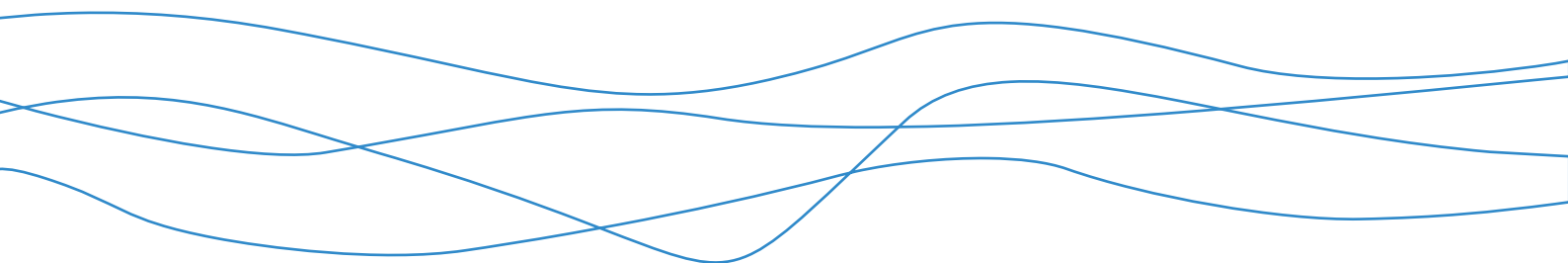




# **Bowdun Offshore Wind Farm, Onshore EIA Report**

Volume 1, Chapter 12: Air Quality

TWP-BOW-JCB-ONE-RPT-00031 | November 2025



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## **12 Air Quality**

### **12.1 Introduction**

12.1.1 This chapter of the Onshore Environmental Impact Assessment (EIA) Report describes the methodology followed and potential impacts identified for the air quality assessment of the Onshore Infrastructure of the Bowdun Offshore Wind Farm ('the Project'). The Onshore Infrastructure of the Project, is the works landward of Mean Low Water Springs (MLWS), including the intertidal area, and are referred to as 'the Proposed Development'. This Onshore EIA Report accompanies the application to Aberdeenshire Council for Planning Permission in Principle (PPP) for the Proposed Development.

12.1.2 This chapter is by its nature inter-related to Volume 1, Chapter 14: Traffic and Transport, as additional traffic movements generated during construction would generate air emissions which could result in adverse effects on the health of human receptors. It is also inter-related to Volume 1, Chapter 7: Biodiversity and Terrestrial Ecology, as the construction works and additional road traffic have the potential to have an effect on sensitive ecological receptors

12.1.3 The assessment presented is informed by the following technical chapters:

- Volume 1, Chapter 2: The Proposed Development
- Volume 1, Chapter 7: Biodiversity, Terrestrial Ecology and Ornithology
- Volume 1, Chapter 14: Traffic and Transport.

12.1.4 As discussed in Section 12.7 and the Scoping Report (TWP, 2024) the only impacts scoped in for their effects on receptors within this assessment are dust and road traffic during the construction phase. It is assumed that the scale of impacts during the decommissioning phase will be similar but lower than those during construction and therefore the Embedded Mitigation and findings for the construction phase are equally applicable to the decommissioning phase.

12.1.5 As discussed in Section 12.7 and the Scoping Report, operational and maintenance (O&M) elements were scoped out of the air quality assessment.

### **12.2 Air Quality Study Area**

12.2.1 The Air Quality Study Area for the assessment of air quality impacts has been based on:

- The Institute of Air Quality Management (IAQM) dust guidance on the assessment of dust from demolition and construction (IAQM, 2024) for construction dust impacts; and
- The Environmental Protection UK (EPUK) and IAQM Guidance on Land-Use Planning & Development Control: Planning for Air Quality (EPUK & IAQM, 2017) for the consideration of road traffic impacts.

### Construction Dust

12.2.2 Potential air quality impacts from construction dust were considered for:

- People and property located within 250 m of the construction work area of the Proposed Development;
- Ecological receptors sensitive to dust located within 50 m of the construction work area; and
- Ecological receptors, people and property sensitive to dust located within 50 m of roads used by construction vehicles, and up to a distance of 250 m of the entrance to the construction work areas for the Proposed Development.

12.2.3 The above areas define the Air Quality Zone of Influence for construction dust.

### Construction Vehicle Emissions

12.2.4 Potential air quality impacts from road traffic emissions were considered for human and ecological receptors sensitive to vehicle emissions within 200 m of the affected road network, to be used by construction vehicles. The affected road network was defined based on where either of the following IAQM indicative criteria were satisfied:

- A change in Light Duty Vehicle (LDV) flows of more than 100 Annual Average (AADT) within or adjacent to an Air Quality Management Area (AQMA), or more than 500 AADT elsewhere; and
- A change in Heavy Duty Vehicle (HDV) flows of more than 25 AADT within or adjacent to an AQMA, or more than 100 AADT elsewhere.

12.2.5 The Air Quality Study Area for construction dust is shown in Figure 12.1, Figure 12.2 and Figure 12.3 in Annex – Figures. No construction traffic met the criteria above for inclusion and therefore there is no associated Study Area, as discussed in Section 12.11.

## 12.3 Legislative and Policy Context

12.3.1 The overarching policy and legislation applicable to the Proposed Development is presented in Volume 1, Chapter 1: Introduction. The legislation and strategies that are relevant to Air Quality, are provided in Table 12.1.

**Table 12.1: Summary of Legislation and Strategies relevant to the Air Quality Assessment**

Legislation	How and where considered in the EIA Report
<b>Her Majesty’s Stationary Office (HMSO) (1999) Environment Protection Act 1990 amended by the Pollution Prevention and Control Act 1999</b>	Part III provides statutory nuisance provisions for dust, which would be generated during construction.  Construction dust has been assessed in Section 12.10, with mitigation measures presented in Section 12.9 which sign post to the outline Construction Environmental Management Plan (CEMP)
<b>HMSO (1995) Environment Act 1995, Part IV</b>	Introduced a system of Local Air Quality Management (LAQM) in the UK. This requires local authorities to review and assess air quality within their boundaries regularly and systematically against Air Quality Objectives (AQOs), appraise development and transport plans against these assessments and make plans to meet the AQOs where these are exceeded.

Legislation	How and where considered in the EIA Report
	AQOs have been considered in Section 12.8 based on the nearest monitoring stations to the Proposed Development. This shows that concentrations are well within their respective AQO for the years reported.
<b>The Air Quality (Scotland) Regulations 2000, and The Air Quality (Scotland) Amendment Regulations 2002</b>	Legislates for the Air Quality Objectives (AQOs) for pollutants set out in the 2000 Air Quality Strategy, which was revised in 2007 (Defra, 2007). AQOs exist for a variety of pollutants including oxides of nitrogen (NOX), nitrogen dioxide (NO <sub>2</sub> ), particulate matter (PM <sub>10</sub> and PM <sub>2.5</sub> ) which are discussed at paragraph [12.4.3]. These are established for both the protection of human health and the protection of vegetation and ecosystems.
<b>The National Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland (Defra, 2007)</b>	Updates the 2000 Air Quality Strategy, and sets out how local air quality is managed, through the application of AQOs based on the above Air Quality (Scotland) Regulations 2000 and 2002 Amendments.
<b>Directive 2008/50/EC on ambient air quality and cleaner air for Europe</b>	Consolidates previous European Directives on ambient air quality. These Directives form the basis for UK air quality legislation and were transposed into UK law via The Air Quality Standards (Scotland) Regulations 2010. Although published in 2007, the Air Quality Strategy (AQS) is consistent with The Air Quality Standards (Scotland) Regulations 2010.
<b>The Air Quality Standards (Scotland) Regulations 2010</b>	Transposes the formalised Limit Values (LVs) set out in the European Union (EU) Ambient Air Quality Directive 2008/50/EC (European Commission, 2008) to Scottish law.
<b>Cleaner Air for Scotland (CAFS) (Scottish Government, 2015)</b>	A national strategy setting out the Scottish Government's proposals for delivering further improvements to air quality for compliance with EU air quality legislation. Commits to aligning the AQOs in relation to PM with the World Health Organisation (WHO) recommendations.
<b>The Air Quality (Scotland) Amendment Regulations 2016</b>	Updates the annual mean PM <sub>2.5</sub> AQOs from the Air Quality (Scotland) Regulations 2000.
<b>The Environment Strategy for Scotland: visions and outcomes (Scottish Government, 2020)</b>	This provides the framework and policy priorities for Scotland.
<b>Cleaner Air for Scotland 2 (CAFS2) (Scottish Government, 2021)</b>	CAFS2 supersedes CAFS and sets out actions to improve air quality and how these will be delivered based upon the 2020 Environment Strategy for Scotland.

12.3.2 The Environment Protection Act 1990, amended by the Pollution Prevention and Control Act 1999, provides statutory nuisance provisions for dust which would be produced during construction. The Act enables local authorities to inspect their areas for nuisance and take reasonable steps to investigate and enforce the regulations.

12.3.3 The AQOs applicable to Local Air Quality Management (LAQM) in Scotland are set out in The Air Quality (Scotland) Regulations 2000 and its associated amendments, whilst LVs are set out in The Air Quality Standards (Scotland)

Regulations 2010. AQOs are health-based standards set at a level to provide protection to the whole population. The pollutants relevant to this assessment are NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>, which are most likely to be the result of road traffic and impact human health or ecological receptors. The relevant AQOs/LVs for these pollutants are presented in Table 12.2. The AQS also provides a non-statutory objective for NO<sub>x</sub>, for the protection of vegetation. This is currently not assessed by Scottish local authorities.

**Table 12.2: Relevant Air Quality Limit Values and Air Quality Objectives**

Pollutant	Threshold	Averaging Period
Nox*	30 µg/m <sup>3</sup>	Annual mean
NO <sub>2</sub>	40 µg/m <sup>3</sup>	Annual mean
	200 µg/m <sup>3</sup> (not to be exceeded more than 18 times/yr)	1-hour mean
PM <sub>10</sub>	18 µg/m <sup>3</sup>	Annual mean
	50 µg/m <sup>3</sup> (not to be exceeded more than 7 times/yr)	24-hour mean
PM <sub>2.5</sub>	10 µg/m <sup>3</sup>	Annual mean

\* Objective set for the protection of vegetation and ecosystems. The standard does not apply to human health.

### National Policy

12.3.4 The National Planning Framework 4 (NPF4) 2023 was adopted in February 2023 (Scottish Government, 2023). NPF4 outlines the Scottish Ministers' policies and proposals for development and land-use in Scotland and details the long-term spatial strategy, spatial principles, priority actions and National Developments up to 2045. The following policy is related to air quality in the context of the Proposed Scheme:

- Health and Safety - Policy 23d *“Development proposals that are likely to have significant adverse effects on air quality will not be supported. Development proposals will consider opportunities to improve air quality and reduce exposure to poor air quality. An air quality assessment may be required where the nature of the proposal or the air quality in the location suggest significant effects are likely”.*

12.3.5 Planning Advice Note (PAN) 51 summarises the statutory responsibilities of the environmental protection bodies (Scottish Executive, 2006). The purpose of PAN 51 is to support the existing policy on the role of the planning system in relation to the environmental protection regimes.

### Local Policy and Plans

12.3.6 The local policy and plans relevant to the assessment of Air Quality in the Aberdeenshire Local Development Plan (ALDP) (Aberdeenshire Council, 2023) are:

- Policy P4 Hazardous and Potentially Polluting Developments and Contaminated Land; and

- Policy PR1 Protecting Important Resources of the Aberdeenshire Local Development Plan.

12.3.7 These policies are relevant to air quality stating that proposals with significant adverse impacts upon air quality will not be supported unless satisfactory steps to mitigate the impacts are taken.

## 12.4 Consultation

12.4.1 The approach to consultation for the Proposed Development is set out in Chapter 4: Stakeholder Engagement and Consultation. A summary of the issues raised during consultation activities undertaken to date specific to Air Quality is presented in Table 12.3, together with how these issues have been considered in the production of this assessment. Further detail is presented within Volume 1, Chapter 4: Stakeholder Engagement and Consultation, and Pre Application Consultation Report (TWP, 2025).

**Table 12.3: Summary of key consultation issues raised during consultation activities undertaken for the Proposed Development relevant to Air Quality**

Date	Consultee and Type of Consultation	Summary of Issue(s) Raised	Response to Issue Raised and/or Where Considered in this Chapter
<b>24 October 2024 as part of Council's full response</b>	2024 Bowdun Scoping Opinion (Aberdeenshire Council Environmental Health Department, 2024)	Dust Risk Assessment and Dust Management Plan	Considered within the Air Quality Assessment in Section 12.11.
		Air Quality Screening Assessment	Considered within Air Quality Assessment in Section 12.11.

## 12.5 Data Sources

12.5.1 Information on baseline air quality has been reviewed to inform this air quality baseline.

12.5.2 No site-specific surveys have been undertaken to inform the EIA for Air Quality as there was sufficient local authority air quality monitoring to inform the air quality baseline and show that concentrations in the area are very low.

