Environmental Impact Assessment Report

Beinneun 2 Wind Farm

Volume 3

Technical Appendix A4.1: Outline Construction Environmental Management Plan

Document prepared by Envams Ltd and Raincloud Consulting Ltd for Beinneun 2 Ltd

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Contents

1 INTRODUCTION

1.1 SCOPE AND CONTENT

This outline Construction Environmental Management Plan (oCEMP) has been prepared by Envams and Raincloud for Beinneun 2 Limited ('the Applicant') in support of a planning application for the Beinneun 2 Wind Farm ('the Development'). The Development would be situated approximately 5.4 kilometres (km) northwest of Invergarry, and approximately 11.3 km southwest of Fort Augustus (the Site), centred on grid reference NGR 223398 805392 (these are the average of the turbine co-ordinates).

This oCEMP provides information about the controls required during construction to avoid, minimise or mitigate any construction effects on the environment.

A detailed CEMP will be prepared prior to the commencement of works and will be based on this oCEMP. The CEMP will be a 'live' document and will be monitored regularly throughout the construction phase to ensure good practice is applied and the mitigation measures contained within it remain appropriate.

The methods set out in this oCEMP are based on good practice.

1.2 PROPOSED WORKS

The Development will comprise:

- Up to 19 wind turbines, with a maximum tip height of up to 200 m;
- Associated foundations and crane hardstandings at each wind turbine location;
- Access tracks linking the turbine locations comprising of 17.5 km of new tracks;
- Battery Energy Storage System (BESS) compound containing approximately 27 no. 40-ft (or equivalent) battery containers;
- One meteorological mast;
- Network of underground cabling;
- New substation compound; and
- One construction and storage compound.

Access to the Site will be taken from the west of the Site from the A87 at National Grid Reference (NGR) 219586, 806801.

Borrow pits will be developed for the purposes of winning stone for use principally for the access tracks and crane hardstandings.

SuDS provisions and ecological and landscape mitigation have been integrated into the design as well as proposals that will achieve significant biodiversity enhancement.

1.3 LOCAL COMMUNITY LIAISON

The Applicant or the appointed contractor will identify an individual to be the first point of contact for local residents. They will be available to liaise with members of the local community to ensure any concerns are addressed quickly and resolved efficiently.

2 ENVIRONMENTAL CLERK OF WORKS

An EnvCoW will be appointed prior to the enabling and construction phases and up to the end of the construction period.

The appointed EnvCoW should be accredited with the Association of Environmental and Ecological Clerk of Works (AEECoW) and should have relevant knowledge and experience to provide advice and monitor compliance with measures for the protection of water quality in relation to abstractions for water supply as well as ecological protection. For the avoidance of doubt, the use of the term EnvCoW, here, includes the more traditional role of the Ecological Clerk of Works (ECoW).

The Principal Contractor will work with the EnvCoW to ensure compliance with relevant legislation for protected species and habitats.

The EnvCoW scope of works is likely to include:

- Monitoring compliance with this CEMP;
- Providing advice on adequate protection of nature conservation interests on the Site;
- Providing contractors with tool-box talks about relevant legally protected species and their habitats;
- Ensuring any required protected species licensing is in place and providing advice and monitoring compliance with licence conditions; and
- Ensuring all measures relating to biodiversity and landscape planting are undertaken, monitored and remediated where necessary.

3 SITE INDUCTION

All visitors to Site during the construction phase will be required to undertake a site induction on arrival. The induction will be required for all deliveries, operatives, subcontractors and others visiting the Site during the construction period.

The induction will be undertaken by the Principal Contractor, and other parties, as required. The induction will include emergency procedures, assembly points, first aid, Site rules, location of welfare facilities, policies, contacts, environmental constraints and protection, details of any protected species licences and working methodologies at this time. This list is not exhaustive and is indicative of the elements that should be included within the Site induction.

All visitors to Site will be instructed to sign in and out at the Site access each day.

4 WORKING HOURS

Core working hours will be between 07:00 until 19:00, Monday to Friday, and 08:00 until 12:00 on a Saturday (unless in exceptional circumstances where need arises to protect plant, personnel or the environment). These working hours may not apply to the turbine blade delivery, which may require the use of blade lifting and vehicle escort and therefore depend on the availability of the blade lifting vehicle, and where timings outside of these hours may be more suitable to minimise impact on other road users.

In addition to this, a start-up and close down period for up to an hour before and after the core working hours is proposed (this does not include the operation of plant or machinery likely to cause a disturbance).

There will be no construction activities or scheduled deliveries on a Sunday or on bank holidays. The purpose of the defined working hours is to find a balance between progressing the Development at an acceptable pace and minimising the impact upon local residents.

5 CONTROL OF LIGHTING

Depending on the time of year, some work lighting may be required for security and to facilitate construction during the hours set out in Section 3. There will be no continuous lighting at the Site.

The vast majority of construction activities will be undertaken during daylight hours. In winter, the short daylight hours may require some temporary lighting to be deployed during construction however this will be avoided as far as practicable, and limited to where it is required for safety.

All construction lighting will be deployed in accordance with the following recommendations to reduce or remove impacts on human and ecological receptors:

- The use of lighting will be minimised to that required for safe site operations;
- Lighting will utilise directional fittings to minimise outward light spill and glare, e.g., via the use of light hoods/cowls which direct light below the horizontal plane (preferably at an angle greater than 20° from horizontal);
- Lighting will be directed within the Site rather than towards the boundaries; and
- All site lighting (if required) will be directed to the area of works and light spill minimised.

Motion-sensors will be used to trigger security systems, including remotely monitored cameras and lighting. This security lighting will be used only in response to the motion sensors, and thus will generally not be lit.

6 CONTROL OF NOISE AND VIBRATION

Materials would be delivered to the construction compound during the working hours set out in Section 4, above.

There is the potential for increased noise and vibration during construction relating to the building of the infrastructure and use of plant and machinery on Site. Sensitive receptors in proximity to the Site can potentially be affected by noise and vibration during the construction period. The nearest sensitive receptors will be identified prior to works commencing. All site workers will be advised of the noise sensitive receptors and will be informed to adopt quiet working practices, where appropriate.

The good practice measures detailed below will be implemented to manage the effects of noise and vibration during construction operations, and will be required of all contractors:

- Deliveries of turbine components, plant and materials by HGV to site shall only take place within times agreed with The Highland Council;
- The site contractors shall be required to employ the best practicable means of reducing noise emissions from plant, machinery and construction activities, as advocated in BS 5228-1:2009+A1:2014;
- Where practicable, the work programme will be phased, which would help to reduce the combined effects arising from several noisy operations;
- Where necessary and practicable, noise from fixed plant and equipment will be contained within suitable acoustic enclosures or behind acoustic screens;
- All sub-contractors appointed by the main contractor will be formally obliged through contract to comply with all environmental noise conditions;
- Night-time construction working will not be carried out, unless otherwise agreed in advance in writing with The Highland Council. Local residents shall be notified in advance of any night- time construction activities with the potential to generate significant noise levels, e.g., abnormal load movement; and
- Any plant and equipment normally required for operation at night (23:00 - 07:00), e.g. generators or dewatering pumps, shall be silenced or suitably shielded to ensure that the night-time lower threshold of 45 dB, LAeq,night shall not be exceeded at the nearest Noise Sensitive Receptors (i.e., residential properties).

7 CONTROL OF WATER

This section addresses construction activities that may result in direct or indirect impacts to the hydrological network or hydrogeology of the Site. Potential receptors in proximity to the Site could include watercourses, surface water bodies and ground water.

7.1 GUIDANCE AND LEGISLATION

The following legislation and guidance documents have been used to inform the CEMP:

- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR)[1];
- The Water Supplies (Water Quality)(Scotland) Regulations 2014[2];
- Good practice during wind farm construction (2024)[3];
- Scottish Water List of Precautions for Drinking Water and Assets – Wind Farms EdE – Annex 1[4];
- Groundwater Protection Policy for Scotland Version 3 (2009)[5];

[1] https://www.legislation.gov.uk/ssi/2011/209/contents
[2] https://www.gov.scot/publications/water-supplies-water-quality-scotland-regulations-2014/pages/2/
[3] https://www.nature.scot/doc/good-practice-during-wind-farm-construction
[4] https://www.scottishwater.co.uk/-/media/ScottishWater/Document-Hub/Key-Publications/Energy-and-Sustainability/Sustainable-Land-Management/091120SWListOfPrecautionsForDrinkingWaterAndAssetsWindFarmsEdE.pdf
[5] https://www.sepa.org.uk/media/60033/policy-19_groundwaternov09.pdf

- The Construction Industry Research and Information Association (CIRIA) (2015), Environmental Good Practice on Site (C741)[6];
- Guidance for Pollution Prevention (GPP) 1 to GGP 22[7]; and
- Planning Advice Note (PAN) 61 - Planning and Sustainable Urban Drainage Systems[8].

Relevant guidance and best practice documents are subsequently provided in the relevant sections of this report.

7.2 POTENTIAL SOURCES OF POLLUTION

The identified potential sources of pollution as a result of the construction phase of the Development, based on the findings of the EIA Report Chapter 12, Hydrology, Hydrogeology and Soils, are as follows:

- Direct disturbance of banks and bed of river;
- De-watering of excavations;
- Run-off from exposed ground and material stockpiles;
- Run-off from roads and haul routes and river crossings;
- Plant washings / washing areas;
- Fuel and chemical storage/ refuelling areas; and
- Leaking / vandalised equipment.

