Revised Coire Glas Pumped Storage Scheme

EIA Report - Volume 1 Non Technical Summary

March 2018

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Preface

This document forms the Non-Technical Summary (NTS) of the Environmental Impact Assessment (EIA) Report for the Revised Coire Glas Pumped Storage Scheme, the key components of which are situated on Forestry Commission (Scotland) land approximately 19 kilometres (km) to the south west of Fort Augustus in the Highlands of Scotland. The EIA Report accompanies a Section 36 application to the Scottish Ministers for consent under the Electricity Act 1989, and deemed planning permission under the Town and Country Planning (Scotland) Act 1997, section 57 (2), for a scheme with a maximum generating capacity of up to 1500 megawatts (MW).

The EIA Report comprises the following volumes:

- Volume 1: NTS;
- Volume 2: Written Statement;
- Volume 3: Figures; and
- Volume 4: Technical Appendices.

A Planning Statement has also been submitted with the Application.

The EIA Report documents (NTS, Written Statement, Figures and Technical Appendices) are available for viewing at the following locations:

The Highland Council Department of Planning & Development Glenurquhart Road Inverness IV3 5NX (open during normal office hours)	Fort Augustus Service Point Memorial Hall Fort Augustus PH32 4DJ (open from 9.30am to 1pm Monday to Friday)

The EIA Report will also be available for purchase, at £250 for a paper copy and £10 for an electronic version on CD, from:

For the attention of Jamie Watt
SSE
Inveralmond House
200 Dunkeld Road
Perth
PH1 3AQ
Tel: 07540 318955 / Email: jamie.watt@sse.com

Paper copies of the NTS are available free of charge, or an electronic version is available online at http://sse.com/whatwedo/ourprojectsandassets/renewables/coireglas

The Application and EIA Report has been advertised in the following newspapers:

- Edinburgh Gazette;
- The Herald; and
- Inverness Courier.

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Glossary of Terms Specific to The Proposed Development

Access Tunnel	Provides access to the cavern power station.
Administration Building	An above ground administration building required for day to day operational and maintenance tasks.
Cavern Power Station	A series of underground caverns containing reversible pump turbines and motor-generators together with associated equipment such as transformers and switchgear.
Cofferdam	A watertight enclosure pumped dry to permit construction work below the waterline.
Compensation Flow	Water released at the foot of the dam to maintain a flow of water down a watercourse (see Q95).
Dam	A new dam would be constructed to enable the storage of water, significantly increasing the size of the existing Loch a' Choire Ghlais to form the upper reservoir.
Emergency Access Tunnel	Provides an emergency access route from the cavern power station and ventilation shaft to a tunnel portal on the shore of Loch Lochy.
High Pressure Tunnel	The headrace tunnel transitions to a high pressure shaft and high pressure tunnel.
Headrace Tunnel	A low pressure tunnel leading from the upper reservoir to the cavern power station.
Intake Tower	A structure located in the upper reservoir to direct water into the headrace tunnel and underground waterway system (see also Upper Control Works).
Jetty	Constructed on the shore of Loch Lochy to facilitate use of the Caledonian Canal system for the transport of heavy equipment and materials, and the removal of tunnel spoil.
Lower Control Works	Two screened inlet / outlet structures and stop logs, positioned at the end of the tailrace tunnel below minimum water level. These structures would channel water in and out of Loch Lochy.
Lower Reservoir	Loch Lochy
Lower Reservoir Works	Term used to describe all works at the lower reservoir.
Mucomir Barrage and Hydroelectric Power Station	Loch Lochy water levels are currently controlled by the operation of Mucomir Hydroelectric Power Station.
Pumped Storage Hydro	A proven technology with the ability to consume and store large quantities of energy making it a flexible and efficient electricity storage solution, helping to balance supply and demand across the National Grid with the ability to quickly respond to varying demands.
Q95	The predicted minimum flow of water in m^3/s for 95% of the time in a given month.
Spillway Channel	Discharge point at the dam designed for natural flood events.
Surge Shaft	Designed to respond to fluctuations in pressure within the underground tunnels.
Tailrace Tunnel	A tunnel to convey water between the cavern power station and the lower reservoir.
Underground Waterway System	A series of underground intakes, caverns and tunnels carrying water between the upper reservoir and lower reservoir through the cavern power station.
Upper Control Works	Comprising the intake tower within the upper reservoir (including screens) and the gate/gate shaft. Access to the gate shaft would be through a short access tunnel high on the right abutment of the dam.
Upper Reservoir	Created for the storage of water by the construction of a dam which would inundate the existing Loch a'Choire Ghlais and impound the Allt a'Choire Ghlais watercourse.

Upper Reservoir Works	Term used to describe the construction of the upper reservoir, dam, upper control works, surge shaft and ventilation shaft.
Ventilation Shaft	Aids the circulation of fresh air through the underground access tunnel and powerhouse complex.

1 Introduction

1.1 OVERVIEW

1.1.1 Coire Glas Hydro Pumped Storage Ltd ('the Applicant'), a wholly owned subsidiary of SSE plc, is proposing to construct Coire Glas Pumped Storage Scheme (The Proposed Development), between Loch Lochy (lower reservoir) and a new reservoir created at Loch a' Choire Ghlais (upper reservoir).

1.1.2 The total installed capacity of The Proposed Development would be up to 1500 megawatts (MW), with an energy storage capacity of up to 30 Gigawatt Hours (GWh). The key components of The Proposed Development are located on Forestry Commission (Scotland) land, approximately 19 kilometres (km) to the south-west of Fort Augustus in the Highlands of Scotland, as illustrated in Figure 1: Site Location.

1.1.3 The primary function of The Proposed Development would be to extract, store and release energy to or from the electricity transmission system as required to help balance supply and demand for power at a national scale.

1.2 BACKGROUND TO THE SCHEME

1.2.1 In February 2012, Coire Glas Pumped Storage Scheme Environmental Statement (ES) was submitted in support of an application for consent under the Electricity Act 1989 to construct and operate a hydroelectric pumped storage scheme at Coire Glas. Section 36 consent was granted on 13th December 2013, with an extension to this granted by Scottish Ministers on 14th March 2017, which is due to expire on 12th December 2021 (referred to hereafter as The Consented Development).

1.2.2 To maximise the potential of the site, in addition to contributing to The Scottish Government's commitment to pumped storage hydro[1], the Applicant is now proposing to increase the generating capacity of the project from the consented 600 MW to up to 1500 MW.

1.3 DEVELOPMENT CONTEXT

1.3.1 The Proposed Development comprises two main areas of work (as shown on Figure 2): the upper reservoir works including the upper reservoir, dam, upper control works, surge shaft and ventilation shaft; and the lower reservoir works including the lower control works, a jetty, administration building, and emergency access tunnel portal on the shore of Loch Lochy, linked by a series of underground tunnels and the cavern power station. The lower slopes encompass a combination of woodland and commercial forestry whilst the upper area consists primarily of upland moorland with no active land use.

1.3.2 The upper reservoir works would be accessed off the A87 at White Bridge (Invergarry) utilising existing forestry tracks (some of which require to be upgraded) and the creation of new tracks. The lower reservoir works would be accessed off the A82 at North Laggan, following the minor public road (known locally as Kilfinnan Road) and existing forestry tracks, both of which would require upgrading.

[1] The Scottish Energy Strategy (January 2017) recognises that pumped storage hydro will play an important role in achieving a balanced energy portfolio.

1.4 PROJECT NEED

1.4.1 Hydro power is a very flexible method of electricity generation due to its ability to rapidly start and stop without constraint. Pumped storage hydro schemes add to this the ability to consume and store large quantities of energy. Pumped storage hydro is an efficient electricity storage solution which helps balance supply and demand across the National Grid, and has the ability to quickly respond to varying demands. As the UK seeks to increase the proportion of low-carbon generation in its electricity mix, pumped storage hydro is an essential component of the electricity network in maintaining electricity system flexibility.[2]

1.4.2 The Applicant believes that highly flexible large scale energy storage schemes will become essential to compliment the ongoing significant increase in less-flexible energy generation due largely to the development of renewable energy.

1.4.3 The Proposed Development would be unique when compared to other existing pumped storage hydro schemes in the United Kingdom (Dinorwig, Ffestiniog, Cruachan and Foyers) in its ability to extract and release energy to or from the electricity transmission system for a much longer period.

1.5 PROPOSED CHANGES FROM THE CONSENTED DEVELOPMENT

1.5.1 Due to the increase in generating capacity of The Proposed Development, which is more than doubling the capacity of The Consented Development, certain modifications would be required to the consented design. It is anticipated that the main design changes of The Proposed Development compared to The Consented Development would be:

- Increase in size of underground waterway system to enable water to be transferred through the system to support the larger generating / pumping capacity;
- Increase in size of underground cavern power station to facilitate larger and/or greater number of reversible pump-turbines, motor generators, transformers and other associated equipment;
- Increased footprint of the lower control works (i.e. screened inlet/outlet structures and stop logs);
- Increase in the excavated material generated by the underground works (tunnels, shafts and caverns);
- Requirement for a surge shaft (and associated access track) to respond to the fluctuations in pressure within the tunnels due to increased flow rates;
- Requirement for a ventilation shaft adjacent to the surge shaft to circulate fresh air through the access tunnel and underground cavern power station;
- Requirement for an intake tower within the upper reservoir footprint;
- Creation of a temporary haul road to connect the lower reservoir works with the upper reservoir works to enable tunnel spoil (rock), excavated from the underground works, to be transported and used to supplement construction materials at the dam;
- Construction duration likely to increase; and

[2] Scottish Renewables (2016), The Benefits of Pumped Storage Hydro to the UK

- The flow rate of water being transferred between the upper and lower reservoirs would be greater, however, it is not intended to manage Loch Lochy outwith the existing level range (as per The Consented Development).

2 Consideration of Alternatives

2.1 INTRODUCTION

2.1.1 The Proposed Development has evolved through an iterative design process which has been influenced by engineering feasibility design works, economic considerations, environmental survey data and from responses received through the consultation process.

2.2 SITE SELECTION

2.2.1 There are very few sites within the UK which could be considered to have potential for the development of a viable pumped storage scheme but Coire Glas ranked highly in a preliminary strategic review of sites across Scotland.

2.3 DESIGN PROCESS

2.3.1 Following identification of the Coire Glas site as a potential pumped storage site, SSE Renewables commissioned MWH in 2011 to carry out a technical feasibility study and outline design of a 600 MW pumped storage scheme in this location which was progressed through the planning process and gained Section 36 consent in December 2013.

2.3.2 Due to the increase in generating capacity of The Proposed Development (up to 1500MW), compared to The Consented Development (600 MW), certain modifications are required to the consented design. MWH (now Stantec UK) has therefore provided engineering design advice in relation to the increase in generating capacity, working closely with environmental consultants to ensure the project is informed by environmental considerations where possible.

2.4 DESIGN EVOLUTION

2.4.1 Given the complexity of the project, there are many elements of The Proposed Development that are necessarily technically and economically driven in order to achieve a viable project. These include the size and location of the dam, location of the surge and ventilation shaft, the tunnelling and underground cavern power station, and the general location of the lower control works.

2.4.2 However, within these technical and economic parameters, there remain design and environmental considerations, opportunities and constraints to be factored in during the iterative design. These have included micro-siting the location of the lower control works and administration building, whilst incorporating design concepts and landscape mitigation measures to ensure a high quality of design. The design process is reported within a Design Statement which accompanies the EIA Report (Appendix 3.1).

2.4.3 Construction access routes have also been informed through the consideration of environmental constraints. Options to transport spoil from the lower reservoir works to the upper reservoir works for use in construction of the dam were also reviewed. The consideration of solutions to transport spoil off site are discussed in Section 7: Spoil Management.

2.4.4 The Proposed Development configuration presented in the EIA Report is considered to be the optimal design for a 1500 MW scheme, whilst minimising any environmental effects where practicable.

3 Description of Development

3.1 OVERVIEW

3.1.1 The Proposed Development would operate by transferring water between Loch Lochy (lower reservoir) and the enlarged Loch a' Choire Ghlais (upper reservoir) through an underground tunnel and cavern power station system. The Proposed Development would be operated in 'generating' mode when electricity would be generated by releasing water from the upper reservoir through the pump-turbines and into Loch Lochy, or in the 'pumping' mode, when electricity is used to drive water through the pump-turbines in the other direction from Loch Lochy to the upper reservoir. The Proposed Development would also be capable of maintaining a 'stand-by' state of not generating or pumping (i.e. no significant water transfer is taking place through the underground cavern power station).

