

**Beauly to Blackhillock to New Deer to
Peterhead 400 kV Project**

Environmental Impact Assessment Report

Volume 5 | Appendices

Appendix 10.8 – Flood Risk Assessment



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1 Introduction

1.1 Project Background

- 1.1.1 This Flood Risk Assessment (FRA) has been prepared by WSP UK Ltd (WSP) on behalf of Scottish Hydro Electric Transmission plc (the Applicant) who, operating and known as Scottish and Southern Electricity Networks Transmission (SSEN Transmission), own operate, develop and maintain the high voltage electricity transmission network across the north of Scotland and remote islands. In this report "the Applicant" and "SSEN Transmission" are used interchangeably unless the context requires otherwise.
- 1.1.2 SSEN Transmission is submitting an application for consent under section 37 of the Electricity Act 1989 to construct and operate a new double circuit steel structure 400 kV overhead transmission line (OHL), approximately 192 km in length, to connect into new substation sites near Beaulay (Fanellan), New Deer (Greens) and Peterhead (Netherton) (hereafter referred to as the 'Proposed Development'). These substations are separate applications and do not form part of this assessment. WSP have been appointed to assist with producing the Environmental Impact Assessment (EIA) Report, to support the section 37 consent application, of which this FRA forms an appendix to **Chapter 10: Water and the Geological Environment**.
- 1.1.3 This FRA has been carried out in accordance with guidance from The Highland Council (THC), Moray Council (MC), Aberdeenshire Council (AC), and the Scottish Environment Protection Agency (SEPA) requirements for undertaking a Flood Risk Assessment.

1.2 Scope of the Assessment

- 1.2.1 This FRA investigates flood risk in the vicinity of the Proposed Development and establishes if any mitigation measures are required to ensure the sustainability and safety of the Proposed Development and nearby receptors over its lifetime and includes:
- an overview of the Proposed Development;
 - a review of SEPA flood maps¹ presenting the current flood risk to the Proposed Development and consideration of the flood risk implications to and from the Proposed Development;
 - consideration of how the Proposed Development aligns with national and local policies (see **Section 3 – Policy Context and Guidance**);
 - a qualitative assessment of the flood risk from all sources of flooding outlined in **Section 4.1 Flood Risk Sources**; and
 - advice on whether further detailed FRA analysis is required beyond this assessment.
- 1.2.2 This FRA focuses on locations where permanent structures such as towers are proposed, particularly those which require foundations above ground level.
- 1.2.3 Access tracks have also been assessed based on the information provided at this stage of the design (e.g. locations and typical sections).

1.3 Assumptions and Limitations

- 1.3.1 WSP have prepared this report on behalf of SSEN Transmission, with reference to the Proposed Development, for their sole and specific use.

¹ SEPA (2021a). SEPA Flood Maps. Available at: <https://map.sepa.org.uk/floodmap/map.htm>. This link, and all subsequent links, were accessed on [08 August 2025]

- 1.3.2 The information given in this report is for the purpose of the FRA as commissioned by SSEN Transmission. Its suitability for other purposes is not guaranteed and is at the risk of the user.
- 1.3.3 Third party information has been used in the preparation of this report, which WSP, by necessity, assumes is correct at the time of writing. Whilst all reasonable checks have been made on data sources and the accuracy of the data, WSP accepts no liability for this data.

2 Proposed Development Setting

2.1 Overview

- 2.1.1 An overview of the Proposed Development is illustrated in **Figure 3.1: Site Layout**.
- 2.1.2 Ground levels vary across the Proposed OHL Alignment, ranging from 0 m above ordinance datum (AOD) to 330 m AOD. In the first 30 km (Beauly to Inverness) and final 100 km (Keith to Peterhead) of the Proposed OHL Alignment, the landscape is predominantly composed of arable fields and pastureland. The Proposed OHL Alignment is situated in areas of forestry, woodlands, and highland terrain as it passes between Inverness and Loch Ness to the north of the Cairngorm National Park.
- 2.1.3 Key aspects considered in this FRA include:
- steel lattice towers (locations, structure type and design heights provided in **Appendix 3.1 Tower Schedule**);
 - concrete necks at the base of each tower leg (maximum size of 1.5 x 1.5 x 0.5 m);
 - towers (Ref: CB12-16A and CB14-1B) which require above ground pile caps (maximum size of 5 x 5 x 1.5 m); and
 - Access tracks, including floated (raised) access tracks in areas of peatland.

2.2 Site Visit

- 2.2.1 A site visit was completed on the 25 November 2024 by SSEN Transmission representatives to several locations of interest for this FRA, particularly areas where towers were proposed.
- 2.2.2 Observations from the site visit support the desk-based evidence throughout this FRA, and site photos have been included where relevant.

2.3 Consultation

- 2.3.1 Consultation with SEPA, Scottish Water, THC, MC, and AC was undertaken regarding any records of flooding they might hold within approximately 1 km of the Proposed OHL tower locations. The correspondence is summarised in **Table 2.1: Consultation Responses Relevant to Flood Risk Assessment**.

Table 2.1: Consultation Responses Relevant to Flood Risk Assessment

Organisation	Type of Consultation	Response	How response has been considered
SEPA	Site specific advice and position on compensatory storage requirements requested in February 2025.	Response received March 2025. SEPA confirmed that the Proposed Development falls under the NPF4 definition of Essential Infrastructure and can be supported despite being in a flood risk area. SEPA noted compensatory storage should be considered.	SEPA's standing advice for Essential Infrastructure (see Section 3.1 – National Planning Policy) has been considered as part of the FRA. Estimates for floodplain volume displaced by Proposed Development have been calculated. Compensatory storage options are being considered by SSEN Transmission in consultation with relevant landowners.

Organisation	Type of Consultation	Response	How response has been considered
SEPA	Historic flood records in areas surrounding Proposed OHL towers requested in February 2025.	Response received February 2025. SEPA provided two records of historic flooding within 0.25 km of the Proposed OHL towers.	This information was considered as part of the FRA in Section 4.2. Historic flood records locations have been included in Figure 10.8.1: Fluvial Flood Risk and Figure 10.8.2: Surface Water Flood Risk .
Scottish Water	Historic flood records and public sewer assets in areas surrounding Proposed OHL towers requested in February 2025.	Response received February 2025. Scottish Water confirmed they held no public sewer assets or flood records in the vicinity of the Proposed OHL towers.	This information was considered as part of the FRA in Section 4.2.
The Highland Council (THC)	Historic flood records for THC administrative area, focusing on areas surrounding Proposed OHL towers requested in February 2025.	Response received February 2025. THC provided five records of historic flooding within 0.75 km of the Proposed OHL towers.	This information was considered as part of the FRA in Section 4.2. Historic flood records locations have been included in Figure 10.8.1: Fluvial Flood Risk and Figure 10.8.2: Surface Water Flood Risk .
Moray Council (MC)	Historic flood records for MC administrative area, focusing on areas surrounding Proposed OHL towers requested in February 2025.	Response received February 2025. MC confirmed they do not hold any historic information of flooding in the vicinity of the Proposed OHL towers.	This information was considered as part of the FRA in Section 4.2.
Aberdeenshire Council (AC)	Historic flood records for AC administrative area, focusing on areas surrounding Proposed OHL towers requested in February 2025.	Response received March 2025. AC provided 26 records of historic flooding within 5 km of the Proposed OHL towers.	This information was considered as part of the FRA in Section 4.2. Historic flood records locations have been included in Figure 10.8.1: Fluvial Flood Risk and Figure 10.8.2: Surface Water Flood Risk .

