



N63 LISS TO ABBEY REALIGNMENT SCHEME

IN THE MATTER OF AN APPLICATION TO AN BORD PLEANÁLA
FOR APPROVAL OF THE N63 LISS TO ABBEY REALIGNMENT SCHEME

ABP Ref. ABP-312875-22 and ABP-312877-22

ORAL HEARING

Part 2.2 – Response to DAU Submission

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Comhairle Chontae na Gaillimhe
Galway County Council



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1 Introduction

The purpose of this report is to provide responses from the scheme environmental team to the submissions received by An Bord Pleanála from the National Parks and Wildlife Service (NPWS) Development Applications Unit (DAU) on the EIAR, NIS for the N63 Liss to Abbey Realignment Scheme (hereafter referred to as the 'Proposed Road Development'), (ABP-312875-22).

This report has been divided into two sections to aid grouping of the responses, initially covering submission comments related to Nature Conservation, and secondly covering comments related to other biodiversity issues.

The report below provides an extract of the DAU submission at the start of each section for ease of reference.

2 Nature Conservation

2.1 Annex 1 Habitat: Petrifying Springs

DAU Submission Comment: *Particular attention should be paid to ensuring the adequacy, design and mitigation of the proposal regarding the avoidance of negative impact through hydrological effects on the adjacent Annex 1 Qualifying Interest Priority habitat Petrifying Springs*(NATURA code 7220) which occurs within the SAC. In the Corrib SAC Conservation Objectives for this habitat there is a Target to "Maintain appropriate hydrological regimes" and it is stated that "Water flow should not be altered anthropogenically".*

2.1.1 Response

The design of the road has ensured that the layout is sympathetic to and will not, beyond reasonable scientific doubt, adversely affect the petrifying springs habitat. As the project is not in deep cut in the vicinity of the Petrifying springs habitat, there will be no alteration of the water table or the water flow to and from the petrifying springs. It should be noted that groundwater investigations have concluded that it is unlikely that the construction works here will impact on groundwater conditions here. Therefore, it is highly unlikely that any hydrological impacts will occur on the petrifying spring habitat here.

We note that during the EIAR survey and preparation one spring was identified as a calcareous spring, the other as petrifying springs, this has been re-stated here for clarity.

Specific mitigation for the Petrifying springs habitat is described in the EIAR chapter 7.7.1.3.1.1 and 7.7.2 which notes that ecological monitoring and protection will be undertaken to ensure protection of this habitat. We note that an outline method statement has been included as part of this response in appendix A, which expands on the following Specific mitigation measures as outlined in the EIAR:

- Strictly delineating the works area.
- Minimising any additional hard-surfaced areas to avoid increase of runoff.
- Changes in surface water hydrology have been considered in the drainage and overall construction design for the Proposed Road Development. Groundwater investigations to date have concluded that it is unlikely that the construction works here will impact on groundwater conditions here.
- A hydrogeological risk assessment, also known as a groundwater risk assessment, has been completed for this project, and has considered the potential for adverse impacts on the Petrifying Springs habitat. Mitigation measures and recommendations have been provided in the EIAR.
- A quarterly sampling programme will be undertaken for one year before construction and throughout the duration of construction works. This will include scheduling samples for an inorganic suite of analyses, to include pH, electrical conductivity, ammonium, nitrate, fluoride, chloride and sulphate.

- The footprint of construction activities in the area will be minimised. The area will be clearly marked and areas to be retained/protected will be cordoned off in advance of works.
- The existing bank and hedgerows which act as a barrier between the road and this habitat area shall be retained, as per the current scheme design.
- Temporary signage will be installed to highlight the location of the Petrifying Springs habitat to construction personnel accessing the site.
- Any requirement for stockpiling, re-fuelling of machinery, etc. during the construction phase will be sited >50 m away from the Petrifying Springs habitat.
- There will be no interference with areas of the Petrifying Springs habitat during site works, outside of the proposed works footprint.
- The quantity of material to be translocated will be minimized through careful marking of the route footprint.
- Silt fencing and silt traps will be installed along the route to ensure any runoff from the works in the vicinity of this habitat area is captured.
- A buffer zone of a minimum allowable distance of 10 m between works activities from this Annex I habitat is to be maintained throughout works.
- Clearance of existing vegetation is to be kept to an absolute minimum within 50 m of this habitat area.
- Clearance of topsoil/substrate is to be kept to an absolute minimum within 50 m of this habitat area.
- To prevent any impacts to the Petrifying Springs habitat, imported material if required for base fill used within 100m of the spring habitat would be derived from limestone and would be of a size that would freely permit flow of waters through it.
- In order to avoid any alteration to groundwater pH, only locally-derived limestone shall be used in the construction within the Zol of this habitat. This limestone for base fill will be of a size that permits flow of waters through it. This mitigation measure may ensure no changes to the alkalinity of the Petrifying Springs habitat and will support hydrological connectivity between the north and south side of the Proposed Road Development.
- The Zol has been informed by hydrogeological investigation, and no impact is deemed likely on this habitat type. However, monitoring is to be carried out throughout the construction phase and further mitigation measures shall be devised and implemented as necessary. Minimising the compaction of soils and other substrates associated with construction within the Zol of this habitat type would be required.
- Weekly visual checks will be undertaken of the Petrifying Springs habitat while construction works are occurring within the Zol, with photographs taken and written descriptions of flow recorded.
- Ecological monitoring is to be undertaken as per guidelines given by the NPWS (2016). This monitoring is to employ suitable indicator criteria as per Lyons & Kelly (2016) such as tufa type, surface water characteristics and field/ground flora.
- If ecological monitoring determines that flow rates are being influenced within the Petrifying Springs habitat, additional mitigation measures may be required to ensure the protection of the Petrifying Springs habitat (e.g. alterations of works area amending ground works to ensure that the Petrifying Springs habitat is receiving suitable water).

Pollution Prevention

- Best practice protocols in construction will be followed for the duration of the works. These include the measures to protect water and prevent water pollution, avoid, and prevent the spread of invasive species, dust and air emissions, and prevention of unnecessary clearance (see Chapter 09 Water and Chapter 08 Land and Soils).

2.2 Lamprey ammocoetes

DAU Submission Comment:

Regarding the timing of the Sheet Piling for abutment construction within 10 m of the riverbank the NIS states that the Piling of the proposed bridge abutments adjacent to the Abbert River should be programmed so as to avoid sensitive lifecycle periods for QI Atlantic Salmon and Brook Lamprey and that Piling is to be scheduled from July to September inclusive. However Sea Lamprey are also mentioned as an effected species in the column and though varying with water temperature, are known to spawn into July and therefore would not be fully mitigated for under the proposed timing if present. As a Qualifying Interest of the Corrib SAC it needs to be clarified whether or not they are potentially present (surveyed for).

The NIS does not assess potential impacts on Lamprey ammocoetes and no survey for their potential presence or potential supporting habitat appears to have been carried out either at the river itself or in any other potentially suitable watercourses (for example at the drain with fisheries potential). Ammocoetes burrow in areas of fine sediment in relatively still water. As qualifying interest species of SAC this should be addressed. Potential effects could be through the river side sheet pilling abutment work or direct loss during drain works. There is some limited suitable ammocoete habitat on the north bank of the river where it is to be crossed. Any potential effects should be assessed in terms of the SAC Conservation Objectives Attributes and Targets regarding Availability of juvenile habitat and Juvenile Density.

2.2.1 Response

A survey for Sea Lamprey *Petromyzon marinus* was not carried out. Sea Lamprey are not known to occur within the Abbert. A survey by O'Connor (2007)¹ found that only one species of lamprey was confirmed from the Corrib catchment - Brook Lamprey *Lampetra planeri*. The Abbert River was surveyed along 5 discrete sites and Brook Lamprey were present in 3 of these sites, which confirmed River Lamprey and Sea Lamprey to be absent. The overall survey found that Sea Lampreys are confined to below the Galway Regulating Weir and their spawning success here is unknown. In addition it is noted in King et al. (2008)² that recent reports of sightings of adults passing through the fish pass structures on the Galway weir and of spawning adults were anecdotal only. Although there are records of Sea Lampreys in some of the tributaries of Lough Corrib, these records pre-date the construction of the existing weir. The mitigation measures described are therefore adequate as there will be no impacts on this species. However, to ensure the absence of both sea and brook lamprey, preconstruction surveys will occur within the zone of influence of the bridge prior to construction.

Mitigation measures for Brook Lamprey have been identified within the NIS and the EIAR, these mitigation measures also protect Sea Lamprey and all fish species. It is also noted that the bridge form and span selected for this scheme has ensured that no instream works will occur, with a substantial set back from river banks, and for clear spanning of the River Abbert.

Works are not predicted to have any direct impacts on Lamprey ammocoetes that may be present in the River Abbert. This is given the absence of in-stream works and the set-back of works from the river. Taking the above into consideration and given that Sea Lampreys are confined to below the Galway Regulating Weir, measures to mitigate impacts on Lamprey species in the river and drain include those listed below and as presented in Sections 7.5.2.6.4, 7.5.4.9.1 and 7.7.1.1.3 of the EIAR Chapter 07 Biodiversity:

- Chapter 7 biodiversity section 7.5.4.9.1 states that: Sheet piling will be required for abutment construction within 10m of the riverbank. The set back of the final bridge abutment from the river back is 5m at its closest point. Piling of the proposed bridge abutments adjacent to the River Abbert should be programmed so as to avoid sensitive lifecycle periods for QI Atlantic Salmon and Brook Lamprey. Piling is advised to be scheduled from July to September inclusive, unless otherwise agreed with IFI.

¹ O'Connor, W. (2007) A Survey of Juvenile Lamprey Populations in the Corrib and Suir Catchments. *Irish Wildlife Manuals No. 26*. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

² King J.J., Hanna G. And Wightman G.D. 2008 Ecological Impact Assessment (EcIA) of The Effects of Statutory Arterial Drainage Maintenance Activities on Three Lamprey species (*Lampetra planeri* Bloch, *Lampetra fluviatilis* L., and *Petromyzon marinus* L.). *Series of Ecological Assessments on Arterial Drainage Maintenance No 9 Environment Section*, Office of Public Works, Headford, Co. Galway.

