Appendix 3.1

Draft Construction Environmental Management Plan

1 Introduction

1.1 Introduction

1.1.1 This draft Construction Environment Management Plan (CEMP) has been prepared by Stantec UK Limited (Stantec) on behalf of Drax Cruachan Expansion Limited ('the Applicant') for the proposed Cruachan Expansion Project, a new 600MW pumped storage electricity generating station ('the Proposed Development').

1.2 Overview of Site and Proposed Development

1.2.1 The Proposed Development will be located on land around and to the east of the existing Cruachan 1 pumped storage hydro power station (Cruachan 1) on the northern banks of Loch Awe in Argyll and Bute (National Grid Reference for Cruachan Reservoir: NN 080 282) (the Site). The Site is located within the administrative boundary of Argyll and Bute Council (ABC). A Site Location Plan provided in **Figure 1.1 of the EIA Report**.

1.2.2 The Site comprises all areas needed for construction and operation of the Proposed Development. The Site area is broad and includes a corridor of land running from Cruachan Reservoir, extending into Loch Awe.

1.2.3 The Site encompasses the existing Cruachan 1 facilities, including Cruachan reservoir, underground power station and visitor centre. Existing private and public roads which connect the A85 to Cruachan Reservoir (including St Conan's Road), a small section of the A85, Falls of Cruachan railway station, part of the Oban to Glasgow railway line, and Loch Awe also lie within the boundaries of the Site.

1.3 The Proposed Development

1.3.1 The Proposed Development seeks to optimise use of the existing Cruachan Reservoir and Dam through development of a new underground power station and associated infrastructure adjacent to Cruachan 1 to provide up to 600MW of additional new generating capacity. The Proposed Development will be operated independently of Cruachan 1, although both will use Loch Awe as the lower reservoir and Cruachan Reservoir as the upper reservoir.

1.3.2 The following temporary works will be required for the Proposed Development:

- An upper site compound to be used for construction laydown and concrete batching plant would be established in the vicinity of the existing dam. Once construction work for the Upper Control Works and sub-station is complete, this compound would be removed and the land restored;
- A lower site compound including workers welfare will be established to the North East of Lochawe village, with access from the junction of the A85 and B8077 (Stronmilchan Road) (as shown on Figure 1.1). Once construction work is complete, this compound would be removed and the land restored. The total area required for this compound would be approximately 9ha;
- A temporary diversion of the A85 using an existing car-parking layby at the Falls of Cruachan Station would be required in order to facilitate construction of the initial sections of the main access tunnel and lower control works. The A85 would revert to its current alignment once the bridge structure within the A85 has been complete (after a period of approximately 3 months).

1.4 Construction Process

1.4.1 The construction process will take place over an estimated 65-month programme to achieve commercial operation of the first unit. Surface work is expected to take place Monday – Saturday 7am -7pm and Sundays 7am – 12pm with underground works expected to take place 24 hours a day. Some construction activities may need to be undertaken outside these hours, for which agreement would be sought from ABC.

1.4.2 Key construction activities will include the following:

- Mobilisation, site set up, camps, crushing, batching, concrete mixing plants, and haul roads;
- Setup traffic management and temporary diversion of A85;
- Construct bridge piles and pile cap to allow a bridging structure to be created in the main A85 carriageway;
- Re-divert A85 back onto permanent alignment;
- Construction of initial phase of working quayside platform on the foreshore of Loch Awe;
- Excavation of main access tunnel;
- Using spoil from main access tunnel to create the remainder of the quayside area;
- Continued construction of the main access and tunnel, tailrace gate chamber, ventilation tunnel, a tailrace surge shaft, and a tailrace tunnel under A85;
- Construction of the intake structure within Loch Awe to connect to the tailrace tunnel, including gates, screens and stoplogs;
- Drive and support main access tunnel to powerhouse complex;
- Excavation and support of powerhouse complex;
- Excavation and support of the high-pressure tunnel system connecting the Cruachan reservoir and the powerhouse;
- Excavation and construction and installation of a headgate to manage water flow to the powerhouse;
- Construction of the upper control works within and adjacent to the Cruachan reservoir to allow water in and out of the new tunnel system;
- Installation of powerhouse overhead crane;
- Installation of powerhouse electromechanical and hydromechanical equipment;
- Installation of powerhouse balance of plant (mechanical and electrical); and
- Dry & Wet commissioning of turbines.

1.4.3 Mobilisation will be required at the upper reservoir area and as close as possible to the lower foreshore area. Access to the upper reservoir already exists but the existing dam access road will

require to be widened in places and additional passing places formed to accommodate construction traffic.

1.4.4 The first phase would be to establish site offices and laydown areas. It is likely that the main site offices would be located within the lower site compound (as described in 3.2.2 above), with smaller construction working areas at the lower works and upper works sites. After the establishment of the site office and laydown areas, access to the main construction areas would be established, with access roads completed prior to commencing the main construction and excavation phases to prevent excessive vehicle movements over unsuitable ground.

1.4.5 The main construction laydown area would be decommissioned on completion of the works and the land restored to a suitable standard before being returned to the owners at the end of the construction phase.

1.4.6 All underground works are assumed to use drill and blast methodology. It is assumed that suitable concrete aggregates can be produced from tunnel spoil on the site.

1.5 Purpose of the Document

1.5.1 This document sets out broad procedures and principles to govern the construction phase of the Proposed Development. The measures identified will seek to ensure that effects on the environment are avoided and minimised as far as practicable during the construction phase.

1.5.2 The document shall form part of the construction contracts for the Proposed Development. It is anticipated that the production of a final CEMP will be secured by way of a condition to deemed planning permission granted along with Section 36 consent. Production of a final CEMP should be in line with the principles outlined in this document but refined to take account of design changes and specific construction practices used by the selected EPC Contractor. The CEMP will remain a 'live' document which will continually be updated throughout the construction phase to reflect changes in construction practices and emerging mitigation and risks.