3 Policy Context and Guidance

3.1 National Planning Policy

- 3.1.1 National Planning Framework 4 (NPF4)² was published by the Scottish Government on 13 February 2023. It is the national spatial strategy for Scotland which sets out the spatial principles, regional priorities, national developments, and national planning policy for Scotland.
- 3.1.2 NPF4 Policy has an emphasis on tackling the climate and nature crises (Policy 1). Climate mitigation and adaptation (Policy 2) is another important theme with the intent of this policy being *"To encourage, promote and facilitate development that minimises emissions and adapts to the current and future impacts of climate change."*
- 3.1.3 This FRA has been undertaken to comply with the policies of NPF4, including Policy 22.
- 3.1.4 Upon review of the categories of vulnerability, the Proposed Development would be classified as "Essential Infrastructure", given the description of one of the Essential Infrastructure land use types in NPF4 p148:
- "All forms of renewable, low-carbon and zero emission technologies for electricity generation and distribution and transmission electricity grid networks and primary sub stations".*
- 3.1.5 The Proposed Development will be part of the transmission grid network transporting clean, renewable power from offshore wind turbines.

NPF4 Exception

- 3.1.6 With the designation of Essential Infrastructure and the need for the development in this location, it is considered the Proposed Development would be subject to the exception of *"Essential Infrastructure where the location is required for operational reasons."*
- 3.1.7 Given this exception, SEPA standing advice³ would apply to the Proposed Development and therefore it is noted the following matters would need to be satisfied in a site-specific Flood Risk Assessment (FRA):
- 1 *all risks of flooding are understood and addressed;*
 - 2 *no reduction in floodplain capacity, increase of flood risk, or need for a future flood scheme (the Proposed Development may have potential to reduce floodplain capacity and it is noted in the standing advice SEPA should be consulted for site-specific advice, which is undertaken as part the FRA);*
 - 3 *the Proposed Development remains safe and operational during floods;*
 - 4 *flood resistant and resilient materials and construction methods are used; and*
 - 5 *future adaptations can be made to accommodate the effects of climate change.*
- 3.1.8 Where a potential floodplain loss is involved, SEPA should be consulted, with this clearly indicated in the consultation email⁴.
- 3.1.9 Where SEPA is consulted, it will provide advice accordingly to the planning authority in its role as a statutory consultee. The Planning Authority must consider SEPA's advice, alongside all other relevant NPF4 and local development plan policies and material considerations, before reaching a decision⁵.

² Scottish Government (2023). National Planning Framework 4. Available at: <https://www.gov.scot/publications/national-planning-framework-4/>

³ SEPA (2024). Flood Risk Standing Advice for Planning Authorities. Available at: <https://www.sepa.org.uk/environment/land/planning/guidance-and-advice-notes/>

⁴ SEPA (2025). Statement on SEPA approach to National Planning Framework 4 Policy 22 exceptions. Available at: <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.sepa.org.uk%2Fmedia%2Fxfkdqibf%2Fstatement-sepa-approach-national-planning-framework-4-policy-22-exceptions.docx&wdOrigin=BROWSELINK>

⁵ Scottish Government (2025). National Planning Framework 4: Policy 22 (flood risk and water management) – Chief Planner letter – June 2025. Available at: <https://www.gov.scot/publications/national-planning-framework-4-policy-22-flood-risk-and-water-management-chief-planner-letter-june-2025/>

3.2 Local Planning Policy

3.2.1 The local planning policies relating to flood risk within the following Local Development Plans have been superseded by NPF4:

- Highland-wide Local Development Plan 2012
- Moray Local Development Plan 2020
- Aberdeenshire Local Development Plan 2023

3.3 Technical Flood Risk Guidance for Stakeholders

3.3.1 SEPA's Technical Flood Risk Guidance for Stakeholders⁶ outlines the requirements for conducting an FRA in Scotland. This includes minimum requirements (e.g. plans, photographs, topographic information), various methodologies for different types of assessment, and information on land raising and compensatory storage.

⁶ SEPA (2022). Technical Flood Risk Guidance for Stakeholders. Available at: <https://www.sepa.org.uk/media/162602/ss-nfr-p-002-technical-flood-risk-guidance-for-stakeholders.pdf>

4 Flood Risk Assessment

4.1 Flood Risk Sources

4.1.1 There are many sources of flood risk, as outlined below:

- **Fluvial Flooding** - originates from a watercourse, whether it be natural or culverted and is normally caused when the river channel, or culvert capacity is exceeded, and water flows out of the riverbank onto the floodplain.
- **Surface Water Flooding** - also known as pluvial flooding, is defined as flooding as a result of rainfall when water ponds or flows over ground before it enters a natural or man-made drainage system or watercourse, or when it cannot enter because the system is already full to capacity.
- **Groundwater Flooding** - can happen when the level of groundwater within the rock or soil underground, known as the water table, rises above ground levels. Groundwater flooding is much slower to occur than river flooding and can happen days, weeks, or months after heavy or prolonged rainfall.
- **Sewer Flooding** - the overflow of water from the drainage and sewerage system and can occur during a flash flood where high intensity rain falls, and the capacity of the sewerage system becomes overwhelmed by the heavy rain causing internal or external flooding to the surrounding areas or properties.
- **Coastal Flooding** - normally occurs when dry and low-lying land is submerged by seawater and is the result of floodwater that penetrates the inland area controlled by the topography of the coastal land exposed to flooding.
- **Artificial Sources of Flooding** - from canals, reservoirs, and failure of flood defences.

4.2 Flood Risk Assessment

4.2.1 A desktop review of available flood risk data was carried out to understand the flood risk at the Proposed Development from relevant sources.

4.2.2 SEPA's fluvial, coastal, and surface water flooding flood mapping⁷ has been used in this section of the report. Site photographs were used to understand existing conditions, such as topography and watercourses. Historic flood records were used to understand if any areas along the Proposed OHL Alignment have previously flooded and are therefore likely to be at risk. SEPA's Flood Risk Assessment Checklist has been included in **Annex A: Flood Risk Assessment Checklist**.

