Cutaway Bog Decommissioning & Rehabilitation Plan

Glenlough Bog

Two Year Review

October 2025

This document supports the requirements of Condition 10.2 of IPC Licence Ref. P0504-01:

> *"10.1.2 Implement the agreed cutaway bog rehabilitation plan (refer Condition 10.2). 10.2.2 The plan shall be reviewed every two years and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the written agreement of the Agency."*

This licence condition requires BnM Energy Ltd, in agreement with the EPA (Agency), to implement the rehabilitation plan as agreed, which will enable the stabilisation of this bog after the cessation of peat production and leave it free of any environmental liabilities.

Section 6 of the EPA guidance document states that the rehabilitation plan be reviewed every two years. This document outlines the review of the Glenlough Rehabilitation Plan by BnM.

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NON-TECHNICAL SUMMARY

- BnM has carried out a two-year review of the Glenlough Bog Decommissioning and Rehabilitation Plan.
- Glenlough Bog is located on the border of counties Longford and Westmeath, approximately 5 km south of Edgeworthstown, Co. Longford and the overall area of the bog is 335 hectares.
- The key objective of the proposed rehabilitation measures was to achieve best re-wetting outcomes for this site. Some of this re-wetted habitat is likely to be analogous to peat-forming *Sphagnum*-rich vegetation. The majority of the site not likely to be *Sphagnum*-rich and will be dominated by fen mosses.
- There were no significant changes to the scope of the rehabilitation plan as submitted and agreed by the Agency. There were minimal changes in rehabilitation type made after rehabilitation commenced due to ground conditions encountered on the ground.
- Rehabilitation commenced in June 2022, generally by blocking existing active drains with peat drain blocks. The vast majority of the planned rehabilitation has been implemented with the exception of fertiliser application which is ongoing, and the re-wetting measures have been implemented.
- Water quality monitoring indicates that suspended solids are well below the emission limit value, with ammonia and COD well below the associated trigger. Ammonia appears to be trending downwards. Results to date 2024 have been submitted to the Agency, with the 2025 results to be submitted later in 2026.
- Progress has also been reported in the Annual Environmental Report, which was submitted to the Agency on the 31st of March 2025.
- The main objective of this rehabilitation plan is raised bog restoration. Re-wetting via drain blocking has been very effective – high water levels have been noted in blocked drains and overall, the bog has become significantly wetter post rehabilitation. Some Annex I Active raised bog habitat was already present on site. No significant changes in vegetation have been noted since restoration was carried out in 2023. More time is required (5-10 years) to measure and record changes in raised bog condition in response to re-wetting.
- The Glenlough bog was firstly surveyed January 2023. No waste items were identified hence no cleanup was required. Additionally, there are no rail lines or pumping infrastructure onsite, thus no decommissioning was required.
- There were no significant amendments to the rehabilitation plan as submitted and agreed by the Agency. Several minor changes in rehabilitation type were made after rehabilitation commenced due to ground conditions encountered however, these changes were minimal.
- Rehabilitation of Glenlough Bog has been very successful. Drains have been blocked. This bog is on a positive restoration trajectory and has been stabilised.

1. INTRODUCTION

BnM operates under an Integrated Pollution Control Licence (IPC) issued and administered by the Environmental Protection Agency (the Agency) (Ref. P0504-01). As part of Condition 10.2 of this licence, a rehabilitation plan

must be prepared for permanent rehabilitation of the boglands within the licenced area. Glenlough bog is part of the Mountdillon bog group. Glenlough Bog is located on the border of counties Longford and Westmeath.

This rehabilitation was finalised by BnM in 2022 and approved by the Agency on the 30/08/2022. This rehabilitation plan can be viewed at Glenlough-Final-Rehab-Plan-_v6.pdf.

The development of the rehabilitation plan for this bog considered published guidance issued by the EPA in 2020 – Guidance on the process of preparing and implementing a bog rehabilitation plan. 05467-EPA-Bog-Rehabilitation-Report-Web-Proof-03.pdf.

Section 6 of this EPA guidance document states that the rehabilitation plan must be reviewed every two years.

This document outlines the two-year review of the Glenlough Rehabilitation Plan by BnM.

This document should be read in conjunction with the Glenlough Bog Cutaway Bog Decommissioning and Rehabilitation Plan available on the BnM Peatlands Climate Action Scheme website at the following location https://www.bnmpcas.ie/bogs-peatlands-climate-action-scheme/.

The Annual Monitoring Reports for the Peatlands Climate Action Scheme also outlines progress of the PCAS programme at Glenlough. The Annual Monitoring Report can be viewed at Supporting Material - BNM Peatlands Climate Action Scheme (bnmpcas.ie). The Annual Environmental Reports submitted each year to the EPA can be viewed at www.epa.ie.

2. BASELINE ENVIRONMENT

The original baseline environment was outlined in the Glenlough Bog Rehabilitation Plan.

Restoration has been carried out at Glenlough Bog, and this drained raised bog as well as cutover sections has been re-wetted. The bog has become significantly wetter post rehabilitation/drain blocking. Further time however is required before any significant changes in the vegetation composition is likely to be recorded.

Drain-blocking has consolidated changes for raised bog habitat to continue to improve condition in the re-wetted parts of this site in the future.

The baseline largely reflects the baseline status of a recently rehabilitated raised bog and there have been no other significant changes to the baseline environment at Glenlough Bog.

3. CONSULTATION

3.1 Consultation with interested parties.

As required under the EPA's guidance document and as part of the two-year rehabilitation plan review BnM sought consultation and feedback from stakeholders of the relevant bogs. As part of this process a questionnaire was sent to interested parties who were consulted on the draft rehabilitation plan in 2021 or who expressed an interest subsequent to the commencement of the rehabilitation.

An email was sent to all relevant stakeholders on July 1st, 2025, asking that they provide feedback via a questionnaire link. Where an email address was not available, a text message was sent, and a hard copy of the questionnaire was issued by post on request. The closing date for responses was July 29th, 2025.

The stakeholders contacted included local landowners/householders who had engaged in the initial public consultation process along with other interested organisations and groups at national and local levels.

Questionnaire.

A total of 402 stakeholders were contacted and invited to complete the questionnaire, for all bogs in that year of the scheme.

The stakeholders contacted were both local and national in nature, including relevant government departments and agencies, relevant semi-state bodies, NGOs, representative groups, farming organisations, research bodies and other environmentally focused groups with a national remit. Most if not all of these organisations would also have been invited to make submissions when the Rehabilitation Plans were first drafted. Local community groups and private individuals or landowners who contacted us previously during the original consultation or since were also invited to participate.

Summary of responses received.

Respondents were invited to provide feedback on the perceived importance of various elements of the Scheme, including how rewetting former industrial peat extraction sites could support natural vegetation recovery, improve water quality, reduce carbon emissions, enhance biodiversity and ecosystem services, and protect on-site archaeological features. While many responses were general in nature, BnM has addressed any specific issues raised.

Submissions also allowed respondents the opportunity to provide feedback/comments on various aspects of the scheme while also providing them with a forum to highlight any issues. In analysing the responses to the questionnaire, the feedback/issues were grouped into four categories. Those categories and a summary of responses are outlined below.

Table 1. Feedback Categories

Total Number of Questionnaires Issued	402
Total number of Questionnaires Returned	24
Response Category	**No. of Responses per category contained within the returned questionnaires**
Community Engagement/Communication	24
Rehab Plan Design/Objectives	24
Biodiversity/Environment/Conservation	24
Other	19
Total no of topics commented on?	91

Respondents expressed a strong appreciation for the ongoing efforts by BnM to restore and protect Ireland's boglands, recognising the importance of these landscapes for biodiversity, climate action, and local communities. There is clear enthusiasm for the potential of well-planned rehabilitation to enhance both environmental and social value across the regions.

