Campbell of Doune Ltd
Consulting Civil and Structural Engineers

Construction Method Statement

Ardchullarie Burn HEP Scheme

Rev E

May 2014

Contents

Ardchullarie Burn HEP Scheme
Construction Method Statement

1 INTRODUCTION

This Construction Method Statement covers all civil works including construction of an intake structure, Powerhouse, Pipeline, installation of Screen, Turbine and Tracks.

The proposed scheme will consist of an intake weir on the Ardchullarie Burn. The overall length of pipeline will be constructed from the intake weir to a powerhouse that is located further downstream in farmland close to the access road.

The Scheme is a run-of-river type and the layout is illustrated in the planning drawings which includes the major project components. The electricity generated will be exported to the nearby national grid.

The Scheme generally comprises the following, but not necessarily sequential, stages:

- Construct site compounds and lay-down areas and other initial preparatory works;
- Bring equipment onto site;
- Initial construction works – construct additional access tracks;
- Main construction works – construction of intake weir, header chamber, pipeline, turbine house and tailrace; and
- Reinstatement

The construction process will normally run over a period of up to 24months though much of the main construction operations would be achieved in a shorter period of approximately 9 months.

1.1 Programme

The construction of the scheme is programmed to start in July 2014 with expected completion in April 2015.

The principle contractor is to be appointed by late June 2014.

In stream working is restricted to the months from June to September (inclusive).

2 ROLES AND RESPONSIBILITIES

All parties will operate within the environmental constraints identified in the Environmental Statement (ES), the Planning Conditions, CAR Licence Regulations and such other instructions as may be issued by any statutory body and approved by the Project Manager.

The following outlines the roles and responsibilities of all persons involved in the project.

2.1 *Project Manager*

Responsibilities include liaison with client and designers during the design stage to ensure that all planning conditions are met. During construction, site visits will be scheduled according to specific project duties.

The Project Manager will have overall responsibility for ensuring that the action of each party accords with their responsibilities and for implementing such corrective measures as may be needed.

The Project Manager will ensure that any pollution incident is promptly reported to SEPA and other parties as agreed.

2.2 *CDM Co-ordinator*

The CDM Coordinator is appointed under Construction (Design and Management) Regulations 2007. He is responsible for preparation of pre-construction Information and the Health and Safety File. He gives advice on suitability of the contractors construction phase Plan. He delivers the Health and Safety File to client. The CDM Coordinator is not responsible for any aspect of design.

2.3 *Environmental Clerk of Works (ECoW)*

The ECoW ensures adherence to all environmental-related recommendations in Planning Conditions, SEPA's CAR Licence and in statutory legislation, also policies specified in the ES which may not be embodied in those regulations. This will include monitoring disturbances to soils, vegetation and wildlife.

The ECoW is employed directly by the client but is able to report any concerns on any matter directly to the relevant statutory authority. The ECoW must report monthly to the planning authority's monitoring officer for the first 6 months and every 2 months for the remaining construction period. The report will include:

- Weather conditions;
- Details of any toolbox talks given to the contractors including number of attendees;
- An update on the condition of silt protection measures;
- An update on the condition of tree protection measures;
- Turbidity checks of the watercourse;
- Any results from wildlife monitoring;
- Any results from onsite construction vehicle checks;
- Any environmental issues that have been included in the site diary for that week;
- Details of any pollution incidents.

The ECoW will also ensure that an assessment has taken place checking for Red squirrels, if any are found then appropriate measures will be taken to ensure the correct procedures are in place with local planning authority.

A tree protection plan shall also be drawn up between the ECoW and the contractor to ensure that all trees and tree roots within the site and adjacent to the site are protected from damage.

A bat survey may also have to be undertaken by the ECoW and if Bats are found to be present then an appropriate plan to ensure the full safety of these animals is in place and is satisfactory to the local planning authority

A bird survey shall take place prior to commencement by means of a walkover to survey for nesting birds

Otters shall also be surveyed for to ensure no otters are in the vicinity, if they are found to be present then a safeguard to ensure the safety of these animals shall have to be put in place and is satisfactory to the local planning authority
The ECoW will ensure any ecological exclusion zones are set out prior to works commencing in that area and ensure they are maintained throughout the duration of the works. The ECoW will ensure the contractor is complying with any conditions laid out in the licence.

The ECoW will be available to respond to calls from the Project Manager whether for routine or emergency duties. The ECoW will regularly inspect the contractor's daily records of environmental incidents and advise on the acceptability of the actions taken.

The timing of site visits will correlate with specific construction- related activities including:

- Pre-construction surveys to take place within 3 weeks of the initiation of ground-breaking works. Should any sensitivities be identified then the ECoW will also be responsible for monitoring these locations until it is appropriate to
- Commence construction activities in the area of the sensitivity.
- Provision, operation and reinstatement of sediment collecting lagoons and all other measures taken to mitigate the release of potentially polluting material to watercourses (Section 6).

2.4 Archaeologist

If archaeology is found to be present the archaeologist (TBC) shall have an approved plan in place with the contractor before work commences, with a programme of works fully implicated that all recordings and recovery of archaeological resources within the site are undertaken to the satisfaction of the local planning authority. Any features found shall be protected before any works commence

2.5 Principle Contractor

The primary duty of the Principle Contractor is to ensure that all contract conditions are adhered to such as;

- The works are carried out according to the specifications and drawings supplied.