4.2.3 SEPA's flood mapping defines flood risk as follows:

- **High Risk:** 10-year return period (0.1% Annual Exceedance Probability (AEP))
- **Medium Risk:** 200-year return period (0.5% AEP)
- **Low Risk:** 1000-year return period (1% AEP)

Fluvial Flood Risk

4.2.4 From SEPA's flood maps a total of 20 towers along the Proposed OHL Alignment were identified within the high, medium, or low flood zones as outlined in **Table 4.1: Fluvial Proposed OHL Alignment Flood Risk Summary**. These are shown in **Figure 10.8.1: Fluvial Flood Risk**.

⁷ SEPA (2021a). SEPA Flood Maps. Available at: <https://map.sepa.org.uk/floodmap/map.htm>

Table 4.1: Fluvial Proposed OHL Alignment Flood Risk Summary

	Fluvial Flood Risk		
Risk	High	Medium	Low
No. Towers	7	16	20

- 4.2.5 Although efforts have been made to locate towers outside of flood zones, it is not possible to completely avoid them, due to the extent of the floodplains and technical requirements of the infrastructure (e.g. spacing between towers). Although within flood zones, the towers at risk are classed as essential infrastructure and therefore permissible within flood zones due to their requirement to be in these areas for operational reasons, as per NPF4 Policy 22 (see **Section 3.1**). However, SEPA standing advice highlights the criteria listed in **Table 4.2: SEPA Standing Advice Criteria** should be demonstrated.

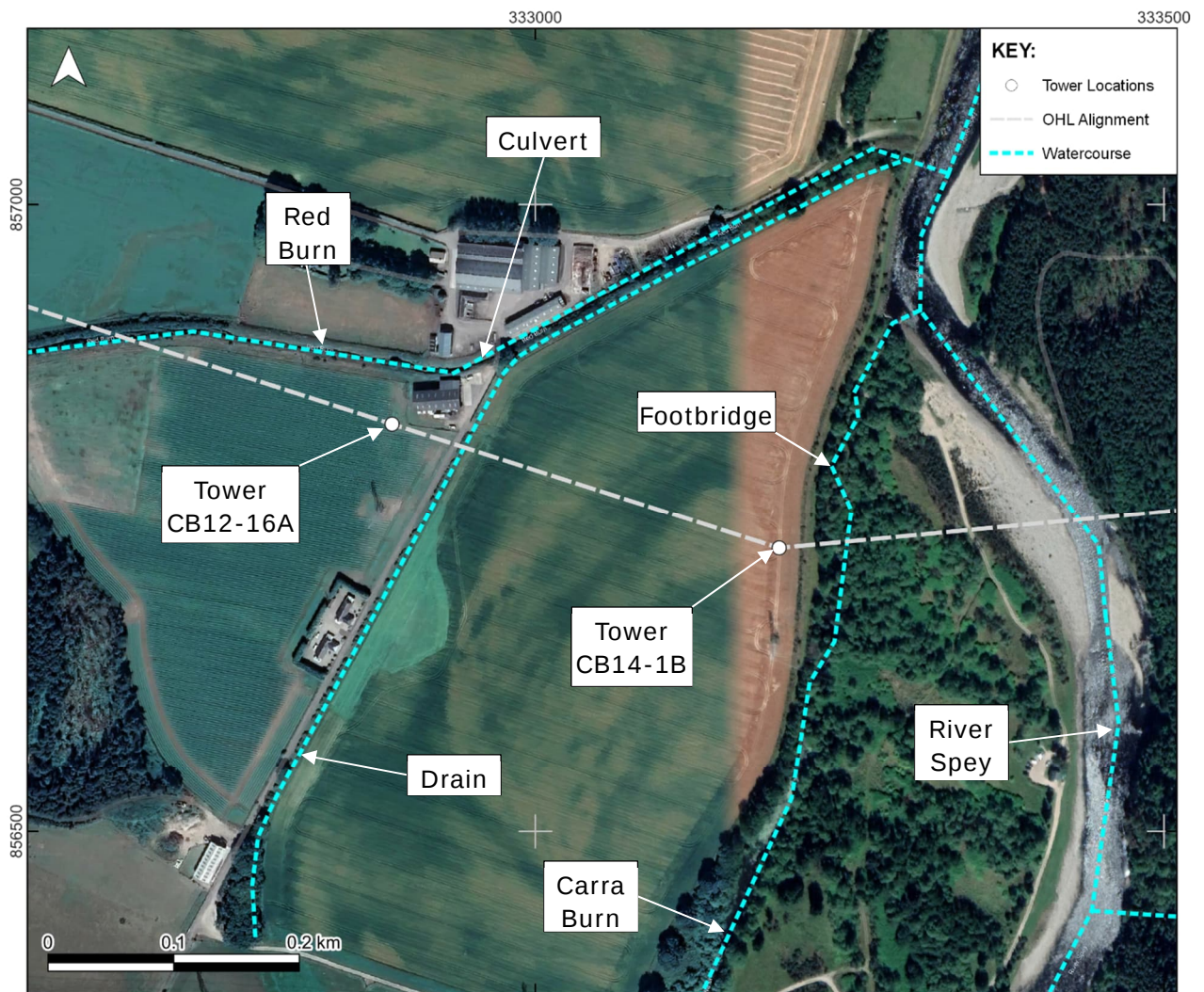
Table 4.2: SEPA Standing Advice Criteria

Criteria		Comment
1	All risks of flooding are understood and addressed	The flood risk zones for each tower have been identified, ensuring a clear understanding of the associated risks. As towers are unmanned supporting infrastructure that require infrequent access, the risk posed by flooding is minimal and they are flood compatible infrastructure. They will be designed to remain securely anchored to the ground during flood events (see point 4). If access tracks cannot be located outside of areas at risk of flooding, they will be designed to not increase flood risk by including appropriate drainage and using permeable materials. Flood risk will be considered during the construction phase (see Section 5.2).
2	No reduction in floodplain capacity, increased flood risk or need for a future flood protection scheme	The towers located within flood risk / floodplain areas will have minimal footprints and anticipated to have negligible effect on floodplain capacity, see sections below. Two specific towers (with larger above ground footprints than standard) highlighted below at the Dipple well field have had specific analysis which highlights the negligible scale within the larger Spey floodplain. Access tracks would be positioned at ground level or outside of areas at risk of flooding where possible. Otherwise tracks will be designed to allow water to continue along existing flow paths through the use of permeable materials and / or localised drainage, such as swales and infiltration trenches. Approximately 7.5 km of access tracks pass through floodplains. However, these access tracks are not located near receptors and do not require floated designs. Therefore, the access tracks will not impede flow paths and will not impact nearby receptors. The existing flooding mechanisms will therefore overall remain unchanged from their pre-development state.
3	The development remains safe and operational during floods.	The design of the Proposed Development ensures that operations will remain unaffected by flooding, as the operational component (the Proposed OHL conductor) is positioned at great height above the floodplain area and towers will be unaffected by a flood event. Flood alert systems will be used during construction and maintenance activities to ensure safe access and egress (See Section 5 – Additional Flood Risk Considerations).
4	Flood resistant and resilient materials and construction methods are used.	Ground investigation, detailed design, and the selection of appropriate construction methods will be carried out prior to the commencement of construction. A Construction Environmental Management Plan (CEMP) will

Criteria	Comment
	be produced to ensure the use of suitable materials and construction techniques for the project.
5	Future adaptations can be made to accommodate the effects of climate change. Given the significant height of the operational part of the Proposed OHL, the Proposed Development is not at risk of the effects of climate change. The potential risk of higher flood water will be considered at the detailed design stage of work.

