

20 Cumulative Impacts

This chapter considers potential for cumulative impacts of the proposed scheme, and those of the proposed scheme in combination with committed developments and other major proposed development projects, including those forming part of the 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 the combination of residual visual, access and land-take impacts of the proposed scheme. These receptors are Warren Lodge, Ledpetty Lodge, 1-4 Dowally Cottages, Dowally Farm (including Robert Laird and R.A. Laird Contractors Ltd.), Guay Farmhouse, 1 and 2 Croft Croy, Haugh of Kilmorich, Haugh Cottages, and Westhaugh of Tullimet.

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), flood risk, material use and waste management, long distance path/cycle routes, and land-take from land holdings affected by multiple projects. With mitigation, there are expected to be no significant residual cumulative impacts on flood risk, material use and waste management, long distance path/cycle routes, or as a result of land-take from land holdings. However, it is anticipated the proposed scheme will contribute a significant cumulative impact in terms of loss of AWI.

No additional committed developments or proposed major development projects were identified that may contribute to a significant cumulative impact in combination with the proposed scheme.

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 The requirement for an assessment of cumulative effects is set out in EIA Directive (85/33/EEC) which, along with amendments, was codified by Directive 2011/92/EU, which was further amended in 2014 by Directive 2014/52/EU.

20.1.3 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'.*

20.1.4 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.

20.1.5 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 of outfalls or realignment). This cumulative impact assessment references back to this approach, but does not aim to arbitrarily extract the cumulative element of these assessments.

20.1.6 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 effect 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 include the traffic increase predicted as a

consequence of implementing the full programme of works to dual the A9. Consequently, potential cumulative environmental impacts of these traffic changes are incorporated within these assessments, and no supplementary assessment is required:

- Chapter 9 (People and Communities: All Travellers): non-motorised users (NMUs) 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:
- **Type 1 cumulative impacts:** the combined effect 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 effects 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 January 2015 and 31 December 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 January 2015 to 31 December 2017 period 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 authority, Perth & Kinross Council (PKC). PKC was 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 Tay (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, therefore the potential for cumulative impacts to occur due to subsequent A9 dualling projects currently 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 environmental topic area impacts on specific 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. As such, impacts are often unlikely to be significantly different during operation of the proposed scheme.

