

20 Cumulative Impacts

This chapter considers the potential for cumulative impacts of the proposed scheme, and of the proposed scheme in combination with 'reasonably foreseeable' developments (committed developments and other major development proposals, including those forming part of the wider A9 dualling programme).

Potential for cumulative impacts due to the combined effect of a number of different environmental impacts of the proposed scheme on a single receptor/resource was assessed, based on the findings of the topic chapters in this ES. Significant cumulative impacts on nine people/property receptors are expected to result from residual visual, noise, access and land-take impacts of the proposed scheme (Type 1 impacts). These receptors are Clunebeg Bungalow, Clunebeg Farmhouse, Tigh Bruadar, Garrybank, Glackmore Farm, 1 Essangal Cottage, Tomchitchen, Pitaldonich, and Balnastuartach.

The combination of projects forming the A9 dualling programme from Perth to Inverness was identified as having the potential to have a cumulative impact in terms of loss of woodland (including areas on the Ancient Woodland Inventory; AWI), material use and waste management, long distance NMU routes, and land-take from land holdings affected by multiple projects. In relation to construction impacts on NCR7 and operational impacts resulting from the loss of AWI, significant cumulative impacts are expected. Further details of the expected impacts from other A9 dualling projects are required to confirm the level of these cumulative impacts. It may be possible to mitigate construction impacts on NCR7 through coordination and refinement of the construction programmes of the A9 dualling projects but these are not known at this stage. The detailed design and construction programmes will continue to be considered at a strategic level by Transport Scotland and in future scheme assessments as more information becomes available.

No significant cumulative impacts are expected for materials and waste from the other A9 dualling projects.

Cumulative impacts due to changes in traffic volumes as a consequence of dualling the A9 from Perth to Inverness were incorporated into the relevant assessments reported in Chapters 8 to 19 of this ES and are not considered in this chapter.

No other cumulative impacts were identified in terms of the proposed scheme in combination with any other reasonably foreseeable project.

20.1 Introduction

20.1.1 European Commission 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'.

20.1.2 DMRB HA218/08 (The Highways Agency et al., 2008a) provides a glossary of technical terms, which expands on the above definition, noting that a cumulative impact may arise as the result of:

- a) the combined impact of a number of different environmental topic-specific impacts from the proposed scheme on a single receptor/resource; and*
- b) the combined impact of a number of different projects within the vicinity (in combination with the proposed scheme) on a single receptor/resource'.*

20.1.3 This chapter therefore includes consideration of both the impacts of the proposed scheme on receptors, and the impacts of other 'reasonably foreseeable' projects in line with the EC guidelines.

20.1.4 The assessments as reported in Chapters 8 to 19 of this ES have, where relevant, already taken into account the potential for cumulative impacts within a specific topic area as a result of a number of different activities affecting a single receptor. An example of this is Chapter 11 (Road Drainage and the Water Environment), which identified a single level of overall significance for each water feature, taking into account a number of different activities potentially affecting the same waterbody (such as bridge or culvert construction, installation or realignment of outfalls). This chapter refers back to this approach, but does not aim to extract the cumulative element of these assessments.

20.1.5 Traffic modelling (TMfS14) has indicated that whilst individual A9 dualling projects are generally not likely to notably affect the traffic demand at a local level, the cumulative impact of full implementation

of wider programme of A9 dualling works may be to increase traffic flows on the A9 by attracting additional usage of this strategic route. To ensure that the potential cumulative impact 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 EIA therefore included the traffic increase predicted as a consequence of implementing the full programme of works to dual the A9. As a consequence, potential cumulative environmental impacts of these traffic changes are incorporated within these assessments, so no supplementary assessment is required:

- Chapter 9 (People and Communities: All Travellers): non-motorised users such as pedestrians and cyclists and driver stress.
- Chapter 11 (Road Drainage and the Water Environment): water quality of receiving watercourses; and drainage design.
- Chapter 16 (Air Quality).
- Chapter 17 (Noise & Vibration).

