

Netherton Hub 400 kV OHL Connection to New Deer and Peterhead: Tie-In

Environmental Appraisal Report Volume 1 Chapter 9: Hydrology, Hydrogeology, Geology and Soils

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9. HYDROLOGY, HYDROGEOLOGY, GEOLOGY AND SOILS

9.1 Introduction

- 9.1.1 This chapter appraises the environmental risks to hydrology, hydrogeology, geology and soil receptors resulting from the construction and operation of the Proposed Development. Each of these topics are defined below, and for each case, this chapter details a baseline description, identifies and appraises the effects on each receptor and, where relevant, proposes mitigation.
- 9.1.2 Hydrology in this appraisal relates to the potential effects to drainage regimes and associated alteration to surface water runoff rates and volumes, erosion and sedimentation within water bodies, and water quality characteristics across the Study Area (see **Section 9.5: Methodology**) and the wider catchments. This includes potential effects to hydrologically relevant nationally and internationally designated sites, including Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and Ramsar sites. This appraisal also focuses on potential effects to water resources, such as Scottish Water drinking water abstractions, Private Water Supplies (PWS), and both Scottish Environment Protection Agency (SEPA) and Scottish Water Drinking Water Protected Areas (DWPA).
- 9.1.3 Hydrogeology in this appraisal relates to the potential effects to groundwater infiltration and groundwater levels, water quality and quantity, with consideration of water resources supporting water supplies, Groundwater Dependent Terrestrial Ecosystems (GWDTE) and wetlands.
- 9.1.4 Geology and Geomorphology includes consideration of potential effects on geological structures or geomorphological characteristics of the Study Area, or effects on designated sites relevant for their geological or fluvial geomorphological features, such as SSSIs.
- 9.1.5 Soils in this appraisal relates to potential effects to soil characteristics with regards to erosion, compaction and soil quality, and includes effects to peat and peaty soils, such as disturbance, excavation and increased instability.
- 9.1.6 This chapter should be read in conjunction with the following chapters and figures.
- **Chapters 1 – 4 (Volume 1)** of this Environmental Appraisal Report (EAR);
 - **Chapter 7 – Ecology (Volume 1)**;
 - **Appendix 9.1: Private Water Supply Risk Assessment (Volume 3)**;
 - **Figure 9.1: Hydrological Features (Volume 2)**;
 - **Figure 9.2: Bedrock Geology (Volume 2)**;
 - **Figure 9.3: Superficial Geology (Volume 2)**;
 - **Figure 9.4: Private Water Supplies (Volume 2)**; and
 - **Figure 9.5: Soil Depth (Volume 2)**.

9.2 Legislation, Policy and Guidance

Legislation

- 9.2.1 This appraisal is carried out in accordance with the principles contained within the following pieces of legislation:

- The Water Environment and Water Services (Scotland) Act (WEWS) 2003¹;
- Environmental Authorisations (Scotland) Regulations (EASR) 2018² as amended by the Environmental Authorisations (Scotland) Amendment Regulations 2025³.
- The Private Water Supplies (Scotland) Regulations 2006⁴;
- The Public Water Supplies (Scotland) Regulations 2014 (as amended 2017)⁵;
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017⁶;
- The Flood Risk Management (Scotland) Act 2009⁷;
- The Private and Public Water Supplies (Miscellaneous Amendments) (Scotland) Regulations 2015⁸;
- The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013⁹; and
- The Pollution Prevention and Control (Scotland) Regulations 2012¹⁰.

Policy

9.2.2 This appraisal is carried out in accordance with the principles contained within the following documents:

- National Planning Framework 4 (NPF4) 2023¹¹;
- SEPA Environmental Policy Number 19, Groundwater Protection Policy for Scotland v3¹²;
- SEPA (2022), Position Statement on Planning and Soils¹³;
- Aberdeenshire Local Development Plan (2023)¹⁴; and
- Scottish Government (2009) Scottish Soil Framework¹⁵.

Guidance

9.2.3 This appraisal is carried out in accordance with the principles contained within the following guidance documents:

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- ¹ Scottish Government (2003) The water environment and water services Scotland act available at: <https://www.legislation.gov.uk/asp/2003/3/contents> [Accessed October 2025]
- ² Scottish Government (2018). Environmental Authorisations (Scotland) Regulations (EASR) 2018. Available at: <https://www.legislation.gov.uk/sdsi/2018/9780111039014/contents> [Accessed October 2025]
- ³ Scottish Government (2025). Environmental Authorisations (Scotland) Amendment Regulations 2025. Available at: <https://www.legislation.gov.uk/sdsi/2025/9780111061473/contents> [Accessed October 2025]
- ⁴ Scottish Government (2006) The Private Water Supplies (Scotland) Regulations 2006. Available at: <http://www.legislation.gov.uk/ssi/2006/209/contents/made> [Accessed October 2025]
- ⁵ The Scottish Government (2017). The Public Water Supplies (Scotland) Regulations 2017 (as amended). Available at: <https://www.legislation.gov.uk/ssi/2017/281> [Accessed October 2025]
- ⁶ UK Government (2006). The Private Water Supplies (Scotland) Regulations 2006. Available at: <http://www.legislation.gov.uk/ssi/2006/209/contents/made> [Accessed October 2025]
- ⁷ Scottish Government (2009). Flood Risk Management (Scotland) Act 2009. Available at: <https://www.legislation.gov.uk/asp/2009/6/contents> [Accessed October 2025]
- ⁸ UK Government (2015). The Private and Public Water Supplies (Miscellaneous Amendments) (Scotland) Regulations 2015. Available at: [The Private and Public Water Supplies \(Miscellaneous Amendments\) \(Scotland\) Regulations 2015](#) [Accessed March 2026]
- ⁹ UK Government (2013). The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013. Available at: [Microsoft Word - A4357456PN](#) [Accessed March 2026]
- ¹⁰ UK Government (2012). The Pollution Prevention and Control (Scotland) Regulations 2012. Available at: [The Pollution Prevention and Control \(Scotland\) Regulations 2012](#) [Accessed March 2026]
- ¹¹ National Planning Framework 4 (NPF4) [online] Available at: <https://www.gov.scot/publications/national-planning-framework-4/documents/> [Accessed October 2025]
- ¹² SEPA groundwater protection policy v3 available online at https://www.sepa.org.uk/media/60033/policy-19_groundwaternov09.pdf
- ¹³ SEPA Position Statement on Planning and Soils (2022). Available at: [Soil | Scottish Environment Protection Agency \(SEPA\)](#) [Accessed March 2026]
- ¹⁴ Aberdeenshire Local Development Plan (2023). Available at: [Aberdeenshire Local development Plan - January 2023 - Introduction and Policies](#) [Accessed March 2026]
- ¹⁵ Scottish Government (2009) The Scottish Soil Framework. Available at: [The Scottish Soil Framework - gov.scot](#) [Accessed March 2026]

- Construction Industry Research and Information Association (CIRIA) (2001) Report C532, Control of water pollution from construction sites: Guidance for consultants and contractors¹⁶;
- CIRIA (2006) Report C648, Control of water pollution from linear construction projects: Technical guidance¹⁷;
- CIRIA (2006) Report C649, Control of water pollution from linear construction sites: Site guide¹⁸;
- CIRIA (2015) Report C753, The Sustainable Drainage Systems (SuDS) Manual¹⁹;
- CIRIA (2006) Report C618, Control of Water Pollution from linear construction projects²⁰;
- Scottish Executive (2000) River crossings & migratory fish: Design guidance²¹;
- Scottish Executive (2017) Peat Landslide Hazard and Risk Assessment: Best Practice Guide for Proposed Electricity Generation Developments, 2nd Edition²²;
- NatureScot (2018) Environmental Impact Assessment Handbook, Version 5²³;
- NatureScot (2010) Floating roads on peat²⁴;
- SEPA (2024) (Controlled Activities) (Scotland) Regulations 2011 (as amended), A Practical Guide, Version 9.4²⁵;
- SEPA Recommended Riparian Corridor Layer for use in Land Use Planning 2024²⁶;
- SEPA (2025) Position Statement WAT-G-024: Engineering: Activity Guide: Crossings²⁷;
- SEPA (2025) WAT-G-030: Engineering: Meeting Good Practice²⁸;
- SEPA (2025) WAT-G-026: Engineering: Activity Guide: Sediment Management²⁹;