A consistent theme throughout the feedback is the desire for improved communication and collaboration. Many respondents highlighted the importance of ensuring that all local landowners and community members are kept fully informed and have opportunities to engage with the rehabilitation process. Enhanced consultation, transparency, and responsiveness from BnM and local authorities were identified as key to building trust and achieving shared goals.

Several respondents encouraged the integration of rewetting, wetland creation, and species conservation within a broader, landscape-scale approach. These respondents support initiatives that promote biodiversity, including the return of waders, ducks, and ground-nesting birds such as curlew, and that prioritise ecological restoration over industrial or energy developments.

Some contributors see great potential in developing eco-tourism and amenity opportunities linked to peatland restoration. Providing public access, walking trails, and educational signage would help raise awareness of the ecological and climate importance of bogs while benefiting local economies and well-being.

Feedback from some respondents also emphasises the importance of community partnerships and local stewardship, with a call for communities to be recognised as key stakeholders in the Just Transition. Respondents stressed that the process should deliver lasting benefits for both nature and people, through regenerative tourism, community engagement, and respect for local knowledge.

Practical suggestions were also offered, such as producing clearer maps and site overviews, improving responses to submissions, and addressing site-specific issues like water management near forestry areas.

Overall, the feedback reflects a deep commitment to conservation, collaboration, and accountability. There is clear public support for BnM's transition toward restoration, provided that it remains transparent, inclusive, and guided by long-term ecological and community values.

BnM response to observations/issues raised during review process.

Community Engagement/Communication

BnM endeavour to engage with all stakeholders including landowners and interested parties through a variety of means, including the issue of emails and rehab plans to NGOs, Councillors, community groups, farming bodies, Government Bodies etc., the provision of a website with a map of the bogs to be rehabilitated in 2022 and copies of the draft rehabilitation plans. BnM have also used a combination of newspaper notices, media interviews, virtual calls, and presentations where necessary, at different times during consultation.

Submissions are invited from all interested parties before the Rehabilitation Plans are finalised. A Community Liaison Officer (CLO) was also appointed at the outset of the scheme, who was available to take calls to discuss specific bogs, contact details are available on the website.

Stakeholders were invited to make submissions in advance of rehabilitation taking place on the Year 2 bogs, as part of this consultation an email advising of BnM's intention to rehabilitate each bog along with a link to the Draft Rehabilitation Plan was sent to a list of stakeholders. The stakeholders included local authorities, farming organisations, community groups, environmental groups, Non-Governmental Organisations (NGOs), relevant

Government Departments, relevant semi-state organisations and regulatory/statutory bodies along with local and national elected representatives. Submissions were invited from all stakeholders, and a consultation period (typically three weeks) was provided for.

In addition to this email, households within a 1 km radius of the bog boundary received a letter advising of the intended rehabilitation and providing contact details for any queries. This letter was accompanied by an information leaflet, and these documents were hand delivered by the dedicated EDRRS Community Liaison Officer (CLO) with the assistance of other BnM representatives as needed. The CLO and BnM engaged with householders where queries or concerns were raised when delivering these documents.

The consultation period for the EDRRS Year 2 bogs commenced in October 2022 and ran until May 2022.

A full list of the Year 2 bogs is available on the website along with Rehabilitation Plans and associated map books for each site, these documents are available at: https://www.bnmpcas.ie/2022bogsrehabilitation/.

Full details of all other current PCAS bogs are on the website.

Rehabilitation Plan Design/Objectives

The measures included in the Rehabilitation Plan design were planned by a team consisting of expert ecologists, hydrologists, and engineers. Each Rehabilitation Plan is reviewed and subject to approval by both the National Parks and Wildlife Service (NPWS) and the Environmental Protection Agency (EPA). It is a guiding principle of BnM rehabilitation planning that no actions or activities will be undertaken that would negatively impact on adjacent land. No boundary drains will be blocked. Water will still leave the bog via the existing outlets.

Various methodologies are employed depending on conditions on each site though primarily these would include the creation of cells and carrying out drain blocking with the aim of retaining water on each bog.

The objective of the rehabilitation is to ensure environmental stabilisation of the former peat production areas and set each bog on a trajectory towards peat forming conditions. There is an ongoing programme to monitor, verify and report on the changes observed following rehabilitation including hydrology, biodiversity, and carbon fluxes.

Further details on monitoring carried out as part of PCAS is available on the website at https://www.bnmpcas.ie/supporting-material/.

Drainage/Flooding

A Hydrological risk assessment was undertaken for all PCAS bogs which among other things, assesses the potential impact of the various rehabilitation measures which are proposed on the local drainage network and the potential risk of causing additional flooding of adjoining lands or roads. Where any such additional flooding risks are identified, the proposed rehabilitation measures are adjusted to minimise any such additional risks and such adjusted measures are identified in the hydrological assessment.

The rewetting of bogs in this scheme involves the blocking of the former peat production drains and this in turn will return the bogs to a more natural water retention function. As a result of this rehabilitation, it is expected that peak flows will reduce during intense rainfall events. All boundary drains and outfalls will continue to operate and will not be affected by the rehabilitation measures.

BnM will continue to manage their land bank into the future. As industrial peat production has now ceased on BnM lands and rehabilitation measures will be carried out, a regular drainage maintenance programme will not be required or carried out as would have been the case in the past. However, if issues arise with the BnM internal drainage system that affects upstream or downstream landowners, then these issues will be addressed by BnM through its care and maintenance programme.

Where specific concerns have been raised regarding impacts on adjoining lands BnM have engaged with individuals as needed.

Our Community Liaison Officer has been available to meet with landowners since the commencement of the scheme and, where required, the wider team including the Design Engineers have also been available where specific queries required their input. To date the majority of queries have been resolved to the satisfaction of both parties with a number of queries still ongoing.

Monitoring/Results

As part of PCAS, a monitoring and verification plan has been developed to support climate action and biodiversity objectives. Monitoring currently being carried out includes biodiversity, carbon, hydrology (water levels) surface water and flow monitoring.

Biodiversity monitoring includes stratified monitoring of bog condition, habitats, and biodiversity at several different scales. It is proposed to monitor the improvement of some biodiversity ecosystem services. The appearance of key species such as *Sphagnum* moss will be monitored during walk-over questionnaires and general monitoring visits. Biodiversity monitoring for PCAS planned for a stratified approach with different targeted monitoring at different sites based on the site characteristics.

Significant time and resources have been inputted into the monitoring of the Year 2 bogs and the data collected will be utilised to verify the benefits of the scheme. While these benefits and their verification will take time to determine, the data collected on an annual basis can be used to assess the trajectory of each bog in terms of hydrogeology, carbon emissions, biodiversity benefits and surface water quality. Further data over the lifetime of the scheme will continue to provide information in this regard, in particular as the availability of sites with both climate action measures and other effective conservation measures becomes more important at a National and International level.

Further details on monitoring carried out as part of PCAS is available on the website at https://www.bnmpcas.ie/supporting-material/.

BnM Land-use strategy

BnM have now transitioned to a renewable energy company. We utilised these bogs in the past to extract peat for energy and other uses. Now, BnM's vision is to develop renewable energy across its landbank to support Irelands energy supply and targets for renewable energy in the National Climate Action Plan. This strategy means that infrastructure will be integrated with the cutaway landscape. Previous renewable energy projects have demonstrated that only a small portion of land is required for renewable energy infrastructure (< 5%). This means there is still plenty for space for biodiversity. Re-wetting can be carried out between this infrastructure and Cloncreen Windfarm and Mountlucas Windfarm are great examples of this integrated land-uses strategy. Ultimately this strategy looks to optimise multiple benefits from this cutaway landscape by developing renewable energy, by providing amenity across these sites for local communities and other visitors and by re-wetting residual peat and providing new habitats for biodiversity. BnM are still committed to the rehabilitation of these cutaway bogs and this will be delivered by this strategy.

