

A75 Hardgrove to Kinmount Improvement

Environmental Statement

June 2008

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Contents

1	Introduction	2
1.0	Background	2
1.1	Statutory Context	2
1.2	Assessment Methodology	3
1.3	The Content of the Environmental Statement.....	3
1.4	Structure of the Environmental Statement.....	3
1.5	Consultations	4
1.6	Review and Comments.....	5
2	The Need for the Scheme.....	6
2.0	Strategic Role of the A75	6
2.1	Existing Conditions	6
3	Alternatives Considered.....	8
3.1	Scheme 1	8
3.2	Scheme 2	9
3.3	Scheme 3	9
3.4	DMRB Stage 2 Assessment Conclusions.....	9
3.5	Scheme Modification.....	10
4	The Proposed Scheme	11
4.1	Landscape and Environmental Proposals	13
4.2	Construction.....	14
5	Scope of the Assessment and Significance of Effects.....	16
5.0	Scope of the Assessment	16
5.1	Scoping for the Stage 3 Assessment.....	17
5.2	Summary of Scope	20
5.3	Format for the Environmental Assessments.....	20
5.4	Forms of Impact	21
5.5	Impact Ratings and Significance of Residual Effects	21
6	Cultural Heritage	23
6.0	Introduction	23

6.1	Scope of the Assessment	23
6.2	Statutory and Planning Context	23
6.3	Assessment Methodology	25
6.4	Baseline Conditions	26
6.5	Predicted Impacts	30
6.6	Mitigation and Monitoring.....	31
6.7	Residual Effects	31
7	Ecology and Nature Conservation	32
7.0	Introduction	32
7.1	Scope of the Assessment	32
7.2	Statutory and Planning Context	32
7.3	Assessment Methodology	34
7.4	Baseline Conditions	38
7.5	Nature Conservation Evaluation	44
7.6	Potential Impacts	46
7.7	Mitigation.....	47
7.8	Residual Effects	48
8	Landscape Effects	50
8.0	Introduction	50
8.1	Scope of the Assessment	50
8.2	Statutory and Planning Context	50
8.3	Assessment Methodology (Landscape).....	51
8.4	Assessment Methodology (Visual Impact).....	54
8.5	Baseline Conditions	56
8.6	Predicted Impacts	59
8.7	Mitigation.....	62
8.8	Residual Effects	63
9	Land Use	64
9.0	Introduction	64
9.1	Scope of the Assessment	64

9.2	Statutory and Planning Context	64
9.3	Assessment Methodology	64
9.4	Baseline Conditions	67
9.5	Impacts of the Proposed Scheme.....	68
9.6	Mitigation.....	70
9.7	Residual Effects	71
10	Pedestrians, Cyclists, Equestrians and Community Effects.....	72
10.0	Introduction	72
10.1	Scope of the Assessment	72
10.2	Statutory and Planning Context	72
10.3	Assessment Methodology.....	72
10.4	Baseline Environment.....	74
10.5	Impacts of the Proposed Scheme.....	75
10.6	Mitigation.....	76
10.7	Residual Effects	76
11	Vehicle Travellers	77
11.0	Introduction	77
11.1	Scope of the Assessment	77
11.2	Statutory and Planning Context	77
11.3	Assessment Methodology.....	77
11.4	Baseline Conditions	79
11.5	Impacts of the Proposed Scheme.....	80
11.6	Mitigation and Monitoring.....	81
11.7	Residual Effects	81
12	Road Drainage and the Water Environment.....	82
12.0	Introduction	82
12.1	Scope of the Assessment	82
12.2	Statutory and Planning Context	82
12.3	Assessment Methodology.....	83
12.4	Baseline Conditions	88

12.5	Predicted Impacts	89
12.6	Mitigation.....	90
12.7	Residual Effects	91
13	Geology and Soils.....	92
13.0	Introduction	92
13.1	Baseline Conditions	92
14	Policies and Plans	95
14.0	Introduction	95
14.1	Scope of the Assessment	95
14.2	Statutory and Planning Context	95
14.3	Assessment Methodology.....	95
14.4	Policy Review.....	96
14.5	Impact Summary.....	105
15	Disruption due to Construction.....	106
15.0	Introduction	106
15.1	Scope of the Assessment	106
15.2	Statutory and Planning Context	106
15.3	Assessment Methodology.....	107
15.4	Baseline Conditions	108
15.5	Predicted Impacts	108
15.6	Mitigation.....	111
15.7	Residual Effects	114
	References	115

Tables

Table 1.1 – Consultees	4
Table 4.1 – Lengths of new transitional road sections.....	11
Table 6.1 – Recorded Archaeological Sites.....	29
Table 6.2 – Listed Buildings	29
Table 7.1 - Level of bat roost potential in trees - based on Mitchell-Jones (2004)	36
Table 7.2 - Level of bat roost potential in buildings - based on Mitchell-Jones (2004).....	37
Table 8.1 – Landscape Quality	53
Table 8.2 – Sensitivity to Change	53
Table 8.3 – Magnitude of Change.....	54
Table 8.4 – Significance of Change	54
Table 8.5 – Summary of significance of Visual Impact on properties – opening year	61
Table 8.6 – Residual effects upon properties	63
Table 9.1 – Agricultural Land-take	69
Table 9.2 - Severance and Access of farm holdings	70
Table 10.1 – Community Facilities	74
Table 11.1 – Stress ratings for single carriageway roads.....	78
Table 12.1 – Criteria for Evaluating Importance	86
Table 12.2 – Magnitude of Impacts.....	87
Table 12.3 – Significance of Potential Effects.....	87
Table 14.1 – Dumfries and Galloway Structure Plan Policies.....	100
Table 14.2 – Annandale and Eskdale Local Plan Policies.....	104

Figures

- Figure 1.1 – Scheme Location
- Figure 2.1 – The Extent of the Scheme
- Figure 3.1 – Considered Alternatives (Sheet 1 to 3)
- Figure 4.1 – Proposed Scheme Layout
- Figure 4.2 – Specimen Drainage (Sheet 1 to 4)
- Figure 6.1 – Cultural Heritage
- Figure 7.1 - Ecology and Nature Conservation (Sheet 1 to 2)
- Figure 8.1 – Landscape Character
- Figure 8.2 – Landscape Components
- Figure 8.3 - Visual Context and Impacts (Sheet 1 to 2)
- Figure 8.4 – Indicative Landscaping Planting Design
- Figure 9.1 – Agricultural Land Use Capability
- Figure 9.2 – Land Owner and Occupier Information (Sheet 1 to 4)
- Figure 10.1 – Community Facilities and Non-Motorised Users
- Figure 11.1 – Water Resource
- Figure 13.1 – Soils and Geology

Appendices

- Appendix A – Figures
- Appendix B – Consultation Responses
- Appendix C – Traffic Data
- Appendix D – Special Requirements in Relation to Historic Scotland
- Appendix E – Pollution Prevention Guidelines
- Appendix F – Visual Impact Assessment Tables
- Appendix G1 – Ecological Planning and Legislative Context
- Appendix G2 – 2007 Ecological Survey
- Appendix G3 – Confidential Badger Report*
- Appendix G4 – Biological Records and Received Data
- Appendix G5 – Invertebrate Report
- Appendix H – Environmental Impact Tables (EITs)
- Appendix I – Schedule of Environmental Commitments

Acronyms

AADT	Annual Average Daily Traffic
ACZ	Archaeology Consultation Zone
AIPs	Accident Investigation and Prevention Schemes
BAP	Biodiversity Action Plan
CAR	Controlled Activity Regulations
cEMP	construction Environmental Management Plan
CoPA	Control of Pollution Act
COSSH	Control of Substances Hazardous to Health
CRoW	Countryside and Rights of Way Act
CRTN	Construction Road Traffic Noise
D&GC	Dumfries and Galloway Council
DEFRA	Department of Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
EEC	European Economic Community
EIA	Environmental Impact Assessment
EITs	Environmental Impact Tables
ES	Environmental Statement
FSR	Firm Strategy Report
GDERC	Dumfries and Galloway Environmental Resources Centre
HAP	Habitat Action Plan
HGV	Heavy Goods Vehicle
HS	Historic Scotland
IEEM	Institute of Ecology and Environmental Management
IFA	Institute for Field Archaeologist
JNCC	Joint Nature Conservation Committee
LGV	Light Goods Vehicle
LNRs	Local Nature Reserves
NMU	Non-Motorised Users
NNRs	National Nature Reserves
NPPG	National Planning Policy Guidance
PAN	Planning Advice Note
PPG	Pollution Prevention Guidance
RAPS	Route Action Plan Study
RARP	Route Accident Reduction Plan
SAC	Special Areas of Conservation
SAM	Scheduled Ancient Monument
SAR	Strategic Assessment Report
SDD	Scottish Development Department
SEERAD	Scottish Executive Environment and Rural Affairs Department

SEPA	Scottish Environment Protection Agency
SMR	Sites and Monuments Record
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SPP	Scottish Planning Policy
SSSIs	Sites of Special Scientific Interest
SuDS	Sustainable Drainage Systems
WCA	Wildlife and Countryside Act
WMP	Waste Management Plan
WS2+1	Wide-Single Carriageway two lanes in one direction and one in the other
ZVI	Zone of Visual Influence

1 Introduction

1.0 Background

- 1.0.1 Transport Scotland is proposing to improve the overtaking opportunities along the A75 Trunk Road (hereafter referred to as 'the A75' or 'A75') between Carrutherstown and Upper Mains Farm.
- 1.0.2 The wider A75 between the A74 (M) at Gretna and the ferry ports of Stranraer and Cairnryan forms part of the Trans-European Transport Network. With the exception of a few short sections of dual-carriageway the route is single-carriageway throughout its length.
- 1.0.3 As part of a wider strategy for improving the effectiveness of the A75 and resolving conflicts between strategic and local traffic, Transport Scotland (the agency responsible for delivering the Scottish Government's vision for transport) has identified a number of sections of the route for upgrading.
- 1.0.4 This included a 3.6 km section of the road between Carrutherstown and Kinmount (nominated as A75 Hardgrove to Kinmount improvement, which is referred to throughout this statement document as the Proposed Scheme). This is a section with a poor safety record and higher number of accidents than the national average.
- 1.0.5 The Proposed Scheme involves the introduction of a new offline section of carriageway to the south of the existing road, which will include an alternating third lane to provide safe overtaking opportunities for road users in both directions.
- 1.0.6 The Proposed Scheme has been subject to a formal process of Environmental Impact Assessment (EIA) in accordance with European Directives and Scottish statutes.
- 1.0.7 This Environmental Statement (ES) reports the findings of the EIA.

1.1 Statutory Context

- 1.1.1 The requirement to assess the environmental impact of road improvement schemes is contained with the provisions of the Roads (Scotland) Act 1984 ('the 1984 Act'). These requirements were inserted and amended in to the 1984 Act through the Environmental Impact Assessment (Scotland) Regulations 1999 and the Environmental Impact Assessment (Scotland) Regulations 2006 respectively¹.
- 1.1.2 Council Directive 97/11/EC introduced a requirement for trunk road projects to be screened to determine whether the potential environmental impacts of the project will be such that an EIA will be required. Transport Scotland undertakes such screening and publishes the resulting 'determination'. Such a determination was made in relation to the Proposed Scheme identifying the need for a full EIA².

¹ Specifically, the insertion were covered by Part III of the Environmental Impact Assessment (Scotland) Regulations 1999 ('the 1999 Regulations') with a further amendment by Part III of the Environmental Impact Assessment (Scotland) Regulations 2006 ('the 2006 Regulations'). As such, EIA is implemented through Sections 20A, 20B, 55A and 151 along with Schedule 1 of The 1984 Act. The amendments to the 1984 Act implement Council Directive 85/337/EEC and Article 3 of Council Directive 2003/35/EC in so far as it applies to trunk road development.

² The Proposed Scheme exceeds the threshold criteria in the Roads (Scotland) Act 1984 (as amended) in that it would require works over an area in excess of 1ha. Taking this, combined with the fact that the Proposed Scheme is located within sensitive environs, it was determined through the screening process that the Proposed Scheme is subject to the requirements of a full EIA.

1.2 Assessment Methodology

- 1.2.1 Transport Scotland adopts a standardised framework for undertaking a full EIA. Detailed in Volume 11 of the Design Manual for Roads and Bridges (DMRB), Environmental Impact Assessment, the framework schedules a number of environmental topic areas that should be considered when establishing the scope for the assessment of any particular scheme proposal. This is discussed further in Chapter 5.

1.3 The Content of the Environmental Statement

- 1.3.1 Annex IV of the EIA Directive (97/11/EA) sets out the information to be presented in an Environmental Statement. This is -

1. Description of the project, including in particular:

- a description of the physical characteristics of the whole project and the land-use requirements during the construction and operational phases,
- a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used,
- an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed project.

2. An outline of the main alternatives studied by the developer and an indication of the main reasons for this choice, taking into account the environmental effects.

3. A description of the aspects of the environment likely to be significantly affected by the proposed project, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.

4. A description of the likely significant effects of the proposed project on the environment resulting from:

- the existence of the project,
- the use of natural resources,
- the emission of pollutants, the creation of nuisances and the elimination of waste,

and the description by the developer of the forecasting methods used to assess the effects on the environment.

5. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.

6. A non-technical summary of the information provided under the above headings.

7. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the developer in compiling the required information.

1.4 Structure of the Environmental Statement

- 1.4.1 The ES comprises fifteen chapters. Chapters 1-5 introduce and describe the Proposed Scheme, explain the statutory basis and framework adopted and the need for the development, outline the alternative solutions considered, and present a common reporting format for the ES.

- 1.4.2 Chapters 6–15 report the findings of the various environmental assessments undertaken. Chapter 14 outlines the relationship of the proposals to current policies and plans for the study area; whilst Chapter 15 appraises the construction-related impacts. The ES is supported by a series of figures and a number of appendices.
- 1.4.3 Figures are provided in Appendix A and consultation responses in Appendix B. Traffic data are presented in Appendix C. Historic Scotland (HS) special provisions with respect to archaeology are presented in Appendix D, and pollution prevention guidelines, provided by the Scottish Environment Protection Agency (SEPA), are found in Appendix E. Appendix G1-5 provide the necessary ecological data whilst the visual impact assessment tables are presented within Appendix F and the Environmental impact tables (EITs) are given in Appendix H. Appendix I includes the schedule of environmental commitments.

1.5 Consultations

- 1.5.1 Consultation has remained an integral part of understanding and assessing the environmental impacts of the Proposed Scheme; the objective being to inform the scope of the EIA, seek specialist knowledge about the site and ensure that the EIA is objective. The following statutory, non-statutory and interest groups were formally approached for their comments throughout the design and assessment process. These organisations are listed in Table 1.1 below. It should be noted that not all organisations provided a response.

Architectural Heritage Society of Scotland	Historic Scotland*
Byways and Bridleways Trust	Macaulay Land Use Research Institute
Council for Scottish Archaeology	Meteorological Office
Cummertrees & Cummertrees West Community Council	National Trust for Scotland
Cyclists' Touring Club Scotland	RSPB Scotland
Dalton and Carrutherstown Community Council	Scottish Biodiversity Forum Secretariat
Department for Environment, Food and Rural Affairs (DEFRA)	Scottish Civic Trust
Dumfries and Galloway Council*	Scottish Cyclists' Union
Forest Enterprise	Scottish Environment Protection Agency*
Galloway Fisheries Trust	Scottish Executive*
Garden History Society	Scottish Executive Environment and Rural Affairs Department (SEERAD)
Dumfries and Galloway Badger Group	Scottish Natural Heritage*
Dumfries and Galloway Bat Group	Dumfries and Galloway County Bird Recorder
Dumfries and Galloway Environmental Resources Centre	Scottish Wildlife Trust
Health and Safety Executive*	

*Statutory Consultees

Table 1.1 – Consultees

- 1.5.2 Consultations information/responses are presented, where appropriate, throughout the ES.

1.6 *Review and Comments*

1.6.1 This ES and copies of the Draft Orders can be viewed during normal working hours at:

Transport Scotland Major Transport Infrastructure Projects Buchanan House 58 Port Dundas Road Glasgow G4 OHF	Dumfries & Galloway Council Council Offices English Street Dumfries DG1 2DD	Georgetown Library Gillbrae Road Dumfries DG1 4EJ
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1.6.2 The ES can also be viewed on Transport Scotland website: www.transportscotland.org.uk.

1.6.3 Copies of the ES are available in hard copy for £150 or on CD or DVD for £10 (both including postage and packing). VAT is chargeable on DVDs and CDs. The statement also contains a Non-Technical Summary (NTS), which is provided free of charge. The NTS and the main ES are available from the Director of Major Transport Infrastructure Projects at Transport Scotland (address as above).

1.6.4 Comments on the proposals or their environmental effects can be sent in writing to the Director of Major Transport Infrastructure Projects at Transport Scotland at the address given above within six-weeks of publication of the notice of the ES.

