# VOLUME 6: CHAPTER 6 – WATER ENVIRONMENT – ALTERNATIVE ALIGNMENT



**Appendices (Volume 5 of this EIA Report)**

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Appendix V6-6.2: Schedule of Permanent Watercourse Crossings

Appendix V6-6.3: Drinking Water Protected Area and Private Water Supply Risk Assessment (Confidential)

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Figure V6-6.3: Groundwater Vulnerability

Figure V6-6.4: GWDTE

# 6. WATER ENVIRONMENT

## 6.1 Executive Summary

6.1.1 An assessment has been undertaken of the Alternative Alignment within Section 3 of the project between Broadford and Kyle Rhea on hydrology and hydrogeology (the water environment) during the construction and operational phases. The Alternative Alignment is referred to interchangeably with “the Proposed Development” for the purposes of this Chapter.

6.1.2 Information for the study area was compiled using baseline information from a desk study which was verified by an extensive programme of field work. The field work included investigation of private and public water supply sources in order to determine those which might be hydrologically connected to and at risk from the Proposed Development. Measures required to protect these sources have been confirmed.

6.1.1 The assessment considers designated sites and where these are water dependant and have a potential hydrologic connection to the Proposed Development these have been considered in the assessment.

6.1.2 The assessment was undertaken considering the sensitivity of receptors identified during the baseline study and considering mitigation measures incorporated in the development design. It has also considered potential future changes to baseline conditions.

6.1.3 The scope of the assessment was informed by scoping responses received from statutory and non-statutory consultees, as well as feedback received by the project team at public information and consultation meetings. Further consultation was undertaken with Scottish Water and residents who use a private water supply to enable a thorough assessment of the potential effects the Proposed Development on public and private water supply sources.

6.1.4 The assessment is supported by Appendices that consider potential effects on Drinking Water Protected Areas and private water supplies, and on habitat which could be sustained by groundwater (Groundwater Dependent Terrestrial Ecosystems). A schedule of proposed permanent watercourse crossings associated with the Proposed Development is also provided as an Appendix.

6.1.5 A buffer of at least 20 m to water features has been applied in the Proposed Development design and has been maintained throughout the design of the Alternative Alignment.

6.1.6 Subject to adoption of best practice construction techniques and a site specific Construction Environmental Management Plan (CEMP), no significant adverse effects on the water environment have been identified for the Alternative Alignment. The CEMP includes provision for drainage management plans which will be agreed with statutory consultees, including SEPA and which will be used to safeguard water resources and manage flood risk. A commitment to deploy Sustainable Drainage Systems (SuDS) in these plans has been made. The CEMP also includes provision of a Pollution Prevention Plan which would also be agreed with statutory consultees including SEPA prior to any construction or dismantling works being undertaken.

6.1.7 Notwithstanding these safeguards, a programme of baseline and construction phase water quality monitoring is proposed to ensure the Alternative Alignment does not have a significant effect on the water environment. The monitoring programme would also be used to ensure private water supplies, Drinking Water Protected Areas and Scottish Water supply sources are safeguarded. It is proposed that the monitoring programme is agreed with statutory consultees

## 6.2 Introduction

6.2.1 This Chapter assesses the potential effects of the Alternative Alignment on hydrology and hydrogeology (the water environment). It outlines the embedded good practice methods which have been incorporated into the design and would be used to prevent or reduce identified effects and risks.

6.2.2 Further mitigation methods to address any potential effects are proposed, where appropriate, and residual effects are then assessed.

6.2.3 In addition, the assessment uses information and findings presented in **Volume 6, Chapter 4: Ecology** and **Volume 6, Chapter 7: Geology and Soils Environment**. This Chapter also presents summary information from the following Appendices:

- Appendix V2-6.1: Significance Criteria
- Appendix V6-6.2: Schedule of Permanent Watercourse Crossings;
- Appendix V6-6.3: Drinking Water Protected Area and Private Water Supply Risk Assessment (Confidential); and
- Appendix V6-6.4: Groundwater Dependent Terrestrial Ecosystems (GWDTE) Assessment.

6.2.4 This Chapter has been prepared by SLR Consulting Ltd (SLR), who has also undertaken the assessment. It has been informed by a detailed programme of site investigation and surveys undertaken by the report authors.

*Statement of Qualifications*

6.2.5 Production of this Chapter has been overseen by Gordon Robb (BSc, MSc, MBA, C.WEM, FCIWEM). Gordon is a Technical Director (Hydrology and Hydrogeology) and has more than 30 years' experience assessing renewable energy and electrical infrastructure projects and specifically their potential effects on soils, geology and the water environment. He is based in Scotland and has worked throughout Scotland, including sites in similar settings to the Proposed Development. He has also prepared and given expert witness testimony for wind and electrical infrastructure projects. A table presenting relevant qualifications and experience is included in **Appendix V1-5.1: EIA Team**, contained within Volume 5 of this EIA Report.

## 6.3 Scope of Assessment and Methodology

6.3.1 The potential effects from the Proposed Development on the water environment have been assessed by completing an initial desk study and a detailed programme of site investigation followed by an impact assessment.

*Study Area*

6.3.2 The study area includes all elements of the Alternative Alignment infrastructure, as described within **Volume 6, Chapter 2: Project Description**. In addition, details of local water use and quality within a buffer of 1 km from the Proposed Development has been considered. The study area encompasses the Proposed Development as well as bodies of water and their catchments which could potentially be affected by the construction and operation of the Proposed Development, as well as dismantling the existing OHL.

*Consultation and Scoping*

6.3.3 The scope of the assessment has been determined through a combination of professional judgement, reference to the relevant guidance documents and consultation with stakeholders through a formal EIA scoping process and pre-application advice, and is based on the formal Scoping Opinion issued by Scottish Ministers.

6.3.4 The assessment has considered the issues raised in the scoping consultation responses including those provided by ECU, SEPA, Scottish Water, NatureScot, and THC. The scope of the assessment has also been

informed by responses received at local community public information events, and through specific consultation with residents at Kylerhea. Further consultation has also been undertaken with Scottish Water.

6.3.5 Scoping responses, relevant to the water environment, are summarised in **Volume 2, Chapter 6 – Water Environment** (see Table V2-6.1).

*Potential Impacts*

6.3.6 The following potential impacts have been assessed in full in relation to the Proposed Development:

- pollution risk, including potential impact on surface water and groundwater quality and public and private water supplies during construction and operation;
- erosion and sedimentation which could give rise to potential impact on surface water and groundwater quality, and private water supplies construction and operation;
- fluvial flood risk resulting from changes to runoff volumes and rates and modifications to natural and man-made drainage patterns during operation;
- potential impact upon the linkage between groundwater and surface water during construction and operation;
- potential impact on areas of peat during construction and operation;
- potential impact on areas of GWDTE during construction and operation; and
- potential cumulative impact during construction and operation.

*Issues Scoped Out*

6.3.7 On the basis of the desk based and survey work undertaken, policy, guidance and standards, the professional judgement of the EIA team, feedback from consultees and experience from other relevant projects, the following topic areas have been 'scoped out':

- Detailed Flood Risk and Drainage Impact Assessment. Published mapping confirms that most of the Alternative Alignment is not located in an area identified as being at flood risk. A simple screening of potential flooding sources (fluvial, coastal, groundwater, infrastructure etc.) is therefore presented and measures that would be used to control the rate and quality of runoff will be specified in the site-specific Construction and Environmental Management Plan (CEMP).
- Effects associated with forest felling as the extent of proposed felling is very small compared to the surface water catchment in which the felling would occur. Forest felling would also been undertaken in accordance with industry standard best practice with regard to minimising the potential for pollution and alteration of water drainage paths.
- Baseline water quality monitoring as water quality data is published by SEPA and can be used to characterise baseline water quality in this assessment.
- Increased flood risk caused by blockages to flow in watercourses during operation and maintenance of the Proposed Development as any required permanent watercourse crossings would be subject to maintenance requirements under the Controlled Activity Regulations.
- A Geomorphological Assessment as photographs and records of baseline water features are recorded and presented in the EIA.
- Watercourse crossing assessment of temporary tracks which would be used as part of the construction phase of the Proposed Development as measures to mitigate potential effects would be agreed in the site specific CEMP.