3.5 Glenlough Bog

No comments or feedback was received specific to Glenlough Bog.

BnM responded to each consultee, acknowledging their feedback and advising of the location where final reviews will be available to view, via the following link: BNM Peatlands Climate Action Scheme (bnmpcas.ie).

4. Rehabilitation Goals and Outcomes

No change from what was submitted and agreed upon by the Agency.

5. Scope of Rehabilitation

No change from what was submitted and agreed upon by the Agency.

6. Review of Rehabilitation Actions

https://www.bnmpcas.ie/2022bogsrehabilitation/

6.1 Short-term planning actions (0-1 years)

- Develop a detailed site plan with detailed site drawings outlining how the various rehabilitation methodologies (within the proposed PCAS) will be applied to Glenlough Bog. This will take account of peat depths, topography, drainage and hydrological modelling. A detailed site plan with site drawings outlining the planned rehabilitation was developed and incorporated into the Rehabilitation Plan. See the accompanying Map Book.
- Carry out a hydrology and drainage management assessment of the proposed enhanced rehabilitation measures. A hydrology and drainage assessment of the proposed enhanced rehabilitation measures was carried out and the conclusions incorporated into the final rehabilitation plan.
- A review of issues that may constrain rehabilitation such as known rights of way, archaeology, turbary, and existing land agreements was carried out and incorporated in the rehabilitation plan, where required. A review of issues that could constrain rehabilitation was carried out. There are a number of rights of way on the western margins of Glenlough Bog which were constrained from rehabilitation to avoid any impacts on access to the various landowners/stakeholders. Some land to the west was also constrained from rehabilitation due to existing Coillte forestry.
- A review of remaining milled peat stocks was carried out. There are no peat stocks on the Glenlough Bog.
- Ensure all activities comply with the environmental protection requirements of the IPC Licence. All activities were regulated and governed under the applicable IPC Licence and associated 14 conditions. There were no exceedances in water quality emission limit values and limited trigger level exceedances in COD noted during the period of the rehabilitation or reported to the Agency.
- Track implementation and enforcement of the relevant IPC Licence conditions, the mitigation measures (AA) and other environmental control measures during the implantation of the rehabilitation plan. Ongoing - This was managed through a system of engagement, communication and training with operatives on the ground to ensure all mitigation measures, constraints and restrictions were managed.

6.2 Short-term Practical Actions (0-2 years)

- Carry out proposed measures as per the detailed site plan. This will include a combination of pump management, drain blocking, peat field re-profiling, cell-bunding and fertiliser applications targeting headlands, high fields and other areas. All rehabilitation will be carried out with regard to environmental control measures. Drain blocking completed with 6,848 blocks installed across Glenlough since 2022. See Section 7.2.
- Monitor the success of rehabilitation measures in relation to developing suitable hydrological conditions. Ongoing, See Section 7.
- Silt ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent silt run-off from the site during the rehabilitation phase. Silt ponds have been maintained as required under the licence during this period. Based on water quality results submitted to the Agency in August 2023 indicating ongoing improvements in suspended solids in the surface water, and subsequent

monitoring results in May 2025, the Agency have agreed to approve a request to base the annual silt pond cleaning schedule on water quality monitoring results and inspections.

6.3 Long-term (>3 years)

- Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary. This evaluation is Ongoing and will be made available when annual monitoring reports for the overall scheme, including Glenlough Bog, will be made available on the PCAS website.
- Potential for decommissioning of silt-ponds will be assessed and carried out, where required. Silt pond maintenance requirements are water quality results based. Silt ponds in the bogs will not only be required to be maintained if water quality monitoring of suspended solids indicate that the pond system is starting to retain silt.
- Reporting to the EPA will continue until the IPC Licence is surrendered, or the boundary amended.

6.4 Budget and Costing

No change.

7. CRITERIA FOR SUCCESSFUL REHABILITATION

This section outlines what criteria were used to indicate successful rehabilitation and what critical success factors were needed to achieve successful rehabilitation. All criteria used to indicate successful rehabilitation were measured to validate the achievement of the rehabilitation goals and outcomes and validate the completion of the rehabilitation.

The key objective of this rehabilitation plan is **environmental stabilisation** and the stabilisation of any emissions from the site that related to the former industrial peat extraction activities.

Rehabilitation is generally defined by BnM as

- stabilisation of bare peat areas via targeted active management (e.g. drain-blocking/re-wetting) slowing movement of water across the site and encouraging natural colonisation; and
- mitigation of key emissions (e.g. potential suspended solids run-off).

7.1. Criteria for successful rehabilitation to meet EPA IPC licence conditions:

Table 7.1.1. Summary of Success criteria, targets, how various success criteria will be measured and expected timeframes.

Criteria type	Criteria	Target	Measured by	Expected Timeframe	Status
IPC validation	Rewetting in the former area of industrial peat production	Delivery of planned rehabilitation measures. This will be a combination of drain blocking and bunding	Aerial photography after rehabilitation has been completed – to demonstrate measures (drain-blocking)	2021-2025	Completed See Section 7.2
IPC validation	Key water quality parameters Ammonia, Phosphorous, Suspended solids, pH and conductivity	Reduction or stabilization of key water quality parameters	Monthly Water quality monitoring. Started in advance of the proposed rehabilitation.	2021-2023	Ongoing See Section 7.3
IPC validation	Reducing pressure from peat production on the local water body	Where the section of the water body, that this bog drains to, has been identified as under pressure	EPA WFD monitoring programme Additional BnM water quality monitoring	WFD schedule	N/A

Criteria type	Criteria	Target	Measured by	Expected Timeframe	Status
	catchment (WFD)	from peat extraction, that the intervening EPA monitoring programme associated with its Programme of Measures for this water body, confirms that there is an improving trajectory in water quality from the peat extraction associated with activities at this bog.			
Climate action verification	Optimising the extent of suitable hydrological conditions to optimise climate action.	Optimal extent of suitable hydrological conditions	Aerial photography and Habitat mapping to map extent of suitable hydrological conditions.	2021-2025	Completed See Section 7.2, 7.3
Climate action verification	Reduction in carbon emissions.	Reduction in carbon emissions	Carbon emissions – estimated using a high bog condition assessment and appropriate carbon emission factors.	2021-2025	Ongoing Section 7.5
Climate action verification	Setting the site on a trajectory towards establishment of a mosaic of compatible habitats	Establishment of compatible cutaway habitats	Habitat map, Cutaway bog condition map.	2021-2025	Ongoing Section 7.5
Climate action verification	Biodiversity and ecosystem services.	Improvement in biodiversity and ecosystem services.	Metrics that relate to selected biodiversity and ecosystem services	2021-2025	Ongoing See

Criteria type	Criteria	Target	Measured by	Expected Timeframe	Status
	Habitat establishment Presence of key species – Sphagnum Breeding birds Pollinators		Presence of key species – Sphagnum – Walkover survey Breeding birds – Breeding bird survey Pollinators – Pollinator walk		Section 7.5

7.2. Delivery of Measures:

At the time of writing this report rehabilitation measures are on ongoing in Glenlough. The following figures show some typical images of the rehabilitation measures carried out in Glenlough Bog.

Figure 7.2.1. Glenlough Bog restoration measures – November 2022.

Figure 7.2.2. Glenlough Bog restoration measures – October 2024.