4.2.6 Two towers identified within the flood risk area require foundations which sit above ground level due to nearby water abstractions at Scottish Water's Dipple well field and could therefore cause a reduction in floodplain capacity. These are located within the floodplain of the River Spey, 2 km south of the village of Fochabers. An indicative layout of these two towers is provided in **Plate 4.1 – Proposed OHL Towers**.

Plate 4.1 – Proposed OHL Towers with Foundations Above Ground Level



Imagery ©2025 Maxar Technologies, CNES / Airbus, Imagery ©2025 Airbus, CNES / Airbus, Getmapping pls, Maxar Technologies, Map data ©2025

- 4.2.7 SEPA's Flood Maps show there is risk from fluvial sources for the two towers (Ref: CB12-16A and CB14-1B), with a 10 % chance of flooding each year. Fluvial flood risk is shown in **Figure 10.8.1: Fluvial Flood Risk**. A review of SEPA's Flood Risk Management Map⁸ confirms there are no formal flood defences which offer protection to these towers. The towers are located within SEPA's Findhorn, Nairn, Moray, and Speyside flood alert area⁹.
- 4.2.8 The requirement for the towers in this location to be above ground level is to minimise impacts on drinking water abstractions. **Table 4.3: Estimated Maximum Tower Foundation Volume Displacement** provides the piling cap foundation dimensions and the total volume which would be displaced from the floodplain.
- 4.2.9 The volume of water displaced by the tower foundations (300 m³) is minimal compared to the size of the floodplain, and it is therefore considered to have an inconsequential impact on the floodplain's capacity. The width of the floodplain at this location is approximately 1 km, consisting predominantly of flat, open farmland, as evident from the LiDAR imagery (**Plate 4.2 - Dipple Area Topography and 200-year Fluvial Flood Extent**). To estimate the area of the Spey floodplain in this area, the 200-year fluvial flood extent has been clipped using the B9103 bridge as the upstream extent and A96 bridge as the downstream extent. This area is shown in **Plate 4.3 - Dipple Floodplain Area** and is approximately 7 km². Reviewing SEPA flood map depth layers, most of this area has a flood depth band of 0.3 - 1.0 m. This means the maximum capacity of the floodplain is estimated to be 7,000,000 m³, making the volume displaced by towers CB12-16A and CB14-1B approximately 0.004% of the total floodplain capacity.
- 4.2.10 The floodplain mechanism would continue to operate in the same manner as pre-Proposed Development. The only property in close proximity to this location is Burnside of Dipple Farm, which is already situated within a flood risk area. However, it is highly unlikely to be affected by the proposed towers, given their minimal impact on the floodplain's capacity. As a result, the Proposed Development complies with relevant policy and guidance. At this stage compensatory storage is not considered to be required, however compensatory storage options are being considered by SSEN Transmission in consultation with relevant landowners. Any potential future requirements for compensatory storage will be further considered at the detailed design stage, post consent and prior to construction.

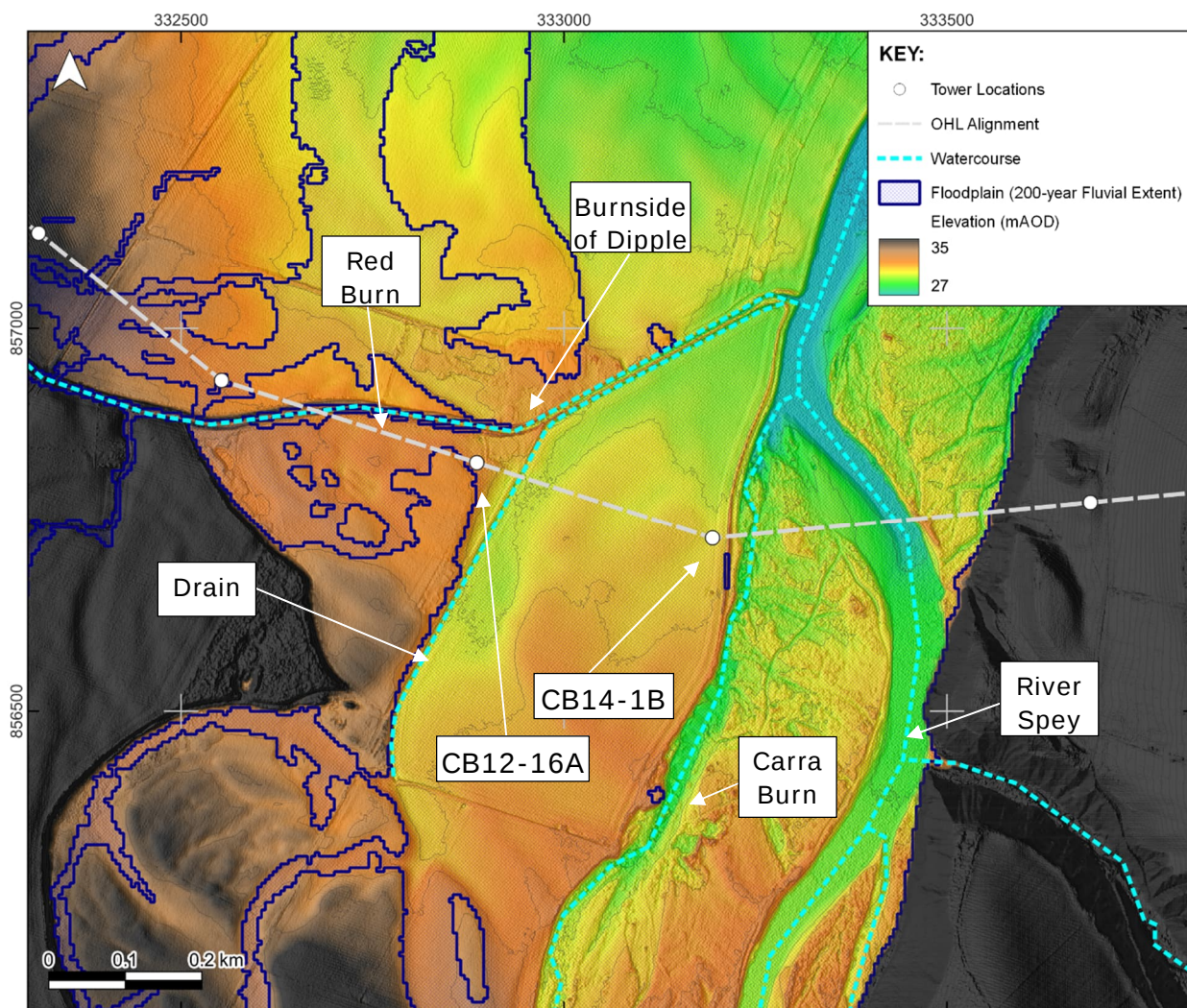
Table 4.3: Estimated Maximum Tower Foundation Volume Displacement – Above Ground Pile Caps

