Cia-Aig Hydroelectric Scheme
Environmental Statement

September 2009

By:

ash
design + assessment

For:

RWE
npower renewables

CIA-AIG HYDROELECTRIC SCHEME

ENVIRONMENTAL STATEMENT

SEPTEMBER 2009

ash
design + assessment

ASH
21 Gordon Street
Glasgow
G1 3PL

Tel: 0141227 3388 Fax: 0141 227 3399
email: info@ashglasgow.com
www.ashdesignassessment.com

CIA-AIG HYDROELECTRIC SCHEME:

ENVIRONMENTAL STATEMENT

CONTENTS

CIA-AIG HYDROELECTRIC SCHEME

ENVIRONMENTAL STATEMENT

APPENDICES AND FIGURES

Appendices

Figures

GLOSSARY AND ABBREVIATIONS

ADF	Average Daily Flow
CAR	Water Environment (Controlled Activities) (Scotland) Regulations 2005
EIA	Environmental Impact Assessment
ES	Environmental Statement
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GWh	Gigawatt hour
FDC	Flow Duration Curve
HGV	Heavy Goods Vehicle
kV	Kilovolt
LBAP	Local Biodiversity Action Plan
m	Metre
MW	Megawatt (1,000kW)
NPPG	National Planning Policy Guideline
OS	Ordnance Survey
RSPB	Royal Society for the Protection of Birds
RWE NRL	RWE Npower Renewables Limited (the developer)
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SPP	Scottish Planning Policy
UKBAP	United Kingdom Biodiversity Action Plan
WFD	Water Framework Directive
ZTV	Zone of Theoretical Visibility

PART ONE

1 INTRODUCTION AND BACKGROUND

1.1 Background to the Scheme

1.1.1 RWE Npower Renewables Limited (RWE NRL) is proposing to construct a new hydroelectric scheme on the Abhainn Chia-aig (river of the Cia Aig), located at the eastern end of Loch Arkaig, approximately 15 kilometres (km) to the north of Fort William (see Figure 1.1). The proposal would be a run-of-river scheme and would comprise the construction of the following: an intake weir on the Abhainn Chia-aig; a semi-buried powerhouse; a buried pipe to convey water from the intake to the semi-buried powerhouse; a pipe bridge crossing; a short buried tailrace; a number of temporary access tracks, including the upgrading of existing forestry tracks; the construction of two short sections of new track for permanent access to the intake weir and powerhouse sites; and temporary site establishment and compound areas.

1.1.2 The scheme is likely to be connected to the grid via a buried cable connection to the nearby distribution network.

1.1.3 The project is one of a number of significant projects being promoted by RWE NRL in support of Scottish and UK commitments to increase the proportion of electricity generated by way of renewable sources. The capacity for the scheme would be up to 3 Mega Watts (MW), generating on average more than 8 Gigawatt hours (GWh) each year, enough to supply the domestic needs of over 1,600 households.

1.1.4 RWE NRL is seeking a consent that is not time limited and because of this no decommissioning date has been specified.

1.2 Consent Requirements

1.2.1 Consent for construction of the hydroelectric generating components of the proposal is being sought by way of an application to the Scottish Ministers under Section 36 of the Electricity Act 1989.

1.2.2 An additional consent to impound, abstract and return water to the river and to undertake engineering works in and alongside the watercourses is being sought from the Scottish Environmental Protection Agency (SEPA) who have powers under the Water Environment (Controlled Activities) (Scotland) Regulations 2006 (CAR). Further details relating to the CAR application are contained in Appendix 2.1 (Water Framework Derogation Paper) and Appendix 3.1 (Watercourse Crossing Schedule) of this Environmental Statement (ES).

1.2.3 The proposed grid connection is likely to involve a buried cable connection between the powerhouse site and an existing 11kV line within 650 metres (m) of the proposed powerhouse site. This connection would be permitted development under the Town and Country Planning (General Permitted Development) (Scotland) Order 1992 (SI 1992 No 223), As Amended. However, if an overhead line is required, a separate application for consent would be made by others under Section 37 of the Electricity Act 1989.

1.2.4 The grid connection would be carried out by others and is therefore not considered further within this ES.

1.3 The Need for Environmental Assessment

1.3.1 In June 1985 the Council of the European Economic Community (EEC) determined that an Environmental Assessment (EA) should be prepared by the promoters of certain categories of major infrastructure developments and that these should be published prior to statutory consent being given for the developments. This determination was enacted by EEC Directive 85/337/EEC, which came into effect in 1988 which was itself superseded by Directive 97/11/EC in 1997.

1.3.2 In Scotland the requirements of the Directive have been interpreted and enacted in relation to generation and transmission of electricity by way of various Electricity EIA Regulations, including The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (Scottish Statutory Instrument 2000 No 320) (The Regulations).

1.3.3 In February 2008, RWE NRL sent a copy of a preliminary environmental scoping report for this project to Scottish Ministers with a request for a formal Scoping Opinion.

1.3.4 In May 2008, Scottish Ministers issued their Scoping Opinion for the scheme, which defined what issues should be addressed in the environmental impact assessment. A copy of the scoping opinion is included in Appendix 1.1 of this ES.

1.4 The Environmental Assessment Requirements

1.4.1 The Regulations stipulate requirements relating to the information to be included in an ES for Environmental Impact Assessment (EIA) development. Schedule 4 of the Regulations details these requirements and Part 1 of the schedule identifies a description of the development, including in particular:

- a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases;
- a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used;
- an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, light etc.) resulting from the operation of the development;
- an outline of the main alternatives studied by the applicant and an indication of the main reasons for that choice, taking into account the environmental effects;
- a description of the aspects of the environment likely to be significantly affected by the development, including, in particular: population; fauna; flora; soil; water; air; climatic factors; material assets (including the architectural and archaeological heritage); landscape; and the inter-relationship between the above factors;
- a description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:
    a) the existence of the development;
    b) the use of natural resources;

c) the emission of pollutants, the creation of nuisances and the elimination of waste;

- description by the applicant of the forecasting methods used to assess the effects on the environment;
- a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment;
- a non-technical summary of the information provided under paragraphs 1 to 4 of this Part; and
- an indication of any difficulties (technical deficiencies or lack of 'know-how') encountered by the applicant in compiling the required information.