¹⁶ CIRIA (2001) Control of water pollution from construction sites: Guidance for consultants and contractors [online]. Available at: <https://www.ciria.org/ItemDetail?iProductCode=C532&Category=BOOK&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91> [Accessed October 2025]

¹⁷ CIRIA (2006) Report C648, Control of water pollution from linear construction projects: Technical guidance. https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C648&Category=BOOK [Accessed October 2025]

¹⁸ CIRIA (2006) Report C649, Control of water pollution from linear construction project: Site guide. Available at: <https://www.ciria.org/ItemDetail?iProductCode=C649&Category=BOOK&WebsiteKey=a054c7b1-c241-4dd4-9ec1-38afd4a556> [Accessed October 2025]

¹⁹ CIRIA (2018) Report C753, The Sustainable Drainage Systems (SuDS) Manual [online]. Available at: <https://www.ciria.org/ItemDetail?iProductCode=C753F&Category=FREEPUBS> [Accessed October 2025]

²⁰ CIRIA (2006) Report C618, Control of Water Pollution from linear construction projects. Available at: <file:///C:/Users/UKEXE012/Downloads/c648.pdf> [Accessed October 2025]

²¹ Scottish Executive (2012) River crossings & migratory fish: Design guidance [online]. Available at: <https://studylib.net/doc/7380716/river-crossings-and-migratory-fish--design-guidance> [Accessed November 2025]

²² Scottish Executive (2017) Peat Landslide Hazard and Risk Assessment: Best Practice Guide for Proposed Electricity Generation Developments, 2nd Edition [online]. Available at: <https://www.gov.scot/publications/peat-landslide-hazard-risk-assessments-best-practice-guide-proposed-electricity/> [Accessed October 2025]

²³ NatureScot (2018) Environmental Impact Assessment Handbook, Version 5 [online]. Available at: <https://www.nature.scot/doc/archive/environmental-impact-assessment-handbook-version-5-2018> [Accessed October 2025]

²⁴ NatureScot (2010) Floating roads on peat [online]. Available at: <http://www.roadex.org/wp-content/uploads/2014/01/FCE-SNH-Floating-Roads-on-Peat-report.pdf>

²⁵ SEPA (2023) (Controlled Activities) (Scotland) Regulations 2011 (as amended) A Practical Guide [online] Available at: <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.sepa.org.uk%2Fmedia%2Fcd3doeli%2Fcar-a-practical-guide.docx&wdOrigin=BROWSELINK>

²⁶ SEPA, 2024, Recommended Riparian Corridor Layer for use in Land Use Planning 2024. Available at <https://www.sepa.org.uk/environment/water/river-basin-management-planning/publications/> (Accessed November 2026).

²⁷ SEPA, 2025, EASR Guidance: WAT-G-024: Engineering: Activity Guide: Crossings. Available at https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fbeta.sepa.scot%2Fmedia%2Ftwimqfru%2Fwat-g-024_engineering_activity_guide_crossings.docx&wdOrigin=BROWSELINK

²⁸ SEPA, 2025, EASR Guidance: WAT-G-030: Engineering: 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

²⁹ SEPA, 2025, EASR Guidance: WAT-G-026: Engineering: Activity Guide: Sediment Management. Available at https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fbeta.sepa.scot%2Fmedia%2Faafny0ht%2Fwat-g-026_engineering_activity_guide_sediment_management.docx&wdOrigin=BROWSELINK (Accessed November 2025).

- SEPA (2025) WAT-G-034: Construction works and silt/pollution mitigation³⁰
- SEPA (2024) Guidance on assessing the impacts of development on groundwater dependent terrestrial ecosystems³¹;
- SEPA (2024) Guidance on assessing the impacts of development on groundwater abstractions³²;
- NatureScot (2023) Advising on peatland, carbon rich-soils and priority peatland habitats in development management³³;
- Guidance for Pollution Prevention, Vehicle Washing and Cleaning: GPP 13³⁴;
- Guidance for Pollution Prevention, Pollution incident response planning: GPP 21³⁵;
- Guidance of Pollution Prevention, Dealing with spills: GPP 22³⁶; and
- Guidance for Pollution Prevention, Safe Storage of Drums and Intermediate Bulk Containers (IBCs): GPP 26³⁷

9.3 Information Sources

9.3.1 The following sources of information have been reviewed during the desk-based research:

- Ordnance Survey (OS) (2022) digital mapping³⁸, 1:10,000, 1:25,000 and 1:50,000 scales;
- SEPA Water Classification Hub (2024) (River Basin Management Plan interactive web map)³⁹;
- SEPA Flood Maps (2015) (interactive web map)⁴⁰;
- British Geological Survey (BGS) Hydrogeological Map of Scotland (2020), 1:625,000 scale⁴¹;

³⁰ SEPA, 2025, EASR Guidance: WAT-G-034: Construction works and silt / pollution mitigation. Available at https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fbeta.sepa.scot%2Fmedia%2F40yhm5lc%2Fwat-g-034_construction_works_and_silt_pollution_mitigation.docx&wdOrigin=BROWSELINK (Accessed November 2026).

³¹ SEPA Guidance on assessing the impacts of development proposals on groundwater dependent terrestrial ecosystems, [online] Available at: <https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf> guidance-on-assessing-the-impacts-of-developments-on-groundwater-dependent-terrestrial-ecosystems.docx

³² SEPA Guidance on assessing the impacts of developments on groundwater abstractions (online) available at: <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.sepa.org.uk%2Fmedia%2Fmfzpnjwb%2Fguidance-on-assessing-the-impacts-of-developments-on-groundwater-abstractions.docx%23%3A~%3Atext%3DQualitative%2520assessment%2520of%2520the%2520potential%2Creversibility%2520of%2520any%2520potential%2520impacts.&wdOrigin=BROWSELINK>

³³ NatureScot (2023) Advising on peatland, carbon rich-soils and priority peatland habitats in development management [online] Available at: <https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management> [Accessed November 2025]

³⁴ Natural Resources Wales (NRW), Northern Ireland Environment Agency (NIER), Scottish Environment Protection Agency (SEPA). Vehicle Washing and Cleaning GPP 13 (2021). Available at: [guidance-for-pollution-prevention-13-2022-update-v2.pdf](#) [Accessed March 2026]

³⁵ Natural Resources Wales (NRW), Northern Ireland Environment Agency (NIER), Scottish Environment Protection Agency (SEPA). Pollution incident response planning GPP 21 (2021). Available at: [gpp-21-final.pdf](#) [Accessed March 2026]

³⁶ Natural Resources Wales (NRW), Northern Ireland Environment Agency (NIER), Scottish Environment Protection Agency (SEPA). Dealing with spills: GPP 22 (2018). Available at: [gpp-22-dealing-with-spills.pdf](#) [Accessed March 2026]

³⁷ Natural Resources Wales (NRW), Northern Ireland Environment Agency (NIER), Scottish Environment Protection Agency (SEPA). Safe Storage of Drums and Intermediate Bulk Containers (IBCs): GPP 26 (2021). Available at: [guidance-for-pollution-prevention-26-2022-updated.pdf](#) [Accessed March 2026]

³⁸ Ordnance Survey Online Mapping (2022). [online] Available at: <https://osmaps.ordnancesurvey.co.uk/> [Accessed October 2025]

³⁹ SEPA Water Classification Hub (2022). [online] Available at: <https://www.sepa.org.uk/data-visualisation/water-classification-hub/> [Accessed October 2025]

⁴⁰ SEPA Flood Maps (2025). [online] Available at: <https://beta.sepa.scot/flooding/flood-maps/> [Accessed October 2025]

⁴¹ BGS GeoIndex Onshore Viewer for Hydrogeological map of Scotland (2020). [online] Available at: http://mapapps2.bgs.ac.uk/geoindex/home.html?layer=BGSHydroMap&_ga=2.59199725.1532853921.1644263485-96331536.1635767367 [Accessed October 2025]

- BGS GeoIndex Onshore viewer: Bedrock and Superficial Geology (2020). 1:50,000 scale (interactive web map)⁴²;
- NatureScot SiteLink (2025) (interactive web map)⁴³;
- James Hutton Institute National Soil Map of Scotland (2024)⁴⁴;
- NatureScot Carbon and Peatland Map (2024)⁴⁵;
- PWS information was obtained from Aberdeenshire Council in February 2024 via email correspondence.
- Scottish environment catchments (2024)⁴⁶;
- Scottish Government, Drinking Water Protection Areas (DWPA) (2025)⁴⁷; and
- Scottish Government (2024) Scotland's Environment Map⁴⁸.