7.3 REGULATION AND AUTHORISATION

All construction and engineering activities within or hydrologically connected to the water environment require authorisation under Controlled Activities Regulations (CAR). There are three levels of authorisation and the level required is site-specific and based on the level of risk of the activity to the water environment. The levels of authorisation are:

1. General Binding Rules (GBR): low risk activities. All Development activities must comply with these rules. No application to SEPA is required.
2. Registration: medium risk activities. Application to SEPA is required to register an activity.
3. Licence: high risk activity. Simple or complex licences exist depending on the activity. Application to SEPA is required to obtain a licence for the activity.

Further guidance on the requirement for authorisation are outlined in the following documents:

- CAR – A Practical Guide (Controlled Activities Regulations) v9.4 (2024)[9];
- Introduction to Controlled Activities Regulation[10]; and
- SEPA LUPS-GU-15: Planning guidance in relation to SEPA regulated sites and processes[11].

The requirements for authorisation of specific activities are outlined in the relevant sections of this document.

7.4 ENVIRONMENTAL CLERK OF WORKS (E_{NV}COW)

As set out in Section 2 of this outline CEMP, an Environmental (or Ecological) Clerk of Works (EnvCoW) will be appointed prior to the enabling and construction phases and up to the end of the construction period. The EnvCoW will hold an advisory role. In relation to the water environment, the scope of the EnvCoW role will include:

[6] https://www.ciria.org/ci/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=C811&Category=BOOK
[7] https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/
[8] The Scottish Government (2001) PAN61 Planning and Sustainable Urban Drainage Systems [Online] Available at: https://www.gov.scot/publications/pan-61-sustainable-urban-drainage-systems/ [Accessed: 27/01/2025].
[9] SEPA (2019) *The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) A Practical Guide* [Online] Available at: https://www.sepa.org.uk/media/cd3doeli/car-a-practical-guide.docx (Accessed: 14/03/2025)
[10] SEPA (n.d.) *Introduction to the Controlled Activates Regulations* [Online] Available at: https://www.sepa.org.uk/media/34800/introduction-to-the-controlled-activities-regulations.pdf (Accessed: 14/03/2025)
[11] SEPA (2013) *Land Use Planning System SEPA Guidance Note 15: Planning Guidance in Relation to SEPA Regulated Sites and Processes (LUPS-GU15)* [Online] Available at: https://www.sepa.org.uk/media/136091/planning-guidance-in-relation-to-sepa-regulated-sites-and-processes.pdf (Accessed: 14/03/2025)

- Monitoring compliance with the mitigation outlined in the EIAR, oCEMP and other relevant documentation relating to the planning condition and site licence, such as the Pollution Prevention Plan (PPP);
- Routine monitoring of water pollution prevention measures, such as silt management measures, and inspection following storm events; and
- Routine visual inspection and observation of watercourses for the presence of silt, discolouration and hydrocarbons.

7.5 SITE DRAINAGE

Drainage from the site will include elements of Sustainable Drainage Systems (SuDS) design, where appropriate. SuDS is a method of controlling surface water run-off in a manner that replicates natural drainage patterns and has a number of benefits, including:

- SuDS will attenuate run-off, thus reducing peak flow and any flooding issues that might arise downstream;
- SuDS will treat run-off to a certain degree, which can reduce sediment and pollutant volumes in run-off before discharging back into natural drainage network; and
- SuDS measures, such as lagoons or retention ponds, correctly implemented will produce suitable environments for wildlife.

The following best practice guidance should be used:

- CIRIA C648 – Control of water pollution from linear construction projects[12];
- CIRIA C352 – Control of water pollution from construction sites[13];
- CIRIA SuDS Manual (C753)[14];
- CIRIA Guidance on the construction of SuDS (C768)[15];
- SEPA WAT-RM-08 Regulatory Method: SuDS[16];
- SEPA WAT-SG-75 Sector-specific Guidance – Construction Sites[17];
- Water Assessment and Drainage Guide (WADAG)[18];
- GPP5: Works and maintenance in or near water[19]; and
- GPP4: Treatment and disposal of wastewater where there is no connection to the public foul sewer[20].

7.5.1 Authorisation

SuDS are a legal requirement for all developments draining to the water environment (other than a single dwelling or discharges to coastal water). All developments must comply with all conditions of the CAR Regulations GBR including the requirement for SuDS.

Proposed developments require authorisation for surface water run-off discharges under CAR regulations by a SEPA licence (Construction SUDS licence) for construction sites which:

- Exceed 4 ha area;
- Contain a road or track length in excess of 5 km; and / or
- Include any area with a slope gradient of more than 250 m over 1 ha or 500 m length.

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[12] CIRIA (2006) *C648: Control of water pollution from linear construction projects: Technical Guidance* [Online] Available at: https://www.ciria.org/Search?SearchTerms=c648 (Accessed: 14/03/2025)
[13] CIRIA (2001) *C532: Control of water pollution from construction sites: Guidance for consultants and contractors* [Online] Available at: https://www.ciria.org/ProductExcerpts/C532.aspx (Accessed: 11/03/2025)
[14] CIRIA (2015) *C753: The SuDS Manual*
[15] CIRIA (2017) *C768: Guidance on the construction of SuDS*
[16] SEPA (2019) *WAT-RM-08: Regulatory Method Sustainable Drainage Systems (SUDS or SUD Systems) v6.4* [Online] Available at: https://www.sepa.org.uk/media/219048/wat-rm-08-regulation-of-sustainable-urban-drainage-systems-suds.pdf Accessed: 18/03/2025)
[17] SEPA (2021) *WAT-SG-75 Supporting Guidance Sector Specific Guidance: Water Run-Off from Construction Sites* [Online] Available at: https://www.sepa.org.uk/media/340359/wat-sg-75.pdf (Accessed: 18/03/2025)
[18] SUDSWP (n.d.) *Water Assessment and Drainage Assessment Guide* [Online] Available at: https://www.sepa.org.uk/media/163472/water_assessment_and_drainage_assessment_guide.pdf (Accessed: 18/03/2025)
[19] NetRegs (2018) *GPP5: Works and maintenance in or near water* [Online] Available at: https://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf?utm_source=website&utm_medium=social&utm_campaign=GPP5%2027112017 (Accessed: 18/03/2025)
[20] NetRegs (2021) *GPP4: Treatment and disposal of wastewater where there is no connection to the public foul sewer* [Online] Available at: https://www.netregs.org.uk/media/1887/guidance-for-pollution-prevention-4-2022-update.pdf (Accessed 18/03/2025)

This includes the Development.

SEPA WAT-RM-08 Regulatory Method: SuDS provides further details on the licence requirements.

CAR licences will be obtained prior to the construction phase.

7.5.2 Pre-Earthworks Drainage

Pre-earthworks drainage relates to the required drainage measures to be installed prior to earthwork activities such as access track construction.

Best practice pre-earthworks drainage measures include:

- Cut-off/ diversion ditches;
- Temporary interception bunds;
- Swales; and
- Retention ponds.

7.5.2.1 Purpose/ Aim

The aim of pre-earthworks drainage is to:

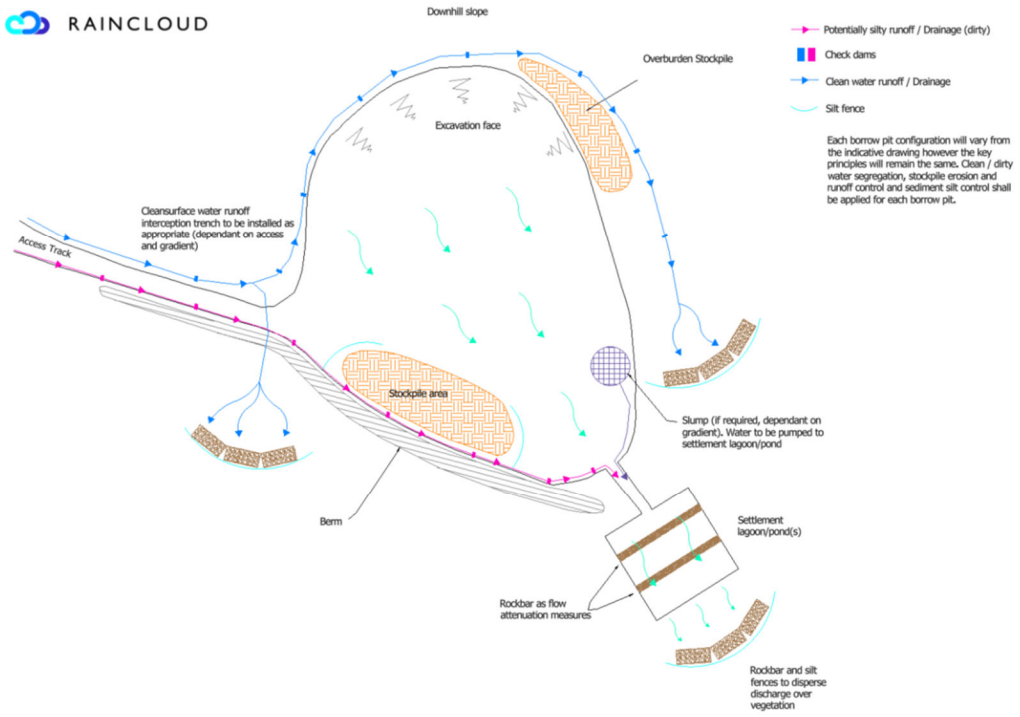
- Divert ‘clean’ surface water run-off and stormwater away from exposed soils of earthworks preventing further erosion; and
- Prevent ‘clean’ water from mixing with potentially silt-laden water generated from construction works.

