Hydromorphology Supplementary Information

Project name	Client	Subject	Date
Balliemeanoch Pumped Storage Hydro	ILI Pump Storage Hydro PLC	CAR Application Request for Further Information	27 February 2026

Prepared by	Checked by	Verified by	Approved by
[redacted]	[redacted]	[redacted]	[redacted]

1. Introduction

An application for the discharge and abstraction of water for the Balliemeanoch Pumped Storage Hydro Scheme (the Proposed Development), under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) (the Application), was submitted to the Scottish Environment Protection Agency (SEPA) in June 2025. Following an initial review of the application submitted by AECOM on behalf of Intelligent Land Investments Ltd (the Applicant), SEPA have formally written to the Applicant dated 17 December 2025, detailing their Request for Further Information.

Subsequently, a meeting was held between SEPA, AECOM and the Applicant on 22nd January 2026 and a further meeting was held with the SEPA geomorphologist on 26th January 2026. In this second meeting, it was concluded that much of the information requested by SEPA was presented as part of the Environmental Impact Assessment Report (EIAR) and would be provided to SEPA via a supplementary submission.

This technical note (TN) sets out the Applicant's response to SEPA's queries raised in relation to hydromorphology and signposts where this information can be found in the EIAR and, for ease of review, provides this information as per the following appendices.

- Appendix A Balliemeanoch Pumped Storage Hydro Environmental Impact Assessment Report Volume 2: Main Report Chapter 11: Water Environment
- Appendix B Balliemeanoch Pumped Storage Hydro Environmental Impact Assessment Report Volume 5: Appendices Appendix 11.1 Walkover and Water Quality Results.
- Appendix C Balliemeanoch Pumped Storage Hydro Environmental Impact Assessment Report Volume 5: Appendices Appendix 11.4: Watercourse Crossings.
- Appendix D Balliemeanoch Pumped Storage Hydro Environmental Impact Assessment Report Volume 3: Figures

2. SEPA Request – Geomorphology

Table 1, below, details the Applicant's response to SEPA's Request for Further Information to the CAR application, specifically relating to hydromorphology. The supporting information and clarification regarding sediment transport processes, potential impacts and mitigation is detailed in **Section 3** below. The relevant documents (excluding the CAR License Supporting Document) is cross referenced within the AECOM responses and can be found in the Appendices, included with this Supplementary Information.

The proposed scheme is presented in drawing S03-Z1-00-DR-CE-310101. The tailpond (Loch Awe) inlet/outlet structure is presented in drawings S03-Z1-08-DR-CE-318501 and S03-Z1-08-DR-CE-318202.

Table 1. Hydromorphology Response to 'Request for Further Information'

Ref.	SEPA Comment	AECOM Response	Relevant Document Cross Reference	Actions / Notes
3.1	Form D (section 4.17) states "sediment load expected to be low based on existing morphology" Please provide details of how this conclusion was reached.	Supporting information relating to sediment is contained within the EIAR as noted in Column G. Additional information is provided in Section **Error! Reference source not found.** of this document.	EIAR Volume 2: Main Report, Chapter 11: Water Environment EIAR Appendix 11.1 EIAR Appendix 11.4	Additional information provided for clarity
3.2	The footprint of the proposed upper reservoir will intercept a watercourse. A geomorphology assessment is required to assess the potential impact of this proposal. The extent of the assessment should identify sediment processes and fluvial forms upstream and downstream of the impoundment and how the proposal will impact these and how any impacts identified are mitigated.	The EIA was based on a design which involved intercepting the main Allt Beochlich. However, the amended design submitted for CAR/EASR has less impact as the main embankment crosses only tributaries of the Allt Beochlich. AECOM therefore do not see the benefit in undertaking a geomorphology assessment of the watercourse. Additional information provided **in Section** Error! Reference source not found. below.	-	Discussion with SEPA required to understand the purpose of this request. As per Column F, AECOM do not believe this work is necessary as the system is highly impacted by the existing reservoir and hydro scheme.
3.3	Building power stations on or close to the shoreline can disrupt sediment transport along the shores of lochs, a process known as longshore drift. Please provide an assessment of the potential impacts from the intake/outflow arrangement on the banks of Loch Awe. Further details are required of the intake/outfall arrangement including dimensions this extends into Loch Awe and area of proposed rock armour and any other proposed engineering works to allow assessment against environmental standards. Please provide a sediment management plan or justification as to why one is not required.	Details of the inlet/outlet structure on Loch Awe are presented in Section 4 of the CAR Supporting Documentation. However, as requested by SEPA, additional information has been provided in Section 2 of this letter. A shoreline drift assessment will be undertaken and submitted in a separate submission to SEPA. It will consider the preliminary design of the structure, which is subject to detailed design and further modelling, which will be confirmed post-consent.	CAR Supporting Documentation Section 4: The Proposed Development	Additional information provided for clarity