Construction

- 20.3.3 Chapter 5 (The Proposed Scheme) and Appendix A5.1 (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.
- 20.3.4 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. Properties within 100m of the indicative land made available (LMA) to the Contractor are identified in Appendix A17.7 (Noise Sensitive Receptors Closest to Construction Works). Mitigation is proposed in the relevant chapters to mitigate potential impacts during construction. Key controls to facilitate implementation of this mitigation will be the Construction Environmental Management Plan (CEMP) and the appointment of a Community Liaison Officer, both of which are required by mitigation measures set out in Chapter 21 (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 air quality and noise and vibration impacts during construction are unlikely to arise and any that do would be short-term in nature. Changes to views at approximately 26 built receptor and 17 outdoor receptor locations are assessed to be significant (Chapter 14: Visual) following the implementation of mitigation in the winter year of opening. In relation to access to/from properties, construction and operational 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 20.3.7-20.3.10. 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 considered in combination are not predicted 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 below, and with the exception of the River Tay, 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 Tay	<ul style="list-style-type: none"> Significant (Moderate) changes to flood risk (Chapter 11: 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 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 aquatic and terrestrial habitat within the River Tay SAC designation (Chapter 12: Ecology & Nature Conservation). <p><u>Summary</u> Non-significant geomorphology and habitat impacts on the River Tay SAC are localised. The residual significant flood risk impact attributed to the River Tay is due to localised increases in the fluvial flood depth from the 0.5% AEP (200-year) plus CC event at ch3000 on right (west) bank of River Tay (agricultural land) and at ch6400 north of Kindallachan and on east side of the proposed scheme (existing wetland). Neither of these locations are deemed sensitive to increased flood depths and as such the cumulative impact is not considered overall to be significant.</p>	Not Significant
Woodlands	<ul style="list-style-type: none"> Significant (Moderate) changes in vehicle access (Chapter 8: People and Communities: Communities and Private Assets); Significant visual impacts (Moderate) in winter year of opening (WYO) and non-significant (Slight) visual impacts at summer after 15 years (SY15) once mitigation planting has become established (Chapter 14: Visual); and Non-significant (negligible) increases in noise at ground floor level (Chapter 17: Noise and Vibration). <p><u>Summary:</u> There will be a permanent significant change in vehicle access. Once mitigation planting becomes established by SY15, the visual impacts are predicted to reduce to non-significant. Given the limited duration of visual impacts, overall the cumulative impact is not considered to be significant for Woodlands.</p>	Not Significant
Warren Lodge	<ul style="list-style-type: none"> Significant (Moderate) changes in vehicle access (Chapter 8 People and Communities: Community and Private Assets); Significant visual impacts (Substantial) in winter year of opening (WYO) and (Moderate) at summer after 15 years (SY15) once mitigation planting has become established (Chapter 14: Visual); and Non-significant (negligible) increases in noise at ground floor and first floor level (Chapter 17: Noise and Vibration). <p><u>Summary:</u> Once mitigation planting becomes established by SY15, the visual impacts will reduce, however, not sufficiently to be considered non-significant. Given the combination of significant visual impacts, significant changes in vehicle access and the remaining non-significant noise impacts, there is expected to be a significant cumulative impact overall for Warren Lodge.</p>	Significant
Ledpetty Lodge	<ul style="list-style-type: none"> Significant (Moderate) changes in vehicle access (Chapter 8: People and Communities - Community and Private Assets); Significant visual impacts (Moderate) in winter year of opening (WYO) and non-significant (Slight/Moderate) visual impacts at summer after 15 years (SY15) once mitigation planting reasonably well established (Chapter 14: Visual); and Non-significant (negligible) increases in noise at ground floor and first floor level (Slight) (Chapter 17: Noise and Vibration). <p><u>Summary:</u> Once mitigation planting becomes established by SY15, the visual impacts reduce to not-significant. However, given the combination of significant permanent change in vehicle access and the remaining non-significant impacts arising from visual impacts, and noise there is expected to be a significant cumulative impact overall for Ledpetty Lodge.</p>	Significant
1-4 Dowally Cottages (3 residential)	<ul style="list-style-type: none"> Significant (Moderate) changes in vehicle access and the required (Moderate) land-take (of an area of residential land (Chapter 8: People and Communities - Community and 	Significant

Receptor	Description of Individual Impacts	Cumulative Impact
properties)	<p>Private Assets);</p> <ul style="list-style-type: none"> • Non-significant (Slight/Moderate) noise increase in the short-term only, with no residual effect in the long-term (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, land-take and visual impacts at WYO and SY15 along with non-significant noise impacts are considered to result in a significant cumulative impact overall for 1-4 Dowally Cottages.</p>	
Dowally Farm (including Robert Laird and R. A Laird Contractors Ltd.)	<ul style="list-style-type: none"> • Significant (Substantial) agricultural land-take and changes in access (Moderate) are required for Dowally Farm (Robert Laird) (Chapter 8: People and Communities - Community and Private Assets); • Significant (Substantial in WYO and Moderate/Substantial in SY15) visual impacts due to new infrastructure in close proximity and only partially mitigated by planting (Chapter 14: Visual); and • Non-significant (negligible) increases in noise at ground floor and first floor level (Appendix A17.3: Predicted Noise Levels). <p><u>Summary:</u> The combination of significant permanent impacts in terms of land-take, changes in vehicle access and visual impacts are considered to result in a significant cumulative impact overall for Dowally Farm.</p>	Significant
Dowally Chalet and Caravan Park	<ul style="list-style-type: none"> • Significant (Moderate) changes in vehicle access (Chapter 8: People and Communities - Community and Private Assets); • Significant (Moderate) visual impacts in WYO, reducing to non-significant levels (Slight) in SY15 due to mitigation planting (Chapter 14: Visual); and, • Non-significant (Slight) increases in noise levels at the site (Chapter 14: Visual - Figure 17.10). <p><u>Summary:</u> Once mitigation planting becomes established by 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 for the Self-Catering Units for Dowally Farm and Caravan Park.</p>	Not Significant
Guay Farmhouse	<ul style="list-style-type: none"> • Significant (Moderate) changes in vehicle access and significant (Substantial) land-take comprising of alteration to the property (Wing) and partial loss of the adjacent parking area and garden (Chapter 8: People and Communities - Community and Private Assets).; • Guay Farmhouse is a Category B Listed building [Asset 216] and its alteration signifies a significant (Moderate) adverse impact in terms of Cultural Heritage (Chapter 15); and • Significant (Substantial) visual impacts in WYO and SY15 (Chapter 14: Visual); and • Non-significant (negligible) increases in noise at ground floor and first floor level (Chapter 17: Noise and Vibration). <p><u>Summary:</u> The combination of permanent significant impacts in terms of changes in vehicle access, land-take and visual impacts in both WYO and SY15 is considered to result in a significant cumulative impact overall for Guay Farmhouse.</p>	Significant
Guay Lodge	<ul style="list-style-type: none"> • Significant (Moderate) changes in vehicle access (Chapter 8: People and Communities - Community and Private Assets); • Significant (Moderate) visual impacts in WYO and (Slight/Moderate) in SY15 (Chapter 14: Visual); and • Non-significant (negligible) increases in noise at ground floor and first floor level (Appendix A17.3: Predicted Noise Levels). <p><u>Summary:</u> Once mitigation planting becomes established by 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 for Guay Lodge.</p>	Not Significant
Tayview and Charis	<ul style="list-style-type: none"> • Significant (Moderate) changes in vehicle access (Chapter 8: People and Communities - Community and Private Assets); • Significant (Moderate) visual impacts in WYO, reducing in SY15 (Slight/Moderate) to a non-significant level; and • Non-significant (negligible) increases in noise at ground floor and first floor level (Appendix A17.3: Predicted Noise Levels). <p><u>Summary:</u> Once mitigation planting becomes established by SY15, the visual impacts reduce to non-significant. Given the limited duration of visual impacts, the overall cumulative impact is not</p>	Not Significant

