21. Assessment of Cumulative Effects

Summary

This chapter considers potential for cumulative effects of the proposed scheme, and those of the proposed scheme in combination with other reasonably foreseeable developments.

Potential for cumulative effects due to the combined effect of a number of different environmental effects (adverse and beneficial) of the proposed scheme on a single receptor/resource were assessed, based on the findings of the topic chapters in this EIAR. Significant cumulative effects on 22 people/property receptors are expected to result from a combination of residual visual, land-take and/or beneficial noise effects of the proposed scheme. These receptors are Ballincrieff, Oakwood, Tomcroy House, Barbed Wire and Poppies, Rowanlea, Dowiestone, 6 Perth Road, Carse-na-Tay, Shian, Wychwood, Hollybank, 1 Station Cottages, 8 Station Road, 10 Station Road (Tirohia), 12 and 13 Birnam Terrace, Sunnybank Cottage and Niel Gow Cottage (all residential properties), Dunkeld & Birnam Station, The Merryburn Hotel, Craigvinean Surgery and Dunkeld & Birnam Recreation Club.

The combination of projects forming the A9 Dualling programme from Perth to Inverness were identified as having the potential to have a cumulative effect. No other reasonably foreseeable developments were identified that may contribute to a significant cumulative effect in combination with the proposed scheme.

The potential for significant cumulative effects due to construction activities were identified at five visual receptor locations (building locations) and seven visual receptor locations (outdoor locations). Additionally, significant cumulative effects on waste were identified due to the proposed scheme's potential use of the available non-hazardous landfill capacity within the Tayside, Central and Fife Local Authority Region (defined as the second study area in Chapter 14 (Material Assets and Waste)) as well as the use of non-hazardous landfill capacity outside this (second study) area.

The potential for significant cumulative effects were identified during operation on the Strath Tay: Lower Glen Local Landscape Character Area (LLCA), the Strath Tay: Mid Glen LLCA, the River Tay (Dunkeld) National Scenic Area (NSA), five visual receptors (building locations), six visual receptors (outdoor locations) and on habitat on the Ancient Woodland Inventory (AWI). The potential for cumulative effects principally arises due to the combined effects of the proposed scheme with the A9 Dualling: Tay Crossing to Ballinluig project in the vicinity of the Tay Crossing where the two projects adjoin. Effects relate to the presence of road infrastructure, loss of vegetation and in the case of AWI habitat, the loss of irreplaceable woodland.

21.1 Introduction

21.1.1 Annex IV of the Environmental Impact Assessment (EIA) Directive (2014/52/EU) (amending Directive 2011/92/EU) (hereafter referred to as the EIA Directive) requires the consideration of the cumulative effects within an Environmental Impact Assessment Report (EIAR; European Parliament, 2014)). This requirement is reflected within Schedule 1A of the Roads (Scotland) Act 1984 (Environmental Impact Assessment) Regulations 2017 (Scottish Government, 2017).

21.1.2 While the term 'cumulative' is not defined within the EIA Directive, the European Commission (EC) guidelines (European Commission 1999) define 'cumulative impacts' as follows:

> *'Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project'.*

21.1.3 DMRB LA 104 (National Highways et al, 2025) states that '*EIAs must include cumulative effects in accordance with the requirements of the EIA Directive 2014/52/EU*' and provides a glossary of technical terms, which expands on the above definition, noting that a cumulative effect may arise as the result of:

> *'a) the combined impact of a number of different environmental factors - specific impacts from a single project on a single receptor/resource (referred to as Type 1 cumulative effects); and/or*
>
> *b) the combined impact of a number of different projects within the vicinity (in combination with the environmental impact assessment project) on a single receptor/resource (referred to as Type 2 cumulative effects).'*

21.1.4 Taking the above into account, the cumulative effects captured in this assessment refer to how an environmental receptor/resource may be subject to multiple topic-specific impacts of the proposed scheme (Type 1) and impacts on an environmental receptor/resource arising from more than one development/project (Type 2).

21.1.5 The impacts of the proposed scheme and from multiple developments/projects may overlap, or act in combination, at a particular location or upon a particular receptor/resource, thereby leading to more significant effects than if the effects were considered in isolation. For example, two visually intrusive developments/projects proposed within a sensitive landscape may lead to more significant landscape and visual impacts than just one of the developments/projects considered in isolation.

21.1.6 Traffic modelling (TMfS18) has indicated that whilst individual A9 Dualling projects (Transport Scotland, 2025) are generally not likely to notably affect the traffic demand at a local level, the cumulative effect of full implementation of the wider programme of A9 Dualling works may change traffic flows on the A9 by, for example, attracting additional usage of this strategic route. To ensure that the potential cumulative effect of the proposed scheme in combination with other projects anticipated as part of the A9 Dualling programme was taken into account, traffic data utilised in the EIAR included the traffic changes predicted as a consequence of implementing the full programme of works to dual the A9 using a 'without policy' scenario which assumes traffic levels continue to increase. Consequently, potential cumulative

environmental effects of these traffic changes are incorporated within the following assessments, and no supplementary assessment is required:

- Chapter 8 (Air Quality);
- Chapter 15 (Noise & Vibration);
- Chapter 17 (Population - Accessibility);
- Chapter 18 (Human Health); and
- Chapter 19 (Road Drainage and the Water Environment).

21.1.7 As discussed in Chapter 6 (The Proposed Scheme), the assessment years adopted for operational assessment of the proposed scheme are 2036 and 2051 (although completion of the proposed scheme is anticipated before 2036). The year of opening as referred to in this assessment is therefore 2036 and the Design Year of 2051 is referred to as 15 years after the (assumed) year of opening.

21.2 Approach and Methods

General Approach

21.2.1 This chapter considers the following two categories of scenario to identify potential for significant cumulative effects, based on the DMRB LA 104:

'1) a single project (e.g. numerous different effects impacting a single receptor); and

2) different projects (together with the project being assessed).'

21.2.2 It also states that:

'The assessment of cumulative effects shall:

1) establish the zone of influence of the project together with other projects;

2) establish a list of projects which have the potential to result in cumulative impacts; and

3) obtain further information and detail on the list of identified projects to support further assessment.'

Study Area (zone of influence)

21.2.3 For same project (Type 1) impacts, the study areas defined in the technical chapters (8-20) have been applied with any exceptions being identified in those chapters.

21.2.4 For different (Type 2) projects, a cumulative assessment of the combined projects making up the A9 Dualling was undertaken. In addition, in accordance with the Environmental Impact Assessment (EIA) Scoping Report, a wider area search of additional projects that may contribute to a cumulative effect was then undertaken through review of planning information including the Perth and Kinross Local Development Plan 2 (PKC, 2019).

Identification of Cumulative Effects

Type 1 Cumulative Effects (of the proposed scheme)

21.2.5 To consider the potential for a combined effect of different environmental topic-specific impacts on a single receptor/resource, a three-step process has been followed.