1.6 Training and Awareness

1.6.1 All site personnel will receive site induction training prior to starting on site. Induction checklists will be used, and inductees should sign the induction checklist after having understood the relevant induction material. This includes reading and understanding relevant environmental procedures.

1.6.2 Induction training will include as a minimum:

- Introduction to the Site;
- Site awareness overview (if deemed appropriate, relative to the spatial and technical extent of works that the staff member will undertake);
- Awareness of the Environmental Management System (EMS);
- Key roles and responsibilities;
- Environmental objectives, targets, applicable improvement plans and environmental key performance indicators; and
- Relevant risk assessments, operating procedures and site safety procedures.

1.6.3 Induction/ awareness raising will include information on:

- Site history, actual or potential consequences of their work activities and behaviour on environment performance;
- Potential consequences of the departure from specified procedures; and
- Role and importance of achieving conformity with environmental objectives, targets and procedures.

1.7 Checking and Corrective Action

1.7.1 Regular audits and site inspections will be undertaken by the site Health Safety, and Environment (HSE) Advisor(s) to ensure that operations and activities are in accordance with the EMS requirements. Any corrective actions resulting from these audits will be agreed, with responsibility and a timescale assigned and recorded.

2 General Information

2.1 Introduction

2.1.1 This section of the document sets out the general information which will be implemented during construction of the Proposed Development and is not necessarily linked to a specific environmental topic area. Section 3 of this document covers specific considerations for relevant environmental topics.

2.2 Register of Environmental Aspects and Impacts

2.2.1 The Applicant will compile an Environmental Aspects Register (EAR) of all the environmental aspects/risks of the project likely to be encountered during the construction phase (civil works, M&E and commissioning). This will be produced in discussion with appointed contractors.

2.2.2 The final register will cover several environmental topic areas and will be regularly updated to reflect any additional risks resulting from the EPC Contractor's selected methods of working, changing site conditions etc. Risks (and other relevant aspects) will be identified under the following general headings:

- Hours of Operation;
- Storage of Materials;
- Waste Management;
- Noise & Vibration;
- Air Quality;
- Cultural Heritage;
- Lighting
- Hydrology;
- Transport and Access;
- Climate Change;
- Ecology; and
- Ground Conditions.

2.2.3 The Register of Environmental Aspects and Impacts is a 'live' document which covers the relevant environmental topics and assesses the level of significance of each. The register will be regularly updated by the EPC Contractor's HSE Advisor to reflect any additional risks resulting from the EPC Contractor's chosen working methods and changing site conditions as the construction progresses. This register will be readily available at each respective site office.

2.3 Risk Assessments

2.3.1 The majority of construction activities undertaken on-site will be subject to an environmental risk assessment which will be required by the EPC Contractor, which will:

- Identify potential significant environmental impacts or effects that can be anticipated;
- Assess the impact or effects and probability of risks from these;
- Identify the control measures to be taken and re-calculate the risk; and
- Report where an unacceptable level of residual risk is identified so that action can be taken through design changes, re-scheduling of work or alternative methods of working in order to reduce the risk to an acceptable level.

2.3.2 The results of risk assessments, and their residual risks are only considered acceptable if:

- The severity of outcome is reduced to the lowest practical level;
- The number of risk exposures are minimised;
- All reasonably practical mitigating measures have been taken; and
- The residual risk rating is reduced to a minimum.

2.3.3 The findings of the risk assessment and in particular the necessary controls will be incorporated by the EPC Contractor before the commencement of the relevant works using an agreed instruction format (e.g. Toolbox Talks). The controls will be agreed by the relevant Project Manager(s).

2.3.4 The risk assessments would be kept and filed to be checked/reported against.

2.4 Method Statements

2.4.1 Method statements (generic or bespoke depending on the activity) will be completed by the EPC Contractor. Method statements will be approved (where necessary) by the Applicant. Method Statements will include a review of the environmental risks and commitments referred to in the final Register of Environmental Aspects and Impacts, so that appropriate control measures are developed and included within construction processes.

2.4.2 The EPC Contractor shall decide which of the works have environmental implications using the following criteria:

- The work may result in an adverse effect on the environment or human health; and /or
- The work is adjacent to a surface water drain or water body.

2.4.3 Where required, method statements would also be submitted to the relevant enforcement agencies.

2.4.4 Method statements should contain at least the following information:

- Location of the activity and access/egress arrangements;
- Work to be undertaken and methods of construction;
- Plant and materials to be used;

- Labour and supervision requirements;
- Health, safety and environmental considerations; and
- Any permit or consent requirements beyond those already obtained.

2.5 Site Environmental Standards

2.5.1 Site environmental standards will be agreed between the EPC Contractor and Applicant and will detail the minimum measures that should be achieved for general operations falling outside the risk assessment/method statement procedure. These will be determined on a case-by-case basis and through consideration of e.g. site conditions or weather conditions. The site environmental standards would be designed to cover the majority of construction activities in accordance with the Environmental Impact Assessment (EIA) Report.

2.5.2 These will cover issues such as storage of materials, management of waste, dust, noise and vibration, and water pollution control. These standards will also form the basis of Toolbox talks which will inform all contractors working on site of the potential environmental risks arising from construction activities.

2.5.3 Best practice construction management techniques will be implemented to avoid/minimise the generation of excessive waste, dust, noise, lighting, noise and vibration, in accordance with the EIA Report. These are discussed in more detail in **Section 3** of this document.

2.6 Environmental Management System

2.6.1 Following construction, the EPC Contractor shall be required to have EMS for commercial operation compliant with ISO 14001 (or similar) to identify and manage their environmental obligations and involve subcontractors.