- Instructions issued by the Project Manager and the ECoW will be actioned,
- All statutory duties such as for Health & Safety on site are followed
- Maintaining site records and diaries
- Reports on site visits by the design team and the project manager and the ECoW
- The display of Notices as per statutory regulations
- The implementation of the required signage as outlined in the Access plan for the site.
- Ensuring safe access for the public where it normally takes access to the hills over and through what will become the site.
- A safe access for walkers along the top section of forestry road will be put in place prior to work commencing, this been by way of signage , barriers and exclusion zones

The principle contractor will carry out all forms of silt mitigation works.

A condition of the construction contract will be that this contractor shall comply with the approved Construction Method Statement.

The principle contractor will ensure that any pollution incident is promptly reported to SEPA without delay.

2.6 Civil and Structural Engineer

The civil and structural engineer will be responsible for all design work associated with Ardchullarie Burn hydro scheme. The Engineer will make regular inspections of the work being undertaken by the contract(s) and reports will be made to the Project Manager.

3 CONSTRUCTION PROCEDURES (ref SEPA WAT-SG-29)

3.1 General Procedures

The measures proposed for managing and constructing the main element of the project are set out in this section. These works will be carried out within the following framework:

- The Contractor`s Site Manager will inspect all working areas regularly through each working day to ensure that work is being carried out to plan, and that risks to the health and safety of the workforce, the general public and any other who may be affected are minimised. Additionally the contractor will ensure the signage and way marking as detailed in the Access plan is visible including placement of the signs diverting walkers on the descent (the "Dynamic signage").
- The LLTNP Access Officer must approve all site signage to all safe access by the public prior to it being installed for the first time. The effectiveness of the signage guiding the general public and any requirement to vary it must be carried out on a daily basis at the start of each day and as the need arises during the day.

Consideration of safe site signage must be recorded in the site agent's diary. This diary must be available for the Access Officer to read at all times.

- The Site Manager will review the Health and Safety Plan to ensure it remains fully relevant and that all arrangements are being followed.
- The Contractor's Site Manager and the Site Manager will meet at least weekly to review all active and planned working procedures.
- The Contractor's Site Manager will consult regularly with site staff regarding implementation of the Contractor's Health and Safety Plan and report thereupon to the Client's CDM Coordinator who will carry out regular independent site visits.
- Sub-contractors will only be appointed for specialist task, for example joinery and steel fixing. They will be managed by the Contractor and will work to the same site rules as apply to the Contractor's workforce.
- Clear warning signs and secure protection will be rigorously applied, this including areas which may be accessed by members of the general public, e.g., by walkers (see access management plan in ES, Section 11.1, pg 50). Site Manager will check signage and fencing regularly throughout each working day, all signage and welfare equipment to comply with CDM 2007 regulations.
- All construction plan and equipment will be regularly inspected and maintained to statutory and manufacturers' specifications and a copy kept in the site office for inspection at any time. Any plant and machinery that will be operated within 10m of a watercourse will be checked for fuel and lubricant leaks prior to operating each day, and regularly throughout a working day. Any leaks shall be immediately fixed. Only competent and trained persons shall operate plant.
- The Contractor shall ensure that all other authorised and mutually compatible estate operations shall be permitted to proceed in a safe manner.
- The on-site storage of materials and equipment should be kept to a minimum. Any health and safety restrictions attached to such storage must be established and recorded. The public and natural environment must be protected from any risk associated with such storage. All hazardous materials must be identified and evaluated by means of a COSHH assessment prior to being permitted on site and records kept in office. Risk assessments will be carried out for all high-risk activities and for dealing with materials covered by COSHH regulations and kept in the site office.
- Plant and machinery must only be refuelled on hardstanding / prefabricated "drip" trays or site nappies at recognised refuelling points that are located more than 10m from any watercourse. An appropriate spill kit will be stored here.
- No mobile concrete mixers shall cross a watercourse unless they are empty, clean and oil free. Concrete mixers will be washed out on site in a designated washout pit located at least 10m from any watercourse.
- All waste generated during site operations will be removed to an agreed temporary location and stored securely in appropriate containers.
- In the event of adverse weather, i.e. period of heavy rainfall, the Site Manager and ECoW will determine which if any active operations shall be permitted to continue.
- No river-related construction activities at the intakes, burn crossings and outfall will attempted if high flows are present or imminent.
- Materials and equipment transported on site must be securely restrained to minimise the risk of shedding the load.

Construction works which are audible outwith the site boundary shall be undertaken during normal working hours:

a) 08:00 to 18:00 hours Monday to Friday
b) 09:00 to 13:00 hours on Saturdays
c) No noisy works audible outwith the site boundary are permitted on Sundays or Bank Holidays.

3.2 Access Track Construction

There is a new temporary track to be constructed and narrowed down to quad access on completion which leads off the Ardchullarie burn access track to the intake structure. This track will be built by the following methods:

- Strip off topsoil and spoil.
- Store excavated spoil in a manner that encourages reinstatement following construction
- Install drainage and silt mitigation prior to use by construction plant.
- The site silt pit map shows the location of silt pits on this access track.

3.3 Intake Construction

No construction plant will operate within the river at any time other than from behind a cofferdam (which will divert the river flow around the working area).

The construction plan required for the intake and river weir comprises:

- Dump truck
- One Water Pump with screened intakes
- All Terrain Concrete Mixer
- Generator
- 14 Tonne Tracked Excavator
- 1 Rock Breaker
- Concrete Vibrator
- Power Tools, Miscellaneous

The Construction process will comprise levelling off a temporary compound area and form suitable accesses for construction of the weir. Temporary fences will be erected around compounds when no operatives are present in order to exclude any animals or unauthorised personnel.