Step 1: Review of EIAR Residual Effects and Identification of Receptors

21.2.6 A list of all the receptors considered in this EIAR was compiled and a review of the residual effects from the individual topics was undertaken and, using professional judgement, the potential for interaction with other topic areas was identified. The spatial boundary of the receptor/resource with the potential to be affected by Type 1 cumulative effects are defined in the study area for each environmental parameter as explained in Chapters 8-20 of this EIAR. Sensitive receptors such as residential properties, ecological features and the water environment, have the potential to be impacted in multiple ways (e.g. from factors such as air quality, noise, water quality, habitat loss).

Step 2: Identification of Potential Cumulative Effects

21.2.7 Where the same receptor is identified in relation to two or more individual topics, professional judgement was used to determine where multiple impacts could combine to result in a cumulative effect.

Step 3: Identification of Significant Cumulative Effects

21.2.8 Where cumulative effects were identified, the nature of these were considered e.g. duration (temporary or permanent), extent, frequency and sensitivity of the receptor, and the significance of the effect determined using professional judgement.

21.2.9 It is possible to have multiple significant residual effects which in combination do not constitute a significant (cumulative) effect. However, it is also acknowledged that there is potential that multiple non-significant effects in combination could result in a significant cumulative effect, and therefore non-significant residual effects reported in the individual assessments of this EIAR were also reviewed. Effects of negligible or neutral significance were excluded from the assessment as by definition they are inconsequential.

Type 2 Cumulative Effects (of the proposed scheme with other reasonably foreseeable developments)

21.2.10 To consider the potential for a combined effect of the proposed scheme with other 'reasonably foreseeable' developments (refer to paragraph 21.1.2) on a single sensitive receptor/resource, a three-step process has been followed.

Step 1: Identification of 'Reasonably Foreseeable' Developments

21.2.11 The study area was defined as up to 500m from the proposed scheme for the purposes of initial identification of 'reasonably foreseeable' developments. Following this, a wider area

search beyond 500m of additional projects that may contribute to a cumulative effect was undertaken to confirm identification of reasonably foreseeable developments. The spatial boundary of the receptor/resource with the potential to be affected by Type 2 cumulative effects are as defined in the study area for each environmental factor.

21.2.12 DMRB LA 104 sets out that the assessment of cumulative effects should report on:

- *roads projects which have been confirmed for delivery over a similar timeframe;*
- *other development projects with valid planning permissions or consent orders, and for which EIA is a requirement; and*
- *proposals in adopted development plans with a clear identified programme for delivery.*

21.2.13 A review of other developments beyond those that are 'committed' has also been undertaken to ascertain whether any should justifiably also be included in the assessment by virtue of their scale, location or timing. These are identified through a review of PKC LDP2 (PKC, 2019).

Step 2: Potential for Significant Cumulative Effects

21.2.14 Once 'reasonably foreseeable' developments were identified, DMRB LA 104 guidance and professional judgement was used to 'scope out' the developments that were not considered likely to have in-combination significant cumulative effects. This involved a review of the developments based on their location, type or status of development and a review of relevant environmental information included within planning applications (PKC, 2024) and published environmental assessments. A scenario was developed based on the relative timescale for the developments' construction and operation and the potential for overlap with the proposed scheme. This allowed the assessment to focus on those 'reasonably foreseeable' developments that may potentially result in significant cumulative effects in combination with the proposed scheme.

Step 3: Review of Cumulative Effects

21.2.15 The 'reasonably foreseeable' developments identified as having the potential for significant Type 2 cumulative effects were subject to a topic-by-topic review, relying on professional judgement to determine the potential for combined effects. The review considered all findings of this EIAR and available information regarding other 'reasonably foreseeable' developments.

Limitations to Assessment

21.2.16 The cumulative effect assessment has utilised available information on construction methodologies, programmes and mitigation measures for 'reasonably foreseeable' developments, which is often not sufficiently detailed to quantify cumulative effects. As such, professional judgement was used where necessary to qualitatively ascertain the likelihood of environmental impacts and effects on receptors that may also be affected by the proposed scheme.

21.3 Potential Cumulative Effects

Type 1 Cumulative Effects (of the proposed scheme)

Introduction

21.3.1 For each environmental topic area, as reported in Chapters 8 to 20 of this EIAR, the potential for a number of construction or operational impacts on the same receptor was considered where appropriate and is therefore not repeated here. The following paragraphs relate to potential combinations of environmental topic area effects on specific areas/receptors.

21.3.2 Following implementation of mitigation, there are comparatively few significant residual effects for a large-scale development of this type in a sensitive area (see Chapter 23: Summary of Residual Significant Effects). This is due to the fact that the proposed scheme is largely online widening, which limits the area of land required and also means that the baseline conditions already include the existing A9 trunk road.

Construction

21.3.3 Chapter 6 (The Proposed Scheme) and Appendix A6.1 (Construction Information) provide information regarding the timing/programming and type of construction activities anticipated at present. The precise details of these will be dictated by the Contractor(s) detailed design and construction methodology.

People/Property Receptors

21.3.4 During construction, those properties closest to the works may be subject to several types of temporary disturbance such as changes to noise and vibration, air quality, visual amenity and access to/from properties. The construction noise assessment identified five individual or groups of noise sensitive receptors that had the potential to experience significant construction noise effects and three individual or groups of vibration sensitive receptors which had the potential to experience significant construction vibration effects.

21.3.5 Mitigation is proposed in the relevant chapters to mitigate potential impacts during the construction phase and is collated in Chapter 22 (Schedule of Environmental Commitments). To facilitate the implementation of this mitigation a Construction Environmental Management Plan (CEMP) is required (Mitigation Item SMC1). The CEMP will include subsidiary plans relating to: surface water and groundwater (including a Flood Response and Pollution Incident Response Plan); ecology (including specific Species and Habitat Management Plans); landscape, air quality and noise and vibration.

21.3.6 Following application of the mitigation measures as outlined in Chapter 8 (Air Quality) and Chapter 15 (Noise and Vibration), (Dust Management Plan - Mitigation Item P02-AQ1, Noise Management Plan - Mitigation Item SMC-NV1), it is considered unlikely that potentially significant adverse air quality and vibration effects during construction would arise. The potential for significant residual adverse construction noise effects will remain at three

individual or groups of noise sensitive receptors, but these would be minimised as far as practicable.

21.3.7 The visual assessment presented in Chapter 11 (Visual) concludes that people at 73 built receptor locations and 35 outdoor receptor locations are predicted to experience significant visual effects during construction. Mitigation measures employed during construction such as keeping construction areas tidy, appropriate siting of construction plant and materials storage areas, and minimising use of directed lighting would limit landscape and visual construction impacts.

21.3.8 Chapter 18 (Human Health) identified the potential for significant residual effects on health and wellbeing of vulnerable groups related to construction noise and safety (Health Determinant HD7 – noise and the ambient noise environment and safety risks HD9 – safety associated with the affected road network). However, these effects will be short-term and reversible on completion of the works; further details are outlined in Chapter 18 (Human Health).