### Desktop Study

12.5.3 Information on baseline air quality and construction dust human health and ecological receptors was collected through a detailed desktop review of existing studies and datasets which are summarised in Table 12.4. These were used to characterise the baseline.

**Table 12.4: Summary of Key Data Sources**

Title	Source	Extent	Published Year	Author
<b>OS AddressBase Plus</b>	<a href="https://www.ordnancesurvey.co.uk/products/addressbase-plus">https://www.ordnancesurvey.co.uk/products/addressbase-plus</a>	UK	2025	Ordnance Survey (GB)

Title	Source	Extent	Published Year	Author
<b>Aberdeenshire Council Annual Progress Report</b>	<a href="https://www.aberdeenshire.gov.uk/environment/environmental-health/atmospheric-pollution/">https://www.aberdeenshire.gov.uk/environment/environmental-health/atmospheric-pollution/</a>	Aberdeenshire Council administrative area	2025	Aberdeenshire Council
<b>Air Quality in Scotland Background Pollutant Mapping</b>	<a href="https://www.scottishairquality.scot/data/mapping/data">https://www.scottishairquality.scot/data/mapping/data</a>	Aberdeenshire and Aberdeen City Council local authority areas	2025	Scottish Government
<b>Air Quality Management Areas</b>	<a href="https://uk-air.defra.gov.uk/aqma/maps/">https://uk-air.defra.gov.uk/aqma/maps/</a> <a href="https://www.scottishairquality.scot/laqm/aqma">https://www.scottishairquality.scot/laqm/aqma</a>	UK Scotland	2025	Department for Environment and Rural Affairs (Defra) Scottish Air Quality
<b>Aberdeen City Council Annual Progress Report</b>	<a href="https://www.aberdeencity.gov.uk/services/environment/air-quality-aberdeen/air-quality-reports">https://www.aberdeencity.gov.uk/services/environment/air-quality-aberdeen/air-quality-reports</a>	Aberdeen City Council administrative area	2024	Aberdeen City Council
<b>Angus Council Annual Progress Report</b>	<a href="https://www.scottishairquality.scot/sites/default/files/publications/2024-10/Angus_APR_2024.pdf">https://www.scottishairquality.scot/sites/default/files/publications/2024-10/Angus_APR_2024.pdf</a>	Angus Council administrative area	2024	Angus Council
<b>Pollution Climate Mapping Modelling (PCM)</b>	<a href="https://uk-air.defra.gov.uk/library/no2ten/2020-no2-pm-projections-from-2018-data">https://uk-air.defra.gov.uk/library/no2ten/2020-no2-pm-projections-from-2018-data</a>	UK	2020	Defra
<b>Habitat Data (and the Habitat Map of Scotland)</b>	<a href="https://www.nature.scot/lands-capes-and-habitats/habitat-data-and-habitat-map-scotland">https://www.nature.scot/lands-capes-and-habitats/habitat-data-and-habitat-map-scotland</a>	Scotland	2025	NatureScot

### Identification of Human Receptors

12.5.4 Receptors were identified using OS AddressBase Plus (AB+) data within 250 m of the PPP Application Boundary for the construction dust assessment. Representative locations include residential properties, schools, hospitals and care homes.

### Identification of Designated Sites

12.5.5 A three-step process was used to identify all designated sites within the Air Quality Study Area and qualifying features that could be affected by the construction and decommissioning phases of the Proposed Development. This process is described below:

- Step 1: All designated sites of international, national, and local importance within the Air Quality Study Area were identified using a number of sources. These sources included Ecology site open data (NatureScot, 2025), data on Local Nature Conservation Sites (LNCS) and Native

Woodland Survey of Scotland (Ancient Woodland) provided from Project Ecologist (ERM, 2025).

- Step 2: Information was compiled from ERM on the relevant habitat features for each of these sites and if they were sensitive to dust.
- Step 3: Using the above information and professional judgement, sites were included for further consideration if:
  - a designated site is within the parameters detailed within paragraph 12.2.2 and therefore has the potential to be directly affected by the Proposed Development; or
  - sites and associated features were located within the Air Quality Zone of Influence (ZoI) i.e. within the indicated Air Quality Study Area for impacts associated with the Proposed Development.

## 12.6 Methodology for Assessment of Effects

### Overview

12.6.1 The Air Quality assessment of potential effects has broadly followed the methodology set out in Volume 1, Chapter 3: EIA Methodology. However, specific to the Air Quality assessment, the following guidance documents have also been considered, which includes reference to IAQM Guidance on the assessment of dust from demolition and construction and EPUK & IAQM Land-use planning and development control: Planning for air quality.

### Dust

12.6.2 In relation to dust generated by construction activities on human health and ecological receptors, the assessment has followed the methodology contained within the IAQM Guidance on the assessment of dust from demolition and construction. A summary is provided in Table 12.5.

12.6.3 The construction dust assessment has been split into five areas across the PPP Application Boundary as shown in Figure 12.1, Figure 12.2 and Figure 12.3 in Annex – Figures to represent the areas with the greatest number of sensitive receptors. At this PPP stage there is limited data on construction to undertake all steps detailed in Table 12.5 (that is Step 2A). Distance band buffers were utilised using GIS software to determine the number of receptors located within the following distance bands from the PPP Application Boundary:

- 0 to 20 m;
- 20 to 50 m;
- 50 to 100 m; and
- 100 to 250 m.

12.6.4 In line with the IAQM guidance, the assessment considers people and property and ecological receptors within the distance band criteria detailed in paragraph 12.2.2.

**Table 12.5: Summary of the Construction Dust Assessment Methodology**

Step	Methodology Summary
<b>Step 1</b>	Screen the need for a detailed assessment. No assessment is required if there are no receptors within a certain distance of the works.
<b>Step 2</b>	Assess the risk of dust impacts separately for each of the four activities considered (demolition, earthworks, construction and trackout).
<b>Step 2A</b>	Define the potential dust emission magnitude for each activity in accordance with the criteria detailed within the IAQM guidance.
<b>Step 2B</b>	Define the sensitivity of the area, which includes Receptor sensitivity based on type of receptor. Sensitivity of the Air Quality Study Area (human health and ecological receptors) to dust soiling and human health impacts based on the relative proximity and number of receptors and existing PM <sub>10</sub> concentrations.
<b>Step 2C</b>	Define the risk of impacts, based on the dust emission magnitudes and sensitivity conclusions from Step 2A and Step 2B.
<b>Step 3</b>	Identify site-specific construction management measures for each of the four activities.
<b>Step 4</b>	Examine any residual significant effects and determine significance.

### **Road Traffic**

12.6.5 For the screening assessment of road traffic emissions during the construction phase, the assessment has followed the methodology outlined in EPUK and IAQM Land-use planning and development control: Planning for air quality. This guidance sets out criteria (as detailed in paragraph 12.2.4) to determine whether a change in road traffic from a proposed development, is likely to result in a change in air pollution (NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>) concentrations; these roads are classed as ‘affected’ roads. Affected roads are defined by considering the proposed development changes in traffic flows for the ‘with’ and ‘without’ proposed development as detailed within the criteria in paragraph 12.2.4.

### **Criteria for Assessment**

12.6.6 This section outlines the sensitivity of receptors and defines the magnitude of impact. There are two separate processes for determining the overall significance of effect for construction dust and road traffic, both of which are detailed below. By using the classification and criteria detailed below, the terms used to define magnitude and sensitivity, as described in Volume 1, Chapter 3: EIA Methodology, are not used.

### **Determining the Sensitivity of Receptors**

#### **Dust**

12.6.7 Receptor sensitivity are defined as described in Table 12.6. The sensitivity of an area to the potential impacts of each construction activity is calculated using

Table 2, Table 3 and Table 4, within the IAQM guidance, and the receptor sensitivity and the number of receptors within the distance bands.

**Table 12.6: Criteria for Determining the Sensitivity of Receptors for the Dust Assessment**

Receptor Sensitivity	Dust Soiling Receptors (Human and Ecological)	Receptors for Human Health Effects of PM <sub>10</sub>
<b>High</b>	Residential properties, museums and other culturally important collections, medium and long-term car parks and car show rooms. Locations with an international or national designation and the designated features may be affected by dust soiling, locations where there is a community of particularly dust sensitive species, such as a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete buildings.	Residential properties, hospitals, schools and residential care homes.
<b>Medium</b>	Parks, places of work. Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or not known, locations with a national designation where features may be sensitive to dust, such as a Site of Special Scientific Interest (SSSI) with dust sensitive features.	Office and shop workers not occupationally exposed to PM <sub>10</sub> .
<b>Low</b>	Playing fields, farmland, footpaths, short-term car parks and roads. Locations with a local designation where the features may be affected by dust deposition, such as a local Nature Reserve with dust sensitive features.	Public footpaths, playing fields, parks and shopping streets.

### **Road traffic**

12.6.8 In the absence of specific guidance within EPUK and IAQM guidance, all sensitive receptors are considered of equal (high) value.

### **Determining the Classification for Magnitude of Impact**

12.6.9 This section describes the criteria applied in this chapter to assign values to the magnitude of potential impacts.

### **Dust**

12.6.10 The dust emission magnitude is determined in Step 2A classified on a scale of the anticipated works and is classified as ‘small, medium or large’ for the four activity types, distance banded up to 250 m from human health receptors and 50 m for ecological receptors. Under Step 2C, this dust emission magnitude is combined with the sensitivity of the area to determine the overall risk of impacts with no mitigation applied as shown in Table 12.7.

**Table 12.7 Risk of Dust Impacts**

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
<b>Demolition</b>			
<b>High</b>	High Risk	Medium Risk	Medium Risk
<b>Medium</b>	High Risk	Medium Risk	Low Risk
<b>Low</b>	Medium Risk	Low Risk	Negligible
<b>Earthworks</b>			
<b>High</b>	High Risk	Medium Risk	Low Risk
<b>Medium</b>	Medium Risk	Medium Risk	Low Risk
<b>Low</b>	Low Risk	Low Risk	Negligible
<b>Construction</b>			
<b>High</b>	High Risk	Medium Risk	Low Risk
<b>Medium</b>	Medium Risk	Medium Risk	Low Risk
<b>Low</b>	Low Risk	Low Risk	Negligible
<b>Trackout</b>			
<b>High</b>	High Risk	Medium Risk	Low Risk
<b>Medium</b>	Medium Risk	Medium Risk	Low Risk
<b>Low</b>	Low Risk	Low Risk	Negligible

### **Road Traffic**

12.6.11 The EPUK and IAQM guidance provides a framework to determine significance of development related to road traffic emissions. The impact descriptors at sensitive receptors are detailed in Table 12.8. These impact descriptors consider the predicted magnitude of change in pollutant concentrations and resulting concentration in relation to the relevant Air Quality Objectives (AQOs).

**Table 12.8: Impact Descriptors for Individual Receptors**

Modelled Annual Mean Concentration Relative to the AQO (%)	Change in Modelled Concentration Relative to the AQO (%)			
	1	2 -5	6 -10	>10
<b>75 or less of AQO</b>	Negligible	Negligible	Slight	Moderate
<b>76 – 94 of AQO</b>	Negligible	Slight	Moderate	Moderate
<b>95 – 102 of AQO</b>	Slight	Moderate	Moderate	Substantial
<b>103 – 109 of AQO</b>	Moderate	Moderate	Substantial	Substantial
<b>110 or more of AQO</b>	Moderate	Substantial	Substantial	Substantial

## Assessing the Significance of Effect

### Dust

- 12.6.12 Under Step 3, the dust emission magnitude determined in Step 2A is combined with the sensitivity of the area determined in ‘Step2B’ to determine the risk of impacts with no mitigation applied. This is then used to inform the identification of site-specific construction management measures (i.e. Embedded Mitigation) for the four activities considered (demolition, earthworks, construction and trackout). IAQM guidance recommends that significance is only assigned after considering each activity with mitigation.
- 12.6.13 Step 4 of the IAQM guidance states “*for almost all construction activity, the aim should be to prevent significant effects in receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effects will normally be ‘not significant’*”. This guidance also states “*even with a rigorous DMP [Dust Management Plan] in place, it is not possible to guarantee that the dust mitigation measures will be effective all the time, and if, for example, dust emissions occur under adverse weather conditions, or there is an interruption to the water supply used for dust suppression, the local community may experience occasional, short-term dust annoyance. The likely scale of this would not normally be considered sufficient to change the conclusion that, with mitigation, the impacts will be ‘not significant’*”.

### Road Traffic

- 12.6.14 Where traffic data is screened and the trip generation is below the criteria laid out in the guidance (see paragraph 12.2.4), EPUK and IAQM guidance consider the effect ‘not significant’ and the impact descriptors described in Table 12.8 are not applicable. Otherwise, the impact descriptors are used to assess whether there are any significant effects.

## 12.7 Key Parameters for Assessment

### Maximum Design Scenario

- 12.7.1 The Maximum Design Scenario (MDS) identified in Table 12.9 are those parameters expected to have the potential to result in the greatest effect on an identified receptor or receptor group. Any other development scenario within the Project Design Envelope (PDE), will result in the same, or less, level of environmental effect. The scenario has been selected from the details provided in Volume 1, Chapter 2: Project Description.