6.3.8 As assessment of potential cumulative effects associated with the Proposed Development and other proposed electrical transmission projects has also been 'scoped out' of the assessment. Other developments would also be designed, developed and managed in accordance with best practice, industry standards and relevant

legalisation, planning policy and guidance regulated by statutory consultees. These standards ensure, with respect to the water environment, potential impacts are mitigated and controlled at source.

6.3.9 It will be necessary to establish borrow pits and construction compounds to facilitate the Proposed Development. They do not form part of this Section 37 consent application and measures required to control or mitigate the potential effects of these on the water environment will be presented as part of their planning application(s). Indicative locations and a preliminary appraisal of the potential environmental constraints associated with these works is included in **Appendix V1-3.3**.

*Legislation, Planning Policy and Guidance*

6.3.10 The aquatic environment in Scotland is afforded significant protection through key statutes and the regulatory activity of SEPA and the local authorities. Relevant legislation, policy and guidance documents have been reviewed and considered as part of this assessment, as follows.

Legislation

6.3.11 Relevant legislation includes:

- The Water Environment (Controlled Activities) (Scotland) Amendment Regulations, 2013 (CAR);
- EU Water Framework Directive (2000/60/EC);
- EU Drinking Water Directive (98/83/EC);
- The Environment Act 1995;
- Environmental Protection Act 1990;
- The Water Supply (Water Quality) (Scotland) Regulations, 2001;
- The Flood Risk Management (Scotland) Act 2009;
- Water Environment and Water Services (Scotland) Act 2003 (WEWS Act);
- Private Water Supplies (Scotland) Regulations 2006; and
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017.

Planning Policy

6.3.12 In addition to Scottish Planning Policy (SPP) published by The Scottish Government[1], the Highland Wide Local Development Plan (HwLDP)[2] provides planning guidance on the type and location of development that can take place in the region. The HwLDP presents development polices of which the following are relevant to this assessment:

- Policy 60: Other Important Habitats and Article 10 Features;
- Policy 63: Water Environment;
- Policy 64: Flood Risk;
- Policy 66: Surface Water Drainage; and
- Policy 69: Electricity Transmission Infrastructure.

Guidance

6.3.13 Planning Advice Notes (PANs) and Specific Advice Sheets,, published by the Scottish Government of relevance to this assessment , include:;

- PAN 50 Controlling the Environmental Effects of Surface Mineral Workings;
- PAN 61 Planning and Sustainable Urban Drainage Systems; and
- Online Planning Advice on Flood Risk (which supersedes PAN 69).

[1] The Scottish Government (2014) Scottish Planning Policy

[2] The Highland Council (April 2012) Highland-wide Local Development Plan

6.3.14 Scottish Environment Protection Agency (SEPA) Pollution Prevention Guidance Notes (PPG) and Guidance of Pollution Prevention (GPP):

- GPP01: Understanding your environmental responsibilities – good environment practices;
- GPP02: Above ground oil storage;
- PPG03: Use and design of oil separators in surface water drainage systems;
- GPP05: Works and maintenance in or near water;
- PPG06: Working at construction and demolition sites;
- PPG07: Safe storage - the safe operation of refuelling facilities;
- GPP08: Safe storage and disposal of used oils;
- GPP13: Vehicle washing and cleaning;
- GPP21: Pollution incident response plans; and
- GPP22: Dealing with spills.

6.3.15 CIRIA publications:

- C532 Control of Water Pollution from Construction Sites (2001);
- C648 Control of Water Pollution from Linear Construction Projects – Technical Guidance (2006);
- C741 Environmental Good Practice on Site (2015); and
- C753 The SUDS Manual (2015).

6.3.16 SEPA publications:

- Engineering in the Water Environment: Good Practice Guide – River Crossings (2010);
- Engineering in the Water Environment: Good Practice Guide – Sediment Management (2010);
- Groundwater Protection Policy for Scotland, Version 3 (2009);
- Land Use Planning System SEPA Guidance Note 2a, Version 2 – Flood Risk (2018)
- Land Use Planning System SEPA Guidance Note 31, Version 3 – GWDTE (2017); and
- Position Statement – Culverting of Watercourses, Version 2.0 (2015).

*Desk Study*

6.3.17 An initial desk study has been undertaken to determine and confirm the baseline characteristics by reviewing available information relating to the water environment. The following sources of information have been consulted to characterise and assess the water environment within and surrounding the Proposed Development:

- Ordnance Survey (OS) 1:50,000 and 1:25,000 scale mapping;
- Natural England MAGIC map[3];
- NatureScot SiteLink[4];
- James Hutton Institute, The National Soil Map of Scotland (1:250,000)[5];
- British Geological Survey (BGS) Onshore GeoIndex (1:50,000)[6];
- BGS Hydrogeological maps of Scotland[7];

[3] Natural England (2022) MAGIC map, available at https://magic.defra.gov.uk/MagicMap.aspx [Accessed January 2022]
[4] NatureScot (2022) SiteLink, available at https://sitelink.nature.scot/home [Accessed January 2022]
[5] James Hutton Institute (2022) National soil map of Scotland https://soils.environment.gov.scot/maps/ [Accessed January 2022]
[6] British Geological Survey (2022) GeoIndex (onshore), available at https://www.bgs.ac.uk/map-viewers/geoindex-onshore/ [Accessed January 2022]
[7] British Geological Survey (2022) Hydrogeological maps of Scotland, available at https://www.bgs.ac.uk/datasets/hydrogeological-maps-of-scotland/ [Accessed January 2022]

- SEPA flood maps[8];
- SEPA environmental data[9]; and
- Data requests to SEPA and the THC (November 2020).

*Field Work*

6.3.18 The project hydrologists, geologists and ecologists have worked closely on this assessment to ensure that appropriate information is gathered to allow a comprehensive impact assessment to be completed.

6.3.19 Detailed site visits and walkover surveys have been undertaken by SLR on the following dates:

- 7th – 18th February 2022 to collect peat depth and condition information and details of proposed permanent watercourse crossings;
- 14th – 25th March 2022 to collect data regarding private water supplies, Drinking Water Protected Areas, permanent watercourse crossings and assess potential areas of GWDTE;
- 16th – 19th May 2022 to meet with residents at Kylerhea to obtain further details of private water supplies; and
- 18 – 21 June 2022 to collect further data regarding private water supplies and of proposed permanent watercourse crossings.

6.3.20 The field work has been undertaken in order to:

- verify the information collected during the desk and baseline study;
- allow appreciation of the study and undertake visual assessment of the hydrology relative to the Proposed Development;
- identify and verify private water supplies and Drinking Water Protected Areas;
- identify drainage patterns, areas vulnerable to erosion or sedimentation deposition and any pollution risks;
- assess areas of potential GWDTE; and
- visit proposed new permeant watercourse crossings and prepare a schedule of these.

6.3.21 The scope of the private water supply survey was also informed by data received from THC and Scottish Government, and a review of OS mapping and aerial photography and set out within **Confidential Appendix V6-6.3: Drinking Water Protected Area and Private Water Supply Risk Assessment**. To complete the Private Water Supply Risk Assessment properties which may have or have a recorded private water supply downstream of the Proposed Development were visited and where possible the source of the water supply was verified and confirmed. Where this was not possible a questionnaire was left with the occupiers of the property and they were asked to provide details of their water supply. Their responses have been incorporated in the assessment. This has ensured a thorough assessment of private water supplies has been completed.

*Significance Criteria*

6.3.22 The significance of effects of the Proposed Development has been assessed by considering two factors: the sensitivity of the receiving environment and the potential magnitude of impact, should that effect occur.