21.3.9 Considering the conclusions of the topic specific assessments, the residual effects identified in the EIAR topic chapters outlined above are not considered to result in in-combination effects that would constitute a significant cumulative effect on people/property receptors.

Water Environment

21.3.10 Chapter 19 (Road Drainage and the Water Environment) of the EIAR has assessed the impact of the proposed scheme in relation to flood risk, surface water quality, hydromorphology and water supply. Chapter 13 (Geology, Soils, Groundwater and Land Contamination) has assessed the impact of the proposed scheme in relation to groundwater quality and land contamination. Within DMRB guidance there is no specific methodology outlined to categorise cumulative effects on the water environment. However, a qualitative cumulative assessment has been undertaken, using the residual effects of each discipline and professional judgement to establish an overall effect on the water environment during construction.

21.3.11 The impacts of any flood event larger than a 10% Annual Exceedance Probability (AEP) (10-year) size during construction would have a minor adverse effect compared to the current situation. With the construction programme scheduled to last approximately 3-4 years, the probability of such flood events occurring during the construction phase are relatively low. For surface water quality, groundwater quality, and hydromorphology, the impact of a pollution incident during construction is greatly reduced by adhering to prescribed mitigation measures, good practice guidelines and effective on-site management, all which would be adopted during the construction of the proposed scheme (refer to Chapter 22: Schedule of Environmental Commitments). Additionally, groundwater and surface water will be monitored during construction to determine whether construction activities are affecting the water environment.

21.3.12 Overall, provided that mitigation measures are implemented, the potential for a significant cumulative effect from several factors on the water environment during the construction of the proposed scheme is considered unlikely.

Biodiversity

21.3.13 Potential impacts on biodiversity that could interact cumulatively include:

- construction related activities including vehicle movement and vegetation clearance;
- construction related noise, vibration, light spill and increased human presence; and
- loss of breeding, foraging and commuting habitat under the proposed scheme footprint.

21.3.14 Mitigation measures to reduce the potential for impacts on Biodiversity are identified in Chapter 12 (Biodiversity) and no significant residual effects are reported.

21.3.15 Taking consideration of the residual effects identified in this EIAR in combination, additional cumulative significant effects are not expected at any receptor during construction.

Material Assets and Waste

21.3.16 Potential Type 1 cumulative effects which are associated with materials and waste during construction of the proposed scheme comprise those affecting receptors concerned with the management of waste and the use of materials including embodied carbon; and those affecting receptors associated with wider material assets such as land uses and mineral resources. The elements of this environmental factor have synergies with Chapter 13 (Geology, Soils, Groundwater and Land Contamination) covering soils and potential sources of contaminated land and Chapter 20 (Climate) covering greenhouse gas emissions emitted in producing materials and managing waste, However, as these environmental factors and elements of the proposed scheme do not impact the same receptors, Type 1 cumulative effects are not considered feasible. Additionally, no mineral safeguarding sites (both operational and those identified in strategic planning documents for mineral extraction) or peat resources (existing or potential extraction sites) have been identified within the proposed scheme boundary. There is therefore no potential for Type 1 cumulative effects associated with Chapter 16: Population - Land Use receptors, such as impacts on commercial and industrial property and development land.

<u>Operation</u>

21.3.17 Receptors discussed in the EIAR with the potential for cumulative impacts during operation of the proposed scheme have been identified using the approach outlined in paragraphs 21.2.5 to 21.2.9. The assessment of effects on landscape and visual receptors took into account the proposed landscape mitigation measures, considering the impacts of the proposed scheme in two scenarios. These comprised the winter of the year of opening (WYO) when planting has been implemented but has not established; and in the summer 15 years after opening (SY15) when the proposed planting would be reasonably established.

21.3.18 Receptors which have potential to experience a significant cumulative effect from the proposed scheme are reported in Table 21.1. The nature of the individual impacts has been reviewed and professional judgement used to determine whether these cumulative effects would be significant.

Table 21.1: Potential for Type 1 Cumulative Effects (of the proposed scheme) During Operation

Receptor	Description of Individual Effects	Potential Cumulative Effect
River Tay (Figure 19.1) (Figure 12.1)	▪ Non-significant flood risk (Chapter 19: Road Drainage and the Water Environment); ▪ Non-significant geomorphological changes due to construction of outfalls and new and extended structures including any necessary bank protection measures (Chapter 19: Road Drainage and the Water Environment); ▪ Non-significant habitat disturbance, habitat loss and pollution risk (Chapter 12: Biodiversity); and ▪ Non-significant permanent loss of habitat including aquatic and terrestrial habitat within the River Tay SAC designation (Chapter 12: Biodiversity).	Not Significant
Ballincrieff (Figure 11.3d, Receptor No. 11)	▪ Significant residual visual effects at winter year of opening (**Large**) and in the summer 15 years after opening (**Moderate**). ▪ Significant residual effects arising from land-take/change in access (**Large**). ▪ Significant beneficial effects on noise receptor.	Significant
Oakwood, Tomcroy House, Barbed Wire and Poppies (Figure 11.3d, Receptor No. 11)	▪ Significant residual visual effects at winter year of opening (**Large**) and in the summer 15 years after opening (**Moderate**). ▪ Significant beneficial effects on noise receptors.	Significant
Rowanlea (Figure 11.3d, Receptor No. 14)	▪ Significant residual visual effects at winter year of opening (**Moderate**) and in the summer 15 years after opening (Slight). ▪ Significant residual effects arising from land-take/change in access (**Large**). ▪ Significant beneficial effects on noise receptor.	Significant
Dowiestone, 6 Perth Road, Carse-na-Tay, Shian, Wychwood	▪ Significant residual visual effects at winter year of opening (**Moderate**) and in the summer 15 years after opening (Slight). ▪ Significant beneficial effects on noise receptors.	Significant

Receptor	Description of Individual Effects	Potential Cumulative Effect
and Hollybank (Figure 11.3d, Receptor No. 14)		
1 Station Cottages (Figure 11.3d, Receptor No. 47)	▪ Significant residual visual effects at winter year of opening (**Large**) and in the summer 15 years after opening (Slight). ▪ Significant beneficial effects on noise receptor.	Significant
8 Station Road (Figure 11.3d, Receptor No. 47)	▪ Significant residual visual effects at winter year of opening (**Large**) and in the summer 15 years after opening (Slight). ▪ Significant beneficial effects on noise receptor.	Significant
10 Station Road (Tirohia) (Figure 11.3d, Receptor No. 47)	▪ Significant residual visual effects at winter year of opening (**Large**) and in the summer 15 years after opening (Slight). ▪ Significant residual effects arising from land-take/change in access (**Large**). ▪ Significant beneficial effects on noise receptor.	Significant
Dunkeld & Birnam Station (Figure 9.1f)	▪ Significant residual visual effects at winter year of opening (**Moderate**) and in the summer 15 years after opening (**Moderate**). ▪ Significant residual effects arising from land-take, change in access and accessibility (**Moderate to Large** adverse and **Very Large** beneficial). ▪ Significant residual effects on historic buildings (**Moderate**). ▪ Significant beneficial effects on noise receptor.	Significant
12 and 13 Birnam Terrace (Figure 11.3d, Receptor No. 45)	▪ Significant residual visual effects at winter year of opening (**Moderate**) and in the summer 15 years after opening (Slight). ▪ Significant beneficial effects on noise receptors.	Significant
The Merryburn Hotel	▪ Significant residual visual effects at winter year of opening (**Large**) and in the summer 15 years after opening (Slight).	Significant

