



Bloch Wind Farm

Technical Appendix 2.3

Outline Pollution Prevention Plan

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1 Introduction & Scope

1.1 Introduction

1.1.1 This outline Pollution Prevention Plan (PPP) is submitted by RES Ltd (RES). The principal objective of this document is to provide details of the proposed surface water drainage management arrangements for the proposed development.

1.2 Description of the Site

1.2.1 The proposed development is located south of the B7068, approximately 5.5km south-west of Langholm in Dumfries and Galloway.

1.2.2 The site is centred on Ordnance Survey grid reference E333000, N580000, and covers an area of approximately 1,020ha with wind turbines occupying hills locally known as Collin Haggs, Healy Hill and Bloch Hill. The site is currently used predominately for sheep and cattle grazing with small areas of commercial forestry.

1.2.3 The Wauchope Water passes to the north of the site, which flows into the River Esk at Langholm, ultimately flowing south to the Solway Firth. The A7 between Edinburgh and Carlisle passes to the east. To the south along the B6357 are the settlements of Chapelknowe, Milltown, Evertown and Canonbie. The operational wind farm Solwaybank Wind Farm sits adjacent to the west of the site, with the settlements of Kirtleton and Waterbeck west of Solwaybank Wind Farm.

1.2.4 The proposed development includes the installation of 21 wind turbines with a maximum height to blade tip of 230m and associated infrastructure including;

- external transformers at each wind turbine ;
- wind turbine foundations ;
- hardstand areas for erection cranes at each wind turbine location ;
- a network of access tracks including site entrances from the public road network ;
- borrow pits (dependent on availability of stone within the site) ;
- a substation compound containing electrical infrastructure, control building, welfare facilities and a communications mast ;
- a battery energy storage system (BESS) compound ;
- a network of buried electrical and communication cables ; and

- a temporary construction compound.

1.2.5 The total construction area for the proposed development is approximately 51ha. This allows for a construction footprint around the infrastructure and an estimated buffer for spoil placement (temporary and permanent). Where sites are greater than 4ha and discharge water run-off to the water environment *The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended)* (CAR) requires a license to be applied for.

1.2.6 It is intended that this outline PPP is developed further through provision of detailed plans and calculations for surface water drainage management on the site post consent.

1.3 Existing Hydrology

1.3.1 There are several artificial drainage features across the site, typical for a site predominately used for agricultural purposes. See Technical Appendix 9.6 Watercourse Assessment for further details.

1.3.2 Surface water within the site appears to drain equally northwards towards Back Burn and Bloch Burn and southwards towards Hall Burn, Kerr Burn and Irvine Burn. Back Burn and Bloch Burn are both tributaries of the Wauchope Water and eventually drain to the River Esk. Both the Kerr Burn and Irvine Burn are tributaries of the River Esk. Hall Burn drains to the River Sark which also eventually drains to the River Esk. Wind turbines T1 to T7, drain to Back Burn. Wind turbines T8, T14, T16, T18 and T20 drain to Bloch Burn. Wind turbines T9 and T10 drain to the Hall Burn, while T11, T12, T13, T15 and the substation and battery energy storage system compounds drain to the Kerr Burn. Wind turbines T17, T19 and T21 drain south to the Irvine Burn.

1.3.3 The site is adjacent to the Winterhope Reservoir Drinking Water Protected Area (DWPA), which serves Winterhope Reservoir Water Treatment Works (WTW) operated by Scottish Water. Both the DWPA catchment boundary and WTW are situated 1km and 3km from the site boundary respectively. As the DWPA and WTW are located in a separate catchment from the proposed development they not hydrologically connected.

1.4 Existing Geology

1.4.1 The geology on site is hugely varied. Typically it comprises peat overlying clay, silt and till. The Bedrock Geology (BGS, 1:50k) of the proposed

development (Figure 9.9) is split into three separate units all formed during the Carboniferous period and comprised of sedimentary rocks that are fluvial in origin. To the north and west of the site, Ballagan Formation - Sandstone, siltstone and dolomitic limestone. To the south of the site, Border Group - Sandstone, siltstone and mudstone. To the north-east of the site, Whita Sandstone Beds - Sandstone.