6.3.23 This approach provides a mechanism for identifying the areas where mitigation measures are required and for identifying mitigation measures appropriate to the significance of likely effects presented by the Proposed Development.

[8] SEPA (2022) Flood Maps, available at https://www.sepa.org.uk/environment/water/flooding/flood-maps/ [Accessed January 2022]

[9] SEPA (2022) Environmental data, available at https://www.sepa.org.uk/environment/environmental-data/ [Accessed January 2022]

6.3.24 Criteria for determining the significance of effect are provided in **Appendix V2-6.1: Significance Criteria**.

*Limitations of Assessment*

6.3.25 The assessment uses site investigation, survey data and publicly available data sources, including but not limited to SEPA, Met Office, THC and commercial data supply companies, as well as additional information supplied from stakeholders during the scoping and consultation stages.

6.3.26 It is considered that the data and information used to complete this assessment is robust and that there are no significant data gaps or limitations.

## 6.4 Baseline

6.4.1 This part of the Chapter outlines the baseline hydrology and hydrogeology within the study area as shown on **Figure V2-6.1** (Maps 1 – 3).

6.4.2 The Alternative Alignment is located in eastern Skye and comprises a new steel lattice OHL from Broadford Substation to the existing OHL crossing towers at Kyle Rhea via Glen Arroch (approximately 20.8 km in length).

6.4.3 The proposed works relate to construction of the OHL and of temporary and permanent access tracks and dismantling of the existing 132 kV steel lattice OHL between Broadford Substation and the existing crossing towers at Kyle Rhea, that would remain.

6.4.4 Ground elevations generally decrease northwards and eastward towards the Inner Sound. Elevations range from sea level to approximately 300m AOD at the western end of Glen Arroch.

*Designations*

6.4.5 Review of the NatureScot SiteLink, as shown on **Figure V6-6.1** (Maps 1 – 3), indicates that the following designations are located within the 1 km study area:

- Strath Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC). A 1,847 ha site designated for geological features and a range of limestone habitats including fen, marsh and swamp habitats. The SSSI / SAC is approximately 500 m up slope from the Proposed Development and therefore the hydrology and hydrogeology of the SSSI and SAC will not be impaired by the Proposed Development and it is not considered further in this Chapter. The geological features of this SSSI/SAC are considered in **Volume 6, Chapter 7: Geology and Soils Environment**.
- Cuillins Special Protection Area (SPA). A 29,503 ha predominantly upland site designated for breeding golden eagles. The northern boundary of this SPA is immediately upslope from the Proposed Development. Its designation is not water dependent and it is not considered further in his Chapter.
- Mointeach Lochain Dubha SSSI and SAC. A 410 ha site designated for blanket bog, comprising a wide range of oceanic mire types over plateaux, terraces, valleys and gentle slopes. The diversity results from the site's topographic and hydrological variation. Also of importance is the general lack of disturbance to the site. The Proposed Development crosses the most northern part of the Mointeach nan Lochain Dubha SAC / SSSI, although no infrastructure is proposed within the designated site. A new temporary access track is proposed approximately 12 m north of the site. Potential impacts to this SSSI and SAC are considered in this Chapter.
- Loch Ashaig SSSI and Geological Conservation Review (GCR) site. This 3.3 ha site designated for fossil pine stumps is approximately 700m downslope from the Proposed Development. The SSSI/GCR is not water dependent and is not considered further in this Chapter. The geological features of this SSSI/GCR are considered in **Volume 6, Chapter 7: Geology and Soils Environment**.
- Kinloch and Kyleakin Hills SSSI and SAC. A 5,275 ha site designated primarily for old sessile oak woods. Other Annex I habitats present within the SAC as qualifying features (but not primary reasons

for site designation) include Northern Atlantic wet heaths, dry heaths, Alpine heaths, blanket bogs and forests. The JNCC report that 19% of the site area comprises bogs. marshes, fens or water-fringed vegetation. Approximately 4 km of the Proposed Development crosses this SSSI/SAC. It is considered further in this Chapter.

- Inner Hebrides and the Minches SAC, and Lochs Duich, Long and Alsh Reefs SAC, which lies within the much larger Inner Hebrides and the Minches SAC. Lochs Duich, Long and Alsh Reefs SAC is a 2,373 ha site designated for extensive sheltered reefs, including at Kyle Rhea reefs subject to some of the strongest tidal streams in the UK, where the bedrock supports rich communities typically dominated by the hydroids Tubularia indivisa and Sertularia argentea, the barnacle Balanus crenatus, anemones, sponges and ascidians. The wider Inner Hebrides and Minches SAC is also designated for harbour porpoise. Given the size of both SAC's and the proposed controls associated with the Proposed Development it is considered that any effects on both SAC's would not be discernible nor impair the qualifying interest of the SAC's. They are therefore not considered further in this Chapter.

*Geology and Soils*

6.4.6 A comprehensive description of the geology and soils for the Alternative Alignment is provided in **Volume 6, Chapter 7: Geology and Soils Environment**.

6.4.7 The bedrock beneath the Proposed Development and surrounding area is (from west to east):

- Ardnish Formation sandstone and mudstone;
- Applecross Formation sandstone;
- Breakish Formation limestone
- Kinloch Formation sandstone and mudstone; and
- Beinn na Seamraig Formation sandstone.

6.4.8 There are no superficial deposits beneath most of the Proposed Development. The exceptions are localised areas of glacial deposits (comprising till, sand and gravel) in Glen Arroch and near Kyle Rhea and occasional areas of peat toward Broadford. Discrete areas of alluvium are recorded adjacent to larger watercourses. The soils within the study area generally comprise brown soils to the west, peaty gleys in the centre and peaty podzols to the east.

6.4.9 The published mapping has been confirmed by a programme of site inspection and investigation.

6.4.10 Details of the extent and distribution of peat are given in **Appendix V2-7.2: PLHRA** which presents the results of a comprehensive peat depth probing campaign.

*Hydrogeology*

Aquifer characteristics and groundwater vulnerability

6.4.11 An extract of the BGS 1:100,000 scale Aquifer Productivity and Groundwater Vulnerability datasets are presented in **Figure V6-6.2** and **Figure V6-6.3** respectively.

6.4.12 The glacial and peat superficial deposits are not considered an important aquifer. Small amounts of groundwater may be present within the sand and gravel horizons of the glacial superficial deposits; however groundwater yields are likely to be low given limited lateral and vertical extent of these horizons. Peat is characterised by a low bulk permeability, and does not, therefore readily permit water movement. Alluvium has a greater propensity to store and allow groundwater movement and groundwater in this unit is likely to be shallow and in hydraulic conductivity with the adjacent watercourses.

6.4.13 This is confirmed by the superficial mapping shown on **Figure V6-6.3** which illustrates that the superficial deposits underlying the Proposed Development are not classed as significant aquifers and only small discrete areas (which generally correspond to alluvium) are mapped with potential moderate to high productivity.

6.4.14 **Figure V6-6.2** shows that the bedrock deposits beneath this area in Section 3 are mapped as a 'low productivity aquifer' except the westernmost 1km of Section 3 (Ardnish Formation sandstone and mudstone) which is mapped as 'moderately productive'. **Figure V6-6.3** confirms the low productivity of the bedrock apart from the westernmost 1 km of the Section. Groundwater resources in the bedrock beneath all but the westernmost 1km are therefore limited and are likely to be restricted to near surface weathered zones and secondary fractures. Where present, groundwater movement will occur by intergranular and fracture flow mechanisms.

6.4.15 Groundwater vulnerability is divided into five classes (1 to 5) with 1 being least vulnerable and 5 being the most vulnerable. Review of **Figure V6-6.3** shows that the potential groundwater vulnerability in the uppermost aquifer in the vicinity of the Proposed Development is classified as Class 4a, 4b and 5, generally due to the shallow depth to groundwater.