Receptor	Description of Individual Effects	Potential Cumulative Effect
(Figure 11.3d, Receptor No. 46)	▪ Significant beneficial effects on noise receptor.	
Craigvinean Surgery (Figure 11.3e, Receptor No. 79)	▪ Significant residual visual effects at winter year of opening (**Moderate**) and in the summer 15 years after opening (Slight). ▪ Significant beneficial effects on noise receptor.	Significant
Dunkeld & Birnam Recreation Club (Figure 11.3e, Receptor No. 80)	▪ Significant residual visual effects at winter year of opening (**Moderate**) and in the summer 15 years after opening (Slight). ▪ Significant beneficial effects on noise receptor.	Significant
Sunnybank Cottage and Niel Gow Cottage (Figure 11.3e, Receptor No. 101)	▪ Significant residual visual effects at winter year of opening (**Moderate**) and in the summer 15 years after opening (Neutral). ▪ Significant beneficial effects on noise receptors.	Significant

21.3.19 As outlined in Chapter 2 (Need for the Scheme), the proposed scheme would reduce driver frustration and provide opportunity for safer overtaking. The proposed junctions at Birnam and Dunkeld avoid the need for potentially dangerous right turns across the path of traffic travelling in opposite direction which will improve safety for vehicle travellers and walkers, wheelers, cyclists and horse riders.

21.3.20 Potential for cumulative effects in the context of the River Tay SAC has been considered in Chapter 12 (Biodiversity) and also as part of a Habitats Regulations Appraisal (HRA) under the requirements of the EC Habitat Directive. This considered a range of impacts and determined that there would be no adverse effects on the conservation objectives of the River Tay SAC as a result of the proposed scheme.

Type 2 Cumulative Effects (of the proposed scheme with other reasonably foreseeable developments)

21.3.21 As noted in Section 21.2 (Approach and Methods), the wider A9 Dualling programme from Perth to Inverness was included in the assessment of cumulative effects. The A9 Dualling programme comprises the upgrade of 11 sections of the A9 between Perth and Inverness to dual carriageway, as listed in Chapter 1 (Introduction) and shown on Diagram 1.

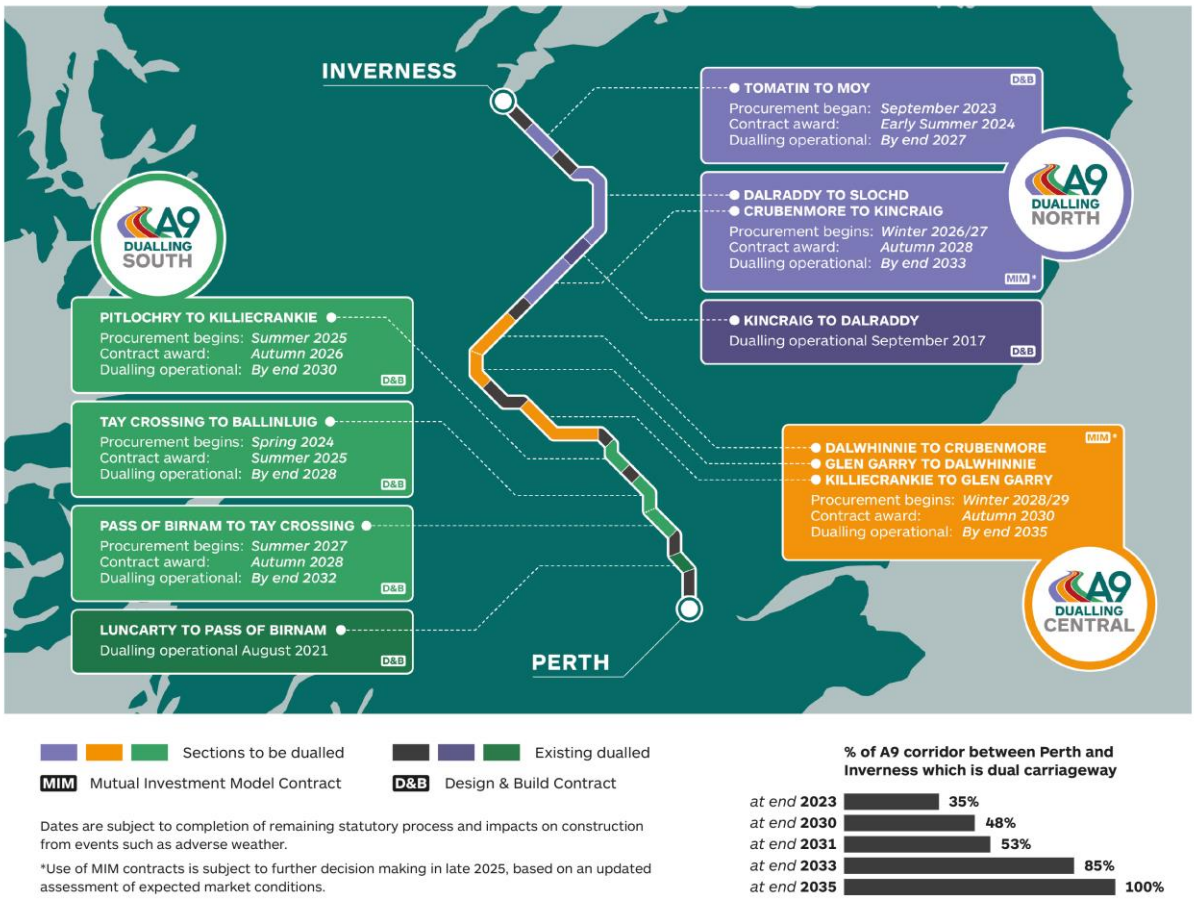

Diagram 1: A9 Dualling Programme (Transport Scotland, 2025)

21.3.22 The Perth and Kinross Local Development Plan settlement plan for Birnam and Dunkeld (PKC, 2019) was checked and no zoning or plans were identified for the area that may have a cumulative effect in relation to the proposed scheme.

21.3.23 Other reasonably foreseeable developments have been identified in the vicinity of the proposed scheme, but none were found to be subject to EIA so were screened out in accordance with DMRB LA 104.

Construction

21.3.24 The construction period is anticipated as being 3-4 years with a construction phase start date of Winter 2028/29 and the proposed scheme operational by the end of 2032. Construction impacts and effects generally occur in a localised area in the vicinity of particular construction activities (e.g. earthwork excavations, foundation piling, or formation of road pavement). As such, whilst there is currently limited information regarding construction, it is unlikely that individual receptors will be affected by multiple projects, due to their geographical separation. Potential Type 2 cumulative construction impacts identified in this assessment comprise the following:

- impacts and effects on visual receptor locations;

- impacts and effects on material asset and waste receptors;
- impacts and effects on receptors associated with the River Tay catchment;
- impacts and effects on the River Tay SAC designation; and
- impacts and effects on users of long-distance WCH routes.