2 The Need for the Scheme

2.0 *Strategic Role of the A75 Trunk Road*

- 2.0.1 The A75 has been the subject of ongoing studies relating to its effectiveness as a key strategic corridor since the early 1990s. At that time, Dumfries and Galloway Council investigated the corridor on behalf of the then Scottish Office (latterly the Scottish Executive) with a view to identifying sections that pose a high safety risk. These studies culminated in the identification of a number of Accident Investigation and Prevention schemes (AIPs).
- 2.0.2 In 1996, a Route Accident Reduction Plan (RARP) specific to the A75 was completed; the objective being to bring the route up to a consistent standard in terms of safety and the 'level of service'³.
- 2.0.3 In 1997, the RARP was followed up by a Route Action Plan Study (RAPS), which covered the entire length of the A75. The trunk road was subsequently divided into four sections along its length based on differing standards and traffic conditions. Strategic Assessment Reports (SARs) detailing various strategies were produced for each section; the four studies being combined in a final Firm Strategy Report (FSR).
- 2.0.4 The SAR relevant to the Proposed Scheme comprised three strategies one of which saw the upgrading of the 7 km section of the A75 between Carrutherstown to the western end of the Annan Bypass. The proposals within this section took the form of the creation of wide-single carriageway with alternating overtaking sections (referenced as WS2+1) and the restriction of side-road access to transitional lengths of road between the overtaking sections.
- 2.0.5 Out of this it was identified that the section between Hardgrove to Kinmount provided the only positive benefit in terms of safe overtaking; thus the development of the Proposed Scheme.

2.1 *Existing Conditions*

- 2.1.1 The existing section of the A75 extends some 3.6 km, from a point immediately south and west of Carrutherstown village to a point some 50 m west of the existing access off the trunk road to Upper Mains Farm (Figure 2.1 – Extent of Scheme). It is a single-carriageway road that does not meet the current design standards required of a strategic route carrying the volumes and mix of traffic that routinely use it.
- 2.1.2 Recent data indicates that the two-way daily traffic flows on the trunk road are approximately 13,000 vehicles and that 18% of the traffic comprises HGVs (the national average for similar roads is 10%).
- 2.1.3 Forward visibility is poor. There is no provision for overtaking. There are four side road junctions and six private access junctions within this relatively short section of the trunk road which are used by residents, the local community and farm vehicles on a daily basis.
- 2.1.4 The result is a section of road where there are significant conflicts between the local/agricultural traffic and the strategic traffic travelling to and from Stranraer and Cairnryan resulting in frequent travel delays and a high accident rate. A total of 56 accidents have been recorded between 1992 and 2007 (2 fatal, 18 serious and 34 slight). The main likely cause of these relates to dangerous attempted overtaking manoeuvres.

³ This is a term used to refer to the standardisation of the carriageway width, signing and lining strategy. The ultimate goal is to have the entire length of a carriageway the same standard (or level of service) so as to avoid driver confusion from differing standards.

2.1.5 Access from side roads onto the trunk road and for turning movements off the trunk road into side roads involves merging with, and crossing oncoming, traffic. This presents a safety issue along with raised levels of driver frustration, stress and anxiety caused by the associated delays.

Scheme Objectives

2.1.6 In light of the strategic and local context for the Proposed Scheme, the following scheme objectives have been identified.

- Improve the operational performance and level of service and safety on the A75 by reducing the effects of driver stress and journey times by constructing guaranteed overtaking sections designed to break up the effects of convoys/platoons.
- Improve and increase the number of overtaking opportunities to eradicate the conflicts between long distance users and the local and agricultural traffic.
- Undertake the construction of one long-term overtaking section which includes carriageway widening, the rationalisation of side road junctions and realignment improvements to junctions, bends and private accesses.
- Wherever practicable, incorporate measures for non-motorised users, incorporating the 'Trunk Road Cycling Initiative'.
- Maintain the asset value of the A75 Trunk Road.
- Mitigate the environmental impact of the new works where possible.
- Achieve good value for money for both taxpayers and transport users.

3 Alternatives Considered

- 3.0.1 The Initial DMRB Stage 1 assessment involved the consideration of the entire A75 between Gretna and Stranraer and identified short, medium and long term projects to improve the safety and strategic value of the route. One of the sections considered by this report was the section identified as Hardgrove to Kinmount.
- 3.0.2 The Stage 2 process started by extending the corridor to cover the entire section of the A75 between Carrutherstown and Annan. Three strategies were developed with varying directions of overtaking and overtaking section lengths and concluded in demonstrating that the second of the three corridor strategies provided the best perceived advantage of uphill overtaking in both directions at Hardgrove; the key accident spot. This strategy was therefore taken forward as the preferred alternative at Stage 2 through considering three overlapping sub-strategy scheme improvements between Carrutherstown and the western end of the Annan Bypass.
- 3.0.3 Online improvements were developed for these three schemes (as shown in Figure 3.1 sheets 1 to 3 inclusive) which were subject to assessment under Stage 2 of the DMRB.
- Scheme 1 provided westbound overtaking opportunities over the western half of the section and eastbound opportunities over the eastern half. The scheme provided for transitional two lane sections at each end and centrally along the section to effect the transition in overtaking priority. The overall length of the scheme was 3.3 km and essentially covered the length of the Proposed Scheme.
- Scheme 2 commenced with the easternmost two lane section of Scheme 1 followed by a three lane section providing for westbound overtaking. It then provided a two lane transitional section of road followed by an additional three lane section with priority for eastbound overtaking and a final two lane transitional section at Kinmount East. The overall length of the scheme was 3.2 km.
- Scheme 3 commenced with the easternmost two lane section of Scheme 2 followed by a three lane section providing for westbound overtaking. It then provided a two lane transitional section of road followed by an additional three lane section with priority for eastbound overtaking and a final two lane transitional section at Annan. The overall length of the scheme was 3.9 km.
- 3.0.4 A summary of the Stage 2 assessment is presented below. Given the overlap between the schemes the range of potential impacts was broadly consistent.

3.1 *Scheme 1*

- 3.1.1 Existing known cultural heritage assets potentially affected by Scheme 1 included the Whitecroft Gate Piers and Braehill Fort Settlement and Enclosure, the latter of which is important at the national level. Historic Scotland (HS) also indicated that there would be the potential for exposure of other currently unknown features of archaeological interest and value during road construction.
- 3.1.2 A preliminary site appraisal of sensitive habitats and fauna associated with the scheme corridor identified woodland and grassland habitat, wetlands, waterbodies and peatland habitats. Faunal records indicated the presence of badgers and otters. The assessment also concluded there was the potential for bat and water vole activity within the area. Of the three schemes, Scheme 1 was anticipated to result in the least impact on the ecology and nature conservation of the area.
- 3.1.3 Predicted impacts on landscape character were identified as being slight and negative taking account of the potential for mitigation. Predicted impacts on locally sensitive visual receptors were assessed as varying between slight to moderate with the potential for the significance of the impact to be reduced overtime as the mitigation, in the form of planting, would become established and mature.
- 3.1.4 It was predicted that there would be a moderate to slight negative impact in terms of agricultural land losses; primarily as a result of the implications for existing access.

- 3.1.5 The assessment identified potential impacts associated with surface water discharge to Glen Burn and changes in the quality of discharges to the Kelhead Quarry surface water network. Assuming the adoption of best practice during construction and the implementation of drainage proposals in accordance with current standards it was concluded that potential impacts on the watercourses and surface water quality would be slight and negative.
- 3.1.6 The assessment concluded that impacts associated with construction could be appropriately mitigated for a construction period of approximately 52 weeks.

3.2 *Scheme 2*

- 3.2.1 Existing known cultural heritage assets potentially affected by Scheme 2 included Kinmount House Designed Landscape. There is also the potential for exposing unknown archaeological features during construction.
- 3.2.2 A cluster of moderately important habitats at Kinmount Farm and Kelhead Moss Plantation resulted in Scheme 2 having a higher ecological impact overall above Scheme 1.
- 3.2.3 Predicted impacts on landscape character were identified as being slight to moderate and negative taking account of the potential for mitigation. Predicted impacts on locally sensitive visual receptors were assessed as varying between large/moderate to slight/moderate and reducing as potential mitigation in the form of planting would become established and mature.
- 3.2.4 It was predicted that there would be a slight to moderate negative impact in terms of on agricultural land losses.
- 3.2.5 The impact on water resources was considered the same as Scheme 1.
- 3.2.6 Construction would also last for approximately 52 weeks.

3.3 *Scheme 3*

- 3.3.1 Existing known cultural heritage assets potentially affected by Scheme 3 included Ladyfield House and Justenlees Enclosure (the latter is located within an archaeological consultation zone) and Kinmount House Designed Landscape. The risk of encountering hitherto unknown archaeology is also a potential.
- 3.3.2 The potential ecological impacts were assessed as being identical as Scheme 2.
- 3.3.3 The potential impact on the landscape character and visual receptors were assessed as being identical as Scheme 2.
- 3.3.4 The land use impacts were assessed as being identical as Scheme 2.
- 3.3.5 The impact on water resources was considered the same as Schemes 1 and 2.
- 3.3.6 Construction would also last for approximately 52 weeks.

3.4 *DMRB Stage 2 Assessment Conclusions*

- 3.4.1 The Stage 2 assessment concluded that there were no marked differences between the three alternative schemes in relation to the majority of the environmental interests associated with the local area. It did identify that Scheme 1 would be likely to involve lesser impacts on ecological, landscape and visual interests due to a reduced land-take.

3.5 Scheme Modification

- 3.5.1 Forward of this stage it was realised that large sections of the route between Carrutherstown and the western end of the Annan Bypass provided 'safe' overtaking opportunities in both directions. Thus reconfiguring the entire carriageway section to only favour overtaking in one direction would effectively prejudice traffic in the other direction, which would increase driver stress and journey travel times overall. The only exception was a section of the A75 covered by Scheme 1.
- 3.5.2 However, in reviewing Scheme 1 in 2005 it was recognised that there would be merit in considering further alternatives involving the construction of a new offline section to accommodate a wide-single carriageway with three lanes to cater for the safer overtaking opportunities necessary for this section of the A75.
- 3.5.3 This also provided the ability to retain the existing carriageway as a local road whilst also allowing a safer means for the local traffic that currently use the U81a to cross under the A75 via a newly constructed underpass. There would also be potential benefits related to construction that would improve the economic viability of the scheme, simply as much of the scheme could be built offline with minimum disruption to traffic flows along the existing A75 and the requirement for costly traffic management.
- 3.5.4 It was recognised that the new offline scheme would need to be aligned to the south of the existing road; there being fewer environmental constraints within this area in comparison to the area immediately north of the existing road. Thus the Proposed Scheme was developed.

4 The Proposed Scheme

Proposed Trunk Road

- 4.0.1 The Proposed Scheme would involve the construction of a new section of wide single-carriageway with alternating overtaking sections (Figure 4.1). It would diverge from the existing single-carriageway at the western end of the Carrutherstown bypass, following a line to the south of the existing trunk road and rejoining the existing alignment some 50 m west of the access to Upper Mains (Figure 4.1). The total land-take would be 21.9 ha.
- 4.0.2 Opportunities for overtaking would be prioritised for westbound traffic between Carrutherstown and the U81a (two of the three lanes would be dedicated to westbound traffic). The priority would change in favour of eastbound traffic between the U81a and Upper Mains. There would be short transitional sections at the eastern and western tie-in points with the existing trunk road and centred on the junction with the U81a to effect the change in priority from westbound to eastbound. The relevant lengths of these and the two sections of new three-lane carriageway are detailed in Table 4.1.

Type	Lanes	Length (m)	Location
Divergence	1E+1W to 1E + 2W	115	Carrutherstown Bypass
Westbound Overtaking	1E+2W	1125	-
Switchover	1E+2W to 2E + 1W	150	U81a junction
Eastbound Overtaking	2E+1W	1125	-
Convergence	2E+1W to 1E + 1W	115	Topmuir Farm

Table 4.1 – Lengths of new transitional road sections

- 4.0.3 The new section of trunk road carriageway would comprise a total running width of 13.5 m and would have a design speed of 100 kph (60 mph) in accordance with Table 2 of TD 9/93 (DMRB Volume 6, Section 1, Part 1).

Proposed Local Road

- 4.0.4 The existing section of the A75 would be retained as a local road between Whitecroftgate and Stenries View (Figure 4.1). New sections of road would be introduced at each end of the retained section of road to provide segregated access for local traffic to Carrutherstown and to form an access between the retained local road and the proposed new section of trunk road at Stenriesgate.

Side Roads and Junctions

- 4.0.5 Travelling west to east, modifications to existing side roads and junctions would comprise:
- local modification to the existing staggered junction where the B725 crosses the trunk road corridor at the western end of the Proposed Scheme. The northern arm of the junction would continue to provide access off the trunk road to Carrutherstown;
 - closure of the private access from Fostermeadow to the existing A75. New access would be provided by upgrading an existing track running west of the farmstead to the B725. Access to the A75 and Carrutherstown would then be via the local road and the modified staggered junction at the western end of the Proposed Scheme;
 - closure of direct access from the U81a to the proposed new section of the A75. Future access for local traffic from the north would be via the existing junction onto the retained section of the declassified trunk road and along the retained road to the modified junction at

Carrutherstown or the new junction at Stenries View. Access from the south would be via a realigned section of the U81a routed beneath the proposed new section of trunk road with a new junction onto the retained section of the existing trunk road and then along the retained road to the west or east as described for local traffic using the U81a from the north;

- retention of the existing junctions within the retained section of the existing trunk road that provide private access for Oakbank and for traffic travelling from the north on the U82a;
- modification of the existing private access from Nether Stenries and Stenries View onto the new section of local road at the eastern end of the Proposed Scheme;
- closure of the existing access from Stenriesgate onto the new A75 (the property would be demolished to accommodate the proposed trunk road alignment); and
- retention and modification of the existing private access for Topmuir Farm.

Structures

4.0.6 The proposals include six new structures:

- an underbridge to provide grade-separated cross movement of the U81a beneath the proposed trunk road;
- four culverts to accommodate existing watercourses flowing north to south across the Proposed Scheme corridor; and
- a concrete culvert near Oakbank to provide for the passage of wildlife.

4.0.7 The U81a under-bridge would comprise a 6 m high by 13 m wide reinforced concrete structure approximately 20 m in length.

4.0.8 The five culverts would be designed in accordance with the requirements of Volume 10, Section 4, Part 2 (Highways Agency, 2001a); Volume 10, Section 4, Part 4 (Highways Agency, 2001b); and Volume 10, Section 4, draft Part X (Highways Agency, 2007).

Drainage

4.0.9 Surface water run-off for the new section of trunk road would involve over-the-edge drainage collected via filter strips in the roadside verges. The collected waters would be carried to balancing ponds prior to discharge to local watercourses (Figure 4.2). There would be two balancing ponds between the new alignment and retained local road in the vicinity of the U81a, one either side of the realigned side road. Both will discharge to the Hardgrove Burn. A third balancing pond would be located at the eastern end of the Proposed Scheme to the north of the trunk road as it rejoins the existing alignment. This would discharge to the Glen Burn.

4.0.10 Reed-beds would be established in the balancing ponds to settle out pollutants suspended in runoff. Petrol interceptors would be provided to remove hydrocarbons associated with routine use and accidental spillage.

4.0.11 Where the proposals would involve severance of existing field drains and ditches, these would be collected and diverted to avoid disruption to local agricultural holdings.

Lighting

4.0.12 The existing lighting at the Carrutherstown junction would be retained and modified as part of the redesign of the B725 staggered junction.

Fencing

4.0.13 Along the extent of the scheme stock proof fencing will be included, which will be timber post and wire. Accordingly, 250 m sections of wire fencing will also be provided either side of any culvert passing under the road and on both sides of the road; the first 100 m of which will include an overhang. The wire fencing is being provided to exclude badgers and otters from the highway

and has been designed in accordance with Volume 10, Section 4, Parts 2 and 4 of the DRMB. Further information is provided in Chapter 7.

4.1 *Landscape and Environmental Proposals*

Principles and Objectives

- 4.1.1 The landscape and environmental proposals for the Proposed Scheme have been developed with reference to Volume 10 of the DMRB. The prime objective has been the integration of the new road into the local countryside and the avoidance, reduction or compensation of environmental impacts that would be associated with the introduction of a new section of trunk road and its associated traffic into the local area.
- 4.1.2 The specimen design and its related landscape and environmental measures have accordingly been developed with a view to ensuring that:
- the road alignment achieves best fit within local landform and respects existing landscape character;
 - existing planting is safeguarded as far as is possible and that proposed planting enhances the existing planting structure;
 - that potential visual impacts on residents and users of open space and public facilities are mitigated as far as is practicable and consistent with other design objectives; and
 - that ecological resources and assets are safeguarded as far as is possible and that local biodiversity is enhanced where appropriate.
- 4.1.3 There are some areas where the alignment of the new road would sever parts of existing agricultural holdings, and the severed areas would be likely to prove of marginal operational and economic viability. These have been included within the Draft Compulsory Purchase Orders (CPOs) and have been used with a view to enhance integration and biodiversity.
- 4.1.4 Key issues addressed by the landscape and environmental design and mitigation proposals comprise:
- screening and integration of the realignment and grade separated crossing of the U81a beneath the new section of trunk road;
 - differentiation and separation between the new section of trunk road and the retained local road;
 - establishment of an appropriate rural character along the retained existing section of the A75 to reflect its function as a local road; and
 - provision of crossings beneath the proposed new alignment to cater for established mammal movements.

Landscape Proposals

4.1.5 The landscape proposals comprise a combination of earthworks, planting and grassland establishment (Figure 8.4).

4.1.6 Key mitigation measures described in Section 8.7 relate to the following.

The introduction of low mounding between the new section of trunk road and the newly nominated local road.

The extension and relaxation of embankment slopes where the proposed new trunk road would cross over the U81a. There is some available space between the line of the old road and new road to modify the essential engineering landform, soften slopes and establish a combination of dense woodland planting and scrub edge. This would achieve a balance between mass planting, which would soften and enclose the earthworks supporting the road, whilst avoiding over enclosure for users of the approach road to the underpass.