**Table 12.9: Maximum Design Scenario Considered for Each Potential Impact as Part of the Assessment of Likely Significant Environmental Effects on Air Quality**

Potential Impact	Phase			Maximum Design Scenario
	C	O&M	D	
<b>The impact of dust soiling (nuisance) on property arising from dust emissions generated by onsite construction and activities</b>	✓	x	✓	The PPP Application Boundary and associated construction dust buffer used in the dust assessment to inform sensitive receptor counts may be larger than required. As detailed construction data to undertake a full construction dust assessment is not available at the

Potential Impact	Phase			Maximum Design Scenario
	C	O&M	D	
				PPP stage and a worst-case approach used, this may result in the mitigation measures detailed in Section 12.10 and 12.11 being greater than required.
<b>The impact of increases in suspended particulate matter on human and ecological receptors arising from dust emissions generated by onsite construction and decommissioning activities.</b>	✓	x	✓	As detailed construction data to undertake a full construction dust assessment is not available at the PPP stage and a worst-case approach used, this may result in the mitigation measures detailed in Section 12.9 and 12.10 being greater than required.
<b>The impact on human receptors arising from air emissions generated by vehicles during the construction and decommissioning phase.</b>	✓	x	✓	Additional vehicle movements required to facilitate construction and decommissioning of the Proposed Development would generate emissions (i.e. NO <sub>2</sub> , PM <sub>10</sub> and PM <sub>2.5</sub> ) which could result in adverse effects on the health of human receptors. The traffic data screened is based on traffic flows with the greatest construction movements across the assumed construction routes and across the construction programme. This is deemed robust as the situation would not realistically occur. Further information is provided in Volume 1, Chapter 14: Traffic and Transport.

\* Project Phase refers to Construction (C), O&M and Decommissioning (D)

### Impacts Scoped Out of the Assessment

- 12.7.2 On the basis of the baseline environment and the Project Description outlined in Volume 1, Chapter 2: Project Description, a number of impacts are scoped out of the assessment for Air Quality. These were proposed to be scoped out in the Scoping Report (TWP, 2024) and as no concerns were raised by consultees within the Scoping Opinion received this was considered acceptable.
- 12.7.3 The parameters scoped out are outlined, together with a justification for scoping out, in Table 12.10.

**Table 12.10: Impact Scoped Out of the Assessment for Air Quality (Tick Confirms the Impacts is Scoped Out)**

Potential Impact	Phase			Justification
	C	O&M	D	
<b>The impact on human and ecological receptors (dust soiling and human health) arising from fugitive dust emissions generated during O&amp;M of the Proposed Development.</b>	x	✓	x	Activities associated with the O&M of the Proposed Development are unlikely to generate large quantities of dust. Therefore, the potential impact on human or ecological receptors arising from fugitive dust emissions generated during O&M of the Proposed Development is unlikely to be significant.
<b>The impact on human and ecological receptors arising from air emissions generated by vehicle traffic during O&amp;M of the Proposed Development.</b>	x	✓	x	Operation of the Proposed Development will generate a small number of additional two-way vehicle movements as a result of staff trips and occasional maintenance activities. However, the additional two-way vehicle movements associated with operation and maintenance of the Proposed Development are unlikely to exceed the EPUK and IAQM indicative criteria for an air quality assessment. Therefore, the potential impact on human or ecological receptors arising from air emissions generated by vehicle traffic during operation and maintenance of the Proposed Development is unlikely to be significant.
<b>The impact on human and ecological receptors from air emissions generated by plants or stacks during O&amp;M of the Proposed Development.</b>	x	✓	x	The Proposed Development does not include proposals for the construction of plants or stacks which could give rise to air emissions during operation of the Proposed Development. Therefore, the potential impact on human or ecological receptors arising from plant or stack emissions is unlikely to be significant.

\* Project Phase refers to Construction (C), O&M and Decommissioning (D)

## 12.9 Baseline Environment

### Air Quality Management Areas

- 12.9.1 A review of Aberdeenshire Council's, Aberdeen City Council's and Angus Council's latest Annual Progress Report (APR) (Aberdeenshire Council, 2025, Aberdeen City Council, 2024, and Angus Council, 2024) has identified that there are no AQMAs located within these three councils, with the exception of the City Centre AQMA in Aberdeen City Centre, declared for exceedances of annual mean NO<sub>2</sub> and PM<sub>10</sub> and 24 hour PM<sub>10</sub> mean. Road traffic was identified as a key contributor to the AQMA. This AQMA is located approximately 23 km to the north east of the Proposed Development.

### Air Quality Monitoring

- 12.9.2 There are no air quality monitoring sites (NO<sub>2</sub>, PM<sub>10</sub> or PM<sub>2.5</sub>) in the vicinity of the Proposed Development, owing to the pre-existing low levels of air pollution in the area. The nearest monitoring stations to the Proposed Development are detailed in Table 12.11, Table 12.12 and Table 12.13 for years 2019-2024 and also displayed in Figure 12.4 in Annex – Figures. These show that concentrations of NO<sub>2</sub>, PM<sub>10</sub> or PM<sub>2.5</sub> are well within their respective AQO (40µg/m<sup>3</sup>, 18µg/m<sup>3</sup> or 10µg/m<sup>3</sup> respectively) for any of the years reported.

Table 12.11: Local Authority NO<sub>2</sub> Monitoring Sites in the Vicinity of the Proposed Development

Local Authority	Site ID	Site Type	In AQMA	Distance from Proposed Development (km)	Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )					
					2019	2020	2021	2022	2023	2024
Aberdeenshire Council	W/AM	Roadside	No	17.9	-	11.3	14.0	13.7	12.7	12.0
Aberdeenshire Council	W/SR	Roadside	No	17.6	18.0	9.4	11.0	9.3	9.0	8.0
Aberdeen City Council	CM3	Roadside	No	20.0	17.0	12.0	13.0	11.6	11.3	-
Aberdeen City Council	DT8	Roadside	No	20.0	39.0	31.0	32.0	29.0	23.4	-
Aberdeen City Council	DT45	Facade	No	20.0	21.0	16.0	17.0	15.0	15.5	-
Aberdeen City Council	DT70	Urban Background	No	22.3	13.0	10.0	12.0	11.0	11.9	-
Aberdeen City Council	DT71	Urban Background	No	21.5	9.0	7.0	8.0	7.0	7.0	-
Aberdeen City Council	DT72	Urban Background	No	20.3	7.0	5.0	6.0	5.0	5.0	-
Aberdeen City Council	DT75	Urban Background	No	23.1	15.0	12.0	15.0	13.0	14.2	-
Aberdeen City Council	DT85	Urban Background	No	22.3	13.0	11.0	13.0	10.0	10.7	-
Aberdeen City Council	DT98	Roadside	No	20.1	-	-	-	34.0	31.5	-
Aberdeen City Council	DT103	Urban Background	No	22.1	-	-	-	10.0	7.5	-
Aberdeen City Council	CL3	Roadside	No	20.0	-	-	-	-	-	-

Local Authority	Site ID	Site Type	In AQMA	Distance from Proposed Development (km)	Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )					
					2019	2020	2021	2022	2023	2024
Angus Council	M2	Kerbside	No	15.0	18.1	13.1	14.8	13.3	14.2	-
Angus Council	B2	Industrial	No	22.1	5.6	4.1	4.9	4.2	5.0	-
Angus Council	B1	Kerbside	No	23.2	12.6	7.8	8.2	7.4	9.6	-

“-“ information on monitored concentration unavailable

Table 12.12: Local Authority PM<sub>10</sub> Monitoring Sites in the Vicinity of the Proposed Development

Local Authority	Site ID	Site Type	In AQMA	Distance from Proposed Development (km)	Annual Mean PM <sub>10</sub> Concentration (µg/m <sup>3</sup> )					
					2019	2020	2021	2022	2023	2024
Aberdeen City Council	CM3	Roadside	No	20.0	13.0	9.0	9.0	11.1	10.4	-

“-“ information on monitored concentration unavailable

Table 12.13: Local Authority PM<sub>2.5</sub> Monitoring Sites in the Vicinity of the Proposed Development

Local Authority	Site ID	Site Type	In AQMA	Distance from Proposed Development (km)	Annual Mean PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> )					
					2019	2020	2021	2022	2023	2024
Aberdeen City Council	CM3	Roadside	No	20.0	-	-	5.0	6.0	5.4	-

“-“ information on monitored concentration unavailable

### Mapped Background Concentrations

- 12.9.3 The Scottish Air Quality website (Scottish Air Quality, 2025a) provides empirically derived national background maps, as part of the Scottish Air Quality Database project, which provides estimates of background pollutant concentrations on a 1 km x 1 km grid square resolution.
- 12.9.4 The range of pollutant concentrations within 250 m of the PPP Application Boundary are presented in Table 12.14 for the 2025 current year and 2031 worst case construction year when the majority of construction is expected to happen.
- 12.9.5 As shown in Table 12.14 background concentrations for all pollutants are well within the relevant AQOs.

**Table 12.14: Background Pollutant Concentrations for 2025 and 2031 ( $\mu\text{g}/\text{m}^3$ ) across the Proposed Development**

Pollutant	AQO	Mapped Background Annual Mean Concentration Range 2025 ( $\mu\text{g}/\text{m}^3$ )	Mapped Background Annual Mean Concentration Range 2031 ( $\mu\text{g}/\text{m}^3$ )
<b>NO<sub>x</sub></b>	30	2.0 – 3.2	1.6 – 2.4
<b>NO<sub>2</sub></b>	40	1.6 – 2.5	1.3 – 1.9
<b>PM<sub>10</sub></b>	18	5.8 – 10.6	5.5 – 10.4
<b>PM<sub>2.5</sub></b>	10	3.1 – 3.9	2.9 – 3.7

### Pollution Climate Mapping Model

- 12.9.6 The Pollution Climate Mapping (PCM) model is run by Ricardo Energy & Environment on behalf of Defra and is designed to assess Limit Value compliance. The PCM model reports on the concentrations of NO<sub>2</sub> and PM (PM<sub>10</sub> and PM<sub>2.5</sub>) in the atmosphere at representative roadside locations that need to be assessed for Limit Value compliance. Modelled PCM concentrations are projected from a base year (2018) and for every year up to 2030, for NO<sub>2</sub>. For PM<sub>10</sub> and PM<sub>2.5</sub> results are projected from a base year to specific years 2020, 2025 and 2030.
- 12.9.7 A review of the most recent PCM NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> model data (Defra, 2020), identified no modelled links within 250 m of the PPP Application Boundary. The nearest PCM link to the Proposed Development is on the A957 at Stonehaven (census ID802010776), approximately 8.1 km east. There were no predicted exceedances of the annual mean NO<sub>2</sub>, PM<sub>10</sub> or PM<sub>2.5</sub> Limit Values (40 $\mu\text{g}/\text{m}^3$ , 18 $\mu\text{g}/\text{m}^3$ , 10 $\mu\text{g}/\text{m}^3$  respectively) in either 2025 or worst case construction year (2030 used as representative of 2031) on this PCM link.

### Sensitive Human Receptors

- 12.9.8 Human receptors located within 250 m of the PPP Application Boundary include the residential properties and schools associated with nearby Benholm, Arbuthnott, Drumlithie and rural properties within 250 m of the PPP Application Boundary. The human receptors within the Air Quality Study Area are identified in Table 12.15 and presented in Figure 12.5 in Annex – Figures.

Table 12.15 Human receptors by type within the Air Quality Study

Human Receptor Type	Number within 250 m of PPP Application Boundary
Residential	208
Education establishment	2 (Glenbervie School shown as two receptors in mapping for School and Primary School)
<b>Total</b>	210

### Designated Sites

12.9.9 Designated sites and relevant qualifying features (i.e. sensitive ecological receptors) identified within 50 m of the PPP Application Boundary are summarised in Table 12.16 and presented in Figure 12.6 in Annex – Figures.

Table 12.16: Designated Sites within the Air Quality Study Area

Designated Site	Closest Distance to PPP Application Boundary (m)	Reported Habitat
Annies Dam Local Nature Conservation Site	0	Birch Woodland, acid grassland
Arbuthnott Local Nature Conservation Site	0	Woodland and wetland plants
Elfill Local Nature Conservation Site	0	Broadleaved Woodland, Acid grassland
Todhead Point to Johnshaven Coast Local Nature Conservation Site	0	Locally interesting plants, Red Sandstone
Wood of Mergie Ancient Woodland	0	Woodland
Wood of Mergie Ancient Woodland	0	Woodland
Ancient Woodland un-named in parish of Arbuthnott*	0	Woodland
Wills Wood Ancient Woodland	38	Woodland
Ancient Woodland un-named in parish of Bervie*	0	Woodland
Ancient Woodland un-named in parish of Glenbervie*	0	Woodland
Ancient Woodland un-named in parish of Glenbervie*	40	Woodland
Ancient Woodland un-named in parish of Glenbervie*	26	Woodland
Ancient Woodland un-named in parish of Glenbervie*	0	Woodland

\* Site name unavailable within the data provided by ERM. The habitat type and Parish have therefore been reported.