Receptor	Description of Individual Impacts	Cumulative Impact
	considered to be significant for Tayview and Charis.	
1 and 2 Croft Croy	<ul style="list-style-type: none"> • Significant (Moderate) changes in vehicle access and significant (Moderate) land-take of garden (Chapter 8: People and Communities - Community and Private Assets); • Significant (Moderate/Substantial) visual impacts in WYO, reducing in SY15, however remaining significant (Moderate) (Chapter 14: Visual); and • Non-significant (negligible) increases in noise at ground floor and first floor level (Appendix A17.3: Predicted Noise Levels). <p><u>Summary:</u> The combination of permanent significant impacts in terms of changes in vehicle access, land-take and visual impacts is considered to result in a significant cumulative impact overall for 1 and 2 Croft Croy.</p>	Significant
Croftnascallaig Farmhouse	<ul style="list-style-type: none"> • Significant (Moderate) changes in vehicle access (Chapter 8: People and Communities - Community and Private Assets); • Significant visual impacts (Moderate) in WYO, reducing to non-significant (Slight) visual impacts at SY15 due to new infrastructure that are only partly mitigated by woodland planting (Chapter 14: Visual); and • Non-significant (negligible) increases in noise at ground floor and first floor level (Appendix A17.3: Predicted Noise Levels). <p><u>Summary:</u> Permanent significant impacts on vehicle access. 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 for Croftnascallaig Farmhouse.</p>	Not Significant
Haugh of Kilmorich	<ul style="list-style-type: none"> • Significant (Moderate) changes in vehicle access and non-significant (slight) land-take of garden land (Chapter 8: People and Communities - Community and Private Assets); • Significant visual impacts (Substantial) in WYO and (Moderate) in SY15 (Chapter 14: Visual); and • Non-significant (negligible) increases in noise at ground floor and first floor level (Chapter 17: Noise and Vibration). <p><u>Summary:</u> The combination of permanent significant impacts in terms of changes in vehicle access and visual impacts is considered to result in a significant cumulative impact overall for Haugh of Kilmorich.</p>	Significant
Haugh Cottages	<ul style="list-style-type: none"> • Significant (Moderate) changes in vehicle access and non-significant (slight) land-take of residential land (Chapter 8: People and Communities - Community and Private Assets); • Significant visual impacts (Substantial) in WYO, remaining significant (Substantial) in SY15 (Chapter 14: Visual); and • Reduction in noise levels at ground floor and first floor levels (Chapter 17: Noise and Vibration). <p><u>Summary:</u> The combination of permanent significant impacts in terms of changes in vehicle access and visual impacts in both WYO and SY15 is considered to result in a significant cumulative impact overall for Haugh Cottages.</p>	Significant
Westhaugh of Tulliemet	<ul style="list-style-type: none"> • Significant (Moderate) changes in vehicle access (Chapter 8: People and Communities - Community and Private Assets); • Significant visual impacts (Substantial) in WYO, remaining significant (Substantial) in SY15; and • Reduction in noise levels at ground floor and first floor levels (Chapter 17: Noise and Vibration). <p><u>Summary:</u> The combination of permanent significant impacts in terms of changes in vehicle access and visual impacts in both WYO and SY15 is considered to result in a significant cumulative impact overall for Westhaugh of Tulliemet.</p>	Significant

