Environmental Impact Assessment Report

Swarclett Wind Farm

Technical Appendix 15-1: Outline Construction Environmental Management Plan

Swarclett Wind Energy Limited

June 2024

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Glossary of Terms

Term	Definition
The Applicant	Swarclett Wind Energy Limited
Environmental Advisors and Planning Consultants	Atmos Consulting Limited
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of carrying out, in a systematic way, an assessment of the likely significant environmental effects from a development.
Environmental Impact Assessment Regulations	The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations)
Environmental Impact Assessment Report	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Proposed Development	The Swarclett Wind Farm
The Proposed Development Footprint	The area within which the Proposed Development will be located
The Proposed Development Site	The full application boundary, i.e. the red line boundary (Figure 1-1 Site Location)

List of Abbreviations

Abbreviation	Description
AMP	Accident Management Plan
CAR	Controlled Activities Regulations
CEMP	Construction Environmental Management Plan
CMS	Construction Method Statement
CTMP	Construction Transport Management Plan
DIA	Drainage Impact Assessment
EIA	Environmental Impact Assessment
EnvCoW	Environmental Clerk of Works
ERP	Emergency Response Plan
GBR	General Binding Rules
GPP	Guidance for Pollution Prevention
GWDTE	Groundwater Dependent Terrestrial Ecosystems
HET	Historic Environment Team
HMP	Habitats Management Plan
THC	The Highland Council
SSPCA	Scottish Society for the Prevention of Cruelty to Animals
SEPA	Scottish Environment Protection Agency
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
SWMP	Site Waste Management Plan
WSI	Written Scheme of Investigation
WQMP	Water Quality Monitoring Plan

1 Introduction

This document presents an Outline Construction Environmental Management Plan (CEMP) for the proposed Swarclett Wind Farm (the 'Proposed Development').

The Outline CEMP provides the overarching environmental management principles that will be taken forward into all environmental management plans, supporting documents and method statements. As such it sets out the key 'threads' of environmental management that will be woven through the construction methods and practices during the construction phases for the Proposed Development.

It is intended to be read as an iterative document, which will be further developed with cognisance of the conditions on the deemed planning permission from the Highland Council (THC) and other relevant consultees. The Final CEMP will comply with the relevant terms of the consent and attendant planning conditions and other agreements and commitments made during the consenting process.

Subject to receipt of consent and deemed planning permission and sign-off of pre-commencement conditions; construction works are anticipated to commence in 2028 with a total duration estimated at approximately 12 months. The work would proceed in the phases as summarised in Table 15-1.

Table 15-1: Construction Programme

Phase	Summary of Works
Phase 1 (months 1 to 6); Enabling/Access Works and Civil Balance of Plant Works	Construction of new access routes from existing access tracks to the turbine locations. Establishment of site facilities, turbine foundations and turbine cabling.
Phase 2 (month 6 to 12); Development and Commissioning	Delivery of turbine components & installation with cranes. Testing and commissioning equipment and turbines.
Phase 3 (month 12); Reinstatement and Restoration	Removal of temporary facilities and re-instatement of temporary working areas. Restoration of working areas as set out in the Schedule of Mitigation and CEMP.

The Final approved CEMP documents will be incorporated into the Applicant's contract with the selected Contractor (as defined in the Construction (Design & Management) Regulations 2015). By doing that, the Contractor will be obliged contractually to adhere to the requirements of the plan. As part of the Contractor's prestart conditions, they will be required to produce a series of specific environmental risk assessments and management plans and detailed method statements for implementation at a construction level of detail.

The Final CEMP will incorporate the generic and site-specific mitigation measures identified during the EIA and reported in the EIA Report. These measures are listed in a Schedule of Mitigation Measures presented in the Schedule of Mitigation (Chapter 15) of the EIA Report.

The Outline CEMP has been structured to reflect the aspects of construction works that could potentially affect the environment as follows:

- Site Induction and Training;
- Transport and Access;

- Pollution Prevention;
- Materials employed to construct the access track and hardstanding will be of a sufficient grade/type so as not to easily breakdown as a result of construction traffic;
- The gradient of drainage ditches shall be kept as shallow as possible to avoid high velocities during storm events, check dams shall be installed at regular intervals along drain lengths to reduce velocities and encourage settlement of sediment particles;
- The length of track drainage shall be minimised and tracks shall be cambered to direct runoff to trackside drainage, which will lower water tables locally and prevent ponding;
- Access Tracks will undergo regular maintenance to keep them fully operational and to ensure there are no run-off issues onto the public road network;
- Inspections and cleaning of silt traps and sediment settlement tanks will be undertaken regularly to ensure they remain fully operational and effective;
- Temporary pumping of localised spring/groundwater from turbine bases shall be attenuated in bunded/impermeable settlement ponds and treated before being discharged to areas of ground capable of absorbing the water;
- Stockpiles of any excavated materials (fines in particular) shall be minimised in extent. The stockpiles shall be sited outwith 50m from any watercourse and outwith 10m from any installed/constructed drainage measures. Where practicable these stores will be sited on flat ground, enclosed within keyed in silt fencing and reinstated/covered over at the earliest possible opportunity;
- Destabilisation works, excavations, ground disturbance or stripping of vegetation and/or topsoil will be planned to be undertaken, where practicable, to avoid the local higher rainfall periods;
- Turves will be carefully handled, separated from other materials and reinstated within as shorter time period as possible;
- Any works shall be suspended during high rainfall events to minimise creation of sediment laden surface runoff and weather forecast information shall be utilised to plan the timing of excavation works; and
- Timing of works will be considerate to sensitive periods for fish fauna present within the watercourses, avoiding certain works during the important migratory and spawning periods for salmonids (typically October to mid-May).
- Chemical, fuel and oil storage will be undertaken within the site compound (>50m from watercourse and GWDTE); the store will be locked, sited on an impervious base within a secured bund of 110% of the storage capacity;
- Standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution to surface water and groundwater; any pumps to be used on site will be contained and incorporate internal drip trays with sufficient capacity for spillages;
- Refuelling of vehicles and machinery will be carried out on an impermeable surface in the site compound, or where not possible, a lockable mobile refuelling bowser (double skinned) will be used and operated by a designated person;
- An Accident Management Plan will ensure that emergency equipment is available on site (i.e., spill kits and absorbent materials) and advice is available on action to be taken in the event of a pollution incident;