7.5.2.2 Installation

Pre-earthwork drainage should be installed immediately prior to earthworks and construction works commencing.

Temporary interception bunds and cut-off drainage ditches (‘clean water drains’) will be constructed on the ‘high-side’ boundary of the earthwork operations to prevent surface water run-off entering excavations. Run-off collected in the drainage ditches will be diverted along a channel which follows the natural gradient of the ground, avoiding steep gradients. A schematic drainage layout for a borrow pit is shown in Plate 1.

Plate 1: Schematic of Borrow Pit Drainage



The profile of the ditch can vary from a 'v' shape to a 'u' shape but should have a constant uniform depth. The profile of the ditch will depend on the soil type and stability.

The use of 'u'-shaped vegetated ditches is preferential, these are also known as swales. The dimensions and gradient of swales will be kept to a minimum to prevent rapid flow of water. Swales to collect runoff will be placed on the downslope of earthworks and stockpiles and will be designed to treat potentially silty runoff before discharging back into the drainage system. This may include constructing check dams within the channel and employing silt management measures. The use of retention ponds allows for additional storage capacity during heavier rainfall events.

7.5.2.3 Reinstatement

All pre-earthworks drainage channels should be re-instated unless required for long-term drainage on the site. No exposed soils should remain, and turves should be emplaced to prevent erosion.

Where exposed soil is to be left for a long period before reinstatement or re-seeding, other measure to prevent erosion may be required:

- Geotextiles (biodegradable and non-biodegradable);
- Mulching/ binders/ hydro-seeding;
- Turf cut from other areas on site; and
- Surface roughening.

7.5.3 Earthworks Drainage

Drainage for permanent or semi-permanent earthworks such as access tracks is required to control surface water run-off and discharge to appropriate outlets.

Best practice pre-earthworks drainage measures include:

- Drainage ditches;
- Sumps; and
- Culverts.

Purpose/ Aim

To manage surface water run-off from earthworks e.g. access tracks, and manage and allow for continuity of the natural drainage of surface water and groundwater from higher elevations to lower.

Pre-installation

Prior to access track and earthwork construction, site operatives will identify flush areas, depressions or zones which may concentrate water flow so that site drainage design will maintain hydrological connectivity. Site drainage design will be produced in advance of construction.

While areas of peat have been avoided where possible, floating roads may be used in small sections if required following pre-construction ground condition surveys. Measures determining the requirement for floating roads include:

- Peat type and characteristic;
- Areas identified as GWDTEs;
- Length of road section;
- Wind farm road layout; and
- Footprint of the road on the local habitat.

Further details of good practice with regards to drainage for floating roads is provided in Floating Roads on Peat[21] good practice guidance document.

Installation

All earthworks will have a gravity drainage system and all water will drain to an adequately sized sump. If dewatering of excavations is necessary, waste water will be treated by

[21] SNH and Forestry Civil Engineering (2010) *Floating Roads on Peat: A Report into Good Practice Design, Construction and Use of Floating Roads on Peat with particular reference to Wind Farm Developments in Scotland* [Online] Available at: https://www.roadex.org/wp-content/uploads/2014/01/FCE-SNH-Floating-Roads-on-Peat-report.pdf (Accessed: 18/03/2025)

designed settlement lagoons and retention ponds, further details are provided in Section 7.6.5.

Trackside drainage ditches are to be constructed parallel to the access tracks and follow the same gradient as the access tracks. To allow for continuity of surface and ground water flow from the high-side of the track to low-side, culverts are required to be built crossing the track at appropriate intervals, as shown in Plate 2 to peak rainfall intensity plus a climate change allowance of 40 % in the North Highland Scotland catchment in accordance with SEPA climate change allowances for flood risk guidance.

Plate 2: Trackside drainage ditch and cross-drainage culvert

Examples of these flow pathways on Site are shown in Plate 3. Further details of culvert design are provided in Section 6.8.4.

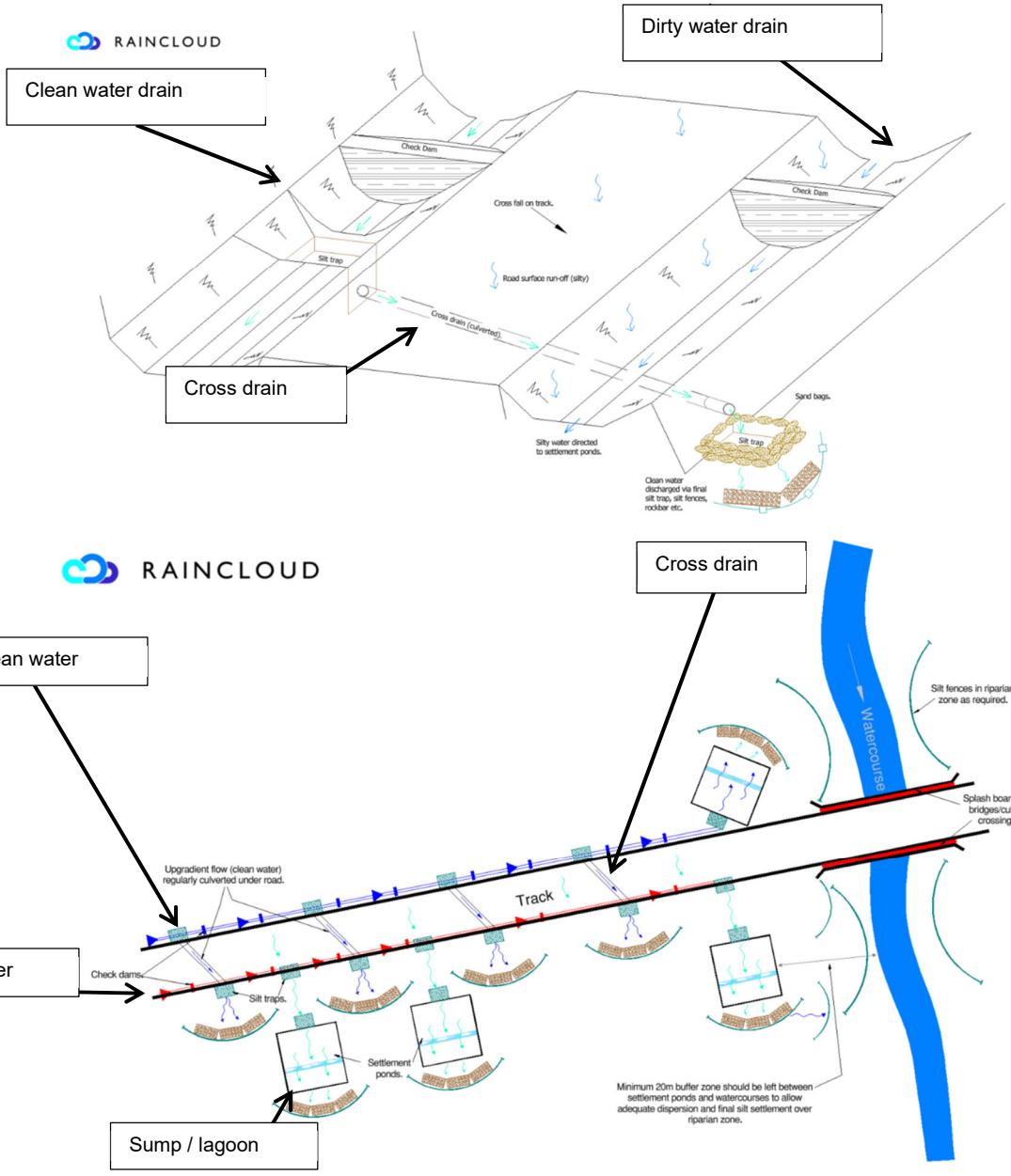
Plate 3: Flow pathways on Site

Track surface cross-drains can be installed on tracks with long gradients and limited camber. Measures to ensure hydrological connectivity is maintained between saturated ground and their water source will include the following:

- The site drainage design will, where possible, avoid any severance of saturated areas;
- The Principal Contractor's Designer will identify flush areas, depressions or zones which may concentrate water flow. Floating roads could be used in these areas with pipes or drainage matting below the formation to ensure hydraulic conductivity and reduce water flow over the road surface; and
- The drainage design will incorporate a drainage ditch on the upslope side of all access tracks to ensure limited crossflow and sediment transport, with regular outfalls to the down-slope side which would shed track runoff to adjacent rough ground or discharge to a settlement lagoon or retention pond if necessary, to control flows and sediment transfer.

A schematic of the track drainage is shown in Plate 4.

Plate 4: Schematic of Track Drainage



Permanent check dams can also be installed to slow the flow of water in ditches with steeper gradients and straightened channels to prevent erosion of channels. Water within channels should be allowed to flow and should not be stagnant, and tracks should be free from standing water through inclusion of camber or cross-fall.

Sustainable drainage systems such as swales with vegetated channels are preferential and will be designed to intercept, filtrate and convey run-off. Permanent swales and drainage ditches adjacent to access tracks will have outlets at specified intervals to reduce the volume of water collected in a single channel and, therefore, reduce the potential for erosion.

Settlement lagoons should be installed at drainage ditch outlets, prior to discharge to watercourse. They should be constructed to allow for adequate attenuation of water and settlement of sediments to peak river flow plus a climate change allowance of 40 % in the North Highland Scotland catchment in accordance with SEPA climate change allowances for flood risk guidance. Silt mats may be used at the outfalls of settlement lagoons and retention ponds to further aid the settlement of sediment from earthworks drainage. Further details on sediment management are provided in Section 7.6.