20.2 Approach and Methods

General Approach

- 20.2.1 This chapter considers the following two categories of scenario to identify potential for significant cumulative impacts, based on the DMRB HA218/08 guidance:
- **Type 1 cumulative impacts:** the combined impact of a number of different environment topic-specific impacts arising as a result of the proposed scheme on a single sensitive receptor/resource; and
 - **Type 2 cumulative impacts:** the combined impacts of the proposed scheme with other 'reasonably foreseeable' developments on a single sensitive receptor/resource.
- 20.2.2 Taking into account guidance provided within DMRB HA205/08 (The Highways Agency et al., 2008b) 'reasonably foreseeable', in relation to Type 2 cumulative impacts was determined to include 'committed' projects, including:
- confirmed trunk road and motorway projects (i.e. gone through the statutory processes);
 - other relevant projects of the A9 dualling programme irrespective of their status; and
 - committed developments with consented, or yet to be determined, planning applications valid within the period 01 October 2017 and 30 September 2017 (i.e. within a three-year implementation timeframe, and for which formal EIA is a requirement or for which non-statutory EIA has been requested by the determining local authority to support the planning application).
- 20.2.3 The study area was defined as up to 500m from the proposed scheme for the purposes of initial identification of committed developments. However, a wider area search of additional projects that may contribute to a cumulative impact was then undertaken through review of planning information such as development plans (refer to Chapter 19: Policies and Plans), which included the projects of the A9 dualling programme.
- 20.2.4 Approved applications outwith the 01 October 2014 to 30 September 2017 period stated above are either assumed to have lapsed or been completed, at which point they are assessed as existing land use. However, where consultation with landowners and the planning authority has confirmed the presence of a planning application outwith this period which is an extant consent (e.g. due to development being initiated but not completed), this was included in the assessment.
- 20.2.5 Further to the above, a review of other major developments beyond those that are 'committed' was also undertaken to ascertain whether any should justifiably be included in the assessment by virtue of their scale, location or timing.

- 20.2.6 Consultation was undertaken with the local authorities PKC and Cairngorms National Park Authority (CNPA), who were requested to confirm the committed developments proposed for inclusion in the cumulative assessment.

Identification of Cumulative Impacts

Type 1 Cumulative Impacts (of the proposed scheme)

- 20.2.7 To consider the potential for a combined effect of different environmental topic-specific impacts on a single receptor/resource, a review was undertaken of the topic-area environmental assessments undertaken as part of the EIA process, as reported in Chapters 8 to 19 of the ES.
- 20.2.8 The assessment paid particular attention to the impacts summarised in Chapter 22 (Summary of Significant Residual Impacts), which are those that are expected to remain as significant in the context of the EIA Regulations after application of any proposed mitigation, as these generally have the greatest potential to contribute to a significant cumulative impact. It is possible to have multiple significant residual impacts (as reported in the ES chapters for each environmental parameter) which in combination do not constitute an *additional* significant (cumulative) impact. However, it is also acknowledged that there is potential that multiple non-significant impacts in combination could result in a significant cumulative impact, and therefore residual impacts of Slight significance and above were reviewed including non-significant residual impacts reported in the individual assessments of this ES. Impacts of negligible or neutral significance were excluded from the assessment as by definition they are inconsequential.
- 20.2.9 Impacts on cultural heritage assets and all travellers were not considered in the identification of Type 1 cumulative impacts, as the assessments in these chapters already take into account other environmental parameters when determining significance of impact. For example, to determine impacts on setting of cultural heritage assets the assessment takes into account proximity, land-take, landscape, visual and noise impacts. Similarly, for impacts on all travellers the assessment requires journey length changes and changes to amenity to be considered, which takes into account visual, air quality, and noise impacts.
- 20.2.10 The significance of Type 1 cumulative impact was assessed through a three stage process:
- Stage 1 (Topic Areas): review of the residual impacts from the individual disciplines and, using professional judgement, identification of potential for interaction with other topic areas. For the proposed scheme visual, noise, community and private assets (land-take and revised access) were identified as having the potential to result in combined impacts. In addition, multiple impacts on the River Garry (ecological receptors, geomorphology and flood risk) were also considered.
 - Stage 2 (Cumulative Impacts): cumulative impacts were identified where significant impacts were assessed in two or more disciplines. In addition, professional judgement was used to determine where multiple non-significant impacts (Slight or Slight/Moderate) combined to result in a cumulative impact.
 - Stage 3 (Significance of Cumulative Impacts): where cumulative impacts were identified, the nature of these combined impacts were considered e.g. duration (temporary or permanent), extent, frequency and sensitivity of the receptor, and the significance determined using professional judgement.

Type 2 Cumulative Impacts (of the proposed scheme with other developments)

- 20.2.11 To consider the combined impact of a number of different projects on a single receptor/resource in combination with the proposed scheme, the planning applications or permissions listed in Chapter 8 (People and Communities: Community and Private Assets) were reviewed. There is often little information available regarding these developments or likely timing, so professional judgement was used where necessary to qualitatively ascertain likelihood of environmental impacts on receptors that may also be affected by the proposed scheme. As noted, previously, this cumulative impact assessment included a data review and consultation to identify any additional large-scale developments beyond the 500m study area to identify any that should be added to the assessment due to their scale, location or timing.

- 20.2.12 Professional judgement was used by EIA specialists to identify potentially significant cumulative impacts, based on a review of all findings of this ES and available information regarding other committed developments, including those forming part of the A9 dualling programme.