Tower ID	Width (m)	Length (m)	Height (m) (above ground)	Total volume m ³ above ground (account for 4 legs per tower)
CB12-16A	5	5	1.5	150
CB14-1B	5	5	1.5	150

⁸ SEPA (2021a). SEPA Flood Maps. Available at: <https://map.sepa.org.uk/floodmap/map.htm>

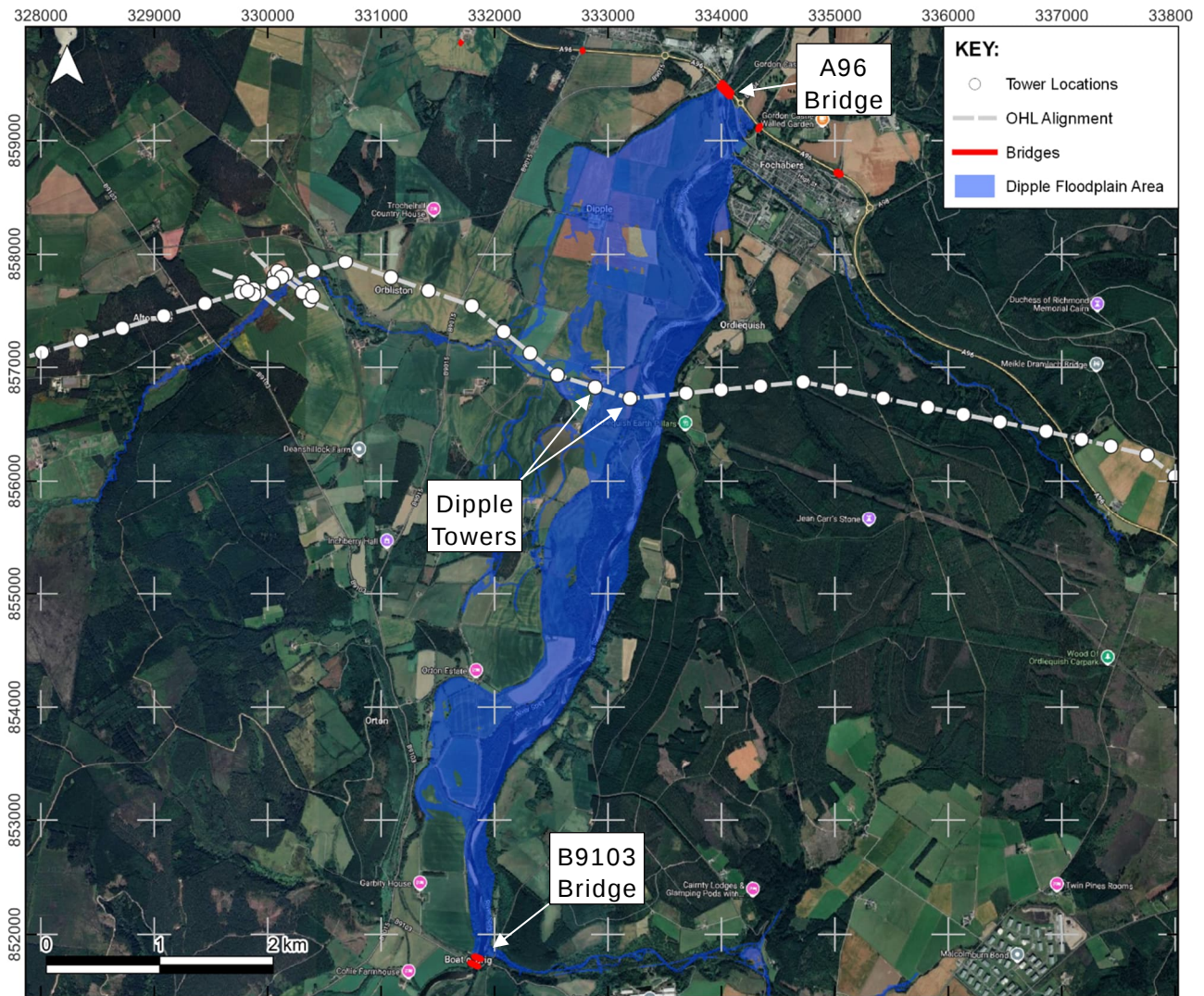
⁹ SEPA (2011). SEPA Floodline. Available at: <https://floodline.sepa.org.uk/floodupdates/>

Plate 4.2 - Dipple Area Topography and 200-year Fluvial Flood Extent



Imagery ©2025 Maxar Technologies, CNES / Airbus, Imagery ©2025 Airbus, CNES / Airbus, Getmapping pls, Maxar Technologies, Map data ©2025

Plate 4.3 - Dipple Floodplain Area



Imagery ©2025 Maxar Technologies, CNES / Airbus, Imagery ©2025 Airbus, CNES / Airbus, Getmapping pls, Maxar Technologies, Map data ©2025

4.2.11 For all other towers the majority of the foundation would be situated below ground, however all towers will have concrete necks at the base of each leg. The permanent footprint above ground is typically 1 m x 1 m (with a maximum dimension of 1.5 m x 1.5 m), with a maximum height of 0.5 m. Therefore, each tower situated within the floodplain will displace a maximum of 4.5 m³. **Table 4.4: Estimated Maximum Tower Foundation Volume Displacement – Necks** shows the total maximum volume displaced by the necks for all proposed towers located within the floodplain (this may be smaller in many locations). As the volume displaced by the necks is minimal and will not impede existing floodplain mechanisms, this is not expected to impact the floodplain's capacity or increase flood risk to receptors.

Table 4.4: Estimated Maximum Tower Foundation Volume Displacement – Necks

No. Towers	Width (m)	Length (m)	Height (m) (above ground)	Total volume for each tower m ³ above ground (account for 4 legs per tower)
18	1.5	1.5	0.5	4.5

Surface Water Flood Risk

- 4.2.12 From SEPA's flood maps a total of 37 towers along the Proposed OHL alignment were identified within the high, medium, or low surface water flood zones as outlined in **Table 4.5: Surface Water Proposed OHL Alignment Flood Risk Summary**. These are shown also in **Figure 10.8.2: Surface Water Flood Risk**.