Relaxation of cutting slopes and extension embankment slopes where space permits to the west and east of the central U81a underpass.

Rounding of the crest of cutting and embankment slopes.

Introduction of hedgerows where verge widths preclude the use of denser planting to define the corridor and tie into existing hedgerows which would be severed by the new alignment.

Planting of dense woodland edge species where the new alignment would encroach into the northern edge of Braemoss Wood.

Reinforcement of existing planting at the modified western junction providing access to Carrutherstown.

Use of native tree and shrub species of local provenance throughout and of grassland species with semi-natural characteristics to enhance local landscape character and contribute to local biodiversity.

Incorporation of landscape design objectives to enhance the appearance and natural interest associated with the proposed balancing ponds whilst maintaining their prime function to regulate flows and minimise pollution discharge.

Demolition

- 4.1.7 The Proposed Scheme would require the demolition of the existing Stenriesgate residential property and outbuildings. The property is currently vacant and is in the ownership of The Scottish Ministers.

Statutory Undertakers Diversions

- 4.1.8 Prior to the commencement of the main construction activities, preliminary works would be required to divert and protect public utilities. The majority of the diversion work relates to the tie-in areas where there is a Virgin Media fibre optic and various BT cables. Scottish Water require to carry out some diversion works around U81a crossroads as existing infrastructure coincides with the proposed balancing ponds. Scottish & Southern Energy (electricity) has two overhead cables crossing the A75, one at each end of the scheme, which will be diverted underground.
- 4.1.9 All diversions are considered minor-works that will be carried out within the standard construction period and the CPO footprint, with plant remaining within the highway boundary at all times.

4.2 Construction

- 4.2.1 It is anticipated that the construction period for the Proposed Scheme would be 52 weeks.
- 4.2.2 The programme would serve to maintain traffic on the existing A75 for the longest possible period whilst the new carriageway is built offline.

Construction Plant

- 4.2.3 Typical plant and equipment used during construction are likely to include mechanical excavators, scrapers, graders and dump trucks, generators, HGV delivery vehicles, ready-mix concrete vehicles, bowsers, road rollers and compaction plant, pumps, hand tools and site staff vehicles.
- 4.2.4 Construction plant will use the existing A75 as it provides the only access link to the work areas. Traffic management procedures will be employed to ensure that the traffic flows along the A75 are maintained throughout the construction period so as to minimise disruption along the route.
- 4.2.5 It is anticipated there would be short-term disruption in the order of 4-6 weeks as flows are temporarily managed to maintain movement whilst merging the new and existing sections of road. There is also a requirement for more limited traffic management levels at the start of the construction phase to establish site accesses and set out the construction site.

4.2.6 There would be no need for the use of piling equipment or blasting techniques.

Working hours

4.2.7 Working hours during construction would be limited between 7am and 7pm weekdays and 7am to 1pm Saturdays. No working is anticipated on Sundays and public holidays.

4.2.8 Additional night works outside normal working hours may be required where operations on existing roads are necessary to avoid peak traffic flows and to reduce disruption to road users; the key ones relating to the tie-in operation required around the A75 and the B725.

Construction Environmental Management Plan (cEMP)

4.2.9 The EIA has identified a number of construction specific mitigation measures which the contractor/s for the construction of the Proposed Scheme would be required to incorporate into their methods of working. There are also many mandatory and good practice requirements and guidelines related to the safeguarding of environmental resources and interests which the contractor would be required to observe during construction. The contractor would be required to demonstrate that these commitments, requirements and guidelines are formally incorporated into their working practices in the form of a Construction Environmental Management Plan (cEMP) for which they are responsible. The contractor would accordingly be required, under the terms of the contract, to submit and obtain approval of the cEMP prior to the commencement of the works.

5 Scope of the Assessment and Significance of Effects

5.0 Scope of the Assessment

- 5.0.1 The overall framework adopted for the assessment of the potentially significant impacts for the Proposed Scheme has been that detailed in Volume 11 of the DMRB.
- 5.0.2 The DMRB identifies three stages of environmental assessment as a scheme is planned and taken through to the specimen design for the Proposed Scheme.
- 5.0.3 Stage 1 establishes key environmental constraints and opportunities as a basis for informing an engineering, environmental, operational and economic assessment and leading to the identification of initial alignment/corridor options. A Stage 1 assessment was undertaken for the project in 1999⁴.
- 5.0.4 Stage 2 involves more detailed consideration of environmental interests and opportunities as part of an engineering, environmental, operational and economic evaluation of the options leading to a recommendation for a preferred scheme. A Stage 2 assessment was undertaken for the project in 2003⁵, the environmental considerations of which are presented in Chapter 3.
- 5.0.5 Stage 3 involves the detailed assessment of the adopted preferred scheme. This enables appropriate design modifications to be made in light of the detailed assessment and subsequent detailed evaluation of the nature and significance of the environmental effects which it is predicted would be associated with the resultant Proposed Scheme. It is the findings of this detailed assessment that are reported in the project ES.
- 5.0.6 Throughout the three stages, a process of scoping ensures that potentially significant environmental impacts are addressed. These may be added to or omitted in light of emerging information or preliminary assessment findings as initial planning and design for the project proceeds.
- 5.0.7 Volume 11 of the DMRB provides guidance on the environmental interests under which a road scheme of the type proposed may result in specific impacts. These comprise:
- Air Quality
 - Cultural Heritage
 - Disruption Due to Construction
 - Ecology and Nature Conservation
 - Landscape Effects
 - Land Use
 - Traffic Noise and Vibration
 - Pedestrians, Cyclists, Equestrians and Community Effects
 - Vehicle Travellers
 - Road Drainage and the Water Environment
 - Geology and Soils
 - Impact of Road Schemes on Policies and Plans

⁴ Halcrow (1999) A75 Gretna to Stranraer Route Action Plan Study – Firm Strategy Report

⁵ Mouchel Parkman (2003), A75 Hardgrove to Kinmount Stage 2 Environmental Assessment Report.

5.1 Scoping for the Stage 3 Assessment

5.1.1 The scoping for the Stage 3 assessment for the Proposed Scheme has been based on consideration of potential impacts under the broad environmental headings defined above. It has been further informed by the following tasks:

a review of the Stage 1 and stage 2 reports for the project to determine the initially identified environmental interests and constraints;

a review of development plan documentation and environmental policies and plans specific to the local and wider area;

consultation with statutory bodies and other environmental groups and interests with knowledge of the environment associated with the Proposed Scheme corridor and other relevant neighbouring areas; and

site appraisal to establish any recent changes in the status or composition of environmental components and interests.

5.1.2 The findings of the Stage 3 scoping are outlined below under the Volume 11 headings.

Air Quality/Traffic Noise and Vibration

5.1.3 The consideration of potential impacts resultant from changes in local air quality and noise levels relates to determining how traffic flows will vary in relation to the displacement of the A75 up to 66.5 m to the south. These factors relate to various threshold screening criteria contained within the DMRB that are used to scope the need for assessment.

Traffic Noise and Vibration

5.1.4 In the period following a change in traffic flow, namely the opening year of a scheme, people may benefit or disbenefit when the noise changes are as small as 1dB(A); equivalent to an increase in traffic flow of 25% or a decrease in traffic flow of at least 20%. In this regard, the B725 north of the A75 just meets the latter of these criteria in the Opening Year. From the Average Annual Weekday Traffic contained in Appendix C, analysis of the difference in traffic flows between the 2010 Do Nothing figure of 668 vehicles and the Do Something figure of 537 is a reduction of 131 vehicles or 20%.

5.1.5 Consideration of potential noise impacts within DMRB requires the application of the Calculation of Road Traffic Noise (CRTN) guidance. This guidance document however states that calculations of noise levels for roads with less than 1000 vehicles per day (taken over an 18 hour period) are unreliable. Consequently, as the predicted flows on the B725 peak at 680 vehicles (2025 Do Something scenario), there is not considered to be a robust technical justification for undertaking such calculations. In addition, given the proximity of the A75 and the relative contribution to noise levels from this dominant source at sensitive receptor locations, it is considered unlikely that the actual change in vehicle numbers over the relative percentage change, modelled as -131 vehicles, will give rise to an effective 1dB(A) change in noise levels. It is for these reasons that this issue has been scoped out.

Air Quality

5.1.6 The DMRB guidance does not expressly define screening criteria relating to air quality in favour of *'identifying areas where it is likely that the air quality will be improved or will deteriorate as a result of a change to traffic flows and speed or as a result of congestion or queuing time'*. However, criteria contained within the Department for Transport (DfT) Transport Analysis Guidance (TAG) and its Scottish equivalent ScotTAG, have been widely adopted by the practicing air quality community. These state that *'due to the uncertainty in traffic forecasting and the size of traffic flow change needed to affect air quality, options which change traffic flows by less than 10% can usually be scoped out, unless the road is a motorway (due to the high traffic flows) or there are particular sensitivities (e.g. traffic congestion, change to the speed limit or the presence of an Air Quality Management Area)'*.

- 5.1.7 Traffic flows on all roads considered in this assessment, with the exception of the B725 south of the A752 and the U81a north of the A75, are affected by the Proposed Scheme by less than 10% in the Opening Year (2010) (see Appendix C) . With the Proposed Scheme in place, the flows these roads are low (less than 350 and 150 vehicles per day respectively). Guidance provided in both the Government's Local Air Quality Management Technical Guidance 2003 (LAQM.TG(03)) and the National Society for Clean Air (NSCA (2006)⁶, states that '*roads below 10,000 AADT normally have a minimal impact on local air quality*', and are also not required to be considered by Local Authorities when conducting air quality assessments as part of the LAQM Review and Assessment Process. As total AADT flows on the two roads in question is significantly below this screening threshold, it is concluded that, despite receiving a change in flow of greater than 10%, the potential impact of such changes on the local air quality at sensitive receptors will be minimal and therefore considered not significant. Air Quality has therefore been scoped-out as there will be an indiscernible change from the current situation once the scheme is operational.
- 5.1.8 Noise and air issues with regards to construction-related activity are considered further in Chapter 15; Disruption Due to Construction

Cultural Heritage

- 5.1.9 The Stage 1 and 2 assessments identified a number of known archaeological sites and features that contribute to the historic built environment in the vicinity of the Proposed Scheme. Braehill Fort and Enclosure, is located some 150 m to the north of the existing road. The north western corner of the Kinmount House Designed Landscape is located some 600 m east of the eastern end of the Proposed Scheme. There is also an Archaeological Consultation Zone centred on Carrutherstown. Taking these findings into account and in light of consultations with Historic Scotland, it was concluded that a further assessment should be undertaken during the Stage 3 assessment of the Proposed Scheme.

Ecology and Nature Conservation

- 5.1.10 The Stage 1 and 2 assessments confirmed that there are no designated nature conservation sites associated with the Proposed Scheme corridor. Consultation with Scottish Natural Heritage (SNH) and Dumfries and Galloway Council (D&GC) and preliminary site visits established that the scheme area is dominated by habitats of negligible ecological value with some areas of woodland of potentially local value. Preliminary studies during the selection of a preferred route established evidence of use of the area by otter and badger and indicated a potential for bat and water vole activity. Some local areas were also identified as being of potential interest for invertebrates. Potential breeding bird activity associated with woodland, scrub and hedgerows within the area was also recognised.
- 5.1.11 In light of these findings and taking into account consultations with SNH and D&GC, it was concluded that further assessment should be undertaken during the Stage 3 assessment of the Proposed Scheme.

Landscape Effects (including Visual Impacts)

- 5.1.12 The landscape associated with the Proposed Scheme corridor broadly comprises pastoral agricultural land and occasional arable fields, which have established a man-made and managed landscape.
- 5.1.13 The Proposed Scheme would involve the retention of much of the existing trunk road for use by local traffic and the establishment of a new alignment to the south of the existing section of trunk road and the grade separation and realignment of the existing U81a junction.

⁶ Development Control: Planning for Air Quality: Updated guidance from the NSCA on dealing with air quality concerns within the development control process, 2006 Update – NSCA.

- 5.1.14 As a result it would serve to extend the influence of roads and their traffic within the local landscape between Carrutherstown and Upper Mains. It would also result in a change in the relationship for a small number of visual receptors associated with the corridor and the traffic which would be transferred from the existing alignment to the proposed more southerly alignment for the trunk road.
- 5.1.15 It was concluded that there would be the potential for significant impact on local landscape character and visual receptors and that a detailed assessment should be undertaken during the Stage 3 assessment of the Proposed Scheme.

Land Use

- 5.1.16 The retention of the existing road and introduction of a new road to the south would result in loss, and severance of, land for a number of agricultural holdings whilst the closure of most of the existing private junctions onto the trunk road would result in diversion of access for a number of properties and holdings.
- 5.1.17 It was concluded that there would be the potential for significant impact on existing holdings and that further assessment should be undertaken during the Stage 3 assessment of the Proposed Scheme.

Pedestrians, Cyclists, Equestrians and Community Effects

- 5.1.18 It was established during the Stage 1 and 2 assessments that there are no designated rights of way within the local area. It was, however recognised that the closure of existing access on to the proposed new section of trunk road and retention of the existing road for local use would impact on Non-Motorised Users (NMU) and access between local communities within the local area.
- 5.1.19 It was concluded that there would be the potential for significant impact on NMU and further assessment should be undertaken during the Stage 3 assessment of the Proposed Scheme.

Vehicle Travellers (View from the Road and Driver Stress)

- 5.1.20 The Proposed Scheme aims to provide safer overtaking opportunities for users along the A75 and to reduce conflicts between strategic and local traffic; an existing and significant contributor to driver stress.
- 5.1.21 The alignment offline would also result in a change in the view from the road where the balance between cutting and embankment, introduced as part of the Proposed Scheme, would modify the experience of the local landscape for users of the trunk road.
- 5.1.22 It was concluded that there would be the potential for significant impact on Vehicle Travellers and that further assessment should be undertaken during the Stage 3 assessment of the Proposed Scheme.

Road Drainage and the Water Environment

- 5.1.23 The Proposed Scheme requires the creation of four new culverts and increases the total surface run-off locally. It was concluded therefore that there would be a potential impact on surface water quality associated with the four local watercourses and that further assessment should be undertaken during the Stage 3 assessment.

Geology and Soils

- 5.1.24 The Stage 1 and 2 assessments did not discount the potential impact on geological interests or soils. However, as the detailed assessment progressed, it became evident that no such potential existed.

- 5.1.25 The site's geology and soils are however an important data source in defining other environmental parameters such as the surface and groundwater quality and regime. A chapter that reports the baseline conditions has been accordingly reported in the ES.

Policies and Plans

- 5.1.26 The scoping concluded that an appraisal of the implications of the Proposed Scheme for policies and plans of relevance in the national, regional and local context should be undertaken.

Disruption Due to Construction

- 5.1.27 There would be the potential for temporary impacts associated with noise and dust generated during the anticipated 52-week construction period. There is also the likelihood of disruption to existing users of the trunk road and temporary local access restrictions to farmsteads and Carrutherstown as the tie-in sections of the new alignment are merged with the existing A75 to the west and east of the upgraded section of the trunk road⁷. There would also be the potential for pollution of watercourses as earth works progress and construction plant operates in close proximity to the existing watercourses.

- 5.1.28 It was concluded that whilst many of these would be relatively short-term impacts, they would potentially constitute some of the more significant impacts associated with the Proposed Scheme and that further assessment should be undertaken during the Stage 3 assessment of the Proposed Scheme.

5.2 Summary of Scope

- 5.2.1 In summary, the scoping of potential issues concluded that the Stage 3 EIA should address the following environmental topics.

- Cultural Heritage
- Disruption Due to Construction
- Ecology and Nature Conservation
- Landscape Effects
- Land Use
- Pedestrians, Cyclists, Equestrians and Community Effects
- Vehicle Travellers
- Road Drainage and the Water Environment
- Geology and Soils
- Impact of Road Schemes on Policies and Plans

5.3 Format for the Environmental Assessments

- 5.3.1 A standardised format has been adopted for each of the chapters reporting the findings of the various assessments.

- Introduction.
- Scope of the Assessment – an outline of the key issues addressed during the assessment.
- Statutory and Planning Context – a summary of the key statutes, regulations and policy documents of relevance to the environmental topic area and the potential issues identified.

⁷ Essentially, there is little choice but to restrict access during the tie-in periods. Mutually acceptable terms will be arranged between the contractor and landowners so as not to disrupt essential movements; such as milk-tanker pick-ups. The exception will be emergency vehicle access that will be allowed at all times.

- Method of Assessment – a description of the baseline data sources, evaluation criteria and significance criteria adopted during the assessment.
- Baseline Conditions – a description of the nature and status of the existing environment.
- Predicted Impacts – a description and quantification of the predicted impacts based on the evaluation criteria defined in the method of assessment.
- Mitigation – a description of the proposed mitigation measures with the objective of avoiding, reducing or compensating for the identified impacts.
- Residual Effects – a description of the residual effects and their significance taking into account the proposed mitigation measures which have been incorporated as part of the Proposed Scheme.