### Future Baseline Scenario

12.9.10 The EIA Regulations require that “a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort, on

*the basis of the availability of environmental information and scientific knowledge*” is included within the EIA Report. Consideration of the ‘without development’ future baseline conditions, assuming the Proposed Development does not come forward, has been carried out and is described within this section.

- 12.9.11 In the absence of the Proposed Development, the existing air quality in terms of dust and road traffic emissions is assumed to be as reported above for the existing baseline. Due to improvements in engine technology and the projected increase in the proportion of electric vehicles, roadside monitored concentrations are likely to be lower in the future compared to those monitored between 2019 and 2024 reported within this section.

#### **Data Limitations and Assumptions**

- 12.9.12 The local authority data on AQMAs and monitoring data used to inform this assessment have been obtained from the most recent publicly available documents and resources as detailed within Section 12.5. Data capture has been assumed to be greater than 75% for monitored data in accordance with each local authority APRs.
- 12.9.13 Sensitive human receptors have been determined using Ordnance Survey AddressBase Plus (AB+) dataset (see Section 12.5.4). There may in some cases be properties, such as those recently built, which are not yet present within these data sources. Ecological receptors have been determined using open data and data on LNCS and Native Woodland Survey of Scotland (Ancient Woodland) provided from the Project Ecologist, ERM.
- 12.9.14 At this PPP stage of assessment there were limited data on construction activities to enable a full construction assessment to be undertaken in accordance with IAQM guidance. Receptor counts have been undertaken to determine the number of sensitive receptors within the defined distance bands described in IAQM guidance as detailed in paragraph 12.2.2. Worst-case embedded dust mitigation within the IAQM guidance has therefore been included within the outline CEMP so that there are no residual significant effects identified from construction dust during the construction phase.
- 12.9.15 The impacts and effects from decommissioning would likely be less than those from construction that are considered within this assessment. It is therefore assumed that any significant effects could be mitigated using the same mitigation measures as construction. Therefore, decommissioning is not discussed further.

## **12.10 Embedded Mitigation**

- 12.10.1 As part of the Proposed Development design process, Embedded Mitigation measures have been proposed to reduce the potential for impacts on Air Quality (see Table 12.17). They are considered appropriate to the construction and decommissioning stages of the Proposed Development through design and best practice and, as there is a commitment to implementing these measures, these have been considered in the assessment presented in Section 12.11 (i.e. the determination of magnitude and therefore significance assumes

implementation of these measures). These Embedded Mitigation measures are considered standard industry practice for this type of development.

**Table 12.17: Embedded Mitigation Adopted as Part of the Proposed Development**

Ref.	Embedded Measures Adopted as Part of the Proposed Development	Justification
GEN2	Construction Environmental Management Plan (CEMP)	Construction of the Proposed Development would be undertaken in accordance with the relevant best practice measures as recommended in the IAQM Guidance on the assessment of dust from demolition and construction. This would include the development of a Dust Management Plan (DMP) (GEN2) and mitigation measures relating to the control of construction road traffic emissions specifically within AQMAs.
GEN3	Construction Traffic Management Plan (CTMP)	The movement of construction vehicles entering or exiting construction sites and utilising the local highway network would be controlled to avoid or reduce potential impacts of air emissions on sensitive receptors (see Volume 1, Chapter 14: Traffic and Transport).
GEN5	Decommissioning Plan	This would set out how dust emissions would be controlled during decommissioning of the Proposed Development as to avoid or reduce potential impacts on sensitive receptors. This would include the development of a DMP (GEN2).

## 12.11 Assessment of Significance

12.11.1 Table 12.18 summarises the potential effects arising from the construction phase of the Proposed Development, as well as the MDS against which each impact has been assessed. An assessment of the likely significance of the effects of the Proposed Development on the Air Quality receptors caused by each identified impact is given below. The conclusions and mitigation measures for the Construction phase would also hold true for the decommissioning phase (as worst case).

### Construction Phase

#### Construction Dust

12.11.2 Construction dust has the potential to cause short term, temporary in nature, localised impacts through deposition of dust at the nearest sensitive receptors. The construction phase will involve a number of activities including emissions of dust generated through demolition, excavation, construction, earthworks and trackout activities.

12.11.3 Following the methodology outlined in this chapter, the number of sensitive human and designated ecological receptors were identified. Within 250 m for human health receptors, and within 50 m for designated habitats, of the PPP Application Boundary, presented in Table 12.18 and shown in Figure 12.7, Figure 12.8 and Figure 12.9 in Annex – Figures for Areas 1 -5. These receptors have the potential to be affected by dust deposition.

12.11.4 Table 12.18 shows that the number of sensitive human receptors within 250 m of the Proposed Development varies from 210 human receptors across the entire PPP Application Boundary to no human receptors in Area 4. Area 2 and 4

are the only areas where any human receptors do not lie within 20 m of the PPP Application Boundary. In accordance with the IAQM guidance, sensitivities of people to dust soiling effects and sensitivities of people to the health effects of PM<sub>10</sub>, the human receptors within 250 m of the PPP Application are considered as high sensitivity receptors. With regard to designated habitats (Local Nature Reserves and Ancient Woodlands), the number of habitats within 50 m of the PPP Application Boundary varies between 0 for Area 3 to 13 across the entire PPP Application Boundary. There are designated habitats (Local Nature Conservation Sites and Ancient Woodlands) within 20 m of the PPP Application Boundary in each Area, with the exception of Area 3, which has no designated habitats within 50 m of the PPP Application Boundary. In accordance with the IAQM guidance, the sensitivities of receptors to ecological effects within 50 m of the PPP Application are considered as high sensitivity receptors.

12.11.5 Table 12.19 details further the designated sites which go through or are within 50 m of the PPP Application Boundary.

**Table 12.18: Number of Sensitive Receptors within 250 m for Human Health and 50 m for Ecological Receptors from the PPP Application Boundary**

Area	Distance from Source (m)			
	0-20	>20-50	>50-100	>100-250
<b>Human Health Receptors</b>				
1	3	4	7	12
2	0	0	17	117
3	2	7	15	27
4	0	0	0	0
<b>Area 5 (Whole Area)</b>	8	18	67	210
<b>Designated Habitats</b>				
1	3	1	-	-
2	1	1	-	-
3	0	0	-	-
4	1	1	-	-
<b>Area 5 (Whole Area)</b>	10	3	-	-

**Table 12.19: Designated Sites within 50 m of the PPP Application Boundary**

Area	Distance from Source (m) and Designated Habitat Name or Parish*		
	Within the PPP Application Boundary (0m)	20 m	50 m
<b>1</b>	Ancient Woodland Arbuthnott Ancient Woodland Bervie Arbuthnott Local Nature Conservation Site	-	Wills Wood Ancient Woodland
<b>2</b>	Ancient Woodland Glenbervie	-	-
		-	Ancient Woodland Glenbervie
<b>3</b>	No designated habitats within 50m of the PPP Application Boundary		
<b>4</b>	Wood of Mergie Ancient Woodland x2 Ancient Woodland Glenbervie	-	Ancient Woodland Glenbervie
<b>Area 5 (Whole)</b>	Wood of Mergie Ancient Woodland x2 Ancient Woodland Arbuthnott Ancient Woodland Bervie Ancient Woodland Glenbervie x2 Annies Dam Local Nature Conservation Site Arbuthnott Local Nature Conservation Site Elfhill Local Nature Conservation Site Todhead Point to Johnshaven Coast Local Nature Conservation Site		Ancient Woodland Glenbervie x2 Wills Wood Ancient Woodland

\* Site name unavailable within the data provided by ERM. The habitat type and Parish have therefore been reported.

12.11.6 Appropriate best practice construction dust management mitigation measures detailed within the outline CEMP and detailed within Section 12.10, are based on those outlined in the IAQM dust guidance. With the implementation of appropriate dust mitigation measures outlined in the CEMP, dust risks from construction will be reduced. The probable scale of this would not usually be considered adequate to alter the conclusion that with mitigation in place, the potential effects would be not significant.

*Significance of the effect*

12.11.7 With the implementation of embedded dust mitigation measures outlined in Section 12.10, dust risks from construction will be reduced. In accordance with the IAQM guidance, the probable scale of this would not usually be considered adequate to alter the conclusion that with mitigation in place, the potential effects are negligible and would be **not significant**.

*Additional Mitigation and Residual Effect*

12.11.8 In accordance with the IAQM guidance, with mitigation in place a potential significant adverse effect will not occur, the residual effect will therefore be **not significant**.

12.11.9 No Air Quality Additional Mitigation is considered necessary because the likely effects are not significant in EIA terms.

**Road Traffic**

*Traffic Screening Assessment*

12.11.10 Analysis of the traffic data provided for the likely peak construction year traffic (2031) were screened against the criteria detailed in paragraph 12.5.3. This analysis identified that the change in traffic flows between the 'without Proposed Development' and 'with Proposed Development' for outside of AQMAs would not trigger the EPUK & IAQM criteria.

12.11.11 For within AQMAs, a small number of road links were triggered for changes in HDV trip generation above the air quality screening criteria on the A92 and A930 in Dundee close to the Port of Dundee. Following discussions with TWP, it was confirmed that the Port of Dundee is highly unlikely to be used for the delivery of construction materials, and as such could be excluded from the assessment.

12.11.12 As road traffic is not expected to travel into any AQMAs, traffic related impacts can therefore be assumed to be not significant. This conclusion only holds true if no traffic enters an AQMA, therefore, as part of the outline CEMP, a mitigation measure is included.

12.11.13 Therefore, in accordance with EPUK and IAQM guidance, the overall effect of construction vehicles with the Proposed Development on local air quality is considered to be not significant.

## **12.12 Inter-Related Effects**

12.12.1 For Air Quality, the following potential impacts have been considered within the inter-related assessment:

- Dust emissions on human health and ecological receptors; and
- Road traffic emissions on human health and ecological receptors.

12.12.2 Table 12.20 lists the inter-related effects (Project lifetime effects) that are predicted to arise during the construction and decommissioning of the Proposed Development and also the inter-related effects (receptor-led effects) that are predicted to arise for Air Quality receptors.

12.12.3 It is not considered that O&M of the Proposed Development will result in significant inter-related impacts with respect to air quality, as dust emissions are not anticipated during this phase (apart from those associated with occasional maintenance vehicles and maintenance works and unlikely to be inter-related). In addition, although vehicles would be used during the operation and maintenance for repair, refurbishment or replacement of various elements, these are considered small scale and below the screening criteria described in EPUK/IAQM planning guidance and again unlikely to be inter-related.

12.12.4 As noted above, effects on Air Quality also have the potential to have secondary effects on other receptors and these effects are fully considered in the topic-specific chapters. These receptors and effects are:

- Biodiversity impact of activities on affected receptors during construction and decommissioning.
- Traffic and transport impact with additional vehicle movements generated during construction and decommissioning.

**Table 12.20: Summary of Likely Significant Inter-Related Effects for Air Quality**

Description of Impact	Phase			Likely Significant Inter-Related Effects
	C	O&M	D	
<b>Receptor-led Effects</b>				
<b>Traffic emissions on Human Health and Ecological Receptors</b>	✓	x	✓	Potential for isolated Human Health Receptors such as Benholm Cottage and properties along likely construction routes such as the A92 as well as the Todhead Point to Johnshaven Coast Local Nature Conservation Site, to be affected by road traffic emissions from construction and decommissioning elements. However, local air quality monitoring in the area generally shows pre-existing low levels of air pollution and with the successful implementation of Embedded Mitigation measures likely effects will be reduced and it is unlikely that there would be a significant effect.
<b>Dust emissions on Human Health and Ecological Receptors</b>	✓	x	✓	Potential for isolated Human Health Receptors such as Benholm Cottage and the Todhead Point to Johnshaven Coast Local Nature Conservation Site to be affected by dust emissions from the onshore elements. However, with the successful implementation of Embedded Mitigation measures , likely effects will be reduced and likely to be not significant.

\* Project Phase refers to Construction (C), O&M and Decommissioning (D)

## 12.13 Cumulative Effects Assessment

### Methodology

12.13.1 The Cumulative Effects Assessment (CEA) assesses the impact associated with the Proposed Development together with other relevant projects and activities. Cumulative effects are defined as the effect of the Proposed Development in combination with the effects from a number of different projects, on the same receptor or resource.

- 12.13.2 The projects selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise of the long list of Cumulative Projects included in Table 3.9 within Volume 1, Chapter 3: EIA Methodology. Full details on CEA methodology are provided in Volume 1, Chapter 3: EIA Methodology where further information is provided in relation to the other projects and how this information is obtained and applied to the assessment. Each project has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.
- 12.13.3 The cumulative effects have been considered and discussed within the context of a 250 m buffer from the PPP Application Boundary, and the justification for screening other projects in or out of the CEA are outlined in Table 12.21.

