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Glen Earrach Pumped Storage Hydro

Environmental Impact Assessment Report

Volume 2: Main Report

Glen Earrach Energy Ltd

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Abbreviations

Abbreviation	Term	Abbreviation	Term
AAWT	Annual Average Weekday Traffic	CoWRP	Control of Woodland Removal Policy
AEP	Annual Exceedance Probability	CRF	Congestion Reference Flow
AESI	Adverse Effect on Site Integrity	CRTN	Calculation of Road Traffic Noise
AIL	Abnormal Indivisible Loads	CTMP	Construction Traffic Management Plan
AOD	Above Ordnance Datum	dB	Decibel
ASNW	Ancient Semi-Natural Woodland	dB(lin)	Decibel (linear weighting)
ATC	Automatic Traffic Counts	DBA	Desk Based Assessment
AWI	Ancient Woodland Inventory	DBW	Daytime Bat Walkover
AWT	Average Weekday Traffic	DEFRA	Department for Environment, Food and Rural Affairs
BAP	Biodiversity Action Plan	DFT	Department for Transport
BCT	Bat Conservation Trust	DMRB	Design Manual for Roads and Bridges
bgl	Below ground level	DOC	Dissolved Organic Carbon
BGS	British Geological Survey	DrWPZ	Drinking Water Protection Zones
BMP	Biosecurity Management Plan	DTM	Digital Terrain Model
BNL	Basic Noise Level	EASR	European Age Standardised Rates
BOD	Biochemical Oxygen Demand	EC	European Commission
BP	Borrow Pit	EclA	Ecological Impact Assessment
BPM	Best Practicable Means	ECoW	Ecological Clerk of Works
BPP	Bird Protection Plan	ECU	Energy Consents Unit
BS	British Standard	eDNA	Environment DNA
BWL	Bottom Water Level	EHO	Environmental Health Officer
CAP	Community Action Plan	EIA	Environmental Impact Assessment
CAR	Controlled Activities Regulations	EIAR	Environmental Impact Assessment Report
CC	Climate Change Uplift	ELC	European Landscape Convention
CCC	Climate Change Committee	EMS	European Macroseismic Scale
CCI	Community Conservation Index	EnvCoW	Environmental Clerk of Works
CCP	Climate Change Plan	EQS	Environmental Quality Standard
CCR	Climate Change Risk	EU	European Union
CCRA	Climate Change Risk Assessment	EUNIS	European Nature Information System
CEMP	Construction Environmental Management Plan	FEH	Flood Estimation Handbook
CFRD	Concrete Faced Rockfill Dam	FLS	Forestry and Land Scotland (FLS) is formerly Forestry Commission Scotland (FCS) and some references may include FCS as legacy.
CIEEM	Chartered Institute of Ecology and Environmental Management	FRA	Flood Risk Assessment
CIHT	Chartered Institute of Highways and Transportation	FTE	Full Time Equivalent
CLG	Community Liaison Group	FWPM	Freshwater pearl mussel