Limitations to Assessment

- 20.2.13 The cumulative impact assessment has utilised available information on other likely developments, including the other projects of the A9 dualling programme from Perth to Inverness. However, this assessment has only been able to take account of currently available information, so the potential for cumulative impacts to occur due to subsequent A9 dualling projects at earlier stages of design development is identified in this assessment but cannot be quantified.

20.3 Potential Cumulative Impacts

Type 1 Cumulative Impacts (of the proposed scheme)

- 20.3.1 As noted in paragraph 20.1.4, for each environmental topic area as reported in Chapters 8 to 19 of this ES, 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 different environmental topic area impacts on the same areas/receptors.
- 20.3.2 Following implementation of mitigation, there are comparatively few significant residual impacts (Chapter 22: Summary of Residual Significant Impacts) for a large scale development of this type in a sensitive area. 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

- 20.3.3 Chapter 5 (The Proposed Scheme) provides 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.
- 20.3.4 During construction, those properties closest to the construction works, may be subject to several types of temporary disturbance such as changes to visual amenity, noise and vibration, air quality and access to/from properties. Properties within 100m of the indicative land made available (LMA) are identified in Appendix A17.7 (Noise Sensitive Receptors Within 100m of Construction Works). Mitigation is proposed in the relevant chapters to mitigate these impacts during construction. Key controls to facilitate implementation of this mitigation will be the Construction Environmental Management Plan (CEMP) and community liaison strategy, both of which are required by mitigation measures set out in Chapter 22 (Schedule of Environmental Commitments) (Mitigation Item SMC-S1 and Mitigation Item SMC-S3, respectively).
- 20.3.5 Following mitigation, it is anticipated that any potentially significant adverse construction impacts in relation to air quality and noise vibration are unlikely to arise and any that do would be short-term in nature. People's views at approximately 77 built receptor locations are assessed to be significant (Chapter 14: Visual) following the implementation of mitigation. In relation to access to/from properties construction and operation impacts have been assessed together as impacts on community and private assets are expected to be similar during both construction and operational phases of the proposed scheme. Operational impacts on community and private assets are discussed in paragraphs 20.3.7-20.3.9. Visual amenity on outdoor receptors is considered in Chapter 9 (People and Communities – Effects on All Travellers).
- 20.3.6 Taking into account the above residual impacts identified in this ES are not, in combination, considered to constitute an additional cumulative significant impact on any receptor during construction.

Operation

- 20.3.7 The review of the findings of each topic area identified a number of receptors that would be subject to a range of residual impacts that could, in combination, potentially contribute to a Type 1 cumulative impact during operation of the proposed scheme.
- 20.3.8 Receptors potentially affected by cumulative impacts during operation are set out in Table 20.1, and with the exception of the River Garry, are all people/property receptors. Whilst there are other properties along the route of the proposed scheme that may experience some degree of environmental impact, those likely to have the greatest potential for overall cumulative impacts are set out in Table 20.1.

Table 20.1: Cumulative operational impacts of the proposed scheme (Type 1)

Receptor	Description of Individual Impacts	Cumulative Impact
River Garry	<ul style="list-style-type: none"> • Non-significant (Slight) indirect dewatering impacts due to two widenings/cuttings (Chapter 10: Geology, Soils and Groundwater); • Significant (Very Large) changes to flood risk (Chapter 11: Road Drainage and the Water Environment); • Non-significant (Slight) geomorphological changes due to construction of eight outfalls and two bridge structures (Chapter 11: Road Drainage and the Water Environment); • Non-significant habitat disturbance, habitat loss and pollution risk (Chapter 12: Ecology & Nature Conservation); and • Non-significant permanent loss of habitat including areas within the River Tay SAC designation (Chapter 12: Ecology & Nature Conservation). <p><u>Summary</u> Slight dewatering and geomorphology impacts are localised while non-significant habitat impacts on the River Tay SAC are very localised. The residual significant flood risk impact attributed to the River Garry is due to increases in the fluvial flood depth from the 0.5% AEP (200-year) plus CC event on agricultural land and terrestrial habitat, neither of which are deemed sensitive to increased flood depths. As such the cumulative impact is not considered overall to be significant.</p>	Not Significant
House of Urrard and 1-5 Urrard Steading Cottages	<ul style="list-style-type: none"> • Significant (Moderate/Substantial) area of agricultural land-take (Chapter 8 People & Communities - Community and Private Assets); • Non-significant (Sight Moderate) noise increase in the short-term and long-term (Chapter 17: Noise and Vibration); and • Significant visual impacts (Moderate/Substantial) in WYO* and non-significant (Slight/Moderate) visual impacts at SY15** (Chapter 14: Visual). <p><u>Summary</u> Once mitigation planting becomes effective in SY15, the visual impacts reduce to non-significant. Given the limited duration of visual impacts, overall the cumulative impact is not considered to be significant.</p>	Not Significant
Clunebeg Bungalow	<ul style="list-style-type: none"> • Significant (Moderate) changes in vehicle access (Chapter 8 People & Communities - Community and Private Assets); • Non-significant (Slight) beneficial noise decreases in the short-term and non-significant (Slight) adverse noise increases at year of opening (Chapter 17: Noise and Vibration); and • Significant (Substantial in WYO and Moderate in SY15) visual impacts due to new infrastructure that are only partly mitigated by woodland planting (Chapter 14: Visual). <p><u>Summary</u> The combination of significant changes in vehicle access and significant visual impacts at WYO and SY15 are considered to result in a significant cumulative impact overall.</p>	Significant
Tigh Bruadar	<ul style="list-style-type: none"> • Significant (Moderate) changes in vehicle access (Chapter 8 People & Communities - Community and Private Assets); • Non-significant (Slight) beneficial noise decreases in the short-term and non-significant (Slight) adverse noise increases at year of opening (Chapter 17: Noise and Vibration); and • Significant (Substantial in WYO and Moderate in SY15) visual impacts due to new infrastructure that are only partly mitigated by woodland planting (Chapter 14: Visual). <p><u>Summary</u> The combination of significant changes in vehicle access and significant visual impacts at WYO and SY15 are considered to result in a significant cumulative impact overall.</p>	Significant