3.1.2 The principal components of The Proposed Development are illustrated on Figures 2 to 4, and set out below:

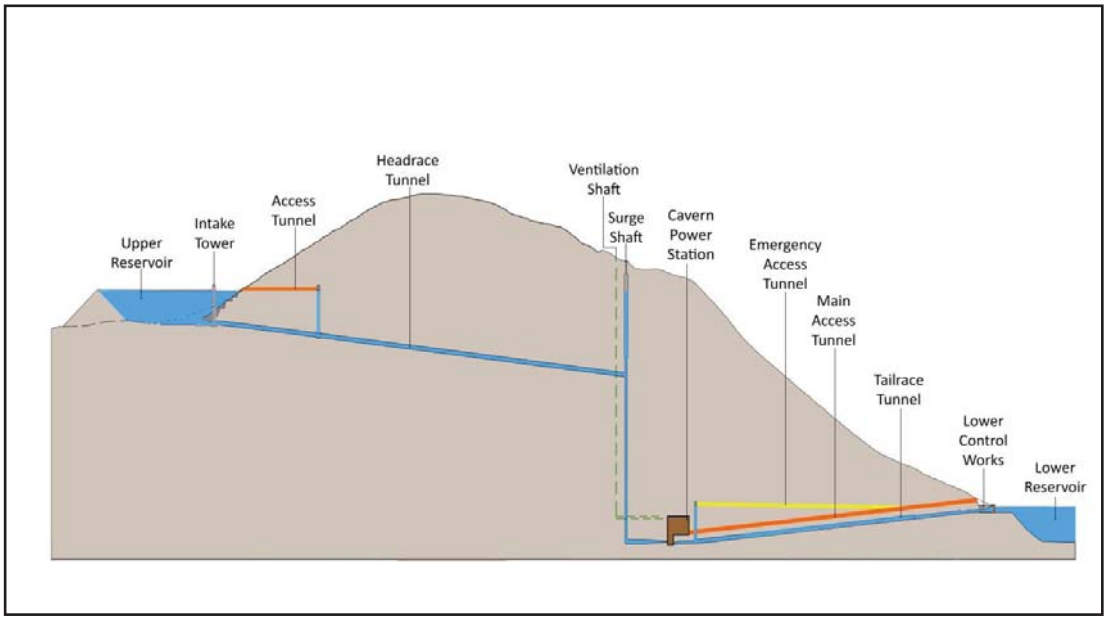
- Dam and Upper Reservoir - A new dam with a height above ground level of approximately 92 m would be constructed to enable the storage of water, significantly increasing the size of the existing Loch a' Choire Ghlais to form the upper reservoir;
- Upper Control Works – An intake tower, screens, gate and gate shaft would be located within the upper reservoir to direct water into the headrace tunnel and underground waterway system;
- Underground Waterway System – A series of underground caverns and tunnels carrying water between the upper reservoir and lower reservoir, through the underground cavern power station;
- Cavern Power Station - A series of underground caverns containing reversible pump-turbines and motor-generators together with associated equipment such as transformers and switchgear;
- Surge Shaft – A surge shaft would be required to respond to the fluctuations in pressure within the tunnels;
- Ventilation Shaft – A ventilation shaft would be required to circulate fresh air through the underground access tunnel and cavern power station complex;
- Lower Control Works – Comprising two screened inlet / outlet structures and stop logs, positioned at the end of the tailrace tunnel below minimum water level. These structures would channel water in and out of Loch Lochy;
- Jetty – Constructed on the shore of Loch Lochy to facilitate use of the Caledonian Canal system for the transport of heavy equipment and materials, and the removal of tunnel spoil;
- Administration building - An above ground administration and workshop building required for day to day operational and maintenance tasks; and
- Access Tunnels – A main access tunnel and an emergency access tunnel would be provided for accessing the underground power plant, close to the shore of Loch Lochy.

3.1.3 An indicative cross section of The Proposed Development is provided in Plate 3.1. Visualisations of The Proposed Development from selected viewpoints are included in this NTS as Figures 5 (a-c) to 7 (a-c).

3.1.4 In addition to the above, it is anticipated that there would be a need for site establishment

and lay down areas in the vicinity of the upper reservoir, surge shaft and lower reservoir works, as well as in a suitable location within the forested area near White Bridge (Invergarry). Borrow pits are required to provide aggregate to supply sufficient rock to construct suitable access tracks. Indicative site establishment areas and borrow pits are identified on Figure 2: Scheme Overview. Rock to construct the dam embankment would be sourced from a quarry established within the upper reservoir area.

Plate 3.1: Indicative Cross Section



3.1.5 The majority of spoil (rock) from the underground works would be removed via the tunnel portals near the shore at Loch Lochy. Excavated spoil from the underground works would be re-used, where possible, in the construction of the dam and within the localised area of construction works wherever feasible. Once this material has been re-used, it is anticipated that there would be a further 3.9 million tonnes (approximately) of surplus material at the lower reservoir works which will require on-site re-use or onward transportation for re-use off site. This estimate is based on the proposed 1500 MW scheme (i.e. the 'worst case scenario' in terms of the generation of excavated materials). This is discussed further in Section 7: Spoil Management.

3.1.6 The operation of The Proposed Development would require the modification of Mucomir Barrage and hydroelectric power station at Gairlochy. Control of Loch Lochy water levels is currently determined by the operation of Mucomir Hydroelectric Power Station but the operation of a pumped storage hydro scheme on the loch would take priority over Mucomir. As such, Mucomir Barrage and Power Station would be modified and a new operating regime determined to allow the necessary control of Loch Lochy levels.

3.1.7 It is not intended to manage Loch Lochy outwith the existing level range, but variations in Loch Lochy water levels are expected to be more frequent than they are at present during operation of The Proposed Development.

3.2 ACCESS TRACKS

3.2.1 Access during the construction and operation of The Proposed Development would utilise existing public roads and forestry tracks where possible. Construction traffic to the upper

reservoir works would take access from the A87 at White Bridge (Invergarry), before utilising existing forestry tracks (to be upgraded) and a new track to the dam site. Construction traffic to the lower reservoir works would take access from the A82 at North Laggan, and then along the existing public road (Kilfinnan Road) and forestry tracks (both to be upgraded). The creation of a new temporary haul road is also proposed to enable tunnel spoil, excavated from the underground works, to be transported and used to supplement construction materials to the dam embankment. This would be reinstated and re-profiled post construction.

3.2.2 Generally track widths would be the minimum necessary to provide safe and practical access to that particular location. All operational and maintenance traffic would also utilise these access routes (reduced in width post construction), although it is anticipated that the majority of this traffic would require access to the lower reservoir works only.

3.2.3 The upgrade of Kilfinnan Road would occur in advance of the core construction period to facilitate the commencement of underground works at the lower reservoir.

3.2.4 The Caledonian Canal system would be used as far as practicable in the delivery of various equipment and materials for the project, as well as in the transport of tunnel spoil off site.

3.2.5 In the vicinity of the lower reservoir works, the existing forestry roads are incorporated in the Great Glen Way. Where required for safety, alternative provision would be made to separate walkers and cyclists from the works, constructed to the same standard as the existing Great Glen Way. Any such provisions would be agreed with the local Access Officer in the form of an Outdoor Access Management Plan, and constructed in accordance with the requirements of the Land Reform (Scotland) Act 2003 where this does not conflict with the health and safety requirements of the construction site. Alternative access provision would be constructed at commencement of works in the area and where appropriate could remain in place as a permanent realignment to this section of the Great Glen Way.

3.3 CONSTRUCTION PROGRAMME / HOURS OF WORKING

3.3.1 It is anticipated that the main civil engineering construction period would last up to seven years.

3.3.2 Normal construction shifts would generally apply for the surface works but these would be subject to some variation to suit the work in hand and weather conditions, to be agreed with The Highland Council. It is anticipated that underground operations would need to continue 24 hours a day, seven days a week.

3.4 ENVIRONMENTAL MANAGEMENT DURING CONSTRUCTION

3.4.1 It is proposed that construction method statements for the construction of The Proposed Development will include the requirements of the Construction Environmental Management Plan (CEMP) which would apply to all construction activities required as part of the proposals. In particular, the CEMP would specify conditions relating to protection of habitats and species, pollution prevention and the means by which site monitoring would occur.

3.5 OPERATIONAL ACTIVITIES

3.5.1 The Proposed Development would be manned, with the majority of operations being

controlled from the administration building. Regular visits would be made to inspect and maintain structures.

3.6 DECOMMISSIONING

3.6.1 With proper maintenance The Proposed Development should remain functional indefinitely. If The Proposed Development ceases operation, decommissioning would take place and the site would be restored as follows:

- Underground tunnels would be sealed;
- Generation plant would be removed;
- Where removal of infrastructure would result in more damage than leaving in place, they would be left in-situ; and
- Disturbed ground would be reinstated.

3.6.2 Full details of the decommissioning plan would be agreed with the appropriate authorities and landowners prior to any decommissioning works commencing.

4 EIA Approach, Consultation and Scoping

4.1 INTRODUCTION

4.1.1 Environmental Impact Assessment (EIA) is a process that considers how a proposed development will change existing environmental conditions and what the consequences of such changes will be. It therefore informs both the project design and decision making processes.

4.2 SCOPING AND CONSULTATION

4.2.1 As The Proposed Development is classed as 'a generating station, the construction of which (or operations of which) will required a Section 36 consent under the Electricity Act', it was accepted that the Section 36 application should be subject to EIA and accompanied by an EIA Report.

4.2.2 On 12th May 2017, a Scoping Report was submitted to Scottish Ministers which identified the potential significant impacts to be addressed in the EIA Report. In July 2017, Scottish Ministers issued their Scoping Opinion for The Proposed Development. This formed the basis for environmental survey and assessment requirements as part of the EIA Report.

4.2.3 During the EIA process, consultation with relevant statutory and non-statutory consultees has been undertaken to review the scope of the EIA Report (where necessary), seek views of the evolving design in response to particular environmental constraints, and to provide an update on the progress of the EIA Report and application submission timescales.

4.3 CONSULTATION WITH THE LOCAL COMMUNITY

4.3.1 In parallel with the statutory consultation process, consultation has been undertaken to keep the local community informed about The Proposed Development, and seek feedback as the design of The Proposed Development has evolved.

Public Exhibition

4.3.2 During June 2017, shortly after the submission of the Scoping Report, a public exhibition event was held within the local area to allow members of the community to obtain information and pass comment upon The Proposed Development. This exhibition took place on the 28th June 2017 at Glengarry Community Hall (15:00 – 19:00).

4.3.3 A second public exhibition took place on the 13th March 2018[3] at Glengarry Community Hall to provide information to the community on the final design, key environmental sensitivities identified through the EIA process, timescales for submission and information on the application process.

Community Councils

4.3.4 Engagement has been maintained with both Glengarry, and Spean Bridge, Roy Bridge and Achnacarry Community Councils.

[3] This exhibition event was originally planned for the 27th February 2018 but had to be postponed on the day due to bad weather.

5 Planning Policy

5.1 INTRODUCTION

5.1.1 A review of policies and plans at a national, regional and local level relevant to The Proposed Development has been carried out, and a summary is provided in this section. A separate Planning Statement is provided with the Section 36 Application which provides an assessment of The Proposed Development against the relevant policies of the Development Plan and other material considerations to assist in the decision making process.

5.2 LEGISLATION

5.2.1 The Proposed Development will generate in excess of 50 MW and therefore requires to be submitted to Scottish Ministers for determination under Section 36 of the Electricity Act 1989 ('1989 Act').

5.3 THE DEVELOPMENT PLAN

5.3.1 The development plan comprises the Highland-wide Local Development Plan, April 2012 ('HWLDP') and the West Highlands and Islands Local Plan, as continued in force, April 2012 ('WHILP'). The key policies, aims and objectives of relevance to The Proposed Development are outlined in the EIA Report.

5.4 EMERGING DEVELOPMENT PLAN

5.4.1 The Emerging Highland Wide Local Development ('EHwLDP') Main Issues Report was consulted upon in September 2015, however progress has since been delayed and work on the plan has been postponed. The EHwLDP therefore remains at an early stage of preparation, and so is not considered to be currently of sufficient weight to be included within the EIA Report.

5.4.2 The West Highland and Islands Local Development Plan, Proposed Plan 2017 ('WestPlan') was issued for consultation in the summer of 2017 and comments to the plan have been published. Whilst the plan is not yet adopted, it is sufficiently progressed to have developed a strategy and policies, and therefore has been considered in respect of The Proposed Development.

5.5 NATIONAL PLANNING POLICY

5.5.1 The Scottish Government published Scotland's third National Planning Framework (NPF3) in June 2014. NPF3 is a long-term strategy for Scotland and is the spatial expression of the Government's Economic Strategy and plans for development and investment in infrastructure. It is a material consideration in the determination of The Proposed Development.

5.5.2 NPF3 and Scottish Planning Policy 2014 are intended to help the planning system deliver the Government's vision and outcomes for Scotland and to contribute to the Government's central objective: sustainable development.

5.6 OTHER MATERIAL CONSIDERATIONS

UK and Scottish Energy Policy

5.6.1 There are a number of UK Climate Change, Carbon and Renewable Energy documents that confirm commitments at a UK level to reduce greenhouse gas emissions and increase the proportion of energy consumption coming from renewable sources. These documents are relevant to the assessment of The Proposed Development in terms of providing the energy and low carbon policy context.

5.6.2 Energy is a devolved matter for the Scottish Government, and a number of policy documents set out the aspirational targets of the Scottish Government, which seeks to secure a de-carbonised economy by 2025. Hydropower (including pumped storage hydropower) is recognised as having a key role in meeting the emission reduction requirements.

6 Water Management

6.1 INTRODUCTION

6.1.1 The principle of a pumped storage scheme broadly involves a system to transfer water between a lower reservoir (Loch Lochy) and an upper reservoir (Loch a' Choire Ghlais). In the case of The Proposed Development, the upper reservoir would need to be formed by the creation of a new dam and reservoir at Coire Glas, which would inundate the existing Loch a' Choire Ghlais and impound the Allt a'Choire Ghlais at this location.

6.2 EXISTING CONDITIONS

6.2.1 During the period 1815 to 1825 the Caledonian Canal Company constructed a canal system linking the lochs of the Great Glen to provide a waterway between the east and west coasts of Scotland. The link between Loch Lochy and Loch Linnhe had lock gates and embankments constructed in the bed of the River Lochy at the west end of Loch Lochy, thus blocking the river flow. To provide a new outlet, the Mucomir Cut was excavated between Loch Lochy and the River Spean bypassing the canal works. In the 1960's, the North of Scotland Hydro-Electric Board constructed Mucomir Power Station and associated barrage structure at the downstream end of the Cut.

6.2.2 The water level in Loch Lochy is currently controlled by SSE Generation Ltd (SSE) at its existing hydroelectric power station at Mucomir (Gairlochy). Water is released from here through turbines to the River Spean (which then flows into the River Lochy just downstream of Mucomir); there are also floodgates to discharge larger flows as required. These activities are covered by a Controlled Activities Regulations (CAR) licence.

6.2.3 A CAR licence was obtained by SSE in 2013 for the consented 600 MW Coire Glas Pumped Storage Scheme. This licence incorporates the requirements of the existing Mucomir Power Station CAR licence and the proposed 600 MW scheme into a single licence. A request will be submitted to SEPA to modify this licence to provide for the requirements of The Proposed Development (up to 1500 MW).

6.3 WATER MANAGEMENT

6.3.1 The operation of The Proposed Development would take priority over the operation of Mucomir Power Station. Mucomir Power Station would be managed to ensure that the operation of The Proposed Development was not constrained by Loch Lochy levels. Ultimately the total volume of water passed through the barrage in a year would remain unchanged.