20.3.9 As noted in Table 20.1, there are localised vehicular journey length increases as a result of removing at-grade junctions on the existing A9. As outlined in Chapter 2 (Need for the Scheme), the proposed scheme would reduce driver frustration, would provide opportunity for safer overtaking and the overbridge forming part of the proposed scheme would provide connections for settlements to the east (Dowally, Guay and Kindallachan) with the northbound carriageway and connection for Dowally Farm to the southbound carriageway. This avoids 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 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 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. No other committed developments shown on Figure 8.1 are considered to have potential cumulative impacts with the proposed scheme.

Construction

20.3.13 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 3.0 years to complete, depending on size and complexity.

20.3.14 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);
- material and waste;
- the River Tay catchment;
- the River Tay SAC designation; and
- impacts on long-distance NMU routes.

People/Property Receptors

20.3.15 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 (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 2018. It is anticipated that Project 01 will be completed prior to commencement 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 adjacent to the start of the proposed scheme and the same receptors are unlikely to be affected.	Not significant
	Project 04: Pitlochry to Killiecrankie	Construction timing not confirmed, but southern extent of Project 04 is approximately 5km north of the end of the proposed scheme and the same receptors are unlikely to be affected.	Not Significant
	Project 05: Killiecrankie to Glen Garry	Construction timing not confirmed, but the southern extent of Project 05 is approximately 12km north of the proposed scheme and 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 40km north of the proposed scheme and the same receptors are unlikely to be affected.	Not Significant
	Project 08: Dalwhinnie to	Construction timing not confirmed, but the southern extent of Project 08 is	Not

Project Name	Details	Cumulative Impact
Crubenmore	approximately 47km north of the proposed scheme.	Significant
Project 09: Crubenmore to Kincaig	Construction timing not confirmed, but the southern extent of Project 09 is approximately >50km north of the proposed scheme.	Not Significant
Project 10: Kincaig to Dalraddy	Already consented, with construction completed in 2017. As Project 10 has been completed prior to commencement of the proposed scheme no cumulative impacts are 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.	Not Significant
Project 12: Tomatin to Moy	Construction timing not confirmed, but the southern extent of Project 12 is >50km north of the proposed scheme.	Not Significant

Materials and Waste

- 20.3.16 Data available to inform the EIA (Chapter 18: Materials) suggests that within The Highland Council and TAY Plan areas there is sufficient capacity to supply high quality aggregate material for the proposed scheme. However, taking into account the other A9 dualling project which are also likely to require locally sourced aggregate material, there is likely to be high demand for materials relative to local availability.
- 20.3.17 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. Based on the DMRB Stage 3 design, it is anticipated that the majority of the excavated material (estimated as 438,000m³) is suitable for re-use on-site as engineering fill and will be modified/processed as required to meet specification requirements. As such, the total earthworks required to be imported has been estimated as 0m³.
- 20.3.18 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.
- 20.3.19 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

- 20.3.20 The proposed scheme is located within the River Tay catchment, which also includes the following A9 dualling projects: Project 01 (Luncarty to Pass of Birnam), Project 02 (Pass of Birnam to Tay Crossing), Project 04 (Pitlochry to Killiecrankie), Project 05 (Killiecrankie to Glen Garry) and Project 07 (Glen Garry to Dalwhinnie). As noted in Table 20.2, construction of Project 02 (Luncarty to Pass of Birnam) is expected to be completed in advance of construction of the proposed scheme.
- 20.3.21 There is expected to be a significant construction impact on flood risk for the River Tay due to the inherent risks associated with the requirement to locate temporary structures within the functional floodplain during the construction of the proposed scheme. However, this change to flood risk 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 20.3.25-20.3.33).

