ScottishPower Renewables

Euchanhead Renewable Energy Development

Additional Environmental Information
Chapter 10: Hydrology, Hydrogeology, Geology and Soils

November 2025

Table of Contents

Abbreviations

AEI	Additional Environmental Information
CAR	Controlled Activities Regulations
CEMP	Construction Environmental Management Plan
EIA	Environmental Impact Assessment
GWDTE	Groundwater Dependent Terrestrial Ecosystems
SEPA	Scottish Environment Protection Agency

10. Hydrology, Hydrogeology, Geology and Soils

10.1. Introduction

SLR Consulting has been commissioned by the Applicant to undertake an update of the hydrology, hydrogeology, geology and soils assessment contained within the 2020 Euchanhead Renewable Energy Development Environmental Impact Assessment (EIA) Report. This updated hydrology, hydrogeology, geology and soils assessment addresses the following changes since the Euchanhead Renewable Energy Development Section 36 (S36) application was made in 2020:

- The removal of Turbines No.20 and No.21;
- The reduction in turbine blade tip height of Turbines No.9, No.10, No.11. No.18 and No.19, from 230m to 200m; and
- The updated cumulative situation in the surrounding area (primarily Sanquhar II Community windfarm being granted consent in August 2023).

This Additional Environmental Information (AEI) Chapter supplements **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the 2020 Euchanhead Renewable Energy Development EIA Report (from herein referred to as the 'EIA Report').

The methodology employed in this AEI remains the same as that set out in EIA Report **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**. It is noted that several guidance documents have been updated since the S36 application was made and this assessment takes cognisance of the updated guidance documents.

The following key documents should be read in conjunction with this AEI chapter:

- EIA Report Volume 2 – **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** (2020)
- EIA Report Volume 3d – **Figures 10.1** to **10.7**; and
- EIA Report Volume 4b – **Technical Appendices 10.1** to **10.6**.

10.1.1. Superseded EIA Report Documents

The following documents from the EIA Report:

- **Technical Appendix 10.2: Peat Management Plan Appendix A**.

Have been superseded by the following:

- **AEI Technical Appendix 10.2: Peat Management Plan Appendix A**.

10.2. Consultee Responses to 2020 Application

All consultation, regarding hydrology, hydrogeology, geology and soils, with statutory consultees that was received prior to the 2020 S36 application being submitted, is outlined in the EIA Report **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**.

Table 10:1 sets out the relevant consultee responses to the 2020 S36 application.

Table 10:1 - 2020 S36 Application Consultee Responses

Consultee	Summary of Key Issues	Response to Comments
SEPA Response Date: 29 April 2022	SEPA have previously offered advice to you regarding the Euchanhead Renewable Energy Development. In our most recent comments (15 July 2021, Ref. 1614) we requested further information regarding the resiting of Turbine 14 off deep peat, an updated Peat Management Plan (PMP) and more information about watercourses and crossing types. We have now been consulted directly by SLR Consulting Limited on 04 March 2022 with a letter response to those points (dated 02 March 2022, Ref. 405.00481.00052). Following our review of the further information we can confirm we are now in a position to remove our objections to the proposed wind farm development.	Noted. No response required.
Ironside Farrar Response Date: 20 April 2021	I've reviewed the letter/plan and can confirm that the response adequately addresses the comments made in the Stage 1 Checking Report. This concludes the assessment relative to PLHRA.	Noted. No response required.
NatureScot Response Date: 16 February 2021	Given the size of the proposed development and the relatively small impact on nationally important 'carbon rich soil, deep peat and priority peatland habitat', NatureScot would not object to this application on National Interest grounds of peat and peatland. However, whilst the wind farm itself almost entirely avoids these areas it is not clear to NatureScot why Route A access track is the preferred route? Our interest in this lies in the impact on habitats of track construction and upgrade, particularly in relation to peatlands on national importance. Figure 8.3 NVC Study Area & Survey Results & Figure 10.4 Peatland Classification has identified route A will have the greatest impact on a feature of national importance. Chapter 12 Paragraph 12.4.3 has identified Route B	The proposed Route B may require considerable engineering works in order to get larger blades from the public highway to Site. Agreement would also be required with several landowners in order for this route to progress. The proposed Route A remains the preferred route as it utilises the existing Hare Hill Windfarm Site entrance and access tracks. In addition to this, the new sections of access track for Route A would also potentially be used by Hare Hill Windfarm Repowering, which would

	has successfully been used for construction access for the Whiteside Hill wind farm with limited impact on national importance areas of peatlands. Therefore, it is unclear to NatureScot why the creation of route A is necessary. The applicant should explain this more clearly.	utilise the majority of Route A for access.
Scottish Water Response Date: 20 November 2020	Scottish Water has no objection to this planning application.	Noted. No response required.