3. Hydromorphology Supporting Information Requirements

3.1 Specific SEPA Response Ref 3.1

- *Form D (section 4.17) states "sediment load expected to be low based on existing morphology"*
- *Please provide details of how this conclusion was reached.*

Conclusions related to the sediment load of watercourses potentially affected by the Proposed Development are based on a walkover survey undertaken on 9th and 10th of August 2023 as presented in the following reports and figures submitted as part of the EIAR:

- Balliemeanoch Pumped Storage Hydro Environmental Impact Assessment Report Volume 2: Main Report, Chapter 11: Water Environment
- Balliemeanoch Pumped Storage Hydro Environmental Impact Assessment Report Volume 5: Appendices Appendix 11.1 Walkover and Water Quality Results.
- Balliemeanoch Pumped Storage Hydro Environmental Impact Assessment Report Volume 5: Appendices, Appendix 11.4: Watercourse Crossings.
- Balliemeanoch Pumped Storage Hydro Environmental Impact Assessment Report Volume 3: Figures;
  - Figure 11.2a_Surface Water and Groundwater Receptors Study Area_240624
  - Figure 11.2b_Surface Water and Groundwater Receptors Study Area_240328
  - Figure 11.3a_Surface Water and Groundwater Receptors Headpond_240328
  - Figure 11.3b_Surface Water and Groundwater Receptors Headpond_240328

The Proposed Scheme has been modified since the time that the EIA was prepared, therefore the attached figures are not current in relation to the design, and the potential impact on watercourses has reduced. However, the figures show the key watercourses in relation to the Proposed Development.

The watercourse directly impacted by the Proposed Headpond is a tributary to the Allt Beochlich, shown on **Figure 3-1**. Photographs of this tributary are included in **Figure 3-2** to **Figure 3-4** and the superficial geology map of the area is given in **Figure 3-5**. Channel typology of the affected tributary is predominantly bedrock, with some cobbles visible but a general lack of alluvial features (e.g., gravel bars and riffles). There is also a general lack of superficial deposits as shown on British Geological Survey (BGS) mapping[1], implying that bedrock is at or near the surface throughout the catchment. Bedrock geology is predominantly Tayvallich Volcanic Formation (metalava and metatuff). The lack of superficial deposits combined with the hard, igneous bedrock and the coarse, bedrock-dominated nature of the channel implies that rates of sediment production and transport on the affected tributary are likely to be low.

[1] British Geological Survey Geology Viewer, available at https://geologyviewer.bgs.ac.uk/?_ga=2.31812986.510489313.1751275562-1059218996.1751275562. Last accessed 9.2.26