2.7 Complaints Procedures

2.7.1 The Applicant will implement a Complaints Procedure to manage any complaints relating to the construction works. Should this be deemed most efficient and subject to prior agreement, the Applicant will centralise and coordinate such procedure for the different parts/members of the EPC Contractor.

2.7.2 Complaints will be possible via telephone or in written form (web-based). The Applicant will publish a website within which written complaints can be submitted and will publish a specific telephone contact number for verbal complaints to be made.

2.7.3 The following steps will be taken to make the public aware of the activities on site and the available lines of communication with the Applicant:

- A Community Liaison Group will be set up;
- Neighbouring occupiers will be notified of the start of site works and the likely duration of the overall construction phase;
- A telephone number for environmental complaints will be published locally;
- The Applicant's site HSE advisor(s) will maintain a close liaison with the council's Environmental Health Officer (EHO) at all times;
- Should any unforeseen event occur within the construction site that has the potential to cause off-site pollution then the EPC Contractor will notify the EHO as soon as possible; and

- A procedure to inform major road users about works affecting the local network will be put in place.

2.7.4 The following procedure will be followed should any complaint be received:

- Subject to the set up envisaged, the complaint will be brought to the immediate attention of the Site Manager and recorded in a complaints log (an electronic log is likely to be used);
- The relevant Site Manager will decide on the appropriate course of action depending upon the nature of the complaint, which will typically require that the complaint is passed on to the EPC Contractor's Site Manager and, depending on the severity may require the ongoing involvement of one or more of the Applicant's Site Manager(s);
- If immediate action is required (for incidents such as spilled material on a public highway, alleged damage to third party property due to either a delivery vehicle, or a construction activity) a representative from the EPC Contractor will attend and take remedial action or record the circumstances for follow-up, with feedback to the Applicant's Site Manager;
- If the action to be taken requires a change of approach or policy, this will be addressed at the EPC Contractor's routine weekly site meeting, or daily commissioning meeting as appropriate, with feedback to the Applicant's Site Manager;
- If the nature of the incident or complaint is too serious to be dealt with through internal discussion and appropriate action led by the EPC Contractor's Site Manager alone (for incidents such as road traffic accidents, allegations of inappropriate behaviour, etc.), it will be discussed and agreed with the Applicant's Site Manager and, if felt to be required, it would be referred to the relevant third-party;
- If the incident or complaint needs to be dealt with at a higher level under a contract (if for instance a previously agreed activity is found to be causing problems, the EPC Contractor may have to be instructed to vary the activity and may be entitled to a variation instruction - such a matter would be dealt with by the Applicant).

2.7.5 All verbal and written complaints will be logged and, if they are comprehensible, reasonable and not repeated from the same or similar parties (only where the complaint relates to a lawful activity and for which realistically achievable action has already been taken and explained by the Applicant), will receive a response, either via phone or email or in person, depending on the nature of the complaint. The response will include an explanation of the steps taken to avoid a repeat occurrence, or if deemed appropriate, an explanation of why the complaint is not considered to be valid. The response will come from the appropriate person, which may be from the EPC Contractor or the respective member of the Applicant.

2.7.6 Details of any responses and remedial action to a complaint will be documented in the log, including information about the recipient, date and time of response(s), and type of response or action discussed.

2.7.7 The complaint log can be discussed during Community Liaison Group meetings, if considered appropriate, so that the local authorities are assured that any such complaints are being taken seriously and addressed.

2.7.8 The complaint log can be made available for inspection by the local authority at any time, should it be requested.

Community Liaison Group

2.7.1 The Applicant will pay particular attention to managing the relationship with local stakeholders that may be affected by the construction works.

2.7.2 A Community Liaison Group (CLG) will be set up as a forum for the Applicant to communicate key activities to be taking place on the site, keeping members of the group informed of the type and timing of works involved, as necessary.

2.7.3 The CLG will meet on a as necessary for the duration of the construction works.

2.7.4 The CLG will be a mechanism by which the occurrence of any construction-related issues arising to date can be reviewed and comments fed back to the EPC Contractor and Applicant to take into account for future construction activity.

2.8 Monitoring and Measurement

2.8.1 Regular site inspections will be carried out by the Site Manager or delegate which will assess the potential for environmental impacts to arise from construction works.

2.8.2 Particular notice will be taken during and following extreme weather events, when working in areas of known or potential contamination, and when particularly hazardous activities are being carried out. Method Statements will be required where the risk assessment has identified a significant risk to the environment (see **Section** Error! Reference source not found. above).

2.8.3 In the event of any environmental incident the Applicant will take the role of the responsible person and will take charge of the situation. Where required, with the Applicant's approval, the EPC Contractor will take immediate steps to eliminate the impact on the environment and mitigate any environmental damage. Where required, the responsible person will take immediate steps to eliminate the impact on the environment and mitigate/minimise any environmental damage through immediate preventative action (e.g. use of spill response kits) or by contacting the relevant regulatory body.

2.9 Roles and Responsibilities

2.9.1 Suggested specific roles and responsibilities for the implementation under this CEMP are described below: :

The Applicant's Project Director

2.9.2 The Applicant's Project Director would have overall responsibility for the environmental performance throughout the construction period and will ensure that appropriate resources are made available, and environmental control and any agreed or appropriate protection measures are implemented.

The Applicant's Day to Day Management

2.9.3 The day-to-day management responsibility for both on-site and off-site activities will be delegated to the Applicant's Construction Manager who will coordinate activities in their respective project area to ensure that all works on and off-site undertaken during construction comply with the CEMP.