9.4 Limitations and Assumptions

- 9.4.1 Baseline conditions have been established from a variety of sources, including historical and current data obtained via online resources, information requests to statutory consultees, including SEPA, Scottish Water and Aberdeenshire Council, and site surveys which were undertaken by WSP between 11 and 14 November 2025 and 24 and 25 February 2026. Due to the dynamic nature of certain aspects of the environment, conditions may change during the construction and operation of the Proposed Development, which has been accounted for in the appraisal process.
- 9.4.2 It is assumed that the design, construction and operational stages of the Proposed Development will satisfy minimum environmental standards, consistent with current legislation.

9.5 Methodology

- 9.5.1 The general methodology used to appraise the effects of the Proposed Development on the hydrology, hydrogeology, geology and soil receptors is as follows:
- Desktop study to obtain baseline and historical data;
 - Consultation with SEPA, Scottish Water and Aberdeenshire Council to identify water abstractions and PWS;
 - National Vegetation Classification (NVC) walkover surveys, to inform appraisal of GWDTE, conducted by WSP Ecology team between 29 September and 2 October 2025.
 - PWS surveys were undertaken between 12 and 14 November 2025 and 24 and 25 February, to determine the precise route of infrastructure between the abstraction and property they serve.
 - Identification of the potential effects of the Proposed Development on sensitive receptors relating to hydrology, hydrogeology, geology and soils; and

⁴² BGS GeoIndex Onshore viewer: Bedrock and superficial geology (2020). [online]. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.200831406.129307875.1654083545-959159431.1654083545 [Accessed October 2025]

⁴³ NatureScot SiteLink (2023). [online] Available at: <https://sitelink.nature.scot/map> [Accessed October 2025]

⁴⁴ James Hutton Institute (2022) Scotland's Soils [online]. Available at: http://map.environment.gov.scot/Soil_maps/?layer=1 [Accessed October 2025]

⁴⁵ Carbon and Peatland Map (2016) [online]. Available at: https://map.environment.gov.scot/Soil_maps/?layer=10 [Accessed October 2025]

⁴⁶ Scottish Government environmental maps (2024) available online at <https://map.environment.gov.scot/sewebmap/?layers=mainRiverAndCoastalCatchments> [Accessed October 2025]

⁴⁷ Scottish Government (2014). Drinking water protected areas - Scotland river basin district: map 8 and 19 [online]. Available at: <https://www.gov.scot/publications/drinking-water-protected-areas-scotland-river-basin-district-maps/> [Accessed October 2025]

⁴⁸ Scottish Government (2024) Scotland's environment map [online]. Available at: <https://map.environment.gov.scot/sewebmap/> [Accessed October 2025]

- Identification of options for the mitigation of potential effects, taking account of SSEN Transmission's General Environmental Management Plans (GEMPs).

Study Area

9.5.2 The appraisal is based upon the land within the Study Area (as shown on **Figure 9.1 Hydrological Features (Volume 2)** and defined in the following bullet point list), professional judgement and experience of assessing similar developments in similar environments. The following terms are used throughout this chapter:

- Limit of Deviation (LoD) comprises an area which defines the practical limits within which micro-siting of the overhead line infrastructure can be sited and construction can be undertaken within the terms of the Section 37 consent. The proposed horizontal LoD is defined in **Chapter 2: Description of Proposed Development (Volume 1)**;
- Proposed Development – as defined by SSEN Transmission, the Proposed Development is a term used to define the entirety of the material works area which comprises of the following elements:
 - Overhead Line Connection - One section of 400 kV overhead line stemming from the existing New Deer to Peterhead OHL to the Netherton Hub substation (the 'In' leg) and one section of 400 kV OHL connecting the substation back to the existing New Deer to Peterhead OHL (the 'Out' leg), and the erection of 18 new towers.
 - Temporary Diversion - Temporary diversions of the OHL to facilitate the diversion of the existing OHL to the new length of OHL during the construction phase.
 - Existing OHL and Towers - Dismantlement of the existing OHL between the points of diversion and 12 redundant towers.
- Study Area – encompasses sensitive hydrology, hydrogeology, geology and soil receptors within 1 km from the LoD. This radius is considered suitable for the appraisal of potential adverse effects resulting from the Proposed Development; and
- GWDTE Study Area - SEPA's guidance³² on assessing the impacts of developments on GWDTE requires assessment of potential GWDTE located around the Proposed Development (10 m for all activities, 100 m for subsurface activities <1 m deep and 250 m for subsurface activities >1m depth).

Consultations Undertaken to Date

9.5.3 **Table 9.1** provides a summary of the consultation activities undertaken in support of the preparation of this chapter.

Table 9.1: Consultation responses of relevance to Hydrology, Hydrogeology, Geology and Soils

Organisation	Type of Consultation	Response	How response has been considered
Aberdeenshire Council	PWS data for the Aberdeenshire administrative areas was requested in February 2024.	Response received February 2024. Aberdeenshire Council provided PWS information for Aberdeenshire administrative areas in February 2024.	This information is considered further within Section 9.6 Baseline Environment.
SEPA	SEPA authorised abstraction data for the whole of Scotland was requested via SEPA's online contact form in March 2024.	SEPA provided registered authorised abstractions information in March 2024.	This information is considered further within Section 9.6 Baseline Environment.

- 9.5.4 Records of Scottish Water abstractions were gathered in August 2025, directly from Scottish Water's asset database under agreement between Scottish Water and WSP. This information is considered further within **Section 9.6 Baseline Environment**.

9.6 Baseline Environment

Surface Water Hydrology

- 9.6.1 Based on a review of Scotland's environment web map⁴⁶, the Study Area is located within the River Ugie (ID: 32) main river catchment.
- 9.6.2 The SEPA Water Classification Hub³⁹ indicates the following water bodies within the Study Area, which are classified by SEPA under the Water Framework Directive (WFD). They are listed from north to south in **Table 9.2** and are also depicted in **Figure 9.1. Hydrological Features (Volume 2)**.

Table 9.2: Surface and Coastal Water Bodies

Main River and Coastal Catchment ⁴⁶	Watercourse Name	Watercourse WFD ID ³⁹	WFD Overall Status ³⁹	Description
River Ugie	Faichfield Burn	23217	Moderate ecological potential	Faichfield Burn is located 150 m east of the Proposed Development. It joins the 'River Ugie - North/South confluence to tidal limit' approximately 3.1 km north of the Proposed Development.
	Burn of Ludquharn	23225	Moderate ecological potential	Burn of Ludquharn is located 670 m northwest of the Proposed Development. It joins 'South Ugie Water - Stuartfield to Longside' 2.5 km north of the Proposed Development.

- 9.6.3 Based on the OS 1:50,000 mapping, the Proposed Development intersects a tributary of the Burn of Ludquharn to the west.
- 9.6.4 Based on a review of SEPA's recommended riparian corridors (see **Figure 9.1: Hydrological Features (Volume 2)**), part of the Proposed Development (namely a temporary proposed access track and temporary proposed tower working area) encroaches into the SEPA riparian corridor for the unnamed tributary of the Burn of Ludquharn. There are also numerous small unnamed watercourses within the Study Area. These are also shown on **Figure 9.1. Hydrological Features (Volume 2)** (also see **Section 9.9 Recommendation and Mitigation** for details on any mitigation required for these watercourses).

Designated Sites

- 9.6.5 Based on a review of NatureScot Sitelink⁴³, there are no designated sites related to hydrology, geology, hydrogeology or soils with regional, national or international importance, identified within the Study Area.