Receptor	Description of Individual Impacts	Cumulative Impact
Clunebeg Farmhouse	<ul style="list-style-type: none"> • Non-significant (Slight) area of agricultural land-take and significant (Moderate) changes in vehicle access (Chapter 8 People & Communities - Community and Private Assets); • Non-significant (Slight) beneficial noise decrease in the short-term and non-significant (Slight) adverse noise increase in the long-term (Chapter 17: Noise and Vibration); and • Significant (Moderate/Substantial in WYO and Moderate in SY15)) visual changes due to new infrastructure that are only partly mitigated by woodland planting (Chapter 14: Visual). <p><u>Summary</u> The combination of significant changes in vehicle access and significant visual impacts at WYO and SY15 are considered to result in a significant cumulative impact overall.</p>	Significant
1 Essangal Cottage	<ul style="list-style-type: none"> • Moderate (significant) area of residential land-take (Chapter 8 People & Communities - Community and Private Assets); • Slight beneficial noise decrease at in the short-term and long-term (Chapter 17: Noise and Vibration); and • Significant (Moderate) visual impacts in WYO and SY15 due to new infrastructure that are only partly mitigated by woodland planting (Chapter 14: Visual). <p><u>Summary</u> The combination of permanent significant impacts in terms of visual and land-take impacts is considered to result in a significant cumulative impact overall.</p>	Significant
Balnastuartach Farm	<ul style="list-style-type: none"> • Significant (Moderate/Substantial) area of agricultural land-take and significant (Moderate) change in vehicle access (People & Communities – Community and Private Assets); • Significant (Moderate) visual impacts in WYO and non-significant (Slight) visual impacts in SY15 (Chapter 14: Visual); and • Slight beneficial noise decrease in the short-term and long-term (Chapter 17: Noise and Vibration). <p><u>Summary</u> The combination of significant change in access and land-take impacts in addition to significant visual impacts in WYO reducing to non-significant in SY15 is considered to result in an overall significant cumulative impact.</p>	Significant
Glackmore Farm	<ul style="list-style-type: none"> • Significant (Substantial) change in access and non-significant (Slight) impact on agricultural land-take (Chapter 8 People & Communities - Community and Private Assets); • Significant (Substantial in WYO and Moderate in SY15) visual impacts due to new infrastructure that are only partly mitigated by woodland planting (Chapter 14: Visual); and • Non-significant (Slight/Moderate in the short-term and Slight in the long-term) noise increases in the short-term (Chapter 17: Noise and Vibration). <p><u>Summary</u> The combination of permanent significant impacts in terms of changes to vehicle access and visual impacts in addition to non-significant impacts for land-take and noise is considered to result in an overall significant cumulative impact.</p>	Significant
Garrybank	<ul style="list-style-type: none"> • Substantial (significant) changes in vehicle access (Chapter 8 People & Communities - Community and Private Assets); • Non-significant (Slight/Moderate in the short-term and Slight in the long-term) noise decrease (Chapter 17: Noise and Vibration); and • Significant (Substantial in WYO and Moderate/Substantial in SY15) visual impacts due to new infrastructure that are only partly mitigated by woodland planting (Chapter 14: Visual). <p><u>Summary</u> The combination of permanent significant impacts in terms of visual impacts and change in access in addition to non-significant noise impacts is considered to result in an overall significant cumulative impact.</p>	Significant
Pitaldonich Farm	<ul style="list-style-type: none"> • Moderate (significant) area of agricultural land-take (Chapter 8 People & Communities - Community and Private Assets); and • Significant (Moderate/Substantial at WYO and Moderate in SY15) visual impacts due to new infrastructure that are only partly mitigated by woodland planting (Chapter 14: Visual); and • Slight (non-significant) noise increase in the short-term and the long-term (Chapter 17: Noise and Vibration). <p><u>Summary</u></p>	Significant