- Section 7.5.4.9.1 also states that: Drain works should be undertaken in a manner, and in a timeframe to be agreed with Inland Fisheries Ireland. It is noteworthy that some drain works are classified as 'instream works' and therefore time restrictions for these works will apply. Drain works may require the use of silt bags, settlement tanks and/or attenuation ponds
- Section 7.5.4.9.1 also states that: The drain identified as having fishery potential will need to be de-fished, under licence, in a manner to be agreed with Inland Fisheries Ireland (e.g. 1. electrofished/ 2. netted/ 3. dewatered with a pump (with a mesh suitable to stop fish suction into the pump) with fish gathered in ponded areas removed. Live fish will need to be removed and released to the Abbert River. Defishing will need to be undertaken under licence from IFI.
- A significant tranche of mitigation of impacts on Lamprey from piling operations is given in Section 7.5.2.6.4, including timing and phasing of works.
- Drainage design, incorporating SuDS principals, inherent in the overall design, will prevent emissions to the river during the construction and operational phase of the Proposed Road Development, and facilitate water treatment;
- Woodland, scrub, treelines, and hedgerows which lie within, or along the boundary of the Proposed Road Development, that are not directly impacted by the Proposed Road Development or drainage will be retained, thus reducing the area for dust generation and risk of silt entry to watercourses. These areas will be protected for the duration of construction works and fenced off at an appropriate distance. Consideration will be made to ensure minimal disturbance of roots, and sensitive areas (including Root Protection Areas) will be cordoned off with post fencing to ensure no unnecessary damage to these habitats. Works will be done in accordance with 'Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes' (TII, 2006d).
- Control measures such as check dams, and silt fencing will be used throughout the construction phase to reduce the risk to Lough Corrib SAC. Regular monitoring and recording of the effectiveness of the control measures will be used and implemented with additional control measures employed if and when required.
- Supported silt fencing (supported by wooden posts or suitable alternative) along the route will be installed where watercourses, including drains, are at risk from silt entry. The base of these curtains will be buried into the ground to ensure the fences work effectively. Diversions of surface flows into swales is also envisaged, if necessary, to manage surface waters and prevent pollution incidents;
- Minimal hedge removal through 'stepping-in' of proposed fence lines near these habitats;
- Installation of cut-off drains, inherent in construction design, will aid in maintaining a drier works area, and limit surface waters within the construction area. This embedded mitigation will prevent risks to surface waters;
- Phasing and other silt control measures to be refined by the Contractor into a construction stage Erosion and Sediment Control Plan (CESCP), which will be agreed between GCC and the appointed Ecological Specialist. It is noted that the EIAR Appendix A4-1 Outline CEMP contains the current scheme CESCP in appendix A;
- Phasing of works and other silt control measures to be refined by the CESCP, which will be agreed between the Contractor, ECoW and Client (and Client's Ecological Specialist). The CESCP will conform to requirements within this EIAR;
- Construction compounds will be required along in the vicinity of the Proposed Road Development. The construction compounds are outside of all European Sites and a minimum of 25m from Rivers and 10m from field drains. The current area for proposed compound areas are flat areas, deemed to be of low risk to the Lough Corrib SAC. Mitigation measures noted in this document, in relation to preventing surface water pollution, will be applied to the proposed compound area and conform to this EIAR and requirements outlined in the CESCP (contained in appendix A4-1 of the EIAR);
- Use of a high-performance silt fence around all works or stockpiles that have potential to affect waterbodies (surface or groundwater) or Annex I habitats; and specifically, and exclusively following installation methods outlined in published literature (Caraco, 2000) to

maximize the effectiveness of particle filtration by geotextiles. Use of silt fencing to specification of Hy-Tex Terrastop Premium or similar, whose efficacy has been proven by credible evidence (Liddon, 2013) is required. Fencing will be inspected and assessed for its effectiveness and suitability by the ECoW and Client;

- Use of additional layers of high-performance silt fence, locally, if necessary, to avoid pollution to watercourses or Lough Corrib SAC/SPA, this requirement will be inspected and assessed for its effectiveness and suitability by the ECoW and Client;
- Supervision of installation and performance throughout construction of silt fencing and other pollution control measures by the ECoW and ER Team who will advise the Contractor on repairs required to maximize performance;
- Procedures for dewatering the working area to include adequate treatment of any resulting silt-laden surface water prior to discharge. Use of silt dewatering bags or tubes in conjunction with filter drains/check dams, silt fencing and other means necessary (including swales) to capture, attenuate, and treat surface water generated during construction prior to any discharge to watercourses. If silt is removed from surface/groundwater from mitigation measures, and no contamination is apparent, no adverse impact of the entry of such waters to the environment is envisaged and this practice is deemed satisfactory. No polluted waters/contaminated water is to be released/discharged to a watercourse without a required discharge licence approved by IFI;
- All bowsers onsite will be clean on arrival (internally and externally) in order to ensure that no pollutants were present within, that may otherwise enter the environment during use;
- Fuel handling and bunding procedures are to be in place during the works, with particular care near rivers, streams, and watercourse (See Chapter 09 Water). Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated areas which will be located away from surface water gullies or drains, with no refuelling within 30 m of a watercourse;
- Stockpiles will have a minimum setback of 20 m and >20 m where possible, from watercourses. Adequate SuDS (e.g. surrounding cut-off drain, silt fencing, settlement ponds) will be installed if required to ensure environmental risks associated with silt are minimised. Seeding of stockpiles (to prevent erosion and dust creation) will be undertaken if deemed necessary by the ECoW or Ecological Specialist;
- Contractor to adopt, and provide evidence to GCC and the Ecological Specialist of staff training in Spill Response & Control Plan to minimize the risk of adverse impacts upon surface waters and groundwater in the potential event of accidental spillages, flooding, or other emergencies;
- Establishment of contingency measures to cater for impacts to unknown services underlying the construction site (for example, old sewers, culverts);
- Control of mud at entry and exit points to the works area using wheel washes;
- Material and machinery/fuel storage to be outside flood-prone areas and removed from such areas in advance of floods to ensure environmental protection; and
- Mitigation measures relating to safeguarding water quality during the construction phase are outlined in Chapter 09 Water of this EIAR.

The following guidelines will be followed to ensure protection of the environment:

- IFI (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Dublin;
- CIRIA Guidelines Control of water pollution from construction sites –Guide to Good Practice (C532); and
- Control of water pollution from linear construction projects. Technical Guidance (C648).

2.3 Molinia meadows

DAU Submission Comment: *Regarding the proposed loss of 0.36ha of the annexed habitat under the Habitats Directive (6410) Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae), it is stated in the NIS that the receptor site for translocation is the field adjacent to the southwest of this area but that it is identified as the preferred location and it is subject to further review at the detailed design stage. As this receptor site is part of the proposed mitigation/compensation in the NIS/EIA it should only be replaced as the receptor site for ecological reasons only. Monitoring is proposed for three years but this is too short a duration as it may take longer to confirm establishment or failure of the translocation than that time period.*

2.3.1 Response

The Applicant welcomes the submission provided by DAU relating to the translocation of *Molinia* meadows habitat.

It is not envisaged that this will change from the proposed receptor site as noted in the EIAR as ecological conditions in the location have been deemed to be suitable.

In relation to monitoring, an annual report, will be produced, documenting the establishment of the translocated *Molinia* meadow habitat. Monitoring will continue until the translocation is confirmed established by an independent ecologist. The success of the translocation will be certified by the independent ecologist.

Reports documenting the establishment of the translocated *Molinia* meadow habitat will be submitted by Galway County Council to NPWS and TII on an annual basis for information.

2.4 Method Statements / Translocation plans

DAU Submission Comment: *The board must ensure that the future Petrifying Springs and Molinia meadows habitat Method statements, Translocation Plan, Monitoring and habitat enhancement and maintenance plan are adequate to ensure no adverse impacts on the Petrifying springs and successful mitigation for the Molinia meadow habitat loss.*

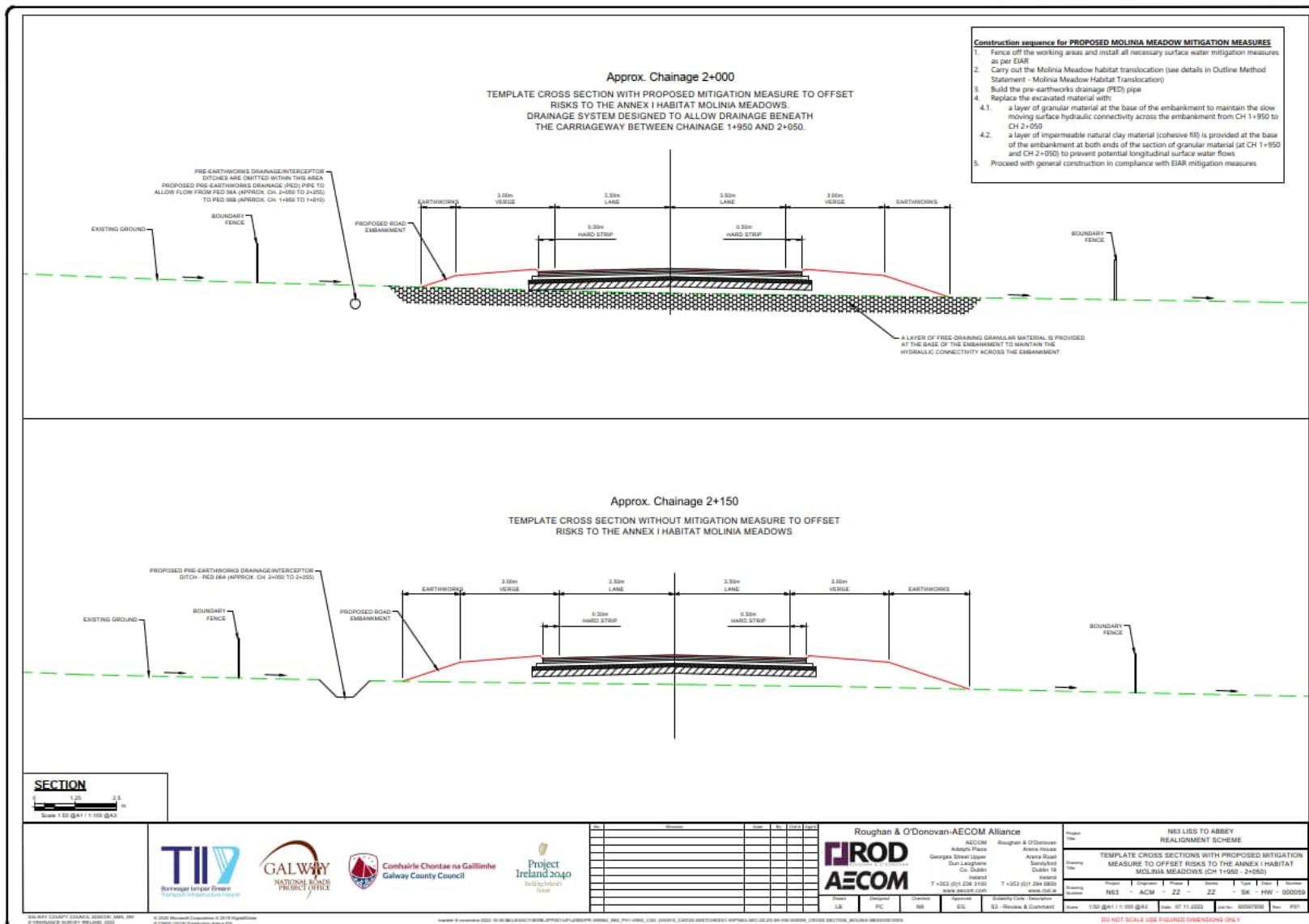
2.4.1 Response

EIAR Chapter 7, biodiversity section 7.7.1.3.1.2, sets out that a detailed Molinia translocation management plan will be drafted by the contractor and a suitably qualified botanist and notes the headings that must be included within the plan. It further notes that the plan is to be reviewed by Galway County council and the NPWS. A method statement which incorporates the following elements as a minimum will be prepared and issued to the NPWS for information, the outline method statement has been prepared and included in appendix B below, which incorporates the following elements as outlined in the EIAR:

- The field for translocation will be the subject of advance consultation with and inspection by a suitably qualified botanist, to ensure it has been prepared appropriately in advance of translocation of sods;
- Sods will be carefully positioned, and not stacked, to avoid damage;
- Sod removal and sod translocation will coincide to maximise likelihood of sod development, and prevent disturbance of adjacent ground associated with tracking or for temporary storage;
- Translocation will only be undertaken under supervision of the ECoW and suitably qualified ecologist/botanist to ensure translocation success;
- Translocation will occur at a time (i.e., season) that will optimise the successful establishment of Annex I Molinia Meadow at the translocation area;
- Sods will be carefully cut, and handled with care, prior to being translocated to the compensation area;

- To complement partial translocation and habitat protection, works will be undertaken to protect remaining areas of this habitat (including translocated sods) and the hydrology of the area either side of the development through installation of suitably free-draining, clean, large, rounded, locally derived limestone under the road embankment;
- Hydrological impacts of the Proposed Road Development have been considered, and retention of hydrological characteristics of retained areas will also be accounted for during construction. The *Molinia* area on both sides of the Proposed Road Development area will be monitored monthly during the construction phase and areas within ownership of the Council will be managed as appropriate to ensure it retains good ecological status; and
- The ECoW and Client's Ecological Specialist will verify that the Contractor has left the site of the Proposed Road Development in a satisfactory condition, and where relevant direct the Contractor to remove any materials offsite.