Geology and Soils

Bedrock geology

9.6.6 Based on BGS Bedrock Geology 1:50,000 scale mapping⁴² the bedrock formations underlying the Study Area (see **Figure 9.2 Bedrock Geology (Volume 2)**) from north to south are:

- Forest of Deer Pluton: Melagranite, biotite – these igneous rocks are magmatic (intrusive) in origin. Rich in silica, they form intruded batholiths, plutons, dykes and sills;
- Crinan subgroup and Tayvallich subgroup (undifferentiated): Semipelite, pelite and psammite – these rocks were sedimentary in origin, but have subsequently undergone metamorphism;
- Peterhead Pluton: Granite – these igneous rocks are magmatic (intrusive) in origin. Rich in silica, they form intruded batholiths, plutons, dykes and sills;
- North Britain Late Carboniferous Tholeiitic Suite: Quartz-Microgabbro – these igneous rocks are magmatic (intrusive) in origin. Poor in silica, they form intruded batholiths, plutons, dykes and sills;
- Collieston Formation: Pelite, semipelite and psammite – these rocks were sedimentary in origin, possibly graded sediments or turbiditic flows in a deep-marine environment, but have subsequently undergone metamorphism;
- Forest Of Deer Pluton: Diorite – these igneous rocks are magmatic (intrusive) in origin. Poor in silica, they form intruded batholiths, plutons, dykes and sills; and
- Deeside Subsuite: Granite – these igneous rocks are magmatic (intrusive) in origin. Rich in silica, they form intruded batholiths, plutons, dykes and sills.

Superficial geology

9.6.7 Based on the BGS superficial Geology 1:50,000 scale mapping⁴² the superficial formations underlying the Study Area (see **Figure 9.3 Superficial Geology**) from north to south are:

- Banchory till formation (diamicton);
- Glaciofluvial sheet deposits (gravel, sand and silt);
- Alluvium (clay, silt, sand and gravel);
- Glacio fluvial ice contact deposits (gravel, sand and silt);
- Alluvial fan deposits (gravel, sand, silt and clay);
- Peat; and
- Head, 1 (gravel, flinty).

Soils and Peat

9.6.8 The James Hutton Institute National Soil Map of Scotland⁴⁴ indicates that from north to south, the Study Area (**Figure 9.5 Soil Depth**) is underlain by:

- Humus-iron podzols;
- Brown earths with gleying;
- Noncalcareous gleys with peaty gleys;
- Noncalcareous gleys;
- Blanket peat; and
- Peaty podzols.

9.6.9 The majority of the Proposed Development is underlain by noncalcareous gleys, peaty gleys, and brown earths with gleying. Additionally, a small section to the south of the Proposed Development is underlain by noncalcareous gleys.

9.6.10 The NatureScot Carbon and Peatland Map⁴⁵ indicates that the majority of the Study Area (**Figure 9.5 Soil Depth (Volume 2)**) is underlain by Class 0 mineral soils, with minor pockets of Class 4

between proposed towers IN4 and IN5, and IN6 and IN7. A small section to the centre of the Study Area and to the south (where a tower will be dismantled (NP7) and a temporary access track is proposed) is underlain by a mixture of Class 1, 4 and 5 soils.

- 9.6.11 Existing tower (NP7) is located within an area of Class 1 soils. Furthermore, two towers to be dismantled (NP3 and NP8) are located within Class 4 soils.
- 9.6.12 WSP completed Phase 1 and Phase 2 intrusive peat depth surveys, including a desk-based assessment and field investigations, across a 250 m wide corridor along the 5.3 km OHL diversion route (see **Figure 9.5 Soil Depth**). For a development area that overlaps with part of the Study Area, Phase 1 peat data was collated by Fluid Environmental Consulting, and shared with WSP.
- 9.6.13 Combined survey data recorded a total of **508 survey points**, with an **average peat depth of 0.28 m**. Most of the area comprised shallow soils: **91.7%** of depth records were **< 0.5 m** (i.e. considered non-peat), and the **maximum** recorded depth was **0.97 m**. A total of 42 probe locations had depth values ≥ 0.5 m, located sporadically across the Survey Area. The majority of probe insertions were noted to be underlain by rocks and/or gravel, based on surveyor judgment.
- 9.6.14 Probing efforts around NP7 recorded soils with 0.63 m depth on average across 19 locations, to a maximum of 0.95 m.
- 9.6.15 Analyses of aerial imagery, site observations and soil depth data suggest the presence of peat is unlikely across the extended LoD. The presence of artificial drainage within the Study Area will have degraded any existing underlying peat, as well as removing potential for future peat formation in drained areas.
- 9.6.16 A Technical Note has been submitted to SEPA on 14 April 2026 (SEPA Ref: PCS20008563 – Presence of Peat Technical Note) to clarify the Applicant's position on the consideration of impact on sensitive soils. The Technical Note summarises the rationale to advise further peat investigation, assessment and guidance with regard to peat management and peat landslide risk assessment would not be appropriate for the Proposed Development.
- 9.6.17 SEPA responded on 20 April 2026 (PCS-20004756 SEPA Response), confirming that the proposed approach to peat survey and peat management across all elements of the Proposed Development is acceptable in this instance. The technical note covered draft measures for how any sensitive /peaty soils would be managed on site, which is extensively modified and agricultural in its nature. On the basis of the above, further assessment of peat have therefore been scoped out of this appraisal below (see **Section 9.7**) as part of a risk based approach. For completeness, a number of recommendations and mitigation measures have been put forward in **Section 9.9** as well.

Groundwater

- 9.6.18 According to SEPA Water Classification Hub³⁹ there is one groundwater body, Mintlaw (ID: 150655), located within the Study Area. The groundwater body was classified by SEPA, in 2023 under the WFD, as having an overall status of 'Good'.
- 9.6.19 According to BGS GeoIndex Onshore Hydrogeology 1:625,000 mapping⁴¹, the Study Area is underlain by Argyll group, unnamed igneous intrusions (late Silurian to early Devonian, and Ordovician to Silurian); Southern Highland group, low productivity aquifers, where small amounts of groundwater may be present near the surface weathered zone and secondary fractures.

Water Supplies

- 9.6.20 According to information provided by Aberdeenshire Council and a review of OS mapping and aerial imagery, there are 84 PWS within the Study Area, as illustrated in **Figure 9.4: Private Water Supplies**. 42 of those PWS are registered with Aberdeenshire Council with 40 identified through OS mapping and aerial imagery and an additional 2 through further correspondence and/or

investigation. A qualitative risk assessment is presented in **Appendix 9.1: Private Water Supply Risk Assessment (Volume 3)** in accordance with the latest SEPA guidance³². This includes a screening table which screens in PWS for assessment based on their potential for hydrological connectivity to the Proposed Development.

9.6.21 Based on information provided by SEPA, there are no authorised activities under the Environmental Authorisations (Scotland) Regulations (EASR) within the Study Area.

9.6.22 According to Scotland's environment web map⁴⁶, The 'River Ugie - North/South confluence to tidal limit' catchment is located 950 m to the northeast of the Proposed Development. The (entire) Study Area is located within the Scottish Water DWPA (Ugie River). However, based on a review of the Scottish Water dataset, there are no Scottish Water abstractions within the Study Area. Furthermore, there is no plausible hydrological connection with the Proposed Development, given the topography, the intervening distance, and the presence of an existing road that bisects the area. The Proposed Development is, however, located within a SEPA DWPA for groundwater.

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

9.6.23 SEPA guidance (2024)³² on assessing the impacts of developments on GWDTE requires assessment of potential GWDTE located around the Proposed Development (10 m for all activities, 100 m for subsurface activities <1 m deep and 250 m for subsurface activities >1 m depth).

9.6.24 The NVC (National Vegetation Classification) is the official system used in Great Britain to classify and describe plant communities. It provides a comprehensive, standardised framework for identifying vegetation types based on detailed floristic survey data and is widely used by statutory agencies and ecologists for environmental assessment and habitat evaluation. It includes 286 plant communities grouped by major habitat categories, providing detailed descriptions and codes for each community⁴⁹.