- Only emergency maintenance to construction plant will be carried out on site, and will preferably be carried out in one designated area (the site compound);
- On-site toilet facilities will be located within the site compound and be adequately designed and maintained to ensure all sewage is disposed of appropriately, as per GPP4;
- As neutral a pH concrete as practicable will be used and any wash waters will be contained within suitable tanks for off-site disposal.
- Should concrete mixing be required batching will make use of appropriate buffers from any watercourses or drainage channels to prevent accidental escapes of liquid or slurries to the water environment;
- Wash out areas for concrete batching plant as well as the use of ready mixed concrete lorries should be located as far as practically possible from watercourses to provide a hydrological buffer on site;
- Wash down water arising from the washing of equipment that has come into contact with concrete must be collected in an impervious container; and
- Water usage on site will be minimised via the use of a settlement and recirculation system.
- Drainage Management;
- Groundwater Protection;
- Watercourse Crossings;
- Water Monitoring and Remedial Actions;
- Ecological Protection Measures;
- Construction Noise and Working Hours;
- Handling of Excavated Materials;
- Resource Management and Site Waste;
- Reinstatement and Restoration;
- Monitoring; and
- Environment Incident Response and Reporting.

2 Construction Environmental Management Process

NatureScot published *Good Practice During Wind Farm Construction* (NatureScot, 2019) which seeks to identify good practice and ensure wind farms are developed in a sustainable way. The guidance sets out recommendations for the following.

- Pre-construction planning;
- The use of Environmental Management Plans and Construction Method Statements (incorporating a Site Waste Management Plan);
- Using a Clerk of Works and other specialist advisors;
- Water Quality monitoring;
- Access tracks;
- Site drainage;
- Managing Recreational Access;
- Site infrastructure;
- Biosecurity and non-native invasive species;
- Post construction habitat management and restoration; and
- Seasonal considerations.

A key element of the guidance is the use of the CEMP and associated plans which should be available on site and used daily, which include relevant legislation and all relevant topics, and ensure aspirations and timings are achievable in practice.

Site Waste Management Plans and Ecological Management Plans such as Species Protection Plans should also form part of the CEMP and the Final CEMP should be developed in collaboration with the key stakeholders.

This process provides for commitments made as mitigation to minimise environmental impact to be incorporated directly into the Construction Environmental Management process and has formed the basis and concept for this Outline CEMP.

Chapter 15 of the EIA Report presents the Schedule of Mitigation for the Proposed Development.

This Outline CEMP provides overarching information which will feed into individual detailed CEMPs (or equivalent method statements) and provides some information which will ultimately be included in the Final CEMP.

Mitigation proposals and assessments follow best practice as detailed within the relevant guidance documents such as the *Reuse of Excavated Peat and Minimisation of Waste* (SEPA/Scottish Renewables 2012, 2014).

These principles will be adopted in the overall management plan as a minimum and where new techniques may be developed or other measures are identified that offer enhanced mitigation and protection they will be adopted where possible.

It is worth noting that the Applicant has already undertaken engagement with the local community to inform the design of the Proposed Development. Engagement with the community will continue as appropriate to keep local people informed of the proposed works, key delivery dates and required road closures.

Details of the Site Manager will be provided so the community have a point of contact if required. The Applicant will also be working closely with THC, and other renewable developers and operators in the region to maximise local contract opportunities.

2.1 Relationship to Other Documents

This Outline CEMP comprises an overarching document containing outline prescriptions for aspects including transport management, waste, and pollution prevention. These aspects are covered in greater detail within the following supporting management plans which will be finalised and agreed with the appropriate authority prior to construction as follows:

- Geotechnical Risk Register;
- Outline Habitat Management Plan (Technical Appendix 6-4);
- Drainage Management Plan (includes a Drainage Impact Assessment);
- Construction Traffic Management Plan;
- Pollution Prevention Plan;
- Water Quality Monitoring Plan;
- A Written Scheme of Investigation for Archaeology;
- Site Waste Management Plan;
- Ecological Mitigation Strategy;
- Accident Management Plan; and
- Emergency Response Plan.

3 Project Description

The Proposed Development consists of two turbines up to a maximum 149.9m tip height, battery storage and associated infrastructure. This combination of wind power and battery storage will allow the efficiency of the Proposed Development to be optimised.

The associated infrastructure includes up to:

- 640m upgraded existing access tracks;
- 1.8km new access tracks;
- Construction of turbine foundations and crane hardstandings;
- Underground cabling;
- Substation (including an area for battery storage);
- Two watercourse crossings.

The wind turbine generators will have an indicative output of approximately 9.6MW and an indicative battery storage capacity of up to 12MW, resulting in a total capacity of 21.6MW.

The Proposed Development has been designed with an operational life of 30 years, at the end of which it will be decommissioned unless further consent is granted.

Following expiry of planning permission, the decommissioned above ground infrastructure will be removed and reinstated in an environmentally sensitive way agreed with statutory consultees. The above ground infrastructure is permanent only for the duration of the planning permission.

Once the turbines have been installed, the access tracks and hardstand areas around the turbines will remain in place as permanent infrastructure.

4 Roles and Responsibilities

The Applicant will establish roles, responsibilities, authorities, and accountabilities in advance of the construction phase, and these will be embedded within the construction contract performance requirements.

Works will be carried out in accordance with the conditions attached to the planning permission and the general law. Following a rigorous selection process, the Applicant will appoint a Contractor to construct the Proposed Development.

The successful Contractor will appoint a suitably qualified and experienced Site Manager who will monitor the day-to-day management of the site, including legal and environmental responsibilities, site health and safety, and to ensure adherence to the CEMP, approved method statements and the consent. Contractors and subcontractors will be required to adhere to the Final version of the CEMP.

The Applicant will nominate a Project Manager for the site whose responsibilities will include overall environmental management of the site on behalf of the Applicant and the landowners.

The Applicant or Contractor will appoint an appropriately qualified Environmental Clerk of Works (EnvCoW) who will be a named individual and whose role will be required by planning condition and approved by the planning authority, NatureScot and the Scottish Environment Protection Agency (SEPA).