Groundwater levels and quality

6.4.16 Baseline factors that inhibit groundwater recharge regionally include the following:

- steep topographic gradients that encourage formation of surface water runoff;
- glacial till and peat limit infiltration of rainwater as a result of their characteristic low bulk permeability; and
- the bedrock beath most of Section 3B (where not weathered or fractured) generally displays a low or negligible permeability that limits groundwater recharge. There is potential for more groundwater recharge in the westernmost 1 km of the Section where the bedrock is Ardnish Formation sandstone and mudstone.

6.4.17 This is witnessed by the high density of surface watercourses shown on **Figure V6-6.1** (Maps 1 – 3) and which confirm that the majority of incident rainfall forms surface water runoff locally and regionally.

6.4.18 Groundwater flow in both the bedrock and superficial deposits is likely to follow the local topography and flow generally northwards towards the Inner Sound or Loch Alsh or eastwards towards Kyle Rhea.

6.4.19 All of Scotland's groundwater bodies have been designated as Drinking Water Protected Areas (DWPA) under the Water Environment (Drinking Water Protected Area) (Scotland) Order 2013 and require protection for their current use or future potential as drinking water resources.

6.4.20 The current status of groundwater bodies in Scotland has been classified by SEPA in accordance with the requirements of the Water Framework Directive (WFD). The Alternative Alignment within Section 3, is located within the Northern Highland groundwater body (SEPA ID: 150701) which is designated with an overall classification of Good with no pressures identified in 2020 (which is the latest reporting cycle).

6.4.21 It is understood that SEPA do not maintain any groundwater level or quality monitoring locations within the study area for Section 3.

Groundwater Dependent Terrestrial Ecosystems

6.4.22 In accordance with SEPA guidance and their Scoping Response an assessment of GWDTE has been undertaken and is presented as **Appendix V6-6.4: Groundwater Dependent Terrestrial Ecosystems**. A summary of the habitat surveys completed is provided in Volume 6, **Chapter 4: Ecology** along with a detailed National Vegetation Classification (NVC) habitat plan which has been used to inform the assessment of GWDTE. **Figure V6-6.4** shows the distribution of potential GWDTE.

6.4.23 **Appendix V6-6.4: Groundwater Dependent Terrestrial Ecosystems** shows, that areas of potential GWDTE are sustained by rainfall and water logging of soils, rather than by groundwater. Buffers to areas of potential GWDTE specified in SEPA guidance therefore do not apply, but safeguards to maintain these habitats, and the source of water to these habitats will need to be maintained during construction and operation of the Proposed Development. Examples of appropriate safeguards and techniques are given in **Appendix V6-6.4: Groundwater Dependent Terrestrial Ecosystems and Volume 6, Chapter 4: Ecology**.

*Hydrology*

6.4.24 The Alternative Alignment crosses the following principal surface water catchments (from west to east):

- Broadford River, which flows north-eastwards into Broadford Bay;
- Allt a Mhuilinn, which flows northwards into Broadford Bay; and
- Abhainn Lusa, which flows north-westwards into Broadford Bay.

6.4.25 The only Drinking Water Protected Area (DWPA) within the study area is in the catchment of Allt a Mhuilinn, located at the western end of the Alternative Alignment.

6.4.26 The location and extent of the DWPA is shown on **Figure V6-6.1** (Map 1). The risk the Alternative Alignment poses to DWPAs has been considered as part of this assessment and is presented in **Confidential Appendix V6-6.3: Drinking Water Protected Area and Private Water Supply Risk Assessment** and confirms required safeguards to protect this water source.

Surface Water Quality

6.4.27 Water quality in Broadford River, Abhainn Lusa and Loch Alsh is monitored by SEPA and classified annually in accordance with the requirements of the WFD. **Table V6-6.1** provides summary details of the SEPA classifications reported in 2020 (the latest reporting cycle). Smaller watercourses within the study area are not monitored by SEPA.

**Table V6-6.1: SEPA Surface Water Classification (2020)**

| Watercourse (SEPA ID) | Overall Status | Overall Ecology | Physico-Chemical Status | Hydromorphology | Pressure |
|---|---|---|---|---|---|
| **Broadford River (20709)** | Good | Good | Good | Good | None |
| **Abhainn Lusa (20710)** | High | High | High | High | None |
| **Loch Alsh (200352)** | Good | Good | N/A | High | None |

Fisheries

6.4.28 Fisheries on the Isle of Skye are managed by the Skye and Lochalsh Rivers Trust. Fishery interests are discussed within **Volume 6, Chapter 4: Ecology**.

Watercourse Crossings

6.4.29 The Proposed Development seeks to utilise existing tracks and access routes wherever possible. There are both existing crossings on tracks which are scheduled to upgraded and new permanent watercourse crossings associated with proposed permanent track. There are no proposed Horizontal Directional Drill (HDD) locations beneath watercourses in this Section. The locations of permanent crossings are shown on **Figure V6-6.1** and a schedule of these crossings, which includes photographs and dimensions of each crossing, is shown in **Appendix V6-6.2: Schedule of Permanent Watercourse Crossings**.

Flood Risk

6.4.30 A summary of the potential sources of flooding and a review of the potential risk posed by each source is presented in **Table V6-6.2**.

**Table V6-6.2: Potential Sources of Flood Risk**

| Potential Source | Potential Flood Risk to the Proposed Development | Justification |
|---|---|---|
| **Coastal flooding** | No | SEPA flood mapping confirms the Proposed Development is not at risk from tidal or coastal flooding. |
| **River flooding** | Yes (localised) | SEPA mapping has identified that the floodplain extents associated with watercourses crossed by the Proposed Development are generally local and do not extend far from the watercourses or lochs.<br>Areas of high risk of flooding are located along the following watercourses which crossed by the Proposed Development; Broadford River, Allt a Mhuilinn, Abhainn Lusa and Kylerhea River. |
| **Surface water flooding** | No | SEPA flood maps indicate that the majority of the Proposed Development is not at risk from surface water flooding, however, small discrete areas of flooding are shown which are likely to be associated with small topographic lows. Surface water flooding is not considered to be a design constraint and potential effects can be mitigated by good design. |
| **Groundwater flooding** | No | The SEPA groundwater flood map illustrates that the Proposed Development is not considered at risk from potential groundwater flooding. This concurs with the desk-based assessment which has shown that there is little potential for significant quantities of groundwater. |
| **Flood Defence Breach (Failure)** | No | The Proposed Development is remote from any flood defences. |
| **Flooding from artificial drainage systems** | No | The Proposed Development is located within a remote area absent of artificial drainage systems. |
| **Flooding due to infrastructure failure** | Yes (localised) | SEPA has produced reservoir inundation maps for those sites currently regulated under the Reservoirs Act 1975. Review of these maps indicates one breach scenario has been recorded along the Allt a Mhuilinn associated with a breach from Loch Buidhe reservoir (reference number RES/R/1128476). The modelled flood extent crosses the Proposed Development, however given the safeguards afforded by the Reservoirs Act the risk of such an event occurring is very low. Therefore flooding from this source is not considered further. |

*Private Water Supplies and Authorised Sites*

6.4.31 As part of this assessment, a data request was made to THC (November 2020) who provided details of Private Water Supply (PWS) sources. This has been supplemented with the most recent PWS data available on the Scottish Government spatial database[10]. In addition to these data sources, a programme of site investigation has been undertaken to confirm the location of PWS sources and the location of DWPA abstraction points.

[10] Scottish Government (2021) Private Water Supplies within the Highland Council Area, available https://data.gov.uk/dataset/6e78286f-2014-4a2c-aefa-c1379b9f7199/private-water-supplies-within-the-highland-council-area [Accessed January 2022]

6.4.32 Further consultation was also undertaken with Scottish Water who confirmed that they do not maintain any assets which they consider at risk from the proposed works within the Alternative Alignment.