The use of retention ponds should be used to allow for additional storage capacity during heavier rainfall and storm events.

7.5.4 Management of Drainage from Surplus and Loose Materials

Careful consideration will be given to the location of topsoil and subsoil storage areas for all areas of the Development during construction. Storage areas will be either in a flat dry area away from watercourses, or be protected by the addition of cut off drains above the storage areas to minimise the ingress of water.

The use of peat and soil stockpiles will be minimised by earthworks planning. However, where stockpiles are used, silt fences and silt mats will be employed to minimise sediment levels in run-off.

All stockpiled material will be stored at least 50 m from watercourses in order to reduce the potential from sediment to be transferred into the wider surface water system and will be regularly inspected to ensure that erosion of the material is not taking place.

An example of a stockpile / overburden and the installation of drainage ditch to divert run-off from the stockpile material is shown in Plate 5.

Plate 5: Typical Stockpile

In accordance with BS 3882 'Specification for Topsoil and Requirements for Use'[22], any long-term stockpiling of topsoil should not exceed 2 m in height with a maximum side slope of 1 in 2. In its dry non plastic state, topsoil can be stockpiled in a 'loose tipped' manner and tracked in a compactive method reducing water ingress. Wetter soils can be stored in windrows for drying and later stockpiled for re-use. The re-wetting of peat will be carried out, if there is a potential risk of the peat drying out. Mineral and peat soil stockpiles will not be allowed to dry out.

Loose materials such as crushed rock and stone will be prevented from entering watercourses through the employment of sediment pollution prevention measures in areas of loose material storage or generation, as outlined in Section 7.6.

7.5.5 Discharge of Water

Discharge of water from the Site will depend on the water environment on site and the quality of the final discharge. This section considers the discharge of surface water drainage to the water environment and does not consider foul drainage from substation and construction compound welfare facilities.

7.5.5.1 Discharge to Sewer

Discharge to foul sewer requires permission from Scottish Water. Scottish Water's starting position is that no new surface water connections to combined/ foul sewer will be accepted.

Scottish Water prefer that surface water is re-used on site where practicable, drained into a SuDS system, drained to ground through soakaway or to an existing watercourse and notes that pumping of water to one of these outlets may be required.

[22] https://knowledge.bsigroup.com/products/specification-for-topsoil

Where it is not practicable to discharge to SuDS, ground or watercourse, surface water may be drained to a combined/ surface water sewer and requires enquiry and an application to Scottish Water.

Further details are provided in Scottish Water Surface Water Policy advice note and guidance[23] and GPP4.

7.5.5.2 Soakaway

Water contaminated with fine silt only can be discharged to vegetated surfaces and required permission from SEPA and landowner.

Irrigation techniques, which may include the use of perforated discharge hoses or similar, will be employed to rapidly distribute discharge across a vegetated slope. This will be carried out in consultation with the EnvCoW.

Details on typical infiltration rates of soil types are provided in GPP5.

7.5.5.3 Drain to watercourse or SUDS system

Treated water can be discharged to watercourse via SuDS. The discharge water must be in line with the baseline water quality and conveyance capacity of the receiving water.

Methods of on-site sediment and chemical pollution prevention and water treatment are outlined in Section 7.6 and Section 7.7.

Authorisation from SEPA is required for discharge of water from the Development to the water environment, as detailed in Section 7.3.

7.5.5.4 Tanker off site

Water which cannot be treated on site and is not of a quality which can be released to water environment, will need to be tankered off site for appropriate treatment and disposal.

7.5.6 Provision for Storm Events

The Site is not at risk from flooding. In extreme storm events, there would be elevated levels of run-off from the hardstanding elements of the Development relative to greenfield flow rates, which has the potential to contribute to down-stream, off-site, flood risk.

In the baseline scenario, the water table is not at the ground surface, and hence some infiltration would be expected. Measures are proposed in this document that would limit run-off rates in Section 7.6.5.

Temporary storage volume for storm run-off from the turbine foundations and crane hardstanding areas would be provided via settlement lagoons, further details of which are provided in Section 7.6.5.

Along the access tracks, drainage channels on the down-slope would shed track run-off to adjacent rough ground approximately every 30 m, to attenuate flow and allow natural filtration to remove sediments. In areas within 50 m of a flow or, where cross-slopes exceed 1 in 20, drainage channels will be bunded and outflow will be monitored daily in areas with on-going construction activity.

7.6 SEDIMENT POLLUTION PREVENTION

Sediment pollution and release of excess sediments can result in detrimental effects to fish spawning habitats by covering the stream bed. Mitigation measures should minimise mobilisation and release of sediments to the water environment. Water polluted by sediments are not allowed to leave the site untreated and the final discharge from the site must have acceptable levels of sediment (in line with baseline levels).

Major construction works will be minimised during heavy precipitation events.

Sediment pollution prevention is to be employed in line with the following best practice guidance:

[23] Scottish Water (2018) Surface Water Policy: Standard advice note and process guidance [Online] Available at: https://www.scottishwater.co.uk/help-and-resources/document-hub/business-and-developers/connecting-to-our-network (Accessed: 01/04/2025)

- SEPA WAT-SG-26: Good Practice Guide – Sediment Management[24];
- SEPA WAT-SG-78 Sediment Management Authorisation[25]; and
- CIRIA C648 – Control of water pollution from linear construction projects[26];
- CIRIA C352 – Control of water pollution from construction sites [27]; and
- GPP5: Works and maintenance in or near water[28].

Best practice methods of sediment management and pollution prevention, and required authorisation are outlined in the following sections.

7.6.1 Authorisation

Under CAR Regulations authorisation is required for all sediment management works within inland surface water and surface water dependent wetlands.

The levels of authorisation are GBR, Registration or Licence and the required level is based on the environmental risk at the Site. More details are provided in SEPA guidance documents WAT-SG-78 Sediment Management Authorisation and WAT-RM-02 Regulation of Licence level Engineering Activities[29].

The appropriate level of authorisation will be obtained prior to the construction phase.

7.6.2 Silt Traps and Silt Matting

Purpose

Silt traps may be utilised to trap, temporarily store and filter sediment-laden run-off from excavation works at the Development, including turbine bases and access roads. This is to prevent discharge of silt-laden waters to watercourses or ground.

Installation

Silt traps and matting have a limited effective flow capacity and must be installed with the peak river flow plus a climate change allowance of an increase capacity of 40 % in the North Highland Scotland catchment in accordance with SEPA climate change allowances for flood risk guidance.

Silt traps and matting are to be installed at the following locations:

- Within drainage ditches but will be sited to avoid slopes with a gradient greater than 1 in 20;
- At the inlet (sump) or outlet side of culverts; and
- At the outfall of settlement lagoons to filter sediment during times of heavy rainfall as shown in Plate 6.

[24] SEPA (2010) *WAT-SG-26: Engineering in the water environment: good practice guide – Sediment management* [Online] Available at: https://www.sepa.org.uk/regulations/water/pollution-control/pollution-control-guidance/ (Accessed: 01/04/2025)
[25] SEPA (2012) *Supporting Guidance (WAT-SG-78) Sediment Management Authorisation v1* [Online] Available at: https://www.sepa.org.uk/regulations/water/pollution-control/pollution-control-guidance/ (Accessed: 01/04/2025)
[26] CIRIA (2006) *C648: Control of water pollution from linear construction projects: Technical Guidance* [Online] Available at: https://www.ciria.org/Search?SearchTerms=c648 (Accessed: 01/04/2025)
[27] CIRIA (2001) *C532: Control of water pollution from construction sites: Guidance for consultants and contractors* [Online] Available at: https://www.ciria.org/ItemDetail?iProductCode=C532D&Category=DOWNLOAD (Accessed: 01/04/2025)
[28] NetRegs (2017) *GPP5: Works and maintenance in or near water* [Online] Available at: https://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf (Accessed: 01/04/2025)
[29] SEPA (2019) *WAT-RM-02 Regulation of Licence Level Engineering Activities* [Online] Available at: https://www.sepa.org.uk/regulations/water/engineering/engineering-guidance/ (Accessed: 01/04/2025)

Plate 6: Silt matting

Maintenance

The silt traps and silt matting will be monitored by the EnvCoW and should be cleared regularly and replaced when necessary.

7.6.3 Silt Fencing

Purpose

Silt fencing is a widely used form of silt trapping and provides a linear barrier for installation upstream of watercourses and lochs. Silt fences are cost-effective and practical methods of attenuating storm water run-off and intercepting sediment and silt.

Installation

Silt fences are a semi-permeable geotextile fabric arranged in the form of a fence (attached to timber posts) as shown in Plate 7.

Silt fences are to be used as perimeter controls on the site at the downslope end of earthworks or disturbed soils, and at watercourse crossings as shown in Plate 4. They should be used in conjunction with other sediment and water treatment solutions where required.

To comply with best practice, they should be installed as follows:

- Installed perpendicular to the gradient of the slope;
- Construct a trench on the up-gradient side;
- Install stakes on the down-gradient side; and
- Position with a curve to the end of the fence in the up-gradient direction to help capture surface run-off as shown in Plate 7.

Silt fences should not be installed in the following:

- Within drainage ditches or channels; and / or
- Running parallel to the direction of slope.

Plate 7: Typical silt fencing

Maintenance

Silt fencing will be monitored by the EnvCoW and should be cleared regularly of sediment and silt build-up, and after heavy rainfall and storm events. Silt fencing should be replaced when necessary.