- 1.4.2 Overlying the bedrock, the Superficial Deposits (BGS, 1:50k) of the proposed development (Figure 9.10) are comprised of Quaternary tills with interspersed areas of peat, alluvium and sedimentary deposits (clay, silt, sand, gravel, boulders).

2 References, Guidance and Legislative Requirements

2.1 References

- 2.1.1 This document should be read in conjunction with the following documents:
- Bloch Wind Farm EIA Report Volume 1 - Chapter 9: Hydrology, Hydrogeology, Geology and Soils.
 - Bloch Wind Farm EIA Report Volume 3- Technical Appendix 9.2 Peat Management Plan.
 - Bloch Wind Farm EIA Report Volume 3 Technical Appendix 2.1 Outline Construction Environmental Management Plan.

2.2 Relevant Guidance and Legislative Requirements

- 2.2.1 All surface water drainage management relating to the proposed development will be constructed using best practice and in conformance with the requirements of the relevant regulatory authorities. The key legislation and guidance that will be adhered to, are as follows:
- The EU Water Framework Directive (2000/60/EC).
 - Scottish Planning Policy 2014.
 - The Water Environment (Controlled Activities) (Scotland) Regulations 2011.
 - SEPA Supporting Guidance (WAT-SG-75) Sector Specific Guidance: Construction Sites, Feb 2018.
 - SEPA Guidance for Pollution Prevention (GPPs and PPGs).

- Engineering in the Water Environment, Good Practice Guide, Temporary Construction Methods, First Edition, March 2009.
- Good Practice during Wind Farm Construction, A joint publication by Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland, 4th Edition, 2019.
- Dumfries and Galloway Local Development Plan 2 (DGLDP2), October 2019.
- Dumfries and Galloway LDP2 Supplementary Guidance: Surface Water Drainage and Sustainable Drainage Systems (SuDS), February 2020.
- The Sustainable Urban Drainage Scottish Working Party (SuDSWP) Water Assessment and Drainage Assessment Guide.
- CIRIA Guidance. C532, C609, C648, C649, C698, X108, C768.
- The SuDS Manual 2015. CIRIA C753.

3 Potential Sources of Pollution

3.1.1 The following potential sources of pollution have been identified for the proposed development:

- Suspended solids / fines laden run-off from site won / imported stone for access track / hardstand construction.
- Suspended solids / fines laden run-off from exposed excavations.
- Suspended solids / fines laden run-off from excavations in watercourses.
- Fuel / chemical spills.
- Concrete from spills / washouts.
- Foul drainage discharges from temporary and permanent welfare facilities.

3.1.2 The subsequent sections outline how the risk of pollution from the identified pollution sources will be mitigated.

4 Pollution Prevention Proposals

4.1 Surface Water Drainage Management

4.1.1 A sustainable drainage system (SuDS) will be implemented in accordance with the principles laid out in Chapter 9: Hydrology, Hydrogeology, Geology and Soils of the EIA Report. The overarching aim of the SuDS design is to minimise, where possible, any change to the hydrology and groundwater conditions within the site. The SuDS will utilise a series of

surface water drainage management techniques that will mitigate any adverse impact on the hydrology of the site.

Water Quality and Treatment

- 4.1.2 A surface water treatment system will be implemented for the treatment of surface water run-off from the site during the construction phase prior to flows entering receiving watercourses.
- 4.1.3 All temporary and permanent SuDS from the site will have a minimum three stages of treatment. A single stage of treatment is considered as any of the following:
- Conveyance through a swale.
 - Filtration of water through filter media (e.g. check dam).
 - Detention in settlement ponds / behind dam in overland breakout.
 - Filtration / settlement across vegetated ground.
- 4.1.4 Clean water (groundwater, natural overland flows, watercourses, etc.) and dirty water (from access tracks, hardstands and cut slopes) will be as far as practicably possible kept separate. Reducing the volume of water entering the surface water treatment system will significantly improve the performance of the treatment. Where appropriate, a cut off ditch will be installed to ensure that surface water run-off can be directed around areas of work and consequently reduce volumes of silt laden construction run-off.