Preparatory works are required in order to ensure the existing weir is suitable for the installation of the required Coanda screen intake mechanism. These are:

- Construct a piped diversion in the left bank of the burn using a pipe of sufficient capacity to carry the 1.5 x Q5 flow to allow all the water to adequately flow around the intake construction area back to the natural watercourse. Construction will be in such a way that the banks will not allow erosion and subsequent pollution of the water course. The bed of the burn at the intake is bedrock. This

will require one watercourse crossing, over bedrock, by a 15 ton excavator. This will remain on the east side until that portion of work is complete. This will occur only in low flow conditions.

- Form a "cofferdam" consisting of one tonne bags immediately upstream of working area, consisting of the following
    - Heavy duty Polyethylene to form impermeable layer
    - 1 ton Sand bags filled with course sand
    - Small sandbags to fill in voids between larger sandbags
- Excavate area. Take care to ensure no mud or fine silt can wash back in to watercourse during excavation work; install straw bales
- ,Drill approx 500mm into bedrock if found and fix the 25mm diameter steel bars in place to secure the foundations
- Shutter and pour mass concrete for foundations on the downstream side of the existing weir
- Drill approx 500mm into the foundations and fix the 25mm diameter steel bars in place to secure the concrete trough
- Pour up to 75mm of blinding concrete, then fix rebar, shutter and pour concrete to base of weir.
- Fix rebar shutter and pour concrete to weir walls and fish pool walls
- Remove shutters then install Coanda screens and covers
- Place boulders on the outer river bed against the banks upstream of the intake structure. No boulders may be placed within the fish apron.
- Reinstate area remove cofferdam once the concrete has cured for a sufficient period, and allow water over the weir. Repeat process for 2nd half of works.
- One watercourse crossing by a 15 ton excavator will be required over bedrock to allow completion of the left bank weir wing wall. This excavator will remain of the left/east bank until the weir is completed.

3.4 Header Tank

The construction plant required for header tanks, which is integral with the weir, comprises:

- Dump truck
- One Water Pump with Screened intakes
- All Terrain Concrete Mixer
- Generator
- 14 Tonne Tracked Excavator
- 1 Rock Breaker
- Concrete Vibrator
- Power Tools, Miscellaneous

The construction procedures will roughly follow the procedures below:

- Excavate area large enough for the tank, placing the turf removed separate from the sub-soil

- Drill approx 500mm into bedrock and fix the 25mm diameter steel bars in place to secure the foundations
- Shutter and pour mass concrete for foundations
- Supply / fix steel reinforcement for bases and pour concrete
- Fix rebar to pit walls, shutter and pour concrete.
- Install valves etc then shutter and fix rebar to the intake roof.
- Install sensory unit and lay cable along to intake structure
- Replace sub-soil

3.5 Pipeline Construction

The Plant required for pipeline construction per construction front comprises:

- 1 No 360 Tracked excavator, 18 tonnes with rotating screening bucket
- 1 No 360 tracked excavator 14 tonnes
- Tractor and Trailer
- 1 No All terrain concrete mixer
- 1 tracked dumper

The majority of the pipeline is in woodland which has being cut and shall be reinstated to a suitable standard. The rest of the pipeline is incorporated in a forestry track, which will be reinstated to the same or better standard the working procedures will generally be:

- Pipes will be offloaded at the pipe storage compound at the lay-down area
- Pipes will be taken up the hill either by tractor and trailer or by tracked dumper
- Pipeline excavation will occur where environmental conditions allow, however it is preferable to begin at the powerhouse and work up the hill.
- The trench will be excavated next to the access track by the first excavator which will lay HDPE pipe. The second excavator will screen the excavated material over the laid pipe to approximately 200mm over the crown of the pipe
- The telemetry cable will then be laid and marker tape laid 100mm above it. The pipe will have a minimum cover of 800mm inclusive of topsoil
- Each night all open pipes will be capped ended , tracks will be secured and a ramp made to allow any animal egress out of the trench
- Where rock is encountered this will be broken using a mechanical rock breaker. Screened material from the excavation of borrow pit (if required) will be used to bed and blind the pipe.
- All water courses shall be diverted before trenching underneath them and reinstated after the pipe is laid, natural stone being laid across the pipe top
- Concrete thrust blocks will be constructed wherever a bend is installed either horizontally or vertically. This will be done as soon as possible after laying to allow the thrust block to get a good anchor to the undisturbed soil. Size and design will be determined by the structural engineer.
- Final reinstatement will be carried out with pipe track reinstatement.
- Where the penstock is required to cross a small watercourse this will be done so by isolated open cut, and will follow the procedures displayed in section 5.6 (Culvert Replacement). It is anticipated that there will be no more than 4 crossings of this type.

- .Temporary soil stockpiles will be stored so as to minimise the potential for erosion.
- Any excavated top soil will be excavated and stored locally. Sub-solid and rock will then be excavated and stored separately from the topsoil and vegetation. Areas disturbed during construction of the scheme will be fully restored on completion of the works using the original rock and soil to recreate the former habitat as far as possible.
  During construction activities, surface water flows will be captured through a series of cut off drains to prevent water entering excavations or eroding exposed surfaces. If dewatering of excavations is required, pumped discharges will be passed through settlement / attenuation ponds and silt fences to capture sediments before release to the surrounding land.
- Appropriate sediment control measures (silt fences, settlement / attenuation ponds etc.) will be used in the vicinity of watercourses, springs or drains where natural features (e.g. hollows) do not provide adequate protection.
- Trenching or excavation activities in open land will be restricted during periods of intense rainfall, and temporary bunding will be provided as required to reduce the risk of sediment transport to the natural drainage system.
- When capturing surface water flows clean and dirty water should be segregated if practicable.
- Any discharge from the dewatering of excavations should be carried out at least 10m from a watercourse and the outlet pipe moved at regular intervals to ensure no ground saturation

3.6 Powerhouse Construction

The Contractor is responsible for the security of the fending and erecting of all relevant HSE signage and welfare equipment in the Site Compound, in compliance with CDM 2007 Regulations.