2.9.4 The Applicant's Site Manager will be responsible for co-ordinating and managing all the environmental activities during the construction phase through proper supervision of the EPC Contractor. The role would involve carrying out the following duties:

- Develop and review the final CEMP and specialist procedures;

- Lead the appointment of construction environmental specialists;
- Review method statements for environmental aspects prior to works starting;
- Ensure delivery of environmental training to personnel within the project team;
- Monitor construction activities and performance to ensure compliance with the CEMP and that identified and appropriate control measures are being effective;
- Act as a main point of contact between the regulatory authorities and the Project on environmental issues;
- Monitor construction activities and performance to ensure control measures are effective;
- Maintain full records of the progress of any environmental works;
- Implement an auditable environment record system;
- Maintain regular contact and liaison with the Environmental Specialists and the Applicant's Project Director;
- Carry out audits as required by the CEMP; and
- Implement and monitor measures to ensure correct waste minimisation, segregation and disposal.

2.9.5 The Applicant's Site Manager may delegate some or all of the Applicant's health, safety, and environmental responsibilities in respect of achieving the Applicant's obligations in this CEMP to the Applicant's HSE Advisor. This does not affect any other roles or responsibilities that may fall to the Site Manager and Site HSE Advisor under their statutory or non-statutory duties in respect of safety, health and welfare.

Ecological Clerk of Works

2.9.6 An Ecological Clerk of Works will be appointed by the Applicant as required to undertake pre-construction ecological surveys, supervise any vegetation clearance and be available to advise the EPC Contractor and liaise with the relevant regulatory agencies, should protected species be found or disturbed during the construction process.

The EPC Contractor's Working Level Compliance

2.9.7 The EPC Contractor's Site Manager will be responsible for co-ordinating and managing all day-to-day staff activities at site during the construction phase through proper supervision of either direct employees or sub-contractors. The role would involve carrying out the following duties:

- Ensure the involvement of construction environmental specialists e.g. Ecological Clerk of Works;
- Ensure delivery of environmental training to personnel within the EPC Contractor's project team;
- Monitor construction activities and performance to ensure compliance with the CEMP and that identified and appropriate control measures are being effective;
- Ensure full records of the progress of the Environmental Works are maintained;
- Implement an auditable environment record system;

- Maintain regular contact and liaise with the environmental specialists;
- Carry out audits as required by the CEMP of their own activities and those of their sub-contractors;
- Ensure compliance with Duty of Care at all times;
- Implement and monitor measures to ensure correct waste minimisation, segregation and disposal;
- In the event of an environmental incident, will agree appropriate mitigation with the Applicant and implement mitigation and controls.

2.9.8 The EPC Contractor's Site Manager may delegate some or all of the EPC Contractor's safety, health and environmental responsibilities in respect of achieving the EPC Contractor's obligations in this CEMP to the EPC Contractor's Site HSE Advisor. This does not affect any other roles or responsibilities that may fall to the EPC Contractor's Site Manager and EPC Contractor Site HSE Advisor under their statutory or non-statutory duties in respect of safety, health and welfare.

EPC Contractor Site HSE Advisor (Communication and Co-ordination)

2.9.9 The following mechanisms enable effective two-way communication and feedback between the EPC Contractor's management, the respective EPC Contractor Site HSE Advisor(s) and their respective construction staff (in terms of supervision levels and labour). The processes described below would work within each EPC Contractor and coordination between Contractors would take place between HSE advisor(s) or at a Site Manager level. Measures may include, but shall not be limited to:

- **Site Induction** – site inductions will be provided to all personnel working at the site (including the Applicant's project team) and all visitors (appropriate to the nature of their work). Visitors may receive shorter induction, but will receive as a minimum, appropriate information on site rules, emergency preparedness and response procedures;
- **Training** – all personnel working on the site will receive appropriate training on the environmental management procedures and principles implemented on the project;
- **Toolbox Talks** – the majority of information will be communicated to construction staff via verbal instructions during the working day. Formal communication will take the form of group 'toolbox talks', utilising communication tools such as written material, presentations, videos, photos etc.;
- **Site Meetings** – meetings will be held periodically as required and notes maintained;
- **Notice Boards** – notice boards located around the site will be periodically used for communicating environmental control and other information; and
- **Feedback** – feedback systems will be established (such as feedback cards), which can be used to capture and report information on environmental incidents, hazards and near misses. This feedback will be reviewed by the respective EPC Contractor's Site HSE Advisor, who will in turn provide feedback to the EPC Contractor management and will also disseminate information to the other Site HSE Advisors on their relevant project area.

3 Specific Measures

3.1 Introduction

3.1.1 This section outlines some of the specific design and mitigation measures in order to limit impacts on noise and vibration, air quality, cultural heritage, hydrology, transport and access, climate change, ecology and ground conditions during construction of the Proposed Development. It will additionally outline the measures to prevent impacts arising from artificial lighting and also considers any waste management measures.

3.1.2 For all the measures listed below the EPC Contractor is responsible for implementation, but the effectiveness of the mitigation will be audited by the Applicant.

3.2 Ground Conditions

3.2.1 This section outlines the specific design and mitigation measures related to ground conditions for the Proposed Development. An assessment of the likely significant effects on hydrology from construction of the Proposed Development has been undertaken and this is set out in Chapter 6 of the EIA Report.

3.2.2 To avoid disturbance to areas of the Site outside of the Proposed Development footprint, standard measures relating to contractor management, materials storage, working methods and physical controls will be implemented. To ensure no pollution would be capable of reaching the water environment, standard measures and procedures to manage sources of potential pollution (e.g. fuel and other chemical spillages, concrete contamination, sediments, silts, grits and other pollutants) will be implemented through suitable site management practices using bunds and containment systems, and or suitable treatment or settlement facilities.

3.2.3 Where ground improvement or piling techniques are required, contamination aspects of the site as identified in the EIA Report associated technical appendices must be carefully considered such that pathways are not created for contaminants to travel from the upper strata downwards. Cognisance of the site conditions, following any necessary remediation, will be required and method statements produced and adhered to accordingly.

3.2.4 Ground and construction workers will be required to develop appropriate standard Risk Assessments and Method Statements (RAMS) and undertake works in accordance with these RAMS.