6.3.2 As part of the construction of The Proposed Development, Mucomir Power Station would be modified and a new operating regime determined. This would include obtaining all necessary consents and relicensing. It is possible, although to be determined at a later stage, that this modification may involve partially or completely decommissioning Mucomir as a power station and operating it solely as a regulating barrage and fish pass.

6.3.3 Modifications to Mucomir Barrage would generally comprise measures to allow more control of water level in Loch Lochy. When changes in flow were required these would be implemented gradually at rates to be agreed.

6.3.4 It is not intended to manage Loch Lochy outwith the existing level range, although variation

in Loch Lochy level within these limits is expected to be more frequent.

6.3.5 At the dam, a Q95 compensation flow (the predicted minimum flow of water in m^3/s for 95% of the time in a given month), would be released from the upper reservoir to maintain a constant flow from the upper reservoir down Allt a' Choire Ghlais.

6.4 ABSTRACTION AND DISCHARGE RATES AND VOLUMES

6.4.1 The Proposed Development would both abstract and discharge water between the upper and lower reservoirs dependent upon operating mode.

6.4.2 The maximum volume that could be transferred between the upper and lower reservoirs by the operation of The Proposed Development is 26 Mm^3. Based upon an installed generation capacity of 1500 MW this would take 17-28 hours continuous operation at maximum output.

6.4.3 The Proposed Development would be operated as a closed system, which means no water would be transferred outside the catchment.

7 Spoil Management

7.1 INTRODUCTION

7.1.1 A review of options for the transportation and potential re-use of excavated spoil[4] material from the underground works of The Proposed Development has been carried out. The review was undertaken in consultation with stakeholders, to inform an indicative strategy for the re-use of surplus spoil.

7.2 SPOIL EXTRACTION

7.2.1 Where feasible, excavated spoil from the underground works would be re-used in the construction of The Proposed Development. Of the total excavated spoil, it is estimated that 20% would be removed from the tunnel portal at the upper reservoir and will be used in dam and track construction. It has been calculated that approximately 0.6 million tonnes of construction aggregate would be needed for concreting operations both in the underground works and at the lower reservoir.

7.2.2 Once the material re-used at the dam and the processed spoil used for construction aggregate has been accounted for, it is anticipated that the quantity of spoil generated by The Proposed Development will result in approximately 3.9 million tonnes of surplus material at the lower reservoir works, based on the 1,500 MW scheme. This will require on-site re-use or onward transportation for re-use off site. It should be noted that spoil quantities would be reduced if a lesser capacity scheme were to be developed.

7.3 OPTIONS FOR RE-USE OF SPOIL

Re-Use in Construction of the Dam

7.3.1 The ability to use excavated spoil material in the construction of the dam depends on both the construction programme/sequencing of dam construction and the suitability of the spoil. Whilst it is possible that the spoil material produced from the tunnelling would be suitable for dam construction, the following factors may prevent some or all of the material being useable:

- Characteristics of the 'as blasted' rock (not known until Ground Investigation works commence);
- Processing and handling requirements for both transportation to the upper reservoir and for dam construction; and
- Relative cost when compared to the use of a quarry situated close to the dam.

7.3.2 Should it be considered feasible to re-use spoil for dam construction, a review of options determined that the preferred solution to transport excavated spoil to the dam would be to construct a temporary haul road from the lower reservoir works to the upper reservoir works via the east of the lower slopes of Meall nan Dearcag (see Figure 2).

7.3.3 This temporary haul road would offer the potential to reduce impacts on the road network and waterways, by providing an opportunity to supplement rock quarried for dam construction with suitable tunnel spoil from the underground works. However, the viability

[4] Spoil material is defined as the excavated rock from the underground works. In the context of the quantities of spoil discussed in this chapter, the quantity of other near surface materials such as soils and overburden are insignificant and their re-use would be incorporated into the wider works.

of constructing this temporary haul road would be dependent on a number of factors including the scale of the project (i.e. 1500 MW or less), and the outcome of the final Spoil Management Plan (see below).

Re-Use at Potential Off-site Receptor Sites

7.3.4 It is likely that excavated spoil material could be used on local infrastructure projects, thereby providing additional benefit and further helping to reduce traffic numbers on the wider network. Through consultation with stakeholders, several potential receptor sites have been identified that may benefit from the excavated spoil material, assuming that it is suitable. These could include:

- Laggan Bay Breakwater (Scottish Canals);
- A82 Lochside Protection;
- Glensanda Quarry (for onward export);
- Inveroich Pier Works, Fort Augustus (Scottish Canals); and
- Fort William Marina /Cruise Terminal.

7.3.5 Although there is potential, and willingness on behalf of the Applicant, to supply local infrastructure sites with spoil material, the timescales for both The Proposed Development and some of the potential receptor sites are uncertain and suitability of the 'as blasted' rock will not be known until Ground Investigation works commence. Therefore it is not possible to commit to any potential receptor site(s) at this stage. However, it is acknowledged that use of excavated materials at any of these potential receptor sites could reduce the impact on the surrounding transport network and could also have a social and infrastructure benefit for the long term.

7.4 TRANSPORT OPTIONS

7.4.1 Various transport options have been reviewed for the export of surplus spoil material from site. This comprised a review of road, rail and canal transport routes within the vicinity of The Proposed Development that could be utilised to remove spoil material from the lower reservoir works at Loch Lochy. This review concluded that, for the 'worst case scenario', no single transport option has the capacity to accommodate the removal of approximately 3.9 million tonnes of excavated spoil from site at the rate of extraction required. Therefore, it is anticipated that a combination of options, using both the canal and the road network would be required for the 'worst case scenario'.

7.5 ASSESSMENT SCENARIO FOR RE-USE OF SPOIL

7.5.1 Following a review of the options available for the transportation of excavated material from site, based on the 'worst case scenario', it is considered that no single extraction method has the capacity to accommodate the removal of all spoil material at the rate required.

7.5.2 Given the uncertainty associated with the ability to use tunnel spoil in the construction of the dam, the viability of constructing the temporary haul road and the potential to use the Caledonian Canal to transport all spoil, the scenario (in transport terms) that is assessed in the EIA Report for the re-use and transportation of spoil assumes that circa 3.9 million tonnes of excavated material is transported off site. This would result in the following peak road and canal traffic scenarios:

- HGV Road access from the site of no more than 120 trips per day[5] (1200tonnes per day) accessing the trunk road network and allowing access to the A82 (north and south), A86 (east) and A87 (west). This represents fewer than 9 loaded vehicles per hour departing the site (assuming a 7 hour working day), which is considered to be within acceptable levels of disturbance and impact on the trunk road network; and
- Transport to Corpach by 1,000tonne barge on the Caledonian Canal for residual material. At the peak of operation this would result in 3 loaded barges per day leaving the site.

7.5.3 As discussed above, The Proposed Development includes the construction of a temporary haul road to connect the lower reservoir works with the upper reservoir works. It has been estimated that up to 1.9 million tonnes of excavated spoil material could be incorporated into the construction of the dam should tunnel spoil be suitable. This has the potential to reduce road and / or canal traffic volumes during the period of dam construction.

7.5.4 Due to the complexity of the construction programme for the project, the timescales for future site investigation and detailed design, and the need to allow the construction contractor some flexibility in their working methods, it is not feasible to confirm committed re-use options at this time.

7.5.5 As agreed for The Consented Development, it is anticipated that a Section 36 Condition of Consent would cover the implementation of the transportation and re-use of spoil, to enable the Applicant to assess the final spoil volume, identify potential receptor sites and the best practicable environmental option for transporting the excavated spoil to these locations. It is proposed that a detailed report evaluating options for the use of excavated spoil material would be outlined in a Spoil Management Plan prior to commencement of the main underground works. This study would be undertaken in full consultation with The Highland Council and other statutory bodies and stakeholders.

[5] Note that other construction related HGV and Light Good Vehicle (LGV) would be in addition to this, which is described and assessed in Chapter 16: Traffic and Transport of the EIA Report (see Section 16 of this NTS).

8 Landscape Character

8.1 INTRODUCTION

8.1.1 A landscape character assessment was carried out to consider the degree and significance of potential changes to the landscape character and landscape designations within the study area and also considers the potential for cumulative landscape effects. The assessment considers potential effects during the construction phase and ten years after completion.

8.2 BASELINE

8.2.1 The key components of The Proposed Development would be located on the shore and within the hills to the northwest of Loch Lochy, approximately 19 km southwest of Fort Augustus. This is a landscape of large scale patterns and contrasting high mountain summits, deep glens and lochs. The predominant feature of the landscape is the Great Glen, a distinctive steep-sided and flat-bottomed, fjord-like valley, accommodating Lochs Lochy and Oich, which slices through the mountainous landscape providing a route for transport and infrastructure and containing much of the settlement within the area. The more subtle and intricate topography of Glen Garry and Loch Garry lies to the north. Much of the lower slopes and the glen sides are clothed in coniferous forestry plantation whilst the glen floors and fringes of the lochs are commonly colonised with native and deciduous woodland, interspersed with areas of rough agricultural land. This extent of tree cover emphasises the strong contrast between the low lying glen and the open, exposed high mountain slopes, crags and summits. The diverse landscape results in wide ranging experiences with changing views of mountain and loch combining with woodland, fields and settlement within the enclosed glens, and far reaching elevated views from mountain summits.

8.3 LANDSCAPE CHARACTER

8.3.1 Ten local character zones (LCZs) were identified to represent the different areas of landscape character within the study area.

8.3.2 The landscape assessment concluded that during construction of The Proposed Development, there would be significant effects to six of these LCZs. These relate to: the construction of both the lower reservoir works in the Great Glen and on the shore of Loch Lochy; the upper reservoir works / dam within the upland landscape of Coire Glas; and site establishment and access for both areas.

8.3.3 These activities are considered likely to lead to a reduction in remote and wild qualities, potential perceived loss of scale, loss of localised features and disturbance to existing panoramic vistas which contribute to the value of the local landscape.

8.3.4 By 10 years post construction, the level of effect would reduce as there would be minimal activity and movement associated with The Proposed Development, and vegetation disturbed during construction and tree and forest planting would have started to re-establish. This is considered likely to reduce the level of effect within areas around the Great Glen to non-significant levels with the opportunity for a well-designed new administration building to be seen as a new positive feature on the shore of Loch Lochy. Nevertheless, significant effects are anticipated to continue within upland areas surrounding the dam and upper reservoir, due to the scale of these new features. However, these effects would be relatively localised to the immediate area surrounding

Coire Glas.

8.4 LANDSCAPE DESIGNATIONS AND OTHER PROTECTED LANDSCAPES

8.4.1 The assessment of landscape designations included the potential for effects on the Loch Lochy and Loch Oich Special Landscape Area (SLA). Potential effects on Wild Land Areas (WLAs) have been scoped out of the assessment with the agreement of SNH.

8.4.2 The assessment concluded that the landscape effects anticipated would lead to a moderate significant effect on the SLA during construction. This is due to the scale and intensity of construction works within a concentrated area which is anticipated to lead to temporary effects on three identified Special Qualities of the SLA. However, during the operation of The Proposed Development, after 10 years, the reduced extent of the landscape effects is considered to result in this effect reducing to a minor, non-significant level. However, it is recognised that there would be a localised reduction in scenic quality around Coire Glas which may result in a reduction in the perceived value of this small part of the SLA.

8.5 CUMULATIVE LANDSCAPE EFFECTS

8.5.1 There would be few other features within the surrounding landscape with which The Proposed Development would be likely to be perceived in association. Whilst cumulative effects during construction would be difficult to predict due to uncertainty of future events, no significant cumulative landscape effect is anticipated during the operation of The Proposed Development.

9 Visual Amenity

9.1 INTRODUCTION

9.1.1 A detailed visual amenity assessment was undertaken for The Proposed Development to consider the degree and significance of potential changes to views from properties, routes and locally popular vantage points and the potential for cumulative visual effects to occur.

9.1.2 The baseline landscape and its broad visual context is set out in Section 8: Landscape Character.

9.2 PREDICTED VISUAL EFFECTS

9.2.1 During construction, the assessment concluded that a number of significant visual effects would be expected from The Proposed Development. Significant effects are anticipated to views from nine of thirty-five built properties / property groups, two out of four transport routes, five of eight footpaths or walking routes and six out of ten other outdoor locations included within the assessment.

9.2.2 These effects would be predominantly localised, usually within around 1 km of The Proposed Development, with none more than 2.5 km distant. Effects are primarily anticipated in relation to views of either the upper or lower reservoir works and associated road or track construction, upgrading and use, with users of a small number of walking routes potentially obtaining views of both areas during the course of their walk.

9.2.3 During operation, the majority of these effects are anticipated to reduce to a non-significant level. However, a small number of significant effects are anticipated during the operational phase of The Proposed Development. These would be localised to views of the dam and upper reservoir area and are anticipated to effect views from mountain summits and ridges of Ben Tee and Sròn a' Choire Ghairbh which enclose Coire Glas and the walking routes used to approach these locations.

9.2.4 A summary of the anticipated visual effects is provided in Table 9.1.

Table 9-1: Summary of Visual Effects

Location	Effect during construction				Effect during operation			
	Neutral / No View	Minor Adverse	Moderate Adverse	Major Adverse	Neutral / No View	Minor Adverse	Moderate Adverse	Major Adverse
Views from buildings	8	18	9	-	27	8	-	-
Views from roads and transport routes	-	2	-	2	2	2	-	-
Views from footpaths and other walking routes	1	2	2	3	4	2	2	-
Views from recognised outdoor viewing locations	2	2	2	4	5	3	2	-
Totals	11	24	13	9	38	15	4	-

9.3 CUMULATIVE EFFECTS

9.3.1 The assessment identified few other features within the surrounding landscape with which The Proposed Development would likely be viewed in combination with. Whilst some cumulative effects may occur as a result of other activities during the construction of The Proposed Development, no significant short or long term cumulative effects were considered likely.