5.4 Forms of Impact

- 5.4.1 Predicted impacts may be positive or negative, direct or indirect, short-term, medium-term, long-term or permanent.
- 5.4.2 An example of a positive impact would be the introduction of a system for intercepting pollutants in surface water run-off prior to discharge to a watercourse where no existing system is available. An example of a negative impact would be the loss of an archaeological asset or impacts on the local flora/fauna.
- 5.4.3 An example of a direct impact would be loss of woodland to accommodate the proposed alignment. An example of an indirect impact would be loss of sensitive aquatic habitat at distance downstream from the Proposed Scheme as a result of pollution associated with discharge of contaminated run-off.
- 5.4.4 An example of a short-term impact could be dust deposition associated with construction of the Proposed Scheme. Moderate-term impact could be represented by sedimentation of a local watercourse during construction that would take some months to recover. Long-term impacts could relate to the re-establishment of mature woodland as a key landscape component where a proposal requires the removal of such a resource. A permanent impact could be represented by the loss of a sensitive area of habitat which could not be replicated.

5.5 Impact Ratings and Significance of Residual Effects

Impact Ratings

- 5.5.1 The order of predicted impacts has been described in accordance with criteria that have been defined in the method of assessment for each environmental topic.
- 5.5.2 In some instances the criteria relate to quantitative thresholds prescribed by regulation or national targets (e.g. local water quality). In other instances they rely on the sensitivity of the affected receptor and the magnitude of the predicted impact and are represented by descriptive scales (e.g. – minor, moderate or substantial impact on local landscape character).
- 5.5.3 Where considered appropriate, a rating reflecting a point close to the upper or lower end of threshold in a descriptive scale is represented by a combined rating. For instance, a moderate/low rating for landscape character would indicate a moderate impact at the lower end of that threshold. Low/moderate would represent a low impact at the higher end of that threshold.

Determining the Significance of Residual Effects

- 5.5.4 The following factors have been considered during the determination of the significance of the predicted residual effects:
- the relative importance of the environmental resource in question (i.e. national, regional, or local importance);

- whether environmental quality will be impaired or enhanced in relation to standards and guidelines (i.e. noise, air, water quality);
- whether the environmental impact will be direct (such as land-take) or indirect (such as polluted run-off entering watercourses);
- the scale of the change (e.g. the area of land, number of people affected) and the degree of change from existing conditions;
- the scale of change resulting from cumulative impacts;
- whether the effect is permanent or temporary and, if the latter, its duration; and
- the potential for effective mitigation.

5.5.5 For the purpose of this assessment, impacts that have been assessed as being either moderately negative or positive, or greater, are considered to be 'significant' in terms of the definitions held within the Environmental Impact Assessment (Scotland) Regulations 1999.

6 Cultural Heritage

6.0 Introduction

6.0.1 This Chapter reports the findings of the assessment into the implications of the Proposed Scheme on resources and features of cultural heritage interest where the cultural heritage comprises sites and features of archaeological value, historic landscapes and historic building resources.

6.1 Scope of the Assessment

6.1.1 In accordance with the requirement that the form and extent of archaeological assessment for trunk road schemes in Scotland must be determined and administered by Historic Scotland (HS), the agency was initially consulted in May 2003 in relation to the preliminary online options and latterly in March 2006 to establish requirements for the proposed offline scheme.

6.1.2 Evaluation of the potential for impacts on the cultural heritage during the consideration of route options identified a number of potentially significant impacts:

- impact on the setting of the Kinmount House Designed Landscape; and
- impact on currently unknown sites and features associated with known sites at Braehill, north of the existing trunk road (Braehill Fort and Enclosure).

6.1.3 Following the move to the proposed offline scheme, HS further noted the potential impact on other unknown sites in the area to the south of the existing road that could be disturbed during construction.

6.1.4 In their March 2006 response, HS noted that there would be a need for field evaluation and sampling along with a follow-on potential for further intrusive investigation subject to the results of the findings. This was to be undertaken once the land-take requirements for the Proposed Scheme were confirmed and prior to any construction should the scheme be approved for implementation.

6.1.5 The current assessment herein is accordingly based on the desk-based analysis and consultations with HS and the Regional Archaeologist.

6.2 Statutory and Planning Context

6.2.1 The following guidelines, legislation and planning policy documents provide the framework for the protection and conservation of cultural heritage interests within Scotland and more locally within Dumfries and Galloway.

- Ancient Monuments and Archaeological Areas Act 1979.
- Town and Country Planning Act (Scotland) 1997.
- Town and Country Planning (General Development Procedure) (Scotland) Order 1992 (1992 Order).
- Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.
- NPPG5: Archaeology and Planning (1998).
- NPPG18: Planning and the Historic Environment (1999).
- Planning Advice Note 42 (PAN42) Archaeology, the Planning Process and Scheduled Monument Procedures (1994).
- SHEP 1, 2 and 3 (Scottish Historic Environment Policy) (2007).
- Dumfries and Galloway Structure Plan (Adopted December 1999).
- Annandale and Eskdale Local Plan (Adopted October 2006).

Historic Scotland

- 6.2.2 HS is an executive agency within the Scottish Executive and is responsible for the administering of laws concerning protection and management of ancient monuments and historic buildings. The agency is directly responsible for the assessment of the implications of Scottish Executive road schemes on the archaeological and built heritage resource. Appendix D comprises HS's provisions with this respect.

Designations and Planning Policies

- 6.2.3 Designations and features of relevance to the Proposed Scheme corridor and neighbouring areas are outlined below along with an explanation of their protection/regard under the above guidelines, legislation, and policies. The implication of the Proposed Scheme in relation to heritage-related policies is discussed in detail in Chapter 14; Policies and Plans.

Archaeological Sites, Monuments and Landscapes

- 6.2.4 Archaeological sites and monuments without statutory protection are curated by local planning authorities. NPPG5 and PAN42 provide guidance and advice on the treatment of this resource. PAN42 indicates that the principle that should underlie all planning decision-making is preservation of cultural resources, *in situ* where possible, and by record if destruction cannot be avoided. Where preservation does not prove possible, and where damage is unavoidable, various mitigation measures may be proposed.

Archaeological Consultation Zones (ACZ)

- 6.2.5 Archaeological Consultation Zones are those areas where records held indicate that archaeological issues are likely to exist.

Listed Buildings

- 6.2.6 Responsibility for the compilation of lists of buildings of special architectural or historic interest is vested in the First Minister for Scotland. Criteria for determining the value of such buildings has been devised by HS. The listings provide for three categories of building.
- Category A – buildings of national or international importance, either architectural or historic, or fine, little altered examples of some particular period, style of building type.
 - Category B - buildings of regional or more than local importance, or major examples of a particular period, style, or building type which may have been somewhat altered.
 - Category C - buildings of local importance; lesser examples of any period, style or building type, whether as originally constructed or as the result of subsequent alteration; simple, well proportioned, traditional buildings often forming part of a group, for example an estate or an industrial complex, or grouping in association with buildings in a higher category.

Historic Gardens and Designed Landscapes

- 6.2.7 Whilst a non-statutory designation, there is an Inventory of Gardens and Designed Landscapes in Scotland compiled and maintained jointly by HS and Scottish Natural Heritage (SNH). Under the provisions of the 1992 (General Development Procedure) Order (GDPO), planning authorities must consult HS and SNH on any proposed development that may affect a site contained in the Inventory.

Development Plan Policies

- 6.2.8 The Dumfries and Galloway Structure Plan and Annandale and Eskdale Local Plan contain policies that seek to protect non-designated sites of archaeological importance and their settings, historic gardens and designed landscapes, and listed buildings.

6.3 *Assessment Methodology*

6.3.1 The assessment has been undertaken in accordance with the Design Manual for Roads and Bridges (DMRB), Volume 11 Section 3, Chapter 8 and in accordance with best practice, as broadly outlined in the Institute of Field Archaeologists' Standard and Guidance for Archaeological Desk-based Assessment (IFA 2001).

6.3.2 There have been five stages to the assessment:

- the recording and analysis of the existing built heritage and archaeological context of the receiving environment;
- a review of the nature, forms and features of the Proposed Scheme;
- an evaluation of predicted impacts based on the initial two stages;
- an identification of appropriate design and mitigation measures; and
- a description of the residual effects taking proposed mitigation into account.

Baseline Data

6.3.3 Information has been obtained through a combination of desk-based review of existing documentation related to archaeological interests and historic features of the built environment, site survey and consultation with statutory bodies and other organisations with responsibility for or an interest in cultural heritage. A consultation area of 1km centred on the Proposed Scheme was agreed as being appropriate with the Dumfries and Galloway Regional Archaeologist.

6.3.4 Documentary sources included:

- the National Sites and Monuments Record;
- the Inventory for Gardens and Designed Landscapes in Scotland; and
- Historic maps of the area associated with the Proposed Scheme corridor.

6.3.5 A walkover survey was undertaken in early May 2006.

6.3.6 The following bodies and organisations were consulted to source information relating to the Proposed Scheme corridor and associated consultation area:

- Dumfries and Galloway Council, Planning and Environment;
- the Garden History Society;
- Historic Scotland ; and
- National Trust for Scotland (NTS).

6.3.7 Consultation responses are provided in Appendices B and D.

Impact Criteria

6.3.8 The determination of impact significance has involved consideration of the sensitivity of existing resources to change, as represented by the importance of each site or feature, and the magnitude and nature of the impact.

6.3.9 Assessment of the importance of cultural heritage resources has been undertaken in accordance with published guidance in NPPG5. The main thresholds accordingly comprise:

- Sites of National Importance - those sites protected by scheduling under the 1979 Act, and sites of "schedulable quality";
- Sites of Regional and Local Importance - those that do not merit scheduling, but which have significance or distinctiveness within a regional or local context. This may apply to their importance to regional or local history, or they may be the only local example of a monument type; and

- Other sites - sites of lesser importance, although they may comprise component parts of a landscape rich in archaeological monuments, and thereby gain greater significance.
- 6.3.10 Direct impacts are recorded as a physical impact on a cultural heritage asset as a result of development. Indirect impacts are where a cultural heritage asset would be affected visually, by a disturbance such as noise, dust or vibration, or where the setting is compromised. Uncertain impacts are where there is an unsubstantiated risk to a cultural heritage asset.
- 6.3.11 Impacts may be adverse or beneficial; permanent or temporary in effect; reversible or irreversible; and of minor, moderate or major order.
- Minor impacts are detectable but do not alter the asset in question materially.
 - Moderate impacts materially alter the asset in question but not fundamentally.
 - Major impacts fundamentally alter the asset in question.
- 6.3.12 In practice, all direct adverse impacts on cultural heritage features would be permanent and irreversible.
- 6.3.13 For cultural heritage sites of local or lesser importance, material or fundamental changes to baseline conditions are considered to be significant, whereas minor changes are not considered significant. For sites of national or regional importance, all changes to baseline conditions are considered significant.

6.4 **Baseline Conditions**

Regional Cultural and Archaeological Context

Prehistoric

- 6.4.1 The south western region of Scotland was a hive of activity in prehistoric times, from the Mesolithic period onwards. Much of the evidence confirming this activity can only be truly appreciated in an aerial context such as Mesolithic shell middens⁸, post defined Crucis monuments and other timber settings such as the Dunragit complex.
- 6.4.2 The region does however display an abundance of physical remains, i.e. upstanding monuments; although many are located in remote areas and are only accessible on foot. There are also chambered cairns, passage graves and long cairns from the Neolithic period as well as round cairns, cists, burnt mounds, standing stones, short stone rows, stone circles and rock art.

Roman

- 6.4.3 Recent archaeological excavations within the region have unearthed evidence of Scotland's oldest Christian settlement whilst historical documentation and artefacts indicate that the area was the last outpost of Christianity in North West Europe after the fall of the Roman Empire.
- 6.4.4 Despite their short stay in the region, the Romans left behind significant evidence of their presence. The most significant is the Roman road running north from Carlisle into central Scotland. The mound on which the road sat can still be seen around Moffat. The valley of the Evan Water and the ridge to the west of today's town was the site of a number of marching camps. The semi-permanent buildings left scars in the land that have been excavated by archaeologists.

⁸ Old rubbish pits

Anglo-Saxon

- 6.4.5 Less than two centuries following the Roman withdrawal, the region was subsumed into the domain of the Kingdom of Rheged, and monks arriving from Ireland established Christianity as a significant religion. In the 8th century the border area became part of the domain of the Anglo Saxon kingdom of Northumbria which, in turn, was destabilised during the Viking invasions from the 9th century onwards. It was during this period that the kingdom of Galloway became established west of the River Nith. The kingdom survived until its rulers accepted Scots overlordship in 1018, though many historians believe that the area was not securely incorporated into Scotland until as late as the 13th century.

Medieval

- 6.4.6 Although little is left of the medieval town, Dumfries has long been the main centre of this region and was given the status of a royal burgh as long ago as 1186. The medieval town was situated between the wide River Nith, which flows through the modern town, and the old red sandstone bridge, which dates back to the 15th century.
- 6.4.7 The area has always been an agricultural region with much of its economy dependent on sheep and cattle farming; and Dumfries has a long tradition of an allied industry in the manufacture of knitwear and, in particular hosiery. While these trades still significantly contribute to the economy in recent years there have been efforts to attract a wider range of commerce resulting in a range of light industries in the area⁹.

Post-Medieval

- 6.4.8 1633, an important year in Dumfries and Galloway's history, saw a mineral spring discovered near the town of Moffat, and the subsequent development of the town as Scotland's first spa resort. People journeyed long distances to seek respite and remedy for a variety of afflictions. In 1683, the Black Bull Inn became the first of many inns built to accommodate the travellers and the town began to grow considerably. A second spring was discovered in 1748 further reinforcing the town's status.

Industrial

- 6.4.9 In southern Scotland, the Industrial Revolution in the late 18th century brought flourishing towns, expanding populations, and the creation of industries such as cotton and shipbuilding, which brought booming trade. The spread of urban life coincided with an intellectual flowering, the Scottish Enlightenment, personified by the poet Robert Burns, the philosopher David Hume and the political economist Adam Smith.
- 6.4.10 Early industries included tanning in Whithorn, a cotton mill, damask weaving in Sorbie, and local milling of oats using both water and wind-power at Whithorn (now demolished), Portyrock on the east near the Isle, Bysbie Mill in the Isle village, and at the still existing buildings in the middle of Port William. Pigot and Slater's Directory produced throughout the 19th century and republished by Dumfries and Galloway Libraries, lists the trades that once made these small Machars settlements virtually self-sufficient well into the 20th century. Drapers, shoemakers, candle makers, saddlers, blacksmiths and tide-waiters; even actors are listed amongst the traders and shopkeepers of Whithorn, Port William, the Isle and Garlieston.
- 6.4.11 Today, agriculture is still a significant industry, but with the advent of more powerful machinery, it no longer supports a large labour force as it did until the Second World-War. Locally, the construction industry and the army provide employment opportunities. There is a greater level of commuting regionally to larger centres such as Stranraer¹⁰.

⁹ www.dumfries-and-galloway.co.uk/sights/towns.htm

¹⁰ Whithorn First in Scotlands Past: www.whithorn.info/history

Sites Associated with the Proposed Scheme Consultation Area

Scheduled Ancient Monuments (SAMs)

6.4.12 There are no SAMs within the consultation area.

Recorded Archaeological Sites

6.4.13 The Dumfries and Galloway Sites and Monuments Record (SMR) lists various monuments that have been evaluated in accordance with the categories of importance defined within NPPG5 and described in Paragraph 6.3.9.

6.4.14 The sites are scheduled in Table 6.1. Their location is shown in Figure 6.1. Some sites, although listed in the SMR, do not have a designated Dumfries and Galloway SMR significance rating.

Site Name (Period)	Grid Ref.	Monument Type	SMR Reference Number	D&G Significance Rating
Braehill	3119, 5709	Fort, Settlement	DG7094	National
Braehill	3119, 5711	Enclosure	DG7095	National
Gillbrae	3100, 5704	Farmhouse, Farmstead	DG7089	Regional/Local
Kinmount House, Walled Garden	3136, 5693	Walled Garden	DG12185	Regional/Local
Whitecroft Gate Piers	3106, 5717	Gate Pier	DG 7081	Other
Cocklicks	3115, 5696	Rubbing Stone, Findspot	DG 6954	Unknown
Roman Camp Field	3121, 5692	Site	DG6949	Unknown
*Hetland Cottage (at Hetland Road End)	3095, 5720	Building	DG19568	None
Denbie Mains	3103, 5725	Farmhouse, Farmstead	DG7082	None
Carrutherstown	3101, 5718	Village	DG11736	None
Whitecroft	3106, 5720	Farmhouse, Farmstead	DG 7080	None
Hardgrove	3112, 5706	Farmhouse, Farmstead	DG11456	None
Hardgrove Cottages	3114, 5704	House	DG11457	None
Braehill	3121, 5714	Farmhouse, Farmstead	DG11455	None
Kinmount House, Upper mains/ Kelhead	3130, 5698	Farmhouse, Farmstead	DG12322	None
*Kinmount, West Lodge	3135, 5693	Building	DG19651	None

Site Name (Period)	Grid Ref.	Monument Type	SMR Reference Number	D&G Significance Rating
Kinmount, West Lodge	3135, 5693	Lodge	DG6939	None
*Kinmount, Keepers Cottage (to west of walled garden)	3135, 5693	Building	DG19648	None
Kinmount Keepers Cottage	3135, 5693	House	DG6941	None

Table 6.1 – Recorded Archaeological Sites

* site also classified as a Listed Building. Note: Dumfries and Galloway SMR Ref numbers DG19651 and DG6939 both relate to Listed Building Reference number 3546 and Ref numbers DG19648 and DG6941 relate to Listed Building Reference number 3543.

Archaeological Consultation Zones (ACZ) and Records

6.4.15 There are four archaeological consultation zones defined by Dumfries and Galloway Council within, or near to, the 1 km consultation area. Referenced ACZ1 – ACZ4, their location in relation to the Proposed Scheme is shown in Figure 6.1.