9.6.25 Targeted NVC surveys were carried out from 29 September to 2 October 2025 by the WSP Ecology Team to support this appraisal, as the Proposed Development is predominantly comprised of modified grassland and cropland, typical of northeast Scotland. Further details are presented in **Chapter 7: Ecology (Volume 1), Appendix: 7.1 Habitat Baseline (Volume 3) and Figure 7.1.1 Habitat Survey Results (Volume 3)**.

9.6.26 Targeted National Vegetation Classification (NVC) mapping has been undertaken up to 250 m beyond the LoD associated with the alignment of the OHL. The additional surveys carried out in November 2025 were limited to the 'associated infrastructure area' (defined as up to 100 m from the centreline of towers to be dismantled and their associated access tracks), in line with the less intrusive works which were anticipated for dismantling activities. Subsequent design updates confirmed that tower dismantling will require some targeted excavation and that cut-and-fill operations will be necessary for the temporary access tracks. However, due to seasonal constraints at the time of surveying, it was not possible to complete NVC surveys across the full 250 m buffer for the towers to be dismantled and access tracks.

Importance of Potential GWDTE Communities

9.6.27 The following NVC codes within the GWDTE Study Area have been identified as likely to support communities that are indicative of GWDTE:

- M23 – *Juncus acutiflorus* - *Galium palustre* rush-pasture, sub-community; M23 occurs over a variety of moist, moderately acid to neutral, peaty and mineral soils in the cool and rainy lowlands of western Britain. It is a community of gently-sloping ground around the margins of

⁴⁹ JNC. National Vegetation Classification (NVC). Available at: <https://jncc.gov.uk/our-work/nvc/> [Accessed October 2025]

soligenous flushes, as a zone around topogenous mires and wet heaths, and especially widespread in ill-drained, comparatively unimproved or reverted pasture (JNCC, 2004)⁵⁰.

- MG10 - *Holcus lanatus* - *Juncus effusus* rush-pasture; MG10 is a vegetation type of damp acid to neutral soils on level to gently sloping ground in enclosed pastures, and in neglected situations such as ditches, pond sides and roadside verges. This community is widespread in lowland Britain, and it also occurs at low altitudes in most upland areas (JNCC, 2004)⁵⁰.

9.6.28 None of the above habitats form part of a designated nature conservation site.

9.6.29 Based on the Scottish Wetland Inventory⁵¹ there are no wetlands within the Study Area.

9.6.30 The potential GWDTE communities (in **Figure 7.1.1 Habitat Survey Results (in Appendix 7.1 (Volume 3))**) identified on-site are often associated with surface water (pathways, standing water or ponding) or from direct rainfall, with surface water flowing downslope locally to eventually form or join surface water channels. These habitats are typically located on gently sloping ground, away from likely groundwater emergence.

9.6.31 A mixed cluster of rush pastures (MG10a/M23) habitats is located 100 m west of the Proposed Development, with additional areas present immediately to the south; both habitat areas are also adjacent to the existing ditches. These potential GWDTE areas are features in connection to either surface water features or ombrogenous (rain-fed) habitats along surface water pathways and areas of topographic wetness as a result of flow convergence. The retention of surface water in areas of reduced topographic gradient is also likely to be exacerbated by the low permeability of the underlying superficial deposits, as well as the spatially discontinuous overlying peat and organic soils. Furthermore, SEPA flood risk map⁴⁰ indicates that this area has a high likelihood of surface water flooding.

9.6.32 Several MG10 clusters are located on the eastern side of the Study Area, typically near natural and artificial ditches. These habitats are primarily sustained by surface water sources and are unlikely to be fully dependent on groundwater. The combination of low-permeability geology, poor drainage, and historical land use for cattle and livestock grazing suggests that the area is not suitable for supporting GWDTE. Furthermore, site investigation for the Netherton Hub, identified a water table generally below the rooting depth of MG10 communities in the northeastern part of the Study Area. This further supports the conclusion that these habitats rely predominantly on rainfall and surface runoff, with water retention in flatter areas exacerbated by the presence of gley soils.

Conceptual model for GWDTE

9.6.33 The BGS Hydrogeology 1:625,000 mapping⁴¹ indicates that the aquifers underlying the Proposed Development have low productivity and are therefore unlikely to be the primary source for these habitats.

9.6.34 The Study Area is a relatively flat area, with gentle elevation changes (e.g., 40–50 m). This suggests limited gravitational drainage, which can lead to surface water accumulation or perched water tables.

9.6.35 All of the potential GWDTE habitats identified are considered ombrotrophic / surface water-fed and unlikely to be dependent on groundwater. With reference to the impact matrix presented in SEPA guidance (2024)³¹, GWDTE receptors are assessed as of 'low importance'.

9.6.36 Based on the available NVC data and the accompanying GWDTE assessment, covering areas where no true GWDTEs are anticipated, the Applicant does not expect any additional true GWDTEs to occur outside of the 100 m buffer (the Study Area for the associated infrastructure area) which has been surveyed. This conclusion reflects the consistent land use (agricultural and modified land) and

⁵⁰ Averis, A. (2004). *An illustrated guide to British upland vegetation*. Joint Nature Conservation Committee. Available at: An Illustrated Guide to British Upland Vegetation

⁵¹ Scotland's Environment map [online]. Available at: <https://map.environment.gov.scot/sewebmap/?layers=scotWetlandInven> [Accessed November 2025]

comparable hydrological conditions beyond this distance. Furthermore, even if any such potential GWDTE were present, they would lie slightly upgradient of the dismantled tower locations and would be bisected by the existing road, and therefore are not anticipated to be impacted by the proposed works.

Flooding

9.6.37 A review of SEPA's Flood Maps⁴⁰ indicates that the Study Area contains areas with a high likelihood of river flooding, associated with each of the water bodies detailed in **Section 9.6 Baseline Environment, Surface Water Hydrology, Table 9.2** and surface water (pluvial) flooding limited to several small isolated pockets within the Study Area. These areas are typically located within depressions in topography, collecting surface runoff from the surrounding high ground, and along the banks of the noted watercourses and field drains.

9.6.38 The nearest coastline is located approximately 5 km to the east and the Study Area is not considered to be at risk of coastal flooding.

9.6.39 SEPA defines 'High' likelihood as flood events likely to occur on average once in every ten years (1:10), or a 10% chance of happening in any one year, usually referred to as Annual Exceedance Probability (AEP). 'Medium' likelihood is defined as flood events likely to occur on average once in every two hundred years (1:200), or a 0.5% chance of happening in any one year.

Future Baseline

9.6.40 Without the Proposed Development, the baseline conditions within the Study Area are unlikely to change substantially. However, there is potential for climate change to impact on future baseline conditions. Climate change studies predict a decrease in summer precipitation and an increase in winter precipitation alongside slightly higher annual average temperatures. This suggests that there may be greater pressures on water supplies in summer months in the future. Storms are predicted to be of greater intensity. Therefore, peak fluvial flows associated with extreme storm events may also increase in volume and velocity.

9.7 Issues Scoped out of the Appraisal Process

9.7.1 Operational impacts have been scoped out of this appraisal as there are not expected to be any long-term direct or indirect adverse effects on hydrology, hydrogeology, geology and soils as a result of the Proposed Development. This is on the basis of there being successful ground reinstatement and a very limited operational infrastructure footprint and/or operational activities which could impact on the baseline hydrological, hydrogeological or geological environment.

9.7.2 Based on information provided by SEPA, there are no authorised activities under EASR within the Study Area and therefore the assessment of SEPA authorised activities has been scoped out of this appraisal.

9.7.3 There are no Scottish Water abstractions within the Study Area and therefore this has been scoped out of this appraisal.

9.7.4 The SEPA-designated DWPA for surface water (River Ugie—North/South confluence to tidal limit) has been scoped out of the appraisal, as there is no hydrological connection to the Proposed Development. This is due to the topography, the intervening distance, and the presence of an existing road that bisects the area.

9.7.5 The Proposed Development is located within a DWPA for groundwater. With the assumption that design mitigation and CEMP are implemented, and on account that the majority of Scotland is classified as a DWPA for groundwater and that groundwater is already being considered as part of this assessment, significant effects to the groundwater DWPA, specifically, are not anticipated and have therefore been scoped out.

