragh. The National Parks and Wildlife Service Special Protection Unit report notes that it is *impossible to reliably attribute such declines in record numbers to a single causal factor*, and the *declines of the diving ducks are contrasted by significant increases in recorded abundances of Teal and Little Grebe*.

The cause for the decline in bird populations can *be multifactorial. Potential factors for this include: a change in the overall ecology of the wetland system due to natural succession, eutrophication or other forms of pollution; recreational disturbance impacting on a broad scale or targeted to specific areas of the lake; hunting pressure on game species; or even changes in waterbird survey emphasis and /or effort.*

The report also concludes that based on the information there is *no firm evidence in the water bird dataset that can directly link the adjacent peat extraction activities with waterbird declines.*

4. It has been determined that air and noise emissions from the site will not have a significant negative impact on the qualifying interests and other Annexed species.

11.2 Conclusion of Impacts from Westland's Operations in Combination with other Plans and Projects

Plans and policies were assessed with respect to positive/negative impacts on Lough Derravaragh. The potential for in combination effects to occur via a cumulative effect would involve water emissions from Westland in addition to other peat harvesting operations, waste water treatment plants, agricultural, and domestic effluent cause incremental changes to the water quality which indirectly compromise of the integrity of Lough Derravaragh and associated qualifying interests. An assessment of In combination Impacts noted:

1. It was determined that downstream chemical water quality is in line with the requirements of a 'Good' status water course, however the 'Q' rating reflects a doubtful score (2008 due for reassessment in 2011). On review of all of the likely causes for the deterioration in water quality, dissolved oxygen has been identified as a possible reason. Low dissolved oxygen levels may be as a result the deep channel and quiescent conditions which exist along much of the River Inny between Lough Kinale and Lough Derravaragh.

   It is also noted that the River Inny discharges directly to Lough Derravaragh, which is currently described as being at 'Good' status (2009).

2. Shannon River Basin Management Plan (2009-2015) has set an action plan for the River Inny to assist to improve and control the water quality and ensure it reaches "*good status*".

3. The water quality from Lough Derravaragh as undertaken by Westmeath County Council in 2009 has shown that the lake is in *Good* water quality status. This indicates that, Westland's operations, in combination with other potential sources of pollution is not currently negatively impacting Lough Derravaragh.

It is acknowledged there is a significant decrease in the qualifying interests of Lough Derravaragh which is of conservation concern however based on the above assessments it can be objectively concluded that the proposed project on its own, and in combination with other plans and projects will not adversely affect the integrity and conservation status of any Natura 2000 site or annexed species once the mitigation measures and recommendations are adopted.

12. References

1. NPWS.ie, Site Synopsis

2. Bowman, J.J., Clabby, K.J., Lucey, J., McGarrigle, M.L. and Toner, P.F. (1996). *Water quality in Ireland 1991- 1994*. Environmental Protection Agency, Wexford.

3. ODPM (2005a) Minerals Policy Statement 2: Controlling and Mitigating the Environmental Effects of Minerals Extraction in England. Annex 1: Dust. ODPM Publications, Wetherby, UK. http://www.planninghelp.org.uk/NR/rdonlyres/7500D043-A6E1-4C8C-996CA20B3CD62C42/ 0/MPS2annex1.pdf.

4. Klove, B. (1997) Environmental impact of peat mining. Development of storm water treatment methods. Vaitoskirja.

5. Kiely, G. (1997) Environmental Engineering. McGraw Hill, Singapore.

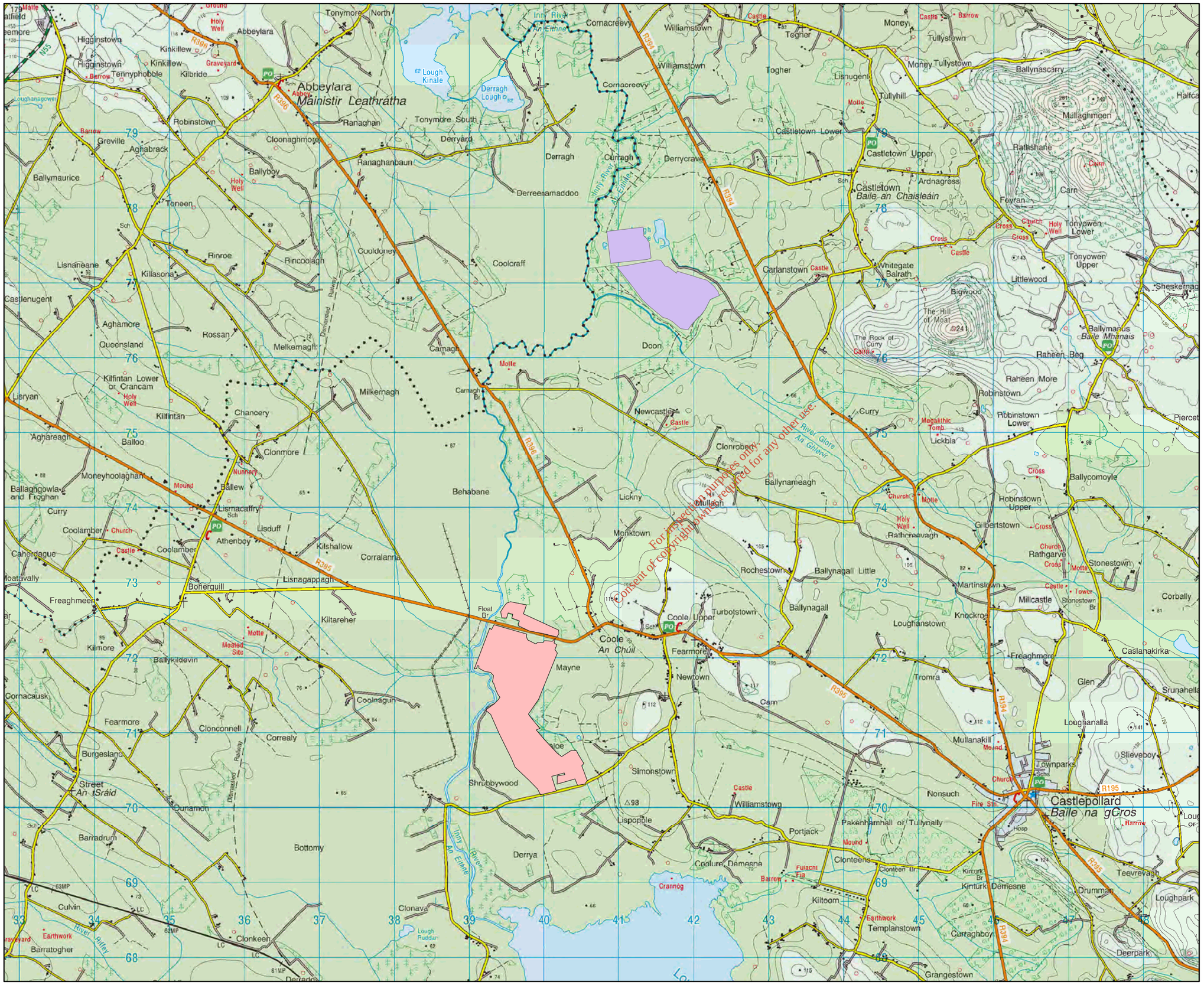
6. 'Water Treatment Methods in Peat Harvesting' for 'Central Finland Regional Environment Centre', (2004).

7. Klove, B. & Bengtsson, L. (1999) 'Runoff generation in a plough-drained cutover fen in Central Finland' Journal of Hydrology Vol. 218, No:1 p.157-168.

8. Krecek, J. & Haigh, M. (2003) 'Environmental Role of Wetlands in Headwaters' Springer, Netherlands.

Attachment A

Figures



Legend

- Coole
- Clonsura

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Fels Point
Tralee
Co Kerry

Energy, Environment & Safety

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Project:	Appropriate Assessment
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Scale:	1:50,000
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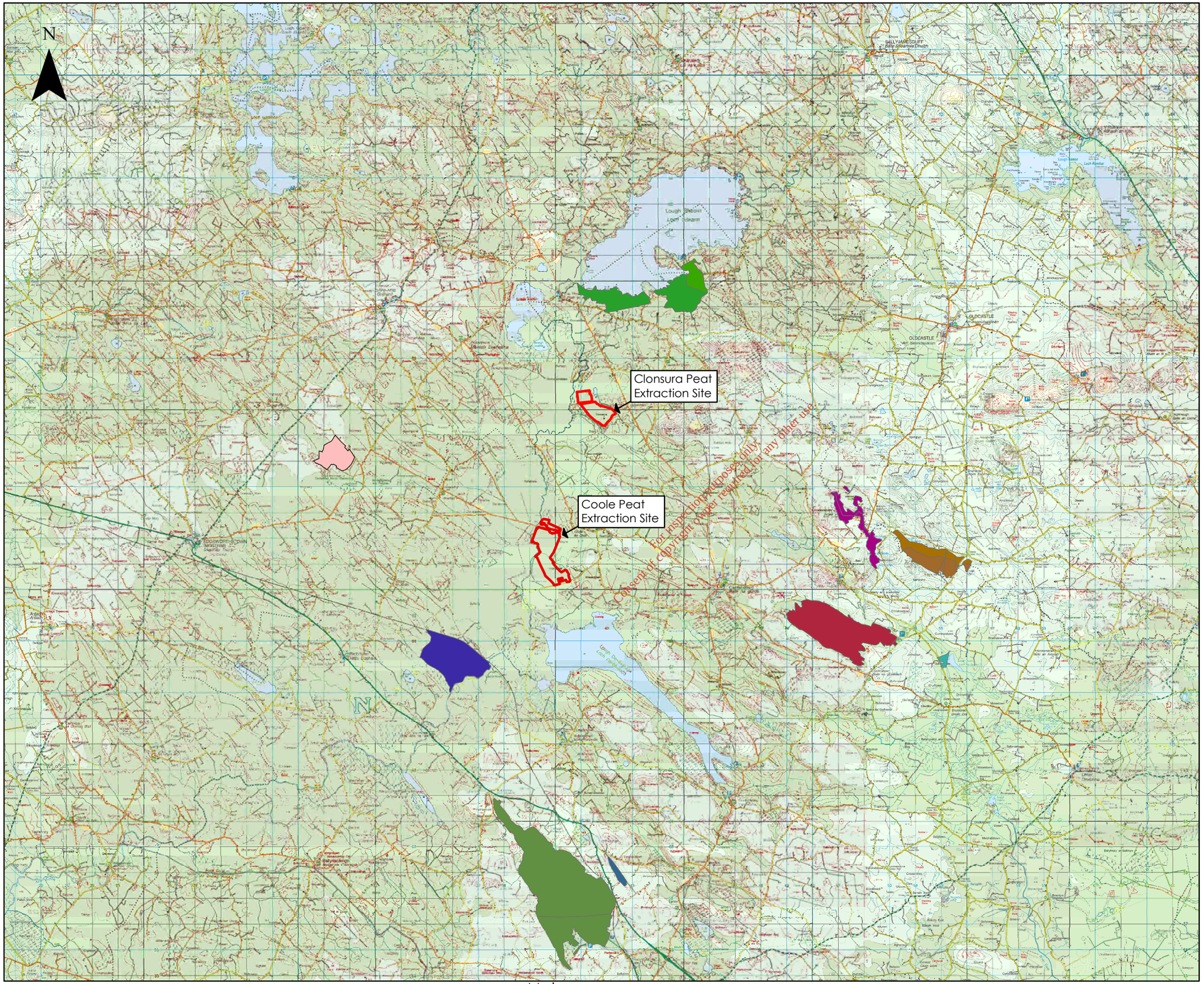
Revision:	00
Document Control:	Drawn By: TQ Checked By: EO'L Approved By:PO'L Date:25/11/2010



Legend

- Westland Horticulture Ltd Peat Extraction Sites.