3.2.5 Where possible, the design and layout of the Proposed Development avoids known areas of deep peat. The following has been applied in the design of the proposed development and will be implemented during construction: (1) Prevent creation of waste peat, (2) Use peat on site or offsite in peatland restoration, (3) Recycle / Recover, and (4) Disposal. A draft Peat Management Plan (PMP) has been prepared and is included in Appendix B.6 of the EIA Report. This has been prepared to set out measures proposed to manage the peat habitat at the site, firstly to avoid the peat habitats during construction where possible, and secondly, where this is not possible, that peat is handled effectively with minimal loss of carbon to the atmosphere. The PMP is based on site specific information available at the time of writing. It is anticipated that the final PMP will be subject to discussion and approval by ABC in consultation with the Scottish Environment Protection Agency (SEPA), as part of a condition attached to the deemed planning permission granted along with Section 36 consent.

3.2.6 Excavated materials will be taken to temporary storage areas positioned at safe slope gradients and certified by a geotechnical engineer.

3.2.7 Earthworks and any excavation will be designed and undertaken in such a way as to avoid any excavation of slope toe support material. The excavation of any temporary slopes would be fully designed.

3.2.8 A Geotechnical Risk Register will be completed as part of the design phase and geotechnical supervision will be provided throughout construction.

3.3 Ecology and Ornithology

3.3.1 An Ecological Clerk of Works (ECoW) will oversee all stages of construction, to ensure that good practice measures with regards to ecology are implemented. This will include:

- Work areas will be carefully marked out and delimited on the ground, with the assistance of the ECoW, to ensure no extraneous habitat loss. Temporary fencing will be used to ensure that plant and operatives do not encroach further than is necessary into ecologically sensitive areas;
- Preparation of a Biosecurity Management Plan;
- Trenches and excavations will be covered at the end of each working day, or will include ramps, and stored pipes will be capped, to prevent entrapment of animals;
- If construction work is carried out during the hours of darkness, machinery and floodlights will be directed away from watercourses and woodland edges. Use of heavy machinery and pile drivers will be limited to avoid two hours before and after dawn and dusk within 30 m of watercourses, waterbodies or woodland edges; and
- A site speed limit of 15 mph for all construction traffic will be in place to protect otter, badger, red squirrel and pine marten.
- The working areas along the Access Track and the A85 widening will be tightly contained to avoid unnecessary encroachment into ecologically sensitive areas, including the fencing-off and clear signage of no-go zones for construction personnel, plant and vehicles.
- The site induction for construction personnel will include a Toolbox Talk provided by the ECoW regarding protected species, and the identification of shelters of this species

3.4 Hydrology

3.4.1 This section outlines the specific design and mitigation measures related to hydrology for the Proposed Development. An assessment of the likely significant effects on hydrology from construction of the Proposed Development has been undertaken and this is set out in Chapter 7 of the EIA Report.

3.4.2 Best practice measures for the management of construction-phase surface runoff and prevention of contamination will comply with relevant legislation and guidance, and best practice measures in line with the Considerate Contractors Scheme and the Site handbook for the construction of SuDS (CIRIA C698), and Control of water pollution from construction sites (CIRIA C532).

3.4.3 An Erosion Prevention and Sediment Control Plan and Construction Phase Surface Water Management Plan will be produced to reduce impacts on water quality and prevent hydro-morphological changes to surface water features during construction.

3.4.4 The following mitigation measures will be implemented during the construction phase to manage flood risk, increase surface water runoff and the disturbance of groundwater flow paths:

- Best practice construction measures would be adopted in line with the Considerate Contractors Scheme and 'Site handbook for the construction of SuDS' (CIRIA C698) and the Control of water pollution from construction sites (CIRIA C532) to minimise the risk of flooding during construction.

3.4.5 The following mitigation measures will be implemented during the construction phase, to manage the risk of alterations to groundwater flow and quality, on-site during construction:

- If perched groundwater is encountered within the made ground or superficial deposits at the Site, during the establishment of the foundations, or during excavation activities, dewatering may be required. The most appropriate method of dewatering would be chosen at this stage, which may include the enclosure of the excavation by sheet piling. Piezometers could be used outside of the sheet-pile to monitor any perched groundwater levels;
- If ground contamination is encountered during construction works, work would stop immediately and measures would be taken to prevent disturbance and mobilisation of contaminants, until the contamination has been treated in-situ or removed for off-site treatment;
- Water arising from excavations would require appropriate disposal; and
- Damp proof membranes will be incorporated during construction, to prevent the ingress of shallow groundwater.

3.4.6 The following mitigation measures should be implemented during the construction phase, to manage the risk of leaks and spillages of contaminants entering surface water or groundwater bodies on-site during construction:

- Preparation of incident response plans, prior to construction, which should be present onsite throughout construction to inform contractors of required actions in the event of a pollution incident;
- Spillages and leaks would be immediately contained in line with the incident response plan;
- On-site availability of oil spill clean-up equipment including absorbent material and inflatable booms for use in the event of an oil spill or leak;
- Wherever possible, plant and machinery would be kept away from the drainage system;
- Use of drip trays under mobile plant;
- Construction materials brought to the Site should be free of any contaminated material, so as to avoid any possible contamination of watercourses; and
- Care should be taken to ensure that wet concrete does not come into contact with surface water. Concrete should be poured in dry conditions, where possible, and consideration should be given to the use of fast drying cement.