In addition, we have produced a cross-section (Figure 2-1 below) to show the maintenance of the hydrological regime across the *Molinia* meadow's footprint. This has also been added as an Addendum to the EIAR. Clay-type material is to be used at either side of the *Molina* meadows side to ensure that the road does not act as a drain.



Specific mitigation for Petrifying springs habitat is also noted in the EIAR sections 7.7.1.3.1.1 and 2 and notes monitoring of the Petrifying Springs habitat will be undertaken along with a groundwater risk assessment and a water sampling regime. A Method statement will be drafted prior to works during the detailed design for construction phase and this method statement will also be provided for information/comment in advance of construction works to the NPWS. The Mitigation measures which will be put in place and which may be augmented by the Method Statement, include:

- Strictly de-lining the works area.
- Minimising any additional hard-surfaced areas to avoid increase of runoff.
- Changes in surface water hydrology would be considered in the drainage and overall construction design for the Proposed Road Development. It should be noted that groundwater investigations have concluded that it is unlikely that the construction works here will impact on groundwater conditions here. Therefore, it is highly unlikely that any hydrological impacts will occur on the Petrifying Spring habitat here.
- A groundwater risk assessment is to be carried out prior to construction works.
- A quarterly sampling programme will be undertaken for one year before construction throughout the duration of construction works. This will include scheduling samples for an inorganic suite of analysis, to include pH, electrical conductivity, ammonium, nitrate, fluoride, chloride and sulphate.
- The footprint of construction activities in the area ~~should~~ will be minimised. The area should be clearly marked and areas to be retained/protected should be cordoned off in advance of works.
- The existing bank and hedgerows which acts as a barrier between the road and this habitat area shall be retained. As per the current scheme design.
- Temporary signage will be installed to highlight the location of the Petrifying Springs habitat to construction personnel accessing the site.
- Any requirement for stockpiling, re-fuelling of machinery, etc. during the construction phase will be sited >50 m away from the Petrifying Springs habitat.
- There will be no interference to areas within the zone of influence of the Petrifying Springs habitat during site works, outside of the proposed works footprint.
- The quantity of material to be translocated will be minimised through careful marking of the route footprint;
- Silt fencing and silt traps will be installed along the route to ensure that any runoff from the works are in the vicinity of this habitat area is captured.
- A buffer zone of a minimum allowable distance of 10 m between works activities from this Annex I habitat is to be maintained throughout works.
- Clearance of existing vegetation is to be kept to an absolute minimum within 50 m of this habitat area.
- Clearance of topsoil/substrate is to be kept to an absolute minimum within 50 m of this habitat area.
- To prevent any impacts to the Petrifying Springs habitat, imported material for base fill used within 100 m of the spring habitat would be made of limestone, if required, and would be of a size that permits flow of waters through it.
- In order to avoid any alteration to groundwater pH, only locally derived limestone shall be used in the construction within the Zol of this habitat. This limestone for base fill will be of a size that permits flow of waters through it, if required. This mitigation measure may ensure no changes to the alkalinity of the Petrifying Springs habitat and will support hydrological connectivity between the north and south side of the Proposed Road Development.
- The Zol has been informed by hydrogeological investigation, and no impact is deemed likely on this habitat type. However, monitoring is to be carried out throughout the construction phase and further mitigation measures shall be devised and implemented as necessary.

Minimising the compaction of soils and other substrates associated with construction within the Zol of this habitat type would be required.

- Weekly visual checks will be undertaken of the spring while construction works are occurring within the Zol, with photographs taken and written descriptions of flow recorded.
- Ecological monitoring is to be undertaken as per guidelines given by the NPWS (2016). This monitoring is to employ suitable indicator criteria as per Lyons & Kelly (2016) such as tufa type, surface water characteristics and field/ground flora.
- If ecological monitoring determines that flow rates are being influenced within the spring, additional mitigation measures may be required to ensure the protection of the spring (i.e. alterations of works area, and ground works to ensure that the spring is receiving suitable water).

2.5 European Communities (Environmental Liability) Regulations 2008

Schedule Criteria in Assessing Damage to Protected Species and Natural Habitats

DAU Submission Comment: *The EPA's European Communities (Environmental Liability) Regulations 2008 Schedule Criteria in Assessing Damage to Protected Species and Natural Habitats may also be relevant with regard to the annexed habitat. Damage to natural habitats and protected species means any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of those habitats or species. The species and habitats covered are those listed in the Birds Directive (79/409/EEC) and the Habitats Directive (92/43/EEC) and the Environmental Liability Regulations apply protection against damage to all species of birds, plant and animals listed in the relevant legislation wherever they occur in Ireland regardless of whether they are within or outside a designated land area. When the EPA is notified of a potential case of environmental damage, an assessment may be undertaken to determine if the Environmental Liability Regulations apply or if other legislation applies.*

2.5.1 Response

It is acknowledged that the Proposed Development will be carried out in compliance with all relevant legislation including the European Communities (Environmental Liability) Regulations 2008 and the Council is cognisant of the Schedule Criteria in Assessing Damage to Protected Species and Natural Habitats as contained in those Regulations as referred to in the DAU submission.

Cognisance will be taken of these regulations in the carrying out of the development in connection with this project.

2.6 Site Compound No.2

"There are concerns regarding the proposed location of Site Compound No.2. It is located on lands adjacent to the current N63 and within 13m of the boundary of Lough Corrib SAC. These lands consist of Wet Grassland with large boundary water filled ditches and hedgerow. These water filled ditches are connected to the adjacent SAC via drains, springs and flushes that flow under the N63. These waters form pools in wet woodland and marsh habitat before flowing over the surface and into the Abbert River. This location is also near to the Annex 1 Petrifying Spring identified and it should be noted that several water leakages along the banks of Abbert River in this area may also correspond to the Annex 1 Petrifying Spring habitat. If this is the desired location for Site Compound No. 2 the board should be satisfied that, as per above, the proposed Mitigation Measures are adequate in order to rule out any significant impact on water quality, wetland habitat and qualify interest species and habitats of Lough Corrib SAC."

2.6.1 Response

The mitigation measures outlined in the Biodiversity chapter (sections 7.7.1.3.1.1 and 7.7.2 and outlined in the above document in section 2.1.1) that are in place for Annex 1 Petrifying Spring are considered sufficient to protect the ditches and Annex 1 Petrifying Spring habitat.

The proposed compound areas are flat areas, deemed to be of low risk to the Lough Corrib SAC. Mitigation measures, noted previously in Section 2.1.1 above, in relation to preventing surface water pollution, will be applied to the proposed compound area. As outlined in Section 9.7.1 of Chapter 09 Water of the EIAR, drainage channels and streams will be clearly identified onsite and shown on method statements and site plans. Construction compounds will also be located at least 25 m from watercourses and 10 m from field drains. The petrifying springs identified adjacent to the scheme are located over 75m upstream from the proposed Site Compound no. 2.

The proposed Site Compound will be within the Red Line Boundary of the scheme and is located between the proposed N63 and the existing N63 to allow for easy access to the works. The wet grasslands that are mentioned are not the location of the proposed Site Compound. These are outside the scheme Red Line Boundary, the Site Compound is to the east of this area. This area is on higher dry ground and is downstream of the petrified streams. As detailed above there will be mitigation measures and pollution control measures put in place to minimise the risk of pollution of the existing water courses.

Figure 2-2 below shows the wet grasslands outside the red line boundary, the proposed site compound, shown in Figure 2-3, will be located to the east of this area on existing farmland within the red line boundary.



Figure 2-2 Aerial Imagery showing wet grassland areas referenced in DAU submission (located to the South-West of actual Site Compound Location)

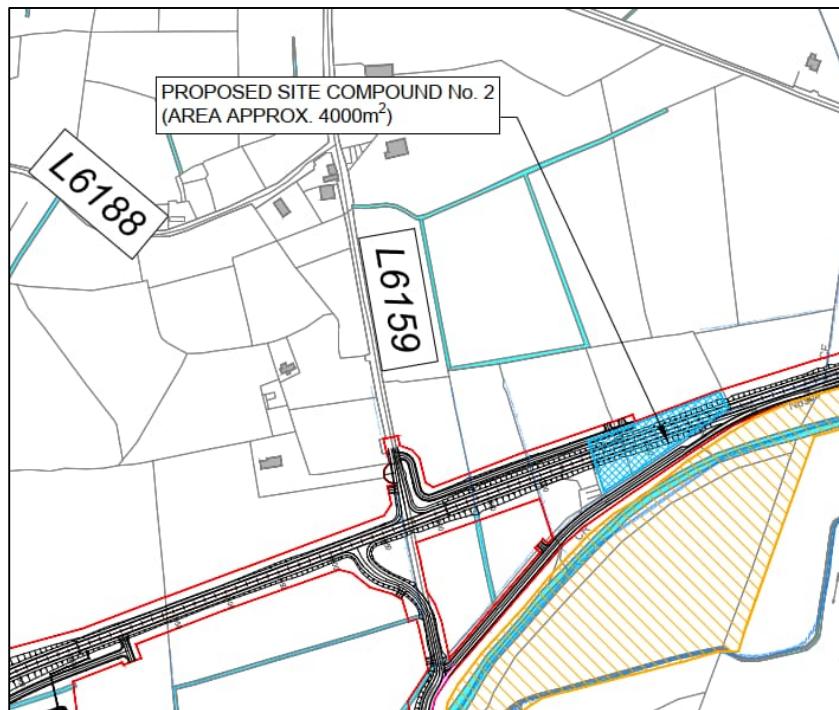


Figure 2-3 Proposed Site Compound No.2 Location

2.7 Replanting Native Species

DAU Submission Comment: *It is noted that it is proposed to include areas of “Wildflower Meadows” from seed in a native wildflower grass mix. Some of the proposed areas for reseeding are adjacent to grasslands within Lough Corrib SAC and along the Abbert River and in other areas it is proposed to reseed existing improved/wet grassland habitat. Restoring the current improved/wet grassland to a semi natural state through a grazing management regime rather than reseeding may be more appropriate as a nature conservation measure. Planting of native trees and shrubs along the Abbert River may be more suitable than reseeding the current grassland up to the SAC boundary. Reseeding poses a risk for the introduction of non-native invasive species including grass species which significantly impact on semi natural grasslands within the SAC and surrounding areas. It may be more suitable and successful to harvest or collect native wildflower seeds and grasses from a meadow or grassland in this locality of Galway to use as part of the landscaping of this development. The bankside of the river contains very few tree’s and it would be a beneficial nature conservation measure to plant native tree species such as alder and willow, this may also aid regarding bank stability as in places it is eroding.*

2.7.1 Response

We confirm that the detailed design planting design will include native trees and shrubs to include Alder and Willow. Within the SAC and surrounding areas, only native seeds will be used and these shall be collected from local sources (supplemented by other suitable native seed). .