7.6.4 Check Dams

Purpose

Check dams will facilitate the settlement of suspended solids by slowing the flow of water within the drainage ditches. An example of a typical check dam is shown in ***Plate*** 8.

Installation

Check dams will be installed within drainage ditches at regular intervals, where appropriate. Appropriately sized stone pitching will be used within the dam in order to provide a rough surface for water within the drainage ditch to pass over.

Plate 8: Check dam example

7.6.5 Settlement Lagoons

Purpose

Retention of contaminated water to allow for the settlement of silt and sediments to an acceptable level (in line with baseline level) prior to discharge to the water environment.

Installation

Settlement lagoons and retention ponds will be implemented where appropriate adjacent to turbine, access track and borrow pit excavations. The proper locating and management of settlement lagoons and retention ponds is essential. They will not be sited within vulnerable wetland areas where they may cause drying out and direct loss of habitat. The locations of settlement lagoons and retention ponds would be set out with the ECoW at agreed offsets from watercourses and sensitive areas on site prior to any excavations commencing.

Settlement lagoons should be installed so as to retain water long enough for silt to settle out. The length of time required will depend on the type of silt with finer silts and clays taking longer to settle.

Further measures may include the use of flocculent to further facilitate the settlement of suspended solids. The appropriateness of flocculent use must be discussed with SEPA prior to its introduction into settlement lagoons. Flocculants can be pollutants if the incorrect dosage is used. Further guidance on the required dimension of settlement lagoon are provided in GPP5.

To comply with best practice, they should be installed as follows:

- Install energy dissipation methods (e.g. rip-rap) at the inlet to minimise flow;
- Install inlet pipe work vertically to dissipate energy of flow in;
- Install a lined inlet chamber and outlet weir with materials such as geotextiles;
- Install a long outlet weir; and
- Install two or three lagoons in a series to increase silt retention and storage as shown in Plate 9.

Plate 9: Typical Settlement lagoons

Maintenance and Operation

Settlement lagoons should be inspected regularly by the EnvCoW to ascertain the functionality of the system. To comply with best practice, the following maintenance measures are to be conducted:

- All settlement lagoons will be actively managed to control water levels and ensure that any run-off is contained, especially during times of rainfall;
- A constant pumped inlet rate should be maintained;
- Inlet chamber should be emptied of silt regularly; and
- Discharge quality to be monitored frequently.

Settlement lagoon outflow discharge may be pumped, when required, for maintenance purposes. A ‘Siltbuster’ is a method of pumping excess silt-laden water and treated prior to discharge, as shown in Plate 10.

Plate 10: Settlement lagoon and Siltbuster pumping out water for treatment

Any pumping activities will be supervised and authorised by the Principal Contractor's Project Manager.

Methods for discharge of outflow water from a settlement lagoon are detailed in the following section.

7.7 CHEMICAL POLLUTION PREVENTION

Pollution from fuels and other chemicals can cause a variety of detrimental effects to freshwater ecology and can lead to loss of aquatic flora and fauna. Cement pollution and concrete wash-out can lead to increases in alkalinity and rase the pH of watercourses, which can be toxic to aquatic flora and fauna.

Chemical pollution prevention is to be employed on site in line with best practice guidance, including the following:

- SEPA Groundwater protection policy for Scotland (Section F)[30];
- SEPA WAT-SG-31: Special Requirements for Civil Engineering Contracts for the Prevention of Pollution[31];
- SEPA WAT-SG-32: SEPA Guidance on the Special Requirements for Civil Engineering Contracts[32];
- CIRIA Control of Water Pollution form Construction Sites (C532)[33];
- GPP5: Works and maintenance in or near water[34];
- GPP8: Safe storage and disposal of used oils[35];
- GPP13: Vehicle washing and cleaning[36];

[30] https://www.sepa.org.uk/media/60033/policy-19_groundwaternov09.pdf
[31] SEPA (2006) *WAT-SG-31: Prevention of pollution from Civil Engineering Contracts: Special Requirements Version 2* [Online] Available at: https://www.sepa.org.uk/regulaions/water/pollution-control/pollution-control-guidance/ (Accessed: 01/04/2025).
[32] SEPA (2006) *WAT-SG-32: Prevention of pollution from Civil Engineering Contracts: Guidelines for the Special Requirements Version 2* [Online] Available at: https://www.sepa.org.uk/regulations/water/engineering/engineering-guidance/ (Accessed: 01/04/2025)
[33] CIRIA (2001) *C532: Control of water pollution from construction sites – Guidance for consultants and contractors*
[34] NetRegs (2017) *GPP5: Works and maintenance in or near water* [Online] Available at: https://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf (Accessed: 01/04/2025)
[35] NetRegs (2017) *GPP8: Safe storage and disposal of used oils* [Online] Available at: https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/gpp-8-safe-storage-and-disposal-of-used-oils/ (Accessed: 01/04/2025)
[36] NetRegs (2017) *GPP13: Vehicle washing and cleaning* [Online] Available at: https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/gpp-13-vehicle-washing-and-cleaning/ (Accessed: 01/04/2025)

- PPG18: Managing fire water and major spillages[37];
- GPP21: Pollution incident response planning[38];
- GPP22: Dealing with spills[39]; and
- GPP26: Safe storage – drums and intermediate bulk containers[40].

To reduce the potential for a chemical pollution incident, areas of high-risk activities are to be located away from watercourses and drainage paths. Areas of high risk include:

- Fuel and chemical storage;
- Refuelling areas;
- Material stockpiles;
- Vehicle and equipment washing areas; and
- Site compounds/parking areas.

7.7.1 Storage of Chemicals and Oil

Potentially contaminating chemicals stored on site will be kept within a secure bunded area to prevent any accidental spills from affecting hydrological resources. The bunded area will be within the construction compound and will be underlain by an impermeable ground membrane layer to reduce the potential pathways for contaminants to enter watercourses and groundwater.

Oil storage areas will be covered in order to prevent rainwater collecting within the bunded area.

The chemicals storage area would be kept secure to prevent theft of vandalism. A safe system for accessing the storage area would be implemented by the Principal Contractor.

The following measures should be employed under best practice guidance for storage of chemicals and oils:

- Storage tanks (above or below ground) should have sufficient strength and structural integrity to hold without leak or burst and bunded in accordance with SEPA guidance, and double-skinned tanks should be used for list I substances;
- Storage containers should have a minimum design life of 20 years; and
- All storage containers are closed and locked when not in use.

Chemical storage areas are to be removed from Site as part of decommissioning, any remnant in-situ storage facilities must be appropriately maintained and monitored for degradation and release of oils or chemicals.

7.7.2 Spillage of Chemicals and Oil

The construction compound will have a bunded area and this area will be underlain by an impermeable ground membrane layer. The bund will have a capacity of 110 % of the stored liquid containers (including fresh concrete). This will reduce the potential for accidental spillages to contaminate surface water or groundwater.

Best practice guidance on the prevention of spillages of chemical outlines the following measures:

- Areas where transfer and handling of chemicals is to occur should have impermeable surface;
- Drainage systems onsite should be designed to enable the containment of spillages and appropriate disposal and treatment; and
- Emergency procedures are implemented for a spillage incident and leak detection measures (if appropriate);

[37] NetRegs (2000) *PPG18: Managing water and major spillages* [Online] Available at: https://www.netregs.org.uk/media/1674/ppg-18.pdf (Accessed: 01/04/2025)
[38] NetRegs (2017) *GPP21: Pollution Incident Response Planning* [Online] Available at: https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/gpp-21-pollution-incident-response-planning/ (Accessed: 01/04/2025)
[39] NetRegs (2017) *GPP22: Dealing with spills* [Online] Available at: https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/gpp-22-dealing-with-spills/ (Accessed: 01/04/2025)
[40] NetRegs (2017) *GPP26: Safe Storage – drums and immediate bulk containers* [Online] Available at: https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/gpp-26-safe-storage-drums-and-intermediate-bulk-containers/ (Accessed: 01/04/2025)

- Regular maintenance and inspection of chemical storage facilities to be conducted (may be carried out by onsite EnvCoW); and
- Provision and training in the use of spill kits, as outlined below.

An appropriately sized spill kit(s) will be provided, maintained and located at strategic points across the site, as shown in Plate 11. This will contain materials, such as absorbent granules and pads, absorbent booms and collection bags. These are designed to halt the spread of spillages and will deployed, as necessary, should a spillage occur elsewhere within the construction compound.

Plate 11: Spill kit provision on site

Speed limits for vehicles transporting concrete will be set at a maximum of 15 miles per hour (mph) and will be monitored. Maximum vehicle load capacities will not be exceeded. Although tracks will be maintained in good condition, vehicle loads will be reduced when a rougher surface is identified prior to track maintenance.

All maintenance and operation of machinery, and use of chemicals and oils on site, will be conducted on suitable absorbent spill pads to minimise the potential for groundwater and surface water pollution. All machinery will be equipped with drip pans to contain minor fuel spillage or equipment leakages.

Appointed refuelling personnel will be trained in the correct methods of refuelling on site to ensure that pollution incidents are prevented and a quick response plan is implemented, should a spill occur, to minimise the impact of spills.

Regular vehicle and machinery maintenance will be conducted to ensure that there is minimal potential for fuel or oil leaks / spillages to occur.

Plates 12 and 13 show examples of drip trays and bunds.

Plate 12 and Plate 13: Drip trays and pads to limit uncontained chemical spillages

7.7.3 Concrete, Cement and Grout

Concrete, cement and grouts which are batched and transported on site will be subject to the same requirements as outlined in Section 7.7.1.