EnvCoW tasks will include:

- Advising and assisting in avoiding, minimising, and mitigating adverse effects of environmental and ecological aspects associated with construction;
- Attending and minuting ecological and environmental meetings to:
  - Review the construction progress on site in the context of agreed ecological and environmental mitigation; and
  - Review the effectiveness of the ecological and environmental mitigation;
- On-site communication, stakeholder liaison (e.g., with Naturescot, THC and SEPA);
- Participation in the preparation of the site induction package;
- Review of water management and pollution control measures;
- Review the need for culverting of the many unmarked drains and channels which will have to be crossed to avoid blockages and local flooding;
- Oversee all peat stripping and removal (where applicable);
- Identify GWDTE at risk and oversee GWDTE drainage mitigation;
- Have the authority to stop works where significant GWDTE, water or peat related impacts are considered likely to occur, and to instigate control/mitigation measures to rectify non-compliance;
- Oversee monitoring according to the (Water Quality Monitoring Plan) WQMP;
- Be part of the team responsible for Emergency Spill Response;
- Be part of the team providing induction, briefings, and toolbox talks; and
- Provide regular weekly reports.

Method Statements for individual works will be prepared prior to the commencement of specific construction activities. The Construction Method Statement (CMS) will be

reviewed by the Project Manager, the Site Manager and the EnvCoW to ensure that operations comply with the best possible environmental practice and the provisions of the CEMP.

Once the specific construction activity commences the Contractor will be required to adhere to these Method Statements.

The Applicant will ensure that a suitably qualified and competent Geotechnical Engineer, Hydrologist and Ecologist/Ornithologist are in place within the Contractor's team by having such requirements written into the Construction Contract or available by contracted/outsourced consultants.

They will be required to be available as required during sensitive earthworks and environmentally sensitive operations and when geotechnical approvals are required, supporting, and reviewing drainage design and operation, reviews of construction methods, and required mitigations and baseline and control monitoring reviews.

All roles will be identified precisely in a schedule in the Final CEMP, with names, roles, responsibilities, access numbers and delegates. This schedule will be kept current and regularly updated.

Should unexpected environmental issues arise during construction; the Contractor will be briefed to immediately report them to the Site Management Team so that suitable measures can be implemented consistent with the CEMP.

5 Environmental Control Measures

5.1 Site Induction and Training

Prior to construction commencement, training will be undertaken for all site staff. Training aspects will include:

- On-site traffic management;
- Ecological/Ornithological protection;
- Environmental risks associated with working in proximity of watercourses/drains etc.;
- Use/storage of fuels, oils, chemicals etc. and spill prevention measures;
- Effects of weather such as heavy rain and wind (dust issues);
- Potential for noise and/or dust issues;
- General housekeeping including good waste segregation; and
- Health and safety for site workers and visitors under site worker escort.

An environmental notice board will be provided on site displaying information on site ecology, pollution prevention, Emergency/Spill response, Consents and/or Licences.

In addition to the above training, site workers will undergo or be able to demonstrate compliance and completed certification as required by the applicable regulations and legislation including:

- Health and Safety at Work Act 1974;
- Management of Health and Safety at Work Regulations 1999;
- Construction (Design and Management) Regulations 2015;
- The Provision and Use of Work Equipment Regulations 1998;
- The Work at Height Regulations 2005; and
- The Control of Substances Hazardous to Health Regulations 2002.

Prior to commencement of works, all site workers will have obtained the relevant permits and licences for plant and machinery.

5.2 Transport and Access

A detailed Construction Transport Management Plan (CTMP) will be produced prior to the commencement of the works which will detail access procedure and mitigation for transport of components and materials and will be subject to approval by THC. The route for abnormal loads and construction traffic will be agreed with THC. The Plan will interface with existing arrangements.

Transport vehicles have the potential to disperse dust and debris and cause hazardous road conditions by depositing soil and debris from the construction site onto road networks. The following measures will be implemented at the site to manage dust and dirt effects:

- A road sweeper will be used as required to maintain clean routes within the site and along the public road network;
- Where possible, HGVs carrying material to and from the site will be covered during transportation to minimise wind-blowing materials from being deposited onto the public road network;

- During periods of particularly dry weather, dust suppression measures such as water spraying will be used on the internal and external access roads where necessary; and
- A wheel washing facility will be present on-site in order to reduce mud and debris being deposited onto the local road network.

Abnormal Loads will be subject to specific speed limits depending upon the type of load / transport vehicle.

Local residents in settlements along the route will be able to report any instances of speeding to the Site Liaison Officer who will take necessary action to prevent a repeat.

5.3 Pollution Prevention

The Final CEMP will include details and responsibilities for environmental management onsite for environmental aspects and will outline the necessary requirements for surface water management, oil and chemical delivery and storage requirements, waste management; and traffic and transport management (in relation to pollution prevention).

It will also specify monitoring requirements for waste water and water supply including an Environmental Incident Response Plan and appropriate method statements and risk assessments for the construction of the Proposed Development. This will comprise an appropriate Pollution Prevention Plan (PPP).

On-site storage will include the provision of secure facilities for the storage of potentially hazardous solutions and materials. Appropriately secure containment arrangements will be put in place for the storage of potentially polluting substances such as fuel and oil for the plant and machinery on site. Temporary storage within these facilities should limit the risk associated with leakage and run off.

Guidance and procedures recommended in the Water Environment (Oil Storage) (Scotland) Regulations 2006 will be followed along with those contained within the Construction and demolition sites, *Pollution Prevention Guidance (PPG6)* (EA, 2012).

Subject to agreement with stakeholders, the Final CEMP measures to prevent erosion, sedimentation and chemical pollution are likely to include:

- Materials employed to construct the access track and hardstanding will be of a sufficient grade/type so as not to easily breakdown as a result of construction traffic;
- The gradient of drainage ditches shall be kept as shallow as possible to avoid high velocities during storm events, check dams shall be installed at regular intervals along drain lengths to reduce velocities and encourage settlement of sediment particles;
- The length of track drainage shall be minimised and tracks shall be cambered to direct runoff to trackside drainage, which will lower water tables locally and prevent ponding;
- Access Tracks will undergo regular maintenance to keep them fully operational and to ensure there are no run-off issues onto the public road network;
- Inspections and cleaning of silt traps and sediment settlement tanks will be undertaken regularly to ensure they remain fully operational and effective;