3.4.7 The following mitigation measures should be implemented during the construction phase, to manage the risk of physical contamination of surface and groundwater bodies, on-site during construction:

- Working areas shall be clearly defined to ensure the disturbance of soils is minimised, where possible;
- The cleaning of vehicle wheels prior to leaving Site;
- Controlled and covered waste storage areas;

- Dust Management Plan (i.e. damping down);
- Installation of systems such as silt traps designed to trap silty water including adequate maintenance and monitoring of these to ensure effectiveness, particularly after adverse weather conditions;

3.5 Transport and Access

3.5.1 This section outlines the specific design and mitigation measures related to transport and access for the Proposed Development. An assessment of the likely significant effects on transport and access from construction of the Proposed Development has been undertaken and this is set out in Chapter 9 of the EIA Report and a separate Transport Assessment (TA) has been prepared.

3.5.2 Prior to the commencement of construction a Construction Traffic Management Plan (CTMP) will be prepared and subsequently implemented. This will include control measures, including robustly enforced traffic management measures, to control construction traffic movements in order to protect the environment, amenity, safety of local residents, businesses, and the general public.

3.5.3 The relevant mitigation measures related to transport and access are as follows:

- The construction process for the Proposed Development has considered: the minimisation of the use of materials; the reuse of materials within the design of the development to reduce importing and exporting where viable; and minimising workforce travel. The works programme will be reviewed to seek to reduce effects on sensitive receptors where reasonably practicable and to consider where seasonal working might reduce the magnitude of effects; and
- The construction sequence and traffic management related to the construction of the main access tunnel portal will be managed to minimise impacts on road users and minimise disruption to vehicles on the A85. A temporary signalised pedestrian crossing on the A85 will be provided near the location of the Falls of Cruachan railway station during the construction of the main access tunnel portal. Further details of the traffic management measures and the pedestrian crossing have been included within the TA.

3.6 Noise and Vibration

3.6.1 This section outlines the specific mitigation measures related to noise and vibration for the Proposed Development. An assessment of the likely significant noise and vibration effects resulting from construction of the Proposed Development has been undertaken and this is set out in Chapter 10 of the EIA Report.

3.6.2 This section outlines the potential sources of noise and vibration created by construction works and the methods of mitigation proposed to reduce such impact.

3.6.3 All construction activities will be undertaken in accordance with the recommendations of *BS 5228 'Noise and Vibration Control on Construction and Open Sites' - Part 1 Noise and Part 2 Vibration*.

3.6.4 These standards provide details the legislative background to noise control, along with the recommended procedures for effective liaison between developers, site operators and local authorities. Methods of how to minimise the impact of site noise on workers and local residents are also provided. Mitigation measures to limit impact of nuisance noise on human receptors with the help of regular monitoring during the construction period will ensure that noise levels do not exceed the noise thresholds set out in the ES unless otherwise approved under Section 61 of the Control of Pollution Act.

3.6.5 The construction process will take place over an estimated 65-month programme to achieve commercial operation of the first unit. Surface work is expected to take place Monday – Saturday 7am

-7pm and Sundays 7am – 12pm with underground works expected to take place 24 hours a day. Some construction activities may need to be undertaken outside these hours, for which agreement would be sought from ABC.

3.6.6 The construction works should adopt the following mitigation measures and management practices:

- Locating noisy plant and machinery as far away as possible from residential dwellings or sensitive environmental receptors, as identified through pre-construction noise baseline surveys;
- Selecting quiet or low noise equipment e.g., use of silent generators;
- Using acoustic screens and enclosures where practical;
- Turning off plant and equipment, when not in use;
- Ensuring site working hour restrictions are effectively communicated to all site staff and subcontractors to ensure strict conformance to working hour restrictions;
- Conducting regular means of communication and liaison with potentially affected parties to minimise the potential for noise and vibration nuisance related complaints;
- Agreeing construction works outside of daytime hours with ABC;
- Restriction of number of plant items in use at any one time;
- Frequent maintenance of plant and equipment;
- Where practical, carry out loading and unloading activities at a suitable distance away from residential dwellings;
- Closing of compressor, generator and engine compartment doors when in use or idling;
- Careful lowering of materials/equipment and the minimisation of drop heights; and
- Undertaking piling work with a method that minimises the transmission of noise (and vibration) to residential dwellings.

3.6.7 The construction of tunnels and power cavern as part of the Proposed Development would be undertaken using a 'drill and blast' method. BS 5228-2 outlines a number of practical measures can be implemented that are likely to reduce the significance of effects at nearby receptors, which include:

- Maintaining good relations with the public and advising occupiers of sensitive properties of any imminent blasting.

- Publicising blasting times and avoid blasting outside of these.
- Good blast design to reduce vibration and air overpressure from blasting, which may include practical measures such as:
  - Ensuring appropriate burden to avoid over or under confinement of the charge;
  - Accurate setting out and drilling;
  - Appropriate charging;
  - Appropriate stemming with appropriate material such as sized gravel or stone chippings;

- Using delay detonation to ensure smaller maximum instantaneous charges (MICs);
- Using decked charges and in-hole delays;
- Blast monitoring to enable adjustment of subsequent charges;
- Designing each blast to maximize its efficiency and reduce the transmission of vibration; and
- Avoiding the use of exposed detonating cord on the surface in order to minimize air overpressure.

3.6.8 The requirement for construction noise and vibration monitoring will be agreed with ABC through the determination process and conditions attached to the Section 36.

3.7 Cultural Heritage

3.7.1 This section outlines the specific mitigation measures related to cultural heritage for the Proposed Development. An assessment of the likely significant effects on the historic environment resulting from construction of the Project has been undertaken and this is set out in Chapter 12 of the EIA Report.

3.7.2 Within the Site there are three designated heritage assets: the existing Cruachan turbine hall and the Falls of Cruachan Railway Viaduct which Category A Listed Buildings and the existing Cruchan Dam which is individually Category B, but forms part of a Category A-group with the turbine hall. These assets are of high sensitivity.

3.7.3 The design of the upper intake and landscaping has been informed by the need to preserve the setting of the Category B-listed Cruachan Dam. Detailed design of the interface between the proposed access tunnel and the Turbine Hall will ensure that the design of the tunnel entrance is in keeping with the existing fabric.