3 Other Biodiversity Issues

3.1 Net Biodiversity Gain/Loss

DAU Submission Comment: However, it is stated in one section of the EIA that there will be permanent net loss of other habitats including scrub and hedge whilst in the summary it is stated that there will be Hedgerow and Scrub Habitat gain (through landscape plan). Therefore, it needs to be clarified if there will be net gain or loss of these habitats. Also there is a lack of quantitative data and therefore an estimate should be provided of the length/area of any hedgerow/scrub/other semi-natural habitat that will be provided regarding the proposed semi-natural habitat gain through the Landscaping plan/masterplan etc.

3.1.1 Response

Approximately 8 hectares of habitat will be lost within the works footprint with approximately 7.55 hectares of habitat areas to be planted post construction. It has been calculated that the overall net loss of habitat area will be approximately 0.47 hectares. However, of the total habitat areas affected, the greatest part of these to be lost is improved agricultural grassland (GA1). This is a species-poor habitat, dominated by a small number of grass species with few other flowering species. The landscaping plan will allow for the creation of 3.5 hectares of mixed native hedgerow and woodland cluster tree planting and 0.04 hectares of shrub planting. It should be noted that this proposed landscaping will see the establishment of **far more valuable habitat in terms of food plants, nesting and roosting habitat**. **The net effect over time will be a more biodiverse area than the existing.** There will be no net loss of Molinia meadow as a result of the Proposed Development. Further information on areas of habitat loss within the works area and proposed areas of habitat planting are included in Table 3-1, which expands on the relevant sections of the EIAR as noted below.

Table 3-1 Table extracted from Chapter 07 Biodiversity Section 7.5.3: Area and Relative Percentage of Habitat/Habitat Features Surveyed

Habitat Types	Habitat Codes	Total Habitat Areas in the Study Area (ha)	Total Habitat Areas within the CPO Line (ha)	Estimated Total Habitat Areas lost in Works Footprint (ha)	Estimated Total Habitat Areas Planted (Operational Phase) (ha)
Amenity grassland	GA2	9.7	0.1	0.1	
Drainage ditches	FW4	0.9	0.1	0.1	
Hedgerow	WL1	12.1	1.1	0.7	0.77
Scrub/Hedgerow	WS1/WL1	0.5	0.1	0.1	
Improved grasslands	GA1	246.2	6.2	3.9	
Native wildflower grass mix	GS1				3.1
Improved grasslands/Wet grasslands	GA1/GS4	27.6	0.0	0.8	
Pond planting	FL8				0.08
Mixed broadleaved woodland	WD1	23.1	0.2	0.1	
Woodland cluster tree planting	WD1				2.74

<i>Molinia</i> Meadow (Annex I)	GS4	1.5	0.35	0.22	0.79
Shrub planting					0.04
Treeline					0.03
Treeline	WL2	2.6	0.1	0.1	
Wet grassland	GS4	52.3	3.3	1.9	
Total:				8.02	7.55

3.2 Bridge Lighting and Bat Boxes

DAU Submission Comment: *It is stated that no bridge lighting is proposed but reference is briefly made to possible future bridge lighting at one point. It should be clarified whether or not bridge lighting will be required.*

The construction of a modern bridge poses an opportunity to enhance suitable resting places and maternity roost for bats species, in particular Daubenton's bats. It is recommended that part of the projects Mitigation Measures/Biodiversity Enhancement that Bat tube bat boxes or integrated bat bricks boxes be installed under or as part of the new bridge structure.

3.2.1 Response

We note the DAU Comment in relation to bat roosts and our EIAR (section 7.7.1.3.3.2) committed to the installation of 10 bat boxes installed locally as determined by the project ecologist. We confirm the bridge will one of the locations where artificial roost structures will be added .

It is not proposed to put any lighting at the bridge structure to minimise light spill on the River Abbert.

3.3 Site/Vegetation clearance

DAU Submission Comment: *It is stated in the EIA that site/vegetation clearance works are to occur ideally outside of bird nesting season and elsewhere that Vegetation clearance for most areas will be restricted to the period from March to August (inclusive) during the "nesting season". This presumably is an error in the EIA and what was meant is that clearance is restricted to outside rather than to within the nesting season.*

3.3.1 Response

It can be confirmed that this was an error in the EIAR and the text should note that clearance is restricted to outside the bird nesting season. This has been added to the errata document (section 5.5 of part 3.1 of our response)

As noted in the DAU submission the only exception to this would be to facilitate earthworks required from July to September inclusive, at the proposed bridge abutments, or stone walls that have suitability for Common Lizard, however this would occur on a case by case basis and would be determined and supervised by the Ecological Specialist.

3.4 Barn Owl

DAU Submission Comment: *As Barn Owl sites occur within 5km of the scheme and considering the species vulnerability to collision mortality (potentially even having population level effects) as well as adherence to all proposed mitigation and monitoring within the EIA a condition should also be included that landscaping will comply with TII (2021) Barn Owl standards (both "The Interactions between Barn Owls and Major Roads :Informing Management and Mitigation" and the "Survey and Mitigation Standards for Barn Owls to inform the Planning, Construction and Operation of National Road Projects" TII publications.*

3.4.1 Response

We agree with the recommendations made in the DAU submission and the scheme has taken into consideration the TII (2021) 'Survey and Mitigation Standards for Barn Owls to inform the Planning, Construction and Operation of National Road Projects' within the landscaping design as noted in EIAR section 7.7.1.3.7.2. The landscape design will include the planting of native Hawthorn and Blackthorn and other native species on banks adjacent to the road, to avoid attraction of this species to the road area, where collision risk may otherwise be high (Volume 3, Figure 13-2 to 13-7).

The application design team also consulted with the Bird Watch Ireland Barn Owl Project, as noted in EIAR section 7.3.35 and 7.3.36.

3.5 Mammal Underpasses

DAU Submission Comment: The EIA states that pipes could function as badger underpasses and also that they will be effective underpasses in most flows for otters and therefore no specific designed underpasses are proposed for mammals. However the use of "could" and "most" introduces an element of reasonable scientific doubt here and therefore under the precautionary principle specific designed underpasses should be appropriately built and incorporated. This is particularly important for otters as they are a qualifying interest species for the Lough Corrib SAC and even outside the SAC boundary are part of the SAC populations and therefore must be assessed as per within the SAC boundary.

3.5.1 Response

A specific mammal underpass has been incorporated into the design in locations required and is shown in drawing figure A7.11.

Mitigation measures for the qualifying interest species, Otters, within the EIAR are based on best practice guidance (TII) and include:

- Otter passage will be enabled under the clear-span bridge structure at Abbert River which provides substantial set back of the abutments from the river bank on both sides. Passage will also be maintained under the existing Liss bridge on the current road.
- A culvert or pipe that is suitable for Otter passage will be installed to ensure safe Otter passage to either side of the Proposed Road Development at chainage 1750. (see Chapter 07 Biodiversity Section 7.7.1.3.5.2 and Figure 3-1 below)
- Otter passage will also be enabled via the (minimum diameter 600 mm pipes) used on crossing drainage ditches, which have been designed primarily for drainage purposes.

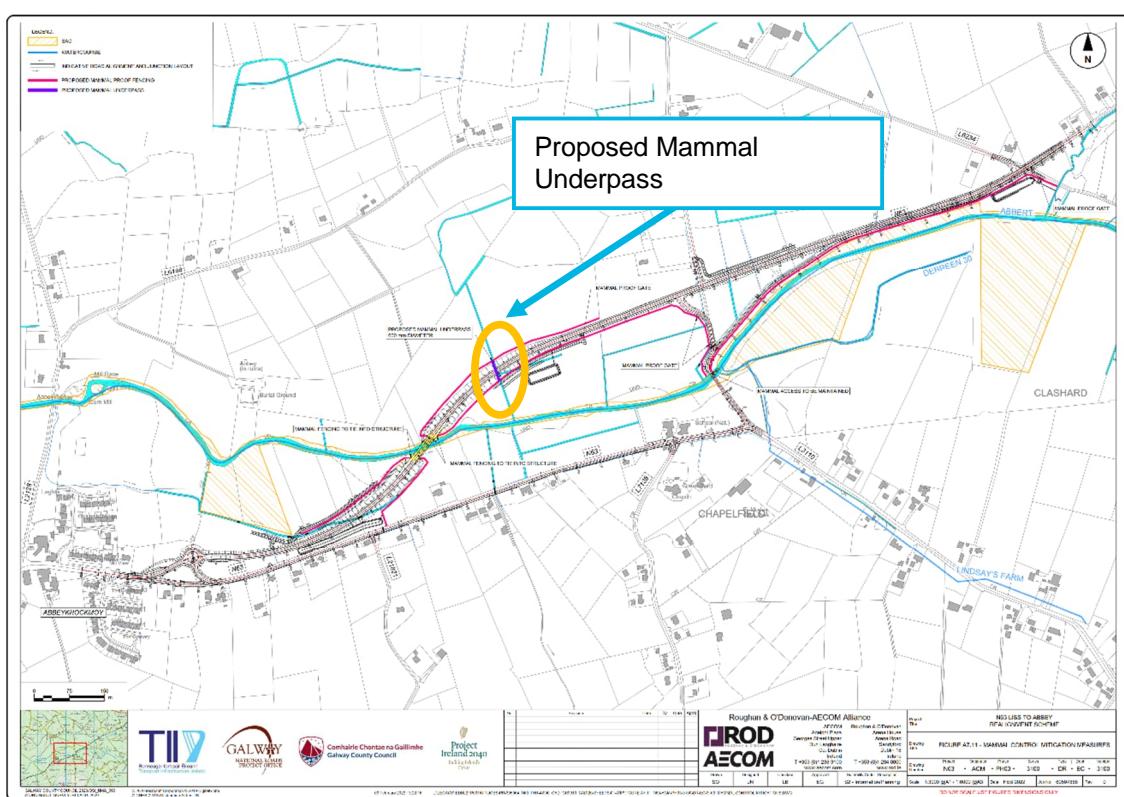


Figure 3-1 Proposed Mammal Underpass Location (Figure A7.11 of the EIAR)

3.6 Light spill

DAU Submission Comment: *In particular, evidence of their usage (footprints) is evident at the proposed river crossing itself and a condition should be applied that during construction works there will be no lighting up of or light spill onto the river during the hours of darkness.*

3.6.1 Response

Lighting mitigation has been designed within the EIAR to ensure no spill of lighting onto the river during the hours of darkness during construction and during the operation phase there will be no lighting on the bridge structure.