10 Terrestrial Ecology

10.1 INTRODUCTION

10.1.1 Desk-based and field surveys have been carried out to identify sensitive habitats and protected species potentially affected by The Proposed Development, including any sites designated for nature conservation interest. All field surveys have followed best practice methodologies.

10.2 BASELINE

10.2.1 The Proposed Development encompasses a mosaic of agricultural, forestry and moorland habitats with a number of small burns and waterbodies across the site, draining into the Kilfinnan Burn (and onto Loch Lochy) and the Allt na Cailliche.

10.2.2 A Phase 1 habitat and National Vegetation Classification (NVC) survey was undertaken and a total of 2090.15 hectares (Ha) of habitats were mapped in the study area. All Annex 1 habitats on the EC Habitats Directive identified through field survey were classed as being relatively common and widespread in a local and regional context. These included wet heath, dry heath, blanket bog and woodlands. Areas of groundwater dependent terrestrial ecosystems were also mapped.

10.2.3 Signs of Red squirrel and Pine marten (*Martes martes)* were recorded, notably within Glen Garry forest and South Laggan forest. No places of shelter were identified, however, the high level of activity of Pine marten recorded in South Laggan forest and the sighting of Red squirrel in the same area indicated these species are present. Signs of otter (*Lutra lutra*) and water vole (*Arvicola amphibious)* were also recorded within the study area, along with potential roosts for bat species and wood ant nests.

10.3 SUMMARY OF POTENTIAL EFFECTS

10.3.1 Potential effects of The Proposed Development on internationally designated sites (i.e. Special Protection Areas and Special Areas of Conservation) considered all sites that fell within 20 km of the site, whilst potential effects on nationally designated sites (i.e. Sites of Special Scientific Interest) were considered for all sites that fell within 5 km of the site. With no possible pathway for effects on these sites or features, none of the sites identified were taken forward for detailed assessment. Ornithological interests are discussed in Section 11.

10.3.2 Habitats potentially affected by The Proposed Development include a range of Annex 1 habitat communities of woodland, mire and heath types. Further to proposed mitigation measures, which include avoidance of sensitive habitats, pollution prevention and control measures and best practice reinstatement of disturbed ground, residual effects on these receptors are considered to be not significant.

10.3.3 Protected species potentially affected by The Proposed Development include otter, water vole, pine marten and bat species. Further to proposed mitigation measures, including avoidance of working near places of shelter (outwith an appropriate distance to avoid disturbance), raising awareness amongst the workforce of the presence of sensitive species, and adoption of best practice working methods to avoid disturbance in areas where sensitive species may occur, residual effects on these receptors are considered to be not significant.

11 Ornithology

11.1 INTRODUCTION

11.1.1 A programme of bird surveys was completed in summer 2017, to provide an update on those undertaken in 2010, in order to assess the potential impacts of The Proposed Development on wild bird populations in the immediate and local area of the proposed works.

11.2 BASELINE

11.2.1 The nearest designated site for ornithology is the West Inverness-shire Lochs Special Protection Area, which lies approximately 6.5 km to the north. It is designated for its breeding Black-throated Diver (*Gavia arctica*) and Common Scoter (*Melanitta nigra*) populations. Suitable breeding habitat for these species is not present within the study area for The Proposed Development and therefore detailed assessment of this site was not taken forward. There are no other sites designated for their ornithology within 10 km of The Proposed Development. During the field surveys in 2017, a total of 52 bird species were recorded. Nine of these species were recorded on the open moorland and mountainous areas of The Proposed Development; 23 species were recorded within the forested habitat along the proposed upgrade of existing forestry tracks; and 47 species were recorded in the mixed habitat along the side of Loch Lochy, Ceann Loch and the Caledonian Canal.

11.2.2 Of the total species recorded, Golden Eagle and Merlin are afforded extra protection under Annex 1 of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act. (Common) Crossbill and Greenshank are also under Schedule 1 and a further seven species are Priority Species on the UK Biodiversity Action Plan (UKBAP).

11.3 SUMMARY OF POTENTIAL EFFECTS

11.3.1 The majority of the 52 species recorded constitute abundant species within the study area recorded many times within suitable habitat (e.g. Meadow Pipit in rough pasture and moorland habitats and Chaffinch, Wren, Blackbird amongst many others in forested habitats), and The Proposed Development would not impact on their local or national populations, and therefore they have been scoped out of the assessment process.

11.3.2 Several species afforded extra protection under Schedule 1 (Greenshank), or considered to have a high conservation concern by appearing on the UKBAP or the BoCC Red List (Dunnock, House Sparrow, Reed Bunting and Starling) were recorded within the study area, but in areas located away from The Proposed Development, or in habitats that will not be directly, or indirectly, affected by The Proposed Development. These species have also been scoped out of the assessment process.

11.3.3 Several species are also afforded protection under Schedule 1 ((Common) Crossbill), or considered to have a high conservation concern by appearing on the UKBAP or the BoCC Red List: (Cuckoo, Grey Wagtail, Lesser Redpoll, Mistle Thrush, Skylark, Song Thrush, Spotted Flycatcher, Tree Pipit and Woodcock). These species were recorded in a variety of habitats that could be affected by The Proposed Development, most likely through habitat loss from their preferred foraging or nesting locations with the creation of access tracks through open moorland, rough pasture and agricultural land, or the felling of trees and loss of the forest understorey in wooded areas. Although these species may potentially be

affected by The Proposed Development, once standard mitigation measures (see below) have been implemented, any residual effects on their preferred habitat will be minimised, and the effect on them will be not significant. As a result, these species were not taken forward for detailed assessment.

11.3.4 The assessment concluded that, once standard mitigation measures (provision of an Ecological Clerk of Works (ECoW), pre-construction monitoring of nesting birds, marking no-go zones around any sensitive nesting areas, etc.) are successfully implemented, there will be no residual effect from the construction or operational activity of The Proposed Development on the general bird life of the area.

11.3.5 For protected bird species, due to confidential sensitivities, a separate confidential annex has been prepared as part of the EIA Report. However, it can be confirmed that, with the implementation of mitigation measures during the construction phase including giving due consideration to timing of works, implementation of appropriate buffer zones and the employment of a qualified and experienced ornithologist throughout the construction period to monitor activity, predicted effects during construction and operation are considered to be not significant.

12 Aquatic Ecology

12.1 INTRODUCTION

12.1.1 An assessment has been carried out to identify potential impacts on aquatic ecology as a result of the construction and operation of The Proposed Development.

12.2 BASELINE

12.2.1 Field survey data collected for The Consented Development confirmed that there are macroinvertebrate communities in Loch a' Choire Ghlais and Allt a' Choire Ghlais that provide food for the resident brown trout population. In their own right, these macroinvertebrate communities are of Less than Local importance. No rare species were identified.

12.2.2 There are records of bryophyte communities in Kilfinnan Burn, and based on SNH's classification of watercourses for bryophytes[6], the bryophytes in Kilfinnan Burn are categorised as A (the highest level of categorisation) as the site has a rich, nationally important flora of bryophyte species.

12.3 SUMMARY OF POTENTIAL EFFECTS

12.3.1 The Proposed Development would comprise two main activities during the construction phase that could potentially result in significant negative impacts on aquatic ecology. These are the construction of the dam and upper reservoir in Coire Glas, and the use of site establishment and lay down areas. During the operational phase, potentially significant negative impacts could result from water level changes in the upper reservoir, changes in water flow and sediment transport in the Allt a' Choire Ghlais/Kilfinnan Burn, and mixing of Loch Lochy and Loch a' Choire Ghlais waters in the respective waterbodies and in Allt a' Choire Ghlais/Kilfinnan Burn.

12.3.2 Significant effects are predicted during the construction phase on the macroinvertebrate communities in Loch a' Choire Ghlais and Allt a' Choire Ghlais from habitat change due to construction of the dam and upper reservoir. However, effective mitigation under the CEMP could be put in place to ensure pollution events are kept to a minimum to avoid deterioration of water quality. Given the inundation of the upper reservoir, changes in water level during operation and the new flow regime, significant effects on macroinvertebrate communities are also predicted.

12.3.3 It is also predicted that a significant effect on Bryophyte communities of national importance in the Kilfinnan Burn during the operation of The Proposed Development could occur as a result of the new flow regime of Allt a' Choire Ghlais. The ecology of nationally rare bryophytes and lichens is poorly understood therefore it should be noted that due to a lack of scientific evidence the confidence that this effect will take place is low.

[6] Bryological assessment for hydroelectric schemes in the West Highlands (2nd edition).

13 Fish

13.1 INTRODUCTION

13.1.1 An assessment has been carried out to identify potential impacts on fish as a result of the construction and operation of The Proposed Development. The assessment covers impacts on the resident brown trout population in Loch a' Choire Ghlais and Allt a' Choire Ghlais, and impacts on Atlantic salmon, brown/sea trout, ferox trout, Arctic charr, brook lamprey and European eel in Loch Lochy.

13.2 BASELINE

13.2.1 Survey work to establish baseline conditions included a review of data collected for The Consented Development, verified through a field visit to Allt a'Choire Ghlais and Kilfinnan Burn in September 2017 to confirm that there were no obvious changes to the baseline conditions and that the previous survey findings were valid. Additional survey work was undertaken on the inflow streams and shoreline habitats of Loch Lochy to understand their value for fish populations, and potential access constraints for fish during low loch levels. A targeted shoreline survey of Loch Lochy was also carried out by boat to ascertain suitable spawning habitat for Arctic charr. There are no sites of nature conservation designated for fish applicable to this assessment.

13.2.2 Loch a' Choire Ghlais is a shallow, weedy basin that nowhere exceeds 50 cm depth. The loch was observed to hold a good number of small trout, and good quality trout habitat is also present in Allt a' Choire Ghlais.

13.2.3 It is considered that Kilfinnan Burn may be accessible to migratory fish only in its lower 400 m, as the bridge apron at Kilfinnan appears to create an almost complete barrier (and hazard) to fish movements both up and downstream. Spawning habitats suited to salmonids and lampreys are present in the lower accessible reaches of the Kilfinnan Burn, close to Loch Lochy. Larval lampreys were present only in the lower reaches of the Kilfinnan Burn, accessible from Loch Lochy. These are likely to be brook lampreys. Juvenile trout were abundant in the lower reaches of the Kilfinnan Burn and some of these fish are likely to contribute to the sea trout population. Other fish species present in Kilfinnan Burn were eels and minnows.

13.2.4 The Lochy catchment is the largest in Lochaber and includes a number of sizeable tributaries, notably the Rivers Spean and Roy, and the large oligotrophic lochs Arkaig and Lochy. At Mucomir Barrage (Gairlochy), the hydroelectric dam incorporates a Borland fish lift to allow the upstream migration of adults. The fish pass at the top of the Borland fish lift is fitted with an automatic fish counter. There is no smolt pass so the smolts mainly pass down through the turbine or down the fish lift.

13.2.5 Salmon, sea trout, brown trout, eel, brook lamprey, stickleback, flounder and stone loach have all been recorded from the Lochy catchment. Minnow and pike have become naturalised in the catchment. There are historical records of sea lamprey on the Lochy system, but local anglers report an absence of the species in recent years.

13.2.6 An Arctic charr population was confirmed present in Loch Lochy by gill-netting in or around

2007 (both polymorphic with both benthic and pelagic morphs present)[7]. The UK rod and line caught record specimen Arctic charr fish was caught in Loch Arkaig. Loch Arkaig is situated to the west of Loch Lochy and is connected to Loch Lochy by the River Arkaig which flows west to east.

13.2.7 The resident brown trout population in Loch a' Choire Ghlais and Allt a' Choire Ghlais is of National (UK) importance. The Atlantic salmon, brown/sea trout, ferox trout and Arctic charr populations in Loch Lochy are all of National (UK) importance. The brook lamprey population in Loch Lochy is of National (Scotland) importance and the population of European eel in Loch Lochy is of International importance.

13.3 SUMMARY OF POTENTIAL EFFECTS

13.3.1 The Proposed Development would comprise three main activities during the construction phase that could potentially result in significant negative impacts on fish. These are the construction of the dam and upper reservoir in Coire Glas, construction of the lower control works, jetty and administration building on the north-west shore of Loch Lochy, and the use of site establishment and lay down areas.

13.3.2 Due to the construction of the dam and inundation of the upper reservoir, it is predicted that significant effects would occur during the construction phase on the resident brown trout population in Loch a' Choire Ghlais and Allt a'Choire Ghlais. This would be due to habitat change, the potential for pollution incidents and the potential effects of lighting during construction. Effective mitigation under the CEMP could be put in place to ensure pollution events are kept to a minimum to avoid deterioration of water quality, and the effects of lighting are minimised.

13.3.3 Potential impacts during operation comprise water level changes in the upper reservoir, water level changes in Loch Lochy, changes in water flow and sediment transport in the Allt a' Choire Ghlais / Kilfinnan Burn, and mixing of Loch Lochy and Loch a' Choire Ghlais waters in the respective waterbodies and in Allt a' Choire Ghlais/Kilfinnan Burn.

13.3.4 It is therefore predicted, on a precautionary basis, that there could be significant effects on the Atlantic salmon, brown trout/sea trout and ferox trout populations in Loch Lochy due to the more frequent changes in water level and potential difficulty of access to some spawning streams.

[7] Mark Hirst, employed by Achnacarry Estate as keeper and acts as the Protection Order warden, confirmed that commercial Arctic charr fishermen using downrigger techniques with a number of silver spoon lures caught “plenty” of “above average sized” charr (pers. comm.).

14 Geology and Water Environment

14.1 INTRODUCTION

14.1.1 An assessment has been carried out to identify potential effects on geology (including soils and peat) and the water environment (hydrology and hydrogeology), as a result of the construction and operation of The Proposed Development. The assessment covers potential effects on surface water and ground water quality, private water supplies, flood risk, areas of peat and ground water dependent terrestrial ecosystems (GWDTE's).

14.2 BASELINE

14.2.1 Superficial geology is largely absent within the site boundary with bedrock at or near the surface. Solid geology underlying the site comprises almost entirely of the meta-sedimentary unit of Upper Garry Psammite Formation – Psammite.