- ACZ1 - Area surrounding Hetland House Hotel (0.6 km north west of the western end of the Proposed Scheme).
- ACZ2 - Area of Braehill Oak Wood (0.1 km north of the central section of the Proposed Scheme).
- ACZ3 - Newfield plantation (1 km south of the central section of the Proposed Scheme).
- ACZ4 - Kinmount Lodge (0.8 km south west of the eastern end of the Proposed Scheme).

6.4.16 ACZ2, the area at Braehill, is the only one of the four close enough to the Propose Scheme where there is a potential for impacts associated with the Proposed Scheme. This ACZ includes two sites identified by the review of the SMR; Braehill Fort and Settlement (DG7094) and Braehill Enclosure (DG7095). Both are sites of national importance as is the ACZ.

Listed Buildings

6.4.17 Three listed buildings have been identified within the consultation area. These are scheduled in Table 6.2 and shown in Figure 6.1. Hetland Cottage is located approximately 1 km west of Carrutherstown. The other two listings are associated with the Kinmount Estate and are located on the western edge of Kelhead Wood approximately 0.6 km east of the eastern end of the Proposed Scheme.

Listed Buildings and Ref. Nos	Grid Ref.	D&G SMR Reference Number	Categories
Hetland Cottage (3463)	3095, 5720	DG19568	B
Kinmount, West Lodge (3546)	3135, 5693	DG19651	B
	3135, 5693	DG6939	
Kinmount, Keeper's Cottage (3543)	3135, 5693	DG 19648	C(S)
	3135, 5693	DG 6941	

Table 6.2 – Listed Buildings

*The specific designation C(S) indicates that the property is Category C and is also included on the statutory list of Buildings of Architectural or Historic Interest.

Conservation Areas

- 6.4.18 There are no conservation areas within the consultation area.

Designed Landscapes

- 6.4.19 The Kinmount Estate is identified within the 'Inventory of Garden and Designed Landscapes in Scotland'. HS note that the estate is of high historic, scenic and nature conservation value whilst being considered a 'work of art' and outstanding in architectural terms.
- 6.4.20 There are two non-inventory designed landscapes within and close to the consultation area. These comprise Denbie, approximately 1 km northeast of Carrutherstown village, and Murraythwaite, approximately 0.7 km northeast of Braehill Farm (See Figure 6.1).

6.5 Predicted Impacts

Archaeological Sites and Features

- 6.5.1 There would be no direct impacts on any known features or designated sites of national, regional or local importance.
- 6.5.2 The proposed tie-in location at the western end of the Proposed Scheme corridor would require the relocation of an old undesignated milestone located in the southern verge of the existing road. The milestone would be removed prior to commencement of the works, stored and relocated locally once the proposed engineering works are completed. There would be no material impact on the feature, its precise location not being the principal interest in the feature, rather its association with the history of the trunk road corridor and modifications to the corridor over time. It has therefore been concluded that the impact would be negligible.
- 6.5.3 The nature of the Proposed Scheme is such that heavy volumes of existing traffic would be displaced further south from known archaeological interests north of the existing A75 and would be more substantially screened from the sites and features by virtue of substantial dense scrub planting that would be introduced between the existing and new section of road (see Chapter 8). The assessment has accordingly concluded there would be no material impact on the setting of these sites and features.
- 6.5.4 Within the narrow corridor that would be disturbed to the south of the existing A75 there would be the potential for direct impacts on currently unknown features. A strategy for addressing any such features encountered during construction is outlined under Section 6.6. The impact on such features would depend on the nature and extent of any finds. The likelihood of a find involving a site or substantive feature of a national or regional significance is considered to be low as confirmed by the proposed strategy to be adopted by HS.
- 6.5.5 It has been concluded that there would therefore, be a low probability of impacts on unknown archaeological sites or features and that the potential impact would be minor-to-moderate adverse at worst.

Listed Buildings and Conservation Areas

- 6.5.6 There would be no direct or indirect impact on existing listed buildings or their setting.

Designed Landscapes

- 6.5.7 The Proposed Scheme would involve localised modification to the existing A75 some 0.6 km north west of the westernmost boundary of the Kinmount House Designed Landscape. There would be no discernable change in the relationship between the trunk road and the designed landscape and no impact on its character or setting.
- 6.5.8 Neither of the two non-inventory designed landscapes, Denbie and Murraythwaite, would be affected by the Proposed Scheme. In their consultation response, The Garden History Society reported that the properties are believed to be naturally screened by intervening topography and are at sufficient distance from the Proposed Scheme to remain largely unaffected.

6.6 Mitigation and Monitoring

- 6.6.1 In the absence of predicted direct or indirect impacts on known sites of cultural heritage value, proposed mitigation is limited to consideration of the potential for the discovery of currently unknown sites and features. HS has indicated that a field walkover survey should be undertaken once the required land-take for the Proposed Scheme is known and prior to construction should approval to proceed be given. The requirement for any further intrusive investigation would be determined by the initial walkover survey and sampling.

6.7 Residual Effects

- 6.7.1 The assessment has demonstrated there would be no direct impacts on known sites of archaeological importance, listed buildings or designed landscapes. It has further demonstrated that there would be no impacts on the settings or context of these known interests. It has concluded there would be no requirement for mitigation in relation to these known interests beyond those implicit in the alignment of the Proposed Scheme. There would accordingly be no significant residual effects on known sites of archaeological or the historic built environment.
- 6.7.2 The assessment has recognised that there would be the potential for unknown archaeological interests to be exposed within the proposed construction corridor to the south of the existing A75. In light of the disposition and nature of existing known features and limited extent of the proposed works it has been concluded that there would be a low likelihood of a significant site or feature find.

7 Ecology and Nature Conservation

7.0 Introduction

7.0.1 This chapter reports the findings of the assessment of predicted impacts on habitats and species associated with the Proposed Scheme corridor. The results of specialist surveys undertaken in 2007 are summarised in this chapter with more detail provided in Appendix G2 (flora, breeding birds, otters, water voles and red squirrels) and Appendix G3 (badgers). Appendix G3 remains confidential in accordance with the standard practiced approach of not revealing the location of known setts.

7.1 Scope of the Assessment

7.1.1 Consultations with SNH, Dumfries and Galloway Council (D&GC), the Scottish Executive (Environment and Rural Affairs Department) (SEERAD) and the Scottish Environment Protection Agency (SEPA) in addition to the Stage 1 and 2 assessments established that sensitive habitats associated with the Proposed Scheme corridor include woodland, grassland, wetland and water body and habitats on peat soils.

7.1.2 In their consultation response, SNH noted that the Proposed Scheme would largely cross areas of improved permanent pasture and one area of recently felled and re-stocked plantation. SNH further noted that the habitats involved are unlikely to hold specific natural heritage interest of particular significance but suggested that a survey of these habitats should be conducted to establish whether there are specific habitats and species of significance within the Proposed Scheme corridor.

7.1.3 SNH noted that there is anecdotal evidence suggesting the presence of badgers within the area and indicated that otters and water voles might be associated with the Pow Water and Glen Burn. Their presence was confirmed through biological records collected at the time. SNH recommended that an otter survey should be undertaken incorporating a search of all ditches and watercourses within 500 m of the Proposed Scheme for signs of otter activity and habitats that may be used for resting or shelter.

7.1.4 In light of the preliminary work and consultations it was concluded that the stage 3 assessment should include the following:

- a Phase 1 Habitat Survey and assessment;
- a badger survey and assessment;
- an otter survey and assessment;
- a bat survey and assessment; and
- a water vole survey and assessment.

7.2 Statutory and Planning Context

7.2.1 Planning guidelines, international commitments, legislation and planning policies relevant to the protection, conservation and enhancement of nature conservation interests associated with the Proposed Scheme corridor are outlined below. A more detailed explanation of these obligations and objectives is included in Appendix G1.

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (1992) ('the Habitats Directive').
- Council Directive 79/409/EEC on the Conservation of Wild Birds ('the Wild Birds Directive).
- The Conservation (Natural Habitats, &c.) Regulations (1994) (The Habitats Regulations).
- The Nature Conservation (Scotland) Act (2004)

- The Wildlife and Countryside Act (WCA) (1981) (as amended).
- Natural Heritage (Scotland) Act (1991).
- The Protection of Badgers Act (Scottish Version) (1992).
- National Planning Policy Guidelines (NPPG) 14: Natural Heritage (1999)¹¹.
- Planning Advice Note 60 – Planning for Natural Heritage (PAN 60) (2000).
- Dumfries and Galloway Structure Plan (Dumfries and Galloway Council), (1999).
- Annandale and Eskdale Local Plan (Dumfries and Galloway Council) (2006).

Statutorily Protected Sites

- 7.2.2 Local Nature Reserves (LNRs); National Nature Reserves (NNRs); Ramsar sites; Sites of Special Scientific Interest (SSSIs); Special Areas of Conservation (SAC); and Special Protection Areas (SPAs) contain examples of some of the most important natural and semi-natural ecosystems in Great Britain and Europe and receive strict protection under both UK and European legislation.

Non-Statutory Sites

- 7.2.3 Local Wildlife Sites receive protection through the policies contained within Dumfries and Galloway Structure Plan (Dumfries and Galloway Council, 1999) and the Annandale and Eskdale Local Plan (Dumfries and Galloway Council, 2006).

Invasive Weeds

- 7.2.4 The WCA makes it an offence to plant or otherwise cause to grow in the wild, Japanese knotweed *Fallopia japonica* and giant hogweed *Heracleum mantegazzianum*.

Protected Species

- 7.2.5 Under European legislation, a number of species and their habitats, including great crested newt *Triturus cristatus*; bats; red squirrel *Sciurus vulgaris*; otter *Lutra lutra*; and badger *Meles meles* are strictly protected from damage, disturbance and destruction etc. Certain species such as some reptiles and birds receive partial protection under UK legislation, e.g. protection from killing/injuring only or protection at certain times of the year only. Other species such as water vole *Arvicola terrestris*, receive protection of their habitat only.

Planning Policy

- 7.2.6 National Planning Policy in Scotland is set out in a series of Scottish Planning Policy (SPP) documents that identify the key priorities for the planning system. Prior to the publication of SPPs, national planning policy was set out in a series of National Planning Policy Guidelines (NPPGs). Existing NPPGs have continued relevance to decision making, until such time as they are replaced by a SPP. A series of Planning Advice Notes (PANs) provide supplementary advice on good practice.
- 7.2.7 Local planning policy is set out in the Dumfries and Galloway Structure Plan (Dumfries and Galloway Council, 1999) and the Adopted Annandale and Eskdale Local Plan (Dumfries and Galloway Council, 2006) both of which contain policies relating to ecology and nature conservation.

¹¹ (<http://www.scotland.gov.uk/Publications/1999/01/nppg14>)

7.3 *Assessment Methodology*

Guidelines and Key Stages

7.3.1 The assessment has been based on the DMRB Volume 11 Section 3, Part 4. Reference has also been made to the Institute of Ecology and Environmental Management (2006) Guidelines for Ecological Impact Assessment in the United Kingdom (version 7 July 2006) - <http://www.ieem.org.uk/ecia/index.html>. The assessment has involved the following key stages:

- scoping and consultation;
- identification of the likely zone of influence of the Proposed Scheme;
- identification and evaluation of ecological resources and features likely to be affected (baseline environment);
- identification of the biophysical changes likely to affect valued ecological resources and features and an assessment of whether these biophysical changes are likely to give rise to a significant ecological impact;
- refinement of the project to incorporate ecological mitigation and enhancement measures to avoid, reduce or compensate for any significant adverse impacts; and
- assessment of the ecological impacts of the project, including any mitigation and enhancement measures and definition of the significance of any residual effects.

Scoping

7.3.2 The basis for the scoping of issues is described in Section 7.1.

Identification of the Likely Zone of Influence

7.3.3 The likely zones of influence comprises:

- an immediate zone of influence within the proposed working area for the scheme; and
- a wider zone of influence extending to all areas/receptors that could be affected by the Proposed Scheme. These include potentially sensitive water-dependent habitats and associated species at varying distance from the immediate scheme corridor.

Establishment of the Baseline Environment

7.3.4 Establishment of the baseline environment has involved a combination of desk based review, consultation and site survey.

Desk Based Review

7.3.5 The desk based review involved reference to documents and reports prepared during the Stage 1 and 2 assessments undertaken during the earlier stages of the planning, design and assessment of the Proposed Scheme.

7.3.6 The following documents were reviewed:

A75 Trunk Road Hardgrove to Kinmount – Stage 2 Report (Mouchel Consulting, 2003a); and
A75 Hardgrove to Kinmount: Otter, Badger & Water Vole Survey Report (Mouchel Consulting, 2003b).

Consultation

7.3.7 Information has been sought through correspondence with the following organisations.

- Dumfries and Galloway Badger Group.
- Dumfries and Galloway Bat Group.
- D&GC.

- Dumfries and Galloway County Bird Recorder.
- Dumfries and Galloway Environmental Resources Centre (DGERC).
- SEPA.
- SNH.

7.3.8 Consultation responses are provided in Appendix B and further data inclusions are contained within Appendix G.

Habitat Surveys

7.3.9 An initial walkover survey was undertaken in June 2005 adopting a survey area 500 m either side of the Proposed Scheme alignment. An Extended Phase 1 Habitat Survey was undertaken in December 2006 adopting a survey area concentrated on all accessible land within 30 m of the Proposed Scheme extent, although some areas beyond 30 m were also surveyed where accessible. This was updated at a more appropriate time of year for habitat surveys, in July 2007, covering all accessible land within 500 m of the alignment (see Appendix G2).

7.3.10 The purpose of the June 2005 survey was to identify the principal habitat types within the Proposed Scheme corridor and to provide an initial indication of their potential to support legally protected or otherwise notable species of flora/fauna including those priority species listed in the UK or Dumfries and Galloway Biodiversity Action Plan (BAP)¹².

7.3.11 The Extended Phase 1 Habitat Survey identified and mapped the habitat types within the Proposed Scheme footprint and the immediate area using the standard Phase 1 Habitat Survey methodology (JNCC, 2003). Target notes were made to describe features of interest.

Invertebrates

7.3.12 During the Phase 1 Habitat Survey in 2006, the habitats were assessed to determine their potential to support invertebrates based on the habitat types and their geographic location. Based on the findings of this assessment, a specialist invertebrate assessment was undertaken in July 2007 (see Appendix G5).

Fish

7.3.13 During the Phase 1 Habitat Survey the watercourses associated with the Proposed Scheme corridor were assessed to determine their potential to support notable fisheries based on marginal and aquatic habitat types, physical condition and their geographic location.

Breeding Birds

7.3.14 Specialist breeding bird surveys were undertaken during July 2007 (see Appendix G2) based on the methodology described in Bibby *et al* (2000). The surveys involved four survey visits, in suitable weather conditions just after dawn or before dusk covering the scheme area plus the surrounding land within approximately 100 m of the Proposed Scheme footprint. The results of the surveys were then subject to territory mapping analysis in accordance with the methodology described in Bibby *et al* 2000. Unfortunately, the survey visits could not be spread throughout the breeding season, as recommended in Bibby *et al* 2000; and it is therefore possible that some species, e.g. early-breeders, may have been under-recorded or over-looked during the surveys. Nonetheless, it is considered that the surveys provide a good indication of the ornithological value of the study area during the breeding season.

7.3.15 Specialist surveys for barn owl *Tyto alba* were undertaken based on the methodology described in Gilbert *et al* 1998. This involved searching potential nest/roost sites approximately 100 m of

¹² (<http://www.dumgal.gov.uk/dumgal/miniweb.asp?id=255>)

the Proposed Scheme footprint for signs of barn owl such as pellets, faeces or the birds themselves.

Badgers

7.3.16 Specialist surveys for badgers within 500 m of the scheme were undertaken in 2003, 2006 and 2007 (see Appendix G3) in accordance with the standard methodology (Harris *et al*, 1989).

Bats

7.3.17 All buildings and trees within 30 m of the Proposed Scheme were subject to an initial assessment in terms of their potential to support bat roosts during the Phase 1 habitat Survey. The two types of feature were assessed as having a high, medium or low potential based on the factors described in Tables 7.1 and 7.2 respectively.

Feature	Assessment
<ul style="list-style-type: none"> • No visible holes or crevices; • No dead branches; • Flight lines to trunk highly obscured; • Very little or no ivy on the trunk; • No water bodies/watercourses within 400 m. 	Low
<ul style="list-style-type: none"> • Visible holes or crevices or small superficial holes beginning to form; • Minor dead limbs but no obvious cavities/lifting bark/splits; • Flight lines to trunk slightly obscured; • Lifting bark on trunk; • Trunks covered by ivy on semi-mature trees; • 200m to 400m from a watercourse/water body. 	Medium
<ul style="list-style-type: none"> • Cavities and crevices present; • Species liable to form cavities, e.g. beech, ash, oak, willow; • Major dead limbs present; • Good flight lines to trunk; • Heavily ridged and lifting bark; • Trunks covered by ivy on mature trees; • <400 m from a watercourse/water body. 	High

Table 7.1 - Level of bat roost potential in trees - based on Mitchell-Jones (2004)

Feature	Assessment
<ul style="list-style-type: none"> • No access points; • No trees or bushes adjacent to building; • No habitat linkages to foraging areas; • No waterbodies/watercourses within 400m. 	Low
<ul style="list-style-type: none"> • Visible holes or crevices or small superficial holes beginning to form; • Potential bat access points but may be a bit too big or in a position unlikely to be used by bats; • 200m to 400m from a watercourse/water body; • Tall vegetation adjacent to building or good habitat linkages to foraging grounds. 	Medium
<ul style="list-style-type: none"> • Signs of bats, e.g. droppings; • Points of access that bats would use (not so large 	High

Feature	Assessment
<p>that birds would use);</p> <ul style="list-style-type: none"> • Tall vegetation adjacent to building and good habitat linkages to foraging grounds; • Good flight lines to building; • <400 m from a watercourse/water body; • Roof exposed to direct sunlight. 	