SAC

- Garriskil Bog
- Lough Bane &Lough Glass
- Lough Lene
- Lough Owel
- Moneybeg & Clareisland Bogs
- River Boyne & River Blackwater
- Scragh Bog
- White Lough, Ben Loughs & Lough
- Ardagullion Bog

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Client:	Westland Horticulture Ltd.
Project:	Appropriate Assessment
Map Title:	Designated SAC Sites Within 15km of Westland.
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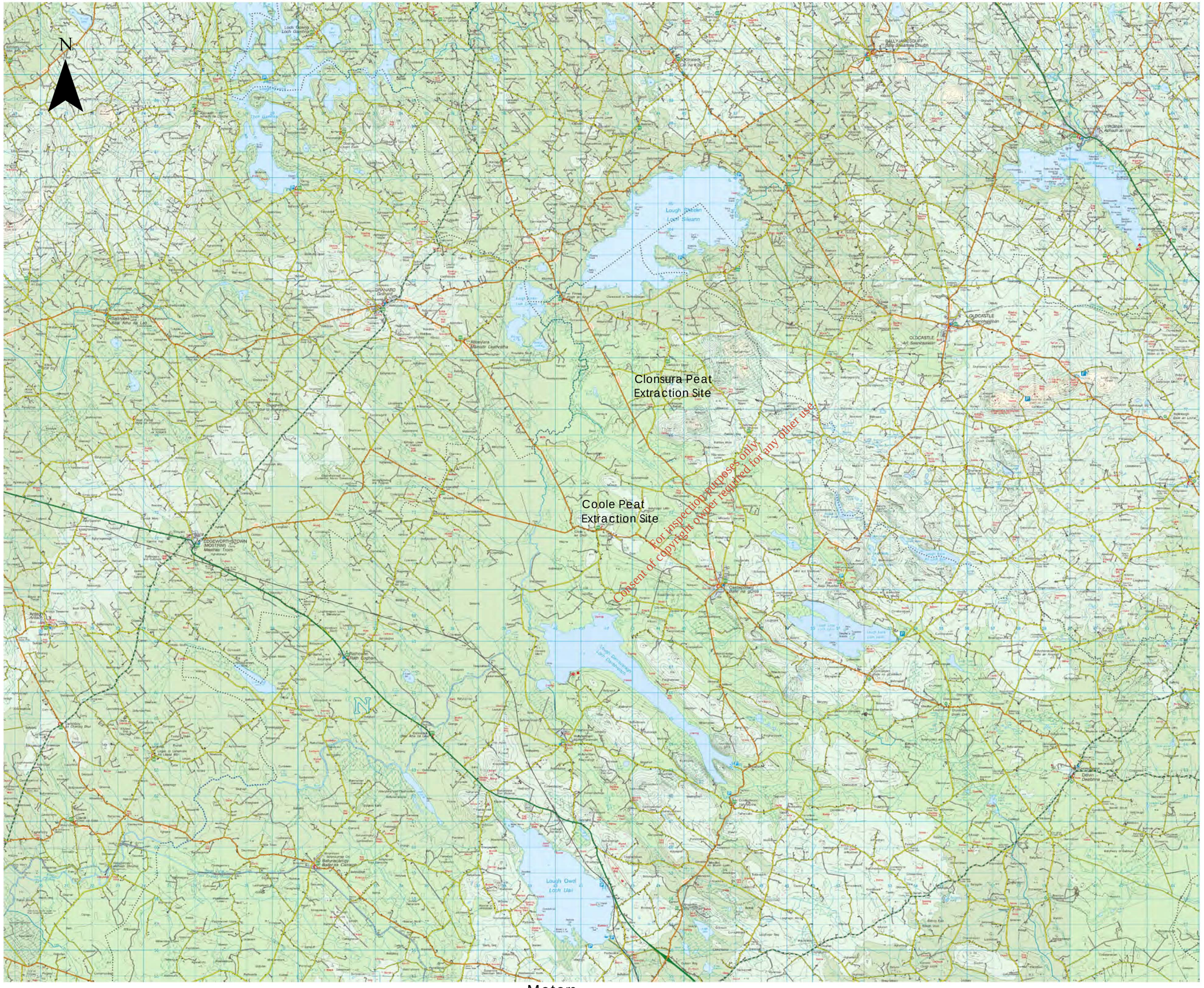
Revision:	00
Document Control:	Drawn By: TQ Checked By: EMcC Approved By:PO'L Date:13/12/2010



Legend

Westland Horticulture Ltd
Peat Extraction Sites.

Special Protection Area (SPA)

- Garriskil Bog SPA
- Glen Lough SPA
- Lough Derravarragh SPA
- Lough Iron SPA
- Lough Kinale & Derragh Lough SPA
- Lough Owel SPA
- Lough Sheelin SPA

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Client:	Westland Horticulture Ltd.
Project:	Appropriate Assessment
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Revision:	00
Document Control:	Drawn By: TQ Checked By: EMcC Approved By:PO'L Date:13/12/2010

Legend

- Chemical Quality
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Revision:	00
Document Control:	Drawn By: TQ Checked By: EMcC Approved By:PO'L Date:24/01/2011