Appendix A - Outline Method Statement – Petrifying Springs

Outline Method Statement - Protection and Monitoring of Annex 1 Habitat Petrifying Springs with Tufa Formation

N63 Liss to Abbey Realignment Scheme

24 October 2022

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1. Background to Annex I habitat Petrifying Springs with Tufa Formation

1.1 Petrifying Springs Habitat

Springs were identified during the ecological survey of the Liss to Abbey Realignment Scheme. The calcareous springs (FP1) were assessed for their correspondence to the Annex I habitat Petrifying Springs with Tufa Formation (Cratoneurion) (7220). One spring adjacent to the route was identified as a Petrifying Spring with Tufa Formation (Cratoneurion). This Petrifying Springs habitat exists within Lough Corrib SAC, in a woodland between the Abbert River and the existing road (See Figure 1 & Figure 2). The Centrepoint ITM coordinates for the Petrifying Spring habitat are X 551987.0363, Y 743959.2134. Petrifying springs rely on permanent irrigation, usually from upwelling groundwater sources or seepage sources (Lyons and Kelly, 2016¹).

1.2 Habitat Location

The location of this (petrifying) springs habitat is outside of the Proposed Road Development boundary (see Fig. 1), however, the groundwater source feeding this spring is likely to flow through the footprint of the Proposed Road Development.

1.3 Potential Impact Assessment

It should be noted that groundwater investigations including a groundwater risk assessment during preliminary design have concluded that it is unlikely that the construction works here will impact on groundwater conditions here. Therefore, it is highly unlikely that any hydrological impacts will occur on the Petrifying Springs habitat here. The existing Petrifying Spring is likely to be flowing under the existing operational (N63) road.

Mitigation and monitoring measures to be implemented and adhered to during both the construction and operational phases have been identified within the EIAR (for example in Chapter 07 Biodiversity, Chapter 08 Land and Soils, and Chapter 09 Water), the CEMP and herein, all of which will be adhered to. An Outline Construction Environmental Management Plan (CEMP) has been prepared for the Proposed Road Development which incorporates relevant environmental avoidance or mitigation measures to reduce potential environmental impact. A number of embedded control measures have also been included within the design of the Proposed Road Development, including:

- Provision of a sealed surface water drainage and attenuation system fitted with control valves and interceptors;
- Provision of a sub-surface drainage system of the road pavement to control groundwater levels in the vicinity of the Proposed Road Development and to drain the road foundation;
- Planting of attenuation ponds to aid pollution control;
- Provision of cut-off drains to intercept overland flow;
- Provision of flood connectivity culverts;
- Sizing of culverts to accommodate adequate flows; and
- Design of watercourse diversions to minimise impacts to existing flows.

¹ Lyons, M.D. and Kelly, D.L. (2016) Monitoring Guidelines for the Assessment of Petrifying Springs in Ireland. Irish Wildlife Manuals No. 94. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Ireland.

The Contractor will construct elements of the permanent drainage system as early as practicable, such as the interceptor drains, to facilitate earthworks haul routes and control drainage from the works, to avoid flows onto adjacent land and/or untreated discharges to watercourses

Excavations will only remain open for limited time periods to reduce groundwater and surface water ingress and water containing silt will be passed through a settlement tank or filtration system prior to discharge

1.4 Habitat Protection and Monitoring

A suite of measures have been developed that will protect water quality and are designed to protect and monitor this Qualifying Interest of Lough Corrib SAC. These measures for protection of the Petrifying Springs habitat are detailed in this document.

Though it has been assessed that no impact is deemed likely on this habitat type, monitoring is to be carried out throughout the pre-construction and construction phase. Post-construction monitoring is also detailed. Further mitigation measures may also be devised and implemented if required as necessary.

2. Preconstruction Measures

The following measures are to be undertaken prior to the commencement of any construction activities on site.

2.1 Delineation and Marking of Area

- Prior to any construction activities taking place, the works area will be strictly delineated and clearly marked using calibrated GPS equipment. The coordinates will be stored by both the Project Ecologist and the Project Manager.
Temporary signage will be installed to highlight the location of the Petrifying Springs habitat to construction personnel accessing the site. This signage is to remain in-situ unless otherwise specified by the Project Ecologist or Project Manager.

2.2 Site Staff Awareness

- All relevant staff are to be made aware of environmental sensitivities of this habitat type, its location and the requirements to protect same throughout site works.
- Any construction staff working within 100m of the Petrifying springs habitat are to be informed of the ecological sensitivity of this feature and of any relevant ecological considerations for their specific works. This is to be achieved via Toolbox Talks that will be given by the Project Ecologist.
- Onsite ecology staff will seek to maintain staff awareness of the sensitivity of this habitat during interactions with staff working in this area.

3. Site Monitoring Prior to Construction Phase

It has been assessed that no impact is deemed likely on this habitat type (See Section 1). However, monitoring is to be carried out prior to construction and further mitigation measures shall be devised and implemented as necessary.

3.1 Baseline Sampling

Monitoring will be undertaken prior to works to identify characteristics of the spring and develop a baseline that will allow future comparisons to be made. A quarterly sampling programme will be undertaken for one year before commencement of construction works. A baseline will be key to monitoring and ensuring protection of the Petrifying Springs habitat. Baseline sampling for an inorganic suite of analysis, to include pH, electrical conductivity, ammonium, nitrate, fluoride, chloride and sulphate is to be completed. Ecological monitoring is to be undertaken as per guidelines given by the National Parks and Wildlife Service. This monitoring is to employ suitable indicator criteria as per Lyons & Kelly (2016), being: tufa type, surface water characteristics and field/ground flora. The monitoring is to be carried out by a suitably qualified and experienced ecologist. The results of this baseline monitoring are to be recorded within a baseline report and held by the Project Ecologist and the Project Manager. The baseline report will be submitted to Galway County Council.

3.2 Quarterly Sampling

A quarterly sampling programme will be undertaken for one year before commencement of construction works. This will include scheduling sampling for an inorganic suite of analysis, to include pH, electrical conductivity, ammonium, nitrate, fluoride, chloride and sulphate. Ecological monitoring is to be undertaken as per guidelines given by the NPWS (2016). This monitoring is to employ suitable indicator criteria as per Lyons & Kelly (2016): tufa type, surface water characteristics and field/ground flora. The results of this quarterly sampling are to be recorded within a quarterly report and held by the Project Ecologist and the Project Manager. The quarterly report will be submitted to Galway County Council.

4. Construction Phase Measures

The following measures are to be put in place for the duration of the construction activities within the site. Mitigation and monitoring measures as outlined within the EIAR and CEMP shall also be implemented and adhered to.

4.1 Restriction of Construction Activities

- The footprint of construction activities in the area is to be minimised. The areas to be retained/protected should be cordoned off in advance of works. The existing bank and hedgerows which acts as a barrier between the road and this habitat area shall be retained. As per the current scheme design. There will be no interference with areas of the Petrifying Springs habitat during site works, in the area outside of the proposed works footprint.
- Clearance of existing vegetation is to be kept to an absolute minimum within 50 meters of this habitat area
- Clearance of topsoil/substrate is to be kept to an absolute minimum within 50 meters of this habitat area.
- A buffer zone of a minimum allowable distance of 10m between works activities from this Annex I habitat is to be maintained throughout works;

4.2 Construction Activities Requirements

- A groundwater risk assessment is to be carried out prior to construction works.
- Strictly de-lineate the works area. The footprint of construction activities in the area should be minimised. The area should be clearly marked and areas to be retained/protected should be cordoned off in advance of works.
- The existing bank and hedgerows which acts as a barrier between the road and this habitat area shall be retained. As per the current scheme design.
- There will be no interference with areas of the Petrifying Springs habitat during site works, outside of the proposed works footprint.
- The quantity of material to be excavated/ removed/ translocated from the Proposed Road Development Site will be minimized through careful marking of the route footprint and careful excavation.
- Clearance of topsoil/substrate is to be kept to an absolute minimum within 50 meters of this habitat area.
- Excavations will only remain open for limited time periods to reduce groundwater and surface water ingress and water containing silt will be passed through a settlement tank or adequate filtration system prior to discharge.
- Runoff from spoil heaps will be prevented from entering watercourses by diverting it through onsite settlement ponds and removing material as soon as possible to designated storage areas.
- Minimising the compaction of soils and other substrates associated with construction within the Zone of Influence (ZoI) of this habitat type is required.
- Any requirement for stockpiling, re-fuelling of machinery, etc. during the construction phase will be sited >50 m away from the Petrifying Springs habitat.
- Drainage channels and streams will be clearly identified onsite and shown on method statements and site plans. Construction compounds will be located at least 25 m from watercourses and 10 m from field drains and the proposed Site Compound No.2 is located 75m downstream of the Petrifying Spring.
- Surface water runoff from working areas will not be allowed to discharge directly to the local watercourses. To achieve this, the drainage systems will be constructed prior to the commencement of major site works or the Contractor will provide an alternative means of silt management such as localised containment and treatment of all surface water run off until such time as adequate filtration and sediment deposition is installed or finalised drainage system is in place. Discharge from settlement/treatment ponds will be controlled and maintained at greenfield runoff rates to avoid impacting existing surface water flow rates. The

attenuation systems have been designed to accommodate a 1 in 100-year event plus 20% for climate change without increasing the discharge rate to the receiving watercourse.