Table 7.2 - Level of bat roost potential in buildings - based on Mitchell-Jones (2004)

7.3.18 Following the initial assessment, specialist dawn and dusk bat surveys were undertaken to confirm the presence of roost sites (see Appendix G2).

Red Squirrel

7.3.19 Specialist red squirrel surveys were undertaken at suitable habitat locations within approximately 250 m of the Proposed Scheme footprint during July 2007 (see Appendix G2).

Water Voles

7.3.20 Specialist surveys for water voles were undertaken at all potentially suitable watercourses and water bodies within 500 m of the Proposed Scheme footprint during the August and September 2003 surveys in accordance with Strachan (1998) and again during the July 2007 surveys in accordance with Strachan and Moorhouse (2006) (see Appendix G2). This involved searching the banks for signs of water vole activity such as burrows, latrines and areas of cropped grass.

Otters

7.3.21 Specialist searches for signs of otters were undertaken during 2003 and 2007 in accordance with Chanin (2003) (see Appendix G2). The suitability of habitats associated with watercourses to support otter holts¹³ was also evaluated during the 2007 surveys.

Impact Criteria

7.3.22 Impact significance and ecological value has been equally evaluated for the associated predicted impacts both prior to and post mitigation.

Ecological Significance and Evaluation

7.3.23 An ecologically significant impact is defined as an (negative or positive) impact on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area. The ecological significance of an impact is not dependent on the value of the feature in question; rather the value of the feature is used to determine the geographic scale at which the impact is significant. For example, an ecologically significant impact on a feature assessed as being of value at the national level is regarded as a significant impact at a national level (as defined by the adopted IEEM guidance).

7.3.24 Each feature has been assessed as being valuable, or potentially valuable, based on the following geographic criteria.

- International, e.g. Special Protection Areas (SPAs), Special Areas of Conservation (SACs) or Ramsar Sites.
- National (i.e. UK), e.g. Sites of Special Scientific Interest (SSSIs).
- Regional, e.g. habitats or species valuable at a regional level.
- County, e.g. sites valuable at a county (i.e. Dumfries and Galloway) level.

¹³ Holt is the term used for otter resting places and breeding sites.

- District, e.g. habitats or species populations of value at the district (i.e. Annan and Eskdale) level.
- Local, e.g. habitats or species populations of value in a local (i.e. within ~5km of the scheme extent) context.
- Within the immediate zone of influence of the scheme only (i.e. within the working area).

7.3.25 In accordance with IEEM (2006), the value of habitats has been measured against published selection criteria where available. Reference has also been made to UK and local Habitat Action Plans (HAPs) although, as the guidance notes, the presence of a habitat subject to a HAP reflects the fact that the habitat concerned is in a sub-optimal state and hence that conservation action is required. The HAP does not necessarily imply any specific level of value to the habitat type concerned. The local BAP for the area is the Dumfries and Galloway BAP¹⁴.

7.3.26 As for habitats, in accordance with IEEM (2006), the evaluation of species populations makes use of relevant published criteria where available. Reference is also made to UK and local Species Action Plans (SAPs) although, as for HAPs, the fact that a species is subject to a SAP implies that the population is in a sub-optimal state and does not necessarily imply any specific level of value to the species concerned.

Significance of Impacts

7.3.27 Impacts are only assessed in detail for ecological receptors considered to be of value at the 'local' level or above, except where subject to some form of legal protection. In some instances, it is possible for a feature to be of less than local value in nature conservation terms yet subject to legal protection. Examples include certain common nesting birds (the nests of which are subject to legal protection) and in many parts of the UK, badgers, which are subject to protection primarily on animal welfare grounds.

7.3.28 When describing impacts, reference is made to the following:

- confidence in predictions (level of certainty that an impact will occur);
- magnitude, i.e. the size of an impact in quantitative terms where possible;
- extent, i.e. the area over which an impact may occur;
- duration, i.e. the time for which an impact is expected to last;
- reversibility, i.e. a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it; a temporary impact is one from which short-term recovery is possible; and
- timing and frequency, i.e. whether impacts occur during critical seasons or life-stages.

7.3.29 Confidence in predictions is based on a four point scale, as follows:

- certain/near certain, probability estimated at 95% chance or higher;
- probable, probability estimated above 50% but below 95%;
- unlikely, probability estimated above 5% but below 50%;
- extremely unlikely, probability estimated at less than 5%.

7.4 Baseline Conditions

Statutory Designations

7.4.1 Data derived from the desk-based review and consultations established that there are no statutorily designated sites within 1 km of the Proposed Scheme.

¹⁴ (www.dumgal.gov.uk/dumgal/miniweb.asp?id=255)

- 7.4.2 The nearest designated site is the Solway Firth, some 4.6 km south of the Proposed Scheme. It is internationally designated as a Ramsar Site, SPA and SAC, and nationally as a SSSI and NNR. Its core value relates to wintering wildfowl, wading birds and migrating birds. The site is also of value for its breeding birds, natterjack toads, invertebrates, geomorphology and vegetation.

Non-Statutory Designations

- 7.4.3 There is one non-statutory nature conservation site within 1km of the Proposed Scheme; Kelhead Flow Local Wildlife Site which comprises an area of some 25 ha located approximately 0.5 km east of the Proposed Scheme. The site is described in the Scottish Wildlife Trust Site Survey (see Appendix G4) as a raised bog, most of which has been cut in the past and planted with a mixture of broad-leaved trees and conifers. The central area of the site is uncut, with good peat-land vegetation under a canopy of conifers.
- 7.4.4 In addition, Kelhead Moss Plantation has been identified by DGERC as a 'Red Squirrel Priority Woodland' (see Appendix G4). The plantation is located approximately 1.5 km east of the Proposed Scheme.

Habitats

- 7.4.5 The various habitats identified during the field surveys are shown in Figure 7.1 and described below. Target notes are described in Appendix G2 and their locations are shown in Figure 7.1.

Broad-Leaved Semi-Natural Woodland

- 7.4.6 The woodland at the location described in target note 4 (Braemoss Wood) is dominated by semi-mature silver birch *Betula pendula* and downy birch *Betula pubescens* with alder *Alnus glutinosa*, sycamore *Acer pseudoplatanus*, holly *Ilex aquifolium* and willows *Salix* spp. There is evidence of supplementary planting with European larch *Larix decidua* and sitka spruce *Picea sitchensis*, which is present in some areas and a number of mature beech *Fagus sylvatica* along the woodland edge.
- 7.4.7 Additional species at Braemoss Wood include elder *Sambucus nigra*, rhododendron *Rhododendron ponticum*, common nettle *Urtica dioica*, soft rush *Juncus effusus*, bramble *Rubus fruticosus* agg., bracken *Pteridium aquilinum*, bluebell *Hyacinthoides non-scripta*, cock's-foot *Dactylis glomerata* and rosebay willowherb *Chamerion angustifolium*. Some areas are marshy and are characterised by locally abundant climbing corydalis *Ceratocarpus claviculata*, frequent soft rush *Juncus effusus* and creeping buttercup *Ranunculus repens*. There are also occasional areas of developing bog communities with very locally frequent heather *Calluna vulgaris*, bog stitchwort *Stellaria uliginosa*, wild angelica *Angelica sylvestris*, marsh thistle *Cirsium palustre* and a very small patch of sphagnum moss *Sphagnum* sp. located amongst the woodland ground flora. The moisture is provided by the wet ditch running through woodland. Of note, is the presence of stand of Japanese knotweed *Fallopia japonica*, which, at the time of the survey, covered an area approximately 40 m by 10 m in the location described by target note 6.
- 7.4.8 The broad-leaved woodland identified by target note 36 is dominated by immature silver birch and willows. Other woody species include ash, sycamore and wild cherry *Prunus avium*. The woodland appears to have been planted approximately 20 years ago on fairly waterlogged ground. The ground flora is reminiscent of a successional bog community with a typically acidic sward of herbs and grasses but with limited diversity due to the evident closing of the tree canopy. Typical species include tufted hair grass *Deschampsia cespitosa*, creeping soft grass *Holcus mollis*, tormentil *Potentilla erecta*, climbing corydalis, and occasional wood sorrel, violet *Viola* sp., marsh thistle *Cirsium palustre*, bog stitchwort *Stellaria uliginosa*, honeysuckle *Lonicera periclymenum*, moss *Hylocomium splendens* and foxglove *Digitalis purpurea*.
- 7.4.9 The area of woodland identified by target note 11 is dominated by mature beech trees with scattered holly over a ground layer dominated by bracken and bluebell. The broad-leaved semi-

natural woodland within the survey area matches the characteristics for the Dumfries and Galloway BAP priority habitat of native woodland.

- 7.4.10 Bluebell is identified as a Dumfries and Galloway BAP priority species.

Broad-Leaved Semi-Natural Plantation

- 7.4.11 Part of the garden of the derelict property known as Stenriesgate adjacent to the existing A75 (target note 26) is characterised by immature broad-leaved plantation woodland dominated by willows *Salix spp.*

Coniferous Plantation

- 7.4.12 The area described by target note 30 (Popin Moss) is characterised by immature coniferous plantation, dominated by Norway spruce *Picea albies* with some European larch approximately 3 m tall. Additional species include a ground layer of cock's-foot, Yorkshire fog *Holcus lanatus*, rosebay willowherb, and hardheads *Centaurea nigra* with occasional sitka spruce and some gorse *Ulex europaeus* at the periphery.

- 7.4.13 The plantation described by target note 32 (Kelhead Moss Plantation) is dominated by semi-mature Scot's pine *Pinus sylvestris* typically around 12-15 m tall (indicating that this area may have been planted around 50 to 70 years ago). The plantation is characterised by a fairly closed canopy of Scot's pine with occasional European larch and Norway spruce over a sparse under-storey including hawthorn, elder and beech. Ground flora is fairly limited to patches of acid preferring flora such as climbing corydalis, broad buckler fern *Dryopteris dilatata*, wavy hair-grass *Deschampsia flexuosa* and common woodland species such as herb robert *Geranium robertianum*, ground ivy *Glechoma hederacea*, bracken *Pteridium aquilinum* and red campion *Silene dioica*. It is identified by DGERC as Ancient Woodland¹⁵. Given this, and based on current survey information, it appears that, whilst this woodland may have pre-AD1860 origins, it is likely to have been significantly modified in the 20th century, e.g. through supplementary planting of non-native species. The coniferous plantation within the survey area matches the characteristics for the Dumfries and Galloway BAP priority habitat of planted coniferous woodland.

Mixed Plantation

- 7.4.14 Popin Well Wood, to the south of the existing A75 (target note 14), is dominated by sycamore, European larch and Scot's pine. There is some alder in the wettest area next to a minor stream that runs through the plantation. The oldest trees in Popin Well Wood appear to be around 50 years old. The under-storey is dominated by hazel *Corylus avellana* with some elder over a ground flora of bramble, bracken, wood sorrel *Oxalis acetosella*, opposite-leaved golden-saxifrage *Chrysosplenium oppositifolium*, foxglove, marsh marigold *Caltha palustris*, climbing corydalis, enchanter's nightshade *Circaea lutetiana*, common nettle and creeping buttercup.

- 7.4.15 Braehill Oak Wood, to the north of the A75 (target note 15), is of similar composition and structure but with a relatively greater frequency of Scot's pine and sycamore. Several of the Scot's pine are mature and appear to be around 70 to 100 years old. There are a relatively high number of wind-felled trees with some associated dead wood. A line of mature beech trees marks the western edge of the wood. There are a small number of immature ash trees. Shrub/ground layer species include rhododendron, bramble, bracken, campion *Silene sp.*, violet, wood avens *Geum urbanum* and ground ivy *Glechoma hederacea*.

¹⁵ In Scotland, ancient woodland sites are strictly those shown as semi-natural woodland on the "Roy" maps (SNH, 1997); a 1750 military survey and the best source of historical map evidence, and as woodland on all subsequent maps. However, they have been combined with long-established woods of semi-natural origin (originating from between 1750 and 1860) into a single category of ancient woodland to take account of uncertainties in compilation of the ancient woodland inventory (www.woodland-trust.org.uk).

- 7.4.16 Braehill Oak Wood is also identified by DGERC as Ancient Woodland and as with Kelhead Moss Plantation it appears likely this area has been significantly modified in the 20th century through supplementary planting of non-native species; however it notionally holds its 'ancient' status.

Scrub

- 7.4.17 There are several areas of scrub dispersed along the verges of the existing A75. Typical species include silver birch, hawthorn, gorse and willows.

Scattered Broad-Leaved Trees

- 7.4.18 Target notes 20, 24 and 25 mark the location of mature and semi-mature ash trees whilst target note 2 marks that of a mature copper beech *Fagus sylvatica purpurea*.

Improved Grassland

- 7.4.19 The majority of the fields associated with the Proposed Scheme corridor are characterised by intensively managed improved grassland. Typical species include perennial rye-grass *Lolium perenne*, red fescue *Festuca rubra*, creeping buttercup, curled dock *Rumex crispus* and ribwort plantain *Plantago lanceolata*.

Species-Poor Semi-Improved Grassland

- 7.4.20 For most of its length, the verges of the existing A75 are characterised by species-poor semi-improved grassland. Typical species include false oat-grass *Arrhenatherum elatius*, cock's-foot, Yorkshire fog, common couch *Elytrigia repens*, cleavers *Galium aparine*, common knapweed *Centaurea nigra*, common sorrel *Rumex acetosa*, cow parsley *Anthriscus sylvestris*, creeping buttercup, creeping cinquefoil *Potentilla reptans*, creeping thistle *Cirsium arvense*, great willowherb *Epilobium hirsutum*, hairy bitter-cress *Cardamine hirsuta*, hogweed, lesser burdock *Arctium minus*, rosebay willowherb, upright hedge-parsley *Torilis japonica*, wild angelica *Angelica sylvestris* and yarrow *Achillea millefolium*.

Marshy Grassland

- 7.4.21 Small patches of marshy grassland adjacent to Glen Burn (target notes 27 and 29) appear to be of slightly greater botanical diversity than other areas of pasture. Additional species here include meadowsweet *Filipendula ulmaria*, sneezewort *Achillea ptarmica*, meadow buttercup *Ranunculus acris*, common bird's-foot trefoil *Lotus corniculatus*, soft rush, creeping thistle, sorrel and Yorkshire fog.

Arable

- 7.4.22 The survey identified one field of set-aside arable. Typical species include cock's-foot, Yorkshire fog, perennial rye-grass, curled dock, broad-leaved dock *Rumex obtusifolius*, ribwort plantain, common nettle and knotgrass *Polygonum aviculare*.

Hedgerows

- 7.4.23 Hedgerows are typically species-poor trimmed features dominated by hawthorn. Other species are typically sparsely distributed and include occasional ash, beech, broom, dog-rose *Rosa canina*, gorse and sycamore. One hedgerow (target note 33) is heavily dominated by beech with occasional hawthorn. There are few hedgerow trees.

Watercourses

- 7.4.24 Four minor watercourses flow beneath the existing section of the A75: Hardgrove Burn (grid ref: NY115711(16) & target note 12); a tributary of Hardgrove Burn (grid ref: NY118709 & target note 13); a tributary of Glen Burn (grid ref: NY127703 & target note 31); and Glen Burn (grid ref: NY130700 & target note 34).

¹⁶ This grid-reference represents the point at which the Proposed Scheme will cross each watercourse.

- 7.4.25 At the time of the December 2006 survey, immediately following a period of heavy rain, Hardgrove Burn had a flow-width of approximately 1 m. It flows along the eastern side of a trimmed hedgerow at this point where it remains largely un-shaded. No true aquatic vegetation was noted other than a small amount of water-cress *Rorippa nasturtium-aquaticum*.
- 7.4.26 A tributary of Hardgrove Burn arises within Popin Well Wood and, where it crosses the existing A75, is a minor feature with an approximate flow-width of 30 cm as recorded in December 2006. At this point the watercourse is quite heavily shaded by the adjacent woodland. No aquatic vegetation was noted.
- 7.4.27 A tributary of Glen Burn crosses beneath the existing A75. At the time of the December 2006 survey, water in the channel was flowing approximately 1 m-wide. The margins of the watercourse comprise improved grassland. Aquatic vegetation includes soft rush and water-cress.
- 7.4.28 Glen Burn follows a southerly course through coniferous plantation before crossing beneath the existing A75 and continuing across open pasture. During the December 2006 survey the flow-width was recorded as being approximately 1.5 m. Though largely un-shaded outside the coniferous plantation, there was no evidence of notable aquatic vegetation.
- 7.4.29 The watercourses within the survey area match the characteristics for the Dumfries and Galloway BAP priority habitat of rivers and streams.

Fauna

Invertebrates

- 7.4.30 Given their intensively managed nature, the grassland, arable land and hedgerows, which dominate the majority of the survey area, are considered to be of relatively low value for invertebrates. Consequently, specialist invertebrate surveys in 2007 concentrated on the areas of woodland within the study area. As described in Appendix G5, a small number of uncommon species were recorded including *Bythinus burrelli*, *Aleochara verna*, *Cryptolestes pusillus* and *Sicus ferrugineus*. However, none of these are identified as protected or nationally or locally scarce and the relative lack of records is likely to be a result of under-recording rather than genuine rarity.