To comply with best practice, concrete, cement and grout mixing and washing areas should:

- Be sited in an impermeable hardstanding or geotextile within a designated area;
- Be sited at least 10 m from any watercourse or surface water drain, rock outcrop or sinkhole;
- Install settlement and re-circulation systems for water re-use in the batching process to minimise water use, treatment requirements and risk of pollution;
- Designated and contained washing areas for batching plant and vehicles; and
- Collect contaminated wash waters which cannot be reused and discharge to foul sewer or tanker off-site (further details of discharge of water is provided in Section 7.5.5). Contaminated water should never be released to the water environment.

To prevent pollution, it is important that all concrete pours are planned and that specific procedures are adopted where there may be a risk of surface water or groundwater contamination, in accordance with CIRIA C532. These procedures will include:

- Ensuring that all excavations are sufficiently dewatered before concrete pours begin and that dewatering continues while the concrete cures. However, construction good practice will be followed to ensure that fresh concrete is isolated from the dewatering system;
- Using blinding concrete layer to ensure a quick curing process;
- Ensuring that covers are available for freshly placed concrete to avoid the surface of the concrete washing away during heavy precipitation;
- Using an impermeable geotextile wrapping layer around the foundation - i.e. line the shuttering with the geotextile layer, therefore limiting the contact between acidic
- groundwater / near-surface water and the foundation;
- Treating the outer concrete with a protective layer; and
- Choosing the right concrete composition to make it as impermeable as possible (using limestone as the aggregate makes the concrete more resistant to acids e.g. Portland cement).

Typical foundation shuttering is shown in Plate 14.

Plate 14: Shuttering for concrete foundation (wind turbine base)

7.7.4 Vehicle Washing

There will be a wash-out facility within the construction area consisting of a sump overlain with an impermeable geosynthetic membrane. The geosynthetic membrane will filter out the concrete fines leaving clean water to pass through to the sump. The sump water will be pumped to a licenced carrier and taken off-site for approved disposal.

No washing of concrete-associated vehicles will be undertaken outside the wash out facilities, and the area will be signposted, with all site contractors informed of the locations.

The frequency of concrete plant washout may also be reduced through the use of retarders.

Plate 15 displays a typical concrete wash-out facility.

Plate 15: Concrete wash-out facility

In the event that plant and wheel washing is required, dry wheel wash facilities and road sweepers will be provided to prevent (as far as is practicable) mud and debris being carried from within the site onto the public road.

Signage will be put in place to direct all plant vehicles to use wheel wash facilities. The track section between the wash facility and the public road will be surfaced with tarmac or clean hardcore and the area surrounding the facilities will be kept clean and in good condition.

The wheel wash facility, which will work on a closed cycle, shall be operated throughout the construction period. Wheel wash facilities will be located within a designated area of hardstanding at least 50 m from the nearest watercourse or 20 m from the nearest surface drain. It is expected that these facilities shall be sited adjacent to the site entrance. An example of a dry-ramp wheel wash facility is shown in Plate 16.

Should debris be spread onto the site access or public road adjacent to the wind farm, then road sweepers will be quickly utilised to clean affected areas. Loose debris will also be

periodically removed from on-site tracks. All HGVs taking construction materials to and from the site will be sheeted to prevent the spillage or deposit of material on the highway.

Plate 16: Vehicle wheel wash facility

7.8 ACTIVITIES IN THE WATER ENVIRONMENT

Temporary activities related to construction phase works within the water environment include construction of permanent watercourse crossings,

7.8.1 Authorisation

Engineering activities within the water environment, including construction of watercourse crossings, culverting, diversions and dewatering requires authorisation under the CAR.

7.8.2 Watercourse Diversions

Temporary watercourse diversions may be required to allow for construction works to be conducted on the banks of a watercourse, within wetlands or a watercourse channel. The requirement for this should be avoided and designed out where possible.

Where required, watercourse diversions are to be installed in line with the following best practice guidance:

- SEPA WAT-SG-29: Temporary Construction Methods[41];
- Isolation of a watercourse to allow works may be in the following good practice methods:
- Partial isolation (cofferdam);
- Partial isolation (cassion);
- Full isolation (temporary diversion);
- Full isolation (gravity / flume pipe); or
- Full isolation (over-pumping / siphon).

[41] SEPA (2009) WAT-SG-29: *Engineering in the Water Environment Good Practice Guide: Temporary Construction Methods First Edition* [Online] Available at: https://www.sepa.org.uk/media/150997/wat_sg_29.pdf (Accessed: 01/04/2025)

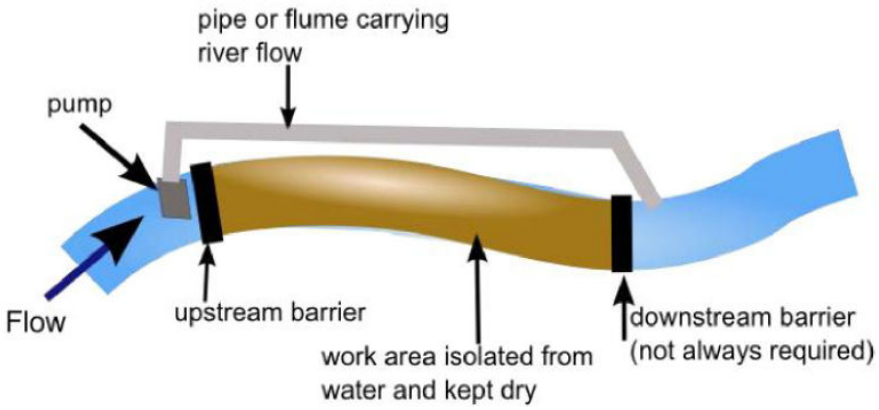
Full isolation: over-pumping / siphon

Allows for a whole section of the channel to be isolated, and water is diverted downstream using a pump or siphon in order to retain hydrological continuity. This temporary diversion may be utilised prior to establishing a long-term watercourse diversion for permanent infrastructure within watercourses.

The section of the watercourse requiring diversion will be isolated using barriers that span the full width of the existing watercourse. This keeps a stretch of the watercourse dry and the water is transferred downstream of the works area by mechanical assistance (pumping), until a long-term diversion is operational.

The pump and associated pipework need not be located in the isolated area, as shown in Plate 17.

Plate 17: Typical over pumping arrangement[41]



It may be necessary to pump water from upstream of the barrier to downstream of the works area, i.e., maintain 'normal' flow in the watercourse either side of the isolated reach. Depending on the gradient of the watercourse, it may also be necessary to install a full width barrier downstream of the work area to prevent ingress of water, as shown in Plate 18.

Plate 18: Watercourse Diversion (Full isolation – over pumping)[41]

Pumps will be kept at least 10 m from the edge of the channel and on drip trays or within bunds that have a capacity 110 % of that of the fuel tank.

7.8.3 Watercourse Crossings

The crossing of watercourses is to be avoided in the design where possible. Existing culverts and watercourse crossings, if any, may be upgraded and anticipated to be replaced with suitable pre-cast culvert designs.

Where required to be installed, watercourse crossings should be designed in order to minimise effects of proposed developments on the natural integrity and continuity of watercourses. The following best practice guidance should be used:

-
- SEPA WAT-SG-25 River Crossing – Good Practice Guide[42];
- SEPA WAT-PS-06-02: Culverting watercourses43; and
- CIRIA C689: Culvert design and operation guide[44].

Pre-installation

Identification of ecological requirements and limiting factors (e.g. breeding birds and fish spawning) should be conducted prior to installation of a watercourse crossing. The EnvCoW should be consulted before watercourse crossing construction can commence.

The hydraulic capacity of the crossing is to be assessed and constructed peak river flow plus a climate change allowance of 40 % in the North Highland Scotland catchment in accordance with SEPA climate change allowances for flood risk guidance. Further information on the hydraulic capacity of a watercourse crossing or culvert is outlined in SEPA River Crossing – Good Practice Guide.

Watercourse crossings should not be installed in 'active' areas of a watercourse e.g. meandering bends and depositional areas.

Consideration should be given to the type of watercourse crossing acknowledging that hard engineering structures, such as concrete culverts, can make it more difficult to restore a site or decommission temporary structures e.g. access tracks. Single span bridges or bridges with an in-stream support should be used for large watercourse crossings and culverts for smaller scale crossings. Further details on the type of culvert to use is provided in Section 7.8.4.

Installation

The use of in-situ fresh concrete in the construction of watercourse crossings will be avoided where possible by the use of pre-cast elements. Watercourse crossings will be installed perpendicular to the direction of flow.

Twenty-three new watercourse crossings are required for the Development. It is anticipated the following type of watercourse crossings are to be installed on Site:

- Ready-made bottomless arched concrete or plastic piped culverts.

However, in accordance with best practice guidance, each watercourse crossing shall be designed on a case by case basis to be appropriate for the width of watercourse being crossed, and the prevailing ecological and hydrological situation (i.e. the sensitivity of the watercourse). A number of factors, both environmental and engineering will influence the selection of structure type and the design of the crossing.