6.4.33 PWS locations and DWPA extents within the study area are shown on **Figure V6-6.1** (Maps 1 – 3).

6.4.34 The risk the Proposed Development poses to PWSs and DWPAs has been considered as part of this assessment and is presented in **Confidential Appendix V6-6.3: Drinking Water Protected Area and Private Water Supply Risk Assessment**, review of which confirms PWS sources that are at potential risk from the Proposed Development and the safeguards that will be required at these locations to confirm the integrity and quality of the water supplies.

6.4.35 SEPA Controlled Activity Regulation (CAR) authorisations were obtained from SEPA environmental database and those recorded in study area and are shown on **Figure V6-6.1** (Maps 1 – 3). SEPA was not able to provide details of the authorisations at the time of reporting.

*Future Baseline*

6.4.36 Due to proposed consent in perpetuity, the temporal scope requires consideration for climate change to alter future baseline conditions. Climate change studies predict a decrease in summer precipitation and an increase in winter precipitation alongside slightly higher average temperatures. This suggests that there may be greater pressures on water supplies and water levels in summer months in the future. In addition, summer storms are predicted to be of greater intensity. Therefore, peak fluvial flows associated with extreme storm events, in summer and winter, may also increase in volume and velocity.

*Summary of Sensitive Water Environment Receptors*

6.4.37 Table V6-6.3 outlines the receptors identified as part of the baseline study, and their sensitivity based upon the criteria contained in **Appendix V2-6.1: Significance Criteria**.

**Table V6-6.3: Sensitivity of Receptors**

| Receptor | Sensitivity | Reason for Sensitivity |
|---|---|---|
| **Statutory Designated Sites** | High | The Proposed Development passes over and through the northern edge of Mointeach Lochain Dubha SSSI and SAC, although no infrastructure is proposed within the designated site.<br><br>The Proposed Development also crosses part of Kinloch and Kyleakin SSSI and SAC. |
| **Groundwater** | High | Groundwater has been classified by SEPA as Good and vulnerability is classified as High. |
| **Surface water** | Medium | All surface water watercourses assessed by SEPA have been classified as Good / High. One catchment has been designated as DWPA. |
| **Flooding** | Medium | Minor floodplains have been identified adjacent to the larger watercourses crossed by the Proposed Development. |
| **Drinking Water Protected Areas and Private Water Supplies** | High | It has been confirmed that the Proposed Development crosses and lies with the catchment of one DWPA.<br><br>Properties have been identified to be served by a PWS that are downgradient of the Proposed Development. |
| **Licensed sites** | Not Sensitive | No licenced activities which are considered at risk are recorded within 1 km of the Proposed Development . |

**Future Baseline**

6.4.38 Due to proposed consent in perpetuity, the temporal scope requires consideration for climate change to alter future baseline conditions. Climate change studies predict a decrease in summer precipitation and an increase in winter precipitation alongside slightly higher average temperatures. This suggests that there may be greater pressures on water supplies and water levels in summer months in the future. In addition, summer storms are predicted to be of greater intensity. Therefore, peak fluvial flows associated with extreme storm events, in summer and winter, may also increase in volume and velocity.

## 6.5 Embedded Mitigation and Mitigation by Design

6.5.1 Mitigation has been developed as the project design has progressed through the route and alignment selection, and EIA stages of the project. The impact assessment and mitigation process has been iterative and therefore mitigation has been developed for the design to be as specific as possible and as an assumed part of the proposed OHL alignment and associated infrastructure. This process has included, for example, citing infrastructure generally in areas that avoid ecologically and hydrologically sensitive areas, other than where these are unavoidable such as crossing of watercourses and extensive areas of peat. In addition to the mitigation embodied in the design and routeing of the project, best practice construction measures have also been developed to ensure that disturbance and pollution during construction is avoided.

6.5.2 A description of all elements of the Proposed Development is given in **Volume 6, Chapter 2: Project Description**. Embedded mitigation and mitigation by design relevant to the water environment is presented below.

Good Practice Measures

6.5.3 As a principle, preventing the release of any pollution/sediment is preferable to dealing with the consequences of any release. There are several general measures which cover all effects assessed within this Chapter, details are given below.

6.5.4 The Proposed Development will be undertaken in accordance with good practice guidance, including UK and Scottish guidance on good practice for construction projects detailed in this Chapter (see paragraphs 6.3.11 – 6.3.17).

6.5.5 In addition, SSEN has established best practice construction techniques and procedures that have been agreed with statutory consultees, including SEPA and NatureScot. These are set out within the Applicant's General Environmental Management Plans (GEMPs) included in **Appendix V1-3.3**. The Proposed Development would be constructed in accordance with these plans.

Construction and Environmental Management Plan

6.5.6 A contractual management requirement of the successful Principal Contractor would be the development and implementation of a comprehensive and project specific CEMP. This document would detail how the successful Principal Contractor would manage the works in accordance with all commitments and mitigation detailed in the EIA Report, Applicant's GEMPs, statutory consents and authorisations, and industry best practise and guidance, including pollution prevention guidance.

6.5.7 The CEMP will also outline measures to ensure that the works minimise the risk to groundwater, surface water, PWS sources, DWPAs and licensed water uses.

6.5.8 It is expected that the following will be included in the CEMP and would ensure the works are undertaken in accordance with good practice guidance and will include but is not limited to the following:

- measures to protect and safeguard private water supplies, DWPAs and associated distribution pipework;
- any above ground on-site fuel and chemical storage would be bunded;
- emergency spill response kits would be maintained during the construction works;
- a vehicle management system would be put in place wherever possible to reduce the potential conflicts between vehicles and thereby reduce the risk of collision;
- drip trays will be placed under vehicles which could potentially leak fuel/oils;
- any temporary construction / storage compounds required will be located remote from any sensitive surface water receptors or private water supplies and will be constructed to manage surface water runoff in accordance with best practice;
- any water contaminated with silt or chemicals will not be discharged directly or indirectly to a watercourse without prior treatment; and
- water for temporary site welfare facilities will be brought to site, and foul water will be collected in a tank and collected for offsite disposal at an appropriately licensed facility.

6.5.9 A wet weather protocol would be developed. This would detail the procedures to be adopted by all staff during periods of heavy rainfall. Tool box talks would be given to engineering/construction/supervising personnel. Roles would be assigned and the inspection and maintenance regimes of sediment and runoff control measures would be adopted during these periods.

6.5.10 In extreme cases, the above protocol would dictate that work onsite may have to be temporarily suspended until weather/ground conditions allow.

6.5.11 Further, Scottish Water best practice guidance for construction and land management practices in DWPAs will be adhered to and included in the CEMP[11]..

Environmental Clerk of Works

6.5.12 To ensure all reasonable precautions are taken to avoid negative effects on the water environment, a suitably qualified Environmental Clerk of Works (ECoW) will be appointed prior to the commencement of construction to advise the Applicant and the Principal Contractor on all ecological and hydrological matters. The ECoW will be required to be present onsite during the construction phase and will carry out monitoring of works and briefings with regards to any ecological and hydrological sensitivities on the Site to the relevant staff of the Principal Contractor and subcontractors

6.5.13 With respect to the water environment, the ECoW would also have responsibility to ensure water flow paths and quality to water dependant habitat are sustained during all phases of the Proposed Development (see **Appendix V6-6.4: Groundwater Dependent Terrestrial Ecosystems (GWDTE) Assessment**).

Water Quality Monitoring (PWS, DWPA and Designated Sites)

6.5.14 It has been confirmed that the Proposed Development crosses one DWPA and that there are a number of PWS sources within the study area. Water quality monitoring before and during the construction phase would be undertaken, to ensure that the tributaries of the main channels identified at risk from the Proposed Development have no significant impacts to water quality and/or quantity. Monitoring would be carried out at a specified frequency (depending upon the construction phase) on these catchments.