Receptor	Description of Individual Impacts	Cumulative Impact
	The combination of permanent significant land-take and visual impacts in addition to non-significant adverse noise impacts is considered to result in an overall significant cumulative impact.	
Invervack Farm	<ul style="list-style-type: none"> • Non-significant (Slight) impact on agricultural land-take and significant (Moderate) change in vehicle access (People & Communities – Community and Private Assets); • Significant (Moderate) visual impacts in WYO and non-significant (Slight) visual impacts in SY15 (Chapter 14: Visual); and • Non-significant (Slight) noise increases in the short-term and long-term (Chapter 17: Noise and Vibration). <p><u>Summary</u> Once mitigation planting becomes effective in SY15, the visual impacts reduce to non-significant. Given the limited duration of visual impacts the overall cumulative impact is not considered to be significant.</p>	Not Significant
Tomban	<ul style="list-style-type: none"> • Non-significant (Slight) impact on agricultural land-take and significant (Moderate) change in vehicle access (People & Communities – Community and Private Assets); • Significant (Moderate) visual impacts in WYO and non-significant (Slight) visual impacts in SY15 (Chapter 14: Visual); and • Non-significant (Slight) beneficial noise decrease in the short-term and long-term (Chapter 17: Noise and Vibration). <p><u>Summary</u> Once mitigation planting becomes effective in SY15, the visual impacts reduce to non-significant. Given the limited duration of visual impacts the overall cumulative impact is not considered to be significant.</p>	Not Significant
Tomchitchen	<ul style="list-style-type: none"> • Non-significant (Slight) impact on agricultural land-take and significant (Moderate) change in vehicle access (People & Communities – Community and Private Assets); • Significant (Substantial in WYO and Moderate in SY15) visual impacts due to new infrastructure that are only partly mitigated by woodland planting (Chapter 14: Visual); and • Non-significant (Slight) adverse noise increase in the short-term at and long-term (Chapter 17: Noise and Vibration). <p><u>Summary</u> The combination of significant visual impacts, significant changes in vehicle access in addition to non-significant noise impacts and land-take are considered to result in an overall significant cumulative impact.</p>	Significant

*WYO denotes the winter of the year of opening (when the proposed planting has been implemented but has not established) as report in Chapter 14 (Visual).

**SY15 denotes summer, 15 years after opening (when the proposed planting would be reasonably established) as reported in Chapter 14 (Visual).

20.3.9 As noted in Table 20.1 there are localised journey length increases as a result of removing at-grade junctions on the existing A9. As outlined in Chapter 2 (Need for the Scheme), having all movement grade separated junctions mitigates the need for potentially dangerous right turns across the path of traffic travelling in opposite direction which will improve safety for motorised and non-motorised users.

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

Type 2 Cumulative Impacts (Other Developments)

20.3.11 As noted in Section 20.2 (Approach and Methods), the wider A9 dualling programme from Perth to Inverness was included in the cumulative impact assessment. The A9 dualling programme comprises upgrade to 11 sections of the A9 between Perth and Inverness, as listed in Chapter 1 (Introduction) and shown on Figure 1.1.

20.3.12 Other reasonably foreseeable developments in the vicinity of the proposed scheme include a number of planning applications as shown on Figure 8.1. The extant planning permission for Shierglas Quarry is the only EIA development that is considered to have the potential to contribute towards cumulative

impacts with the proposed scheme. The application is for the relocation of overburden and the working of additional mineral reserves together with the provision of appropriate restoration.

20.3.13 No other committed developments shown on Figure 8.1 are considered to have potential cumulative impacts with the proposed scheme.

Construction

20.3.14 The A9 Dualling construction programme and phasing of individual projects is not yet known, however majority of the A9 programme is anticipated to be constructed from 2019 to 2025, with individual projects typically taking 1.5 to 3.5 years to complete, depending on size and complexity.

20.3.15 Construction impacts 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 on people/property receptors (noise and vibration, air quality and visual receptors);
- materials and waste;
- the River Tay catchment;
- the River Tay SAC designation; and
- impacts on long-distance NMU routes.