**Table 12.21: Screening of Other Projects for Consideration within the CEA for Air Quality**

Project	Overlap with the Proposed Development	Screened into CEA (Yes/No)
<b>Tier 2</b>		
<b>Hurlie 400 kV Substation</b> APP/2024/1951, ENQ/2024/1176, ENQ/2024/0146	<p>There is the potential for overlap for both projects during construction in terms of both location and time period. With Embedded Mitigation in place for both projects as recommended in the guidance on the assessment of dust from demolition and construction, impacts for dust will be sufficiently mitigated and therefore there should not be significant cumulative effects for dust.</p> <p>There is the possibility that as construction periods may overlap there could be cumulative impacts from road traffic. However, air quality is generally very good in the area (i.e. almost half the air quality objectives in most locations), therefore the cumulative impact of the additional road traffic from more than one project is unlikely to be significant for air quality.</p>	Yes
<b>The Waters BESS</b> ENQ/2024/1615, ENQ/2024/1830	No expected overlap due to distance of the projects from each other for dust.	No
<b>Fetteresso 132 kV Substation Upgrade</b> ENQ/2025/1103, ENQ/2025/1000	<p>There is the possibility that as construction periods may overlap there could be cumulative impacts from road traffic. However, air quality is generally very good in the area (i.e. almost half the air quality objectives in most locations), therefore the cumulative impact of the additional road traffic from more than one project is unlikely to be significant for air quality.</p>	
<b>Grains Of Fetteresso Indoor Play Area</b> APP/2025/0058	<p>There is the possibility that as construction periods may overlap there could be cumulative impacts from road traffic. However, air quality is generally very good in the area (i.e. almost half the air quality objectives in most locations), therefore the cumulative impact of the additional road traffic from more than one project is unlikely to be significant for air quality.</p>	
<b>S36 Windfarm, Fetteresso Forest</b> ECU00001851, APP/2019/1341	<p>There is the possibility that as construction periods may overlap there could be cumulative impacts from road traffic. However, air quality is generally very good in the area (i.e. almost half the air quality objectives in most locations), therefore the cumulative impact of the additional road traffic from more than one project is unlikely to be significant for air quality.</p>	

Project	Overlap with the Proposed Development	Screened into CEA (Yes/No)
<b>Glenskinnan Renewable Energy Park</b> ENQ/2025/0960		
<b>Craigneil Wind Farm</b> ENQ/2024/0640		
<b>Meetlaw Farm Battery Energy Storage System</b> APP/2022/2676		
<b>East Coast Viners Solar Storage Project</b> APP/2022/1701		
<b>Tier 3</b>		
<b>Tealing to Kintore 400 kV OHL</b> ENQ/2024/1397, ECU00005225	No expected overlap due to distance of the projects from each other for dust.	No
<b>Droop Hill Solar Park</b> ENQ/2025/0368, APP/2025/0560	There is the possibility that as construction periods may overlap there could be cumulative impacts from road traffic. However, air quality is generally very good in the area (i.e. almost half the air quality objectives in most locations), therefore the cumulative impact of the additional road traffic from more than one project is unlikely to be significant for air quality.	No
<b>Glendye Wind Farm 132 kV OHL</b> ENQ/2024/1818, ECU0005197		No
<b>Bridgend Farm BESS</b> ENQ/2024/0747, APP/2025/0089		No
<b>Northeast Of Drumlithie BESS</b> ENQ/2023/0093		
<b>Quithel 50 MW BESS</b> ENQ/2023/1713	No expected overlap due to distance of the projects from each other for dust (other than possibly trackout impacts at Quithel Farm, due to the proposed trackout route passing this location).  There is the possibility that as construction periods may overlap there could be cumulative impacts from road traffic. However, air quality is generally very good in the area (i.e. almost half the air quality objectives in most locations), therefore the cumulative impact of the additional road traffic from more than one project is unlikely to be significant for air quality.	Yes

### **Maximum Design Scenario**

- 12.13.4 The MDS identified in Table 12.22 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. The cumulative effects presented and assessed in this section have been selected from the details provided in Volume 1, Chapter 2: Project Description as well as the information available on other projects to inform a 'maximum design scenario'. Any other development scenario within the Project Design Envelope (PDE), will result in in the same, or less, level of environmental effect.

**Table 12.22: Maximum Design Scenario Considered for Each Impact as part of the Assessment of Likely Significant Cumulative Effects on Air Quality**

Potential Cumulative Effect	Phase*			Tier	Maximum Design Scenario
	C	O&M	D		
<b>Air Quality Impacts</b>	✓	x	x	2 - Hurlie 400kV Substation	<p><b>Construction Phase</b>                      Dependent upon programme, there is the potential that the construction phase for both projects will overlap and construction traffic will use the same roads around the area of both Substations.                      There is the potential for overlap for construction dust. With Embedded Mitigation in place (CEMP), impacts from both projects for dust should be sufficiently mitigated and therefore there should not be significant cumulative effects for dust. This is therefore scoped out.</p> <p><b>Operation and Maintenance Phase</b>                      Although vehicles would be used during the O&amp;M for both projects, it is unlikely that there would be an overlap on roads where sensitive receptors are located. These are considered small scale and below the screening criteria described in EPUK/IAQM planning guidance.                      Decommissioning Phase                      Not known at present.</p>
<b>Air Quality Impacts</b>	✓	x	x	3 - Quithel 50MW BESS	<p><b>Construction Phase</b>                      Dependent upon programme, there is the potential for overlap for construction dust in terms of trackout. There is also the possibility that the same access roads are used during construction.</p> <p><b>Operation and Maintenance Phase</b>                      Although vehicles would be used during the O&amp;M for both projects, it is unlikely that there would be an overlap on roads where sensitive receptors are located. These are considered small scale and below the screening criteria described in EPUK/IAQM planning guidance.                      Decommissioning Phase                      Not known at present.</p>

\* Project Phase refers to Construction (C), O&M and Decommissioning (D)

### Cumulative Effects Assessment

- 12.13.5 A review of other nearby developments as detailed within Table 12.23, has identified that there are two potential developments where there could be cumulative effects with the Proposed Development. These are the Hurlie Substation and Quithel 50MW BESS.
- 12.13.6 SSEN-T have submitted an EIA for the construction and operation of a new electricity substation within the Fetteresso Forest, known as the Hurlie Substation. The Hurlie Substation is approximately 750 m to the south-west of the Substation location of the Proposed Development. It is highly unlikely that the two projects will take place at the same time, it has been considered appropriate however, to assume that there is a potential for both sites to be constructed at the same time. However, it is likely that construction activities for the Proposed Development will take place at a different location whilst construction activities for Hurlie are ongoing, which would lessen the cumulative impact.
- 12.13.7 The Scottish Government provided an EIA Screening opinion which has been adopted for the construction of a battery energy storage system located on land to the south of Fetteresso Forest, known as Quithel 50 MW BESS. This is in relative close proximity of a trackout road which may be used for the Proposed Development. It is unlikely that the two projects will be constructed at the same time, however it is appropriate to assume that there is potential for both sites to use the trackout road at the same time and impact upon the nearest sensitive receptors in terms of dust and more generally road traffic.

### Construction Phase

#### *Sensitivity of Receptor*

#### Hurlie Substation

- 12.13.8 Tillybreak Cottage, The Wood of Mergie Ancient Woodland and an un-named Ancient Woodland Glenbervie, lie adjacent to a likely road used for trackout to and from the A957, which may be used for construction traffic to access both sites simultaneously. In the absence of specific guidance within EPUK and IAQM guidance, all sensitive receptors are considered of equal (high) value.

#### Quithel 50 MW BESS

- 12.13.9 Quithel Farm and Upper Quithel Farm lie adjacent to a road used for trackout to access both sites. IAQM guidance considers the sensitivity of human receptors as High for dust. These properties also lie in proximity to roads such as the A957 which may be used for construction traffic to access both sites simultaneously. All sensitive receptors are considered of equal (high) value.

#### *Magnitude of Impact*

#### Hurlie Substation

- 12.13.10 Assessing the combined construction traffic impacts on local air quality against the screening criteria detailed in paragraph 12.5.3, it is highly unlikely that the screening thresholds will be exceeded. Both developments are not in an AQMA and there are none in Aberdeenshire Council area. Due to the rural nature of

both developments and the pre-existing low levels of pollution, the contribution from road traffic towards poor air quality are therefore negligible.

Quithel 50 MW BESS

- 12.13.11 Assessing the likely combined trackout dust impacts, there is potential for localised and temporary effects from trackout activities during dry weather conditions for the sensitive receptors identified. It is highly unlikely however that both sites will have construction activities in parallel along the trackout road adjacent to the worst case sensitive receptors identified. The short-term nature of construction and the assumption that these activities will be controlled at both sites by mitigation, the likely scale of the impacts are considered negligible.
- 12.13.12 Assessing the combined construction traffic impacts on local air quality against the screening criteria detailed in paragraph 12.2.2, it is highly unlikely that the screening thresholds will be exceeded. Both developments are not in an AQMA and there are none in Aberdeenshire Council area. Due to the rural nature of both developments and the pre-existing low levels of pollution, the contribution from road traffic towards poor air quality are therefore negligible.

*Significance of Effect*

- 12.13.13 Overall, the magnitude of the cumulative effect for both the Hurlie Substation and Quithel 50 MW BESS are deemed to be negligible and the sensitivity of the receptors are considered to be high. The cumulative effect will, therefore, be considered to be 'not significant' for both the Hurlie Substation and Quithel 50 MW BESS developments.

*Additional Mitigation and Residual Effect*

- 12.13.14 No additional mitigation is required.
- 12.13.15 No air quality mitigation is considered necessary because the likely effect in the absence of additional mitigation (beyond the Embedded Mitigation outlined in Section 12.10) is not significant for either assessed proposed developments.

***Operation and Maintenance phase***

Hurlie Substation

- 12.13.16 It is not anticipated that O&M activities associated with the two developments (the Proposed Development and Hurlie) would overlap or generate sufficient traffic to exceed the screening criteria described in EPUK/IAQM planning guidance and therefore no assessment of cumulative impacts is required.

Quithel 50 MW BESS

- 12.13.17 Activities associated with the O&M of both developments (the Proposed Development and Quithel) are unlikely to generate large quantities of trackout dust and therefore no assessment of cumulative impacts is required.
- 12.13.18 It is not anticipated that O&M activities associated with the two developments (the Proposed Development and Quithel) would overlap or generate sufficient traffic to exceed the screening criteria described in EPUK/IAQM planning guidance and therefore no assessment of cumulative impacts is required.

**Decommissioning**

12.13.19 It is not expected that decommissioning of any of the developments discussed will take place at the same time, therefore, no assessment of cumulative impacts is required.

**12.14 Summary of Impacts, Mitigation, Likely Significant Environmental Effects and Monitoring**

12.14.1 Table 12.23 reports the summary of impacts, required mitigation and likely significant environmental effects.

**Table 12.23: Summary of Effects**

Activity	Magnitude of impact	Mitigation	Significance following any mitigation
<b>Construction dust</b>	Not determined as not all steps of the dust assessment could be completed. Magnitude of impacts likely to be negligible	Mitigation within CEMP	No likely significant effects
<b>Construction traffic</b>	Magnitude of impact negligible	Mitigation within CEMP	No likely significant effects
<b>Decommissioning</b>	Not determined as not all steps of the dust assessment could be completed. Magnitude of impacts likely to be negligible	Mitigation within CEMP	No likely significant effects