Prevention

- 4.1.5 Potential causes of pollution will be managed at their source. The following working methods will be adopted to avoid mobilisation of pollutants:
- Areas stripped of vegetation will be kept to a minimum. Stripped vegetation will be reinstated on slopes as soon as possible after removal.
 - Where necessary, biodegradable matting will be utilised on cut slopes to prevent washing of fines into the surface water treatment system.
 - Good quality stone will be used in access track and hardstand construction. Construction material will be specified in accordance with the Specification for Highway Works (SHW). SHW compliant material does not permit the use of large quantities of fine material and therefore all material imported to site will not be heavily laden

with silt / fines. Regular inspections and testing of material will ensure the construction material is compliant with the SHW.

Source Control

- 4.1.6 Potential causes of pollution will be controlled at source. Flows from excavations and hardstand areas will discharge into swales. Check dams will be installed in the swales at regular intervals to provide a level of attenuation, reduce water velocity, and promote settlement of suspended solids and silt.

Buffer Zones

- 4.1.7 Wind turbine centres are located a minimum of 60m from watercourses.
- 4.1.8 A 10m buffer zone will be employed for all main watercourses in accordance with *GPP5: Works or maintenance in or near water (2017)*. Where this is impossible at watercourse crossing locations, works will be in accordance with the relevant guidance outlined in Section 2.2.
- 4.1.9 Washing out of concrete mixer lorries will be strictly controlled and limited to a designated wash area a minimum of 50m away from any watercourse. Where a potential risk is identified of an accidental concrete spillage into a watercourse, cut off ditches and diversion dams will be installed to channel potential spillages and run-off water to a suitable collection area. In accordance with *GPP5: Works or maintenance in or near water (2017)*., contaminated water shall not be pumped or allowed to flow into the water environment without treatment. Collected effluent shall be pumped out and disposed of off-site in compliance with the *Waste Management Licensing (Scotland) Regulations 2011*. Residual solidified concrete within the containment area would be broken up and disposed of off-site in accordance with the pertinent regulations, prior to reinstatement of the area.
- 4.1.10 Any dewatering from excavations will be via surface silt traps, check dams, and temporary settlement ponds to reduce potential silt entering receiving watercourses.
- 4.1.11 No dewatering or outflows will be permitted within the 10m buffer zones.

Control of Surface Water Drainage Management Measures

- 4.1.12 All surface water drainage management measures being implemented will be checked regularly and action taken to ensure functionality. Any sign of silt laden water entering a watercourse will be reported immediately to

the Principal Contractor, the source of the silt identified and further remedial measures undertaken.

- 4.1.13 Furthermore, as outlined in the Outline CEMP in Technical Appendix 2.1, a Water Quality Monitoring Plan will be implemented to provide a management tool to monitor the effectiveness of the surface water drainage management measures in place to protect the water environment.

Emergency Pollution Procedures

- 4.1.14 The Emergency Pollution Procedure will form part of the site management procedures adopted by the site team managing the construction works.
- 4.1.15 The procedure will remain in place throughout the operational phase of the wind farm.
- 4.1.16 The Principal Contractor will act as a central point of contact for all identified pollution incidents. The Principal Contractor will inform the Ecological Clerk of Works (ECoW) as quickly as possible upon discovery of any spill or leak. The ECoW will advise on any other response requirements and contact key emergency contacts as required. SEPA should be notified via the pollution hotline number (0800 80 70 60).

5 Controlling Run-off

5.1 Flow Control Measures

- 5.1.1 Run-off will be attenuated in swales and settlement ponds. Attenuated flows will be discharged over existing vegetation prior to discharging into receiving watercourses, as per the existing drainage regime for the site.
- 5.1.2 Rate and volume of run-off will be attenuated using settlement ponds receiving flows from newly constructed hardstand areas. Attenuation features will also reduce flow velocities and allow settlement of fines prior to discharge. Flow rates will also be reduced through the integration of swales and check dams.
- 5.1.3 Access tracks and hardstand areas are to be constructed from unbound aggregate and are therefore not fully impermeable, thus helping to reduce run-off rates.
- 5.1.4 Cross drains, where required, will be provided with associated sumps and check dams. The cross drains will provide a means for flows to pass from a swale on the uphill side of the access track to the downhill side of the access track and would help maintain existing flow patterns.