7.3. Water quality:

Water quality monitoring commenced in August 2020 and is scheduled to cease 2 years after the completion of rehabilitation at this bog. This monitoring programme may be extended and frequency amended if trends need to be tracked beyond the 2 years. As required under the rehabilitation plan approval conditions, annual water quality monitoring results were submitted to the Agency in August 2023 for the period up to December 2022, with the 2023 results to be submitted in 2024. These indicated the trends highlighted below, with the majority of relevant parameters indicating no increase in concentration and some showing an improving downward trend. Suspended solids had very low historical concentrations due to the lack of milled peat activity on the bog and is continuing as such, with pH also being quite low however showing a higher pH level post the rehabilitation measures. COD continues to trend downward over the period, with Ammonia showing a slight increase all be it from a very low concentration due to the lack of historical peat extraction from this bog.

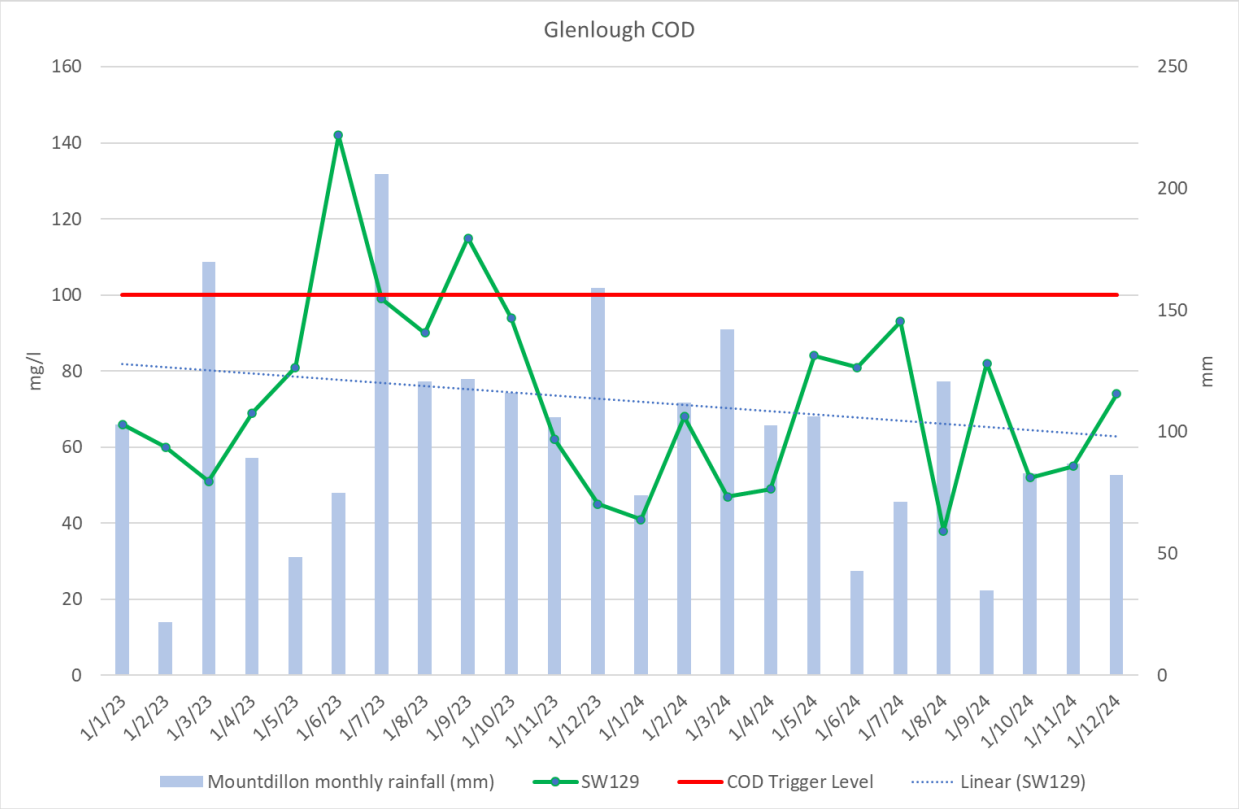

Figure 7.3.1. Glenlough COD monitoring results.

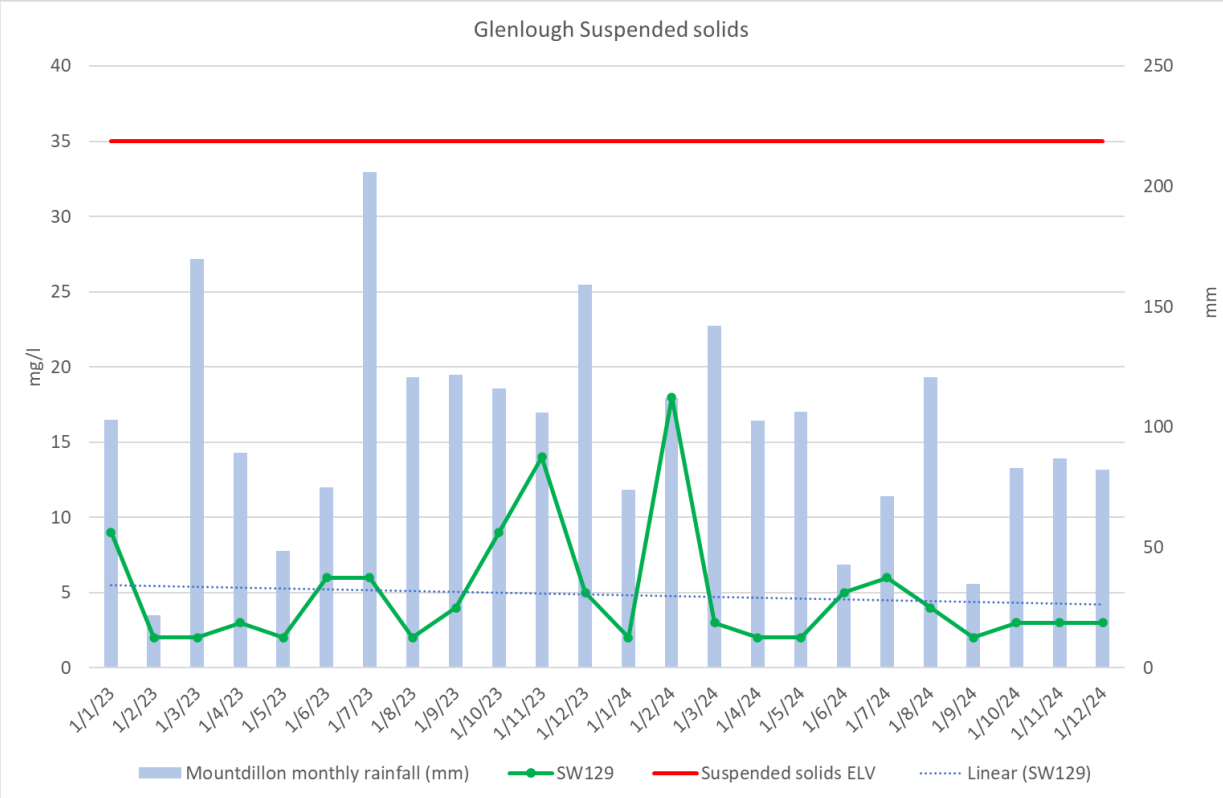

Figure 7.3.1. Glenlough Suspended Solids monitoring results.