The Construction plant required for the buried powerhouse comprises:

- 18 tonne Tracked Excavator
- Mobile Concrete Mixer
- Rock breaker (if necessary)
- Generator and power tool
- Suitable temporary fencing
- Pressure wheel and track washing facilities if necessary

The construction process will be:

- Excavate soil and subsoil in powerhouse area, soil to be stored in accordance with good practice guidelines for re-use in landscaping.
- Excavate thrust block and also turbine sumps
- Lay 75mm of blinding concrete in sump base
- Fix reinforcing steel sump bases , shutter / pour concrete, remove shutters
- Fix steel for sump walls, shutter, concrete to underside of floor slab, remove shutters

- Backfill around sump, compact and lay blinding concrete over floor area
- Supply and fix steel reinforcement for slab, shutter same and pour concrete floor in one operation, remove shutters.
- Lay 100mm diameter drain round floor slab and back fill with 40mm drain fill, drain to run to outfall duct.
- Erect concrete walls and install overhead gantry beam
- Fix timber trusses, insulation and slate to roof
- Fit doors, Louvre, guttering and down pipes
- Install low voltage electrics; install turbine, Generator and control panel and wire up same.
- Concrete transformer plinth and block walls to transformer compound
- Landscape around powerhouse

3.7 Outfall Construction

No construction plant will operate from within the burn. The construction plant required for the outfall comprises:

- 15 Tonne Tracked Excavator
- Mobile Concrete Mixer
- Rock breaker (if necessary)
- Generator and power tools
- 1 no water pump with screened intakes

The construction process will be:

- Lift vegetation and top soil and store
- Form cofferdam in burn formed of bulk 1 Tonnes sand bags lined with polythene or rubber lining.
- The outfall is to be constructed in dry flows when no over-pumping is required.
- Prepare base of outfall area, shutter base, place reinforcing mesh and pour concrete
- Fix steel reinforcement for walls, shutter walls, pour concrete
- Remove cofferdam
- Fix screens over outfall slot with 20mm bar spacing

4 ENVIRONMENTAL CONSTRAINS

Prior to construction commencing, the Project Manager, ECoW, Site Manager and Contractor's Site Manager will together record sensitive areas highlighted in either the ES, the statutory conditions and/or conditions "on the ground" which will take the form of an Environmental Management Plan which will be produced by the contractor a minimum of 3 weeks before any ground breaking duties on site, and pay attention to the site operational issues also listed below:

- The protection of all river-related works against inundation;

- The protections of any areas of flush and seepage and the location of specified plant species and associated mitigation measures.
- Should an active bird`s nest of any bird species be found during construction works must stop immediately in that area and the ECoW be consulted. A minimum exclusion zone will need to be erected until the breeding is complete. Construction activity shall not resume without the prior approval of the ECoW. The site-working exclusion periods collectively set out in the ES, Conditions of Planning and CAR licence will be adhered to at all times.
- River beds / Banks will be restored and protected on installation of structures and pipelines.
- In flush, seepage or other sensitive areas, provision will be made for watering excavated vegetation if so required by the ECoW.
- Excavated soils will be stored in accordance with good practice guidelines.

4.1 GWDTE

To protect the integrity of any Groundwater Dependant Terrestrial Ecosystems (GWDTE`s) that may be downstream (in terms of groundwater) of the proposed infrastructure locations the following mitigation will be implemented:

- The pressure pipe trenches will include impermeable barriers and / or clay plugs to avoid the trench acting as a water conduit where the penstock passes through wet flush areas of steeper slopes.
- The pressure penstock will be reinstated with the locally dug material.
- Temporary peat / soil stockpiles will be stored. Stored peat / soils will be placed so as to minimise the potential for erosion. Peat will be stored in smaller stockpiles distributed in flat areas away from watercourses and, should catotelmic peat be encountered, though little is expected to be encountered by design, then this peat will be prevented from movement by being restrained within fenced off areas where a green open mesh plastic fencing serves as a temporary restraint to movement /sieve, prior to the peat being replaced in the ground.
- Peat and soil must be stored separately from mineral soils and must not be stored on top of sensitive wetland vegetation or indeed other sensitive wetland habitats.
- Acrotelmic peat turves will be stacked wet side to wet side to prevent drying out as per the appended drawing.
- Peat and soil must be monitored during storage to prevent it drying out.
- If peat from habitats of different nutrient status is being excavated they must be kept separate.
- All excavated soils are to be clearly marked when stored to ensure that reinstatement is to the original area.
- SEPA require that Peat must not be stored more than 1.5m high or for more than 3 months. Peat is not likely to require storage for more than three weeks.
- Any excavation in peat is to be monitored by the ECoW.
- Any excavated top soil will be excavated with its vegetation and stored locally. Sub-soils and rock will then be excavated and stored separately from the topsoil and vegetation. Areas disturbed during construction of the scheme will be fully restored on completion of the works using the original rock and soil to recreate the former habitat as far as possible.