Long Distance NMU Routes

- 20.3.23 There are two 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 Regional Cycle Route 83 (RCR 83) between Rotmell and Ballinluig due to temporary closure or disruption to the route, however, no impacts on RCR 83 are expected due to any other projects within the A9 dualling programme.
- 20.3.24 The proposed scheme would not have a significant impact on NCR 77 during construction. There is potential for non-significant cumulative construction impacts on amenity value and potential diversions of NCR 77 arising from A9 dualling Project 02 (Pass of Birnam to Tay Crossing) and Project 04 (Pitlochry to Killiecrankie). However, the impact on NCR 77 from the proposed scheme is not significant, and the resulting cumulative impact is also not expected to be significant.

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 There are no significant operational impacts anticipated to the River Tay catchment as a result of the other A9 projects, resulting in no potential adverse cumulative impacts overall from operation. During operation, there is expected to be both adverse and beneficial impacts on flood risk (flood risk to residential properties has been reduced and there are 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.
- 20.3.27 The upstream A9 dualling projects (P04, P05 and P07) are not expected to result in an increase in flood risk during operation, as summarised below.
- Project 04 has been assessed as having a net beneficial impact 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.
 - Project 05 has been assessed as having a net beneficial impact on flood risk. Significant adverse residual impacts from flood risk are reported for the River Garry, Allt Bhaic and a small watercourse near Calvine. These adverse residual impacts 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 impacts 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.

- Project 07 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.

20.3.28 Consequently, no cumulative impact on flood risk is expected on the River Tay catchment (refer to Appendix A13.3: Tables 12 and 13 and subsequent section titled *Impact of Other Development on the Assessment*).

River Tay SAC

20.3.29 The HRA in-combination assessment (Jacobs, 2018) reports that there would be a *de minimis* (minimal change) effect on the River Tay SAC as a result of SAC land-take from the proposed scheme and three other A9 dualling projects. The assessment of this for the proposed scheme in relation to cumulative impacts is detailed in Table 20.3.

Table 20.3: Cumulative impacts (Type 2) - HRA in-combination assessment

Project Name		Details	Cumulative Impact
A9 Dualling Projects	Project 01: Luncarty to Pass of Birnam	The Luncarty to Pass of Birnam HRA (Jacobs, 2014) identified short-term <i>de minimis</i> effects on the River Tay SAC as a result of construction activities, and permanent <i>de minimis</i> effects as a result of small-scale hydrological changes and a small direct loss of SAC habitat from culvert extensions. Any cumulative effect due to construction activities is considered to be unlikely as Project 01 will be completed prior to commencement of the proposed scheme. No cumulative operational impacts are expected as areas of land-take are not considered to be ecologically important to the qualifying interests of the SAC and therefore are not likely to result in implications for the conservation objectives of the site.	None
	Project 04: Pitlochry to Killiecrankie	The Pitlochry to Killiecrankie HRA (Jacobs, 2017d) identifies that the operational phase of the Pitlochry to Killiecrankie section of the A9 would result in a <i>de minimis</i> effect as a result of SAC land-take. No cumulative operational impacts are expected as areas of land-take are not considered to be ecologically important to the qualifying interests of the SAC and therefore are not likely to result in implications for the conservation objectives of the site.	None
	Project 05: Killiecrankie to Glen Garry	The Killiecrankie to Glen Garry HRA (Jacobs, 2017b) identifies that the operational phase of the Killiecrankie to Glen Garry section of the A9 would result in a <i>de minimis</i> effect as a result of SAC land-take. No cumulative operational impacts are expected as areas of land-take are not considered to be ecologically important to the qualifying interests of the SAC and therefore are not likely to result in implications for the conservation objectives of the site.	None

20.3.30 The HRA 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 effects on site integrity for the River Tay SAC.

Woodland Loss

20.3.31 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 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.