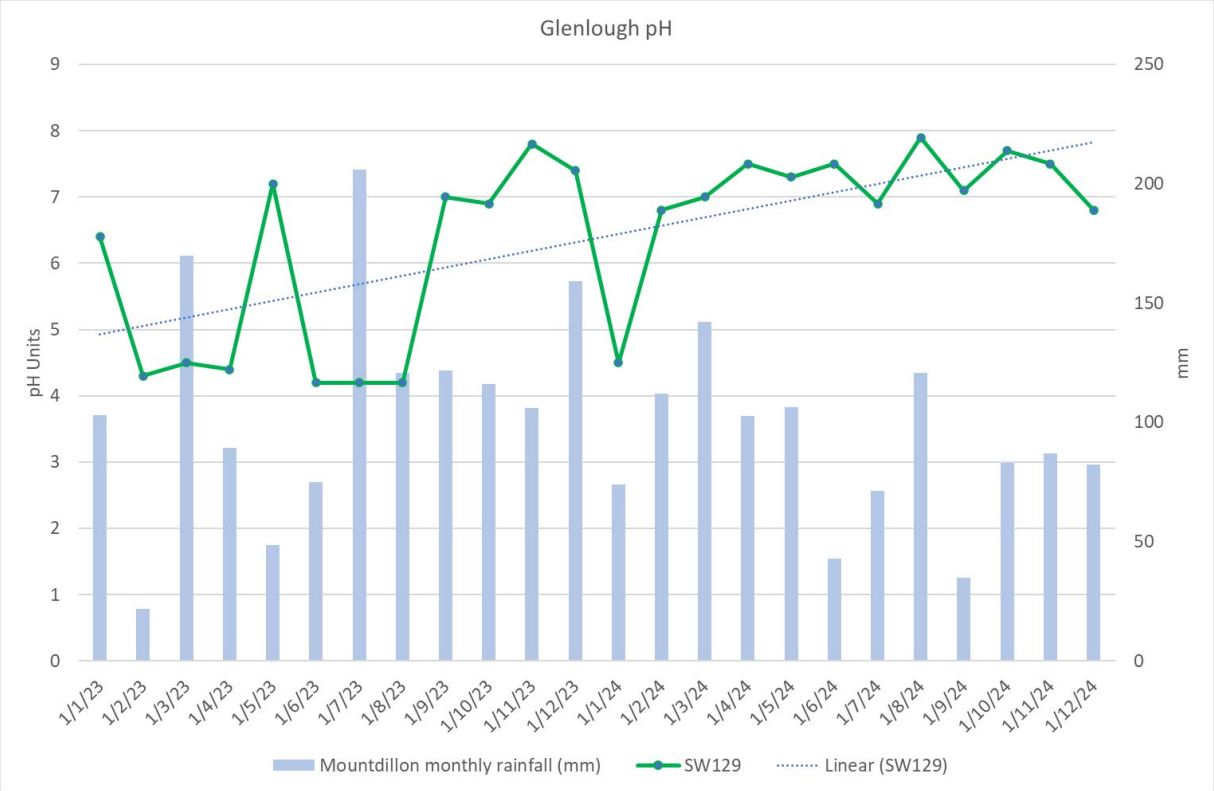

Figure 7.3.1. Glenlough pH monitoring results.

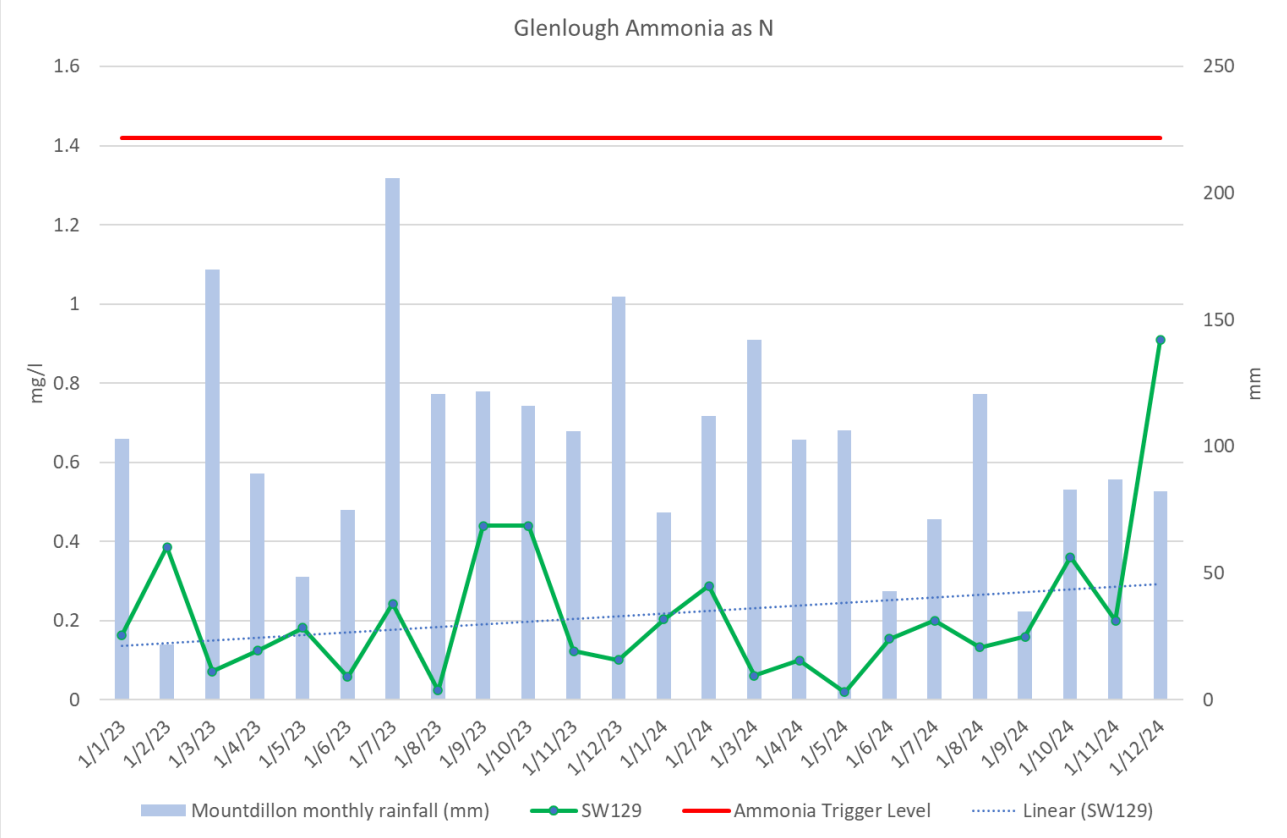

Figure 7.3.1. Glenlough Ammonia monitoring results.

7.4. Hydrology:

Hydrological conditions are one of the most important drivers of ecological functioning of peatlands. A core objective of the Enhanced Decommissioning, Rehabilitation and Restoration Scheme is to improve hydrological conditions in cutaway and drained peatlands to reduce carbon emissions by re-wetting residual peat, and where feasible establish conditions suitable for the development of peat-forming vegetation types and/or the trajectory towards naturally functioning peatland habitats.

A network of monitoring wells (measuring water table levels) and piezometers (measuring hydraulic head at the base of the peat) have been installed across each of the bogs rehabilitated under the scheme. A subset of the locations has also been instrumented with automated data loggers, recording groundwater levels at hourly intervals. These loggers will provide the most suitable long-term datasets that will allow for interpretation of results and incorporation of learnings into the scheme as it progresses.

Hydrological monitoring rationale

Hydrological monitoring locations were selected to meet a range of criteria, including:

a) Collect baseline data on the hydrological setting of each site to inform rehabilitation design and establish appropriate target rehabilitation measures (through improved characterisation of hydrological conditions).

b) Collect data prior to, during and post-rehabilitation to assist in determining the impact of specific rehabilitation measures on groundwater levels and flow direction within the bog (to inform future rehabilitation measure design).

c) Collect data prior to, during and post-rehabilitation that can be extrapolated across representative sections of the site to ensure that the site is on the correct anticipated trajectory.