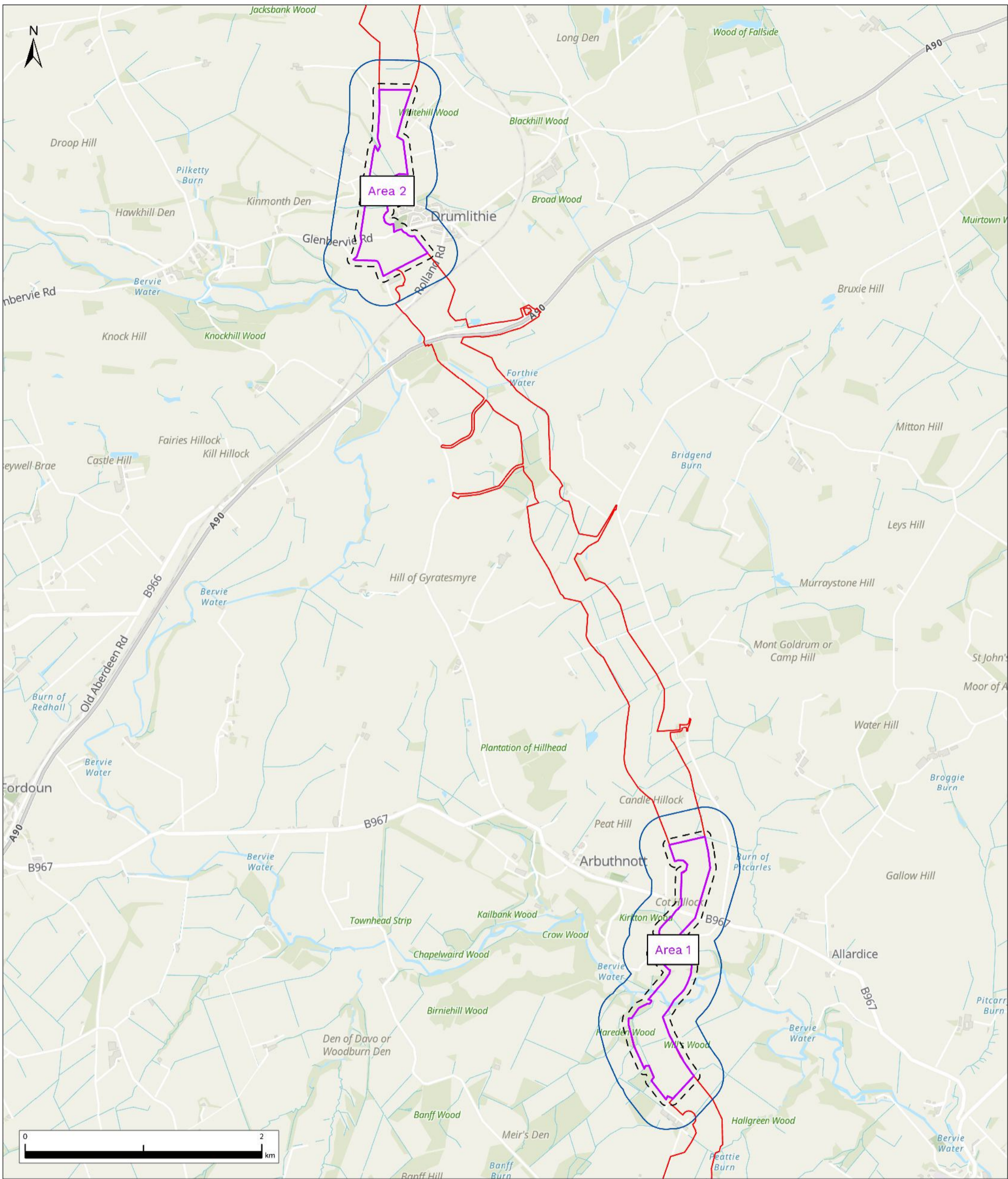
12.14.2 From the assessment undertaken, with the implementation of best practice embedded, dust and road traffic mitigation measures as detailed within this chapter, there are predicted to be no significant effects from construction. Implementation of the same mitigation measures during decommissioning works will likely result in no significant effects during decommissioning. There are assessed to be no significant effects from O&M.

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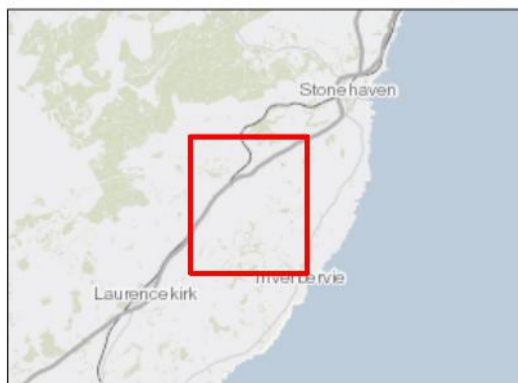
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## **Annex – Figures**



- Legend**
- PPP Application Boundary
  - Area 1 and 2
  - 50m Ecological Receptor Construction Dust Study Area 1 and 2
  - 250m Human Receptor Construction Dust Study Area 1 and 2



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 Area 1 and Area 2

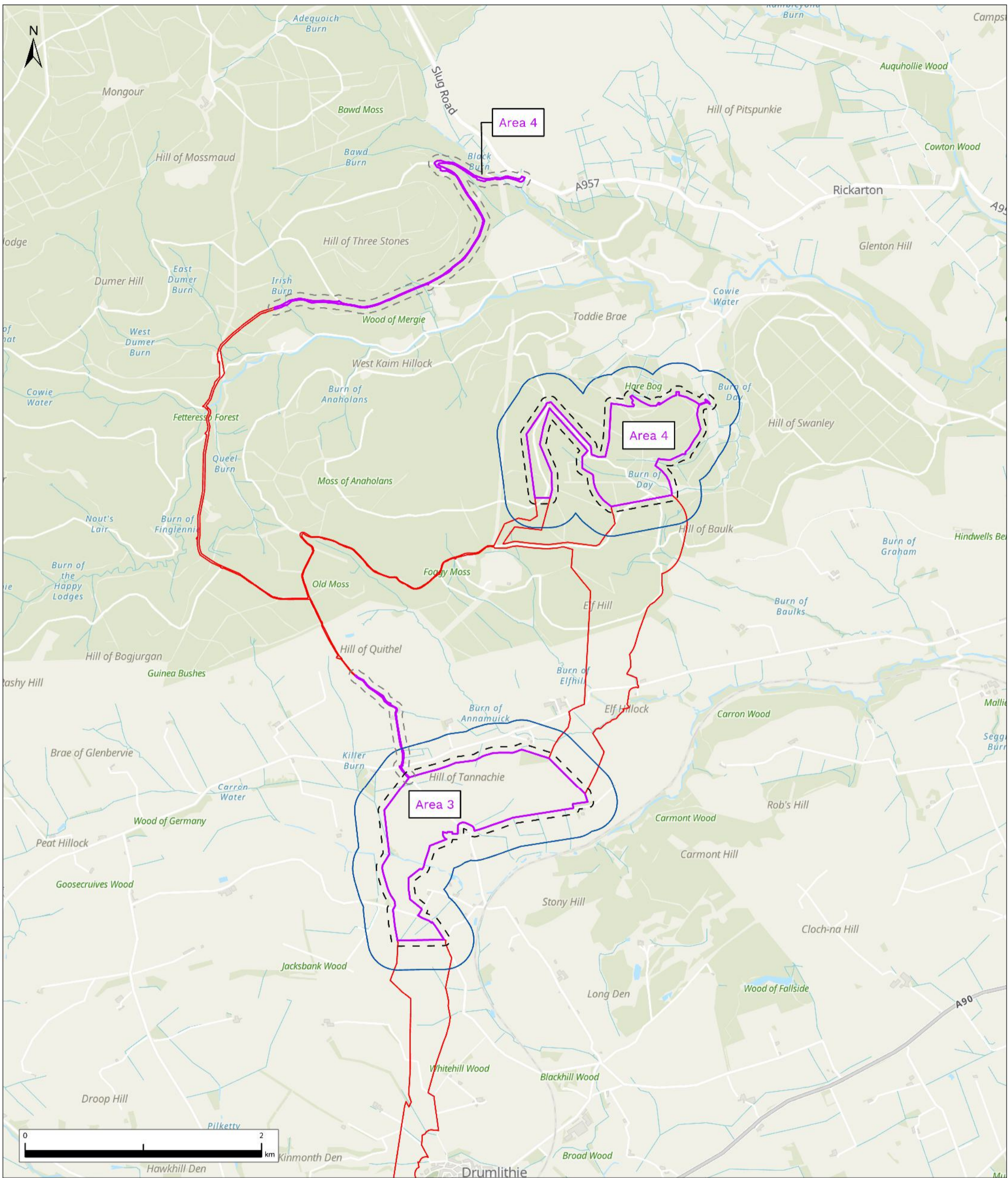
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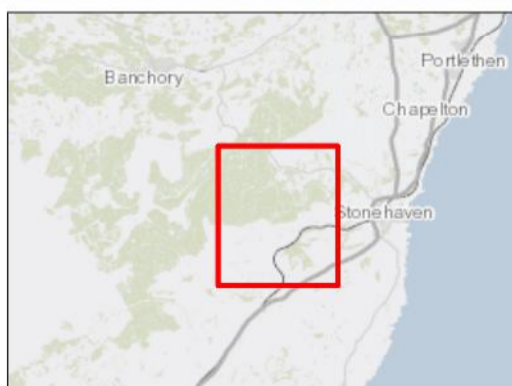
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- Legend**
- PPP Application Boundary
  - Area 3 and 4
  - 50m Ecological Receptor Construction Dust Study Area 3 and 4
  - 50m Trackout Study Area 3 and 4
  - 250m Human Receptor Construction Dust Study Area 3 and 4

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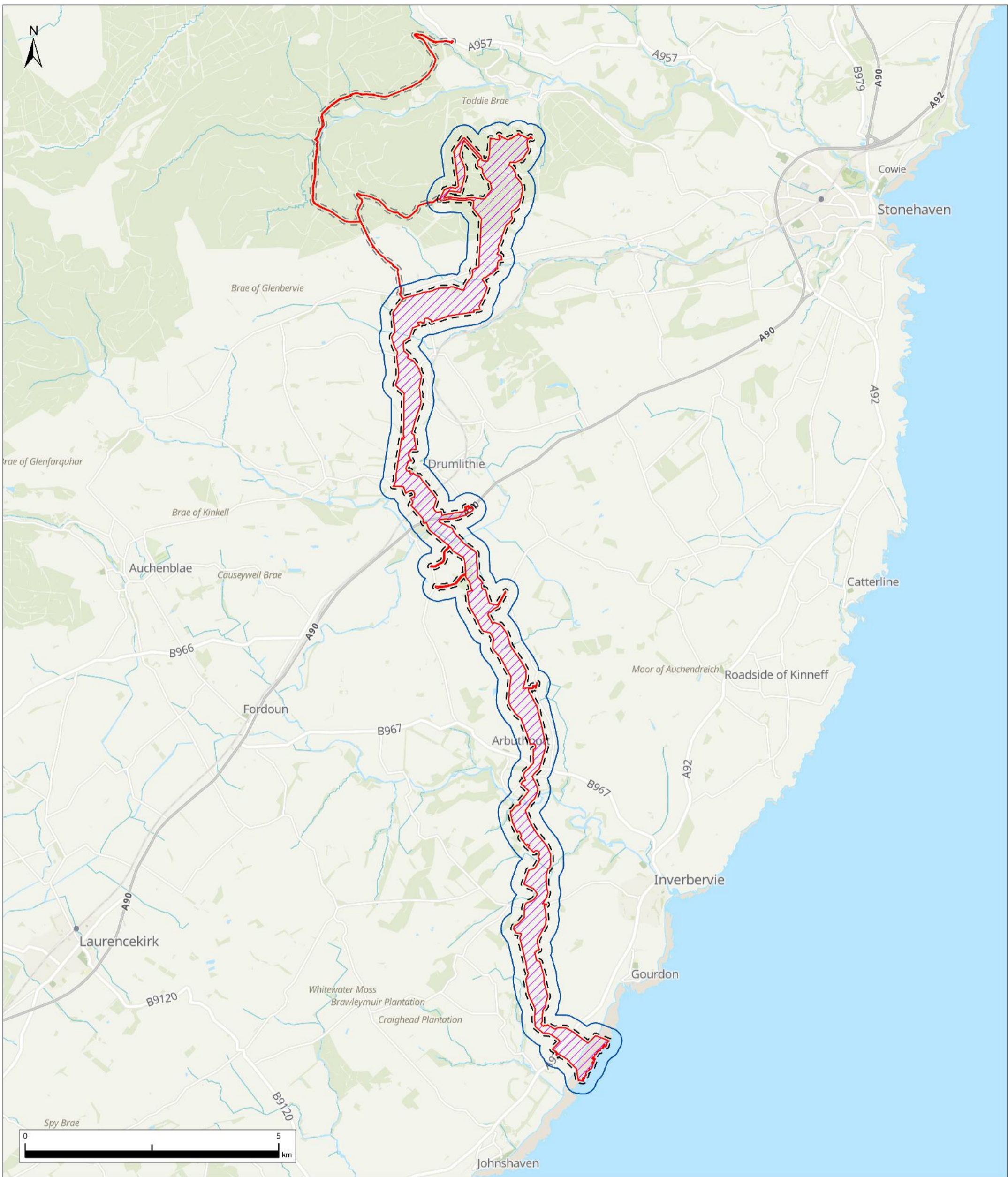
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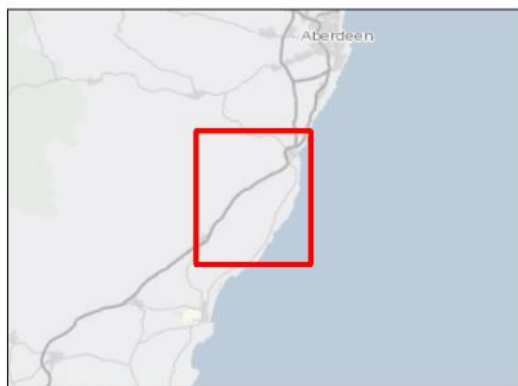
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- Legend**
- PPP Application Boundary
  - Area 5
  - 50m Ecological Receptor Construction Dust Study Area 5
  - 50m Trackout Study Area 5
  - 250m Human Receptor Construction Dust Study Area 5