1.4.2 Part 2 of schedule 4 identifies the following information:

- a description of the development comprising information on the site, designs and size of the development. A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects;
- the data required to identify and assess the main effects which the development is likely to have on the environment;
- an outline of the main alternatives studied by the applicant and an indication of the main issues for his choice, taking into account the environmental effects; and
- a non-technical summary of the information provided under paragraphs 1 to 4.

1.4.3 The Regulations require that an ES describing the EIA for the development should include information referred to in Part 2. It further requires the inclusion of appropriate information referred to in Part 1, if this can reasonably be completed.

1.4.4 It is likely that this development would be procured as a conventional multicontract based on the pre-consent designs included in this ES. Parts of the detailed design for the works have, therefore, not been completed. It is not possible, at this stage, to provide a description of the physical characteristics of the whole development. This Environmental Statement, therefore, can only satisfy Part 2 of Schedule 4; although wherever possible the information listed in Part 1 has been provided.

1.5 Environmental Impact Assessment Approach and Methodology

1.5.1 The process of EIA requires developers to supply information so that the likely effects of the new development on the environment are fully understood by those involved in making the planning decision. Developers are required to objectively describe the main alternatives of the project and must specify the methods used in comparing options so as to allow independent evaluation of impact assessment.

1.5.2 The EIA and preparation of the ES has been undertaken by environmental and landscape consultants ASH design + assessment (ASH), on behalf of RWE NRL. The core ASH team has been supported by the following organisations and individuals, providing specialist inputs as follows:

- EnviroCentre – aquatic ecology, including river habitat surveys and surveys of freshwater invertebrates, fish (inc. electrofishing), peat slide risk assessment and birds;

- Dr Mary Elliott – terrestrial ecology (habitats and mammals);
- Catherine Dagg – cultural heritage (archaeology); and
- Jacobs – CAR Licensing.

1.5.3 Other inputs relating to hydrology, construction and future maintenance of the proposed works have been provided by RWE NRL.

1.5.4 ASH, together with their sub-consultants and RWE NRL have progressed the EIA as an iterative process between themselves, Highland Council (HC), Scottish Natural Heritage (SNH), and the Scottish Environment Protection Agency (SEPA) and have consulted with other bodies, agencies and individuals as appropriate.

1.5.5 For the purposes of this ES the worst case scenario (with regards to the location of each scheme component) has been considered, under each topic of assessment, to allow for final design requirements.

1.6 Structure of the Environmental Statement

1.6.1 The ES is reported in one volume including text, figures and appendices. The appendices provide supporting information such as the technical reports, visual impact tables, and the Draft Code of Landscape Reinstatement and Construction Practice. The figures contain plans, drawings, photographs and artist-impression images to support the text.

1.6.2 In addition to the above, a freestanding Non-Technical Summary has been prepared.

1.6.3 The Environmental Statement is divided into two parts.

Part One

1.6.4 Part 1 consists of four sections comprising the introduction and background to the scheme, details of the scheme alternatives and a description of the scheme proposals, including the scheme hydrology.

Introduction and Background

1.6.5 This section describes the background to the proposal, the current statutory consenting procedures, the requirements of the environmental assessment, the assessment approach and the format for the ES and the consultation process.

Scheme Alternatives

1.6.6 This section describes the alternatives considered during the development of the scheme.

The Proposed Scheme

1.6.7 This section provides a detailed description of the proposed scheme. It describes the principal construction activities and ongoing maintenance requirements and indicates the potential programme for the work should approval be granted. It also provides information on mitigation measures included to help reduce the potential adverse impacts of the scheme. Information on the decommissioning of the scheme is also provided within this section.

The Scheme Hydrology

1.6.8 This section provides information on the hydrology of the Abhainn Chia-aig, as well as data analysis and the flow regime during the operation of the scheme.

Part Two

1.6.9 Part 2 describes the scoping overview and the assessment of environmental effects.

Scoping Overview

1.6.10 This section explains the basis upon which potentially significant environmental issues were identified and the conclusions reached relating to the scope and extent of assessments to be undertaken.

Assessment of Environmental Effects

1.6.11 This section describes the key environmental aspects that would be subject to potential impact as a result of construction and operation of the proposed development. It presents findings for each of the topic areas in a structured form and generally includes the following: introduction, potential impacts, statutory and planning context, methodology adopted for the assessment, a description of the baseline information, assessment of effects and a summary and conclusion.

1.7 Significance of Effects

1.7.1 The Regulations require that the ES should describe the likely significant effects of the development on the environment. In identifying the likely significant effects, an attempt is made to reduce the scope of the assessment process to the most important potential effects. There is no general definition of what constitutes significance. Any consideration of the significance of environmental effects must recognise that environmental assessment is inherently a human concept which is centred on the effects of human activities and the importance that man places upon them. Accordingly, the assessment of significance or the importance of effects ultimately involves a value judgement based on values which reflect environmental, social and economic criteria.

1.7.2 For obvious reasons, the question of significance of effect varies according to the environmental factor under consideration and the context in which the assessment is made. It depends on the availability of data relating to existing environmental conditions (which is unlikely ever to be complete) and the value placed on those conditions. Predicting the significance of effects has to be made against current values and assumes that these would persist for the foreseeable future. The potential for future change in the valuation system raises considerable difficulties when attempting to predict impacts.