The hydrological monitoring network has been designed to consider several key factors including the rehabilitation measure, peat thickness and anticipated water levels post-rehabilitation, while also ensuring adequate spatial coverage across the site to assist in characterising the hydrological profile in transects across each bog. Loggers have been targeted towards locations where the measures represent areas with larger footprints, while also targeting specific features of interest (e.g., mineral mounds or targeted placement in areas anticipated to become wetlands).

Hydrological Monitoring in Glenlough Bog

Seventeen piezometer nests have been installed in Glenlough Bog, consisting of phreatic/deep well pairs installed at the interface of the peat and underlying inorganic deposits, respectively. Of the seventeen phreatic monitoring locations, seven have been instrumented with automated data loggers (Rugged Troll 100) recording groundwater temperature and water level at 15-minute intervals (Resolution 0.01m). Two deep wells were also installed with automated data loggers. Manual dipping of piezometers was completed in Sept 2021, Jan 2022, Aug 2022, and

July 2023. (4nr rounds of dipping). Further monitoring was also carried out in Jul 2024, Mar 2025 and Jul 2025, however this data has not yet been fully analysed.

A review of the logger data up to 2023 for wells 001s and 011s in Glenlough was carried out.

Analysis of the logger data shows the trends in water levels have had no major changes but possibly some minor differences. At well 001s the water levels fluctuated between 0.1-0.3m below the surface in winter 2021/2022 which is around 0.1m deeper than winter 2022/2023. It is important to acknowledge the progress of works on Glenlough Bog. Several key drainage features that would have an impact on ground water levels in proximity to wells 001s and 011s were completed in August 2023, which followed the timelines illustrated in the graphs represented below.

At well 011s the base water level is consistently between 1m and 0.8m below the surface level across the data range. The water levels have very large fluctuations with many spikes rising to just under ground level in the winter months. In the summer months the water levels don't rise as high as in the winter with the peaks reaching 0.2-0.4m in most cases. These peaks are also less common in the summer months. There have been no obvious changes in the water levels as the rehabilitation measures were only completed in August 2023 and the graph below does not show any information from July 2023 onwards.

More thorough analysis will be carried out by reviewing the data collected on Glenlough and other bogs in 2024 and 2025. This analysis will be completed over the coming months.

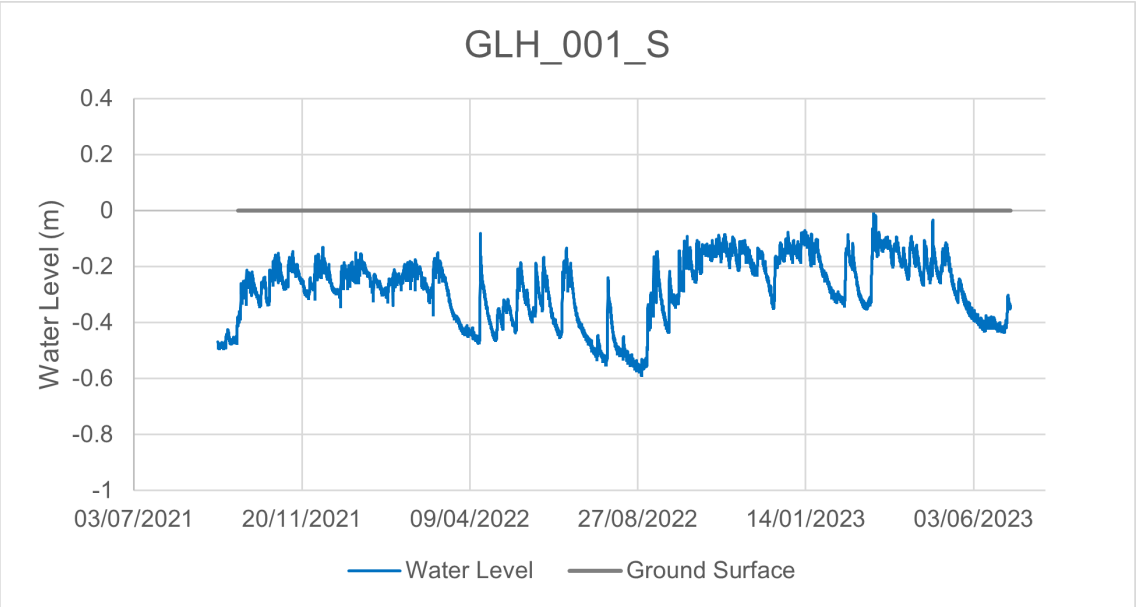

Figure 7.4.1 Hydrograph of the Monitoring Well at GLH_001_S

**PCAS works completed at this Piezometer location in August 2023*

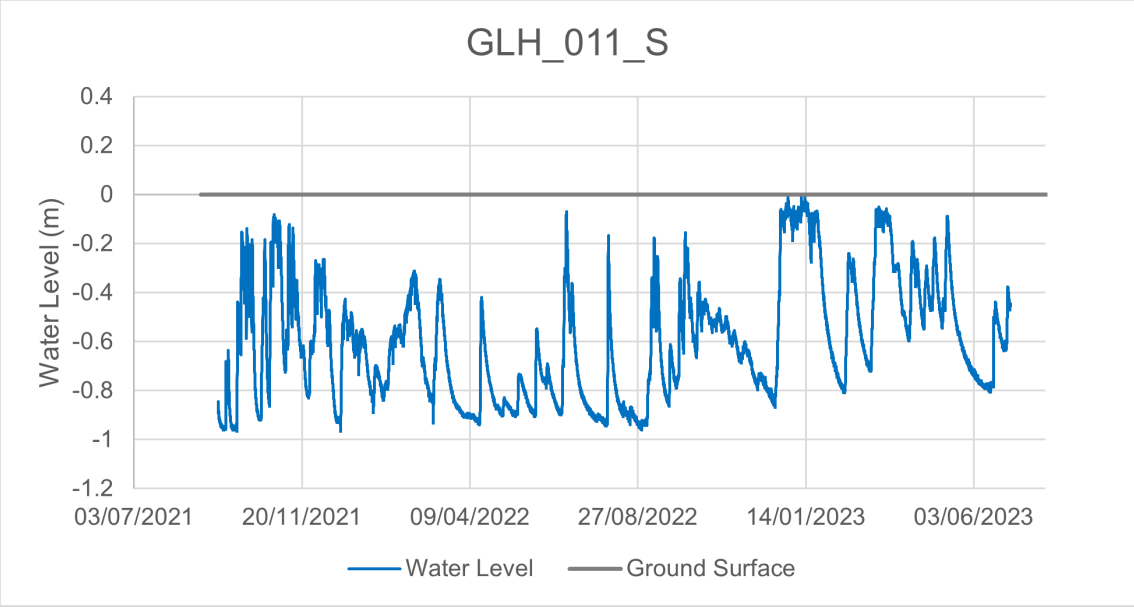

Figure 7.4.2 Hydrograph of the Monitoring Well at GLH_011_S

**PCAS works completed at this Piezometer location in August 2023*

7.5. Ecology:

Vegetation and Habitats Summary

Table 7.5.1. Habitat Findings Summary and Breeding Bird Monitoring Summary.

Attribute	Re-wetting status	Trajectory October 2025	Observations (Oct 2025 based on available imagery and/or site visits where applicable)
Vegetation and habitats	Completed	No significant change Vegetation development and habitats expected to lag after re-wetting	• Drain blocking has been very effective – high water levels noted in blocked drains. • No changes in established vegetation noted yet in response to rehabilitation measures. However, more time is required to monitor these changes. • The bog is significantly wetter, indicates good future prospects for raised bog restoration and increases in extent and quality of Annex I active raised bog habitat.
Breeding birds (2022)		No significant change	• Some breeding peatland bird usage already established. • It is too soon to establish any increase in species richness or abundance directly attributable to rehabilitation.