Table 4.5: Surface Water Proposed OHL Alignment Flood Risk Summary

	Surface Water Flood Risk		
Risk	High	Medium	Low
No. Towers	7	25	37

- 4.2.13 Each tower location identified as being at risk of surface water flooding was reviewed and appeared to be associated with natural low spots within the land where water would collect.
- 4.2.14 The design of the towers ensures they will remain operational even in the event of surface flooding, making them well-suited for areas at risk of surface water. Due to the small footprint of their foundations, there will be minimal changes to the natural overland surface flow paths. Therefore, it is highly unlikely that this development will have any negative impacts on surrounding areas. Furthermore, these towers are located in remote and isolated areas meaning there is no receptors for them to impact. As a result, the Proposed Development complies with relevant policy and guidance.

Groundwater Flood Risk

- 4.2.15 Groundwater flooding occurs when the water table rises from underlying rocks or from springs and is often classified as a contributing factor to flooding rather than the primary source.
- 4.2.16 The Proposed Development will not be susceptible to flooding from groundwater, as if groundwater were to emanate, it is expected it would follow the overland flow paths or sit in low points in the landscape until it saturates back into the ground.
- 4.2.17 The groundwater flood risk to the Proposed Development is considered to be 'Low Risk'. Prior to detailed design and construction, ground investigation will be undertaken to determine construction methodology, such as piling depth. As a result, the Proposed Development complies with relevant policy and guidance.

Sewer Flood Risk

- 4.2.18 Sewer flooding occurs as a result of numerous influencing factors. It is most likely to occur during storms when large volumes of rainwater enter the sewers, however it can also occur when sewer pipes become blocked or damaged.
- 4.2.19 As a Responsible Authority under the Flood Risk Management (FRM) Act 2011¹⁰, Scottish Water has a duty to exercise its functions to reduce overall flood risk. Scottish Water also has a specific duty to assess flood risk from the sewerage system as well as to assist Local Authorities and SEPA in the production of the national flood risk assessment, plans and maps.
- 4.2.20 Due to the nature of development in non-urban areas, there is likely to be a limited sewer network. The presence and location of any sewers will be determined during the detailed design stage through public utility searches and ground investigations. In the event of a sewer leak, water would spill out the sewer and follow overland flow paths. The Proposed Development would not be disrupted by this flooding, nor would it alter flow paths in a way that increases flood risk elsewhere. Therefore, the sewer flood risk to the Proposed Development is considered to be 'Low'.

¹⁰ Scottish Government (2009). Flood Risk Management (Scotland) Act 2009. Available at: <https://www.legislation.gov.uk/asp/2009/6/contents>

Coastal Flood Risk

- 4.2.21 The Proposed Development is located inland and not within any coastal flood zones identified on SEPA's Flood Maps. Therefore, coastal flood risk to the Proposed Development is considered to be 'No Risk'.

Artificial Sources of Flooding

- 4.2.22 *The Reservoirs (Scotland) Act 2011*¹¹ requires SEPA to classify the areas which may be affected in the event of the uncontrolled release of water from controlled reservoirs in Scotland. SEPA's Controlled Reservoirs Register¹² has been reviewed and confirms the Proposed OHL towers in the Dipple area are not within areas at risk of flooding from any controlled reservoirs.
- 4.2.23 Multiple Proposed OHL towers in other locations appear to be situated within inundation areas. However, SEPA's *Reservoir Position Statement*¹³ states that it is not currently possible to assess the probability of an uncontrolled release of water from a reservoir. Furthermore, the probability of failure of a reservoir structure managed under *The Reservoirs (Scotland) Act 2011* is considered to be so low that it is beyond the scope of likely probabilities considered within NPF4. For these reasons, the reservoir inundation maps are not considered appropriate to usefully inform flood risk advice and should not be used for land planning purposes.
- 4.2.24 Therefore, the risk of flooding from artificial sources is considered to be 'No Risk'.

Future Flood Risk

- 4.2.25 SEPA's future flood maps¹⁴ were developed using the same modelling and mapping approaches as the present-day flood maps, but with revisions to the peak river flow, rainfall intensity and sea levels, each based on projections for one future scenario for time periods towards the end of this century.
- 4.2.26 The future flood maps have been developed using projections from a high emissions scenario where little or no action is taken to avoid dangerous levels of climate change, with greenhouse gases continuing to rise and leading to a greater global temperature increase.
- 4.2.27 The UK Climate Projections (UKCP) provide assessments of how the climate of the UK may change over the 21st century. The river and coastal future flood maps are generally based on the UK Climate Projections 2009 (UKCP09)¹⁵, which was the best available projection information for the UK at the time the national river and coastal flood modelling was carried out in 2011-2013. Since then, the UK Climate Projections 2018 (UKCP18)¹⁶ launched and is now the most up to date information on the future climate of the UK to 2100. UKCP18 informed the future surface water and small watercourses flood maps.
- 4.2.28 The SEPA future flood risk maps (200-year return period plus climate change or SEPA medium likelihood plus climate change allowance) were compared to the current flood risk maps and were shown to be slightly smaller in extent than the SEPA low likelihood return period (1000 year). Therefore, no additional towers are shown to be at risk in the future flood maps.

4.3 Overview

- 4.3.1 The flood risk to the Proposed Development is summarised in **Table 4.6: Flood Risk Overview**.

¹¹ Scottish Government (2011). Reservoirs (Scotland) Act 2011. Available at: <https://www.legislation.gov.uk/asp/2011/9/contents>

¹² SEPA (2021a). SEPA Flood Maps. Available at: <https://map.sepa.org.uk/reservoirsfloodmap/Map.htm>

¹³ SEPA (n.d.). Assessment of Potential Application of the Reservoir Inundation Maps for Land Use Planning Purposes Position Statement. Available at: <https://www.sepa.org.uk/media/219585/reservoir-position-statement.pdf>

¹⁴ SEPA (2021a). SEPA Flood Maps. Available at: <https://map.sepa.org.uk/reservoirsfloodmap/Map.htm>

¹⁵ DEFRA (2009). UK Climate Change Projections (UKCP09). Available at: <https://catalogue.ceda.ac.uk/uuid/077fd790439c44b99962552af8d37a22/>

¹⁶ DEFRA (2018). UK Climate Change Projections (UKCP18). Available at: <https://catalogue.ceda.ac.uk/uuid/c700e47ca45d4c43b213fe879863d589/>

Table 4.6: Flood Risk Overview

Source	Risk	Description and Comments
Fluvial	High, Medium and Low Risk	A number of Proposed OHL towers are located within fluvial flood risk areas however the nature of development means they are compatible and will not be affected operationally or create impacts elsewhere. Due to the minimal above-ground footprint of the OHL and their location within large floodplains, the overall impact is considered negligible.
Surface Water	High, Medium and Low Risk	A number of Proposed OHL towers are located within flood risk areas however the nature of development means they are compatible and will not be affected operationally or create impacts elsewhere.
Groundwater	Low Risk	The proposed towers with foundations above ground level at Dipple are not in an area where groundwater could influence the duration and extent of flooding from other sources. If groundwater emanated, it would follow overland flow paths. There are no planned permanent underground structures susceptible to groundwater flood risk such as basement dwellings as part of the Proposed Development and no historic records of groundwater flooding in the area.
Sewer	Low Risk	Limited sewer network anticipated within Proposed Development. Any flooding from sewer would not affect Proposed Development.
Coastal	No Risk	The Proposed Development is not located within a coastal floodplain.
Artificial Sources	No Risk	The Proposed Development is not within risk of flooding from any controlled reservoirs and is a significant distance from the nearest canal.