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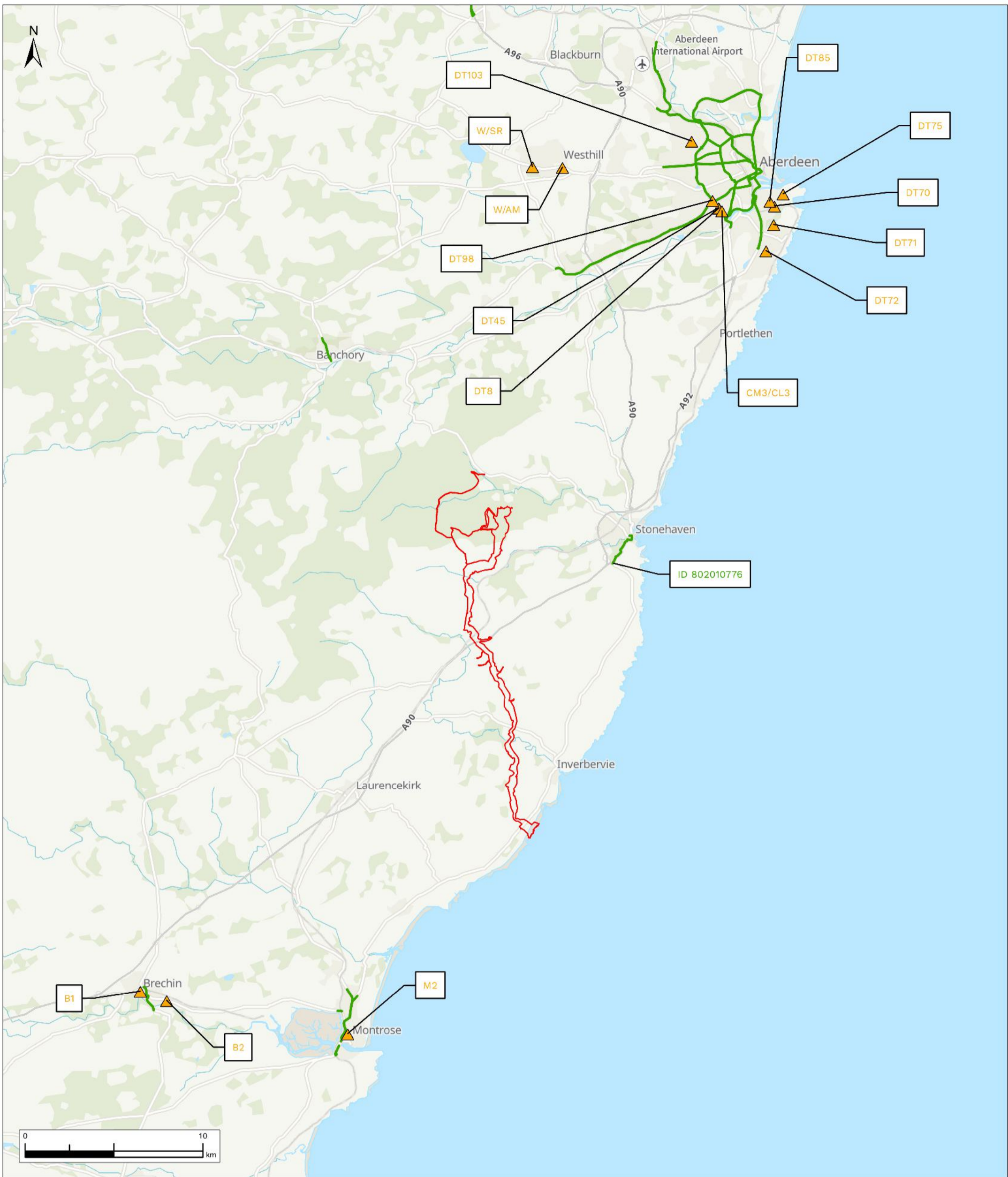
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- Legend**
- ▲ Local Authority Air Quality Monitoring Locations (Site ID)
  - Pollution Climate Mapping Road Links
  - PPP Application Boundary



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nearest to the Proposed Development

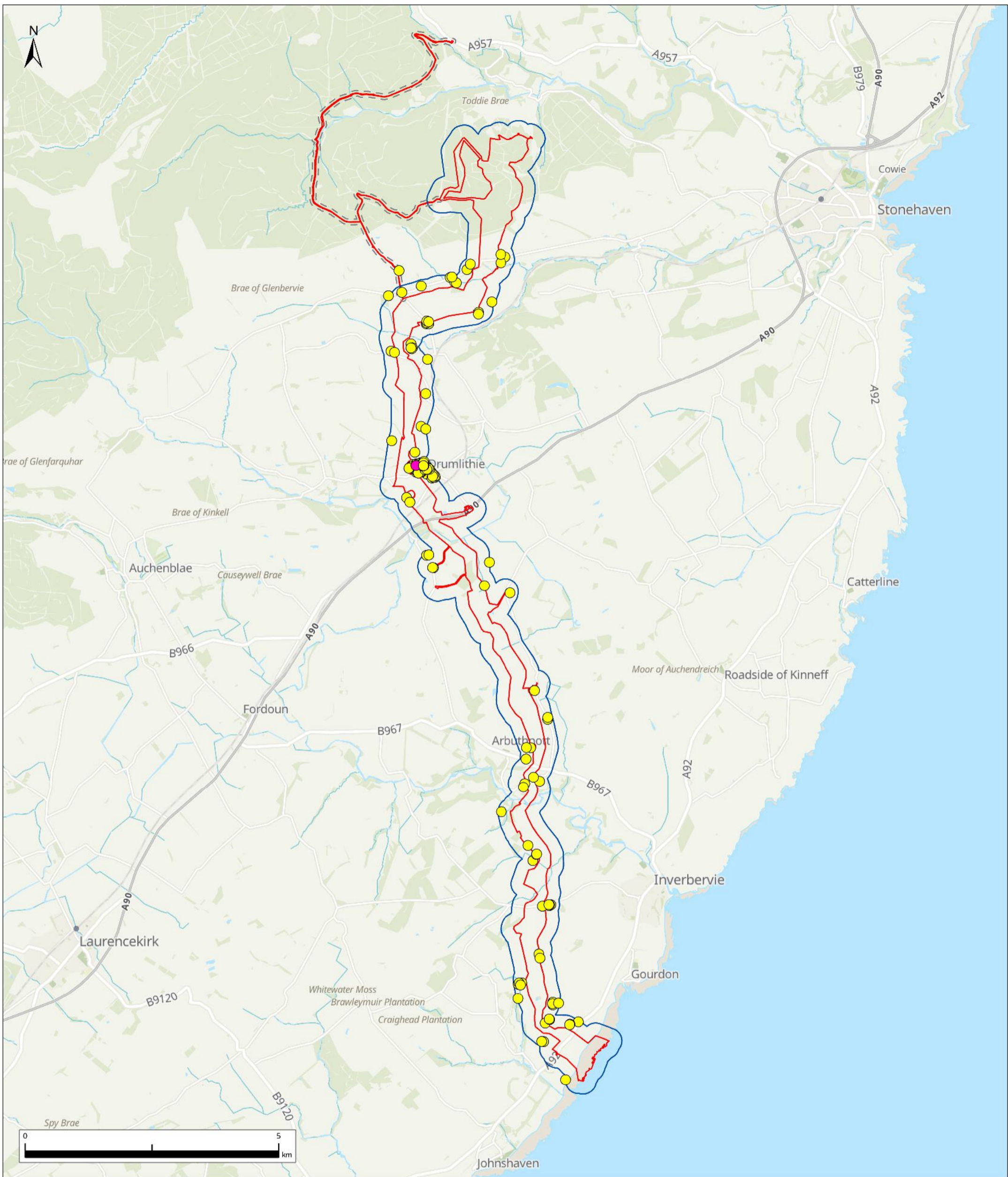
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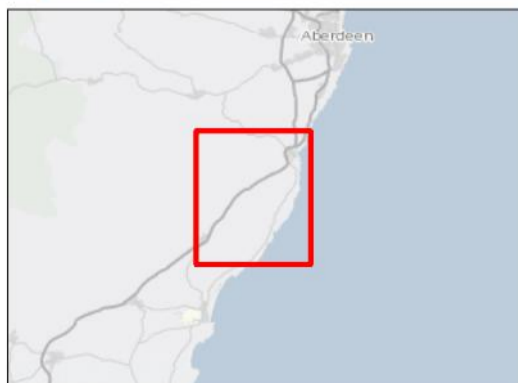
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Sheet 1 of 1



- Legend**
- PPP Application Boundary
  - 50m Trackout Study Area 5
  - 250m Human Receptor Construction Dust Study Area 5
- Sensitive Human Receptors within Air Quality Study Area**
- Education
  - Residential

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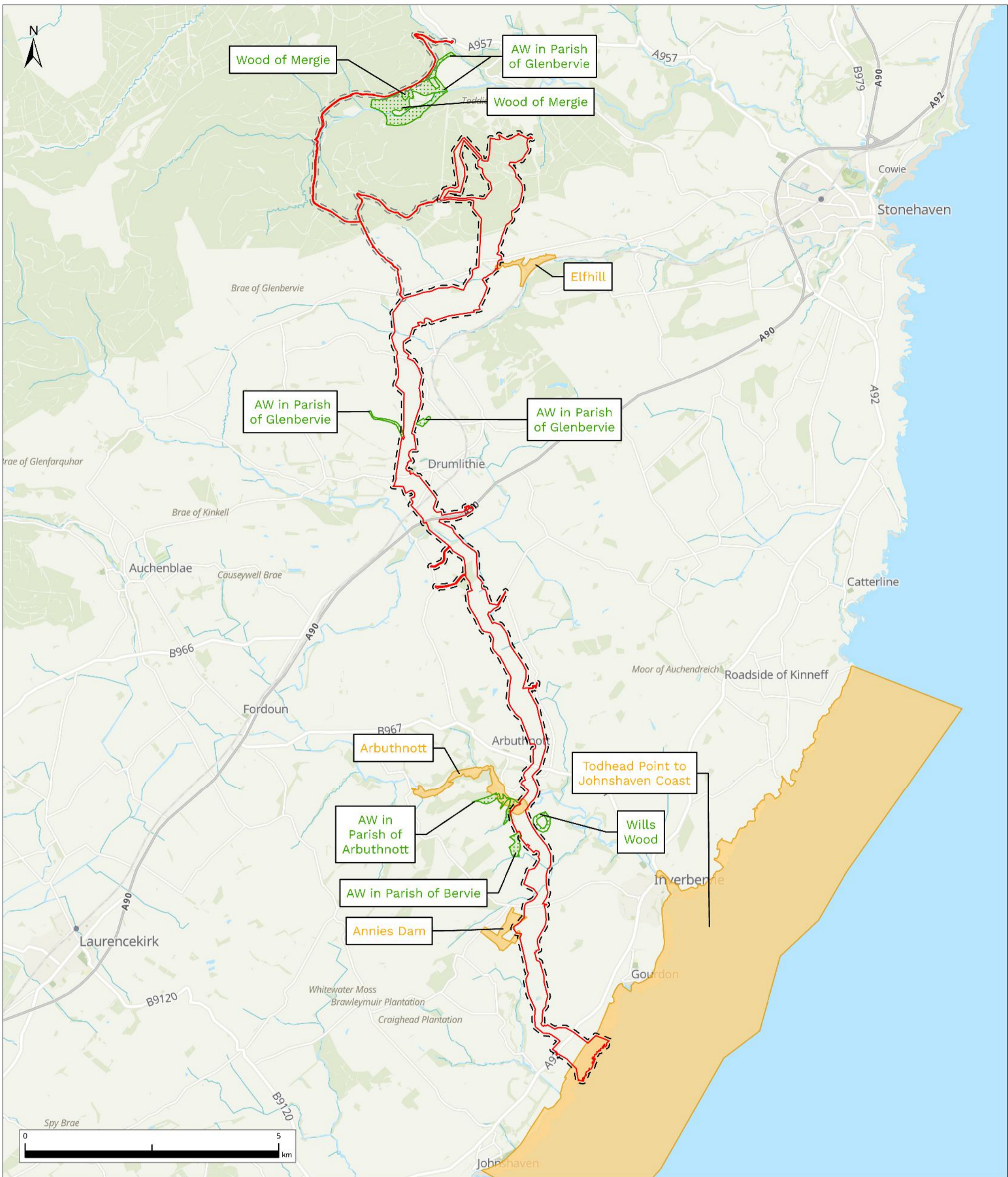
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- Legend**
- PPP Application Boundary
  - 50m Ecological Receptor Construction Dust Study Area 5
  - 50m Trackout Study Area 5
  - Ancient Woodland
  - Local Nature Conservation Site