Abbreviation	Term	Abbreviation	Term
GDL	Garden and Designed Landscape	LA10,18hr	A-weighted, sound level in dB(A) exceeded for 10% of each hour over the period 06:00 - 24:00 hours.
GGF	Great Glen Fault	LA90	A-weighted noise level exceeded for 90% of the measurement period
GHG	Greenhouse Gas	LAeq	A-weighted, equivalent continuous sound level
GI	Ground Investigation	LAeq,1hr	A-weighted equivalent continuous sound level over 1 hour
GIS	Gas Insulated Switchyard	LAeq,4hr	A-weighted equivalent continuous sound level over 4 hours
GLTA	Ground Level Tree Assessment	LAeq,12hr	A-weighted equivalent continuous sound level over 12 hours
GLVIA3	Guidelines for Landscape and Visual Impact Assessment	LAeq,T	A-weighted Leq, measured over a specified period of time (T).
GPP	Guidance for Pollution Prevention	LAfmax	Maximum A-weighted noise level with fast time weighting
GVA	Gross Value Added	LAsmax	Maximum A-weighted noise level with slow time weighting
GWDTE	Groundwater Dependent Terrestrial Ecosystem	LB	Listed Building
HabMoS	Habitat Map of Scotland	LBAP	Local Biodiversity Action Plan
HER	Historic Environment Record	LCT	Landscape Character Type
HES	Historic Environment Scotland	LCW	Lower Control Works
HGV	Heavy Goods Vehicle	LDP	Local Development Plan
HIP	Highland Investment Plan	LEMP	Landscape and Ecological Management Plan
HMP	Habitat Management Plan	LEPO	Long-established forestry plantation (Long Established, Plantation Origin)
HRA	Habitats Regulations Appraisal	Leq	Equivalent continuous sound level
HRSG	Highland Raptor Study Group	LGP	Low Ground Pressure
HV	High Voltage	LGV	Light Goods Vehicle
HwLDP	Highland-wide Local Development Plan	LMP	Land Management Plans
Hz	Hertz	LoD	Limits of Deviation
IAMMWG	Inter-Agency Marine Mammal Working Group	LORS	Lower Old Red Sandstone
IAQM	Institute of Air Quality Management	LOS	Level of Service
ICCI	In-combination Climate Change Impact	LPA	Local Planning Authority
IEMA	Institute of Environmental Management and Assessment	LPP	Local Place Plan
IIA	Important Invertebrate Area	LTFP	Long Term Forest Plans
IMF	Inner Moray Firth	LVIA	Landscape and Visual Impact Assessment
IMFLDP2	Inner-Moray Firth Local Development Plan 2	LZeq,5min	Z-weighted (unweighted) equivalent continuous sound level over 5 minutes
INNS	Invasive Non-Native Species	Ma	Million Years
IUCN	International Union for Conservation of Nature	mAOD	Metres above Ordnance Datum
JNCC	Joint Nature Conservation Committee	MET Office	The Meteorological Office
kV	Kilovolt	MEWP	Mobile Elevated Working Platform

Abbreviation	Term	Abbreviation	Term
MIC	Maximum Instantaneous Charge	PPC	Pollution Prevention and Control (Scotland) Regulations 2012
MIOA	Member of the Institute of Acoustics	PPV	Peak particle velocity
MIV	Main Inlet Valve	PRA	Potential Roost Assessment
MMA	Materials Management Appraisal	PRoW	Public Right of Way
MPH	Miles per hour	PSH	Pumped Storage Hydro
MW	Megawatt	PVA	Potential Vulnerable Area
MWh	Megawatt hours	PWS	Private Water Supplies
NAC	Noise Advisory Council	RBMP	River Basin Management Plan
NBN	National Biodiversity Network	ReFH2	Revitalised Flood Hydrograph Model
NDC	Nationally Determined Contributions	RFC	Ratio of Flow to Capacity
NDSFB	Ness District Salmon Fishery Board	RLB	Red Line Boundary
NGR	National Grid Reference	RPD	Relative Population Density
NHZ	Natural Heritage Zone	RSL	Registered Social Landlord
NPF	National Planning Framework	RSPB	Royal Society for the Protection of Birds
NPF4	National Planning Framework 4	RTS	Regional Transport Strategy
NS	NatureScot (Formerly Scottish Natural Heritage - SNH)	S36	Section 36 (of the Electricity Act 1989)
NSA	National Scenic Area	SAC	Special Area of Conservation
NSL	National Speed Limit	SBL	Scottish Biodiversity List
NSR	Noise Sensitive Receptor	SCL	Sprayed Concrete Lining
NTEM	National Trip End Model	SEPA	Scottish Environment Protection Agency
NTU	Nephelometric Turbidity Unit	SLA	Special Landscape Area
NVC	National Vegetation Classification	SM	Scheduled Monument
OAMP	Outline Access Management Plan	SNH	Scottish Natural Heritage [now NatureScot]
oCEMP	Outline Construction Environmental Management Plan	SPA	Special Protection Area
oLEMP	Outline Landscape and Ecological Management Plan	SPP	Scottish Planning Policy
oPMP	Outline Peat Management Plan	SSE	Scottish and Southern Energy
ORS	Old Red Sandstone	SSSI	Sites of Special Scientific Interest
OS	Ordnance Survey	STGO	Special Type General Order
OSGR	Ordnance Survey Grid References	SuDS	Sustainable Drainage Systems
oWMP	Outline Water Management Plan	SVOCs	Semi-volatile organic Compounds
PANs	Planning Advice Notes	TAN	Technical Advice Note
PAWS	Plantation on Ancient Woodland Sites	TBM	Tunnel Boring Machine
PC	Permanent Compound	TC	Temporary Compound
PCU	Passenger Car Unit	TCP(S)A	Town and Country Planning (Scotland) Act
PPG	Pollution Prevention Guidelines	tCO ₂ e	Tonnes CO ₂ equivalent
PLHRA	Peat Landside Hazard and Risk Assessment	THC	The Highland Council