- Temporary pumping of localised spring/groundwater from turbine bases shall be attenuated in bunded/impermeable settlement ponds and treated before being discharged to areas of ground capable of absorbing the water;
- Stockpiles of any excavated materials (fines in particular) shall be minimised in extent. The stockpiles shall be sited outwith 50m from any watercourse and outwith 10m from any installed/constructed drainage measures. Where practicable these stores will be sited on flat ground, enclosed within keyed in silt fencing and reinstated/covered over at the earliest possible opportunity;
- Destabilisation works, excavations, ground disturbance or stripping of vegetation and/or topsoil will be planned to be undertaken, where practicable, to avoid the local higher rainfall periods;
- Turves will be carefully handled, separated from other materials and reinstated within as shorter time period as possible;
- Any works shall be suspended during high rainfall events to minimise creation of sediment laden surface runoff and weather forecast information shall be utilised to plan the timing of excavation works; and
- Timing of works will be considerate to sensitive periods for fish fauna present within the watercourses, avoiding certain works during the important migratory and spawning periods for salmonids (typically October to mid-May).
- Chemical, fuel and oil storage will be undertaken within the site compound (>50m from watercourse and GWDTE); the store will be locked, sited on an impervious base within a secured bund of 110% of the storage capacity;
- Standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution to surface water and groundwater; any pumps to be used on site will be contained and incorporate internal drip trays with sufficient capacity for spillages;
- Refuelling of vehicles and machinery will be carried out on an impermeable surface in the site compound, or where not possible, a lockable mobile refuelling bowser (double skinned) will be used and operated by a designated person;
- An Accident Management Plan will ensure that emergency equipment is available on site (i.e., spill kits and absorbent materials) and advice is available on action to be taken in the event of a pollution incident;
- Only emergency maintenance to construction plant will be carried out on site, and will preferably be carried out in one designated area (the site compound);
- On-site toilet facilities will be located within the site compound and be adequately designed and maintained to ensure all sewage is disposed of appropriately, as per GPP4;
- As neutral a pH concrete as practicable will be used and any wash waters will be contained within suitable tanks for off-site disposal.
- Should concrete mixing be required batching will make use of appropriate buffers from any watercourses or drainage channels to prevent accidental escapes of liquid or slurries to the water environment;
- Wash out areas for concrete batching plant as well as the use of ready mixed concrete lorries should be located as far as practically possible from watercourses to provide a hydrological buffer on site;
- Wash down water arising from the washing of equipment that has come into contact with concrete must be collected in an impervious container; and

- Water usage on site will be minimised via the use of a settlement and recirculation system.

5.4 Drainage Management

Measures will be developed to treat and deal with all the surface runoff from the site and will be designed in accordance with Sustainable Drainage System (SuDS) principles.

The Final CEMP will include a location map of all areas of disturbance with the potential to generate silt-laden run-off, with details of the proposed mitigation at each point as recommended by the prevailing CIRIA guidance documents. These measures will comprise an appropriate Drainage Management Plan (DMP).

The drainage design will comply with General Binding Rules (GBR's) 10, 11 and 21 for the track drainage, under the Water Environment (Controlled Activities) (Scotland) Regulations (CAR) 2011 (as amended) (SEPA, 2011) and follow guidance set out in SEPA Pollution Prevention Guidance (GPP5).

Drainage design will be developed in response to a risk appraisal undertaken by the Contractor and will be proactive, rather than being reactive to any events arising once works commence.

Silt-laden water generated from the construction works will be settled out as much as possible through drainage mitigation measures (silt traps etc.) and channelled into vegetated areas at least 20m from any water body to allow the settlement of suspended solids. The proposed location of discharge points and mitigation which may be required will be agreed in advance with the EnvCoW.

Silt traps, gravel, sandbags, silt fencing and anchored straw bales may be required at the discharge points in order to prevent erosion at the outlet, alleviate flow and aid in flow dispersion across a wider area of vegetation to prevent potential scour and remobilisation of deposited silt.

No routes of any natural drainage features will be altered as part of the Proposed Development. Mitigation for all aquatic features (e.g., fish) aims to preserve existing water quality ratings as a minimum.

Help in minimising water sent to drains should be implemented where possible. Any waste water used in lined cement washout ponds used for chute cleaning should incorporate a settlement and recirculation system to improve water reusage on Site. This will help to minimise the risk of pollution from concrete batching and reduce overall water usage on site, with minimal use of water take imported onto the Site.

Between November and May, when precipitation rates are likely to be higher, activities would require increased monitoring by the EnvCoW combined with deployment of appropriate measures for surface water drainage management to ensure impacts are minimised.

Measures may include the addition of flocculants to sediment traps, or the use of straw bales to divert additional run off and prevent erosion. The use of chemical additives, if deemed necessary, will be discussed with the EnvCoW and a method statement prepared in consultation with SEPA.

This approach will be of increased importance following periods of heavy rainfall when the potential for site surface drainage impacts on local watercourses may be increased.

The design of the drainage systems will ensure that waters are kept within their original drainage catchments and the tracks will be constructed to be as permeable as practicable, to prevent the build-up of large volumes of water and to prevent direct discharge to surface watercourses.

This design will reduce the risk of sedimentation (from loose material) and pollution (from accidental spillage) on all downstream watercourses. All drainage systems will be designed to withstand a 1 in 200-year rainfall event (including an allowance for climate change).

Where groundwater is encountered along the construction footprint, temporary dewatering may be required but will be kept to a minimum to prevent altering the water table by drawdown. Where necessary a temporary drainage system, either a temporary drainage ditch or a pumped system, depending on the local gradient, will be established to deal with groundwater ingress.

Measures will be taken to ensure no chemical or sediment contamination will occur. These measures will include:

- Maintenance of existing track side drainage to ensure no sediment laden runoff reaches the spring;
- Ensuring no fuels and oils are kept within 250m of any spring source; and
- Regular monitoring (visual and suspended solids) of the water supply and surface water runoff in the area.

Design and implementation of all drainage processes will comply with General Binding Rules (GBR's) for the track drainage (GBR10, 11 and 21) under the Water Environment (Controlled Activities) (Scotland) Regulations (CAR) 2011; and follow guidance set out in SEPA Pollution Prevention Guidance (GPP5):

> *'Works and maintenance in or near water' for all other drainage related process on site not affiliated with access track construction.*

Impacts on the water environment will be minimised by incorporating check dams, silt traps, settlement ponds and buffer strips where required.

These features will have the dual purpose of attenuating peak flows, by slowing the flow of runoff through the drainage system and allowing sediment to settle before water is discharged from the drainage system.