- The extent of all excavations will be kept to a minimum and during construction activities, surface water flows will be captured through a series of cut off drains to prevent water entering excavations or eroding exposed surfaces. If dewatering of excavations is required, pumped discharges will be passed through settlement / attenuation ponds and silt fences to capture sediments before release to the surrounding land.
- The hydrological pathway for all the flushes across the penstock will be maintained through appropriate cross drainage.
- Appropriate sediment control measures (silt fences, settlement / attenuation ponds etc.) will be used in the vicinity of watercourses, springs or drains where natural features (e.g. hollows) do not provide adequate protection.
- Trenching or excavation activities in open land will be restricted during periods of intense rainfall, and temporary bunding will be provided as required to reduce the risk of sediment transport to the natural drainage system.
- Vegetation, ground and water disturbance would be kept to the minimum practicable over the whole site. Excavated vegetation with its root layer (i.e. 'turfs') within the working corridor would be retained for re-instatement. The avoidance of disturbance to habitats outside the construction area would protect and reduce impacts on the surrounding environment and would increase the speed of vegetation recovery within the disturbed corridor.
- Retain as much ground vegetation as possible and store suitably to allow plants (ground flora, tree seeds and seedlings) to survive. This material should be stored for the minimum time necessary before it is used for re-instatement.
- The construction period will be minimised as much as it practicable.
- All SEPA and COSHH guidelines would be followed to avoid pollution occurring. The construction method statement will include pollution prevention measures, including procedures in the event of a spill.
- A site plan showing the location of all numbered silt traps/silt trap systems shall be provide by the contractor as they are being installed. Diagrams of the proposed intake and outfall work areas are appended.
- No work shall be carried out on site until the ECoW is satisfied with the silt mitigation measures which have physically been put in place by the contractor.

4.2 Red Squirrels

The ECoW carried out a walk over survey to identify any dreys or signs of foraging on 02/04/14. No evidence of squirrel (in the form of feeding remains or dreys) was found during the survey. However, red squirrels are present in the wider area and are likely to use the site. In addition, the high number of trees on site and in the surrounding habitat provide good habitat for foraging and drey building. The mature nature of many of the trees on site will provide a good source of seeds. Furthermore, the site is well linked with other woodland patches in the surrounding area, so movement between sites is highly likely. Before any tree felling begins, the ECoW will carry out a prestart walkover survey and assess the trees that need to be removed for signs of red squirrel or dreys. If any dreys are encountered during the prestart walkover survey, advice will be sought from LLTNP Planning Authority on best practice mitigation for the protection of the drey and any necessary licences obtained.

4.3 Tree Protection Plan

Before any ground preparation work can begin, all trees that are on the edge of the development corridor will be surveyed again to identify any trees that require protection. Inside the tree root protection zones, the following shall apply:

- No mechanical excavation
- No excavation by any other means without ECoW site supervision.
- No hand digging without a written method statement having first been approved by the ECoW
- No ground level changes whatsoever
- No storage of plant or materials
- No storage or handling of any chemicals
- No vehicular access

4.4 Breeding Birds

A prestart walk over will be carried out prior to any tree felling in accordance with "FCS Guidance Note 32: Forest operations and birds in Scottish forests: November 2006". A prestart walkover survey for ground nesting birds will also be carried out by the ECoW before any ground excavation works may proceed. The site manager will also inform the ECoW of any changes to the programme of works. The ECoW will regularly monitor during construction.

4.5 Otter Mitigation

In the Ardchullarie catchment, evidence of otter activity was found at 6 spraint sites, 5 resting up sites and 8 potential resting up sites. Disturbance during the construction phase of the scheme is possible due to the proximity of the identified resting up site to the intake, outfall and pipeline. However, the resting up sites will not be lost due to the temporary nature of the works. Disturbance during construction should be minimal as there are a number of alternative resting up sites are available for otters to use, some of which are either more than 100m away from the area of works or well out of the line of sight of the works.

The proposed protection and mitigation measures which will be enforced before and during construction are:

- An Ecological Clerk of Works will be appointed to ensure the protection measures are installed and maintained in the correct locations and to the required standard.
- An otter exclusion fence will be installed around the powerhouse compound and will be comprised of HERAS Fencing with chicken wire sealing off the gap at the foot of the fence. Fence will be closed every night.
- Any excavations which need to be left overnight should be fenced off, fitted with mammal ramps and pipe ends capped. Any excavations will be back filled as soon as possible.

- No work should be carried out in the riparian area before sunrise or after sunset.
- A resurvey of the sites will be carried out within 10 weeks of commencement of the construction. All potential resting up sites within the development corridor should be checked for changes or frequency of use, especially for signs of breeding.
- A disturbance licence will be applied for from SNH for any holts or resting up areas identified within 30m of the construction corridors.
- All resting up sites within 50m of the development will be fenced off before construction starts using high visibility fencing.
- The toolbox talk given by the ECoW prior to construction will include a meeting with all contractors to explain the legislation for the protection of otters, the locations of protected areas, signs of otter activity and that it is illegal to disturb these areas.

4.6 Bats

No evidence of bats found on site. If discovered, the ECoW is to be consulted.

5 POLLUTION CONTROL

Ensure that existing patterns of surface water runoff and natural and man-made drainage are reinstated as soon as practicable. Barrier made from suitable excavated materials are to be placed along pipe trenches to prevent pipe bedding materials forming drains.

Silt pits will be installed at appropriate suitable locations along the length of pipe route. They will be regularly monitored, recorded, maintained and emptied by the contractor. The design of the silt mitigation will be informed from the relevant studies carried out as part of the EIA process; however the design (i.e. location and size) of the on-site mitigation will be established by the contractor and the silt pits recorded on the site plan in the site office .The contractor must ensure that all silt pits, mitigation measures in place are capable of adverse weather conditions and are emptied on a regular basis , allowing the build up of silt in the traps to emptied to allow high volumes of water to accumulate. There is no formal access track along the pipe route. The pipe route is in open ground and scrubland will be tracked by low bearing pressure tracked vehicles to create as least damage as possible.