20.3.32 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

20.3.33 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 20.4.

Table 20.4: 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 is likely to be affected by Project 02 and also has land holdings which would be subject to land-take for the proposed scheme. Due to the differing stages of projects within the A9 dualling programme, these impacts have not yet been fully assessed and defined within a published ES. However, 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
	Project 05: Killiecrankie to Glen Garry	Atholl Estate is likely to be affected by Project 05 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

20.3.34 There are two long distance routes (RCR 83 and NCR 77) in the vicinity of the existing A9, and these were considered in terms of potential for cumulative operational impacts to occur due to proximity to different sections (projects) of the A9 forming part of the A9 dualling programme. The proposed scheme has no significant residual impacts during operation on any long distance routes in the vicinity of the existing A9.

20.3.35 While the proposed scheme will have no significant residual impact on any long distance routes in the vicinity of the existing A9 during operation, it is anticipated that NCR 77 will experience a Slight adverse residual effect on amenity for users of the route. NCR 77 will also be affected by one other A9 dualling project, Project 04. No impacts on journey length are anticipated for NMUs, but residual impacts of Slight significance are expected due to view of the proposed scheme. Whilst the full design and mitigation detail of all A9 projects is not yet available, it is anticipated that impacts along other sections of NCR77 can be mitigated at a local scale, and that there will be no significant cumulative operational impact.

20.4 Conclusions

20.4.1 Significant cumulative impacts are expected as a result of the proposed scheme (Type 1 impacts) for the following receptors: Warren Lodge, Ledpetty Lodge, 1-4 Dowally Cottages, Dowally Farm (including Robert Laird and R. A Laird Contractors Ltd.), Guay Farmhouse, 1 and 2 Croft Croy, Haugh of Kilmorich, Haugh Cottages, and Westhaugh of Tulliemet:

- At Warren Lodge and Ledpetty Lodge, this is predominantly as a result of significant changes in access in both directions while also being affected by significant visual impacts. Dowally Farm (including Farmhouse and R. A Laird Contractors Ltd.) will also be affected by significant changes in access (southbound traffic) and visual impacts, while also being affected by noise impacts, although not significantly.
- Guay Farmhouse and (1 & 2) Croft Croy are also expected to have significant cumulative impacts, predominantly from changes in access (southbound traffic) and visual impacts (receptor in close proximity to the proposed scheme with limited opportunity for mitigation planting) but also from

land-take requirements. Land-take requirements necessitate alteration to the Wing and partial loss of a parking area and garden at Guay Farmhouse, and a partial loss of a garden at (1 & 2) Croft Croy.

- (1-4) Dowally Cottages, Haugh of Kilmorich, Haugh Cottages, and Westhaugh of Tullimet are all expected to have cumulative impacts due to a combination of significant changes in access and visual impacts and, also non-significant land-take requirements.

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 one is considered potentially significant; loss of AWI, as although compensation planting is proposed, it is considered that this will not mitigate for the permanent loss of existing biodiversity.

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 such potential impacts through coordination and refinement of the construction programmes of the A9 Dualling Programme projects, which 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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Forestry Commission Scotland (2009). The Scottish Government's Policy on Control of Woodland Removal.

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Jacobs (2017b). A9 Dualling. Killiecrankie to Glen Garry. Habitats Regulations Appraisal.

Jacobs (2017c). A9 Dualling. Pitlochry to Killiecrankie. Environmental Statement.

Jacobs (2017d). A9 Dualling: Pitlochry to Killiecrankie. Habitats Regulations Appraisal.

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Jacobs (2018). A9 Dualling: Tay Crossing to Ballinluig. Habitats Regulations Appraisal.

The Highways Agency et al. (2008a). DMRB Volume 11, Section 2, Part 7: Glossary of Terms Used in The Design Manual for Roads and Bridges Volume 11 Sections 1 and 2, August 2008. Highways Agency, Scottish Government, Welsh Assembly Government and Department for Regional Development Northern Ireland.

The Highways Agency et al. (2008b). DMRB Volume 11, Section 2, Part 5 HA205/08: Assessment and Management of Environmental Effects, August 2008. Highways Agency, Scottish Government, Welsh Assembly Government and Department for Regional Development Northern Ireland.