The sizing and location of the various elements of the drainage system will be influenced by the topography, gradient, catchment runoff characteristics and the volumes of runoff intercepted by each drain. These factors will be determined at the detailed design and, subject to agreement in the Final CEMP, may include:

- Tracks with camber design;
- Trackside drains will have infiltration trenches with check dams;
- Cross drains at regular intervals along access tracks and check dams will be installed immediately above cross drain inlets; and
- Temporary cut-off drains will be used to prevent water entering excavations.

Drainage/ pumping will be minimised but where necessary water will be repumped to the vicinity of excavations. Routine maintenance of tracks will be undertaken by the EnvCoW. The EnvCoW will review the need for culverting the many unmarked drains and channels which will have to be crossed to avoid blockages and local flooding.

A Drainage Impact Assessment (DIA) will be prepared well in advance of construction and sent for approval by SEPA. It will include drainage features for infrastructure including turbine foundations, watercourse crossings and access tracks. Further information is provided in Chapter 8: Hydrology and Hydrogeology.

5.5 Groundwater Protection

In areas where there are GWDTE, any shallow groundwater encountered during construction and requiring dewatering should be pumped to a small holding sump to allow removal of suspended sediment.

Once the solids have been removed, groundwater should either be discharged direct to or via a small down-slope trench up-gradient of the surrounding GWDTE allowing infiltration back into the ground maintaining natural pre-existing shallow groundwater flow paths wherever possible.

Possible mitigation includes:

- Micro siting to minimise wetland take for turbines and associated infrastructure;
- Installation of permeable layers in track bases;
- Cross drains under track at regular intervals up gradient of moderately dependent GWDTE. The cross drains will initially catch the water on the uphill side of the track or yard and transfer it to a suitable diffuse outfall above the GWDTE on the down gradient side of the track where it will not cause new erosion or runoff issues;
- Temporary cut-off drains to prevent water from adjacent GWDTE entering excavations;
- Placing of turves from construction to areas immediately adjacent to limit indirect effects; and
- Indirect loss of habitats caused by dewatering at turbines will also be minimised by minimising any period of dewatering and designing dewatering in compliance with the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended).

The work will be supervised by the EnvCoW. Designs will be incorporated into the DMP.

A monitoring regime will be developed by the EnvCoW to measure potential effects of permanent and temporary works on GWDTE and within a format which may be provided to regulators upon request. Monitoring should also ensure that sediment blockages in the cross drains are regularly cleaned.

Pollution prevention measures to protect groundwater will be in accordance with best practice guidance including that detailed in section 5.3. Further measures are detailed in Chapter 8: Hydrology and Hydrogeology of this EIA Report.

5.6 Watercourse Crossings

The Proposed Development has been designed to minimise works in the vicinity of mapped watercourses and to minimise the need for new water crossing in order to minimise reduce the risk of pollution and changes to watercourse morphology.

Two watercourse crossings will be required for the proposed new access tracks. These locations are shown in Figure 15-1-1.

The two new watercourse crossings will be constructed by installing a culvert or clear span crossing at each location. All new and upgraded watercourse crossings will be bottomless where possible and designed to accommodate the 1 in 200-year event. Figure 15-1-2 shows an indicative plan of proposed structures.

It is proposed that the final detailed design for all water crossings will be addressed through an appropriately worded condition.

5.7 Water Monitoring and Remedial Actions

Details of monitoring proposals including a Water Quality Monitoring Plan (WQMP), to monitor amongst other parameters pH and turbidity, will be implemented by a designated appointed person on-site.

The WQMP will be accompanied by a specific Emergency Response Plan for water environment incidents and address both surface and ground water quality and protection and include measures for different rainfall and flow conditions.

Water quality monitoring will be undertaken prior to construction works to establish a baseline condition; during construction to monitor effects of construction activities; and post construction (operational and decommissioning phases) to confirm conditions are similar to the original baseline.

Surface water locations close to the development area are to be monitored (close to the source of pollution) and also watercourses near water abstractions (sensitive receptors) are also to be monitored where accessible so that potential pathways of pollutants can be monitored.

Visual and basic field water quality monitoring (such as pH, turbidity, total dissolved solids, and electrical conductivity) should be regularly undertaken by the EnvCoW on site. These records will be available to be supplied to the Regulator if required.

Regular inspections will be made of sediment management systems, to ensure they are effective, and that swift corrective action is taken where problems are encountered.

5.8 Peat Management

The strategy for peat management for the Proposed Development follows guidance for developments on peat and uses of waste peat (SEPA/SR, 2012 and 2014). The hierarchy is as follows: Prevent, Reuse, Recycle and Dispose.

The peat survey results as shown in Technical Appendix 8-1 show, peat and peaty soils are very shallow across the Proposed Development Site.

Although there is a minimal amount of peat of site and Peat management plan will be in place to ensure specific protection for the limited areas of affected peat.

Excavated peat and soil will be re-used in the re-instatement of temporary excavations such as in blade laydown and secondary crane hardstanding areas, in landscaping of permanent infrastructure.

Where possible peat will be directly transported to its point of re-use. Where this is not possible, peat will be stored locally and kept in good condition according to good practice with minimal risk of instability of the stored materials.

Areas of deep peat were avoided through the design review process, principally through locating the turbines within forestry where possible.

Where practicable, access tracks will be floated over peat where depths are in excess of 0.5m, however, this will be subject to design considerations and potential constraints.

The EnvCoW will oversee all peat stripping and removal and a Peat Specialist would be available to assess any technical peat issues.

5.9 Ecological Protection Measures

A summary of habitat protection and enhancement measures from the Outline Habitat Management Plan and Mitigation with regards to protected species potentially utilising the Proposed Development site is detailed below.

5.9.1 Habitats

A Habitats Management Plan (HMP Technical Appendix 6-4 of this EIA Report) has been produced in support of this application, which provides management recommendations for ecological and ornithological mitigation, enhancement and restoration for both flora and fauna on the Proposed Development Site.

The Outline HMP will be used as the basis for a detailed HMP, which will be agreed with THC and NatureScot prior to the commencement of construction.

The outline HMP provides broad heads of terms for the protection and enhancement of habitats and species. These include:

- Promoting natural generation of vegetation: care should be taken during construction of the project infrastructure to not mix soils between different areas of the Proposed Development Site. Any gaps between vegetation cover and project infrastructure should be filled with topsoil from that area to allow for vegetation to spread.
- Wildflower meadow creation: Creation of a wildflower meadow, providing greater diversity of flora.
- Hydrological Management: Hydrological management will be necessary to maintain the plant community in areas with a moderate dependence upon groundwater. To do this, the current levels of soil moisture and groundwater supply to the moderately groundwater dependent M23 will be identified and maintained throughout.