Figure 5. River Inny BOD at Camagh & Shrubbywood

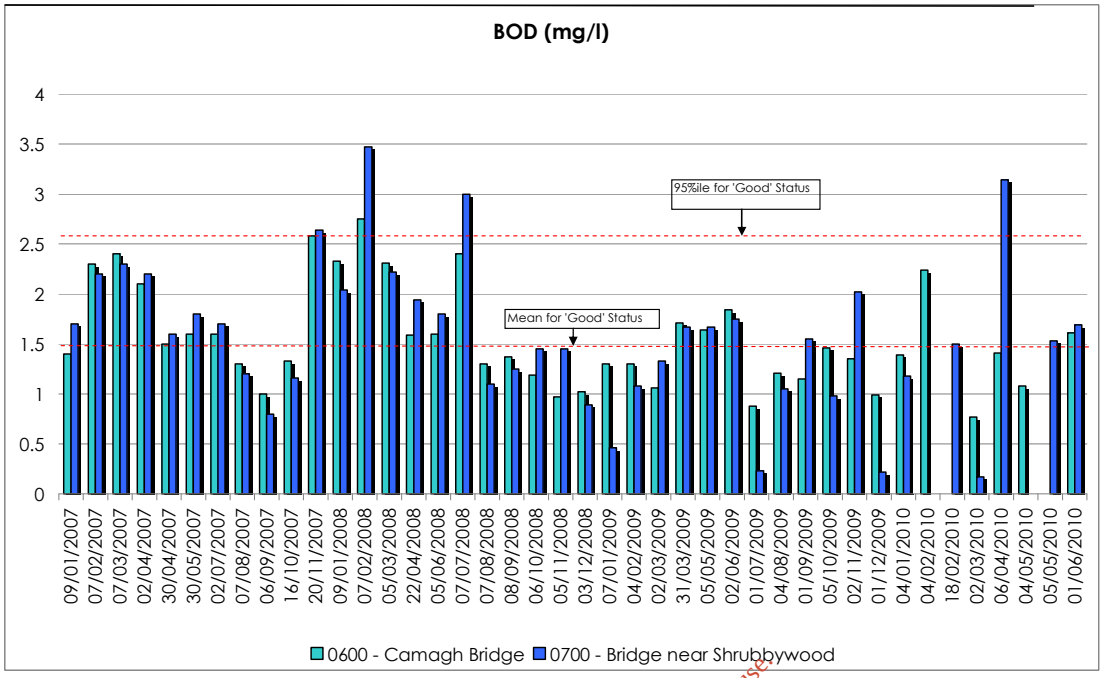


Figure 6. River Inny pH at Camagh and Shrubbywood

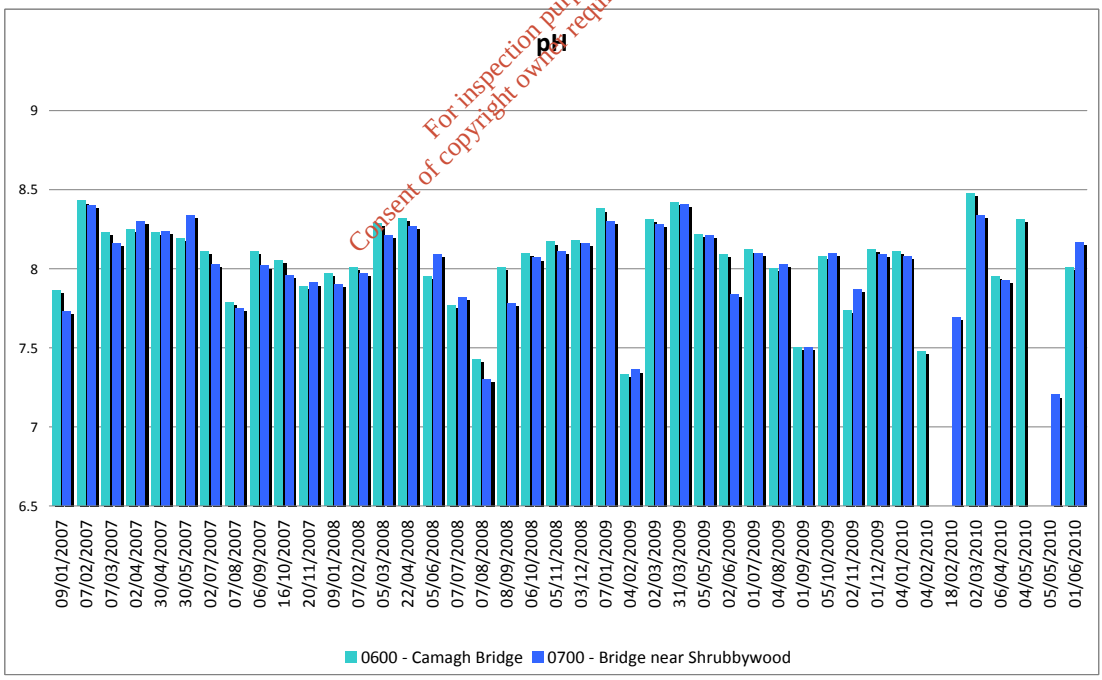


Figure 8. River Inny Orthophosphate at Camagh and Shrubbywood

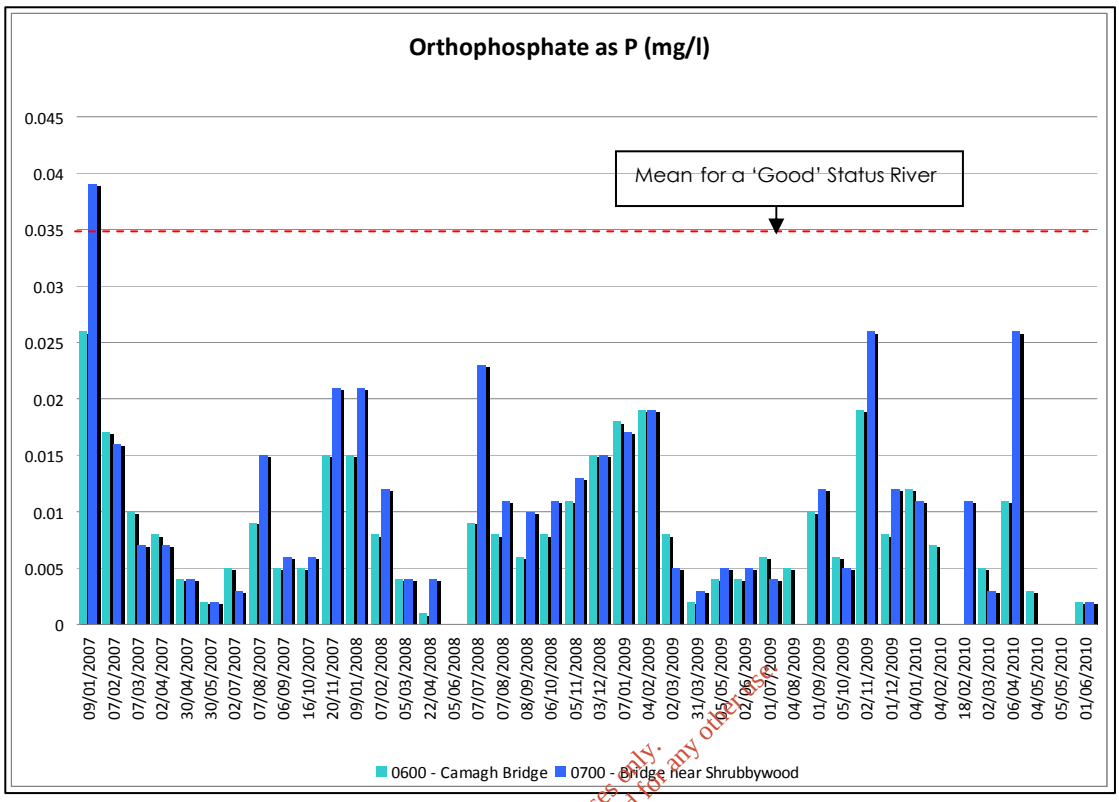


Figure 9. River Inny Ammonia at Camagh and Shrubbywood

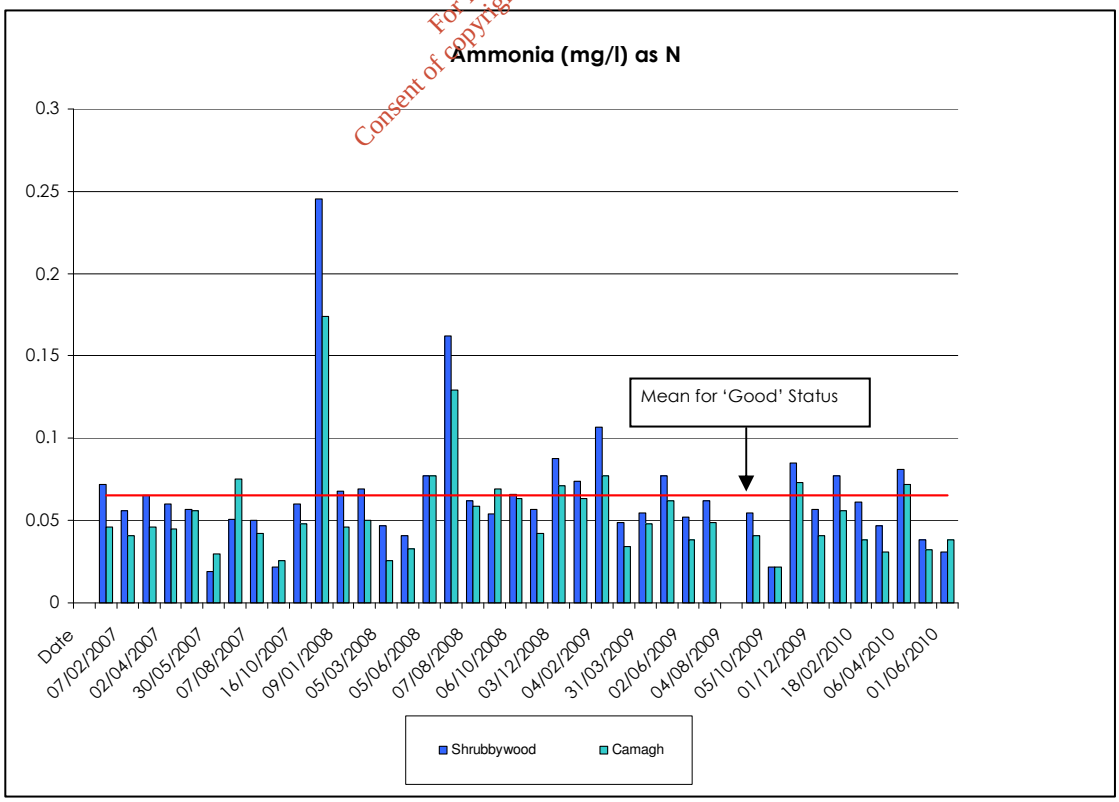
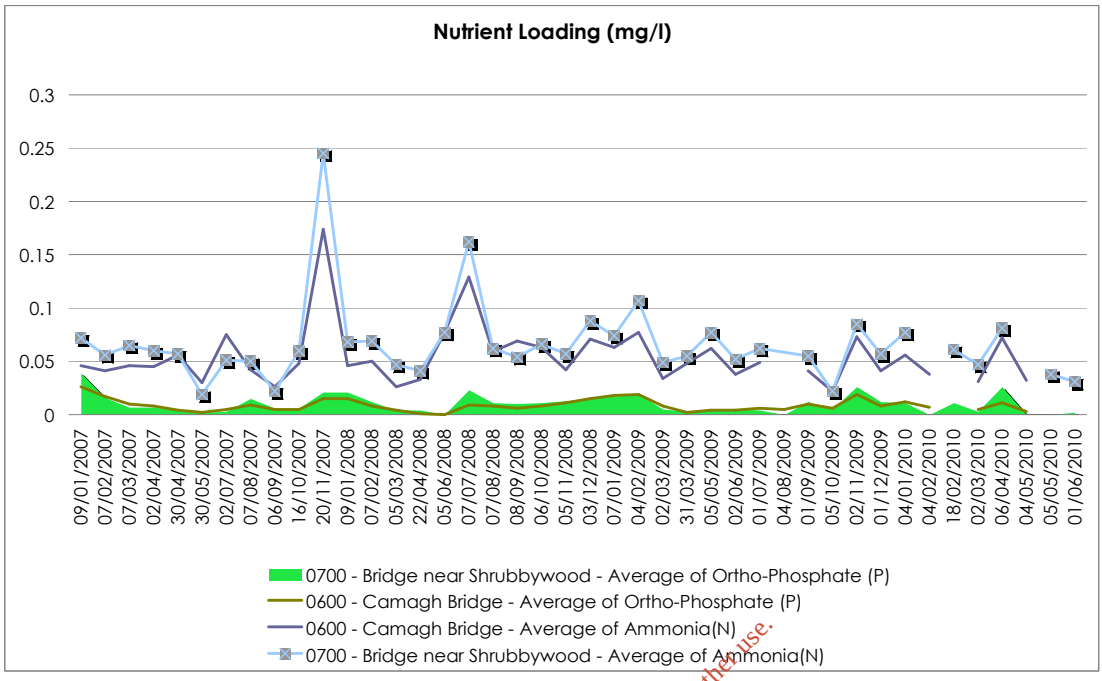


Figure 9. River Inny Nutrient at Camagh and Shrubbywood



Attachment B

National Parks and Wildlife Service Site Synopsis

SITE SYNOPSIS

SITE NAME: ARDAGULLION BOG

SITE CODE: 002341

Ardaguillion Bog is located 5 km north-east of Edgeworthstown, mainly in the townlands of Cloonshannagh (Coolamber Manor Demesne) and Ardaguillon in Co. Longford. The site comprises a raised bog that includes both areas of high bog and cutover bog. The site is bounded in the north-east by the local road running to Coolagherty.

The site is a candidate Special Area of Conservation selected for active raised bog, degraded raised bog and Rhynchosporion, habitats that are listed on Annex I of the E.U. Habitats Directive. Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (*Sphagnum* spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, *Sphagnum* lawns, flushes and soaks. Degraded raised bog corresponds to those areas of high bog whose hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The Rhynchosporion habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (*Rhynchospora alba*) and/or Brown Beak-sedge (*R. fusca*), and at least some of the following associated species, Bog Asphodel (*Narthecium ossifragum*), Sundews (*Drosera* spp.), Deergrass (*Scirpus cespitosus*), Carnation Sedge (*Carex panicea*).

This site is the remnant of a much larger bog that is now cutover and afforested. There are areas of hummocks and pools in the centre of the high bog and the ground is wet and quaking. There is one flush in the centre of the high bog. There is a small area of coniferous forestry on a section of high bog and cutover in the south-west of the site. Cutover is found all around this site.

Much of the high bog has vegetation typical of a Midland Raised Bog, consisting of Ling Heather (*Calluna vulgaris*), Cranberry (*Vaccinium oxycoccos*), Hare's-tail Cottongrass (*Eriophorum vaginatum*), White Beak-sedge, Bog Asphodel and Bog-rosemary (*Andromeda polifolia*). The bog mosses *Sphagnum papillosum*, *S. capillifolium* and *S. magellanicum* are common on the high bog and *S. imbricatum* is found at the centre of the site. At the centre of the high bog there are frequent pools that all contain the bog moss *S. cuspidatum*. Great Sundew (*Drosera anglica*) is found in all the pools in the centre of the bog and Bogbean (*Menyanthes trifoliata*) is present in some. The inter-pool areas have a high bog moss cover. Many hummocks have good clumps of the lichens *Cladonia portentosa* and *C. uncialis*. On the south-west margins of the high bog there are some young Lodgepole Pine (*Pinus contorta*) but none are thriving. There is one very wet flush in the centre of the high bog with Common Cottongrass (*E. angustifolium*), extensive lawns of the bog moss *S. cuspidatum* and some Purple Moor-grass (*Molinia caerulea*). The cutover in the north-west, east and south-east is dominated by Purple Moor Grass, Soft Rush (*Juncus effusus*) and Common Cottongrass. There is some Gorse (*Ulex europaeus*)

scrub in the east of the site and extensive Downy Birch (*Betula pubescens*) scrub in the south-east.

Current landuses on the site include forestry, peat-cutting and agriculture. The forestry is found on a small section of high bog and adjoining cutover in the south-west of the site. Areas of cutover in the south and west of the site that were previously forested have only recently been clear-felled. Active peat-cutting is taking place in the north-west, east and south-east of the site. Two fields in the north of the site have been reclaimed for agriculture. Damaging activities associated with these landuses include drainage throughout the site and burning of the high bog. There is also evidence of old burning in the northern part of the high bog. All these activities have resulted in the loss of habitat and damage to the hydrological status of the site, and pose a continuing threat to its viability.

Ardagullion Bog is a site of considerable conservation significance comprising as it does a raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. The site supports a good diversity of raised bog microhabitats, including hummocks and pools. Active raised bog is listed as a priority habitat on Annex I of the E.U. Habitats Directive. Priority status is given to habitats and species that are threatened throughout the E.U. Ireland has a high proportion of the total E.U. resource of this habitat type (over 60%) and so has a special responsibility for its conservation at an international level.

31.10.2002

SITE SYNOPSIS

SITE NAME: GARRISKIL BOG

SITE CODE: 000679

This raised bog site lies 3 km west of Lough Derravaragh and 3 km east of Rathowen. It is bounded to the southeast and southwest by the rivers Inny and Riffey.

The site has a well developed system of pools and hummocks occupying 25% of the dome. Here, the Bog mosses *Sphagnum imbricatum, S. fuscum* and the moss *Leucobryum glaucum* are important components of the hummocks, frequently crowned by the moss *Racomitrium lanuginosum* and sometimes colonised by Bilberry (*Vaccinium myrtillus*). In the pools *Sphagnum* mosses (*S. auriculatum* var. *auriculatum, S. cuspidatum*), Great Sundew (*Drosera anglica*), White Beak-sedge (*Rhynchospora alba*) and the liverwort *Cladopodiella fluitans* occur. In between the pools and hummocks "quaking" *Sphagnum* moss carpets support Bog Asphodel (*Narthecium ossifragum*). The area of bog away from this system is drier and more uniformly sedge-rich. In the northwest corner of the site, there is a small wet and quaking area dominated by the moss *Sphagnum cuspidatum* and Common Cottongrass (*Eriophorum angustifolium*) with Soft Rush (*Juncus effusus*), Bog Asphodel and Bottle Sedge (*Carex rostrata*) also present. Along the northeast margin a narrow band of fen-grassland occurs.

Old cutaway bog provides an additional habitat where Purple Moor-grass (*Molinia caerulea*) and Heather (*Calluna vulgaris*) dominate, along with Cottongrasses (*Eriophorum angustifolium* and *E. vaginatum*) while in some parts Downy Birch (*Betula pubescens*) woodland is developing.

On and around the hummocks a rich lichen flora, featuring an abundance of the scarce *Cladonia rangiferina*, has developed. Garriskil Bog is, on occasion, used as a refuge by the Greenland White-fronted Goose flock which winters on the large Co. Westmeath lakes. The site is within a breeding territory of a pair of Merlin. Both of these species are of high conservation importance and are listed on Annex I of the EU Birds Directive. Other birds breeding on the site include Snipe, Curlew and Redshank.

In general, human landuse within the site is low, with much of the previous cutaway areas reverting to semi-natural wilderness. Burning in the past has caused damage, with some bare peat exposure evident in places. This is always a very real threat to a bogland habitat. Past drainage of the bog has unfavourably impacted on the site, although many of these drains have now been infilled and blocked. However, a more serious threat is the arterial drainage of the R. Inny. This could result in major and irreversible damage to the hydrological integrity of this raised bog habitat.

Garriskil bog is a very good example of a relatively intact true Midland raised bog characterised by its typical flora. This habitat is increasingly under threat in Ireland.