3.7.4 The final CEMP will provide detailed specification for protective measures to be installed to prevent accidental damage to the Faulkner mural and the tiled floor of the Turbine Hall.

3.7.5 There is low potential for currently unrecorded heritage assets to be adversely affected by works in the eastern part of the site. To address this potential a programme of archaeological works will be undertaken. This will allow for the physical loss of any assets present to be offset by appropriate recording.

3.7.6 The first phase of the programme will comprise trial trenching of the lower construction compound site and the line of the access track serving it. This will determine the need for and form any further work. The programme of work will be undertaken in accordance with a Written Scheme of Investigation (WSI) agreed with the West of Scotland Archaeological Service (WoSAS).

3.7.7 Additionally, this CEMP details mitigation measures for minimising as far as reasonably practical the environmental effects of construction, including the generation of waste, noise and dust.

3.8 Waste Management

3.8.1 This section outlines the specific design and mitigation measures related to waste management for the Proposed Development. An assessment of the likely significant effects on waste management from construction of the Proposed Development has been undertaken and this is set out in Chapter 14 of the EIA Report.

3.8.2 A set of standard measures to be employed for the management of waste are listed below:

- The consumption of materials and production of waste shall be minimised through good design procedures and procurement practice;
- Opportunities for reusing, recycling or recovery of waste will be considered as an alternative to disposal to landfill which should be a last resort;
- Material will be stored for short periods on site within the dedicated canopy structure on the quayside which will prevent wind blown silt and runoff from entering waterbodies. It is estimated that approximately 15,000 tonnes would be stored at any one time;
- All waste will be managed by a nominated Technically Competent Manager i.e. the manager will be technically competent to manage the permitted activity, as defined by the Chartered Institution of Wastes Management/Waste Management Industry Training and Advisory Board's (CIWM/WAMITAB) Operator Competence Scheme (CIWM, 2022);
- All waste management contractors carrying waste shall be authorised to do so (i.e under prevailing Duty of Care) and all sites that receive the waste shall be authorised to do so (i.e. under prevailing WML requirements);
- A sample of waste management routes will be subject to an annual audit to confirm that waste is being managed correctly;
- Management of all waste will be accompanied by the relevant statutory transfer documentation that adequately describes the waste, the documentation will be retained and be readily accessible;
- Quantities of waste generated will be recorded and monitored, records will be kept for a minimum of three years;
- All employees and contractors involved with the handling and managing of waste will have the relevant training and be assessed as competent and training records retained;
- All employees and contractors will have a Duty of Care when controlling the carriage and disposal of waste to ensure it is handled in a responsible manner;
- SWMPs and Materials Management Plans (MMP) will be produced where appropriate.

Duty of Care

3.8.3 All wastes produced by the Applicant and its contractors are governed by waste management legislation. The producer of the waste is the holder of the waste generated by an activity. Duty of Care is a legal process designed to control the carriage and disposal of waste to ensure it is handled in a responsible manner from "cradle to grave". In line with the Duty of Care requirements, waste produced will be:

- Transferred only to an Authorised Person accompanied by a Waste Transfer Note or Hazardous Waste/Special Waste Consignment Note; and

- Not able to escape from anyone's control on site or in transit.

3.8.4 An Authorised Person is a Registered Waste Carrier, broker and/or the manager of a legitimate waste management facility, e.g. a waste disposal site.

3.8.5 If a third party employed by the Applicant or one of its contractors, arranges waste transfer/reuse/disposal, and is not the waste producer, the Registered Waste Carrier or the manager of a receiving site, then that third party shall be a Registered Waste Broker.

3.8.6 Waste shall not be allowed to leave site unless Duty of Care checks are successfully completed.

3.8.7 Where a contractor is employed to undertake work that produces waste, it is the contractor's responsibility as producer of the waste to carry out the Duty of Care checks outlined above (including Registered Waste Carriers, Registered Waste Brokers, and Waste Management Licences for waste disposal sites or proof of exemptions from licensing).

3.8.8 However, the Applicant retain a Duty to ensure that waste is managed in a responsible manner; the member of staff employing the contractor shall ensure the contractor has a system of works to ensure that adequate Duty of Care checks are being undertaken and shall carry out periodic checks to ensure the contractor is using only Authorised Persons.

3.8.9 The contractor shall provide evidence of Duty of Care checks that have been undertaken on request.

Waste Classification

3.8.10 All waste will be classified in accordance with prevailing legislation and principles and procedures defined in core waste classification technical guidance 'WM3', published by DEFRA (2021).

Site Waste Management Plan

3.8.11 Although not legally required, a Site Waste Management Plan (SWMP) can help reduce the amount of waste and its management in the most sustainable manner. It is assumed that appropriate SWMPs shall be produced by each of the Principal Contractors appointed for specific phases of the Proposed Development. The following information will be provided in the SWMPs:

- A description of the proposed works;
    - Measures to increase reuse of any aggregates generated and maximise use of secondary or recycled aggregates;
    - Demonstration of how the consumption of raw materials and generation of waste shall be minimised;
    - Where waste is generated, show measures taken to reduce, re-use and recycle waste within the development or off-site, including the provision of on-site separation and treatment facilities to minimise disposal via landfill; and
    - Demonstrate how waste laydown/stockpile areas have been designed to allow effective sorting and storing of recyclables, recycling and composting of waste and facilitate waste collection.

3.8.12 The SWMPs would be reviewed regularly (as a minimum every six months) and updated as necessary following these reviews to give a current position on how the work is progressing against the waste estimates contained in the plan.