- During the construction activities, there will be a requirement for diverting rainwater away from the construction areas, into nearby drainage channels and streams. Water will be filtered to prevent sediment from entering drainage channels and water streams.
- Silt fencing and silt traps will be installed along the route to ensure sediment from runoff from the works area in the vicinity of this habitat area is captured. These will be maintained and cleaned regularly throughout the construction phase.
- Other key protocols in construction will be followed for the duration of the works in accordance with the EIAR. These include the measures to protect water and prevent water pollution, avoid, and prevent the spread of invasive species, dust and air emissions, and prevention of unnecessary clearance (see EIAR Chapter 07 Biodiversity, Chapter 08 Land and Soils, and Chapter 09 Water).
- In order to avoid any alteration to groundwater pH, only locally derived limestone shall be used in the construction within the Zol of this habitat. This limestone base fill will be of a size that permits flow of waters through it. This mitigation measure may ensure no changes to the alkalinity of the Petrifying Springs and will support hydrological connectivity between the north and south side of the Proposed Road Development.
- The development of any additional hard-surfaced area will be minimized in this area to avoid increase of runoff.
- A sub-surface drainage system of the road pavement will be provided in order to control groundwater levels in the vicinity of the Proposed Road Development and to drain the road foundation. This will be required in areas of cuttings and low embankments (<1.5 m). In general, this will be achieved using a network of filter drains or narrow filter drains.
- The Proposed Road Development involves the construction of a new sealed drainage system which includes the provision of a surface water collection system, earthworks drainage, sub-surface drainage, attenuation and pollution control, and the culverting of existing streams, and will improve the existing situation in the Petrifying Springs. The Contractor will construct elements of the permanent drainage system as early as practicable, such as the interceptor drains, to facilitate earthworks haul routes and control drainage from the works, to avoid flows onto adjacent land and/or untreated discharges to watercourses.
- An Outline Construction Environmental Management Plan (CEMP) has been prepared for the Proposed Road Development which incorporates relevant environmental avoidance or mitigation measures to reduce potential environmental impact. The CEMP includes a Construction Erosion and Sediment Control Plan (CESCP) and a Construction and Demolition Waste Management Plan (WMP). This CEMP will be updated at construction stage and will be prepared in accordance with Department of Environment, Community & Local Government guidelines and any construction-related requirements imposed as conditions of any planning permission granted.

5. Site Monitoring at Construction Phase

It has been assessed that no impact is deemed likely on this habitat type (See Section 1). However, monitoring is to be carried out throughout the pre-construction and construction phase and further mitigation measures shall be devised and implemented as necessary. As a minimum, the following monitoring measures are to be undertaken.

5.1 Monitoring During Construction

- An onsite ecologist will be present to monitor any works within 100m of the petrifying springs habitat until all ground works or any works that may affect groundwater or surface water are complete.
- As material removal in the area within 100m of the Petrifying springs habitat occurs, the ecologist will be notified of any groundwater flows identified that are exposed from the excavation works. Excavation works will stop immediately until the area is assessed, to ensure that the spring and groundwater is protected.
- Weekly visual checks will be undertaken of the spring during construction works, with photographs taken and written descriptions of flow recorded.

5.2 Field Monitoring

- For the duration of any construction works occurring within the Zol of the petrifying springs habitat, the petrifying springs habitat will be visually inspected for observations on surface water characteristics. This is ‘field monitoring’ and shall be undertaken on a weekly basis. Habitat photographs shall be taken and written descriptions of flow recorded.
- A pH monitoring programme will be undertaken following commencement of operation within the Zol of works. This shall be carried out in-field and undertaken on a weekly basis.
- The results of this weekly sampling are to be recorded and held by the Project Ecologist and will be available for inspection by Galway County Council and statutory authorities.
- If field monitoring determines that flow rates are being influenced within the spring, all additional mitigation measures required to ensure the protection of the spring will be undertaken (i.e. alterations of works area, and ground works to ensure that the spring is receiving suitable water).
- The frequency of field monitoring will be increased by the Project Ecologist if determined necessary.

5.3 Quarterly Sampling and Laboratory Analysis

- A quarterly sampling programme will be undertaken for the period of construction works. This will include scheduling samples for an inorganic suite of analysis, to include pH, electrical conductivity, ammonium, nitrate, fluoride, chloride and sulphate as well as groundwater volumes. Ecological monitoring is to be undertaken as per guidelines given by the NPWS (2016). This monitoring is to employ suitable indicator criteria as per Lyons & Kelly (2016): tufa type, surface water characteristics and field/ground flora.
- The results of this quarterly sampling are to be recorded and a report produced, this will be held by the Project Ecologist and the Project Manager. The quarterly report will be submitted to Galway County Council and made available to other statutory authorities.
- If quarterly monitoring determines that flow rates are being influenced within the springs habitat, additional mitigation measures may be required to ensure the protection of the spring habitat (i.e. alterations of works area, and ground works to ensure that the spring is receiving suitable water).
- Sampling and monitoring additional to the quarterly sampling may be ordered by the Project Ecologist or Project Manager if deemed necessary.

6. Post Construction (Operational Phase) Monitoring

The following monitoring schedule will be put in place for a period following the completion of works.

A quarterly sampling programme will be undertaken for two years after construction works. This will include scheduling samples for an inorganic suite of analysis, to include pH, electrical conductivity, ammonium, nitrate, fluoride, chloride and sulphate as well as groundwater volumes. Ecological monitoring is to be undertaken as per guidelines given by the NPWS. This monitoring is to employ suitable indicator criteria as per Lyons & Kelly (2016), being: tufa type, surface water characteristics and field/ground flora. Photographs will be taken and written descriptions of flow recorded. The reporting of same will be made available to Galway County Council and the National Parks and Wildlife Service.

Appendix A - Figures

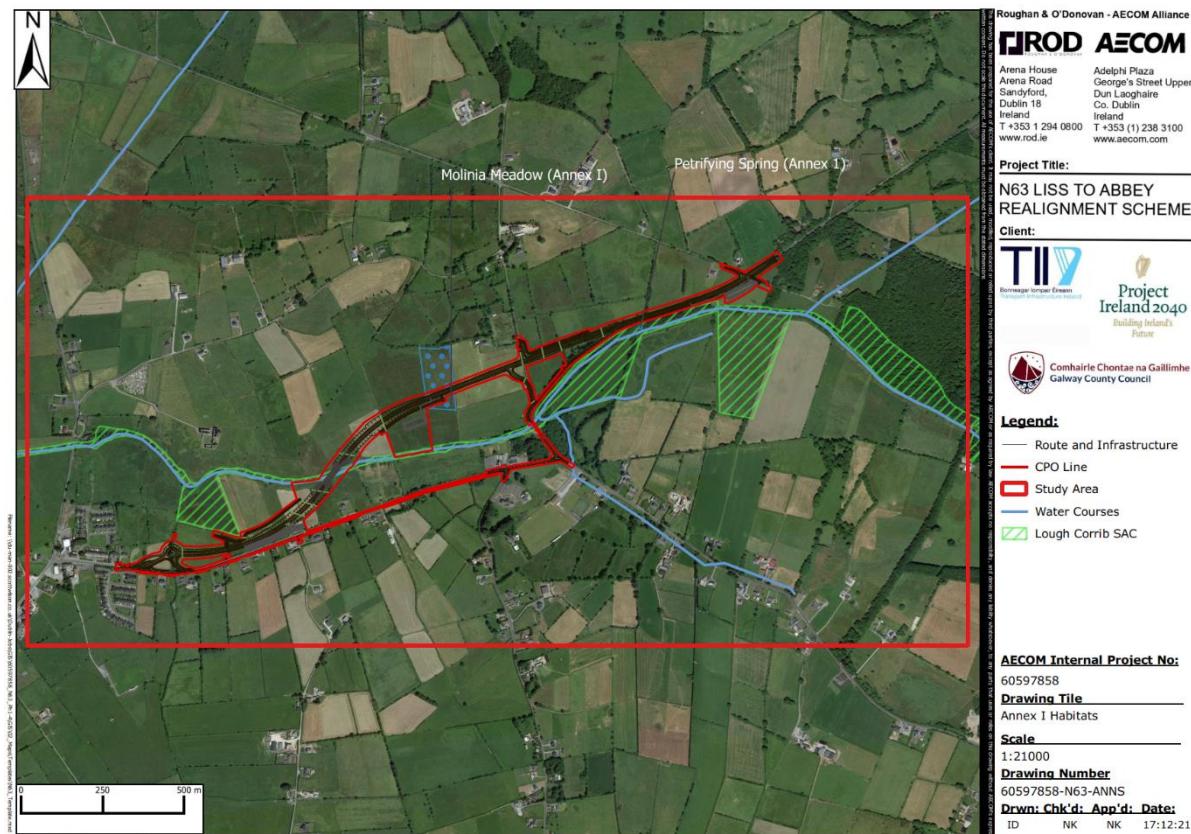


Figure 1: Site location of petrifying springs (calcareous spring) habitat (to south of existing road in woodland area).

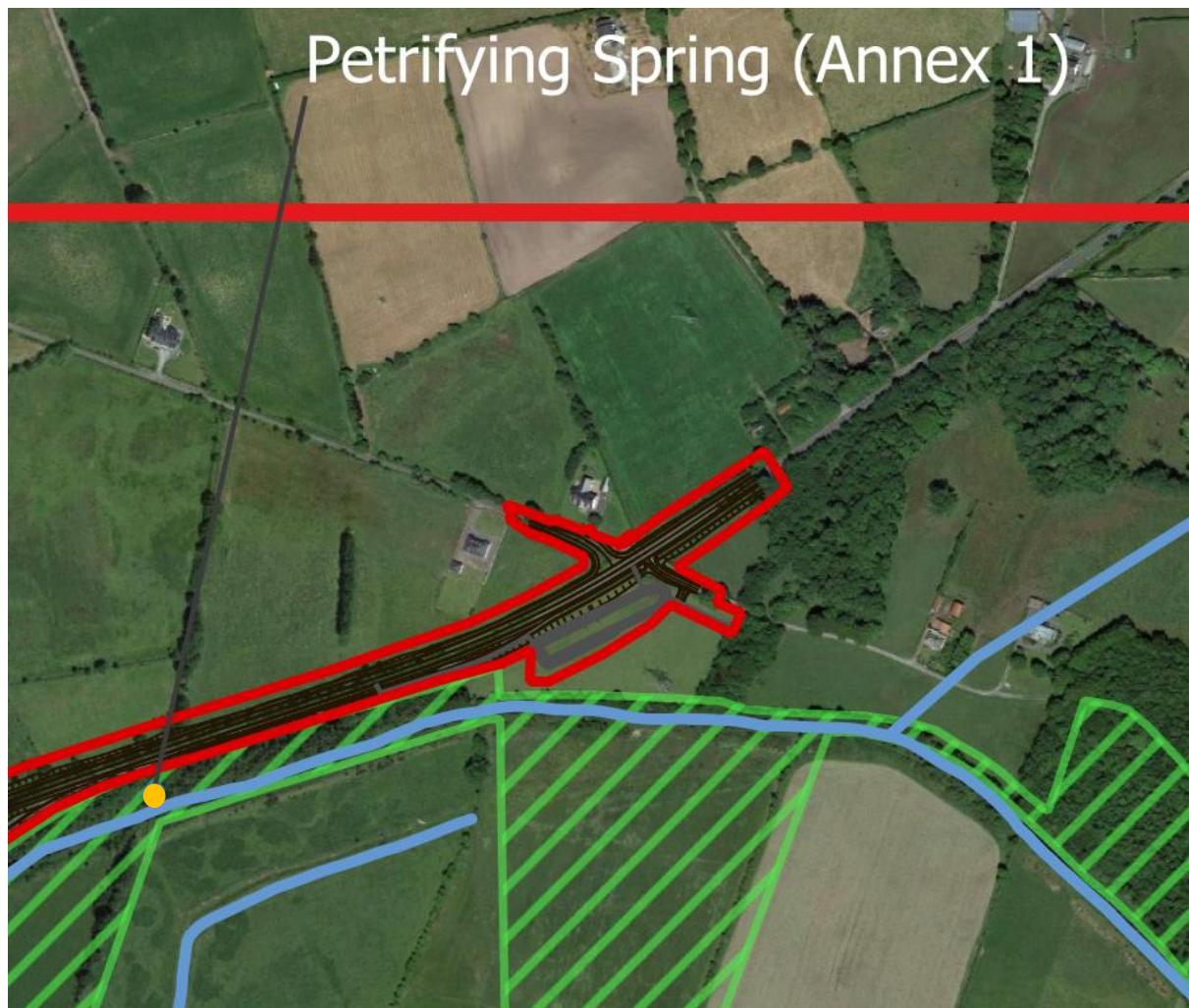


Figure 2: Close up of location of petrifying springs habitat (calcareous spring) habitat (indicated by yellow dot).