- 5.1.5 In cases where the access tracks run significantly downhill, grips will be constructed in the surface of the access tracks to divert any run-off flowing down the access track into the swale.
- 5.1.6 Excavated access tracks will incorporate swales with check dams to overland breakouts over vegetation.
- 5.1.7 Floating access tracks will follow the principles of minimum disturbance of the vegetated layer. Stone / geotextile will be laid directly onto existing vegetation. No swales will be constructed alongside floating access track, water will run-off directly off the access track onto existing vegetation. Flow balancing pipes, in the form of perforated pipes will be provided at existing flush locations and at regular intervals along the sections of floating access track.

5.2 Preserving Site Hydrology

- 5.2.1 Existing overland flow routes and channels will be maintained. Cross drains will be provided under the access tracks at all locations where existing natural flow paths pass through the proposed access track alignment. Buried cable trenches would also be designed in a way to avoid modifying shallow flow patterns.

6 Watercourse Crossings

- 6.1.1 Four watercourses have been identified on the site that will be affected by the construction of new watercourse crossings to allow the proposed development on the site. Consent will be obtained from SEPA under (CAR) for the new or upgraded watercourse crossings on the site. See Technical Appendix 9.1 Schedule of Watercourse Crossings for further details.
- 6.1.2 All works to watercourses will be carried out in accordance with CAR.

7 Foul Drainage / Treated Discharges

- 7.1.1 Disposal of sewage from temporary and permanent facilities on the site will be designed and shall be in accordance with the methods outlined in *GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer*, and treatment systems will be sized in accordance with *British Water Code of Practice - Flows & Loads*.

7.1 Permanent Sewage Treatment Systems

- 7.1.2 At the substation compound, permanent welfare facilities will comprise of toilets and sinks.
- 7.1.3 The preferred option for sewage treatment is via a septic tank with the treated wastewater to then to then discharge to a soakaway.
- 7.1.4 Infiltration tests will be carried out to confirm the infiltration properties of the existing ground in the vicinity of the substation compound.
- 7.1.5 Consents will be sought from SEPA prior to the installation of any sewage treatment system.

7.2 Temporary Treatment Systems

- 7.2.1 At the temporary construction compound, temporary welfare facilities will comprise of toilets and sinks. Temporary sewage treatment system will be installed to discharge flows into a temporary cess pit. Off-site disposal from temporary cess pits will be by a licensed waste haulier / contractor.
- 7.2.2 The temporary sewage treatment system will be removed on completion of construction of the proposed development.

8 Post Construction Monitoring

- 8.1.1 A post construction inspection programme will be implemented, with a walk over site visit to be undertaken on an ongoing 6-monthly basis (winter and summer preferably). Points to be considered during these inspections include, but are not limited to, the following:
- Check dams and settlement ponds will be checked twice yearly on an ongoing basis. Where stone check dams have become clogged with silt, the check dam will be cleared out.
 - Further check dams will be installed within the swales along any steeper sections of the access track.
 - Should there be noticeable effects of erosion at discharge points, suitable erosion protection measures such as reno-mattress or placement of large stones (>150mm) to dissipate water energy levels will be installed at the area affected.
 - Any materials excavated should be placed in such a manner that any instability of excavated materials will not cause further infilling of a swale or drainage feature.

- Inlets and outlets of cross drains are to be free from silt and debris. All litter will be removed from discharge points / outlets and inlets / outlets of storage features to be operating correctly.
- A maintenance record log will be maintained for all maintenance work carried out. Where problems persist on each six-monthly inspection, advice will be sought from a SuDS designer on an alternative drainage solution shall be installed.