Visual Receptor Locations

21.3.25 The assessment of Type 2 cumulative construction effects on visual receptor locations is summarised in Table 21.2.

Table 21.2: Type 2 Cumulative Effects (of the proposed scheme with other reasonably foreseeable developments) During Construction

Project Name	Details	Cumulative Impact
A9 Dualling: Luncarty to Pass of Birnam	Operational since August 2021 so included in baseline of this EIAR.	None
A9 Dualling: Tay Crossing to Ballinluig (Figure 11.3h and Figure 11.4c)	Construction 2025-28, which adjoins the proposed scheme north of the Tay Crossing. The intersect between the projects has commonly affected receptors. This assessment takes into consideration a potential overlap in construction for year 2028 (between construction start date for the proposed scheme and the construction end date for A9 Dualling: Tay Crossing to Ballinluig). *Visual receptors – building locations* The duration of construction phase residual effects would extend at some visual receptor building locations when the Tay Crossing to Ballinluig project is considered in combination with the proposed scheme. The combined cumulative residual visual effects experienced during construction are predicted to be **Large** at Inch Cottage (visual receptor building location 103) and at Inchmagrannachan Farmhouse, The Steading and The Coppers (visual receptor building location 104) and **Moderate** at Cottage No 3 and Cottage No 4 Inchmagrannachan and at 1 – 4 Silver Knowe, Inchmagrannachan (part of visual receptor building location 105), Woodlands (visual receptor building location 107) and Dalmarnock (visual receptor building location 108). Visual effects at other visual receptor building locations with visibility of both projects would be non-significant. *Visual receptors – outdoor locations* The duration of construction phase residual effects would extend at some visual receptor outdoor locations when the	Significant

Project Name	Details	Cumulative Impact
	Tay Crossing to Ballinluig project is considered in combination with the proposed scheme. The combined cumulative residual visual effects experienced during construction are predicted to be **Large** at Core Path DUNK/100 (visual receptor outdoor location O37), NCR77 (visual receptor outdoor location O2), the B898 (visual receptor outdoor location O36) and the Highland Main Line railway (visual receptor outdoor location O1B) and **Moderate** at RCR83 (visual receptor outdoor location O33), King's Pass (C502) Road (visual receptor outdoor location O32) and at Creag an Uamhaidh cairn, Tay Forest Park (visual receptor outdoor location O38). Visual effects at other visual receptor outdoor locations with visibility of both projects would be non-significant.	
A9 Dualling: Pitlochry to Killiecrankie	Construction 2026-30, but southern extent of the project is approximately 13km north of the end of the proposed scheme and the same receptors are unlikely to be affected.	Not Significant
A9 Dualling: Killiecrankie to Glen Garry	Construction 2030-35, but the southern extent of the project is approximately 21km north of the proposed scheme and the same receptors are unlikely to be affected.	Not Significant
A9 Dualling: Glen Garry to Dalwhinnie	Construction 2030-35, but the southern extent of the project is approximately 40km north of the proposed scheme and the same receptors are unlikely to be affected.	Not Significant
A9 Dualling: Dalwhinnie to Crubenmore	Construction 2030-35, but the southern extent of the project is approximately >50km north of the proposed scheme.	Not Significant
A9 Dualling: Crubenmore to Kincraig	Construction 2028-33, but the southern extent of the project is approximately >50km north of the proposed scheme.	Not Significant
A9 Dualling: Kincraig to Dalraddy	Operational since 2017. As the project has been completed prior to commencement of the proposed scheme no cumulative impacts are identified.	None
A9 Dualling: Dalraddy to Slochd	Construction 2028-33, but the southern extent of Project 11 is >50km north of the proposed scheme.	Not Significant
A9 Dualling: Tomatin to Moy	Construction 2024-27, but the southern extent of Project 12 is >50km north of the proposed scheme.	Not Significant

Material Assets and Waste

21.3.26 Chapter 14: Material Asset and Waste indicates that a **Moderate** significant effect is likely for the Waste element of this assessment. This is due to the proposed scheme's potential use of the available non-hazardous landfill capacity within the second study area (Tayside, Central and Fife Local Authority Region) during its anticipated construction period (2028 to 2032), as well as the use of non-hazardous landfill capacity outside the second study area. The substantial quantities (29,452 t) of surplus excavation material that may be landfilled during the construction of the proposed scheme primarily contribute to this likely significant effect.

21.3.27 There is potential for a significant Type 2 cumulative effect on the available non-hazardous landfill capacity within the second study area. This effect could occur if the construction phases of other committed A9 Dualling programme projects coincide with the construction phase of the proposed scheme (see Table 21.1), and if these projects (a) dispose of non-hazardous waste within the second study area, and (b) dispose of more than 1% of non-hazardous project waste outside the second study area. This further assumes that all these projects are assessed according to the same DMRB LA 110 standard significance criteria.

21.3.28 No significant effects have been identified regarding the Material Assets element of this assessment, which includes the overall material recovery/recycling rate, incorporation of reused/recycled aggregate content, and sterilisation of mineral safeguarding sites and/or peat resources. Additionally, due to the nature of the significance category descriptions for overall material recovery/recycling and incorporation of reused/recycled aggregate content, these independent matters do not have the potential to generate negative cumulative effects with other reasonably foreseeable developments within the second study area.

21.3.29 This is because material recycling and recovery focus on the beneficial effects of reusing materials, which reduces the need for new raw materials and minimises waste. Unlike waste disposal, which can lead to cumulative negative effects such as increased landfill use and associated environmental effects, material recycling and recovery contribute positively by reducing waste and conserving natural resources. These activities are therefore inherently beneficial and do not compound negative effects in the same way that waste disposal does. In contrast, waste disposal can lead to cumulative effects because multiple projects disposing of waste simultaneously can overwhelm available landfill capacities.

River Tay Catchment

21.3.30 The proposed scheme is located within the River Tay catchment, which also includes the following A9 Dualling projects: Luncarty to Pass of Birnam, Tay Crossing to Ballinluig, Pitlochry to Killiecrankie, Killiecrankie to Glen Garry and Glen Garry to Dalwhinnie.

21.3.31 No significant residual construction effects have been identified and, taking this and non-significant effects into account, no significant cumulative effect is expected on the River Tay catchment.

River Tay SAC

21.3.32 A detailed consideration of the potential effects on European sites; the River Tay SAC, in the context of The Conservation (Natural Habitats, & c.) Regulations 1994 (referred to as the Habitats Regulations), has been undertaken in a Habitats Regulations Appraisal (HRA) for the proposed scheme which considers construction and operational impacts of the proposed scheme on the River Tay SAC in-combination with other reasonably foreseeable projects. The outcome is summarised under consideration of operational Type 2 cumulative effects.