A remarkable and impressive feature of this site is an extensive and well-developed system of pools and hummocks. Garriskil Bog has one of the best developed pool systems of any remaining raised bog in the country and the site is of unique conservation value.

14.1.1997

SITE SYNOPSIS

SITE NAME: GARRISKIL BOG

SITE CODE: 000679

This raised bog site lies 3 km west of Lough Derravaragh and 3 km east of Rathowen. It is bounded to the southeast and southwest by the rivers Inny and Riffey.

The site has a well developed system of pools and hummocks occupying 25% of the dome. Here, the Bog mosses *Sphagnum imbricatum, S. fuscum* and the moss *Leucobryum glaucum* are important components of the hummocks, frequently crowned by the moss *Racomitrium lanuginosum* and sometimes colonised by Bilberry (*Vaccinium myrtillus*). In the pools *Sphagnum* mosses (*S. auriculatum* var. *auriculatum, S. cuspidatum*), Great Sundew (*Drosera anglica*), White Beak-sedge (*Rhynchospora alba*) and the liverwort *Cladopodiella fluitans* occur. In between the pools and hummocks "quaking" *Sphagnum* moss carpets support Bog Asphodel (*Narthecium ossifragum*). The area of bog away from this system is drier and more uniformly sedge-rich. In the northwest corner of the site, there is a small wet and quaking area dominated by the moss *Sphagnum cuspidatum* and Common Cottongrass (*Eriophorum angustifolium*) with Soft Rush (*Juncus effusus*), Bog Asphodel and Bottle Sedge (*Carex rostrata*) also present. Along the northeast margin a narrow band of fen-grassland occurs.

Old cutaway bog provides an additional habitat where Purple Moor-grass (*Molinia caerulea*) and Heather (*Calluna vulgaris*) dominate, along with Cottongrasses (*Eriophorum angustifolium* and *E. vaginatum*) while in some parts Downy Birch (*Betula pubescens*) woodland is developing.

On and around the hummocks a rich lichen flora, featuring an abundance of the scarce *Cladonia rangiferina*, has developed. Garriskil Bog is, on occasion, used as a refuge by the Greenland White-fronted Goose flock which winters on the large Co. Westmeath lakes. The site is within a breeding territory of a pair of Merlin. Both of these species are of high conservation importance and are listed on Annex I of the EU Birds Directive. Other birds breeding on the site include Snipe, Curlew and Redshank.

In general, human landuse within the site is low, with much of the previous cutaway areas reverting to semi-natural wilderness. Burning in the past has caused damage, with some bare peat exposure evident in places. This is always a very real threat to a bogland habitat. Past drainage of the bog has unfavourably impacted on the site, although many of these drains have now been infilled and blocked. However, a more serious threat is the arterial drainage of the R. Inny. This could result in major and irreversible damage to the hydrological integrity of this raised bog habitat.

Garriskil bog is a very good example of a relatively intact true Midland raised bog characterised by its typical flora. This habitat is increasingly under threat in Ireland.

A remarkable and impressive feature of this site is an extensive and well-developed system of pools and hummocks. Garriskil Bog has one of the best developed pool systems of any remaining raised bog in the country and the site is of unique conservation value.

14.1.1997

SITE SYNOPSIS

SITE NAME: GARRISKIL BOG SPA

SITE CODE: 004102

Garriskil Bog SPA, a raised bog, lies 3 km west of Lough Derravaragh and 3 km east of Rathowen. It is bounded to the south-east and south-west by the rivers Inny and Riffey. The bog is underlain by calcareous shales with a low permeability. A substantial area of uncut high bog remains though much of this is classified as degraded raised bog. Old cutaway bog surrounds the high bog and parts of this are dominated by Downy Birch (*Betula pubescens*) scrub. The site contains good examples of active raised bog, degraded raised bog and depressions on peat substrates (*Rhynchosporion*), habitats which are listed on Annex I of the E.U. Habitats Directive.

The site has a well-developed system of pools and hummocks, and a large proportion of the uncut high bog is notably wet. Common vascular plant species on the bog include Ling (*Calluna vulgaris*), the cottongrasses *Eriophorum angustifolium* and *E. vaginatum*, Bog Asphodel (*Narthecium ossifragum*) and White Beak-sedge (*Rhynchospora alba*). Bog mosses (*Sphagnum* spp.) are important components of the vegetation. The cutaway bog has species such as Ling and Purple Moor-grass (*Molinia caerulea*), while in some parts Downy Birch woodland is developing.

The site is within the range of the midland lakes flock of Greenland White-fronted Geese, which is centred on four major lakes (Derravaragh, Iron, Owel and Ennell). There are 16 known feeding sites, mostly on intensively managed grassland. In the past the bog has been utilised by the geese (up to 60) but nowadays usage of raised bogs by geese is a rare event.

The site is within the breeding territory of a pair of Merlin. Nesting probably occurs outside of the site boundary, with the bog being used primarily as a foraging area.

Several wader species breed within the site, with an estimated 5 pairs of Snipe, 2-3 pairs of Curlew and 2 pairs of Redshank. Barn Owl has been recorded hunting along the margins of the bog, while Red Grouse is considered to occur occasionally.

While the site appears to have been abandoned by wintering Greenland White-fronted Geese, it is still of some ornithological importance as it supports a typical range of bird species of midland raised bogs, including Merlin. Merlin is of high conservation importance as it is listed on Annex I of the E.U. Birds Directive.

11.2.2004

SITE SYNOPSIS

SITE NAME: GLEN LOUGH SPA

SITE CODE: 004045

Glen Lough is situated about 5 km north-west of Lough Iron, to which it is connected by the Black River. Extensive drainage in the 1960s has resulted in a dramatic drop in the watertable here, with the result that there is now little open water, except during flooding in the winter months. Sedge-dominated freshwater marsh now occupies the majority of what was once open water. Plant species present include Bottle Sedge (*Carex rostrata*), Water Horsetail (*Equisetium fluviatile*) and Canary Reed-grass (*Phalaris arundinacea*). Other habitats present include reedswamp, wet and dry grassland, cutaway bog colonised by heath vegetation, scrub and wet willow (*Salix* spp.) woodland.

An internationally important Whooper Swan population uses the site at times. This flock (average peak of 272 individuals for the 5 seasons 1995/96-1999/00) also uses Lough Iron and a range of grassland feeding areas in the vicinity. At times, the site is visited by part of the internationally important Midland lakes Greenland White-fronted Goose population, although numbers are low (17). Dabbling ducks are well represented, but in relatively low numbers, and include such species as Wigeon (85), Teal (75), Mallard 46), Pintail (7) and Shoveler (23). Lapwing (189) are also found in the area.

Glen Lough is surrounded by intensively farmed agricultural land and undoubtedly receives nutrient run-off. The effect of this on the vegetation and indirectly the birds is not known. Planting of forestry around part of the margin of the site has occurred. Any further planting would be of concern as this could destroy feeding areas used by the swans, geese and herbivorous wildfowl.

Whilst this site attracts a range of wintering waterfowl, the principal interest is the internationally important Whooper Swan population that is based in the area. Whooper Swan is of particular note as it is listed on Annex I of the E.U. Birds Directive. Greenland White-fronted Goose, nowadays an occasional visitor to the site, is also listed on Annex I of this Directive. The site provides useful habitat for Shoveler, which in Ireland is a fairly localised species.

18.8.2004

SITE SYNOPSIS

SITE NAME: RIVER BOYNE AND RIVER BLACKWATER

SITE CODE: 002299

This site comprises the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers. These riverine stretches drain a considerable area of Meath and Westmeath and smaller areas of Cavan and Louth. The underlying geology is Carboniferous Limestone for the most part with areas of Upper, Lower and Middle well represented. In the vicinity of Kells Silurian Quartzite is present while close to Trim are Carboniferous Shales and Sandstones. There are many large towns adjacent to but not within the site. Towns both small and large, include Slane, Navan, Kells, Trim, Athboy and Ballivor.

The site is a candidate SAC selected for alkaline fen and alluvial woodlands, both habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive – Atlantic Salmon, Otter and River Lamprey.

The main areas of alkaline fen are concentrated in the vicinity of Lough Shesk, Freehan Lough and Newtown Lough. The hummocky nature of the local terrain produces frequent springs and seepages which are rich in lime. A series of base-rich marshes have developed in the poorly-drained hollows, generally linked with these three lakes. Open water is usually fringed by Bulrush (*Typha latifolia*), Common Club-rush (*Scirpus lacustris*) or Common Reed (*Phragmites australis*) and this last species also extends shorewards where a dense stand of Great Fen Sedge or Saw Sedge (*Cladium mariscus*) frequently occurs. This in turn grades into a sedge and grass community (*Carex* spp., *Molinia caerulea*) or one dominated by the Black Bog-rush (*Schoenus nigricans*). An alternative direction for the aquatic/terrestrial transition to take is through a floating layer of vegetation. This is normally based on Bogbean (*Menyanthes trifoliata*) and Marsh cinquefoil (*Potentilla palustris*). Other species gradually become established on this cover, especially plants tolerant of low nutrient status e.g. bog mosses (*Sphagnum* spp.). Diversity of plant and animal life is high in the fen and the flora, includes many rarities. The plants of interest include Narrow-leaved Marsh Orchid (*Dactylorhiza traunsteineri*), Fen Bedstraw (*Galium uliginosum*), Cowbane (*Cicuta virosa*), Frogbit (*Hydrocharis morsus-ranae*) and Least Bur-reed (*Sparganium minimum*). These species tend to be restricted in their distribution in Ireland. Also notable is the abundance of aquatic Stoneworts (*Chara* spp.) which are characteristic of calcareous wetlands.

The rare plant, Round-leaved Wintergreen (*Pyrola rotundifolia*) occurs around Newtown Lough. This species is listed in the Red Data Book and is protected under the Flora Protection Order, 1999, and this site is its only occurrence in Co. Meath.

Wet woodland fringes many stretches of the Boyne. The Boyne River Islands are a small chain of three islands situated 2.5 km west of Drogheda. The islands were formed by the build up of alluvial sediment in this part of the river where water movement is sluggish. All of the islands are covered by dense thickets of wet, Willow (*Salix* spp.) woodland, with the following species occurring: Osier (*S. viminalis*), Crack Willow (*S. fragilis*), White Willow (*S. alba*), Purple Willow (*Salix purpurea*) and Grey Willow (*S. cinerea*). A small area of Alder (*Alnus glutinosa*) woodland is found on soft ground at the edge of the canal in the north-western section of the islands. Along other stretches of the rivers of the site Grey Willow scrub and pockets of wet woodland dominated by Alder have become established, particularly at the river edge of mature deciduous woodland. Ash (*Fraxinus excelsior*) and Birch (*Betula pubescens*) are common in the latter and the ground flora is typical of wet woodland with Meadowsweet (*Filipendula ulmaria*), Angelica (*Angelica sylvestris*), Yellow Iris, Horsetail (*Equisetum* spp.) and occasional tussocks of Greater Tussock-sedge (*Carex paniculata*).

The dominant habitat along the edges of the river is freshwater marsh - the following plant species occur commonly here: Yellow Flag (*Iris pseudacorus*), Creeping Bent (*Agrostis stolonifera*), Canary Reed-grass (*Phalaris arundinacea*), Marsh Bedstraw (Galium palustre), Water Mint (*Mentha aquatica*) and Water Forget-me-not (*Myosotis scorpioides*). In the wetter areas of the marsh Common Meadow-rue (*Thalictrum flavum*) is found. In the vicinity of Dowth, Fen Bedstraw (*Galium uliginosum*), a scarce species mainly confined to marshy areas in the midlands, is common in this vegetation. Swamp Meadow-grass (*Poa palustris*) is an introduced plant which has spread into the wild (naturalised) along the Boyne approximately 5 km south-west of Slane. It is a rare species which is listed in the Red Data Book and has been recorded among freshwater marsh vegetation on the banks of the Boyne in this site. The only other record for this species in the Republic is from a site in Co. Monaghan.