14.2.2 Review of the regional Hydrogeological Map for Scotland confirms that the Site is underlain by impermeable rocks (Precambrian), generally without groundwater except at shallow depth indicating an aquifer of limited potential.

14.2.3 The Proposed Development is distant from all coastal flooding extents. Little groundwater is present at site and groundwater flooding is not considered to pose a development constraint. No areas of potential significant surface water flooding are shown within the site boundary by SEPA mapping. Areas of surface water flooding are small and discrete. Surface water flooding, therefore, is not considered to pose a development constraint.

14.2.4 Consideration of GWDTEs concluded that the areas identified as being potentially moderately or highly groundwater dependent are likely to be sustained by incident rainfall and local surface water runoff rather than by groundwater.

14.2.5 A comprehensive peat probing exercise was conducted across the site. The data confirmed that soils greater than 0.5 m in depth are largely absent across the site, except for three small discrete areas of deeper peat.

14.2.6 Within the site boundary, there are two principal surface water catchments; the Allt na Cailliche and Allt a' Choire Ghlais (Kilfinnan Burn downstream). Kilfinnan Road and the forestry track is served by many small watercourses that discharge into Loch Lochy.

14.2.7 Private water supplies were identified through consultation with The Highland Council, discussion with property owners and field survey to identify the PWS infrastructure and water source.

14.3 SUMMARY OF POTENTIAL EFFECTS

14.3.1 The assessment considered a range of potential effects on geology and the water environment, and recommended mitigation measures to avoid or reduce these effects. Effects are primarily focussed on the construction phase of the project.

14.3.2 Potential effects included pollution events, which could affect the quality of surface water. The risk of a pollution event occurring could be managed through adherence to good practice construction measures such as undertaking construction activities away from watercourses and identifying safe areas for stockpiling or storage of potential pollutants that could otherwise lead to the pollution of watercourses. These would be included in a

site specific Construction Environmental Management Plan (CEMP).

14.3.3 Construction of hardstanding including the tarmac roads, dam and lower control works would create impermeable surface areas. This would lead to a relatively small increase in the total impermeable surface area of the Site causing negligible increases in runoff rates and volumes. Adherence to good practice measures including appropriate drainage design and compliance with the final CEMP would limit any potential effects of flood risk to being local and of short duration and so would not be significant.

14.3.4 During the construction period, drainage would be required to ensure construction areas are workable and not saturated. These drainage activities could lead to temporary changes in the water table surrounding these construction activities (where de-watering is required below the level of the natural water-table).

14.3.5 The design of The Proposed Development has avoided areas of ecological or habitat interest wherever possible. Furthermore, the underlying bedrock has little groundwater and therefore limited or little dewatering is likely to be required. There remains potential, however, for local dewatering of soils near dam foundations, without incorporation of mitigation measures.

14.3.6 Development of the proposed temporary haul road could affect the quantity and quality of water that drains to the source of some private water supplies. Best practice measures would be used to maintain existing surface water flow paths and further mitigation in the form of a water monitoring programme, to commence at least 12 months prior to construction. Using this data, a specific action plan would be developed and implemented through the CEMP. With this mitigation in place, potential effects on private water supplies are not considered to be significant.

14.3.7 Peat would be managed in accordance with best practice and a site specific Peat Management Plan (PMP). A Draft PMP has been prepared and submitted with the EIA Report, setting out principles for the management of peat on site.

14.3.8 Other mitigation measures have been identified, either through the development design or in accordance with good practice guidance. Examples include no direct discharge of water into watercourses and the specification of Sustainable Drainage Systems (SuDS) to limit the rate of runoff from the development site and allow the quality of water to be managed at source prior to any discharge being made.

14.3.9 These measures have been shown to eliminate any significant residual effects associated with the construction and operation of The Proposed Development on soils, geology and the water environment.

15 Cultural Heritage

15.1 INTRODUCTION

15.1.1 The cultural heritage assessment considered the likely effects of the construction and operation of The Proposed Development on sites of cultural heritage interest, including Scheduled and Designated sites, recorded archaeological features and features previously unrecorded but located during walk-over surveys. Direct impacts, where the feature may be damaged or destroyed, and indirect, visual impacts from both the development and the construction phase are considered.

15.2 BASELINE

15.2.1 A number of archaeological features with statutory protection have been identified in the vicinity of The Proposed Development, including two locks at Laggan on the Caledonian Canal which are designated as Scheduled Monuments. There is one battlefield area on Historic Environment Scotland's (HES's) Register of Battlefields; Blar na Leine, which the proposed access along Kilfinnan Road would pass through.

15.2.2 There are a number of features recorded on the Highland Historic Environment Record (HER) within the general area of The Proposed Development; these are mostly within the crofting township of Balmaglaster. A further site survey was undertaken in August 2017, to provide an update on a site walkover carried out in 2010, to identify previously unrecorded archaeological features for areas not previously affected by development.

15.2.3 No archaeological features are located on the high ground in the vicinity of the proposed dam, associated area of inundation and associated access tracks.

15.3 SUMMARY OF POTENTIAL EFFECTS

15.3.1 The majority of archaeological features in the study area would be unaffected by The Proposed Development. Direct effects consist of probable direct damage to two visible archaeological features of local importance (a shieling structure and a late 19th century trackway) and three archaeological sites with no surviving features (also of local importance).

15.3.2 The potential for damage to unrecorded archaeological features or deposits associated with recorded sites along the route of temporary and permanent access routes is considered to be low.

15.3.3 The permanent indirect visual impact on the Caledonian Canal and locks is considered to be minor and can be minimised by retention of tree cover, good design of the road widening and the site establishment area at the lower reservoir works. The only works within the Blar na Leine Battlefield site would be any upgrading of the public road between North Laggan and Kilfinnan Farm.

15.3.4 There would be an increased visual impact during the construction phase, particularly from the jetty, site establishment area and temporary new access track on the shore of Loch Lochy, from increased traffic on the public road and on the canal. However, use of the canal is in keeping with its original purpose as a commercial waterway serving industry and trade in Scotland. Scheduled Monument and Listed Building Consent will not be required as damage or alteration to the structures and buildings is not intended. Consent is not required for alteration to the setting of, or visual impact on a Scheduled or Listed site.

16 Traffic and Transport

16.1 INTRODUCTION

16.1.1 An assessment of potential impacts on traffic and transport associated with construction of The Proposed Development has been undertaken, based upon traffic surveys collected for the road network surrounding and serving it. The assessment has reviewed existing traffic data and compared it against estimated traffic flows associated with the construction activities of The Proposed Development.

16.1.2 During operation, The Proposed Development would be manned from the administration building at the lower reservoir. It is estimated that an average of 20 staff would be employed at the facility on a permanent basis, requiring daily access. Infrequent access by heavier vehicles for maintenance would occur as required. Given the low frequency of such visits, traffic flows are not considered to be significant and the operational phase of The Proposed Development is therefore scoped-out of the detailed assessment.

16.2 BASELINE

16.2.1 The study area for the appraisal was identified through an assessment of the likely routes between suppliers of equipment and materials and The Proposed Development site.

16.2.2 The Proposed Development site is currently undeveloped and no formal public roads provides access to either the upper or lower working areas.

16.2.3 Access to the lower working area of The Proposed Development is made via a private access track that serves agricultural and timber traffic. This is accessed from a public road, the West Loch Lochy Road (known locally as the Kilfinnan Road), an unclassified road that is maintained by The Highland Council. This road forms part of National Cycle Route 78, part of the Great Glen Way and is also used by pedestrians. Access to the upper working area of The Proposed Development is made via foresty tracks that tie into the A87 trunk road at White Bridge (Invergarry).

16.2.4 The study area includes the A82 trunk road from the south of Fort Augustus, through to the south of Spean Bridge; the A87 from the west of Invergarry; the A86 to the east of Spean Bridge; the unclassified Kilfinnan Road and its junction with the A82 at Laggan Locks, as well as the Caledonian Canal.

16.2.5 To determine the existing road usage, Automatic Traffic Count (ATC) surveys were carried out for a one week period at the end of October 2017. The survey recorded traffic volume, vehicle class and speed. The average 12 hour and 24 hour two way traffic flows at each location were calculated and used to create a base set of traffic flows for 2017. The speed statistics recorded were not unusual for the rural nature of the road network and the low Kilfinnan Road speeds were considered to be a function of the existing road geometry.

16.2.6 A review of the study area to accommodate abnormal load access for road based traffic has been undertaken from Inverness to the Kilfinnan Road and A87 White Bridge access points.

16.3 SUMMARY OF POTENTIAL EFFECTS

16.3.1 The assessment reviewed existing traffic data and compared it against estimated traffic flows associated with the construction activities of The Proposed Development. The

proposed construction process requires the export of a large volume of spoil from The Proposed Development. It may be possible to utilise a large proportion of this material for re-use in construction of the dam via the temporary haul road, resulting in fewer vehicles movements through the study area. The Caledonian Canal will also be utilised as far as practicable in the export of spoil and delivery of materials and construction plant.

16.3.2 It is anticipated that the main civil engineering construction period would last up to seven years. For the purpose of the traffic and transport assessment, it was assumed that the construction start date would be 2021 with the peak period of construction generating greatest volume in 2026 /2027.

16.3.3 With reference to recognised guidelines for traffic and transport assessment, the predicted traffic volumes indicate that neither total nor HGV flows are predicted to increase by more than 30% on the A82 North, A87 Invergarry, A82 Spean Bridge or A86 east of Spean Bridge. As the receptors (users of these links and locations through which they pass) are not considered to be especially sensitive to HGV traffic, no further assessment has been undertaken of this part of the study area.

16.3.4 On the A82 at the Kilfinnan Road junction, total traffic flows are anticipated to increase by less than 10%. However, HGV flows are predicted to increase by just over 30%. On this basis, a detailed assessment has been undertaken of the impact significance.

16.3.5 On Kilfinnan Road, total traffic flows are anticipated to increase by over 30%. The impact on Kilfinnan Road is large in percentage terms due to the low level of traffic use of the road. A detailed assessment has been undertaken of the impact significance.

16.3.6 The detailed assessment concluded that following the implementation of mitigation measures, the residual effects considered to be significant are those on severance and pedestrian amenity on Kilfinnan Road, and in relation to driver delay in the vicinity of the A82 / Kilfinnan Road junction. Impacts would be minimised through development of a Traffic Management Plan, maintenance of access to formal pedestrian and cycle routes, implementation of speed limits for construction traffic and provision of appropriate traffic management which would be agreed with The Highland Council.

17 Noise

17.1 INTRODUCTION

17.1.1 A noise impact assessment has been completed for the purpose of describing the potential noise impacts and likely effects on environmental receptors associated with The Proposed Development. The closest residential properties to the scheme were identified as noise sensitive receptors and a comprehensive ambient noise survey completed to establish the baseline ambient noise at these key receptor positions.

17.2 BASELINE

17.2.1 Five noise sensitive receptors were chosen as being representative of the nearest properties to both The Proposed Development and the associated construction activities. These included locations within close proximity to Kilfinnan Road and the forestry track to the lower reservoir works, the A82 and adjacent to the proposed access through Glen Garry Forest (White Bridge, Invergarry). These locations are consistent with the locations assessed as part of The Consented Development.

17.2.2 Noise measurements for the purpose of describing the ambient noise environment were recorded at each receptor position in October 2017 over an eight day period.

17.3 SUMMARY OF POTENTIAL EFFECTS

17.3.1 The potential noise impacts have been identified as noise from temporary construction works together with operational noise.

17.3.2 To estimate the noise levels resulting from temporary construction works a quantitative assessment was completed, using predictive noise modelling, in line with best practice guidance.

17.3.3 Noise from the operation of The Proposed Development was scoped out of the quantitative assessment, as the reversible pump-turbine, generators and associated equipment would be located within the underground cavern power station, with the bulk of the mountain and the long connecting tunnels reducing noise breakout to the surface to a negligible level.

17.3.4 Predictions were based on sound emission data applicable to the construction plant and equipment forecast for use on the main construction activities.

17.3.5 The following key mitigating measures have been identified for the purpose of controlling noise levels produced by the construction and operation of The Proposed Development:

- Construction noise and vibration would primarily be managed through a Construction Noise & Vibration Management Plan (CNVMP), which would be formally agreed with The Highland Council, prior to construction work commencing;
- Traffic noise would be minimised by using the Caledonian Canal System as far as practicable in the delivery of various equipment and materials, as well as in the disposal of tunnel spoil, thereby reducing heavy vehicle road use for this process. Furthermore, the creation of a temporary haul road to connect the lower reservoir works area to the upper reservoir and dam would provide an opportunity for quarried rock to be supplemented by suitable tunnel spoil from the underground

works and transported to the upper reservoir, thus reducing off-site disposal quantities; and

- The control of operational noise would be integral to the design of the cavern power station, as all the main items of generation equipment would be located underground.

17.3.6 With the implementation of the above mitigation measures, the residual effects of noise associated with The Proposed Development can be summarised as follows:

- For the temporary / long-term lower control works and jetty, noise and vibration effects would be not significant;
- For the temporary / medium-term site establishment works, noise and vibration effects would be not significant;
- For the temporary / short-term access road works, noise effects would be potentially significant, however, as the works would impact on a small number of individual properties for only a short period, the overall significance of the effect would be Low;
- In relation to the temporary increase in traffic noise, due to additional traffic during the construction phase of The Proposed Development, the small increase in noise level on the main A-roads leading to the development site would provide a Negligible adverse impact, with the significance of the noise effect being Slight;
- Due to the much higher percentage increase in traffic on the minor access road from the A82 to Kilfinnan (referred to as Kilfinnan Road), the larger increase in noise would provide a major adverse impact, with the significance of the noise effect being Moderate / Large; and
- For the permanent operation of the cavern power station, the noise and vibration effects would be not significant.

18 Air Quality

18.1 INTRODUCTION

18.1.1 An air quality assessment has been carried out for The Proposed Development. The assessment considered the baseline environment within the site boundary and the surrounding area in terms of air quality and the potential impact on air quality arising from the construction of The Proposed Development, and recommends mitigation measures considered to be required to mitigate any significant effects.