6.5.15 Water quality monitoring before and during the construction phase would be undertaken of water sources which have been identified as potentially at risk from the Proposed Development (see **Confidential Appendix V6-6.3: Drinking Water Protected Area and Private Water Supply Risk Assessment**) without implementation of best practice measures.

6.5.16 The monitoring would be used to ensure that the quality and/or quantity of water to these sources is not significantly impacted. Monitoring would be carried out at a specified frequency (depending upon the construction phase) on these catchments. An example monitoring protocol is given in **Confidential Appendix V6-6.3: Drinking Water Protected Area and Private Water Supply Risk Assessment.**

6.5.17 As detailed in **Confidential Appendix V6-6.3: Drinking Water Protected Area and Private Water Supply Risk Assessment** it is expected that a water monitoring programme proportionate to the risk posed to a PWS source or DWPA area is adopted, with more monitoring (e.g. increased frequency and parameter suite) used at locations where the risk to a water source is greater.

6.5.18 The monitoring would continue throughout the construction phase and immediately post construction when works are undertaken near to a water source. Monitoring would be used to allow a rapid response to any pollution incident and also to assess the impact of good practice or remedial measures. Monitoring frequency would increase during the construction phase if remedial measures to improve water quality were implemented. Water quality monitoring plans would be developed during detailed design (Scottish Water, SEPA, THC and Skye and Lochalsh Rivers Trust would be consulted on the plan) and would be contained within the CEMP.

6.5.19 The water monitoring plan would also ensure that the tributaries of the main channels that discharge to Mointeach Lochain Dubha SSSI and SAC and Kinloch and Kyleakin SSSI and SAC have no significant water quality and/or quantity impacts. Monitoring would be carried out at a specified frequency (depending upon the construction phase) on these catchments, and, like the PWS and DWPA monitoring programme would be agreed with statutory consultees including THC, NatureScot and SEPA .

[11] https://www.scottishwater.co.uk/Help-and-Resources/Document-Hub/Key-Publications/Sustainable-Land-Management

6.5.20 The performance of the good practice measures would be kept under constant review by the water monitoring schedule, based on a comparison of data taken during construction with a baseline data set, sampled prior to the construction period.

Pollution Risk

6.5.21 Good practice measures in relation to pollution prevention would include the following:

- refuelling would take place at least 50 m from watercourses and where possible it would not occur when there is risk that oil from a spill could directly enter the water environment. For example, periods of heavy rainfall or when standing water is present would be avoided;
- foul water generated onsite would be managed in accordance with PPG4;
- areas would be designated for washout of vehicles which are a minimum distance of 50m from a watercourse;
- washout water would also be stored in the washout area before being treated and disposed of;
- a vehicle management plan and speed limit would be strictly enforced onsite to minimise the potential for accidents to occur;
- if any water is contaminated with silt or chemicals, runoff would not enter a watercourse directly or indirectly prior to treatment;
- water would be prevented as far as possible, from entering excavations such as tower foundations;
- procedures would be adhered to for storage of fuels and other potentially contaminative materials in line with the Controlled Activity Regulations, to minimise the potential for accidental spillage; and
- a plan for dealing with spillage incidents would be designed prior to construction, and this would be adhered to should any incident occur, reducing the effect as far as practicable. This would be included in the final CEMP for the Proposed Development.

Erosion and Sedimentation

6.5.22 Good practice measures for the management or erosion and sedimentation would include the following:

- all stockpiled materials would be located out with a 50 m buffer from watercourses;
- water would be prevented as far as possible, from entering excavations through the use of appropriate cut-off drainage;
- where the above is not possible, water would pass through a number of settlement lagoons and silt/sediment traps to remove silt prior to discharge into the surrounding drainage system;
- clean and dirty water onsite would be separated and dirty water would be filtered before entering the water environment;
- if the material is stockpiled on a slope, silt fences would be located at the toe of the slope to reduce sediment transport;
- the amount of ground exposed, and time period during which it is exposed, would be kept to a minimum;
- silt/sediment traps, single size aggregate, geotextiles or straw bales would be used to filter any coarse material and prevent increased levels of sediment. Further to this, activities involving the movement or use of fine sediment would avoid periods of heavy rainfall where possible; and
- SSEN construction personnel, ECoW and the Principal Contractor would carry out regular visual inspections of watercourses to check for suspended solids in watercourses downstream of work areas.

Fluvial Flood Risk

6.5.23 It is proposed to adopt Sustainable Drainage Systems (SuDS) as part of the Proposed Development. SuDS techniques aim to mimic pre-development runoff conditions and balance or throttle flows to the rate of runoff that might have been experienced prior to development. Good practice in relation to the management of surface

water runoff rates and volumes where new permanent tracks or temporary compounds and laydown areas are proposed would include the following:

- drainage systems would be designed to ensure that any sediment, pollutants or foreign materials which may cause blockages are removed before water is discharged into a watercourse;
- onsite drainage would be subject to routine checks to ensure that there is no build-up of sediment or foreign materials which may reduce the efficiency of the original drainage design causing localised flooding; and
- appropriate drainage would attenuate runoff rates and reduce runoff volumes to ensure minimal effect upon flood risk.

6.5.24 Further information on ground conditions and drainage designs would be provided in the final CEMP.

Water Abstraction

6.5.25 Abstraction of water for construction activities is not anticipated. If, however, a source of water is required for construction an application for a CAR Licence would be made to SEPA and managed through the regulation of the CAR Licence(s). Should a suitable source not be identified, water bowsers would be used.

6.5.26 Good practice that would be followed in addition to the CAR regulations includes:

- water use would be planned so as to minimise abstraction volumes;
- water would be re-used where possible;
- abstraction volumes would be recorded; and
- abstraction rates would be controlled to prevent significant water depletion in a source.

Permanent Watercourse Crossings

6.5.27 Good practice in relation to new water crossings involves the following aspects:

- the design of any new the watercourse crossings would be agreed with SEPA prior to construction and be regulated in accordance with CAR;
- the appropriate crossing type would be identified from SEPA's good practice guidance and would consider geomorphological, ecological and hydrological constraints; and
- new crossings would be sized and designed so as to minimise effect upon flood risk (sized to accommodate at least the 200 year flow).

6.5.28 No works are proposed to existing watercourse crossings associated with existing access tracks. Should, it become apparent, as part of the detailed design stage of the project, that an existing crossing needs to be replaced the principles above, for new crossings, would be used.

Temporary Access Tracks

6.5.29 In general, proposed construction site access would be taken via the existing public road network and would make use of existing forest and estate tracks as far as practicable, upgraded as required.

6.5.30 The majority of access will be achieved through upgrade of existing and installation of new tracks. Floating stone road or trackway panel construction may be installed in sensitive areas such as over deeper areas of peat and within parts of the Kinloch and Kyleakin Hills SAC / SSSI. All new tracks would be constructed in accordance with best practice construction methods, and with reference to NatureScot's good practice guide on constructing tracks in Scottish uplands[12].

[12] Constructed Tracks in the Scottish Uplands. Scottish Natural Heritage, September 2015.

6.5.31 Fording will be used where an appropriate crossing point is already in place (on current tracks) with a suitable bed for crossing (where necessary the bed will be protected by the installation of bog mats or similar for running on). Fording will only be used where limited traffic is expected and impacts on the bed and crossing point generally will be monitored with appropriate mitigation being implemented if required.

6.5.32 For watercourse crossings less than 2 m wide CAR General Binding Rules will be adhered to. Bog mats, or similar, be positioned across the water course to enable access, where necessary, side rails will be installed with silt mitigation at either end and across if required to ensure that silt impacts from vehicles crossing are controlled at all times. Crossings will be cleaned at the end of the day if required.

6.5.33 Where possible large water crossings will be avoided by works being accessed and undertaken on either side of the watercourse. Appropriate protection measures (trestles and tables, pilot lines and supports etc.) will be implemented for conductor works to ensure that conductor does not enter the watercourse.