Determinants of Significance

1.7.3 In the assessment of all environmental effects which are likely to be significant, the following factors require consideration:

(a) the relative importance of the environment i.e. whether of national, regional, district or local importance;

(b) the degree to which the environment is affected e.g. is its quality enhanced or impaired;

(c) the scale of the change e.g. the land area, number of people affected and degree of change from the existing situation;

(d) the scale of change resulting from cumulative impacts;

(e) whether the effect is temporary or permanent and, if temporary, its duration; and

(f) the degree of mitigation that can be achieved.

1.7.4 Impacts may also be wide-ranging in nature, for example they could be direct or indirect, short, medium or long-term, permanent or temporary, and have positive or negative effects.

1.7.5 Against this background, the environmental assessment for the proposed works has been progressed through the identification of three levels of impact as appropriate:

1. Substantial - positive or negative

2. Moderate - positive or negative

3. Slight - positive or negative

1.7.6 Any impact or effect assessed as "Major" (substantial) or "Moderate" is considered as "significant" within the terms of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (Statutory Instrument 2000 No. 320). Any impact described as "Minor" (slight) is not considered as "significant" within the terms of these Regulations. Occasionally, where it assists in describing the level of impact, a "Neutral" category is also used. These terms are generally used to define the level of impact arising for the environmental factors. Where different terms to the above are used, they are defined within the methodology section for the topic area as appropriate.

1.8 Scheme Procurement

1.8.1 It is likely that the contract to construct the proposed works would be let as a conventional multicontract based on the pre-consent feasibility stage designs included in this ES. This procedure allows the final designs to take on board the consent conditions and constraints which become apparent as part of the consenting process. It also gives the opportunity for the chosen designer/contractor to develop a design that may be different, in detail only, from the one described in this ES, to address specific issues relating to actual ground conditions and limitations found on site, as well as advances in technology and construction methodology. Importantly, the final scheme configuration is not expected to be significantly different from that described, and any differences are unlikely to have a material impact on the findings of the environmental assessment.

1.8.2 It is important to note that the employer's requirements which would be incorporated into the contract for the works would ensure that the Scheme is constructed such that the adverse impacts identified in this ES are not exceeded. Chapter 3: The Proposed Scheme, includes a description of the mitigation measures proposed.

1.9 Consultations

1.9.1 Consultation with statutory agencies, landowners, environmental bodies and the local community is an essential part of the EIA process. It provides an important source of environmental data, enables concerns and issues to be identified during scoping, and

informs decision making during consideration of planning and design options. A list of the statutory consultees contacted during the assessment is provided in Appendix 1.2.

1.9.2 RWE NRL attended a monthly meeting with the Spean Bridge, Roy Bridge, & Achnacarry Community Council on 4th November 2008 at Spean Bridge Primary School whereby the proposed scheme was presented to community councillors. A further meeting with also held on the 18th June 2009 with Achnacarry, Bunarkaig, & Clunes (ABC) community group whereby the proposed scheme was presented and consulted upon prior to the submission of the planning application and environmental statement.

2 SCHEME ALTERNATIVES

2.1 Introduction

2.1.1 It is a requirement of the Electricity Works (Environmental Impact Assessment) Regulations that alternatives for achieving the objectives of the proposed development should be described and the basis for the selection of the preferred proposal should be outlined.

2.1.2 Article 4.7(d) of the Water Framework Directive (2000) also requires that alternative schemes are considered where derogations from its requirements are required. Specifically it aims to check whether significantly better environmental options exist that are technically feasible and economically viable. A preliminary assessment of the proposed scheme against the Water Framework Directive is included in Appendix 2.1.

2.1.3 Consideration of alternatives relating to the proposed hydroelectric scheme involved an initial review of locations throughout Scotland with hydrological regimes with the potential for generating a range of generating capacities.

2.1.4 The iterative development process applied to the proposed Cia-Aig hydroelectric scheme itself has also provided various design alternatives. Each of these has been considered or discounted on the basis of environmental, technical, financial or practical reasons.

2.2 Preliminary Design Alternatives for the Cia-Aig Scheme

2.2.1 This section outlines the alternatives considered during the preliminary design and development of the Cia-Aig hydroelectric scheme and indicates the main reasons for selecting the proposal. The following section deals with the methods and options considered for:

- Site selection;
- Pipeline route; and
- Powerhouse location.

2.2.2 There is always the option of simply not developing a project. However, given current central and local government policies supporting the development of renewable sources of energy, hydroelectric schemes should be developed where:

- Their environmental effects are acceptable;
- The scheme is accepted by the landowners and occupiers directly affected;
- The scheme is commercially viable; and
- The scheme would contribute positively to sustainable development.

As far as RWE NRL is able to establish at this stage, the Cia-Aig hydroelectric project, in the form now proposed, meets these criteria.

Site Selection

2.2.3 Potential hydroelectric schemes come to the attention of RWE NRL in a variety of ways, including its own site searches and studies. As RWE NRL's resources to develop and implement projects are limited, it gives priority to those schemes that offer the best

combination of high energy output and a high probability of successful development. To this end RWE NRL has a systematic method of assessing and prioritising schemes for development against each of the following general criteria:

- **Output** - the potential electrical energy generated;
- **Land and water rights** - the likelihood of concluding satisfactory agreements with all relevant landowners for the rights to develop the scheme and use the water required;
- **Constructability** - how easy or difficult the scheme would be to construct from an engineering point of view, including the difficulty of the terrain, the need to excavate rock as opposed to soil, access for construction and restoration after construction;
- **Environment and planning -** the likelihood of the necessary consents for the scheme being forthcoming, taking into account known environmental sensitivity, likelihood of encountering protected species, statutory and non-statutory environmental designations (e.g. National Scenic Areas, Sites of Special Scientific Interest, etc.), planning policy and visual amenity issues;
- **Location -** the suitability of the project location in terms of ability to connect to the electricity grid system, ease of management and maintenance, and compatibility with RWE NRL's other interests;
- **Public interest -** the site specific public sensitivities surrounding the scheme, for whatever cause;
- **Competition -** the extent to which other parties are, or might be, competing to develop overlapping or incompatible schemes in the same locality; and
- **Stage of development -** taking into account the fact that the further the development process has progressed, the less is the potential for unforeseen risk to emerge.