All watercourse crossings should be installed in line with SEPA WAT-SG-25 River Crossing good practice guide. General good practice in watercourse crossing design and construction will ensure that site conditions are taken into account and the objectives of the CAR are achieved. These include:

[42] SEPA (2010) *WAT-SG-25 Engineering in the water environment: good practice guide. River Crossings.* [Online] Available at: https://www.sepa.org.uk/media/151036/wat-sg-25.pdf (Accessed: 01/04/2025).
[43] SEPA (2015) *WAT-PS-06-02: Culverting of Water courses - Position Statement and Supporting Guidance* [online] Available at: https://www.sepa.org.uk/media/150919/wat_ps_06_02.pdf (Accessed: 01/04/2025).
[44] CIRIA (2010) *C689: Culvert design and operation guide* [Online] Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C689F&Category=FREEPUBS (Accessed: 01/04/2025)

- The use of appropriate structures to carry access tracks across watercourses taking into account the scale of the watercourse, ecological value, sensitivity to construction activities, topography and construction methodology;
- There is a preference to avoid construction in watercourses altogether through the use of arch culverts appropriately designed not to impede the flow of water and allow safe passage for wildlife, such as fish, water voles, otters etc. However, short- and long-term impact of designs should be considered, and there can be a case for using pipe or box culverts;
- When installing culverts, care will be taken to ensure that the construction does not pose a permanent obstruction to migrating species of fish, or riparian mammals (i.e. the crossings will make provision for fish and wildlife migration);
- Culverts should be sized so that they do not interfere with the bed of the stream post construction, (i.e. the crossings will leave the watercourse in as natural condition as possible or permit re-establishment of substrate post construction);
- Single culverts will be used in preference to a series of smaller culverts that may be more likely to become blocked with flotsam and create erosion (i.e. the crossings will not constrict the channel);
- Although no fish have been recorded within the tributaries running through the Site, if any fish are found during the construction of any culverts, they will be removed from the immediate construction site to a place of safety if deemed necessary after consultation with the relevant fisheries interest;
- To minimise impacts on the breeding of any fish found, any in-stream works in these areas will be conducted during months which have less impact on their breeding and Development, where possible;
- Ease and speed of construction are important to minimise disruption to the watercourse and surrounding habitat;
- Culverts and headwalls should be designed to last the operational life of the Development;
- Designs should be low maintenance and where possible self-cleansing; and
- Structures should be visually in keeping with the surroundings.

Maintenance

Erosion to the bed and banks at a watercourse crossing as a result of scouring can occur during high rainfall and storm events. Erosion can expose span structure foundations and/ or cause a drop forming at the outlet of the watercourse crossing.

If this occurs, the inclusion of erosion protection measures may be required, such as baffles. The crossing should be reinstated and reinforced to allow for scour during higher flows. The crossing should be reinstated to allow for fish passage and continuity of the watercourse bed. If this is not possible, inclusion of a fish pass may be required.

If maintenance works are required within the watercourse bed, then isolation of the watercourse is required, as detailed in Section 7.8.2, and authorisation from SEPA may be required.

Culverts are prone to blockage by debris and may require routine clearing.

7.8.4 Culverts

Culverts are used to create artificial channels and allow for the continuity of water drainage and balance upstream and downstream of infrastructure associated with the Development e.g. access tracks.

Closed culverts for river crossings would only be justified for single track roads over small watercourses (<2 m wide). Closed culverts are sufficient for cross-drainage under an onsite access track, as outlined in Section 7.5.3.

Bottomless arch culverts and box culverts should be used for all culverts over watercourses of 2 m or greater in width.

Culverts will be installed and designed in line with best practice guidance, including CIRIA C689, and incorporate the following criteria:

- Culverts will be well bedded to avoid settlement and protected by an adequate cover of road material;
- The substrate and side/ head walls will be reinforced in order to prevent erosion;
- The culverts will be designed such that it does not cause a barrier to movement of fish or other aquatic fauna;
- Culvert floors will have the same gradient (not exceeding a slope of 3 %) and level, and carry similar bed material and flow, as the original stream;
- There shall be no hydraulic drop at the culvert inlet or outlet;
- The width of the culvert will be greater than the active channel width of the watercourse;
- The culvert must not exacerbate or create flooding;
- Culverts will be used to conduct water under the wind farm tracks;
- Any fences or screens fitted on the inlet or outlet of the culvert will be designed to allow at least 230 mm of space between the bars of the screen of fence, up to the high-water level;
- A natural stone headwall will be provided upstream and downstream of culverts to protect the road embankment. Further protection will be provided to the banks using soft engineering techniques as much as possible; and
- Where there is risk of bed erosion upstream or downstream of culverts, natural stone rip-rap will be provided.

7.8.5 Dewatering

Dewatering may be required for excavations or construction of foundations. Dewatering is regulated under CAR GBR15 if less than 10 m^3 per day.

Dewatering should be employed in line with the following best practice guidance:

- SEPA WAT-SG-29: Temporary Construction Methods;
- SEPA Good Practice Guide WAT-SG-28: Intakes and Outfalls[45]; and
- SEPA Regulatory Method WAT-RM-11: Licensing Groundwater Abstractions including Dewatering[46].

If the dewatering volume is greater than 10 m^3/ day, a CAR licence is required and SEPA WAT-RM-11 is to be referred to. Discharge of water as a result of dewatering must not cause further erosion and energy dissipation measures should be put in place as outlined in SEPA WAT-SG-28 guidance.

[45] SEPA (2019) *WAT-SG-28: Engineering in the Water Environment Good Practice Guide: Intakes and outfalls Second Edition* [Online] Available at: https://www.sepa.org.uk/media/150984/wat_sg_28.pdf (Accessed: 01/04/2025)
[46] SEPA (2017) *WAT-RM-11: Regulatory Method: Licensing Groundwater Abstractions including Dewatering* [Online] Available at: https://www.sepa.org.uk/media/151997/wat-rm-11.pdf (Accessed: 01/04/2025)

7.9 MEASURES TO PROTECT GROUNDWATER DEPENDENT TERRESTRIAL ECOSYSTEMS (GWDTE)

Foundations, borrow pits and linear infrastructure such as roads, tracks and trenches can disrupt groundwater flow. If carried out in close proximity to GWDTE, construction activities can have adverse effects on these receptors.

Measures to protect GWDTE are based on mitigation and good practice, similar to those outlined already in this document, as well as avoidance of GWDTE habitats during design. The following guidance document(s) are used to inform protection of GWDTE habitats:

- SEPA LUPS-GU-31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems[47].

The following measures will ensure that water quality and the flow supply of groundwater and near-surface water are maintained during the construction and operational phase of the Development.

Key measures include the following, which are detailed elsewhere in Section 7 of this oCEMP:

- Silt traps may be deployed to trap and filter sediment-laden run-off throughout the construction phase of the Development;
- Settlement lagoons may be constructed and actively managed to control water levels and ensure that any runoff is contained, especially during times of rainfall. The location and management of the settlement lagoons is essential and will not be sited within vulnerable wetland areas where they may cause drying out and direct loss of habitat;
- Flush areas, depressions or zones which may concentrate water flow, will be identified in advance of construction and a suitable drainage design shall be developed to address each location, to ensure hydraulic connectivity;
- Site drainage design will avoid any severance of saturated areas to ensure hydrological connectivity is maintained. Site drainage design will be produced in advance of construction;
- The length of time excavations are kept open and the duration of any dewatering will be minimised;
- All excavations will be sufficiently dewatered before concrete pours begin and that dewatering continues while the concrete cures. However, construction good practice will be followed to ensure that fresh concrete is isolated from the dewatering system; and
- Water from dewatering activities are generally treated by settlement lagoons and will be discharged onto vegetated surfaces, ensuring no net loss of water from the hydrological system. If ponding of water is observed during the discharge onto vegetated surfaces, additional measures may be employed.

While several NVC communities were noted during the NVC survey, they were considered to be ombrotrophic in nature, meaning that they are rain-fed as opposed to being supported by groundwater. This was due to them either being found in flatter topography where surface water and near-surface water drain and pool.

[47] SEPA (2017) Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (LUPS-GU-31) [Online] Available at: https://www.sepa.org.uk/media/143868/lupsgu31_planning_guidance_on_groundwater_abstractions.pdf (Accessed: 08/07/2025)

7.10 WATER QUALITY AND FISH MONITORING PROGRAMME

Surface water monitoring would be undertaken at locations on the principal watercourses downstream of the Development infrastructure and upstream of other non-natural influences (i.e., control points), where possible.

Regular visual inspections of surface watercourses are proposed, especially during major excavation works, as these allow rapid identification of changes in levels of suspended solids that could indicate construction related effects are occurring upstream. Potential effects can then be investigated and remedial action taken to prevent further effects, if necessary.

To supplement the visual inspections, it is anticipated that there would be a number of surface water monitoring points for extractive sampling and analysis. Details will be agreed with SEPA and Marine Scotland Science (MSS) at least three months in advance of construction.

The following sampling frequency is proposed in order to establish baseline hydro-chemical conditions of surface water constituents:

- Once every month for twelve months prior to the construction phase;
- The following sampling frequencies are proposed in order to monitor surface water conditions against baseline conditions:
  - Once a week during ground breaking works and concrete works, e.g., access track construction, turbine foundations;
  - Twice a month during minor construction works; and
  - Twice a month for three months then once a month for a further nine months during the post construction phase.

Establishing baseline conditions for surface waters will enable any trends in levels of critical parameters to be assessed and deviations from the norm identified and rectified through water management measures.

During activities, a programme of daily visual inspection of the watercourses, flow conditions (i.e. high, medium, low, or no flow), prevailing weather and any other pertinent observations, will be required to be implemented. The results should be recorded and the information submitted to Scottish Water (i.e. in a monthly progress report). This should be undertaken when water quality samples are taken if sampling has been agreed as necessary.

If required by consultees to the final version of the CEMP, that document will include proposals for fish monitoring.