18.2 BASELINE

18.2.1 The Institute of Air Quality Management (IAQM) Guidance states that the majority of impacts from fugitive dust emissions are experienced within 400 m of the dust generating activity. Beyond 400 m of the dust source, impact on receptors is predicted to be minimal. The assessment identified 40 built receptors within 400 m of dust generating activities likely to be affected, and one ecological dust sensitive receptor; South Laggan Fen Site of Special Scientific Interest (SSSI), located close to the A82 site access junction.

18.3 SUMMARY OF POTENTIAL EFFECTS

18.3.1 The assessment identified that construction phase air quality impacts are likely to include the generation of dust during site works and the generation of emissions by off-site transportation.

18.3.2 The activities with the potential for greatest effect on local receptors are from transportation on internal haul roads and from the upgrading of existing access tracks. The upgrading of existing access tracks would be completed within the first 24 months of the construction phase, with the transportation on roads continuing throughout the construction period.

18.3.3 To mitigate potential effects from dust, a number of mitigation measures are proposed. A Construction Environmental Management Plan (CEMP) would be prepared which would apply to all construction activities required as part of the proposal. In particular, the CEMP would specify conditions to limit fugitive dust emissions such as use of wheel wash facilities, use of water spray when weather conditions may cause excessive dust and reduction of construction speed limits to 20mph. With the implementation of such measures, the residual effects due to dust emissions are considered to be not significant.

18.3.4 Given background concentrations at the site of NO_2 and PM_{10} are low, it is considered that the area is less sensitive to incremental pollutant increases with respect of potential exceedences of relevant air quality standards and objectives. Potential effects on air quality as a result of construction phase impacts are therefore concluded to be ‘not significant’.

19 Land Use and Recreation

19.1 INTRODUCTION

19.1.1 An assessment of potential effects on land use and recreation has been undertaken for The Proposed Development. The assessment considers all existing land uses which may be physically or indirectly affected by the construction and operation of The Proposed Development and also considers the potential to which recreational activities which currently take place, may be deterred.

19.2 BASELINE

Land Use

19.2.1 The principal areas of land use across The Proposed Development are two settled and low lying glens: the Great Glen and Glen Garry, which accommodate large open water lochs and provide transport corridors for major trunk roads, electrical infrastructure and recreational routes. Beyond the glens, the land is upland and remote, predominantly moorland and used mainly for recreational activities. Large swathes of forestry cloth sides of the glens and provide linkage between the more intensive activities of the glens and the remote upland landscapes.

19.2.2 The main concentrations of settlement are at Laggan, between Loch Lochy and Loch Oich and at Invergarry. There are also a small number of properties along the shore of Loch Lochy and along Glengarry, at Mandally and Faichem.

19.2.3 The main transport routes through the study area are the A82 (which runs southwest to northeast along the Great Glen between Fort William and Inverness) and the A87 (which initially runs east to west along Glengarry and connects the A82 at Invergarry to Kyle of Lochalsh and the Isle of Skye). The Caledonian Canal is also well used by people travelling by boat along the Great Glen between Fort William and Inverness.

19.2.4 There are frequent overhead lines in the area, most being low level woodpole lines connecting to the settlements and scattered properties. There is also a larger overhead line crossing the study area from the north of Invergarry, to Laggan Locks and down the side of Loch Lochy. A small number of telecommunications masts are present within the study area. These include two masts close to Kilfinnan, one within forest and one near to Kilfinnan Burn.

Recreation

19.2.5 Walking is a popular activity within the area and there are a number of popular trails and routes, most notably, the Great Glen Way, (a long distance route from Fort William to Inverness). Users of the Great Glen Way may also potentially use the 'Trailblazer Rest' wild camp site at Glas-dhoire, although this has been established as part of the Great Glen Canoe Trail (see below). There are also a number of way-marked walking trails in Glengarry Forest as well as popular routes from Glengarry and Kilfinnan to Ben Tee and the two adjacent munros (mountains over 3000ft) Sròn a' Choire Ghairbh and Meall na Teanga.

19.2.6 Cycling is also popular with well used routes including the Great Glen Way and Great Glen Cycle Route (National Cycle Route 78). Mountain biking occurs, particularly in Glengarry Forest and other forestry areas.

19.2.7 Other popular activities in the area include fishing (e.g. River Garry, Loch Garry, Loch Lochy and Loch Oich), and white water canoeing, kayaking and rafting on the River Garry. Along the Caledonian Canal, the Great Glen Canoe Trail has been established with a mapped guide and a number of 'Traiblazer Rest' sites. One of these sites has been established on the Glas dhoire peninsula adjacent to the proposed lower reservoir works, where the beach allows canoes to be easily hauled out onto the shore. The lochs and canal are also popular with cruisers and other boats travelling along the Great Glen.

19.3 SUMMARY OF POTENTIAL EFFECTS

19.3.1 The assessment concluded that The Proposed Development would result in temporary effects to some land uses and recreational activities within the study area. However, for the majority of activities the employment of mitigation measures, such as the provision of alternative walking routes, parking and access provisions within the vicinity of construction activity in discussion with relevant stakeholders, would ensure that significant effects did not occur.

19.3.2 Potentially significant effects have been identified during construction for the amenity of settlements along the minor road between North Laggan and Kilfinnan and the amenity of walking routes including the Great Glen Way and mountain ascents. These effects are anticipated to be significant and temporary, reducing to non-significant levels during the operation of The Proposed Development.

19.3.3 All other effects are anticipated to be not significant and no long term significant effects to land use and recreation are predicted.

20 Socio-economic

20.1 INTRODUCTION

20.1.1 An assessment of potential effects on land use and recreation has been undertaken for The Proposed Development. The assessment considers all existing land uses which may be physically or indirectly affected by the construction and operation of The Proposed Development and also considers the potential to which recreational activities which currently take place, may be deterred.

20.1.2 A socio-economic assessment of The Proposed Development has been carried out in line with Scottish Government guidance on 'Net Economic Benefit and Planning'[8]. The guidance highlights how the net economic benefit generated by a proposed development can be assessed as a material consideration in the decision-making process. The assessment considers the effects of The Proposed Development on employment and economic output.

20.2 POLICY

20.2.1 The Proposed Development has the potential to support both national and regional economic strategies and policies. It is of a scale which suggests the employment generating potential will not only benefit the Highland region but other areas in Scotland.

20.2.2 As a significant capital investment, the proposal will create opportunities for supply change benefits and the 'ripple effect' of the development is likely to support a range of local businesses, and potential to support new business activity.

20.2.3 Although The Proposed Development is not a renewable energy technology, its operation is an important subsidiary of the renewable sector and an important contributor to the energy mix. It therefore supports the national objective of creating a low carbon economy. It also supports the regional drive for more jobs and investment in the energy sectors.

20.3 THE ECONOMY

20.3.1 Although economic activity levels are high in the Highlands, and the area has low unemployment rates, the region continues to face a number of economic challenges. The economic successes of low unemployment and high economic activity rates hide the challenge that the area has a low level of working age residents, as a result of an ageing population and population migration amongst young people.

20.3.2 The construction sector is well represented at the Highlands level, suggesting the local area is well positioned to benefit from aspects of The Proposed Development. The manufacturing sector is under represented which may affect the regions ability to benefit from The Proposed Development.

20.3.3 Similarly, the economy is characterised by lower value economic sectors, such as tourism, which although generates a high volume of employment and has grown in recent years are generally lower value and seasonal in nature. Wages and salaries are depressed and the recent Highland City-Region Deal has been developed to create higher value jobs and increase real wages. The energy sector is characterised as a high value sector and one

[8] Draft Guidance Net Economic Benefit and Guidance, Scottish Government, 2016 http://www.gov.scot/Resource/0049/00498008.pdf

which has a heritage and track record in the Highlands, notably around hydro power and pumped storage.

20.3.4 The Proposed Development can help create higher value jobs, both during construction and at mature operation. The Proposed Development can also act as a catalyst for further development as well as supporting other sectors through its supply chain.

20.4 THE IMPACT

20.4.1 Overall, taking account of displacement and multiplier effects, The Proposed Development is expected to generate 1,387 Person Year Employment (PYE) in the Highlands and 1,816 at the Scottish level. This equates to a Gross Value Added (GVA) (the total amount of extra value that project related expenditure contributes to the Scottish economy) impact of £81.5 million to the Highlands and £123.9 million at the Scottish level over the seven-year core construction period.

20.4.2 In terms of operational employment, The Proposed Development is expected to generate 24 full time jobs in the Highlands and a further seven in the rest of Scotland per annum. This equates to a GVA impact of £1.1 million to the Highlands and £429k to the rest of Scotland per annum.

20.4.3 There are a wide range of harder to measure strategic economic benefits associated with The Proposed Development, including, supporting policy objectives, local supply chain opportunities, pre-development effects, income effects, exchequer impacts, perception benefits and community benefits.

20.4.4 SSE bring an enviable track record in support of economic development across Scotland, and can use this experience to ensure The Proposed Development offers sustainable economic benefits across the Highlands and Scotland.

21 Forestry

21.1 INTRODUCTION

21.1.1 A forestry assessment was carried out to assess the potential effects of The Proposed Development on the forestry in the immediate area of the works in two locations; Clunes Forest (South Laggan Forest), where the lower reservoir works are positioned along with the temporary haul road, and Glengarry Forest, where widening and realigning of the existing forestry tracks would occur from White Bridge, and temporary site compounds and borrow pits would be located.

21.1.2 The forests affected by The Proposed Development are all under the management of Forest Enterprise Scotland and the present and future land management are covered by Forestry Commission management planning documents; Clunes Forest Design Plan (FDP) (2011 – 2021) and Garry FDP (2013 – 2023).

21.2 BASELINE

Designations

21.2.1 Clunes FDP identifies areas of Plantation on Ancient Woodland Sites (PAWS) to the north-east of the proposed lower reservoir works. Within Glengarry FDP, an area of Caledonian Pinewood Regeneration Zone has been identified and within this area, smaller areas of PAWS woodland and remnant of older pines can be found.

Clunes Forest Design Plan

21.2.2 The Proposed Development is located within the younger north end of the Clunes FDP block. This is a second rotation tree crop which was replanted in the late 1980's and early 1990s'. The species choice for productive conifer is predominately Sitka spruce and other non-native conifer. Aside from the small areas listed as Phase 1 felling (2009-2013), the first proposed felling dates in the area of The Proposed Development are indicated as 2034 through to beyond 2044.

Glengarry Forest Design Plan

21.2.3 The FDP includes new planting of 130 ha of commercial conifer and 1077 ha of new native woodland, recreation of ancient woodland through felling and natural regeneration. The areas of the FDP affected by widening of tracks for The Proposed Development are planned to be felled between 2018 and 2022.

21.3 SUMMARY OF POTENTIAL EFFECTS

21.3.1 Construction of The Proposed Development within the area of woodland covered by the Clunes FDP would result in the felling of some 48.69 ha of coniferous forest plantation.

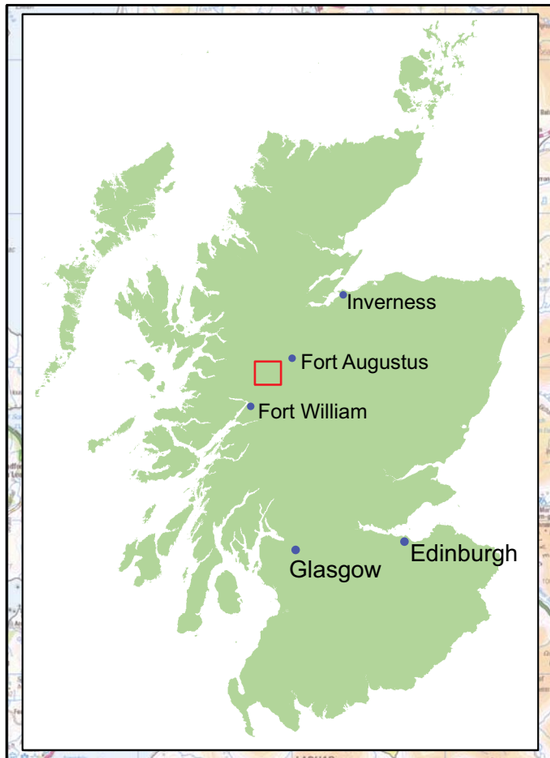
21.3.2 Construction of The Proposed Development within the area of woodland covered by the Garry FDP would result in the felling of a total area of approximately 13.63 ha.

21.3.3 The Proposed Development has been designed to avoid felling of areas classed as Long Term Retention woodland; which are trees retained for environmental benefit significantly beyond the age or size generally adopted by the woodland enterprise, and Plantations on Ancient Woodland Sites (PAWS) wherever possible. A small area of PAWS may be affected

by construction of a temporary haul road between the lower reservoir works and the upper reservoir and dam, which would require the appropriate storage and restoration of forest soils.

21.3.4 Where land would not be occupied by permanent infrastructure, but temporarily affected during construction, woodland loss would be replanted after construction, and this in principle, would follow the current FDP's species and design. There would however be a permanent woodland loss in the region of 21.51 ha over the whole development site as a result of The Proposed Development. The Applicant is therefore committed to making arrangements to plant off-site the equivalent area of woodland as Compensatory Planting. While the Control of Woodland Removal policy will accept compensatory planting anywhere within Scotland, The Highland Council has a strong preference for planting to remain within the Highlands. The location and detail of the new woodland creation as Compensatory Planting will follow post consent in discussion and agreement with Forestry Commission (Scotland).

21.3.5 The main residual effect post construction will be the loss of woodland area at the lower reservoir works due to the ground occupied by the lower control works, the permanent jetty, and administration building, and the access tunnel portals. The widening of tracks to the upper reservoir work will also result in some permanent loss of woodland cover, although they are to be reduced in line with Forestry Commission road specification. The overall impact on the integrity of the forest area is not significant.