6.5.34 Once access routes have been confirmed, water crossing requirements will be assessed in advance of works with regards to compliance with CAR and any required authorisations will be gained prior to works progressing – at this time it is expected that all works will be able to be completed under appropriate GBRs.

6.5.35 All proposed crossing locations, methodologies and structures for overhead line and forestry works will be reviewed and approved by the ECoW, prior to any works being undertaken.

Dismantling the Existing Overhead Transmission Line

6.5.36 To dismantle the existing OHL, access to each tower location would be required. In the majority of cases, this would require access by tracked vehicles. Existing access tracks would be utilised as far as practicable.

6.5.37 In more remote areas, including within the Kinloch and Kyleakin Hills SAC, removal by helicopter is proposed.

6.5.38 Measures detailed above for the control and prevention of pollution, erosion and sedimentation apply to the use of tracks and helicopters during the proposed dismantling works.

6.5.39 For steel lattice tower locations where an excavator can achieve access, the foundations would be removed to below ground level. For towers where steel needs to be removed via helicopter it is proposed that these would be left in place with the steel cut just above the concrete, where deemed safe to do so. The option exists to fly in material to cover remaining foundation material.

6.5.40 Removal of conductors from the existing OHL would be undertaken with minimum disturbance to watercourses. Where conductors need to be pulled across watercourses, this operation would be undertaken swiftly and with minimum disturbance to riparian habitats or stream beds.

6.5.41 All dismantling works would be supervised by the project ECoW.

Steel Lattice Tower Foundation Construction

6.5.42 The following measures are proposed to mitigate the effects of tower foundation construction on the water environment:

- tower foundations would be located and excavated wherever possible in the driest locations with well consolidated superficial geology. Wetland areas, areas of deep peat and a standoff of 30 m to waterbodies and 10 m to watercourses would be adhered to wherever possible;
- wherever possible, towers would be located out with floodplains to reduce potential effects on flooding;

- where excavations for tower foundations encounter localised limited quantities of groundwater or become flooded due to surface water runoff or heavy rainfall, appropriate treatment of dewatering would be instigated under direction of the site ECoW;
- no dewatering discharge would be permitted directly adjacent to watercourses;
- unless directed otherwise by the site ECoW, dewatering discharge would drain across buffer areas of vegetation (e.g. grassland, heather) of at least 20 m width, which would provide for natural attenuation and dispersal of the flow and removal of silt;
- where no suitable vegetation is available for natural treatment of dewatering, the discharge would be passed through on-site settling tanks/lagoons prior to discharge by soakaway or to watercourse;
- the requirement for dewatering would be minimised in all locations by timely and efficient excavation of the foundation void and subsequent concrete pouring and backfilling;
- all procedures for dewatering would be agreed by the Principal Contractor with SEPA, THC and NatureScot and detailed in the CEMP; and
- the Principal Contractor would develop a method statement to address the transport, transfer, handling and pouring of liquid concrete at tower foundation sites.

Concrete Batching, Transport and Pouring

6.5.43 In relation to works involving concrete batching, transport and pouring, the following mitigation would be adopted:

- where concrete transfers are required, measures would be adopted at the point of concrete transfer to prevent accidental spillage of liquid concrete and no transfers would be undertaken in proximity to watercourses or areas of standing water;
- there would be no wash-out of concrete carrying vehicles at tower foundation sites (except the concrete chute) with wash-out undertaken at the nearest compounds where suitably bunded/protected facilities would be provided. Chutes would be washed out to a suitable container, allowed to settle and disposed at suitably licensed facilities;
- excess concrete or wash-out liquid would not be discharged to drains or watercourses. Drainage from washout facilities would be collected and treated or removed to an appropriate treatment point/licensed disposal site; and
- vehicles and plant working at tower foundations would be confined to the area required for safe working only to prevent compaction, rutting and habitat damage to adjacent areas of land. Working areas would be clearly marked out and temporary fencing used where risk assessments indicate a requirement. Similar procedures would be adopted to demarcate areas where plant access is required for conductor stringing and tensioning works.

Forest Felling

6.5.44 Felling required to establish the OHL would be undertaken in accordance with best practice guidance published by Forestry and Land Scotland and overseen by the project ECoW.

## 6.6 Assessment of Likely Significant Effects

6.6.1 The assessment of effects is based on the Proposed Development description outlined in **Volume 6, Chapter 2: Project Description** and is structured as follows:

- construction effects of the Proposed Development (which includes dismantling effects associated with the existing OHL); and
- operational effects of the Proposed Development.

*Potential Construction Impacts*

6.6.2 Potential construction impacts on hydrology and the aquatic environment have been considered for the different phases of the proposed project (construction, operation and dismantling). The impacts have been identified with reference to relevant guidance, through consultation and project team discussions, through targeted research on hydrological and water quality effects and by considering the information provided by the project engineers on infrastructure and construction methods

6.6.3 The impacts of dismantling of the existing 132 kV OHL are less than those reported for construction of the new line and are of a shorter duration and are less intrusive. As a worst case, the proposed dismantling works are considered with the potential construction impacts.

6.6.4 During the construction phase the Proposed Development has the potential to result in the following effects without appropriate controls or mitigation:

- an adverse effect on surface water or groundwater quality from pollution, fuel, oil, concrete or other hazardous substances;
- potential adverse change of surface and groundwater flow paths and contribution to areas of peat and GWDTEs, water dependent habitat and water supplies;
- increased flood risk to areas downstream of the site through increased surface water runoff; and
- potential pollution impacts and adverse effect to public and private water supplies and DWPAs.

Surface Water and Groundwater Quality

6.6.5 As stated above, the Proposed Development would be undertaken in accordance with the Applicant's GEMPs and relevant technical guidance, PPG/GPPs and other codes of best practice, to limit the potential for contamination of both ground and surface waters. In addition, a site specific CEMP would be prepared by the Principal Contractor and include a groundwater and surface water quality management plan.

6.6.6 The above measures would significantly reduce the likelihood of pollutants, including suspended solids, being discharged to nearby watercourses or groundwater.

6.6.7 Surface water and groundwater are considered highly sensitive receptors. The Proposed Development and proposed safeguards embedded in the development design reduce the magnitude of potential impact to negligible, during the construction phase. The significance of effect is therefore assessed as negligible. No additional mitigation, over and above confirmatory monitoring, is therefore required.

Surface and Groundwater Flow

6.6.8 No significant deep or expansive earthworks are proposed at any location of the Proposed Development and therefore there will be no significant impact on surface water or groundwater flows. Notwithstanding this, the best practice measures listed above would be included in the CEMP and would be used to control and manage surface and groundwater flows and maintain existing water flow paths at a local scale and be used to ensure water flow paths to PWS sources and water dependent habitat would be maintained..

6.6.9 Surface and groundwater are highly sensitive receptors. With these safeguards, the potential impact on ground and surface water flows is assessed as negligible and thus the resultant significance of effect is negligible. No additional mitigation, over and above confirmatory monitoring, is required.

Flood Risk

6.6.10 Areas of flood risk are considered of medium sensitivity. As part of the detailed site design the Principal Contractor will prepare a detailed construction method statement which will have regard to areas of known and potential flood risk. This will ensure no new permanent features which are sensitive to flooding is located within the floodplain.

6.6.11 It is proposed that access to the Proposed Development will use existing tracks and watercourse crossings wherever possible. Where permanent new access tracks or watercourse crossings cannot be avoided, the following measures will be implemented to protect surface water and groundwater quality as well as to mitigate flood risk:

- silt traps / check dams will be used to capture suspended solids generated during construction; and
- construction will be carried out in accordance with appropriate SEPA and CIRIA guidance.

6.6.12 The design and capacity of new watercourse crossings would be agreed by the Principal Contractor in consultation with SEPA and reflect the best practice guidance given above.