Abbreviation	Term	Abbreviation	Term
TMP	Traffic Management Plan	VDV	Vibration dose value
TRL	Transport Research Laboratory	VOCS	Volatile organic Compounds
TSS	Total Suspended Solids	VP	Vantage Point
TWL	Top Water Level	WCA	Wildlife and Countryside Act
UCW	Upper Control Works	WEWS Act	Water Environment and Water Services (Scotland) Act 2003
UK	United Kingdom	WFD	Water Framework Directive
UKCIP2018	UK Climate Projections 2018	WML	Waste Management Licence
UKFS	UK Forestry Standards	WMP	Waste Management Plan
UN	United Nations	WTMP	Workers Travel Management Plan
UNEP	United Nations Environment Programme	ZoI	Zone of Influence
UNFCCC	United Nations Framework Convention on Climate Change	ZTV	Zone of Theoretical Visibility

Defined Terms

Term	Definition
Alltsigh Track	Operational access into the Proposed Development site via Alltsigh to be used during Operation for maintenance.
Balnain Main Access	Main access into the Proposed Development Site from the A831 at Balnain to be used during Pre-Construction and Enabling, Construction and Operation.
Borrow Pit Search Area	An area where material is removed for building materials to be utilised for the Proposed Development. In the case of the Proposed Development, this is located within the Headpond..
Cable Tunnel	A dry tunnel which will hold the cables required for the operation of the Proposed Development. There are two Cable Tunnels.
Construction Phase	The building and commissioning phase of the Proposed Development
Decommissioning Phase	The end of operational use and the removal and/or making safe of the Proposed Development
Dochfour Weir Upgrade	Proposed upgrades to the existing Dochfour Weir to improve fish passage and mitigate impact of PSH on levels in river Ness, which will be subject to separate planning consent
Embankment	Structure retaining the Headpond waterbody, and in the case of the Proposed Development, there are three Embankments all of which are concrete faced rockfilled dams.: Main Dam, Saddle Dam 1 and Saddle Dam 2.
Gas Insulated Switchyard (GIS)	Contains the gas insulated switchgear, which is a type of electrical equipment that uses a gas, such as sulphur hexafluoride (SF6), to insulate and protect various components of a power system.
Headpond	The Headpond is the upper reservoir with associated Embankments.
Headpond Waterbody	Specifically refers to the body of water contained within the Headpond area (as distinct from the overall Headpond structure).
Headrace Tunnels	Tunnels (low pressure and high pressure) connecting the Headpond to the pump turbines
Lower Control Works (LCW)	Where the Tailrace Tunnels connect to the Tailpond, the structure will sit on the western bank of Loch Ness. The LCW comprises of a level platform with 4 intake-outlet structures beneath and a smolt screen that is separated from the main structure.
Main Access Tunnel	A dry tunnel for access and construction which will also be used in operation of the Proposed Development.
Main Dam	The largest of the three dams, located to the southeast of the Headpond
Operational Phase	The period when the Proposed Development is active and has the potential to generate electricity