Key:

Site Boundary

0 10 20km

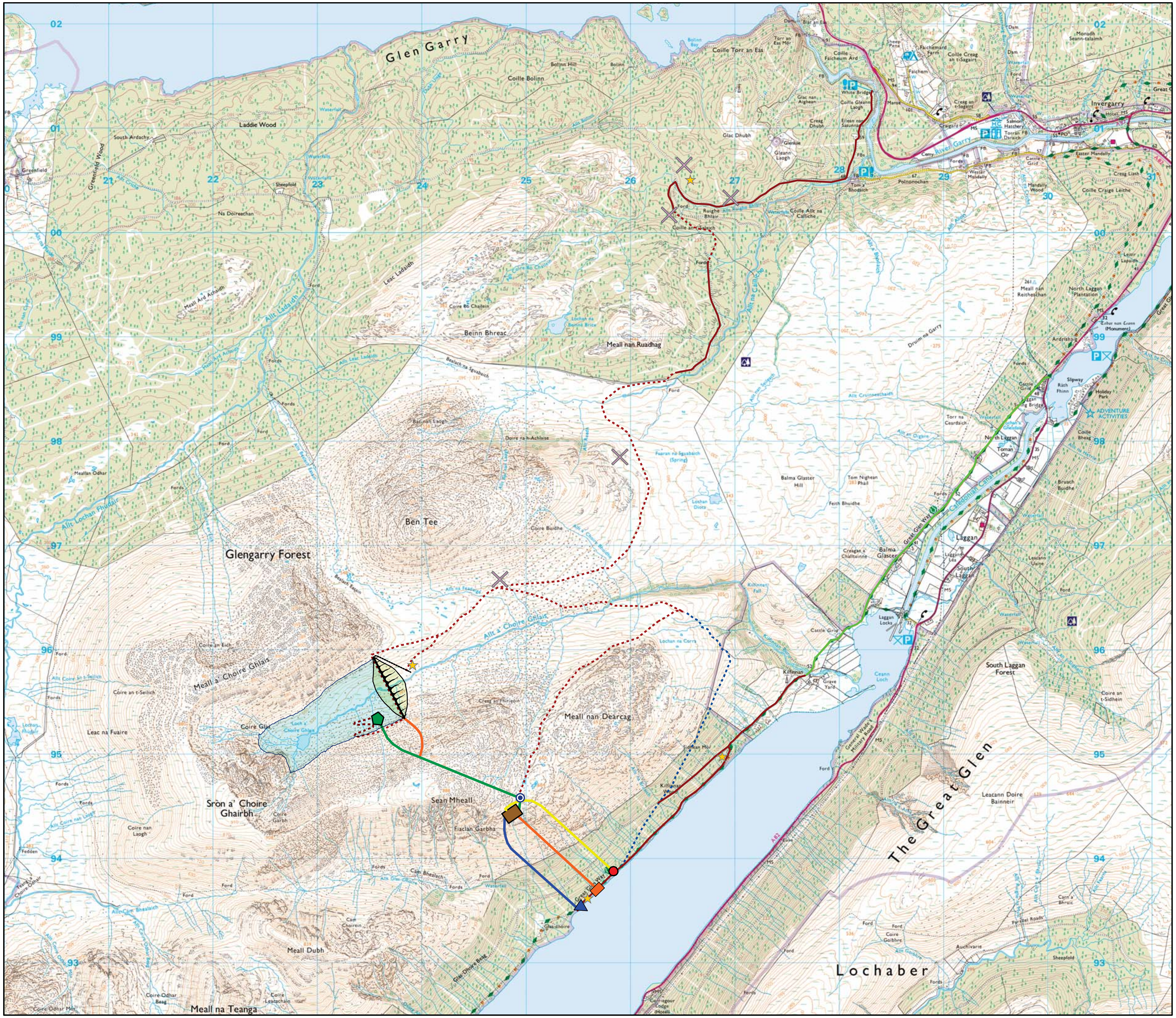
SCALE 1:400,000

N

Figure 1
Scheme Location

Revised Coire Glas Pumped Storage Scheme
Non Technical Summary

116037-D-NTS-1-1.0.0



Key:

Symbol	Description
	Upper Reservoir
	Dam and Embankment
	Spillway Channel
	Intake Tower
	Headrace Tunnel (underground)
	Tailrace Tunnel (underground)
	Access Tunnel (underground)
	Emergency Access Tunnel (underground)
	Cavern Power Station (underground)
	Surge / Ventilation Shafts
	Emergency Access Tunnel Portal
	Lower Control Works
	Jetty & Administration Building
	Existing Road to be Upgraded
	Existing Track to be Upgraded
	Permanent New Access Track
	Temporary New Access Track
	Indicative Borrow Pit Area
	Indicative Site Establishment Area

0 0.5 1 1.5 km

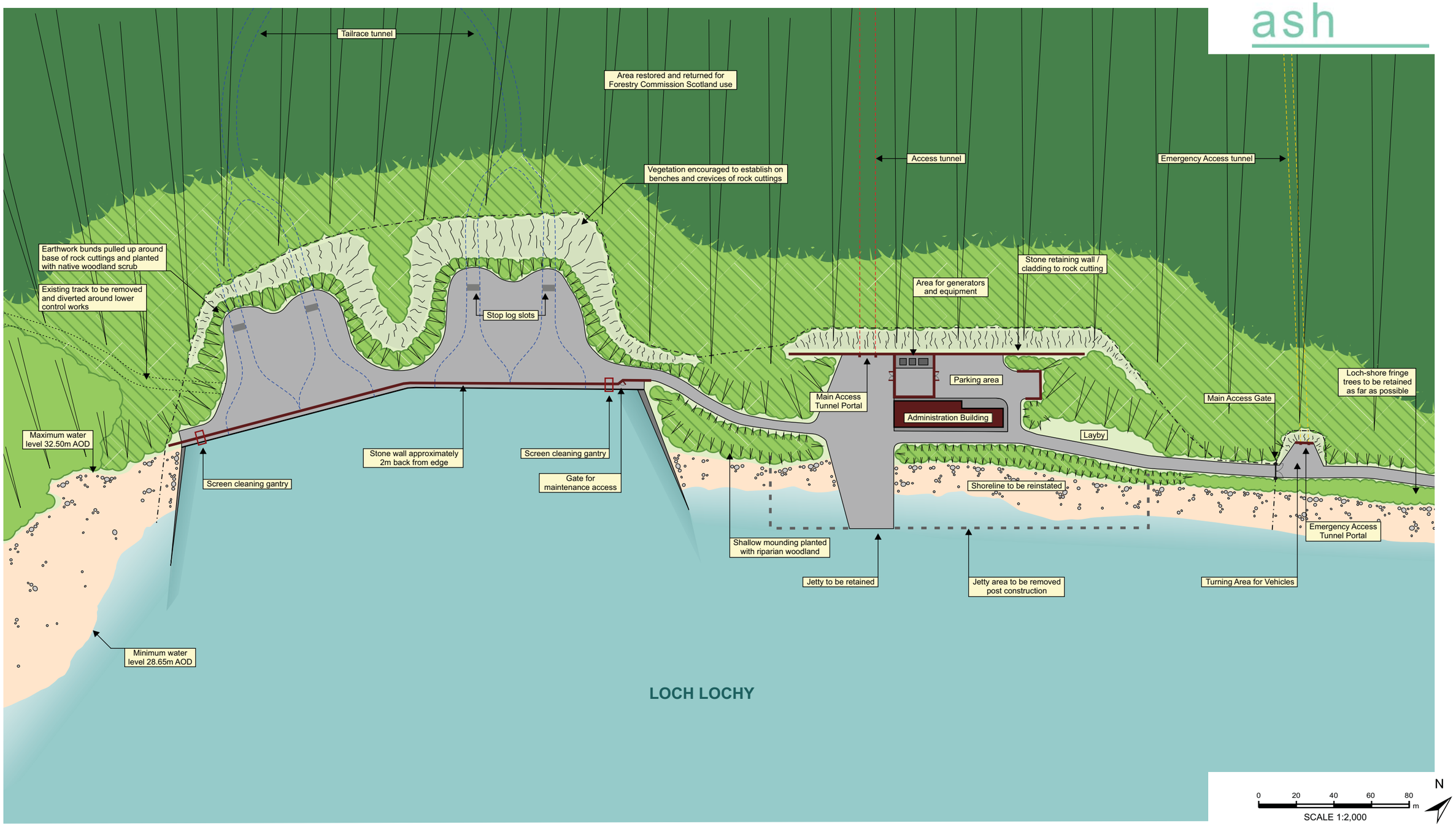
SCALE 1:35,000

N

Figure 2
Scheme Overview

Revised Coire Glas Pumped Storage Scheme Non Technical Summary

116037-D-NTS-2-1.0.0

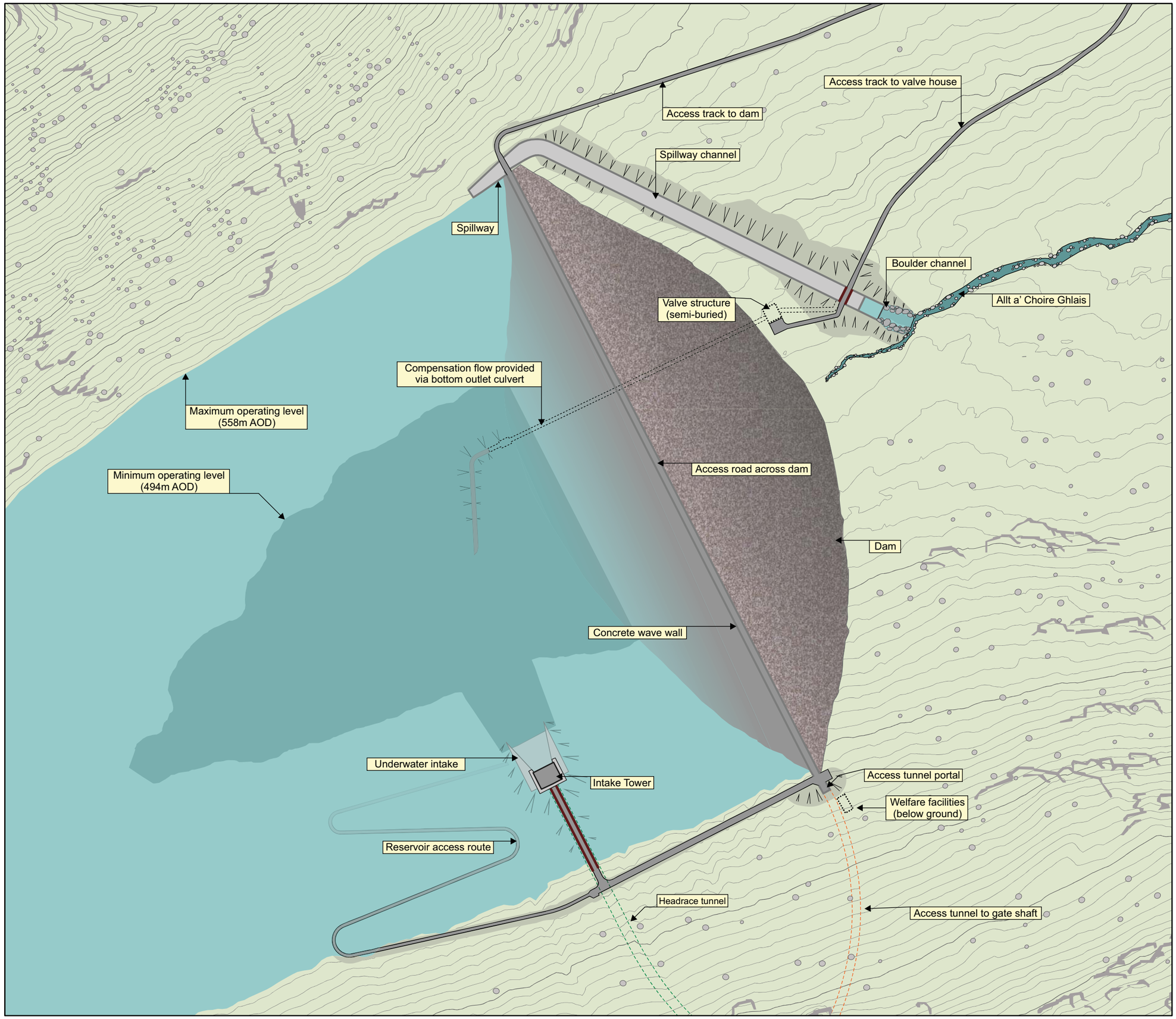


Key:

- Water (Loch Lochy)
- Existing forestry plantation
- Existing native woodland to be retained
- Proposed native woodland planting
- Rock cutting with regeneration of vegetation
- Loch shore
- Indicative alignment of tailrace tunnel
- Indicative alignment of access tunnel
- Indicative alignment of emergency access tunnel
- Proposed stone wall / cladding
- Indicative alignment of post and wire fence
- Indication of slope
- Indicative extent of jetty to be reinstated post construction

Figure 3
Indicative Layout of Lower Reservoir Works

Revised Coire Glas Pumped Storage Scheme
Non Technical Summary



sse

ash

Key:

- Maximum operating level of reservoir (558m AOD)
- Minimum operating level of reservoir (494m AOD)
- Moorland vegetation (existing and areas to be reinstated)
- Exposed bedrock and boulders
- Indicative cutting to be reinstated
- Existing river
- Proposed access track
- Proposed bridge
- Proposed wall
- Indicative alignment of intake tunnel
- Indicative alignment of access tunnel
- Bottom outlet culvert
- Below ground building

