

Technical Appendix 8.1: Assessment Methodology

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1.1 Introduction

- 1.1.1
- The assessment methodology in relation to Hydrology, Hydrogeology, Geology and Soils, including the criteria for assessing sensitivity of receptors, magnitude of change and cumulative effects, as well as overall significance criteria is detailed below. The following methodology has formed the basis of **Chapter 8: Hydrology, Hydrogeology, Geology and Soils (EIAR Volume 2)**.
- 1.1.2
- The Proposed Development is a renewable energy development comprised of up to eight wind turbines, a Battery Energy Storage System (BESS) and associated infrastructure adjacent to Sullom Voe Oil Terminal (SVT) and the Shetland Gas Plant in Shetland, Scotland. The Proposed Development is described in **Chapter 2: Proposed Development (EIAR Volume 2)**.

1.2 Legislation, Guidance and Policies

- 1.2.1
- The following legislation and policy in relation to the water environment has been taken into consideration in the preparation of **Chapter 8: Hydrology, Hydrogeology, Geology and Soils (EIAR Volume 2)**:
 - Water Environment and Water Services (Scotland) Act 2003¹;
 - Environmental Authorisations (Scotland) Regulations 2018 (EASR)²;
 - The Water Environment (Miscellaneous) (Scotland) Regulations 2017³;
 - Scottish Government, National Planning Framework 4 (NPF4)⁴, Policy 22 Flood Risk and Water Management and Policy 5 Soils February 2023;
 - Flood Risk Management (Scotland) Act 2009⁵;
 - The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017⁶;
 - The Public and Private Water Supplies (Miscellaneous Amendments) (Scotland) Regulations 2015⁷;
 - The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013⁸; and
 - Scottish Government (2012) River Crossings and Migratory Fish⁹
 - The Control of Pollution Act 1974¹⁰;
 - Environmental Protection Act 1990¹¹;
 - Environment Act 1995¹²;
 - Climate Change Act (Scotland) 2009¹³;

- The Town and Country Planning (Scotland) Act¹⁴;
 - The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations¹⁵; and
 - Scottish Planning Policy (SPP)¹⁶.
- 1.2.2
- The following guidance has been considered in assessing potential impacts of the Proposed Development.
 - GPP 1 Understanding your environmental responsibilities – good environmental practices (June 2021)¹⁷;
 - GPP 2: Above ground oil storage tanks (January 2021)¹⁸;
 - GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer (June 2021);
 - GPP 5: Works and maintenance in or near water (February 2018);
 - PPG 619: Working at construction and demolition sites (April 2023);
 - GPP 13: Vehicle washing and cleaning (June 2021);
 - GPP 21: Pollution incident response planning (June 2021);
 - GPP 22: Incident response - dealing with spills (October 2018);
 - PAN 79: Water and Drainage (September 2006);
 - UPS-GU418: Planning guidance on on-shore wind farm developments (2025);
 - LUPS-DP-GU2a: Development Plan Guidance on Flood Risk (July 2018);
 - LUPS-GU19: Planning advice on wastewater drainage (2011);
 - LUPS-GU31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (August 2024);
 - WAT-G-025 EASR Guidance: Engineering: Activity Guide: Instream and In-loch structures;
 - WAT-G-028 EASR Guidance: Engineering: Activity Guide: In the vicinity, beyond the vicinity and affecting wetlands;
 - WAT-G-030 EASR Guidance: Engineering: Meeting Good Practice;
 - WAT-G-034 EASR Guidance: Construction works and silt/pollution mitigation;

¹ Scottish Government (2003). Water Environment and Water Services (Scotland) Act 2003. Available at: <http://www.legislation.gov.uk/asp/2003/3/contents> [Accessed 06/04/2026]

² Environmental Authorisations (Scotland) Regulations 2018 (EASR) Available at: <https://beta.sepa.scot/regulation/authorisations-and-compliance/easr-authorisations/>

³ Scottish Government (2017) The Water Environment (Miscellaneous) (Scotland) Regulations 2017. Available at: <http://www.legislation.gov.uk/ssi/2017/389/contents/made> [Accessed 06/04/2026]

⁴ Scottish Government (2023). National Planning Framework 4. [online] Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/02/national-planning-framework-4/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4.pdf>. [Accessed 06/04/2026]

⁵ Scottish Government (2009) Flood Risk Management (Scotland) Act 2009. Available at: <http://www.legislation.gov.uk/asp/2009/6/contents> [Accessed 06/04/2026]

⁶ Scottish Government (2017) the Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017 Available at: <https://www.legislation.gov.uk/ssi/2017/282/note/made> [Accessed 06/04/2026]

⁷ Scottish Government (2015) the Private and Public Water Supplies (Miscellaneous Amendments) (Scotland) Regulations 2015. Available at: <https://www.legislation.gov.uk/ssi/2015/346/contents> [Accessed 06/04/2026]

⁸ Scottish Government (2013) The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013 [Online] Available at: <http://www.legislation.gov.uk/ssi/2013/29/introduction/made> [Accessed 06/04/2026]

⁹ SEPA (n.d.). Crossings. Available at: <https://beta.sepa.scot/regulation/authorisations-and-compliance/easr-authorisations/water-activities/engineering/crossings/> [Accessed 06/04/2026]

¹⁰ The Control of Pollution Act 1974. Available at <https://www.legislation.gov.uk/ukpga/1974/40>.