People/Property Receptors

20.3.16 The assessment of Type 2 cumulative construction impacts on receptors sensitive to air quality, noise and vibration and visual impacts is summarised in Table 20.2:

Table 20.2: Cumulative construction impacts of other developments on people/property receptors (Type 2)

Project Name	Details	Cumulative Impact	
A9 Dualling Programme	Project 01: Luncarty to Pass of Birnam	Already consented, with construction scheduled to commence in 2017. Project 01 will be completed prior to commencement of the construction of the proposed scheme. No cumulative impacts identified.	None
	Project 02: Pass of Birnam to Tay Crossing	Construction timing not confirmed, but northern extent of Project 02 is approximately 21km south of the start of the proposed scheme and therefore the same receptors are unlikely to be affected.	Not significant
	Project 03: Tay Crossing to Ballinluig	Construction timing not confirmed, but northern extent of Project 03 is approximately 13km south of the start of the proposed scheme and therefore the same receptors are unlikely to be affected.	Not Significant
	Project 04: Pitlochry to Killiecrankie	Construction timing not confirmed, but northern extent of Project 04 is approximately 2km south of the start of the proposed scheme and therefore the same receptors are unlikely to be affected.	Not Significant
	Project 07: Glen Garry to Dalwhinnie	Construction timing not confirmed, but the southern extent of Project 07 is approximately 9km north of the proposed scheme and therefore the same receptors are unlikely to be affected;	Not Significant
	Project 08: Dalwhinnie to Crubenmore	Construction timing not confirmed, but the southern extent of Project 07 is approximately 22km north of the proposed scheme and therefore the same receptors are unlikely to be affected.	Not Significant
	Project 09: Crubenmore to Kincaig	Construction timing not confirmed, but the southern extent of Project 07 is approximately 26km north of the proposed scheme and therefore the same receptors are unlikely to be affected.	Not Significant
	Project 10: Kincaig to Dalraddy	Already consented, with construction underway. Project 10 will be complete prior to commencement of the proposed scheme. No cumulative impacts identified.	None
	Project 11: Dalraddy to Slochd	Construction timing not confirmed, but the southern extent of Project 11 is >50km north of the proposed scheme and therefore the same receptors are unlikely to be affected.	Not Significant

Project Name		Details	Cumulative Impact
	Project 12: Tomatin to Moy	Construction timing not confirmed, but the southern extent of Project 12 is >50km north of the proposed scheme and therefore the same receptors are unlikely to be affected.	Not Significant
	Shierglas Quarry	The consent relates to some changes to the internal organisation of the quarry, for which the construction timescales are not yet confirmed. If construction programme overlaps with the proposed scheme it is unlikely to result in significant cumulative impacts due to the location of the construction works.	Not significant

Materials and Waste

- 20.3.17 Data available to inform the EIA (Chapter 18: Materials) suggest that within The Highland Council and TAYPlan areas there is sufficient capacity to supply high quality aggregate material for the proposed scheme. However, taking into account the other A9 dualling projects which are also likely to require locally sourced aggregate material, there is likely to be high demand for materials relative to local availability.
- 20.3.18 It is anticipated that a high proportion of the excavated material from the A9 dualling projects would be suitable for reuse on-site as engineering fill and would be modified/processed as required to meet specification requirements. However, some earthworks materials along with other aggregates for structures, drainage and road pavement construction are expected to be imported and the quantities of these will vary between the different projects.
- 20.3.19 There is scope for recycling and reuse of construction waste from the A9 dualling projects, but the quantity achievable will be dependent on the Contractor(s), and therefore cannot be determined at this stage. However, the construction sector seeks to recycle and reuse construction waste in response to legislative, fiscal and policy drivers, as well as cost minimisation, which would result in a likely reduction in the quantity of material that would leave site.
- 20.3.20 At this stage, material use and waste generation estimates are not available for all A9 dualling projects. However, allowing for intended re-use and availability of material from both local and non-local sources, it is considered that this can be appropriately managed within projects and across the A9 dualling programme and therefore impacts on waste and materials are unlikely to be significant.

River Tay Catchment

- 20.3.21 With respect to the River Tay catchment, which also includes the following A9 dualling projects; P01 (Luncarty to Pass of Birnam), P02 (Pass of Birnam to Tay Crossing), P03 (Pass of Birnam to Tay Crossing), P04 (Pitlochry to Killiecrankie) and P07 (Glen Garry to Dalwhinnie). There is expected to be a significant flood risk impact during construction for the due to the inherent risks associated with the requirement to locate temporary structures within the functional floodplain during the construction. However, this impact is considered to be localised and temporary and as such no significant cumulative impact is expected on the River Tay catchment during construction.

River Tay SAC

- 20.3.22 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 Habitat 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 impacts (paragraphs 20.3.27-20.3.32).