21.3.33 No cumulative construction effects are predicted.

Long Distance WCH Routes

21.3.34 There is one long distance WCH route, the NCR 77, in the vicinity of the proposed scheme (Figure 17.1 and Figure 17.2) and that also runs adjacent to other A9 Dualling Projects.

21.3.35 The proposed scheme would have a residual significant effect on NCR 77 during construction due to impacts on amenity and diversion lengths. There is potential for non-significant cumulative construction impacts on amenity value and potential diversions of NCR 77 arising from A9 Dualling: Tay Crossing to Ballinluig project and A9 Dualling: Pitlochry to Killiecrankie project. However, the resultant cumulative construction effect is not expected to be significant.

Operation

21.3.36 Potential Type 2 cumulative operational effects identified in this assessment arise from the following:

- impacts and effects on landscape and visual receptors;
- impacts and effects on receptors associated with the River Tay catchment;
- impacts and effects on the River Tay SAC designation;
- impacts and effects on receptors associated with woodland loss (especially AWI areas);
- impacts and effects on receptors of land-take from land holdings which are present within multiple project boundaries; and
- impacts and effects on long-distance WCH routes from multiple projects.

Landscape and visual receptors - local landscape character areas (LLCAs) (Figure 10.2)

21.3.37 North of the Tay Crossing, part of the Tay Crossing to Ballinluig project (ch0 to ch570) and the proposed scheme (ch7600 to ch8280) intersect within the Strath Tay: Lower Glen LLCA. The northernmost extents of the proposed scheme lie within the Strath Tay: Mid Glen LLCA (ch8280 to ch8420), also intersecting with the Tay Crossing to Ballinluig project.

21.3.38 Impacts on the elements and features which define the Strath Tay: Lower Glen LLCA would result from the following combined cumulative effects associated with the Tay Crossing to Ballinluig project (ch0 to ch570) and the proposed scheme (ch7600 to ch8280):

- The earthworks associated with the River Tay Bridge temporary launching platform would result in the loss of an area of scrub woodland and the introduction of associated earthworks.
- The introduction of a proposed SuDS feature and associated earthworks, resulting in the loss of an area of riparian woodland adjacent to the northbound carriageway of the proposed scheme at ch7900.
- Widening of the carriageway and associated cuttings on the southbound side of the proposed scheme from ch7900 to ch8280, resulting in the loss of an area of low-lying scrub and a number of mature trees.
- Introduction of signage along the road corridor, resulting in an increase in visible road infrastructure.
- The removal of the Tay Crossing to Ballinluig A9 Southern Tie-in Interim Roundabout and associated signage and lighting (located within the neighbouring Strath Tay: Mid Glen LLCA) would remove indirect effects at night.

21.3.39 During the winter of the year of opening of the proposed scheme, its interaction with the Tay Crossing to Ballinluig project would result in **Large** combined cumulative residual effects on the Strath Tay: Lower Glen LLCA. However, the significance of these combined cumulative residual effects would reduce to **Moderate** in the summer 15 years after opening following the establishment of species-rich grassland, broadleaved and riparian woodland, scattered scrub and individual trees as mitigation planting.

21.3.40 Impacts on the elements and features which define the Strath Tay: Mid Glen LLCA would result from the following combined cumulative effects associated with the Tay Crossing to Ballinluig project (ch570 to ch1050) and the proposed scheme (ch8280 to ch8420):

- Widening of the carriageway and associated cuttings on the southbound side (including visually prominent cuttings near Woodlands (Tay Crossing to Ballinluig project ch650 to ch1050)), resulting in the loss of an area of low-lying scrub and a number of roadside trees.
- The removal of the Tay Crossing to Ballinluig A9 Southern Tie-in Interim Roundabout and associated signage and lighting (located within the neighbouring Strath Tay: Mid Glen LLCA) would remove direct effects at night.

21.3.41 During the winter of the year of opening of the proposed scheme, the interaction with the Tay Crossing to Ballinluig project would result in **Large** combined cumulative residual effects on the Strath Tay: Mid Glen LLCA. However, the significance of these combined cumulative residual effects would reduce to **Moderate** in the summer 15 years after opening following the establishment of species-rich grassland, scattered scrub and individual trees as mitigation planting.

Landscape and visual receptors - Special Landscape Qualities (SLQs) of the River Tay (Dunkeld) NSA

21.3.42 There would be no significant risk to the integrity of the River Tay (Dunkeld) NSA. There would be **Moderate** combined cumulative residual effects during the winter of the year of opening on SLQs 1, 2, 3, 4, 5, 7 and 8. However, in the summer 15 years after opening, following establishment of the proposed mitigation planting, combined cumulative residual effects on these SLQs would reduce to not significant (Slight).

Landscape and visual receptors - building locations (Figure 11.3 g-h)

21.3.43 The following section highlights those visual receptor building locations that are likely to experience significant (**Moderate** and above) combined cumulative residual visual effects post-mitigation.

21.3.44 Residents at Inch Cottage (visual receptor building location 103), Inchmagrannachan Farmhouse, The Steading and The Coppers (visual receptor building location 104), Cottage No 3 and Cottage No 4 Inchmagrannachan, and 1 – 4 Silver Knowe, Inchmagrannachan (part of visual receptor building location 105) would all experience **Moderate** combined cumulative residual visual effects during the winter of the year of opening of the proposed scheme. These combined cumulative residual effects would result from the earthworks associated with the Tay Crossing to Ballinluig project and the proposed scheme widened mainline, SuDS features, and culverts and the earthworks associated with the River Tay Bridge temporary launching platform in views east, resulting in the removal of existing vegetation along the A9 road corridor and an increase in visibility of A9 traffic. The removal of road lighting associated with the Tay Crossing to Ballinluig A9 Southern Tie-in Interim Roundabout would, however, reduce visual effects at night. The combined cumulative residual effects would reduce to Slight in the summer 15 years after opening following the establishment of scattered scrub and individual trees and broadleaved woodland mitigation planting.

21.3.45 **Moderate** combined cumulative residual visual effects would also be experienced during the winter of the year of opening of the proposed scheme by residents at Woodlands (visual receptor building location 107). These combined cumulative residual effects would be due to the proposed cutting slopes (to the immediate west of the property) associated with the Tay Crossing to Ballinluig project, resulting in the loss of existing roadside trees and scrub and an increase in visibility of vehicles on the widened mainline. The removal of road lighting and signage associated with the Tay Crossing to Ballinluig A9 Southern Tie-in Interim Roundabout would, however, slightly reduce visual effects, particularly at night. Views towards the proposed scheme would be screened by existing intervening vegetation and topography. The combined cumulative residual effects would reduce to Slight in the summer 15 years after opening following the establishment of mixed woodland, individual trees, scrub and species-rich grassland as mitigation planting.