Term	Definition
Option A/Option B	Two alternative configurations for certain aspects of the Proposed Development (particularly for the UCW, Waterways and cavern locations).
Permanent Access Track	Permanent roads within the Proposed Development site that will be either existing, upgraded existing, or new roads used during both construction and operation. All permanent tracks will remain throughout the life of the Proposed Development.
Permanent Compound	Areas used for operational activities that will remain throughout the life of the Proposed Development. These areas will be used for GIS Switchyard, Tunnel Portals, Ventilation Shaft and the Valve House.
Power Cavern Complex	Underground cavern split into two sections: powerhouse cavern (containing the pump turbines); and transformer cavern (containing the transformers)
Pre-Construction and Enabling Phase	Initial works that enable the construction of the Proposed Development
Pressure Shaft	A vertical shaft connecting the Headrace Low-Pressure and High-Pressure Tunnels
Rochdale Envelope	An approach to the application documentation whereby the maximum parameters of the Proposed Development are included and the likely worst case effects of the Proposed Development are assessed.
Saddle Dam 1	First of the smaller dams, located to the northwest of the Headpond
Saddle Dam 2	Second of the smaller dams, located to the northeast of the Headpond
Secondary Bund	A small earthen or concrete dam downstream of the Main Dam.
Smolt Screen	A permanently installed screen with an appropriately sized mesh to prevent smolts (juvenile salmon) from being either drawn into the LCW or from being impinged on the screen due to flow rate
Spillway	Allows the Headpond to spill safely in the event of unusually high water level and will therefore protect the Embankments
Study Area	The geographical area assessed for environmental impacts, varying by chapter
Surge Tanks/Chambers	Underground safety features that accommodate changes in pressure along the Waterways
Tailpond	The Tailpond is the lower reservoir, and in the case of the Proposed Development, this will be the existing body of Loch Ness.
Tailrace Tunnels	The Tailrace Tunnels connects the Power Cavern Complex to the Lower Control Works on Loch Ness
Temporary Access Track	Temporary roads within the Proposed Development Site that will be either existing, upgraded existing, or new roads used only for during of construction. All temporary tracks will be removed and reinstated post-construction.
Temporary Construction Compound	Areas used for construction activities that will be removed and reinstated post construction. These areas will be used for construction related activities such as laydown areas, work yards, welfare facilities, temporary workers accommodation, parking, office space and for general site activities.
Temporary Workers Accommodation	Temporary accommodation and associated welfare and sports facilities to accommodate circa 1,000 workers during the construction phase of the Proposed Development
The Applicant	Glen Earrach Energy Ltd
The Application	The application for consent under Section 36 of the Electricity Act 1989 and deemed planning permission under section 57(2) of the Town and Country Planning (Scotland) Act 1997
the Proposed Development	The Glen Earrach Pumped Storage Hydro project
the Proposed Development Site	Land within the Red Line Boundary in which the Proposed Development would be situated
the Red Line Boundary	Application boundary which contains the Proposed Development Site
Tunnel Portal	Entrance to the dry tunnels (Main Access Tunnel, Cable Tunnels and Valve Cavern Access Tunnel). The entrances to the tunnels would have parking, lighting and security fencing.

Term	Definition
Upper Control Works (UCW)	Where the Headrace sections of the Waterways connect to the Headpond. The structure comprises an inlet channel which houses the water intake structures and will predominantly sit within a trench between Saddle Dams 1 & 2 under Option B.
Valve Cavern	Underground cavern located between the UCW and pressure shaft. Within the Valve Cavern, there will be mechanical valves used to isolate the Headrace tunnels.
Valve Cavern Access Tunnel	A dry tunnel for access to the Valve Cavern. The tunnel will be used for Construction and Operation of the Valve Cavern component of the Proposed Development
Valve House	A secure Permanent Compound containing a small control building sited over scour and compensation valving at the foot of the Main Dam.
Ventilation Shaft	A shaft from the Power Cavern Complex to surface level
Waterways	Comprises the wet tunnels required for the movement of water throughout the underground element of the Proposed Development. There are two parallel and separate waterways which convey water through the Proposed Development. Each Waterway comprises a headrace, pressure shaft and tailrace.