Long Distance Routes

- 20.3.23 There are a several long distance routes in the vicinity of the existing A9, and these were considered in terms of potential for cumulative impacts to occur due to proximity to different sections (projects) of the A9 forming part of the A9 dualling programme. The proposed scheme would result in a significant residual construction impact on the amenity value of National Cycle Route 7 (NCR7) north of Calvine.

There is potential for significant cumulative construction impacts on amenity value, as well as, potential temporary diversions of NCR7 arising from A9 dualling Project 07 (Glen Garry to Dalwhinnie), Project 09 (Crubenmore to Kincaig), Project 11 (Dalraddy to Slochd) and Project 12 (Tomatin to Moy) where there is the potential for minor realignments of NCR7.

- 20.3.24 It may be possible to mitigate these impacts through coordination and refinement of the construction programmes of the A9 dualling projects but these are not known at this stage.

Operation

- 20.3.25 Potential Type 2 cumulative operational impacts identified in this assessment comprise the following:

- impacts on the River Tay catchment;
- impacts on the River Tay SAC designation;
- woodland loss (in particular AWI areas);
- land-take from land holdings which are present within multiple project boundaries; and
- impacts on long-distance NMU routes from multiple projects.

River Tay Catchment

- 20.3.26 During operation there is expected to be a net beneficial impact on flood risk (flood risk to residential properties has been reduced at the expense of localised increases in flood depths on agricultural land), with any impacts being localised and not expected to extend beyond the proposed scheme boundary. Furthermore, for water features currently receiving routine runoff from the existing A9 that are included within the drainage design for the proposed scheme, beneficial impacts are anticipated. Therefore, it is anticipated that there would be no potential adverse cumulative impacts on the River Tay Catchment from operation of the proposed scheme.

River Tay SAC

- 20.3.27 The HRA in-combination assessment (Jacobs, 2017a) reports that there would be a *de minimis* (minimal change) effect on the River Tay SAC from the proposed scheme, the other southern section A9 dualling projects, and Project 07 (Garry to Dalwhinnie) which is hydrologically linked to the SAC *via* tributaries of the upper River Garry.
- 20.3.28 It is considered that there would be a *de minimis* effects of the Glen Garry to Dalwhinnie project on the River Tay SAC, provided that mitigation is adhered to in the form of standard practices for the control of water pollution and the inclusion of SuDS in the scheme design.
- 20.3.29 All southern section projects, including Project 01 (Luncarty to Pass of Birnam), are linked to the River Tay SAC via the main components (Rivers Tay, Tummel or Garry) and/or their tributaries. A *de minimis* effect on the River Tay SAC from Project 01 (Luncarty to Pass of Birnam) as a result of SAC land-take was previously recorded (Jacobs, 2014). Therefore, a potential for a cumulative effect on the SAC exists from the loss of habitat which could be ecologically and/or functionally important to the site's qualifying interests. However, the identified land-take was in areas not ecologically important or functionally necessary to the qualifying interests.
- 20.3.30 The DMRB Stage 2 HRAs for Project 02 (Pass of Birnam to Tay Crossing) and Project 03 (Tay Crossing to Ballinluig) identified land-take *de minimis* effects at the upgraded Tay Crossing (Project 02) and from a crossing of the Dowally Burn (Project 03) resulting in the loss of SAC terrestrial and aquatic habitat (Jacobs, 2016a 2016b). It is also considered that Project 04 (Pitlochry to Killiecrankie) will have a *de minimis* effect resulting from SAC land-take (Jacobs, 2016c). The identified land-take in all these areas was concluded as not ecologically important or functionally necessary to the qualifying interests.
- 20.3.31 Therefore, in combination and cumulatively the land-take from the River Tay SAC across all A9 dualling projects it is not considered to result in implications for the conservation objectives of the site

as no habitats important to the maintenance of the qualifying species populations would be lost. As a result, no cumulative impact of this land-take is identified.

- 20.3.32 The HRA for the proposed scheme recommends that the in-combination assessment against projects of the A9 dualling programme is re-determined as detailed design progresses and project level HRAs become available. This will ensure that there continues to be no potential for any adverse impacts on site integrity for the River Tay SAC.

Woodland Loss

- 20.3.33 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 some existing woodland is necessary on each of the A9 dualling projects. In line with Scottish Government policy (Forestry Commission Scotland, 2009 and 2015), 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.

- 20.3.34 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 impact of the proposed scheme. Given an expectation of similar residual impacts on other A9 projects, it is considered that this will constitute a significant cumulative impact for the A9 Dualling programme.

Land-take from Land-holdings

- 20.3.35 Where land-holdings are present within multiple project boundaries there is a potential for a cumulative impact from the A9 dualling projects. The assessment of this for the proposed scheme is detailed in Table 20.3.