Wildflower and hydrological management for the maintenance of M23 can be achieved by blocking some key ditches to arise groundwater levels and ensure that the Drainage Impact Assessment and Management Plans take the M23 water supply into account when planning drainage such that the current or enhanced groundwater flow in the south of the site can be maintained.

Monitoring will be undertaken by a competent ecologist(s) and if required, all monitoring and enhancement would be overseen by a Habitat Management Group formed with key stakeholders.

Working areas would be kept to a practical minimum and clearly defined by pegging out the footprint of the Proposed Development prior to the commencement of works. This will be carried out by the EnvCoW and the Contractor to ensure sensitive habitats are avoided where possible.

The aim of this is to restrict the footprint of the Proposed Development to a minimum and to reduce the risk of unnecessary damage to these retained habitats.

All vegetation clearance works will be undertaken under the supervision of an EnvCoW who will adopt a surveillance programme for protected species places of rest, refuge and/or breeding prior to vegetation stripping or construction works.

The surface layer of soil and vegetation will be stripped separately from the lower soil layers, stored separately, and replaced as intact as possible once the construction phase is complete. Turf material will be replaced as far as possible in similar locations to where it was removed.

Best practice techniques for vegetation and habitat re-instatement will be adopted and implemented on areas subject to disturbance, such as the temporary construction compound area, as soon as is practicable.

Materials and other temporary infrastructure will be removed off-site and all temporary construction areas will be reinstated.

5.9.2 Protected Species

General

No earlier than 12 months, and preferably within 6 weeks prior to commencement of works, an EnvCoW would be commissioned by the Applicant to carry out a walkover survey of the entire Proposed Development in conjunction with the Project Manager (or nominated individual) and a representative of the Contractor(s).

This will have the aim of determining final turbine locations (within the micro-siting allowance) and agreeing, insofar as possible, all elements of the Proposed Development, such that the impacts of the Proposed Development on sensitive ecological features will be minimised.

Works will be overseen by the EnvCoW and their role will include the ongoing monitoring of environmental/ecological constraints, review and audit of the appointed contractors environmental performance, and delivery of toolbox talks.

All construction works will require a CMS to be prepared post-determination and in advance of works commencing on site.

A site speed limit of 15mph will be in place at all times to reduce the risk of collision and protected species mortality associated with construction vehicles.

Excavations should be covered at the end of each working day to minimise the risk of faunal species being injured or trapped. Alternatively, a plank or similar means of egress will be placed inside to allow a means of escape for animals should they enter the

excavation. Open pipes should also be capped or covered to prevent wildlife gaining access.

Where possible works should be carried out during daylight hours, to avoid the sensitive periods at dawn and dusk when wildlife is most active.

In the event that a protected species is discovered on the site, work will stop immediately and the EnvCoW will be contacted. Increased buffer areas or protected species licences may be required before work recommences.

Details of the local police Wildlife Crime Officer, NatureScot Area Officer, and Scottish Society for the Prevention of Cruelty to Animals (SSPCA) relevant Officer should be held in the site emergency response procedure documents.

Whilst otter *Lutra lutra* is a qualifying interest feature of the Caithness and Sutherland Special Area of Conservation (SAC) there was no otter signs recorded in the Proposed Development Site. The Proposed Development Site provides poor habitat for otter.

Wildcat are unlikely to be present within the Proposed Development Site, however optimal foraging habitat for wildcat is present.

The Proposed Development Site contains suitable habitat for water vole, and possible signs of water vole observed during surveys.

No evidence of badger Meles meles was identified, and no previous records for the immediate area for presence of badger exist. There is optimal foraging habitat on the Proposed Development Site, consisting of mainly agricultural grassland.

Concurrently, or shortly thereafter, in the appropriate survey season and under suitable weather conditions, the Applicant would commission an EnvCoW to carry out a final check for the presence of protected species and to advise on final mitigation requirements in a Pre-Construction Ecological Mitigation Strategy report.

Ecological requirements will be agreed between the Applicant, the EnvCoW, THC and NS prior to the commencement of works and would be incorporated into the Proposed Development-specific habitat management plan.

Bats

The Site has been identified as having low-moderate quality for foraging bats.

Measures to minimise the impact on bats will be minimised by maintaining a 50m distance between turbine blade tip and the nearest element of proposed woodland planting as per bat guidance (NatureScot et al., 2021).

If micro-siting occurs, pre-construction re-surveys will not be required. However, if the wind farm design changes and potential impacts are identified, further surveys may be required.

Water Vole

Due to the presence of suitable habitat and observation of potential field signs for water vole, a preconstruction survey will be undertaken. This should be carried out by a suitably qualified ecologist and should cover suitable habitat within 50m of construction areas.

Aquatic Ecology

Watercourses within the survey area are limited to agricultural field drainage ditches. Therefore, their potential to support fish is limited.

5.9.3 Ornithology

Clearance of potential nesting habitat would be undertaken outside the breeding bird season where practicable (between September and mid-March). Where this is not possible, vegetation will be checked by an experienced ornithologist prior to works commencing to identify the presence of any nesting birds.

Clearance will only commence once a check has been undertaken and approved for clearance by the ornithologist.

Borrow pits, laydown areas, access routes, and any other construction activities / mobilisation that require ground-breaking or land-take of habitat will additionally be programmed and undertaken out with the breeding bird season.

If these works are required to take place between March and August, then they will be subject to a ground nesting bird survey by an experienced ornithologist. If breeding activity is recorded, particularly for target species, the EnvCoW will advise on requirements.

Suitable protection / buffer zones for nesting birds within the Proposed Development, where present, will be outlined by the ornithologist and agreed with the EnvCoW and works contractor.

In the 12 months before construction commences, breeding raptor surveys will be undertaken, and should be carried out during construction if it falls within a breeding season. This survey aim is to identify the presence of any Annex I or Schedule 1 species which may be disturbed by construction works.

Should the roost of an Annex I or Schedule 1 species be present, then disturbance buffers based on guidance (Goodship & Furness, 2022), should be established around the nest and no construction activity should be allowed within the area.

The EnvCoW should carry out a risk assessment if access roads are within the buffer distance of the nest to establish is they can be used without unlawful disturbance to the nest. As the buffer distance varies by species, the precise distances would be specified by the EnvCoW.