21.3.46 Residents at Dalmarnock (visual receptor building location 108) would also experience **Moderate** combined cumulative residual visual effects during the winter of the year of opening of the proposed scheme. These combined cumulative residual effects would result from the proposed southbound widening and associated earthworks and the loss of existing woodland and trees, resulting in an increase in visibility of vehicles on the widened mainline along the Tay Crossing to Ballinluig project. Distant views towards the proposed scheme would, however, be largely screened by existing intervening vegetation and topography. The

combined cumulative residual effects would reduce to Slight in the summer 15 years after opening following the establishment of mixed woodland, individual trees, scrub and species-rich grassland as mitigation planting.

Landscape and visual receptors - outdoor locations (Figure 11.4b)

21.3.47 The following section highlights those visual receptor outdoor locations that are likely to experience significant (**Moderate** and above) combined cumulative residual visual effects post-mitigation.

21.3.48 Walkers on Core Path DUNK/100 (visual receptor outdoor location O37) would experience **Large** combined cumulative residual visual effects during the winter of the year of opening of the proposed scheme as a result of the proposed realignment of the route along the new River Tay Bridge, the proposed mainline widening, the temporary launching platform associated with the new River Tay Bridge, SuDS features, all associated earthworks and retaining structures, the introduction of new roadside signage, plus the removal of existing vegetation along the A9 road corridor. The removal of the Tay Crossing to Ballinluig A9 Southern Tie-in Interim Roundabout plus associated road signage and lighting would, however, reduce visual effects at night. The combined cumulative residual effects would reduce to **Moderate** in the summer 15 years after opening following the establishment of species-rich grassland, broadleaved and mixed woodland, scattered scrub and individual trees as mitigation planting.

21.3.49 Cyclists on RCR83 (visual receptor outdoor location O33) and vehicle travellers on King's Pass (C502) Road (visual receptor outdoor location O32) would both experience **Moderate** combined cumulative residual visual effects during the winter of the year of opening of the proposed scheme. These combined cumulative residual effects would be due to the proposed cutting slopes and earthworks associated with the temporary Tay Bridge launching platform which would result in the removal of existing vegetation along the A9 road corridor, thereby opening up views to the proposed mainline widening, the new grade-separated junction at Dalguise, the new River Tay Bridge, SuDS feature, all associated earthworks and retaining structures, the introduction of new roadside signage and A9 traffic. The removal of road lighting associated with the Tay Crossing to Ballinluig A9 Southern Tie-in Interim Roundabout would, however, reduce visual effects at night. The combined cumulative residual effects would reduce to Slight in the summer 15 years after opening following the establishment of species-rich grassland, broadleaved and mixed woodland, scattered scrub and individual trees as mitigation planting.

21.3.50 **Large** combined cumulative residual visual effects would be experienced by cyclists on NCR77 (visual receptor outdoor location O2) during the winter of the year of opening. These combined cumulative residual effects would result from proposed realignment of the route along the new River Tay Bridge and all earthworks associated with the Tay Crossing to Ballinluig project and the proposed scheme widened mainline, SuDS features, and culverts and the earthworks associated with the River Tay Bridge temporary launching platform in views east, resulting in the removal of existing vegetation along the A9 road corridor and an increase in visibility of A9 traffic. The removal of road lighting associated with the Tay Crossing to Ballinluig A9 Southern Tie-in Interim Roundabout would, however, reduce visual effects at night. The combined cumulative residual effects would reduce to **Moderate** in the summer 15

years after opening following the establishment of species-rich grassland, broadleaved, mixed and riparian woodland, scattered scrub and individual trees as mitigation planting.

21.3.51 Vehicle travellers on the B898 (visual receptor outdoor location O36) and rail travellers on the Highland Main Line railway (visual receptor outdoor location O1B) would both experience **Moderate** combined cumulative residual visual effects during the winter of the year of opening of the proposed scheme. These combined cumulative residual effects would result from the new River Tay Bridge and all earthworks associated with the Tay Crossing to Ballinluig project and the proposed scheme widened mainline, SuDS features, culverts and the earthworks associated with the River Tay Bridge temporary launching platform in views east, resulting in the removal of existing vegetation along the A9 road corridor and an increase in visibility of A9 traffic. The removal of road lighting associated with the Tay Crossing to Ballinluig A9 Southern Tie-in Interim Roundabout would, however, reduce visual effects at night. The combined cumulative residual effects would reduce to Slight in the summer 15 years after opening following the establishment of species-rich grassland, broadleaved, mixed and riparian woodland, scattered scrub and individual trees as mitigation planting.

River Tay Catchment

21.3.52 During operation, the proposed scheme would have a neutral effect on flood risk.

21.3.53 The River Tay upstream A9 Dualling projects (Tay Crossing to Ballinluig, Pitlochry to Killiecrankie, Killiecrankie to Glen Garry and Glen Garry to Dalwhinnie) are not expected to result in an increase in flood risk during operation, as summarised below.

- The A9 Dualling: Tay Crossing to Ballinluig project identifies operation phase adverse residual impacts with Moderate significance for the River Tay due to increases in fluvial flood depth from the 0.5% AEP (200-year) plus CC event at the following locations:
  - Field at ch6400 (north of Kindallachan) on the east side of the A9. Increased flood depth of 10mm on existing flood depths of up to 3.6m.
  - Area of land on right (west) bank of the River Tay result in an increase in peak water level of up to 13mm for the 0.5% (200-year) plus CC design event on a baseline flood depth of up to 0.8m.
- The A9 Dualling: Pitlochry to Killiecrankie project has been assessed as having a net beneficial effect due to a reduction in flood risk to residential properties as a result of the proposed mitigation. Adverse residual impacts from flood risk relate to localised increases in flood depths on agricultural land already subject to flooding from the loss of floodplain storage. The results of the flood models do not indicate a material change in flood risk passed downstream.
- The A9 Dualling: Killiecrankie to Glen Garry project has been assessed as having a net beneficial effect on flood risk. Significant adverse residual effects from flood risk are reported for the River Garry, Allt Bhaic and a small watercourse near Calvine. These adverse residual effects from flood risk relate to localised increases in flood depths on agricultural land and a minor road (B847 at Calvine), which are locations already subject to flooding. Beneficial residual effects associated with flood risk are also reported for three

watercourses where the risk of flooding is removed from seven properties. The results of the flood models do not indicate a material change in flood risk passed downstream.

- The A9 Dualling: Glen Garry to Dalwhinnie project has been assessed to achieve a Neutral significance for flood risk through the provision of compensatory storage areas (based on a level for-level volume-slices approach) designed to offset the loss of functional floodplain from encroachment of mainline, access tracks and SuDS. The results of the flood models do not indicate a material change in flood risk passed downstream.

21.3.54 Consequently, no cumulative effect on flood risk is expected on the River Tay.

River Tay SAC

21.3.55 The HRA in-combination assessment (Jacobs, 2025) reports that the A9 Dualling projects that directly affect the River Tay SAC through land-take (the proposed scheme, Tay Crossing to Ballinluig; Pitlochry to Killiecrankie; and Killiecrankie to Glen Garry) are predicted to result in *de minimus* effects. The areas identified to be subject to land-take were not determined to be ecologically important or functionally necessary to the qualifying interests of the River Tay SAC. It was therefore concluded that there would be no cumulative/in-combination effect on the site's conservation objectives.