Fish

- 7.4.31 Given the composition, dimensions and characteristics of the minor watercourses crossed by the Proposed Scheme, along with their culverting, and the unqualified risk of diffuse pollutants from surrounding farmland impacting on the local water quality due to the large expanse of agricultural activity locally (see Paragraph 12.4.4) the potential for notable fisheries contained therein is considered negligible.

Birds

- 7.4.32 A full list of bird species recorded in the vicinity is included at Appendix G2. A total of 45 bird species were recorded during the surveys in 2007; of which thirty-nine are believed to have bred within the study area in 2007. The surveys revealed that six species listed on the Red List of Birds Conservation Concern (Gregory *et al* 2002) breed within the study area. These are house sparrow *Passer domesticus* (numerous nests in farmyards, other buildings and gardens), yellowhammer *Emberiza citronella* (at least 10 pairs), starling *Sturnus vulgaris* (numerous nests in farmyards, other buildings and gardens), song thrush *Turdus philomelos* (one pair), bullfinch *Pyrrhula pyrrhula* (two pairs) and reed bunting *Emberiza schoeniclus* (one pair). All six species are also identified as UK BAP priority species¹⁷ and reed bunting is a local BAP priority species in Dumfries and Galloway. In addition, nine species listed on the Amber List of Birds of Conservation Concern were found to be breeding within the study area.

¹⁷ <http://www.ukbap.org.uk/NewPriorityList.aspx>

- 7.4.33 The only ground nesting species recorded was Eurasian oystercatcher *Haematopus ostralegus*. The surveys did not suggest that this species breeds within the survey area, although it is possible that breeding was overlooked due to the late timing of the surveys. However, the habitat within the survey area is assessed as sub-optimal for this species, e.g. due to high stocking densities in pasture.
- 7.4.34 During the site visit in December 2006, a number of avian casualties were found along the existing A75 including buzzard *Buteo buteo*, rook *Corvus frugilegus*, pheasant *Phasianus colchicus* and a dead barn owl (target note 18; grid ref: NY111713). Approximately six swallow *Hirundo rustica* nests were found in the outbuildings at Stenriesgate (grid ref: NY233705).
- 7.4.35 A range of birds are likely to nest in trees, hedgerows, scrub, woodland and buildings within the survey area.
- 7.4.36 No barn owl nests or roost sites have been identified. However, a barn owl was observed in May 2007 hunting over fields immediately north of the existing A75 opposite Stenriesgate approximately 100 m from the Proposed Scheme. This is in addition to the dead barn owl found in December 2006 on the verge of the existing A75 opposite Braemoss woods; likely to have been killed in a collision with a vehicle.
- 7.4.37 Barn owl receives special protection from disturbance during the breeding season. It is also a priority species in the Dumfries and Galloway BAP. Swallow is also identified as a priority species in the Dumfries and Galloway BAP.

Badgers

- 7.4.38 The results of specialist surveys for badgers undertaken in 2003, 2006 and 2007 are presented in the confidential Appendix G3. There are no badger setts within 30 m of the proposed scheme although setts are known from within 500 m of the Proposed Scheme.

Bats

- 7.4.39 As described in Appendix G2, no bat roosts have been identified within the study area. Based on the habitats present and their geographic location, certain features such as woodland, watercourses and hedgerows could potentially be of moderate value to bats whereas open fields are likely to be of relatively low value. The specialist bat surveys in 2007 revealed relatively low levels of bat activity within the study area; the only species recorded being low numbers of common pipistrelle *Pipistrellus pipistrellus*. Common pipistrelle is listed as priority species in the Dumfries and Galloway BAP and in the UK BAP.

Water Voles

- 7.4.40 Specialist surveys in 2003 and 2007 revealed no evidence of water voles within the study area.

Otters

- 7.4.41 SNH noted that otters may be present in the area. Evidence of otters was found along three of the four watercourses associated with the Proposed Scheme corridor during the 2003 survey; the exception being the tributary of Glen Burn. The specialist survey in 2007 did not identify any signs of otter, although it is likely that this species is still present in the area. No evidence of holts was found during the surveys and no potentially suitable habitat for holts was identified during the 2006 and 2007 surveys. Otter is listed as a priority species in the UK BAP and in the Dumfries and Galloway BAP.

Red Squirrels

- 7.4.42 DGERC provided one red squirrel record within 1 km of the Proposed Scheme development footprint relating to an active individual recorded in April 2006. The individual was located next to the A75 adjacent to Kelhead Moss Plantation, approximately 1 km south east of the Proposed Scheme. This individual is likely to be part of a population known to be present within part of Kelhead Moss Plantation identified as a 'Red Squirrel Priority Woodland'. This area is contiguous

with the coniferous plantation known as Kelhead Moss Plantation (target note 32), which is considered to provide potentially suitable habitat for red squirrels.

- 7.4.43 Specialist surveys in 2007 did not identify any evidence of red squirrels¹⁸. Red squirrel is listed as priority species in the UK BAP and in the Dumfries and Galloway BAP.

Brown Hare

- 7.4.44 During the course of the survey in December 2006, two brown hares *Lepus europaeus* were observed in fields adjacent to the A75 and two brown hare corpses were found on the A75 within the survey area. Brown hare is a UK BAP priority species.

Other Species

- 7.4.45 None of the waterbodies within 1 km of the Proposed Scheme are considered to provide potentially suitable breeding habitat for great crested newts. The only large standing waterbodies are located 1 km to the east. These comprise two ornamental ponds that are likely to support fish and waterfowl. In addition, there are two low-lying areas of pasture, characterised by standing water at the time of survey in December 2006; however they were shallow and temporary in nature and lacked aquatic vegetation. Collectively, these features are considered extremely unlikely to support great crested newts.
- 7.4.46 DGERC provided records of several common plants, mammals, invertebrates and birds from the study area.
- 7.4.47 Given the habitats present and their geographic location, the survey area is not considered likely to support reptiles or other protected species.

7.5 Nature Conservation Evaluation

- 7.5.1 This section evaluates the nature conservation importance of the habitats and species potentially present within the survey area in terms of their importance at the IEEM derived geographic levels described in Paragraph 7.3.24. Habitats are assessed in terms of their intrinsic value only and the evaluation of habitats should be read in conjunction with the evaluation of fauna that may be present within these habitats. Unless otherwise stated, confidence levels are 'certain/near certain'.

Habitats

Broad-Leaved Semi-Natural Woodland

- 7.5.2 Given the species present, the majority of this habitat within the study area is assessed as being of **value within the immediate zone of influence of the scheme only**. The greater species diversity in parts of Braemoss Wood increases the value of this area to local value.

Broad-Leaved Semi-Natural Plantation

- 7.5.3 Given its limited extent and limited species diversity, this habitat is assessed as being of value **within the immediate zone of influence of the scheme only**.

Coniferous Plantation

- 7.5.4 Given its ancient origin and the potential for enhancement, Kelhead Moss Plantation is assessed as being of value at the local level. The coniferous plantation elsewhere within the survey area is assessed as being of **value within the immediate zone of influence of the scheme only**.

¹⁸ e.g. live or dead animals, feeding remains or dreys, within the survey area

Mixed Plantation

- 7.5.5 Given its ancient origin, the species present, the presence of dead wood and the potential for enhancement; the mixed plantation at Popin Well Wood and Braehill Oak Wood is assessed as being of value at the **local level**.

Scrub

- 7.5.6 Given the relatively low species diversity and limited extent, the scrub habitat is assessed as **being of value within the immediate zone of influence of the scheme only**.

Scattered Broad-Leaved Trees

- 7.5.7 Given the relative abundance of scattered trees in the wider area and the species present within the survey area, the scattered broad-leaved trees within the survey area are assessed as being **of value within the immediate zone of influence of the scheme only**.

Grassland

- 7.5.8 Given its relatively low species diversity and the abundance of similar habitats in the wider area; the improved and marshy grassland habitats within the survey area are assessed as being of **value within the immediate zone of influence of the scheme only**.

Arable

- 7.5.9 Given its low botanical diversity and highly artificial nature, this habitat is assessed as being of **value within the immediate zone of influence of the scheme only**.

Hedgerows

- 7.5.10 Given their species-poor nature and low structural diversity, the hedgerows are assessed as being of **value within the immediate zone of influence of the scheme only**.

Watercourses

- 7.5.11 Despite their relatively small size, low botanical and low structural diversity, the watercourses within the survey area are likely to be of some value in terms of habitat connectivity in the wider area and are therefore assessed as potentially being of value **at the local level**.

Fauna

Invertebrates

- 7.5.12 Given the species assemblages recorded, the invertebrate fauna within the study area is assessed as being of **value within the immediate zone of influence of the scheme only**.

Fish

- 7.5.13 Given the nature of the watercourses, the survey area is considered to be of **value within the immediate zone of influence of the scheme only**.

Birds

- 7.5.14 Given the presence of breeding populations of six UK BAP priority bird species, the study area is assessed as being of value at the **local level**. Given the absence of barn owl nesting/roosting sites, the study area is assessed as being of **value within the immediate zone of influence of the scheme only for this species**.

Badgers

- 7.5.15 Given the presence of a strong population of badgers in the wider area; the presence of badgers within 500 m of the Proposed Scheme is assessed as being of value **within the immediate zone of influence of the scheme only**.

Bats

- 7.5.16 Given the absence of roosts, the relatively low levels of bat activity recorded and the nature of the habitats present, the scheme area is assessed as being of **value for bats within the immediate zone of influence of the scheme only**.

Otters

- 7.5.17 Due to its small size in terms of foraging habitat the Proposed Scheme survey area is assessed as being of **value for otters within the immediate zone of influence of the scheme only**. However, given their confirmed presence within the scheme area and the strong population of otters in Dumfries and Galloway, the watercourses within the scheme area are likely to form an integral part of the habitat for the wider otter population which is assessed as being of **value at the regional level**, although this does not mean that the scheme area itself is necessarily of value at this level.

Red Squirrel

- 7.5.18 Given the known population of red squirrels at Kelhead Moss Plantation and elsewhere within Dumfries and Galloway, this woodland is assessed as being of value **at the regional level** for the species. Given the absence of dreys within the scheme area, the scheme area is assessed as being of **value for red squirrels within the immediate zone of influence of the scheme only**.

Brown Hare

- 7.5.19 Given their relative abundance in the wider area, the scheme area is considered to be of **value for brown hare within the immediate zone of influence of the scheme only**.

7.6 Potential Impacts

- 7.6.1 Potential impacts on ecological and nature-conservation receptors during the construction phase are described in Chapter 15. It should be noted that the actual loss of habitats and associated faunal impacts, which will first occur during the construction period but will be felt throughout the life of the scheme, is covered under the section on impacts below.

- 7.6.2 This section characterises and predicts the potential impacts on ecological features in the absence of any mitigation measures during the operation phase of the Proposed Scheme. Unless otherwise stated, confidence levels are 'certain/near certain'.

Impacts on Designated Nature Conservation Sites

- 7.6.3 Given the nature of the Proposed Scheme and the distance between the Proposed Scheme and the nearest statutorily designated site; **no significant** impacts on any statutorily protected sites are anticipated.

- 7.6.4 Similarly, given the distance between the Proposed Scheme and the nearest non-statutory site; no significant impacts on any non-statutory sites are anticipated.

Increased Pollution-Laden Runoff into Watercourses

- 7.6.5 Operational activity could potentially lead to increased pollution-laden runoff into watercourses, resulting in a **significant impact** at the local level (unlikely). This is confirmed through the assessment conclusions discussed in Section 12.5.

Permanent Habitat Loss

- 7.6.6 The Proposed Scheme would result in the permanent loss of four habitat types considered to be at least of local value. These would comprise:

- 1.4 ha of broad-leaved semi-natural woodland at Braemoss Wood;
- 0.7 ha of coniferous plantation at Kelhead Moss Plantation;
- 0.1 ha of mixed plantation at Popin Well Wood; and
- less than 0.1 ha of open watercourse habitat.

7.6.7 The certain loss of broad-leaved semi-natural woodland; coniferous plantation and mixed plantation would be **significant** at the local level.

7.6.8 Given the small extent of the combined total of open watercourse habitat lost where culverts would route the existing watercourses beneath the new section of road, the impact would **not be significant** at the local level.

Habitat Fragmentation

7.6.9 Given the presence of the existing A75, the Proposed Scheme would **not result in significant** fragmentation of existing habitats; simply marginal habitat loss.

Impact on Birds

7.6.10 Given the relatively small amount of direct habitat loss associated with the scheme, the impact of habitat loss on breeding birds, including six UK BAP priority species and four local BAP priority species, is assessed as **not significant** at the local level. The scheme is assessed as not likely to result in an increased rate of collision with vehicles.

Impact on Badgers

7.6.11 The Proposed Scheme could lead to an increased rate of mortality of badgers through collision with vehicles which could result in a **significant impact** within the immediate zone of influence of the scheme due to a breach of the Protection of Badgers Act 1992 (Scottish Version).

Impact on Otters

7.6.12 Given the large home ranges of otters, the potential impact of direct habitat loss on otters within the survey area is assessed as **not significant** at the local or regional level.

7.6.13 However, the operation of the Proposed Scheme could result in the increased mortality of otters through collision with vehicles; particularly if otters are encouraged to cross the carriageway rather than use bridges/culverts/underpasses. The scheme could also result in habitat fragmentation for otters. Together, such impacts could potentially lead to a reduction in the carrying capacity of the wider area. The potential impact of increased mortality and habitat fragmentation for otters is assessed as **not significant** at the district or regional level but potentially **significant** at the local level (probable).

Impact on Red Squirrels

7.6.14 Given the position of the Proposed Scheme in relation to Kelhead Moss Plantation and other areas of potentially suitable habitat, the impact associated with habitat fragmentation is assessed as **not significant** at the regional level.

7.7 Mitigation

7.7.1 This section describes mitigation measures to avoid or reduce impacts on features of nature conservation interest.

Habitat Creation

- 7.7.2 The planting strategy for the Proposed Scheme includes a mix of planting and habitat creation proposals with combined objectives of landscape and ecological mitigation (see Chapter 8). The proposals also serve, in part, to enhance existing habitat diversity within the Proposed Scheme corridor.
- 7.7.3 Implementation of the proposals described within the landscape section would result in a net addition of approximately 0.005 ha of mixed woodland, 1 ha of dense scrub, 4020 linear metres of roadside hedgerow within the Proposed Scheme. In addition, approximately 3,200 m of newly established roadside verge would be seeded with a native species-rich grassland mix of local provenance if possible.

Protection of Species

Birds

- 7.7.4 Should essential maintenance or other works require encroachment into potential bird nesting sites (e.g. hedgerows or scrub) during the operational phase of the project, the favoured mitigation would involve programming of the works outside of the main bird nesting season (March to August inclusive) to ensure legal compliance. Should the nature or urgency of the works preclude this approach, the works would be preceded by a check by a suitably qualified ecologist to ensure that no active nests would be affected. Should active nests be found, works in the immediate vicinity of the nest would be postponed until the young birds have fledged.
- 7.7.5 In order to minimise collisions between barn owls and vehicles, new broad-leaved hedgerows will be planted along the verges of the Proposed Scheme wherever possible and as close to the carriageway as possible. The hedgerows will be planted with native species of local provenance where possible and will be maintained at least 2-3 m tall through cutting in accordance with Ramsden (undated). The hedgerows will encourage barn owls to fly higher whilst crossing the road thereby reducing the likelihood of collisions.

Badgers and Otters

- 7.7.6 As described in the confidential Appendix G3, mammal underpasses will be installed at five locations along the Proposed Scheme in accordance with the recommendations contained in Volume 10, Section 4, Parts 2 and 4 of the DMRB. In total five kilometres of Badger-proof fencing will be installed 250 m either side of the underpasses on both sides of the carriageway. Within 100 m of four of the underpasses (i.e. the four associated with watercourses), the fencing will also include modifications to make it otter-proof.

7.8 Residual Effects

- 7.8.1 The following residual effects have been identified. Unless otherwise stated, confidence levels are 'certain/near certain'.

Increased Pollution-Laden Runoff into Watercourses

- 7.8.2 With the proposed drainage measures for control of surface water run-off and interception of traffic related pollutants carried in surface water run-off, it is predicted there would be **no significant** residual effects related to pollution-laden run-off and discharge to local watercourses.

Permanent Habitat Loss

- 7.8.3 Given the creation of hedgerows and species-rich grassland, the residual impact associated with the permanent loss of broad-leaved semi-natural woodland, coniferous plantation and mixed plantation is assessed as **not significant** at the local level.

Impact on Birds

- 7.8.4 Given standard mitigation measures to avoid impacts on birds' nests whilst in use, the potential residual impact of damage/destruction of birds' nests is assessed as **not significant** in legal terms.

Impact on Badgers

- 7.8.5 Given the installation of five underpasses and 5000 m of badger-proof fencing, the residual impact associated with mortality of badgers through collision with vehicles is assessed as **not significant** in legal terms.

Impact on Otters

- 7.8.6 Given the installation of four underpasses at watercourses and 1600 m of otter-proof fencing, the residual impact associated with mortality of otters through collision with vehicles and habitat fragmentation is assessed as **not significant** at the local level or in legal terms.

8 Landscape Effects

8.0 Introduction

8.0.1 This chapter reports the findings of the assessment of the predicted impacts on the landscape character and visual context of the area associated with the Proposed Scheme.