Table 20.3: Cumulative operational impacts (Type 2) – land-take

Project Name		Details	Cumulative Impact
A9 Dualling Projects	Project 02: Pass of Birnam to Tay Crossing	Atholl Estate (Bruar Trust) is likely to be affected by Project 02 and also has land holdings which will lose land to the proposed scheme. Based on the available information, the small area of Atholl Estate (Bruar Trust) land adjacent to Project 02 and extent of impact from the proposed scheme no significant cumulative impact is identified.	Not Significant
	Project 03: Tay Crossing to Ballinluig	Atholl Estate (Bruar Trust and Home Farm) is likely to be affected by Project 03 and also has land holdings which will lose land to the proposed scheme. Based on the available information and the extent of impact from the proposed scheme no significant cumulative impact is identified.	Not Significant
	Project 07: Glen Garry to Dalwhinnie	Dalnacardoch Estate is likely to be affected by Project 07, and also has land holdings which will lose land to the proposed scheme. Based on currently available information and the very limited impacts of the proposed scheme on Dalnacardoch Estate, no significant cumulative impact is identified.	Not Significant

- 20.3.36 In relation to the Shierglas Quarry, the consent may result in some changes to the operations of the quarry, but commercial activities of the site are not anticipated to be markedly different from those currently in place. Accordingly, no cumulative impacts are identified in combination with the proposed scheme.

Long-distance NMU routes

- 20.3.37 The proposed scheme will require minor realignments along the existing NCR7 route which may result in journey length increases depending on access provision, and minor adverse impacts on amenity due to changes in traffic levels along the existing local road network including A889, General Wade's

Military Road, B9150, A938 and B9154. In addition to the proposed scheme, it is anticipated that NCR7 will be affected by seven other A9 dualling projects as listed in Table 20.4.

Table 20.4: Cumulative operational impacts (Type 2) – NMU routes

Project Name		Summary of NMU Impacts
A9 Dualling Projects	Project 04: Pitlochry to Killiecrankie	No impacts on journey length are anticipated for NMUs, but residual impacts of Slight significance due to view of the proposed scheme.
	Project 07: Glen Garry to Dalwhinnie	Minor realignment of NCR7 and potential impacts on amenity depending on traffic changes along A889. No at-grade crossing of existing A9.
	Project 08: Dalwhinnie to Crubenmore	Potential impacts on amenity for users of NCR7 depending on changes in traffic along A889 and General Wade's Military Road between Dalwhinnie and Crubenmore Junction. No at-grade crossing of existing A9.
	Project 09: Crubenmore to Kincaig	Potential impacts on amenity for users of NCR7 due to new grade-separated junction arrangement at Newtonmore, and changes in traffic along B9150. Unlikely to result in significant changes to journey length though minor realignment may be required. No at-grade crossing of existing A9.
	Project 10: Kincaig to Dalraddy	The ES for the project (Atkins, 2013) predicts that NCR7 will be unaffected.
	Project 11: Dalraddy to Slochd	Potential impacts on NCR7 towards Slochd depending on junction arrangement and traffic changes along A938. No at-grade crossing of existing A9.
	Project 12: Tomatin to Moy	Minor realignment likely but unlikely to result in significant changes to journey length. Potential impacts on amenity for users of NCR7 depending on changes in traffic along B9154. Existing at-grade crossing of A9 which would require mitigation.

20.3.38 Potential impacts on NCR7 are mitigated by the DMRB Stage 3 design for the proposed scheme and/or requirements stated in the Chapter 9 (People and Communities: Effects on All Travellers) and Chapter 13 (Landscape), including a new overbridge and mitigation relating to amenity value (such as landscape planting). Whilst the full design and mitigation detail of all A9 projects is not yet available, it is anticipated that impacts along other sections of NCR7 can be similarly mitigated at a local scale, and that there will be no significant cumulative impact overall.

20.4 Conclusions

20.4.1 Nine people/property receptors are expected to experience significant cumulative impacts of the proposed scheme (Type 1 impacts), namely Clunebeg Bungalow, Clunebeg Farmhouse, Tigh Bruadar, Garrybank, Glackmore Farm, 1 Essangal Cottage, Tomchitchen, Pitaldonich, and Balnastuartach.

20.4.2 A number of potential cumulative impacts of the proposed scheme in combination with other developments (Type 2 impacts) were identified, of which two; construction impacts on NCR7 and operational impacts resulting from the loss of AWI, are considered potentially significant.

20.4.3 It is acknowledged that depending on the detailed design for the remaining sections of the A9 dualling programme, additional cumulative impacts are possible. Conversely, it may be possible to mitigate construction impacts on NCR7 through coordination and refinement of the construction programmes of the A9 dualling projects but these are not known at this stage. The detailed design and construction programmes will continue to be considered at a strategic level by Transport Scotland and in future scheme assessments as more information becomes available.

20.5 References

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