Restoration has been carried out at Glenlough Bog via drain-blocking, between July 2022 and March 2024, with 70% of the work completed by March 2023. A large area of Glenlough was dominated by mainly non-active raised bog (ARB) with less than 5% of Glenlough already developing *Sphagnum*-rich vegetation aligned to ARB, in areas where drainage had broken down. Although the water levels have risen, it is too soon for habitats at Glenlough to reflect post rehabilitation change. Further time is required before any significant changes in the current vegetation composition is likely to be recorded. However, the bog has become significantly wetter post rehabilitation/drain blocking. There is also increased *Sphagnum* growth already in the re-wetted drains and borrow pits used to provide peat for drain-blocking are recovering vegetation cover, as expected.

Hydrological modelling pre-rehabilitation indicated that only a portion of the bog has the potential to develop active raised bog and *Sphagnum*-rich habitats in relation to the overall raised bog. The widespread drain-blocking programme carried out between 2022 and 2024 across Glenlough bog will improve the overall bog condition and improve the condition of the supporting raised bog habitat. When optimal hydrological conditions have developed on the high bog, it is expected that the area of Active Raised Bog (ARB) habitats at Glenlough will increase and the natural micro-topography of an active raised bog (hummocks, hollows, pools) will redevelop in time.

Drain-blocking has consolidated changes for raised bog habitat to continue to improve condition in the re-wetted parts of this site in the future.

Figure 7.5.1. Typical representation of habitats at Glenlough which has become significantly wetter post rehabilitation/drain blocking (October 2024).

Figure 7.5.2. View across the northern section of Glenlough and the area of active raised bog (partially undrained area with pools).

8. AFTERCARE AND MAINTENANCE

As per Rehabilitation Plan. No change.

9. DECOMMISSIONING

Decommissioning of peatlands encompasses the removal of all infrastructure, plant, equipment, materials, and wastes.

The quantities available for decommissioning are identified on Geographic Information System (GIS), for example: rail, pump sites, tea centres, silt ponds etc.

Waste items not identified on GIS i.e., redundant machinery, scrap metal, polythene, polybrane and pipes are located and added to the clean-up schedule using survey-based apps (Survey123). All records surveyed are managed on the BnM GIS mapping system. Materials/ waste items are then removed from the bog for either reuse or recycling to approved licenced waste management facilities.

The Glenlough bog was firstly surveyed January 2023. No waste items were identified hence no cleanup was required. Additionally, there are no rail lines or pumping infrastructure onsite, thus no decommissioning was required.

All waste and associated weights, volumes, EWC codes and final destinations are reported to the Agency as part of the Annual Monitoring Report (AER) and the Environmental Performance Report (EPR).

10. CHALLENGES AND LESSONS LEARNED

No particular challenges or lessons learned were encountered at Glenlough Bog.

11. AMENDMENTS TO THE GLENLOUGH REHABILITATION PLAN

There were no significant amendments to the Glenlough Rehabilitation Plan. Rehabilitation was implemented as per the Rehabilitation Plan with the exception of additional constrained areas where no measures had previously been proposed within marginal areas. A number of other minor changes in rehabilitation type were made after rehabilitation commenced due to ground conditions encountered on the ground, however, these changes were minimal.

12. REFERENCES

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Appendix A
Glenlough Bog Two Year Review
GIS Map Book 2025

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Figure Appendix A - 1. Aerial photo of Glenlough Bog 2020.
Figure Appendix A - 2. Aerial photo of Glenlough Bog 2022, post rehabilitation.
Figure Appendix A - 3. Glenlough Bog as completed rehab measures.

Figure Appendix A- 1. Aerial photo of Glenlough Bog 2020.