2.2.4 The scheme proposed by RWE NRL at Cia-Aig ranked highly in all these criteria.

2.2.5 Other potential hydroelectric schemes were considered by RWE NRL, but these are not currently being pursued for such reasons as economic viability, grid availability, ecological sensitivity, landowner objections, access problems or resource availability.

Design Process

2.2.6 The development of the design has been carried out over three stages of the project's life cycle. These are as follows:

- **Preliminary design** – Various options were generated which provided the design necessary to solve the engineering challenge. The proposals at this stage did not involve much detail but were sufficiently well developed to be assessed from a general engineering and environmental prospective;
- **Feasibility** – The feasibility of various options was considered with respect to a number of criteria including environmental suitability, technical feasibility and economic viability. At this stage initial environmental and topographical surveys were commissioned to determine the environmental and technical constraints of the project; and
- **Design study** – The preliminary design, which was developed further through the feasibility stage, was developed to a higher level of detail with additional engineering

and environmental assessment. This was achieved by an in-depth design study carried out by RWE NRL. The design study examined in detail the various design solutions for the intake, pipeline route, and powerhouse. The design process was run in parallel to the EIA, with the EIA process assessing and informing the design selection of various engineering solutions.

2.2.7 The scheme configuration presented in this proposal has been the result of the design process as described above.

Pipeline Route

2.2.8 During the preliminary design stage a pipeline route was anticipated with the entire route located on the east bank of the Abhainn Chia-aig, giving the most direct route to the powerhouse area. However, after further investigation into the ground conditions and topography it became clear that the upper section of the then proposed pipeline route was technically problematic.

2.2.9 There appeared to be two impassable sections of river bank with steep sided slopes into the river that would not allow for the practical construction of the pipeline.

2.2.10 The revised pipeline route, as presented in the proposal, would start on the west bank of the Abhainn Chia-aig from the intake weir. Due to the fact the powerhouse would still be on the east bank of the river it became evident that a bridge or crossing would be required to cross the pipe over the Abhainn Chia-aig to allow the pipeline to continue downstream to the powerhouse area.

Powerhouse Location

2.2.11 During the preliminary design stage two potential locations were identified as locations for the powerhouse:

(1) A powerhouse located in the Forestry Commission car park down stream of the Eas Chia-aig waterfalls at approximate grid reference: NN 178 888

(2) A powerhouse located above the Eas Chia-aig waterfalls at approximate grid reference: NN 176 890.

2.2.12 Although Location 1 offered substantially greater difference in level between intake weir and powerhouse and hence the potential for greater energy production, Location 2, as presented in the proposal, was selected for the following reasons:

- Water would be returned directly into the Abhainn Chia-aig upstream of the Eas Chia-aig waterfalls and hence would not have any affect on flows passing over the Eas Chia-aig waterfalls;
- Location 2 is more isolated and sheltered and would allow for much of the powerhouse to be located underground meaning that there would be much less of a visual impact than that of Location 1 which is located in an area with high visual and recreational amenity;
- The pipeline route to Location 2 would have much less impact as it would avoid sensitive woodland areas; and

- Location 1 could affect fishing interests and important riparian habitats found further downstream of the Eas Chia-aig falls. Location 2 is upstream of the falls which are impassable to migratory salmon and would therefore have no direct impact to fishing interests.

12 CULTURAL HERITAGE

12.1 Introduction

12.1.1 This evaluation covers the potential impact of the proposed hydroelectric scheme on the archaeological record and cultural heritage of the area.

12.1.2 This Chapter aims to:

- Identify the cultural heritage baseline within and in the vicinity of the proposed area of the development;
- Assess the proposed development site in terms of its archaeological and historic environment;
- Consider the potential impacts of construction and operation of the proposed development on the cultural heritage and archaeological record; and
- Propose measures (where appropriate) to mitigate any predicted adverse impacts.

12.1.3 The cultural heritage resource of an area is taken to consist of the following elements which might be adversely affected by the development:

- Scheduled Ancient Monuments;
- Listed Buildings;
- Designed Landscapes and Gardens; and
- Other archaeological features, conservation areas, historic cemeteries and battlefield sites.

12.1.4 In addition to these 'hard' elements are more nebulous associations with folklore and legendary or historical events which can be an important element in the perception of the landscape by locals and visitors.

12.1.5 The evaluation contains the following elements:

- A desk-based assessment of the archaeological sites and areas of historical or cultural interest considered likely to be affected by the proposed development; and
- A field evaluation of the area of the proposed development, to locate known and recorded archaeological sites and areas of archaeological and cultural significance and to identify previously unrecorded sites.

12.2 Scheme Description

12.2.1 The proposed hydroelectric scheme consists of the following elements:

- Intake on the Abhainn Chia-aig at NN 184 920;
- Pipeline (mostly buried) from intake down right (west) bank of Abhainn Chia-aig, crossing the river by pipe bridge at NN 182 915, continuing down left (east) bank to powerhouse;
- Powerhouse at NN 176 890, set partially into hill slope;

- Buried tailrace into river above falls;
- Access tracks, including use of existing forestry track and upgrading of existing forestry footpath. Construction of new temporary track along same route as pipeline;
- Two temporary construction compounds at the powerhouse site and intake site, and one site establishment area within existing forestry clearing; and
- Borrow pits to be located within existing forestry area.