8 CONTROL OF AIR QUALITY AND DUST

The following mitigation measures will be applied to minimise impacts to air quality from vehicles, machinery and plant during construction:

- All vehicles, plant and machinery are to be well maintained. If any emissions of dark smoke occur then the relevant machinery will stop immediately and any problems rectified;
- Engines will be turned off when not in use; and
- Vehicle movements to be in accordance with the measures to be set out in the Construction Traffic Management Plan, provided within the Transport Chapter (11) of the EIA Report for the Development.

Good practice measures will be adopted during construction to control the generation and dispersion of dust such that significant impacts on neighbouring habitats or receptors will not occur. The hierarchy for mitigation will be prevention, suppression then containment.

The following mitigation measures will be applied to ensure there are no impacts to air quality should dust be generated during construction:

- Use of enclosed chutes, conveyors and covered skips;
- Shielding of dust-generating activities;
- Covering vehicles carrying dry spoil and other wastes to prevent escape of materials;
- Provision of wheel washing and wet suppression during loading of wagons/vehicles;

- Daily visual inspections will be undertaken to assess the condition of any in-use junctions of the site tracks with public roads.
- Excavation and earthworks areas will be stripped as required in order to minimise exposed areas;
- During excavation works, drop heights from buckets will be minimised to control the fall of materials reducing dust escape;
- Completed earthworks and other exposed areas will be covered with topsoil and re-vegetated as soon as it is practical in order to stabilise surfaces;
- During stockpiling of loose materials, stockpiles shall exist for the shortest possible time;
- Material stockpiles will be low mounds without steep sides or sharp changes in shape;
- Material stockpiles will be located away from the site boundary, sensitive receptors, watercourses and surface drains;
- Material stockpiles will be sited to account for the predominant wind direction and the location of sensitive receptors;
- Water bowsers will be available on site and utilised for dust suppression during roadworks/ vehicle movements when and where required; and
- Daily visual inspections will be undertaken to assess need for use of water bowsers, with increased frequency when activities with high potential to generate dust are carried out during prolonged dry or windy conditions.

9 CONTROL OF IMPACTS ON SOILS

This section of the outline CEMP replicates the advice given in EIA Report Technical Appendix A12.2, Peat Landslide Hazard and Risk Assessment, section 4.2, Peat Management During Construction.

Whilst it is considered that the existing deep peat deposits will not be disturbed by the Development, it is considered important to outline an appropriate management plan to be followed in the event that peat or peaty soils are encountered during construction. The peat management is based on the SEPA Good Practice guidelines, stating that these should be followed if peat is to be reused or reinstated with the intention that the habitat it supports continues to be valuable. Peat reuse, reinstatement and / or restoration should always be considered where possible.

The main objectives of peat management are to outline how any peat if encountered is expected to be excavated and managed during the construction of the Development.

9.1 EXCAVATION

Where peat is excavated, the following should apply:

- Excavated peat should be excavated as turves, including the acrotelm (surface vegetation) and a layer of adjoining catotelm (humified peat) typically up to 300 mm thick in total, or as blocks of catotelm; the acrotelm should not be separated from its underlying peat;
- The turves should be as large as possible to minimise desiccation during storage;
- Contamination of excavated peat with substrate materials should be avoided; and
- Consider the timing of excavation activities to avoid very wet weather, to minimise the likelihood of excavated peat remoulding into peat slurry (with potential consequences off site).

9.2 STORAGE

Excavated peat can temporarily be stored, though consideration should be given to the risk of dehydration given that once it is dried, it will not rewet. The following should be adhered to when storing peat:

- No peat will be placed on access track verges where the local topography is steep and / or a watercourse is in close proximity;
- Peat turves should be stored in wet conditions, for example, within waterlogged former excavations, or should be irrigated in order to prevent desiccation. Peat should therefore be laid only to a thickness and slopes that maintains hydrological conditions and to prevent drying out. Peat will not be used as a thin layer or on steeper non-peat

slopes as this promotes dehydration. Low verges and landscaping will be formed to permit surface water to drain off the access tracks;
- Peat should be stockpiled in large volumes to minimise exposure to wind and sun which can lead to desiccation, but with due consideration for slope stability;
- Excavated topsoils should be stored on geotextile matting to a maximum of 1.00 m thickness;
- Stores of non-turf (catotelm) peat should be bladed off to reduce the surface area and desiccation of the stored peat;
- Peat storage areas and areas of steep peat should be monitored during periods of very wet weather, or during snowmelt, to identify early signs of peat instability

9.3 TRANSPORT

Movement of excavated turves should be kept to a minimum, and it is preferable to transport peat intended for translocation to its destination at the time of excavation. If vehicles that are used for transporting non-peat material are also to be used for peat materials, measures should be taken to minimise cross-contamination of peat soils with other materials.

9.4 REUSE AND RESTORATION

Reuse and restoration of the excavated / disturbed peat should be sought where possible as this will promote biodiversity, wildlife, and improves the carbon balance of the development.

The following is recommended:

- Reuse and restoration should be conducted concurrently with construction, rather than at its conclusion; and
- Reuse, restoration, and revegetation works should be undertaken outside winter months.

9.5 MONITORING

Where peat habitat restoration is to be implemented, monitoring might be required to ensure the restoration continues to have a positive impact on the habitat as this often is a slow process. Monitoring refers to the ongoing restoration measures and inspection of the integrity of the proposed scheme. This should be placed around major scheme components within peat to check for water table drawdown.

Settlement of floating tracks – if constructed – during and post-construction should also be monitored to determine if consolidation is occurring as expected, and to identify signs of lateral displacement. This would apply to the existing tracks thought to have been constructed above peat.

Comprehensive inspection and maintenance records should be kept for all floating tracks on site to enable reasons for track degradation to be identified.

There should be a commitment to the monitoring of rehabilitating peatland through the life of the Development, given the typical timescale for peat restoration projects to achieve their objectives (from 5 to 30 years).

10 CONTROL OF WASTE

During the construction phase, the reduction of the production of waste and use of recyclable materials are key considerations. The final CEMP will include a Site Waste Management Plan (SWMP), in accordance with the measures below.

The list below provides an indication of the likely waste streams:

- Waste from welfare and domestic facilities;
- Waste chemicals, fuels and oils; and
- Packaging.

The Waste Hierarchy[48] will be followed, and the Principal Contractor will be responsible for preparing a Site Waste Management Plan prior to the commencement of works.

Collection facilities for refuse will be provided to segregate waste. These facilities will be clearly marked, positioned in appropriate locations and protected from the weather and animals.

The production of waste can be reduced by applying the following measures:

- Using suppliers that produce the least amount of packaging;
- Correct handling and storage of materials to avoid damage and subsequent waste;
- Using reclaimed or recycled materials, if possible; and
- Reducing the potential for oversupply of materials by ordering at appropriate times.

The following measures will be applied to manage any waste produced at the Site.

10.1 WELFARE FACILITIES

During the construction phase, 'Porta-loo' type facilities, or equivalent, will be used and emptied by a waste contractor.

10.2 OTHER GENERAL REFUSE

Collection facilities for refuse will be provided to segregate waste. These facilities will be clearly marked, positioned in appropriate locations and protected from the weather and animals.

10.3 WASTE CHEMICALS, FUELS AND OILS

All fuel and oil will be stored within an area contained by a small bund lined with an impermeable membrane in order to prevent any contamination of the surrounding soils, vegetation and water table. Any contaminated run-off within the bund will be disposed of at an appropriate waste management facility.

Any used (contaminated) spill kits, absorbent granules, sheets or fibres must be disposed of in accordance with the Control of Substances Hazardous to Health (COSHH) regulations and in accordance with a Spill Management Plan.

10.4 PACKAGING

Construction waste generated is expected to be restricted to general construction waste, such as, wire, cleaning cloths, paper, etc. which will be sorted and either recycled or disposed of off-site to an appropriately licenced landfill by the Principal Contractor.

Packaging will be separated at the source of generation on site, where practical. This approach uses the Waste Hierarchy by encouraging reuse and recycling of materials, such as plastic, wood and paper.

10.5 WASTE METALS

Waste metals would be separated for recycling.

11 OTHER CONTROL MEASURES

11.1 EMERGENCIES AND MONITORING

The contractor will prepare a plan for a general response to emergency situations. The emergency contact details will be clearly displayed at all times on Site.

The contractor will prepare a list of all nearby stakeholders and receptors including residential properties, watercourses and other sensitive receptors that could be impacted by an environmental incident.

[48] DEFRA (2011) Guidance on Applying the Waste Hierarchy
https://assets.publishing.service.gov.uk/media/5a795abde5274a2acd18c223/pb13530-waste-hierarchy-guidance.pdf

To reduce the likelihood of an emergency incident arising, daily inspections will be carried out on Site. The daily inspection will report any non-compliance with the mitigation measures detailed in the CEMP and remedial action undertaken, where required.

11.2 SAFETY AND SECURITY

The contractor will have responsibility for applying all Health and Safety measures required on Site. This would include, but not be restricted to, ensuring all personnel visiting or working on the Site are wearing the appropriate Personal Protective Equipment (PPE), ensuring Site sign-in procedures are complied with and sharing any updates relating to Health and Safety.

The contractor shall have responsibility for undertaking and identifying utilities within and near to the Site. Appropriate measures will be put in place to safeguard these features, where appropriate.

Security fencing will be installed around the site during the construction period. During the operational phase, security fencing will be installed around the perimeter of the Site and CCTV cameras and motion-triggered lighting will also be positioned around the Site, facing into the Site for security purposes.