Appendix B – Outline Method Statement – Molinia Meadow Translocation



Outline Method Statement – Molinia Meadow Habitat Translocation

N63 Liss to Abbey Realignment Scheme

24 October 2022

Delivering a better world

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1. Background to Area Specific GS4 Wet Grassland – Molinia Meadows on Calcareous, Peaty or Clayey- Silt-Laden Soils

1.1 Annex I Habitat 6410

Annex I habitats are habitats of European importance which are listed under Annex I of the EU Habitats Directive (92/43/EEC). One field area along the study area (of area approximately 2.5 ha) contains a species-rich wet grassland which botanical field surveys have assessed as having correspondence to the Annex I habitat **Molinia meadows on calcareous, peaty or clayey-silt-laden soils** (*Molinion caeruleae*) (6410). This area is not connected to or in close proximity to any other areas of *Molinia* Meadow within Lough Corrib SAC.

1.2 Molinia Habitat and this Scheme

The Annex I habitat is located in the northern 2/3 of this field with an approximate area of 1.5 ha. There is a partial overlap of the Proposed Road Development (N63-Realignment), and some of this habitat area. In order to mitigate for the loss of this habitat in the road footprint area, mitigation measures have been developed to prevent any net loss of habitat within the proposed road footprint by translocating turves of this habitat (in the road footprint area) to a suitably prepared translocation area.

1.3 Mitigation Measures and this Method Statement

The purpose of this mitigation measure is to ensure the retention of a sufficient quantity of vegetation, substrate and seedbank so that this habitat type will regenerate post-reinstatement. This is to be achieved by the removal of vegetation along with the uppermost soil/substrate layers (turves) in an intact as possible state along with loose soil/substrate for salvage. The above are to be handled and transported in such a condition that these may be positioned in a receptor site and establish this habitat type here. The receptor site is to be monitored during works and for a period of time following placement of the translocated and salvaged material.

This method statement has been prepared following the DAU submission on the scheme and takes cognisance of the subsequent discussions between the project team and the DAU.

1.4 Receptor Area

A receptor area has been identified in close proximity to the existing areas of *Molinia* Meadow. The following document outlines the methodology to be followed during site preparation and translocation, to maximise efficacy of translocation efforts. Much of the information to support the development of this method statement has been extracted from the project specific EIAR document. The field adjacent to the southwest of the Annex I *Molinia* Meadow is an area with similar hydrological and soil conditions and has been identified as a suitable and agreed location for sod translocation, provided it is appropriately prepared.

1.5 This Method Statement

This detailed method statement has been developed to ensure that a suitable translocation plan is adhered to. This document will be reviewed by Galway County Council and the National Parks and Wildlife Service.

2. General Works Requirements and Habitat Protection for Annex I Molinia Meadows

2.1 Preconstruction Measures

All relevant staff are to be made aware of environmental sensitivities of this habitat type, its location and the requirements to protect same throughout site works.

Any construction staff working within 100m of the *Molinia* meadow are to be informed of the ecological sensitivity of this feature and of any relevant ecological considerations for their specific works. This is to be achieved via Toolbox Talks that will be given by the Project Ecologist.

Onsite ecology staff will seek to maintain staff awareness of the sensitivity of this habitat during interactions with staff working in this area.

2.2 Best Practice Protocols

Best practice protocols in construction will be followed for the duration of the works. These include the measures to protect water and prevent water pollution, avoid, and prevent the spread of invasive species, dust and air emissions, and prevention of unnecessary clearance (see Chapter 09 of EIAR - Water and Chapter 08 Land and Soils).

2.3 Limiting Construction Activities

The footprint of construction activities in the area will be minimised to only include the area required for land-take for the Proposed Road Development. All unnecessary tracking will be restricted. The area will be clearly marked and the area to be retained/protected will be cordoned off in advance of works to ensure damage prevention and habitat protection. To complement partial translocation, efforts should be made to protect remaining areas of this habitat either side of the development and the hydrology of the surrounding area. To this end, no ingress of any plant or machinery whatsoever will be allowed within the remaining *Molinia* Meadow habitat area. There will be no interference with areas of Annex I *Molinia* Meadows during site works, outside of the proposed works footprint. The quantity of material to be translocated will be minimised through careful marking of the route footprint and supervision of works by the suitably qualified ecologist.

2.4 Ecologist Supervision

A suitably qualified and experienced ecologist will supervise the setting out of the works area to avoid the potential for disturbing Annex I *Molinia* Meadows during works.

2.5 Setting Out Translocation Area

The specific area to be translocated will be confined to the road development boundary area, and the required footprint will be marked out using GPS. Coordinates are to be recorded and stored. Pegs will be positioned showing the location of material to be translocated.

2.6 Signage

Clear signage will be installed to highlight the location of Annex I *Molinia* Meadows to construction personnel accessing the site. This will be maintained on both the donor and receptor sites for the duration of the works.

2.7 Other Site Activities

Any requirement for other site activities such as re-fuelling, servicing or cleaning of machinery, etc. during the construction phase will be sited at suitable locations. These are to be a minimum of 50m removed from Annex I *Molinia* Meadow habitat and Lough Corrib SAC.

3. Plant, Equipment & Personnel Required

The following is a list of plant and other equipment that will be required.

3.1 Excavating Plant

3 no. excavating machines will be required. Two 12-tonne tracked machines will be required: 1 no. for cutting/lifting turves from donor site and 1 no. for lifting turves onto the receptor site. A smaller (e.g. 9 tonne) tracked machine will be used to excavate loose substrate from the donor site.

3.2 Turf-cutting Bucket

One of the above large excavators will be equipped with a purpose-built turf-cutting (or turving) bucket. This will be designed to cut and lift turves of 2m x 1m. The bucket will be designed to have an adjustable depth setting of between 100-350mm.

3.3 Tractors and Flat-bed Trailers

2 no. tractors and 2 no. flat-bed trailers will be required. These will be used to transport the cut turves between the donor and receptor sites.

3.4 Plywood Sheeting

10 no. sheets of 25mm thickness will be required. These will be used to transport the cut turves which will be slid onto the sheets from the excavator's turving bucket. These sheets will be large enough to accommodate turves of 2m x 1m in area. The sheets may be reinforced with wooden battens on the underside. The sheets are to be pre-drilled with holes on each corner. This will enable ropes to be attached to allow the sheets with turves to be slung by the excavator onto a flat-bed trailer.

3.5 Dumper

A 3-tonne dumper will be required to transport loose substrate from the donor site (after removal of turves) to the receptor site.

3.6 Hand-Tools

Hand-tools to be required will be:

2 no. shovels for removing small amounts of loose substrate from the donor site to the dumper or the small excavator bucket.

2 no. rakes for levelling material imported to the receptor site

1 no. hand-roller for levelling material remaining at receptor site following removal of turves.

3.7 Personnel

3 no. excavator drivers

3 no. banksmen

2 no. onsite ecologists

4. Trial Excavation

4.1 Rationale

It is estimated that turves of between 200-350mm in depth may be excavated intact from the *Molinia* Meadow habitat area. In order to assess possible depth of turves that may be removed from the donor site, a trial excavation will be required. This will allow the depth of the turfing bucket to be set as well as to gauge the depth of excavation required at the donor site. The process is detailed below.

4.2 Depth Cut

The greatest depth of turves (substrate + vegetation) that may be removed intact from the receptor site will be sought. The turfing bucket will be set to its maximum depth (350mm). A turve of 2m x 1m square will be attempted to be cut and lifted from an area on the edge of the southern extent of the donor site.

4.3 If Cut Successful

If the attempt is successful – that is, if the turve may be lifted onto a plywood sheet while staying intact, then the setting on the turfing bucket will remain set at 350mm unless otherwise specified by the onsite ecologist.

4.4 If Cut Unsuccessful

If the attempt is unsuccessful, then the ecologist will direct the banksman to adjust the depth setting of the bucket until a turve of the above dimensions may be cut and lifted intact. The bucket will remain at this setting unless otherwise specified by the onsite ecologist.

4.5 Continuing Works

Works are to pause at the donor site until the receptor site preparation is complete. See Section 5 (below).

5. Preparation of the Receptor Site

5.1 Delineating the Receptor Site

The receptor area will be clearly delineated and marked out. The receptor area is approximately 7885 m² the centre point ITM co-ordinate is X 551263.6221, Y 743611.5119. The co-ordinates of the 5 corner points of the receptor site are:

- Corner 1: X 551227.1621, Y 743661.1945
- Corner 2: 551191.9461, Y 743634.4536
- Corner 3: X 551215.4451, Y 743570.9429
- Corner 4: X 551326.8792, Y 743588.6138
- Corner 5: X 551318.8003, Y 743656.1492

See Figure 1 for location of the receptor area.

An area equivalent to the area of the donor site is to be prepared as detailed in the following sections. A suitable area for stockpiling of excavated materials is to be chosen and agreed by the onsite ecologist and project engineer.

5.2 Fencing the Receptor Site

Suitable fencing will be placed around the receptor area in order to prevent any unnecessary ingress to the site. An area to the north of the receptor site will be allowed for access of plant and other machinery.

5.3 Preparation of the Receptor site

The preparation of this area will occur under ecological supervision. Preparation will consist of the stripping of the upper soil layer to a depth which is to be specified by the ecologist following the trial excavation detailed in Section 4. Some raised areas that exist locally may require greater soil removal to ensure a suitable water table height exists for translocated sods. Some other areas may require to be hand-raked or rolled in order to prepare them.

5.4 Excavated Material

This material should be retained on site for later use as backfill where necessary. This excavated topsoil material could be a source of silt to Lough Corrib SAC and therefore the location and placement of this temporary stockpile should ensure watercourses are protected. The location of this stockpile is to be determined by the Project Engineer in consultation with the Project Ecologist.

5.5 Direction of Site Stripping

The preparation of the area will be undertaken by stripping material from one side to the other (i.e. east to west) across the receptor site. The material will be stripped from the southern part of the receptor site toward the north such that no unnecessary tracking occurs and so tracking is minimised (to prevent soil compaction). Stripping will be undertaken in sections, such that the surface area stripped keeps pace with the amounts of donated material from the donor site arriving. See Section 6 (below).