10.3. Design Amendments

The amendments to the 2020 S36 application Site Layout are detailed in **AEI Chapter 2: Site Description and Design Evolution**. The key amendments with regards to hydrology, hydrogeology, geology and soils are:

- The removal of Turbines No.20 and No.21, as well as the access track associated with these turbines; and
- The reduction in turbine blade tip height of Turbines No.9, No.10, No.11. No.18 and No.19, from 230m to 200m;

These amendments have not been made as a result of feedback from consultees regarding the assessment presented in EIA Report **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**.

10.4. Changes to Baseline Conditions

There are no changes to the baseline conditions at the Site to those set out in **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report.

10.5. Assessment of Design Amendments Effects

10.5.1. Construction Effects

Pollution Risk

Best practice and mitigation measures detailed within **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** or **Technical Appendix 3.1: Outline Construction Environment Management Plan (CEMP)** of the EIA Report remain applicable and can be used to mitigate potential adverse effects on the local hydrology and hydrogeology. These will be included as part of the final CEMP which will be secured by a planning condition (post any consent) and would be prepared and agreed with statutory consultees prior to construction commencing. In addition, as discussed in **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report, a programme of water monitoring is proposed prior to and during construction.

The proposed amendments to the Site Layout do not change the findings of **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report with regards to construction effects and pollution risk. The potential effects would remain as Negligible.

Erosion and Sedimentation

As detailed in the **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report, adherence to good practice measures would ensure that any material generated from construction works such as the excavation of borrow pits, hardstanding construction, and watercourse crossing construction, would not be transported into nearby watercourses, to groundwater, or onto areas of peat.

Location specific good practice measures will form part of the final CEMP and would be used to minimise the potential for erosion and sedimentation.

The proposed amendments to the Site Layout do not change the findings of **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report with regards to construction effects and erosion / sedimentation. The potential effects would remain as Negligible.

Fluvial Flood Risk

As detailed in the **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report, adherence with good practice measures including appropriate drainage design and compliance with the final CEMP would limit potential fluvial flood risk impacts to being local and short duration and so of negligible magnitude.

The proposed amendments to the Site Layout do not change the findings of **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report with regards to construction effects and fluvial flood risk. The potential level of effect on flood risk, would therefore remain as Negligible.

Infrastructure and Man-made Drainage

As detailed in the **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report, the design of the proposed development (including the revised layout) has avoided areas of high ecological or habitat interest, including Groundwater Dependent Terrestrial Ecosystems (GWDTE), wherever possible. Furthermore, the superficial and bedrock deposits have little groundwater and therefore limited or little dewatering is likely to be required. There remains potential however, for local dewatering of soils near cable trenches, turbine bases and borrow pits, without incorporation of mitigation measures.

Location specific good practice measures will form part of the final CEMP and would be used to minimise the potential for drainage and dewatering effects.

The proposed amendments to the Site Layout do not change the findings of **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report with regards to construction effects and infrastructure/manmade drainage leading to dewatering. The potential significance of effect of changing groundwater levels and flow due to dewatering remains as Negligible.

Water Abstraction

As detailed in the **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report any water which is abstracted during construction of the proposed development will be regulated through the Controlled Activities Regulations (CAR).

The proposed amendments to the Site Layout do not change the findings of **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report with regards to construction

effects regarding water abstractions. The potential significance of effect remains as Negligible.

Peat Landslide Hazard Risk Assessment and Peat Management Plan

As a result of the proposed amendments to the Site Layout, the peat excavation and re-use volumes have been updated from those presented in the **Technical Appendix 10.2: Peat Management Plan** of the EIA Report. A comparison of the volumetrics is detailed in **Table 10:1** and an update to the excavated material calculator is provided as **AEI Technical Appendix 10.2 Appendix A**.

Table 10:1 – Excavation and Re-use Volumes Comparison

Type	EIA 2020	AEI 2025
Total Excavated Volume (m^3)	203,037	179,192
Total Re-use Volume (m^3)	217,896	209,775
Net Balance (m^3)	-14,859	-30,582

As can be seen from **Table 10:1**, 23,845m^3 less peat would be disturbed as a result of the amendments to the Site Layout. There would also be an even greater (when compared to the EIA Report) negative net balance of peat excavated to that which could be re-used (i.e. there is even less chance of having a surplus of excavated peat that cannot be re-used on Site.