5 Additional Flood Risk Considerations

5.1 Access

- 5.1.1 Given the scale and location of the Proposed Development, it is not possible to locate all access tracks outside of areas at risk of flooding. Most access tracks will be designed to not significantly alter river or surface water flow paths by being built at elevations similar to existing ground levels (See **Figure 3.6 – Typical Access Track Sections**). Permeable materials should be used where possible to allow free flow of water. Localised drainage, such as swales and infiltration trenches, should be used to control run-off if required and allow it to continue along existing flow paths. Therefore, the access tracks will not impede flow paths and will not impact nearby receptors. Any access tracks requiring water crossings should be sized to convey the 200 year plus climate change flows (including allowance for freeboard).
- 5.1.2 Some access tracks are located in peatland areas and therefore require floating (raised) access tracks as excavation is not possible (See **Figure 3.6 – Typical Access Track Sections**). As with all access tracks, localised drainage, such as swales and infiltration trenches, should be used to control run-off and should be designed to not impede existing flow paths.
- 5.1.3 Approximately 7.5 km of access tracks pass through floodplains. However, these access tracks are not located near receptors and do not require floated designs. Access tracks located within floodplains should be built at elevations similar to existing ground levels. Therefore, the access tracks will not result in a loss of floodplain capacity and will not impact nearby receptors.
- 5.1.4 As the Proposed Development is designed to be unmanned once operational, access will only be required for maintenance activities, which will be conducted at height and infrequently. However, any access to the proposed tower locations should be covered with a suitable risk assessment. If there is any flood risk from extreme site conditions, such as prevailing weather, the visit should be rescheduled to ensure safe access and egress from the site. Safe egress and access should be considered within the risk assessment. A dynamic risk assessment should also be undertaken on-site at the time of visit. If there are any signs of flooding, works should not be undertaken.

5.2 Construction

- 5.2.1 A Schedule of Environment Commitments will be incorporated into the works construction documents and the appointed contractor will be obliged to adhere to these requirements through the contract period. The construction commitments will be addressed through the Construction Environmental Management Plan (CEMP). The CEMP will set out how the construction site should operate, including construction-related mitigation measures. The section below highlights aspects of the CEMP pertaining to flood risk.
- 5.2.2 The CEMP will include an Emergency Flood Plan and reference should be made to SEPA's Floodline service¹⁷ which provides live flooding information. Although the Proposed Development is not within a specific SEPA Flood Warning area, the alignment does fall within the Nairn, Findhorn and Speyside, Aberdeenshire and Aberdeen City and Caithness and Sutherland flood alert areas. Flood alerts indicate that flooding is possible to a wider geographical area and gives an early indication of potential flooding.
- 5.2.3 In relation to flood risk the Principal Contractor will implement the following mitigation measures during construction:

¹⁷ SEPA (2011). SEPA Floodline. Available at: <https://floodline.sepa.org.uk/floodupdates/>

- The Emergency Flood Plan (as part of the CEMP) will be implemented when working within the low-risk areas and greater. It will include details on how information gathered from MET office Weather Warnings and SEPA's Flood Alert will be provided and disseminated;
- During periods of heavy rainfall or extended periods of wet weather (in the immediate locality or wider river catchment) river levels will be monitored using, for example, SEPA Water Level Data when available or visual inspection of water features. The Principal Contractor will assess any change from base flow condition and be familiar with the normal dry weather flow conditions for the water feature and be familiar with the likely hydrological response of the water feature to heavy rainfall (in terms of time to peak, likely flood extents) and windows of opportunity to respond should river levels rise.
- Should flooding be predicted, works close or within the water features should be immediately withdrawn (if practicable) from high-risk areas (defined as: within the channel or within the area where water flows when the watercourse is at its maximum natural capacity – usually the 50% (2-year) AEP flood extent). Works should retreat to above the 10% AEP (10-year) flood extent) with monitoring and alerts for further mobilisation outside the functional floodplain should river levels continue to rise.
- Plant and materials will be stored in areas outside the functional floodplain where practicable, with the aim for temporary construction works to be resistant or resilient to flooding impacts, to minimise / prevent movement or damage during potential flooding events. Where this is not possible, agreement will be required with the Principal Contractor's Environmental Advisor).
- Temporary drainage systems will be implemented to alleviate localised surface water flood risk and prevent obstruction of existing surface runoff pathways.
- Where practicable, haul routes will be located out of the functional floodplain. When in the floodplain stockpiling of material must be carefully controlled with limits to the extent of stockpiling within an area to prevent compartmentalisation of the floodplain and stockpiles should be away from water feature banks (not within 10 m of the water feature banks). This is to limit floodplain encroachment, associated increased flood risk and sediment entering the water feature.