Communications and Training

3.8.13 In order to ensure the relevant principles, standards and requirements relating to waste management are delivered, the Principal Contractor(s) would develop and implement comprehensive communications and training programmes for all relevant staff, to include the following:

- Understanding the different sources, types and nature of wastes and materials likely to be generated during the Proposed Development;
- The legal responsibilities for waste and its impact on the Proposed Development;
- The requirements of the SWMP and CEMP;
- How to conduct basic waste audits to identify, estimate and report quantities of waste;
- How to produce a SWMP;
- The roles and responsibilities of waste regulators and licensed carriers; and
- The roles and responsibilities of site personnel in the management of waste.

3.9 Climate Change

3.9.1 This section outlines the specific design and mitigation measures related to climate change for the Proposed Development. An assessment of the likely significant effects on climate change from construction of the Proposed Development has been undertaken and this is set out in Chapter 15 of the EIA Report.

3.9.2 Mitigation measures to reduce Scope 1 emissions are as follows:

- Optimising construction vehicle use and movement, particularly for large scale excavation and filling;
- Driver training in efficient vehicle operation; and
- Optimising transport efficiency for materials delivery, waste disposal and construction workers travel.

3.9.3 A CTMP will be prepares as detailed in Section 3.8 which will assist in the reduction of greenhouse gas (GHG) emissions associated with transport, for example by consolidating delivery trips. In addition, a Worker Travel Plan will be prepared to manage the construction workforce transportation, which will include measures such as using minibuses for transport and reducing single car use.

3.9.4 Measures will be taken to reduce Scope 2 emissions through the minimisation of energy used in temporary site buildings.

3.10 Air Quality

3.10.1 This section outlines the specific mitigation measures related to air quality for the Proposed Development. This section outlines the potential sources of air pollution created by construction activity and the methods of mitigation proposed to limit these impacts which should be adopted by the EPC Contractor.

3.10.2 Construction activities associated with the greatest potential for dust generation are:

- Earthworks including topsoil excavation, handling on site and deposition;
- Handling and storage of materials (including loading and unloading);
- Wind blow across disturbed/exposed site surfaces and materials; and

- Mechanical operations such as crushing, drilling, concrete mixing and cutting.

3.10.3 In order to ensure the employment of best practical means to minimise the risk of adverse effects from construction dust and causing nuisance or damage, specific control measures are proposed as follows.

Site Planning

- Prior to commencing works, the site manager must have regard to weather conditions and the dust generating potential of material to be excavated.
- Plan site layout to maximise distance from plant/stockpiles etc. to sensitive receptors; and
- Removal of dusty materials from site as soon as possible.

Construction Traffic

- Loads entering and leaving the site with dust generating potential should be covered and wheel washing facilities made available to avoid mud being tracked onto local roads;
- The performance of the wheel washing system will be maintained by the regular removal of settled sediment from within the sump;
- Plant and wheel washing to be carried out in a designated area;
- No idling of vehicles;
- Vehicles to comply with site speed limits;
- Water assisted sweeping of local roads to be undertaken if material is tracked out of site;
- Install hard surfacing (e.g. access roads) as soon as practicable on site and ensure they are in good condition; and
- Site roads should be cleaned regularly, and damped down if necessary to prevent nuisance dust.

Site Activities

- Exposed soils should be re-vegetated as soon as practicable;
- Minimise dust generating activities during prolonged dry, dusty weather unless damping/other suppressants are used;
- Ensure an adequate water supply and use water as dust suppressant where applicable;
- Ensure any site machinery is well maintained and in full working order;
- Ensure equipment available for cleaning spills etc is available at all times; and;
- Fine material should be delivered to site in bags.

3.10.4 Good site management practices (e.g. adherence to guidance such as ‘control of dust and emissions from construction and demolition, best practice guidance’ CIRIA 2006) during the construction works will help to prevent the generation of airborne dust. It will be the responsibility of the EPC Contractor and respective site manager to ensure that sufficient precautionary measures to limit dust generation are undertaken.

3.11 Lighting

3.11.1 This section outlines the specific design and mitigation measures related to artificial lighting for the Proposed Development.

3.11.2 The project sites will require artificial lighting during construction to provide a safe working site during hours of darkness. Measures to ensure obtrusive light (light pollution) is minimised as far as practicable will be adopted by the EPC Contractor working at the Site.

3.11.3 The EPC Contractor should follow guidance and legislation relevant to lighting, including:

- Institution of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light, (2021);
- The Department for Communities and Local Government (DCLG) Guidance on Lighting in the Countryside: Towards Good Practice (1997);
- Assessment of the Problem of Light Pollution from Security and Decorative Light produced by Temple and NEP Lighting Consultancy on behalf of the Department for Environment, Food and Rural Affairs (DEFRA);
- The Bat Conservation Trust – Bats and Lighting in the UK (May 2009);
- The Bat Conservation Trust (BCT) – Statement on the Impact and Design of Artificial Light on Bats; and
- Environmental Protection Act 1990 (as amended).

3.11.4 The working areas and compounds at the site will be lit, as required, for safety and security. The general design objectives that will be used to ensure that potential adverse effects of lighting associated with construction of the Project are minimised are listed below:

- Use appropriately designed luminaires for the task at hand;
- Use louvres and shields to prevent undesirable light break-out;
- Construction lighting should be directed away from all sensitive receptors;
- Preference should be given to several, lower lighting units rather than tall, wide beam lighting units to illuminate large areas as it will limit light trespass, glare and sky glow from the project sites;
- Vehicle lights should be properly directed (conforming to MOT requirements) and lenses must be intact to prevent un-necessary glare and light intrusion;
- Lighting should be reduced or switched off when not required for safety purposes. Security lighting should be kept at the minimum level needed for visual and security protection; and
- Motion sensitive lighting will be considered in order to avoid unnecessary lighting.

3.11.5 Light fittings will comply with the specifications and the requirements of CIE 150 (2003) and Institute of Lighting Professionals Guidance Note for the Reduction of Obtrusive Light (2021).