The recommendations on excavation and re-use of soils and peat detailed within **Technical Appendix 10.2: Peat Management Plan** of the EIA Report remain applicable and would be updated in a final Peat Management Plan which would be secured by a planning condition (post any consent) prior to construction commencing.

With regards to peat landslide hazard risk, there is sufficient peat probe data available, from the 2020 EIA Report, to assess the proposed amendments to the Site Layout.

Review of the proposed amendments to the Site Layout indicates that there has been no change to the level of Peat Stability Risk or the conclusions and recommendations within **Technical Appendix 10.1: Peat Landslide Hazard Risk** Assessment of the EIA Report. No update of the **Technical Appendix 10.1** of the EIA Report is therefore required and no increase in peat slide risk has been identified, and as such remains Negligible.

10.5.2. Operational Effects

Pollution Risk

The possibility of a pollution event occurring during operation is very unlikely. There would be a limited number of vehicles required onsite for routine maintenance and for the operation of the proposed development. Storage of fuels/oils onsite would be limited to the hydraulic oil required in turbine gearboxes and this would be bunded (satisfying storage guidance) to prevent fluid escaping.

The revised layout does not change the findings of **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report with regards to operational effects and pollution risk. The potential effects would remain as Negligible.

Erosion and Sedimentation

During the operation of the proposed Development, it is not anticipated that there would be any significant excavation or stockpiled material beyond the clearing of SuDS features to maintain their efficiency, reducing the potential for erosion and sedimentation effects.

Immediately post-construction, newly excavated drains and track dressings may be prone to erosion as any vegetation would not have matured. Appropriate design of the drainage system, incorporating sediment traps, would reduce the potential for the increased delivery of sediment to natural watercourses. Immediately post-construction, flow attenuation measures would remain and be maintained to slow runoff velocities and prevent erosion until vegetation becomes established.

The revised layout does not change the findings of **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report with regards to operational effects and erosion /sedimentation. The potential effects would remain as Negligible.

Infrastructure and Man-made Drainage

Operation of the proposed Development would require limited activities relative to the construction phase.

The revised layout does not change the findings of **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report with regards to operational effects and infrastructure / man-made drainage leading to dewatering. The potential effects would remain as Negligible and therefore not significant.

10.5.3. Cumulative Effects

Table 10:2 sets out the wind farms ('Consented' or 'In Planning') within the sub catchments of the River Nith and the Water of Ken and within 5km of the application boundary, which were submitted subsequent to the 2020 Euchanhead Renewable Energy Development application.

Table 10:2: New Cumulative Wind Farm Development

Name	Status	Catchment
Manquhill Wind Farm	Consented	Cairn Water
Cornharrow Wind Farm	Consented	Cairn Water
Sandy Knowe Extension Wind Farm	In Planning	River Nith
Cloud Hill Wind Farm	In Planning	Euchan Water

Herds Hill Wind Farm	In Planning	Kello Water
Rowancraig Wind Farm	In Planning	Euchan Water
Appin Wind Farm	In Planning	Partially within the Scar Water and Water of Ken
Lorg 2022	In Planning	Water of Ken

The updated cumulative baseline does not change the cumulative assessment in relation to hydrology, hydrogeology, geology and soils presented in the **Chapter 10** of the EIA Report, as the cumulative developments will be developed and managed in accordance with current best practice, industry standards and relevant legislation, planning policy and guidance regulated by statutory consultees. These standards ensure, with respect to the hydrology, hydrogeology, geology and soils, potential impacts are mitigated and controlled at source. The mitigation measures that are presented in the EIA Report ensure there are no likely effects beyond the application boundary.

It is concluded that there would be a Negligible cumulative effect on hydrological receptors from both the construction and operating phases of the proposed Development.

10.6. Summary of Changes to the Significance of Effects

As detailed above, the proposed amendments to the Site Layout do not change the findings, with regards to significance of effects, of **Chapter 10** of the EIA Report.

The significance of likely effects therefore remains Negligible, as assessed in the EIA Report.

10.7. Conclusion

As a result of the amendments to the Site Layout, 23,845m^3 less peat would be disturbed when compared to the 2020 EIA Report Site Layout.

The significance of likely effects, as a result of the proposed Development remain Negligible.