6 Conclusions

- 6.1.1 A number of the proposed tower locations were shown to be located within high, medium, or low flood risk areas from fluvial and surface water sources. However, due to the design of the Proposed Development, it is not at risk of flooding. Furthermore, it will not exacerbate flood risk elsewhere as the foundations of the towers typically will sit at ground level with a small footprint above ground (maximum 1.5 m x 1.5 m x 0.5 m). Given the Proposed Development is considered essential infrastructure and subject to the exception of “*essential Infrastructure where the location is required for operational reasons*” under NPF4, it is considered the Proposed Development is compliant with NPF4 and standing advice criteria.
- 6.1.2 Two towers (Ref: CB12-16A and CB14-1B) located near Scottish Water’s Dipple well field in Moray require the pile caps to be situated above ground level to minimise impacts on drinking water abstractions (shown in the Plate 1 and 2). The tower footprint at the base of each leg for these towers would be maximum 5.0 x 5.0 m x 1.5 m, therefore the estimated volume of 300 m³ would be displaced by the above ground pile cap foundations. Whilst this is a reduction in floodplain capacity, in comparison to the volume of the Spey floodplain (approximately 7,000,000 m³ in this location (shown in Plate 3)), this is not considered to have significant impact that would affect nearby receptors and therefore compensatory storage is not considered to be required. The other 18 locations where OHL were identified within fluvial flood risk locations are not considered to require compensatory storage based on the 4.5 m³ volume displacement per tower which again would have negligible impact elsewhere.
- 6.1.3 Approximately 7.5 km of access tracks pass through floodplains. However, these access tracks are not located near receptors and do not require floated designs. Access tracks located within floodplains should be built at elevations similar to existing ground levels. Permeable materials should be used where possible to allow free flow of water. Localised drainage, such as swales and infiltration trenches, should be used to control run-off if required and allow it to continue along existing flow paths. Any access tracks requiring water crossings should be sized to convey the 200 year plus climate change flows (including allowance for freeboard). Therefore, the access tracks will not result in a loss of floodplain capacity, impede existing flow paths, or impact nearby receptors.
- 6.1.4 All other sources of flood risk (groundwater, sewer, coastal and artificial sources) were considered low given the nature of the development.
- 6.1.5 The Proposed Development is predicted to have no impact on flood risk to nearby receptors and as such is compliant with NPF4, THC, MC, and AC policy, and SEPA’s developer guidance.

Annex A: Flood Risk Assessment Checklist

 Flood Risk Assessment (FRA) Checklist		Scotland's 4th National Planning Framework has recently been published. This document is therefore being reviewed and updated to reflect the new policies. You can still find useful and relevant information here but be aware that some parts may be out of date and our responses to planning applications may not match the information set out here.	
		(SS-NFR-F-001 - Version 16 - Last updated 27/08/2019)	
This document must be attached within the front cover of any Flood Risk Assessments issued to Local Planning Authorities (LPA) in support of a development proposal which may be at risk of flooding. The document will take only a few minutes to complete and will assist SEPA in reviewing FRAs, when consulted by LPAs. This document should not be a substitute for a FRA.			
Development Proposal Summary			
Site Name:	Beauly to Blackhillock to New Deer to Peterhead 400 kV Project		
Grid Reference:	Easting: n/a	Northing: n/a	
Local Authority:	Select from List		
Planning Reference number (if known):	n/a		
Nature of the development:	Utility Infrastructure	If residential, state type:	
Size of the development site:	n/a	Ha	
Identified Flood Risk:	Source: Select from List	Source name:	
Land Use Planning			
Is any of the site within the functional floodplain? (refer to SPP para 255)	Yes	If yes, what is the net loss of storage?	363 m ³
Is the site identified within the local development plan?	No	Local Development Plan Name:	Year of Publication:
If yes, what is the proposed use for the site as identified in the local plan?	Select from List	Allocation Number / Reference:	
Does the local development plan and/or any pre-application advice, identify any flood risk issues with or requirements for the site.	No	If Other please specify:	
What is the proposed land use vulnerability?	Essential Infrastructure	If so, please specify:	
		Do the proposals represent an increase in land use vulnerability?	No
Supporting Information			
Have clear maps / plans been provided within the FRA (including topographic and flood inundation plans)?	Yes		
Has sufficient supporting information, in line with our Technical Guidance, been provided? For example: site plans, photos, topographic information, structure information and other site specific information.	Yes		
Has a historic flood search been undertaken?	Yes	If flood records in vicinity of the site please provide details:	n/a
Is a formal flood prevention scheme present?	No	If known, state the standard of protection offered:	n/a
Current / historical site use:	Various - fields, farmland		
Is the site considered vacant or derelict?	Yes		
Development Requirements			
Freeboard on design water level:	n/a	m	
Is safe / dry access and egress available?	Vehicular and Pedestrian	Min access/egress level:	n/a m AOD
Design levels:	Ground level: n/a	Min FFL:	n/a m AOD
Mitigation			
Can development be designed to avoid all areas at risk of flooding?	No		
Is mitigation proposed?	Yes		
If yes, is compensatory storage necessary?	No		
Demonstration of compensatory storage on a "like for like" basis?	No		
Should water resistant materials and forms of construction be used?	Yes		

Flood Risk Assessment (FRA) Checklist

(SS-NFR-F-001 - Version 16 - Last updated 27/08/2019)

Hydrology			
Is there a requirement to consider fluvial flooding?	☐ Yes		
Area of catchment:	n/a	km ²	Is a map of catchment area included in FRA? ☐ Yes
Estimation method(s) used (please select all that apply):	☐ Pooled Analysis ☐ Single Site Analysis ☐ Enhanced Single Site ☐ ReFH2 ☐ FEH RRM ☐ Other		If Pooled analysis have group details been included? ☐ No
Estimate of 200 year design flood flow:	n/a	m ³ /s	If other (please specify methodology used): n/a
Qmed estimate:	n/a	m ³ /s	Method: N/A
Statistical Distribution Selected:	N/A		Reasons for selection:
Hydraulics			
Hydraulic modelling method:	n/a		Software used: Select from List
Number of cross sections:	n/a		If other please specify: n/a
Source of data (i.e. topographic survey, LiDAR etc):	n/a		Date obtained / surveyed: n/a
Modelled reach length:	n/a	m	If yes please provide details: n/a
Any changes to default simulation parameters?	n/a		Specify, if combination: n/a
Model timestep:	n/a		
Model grid size:	n/a		
Any structures within the modelled length?	Select from List		
Maximum observed velocity:	n/a	m/s	
Brief summary of sensitivity tests, and range:			Please specify climate change scenario considered: n/a
variation on flow (%)	n/a	%	
variation on channel roughness (%)	n/a	%	
blockage of structure (range of % blocked)	n/a	%	
boundary conditions:			
(1) type	Upstream		Downstream
	Flow		Select from List
(2) does it influence water levels at the site?	Specify if other: n/a		Specify if other: n/a
Has model been calibrated (gauge data / flood records)?	Select from List		Select from List
Is the hydraulic model available to SEPA?	Select from List		
Design flood levels:	200 year	n/a m AOD	200 year plus climate change: m AOD
Cross section results provided?	Select from List		
Long section results provided?	Select from List		
Cross section ratings provided?	Select from List		
Tabular output provided (i.e. levels, velocities)?			
Mass balance error:		%	
Coastal			
Is there a requirement to consider coastal / tidal flooding?	No		
Estimate of 200 year design flood level:		m AOD	If other please specify methodology used:
Estimation method(s) used:	Select from List		
Allowance for climate change (m):		m	
Allowance for wave action etc (m):		m	
Overall design flood level:		m AOD	
Comments			
Any additional comments:			
Approved by:	J. Terras		
Organisation:	WSP		
Date:	16/06/2025		

Note: Further details and guidance is provided in 'Technical Flood Risk Guidance for Stakeholders' which can be accessed here:-

[CLICK HERE](#)