¹¹ The Environmental Protection Act 1990. Available at [Environmental Protection Act 1990](#).

¹² The Environment Act 1995. Available at [Environment Act 1995](#).

¹³ Climate Change Act (Scotland) 2009. Available at: <https://www.legislation.gov.uk/asp/2009/12/contents>.

¹⁴ The Town and Country Planning (Scotland) Act (1997). Available at: <https://www.legislation.gov.uk/ukpga/1997/8/contents>.

¹⁵ The Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations (2017). Available at: <https://www.legislation.gov.uk/ssi/2017/102/contents> .

¹⁶ Scottish Planning Policy (2014). Available at: : <https://www.gov.scot/publications/scottish-planning-policy/pages/2/>.

¹⁷ Guidance for Pollution Prevention documents (including GPP 1, 5, 6, 21 and 22 are published by SEPA online. Available at: <https://www.netregs.org.uk/tools/guidance-for-pollution-prevention-gpp-documents/> [last accessed June 2025]

¹⁸ Guidance for Pollution Prevention: Above Ground Oil Storage Tanks (2021). Available at: [guidance-for-pollution-prevention-2-2022-update.pdf](#)

¹⁹ Guidance provided in recent GPPs will be followed and take precedent over information provided in PPG 6, which was withdrawn on 14th December 2015, where there is overlap in the provision of advice. For example, guidance on the storage of handling of oils /fuels in GPP 2 will take precedent (such as oil use, storage and refuelling) of PPG 6. Available at: [gpp6-working-on-construction-and-demolition-sites.pdf](#).

- WAT-SG-25: Good Practice Guide - River Crossings (November 2010)²⁰;
- SEPA, Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems (August 2024)²¹;
- SEPA, Guidance on Assessing the Impacts of Developments on Groundwater Abstractions (August 2024)²²;
- Scottish Government, SNH, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland²³;
- SNH (2016) Carbon and Peatland Map²⁴;
- The Scottish Government (2009), The Scottish Soil Framework;
- The Construction Industry Research and Information Association (CIRIA) (2015), Environmental Good Practice on Site (C741);
- Scottish Renewables and SEPA (2012). Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste²⁵; and
- SEPA (2011). Restoration Techniques Using Peat Spoil from Construction Works²⁶.

Environmental Protection and Permitting

1.2.3 In Scotland, the Scottish Environment Protection Agency (SEPA) is the public body responsible for environmental protection under the Environmental Protection Act 1990. Many SEPA policies relating to water are now delivered by the regulatory methods produced to implement the Water Environment (Controlled Activities) (Scotland) Regulations 2011 and the Water Environment and Water Services (Scotland) Act 2003.

Water Quality Standards

1.2.4 The water quality of rivers in Scotland is classified by SEPA, which has developed a classification scheme for surface waters following the requirements of the Water Environment and Water Services (Scotland) Act 2003 (WEWS Act), as part of the River Basin Management Plans (RBMP). The application site is within the area covered by the Scotland River Basin Management Plan, the most recent cycle of which is Cycle 3 2021-2027.

Control of Pollution

1.2.5 The Environmental Authorisations (Scotland) Regulations 2018 (EASR) set out requirements for the storage, handling and transport of oils, chemicals and other potential contaminants to prevent pollution of the water environment. The EASR require holders of environmental authorisations to implement minimum standards and operational measures — including appropriate containment, spill prevention and response arrangements, inspection and maintenance, and record-keeping — to manage risks from oil and chemical storage and ensure regulatory compliance.

1.3 Methodology

Criteria for Assessing the Sensitivity of Receptors

1.3.1 Effects on water resources are described as beneficial, neutral or adverse and are considered with reference to the value or sensitivity of the receptor, as described in **Table 8.1.1**.