The secondary habitat associated with the marsh is wet grassland and species such as Tall Fescue (*Festuca arundinacea*), Silverweed (*Potentilla anserina*), Creeping Buttercup (*Ranunculus repens*), Meadowsweet (*Filipendula ulmaria*) and Meadow Vetchling (*Lathyrus pratensis*) are well represented. Strawberry Clover (*Trifolium fragiferum*), a plant generally restricted to coastal locations in Ireland, has been recorded from wet grassland vegetation at Trim. At Rossnaree river bank on the River Boyne, is Round-Fruited Rush (*Juncus compressus*) found in alluvial pasture, which is generally periodically flooded during the winter months. This rare plant is only found in three counties in Ireland.

Along much of the Boyne and along tributary stretches are areas of mature deciduous woodland on the steeper slopes above the floodplain marsh or wet woodland vegetation. Many of these are planted in origin. However the steeper areas of King Williams Glen and Townley Hall wood have been left unmanaged and now have a more natural character. East of Curley Hole the woodland has a natural appearance with few conifers. Broad-leaved species include Oak (*Quercus* spp.), Ash (*Fraxinus excelsior*), Willows, Hazel (*Corylus avellana*), Sycamore (*Acer pseudoplatanus*), Holly (*Ilex aquifolium*), Horse chestnut (*Aesculus* sp.) and the shrubs Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Elder (*Sambucus nigra*). South-west of Slane and in Dowth, the addition of some more exotic tree species such

as Wych Elm (*Ulmus glabra*), Beech (*Fagus sylvatica*), and occasionally Lime (*Tilia cordata*), are seen. Coniferous trees, Larch (*Larix* sp.) and Scots Pine (*Pinus sylvestris*) also occur. The woodland ground flora includes Barren Strawberry (*Potentilla sterilis*), Enchanter's Nightshade (*Circaea lutetiana*) and Ground-ivy (*Glechoma hederacea*), along with a range of ferns. Variation occurs in the composition of the canopy, for example, in wet patches alongside the river, White Willow and Alder form the canopy.

Other habitats present along the Boyne and Blackwater include lowland dry grassland, improved grassland, reedswamp, weedy wasteground areas, scrub, hedge, drainage ditches and canal. In the vicinity of Lough Shesk, the dry slopes of the morainic hummocks support grassland vegetation which, in some places, is partially colonised by Gorse (*Ulex europaeus*) scrub. Those grasslands which remain unimproved for pasture are species-rich with Common Knapweed (*Centaurea nigra*), Creeping Thistle (*Cirsium arvense*) and Ribwort Plantain (*Plantago lanceolata*) commonly present. Fringing the canal alongside the Boyne south-west of Slane, are Reed Sweet-grass (*Glyceria maxima*), Great Willowherb (*Epilobium hirsutum*) and Meadowsweet.

The Boyne and its tributaries is one of Ireland's premier game fisheries and it offers a wide range of angling from fishing for spring salmon and grilse to seatrout fishing and extensive brown trout fishing. Atlantic Salmon (*Salmo salar*) use the tributaries and headwaters as spawning grounds. Although this species is still fished commercially in Ireland, it is considered to be endangered or locally threatened elsewhere in Europe and is listed on Annex II of the Habitats Directive. Atlantic Salmon run the Boyne almost every month of the year. The Boyne is most important as it represents an eastern river which holds large three-sea-winter fish from 20 –30 lb. These fish generally arrive in February with smaller spring fish (10 lb) arriving in April/May. The grilse come in July, water permitting. The river gets a further run of fish in late August and this run would appear to last well after the fishing season. The salmon fishing season lasts from 1st March to 30th September.

The Blackwater is a medium sized limestone river which is still recovering from the effects of the arterial drainage scheme of the 70's. Salmon stocks have not recovered to the numbers pre drainage. The Deel, Riverstown, Stoneyford and Tremblestown Rivers are all spring fed with a continuous high volume of water. They are difficult to fish in that some are overgrown while others have been affected by drainage with the resulting high banks.

The site is also important for the populations of two other species listed on Annex II of the E.U. Habitats Directive, namely River Lamprey (*Lampetra fluviatilis*) which is present in the lower reaches of the Boyne River while the Otter (*Lutra lutra*) can be found throughout the site. In addition, the site also supports many more of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. Common Frog, another Red Data Book species, also occurs within the site. All of these animals with the addition of the Stoat and Red Squirrel, which also occur within the site, are protected under the Wildlife Act.

Whooper Swans winter regularly at several locations along the Boyne and Blackwater Rivers. Parts of these areas are within the cSAC site. Known sites are at Newgrange (c. 20 in recent winters), near Slane (20+ in recent winters), Wilkinstown (several records of 100+) and River Blackwater from Kells to Navan (104 at Kells in winter 1996/97, 182 at Headfort in winter 1997/98, 200-300 in winter 1999/00). The available information indicates that there is a regular wintering population of Whooper Swans based along the Boyne and Blackwater River valleys. The birds use a range of feeding sites but roosting sites are not well known. The population is substantial, certainly of national, and at times international, importance. Numbers are probably in the low hundreds.

Intensive agriculture is the main landuse along the site. Much of the grassland is in very large fields and is improved. Silage harvesting is carried out. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the lakes. In the more extensive agricultural areas sheep grazing is carried out.

Fishing is a main tourist attraction on the Boyne and Blackwater and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. The Eastern Regional Fishery Board have erected fencing along selected stretches of the river as part of their salmonid enhancement programme. Parts of the river system have been arterially dredged. In 1969 an arterial dredging scheme commenced and disrupted angling for 18 years. The dredging altered the character of the river completely and resulted in many cases in leaving very high banks. The main channel from Drogheda upstream to Navan was left untouched, as were a few stretches on the Blackwater. Ongoing maintenance dredging is carried out along stretches of the river system where the gradient is low. This is extremely destructive to salmonid habitat in the area. Drainage of the adjacent river systems also impacts on the many small wetland areas throughout the site. The River Boyne is a designated Salmonid Water under the EU Freshwater Fish Directive.

The site supports populations of several species listed on Annex II of the EU Habitats Directive, and habitats listed on Annex I of this directive, as well as examples of other important habitats. Although the wet woodland areas appear small there are few similar examples of this type of alluvial wet woodland remaining in the country, particularly in the north-east. The semi-natural habitats, particularly the strips of woodland which extend along the river banks and the marsh and wet grasslands, increase the overall habitat diversity and add to the ecological value of the site as does the presence of a range of Red Data Book plant and animal species and the presence of nationally rare plant species.

19.06.2003

SITE SYNOPSIS

SITE NAME: LOUGH BANE AND LOUGH GLASS

SITE CODE: 002120

This site is located on the Meath/Westmeath border, about 10 km south of Oldcastle. It comprises three lakes situated in a shallow valley. Lough Bane is by far the largest of the group, with the much smaller Lough Glass occurring immediately to the east and Lough Glass North to the north-west. The lakes occur at the headwaters of the River Deel, with the main outflow at the south-east end of Lough Bane. The outflow is not very substantial and partly overgrown with vegetation. The connection between Lough Glass and Lough Bane has now been severed and the flow from Glass is diverted to the south-west. The water level has dropped over the years and has exposed soft marl along parts of the shore.

Lough Bane is a good example of a hard water marl lake with well developed stonewort (*Chara* spp.) communities. This is an important habitat listed on Annex I of the E.U. Habitats Directive. Sampling of the aquatic flora has shown the presence in Lough Bane of at least four species of Charophyte, i.e. *Chara rudis* (dominant in deep water), *C. curta* (shallow water at north shore), *C. globularis* and *C. contraria* (both mid-south shore).

Much of the shoreline of the lakes has a fringe of wetland vegetation, mostly Common Reed (*Phragmites australis*) and Common Club-rush (*Scirpus lacustris*), but also some Water Horsetail (*Equisetum fluviatile*) and Bottle Sedge (*Carex rostrata*). At the east and west ends of Lough Bane the swamp vegetation is particularly well developed and there is also fen vegetation. Species include Jointed Rush (*Juncus articulatus*), Water-cress (*Nasturtium officinale*), Meadowsweet (*Filipendula ulmaria*), Devils'-bit Scabious (*Succisa pratensis*), Meadow Thistle (*Cirsium dissectum*), Marsh Bedstraw (*Galium palustre*) and Grass-of-parnassus (*Parnassia palustris*).

Mixed woodland occurs along parts of the south and north shores. Species present include Beech (*Fagus sylvatica*), Oak (*Quercus* sp.), Holly (*Ilex aquifolium*), Scots Pine (*Pinus sylvestris*) and European Larch (*Larix decidua*). In some areas Hazel (*Corylus avellana*) becomes dominant, along with other shrubby species such as Hawthorn (*Crataegus monogyna*).

Dry calcareous grassland (mostly unimproved) is found in a few areas, notably at Noggin Hill. Species present here include Primrose (*Primula vulgaris*), Fairy Flax (*Linum catharticum*), Lady's Bedstraw (*Galium verum*), Ribwort Plantain (*Plantago lanceolata*) and the grasses *Briza media* and *Cynosurus cristatus*.

The lake has Brown Trout and is an important angling lake. An important population of White-clawed Crayfish (*Austropotamobius pallipes*), a species listed on Annex II of the E.U. Habitats Directive, was known from these lakes, but it was wiped out by a

fungal plague (*Aphanomyces astaci*) in the 1980s. Crayfish have successfully been re-introduced to other lakes in the area and National Parks and Wildlife intend to re-introduce them to Lough Bane. The lakes and fringing wetlands also support a varied avifauna including Little Grebe, Cormorant, Lapwing, Curlew and Snipe.

Despite being surrounded by mostly improved pasture, the quality of the water appears good and Lough Bane has been classified as a very oligotrophic system. However, as it is a small waterbody and situated in a valley, it is vulnerable to water pollution. A further threat comes from afforestation within the catchment - should there be an increase in the areas under commercial forestry, the quality of the water could be affected.

Overall, this is a fine example of a hard water marl lake system with good *Chara* communities. Such systems are becoming scarce in Europe.

31.10.00

SITE SYNOPSIS

SITE NAME: LOUGH DERRAVARAGH SPA

SITE CODE: 0004043

Lough Derravaragh is located approximately 12 km north of Mullingar town. It is a medium- to large-sized lake of relatively shallow water (maximum depth 23 m). The lake extends along a south-east/north-west axis for approximately 8 km. The Inny River, a tributary of the River Shannon, is the main inflowing and outflowing river. It is a typical limestone lake with water of high hardness and alkaline pH, and is classified as a mesotrophic system.

A notable feature is the range of charophytes that occur in the lake (eight species have been recorded, including the rare, Red Data Book species *Chara denudata* and *C. tomentosa*). It has a good diversity of marginal habitats. At the western end of the lake are extensive areas of swamp dominated by Common Reed (*Phragmites australis*). Elsewhere along the shore there is freshwater marsh vegetation dominated by sedges (*Carex* spp.) and tussock-forming grasses such as Tufted Hair-grass (*Deschampsia cespitosa*) and fescues (*Festuca* spp.), with a range of flowering herbs including Nodding Bur-Marigold (*Bidens cernua*) and Trifid Bur-Marigold (*Bidens tripartita*). The lakeshore is a mineral-rich substrate and several plant species of poor fen habitats occur in abundance, such as Black Bog-rush (*Schoenus nigricans*) and Long-stalked Yellow-sedge (*Carex lepidocarpa*). Deciduous woodland fringes the lake in some areas.

Lough Derravaragh is one of the most important midland lakes for wintering waterfowl. It supports nationally important populations of Little Grebe (42), Mute Swan (159), Pochard (3,129), Tufted Duck (1,073) and Coot (1,358) - all counts are average maxima over the five winters 1995/96 to 1999/00. The Pochard population is of particular note as it represents over 6% of the national total, and at times has exceeded the threshold for International Importance (i.e. 3,500). The lake is a traditional haunt for the internationally important Midland lakes Greenland White-fronted Goose flock (which also uses Loughs Iron, Owel and Ennell). This flock, whose numbers usually range between 300 and 400 birds, use the lake mainly for roosting purposes. A regionally important population of Whooper Swan (102) occurs, along with a range of other species including Great Crested Grebe (34), Cormorant (34), Wigeon (207), Teal (52), Mallard (195), Pintail (6), Shoveler (12), Goldeneye (46), Golden Plover (158) and Lapwing (1,079).

Enrichment of the lake, mainly by agricultural run-off, is a threat and could affect the bird populations and especially the diving ducks. An increase in recreational and wildfowling activities could cause disturbance to the birds though this is not considered to be a major threat.