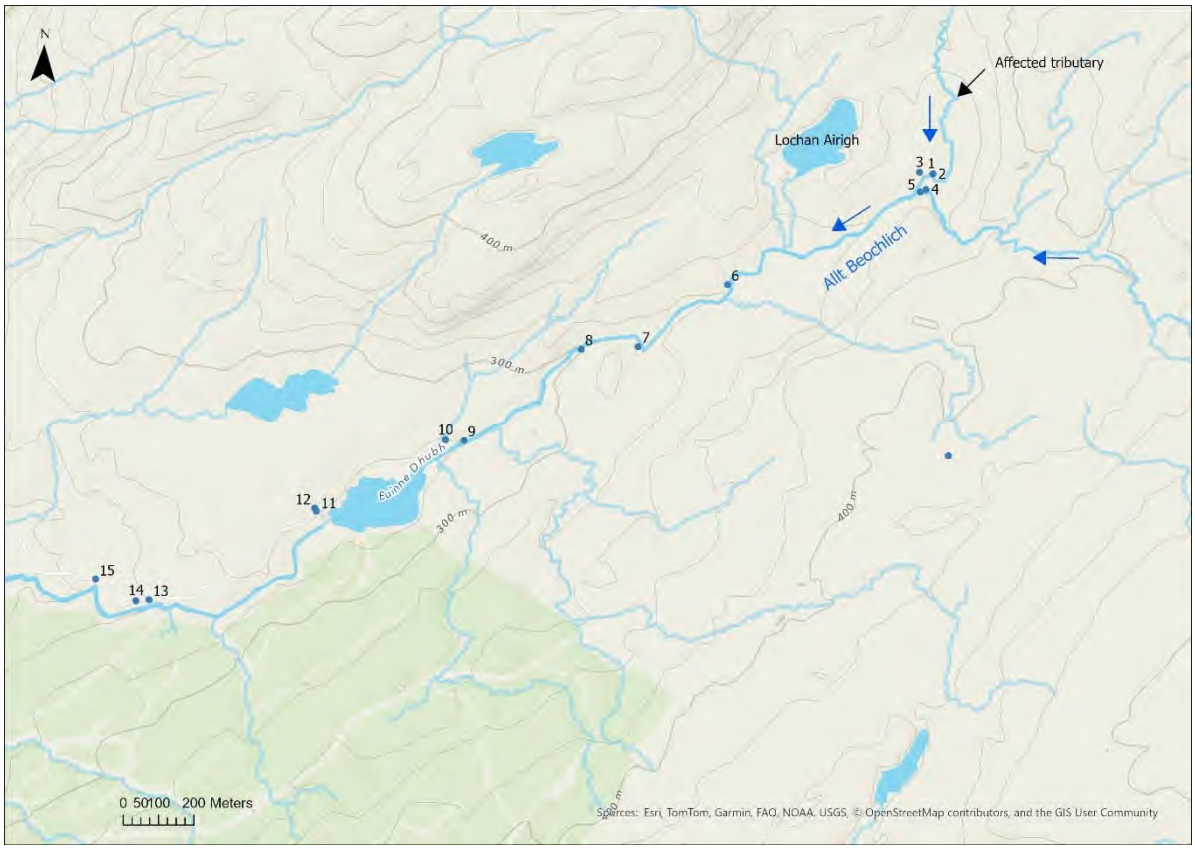

Figure 3-1 Location of the watercourses affected by the proposed PSH scheme showing flow direction and photo locations

Figure 3-2 Affected tributary looking upstream (photo 1)

Figure 3-3 Affected tributary looking downstream (photo 2)

Figure 3-4 Affected tributary (foreground) with Allt Beochlich to the far right of the image (photo 3)