12.3 Baseline Conditions

Archaeological Background

Scheduled Ancient Monuments

12.3.1 Scheduled Ancient Monuments are nationally important monuments protected by the Ancient Monuments and Archaeological Areas Act 1979. The recently published Scottish Planning Policy (SPP) 23, Planning and the Historic Environment, Model Policy 3 states that Scheduled Ancient Monuments and other identified nationally important archaeological resources shall be preserved in situ, and within an appropriate setting. Developments which have an adverse on Scheduled Monuments or the integrity of their settings shall not be permitted unless there are exceptional circumstances.

12.3.2 There is one Scheduled Ancient Monument in the vicinity of the area of the proposed development:

- Eilean Loch Arkaig : chapel, crannog at NN 1599 8885 SAM ref.no. 6154

Listed Buildings

12.3.3 Under the 1997 Act, the Scottish Ministers are required to compile a list of buildings of special architectural or historic interest. These buildings are classified into Categories A, B and C (S), in decreasing order of importance. This statutory protection covers not only the building itself, but also other features within its curtilage (e.g. stables and garden walls). There is a presumption against development that would adversely affect the character of a listed building or its setting, and planning authorities are required to have a special regard for the desirability of preserving listed buildings and their settings. Further policy information on listed buildings is published in NPPG 18. Additional guidance is published in the Memorandum of Guidance on Listed Buildings and Conservation Areas 1998 (hereafter ‘memorandum’; Historic Scotland 1998).

12.3.4 There are five Listed buildings in the vicinity of the area of the proposed development:

- Cia-Aig Bridge at NN 1758 8884 (Listed no. 7100, Category B);
- Achnacarry House at NN 1767 8796 (Listed no. 7096, Category: B);
- Achnacarry, St Cian’s Church of Scotland (Listed no. 7099, Category: B);
- Achnacarry, stables at NN 1744 8739 (Listed no. 7087, Category C(S)); and
- Achnacarry, Old Post Office at NN 1757 8773 (Listed no. 7098, Category: C(S)).

Gardens and Designed Landscapes

12.3.5 There is one designed landscape in the vicinity of the area of the proposed development (approximately 500m at its closest point to the proposed powerhouse location):

- Achnacarry House, gardens and policies to an area of 86 ha.

Archaeological Sites

12.3.6 Archaeological sites and monuments without statutory protection are curated by the local planning authority. SPP 23 and PAN 42 provide national planning policy guidance and advice on the treatment of this resource. PAN 42 indicates that the principle that should underlie all planning decision-making is preservation of cultural resources, in situ where possible, and by record if destruction cannot be avoided. It is recognized in that document that preservation may not always be possible, and where damage is unavoidable various mitigation measures may be proposed.

12.3.7 No systematic archaeological field survey has been carried out in the general area of Glen Cia-aig. There is therefore a high probability of unrecorded sites being located in this area.

12.3.8 The following archaeological sites are recorded on the Highland Sites and Monuments Record as within or adjacent to the area of this evaluation:

- Eilean Loch Airceig: crannog at NN 1599 8885 (Her ref . MHG 4258);
- St Columba's Chapel at NN 1599 8885 (Her ref. MHG 4352);
- Eilean Loch Airceig: cemetery at NN 1599 8885 (Her ref. MHG 40710);
- Achnacarry House at NN 1767 8796 (Her Ref. MHG 4260);
- Achnaharry: stables at NN 1744 8793 (Her ref. MHG 17208);
- Achnacarry: castle at NN 1750 8797 (Her ref. MHG 17258);
- Achnacarry Old post office at NN 1757 8773 (Her ref. 17258);
- Achnacarry: saw mill at NN 1750 8810 (Her ref. MHG 29819);
- Achnacarry: grain mill at NN 1750 8810 (Her Ref. MHG 29818);
- Achnacarry: Timber Workshop at NN 17540 88104 (Her ref. 48457);
- Achnacarry: Summer House at NN 17653 88028 (Her ref. MHG 48459); and
- Chia-Aig Bridge at NN 1758 8884 (Her ref. 17305).

12.3.9 Of these, the first three correspond to the Scheduled site at Eilean Loch Arkaig, 1.5km from the area of the proposed scheme. The next eight correspond to the grounds of Achnacarry, approximately 1km from the scheme. Only the last, the Chia-aig bridge, is adjacent to the scheme, being less than 150m from the tailrace.

12.4 Data Sources and Bibliography

12.4.1 The following data sources were consulted during this evaluation:

- Highland Sites and Monuments Record (SMR) held by the Archaeology Unit at Highland Council in Inverness;

- National Monuments Record for Scotland (NMRS) held by the RCAHMS in Edinburgh;
- Early maps held by the Map Library within the National Library of Scotland in Edinburgh; and
- Papers and maps relating to the forfeited estate of Lochiel in the National Archive of Scotland.

12.4.2 The following works provided background information for the evaluation:

- Blaikie, WB, 1897: The Itinerary of Prince Charles;
- Gibson JS, 1998: The Gentle Lochiel;
- Haldane ARB 1952: The Drove Roads of Scotland;
- Hogg J, 1888: A Tour of The Highlands in 1803;
- Linklater, E, 1976: The Prince in the Heather;
- Smout TC, 1997: Scottish Woodland History;
- Smout TC, 2003: People and Woods in Scotland; and
- Stott, L. 1987: The Waterfalls of Scotland.

12.5 Historical Background

Landownership, Settlement and Land Use

12.5.1 The hills to the north of Loch Arkaig form a part of the traditional lands of Cameron of Lochiel, although their wild nature led to the actual boundary with Glengarry to the north being uncertain, and this area was known as the Disputed Lands. The steep hills rising from the loch side led to there being very few townships here compared with Glen Dessary and Glen Pean to the west and Glen Mallie to the south. No permanent settlements are recorded between Clunes on Loch Lochy and Achnasual on Loch Arkaig.