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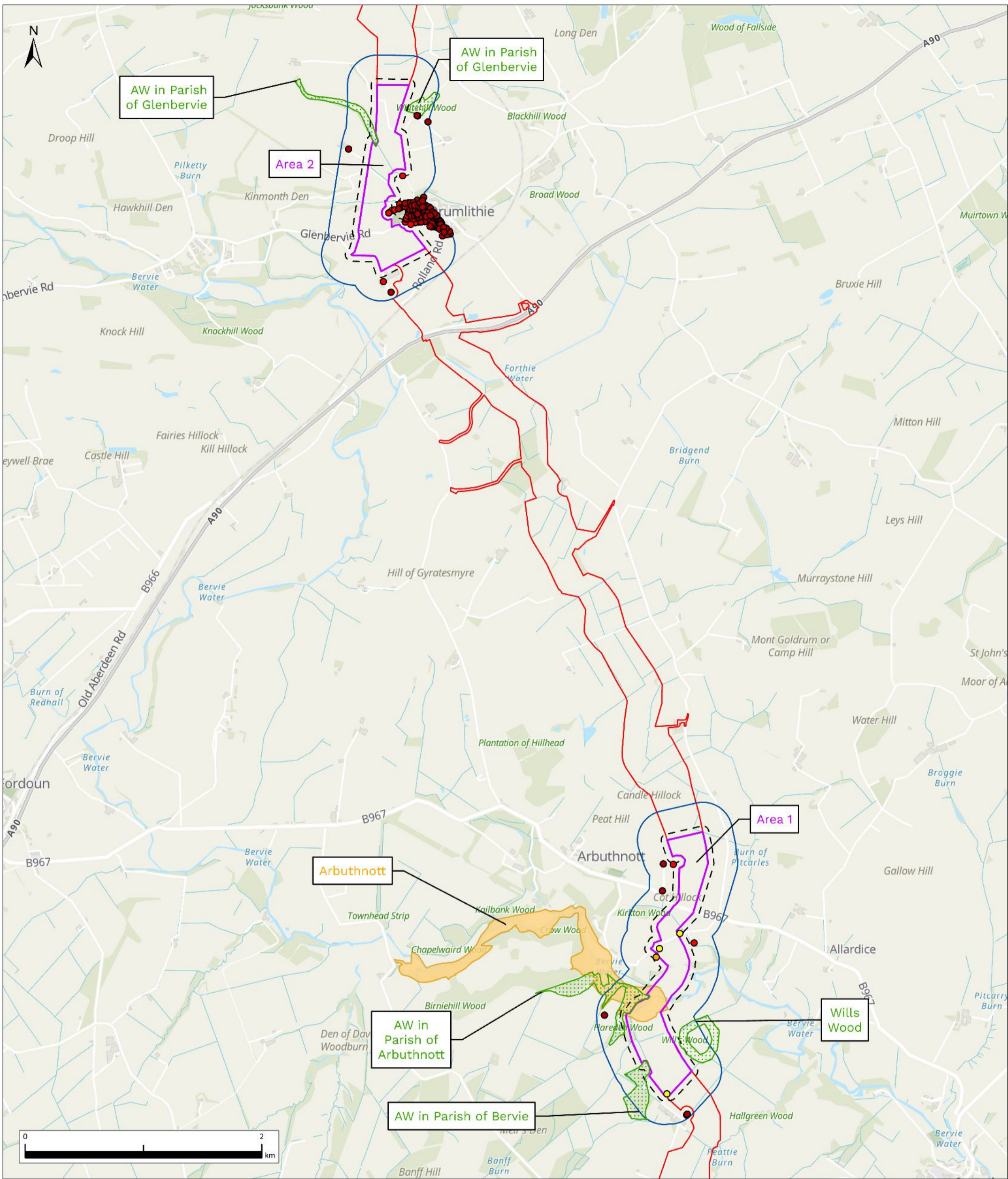
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- Legend**
- PPP Application Boundary
  - Area 1 and 2
  - 50m Ecological Receptor Construction Dust Study Area 1 and 2
  - 250m Human Receptor Construction Dust Study Area 1 and 2
  - Ancient Woodland
  - Local Nature Conservation Site

- Sensitive Human Receptors**
- 0-20m
  - >20-50m
  - >50m-100m
  - >100m-250m



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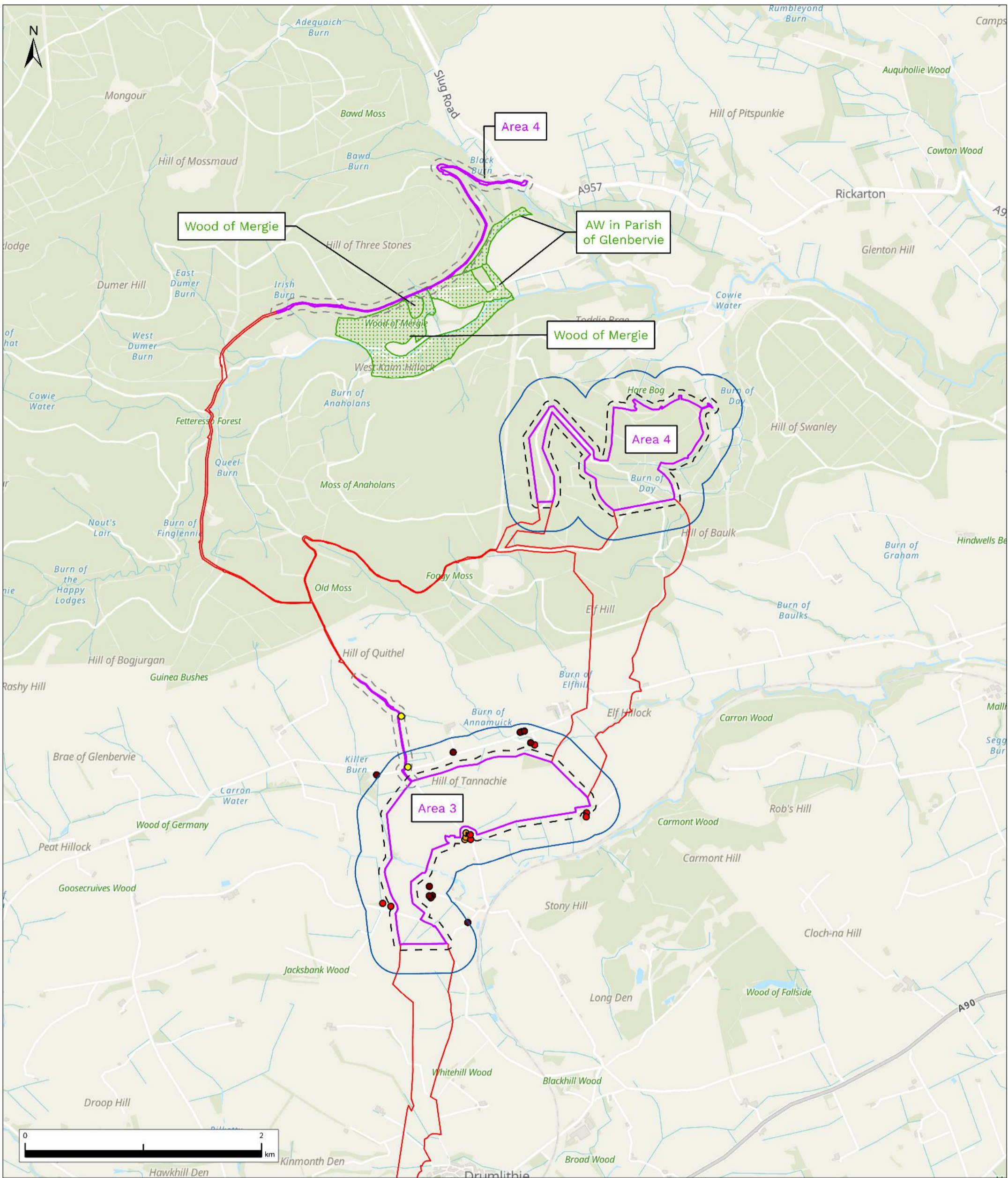
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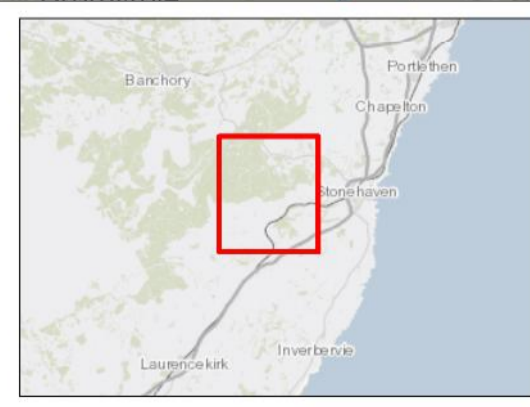


**Legend**

- PPP Application Boundary
- Area 3 and 4
- 50m Ecological Receptor
- Construction Dust Study Area 3 and 4
- 50m Trackout Study Area 3 and 4
- 250m Human Receptor Construction Dust Study Area 3 and 4
- Ancient Woodland
- Local Nature Conservation Site

**Sensitive Human Receptors**

- 0-20m
- >20-50m
- >50m-100m
- >100m-250m



**Jacobs**

Client: **TWP THISTLE WIND PARTNERS**

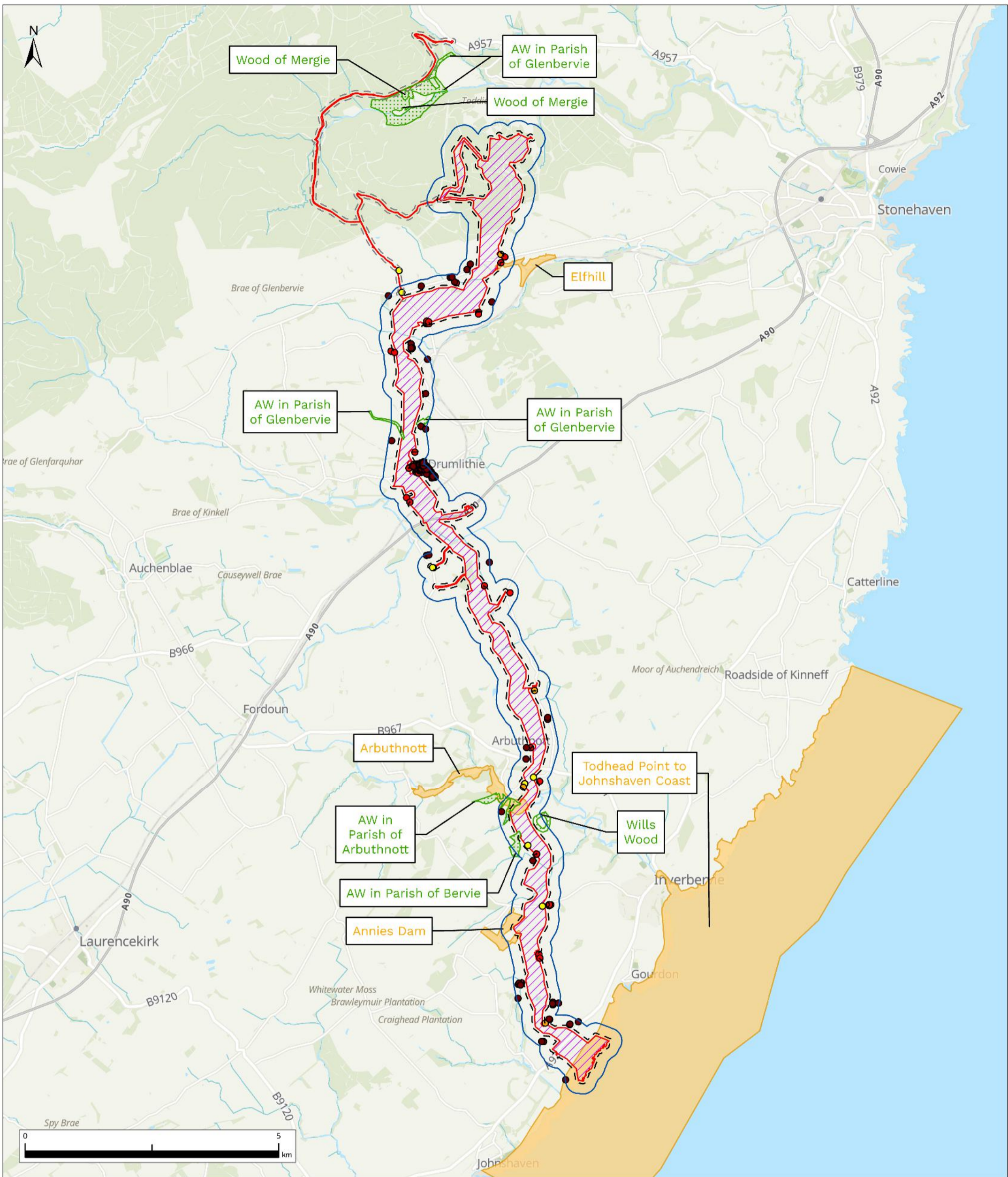
Project: **Bowdun Offshore Wind Farm Onshore EIA Report**

Drawing Title: **Sensitive Receptors within their respective dust boundaries - Area 3 and Area 4**

Aconnex Number: TWP-BOW-JCB-ENV-DWG-00008      Drawing Status: **FINAL**



04	NOV 25	FINAL	AH	SK	HP	GG
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	App'd
Scale @ A3	Scale: 1:30,000		DO NOT SCALE			
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Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
04	NOV 25	FINAL	AH	SK	HP	GG
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Client		
Project	Bowdun Offshore Wind Farm Onshore EIA Report	
Drawing Title	Sensitive Receptors within their respective dust boundaries - Area 5 (Whole Area)	
Aconnex Number	TWP-BOW-JCB-ENV-DWG-00009	Drawing Status
		FINAL
Figure 12.9		
Sheet 1 of 1		