6.6.13 With these safeguards the magnitude of potential impact is assessed as negligible and the resultant significance of effect is assessed as negligible. No additional mitigation is required.

Public and Private Water Supplies and DWPA's

6.6.14 The baseline assessment has confirmed that properties locally maintain private water supplies and that some water sources lie close to or downstream of the Proposed Development. Micro-sting, and good practice techniques that prevent pollution of surface water and maintain the integrity of the distribution pipework, will be required to safeguard these private water supplies.

6.6.15 The Proposed Development also crosses a surface water catchment which is designated as a DWPA.

6.6.16 Both DWPAs and PWS sources are considered highly sensitive receptors. It is proposed therefore prior to construction, as part of the detailed design stage of the project, a DWPA and PWS monitoring and protection strategy is prepared and agreed with THC, Scottish Water and SEPA.

6.6.17 A detailed assessment of the DWPAs and PWS sources is presented as **Confidential Appendix V6-6.3: Drinking Water Protected Area and Private Water Supply Risk Assessment**, and DWPAs and PWS sources identified at risk from the Proposed Development are identified.

6.6.18 With the best practice construction techniques to protect surface water and groundwater receptors outlined above, in combination with the proposed DWPA and PWS monitoring programme (an example is included in **Confidential Appendix V6-6.3: Drinking Water Protected Area and Private Water Supply Risk Assessment**), the magnitude of potential impact is assessed as negligible and the resultant significance of effect is assessed as negligible. No additional mitigation is required.

Designated Sites within Hydraulic Connection to the Proposed Development

6.6.19 The baseline assessment has confirmed without safeguards Mointeach Lochain Dubha SSSI and SAC, and Kinloch and Kyleakin SSSI and SAC could be impaired by the Proposed Development.

6.6.20 The controls which would be adopted at site in accordance with best practice would ensure that the potential impact on the designated sites is negligible and thus the significance of effect is negligible. No additional mitigation is required.

*Potential Operation Impacts*

6.6.21 During the operational phase of the Proposed Development, it is anticipated that routine maintenance of infrastructure would be occasionally required.

6.6.22 During the operational phase the Proposed Development has the potential to result in the following effects without appropriate controls or mitigation:

- adverse changes to surface water flow paths, watercourse discharge rates and volumes, and alteration of watercourse geomorphology;

- as a result of an alteration of groundwater and surface water flow paths, an adverse effect on water abstractions and water dependent habitat;
- an adverse effect on surface water or groundwater quality from pollution, fuel, oil, concrete or other hazardous substances from site traffic associated with maintenance activities; and
- increased flood risk through increased surface water runoff from new impermeable areas.

6.6.23 Should any maintenance be required onsite which would involve construction activities method statements would be developed and used which will adopt the best practices agreed with regulators as part of the construction phase CEMP.

Surface Water and Groundwater Quality

6.6.24 The possibility of a pollution event, resulting in impairment of surface water or groundwater impairment, occurring during operation is very unlikely as there would be a limited number of vehicles required onsite for routine maintenance.

6.6.25 Any maintenance activities would be undertaken using the same controls agreed with statutory consultees and deployed during the construction phase, including supervision of all works. Further the scope of works which might be undertaken are no different to the work which would be undertaken during the construction phase.

6.6.26 Immediately post-construction, newly excavated drains and track dressings may be prone to erosion as any vegetation would not have matured. Appropriate design of the drainage system, incorporating sediment traps, would reduce the potential for the increased delivery of sediment to natural watercourses. Potential effects from sedimentation or erosion during the operational phase are considered to come from linear features on steeper slopes, where velocities in drainage channels are higher. Immediately post-construction, flow attenuation measures would remain and be maintained to slow runoff velocities and prevent erosion until vegetation becomes established.

6.6.27 The Applicant is committed to delivering a Habitat Management Plan for the Proposed Development, details of which will be provided and agreed upon with relevant consultees post submission of the application and prior to construction commencing, secured by a condition of consent...

6.6.28 Based upon this, the potential risk associated with frequency, duration and likelihood of a pollution event is low. It is, therefore, anticipated that the magnitude of a potential imoact on surface water or groundwater during the operational phase of the Proposed Development would be negligible, as no detectable change would likely occur. Therefore, the significance of effect during the operational phase of the Proposed Development is predicted to be negligible on surface water and groundwater. No further or additional mitigation, therefore, is required.

Surface and Groundwater Flow

6.6.29 During the operation of the Proposed Development, it is not anticipated that there would be any excavation or need to stockpile large volumes of soils, reducing the potential for effects on surface and groundwater flows. Should any excavation be required, this is likely to be limited and required for maintenance of tracks etc. Any excavation, handling and placement of material would be subject to the same safeguards that would be used during the construction phase of the project.

6.6.30 Should any non-routine maintenance be required at the sections of track crossing wet areas (defined visually onsite by a contractor or operational personnel) then the good practice measures as detailed for the construction phase would be required on a case by case basis. Extensive work at watercourse crossings/adjacent to the water environment may require approval from SEPA under the CAR (depending upon the nature of the activity).

6.6.31 The likelihood, magnitude of impact and duration of works which have the potential to alter surface and groundwater flow paths would be negligible following adherence to good practice measures. Therefore, the potential significance of effect on surface and groundwater is negligible. No mitigation is, therefore, required.

Flood Risk

6.6.32 Culverts beneath permanent access tracks could become blocked without routine inspection or maintenance. Any reduction in conveyance could locally increase flood risk.

6.6.33 In accordance with the Applicants GEMP's proposed infrastructure would be subject to routine inspection, and if required maintenance. Where identified, any remedial works would be undertaken using the same controls and authorisations detailed above and would be deployed during the construction phase of the project.

6.6.34 The likelihood, magnitude and duration of works which have the potential to impact surface and groundwater flow paths would be negligible following adherence to good practice measures. Therefore, the potential significance of effect on surface and groundwater is negligible. No mitigation is, therefore, required.

Private Water Supplies and DWPAs

6.6.35 Given the controls and assessment presented above, no significant impact on surface water or groundwater quality or flow is anticipated during the operational phase of the development. Accordingly, the potential significance of effect on PWS sources and DWPAs is assessed as negligible. No mitigation additional is therefore required.

Designated Sites within Hydraulic Connection to the Proposed Development

6.6.36 The controls which would be adopted at site during the operational phase and which are in accordance with best practice will safeguard surface water and groundwater quality, surface water and groundwater flows, and mitigate flood risk. They would ensure that the potential impact on Mointeach Lochain Dubha SSSI and SAC and Kinloch and Kyleakin SSSI and SAC is negligible and thus the significance of effect is negligible. No additional mitigation is required.

## 6.7 Mitigation

6.7.1 As there are no predicted likely significant effects under the terms of the EIA regulations, other than the good practice measures that SSEN Transmission implement as standard, no specific mitigation, is required.

## 6.8 Residual Effects

6.8.1 No significant residual effects on surface water or groundwater receptors including designated water dependent sites, GWDTE, PWS sources and DWPAs are predicted during the construction and operation of the Proposed Development, nor associated with dismantling of the existing OHL.

## 6.9 Summary of Effects

6.9.1 A summary of assessed effects and identified mitigation measures required to reduce the potential effects to acceptable levels are identified in **Table V2-6.4.**.

**Table V2-6.4: Summary of Effects and Proposed Mitigation Measures**

| Potential Effect | Proposed Mitigation / Enhancements | Resultant Significance of Effect |
|---|---|---|
| **Construction Phase (inc. dismantling the existing OHL)** | | |
| • Alteration of surface water or groundwater flow<br>• Impairment of surface water or groundwater quality<br>• Increase in flood risk<br>• Impairment of PWS and DWPA supplies<br>• Adverse effect on water dependent designated sites | • Mitigation by design<br>• Good practice construction techniques<br>• Confirmatory water quality monitoring | Negligible |
| **Operational Phase** | | |
| No additional effects or mitigation / enhancement identified. | | |