12.5.2 The estate of Cameron of Lochiel was forfeit after his part in the 1745 Jacobite rising. In 1770 the Commissioners for the Annexed Estates purchased Lochiel and, in order to manage and improve the estate, commissioned a set of maps of the various small farms, together with details of their present rents and proposed improvements. These maps show the Cia-aig to form part of the boundary between the farmlands of Achnacarry, Achnasaul and Clunes.

12.5.3 Achnacarry, site of the chief's house, lay mostly to the south of the River Arkaig but included on the north side a small enclosed field west of the Abhainn Chia-aig and a birch wood to the east, these two extending north to approximately the line of the present road. North of this, the west side of the Abhainn Chia-aig was a part of the farm of Achnasaul and was planted with oak, apart from a small triangle of arable ground beside the river. East of the river was the farm of Clunes, wooded with birch and again with a small rectangular patch of arable adjacent to the river. The 1774 map of Clunes shows the line of a dyke 'for inclosing the wood' and a head dyke, both running east from the Abhainn Chia-aig, although it is unclear whether these were extant or proposed and whether the proposed improvements were ever carried out.

12.5.4 A short distance to the north, beside a rectangular birch plantation, the boundary crosses the Abhainn Chia-aig to include its west banks in the farmlands of Clunes north to the march with Glengarry.

12.5.5 These maps show that although the settlements were small and scattered, the lands between were clearly defined as pasture, hill ground with shielings, and woodland belonging to each farm. Only one early map suggests further settlement placenames. This map, published by J Cary in 1801, gives 'Inverchtak' east of Achnasual and immediately east of a small stream emptying into Loch Arkaig. This may be 'Inver Cia-aig' and may indicate some dwelling here at this date.

Drove Roads and New Roads

12.5.6 One of the main drove routes for cattle from Skye via Kyle Rhea turned south at the head of Loch Garry, crossed the watershed at the stance of Fedden and descended via Glen Cia-aig to the east end of Loch Arkaig. From here, joined by cattle from Glen Dessary and Loch Nevis, the drove route continued across the Great Glen to Spean Bridge, then south by a choice of routes.

12.5.7 The drove route is unlikely to have continued down the river side past the falls, a route which would have been awkwardly steep for livestock. It is more likely that it contoured more gently down to the east, north of Torr a'Chronain. A trackway recorded on the 1st edition OS map which at that date marked the north boundary of the plantations, is likely to have been the route and, significantly, there is a sheepfold where this track meets the public road, possibly the remains of a drove stance. This trackway is now partly overlain by the present forestry track. South of the Dark Mile the drove route is uncertain, although there is an island at Bunarkaig named the Island of the Drovers.

12.5.8 It is by the Glen Cia-aig drove road that Lord Loudon attempted to bring a force in a surprise attack on the remaining Cameron rebels in May of 1746 but failed to arrive at Loch Arkaig in time, after 'the worst and most fatiguing march I ever made'. James Hogg, on his tour of the Highlands in 1803: 'proceeded by the way of Glenkekuich, a most shocking road, where I thought Mr Gillespie should have lost his horse' The convenience of this short cut through the hills 'nearly equal to a day's journey of a drove of cattle or sheep' compared with Invergarry was, however, noted by Thomas Telford, who proposed this as the route for the new road from Skye. Although this never came about, it is shown as a road on the map accompanying the 5th Report of the Commissioners as 'made or under contract' It is also shown on the SDUK map of North Scotland of 1834 and James Knox's map of Scotland in 1838.

12.5.9 Telford did undertake, in 1808, the construction of the new road through the Mile Dorcha, branching off from the road up Loch Lochy side 'at about 560 yards from the Irishman's Hill, proceeding through the Dark Mile and across the water of Riachback and extending two miles towards Loch Arkaig and ending at the west end of the loch which commences with and extends a short distance along the north side of the said loch'. This was to be completed before November 1810. This work is likely to have included the bridge over the Abhainn Chia-aig, giving this bridge a definite date of 1808-10.

Trees and Forestry

12.5.10 Timothy Pont, who surveyed the Highlands in the 1580s, recorded 'Upon the south side (of Loch Arkaig) there is a fir wood upon fourteen miles of length and upon the north side fair

oaken wood. The country about is fit for pasture but no corn is here'. In 1611 the Loch Arkaig trees were noted as being very large and of interest to the Royal Navy, although there is no indication of commercial felling at this date. External interest in the wood began in 1674 with proposals for an iron works, which would have required copious quantities of charcoal from the oaks. In 1701 oakwoods were being sold by Lochiel to an Irishman, and in 1714 he sold the 'oak bark from the foot of Loch Arkick joining Loch Lochy on the north side to the head of Locharkick'.

12.5.11 Just before the Jacobite rising, Lochiel was selling fir trees to an English company, who apparently left 'vast numbers' of discarded tops. When Prince Charles Edward Stuart sent Murray of Broughton to contact Lochiel in 1745 he went under an assumed name pretending to 'come from England to buy wood'.

12.5.12 A detailed survey of the Loch Arkaig woods was carried out by the Commissioners for the Annexed Estates in 1756, who considered the trees to be a great asset. About one fifth of the trees were considered immediately merchantable. Over the next few years so much wood was extracted that by 1772 it was declared 'necessary for the preservation of the woods that no more of it should be cut for some years' Also noted in 1756 were 726 trees that had (it was alleged) been illegally felled the previous year. Illegal cutting for local use was on such a scale that in the 1750s an armed forest guard was employed and it is likely that the woods only survived the 18th century because the Commissioners exerted management responsibility in time.

12.5.13 The Commissioners paid for the woods to be enclosed against stock. The enclosing dykes were definitely built around the fir woods south of the loch, and the 1774 map of Clunes shows a 'line for enclosing the woods' proposed but not necessarily completed.