The new Ardchullarie Burn access road to the powerhouse shall be in conjunction with agreements with the local planning authority and transport Scotland. The new access road to the powerhouse afterwards shall protected by it new ditches and silt traps where the ditches can flow into new silt traps which will be designed by the contractor and the ECOW and will be sufficient to accept any high rainfall .

The Ardchullarie Burn intake construction access is via an existing forestry road which has existing side drainage ditches already installed and be protected by silt pits located on the site silt pit location map and monitored by the ECoW.

When pumping water directly onto vegetation (when de-watering a trench) ensures that the outlet pipe is regularly moved in order to prevent saturating the ground. Regularly check nearby watercourses downstream of pumping operation for signs of mobilised sediment which may be resulting from that activity. All pumped silt water shall be pumped to an area that shall be at least 10m away from the nearest watercourse.

The weir concrete will be site batched and there will be no requirement to washout ready mixed concrete lorries at the weir. A depression in the ground will be located for the washing of spent site mixers on the right bank of the burn at the weir site at least 10metres from the watercourse.

Any concerns expressed by visiting representatives of the statutory bodies will be reported by the principle contractor in writing to the Project Manager or Ardchullarie Burn HEP (the client) as soon as practicable.

The importance of correct storage procedures for fuels, oils and chemicals will be stressed to all site personnel. All fuels are to be stored in bunded tanks at least 10m from watercourses (i.e. in laydown area).

All on-site vehicles will carry spillage mats, and drip trays or site nappies will be placed under all static items, e.g. pumps. Cement will be stored in waterproof conditions away from watercourses.

When working in or near water courses, extreme care will be taken to prevent pollution and the mobilisation of silt and sediment, both during construction of water intakes, outfall and crossing of watercourses. All in-stream works will take place in a dry working environment as detailed in the relevant sections below.

The contractor must keep on site at all times pressure washing equipment and adequate supplies of clean water to allow dirty wheels to be washed prior to vehicles leaving the site. Wheels must be washed in an area of depression from which water cannot run-off into water courses. Rev D

The principle contractor will keep a site diary recording all activities associated with sediment / pollution control, this to include the weather and installation, inspection and improvement:

- Updates of work progress
- Numbering of silt pits, times checked , times emptied etc
- Consideration of signage for the public and keeping the public in and around the works safe.
- Events / incidents
- Days when ECoW is on site and their findings from their visit
- Settlement pools / sediment traps;
- Sediment barriers / fences;
- Water sampling for turbidity.
- Cofferdams & bunds;
- This diary will be kept in the site office and will be available for inspection
- No work shall be carried out on site until the ECoW is satisfied with the silt mitigation measures.
- If the ECoW reports that any silt mitigation improvement measures are required then the work in the area determined by the ECoW must cease until the ECoW permits work to recommence.

It is the responsibility of the contractor's site manager to formally brief all site personnel on the contents of the above and any task-specific method statements, also to train all personnel in the use of spill kits. These kits will accompany all on-site vehicles; spare kits will be stored at the office or compounds when used to service specific parts of the works, e.g., the intake structures.

Spill kits will also be located at the main weir, outfall, powerhouse, and in the site office and on all machinery on site.

Failing to undertake these tasks may be treated as a breach of contract and may result in the construction contracts being terminated and the contractor being dismissed.

A Construction Environmental Management Plan has been assembled by MNV consulting. The plan details the specific mitigation to be installed prior to the beginning of ground-breaking works and is attached below.

This will be developed in close liaison with the LLTNPA, SEPA, and SNH.

6 SEDIMENT CONTROLS (REF: SEPA WAT-SG-29)

All sediment controls will be regularly inspected and maintained to ensure they are effective. The release of material to watercourses falls into two categories:

- The short-duration of works on the intake and outfall structures and river crossing works (all of which must as far as possible be geared to times of lover flows), means that the sediment control task in these areas is focused in time and space, and it can be contained by cofferdam.
- The overland release of flows containing sediments to near-by watercourses. This will be concentrated at locations such as pipe trenches, access tracks and exposed soils. Where the access track runs close to the main burn it will be particularly important that effective sediment control measures are in place.
- When in river works are taking place, including work within dry cofferdams, then the burn downstream should be checked twice per day for siltation and the details logged in the site diary.

Measure to deal with construction (short-term) polluted runoff must either be:

- Diverted to suitably grassed and near-level (no risk of overland flow) settlement areas from where it can percolate into the water table:
- Diverted into sediment pits;
- Passed through multiple (parallel) filter layers (e.g., straw / geotextile fences) clear of watercourses.
- All silt mitigation measures must be labelled on site and noted with unique references on the silt pit location plan maintained in the site office.

In order to ensure the sediment management regime proposed for the development is robust the contractor will liaise with the ECoW to ensure that his sediment management plan is suitable and robust and identifies type of mitigation to be placed at the most effective location. This will minimise the risk of the release of sediment into nearby watercourses.

7 ACCESS TRACKS (Not Pipe track) AND WATERCOURSE CROSSINGS

Drainage ditches will be provided at regular intervals along tracks to prevent large volumes of water flowing down them at times of high rainfall. Runoff will be channelled to water treatment areas and prevented from flowing directly into watercourses. Access tracks must be regularly maintained to prevent the build-up of mud and formation of ruts.

Smaller watercourses, e.g., upland burns, ditches and seepage areas not marked on the 1:50,000 scale OS map (hence CAR Registrations are not required) will be crossed by either:

- Installing a temporary bridging structure, for example using steel or wooden beams to support a timber deck; or
- Installing temporary culverts. To maintain the natural flow regime, the inverts of pipes will be below stream bed level, and the diameter (or sum thereof if more than one) should not be less than the width of the watercourse.
- When watercourse crossing works are taking place, including work in isolated open cut then the burn downstream should be checked twice per day for siltation and the details logged in the site diary.