Lough Derravaragh is of major ornithological importance as it regularly supports nationally important populations of five species, and at times is used by the

internationally important population of Greenland White-fronted Goose which is based in the region. Also of note is that three of the species which occur at the site (Greenland White-fronted Goose, Whooper Swan, Golden Plover) are listed on Annex I of the E.U. Birds Directive.

13.8.2004

SITE SYNOPSIS

SITE NAME: LOUGH IRON SPA

SITE CODE: 004046

Lough Iron is a small- to moderately-sized midland lake, located some 12 km north-west of Mullingar. It is situated on the Inny River, which flows from Lough Derravaragh approximately 5 km to the north-east. Lough Owel occurs a few kilometres to the south-east and is connected to Lough Iron by a small stream. The underlying geology is limestone and the lake is mesotrophic in character.

Drainage of the River Inny in the 1960s has led to a dramatic drop in the level of the lake and this in turn has led to the development of freshwater marsh and wet grassland on what was previously lake bed. The lake is partially surrounded by agricultural land, much of which is managed intensively. Conifers are also present along stretches of the lake edge. The grassland fields which are used by geese and swans for feeding purposes are included in the site. Some conifer plantations along the south-western shore of the lake are also included in the site to provide screening for feeding birds.

The dominant wetland plant species along the margins of the lake are Canary Reed-grass (*Phalaris arundinacea*) and Purple Moor-grass (*Molinia caerulea*), the latter species forming large expanses of wet grassland. There are also patches of calcareous fen, wet woodland dominated by Downy Birch (*Betula pubescens*) and tall sedge swamp dominated by Tufted Sedge (*Carex elata*) and Bottle Sedge (*Carex rostrata*). Quite a wide band of Common Reed (*Phragmites australis*) fringes the lake. The marsh areas contain several scarce plant species, including Fen Bedstraw (*Galium uliginosum*), Frogbit (*Hydrocharis morsus-ranae*), and Marsh Pea (*Lathyrus palustris*).

Lough Iron is of International Importance as a site for wintering waterfowl. It is a traditional haunt for the internationally important Midland lakes Greenland White-fronted Goose flock (which also use Loughs Owel, Ennell and Derravaragh), and is also frequented by a nationally important population of Whooper Swan. Counts for principal waterfowl species over the five winters 1995/96 to 1999/00 are as follows (figures are average maxima): Mute Swan (52), Whooper Swan (154), Greenland White-fronted Goose (409), Wigeon (1,229), Teal (736), Mallard (257), Pintail (19), Shoveler (164), Pochard (239), Tufted Duck (208), Coot (293), Golden Plover (2,200), Lapwing (1,670), Snipe (30) and Curlew (136). The populations of Whooper Swan, Wigeon, Teal, Shoveler and Golden Plover are of National Importance. At times the Whooper Swan population exceeds the qualifying threshold (160) for International Importance.

Lough Iron SPA is of high ornithological importance primarily as it supports an Internationally Important population of Greenland White-fronted Geese, with both feeding and roosting areas available to the birds. Nowadays it is the main site used by this flock. An Internationally Important population of Whooper Swans sometimes

occurs. The site also supports a notable diversity of other waterfowl, including dabbling duck, diving duck and waders. Of particular importance is that three of the species which occur are listed on Annex I of the E.U. Birds Directive (Greenland White-fronted Goose, Whooper Swan and Golden Plover).

SITE SYNOPSIS

SITE NAME: LOUGH KINALE AND DERRAGH LOUGH SPA

SITE CODE: 0004061

Lough Kinale is a relatively small lake that is situated immediately downstream of Lough Sheelin, both lakes being near the top of the catchment of the Inny River, a main tributary of the River Shannon. Derragh Lough, a much smaller system, is connected to Lough Kinale and the Inny River. This is a typical limestone system and is very shallow (maximum depth of Lough Kinale is *c*. 4 m). As with Lough Sheelin, the trophic status of the lake has varied greatly since the 1970s due to pollution. It was recently (1998-2000) classified as a highly eutrophic system. The lake was formerly an important Trout fishery.

Lough Kinale has two main basins, almost separated by swamp formations. Reed swamp is frequent around the lakes, with Common Reed (*Phragmites australis*) and Tufted-sedge (*Carex elata*) occurring commonly. A calcium-rich small sedge marsh occurs along parts of the shoreline. This is characterised by species such as Long-stalked Yellow-sedge (*Carex lepidocarpa*), Marsh Pimpernel (*Anagallis tenella*), Knotted Pearlwort (*Sagina nodosa*), Marsh Pennywort (*Hydrocotyle vulgaris*) and Water Mint (*Mentha aquatica*). Areas of bog occur around the margins of the lakes in places but some of these have been planted with conifers.

Despite the very variable water quality in recent decades, Lough Kinale and Derragh Lough remain an important site for wintering waterfowl, especially diving duck. The site supports nationally important populations of two species, i.e. Pochard (951) and Tufted Duck (449) - figures are average peaks for the 5 seasons 1995/96-1999/00. A large population of Mute Swan (120), close to the threshold for national importance, also uses the site. Coot (199), whilst still occurring in substantial numbers, formerly had a population of national importance. A number of other species are found, in relatively low numbers, including Great Crested Grebe (25), Mallard (130) and Goldeneye (22). Marginal grassland areas outside of the site attract feeding wildfowl and waders such as Lapwing and Golden Plover.

The variable water quality over the years, with periods of highly eutrophic conditions, undoubtedly has had adverse impacts on the wintering waterfowl, and especially the diving duck. This would appear to be borne out by very variable numbers of birds recorded over the years. The lake is still vulnerable to pollution and it is considered that there is urgent need to reduce the phosphorus inputs to the system. Afforestation has taken place close to parts of the shoreline and further planting would be undesirable. Angling and wildfowling activities currently cause some disturbance to the birds and any increase in such activities would be of concern.

Whilst relatively small in area and subject to a number of damaging activities, this site retains national importance for two duck species. With an improvement in the

environmental conditions pertaining at the site, higher numbers of some species would undoubtedly occur.

19.8.2004

SITE SYNOPSIS

SITE NAME: LOUGH LENE

SITE CODE: 002121

This lake is situated 4km north east of Castlepollard in Co. Westmeath. It is a deep (20m max.), clear hard-water lake with marl deposition (especially noticeable on the margins).

The lake supports a range of pondweeds (including *Potamogeton perfoliatus* and *P. lucens*), Canadian Pondweed (*Elodea canadensis*) and a variety of stoneworts (*Chara* spp.), such as *C. pedunculata* and *C. curta* which are marl or hard water lake indicators. A stony shore fringes much of the lake - here species such as spike-rush (*Eleocharis* sp.), Jointed Rush (*Juncus articulatus*), Shoreweed (*Littorella uniflora*), Redshank (*Polygonum persicaria*), Marsh Pennywort (*Hydrocotyle vulgaris*) and sedges (*Carex* spp.) are found. A narrow fringe of emergent plant species dominated by Common Reed (*Phragmites australis*) and Common club-rush (*Schoenoplectus lacustris*) occurs along some areas of the lakeshore.

Patches of wet woodland colonise former areas of cut-away and other low-lying areas close to the lake and are dominated by willows (*Salix* spp.), birch (*Betula* sp.) and Alder (*Alnus glutinosa*) with patches of Common Reed also occurring. These areas support a rich ground flora. The ground flora of the wood at the north-western end of the site supports a range of *Sphagnum* mosses, Bilberry (*Vaccinium myrtillus*) and Heather (*Calluna vulgaris*). Alder carr occurs on the spur of land jutting into the lake at its north-western end.

Freshwater marsh/fen vegetation, with such species as Purple Moor-grass (*Molinea caerulea*), Bottle Sedge (*Carex rostrata*), Black Bog-rush (*Schoenus nigricans*), and Marsh Cinquefoil (*Potentilla palustris*), occurs in some areas by the lake; one such area supports a population of the rare Round-leaved Wintergreen (*Pyrola rotundifolia* subsp. *rotundifolia*).

Bird species using the site include Mute Swan, Teal, Pochard, Great-crested Grebe, Little Grebe, Tufted Duck, Grey Heron, Water Rail, Mallard, Golden Eye, Cormorant and Wigeon. The surrounding lands are used by Snipe, Lapwing and Curlew. Of particular significance is the Pochard population which, in the winters 1995/96 and 1996/97, was of national importance (average max. 515 individuals).

Much of the lakeshore is accessible to grazing cattle and the surrounding fields have been heavily improved. The stoneworts may become gradually displaced as the principal primary producers by phytoplankton or vascular plants if this and other such hard-water lakes become artificially enriched with nutrients. Unpolluted hard-water lakes such as Lough Lene are becoming increasingly rare in Ireland and in Europe and are of a type that is listed on Annex I of the E.U. Habitats Directive.

Lough Lene had a notable population of Freshwater Crayfish, a species that is listed on Annex II of the E.U. Habitats Directive, but this species disappeared from the site in 1987 following an outbreak of crayfish fungus plague. The species was since re-introduced to the site and breeding was recorded in 1995; however, since then a further outbreak of crayfish fungus plague has led to the disappearance of the species at the site.

1.8.2006

SITE SYNOPSIS

SITE NAME: LOUGH OUGHTER SPA

SITE CODE: 004049

Lough Oughter is a medium-sized lake that extends over a wide area. Its situation in submerged drumlin country accounts for the extremely ramified nature of its basin. The main feeders to the lake are the River Erne and the Annalee River. These flow over relatively insoluble rock (Ordovician and Silurian strata) so that the lake water is only moderately hard, despite the fact that most of the immediate surroundings are of Carboniferous limestone. Lough Oughter is a shallow lake (maximum depth 10 m) and is considered to be a naturally eutrophic system. Since the 1970s the lake has, however, shown clear signs of organic enrichment and has most recently been classified as being hypertrophic (though chlorophyll levels have dropped markedly in recent years).

The lakes have a well-developed aquatic flora, with a range of pondweeds (*Potamogeton* spp.) and such species as Yellow Water-lily (*Nuphar lutea*), Canadian Pondweed (*Elodea canadensis*), Mare's-tail (*Hippuris vulgaris*), Spiked Water-milfoil (*Myriophyllum spicatum*) and Water-starwort (*Callitriche* sp.). The aquatic community includes species of limited distribution in Ireland such as the duckweeds, Fat Duckweed (*Lemna gibba*) and Greater Duckweed (*Spirodela polyrhiza*). Around much of the shoreline there are well developed swamp and marsh communities, typically with a zone of Common Clubrush (*Scirpus lacustris*) in front of a zone of Common Reed (*Phragmites australis*) which is in turn backed by a more species-rich zone of sedges, grasses and herbs. In places, wet woodland is well-developed at the lake margins. This is mainly of willows (*Salix caprea* and *S. cinerea*), along with Alder (*Alnus glutinosa*), Downy Birch (*Betula pubescens*) and Hazel (*Corylus avellana*).

Lough Oughter is of importance for a range of wintering waterfowl. Of particular note is an internationally important population of Whooper Swan (302) that is based in the area and which uses the lakes as a roost - all figures are average peaks for the 5 seasons 1995/96-1999/00. A population of Greenland White-fronted Goose (67) of regional importance also roosts on the lakes and feeds mainly on nearby improved grassland. The site supports nationally important wintering populations of four species, i.e. Great Crested Grebe (92), Mute Swan (128), Wigeon (910) and Goldeneye (123). Other species which occur regularly include Teal (225), Mallard (341), Pochard (60), Tufted Duck (160), Lapwing (523), Curlew (95), Little Grebe (9), Cormorant (83) and Black-headed Gull (357).

Lough Oughter is at the centre of the breeding range of the Great Crested Grebe in Ireland and the site supports in excess of 10% of the estimated national breeding total (115 individuals in 1986-88). A small colony of Common Tern occurs, with 10 pairs on Farnham Lough in 1995.

Otter, a species that is listed on Annex II of the E.U. Habitats Directive, occurs at the site.

Lough Oughter is a very nutrient-enriched lake and numbers of wintering wildfowl, especially diving duck, are likely to be depressed due to the enriched conditions. Water pollution is likely to remain a problem in the near future. Recreational and wildfowling activities currently cause some disturbance to the birds and any increase in such activities would be of concern. Increased afforestation in surrounding areas could result in the loss of feeding habitat for wintering birds such as Whooper Swan and Greenland White-fronted Goose.