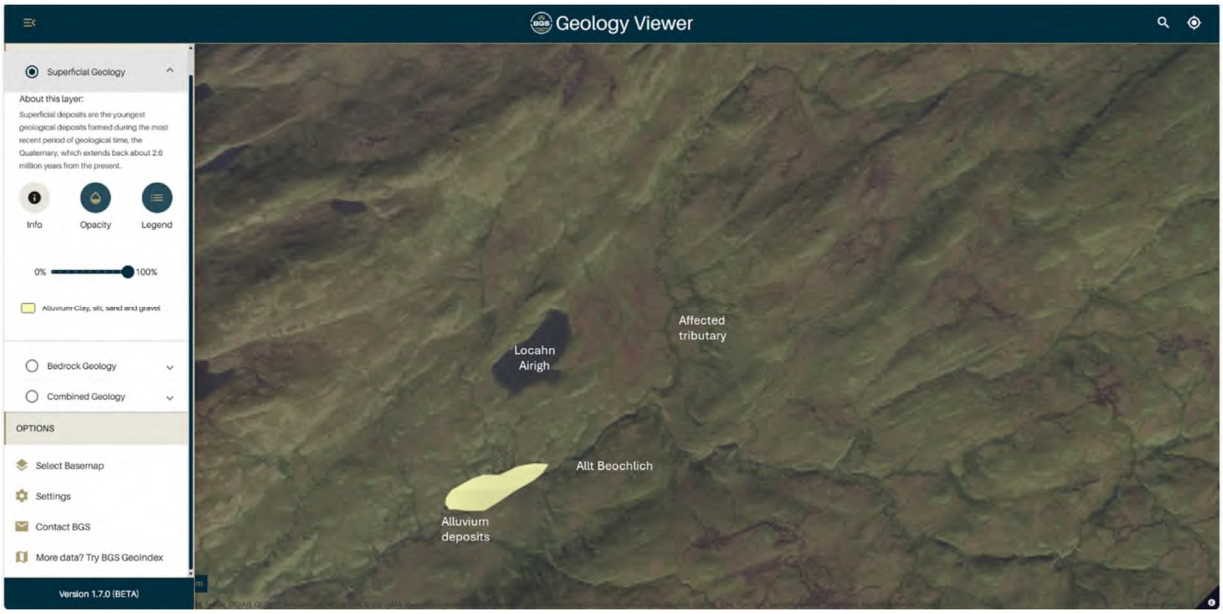

Figure 3-5 Superficial deposits mapping at the Proposed Development site

3.2 Specific SEPA Response Ref 3.2

- *The footprint of the proposed upper reservoir will intercept a watercourse.*
- *A geomorphology assessment is required to assess the potential impact of this proposal. The extent of the assessment should identify sediment processes and fluvial forms upstream and downstream of the impoundment and how the proposal will impact these and how any impacts identified are mitigated.*

As discussed in **Section** Error! Reference source not found. above, one tributary of the Allt Beochlich will be impacted by the Proposed embankment.

3.2.1 Sediment processes and fluvial forms

Sediment processes in the affected tributary are transport dominated, through a relatively steep, confined bedrock reach. A lack of superficial deposits contributes to the absence of transportable material or alluvial features, with weathering of bedrock the likely main contributor to coarse sediment which is predominantly cobble sized. The slope of the channel at the Proposed Development site is steep, at approximately 3.36%.

The Allt Beochlich is a steep, bedrock dominated channel which flows through a confined valley and with several small waterfalls/cascades (**Figure 3-8** and **Figure 3-9**). Coarse, transportable sediment is present in the form of bars at various locations (**Figure 3-6** and **Figure 3-10**). Material within the bars is angular and dominated by cobble size clasts (**Figure 3-7**). Downstream of the Proposed Development, sediment transport processes on the Allt Beochlich are impacted by the presence of a small reservoir, which fully impounds the watercourse. There is no evidence of substantial accumulation of sediment in the reach upstream of the reservoir and within the reservoir itself (**Figure 3-11** to **Figure 3-14**). This further points to the limited rates of sediment transport in the system generally.

Additionally, downstream of the dam, there is a run of river hydropower scheme, with an intake weir, which further disrupts sediment transport (**Figure 3-15**). Downstream of these structures, the channel remains steep, with a bedrock/cascade typology and lack of transportable coarse sediment evident (**Figure 3-16** and **Figure 3-17**).

Figure 3-6 Allt Beochlich upstream of affected tributary (photo 4)

Figure 3-7 Coarse sediment deposits on the Allt Beochlich just upstream of affected tributary (photo 5)

Figure 3-8 Allt Beochlich downstream of Proposed Development (photo 6)

Figure 3-9 Small waterfall on Allt Beochlich downstream of Proposed Development (photo 7)

Figure 3-10 Allt Beochlich downstream of Proposed Development (photo 8)

Figure 3-11 Allt Beochlich immediately upstream of the reservoir (photo 9)

Figure 3-12 Allt Beochlich entering the reservoir (photo 10)

Figure 3-13 Allt Beochlich reservoir (photo 11)

Figure 3-14 Dam on Allt Beochlich (photo 12)

Figure 3-15 Small hydro scheme intake (photo 13)

Figure 3-16 Waterfall on Allt Beochlich downstream of reservoir and small hydro intake (photo 14)

Figure 3-17 Allt Beochlich downstream of reservoir and small hydro intake (photo 15)