5.10 Designated Site Integrity

Loch Watten SAC/Site of Special Scientific Interest (SSSI) is located approximately 4.12km to the south of the Proposed Development (at its closet point). The qualifying interests include naturally nutrient-rich lochs which are often dominated by pondweed. Loch Watten SSSI shares the same boundary as the SAC. The SSSI is designated for its base-rich waters, open water transition fen, and non-breeding population of greylag goose.

River Thurso SAC is located approximately 5.98km to the west of the Proposed Development at its closest point. The qualifying interests include Atlantic salmon.

Caithness and Sutherland Peatlands SAC is located approximately 8km to the east of the Proposed Development. The qualifying interests include blanket bog, depressions

on peat substrates, otter, acid peat-stained lakes and ponds, wet heathland with cross-leaved heath, clear-eater lakes or lochs with aquatic vegetation and poor to moderate nutrient levels and transition mires and quaking bogs.

Loch of Durran SSSI is located approximately 1.04km to the north of the Proposed Development (at its closest point). The site is designated for its transition grassland and vascular plant assemblage.

Loch Scarmclate SSSI is located approximately 2.5km to the south-west of the Proposed Development. The site is designated for its base-rich loch and non-breeding population of greylag goose.

Dunnet Links SSSI is located approximately 4.48km to the north-north-east of the Proposed Development. The site is designated for its coastal geomorphology and sand dunes.

Loch Heilen SSSI is located approximately 6.00km to the north-east of the Proposed Development. The site is designated for its mesotrophic waters, and non-breeding populations of Greenland white-fronted goose, greylag goose, and whooper swan.

Stroupster Peatlands SSSI is located approximately 8.00km to the east of the Proposed Development. The site is designated for its blanket bog and oligotrophic waters.

Given the separation distance between the Proposed Development and these designated sites, and the intervening topography and the implementation of appropriate pollution control measures, there is no significant adverse effects anticipated on any of these designated sites.

5.11 Cultural Heritage Protection Measures

Twelve non-designated heritage assets (70, 96 and 104-113) have been identified within the Proposed development Site that have the potential to be directly impacted by the construction of the Proposed Development . Of these, only linear field boundaries and a quarry fall within the construction footprint.

Non-linear heritage assets (Assets 70c, 70d, 96, 104, 105 and 107) will be demarcated prior to construction commencing to avoid direct effects. Direct effects on linear heritage assets (Assets 70a, 70b, 106, 108, 110 and 112) should be minimised by breaching only necessary widths to facilitate access and construction. This breaching should only be done during the archaeological watching brief to ensure preservation by record.

Ground breaking works within 50m of recorded heritage assets will have a watching brief, and on a proportion of the remaining ground breaking works elsewhere on the Proposed Development Site will have a watching brief undertaken to identify any unknown heritage assets. The results of these works may result in the need for further mitigation such as post-excavation work.

The proposed track and infrastructure footprint would be microsited (within permitted limits) to avoid direct impacts where possible.

Detailed mitigation will be agreed with THC Historic Environment Team (HET) through a Written Scheme of Investigation (WSI).

5.12 Construction Noise and Working Hours

A number of measures exist to control and minimise the impact of noise and vibration from construction sites. These include:

- European Commission (EC) Directives and United Kingdom (UK) Statutory Instruments in place to control noise emissions from construction plant;
- The guidance within BS5228:2009 on the control of noise from construction sites; and
- Section 61 of the Control of Pollution Act 1974 and Section 80 of the Environmental Protection Act which gives Local Authorities the power to control noise from construction sites.

The proposed normal hours of operations for construction activity are between 07:00 - 19:00 Monday to Friday and 07:00 – 13:00 on Saturday. During the installation phase, there may be a requirement for extended working hours as some critical elements of installation cannot be stopped once started such as concrete pouring, this will be agreed in advance with THC.

Although it is not anticipated that construction noise levels will exceed the guideline noise level limits of BS5228, the general principles of construction site noise control as described in BS5228:2009 will be implemented prior to construction management plans or schedules being Finalised.

No specific mitigation measures, above best practice is considered to be required.

5.13 Handling of Excavated Materials

Materials, where possible, will be sourced on-site, and materials excavated from works such as turbine foundations will be reused on site for the reinstatement or construction of access tracks and other above ground construction areas. This process will reduce transport activity, spoil storage/removal and assist in limiting imported materials.

The ground excavation methods will vary depending on the local ground conditions and the nature of the surface vegetation. The general processes will be as follows:

- Earthworks extents, including haul routes and storage areas, to be pegged out prior to commencement to minimise/ control exposed soils and damage;
- Soils removed from the excavated area will be stored separately in piles on suitable dry, flat ground no greater than 3m in height a minimum of 50m from watercourses;
- The EnvCoW will undertake a walkover to determine which stockpiles require silt fencing based on proximity to sensitive receptors;
- Stockpiles will be tamped by light compaction prior to heavy rain to prevent wash-out;
- Surplus excavated material will be removed from the site, or used for track maintenance during construction, as appropriate;
- After the foundation has been poured the area will be backfilled as soon as practicable with spoil, pending turbine installation;
- Once the turbines have been installed, the immediate construction area around the turbine bases will be restored using the retained topsoil or turf to within approximately 1m of the tower bases;
- Surplus topsoil will be used to restore track edges after construction or removed from the site; and

- Material won from foundation excavations will, if suitable, be used in the landscaping of access tracks and other site infrastructure as stated above. If not suitable, it will be disposed of off-site to a suitably licensed facility.

All excavation, handling and storage of materials will follow guidance set out in SEPA PPG6: Working at construction and demolition sites.

5.14 Resource Management and Site Waste

Water for the construction facilities will be provided by a licensed abstraction from a local water course or will be imported to site. Should abstraction be used this will be subject to CAR licencing with SEPA.

During construction and operation, materials to be removed from site will be separated into recyclable types (where possible) to be disposed of by suitably licensed waste management companies, in accordance with the Waste Management Licensing Regulations 1994, (SI 1994) and best practice at the time.

Foul water and effluent would be treated either via septic tank with soakaway designed to SEPA guidelines (including GPP4 'Treatment and disposal of wastewater where there is no connection to the public no foul sewer' and PPG6: 'Working at construction and demolition sites') or by the use of chemical facilities with periodic material for off-site disposal.

Treatment facilities would be subject to agreement with SEPA.