The core path to Glen Ample, which dissects the proposed intake access track, is to be maintained across the track with the implementation of signs on the path, warning walkers of construction vehicles. Signage is to be erected along the private road to Ardchullarie House and to the forest access roads.

8 WASTE

Suitably marked and secured containers will be situated on site for the storage of waste. There materials must be transported by the Contractor on a regular basis to a covered skip in his Compound. The Contractor is responsible for making arrangements for the proper servicing of port-a-loos. It is not anticipated that any hazardous materials will enter the site but SEPA will be consulted should this situation change. Waste will not be burned or buried on site – ref SEPA PPG6 Section 7:

- The Contractor must identify waste on the site which will require to be registered with SEPA as an exempt activity;
- Waste must be stored in such a manner as to prevent its escape or scavenging by vandals, thieves, trespassers or children;
- Waste may only be carried by a person either registered with SEPA as a carrier of controlled waste or who is exempt from holding such registration;
- Transfer Notes must be kept for two years and available to SEPA officers on request;
- The Contractor must identify wastes hazardous to human health or the environment. In these cases a "Consignment Note" (which can be purchased from SEPA must accompany the movement of waste;
- Waste may only be disposed of at a licensed Waste Management facility such as a landfill site, or at a site which has registered its activity with SEPA as being "exempt". In both cases, strict controls operate which regulate the type and quantity of waste which may be accepted at the site by the operation;

- The transporter must check that the site to which waste is to be taken has the relevant licence or exemption. This may be checked with the local SEPA office.

9 TRAFFIC

- Restriction of construction traffic to avoid the tabled times to minimize the impact on local communities, particularly at school start and finishing times, and on Sundays and during local events:

  8.00 – 9am (ensuring travel to work/school is covered)
  3.30 – 5.00pm (travel back from school/work)

  Delivery vehicles will be programmed to arrive after 9.30am, and leave the site before 3pm. This allows the vehicles to be free from the A84 prior to the identified busy periods and ensure disruption to normal road users is minimal.

  This information will be relayed to each supplier when ordering of all goods. The construction contractor will be responsible for ensuring the delivery driver is aware of the restrictions.

  Construction traffic (i.e. the workforce) will arrive on site in cars, pickups or a transit van type vehicles between 7am and 7.30am, and leave site between 5.00 and 7.00pm, therefore will be outwith the expected busy periods of the day.

  All deliveries and construction traffic will approach the site along the A84 either from Killin or Callander.

- A code of conduct will be issued to all HGV drivers to allow for queuing traffic to pass and all drivers shall adhere strictly to the speed limits at all times.

- Emergency arrangements detailing communication and contingency arrangements in the event of vehicle breakdown:

  All HGV delivery drivers shall have contact numbers for site staff. The site manager will take the necessary action should a vehicle breakdown. A contingency plan will be established using Lix Toll at Killin. They have the required vehicles to ensure any potential causes for delay are removed from the roads as quickly as possible.

- Arrangements for the cleaning of wheels and chassis of vehicles to prevent material from construction sites associated with the development being deposited on the road:

  Pressurised wheel washers will be kept on site and used when necessary.

- Emergency arrangements for cleaning of roads affected by material deposited from construction sites associated with the development:

In the unlikely event that the above arrangement fails, Breedon Aggregates will be retained to control any mud and debris deposited on the main roads.

- Arrangements for signage at site access, public footpaths and crossovers and on private roads to be used by construction traffic:

  In order to provide safe access for motorists, cyclists, pedestrians and equestrians, adequate warning signs will be erected to inform other users of construction traffic and suitable diversions will be made when required.

- Details of information signs to inform A84 road users of construction traffic:

  Road and Site Signage – SLOW, SITE ACCESS signs at 50m & 150m intervals on approach to entrance. NO ENTRY DUE TO CONSTRUCTION WORKS sign on gate to the secured site offices and storage compound.

- Arrangements to ensure that access for emergency service vehicles are not impeded:

  All deliveries will be made out with the main public road and all operatives will be briefed to avoid any possible obstruction of the main road and site access.

- Traffic arrangements in the immediate vicinity of temporary construction compounds:

  All delivery drivers are required to phone the site office or site manager when they are within an hour of the site to confirm their time of arrival. The site manager will therefore be able to co-ordinate the deliveries to avoid congestion on the A84 and on site. All delivery drivers will be required to attend the site office on arrival. A turning head will be provided for their use and be kept clear.

  Users of the road will already be aware of the construction activity and associated movements through the erection of signage as detailed in sections g) and h) above.

- It is proposed that a detailed log of all delivery vehicles associated with the development will be kept to record the following information which will be kept on site for the duration of the construction phase:

    - Time
    - Date
    - Vehicle registration and type
    - Purpose

  This will be made available for inspection at any time. This information will be recorded at the site.

Table 1 – Anticipated Vehicle Movement		
VEHICLE TYPE	DURATION	MOVEMENT* / WEEK
Light Vehicles (i.e. Cars, Vans for site staff)	Weeks 1 > 40	60
HGV (Plant &Materials)	Weeks 1 > 3	24
HGV (Materials)	Weeks 4 > 25	20
HGV (Plant & Materials)	Weeks 26 > 40	20

- Monitoring, reporting and implementation arrangements:

  The site manager is to have monitoring sheets etc on site which will be completed on a weekly basis. Prior to the initiation of the construction period, or whenever a new work person is brought on to site, the work force will be made fully aware of the arrangements within this document during a briefing. This will also be used to provide details on health and safety arrangements etc.