The Lough Oughter SPA is of importance for both wintering and breeding birds. Of particular note is the internationally important population of Whooper Swan that is based in the area. The site also supports nationally important populations of a further four wintering species. The site is of especial importance for one of the highest breeding concentrations of Great Crested Grebe in the country. Of note is that three of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Greenland White-fronted Goose and Common Tern.

19.8.2004

SITE SYNOPSIS

SITE NAME: LOUGH OWEL

SITE CODE: 000688

Lough Owel is a large hard water lake, a habitat listed on Annex I of the EU Habitats Directive. The lake is located approximately 4km north-west of Mullingar. It is a relatively shallow lake with a rocky, marl-covered bottom. Submerged vegetation includes a number of Stoneworts, notably *C. rudis* and *C. tomentosa*. The rocky nature of the shoreline has given rise to marginal vegetation which is patchy and sparse. Apart from some reedswamp formed by Common Reed (*Phragmites australis*) and Common Clubrush (*Scirpus lacustris*), shoreline vegetation is dominated by occasional patches of Alder (*Alnus glutinosa*).

There are, however, areas of marsh and fen in the northern and south-western corners of the lake. These areas (Bunbrosna marsh and Tullaghan fen) were formerly separate Areas of Scientific Interest but have now been included within the Lough Owel site. Bunbrosna is an area of marsh and fen which is partially invaded by Downy Birch (*Betula pubescens*) and Willows (*Salix* spp.). The area contains some rare plant species, namely Marsh Pea (*Lathyrus palustris*), Marsh Fern (*Thelypteris palustris*) and the protected Round-leaved Wintergreen (*Pyrola rotundifolia*). In addition, four other rare plant species are found along the lake margins namely, White Sedge (*Carex curta*), Fibrous Tussock-sedge (*Carex appropinquata*), Marsh Stitchwort (*Stellaria palustris*) and Frogbit (*Hydrocharis morsus-ranae*). Tullaghan fen is an area of flooded cut-over bog which has developed a varied fen and marsh vegetation quite similar to Bunbrosna marsh. Bog-sedge (*Carex limosa*), Tussock-sedge and Marsh Fern are to be found here.

Although Lough Owel is not noted for its wildfowl, there are small populations of Mallard, Shoveler, Pochard and Tufted Duck present. Farmland adjacent to the lake provides feeding grounds for internationally important numbers of Greenland White-fronted Goose. Lough Owel is one of the most important fishing lakes in the midlands and is especially good for Trout. Scharff's Char (*Salvelinus scharffi*), a distinct race of char which was once found only in Lough Owel and Lough Ennell, is now thought to be extinct. Notable invertebrates recorded from the lake include three caddis fly species: *Tinodes maculicornis, Metalype fragilis* and *Limnephilus nigriceps* (Trichoptera).

With the exception of Lough Carra in County Mayo, Lough Owel is the best example of a large, spring-fed calcareous lake in the country. The site is of major conservation significance, containing, as it does, three habitats that are listed on Annex I of the EU Habitats Directive, i.e. alkaline fens, transition mires and hard water lakes. Additionally, the site supports bird populations of conservation significance. Potential threats to the conservation interest of the lake include the increasing level of water supply to Mullingar, overfishing, eutrophication caused by local farming practices and pressure from amenity uses such as boating and fishing.

7.12.1999

SITE SYNOPSIS

SITE NAME: LOUGH OWEL SPA

SITE CODE: 004047

Lough Owel is a medium- to large-sized lake, with a length of *c.* 6 km along its long axis and a maximum width of 3 km. It is fed by a number of small streams and the main outflow is to the Royal Canal. Water is relatively shallow, with a maximum depth of 22 m. Overlying Carboniferous limestone, Lough Owel is one of the most important examples of a limestone lake in the Midlands. The water is moderately hard, alkaline and virtually colourless. The lake appears to be relatively unproductive with low levels of orthophosphate and moderate chlorophyll concentrations. The lake is classified as a mesotrophic system and its status has been stable in recent years.

Aquatic vegetation includes a number of stoneworts (*Chara* spp., notably *C. denudata* and *C. tomentosa* which are Red Data Book species). The rocky nature of the shoreline has given rise to marginal vegetation which is patchy and sparse. Apart from some reedswamp formed by Common Reed (*Phragmites australis*) and Common Clubrush (*Scirpus lacustris*), shoreline vegetation is dominated by occasional patches of Alder (*Alnus glutinosa*). Areas of marsh and fen occur above the shoreline in the northern and south-western corners of the lake. Several small islands occur in the southern sector.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Shoveler and Coot. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetlands & Waterbirds.

Lough Owel is one of the most important Midland lakes for wintering waterfowl, with nationally important populations of Shoveler (142) and Coot (1,825) - figures given are average peaks for the five seasons 1995/96-1999/00. The populations for both of these species represent a significant proportion (*c.* 5%) of the respective national totals. The lake is also of importance for diving duck, including Pochard (291), Tufted Duck (227) and Goldeneye (75). The lake has been used as a roost by the internationally important Midland lakes Greenland White-fronted Goose population (*c.* 400 strong). The lake also supports populations of Little Grebe (16), Great Crested Grebe (18) and Cormorant (32). Lough Owel is one of the most important fishing lakes in the Midlands and is especially good for Trout. The lake also holds an important population of White-clawed Crayfish (*Austropotamobius pallipes*), a species that is listed on Annex II of the E.U. Habitats Directive.

Whilst the water quality has been satisfactory in recent years, Lough Owel is vulnerable to pollution from agricultural and domestic sources. A deterioration in water quality could affect bird populations. Some of the areas above the shoreline, which are not within the site, have been afforested - further afforestation could be damaging to the system. An increase in recreational and wildfowling activities could cause disturbance to the birds though this is not considered to be a major threat.

Lough Owel has very significant populations of two species, Shoveler and Coot. It is also a notable site as it is used on occasions by the internationally important Midlands Greenland White-fronted Goose flock.

14.11.2007

SITE SYNOPSIS

SITE NAME: LOUGH SHEELIN SPA

SITE CODE: 004065

Lough Sheelin is a medium- to large-sized lake, with a maximum length of 7 km. The lake lies near the top of the catchment of the Inny River, a main tributary of the River Shannon. It is a typical limestone lake and is fairly shallow (maximum depth 14 m). The trophic status of the lake has varied greatly since the 1970s due to pollution from mainly agricultural sources. It was recently (1998-2000) classified as a highly eutrophic system.

The shoreline is varied and no one plant species predominates over large areas. Species present include Jointed Rush (*Juncus articulatus*) and Common Spike-rush (*Eleocharis palustris*) growing on stony beaches, with Yellow Sedges (*Carex cf. demissa*), Lesser Spearwort (*Ranunculus flammula*), Water Mint (*Mentha aquatica*) and Black Bog-rush (*Schoenus nigricans*) also represented. The shore of the lake is also wooded in places and there are some very small offshore islands that are wooded with willows (*Salix aurita* and *S. cinerea*). The islands are fringed by swamp communities of Common Reed (*Phragmites australis*), Common Clubrush (*Scirpus lacustris*) and Bottle Sedge (*Carex rostrata*). A good range of Charophytes has been recorded from the lake, including *Chare denudata*, a Red Data Book species.

Despite very variable water quality in recent decades, Lough Sheelin remains a very important site for wintering waterfowl, especially diving duck. It supports nationally important populations of four species, i.e. Great Crested Grebe (140), Pochard (546), Tufted Duck (762) and Goldeneye (224) all figures are average peaks for the 5 seasons 1995/96-1999/00. A number of other species occur in relatively low numbers, including Mute Swan (28), Mallard (76), Coot (24), Little Grebe (19), Cormorant (42) and Black-headed Gull (202).

The variable water quality over the years, with periods of highly eutrophic conditions, undoubtedly has had some adverse impacts on the wintering waterfowl, especially the diving duck. This would appear to be borne out by the very variable numbers of birds recorded over the years. It is considered that there is urgent need to reduce the phosphorus inputs to the feeder streams entering the lake.

Lough Sheelin is a nationally important site for four species of wintering wildfowl and is one of the main Midlands lakes sites for wintering birds. An improvement in water quality would probably result in higher numbers of birds frequenting the site.

6.10.2004

SITE SYNOPSIS

SITE NAME: MONEYBEG AND CLAREISLAND BOGS

SITE CODE: 002340

This site is located on the border of Counties Meath and Westmeath 9 km east of the town of Granard. It is situated mainly in the townlands of Clareisland or Derrymacegan, Williamstown and Moneybeg in County Westmeath and Ross in County Meath.

The site is a candidate Special Area of Conservation selected for active raised bog, degraded raised bog and Rhynchosporion, habitats that are listed on Annex I of the E.U. Habitats Directive. Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (*Sphagnum* spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, *Sphagnum* lawns, flushes and soaks. Degraded raised bog corresponds to those areas of high bog whose hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The Rhynchosporion habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (*Rhynchospora alba*) and/or Brown Beak-sedge (*R. fusca*), and at least some of the following associated species, Bog Asphodel (*Narthecium ossifragum*), Sundews (*Drosera* spp.), Deergrass (*Scirpus cespitosus*), Carnation Sedge (*Carex panicea*).

The site consists of twolowland raised bogs at Moneybeg and Clareisland, situated on the south and south-west shores of Lough Sheelin. An important feature of these bogs is that in some areas the transition from high bog to open water is intact and not separated by cutover.

The raised bog habitat includes both areas of high bog and cutover. The high bog at Moneybeg consists of a single small dome with extensive cutover to the east and west. Overall the high bog is flat with slopes associated with the southern margin. There is a wet area with a characteristic microtopography of pools, hummocks and hollows. The local road from Mount Nugent to Finnea runs through the bog and an isolated northern section adjoins the lake shore. There is also a large mound located to the west of the high bog. The raised bog is surrounded by agricultural land, which in the east, slopes steeply down to the cutover. There is forestry to the south and south-west. The raised bog at Clareisland consists of a small linear high bog extending along the shore of Lough Sheelin with only limited cutover to the east and west. There is an extensive wet area with frequent pools on the high bog and there is a slight slope towards the semi-natural lake margin. The local road described above runs by the southern margin of the high bog and there is forestry on cutover south of the road.

These high bogs have vegetation typical of Midland Raised Bog type consisting of Ling Heather (*Calluna vulgaris*), Hare's-tail Cottongrass (*Eriophorum vaginatum*), White Beak-sedge and bog mosses (*Sphagnum* spp.) with Cranberry (*Vaccinium*

oxycoccos) and Bog-rosemary (*Andromeda polifolia*) also present. On Moneybeg Bog, the bog mosses *Sphagnum capillifolium, S. papillosum, S. tenellum* and *S. imbricatum* are plentiful in the extensive wet area, with many large pools lined by bog mosses including the rare *S. fuscum*. Great Sundew (*Drosera anglica*) is present in some pools along with the bog moss *S. cuspidatum.* A few of the pools are completely in-filled with bog mosses and Common Cottongrass (*E. angustifolium*).

Clareisland Bog has a semi-natural margin with Lough Sheelin and an extensive wet area with a high cover of bog mosses and pools. Most of the pools are in-filling with Bog Asphodel, White Beak-sedge and bog mosses. Great Sundew and the bog moss *S. cuspidatum* occur in the pools and other bog moss species occur at the pool edges, especially *S. capillifolium, S. papillosum, S. magellanicum* and the rare *S. fuscum*. The lichen *Cladonia portentosa* is common, along with Bog-rosemary and Cranberry growing through the bog mosses. The semi-natural margin is dominated by tall Ling Heather with lush carpets of the moss *Hypnum jutlandicum* and large hummocks of the bog moss *S. capillifolium*. There are many deep cracks in the peat due to subsidence at the lake margin. A thin margin of Gorse (*Ulex europaeus*) and Downy Birch (*Betula pubescens*) scrub occurs at the lake edge.