Guidance and procedure recommended in the Water Environment (Oil Storage) (Scotland) Regulations 2006 will be followed along with that contained within PPG6 in relation to waste oils or fuels.

Good construction site management will be implemented to avoid/minimise generation of litter, dust, noise, and vibration. Requirements for waste storage shall be detailed and implemented through a Site Waste Management Plan (SWMP).

Surplus soils will be re-used on-site for the road edgings, verge profiling, restoring borrow pits, reinstating ground around turbines, and temporary construction compounds. All of the material generated from excavations will be able to be re-used on site and no disposal is anticipated as part of the application.

Waste will be removed off-site for safe disposal at a suitably licensed waste management facility in accordance with current waste management regulations. Wherever possible, excavated stone or soils will be re-used on site, primarily for the restoration of disturbed ground. Details of this will be included within the Final CEMP, as agreed with THC and SEPA.

The main items of construction waste and their sources are expected to be:

- Hardcore, stone, gravel from temporary surfaces to facilitate construction waste, and concrete;
- Subsoil from excavations for foundations and roads;
- Timber from temporary supports, shuttering and product deliveries;
- Miscellaneous building materials left over from construction of the control building;
- Sanitary waste from chemical toilets (if used);
- Plastics packaging of material; and
- Lubricating oils, diesel - unused quantities at end of construction period.

Subsoil not required for reinstatement purposes will be collected at the end of the construction phase and disposed of according to best practice and existing waste legislation. Waste oils and diesel will be removed from the Proposed Development Site and disposed of by an approved waste contractor in accordance with provisions of the Special Waste Regulations 1996 (Scottish Government, 1996).

5.15 Reinstatement and Restoration

Reinstatement will be carried out as soon as possible after each part of the project is completed and will involve the restoration of disturbed ground caused by the construction of and dismantling of the construction compound. This will be undertaken to restore a natural profile.

Areas of the site will be reinstated in line with planning condition requirements.

Materials and other temporary infrastructure will be removed off-site and the temporary storage area will be reinstated.

The site access tracks will be minimised where possible but left in place after completion of the construction phase to provide ongoing access for maintenance, repairs, and the eventual decommissioning phase.

Once the turbines have been installed, the immediate construction area around the turbine foundations will be restored using the retained topsoil or turf to within approximately 2m of the tower bases. Material won from foundation excavations will, if suitable, be used in the landscaping of access tracks and other site infrastructure. If not suitable, it will be disposed of off-site to a suitably licensed facility.

Hardstanding areas at each turbine location will be retained for use in on-going maintenance operations, with the edges as far as possible blended to the adjacent contours with natural vegetation being allowed to re-establish.

At the expiry of the Proposed Development's lifespan of up to 30 years, it is proposed that the turbines and their transformers and the battery storage and its compound will be removed.

The upper sections of the turbine foundations will be removed to a depth which will permit the continuation of current land use practises and backfilled with appropriate material.

Topsoil will be replaced and the area reseeded. Tracks and crane hardstands will be left in situ and allowed to grass over or will be covered with soil and reseeded. Cabling will be left in-situ. At least six months prior to the decommissioning of the site, a Decommissioning Method Statement will be prepared, for agreement with the local authorities and relevant consultees.

Further detail on measures is provided in sections 5.5 and 5.8 above.

Restoration will be overseen by the EnvCoW and in compliance with all planning conditions, SEPA and NatureScot guidance.

5.16 Monitoring

A monitoring regime has been developed within the Outline HMP to measure potential effects of permanent and temporary works on GWDTE and within a format which may be provided to regulators upon request.

Construction phase monitoring will also ensure that sediment blockages in the cross drains ae regularly cleaned. The EnvCoW will also oversee monitoring according to the WQMP as detailed in the Final CEMP. The CEMP will cross-reference with the aims of the HMP to ensure that the construction works on site minimise environmental effects and the post-construction conditions are suitable for the implementation of the HMP.

To monitor the effect of the Proposed Development on birds, post construction surveys will take place in years 1, 3 and 5 following the commencement of operation, with a review being undertaken as to the need for any further monitoring following year 5.

The aim of post construction monitoring would be to monitor bird populations within the Proposed Development to ensure there is no unpredicted adverse effects on the bird populations present, and to ensure that the HMP is effective in supporting the bird populations on site.

The following surveys are proposed, at the post construction stage, however detailed scope of monitoring will be agreed with THC, NatureScot and RSPB Scotland:

- Breeding bird surveys (using a Brown and Shepherd approach (Brown, 1993)) to allow breeding waders to be monitored across the Proposed Development Site and 500m buffer; and
- Vantage Point surveys undertaken during the non-breeding season to monitor the effect of the wind farm on qualifying species of the Caithness Lochs SPA.

The post construction outline monitoring schedule should be reviewed on a 5-yearly basis. Ongoing monitoring commitments will be reviewed and, if necessary, any adjustments to the HMP will be carried out.

In order to assess the effectiveness of the creation of the wildflower meadow, long-term vegetation / habitat monitoring will be undertaken commencing in the year following seeding, likely to be in the post construction phase, with the aim being to monitor the long-term condition of the Proposed Development Site through a programme of fixed point photography and quadrat monitoring in years 1, 3 and 5.

The monitoring will be used to assess the effectiveness of the HMP, which can be updated in relation to this data if required. These surveys will be undertaken for the life of the project and target the areas of wildflower creation.

5.17 Environment Incident Response and Reporting

Two action plans will be produced; an Accident Management Plan (AMP) to detail emergency contingency and spillage plans, and an Emergency Response Plan (ERP) for pollution incidents (fuel leak or sediment entering a watercourse). All plans will be compiled using guidance from *SEPA GPP 21: Pollution Incident Response Planning* (SEPA/NEIA/ NRW, 2021) and include protocols for:

- Delivery and use of materials;
- Overfilling containment vessels;
- Plant or equipment failure;
- Containment failure;
- Fires, explosions or failure to contain firefighting water;
- Wrong connections of sewers and pipes;
- Incompatible materials coming in contact;

- Uncontrolled reactions;
- Discharge of partially treated or raw effluent;
- Vandalism; and
- Flooding of part or all of the site.

These incidents could affect:

- Drainage systems, surface waters, aquatic ecosystems, groundwater and soil; and
- Air quality by producing toxic fumes and airborne pollutants which may damage human health, wild and domestic animals, and ecosystems.

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