Place Names

Name	Description in Document
A82	Classified road that runs along the western side of Loch Ness, and is closest road to the Lower Control Works.
A831	Classified road from which the Proposed Development Site is accessed at Balnain.
Affric Kintail Way	Core path that runs along the FLS track considered as the main construction access to the Proposed Development Site.
Allt Saigh	Watercourse in the development area.
Alltsigh	Settlement on A82, which is also the starting point for an access track to the Proposed Development Site.
Balmacaan Forest Estate	Estate on the west side of Loch Ness, includes the majority of the land used for the Proposed Development.
Balnain	Local settlement to the north of the Proposed Development Site, location of A831 access point.
Bingally	Name of proposed connection point to 400 kV grid, approximately 15 km west of the Proposed Development Site (was originally named Fasnakyle).
Bunloit	Settlement in the area, on the western side of Loch Ness.
Caledonian Canal	Navigable canal linking the Scottish east and west coasts, passes through Loch Ness.
Creag nan Eun Forest	Forested area restricted to the eastern, southern and southwestern boundaries of the Proposed Development Site.
Divach Burn	Named water feature (SW10) within the River Coiltie sub-catchment.
Dochfour Weir	Existing weir controlling outflow from Loch Ness into the River Ness, maintains the level in the Caledonian Canal.
Dochgarroch	Settlement and canal lock location at the northern end of Loch Ness, part of the Caledonian Canal system.
Drumnadrochit	Largest settlement near the development.
Dubh Lochs	Site of Special Scientific Interest (SSSI) just outside the Proposed Development Site, to the north.
Dun Scriben	Scheduled monument within the site.
Fasnakyle	Small settlement approximately 15km west of the Proposed Development Site, location of the Bingally 400 kV Substation.
Fort Augustus	Settlement at the southern end of Loch Ness, near the Caledonian Canal.
Foyers	Settlement in the area, on the eastern side of Loch Ness, opposite the Proposed Development site, location of the existing Foyers PSH.
Glas-bheinn Mhòr	Hill near the Headpond on opposite side from Meall Fuar-mhonaidh.
Glen Earrach	Name of the Proposed Development, the Applicant is "Glen Earrach Energy Ltd".

Glen Moriston	Glen to the south-west of Loch Ness, includes Invermoriston; near the Proposed Development.
Glen Urquhart	Glen and community area near Drumnadrochit, relevant for community consultation and potential benefit zones.
Great Glen	Geographical feature encompassing Loch Ness and the surrounding area, major glacial valley.
Great Glen Way	Long-distance footpath, running alongside Loch Ness, routes through the south-eastern section of the Proposed Development Site.
Grotaig	Settlement in the area, on the western side of Loch Ness.
Invermoriston	Settlement in the area, on the western side of Loch Ness, to the south of the Proposed Development Site.
Levishie Wood	SSSI approximately 3 km southwest of the Proposed Development Site.
Loch Dochfour	Waterbody immediately downstream of Loch Ness to the north.
Loch nam Breac Dearga	Loch at the Headpond location.
Loch Ness	Major loch used as the Tailpond.
Meall Fuar-mhonaidh	Hill near the Headpond, between Headpond and Loch Ness, highest point within the Proposed Development Site.
Nighean a' Mhill	Hill between Saddle Dams and Spillway.
River Coiltie	Tributary of River Enrick, partially within the Proposed Development Site
River Enrick	River to the north of the Proposed Development Site, flows down Glenurquhart, and into Loch Ness at Drumnadrochit
River Moriston	River flowing into Loch Ness at Invermoriston, near the Tailpond.
River Ness	River flowing from Loch Ness (via Loch Dochfour) to the Moray Firth.
The Highland Council	Local authority for the area, abbreviated as THC.
Urquhart Castle	Historic castle located on the western shore of Loch Ness, near Drumnadrochit.