21.3.56 No cumulative effect on the River Tay SAC is predicted.

Woodland Loss

21.3.57 As part of the iterative design process for each of the A9 Dualling projects, loss of areas of woodland has been avoided or reduced, for example by refining the road alignment or using retaining walls to reduce earthworks extents. However, as much of the A9 runs through areas with numerous environmental constraints, removal of existing woodland is necessary on each of the A9 Dualling projects. In line with Scottish Government policy (Forestry Commission Scotland, 2009 and 2019), each project has aimed to replant equivalent areas of woodland to achieve no overall loss (i.e. 1:1 replacement). Woodland connectivity has also been considered at a project and programme level to ensure that this is maintained or enhanced.

21.3.58 Proposed replacement planting can mitigate woodland loss, and as tree cover becomes established the woodland functionality will develop and currently fragmented woodland areas will be connected to reduce existing fragmentation. However, AWI has a particularly high intrinsic value due to its age, which means it is not readily replaceable, and for this reason AWI loss remains a significant residual effect of the proposed scheme. Given an expectation of similar residual effects on other A9 projects, it is considered that this will constitute a significant cumulative effect for the A9 Dualling programme.

Land-take from Land-holdings

21.3.59 Where land-holdings are present within multiple project boundaries there is a potential for a cumulative effect from the A9 Dualling projects. The assessment of this for the proposed scheme is detailed in Table 21.4.

Table 21.4: Cumulative Operational Effects (Type 2) – Land-take

Project Name	Details	Cumulative Effect
A9 Dualling: Luncarty to Pass of Birnam	Murthly Estate is affected by land-take for the Luncarty to Pass of Birnam project and also has land holdings subject to land-take for the proposed scheme. Based on the cross-project baseline and assessment information currently available and using professional judgement, it is assessed that the cumulative impact on this land interest would be not significant in the context of the EIA Regulations.	Not significant
A9 Dualling: Tay Crossing to Ballinluig	Atholl Estate is affected by land-take for the Tay Crossing to Ballinluig project and also has land holdings subject to land-take for the proposed scheme. Based on the cross-project baseline and assessment information currently available and using professional judgement, it is assessed that the cumulative impact on this land interest would not be significant in the context of the EIA Regulations.	Not significant
A9 Dualling: Killiecrankie to Glen Garry	Atholl Estate is affected by land-take for the Killiecrankie to Glen Garry project and also has land holdings subject to land-take for the proposed scheme. Based on the cross-project baseline and assessment information currently available and using professional judgement, it is assessed that the cumulative impact on this land interest would not be significant in the context of the EIA Regulations.	Not significant

Long-distance NMU routes

21.3.60 The proposed scheme would have a significant residual effect on users of NCR 77 during operation due to impacts on amenity and diversion lengths (as well as the significant Type 2 residual visual effects during winter of the year of opening already discussed in paragraph 21.3.50). There is potential for non-significant cumulative impacts on amenity value and potential diversions of NCR 77 arising from A9 Dualling: Tay Crossing to Ballinluig project and A9 Dualling: Pitlochry to Killiecrankie project. However, the resultant cumulative effect is not expected to be significant.

21.4 Conclusions

21.4.1 Significant Type 1 cumulative effects (of the proposed scheme) are not expected during construction but are expected during operation for the following receptors:

- Ballincrieff: Visual effects at winter year of opening and in the summer 15 years after opening combined with effects arising from land-take and change in access; and beneficial noise effects.
- Oakwood, Tomcroy House, Barbed Wire and Poppies: Visual effects at winter year of opening and in the summer 15 years after opening combined with beneficial noise effects.
- Rowanlea: Visual effects at winter year of opening combined with effects arising from land-take and change in access; and beneficial noise effects.
- Dowiestone, 6 Perth Road, Carse-na-Tay, Shian, Wychwood and Hollybank: Visual effects at winter year of opening combined with beneficial noise effects.
- 1 Station Cottages: Visual effects at winter year of opening combined with beneficial noise effects.
- 8 Station Road: Visual effects at winter year of opening combined with beneficial noise effects.
- 10 Station Road (Tirohia): Visual effects at winter year of opening combined with effects arising from land-take and change in access; and beneficial noise effects.
- Dunkeld & Birnam Station: Visual effects at winter year of opening and in the summer 15 years of opening combined with effects arising from land-take and change in access, effects on historic buildings; and beneficial noise effects.
- 12 and 13 Birnam Terrace: Visual effects at winter year of opening combined with beneficial noise effects.
- The Merryburn Hotel: Visual effects at winter year of opening combined with beneficial noise effects.
- Craigvinean Surgery: Visual effects at winter year of opening combined with beneficial noise effects.
- Dunkeld & Birnam Recreation Club: Visual effects at winter year of opening combined with beneficial noise effects.
- Sunnybank Cottage and Niel Gow Cottage: Visual effects at winter year of opening combined with beneficial noise effects.

21.4.2 Significant Type 2 cumulative effects (of the proposed scheme with other reasonably foreseeable developments) are expected during construction and operation as follows:

- Construction
  - Five visual receptor building locations due to construction activities.
  - Seven visual receptor outdoor locations due to construction activities.

- Material assets and waste (waste element) due to the proposed scheme's potential use of the available non-hazardous landfill capacity within the second study area as well as the use of non-hazardous landfill capacity outside the second study area.

- Operation
  - Strath Tay: Lower Glen LLCA during the winter of the year of opening and in the summer 15 years after opening due to the combined effects of the proposed scheme and the A9 Dualling: Tay Crossing to Ballinluig project road infrastructure and loss of vegetation.
  - Strath Tay: Mid Glen LLCA during the winter of the year of opening and in the summer 15 years after opening due to the combined effects of the proposed scheme and the A9 Dualling: Tay Crossing to Ballinluig project road infrastructure and loss of vegetation.
  - River Tay (Dunkeld) NSA during the winter of the year of opening on SLQs 1, 2, 3, 4, 5, 7 and 8 due to the combined effects of the proposed scheme and the A9 Dualling: Tay Crossing to Ballinluig project road infrastructure and loss of vegetation.
  - Five visual receptor building locations during the winter of the year of opening due to the combined effects of the proposed scheme and the A9 Dualling: Tay Crossing to Ballinluig project road infrastructure and loss of vegetation.
  - Six visual receptor outdoor locations during the winter of the year of opening and two in the summer 15 years after opening due to the combined effects of the proposed scheme and the A9 Dualling: Tay Crossing to Ballinluig project road infrastructure and loss of vegetation.
  - AWI habitat due to loss of irreplaceable woodland across the A9 Dualling programme projects.

21.4.3 It is acknowledged that depending on the detailed design for the other projects of the A9 Dualling programme, additional cumulative effects are possible. It may be possible to mitigate such effects and the cumulative effects identified in this EIAR through the coordination and refinement of the construction programmes of the A9 Dualling programme projects. The detailed design and construction programmes will continue to be considered by Transport Scotland.

21.5 References

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