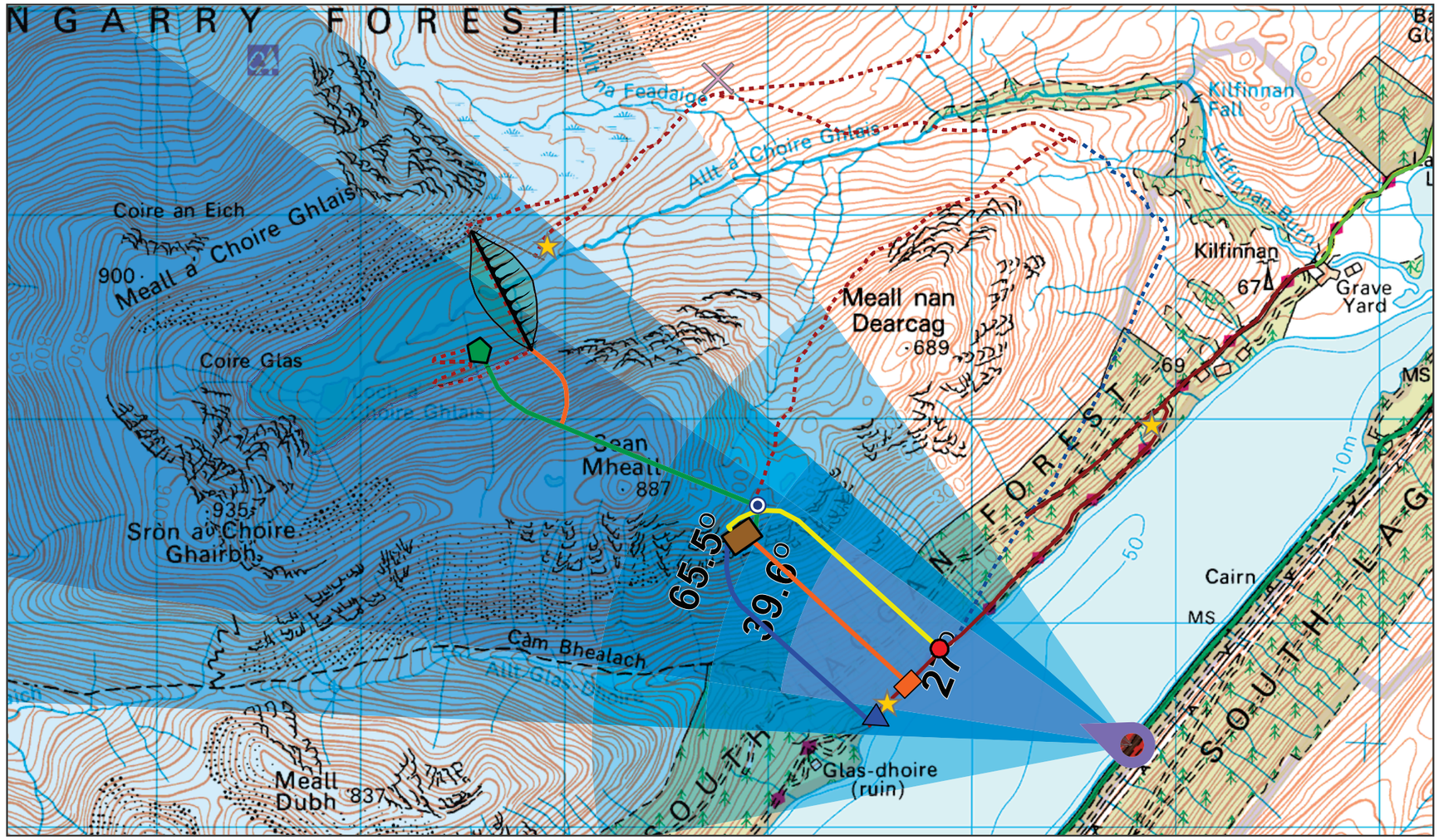
0 50 100 150 km

SCALE 1:3,500

N

Figure 4
Indicative Layout of Dam

Revised Coire Glas Pumped Storage Scheme
Non Technical Summary



Grid Ref: 226745 793365 Distance to development: 1.07km AOD: 53.1m

Scale 1:25000 @A3

Travelling by vehicle in a southerly direction along the A82, the viewpoint is accessed from the layby prior to reaching Corriegour Hotel. The viewpoint itself is on the opposite side of the road to the layby, beyond the safety barrier.

FIGURE 5a
VIEWPOINT 1 - A82

Drawing No. - 116037-D-NTS-5a
Revision - 1.0.0
Date - 14.03.2018

Existing View

Terrain model

Distance to development 1.07km Camera: Canon EOS 6D Focal length: 50mm vertical (27º) x 28mm horizontal (65.5º) Camera height: 1.5m Date: 17/05/17 Time: 14:24

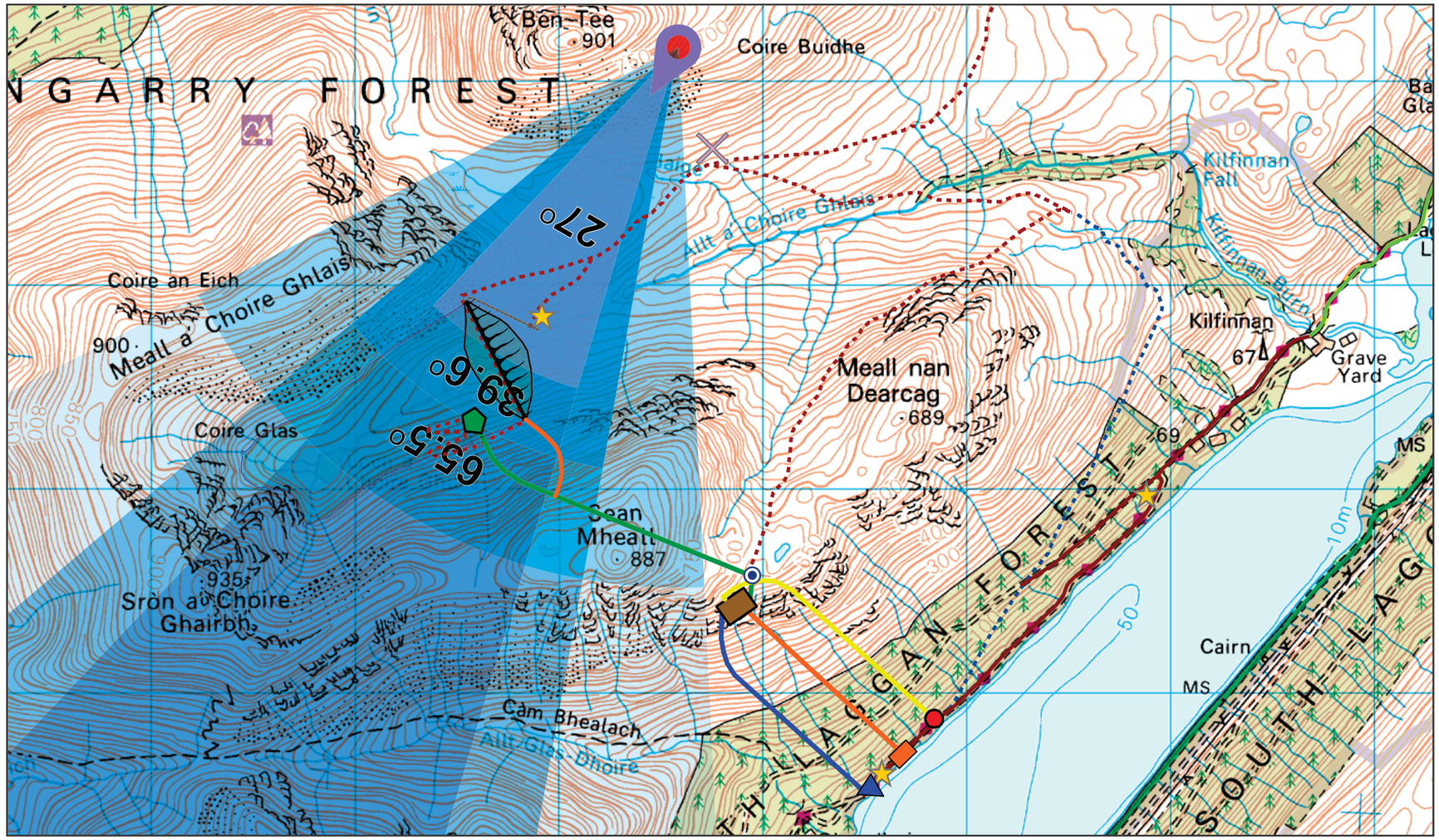
FIGURE 5b: VIEWPOINT 1 - A82

FIGURE 5c: VIEWPOINT 1 - A82

When viewed at a comfortable arms length, this image is representative of the maximum field of view of clear vision but is not representative of scale and distance

Drawing No. - 116037-D-NTS-5c
Revision - 1.0.0
Date - 14.03.2018

Distance to development 1.07km Camera: Canon EOS 6D Focal length: 50mm Camera height: 1.5m Date: 17/05/17 Time: 14:24



Grid Ref: 224578 797097 Distance to development: 2.07km AOD: 700.7m

Scale 1:25000 @A3

On ascending Ben Tee stop at 700m at location with view of Coire.

FIGURE 6a
VIEWPOINT 2 - Ben Tee

Drawing No. - 116037-D-NTS-6a
Revision - 1.0.0
Date - 14.03.2018

Existing View

Terrain model

Distance to development 2.07km Camera: Canon EOS 6D Focal length: 50mm vertical (27º) x 28mm horizontal (65.5º) Camera height: 1.5m Date: 05/11/17 Time: 11:45

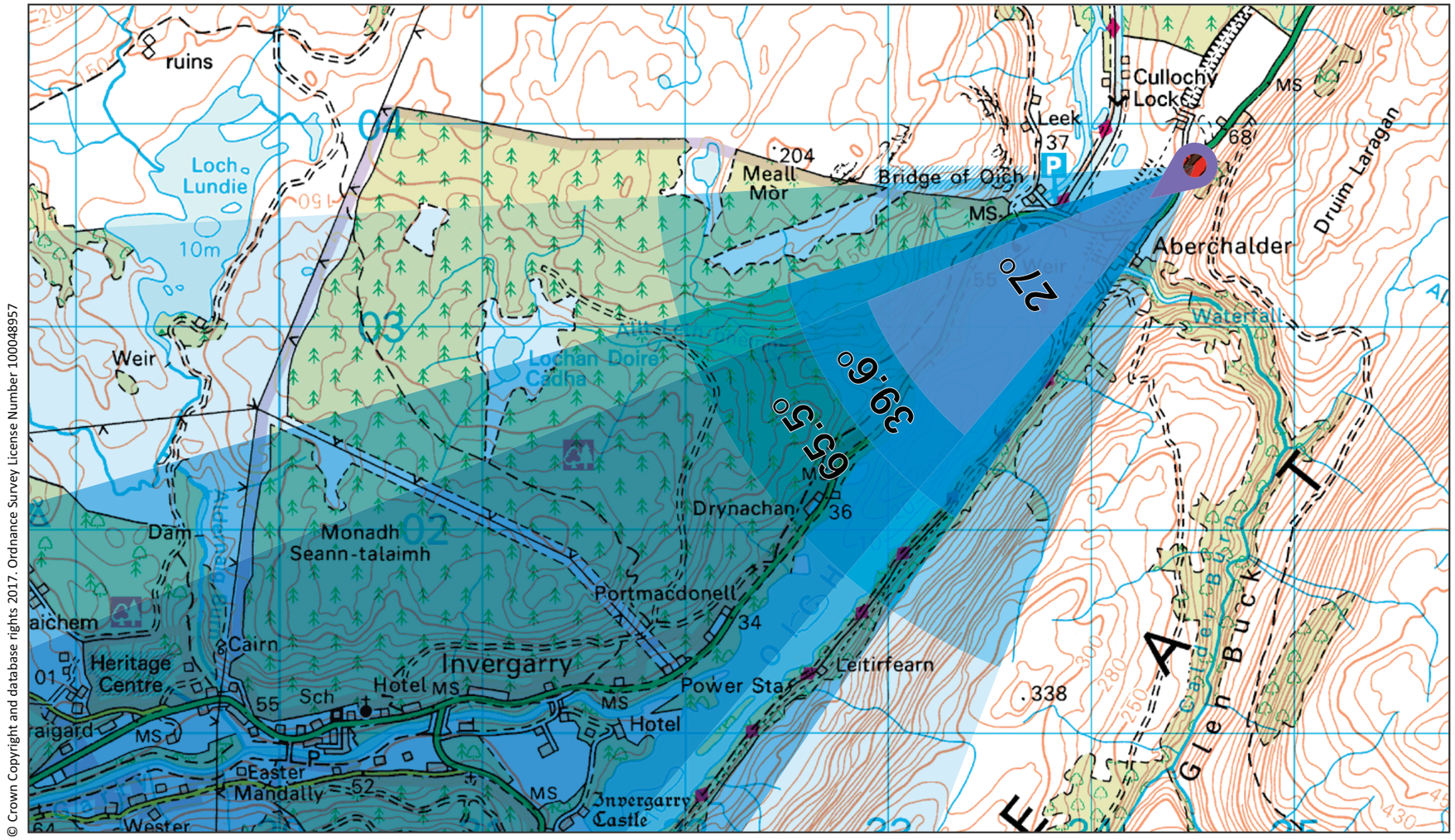
FIGURE 6b: VIEWPOINT 2 - Ben Tee

FIGURE 6c: VIEWPOINT 2 - Ben Tee

When viewed at a comfortable arms length, this image is representative of the maximum field of view of clear vision but is not representative of scale and distance

Drawing No. - 116037-D-NTS-6c
Revision - 1.0.0
Date - 14.03.2018

Distance to development 2.07km Camera: Canon EOS 6D Focal length: 50mm Camera height: 1.5m Date: 05/11/17 Time: 11:45



Grid Ref: 234441 803712 Distance to development: 13.72km AOD: 60.2m

Scale 1:25000 @A3

Viewpoint is located at the road verge of the A82, between Strathoich Bed and Breakfast and the point at which the A82 turns toward Aberchalder and Oich Bridge.

FIGURE 7a
VIEWPOINT 4 - Aberchalder

Drawing No. - 116037-D-NTS-7a
Revision - 1.0.0
Date - 14.03.2018

Existing View

Terrain model

Distance to development 13.72km Camera: Canon EOS 6D Focal length: 50mm vertical (27º) x 28mm horizontal (65.5º) Camera height: 1.5m Date: 02/08/17 Time: 09:03

FIGURE 7b: VIEWPOINT 4 - Aberchalder

FIGURE 7c: VIEWPOINT 4 - Aberchalder

When viewed at a comfortable arms length, this image is representative of the maximum field of view of clear vision but is not representative of scale and distance

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