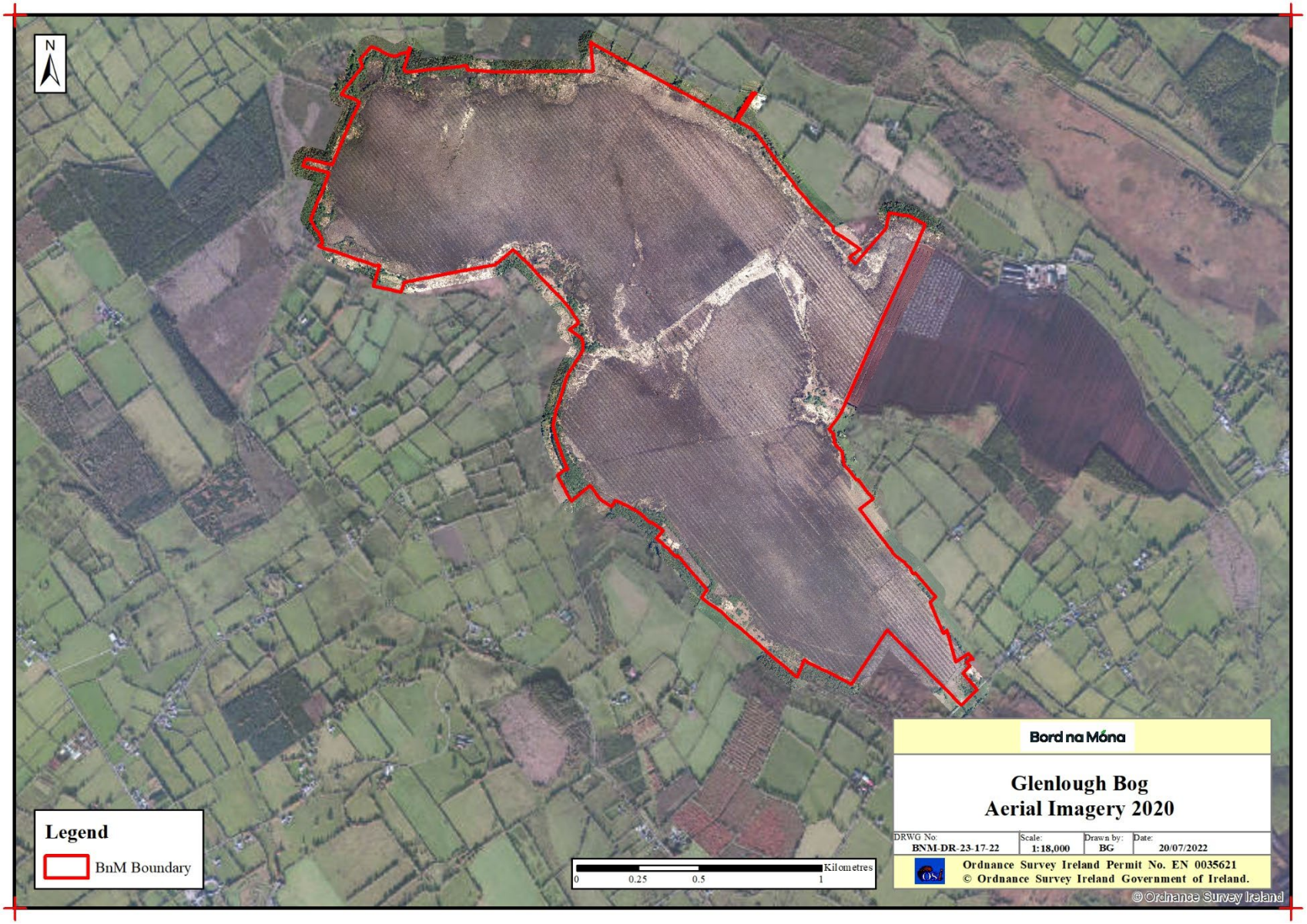

Figure Appendix A-2. Aerial photo of Glenlough Bog 2022,

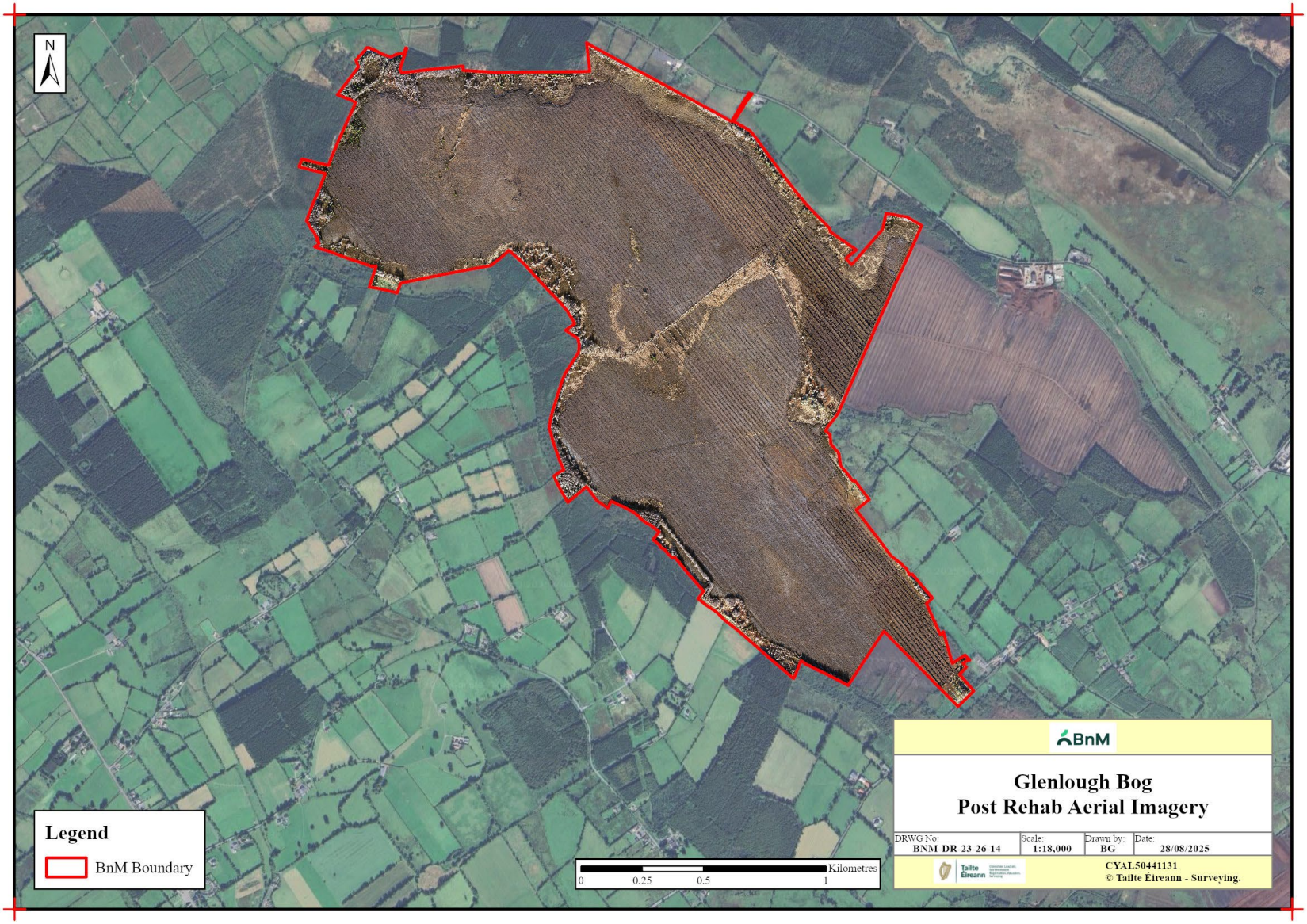
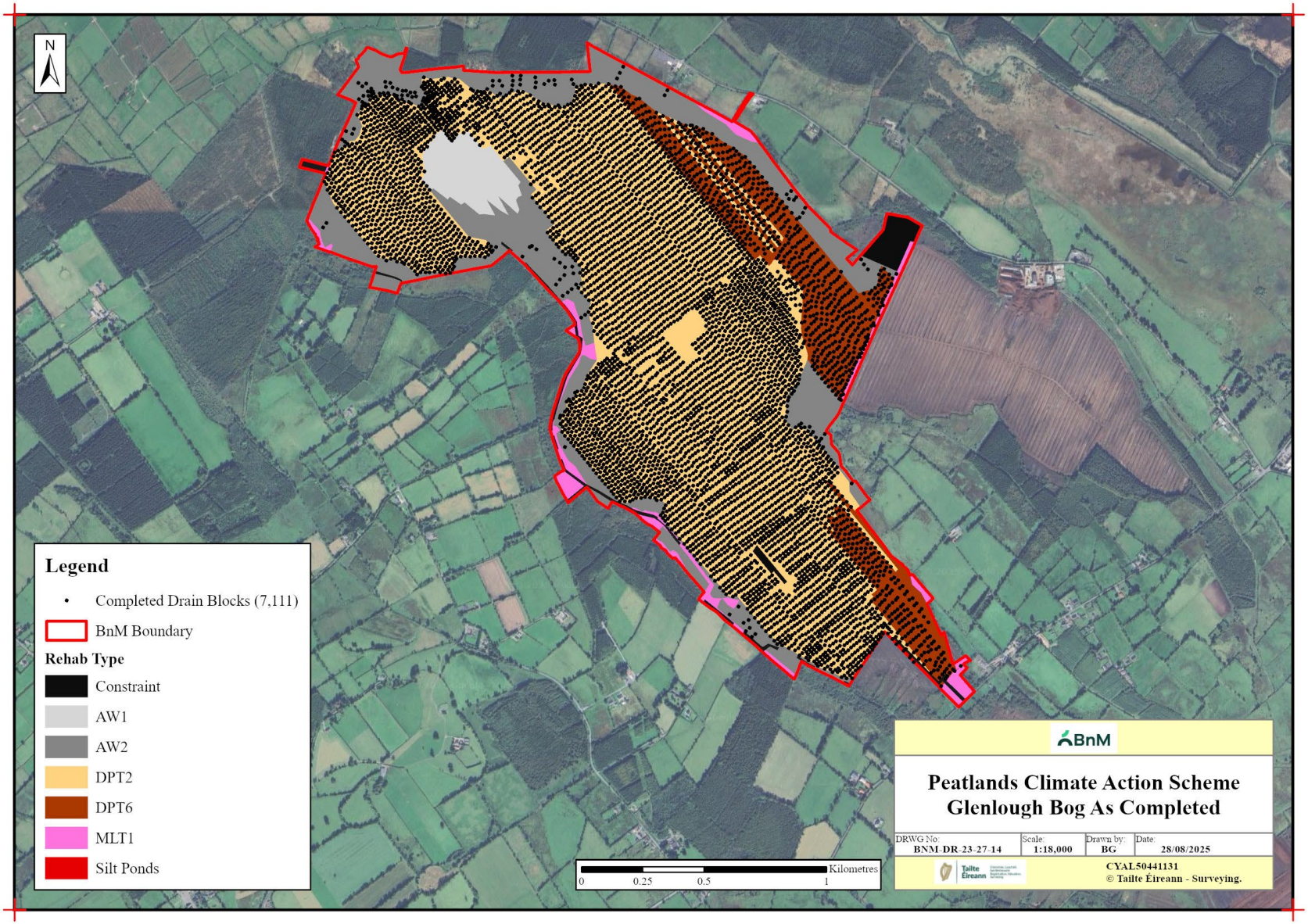
Figure Appendix A-3. Glenlough Bog as completed rehab measures.