- 9.7.6 There are no designated sites within the Study Area and therefore this has been scoped out of this appraisal.
- 9.7.7 Geology is typical of wider area with no designated sites of geological interest located within the Study Area or in a location downstream that could be impacted by the Proposed Development, and therefore this has been scoped out of this appraisal.
- 9.7.8 Presence of peat has not been identified across the probed locations within the Study Area (with the exception of a minor area described in **paragraph 9.6.14** and displayed in **Figure 9.5 Soil Depth (Volume 2)**) and should it occur impacts would be expected to be limited. A small area of Class 1 peat has been identified at the centre of the existing OHL, around an existing tower to be dismantled (NP7). Where temporary access is planned over sensitive soils, the Applicant intends to float access tracks. In addition, the anticipated level of impact on sensitive soils in relation to the removal of VDN71 foundations would be limited and can be mitigated should they occur. A standalone Technical Note has been submitted to SEPA on 14 April 2026 (SEPA Ref: PCS20008563 – Presence of Peat Technical Note) to clarify that, based on a risk-based approach, undertaking further peat investigations, calculations, or detailed assessments to inform a Peat Management Plan and a Peat Landslide Hazard and Risk Assessment would not be appropriate. As a result, further considerations relating to peat have therefore been scoped out of this appraisal. SEPA responded on 20 April 2026 (PCS-20004756 SEPA Response), confirming that the proposed approach to peat survey and peat management is acceptable in this instance.

9.8 Appraisal

Construction Phase Effects

Pollution Incidents

- 9.8.1 There is potential for contamination of water bodies mentioned in **Table 9.2** and their tributaries, from spillage or leaks of hydrocarbons, concrete, and other fluids. Sources of oils and hydrocarbons on construction sites include storage tanks, plant and machinery, spillage and leakage at refuelling areas, and vandalism. Pollution of groundwater is also possible.
- 9.8.2 Construction of the Proposed Development presents potential pathways for oils and hydrocarbons to enter surface waters from runoff or spillages. These pathways include overland flow (suspended in surface water runoff into drains and watercourses, especially during periods of high runoff rainfall events) and through infiltration, particularly if areas are subject to 'wash down'.
- 9.8.3 These pollutants can also infiltrate and contaminate soils and bedrock, thereby polluting groundwater bodies. This can impact on the quality of both potable water and abstracted water for agriculture and industry.
- 9.8.4 The major pathways for cement contaminated water to reach surface water bodies within the Study Area, is overland flow (suspended in surface water runoff into drains and watercourses, especially during periods of high runoff rainfall events).
- 9.8.5 Following the implementation of construction good practice measures outlined in **Chapter 2: Description of Proposed Development (Volume 1)**, including those detailed within the following GEMPs and SEPA GPPs (13³⁴, 21³⁵, 22³⁶ and 26³⁷), the effects listed above would be managed to greatly reduce the probability of any impact from pollution.
- Working in or Near Water;
 - Working in Sensitive Habitats;
 - Private Water Supplies;
 - Soil Management; and

- Oil Storage and Refuelling.

9.8.6 Impacts associated with accidental spillage would be managed through the use of Emergency Spillage Action Plans which the Principal Contractor would be responsible for preparation and implementation. As such there will be no residual material potential effects from pollution incidents related to the Proposed Development.

Erosion and Sedimentation

- 9.8.7 Soil erosion, loss of soil, and sediment generation may occur in areas where the ground has been disturbed during construction, including in situations where engineering activities occur close to or in watercourses, or where higher velocity surface water flows may occur due to local slopes and drainage design.
- 9.8.8 Where the Proposed Development crosses tributaries of the Faichfield Burn and the Burn of Ludquharn, which are identified as 'High' likelihood of river flooding, there is potential for mobilisation of sediments if surface flooding occurs during construction (especially during periods of high runoff rainfall events).
- 9.8.9 Sediment transport in watercourses can result in high turbidity levels which may affect the aquatic ecology, by reducing the light and oxygen levels in the water. Sediment deposition can further affect watercourses by smothering aquatic life, riparian flora and fauna, and detrimentally impacting spawning grounds; for further details see **Chapter 7: Ecology (Volume 1)**. An increase in sediment into a water environment can furthermore reduce the flood storage capacity of channels and block culverts, resulting in an increased flood risk.
- 9.8.10 Requirements for soil excavation, transport and storage may lead to additional sedimentation issues at locations where construction activities are necessary.
- 9.8.11 The construction activities required for the construction of the Proposed Development mean there is potential for sediment laden runoff to surface waters. To mitigate this, and other effects described above, following SuDS good practice guidelines, agreed with SEPA, is essential. With the adoption of measures identified in the Working in or Near Water, Working in Sensitive Habitats and Soil Management GEMPs, the potential effects associated with erosion and sedimentation will be greatly reduced. On this basis there will be no residual material potential effects on erosion and sedimentation from the Proposed Development.

Loss and Compaction of Soils

- 9.8.12 Soil compaction as a result of construction works within the Proposed Development may damage the vegetation and result in a reduction in soil permeability and rainfall infiltration, particularly on peaty soils, thereby increasing the potential for longer-term erosion from surface water runoff. This would be most likely caused by tracking of heavy plant machinery or from handling during excavation and reinstatement.
- 9.8.13 Stockpiled and unvegetated / exposed areas of soils are at risk of desiccation and erosion by wind and water, also potentially causing soil loss.
- 9.8.14 Soil stripping and stockpiling will be subject to good practice, including the appropriate separation and temporary storage of topsoil soil and substrate. No mixing of topsoil with subsoil will occur, nor will soil be mixed with other materials, unless specifically required as part of an approved soil-amelioration strategy.
- 9.8.15 Soil handling to be avoided when the soil moisture content is above the lower plastic limit.
- 9.8.16 Considering the design mitigation and construction good practice, specifically the Soil Management GEMP, the effects listed above will be managed and the probability of any loss or compaction of soils will be minimised. On this basis there will be no residual material potential effects on the loss or compaction of soils from the Proposed Development.

Modification of Surface Water Drainage Patterns

- 9.8.17 The proposed works have the potential to act as a temporary conduit for the movement of excess runoff/surface flood waters during construction. Any damage or disruption to field drainage systems will be restored at the time of impact.
- 9.8.18 Temporary drainage installed during construction will use SuDS best practise and aim to mimic greenfield runoff patterns.
- 9.8.19 Assuming implementation of construction good practice, specifically the Working in or Near Water, Working in Sensitive Habitats, and Soil Management GEMPs, further explained in **Chapter 2: Description of Proposed Development**, the effects listed above would be managed to greatly reduce the probability of any modification of surface water drainage patterns. On this basis there will be no residual material potential effects on the modification of surface water drainage patterns from the Proposed Development.

Modification of Groundwater Levels and Flows

- 9.8.20 Construction works associated with the installation of the towers may result in localised lowering of groundwater levels in the immediate vicinity of the excavations during dewatering activities. Access tracks and associated drainage may result in the diversion of overland flow or shallow subsurface flow; however, any effects would be transient and unlikely to persist following reinstatement.
- 9.8.21 Changes in groundwater levels and flows have the potential to impact GWDTE and PWS, potentially affecting both the quality and quantity of water nourishing receptors. As described in **Section 9.6: Baseline Environment**, potential GWDTE habitats identified are considered to be ombrotrophic / surface water fed and they are unlikely to be dependent on groundwater.
- 9.8.22 Assuming implementation of construction good practice set out in the Working in Sensitive Habitats GEMPs, the effects listed above would be managed to greatly reduce the probability of any modification of groundwater levels and flows. On this basis there will be no residual material potential effects on the modification of groundwater levels and flows from the Proposed Development.

Flood Risk

- 9.8.23 According to SEPAs flood maps⁴⁰, the Proposed Development crosses the rivers mentioned in **Section 9.6: Baseline Environment**, and these are identified of 'High' likelihood of river flooding. Fluvial and pluvial flows can be impeded by construction activity. Blockages can be caused by inadequate control of earthmoving plants, sedimentation, and poor waste management, all of which could lead to localised flooding. These effects could be mitigated by measures such as the timing of works to avoid wet periods as well as avoiding the storage of fuel, chemicals and materials within high flood risk areas.
- 9.8.24 The Proposed Development is not predicted to have any material impact on the current extents and depths of flooding within the Study Area.