3.2.2 Impact of the scheme on sediment processes

The Headpond Embankment is proposed to intercept the tributary of the Allt Beochlich, described above, interrupting sediment transport processes. However, given the steep and stable bedrock nature of the channel and general lack of transportable coarse sediment, the impact downstream is expected to be low. There is approximately 360m of affected channel downstream of the Headpond Embankment to the confluence with the Allt Beochlich, downstream of which impacts are likely to be substantially reduced due to flow and sediment inputs from the upper reaches of the Allt Beochlich. The Headpond would not be expected to be subject to excessive sediment build up due to low input rates as discussed above. The risk of sediment depletion and scour downstream is low, due to the existing low transport rate and stable bedrock nature of the downstream channel of the tributary and Allt Beochlich, which make these channels relatively insensitive to changes in flow and sediment regimes.

The risk of sediment depletion within the Allt Beochlich is also low, due to the currently low level of input from the tributary. Furthermore, coarse sediment is present in the Allt Beochlich as a result of input from numerous tributaries up and downstream of the affected tributary.

The reach upstream of the Proposed Development that is predicted to be affected is approximately 690m. The Headpond Embankment and area of inundation is likely to impact this upstream reach by reducing normal sediment transport processes and increasing deposition of any existing transportable material. However, given the nature of low geomorphic activity in this reach, the impact is expected to be low.

Downstream of the Proposed Development, sediment transport processes on the Allt Beochlich are impacted by the presence of the small reservoir, and the run of river hydropower scheme. It is highly unlikely that any impact from the Proposed Development on geomorphological processes would affect this reach of the watercourse, due to the distance downstream, with multiple other tributary inflows. Furthermore. the impact of the current infrastructure on the watercourse is much more significant and therefore the impact of the Proposed Development is assessed to be very low.

3.2.3 Proposed mitigation

A constant compensation flow is to be maintained to the affected tributary and in order to provide some variance in flow, the scour valve will be opened twice yearly. No sediment management at the Headpond is proposed as there is no anticipated impact and sediment accumulation upstream is considered unlikely based on the current condition of the watercourse.

3.3 Specific SEPA Response Ref 3.3

- *Building power stations on or close to the shoreline can disrupt sediment transport along the shores of lochs, a process known as longshore drift.*
- *Please provide an assessment of the potential impacts from the intake/outflow arrangement on the banks of Loch Awe.*
- *Further details are required of the intake/outfall arrangement including dimensions this extends into Loch Awe and area of proposed rock armour and any other proposed engineering works to allow assessment against environmental standards.*

Please provide a sediment management plan or justification as to why one is not required.

Details of the inlet/outlet structure on Loch Awe are presented in Section 4 of the CAR Supporting Documentation. A shoreline drift assessment will be undertaken and submitted in a separate submission to SEPA. It will consider the preliminary design of the structure, which is subject to detailed design and further modelling, which will be confirmed post-consent. The requirement for a sediment management plan will be assessed at this stage and agreed with SEPA.

For reference, photographs of the shoreline in the area of the proposed inlet/outlet structure are shown in **Figure 3-18** and **Figure 3-19.**

Figure 3-18 Loch Awe shoreline in the vicinity of the Proposed Development (at outlet of Allt a' Chrosaid)

Figure 3-19 Loch Awe shoreline in the vicinity of the Proposed Development (approx. 30m north of outlet of Allt a' Chrosaid to Loch Awe)

Appendix A Balliemeanoch Pumped Storage Hydro Environmental Impact Assessment Report Volume 2: Main Report Chapter 11: Water Environment

Please see accompanying document / folder.

Appendix B Balliemeanoch Pumped Storage Hydro Environmental Impact Assessment Report Volume 5: Appendices Appendix 11.1 Walkover and Water Quality Results.

Please see accompanying document / folder.

Appendix C Balliemeanoch Pumped Storage Hydro Environmental Impact Assessment Report Volume 5: Appendices Appendix 11.4: Watercourse Crossings.

Please see accompanying document / folder.

SEPA Reference: CAR/L/5011121
AECOM Project Number: 60570241

Appendix D Balliemeanoch Pumped Storage Hydro Environmental Impact Assessment Report Volume 3: Figures

Please see accompanying document / folder.