Table 8.1.1: Sensitivity of Environmental Receptor		
Sensitivity of Receptor	Definition	Typical Criteria
High	International or national level importance. Receptor with a high quality and rarity, regional or national scale and limited potential for substitution/replacement.	High likelihood of fluvial/ tidal flooding in the sub catchment – defined as 1:10 probability in a year. European Commission (EC) Designated Salmonid/Cyprinid fishery. Surface Water Framework Directive (WFD) class 'High'. Scottish Government Drinking Water Protected Areas. Aquifer providing regionally important resource such as abstraction for public water supply, abstraction for private water supply. Supporting a site protected under EC or UK habitat legislation/species protected by EC legislation. Protected Bathing Water Area. Active floodplain. Highly Ground Water Dependant Terrestrial Ecosystems (GWDTE). Average peat depth >1 m within the sub-catchment – near natural condition. Peat >2 m in depth that is drained, eroded or modified. Peat Landslide Hazard Risk Assessment shows High to Moderate Risk of peat landslides.
Medium	Regional, county and district level importance. Receptor with a medium quality and rarity, regional scale and limited potential for substitution/replacement.	Medium likelihood of fluvial/tidal flooding in the sub catchment – defined as a 1:200 probability in a year. Surface water WFD class 'Good' or 'Moderate'. Aquifer providing water for agricultural or industrial use. Local or regional ecological status/locally important fishery. Contains some flood alleviation features. Moderately GWDTEs. Average peat depth >0.5 m to 1.0 m within the sub catchment – mostly near natural condition. Peat >1 m to 2 m that is drained, eroded or modified. Peat Landslide Hazard Risk Assessment shows Low Risk of peat landslides.
Low	Local importance Receptor is on-site or on a neighbouring site with a low quality and rarity, local scale. Environmental equilibrium is stable and is resilient to changes that are greater than natural fluctuations, without detriment to its present character.	Surface water WFD class 'Poor'. Unproductive strata/no abstractions for water supply. Sporadic fish present. No flood alleviation features. Sewer. No Peat or non-peat/organic rich soils <0.5 m within the sub catchment. Peat <1 m depth that is drained, eroded or modified.

²⁰ SEPA WAT-G-030: Meeting Good Practice. Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fbeta.sepa.scot%2Fmedia%2Fnpyb3xct%2Fwat-g-030_engineering_meeting_good_practice.docx&wdOrigin=BROWSELINK

²¹ SEPA (2024) Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems. Available online: <https://www.sepa.org.uk/media/a1yh0blq/guidance-on-assessing-the-impacts-of-developments-on-groundwater-dependent-terrestrial-ecosystems.docx> [last accessed August 2025]

²² SEPA (2024) Guidance on Assessing the Impacts of Developments on Groundwater Abstractions. Available online: <https://www.sepa.org.uk/media/mfzpnjwb/guidance-on-assessing-the-impacts-of-developments-on-groundwater-abstractions.docx> [accessed August 2025]

²³ Scottish Government, Scottish Natural Heritage, SEPA. (2017). Peatland Survey: Guidance on Developments on Peatland, online version only.

²⁴ Scottish Natural Heritage. (2016). Carbon and Peatland 2016 Map (Carbon and peatland 2016 map | (Scotland's soils) http://map.environment.gov.scot/soil_maps/.

²⁵ Scottish Renewables and SEPA (2012). Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste.

²⁶ SEPA (2011). Restoration Techniques Using Peat Spoil from Construction Works.

Criteria for Assessing the Magnitude of Impact

1.3.2 The size or magnitude of each impact is determined as a predicted deviation from the baseline conditions during construction, operation and decommissioning of the Proposed Development, as described in **Table 8.1.2**.

Table 8.1.2: Magnitude of Impact on a Receptor	
Magnitude of Impact	Criteria
Large	Total or near total loss of peat resource. Fundamental loss of integrity or function of the geological/soil/peat receptor. Peat resource loss represents >50 % of the peat resource present in the survey area. Large alteration/change in the quality or quantity of and/or to the physical or biological characteristics of controlled waters.
Medium	Partial loss of peat resource. Local to site wide disturbance to function of the geological/soil/peat receptor. Peat resource loss represents >5 % and <50 % of the peat resource in the survey area. Medium alteration/change in the quality or quantity of and/or to the physical or biological characteristics of controlled waters.
Small	Localised excavation of peatland resource. A detectable but non-material effect such that the integrity of the geological/soil/peat receptor is not affected. Peat resource loss represents <5% of the peat resource in the survey area. Small alteration/change in the quality or quantity of and/or to the physical or biological characteristics of controlled waters.
None	No excavation peatland resource. No alteration/change detectable in the quality or quantity of and/or to the physical or biological characteristics of controlled waters.

Criteria for Assessing Cumulative Effects

- 1.3.3 The potential for cumulative effects to occur as a result of the Proposed Development is assessed based on:
- The potential hydrological connection of other similar developments, which are consented or the subject of a valid planning application;
 - The potential for concurrent phases of construction with other similar developments with the potential for hydrological connection to the Site; and
 - Applicable planning conditions with regards to the potential impact of other similar developments on the water environment including requirements for the implementation of drainage measures, pollution prevention and best practice working measures with regard to the water environment.

Criteria for Assessing Significance

1.3.4 **Table 8.1.3** illustrates how the significance of effects are determined by comparison of the sensitivity of receptors with the magnitude of impact (i.e. predicted change). For the purposes of this assessment, significant effects are **Major** or **Moderate**.

Table 8.1.3: Significance Criteria					
		Magnitude of Impact			
		None	Small	Medium	Large
Sensitivity of Receptor	High	None	Minor	Major	Major
	Medium	None	Minor	Moderate	Moderate
	Low	None	Negligible	Minor	Minor