Jacobite Connections

The Loch Arkaig Treasure

12.5.14 Although the lost cache of French coins, buried in 1746 somewhere around Loch Arkaig is now a legend firmly fixed in peoples' imagination, it is most likely that the money, landed at Loch nan Uamh and initially brought to Loch Arkaig, was for the most part spent or distributed at the time. Some part of the hoard does appear to have been divided into smaller units and buried at several locations around the loch, probably temporarily and not all of these may have been recovered as there is a record of some French coins being discovered somewhere along the loch side during the 19th century. However, there is no evidence to suggest any connection between Cia-aig and the money

Prince Charlie's Cave

12.5.15 Above the Eas Chia-aig falls a Forestry Commission path, with signs, leads to Prince Charlie's Cave, in fact no more than a tiny shelter between two boulders. The historical facts of Charles' refuges are well documented:

12.5.16 On April 17th 1746, only one day after the Battle of Culloden, the prince travelled along the shore of Loch Arkaig on his way to Glen Pean, but his associations with the area of Glen Cia-aig come after his return from the islands and failure to reach a French ship at Poolewe. On August 14th his party of ten crossed the Garry and spent the night one mile to the south. Their subsequent travels are described (Blaikie 1975):

Aug 15th Travelled six miles across the hills to the Brae of Achnasual. Passed the day in 'a most inconvenient habitation, it raining as heavily within as without it' the messengers returned here from Clunes with instructions to go to a wood two miles off where he would meet them next day. They found it to be 'a very fast place' [The present Lochiel informs me that this 'fast place' is a cave about two miles east of Achnasual, in the wood of Torre Chrone, on the left bank of the stream flowing through Glen Cia-aig] (Here occurred the incident of shooting the stag, when they were entirely destitute of food) They were joined this night by MacDonald of Lochgarry and (probably) by Cameron of Achnasual and Captain MacRow of Glengarry's regiment.

Aug 16th At Loch Arkaig. Joined by Cameron of Clunes, who took them to a wood at the foot of Loch Arkaig [This second shelter was probably near Clunes House, at the east end of Loch Arkaig]

12.5.17 On August 21st they removed again, to a hut at Torvault or Tor Gallain but on the 23rd government troops were spotted and the prince retired to the top of the hill Meall an Tagraidh at the top of Glen Cia-aig. On the 26th they probably returned to the Braes of Achnacarry before removing to Cluny's Cage in Badenoch. On September 16th the prince returned again to Achnacarry, spending the day there before travelling through the night to meet the boat which took him to the Continent.

12.5.18 So the 'cave' on Torr a' Chronain (the knoll of the murmuring noise) by the Cia-aig was not actually a cave and was only occupied by the prince for one night. The incident of shooting the stag mentioned by Blaikie was no more memorable than the shooting a beast by one of the men of Glenmoriston on their way to the refuge which provided the first proper meal the prince's party had had for some days. More memorable is the encounter below the refuge with the Rev. John Cameron which provides a first-hand portrait of the fugitive prince: he was 'barefooted, had an old black kilt coat on, philabeg and waistcoat, a dirty shirt and a long red beard, a gun in his hand, a pistol and dirk by his side. He was very cheerful and in good health, and in my opinion fatter than when he was in Inverness'

Prince Charlie's Tree

12.5.19 Legend has one of the oak trees lining the Dark Mile as one of Prince Charlie's hiding places. The tree is long-gone and there seems to be little foundation to this association. The road was not built until more than 60 years after the rebellion and the avenue of oaks is likely to have been planted then.

Folklore: The Witch's Cauldron

12.5.20 Below the Falls of Cia-aig is a pool known as the Witch's Cauldron, to which the following legend is attached:

'The cattle in the district were suffering from an unexplained malaise and the Camerons consulted a seer about it. The seer attributed the malaise to an old hermit woman who lived beside the loch and said that it would persist until the witch was killed. The Camerons therefore sought her out at her cottage, but when they got there all they found was a cat which they set upon and wounded. However, it escaped and they followed the trail of blood to the Chia-aig Falls where they found the dying cat. They were about to finish the wretched animal's life when it let out a terrifying scream and leapt into the pool. As it leaped, it changed

into the witch they were looking for. The Camerons stoned the old hag to death and the malaise did not recur'. (Stott 1987)

12.5.21 This is a variation of a fairly common theme of Highland superstition, and it is likely that the boiling nature of the water below the falls gave rise to the 'cauldron' name element, the legend developing later to explain the name.

20th Century Cultural Connections

The Jacobite trilogy of DK Broster

12.5.22 This series of novels, written in the 1920s, use the Loch Arkaig-Dark Mile area as their setting. While many of the characters and locations did exist, the main protagonists and location are fictional, although bearing a resemblance to Achnasual and Clunes. The road through the Dark Mile is anachronistic, having been constructed over 50 years after the time setting of the books.

The Film 'Rob Roy,

12.5.23 The bridge and falls at Cia-aig were used as the location for a scene in the 1995 film Rob Roy. There are no actual connections between the Loch Arkaig area and the MacGregors. The scene occurs towards the end of the film, and although recognisable to people who are acquainted with the falls, they are not intended to represent the actual Cia-aig. Although the association with the film is advertised at the local clan centre, it is unlikely that this fact attracts many visitors to the falls.