At Moneybeg Bog there is extensive areas of cutover to the east and west, which have some active peat-cutting. Sections of old cutover are dominated by Ling Heather, Purple Moor-grass (*Molinia caerulea*) and Gorse scrub. These areas are bordered by Birch scrub and woodland. Across the road on the slope to the lake there is old cutover dominated by Purple Moor-grass grading into Birch scrub at the shoreline. The presence of a large wooded mound, which may be man-made in origin adds to the interest of this raised bog. At Clareisland Bog there are abandoned peat-cuttings in the north-west dominated by Ling Heather and to the east there is cutover dominated by Purple Moor-grass with encroaching Gorse scrub.

Landuse at Moneybeg Bog includes active peat-cutting to the east and west and forestry along the western margin. Current landuse at Clareisland Bog includes peat cutting to the west and north-west of the high bog and forestry along the southern margin. Damaging activities associated with these landuses include drainage and burning. Drainage has occurred on these high bogs in the past and at Moneybeg Bog there is evidence of recent and frequent burning of the high bog. These activities have resulted in habitat loss and damage to the hydrological status, and pose a continuing threat to the viability of these high bogs.

The Moneybeg and Clareisland Bogs site is of considerable conservation significance, comprising as it does two raised bogs with semi-natural lake margins at the north-eastern extreme of the range of raised bogs in Ireland. This is a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. The site supports a diversity of raised bog habitats including, hummock/hollows and pools. Active raised bog is listed as a priority habitat on Annex I of the E.U. Habitats Directive. Priority status is given to habitats and species that are threatened throughout the E.U. Ireland has a high proportion of the total E.U. resource of this type (over 60%) and so has a special responsibility for its conservation at an international level.

31.10.2002

SITE SYNOPSIS

SITE NAME: WHITE LOUGH, BEN LOUGHS AND LOUGH DOO

SITE CODE: 001810

This site is comprised of four hard water lakes, a habitat listed on Annex I of the EU Habitats Directive, in a small, poorly-drained valley, 4 km east of Castlepollard, Co. Westmeath.

A curious feature of the site is the contrast between Lough Doo and the other loughs. Although they are in close proximity and are connected by a ditch, Lough Doo has a very limited aquatic and marginal flora while all the rest are colonised by a wide, dense fringe of Great Fen-sedge (*Cladium mariscus*) swamp.

The bottom of Doo Lough is covered by an unusually extensive mat of stonewort species (*Chara* spp.) with a few sparse stands of Common Reed (*Phragmites australis*). The calcium-rich water has deposited marl on the lake bed and over the stoneworts themselves. The presence of stoneworts in such abundance is significant as many of these species are threatened by loss of habitat or by pollution.

Areas of wet woodland dominated by willows (*Salix* spp.) fringe some of the lakes, and elsewhere wet grassland and freshwater marsh occur. In places peat formation and acidification is indicated by the presence of heath species. Some of the steeper slopes around the lakes are covered with scrub or small areas of broadleaf woodland.

The White-clawed Crayfish (*Austropotamobius pallipes*), a species listed on Annex II of the EU Habitats Directive and protected under the 1976 Wildlife Act, has been recorded from these lakes.

This site is of considerable conservation significance for its hard water lakes and for the occurrence of White-clawed Crayfish. The variety of habitats within this valley and the contrasting vegetation types add further to its interest.

9.2.1999

Attachment C

Correspondence Received from National Parks & Wildlife Service and the Fisheries Board

Iascach Intíre Éireann
Inland Fisheries Ireland

Inland Fisheries Ireland
Drumsna
Carrick on Shannon
Co. Leitrim

Ms Emily McCarthy
OES Consulting Ltd
FBD House
Fels Point
Tralee
Co. Kerry

31st December 2011

RE: 1182_01 Appropriate Assessment of Peat Extraction Operations, Westland Horticulture.

Dear Emily

In response to your query regarding scoping for an Appropriate Assessment for Westland Horticulture's Peat Harvesting Activities on the River Inny.

Inland Fisheries Ireland (formerly Shannon Regional Fisheries Board) is a statutory agency with responsibility under the provisions of the Fisheries Acts for the protection, management and conservation of Ireland's inland fisheries resource.

Westland Horticulture is sited in close proximity to the River Inny and the silt ponds discharge to the River Inny. The River Inny holds good stocks of brown trout and has good salmonid habitat, it also supports coarse fish populations. The Shannon Salmon Restoration Project is committed to the restoration of sustainable stocks of salmon throughout the Shannon Catchment, the River Inny would be included within this plan. It in interests of sustainability it is imperative that all assessments carried out are cognisant of the River Inny's ability to support salmon in the future and do not impact on this plan in any negative way.

The River Inny and its tributaries holds crayfish and lamprey were found in a survey at Coolnagun Bridge. Lamprey and Crayfish are protected under Annex II of the EU Habitats Directive, you should consult with National Parks and Wildlife Services in this regard.

The assessment must consider the aquatic habitat in terms of spawning, river morphology, riparian and instream habitat and impacts on the fish species and water quality and invertebrates.

An assessment of the available dilution should be carried out, considering the cumulative impacts of discharges along the Inny and the large volumes of waters discharged to determine if the is sufficient assimilative capacity to discharge at a rate of 35 mg/l suspended solids. The impacts of peat siltation on watercourses and aquatic life are well documented.

It is important that the potential damage of pollutants and suspended solids can cause to the aquatic life is noted and measures are introduced to reduce risks to the aquatic environment. Increased levels of suspended solids will have negative effects on invertebrates (and an important source of food for trout). High levels of suspended solids can also cause fish habitat displacement, increased incidences of disease in fish, damage to the gills of fish and increased fish mortality rates and be detrimental to coarse fish spawning.

Impacts of elements of the operation, such as fuel storage, pump operations, peat stockpiles and silt from peat harvesting operations must be assessed and appropriate mitigation and control measures incorporated into the EMP and any EIS.

There is evidence of peat siltation within the River Inny over the years. The diffuse nature of the catchment and the increased run-off due to drainage of the working areas means that in periods of heavy precipitation plug flows can be significant in terms of run-off into the ponds and overflow across the outflow weirs, in these conditions retention time is more than likely reduced.

IFI has concerns about the frequency, accuracy and suitability of visual inspections (detailed within the Environmental Management plan) in relation to a fast response to unfavourable water quality as these inspections are subjective and not quantifiable. The potential impact of a once off large scale discharge or a number of smaller scale episodes lasting for up to 6 days is unacceptable in terms of an effect on the aquatic environment, peat siltation and water quality. I would therefore suggest the following:

The use of a wiped turbidity probe on a daily basis (or permanently deployed with regular maintenance checks) would provide meaningful data and information to allow for a fast response to any detrimental changes to water quality at pond discharges.

The pond retention times are not quantified within the EMP. In relation to the proposals (within the EMP dated 09/09) to investigate the use of wetland plants, Inland Fisheries Ireland requests that an update be provided in relation to works in this regard. Also consideration could be given to the use of cutaway bog area to facilitate extensive settlement with a view to increasing retention times. The optimum retention time would be 24 hours, but this will ultimately depend on the volumes of water and the peat silt concentrations within the water. Pond retention times should be quantified over a range of conditions.

Inland Fisheries Ireland requires that you consult further with the undersigned at the EIS stage in relation to this project.

Please do not hesitate to contact me should you have any queries.

Yours sincerely

Catherine Kerins
Fisheries Environmental Officer

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government

Ms Emily McCarthy,
OES,
FBD House,
Fels Point,
Tralee,
Co. Kerry,

Gov Buildings
Bellview
Mullingar
Co Westmeath

December 22nd 2010 .

Appropriate Assessment on behalf of Westland Horticulture Ltd , in regard to peat extraction works at Lower Coole, Mayne, Ballinealoe, Clonsura in Co.Westmeath.

Dear Emily ,

Further to your contacting Ms Triona Finnen, NPWS, Conservation Ranger for N. Westmeath . NPWS wish to assist you with your request and understand that you are in the process of drawing up an AA in relation to an EPA licence for this development
We welcome that the AA and EPA licence will assist in insuring protection for sites and species of nature conservation interest .We welcome also that the AA will assist in compliance to legislation and reduce any likely harmful emissions .
At the outset please note that NPWS are aware of peat extraction ongoing in this general location for many years . Due to a number of complaints and high level of concern reported to us and due to discussions on the possibility of seeking a ministerial order , NPWS Research Section (Mr D Tierney, Birds Unit) completed a water bird analyses regarding peat siltation impacts on L Derravaragh and concluded that

' *In response to Species Protection Unit's request there is no firm evidence in the waterbird dataset that can directly link the adjacent peat extraction activities with waterbird declines. However significant declines have been identified for several of the species of special conservation interest for Lough Derravargh SPA.*'

A copy of this analysis may be made available, on written application or request to NPWS .

In relation to the proposed AA under consideration here NPWS wish to highlight likely impacts on habitats and species of conservation concern ;
-including but not exclusively Otter ,Kingfisher ,Lamprey species and White- clawed crayfish -all of which may occur along the River Inny and in its associated tributary streams etc ,
-qualifying interests in the Lough Derravaragh Natura 2000 site (Special Protected Area for Birds)
-water quality impacts (in so far as these are likely to impact on habitats and species of conservation concern) .

We recommend that:
- the A.A. accurately describe the operation in terms of its scale, nature and location. Adequate descriptive information on the surrounding environment (should include natural heritage features and attributes, maps of habitats and some information on species using the site and adjacent area) .
- that the overall all finding of the AA be unambiguous and state with a high degree of certainty the extent of any likely impacts related to the works (and in particular impacts, if any, on Natuara 2000 sites , their habitats and species) .

In order to inform your position we request that you consider
- a review of any available information (OPW , Fisheries Board) on extent of peat siltation in Lough Derravaragh SPA (site code: 004043) .
- screening for including /exclusion -re likely impacts or otherwise - on any other downstream Natuara 2000 site or site of ecological concern (i.e. may need to consider distance from the development site , buffering capacity of L Derravaragh etc)

If any negative impacts are likely then the AA should include robust and proportionate mitigating measures to include .

1. Measures to reduce the risk of siltation along streams which run into the Inny River . Provision of sediment traps and outflow weirs of appropriate design (based on appropriately calculated surface water runoff). Contingency measures to account for periods of torrential rainfall/ flash flooding.
2 . In relation to any waste /water treatment a secondary treatment /filtering system should be described and appropriately sited .
3. A monitoring plan should include: an inspections sampling and analysis regime and also include a detailed maintenance programme (to insure that weirs etc are functioning correctly and that silt traps maintenance is ongoing).
4. Include proposals for dust suppression and measures to prevent, where possible , peat participle from becoming airborne. In particular consider duration and location of peat mound storage - eg no storage in proximity to riparian zones/natural water courses etc .
5 The provision of a buffer zone along the River Inny /riparian zone
6 General guidance for on site operatives to help prevent impact on water quality of Inny River including recommendations regarding use of herbicides near watercourses.
7 In order to reduce the potential impact on the designated sites from negative impacts

on water quality and habitat during the decommissioning of the site- we request that the AA considers recommending a restoration plan .

Additional information regarding designated sites is available on the NPWS website. Irish Wetland Bird data (IWeBS) and Whooper Swan data is collected by NPWS staff and collated by Birdwatch Ireland. Bird Usage Mapping data (available for SPAs) is held by the Divisional Ecologist (William Cormacan- 071 9666703) at NPWS, Ballinafad, Near Boyle, Co. Sligo.

Yours sincerely

Padraig O Donnell
Deputy Regional Manager
NPWS
North Midlands Region

0449342661

Cc i) to William Cormacan Divisional Ecologist NPWS
ii) WESTLAND HORTICULTURE
UNIT 14/GRANVILLE INDUSTRIAL ESTATE, GRANVILLE ROAD
BT70 1NJ DUNGANNON , COUNTY TYRONE

Appendix L.1.2

Site Survey Drawings of the Bogs

FINEA PEAT BOG

CONCRETE BASE

TRACK

SILT–PONDS

LSS Land Survey Services

FINEA PEAT BOG

WESTLAND PEAT

Topographical Survey

1:1000 | 01-07-09

SAM EWART | 17675-01

STATION POINT 66.86m

A.B.M ON STATION PEG=66.86m

COOLE PEAT BOG

CONCRETE BASE

SILT-PONDS

A.B.M ON BRIDGE WALL=70.60m

LSS Land Survey Services

COOLE PEAT BOG

WESTLAND PEAT

Topographical Survey

1:1000

SAM ELWARD

BRIDGE WALL 70.60m