Public / Private Water Supplies

- 9.8.25 PWS information was obtained from Aberdeenshire Council in February 2024 and additional, potentially unregistered, PWS were identified by a review of OS mapping and available aerial imagery. Detailed assessment of these PWS is presented in **Appendix 9.1: Private Water Supply Risk Assessment (Volume 3)** in accordance with SEPA's guidance (SEPA, 2024)³² on assessing the impacts of any potential infrastructure.
- 9.8.26 **Appendix 9.1: Private Water Supply Risk Assessment (Volume 3)** identifies 84 supplies; comprising of 42 PWS sources included in Aberdeenshire Council's PWS register, and 40 properties identified using aerial imagery and an additional 2 through further correspondence and/or investigation. These are presented in **Figure 9.4 Private Water Supplies (Volume 2)**.

- 9.8.27 The list of PWS were screened to determine the potential to be impacted by the Proposed Development, based on the source-pathway-receptor (S-P-R) framework, as discussed in **Appendix 9.1: Private Water Supply Risk Assessment (Volume 2)**. The screening has been undertaken using baseline conceptual information presented in this Chapter, including topography, hydrology, and hydrogeology context. The screening also considered information obtained via direct consultation with PWS users via questionnaires and site visits which were undertaken in November 2025 and February 2026. Where source locations could not be fully confirmed by questionnaires or site visits, these have been based on national grid coordinates provided by Aberdeenshire Council.
- 9.8.28 The screening identified that of the 84 PWS initially considered, 4 required further assessment as part of **Appendix 9.1: Private Water Supply Risk Assessment (Volume 3)**. This included Hill of Dens Cottage (ID 9), Kinmundy Mains, Home Farm, Home Farm Cottage (ID: 14), Knockleith (ID: 16); and Mains of Ludquharn and Salish Lodge (ID: 18).
- 9.8.29 The Principal Contractor will conduct a detailed PWS risk assessment for four screened in PWS in accordance with SEPA guidance (2024)³². The Principal Contractor will be required to consider all construction activities to ensure that they are aware of all authorised abstractions and PWS in the local area. Mitigation measures comprise of further investigation and demarcation and the implementation of a PWS monitoring plan. Detail on mitigation measures advised are noted in **Appendix 9.1: Private Water Supply Risk Assessment (Volume 3)**.
- 9.8.30 Assuming implementation of construction good practice and measures detailed within the GEMP and assuming further investigation by the contractor and consultation with SEPA, the potential for water supplies to be affected will be minimised. The construction works will not require any new water abstractions from local sources. Construction foul water will be collected and removed from the Study Area for off-site disposal at a licensed premises.
- 9.8.31 Following good practice and the measures outlined in the water supplies GEMP, and **Appendix 9.1 Private Water Supply Risk Assessment (Volume 3)** to be specified in the detailed PWS assessment conducted by the Principal Contractor before construction, no residual material potential effects on PWS from the Proposed Development are anticipated.

9.9 Recommendations and Mitigation

Design Mitigation and Assumptions

- 9.9.1 Design mitigation and good practice measures are detailed in **Chapter 2: Description of Proposed Development (Volume 1)**, including GEMPs in **Table 2.3**.
- 9.9.2 The adoption of the applicable GEMPs would reduce the probability of potential effects occurring and further reduce the magnitude of any potential effect due to a combination of good site environmental management procedures, including minimised storage soil and peat volumes, soil management, staff training, contingency equipment, and emergency plans.
- 9.9.3 GEMPs applicable to this chapter are:
- Working in or Near Water;
 - Working in Sensitive Habitats;
 - Watercourse Crossings;
 - Private Water Supplies;
 - Working with Concrete;
 - Soil Management; and
 - Bad Weather.

- 9.9.4 The following appraisal assumes that good practice measures (outlined in **Chapter 2: Description of Proposed Development (Volume 1)**, including GEMPs and a Construction Environmental Management Plan (CEMP)) are implemented on-site. The conditions to prevent pollution and manage drainage will be addressed within the CEMP.

Additional Mitigation

- 9.9.5 Consultation with Scottish Water by the Principal Contractor is required prior to construction commencement to verify that there are no Scottish Water assets which require protection. Should any such assets be identified, specific mitigation measures will be developed and agreed with Scottish Water.
- 9.9.6 Pre-construction surveys and discussions with SEPA are required to identify any authorised abstractions not included in the data WSP received during consultation that could be at a potential risk from the Proposed Development. If applicable, measures to mitigate for temporary interruption of water supply, or permanent alternative supply, are to be agreed prior to works commencing.
- 9.9.7 Prior to construction, the Principal Contractor must conduct a detailed PWS risk assessment in accordance with SEPA guidance (2024)³².
- 9.9.8 Presence of peat was not observed across probed locations within the Study Area (with the exception of a minor area (NP7) described in **paragraph 9.6.14** and displayed in **Figure 9.5 Soil Depth (Volume 2)**), and for that reason SEPA has been consulted about suitable address of mitigation of sensitive soils where they may occur. As a result, a Peat Management Plan and a Peat Landslide Hazard and Risk Assessment have not been prepared to support this EAR. Should peat be identified during construction works, the Applicant proposes to implement best-practice mitigation measures to safeguard sensitive soils where they occur. In addition, for any temporary access required across sensitive soils, the Applicant intends to utilise floating access tracks to minimise ground disturbance.
- 9.9.9 As part of the layout design strategy, watercourse crossings were minimised. Where access necessitates watercourse crossings, construction features should maintain SEPA's recommended riparian corridor buffers as far as possible (see **Figure 9.1 Hydrological Features (Volume 2)** and HYD3 below). A total of nine watercourse crossings along the Proposed Development have been identified (see **Figure 9.1 Hydrological Features (Volume 2)**).
- 9.9.10 One of the watercourses crossed (ID: 3) is mapped on OS 1:50,000 scale mapping and is therefore subject to EASR regulations^{2,3}. The Principal Contractor will be responsible for the crossing methodology and agreeing the appropriate type of authorisation with SEPA at the detailed design stage.
- 9.9.11 A number of additional, smaller watercourse crossings have also been identified; these watercourses are not mapped on OS 1:50,000 scale mapping and could comprise crossings of flush zones and small headwater channels. It is the Principal Contractors' responsibility to consult with SEPA and apply for authorisation, where required.
- 9.9.12 **Table 9.3** presents all proposed watercourse crossings within the Study Area.

Table 9.3: Surface Water Bodies to be Crossed by the Proposed Development

Watercourse ID	Watercourse name	Crossing Location (BNGR)
1	Unnamed watercourse	403903, 844591
2	Unnamed watercourse	403943, 844659
3	Tributary of Burn of Ludquharn	404213, 845202

Watercourse ID	Watercourse name	Crossing Location (BNGR)
4	Unnamed watercourse	404259, 845219
5	Unnamed watercourse	404914, 845362
6	Unnamed watercourse	405089, 845446
7	Unnamed watercourse	406321, 844579
8	Unnamed watercourse	404285, 843861
9	Unnamed watercourse	403989, 843764

9.9.13 A CEMP will be produced by the Applicant's Principal Contractor and implemented during the construction of the Proposed Development. The CEMP will detail best practice construction management measures, including measures to manage risks associated with the construction of the Proposed Development to the environment and human health, such as those associated with pollution and resource use.