- Arrangements for dealing with non-compliance:

  Any worker/delivery driver not complying with the arrangements will be given a written warning, if a second offence occurs he will be removed from site or the delivery company will be advised that the driver is no longer to be used on this project. The parent company and all appropriate persons will be informed of the decision, and a record of the reason and action noted in the daily monitoring sheets.

- A review will be undertaken at the end of every week to ensure the methods employed are effective. Monthly project meetings will take place in which compliance with the TMP will be discussed and recorded. Any change in the TMP will be agreed with the relevant authorities prior to its implementation.

10 NOISE

During construction, the main source of noise will be from occasional vehicles moving to and from the site and those working on it. Construction works which are audible out with the site boundary shall be undertaken 0800 and 1800 hrs on weekdays, and 0900 and 1300hrs on Saturdays. All operations will be carried out in accordance with the constraints identified within the Noise Impact Assessment in the ES.

11 EMERGENCY ARRANGEMENTS

This CMS Provides guidance to the Contractor on how the project should be carried out to protect environmental interests. In the event of a serious incident, for example spillage of fuels, chemicals, concrete or large sediment release into a waterway, the following actions must be taken:

- Contain and limit the problem (see below);
- Contact the Site Manager and SEPA immediately, also KN Services if appropriate;
- Contact KN services of Balbeggie, Perth ([redacted]).

Measures available on site at all times shall include the following and shall be held in the Contractor`s Site Office and also as appropriate on individual items of manned construction plant when operating within the site. Stocks of any items used will be replenished immediately.

- Spill kits – min of 6 held in Site Office, one per site vehicle;
- Booms – min of three held in Site office;
- Silt retaining devices including silt fence, sedimat, and straw bales – held in store adjacent to Site Office.

All site staff shall be briefed in the use of all items of safety equipment upon first arrival on site and shall be required to attend "refresher" courses at not more than monthly intervals thereafter. Induction and further instruction shall cover the use of all emergency-related equipment, including recover from incidents. Recovery involves dealing with the residue of "spillage", whether this be of chemicals including fuels or of sediments. All site staff shall be instructed in the procedures to be followed in dealing with residues according to the arrangements made by KN Services for safe disposal according to pollutant.

The Contractor`s Site Manager shall have overall responsibility for ensuring that all emergency procedures are understood by all site staff and sub-contractors and carried through as specified, and that all preparations for and reports of any incidents are fully documented and reported to the Site Manger. The Contractor`s Site Manager shall ensure that the Site Manager is fully briefed regarding the arrangements which have been made, including making available current inventories or all safety-related equipment held on site including its whereabouts at any time.

The planning conditions are attached to this Construction Method Statement and must be adhered to at all times. Where appropriate the ECoW must prepare and follow procedures which allow the planning conditions to be met and must report to the planning authority monthly thereon.

12 CONTACT DETAILS

Role	Responsibilities	Contact Details
Project Manager	Ensuring the construction phase proceeds as agreed with the Planning Authorities and all conditions met	Campbell of Doune Ltd Tel : [redacted]
CDM Coordinator	Providing the development with the H&S plan, and ensuring the contractors construction plan is sufficient	Campbell of Doune Ltd Tel : [redacted]
Design and Structural Engineer	Providing the client with the detailed design drawings and inspecting the construction work.	Campbell of Doune Ltd Tel: [redacted]
Contractor	All civil works on site	TBC
ECoW	Ensure that the scheme is constructed in a manner which is not detrimental to the surrounding environment	MNV
SEPA Stirling	Regulating the in-stream works, and monitoring the operation of the scheme re abstraction and impoundments	[redacted] Emergency [redacted]
TLLNP	Regulating the discharge of the Planning Conditions and	T B C

13 LOCH LOMOND & TROSSACHS NATIONAL PARK CRITERIA INDEX

Criteria Ref.	Criteria Description	Section
(a)	Detailed construction methods for all aspects of the scheme (temporary access tracks, site compounds, intakes, pipeline, tailrace, powerhouse, borrow pits	3
(b)	Pollution prevention safeguards and sedimentation safeguards including a silt management plan which includes a contingency plan for adverse weather and detail on silt traps	5 & 6
(c)	Storage and disposal of materials	8
(d)	Construction site facilities including the location of construction site huts, vehicle equipment, materials storage and location of parking area(s) for construction workers	3
(e)	Duration, timing and phasing of works	1.1
(f)	The width of the working corridor that construction works will be confirmed to (shown on a plan)	3.5
(g)	Detailed landscape mitigation and restoration techniques for the entire route with specific focus on the route of the pipeline / temporary access tracks and hard standing/ and use of existing forestry tracks	3.5
(h)	Landscape mitigation measures proposed at the intake (this should include details of ground profiling to screen higher areas of the wing walls and the placing of boulders adjacent to the intake site)	3.3
(i)	Detailed habitat mitigation and restoration targets	4
(j)	Treatment of peats and turves	4.1
(k)	Protected species plan including mitigation for otter (including the provision of temporary ramps in trenches and the capping of pipes at the end of a working day), red squirrels, pine marten, badger, bats and breeding birds	4
(l)	Details of toolbox talk for bats, otters and reptiles to ensure all personnel are aware of what to do should evidence of bats, otters or reptiles be discovered during construction of the hydro scheme	4
(m)	Public access management plan which details the impacts and mitigation proposed regarding public recreational use of the core path and forest road network. The plan should ensure public access is maintained and disruption minimised, including a method statement (damage and reinstatement) focusing on where new works impact on the core path; mitigation which includes "banks men" to ensure public access to the core path is not unreasonably affected; and the erection of site threshold signage;	7
(n)	Traffic management plan – to minimise any conflict between construction vehicles and other road users	9
(o)	Hours of operation on site	3.1