12.6 Archaeological Field Survey

12.6.1 The following archaeological sites or areas of archaeological or historical interest were noted during the field evaluation, carried out on 03.08.2008. Sites 2 – 6 are indicated on Figure 12.1:

- **Drove road** (Site 1). This is only visible in its original form north of the present forestry plantations, ie. north of NN 185 925. Here it is visible only as a worn route following a high contour, for the most part on the west side of the river but crossing at a ford just north of the forestry. The only constructed elements of the route are cairns such as at NN 1918 9329 and shelters constructed against boulders such as at NN 1938 9336. Within the forestry the route is overlain by 20th century forestry tracks. No cairns or shelters were noted within the forestry and any formerly present are likely to have been destroyed by track building or ploughing and planting trees;
- **Shieling site** (Site 2) at NN 1832 9203 on the alluvium of the Allt Coire na Coisag. One small shieling structure on the north bank of the stream, in the form of rubble circular walling approximately 1.5m in diameter and 1-3 courses high;
- **Building** (Site 3) at NN 1765 8895. Moss covered boulder footings of a rectangular building aligned NNW-SSE and measuring approximately 5.6m by 3m, with a possible entrance on the SW long wall. This is located on a slight platform on an otherwise steep slope within the coniferous plantings. A possible line of former walling runs SSE along the contour. This structure is not recorded on either the 1774 estate map or the 1st edition Ordnance Survey, and is unlikely to have been a permanent settlement such as a farmstead. It may have been a temporary hut

associated with forest management, either for a forest guard or for tree fellers, charcoal burners, etc, or could be a small byre associated with the areas of cultivated ground in the vicinity which are recorded on the 1774 maps. However, its relative inaccessibility, even without the present tree cover, makes this latter interpretation unlikely. The walling may be the remains of the Clunes township head dyke or a plantations boundary; and

- **Cia-Aig bridge** (Site 4) at NN 1758 8884. This Listed bridge carries the public road to Loch Arkaig and is the viewpoint for the Eas Cia-aig falls. Footpaths to the bridge from the adjacent visitors car park are maintained by Forestry Commission Scotland.

12.6.2 The following sites associated with legend or historical events were also evaluated:

- **The Witch's Cauldron** (Site 5) at NN 1758 8885. This is the pool immediately below the Falls Of Cia-aig and is referred to in the visitors interpretation, although the associated legend is not presented, nor is the legend referred to or even known in the nearby Clan Cameron museum. The pool is within the area maintained for visitors by Forestry Commission Scotland; and
- **Prince Charlie's Cave** (Site 6) at NN 1829 8924. A relatively new path has been constructed to lead visitors to the 'cave', with a small, modest sign at its junction with the forestry track. This is a part of the network of paths into the forestry from the Cia-aig car park but the only signage for the cave is at this junction. The cave itself is not signed and could be easily missed as it is no more than a cramped shelter under some tumbled boulders. The setting of the cave, originally concealed within dense woodland, is now exposed by the felling of the adjacent forestry block which, while revealing the cave and giving a fine view towards Loch Lochy, removes any sense of concealment.

12.7 Potential Impacts

Scheduled Ancient Monuments, Listed Buildings and Designed Landscapes

12.7.1 None of the above would be directly affected by the proposed scheme. The existing forestry, until felled, provides an adequate screen between the elements of the proposed hydroelectric scheme and the nearest Listed site, which is the Cia-aig Bridge, while rising ground north of the River Arkaig, particularly the hills of Torr a'Mhuilt and Creag an t-Saighdear block any view of the Cia-aig glen from Achnacarry and its grounds.

Archaeological Sites

12.7.2 Only two archaeological sites have been identified in the close vicinity of elements of the scheme:

- **Site 2. Shieling site** at NN 1832 9203. This is approximately 50m north of the proposed intake site. It may be affected by construction of the site compound; and
- **Site 3. Building** at NN 1765 8895. This is approximately 60m from the power house site. It may be affected by construction of the site compound or temporary access tracks.

Sites of Historical or Folkloric Interest

- The Witch's Cauldron (Site 5) is less than 150m from the tailrace of the scheme but, like the falls themselves and the bridge, would be screened from the works by the existing trees. There may be some visual and noise impact during the construction phase; and
- Prince Charlie's Cave (Site 6): Access to this site from the visitors' car park would pass close to elements of the scheme such as the power house and would have to cross or join the access track to the power house. This may detract from the experience of the remoteness and concealment but, as mentioned above, the site has already been exposed by felling and path making.

12.8 Mitigation

Archaeological Sites

12.8.1 It is recommended that damage to the archaeological record be minimised by protecting the sites adjacent to the development, both by careful design to exclude the sites from areas to be directly affected and by marking the sites before work commences to prevent accidental damage.

Sites of Historical or Folkloric interest

12.8.2 There would be no direct impact on these sites, but there may be an adverse impact on visitors' experiences, particularly during the construction phase. Visual screening using existing trees and reinstatement and replanting as well as ensuring that public access to sites such as Prince Charlie's cave is not blocked or endangered during construction would minimise these impacts.

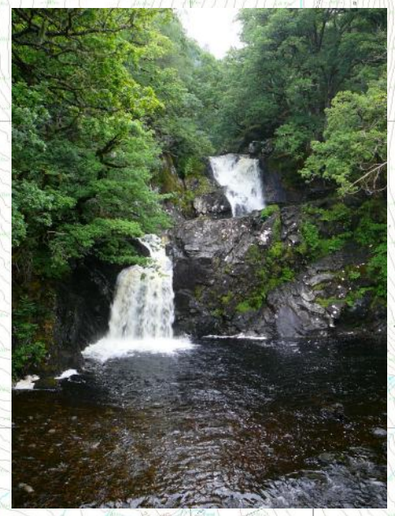
12.9 Conclusions

12.9.1 There are very few archaeological or historical sites within or adjacent to the area of development. The impact on the archaeological record would be minimal, and minor adverse impacts on historical sites can be reduced by good design and work practice.

Site 2

Site 3

Site 4



Site 5

Figure 12.1

Key

- Location of Proposed Intake*
- Location of Proposed Powerhouse*
- Proposed Pipeline Route
- Location of Proposed Pipe Bridge
- Access via Existing Forestry Track
- Existing Forestry Track to be Upgraded
- Temporary Access Route to be Reinstated
- Proposed New Permanent Access Track
- Main Site Establishment Area
- Archaeological Sites

Client: RWE npower renewables

Project: **Cia-Aig Hydroelectric Scheme**

Title: Cultural Heritage

Drwg No.	Date	Rev.	Drwn.	App'd
108004/12.1	Oct '08			

ash design + assessment