Table 9.4: Schedule of Mitigation

Reference	Title	Description
HYD1	PWS	Appendix 9.1 Private Water Supply Risk Assessment provides a range of mitigation measures including those which have been recommended for the 4 PWS which were screened in for assessment. PWS will require further investigation by the Principal Contractor prior to construction to verify the infrastructure location, source location and its use. Potential further unregistered supplies may also need to be established through consultation with local property owners. If applicable, measures to mitigate for temporary interruption of water supply, or permanent alternative supply to be agreed prior to works commencing. Where applicable, water quality and/or quantity monitoring of water supply before, during and after construction should be implemented. The Principal Contractor will be required to consider all construction activities and satisfy themselves that they are aware of all PWS in the local area that may be at risk of adverse effects as a result of the Proposed Development. Should any PWS be identified which require protection, specific mitigation will be developed and agreed with Aberdeenshire Council and SEPA. Wastewater from construction and welfare facilities will be removed by tanker to the nearest licensed Scottish Water wastewater facility.
HYD2	Management of excavated material storage	Mitigation to prevent sediment runoff from temporary soil bunds will be implemented consisting of silt fences, cut-off drains and water pumps with silt socks/bags where needed.
HYD3	Working in Water	Within the Study Area, and in line with SEPA's recommended riparian corridors (see Figure 9.1 Hydrological Features), all works should maintain a 10 m buffer from the unnamed tributaries of the Burn of Ludquharn and the tributary of the Burn of Faichfield. In addition, a 15 m

Reference	Title	Description
		buffer should be maintained from both the Burn of Ludquharn and the Burn of Faichfield. It is recommended to microsite the section of the temporary proposed access track and temporary tower working area that encroaches into the SEPA riparian corridor for the unnamed tributary of the Burn of Ludquharn. Refuelling of vehicles and machinery will be carried out in a designated area located on an impermeable surface, at least 50 m from any watercourse, and by designated refuelling marshals only. Where works within this buffer are unavoidable, appropriate pollution prevention measures such as spill kits, drip trays, and emergency response procedures will be implemented.
HYD4	Field drainage	Any sub-surface field drainage systems, damaged or affected by works, will be restored at the time of damage / impact.
HYD5	Restoration Plan	The banks and bed of any watercourse disturbed by construction activities will be reinstated to a condition as close as possible to that existing before construction. Details of the reinstatement practices and locations to be provided in the Restoration Plan as part of the CEMP. Monitoring will be carried out post-works and any remedial actions with regards to erosion of the affected areas will be carried out as soon as possible.
HYD6	Sensitive Soils including Peaty Soils	The Applicant has indicated that excavation will be required for the foundation removal of tower NP7. The footprint of excavations will be limited to the developable area (i.e. tower foundation footprint and temporary storage of excavated soils). For temporary access over sensitive soils (including any isolated areas where peat exists around NP7), the Applicant intends to float access tracks; all other temporary tracks will be cut tracks. Access will be taken by low-ground-pressure all-terrain vehicles, using trackway matting where required. All proposed temporary tracks for the proposed development will be removed at completion of the Project, and soils will be restored in situ following best practice guidance⁵². Should (buried) peat be identified across the Proposed Development, the Applicant proposes using best practice mitigation measures in order to safeguard sensitive soils where they occur. As such, the anticipated level of impact on peat in relation to the construction of the Proposed Development would be limited and can be mitigated should it occur. SEPA should be consulted at the pre-construction detailed design stage, at which point it is anticipated that floating tracks will be required in areas where peat depths exceed 1 m. Furthermore, any micrositing is expected to avoid peat of greater depth than that accepted at the application stage.

⁵² DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Online: Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/716510/pb13298-code-of-practice-090910.pdf [Accessed May 2026]

9.10 Cumulative Effects

9.10.1 Cumulative effects are additional effects as a result of the Proposed Development in combination with other developments, referred to as cumulative developments as described in **Chapter 12: Cumulative Appraisal (Volume 1)**.

9.10.2 For hydrology, hydrogeology, geology and soils, a Zone of Influence (ZOI) of 5 km has been applied to ensure direct and indirect cumulative effects can be appropriately identified and assessed.

9.10.3 Cumulative developments which are operational are not considered to have the potential to lead to in-combination effects with the Proposed Development. This is because the potential for more material effects on hydrology, hydrogeology, geology and soils are considered greatest during construction. Accordingly, only developments situated within the same catchment as the Proposed Development and within 5 km of it are considered in the assessment below.

In-combination Effects

9.10.4 As discussed in **Chapter 12: Cumulative Appraisal (Volume 1)**, two aspects of cumulative assessment are being considered in the EAR, in-combination effects (also known as 'inter' effects) and effect interactions (also known as 'intra' effects).

9.10.5 A total of 13 cumulative developments located within 5 km of the Proposed Development are presented for in-combination (inter) effects below (and illustrated on **Figure 12.1: Cumulative Developments (Volume 2)**):

- Land Circa 200 m West of Greystone Peterhead Aberdeenshire AB42 3JP, 4.5 km southeast;
- Buchan Offshore Wind Rattray Bay To Peterhead Substation, Southwest of Peterhead, 1.8 km east at closest point;
- Netherton Hub Land West of Parkhills Farm Blackhills Peterhead, overlaps Site boundary;
- Land North of Longside Road Flushing Peterhead Aberdeenshire, 2 km north;
- Between Rattray Head and Netherton Hub, adjacent;
- Land From North of Peterhead to South Of New Deer Green Volt Offshore Windfarm Aberdeenshire, 3.5 km west at closest point;
- MarramWind Offshore Wind Farm, Onshore Transmission Works, North East Scotland, adjacent;
- Newton of Savoch Quarry Blackhills Peterhead Aberdeenshire AB42 4YS, 2.4 km southeast;
- Netherton Hub 400 kV OHL Connection to New Deer and Peterhead: Rebuild, adjacent;
- Peterhead Flexpower 500 MW BESS, 3 km southeast;
- Netherton BESS, adjacent;
- BBNP Beauly To Blackhillock to New Deer to Peterhead 400 kV OHL, overlaps site boundary; and
- Location to the North of St Fergus Gas terminal and south of Rattray Head to Netherton Hub, overlaps site boundary.

9.10.6 All available documentation submitted in support of the above cumulative developments have been reviewed to identify programmes, sensitive receptors and relevant effects to determine the cumulative developments that should be considered for further assessment.

9.10.7 No material direct and indirect environmental risks have been identified which are associated with the Proposed Development. Also, assuming that effective 'source' controls for each cumulative development and good practice methodology is applied (as per commitments within their associated EA/EIARs), during each phase of the shortlisted sites would be substantially reduced (for all potential hydrology, hydrogeology, and soils receptors including surface water bodies, groundwater bodies, water supplies, potential GWDTE and flood risk). Furthermore, the differing construction programming and timeframes of activities that would be anticipated to occur across various

developments further reduce the probability that water quality and flow issues would be coincident across the same catchments, or that the severity of any incidents would be aggravated by activities elsewhere.

- 9.10.8 On this basis cumulative effects are not anticipated, even if these cumulative developments present potentially material effects on the receiving hydrology, hydrogeology, geology and soils environment.

Effects Interaction

- 9.10.9 Hydrology, hydrogeology, geology and soils receptors have been excluded from further consideration, as they are not expected to interact significantly with other environmental topics. This is on the basis of the successful implementation of mitigation measures outlined within this chapter and in **Section 9.9**.

9.11 Summary

- 9.11.1 The following sensitive hydrology, hydrogeology, geology and soil receptors along the Proposed Development have been identified:

- Surface water bodies (listed in **Table 9.2**) and private water supplies (**Appendix 9.1: Private Water Supply Risk Assessment (Volume 3)**),
- Groundwater bodies (Mintlaw, Argyll group, unnamed igneous intrusions (late Silurian to early Devonian and Ordovician to Silurian) and Southern Highland group); and
- Flooding including baseline fluvial and pluvial sources of flood risk.

The appraisal has demonstrated how the Proposed Development may potentially affect the above sensitive receptors during the construction phase via pollution incidents, erosion and sedimentation, loss and compaction of soils, modification of surface water drainage patterns, and modification in groundwater levels and flow, and/or impacts on public/private water supplies or flooding. However, through successful application of good practice measures (GEMPs and CEMP) and additional mitigations identified in the mitigation **Section 9.9**, the appraisal has concluded that impacts from the Proposed Development can be mitigated to reduce the likelihood of any direct and indirect environmental residual risks on the hydrology, hydrogeology, geology and soil receptors. Therefore, no residual material effects are considered likely to arise as a result of the Proposed Development.