6. Translocation of Molinia Meadow Material

6.1 Cutting of Turves

Once the onsite ecology team are satisfied that a suitable area of the receptor site has been prepared, the driver of the excavator with the turving bucket will be directed to commence cutting of the turves from the donor site. This is to be carried out by commencing on the south-western extent of the *Molinia* Meadow habitat area and continuing in an easterly direction.

6.2 Lifting of Turves

Turves will be lifted using the turving bucket. These will be slid onto plywood sheets until 5-6 turves are cut. These will then be slung individually onto the flatbed trailer. Turves will not be stacked.

6.3 Loose Substrate

Any loose substrate from the cut areas will be collected using a small excavator. The substrate will then be placed into a dumper truck and transported to the receptor site. Here it will be deposited on the prepared ground. It will then be raked as required by the ecologist and site staff.

6.4 Translocation of Turves

When the ecologist is satisfied that the receptor site is adequately prepared, the turves will be transported across the site by tractor and trailer to the receptor area. Here, they will again be slung individually from the trailer by an excavator and slid into position as directed by the site ecologist.

6.5 Timing of Actions

In order to expediate the operation, the removal of the turves will (insofar as possible) keep pace with the stripping of the topsoil and deposition of the loose substrate. This will prevent the receptor site from becoming dehydrated before turves are put in place. Works should not take place during wet conditions. The onsite ecologist will monitor rainfall radar throughout the operation in order to avoid this. Any temporary storage of either turves or substrate should be avoided or kept to minimal time periods. It is suggested that excavated turves are not left any longer than 48 hours before their instatement in the donor site.

6.6 Storage/Deposition of Material from Receptor Site

To prevent issues associated with drainage of the Molinia area, the soil stripped from the translocation area should be placed and graded back into the area from which Molina turves were extracted if road construction operations are not imminent.

6.7 Completion of Works

The translocation of substrate and turves will continue until the onsite ecologist confirms that all of the *Molinia* Meadow habitat has been translocated from the footprint of the scheme to the receptor site. The fencing and signage will remain in-situ for the duration of the project unless otherwise directed by the Project Engineer or onsite ecologist. The Ecologist will verify that the Contractor has left the site of the Proposed Road Development in a satisfactory condition and where relevant direct the Contractor to remove any materials offsite.

7. Operational Phase Mitigation and Monitoring

7.1 Monitoring Programme on Translocation (Receptor) Area

A monitoring programme will be established in order to assess the translocation of *Molinia* sods. This will include quarterly visits by specialist ecologists who will assess species diversity and abundance and produce a quarterly report. Monitoring will continue until the translocation is confirmed established and signed off by an independent ecologist and the contractors ecologist. The quarterly reports shall be used to draw up an annual report on this area. These reports will be issued to the National Parks and Wildlife Service and Galway County Council. A similar monitoring programme is to be carried out on the remaining Annex I habitat areas outside the footprint of the scheme (see below). It is recommended that this is carried out concurrently with the above programme

7.2 Monitoring Outside Translocation Area

Hydrological impacts of the Proposed Road Development have been considered, and retention of hydrological characteristics of retained areas will also be accounted for during construction. The *Molinia* area on both sides of the Proposed Road Development area will be monitored monthly during the construction phase and areas within ownership of the Council will be managed as appropriate to ensure it retains good ecological status. This area will require grazing or mowing and possible future scrub removal and invasive species treatment. Due to practical requirements such as livestock management, mowing is likely to be more undertaken in this area. A management plan will be developed in conjunction with National Parks and Wildlife Service and Galway County Council.

7.3 Management Plan

The results of the above monitoring are to be used to draw up an operational phase Molinia habitat management plan for the area within the boundaries of the development. This gathered information will set out appropriate methodologies for the management and conservation of the receptor site. Ecological monitoring will be ongoing, and some actions such as grazing, mowing, or invasive species treatment may be required to be acted upon. This plan shall be drawn up in consultation with National Parks and Wildlife Service and Galway County Council.

The Project Ecologist will oversee the implementation of this management plan throughout the course of works. Ecological monitoring will inform recommendations for any changes or alterations to the management regime that may be required. Should it be noted that the translocated materials are failing to establish or are not establishing to a satisfactory degree, the Project Ecologist shall draw up measures to rehabilitate this area. These shall be agreed with the Project Engineer and NPWS.

Appendix A - Figures

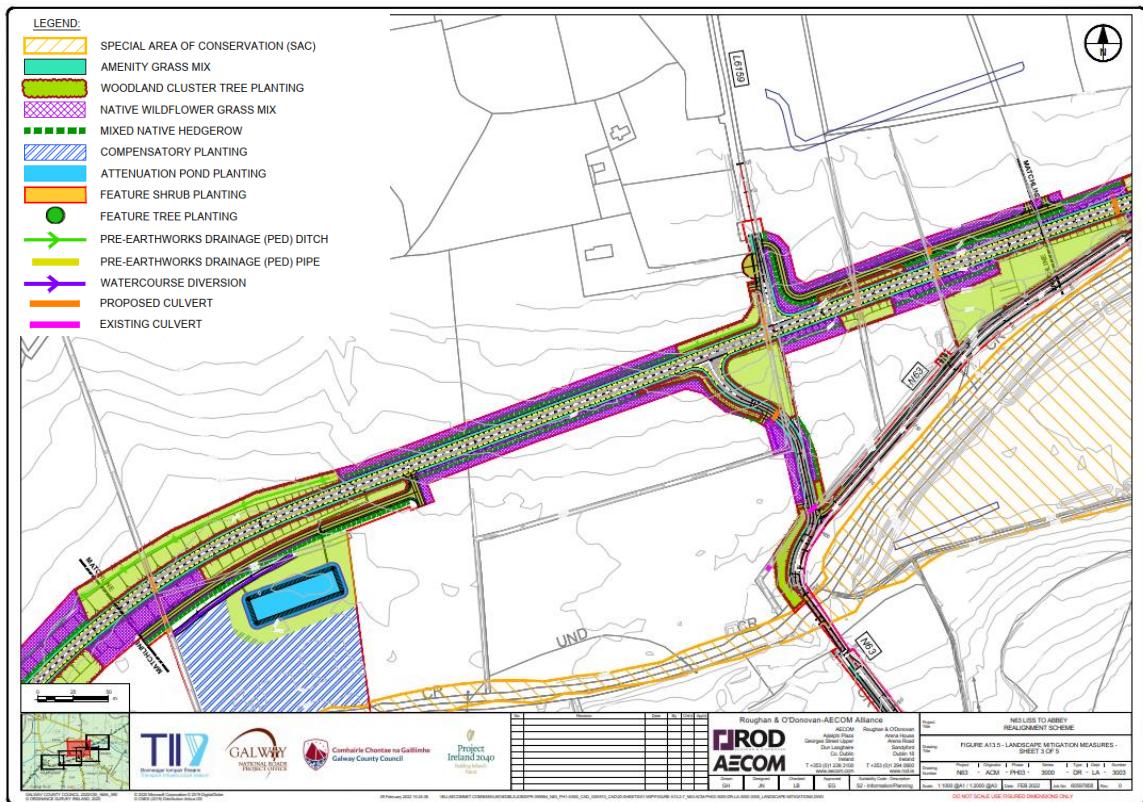


Figure 1: Location of the Receptor Site (Volume 03 Figure A13.5 of the EIAR) (Blue Diagonal Cross Hatch)

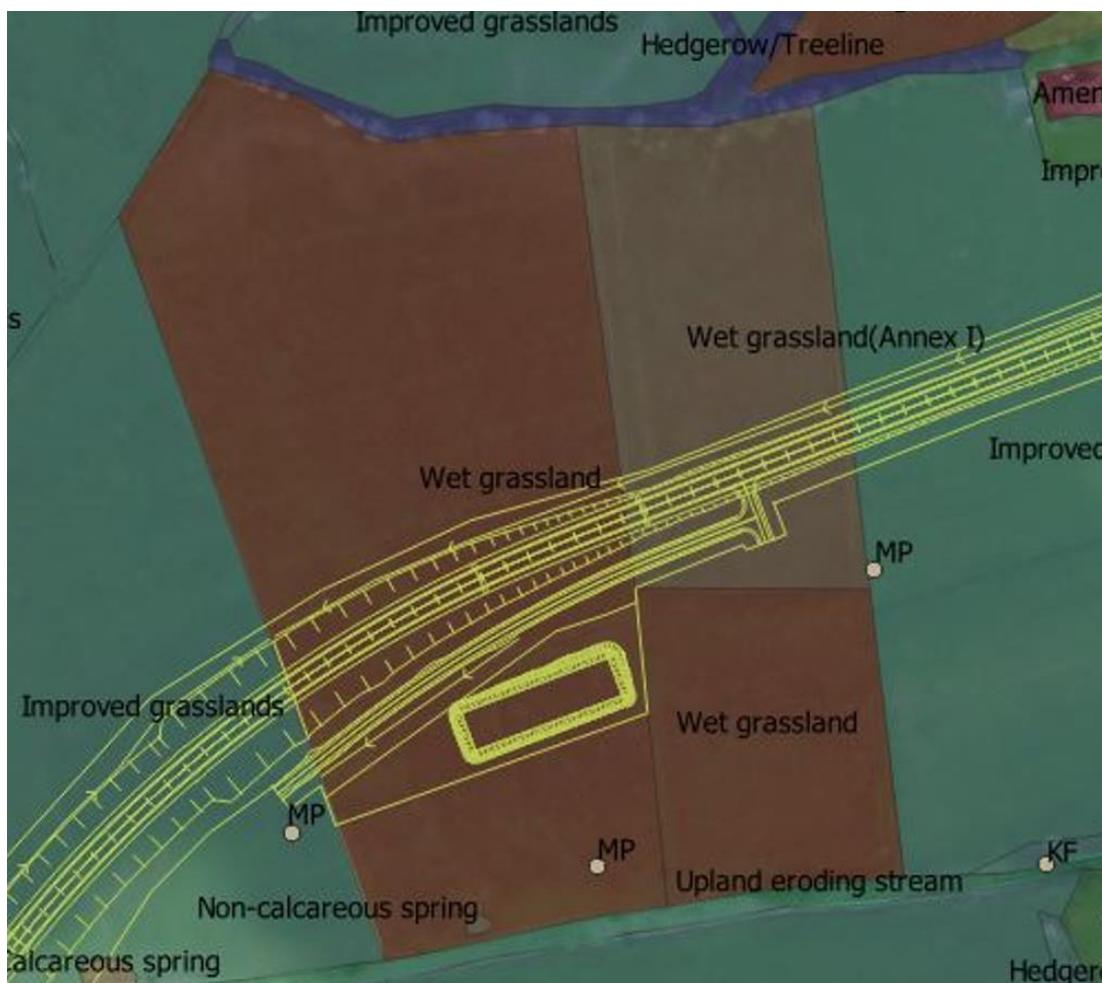


Figure 2: Proposed Road Development Boundary (in yellow) overlaying Annex I Molinia Meadows. The area where intersection is occurring (where the road overlays the Annex I habitat) is proposed to be translocated to the area in vicinity of and surrounding the Settlement Pond (in yellow).