8.1 Scope of the Assessment

8.1.1 The Proposed Scheme would involve the introduction of a new section of road and its associated traffic immediately south of the existing A75 within an area of un-designated landscape north of the Solway Firth. The Stage 1 and 2 assessments recognised the following potential impacts related to landscape and visual impacts:

Landscape Character

- the loss of existing landscape components such as woodland or hedgerows;
- modification of landform to accommodate a new alignment;
- disruption to the established relationships between components and local landscape pattern;
- impacts on designated landscapes, conservation sites and cultural assets associated with the Proposed Scheme corridor;
- consequent impacts on local and regional landscape character as a result of the above, individually or in combination;

Visual Impact

- increased prominence of the newly aligned road and its traffic in existing views from property and communally used land and rights of way; and
- intrusion of the new road and its associated traffic in views from property and communal land and facilities not currently influenced by the road or its traffic.
- Preliminary studies identified a visual envelope¹⁹ for the proposed scheme extending some 2 km from the Proposed Scheme corridor. Site review confirmed that this would prove appropriate for the assessment of landscape character and visual impacts.

8.2 Statutory and Planning Context

Landscape Character

8.2.1 The assessment has been informed by reference to the following statutes.

- The National Parks and Access to the Countryside Act 1949.
- The Countryside (Scotland) Act 1967.
- The Natural Heritage (Scotland) Act 1991.
- The Town and Country Planning (Scotland) Act 1997.
- Land Reform (Scotland) Act 2003.

¹⁹ The visual envelope (Zone of Visual Influence, ZVI) for the Proposed Scheme represents the area over which receptors (viewers) might be able to fully/partially see the Proposed Scheme.

Planning Guidance

- 8.2.2 The primary source for planning guidance is National Planning and Policy Guidance relating to the Natural Heritage (NPPG 14) (Scottish Executive, 1999). The document defines statutory obligations in relation to the conservation of natural heritage, describes how natural heritage objectives should be reflected in development plans and the role of the planning system in safeguarding sites of national and international importance. It also highlights the importance of heritage outside of designated areas and provides guidance on the approach to be adopted in relation to local and non-statutory designations.

Regional and Local Policies

- 8.2.3 The Dumfries and Galloway Structure Plan includes a series of overarching environmental objectives that include the safeguarding of high quality natural resources declaring support for a general uplifting of the appearance and design of development within the varied landscapes and settlements of the region.

Visual Context and Views

- 8.2.4 Statutes and national planning policy make no direct provision for the protection or conservation of specific views. They are, however, an implicit part of the values and qualities recognised in broader landscape and townscape designations that seek to protect areas of recognised scenic quality.

8.3 Assessment Methodology (Landscape)

- 8.3.1 The assessment has been undertaken in accordance with the guidelines in Volume 11, Section 3, Part 5 of the DMRB. Reference has also been made to the Guidelines for Landscape and Visual Impact Assessment (The Landscape Institute and Institute of Environmental Management & Assessment, 2002).

Landscape Character

- 8.3.2 There have been six stages to the assessment:

recording and classification of existing landscape character including an evaluation of quality, value and sensitivity to the introduction of the Proposed Scheme;

- an appreciation of the nature, forms and features of the Proposed Scheme;
- an assessment of the magnitude of change within the scheme corridor and neighbouring landscapes;
- an evaluation of the significance of the impact on landscape character taking into account sensitivity to change and magnitude of change;
- identification of landscape design and mitigation measures; and
- assessment of the residual effects on landscape character.

Baseline - Desk Study

- 8.3.3 The desk based assessment involved reference to the following documentation and mapping.
- The A75 Route Action Plan Study (Halcrow Crouch Ltd -February 1998).
 - The Hardgrove to Kinmount Stage 2 Environmental Assessment Report (Mouchel Parkman, July 2003).
 - Data collected for the cultural heritage, land use and ecological and nature conservation assessments for the Proposed Scheme.
 - The Dumfries and Galloway Structure Plan (1999).
 - The Annandale and Eskdale Local Plan (2006).

- Current and historic 1:25,000 and 1:10,000 scale Ordnance Survey maps.
- Dumfries and Galloway Landscape Character Assessment, Scottish Natural Heritage, 1999.

8.3.4 The above information provided the basis for a preliminary drafting of local landscape character areas taking into account:

- the pattern and scale of landform, land cover and built development;
- special values including national and local landscape designations, conservation areas and historical and cultural associations; and
- specific potential receptors, including important parts of the landscape, residents, visitors, travellers and other groups of viewers.

Baseline - Field Survey

8.3.5 Site surveys to determine the local landscape character and predicted visual impact were undertaken during January, February and May 2006. Public use of open spaces, roads and footpaths were also observed during the course of the field surveys.

Baseline - Consultation

8.3.6 The following organisations with an interest in landscape as a natural resource were consulted during the assessment.

- Dumfries and Galloway Council Planning and Environment.
- Scottish Environment Protection Agency (SEPA).
- Scottish Natural Heritage (SNH).

8.3.7 A summary of consultee responses is provided in Appendix B.

Evaluation of Predicted Impacts

8.3.8 The prediction of impacts on landscape character has been based on the consideration of the sensitivity of the landscape to road development and the magnitude of change anticipated during construction and future use of the Proposed Scheme.

Existing Landscape Character and Sensitivity to Change

8.3.9 The description and classification of existing character has involved a review of the Dumfries and Galloway Landscape Character Assessment, the identification of landscape designations associated with the study area and the identification of local landscape character areas.

8.3.10 Local landscape character areas have been defined taking into account how landform, hydrology, vegetation, settlement, land use pattern and cultural and historic features and their associations combine to create definable units (character zones) with a common 'sense of place' or identity. The quality of each of the considered local character areas has been based on the criteria described in Table 8.1.

QUALITY	DEFINITION
Highest Quality	Areas comprising a clear composition of valued landscape components in robust form and health, free of disruptive visual detractors and with a strong sense of place.
Very Attractive	Areas primarily of valued landscape components combined in an aesthetically pleasing composition and lacking prominent disruptive visual detractors.

QUALITY	DEFINITION
Good Landscape	Areas primarily of valued landscape components combined in an aesthetically pleasing composition with low levels of disruptive visual detractors.
Ordinary Landscape	Areas containing some features of landscape value but lacking a coherent and aesthetically pleasing composition.
Poor Landscape	Areas lacking valued landscape components or comprising degraded features and lacking any aesthetically pleasing composition.

Table 8.1 – Landscape Quality

- 8.3.11 Consideration has also been given to the value of the local landscape character areas. Value is frequently addressed by reference to international, national, regional and local designations determined by statutory and planning agencies. Absence of such a designation, however, does not infer a lack of quality or value. Factors such as accessibility and local scarcity can render areas of nationally unremarkable landscape quality highly valuable as a local resource.
- 8.3.12 The local character areas have been rated in relation to their potential sensitivity to the introduction of the Proposed Scheme, by taking landscape quality and value into account. Table 8.2 defines the sensitivity ratings adopted.

CATEGORY	CRITERIA
High	Landscape or landscape elements of particular distinctive character, highly valued and considered susceptible to relatively small changes.
Medium	A landscape of moderately valued characteristics considered reasonably tolerant of change.
Low	A landscape of generally low valued characteristics considered potentially tolerant of substantial change.
Negligible	A landscape of low valued characteristics considered tolerant of substantial change.

Table 8.2 – Sensitivity to Change

Magnitude of Change

- 8.3.13 The magnitude of change has been predicted by considering the anticipated loss or disruption to character forming landscape components (tree planting, landform, buildings, and watercourses), the scale of the character area and the proportion of it that would be affected by the introduction of the Proposed Scheme. In common with the evaluation of sensitivity, four levels of magnitude of impact have been adopted. These are defined in Table 8.3.

CATEGORY	CRITERIA
High	Notable changes in landscape characteristics over an extensive area ranging to very intensive change over a more limited area.
Medium	Minor changes in landscape characteristics over a wide area

CATEGORY	CRITERIA
	ranging to notable changes in a more limited area.
Low	Minor changes in landscape characteristics over a limited area.
Negligible	Minor or virtually imperceptible change in any area or landscape components.

Table 8.3 – Magnitude of Change

Significance of Impacts on Landscape Character

- 8.3.14 The significance of the predicted impacts has been assessed by considering the sensitivity to change and magnitude of change for each of the local character areas. Account has been taken of the effect landscape proposals and mitigation measures would have in offsetting or minimising potentially adverse impacts.
- 8.3.15 Impact significance (adverse or beneficial) has been determined by combining sensitivity and magnitude in accordance with the matrix provided in Table 8.4 below. However, it should be noted that this only provides an indication of the likely impact arising from the assessment of magnitude and sensitivity. Given that the criteria represent levels on a continuum, professional judgement and awareness of the relative balance of importance between sensitivity and magnitude has also been exercised.

Sensitivity	Magnitude			
	High	Medium	Low	Negligible
High	Major	Major/Moderate	Moderate	Negligible
Medium	Major/Moderate	Moderate	Moderate/ Slight	Negligible
Low	Moderate	Moderate/Slight	Slight/Negligible	Negligible
Negligible	Slight	Slight/Negligible	Negligible	Negligible

Table 8.4 – Significance of Change

- 8.3.16 Impacts of 'moderate' and above are considered 'significant'; this being the level at which changes to the landscape would be clearly perceived and mitigation is considered essential. All impacts are considered adverse unless otherwise stated.
- 8.3.17 Impacts have been assessed for winter in the year of opening and winter and summer fifteen years after opening to demonstrate the predicted effect of the proposed screening/planting once they have become established and are beginning to mature.
- 8.3.18 Construction impacts on the landscape are considered in Chapter 15 (Disruption due to Construction).

8.4 Assessment Methodology (Visual Impact)

- 8.4.1 The visual impact assessment has involved the following stages:
- plotting the visual envelope for the Proposed Scheme corridor;
 - the identification of receptors and their sensitivity to potential changes in view related to the implementation and future use of the Proposed Scheme;
 - site survey to verify receptors and determine the potential magnitude of impact for the identified receptors;
 - the identification of appropriate and feasible mitigation measures to address significant impacts identified by the assessment; and

- a statement of the residual impacts assuming mitigation is in place.

Identification of the Visual Envelope

- 8.4.2 The visual envelope provides a basis for preliminary identification of potential receptors that are then verified through site survey. The visual envelope is neither representative of visual impact in itself nor does it indicate that the Proposed Scheme would be visible from all locations within the envelope. There are inevitably many localised obstructions (small buildings planting, hedges, local landform *et al*) that may not be identified by the broad plotting of the envelope but which may obstruct potential viewpoints. The envelope is, therefore, a useful indicator of the potential area of influence of the road and its traffic.
- 8.4.3 The visual envelope has been plotted by reference to OS mapping for the local area and the subsequent verification and modification of initial desk plots on site. The assumptions adopted in drafting the envelope have been that the observer height is 1.8 metres above ground level and that the height of vehicles on the road, which could intrude into views 4 metres above ground level (the nominally accepted height of an average commercial vehicle).

Identification of Key Receptors

- 8.4.4 Potential receptors (locations from which people would be able to view the scheme) comprise individual properties, groups of properties that share views and potential change in view, and public areas with a clear relationship to the existing or proposed road. They are initially recorded by reviewing the settlement, land use, access and transportation patterns of the area contained within the visual envelope and validated by survey in the field. Key receptors plotted via the desk based review and validated through site survey include:
- settlements, residential areas and individual properties;
 - roads within the study corridor; and
 - recreational and public areas including footpaths, bridleways and other public rights of way.

Field Assessment of Affected Receptors - Recording Visual Impacts

- 8.4.5 Desk studies and site-based surveys were carried out between March 2005 and January 2006 to record and evaluate potential visual impacts for the key receptors. Recording involved the use of a standard record sheet for each receptor. Factors included:
- receptor types and number (dwelling/footpath/open space/school);
 - receptor height ;
 - existing view;
 - distance of view;
 - percentage and elements of the proposals that would be visible;
 - viewpoint position (view up/view down/level);
 - angle of view (acute/perpendicular/average);
 - type of view (foreground /middle-ground/background); and
 - position of the development in the view.

Visual Evaluation and Impact Analysis

- 8.4.6 The evaluation and impact assessment involved consideration of a receptor's sensitivity to change and the magnitude of change based upon information gathered through the site surveys and analysis of the design proposals.
- 8.4.7 Sensitivity to change considers the nature of the receptor, for example a residential dwelling is generally considered highly sensitive to change. The importance of the view experienced by the

receptor also contributes to an understanding of how sensitive the receptor is to change. Therefore, scenic quality is also considered.

- 8.4.8 Magnitude of change considers the extent of the scheme that would be visible, the percentage of the existing view newly occupied by the scheme and the viewing distance from the receptor to the scheme.
- 8.4.9 Impact analysis relates to the potential impacts during construction, upon the opening of the Proposed Scheme opening and fifteen years into operation as per the landscape assessment. The analysis assumes that the visual context applicable at the year of opening is that which would be experienced during winter months when the degree of visual exposure is potentially at its greatest. The analysis fifteen years into operation considers potential impacts during winter and summer, and demonstrates the effectiveness of landscape and mitigation proposals for the project. The analysis relates to each key receptor and concludes with an evaluation of the significance of impact related to each receptor.

Impact Ratings and Criteria

- 8.4.10 The prime criteria used to evaluate visual impact relates to the extent to which existing views for key receptors would change; taking into account landscape proposals and mitigation measures.
- 8.4.11 In common with landscape character, an initial indication of impact significance (adverse or beneficial) was gained by combining sensitivity and magnitude in accordance with the matrix provided in Table 8.4 and then applying professional judgement.
- 8.4.12 Each of the identified receptors has been evaluated against the key visual criteria and has been allocated an impact rating. The assessment concludes with a brief discussion of the overall visual implications of the proposal and a summary rating for visual impact.

8.5 Baseline Conditions

Regional Landscape Context

- 8.5.1 The Proposed Scheme is predominantly located within the Coastal Plateau Type sub-division of the Dumfries Coastland Regional Character area as defined in the SNH Landscape Character Assessment for Dumfries and Galloway. The extreme western and eastern ends of the proposal are at the point of transition from the Coastal Plateau to the Upland Fringe landscape character (LC) type and Coastal Flats LC type respectively (Figure 8.1 illustrates).
- 8.5.2 The nature of the proposal is such that the assessment has recognised that the potential for impacts on these two regional landscape types would not be significant; there being no material direct impact on established landscape components or change in the relationship between the two areas and the A75 as a principal road corridor within the Coastal Plateau located between them. The baseline description of regional landscape character has accordingly been limited to the Coastal Plateau type.
- 8.5.3 The Coastal Plateau is an area of gently rolling topography that levels out as it falls towards the northern coastline of the Solway Firth. Open areas of arable and pastoral agriculture are punctuated by numerous small forestry plantations and shelterbelts. There is a pronounced pattern of hedgerows, occasional drystone dykes, sparse settlement and straight roads.
- 8.5.4 The busy A75 trunk road is a significant element within the landscape influencing the character of the road corridor. The small scale undulations of the topography help mask its presence when viewed from the north and the south. The low embankments formed by the road immediately south of Carrutherstown village, immediately west of the scheme, illustrates the local impact of the road on the landscape character (Photograph 1).

Local Landscape Context

- 8.5.5 The assessment has identified a single local landscape character area extending some 2km to either side of the existing and proposed trunk road alignment.



Photograph 1: Small scale undulations typify the topography

- 8.5.6 The landscape centred on the trunk road corridor is one of moderately sized pastures and some arable fields with hedgerow boundaries that follow the lines of a gently undulating landform (Figure 8.2). There is a local ridge at Braehill comprising Birch Bank and Oak Wood and two hillock summits, one immediately south of Popin Moss and the other at Kiln Knowe. These emerge as prominent features from this gentle form. Local watercourses, comprise Pow Water as it crosses the existing A75 some 200m east of Carrutherstown, Hardgrove Burn (a tributary of Pow Water), Stenries Burn and Glen Burn. None are substantial or dominant features as they run broadly north to south between low containing undulations in the landform.
- 8.5.7 Farmsteads are dispersed and locally enclosed or partly screened by copses of planting which provide a degree of shelter. Less accessible or fertile areas have been planted with mixed and coniferous plantations, which serve to break an otherwise open landscape. Prominent areas of woodland include Kelhead Moss, Bellridden Wood, Newfield and Cocklicks. Smaller woodland stands at Oakbank, Braehill and near to Carrutherstown break views for travellers using the existing A75; the road being the most intrusive of the landscape components within the area. Occasional lone trees characterised by their windswept form line the side of the road. Side roads and lanes are relatively unobtrusive as they sit more comfortably within the undulating landscape. This is most evident where the U81a follows the shallow valley that houses the Hardgrove Burn mid way along the Proposed Scheme corridor (Figure 8.2).
- 8.5.8 Part of the distinctive woodland at Braehill is identified in the SNH Inventory of Semi-Natural Woodlands. The remainder is long established plantation woodland comprising Beech, Scot's Pine, Sycamore and Oak. There is a spring ground flora of bluebells *Hyacinthoides non-scripta* and red campion *Silene dioica*. The woodland is divided by the A75 and provides a distinct point of enclosure for the road user.



Photograph 2: Woodland on Braehill has been modified with the introduction of non-native species

8.5.9 Carrutherstown, at the western end of the character area and road corridor, appears as a small collection of typically white-rendered buildings. There is a local school with playing fields, a village hall and post office. East of the village impressive stone gateposts mark the access to Whitecroft Gate. The pillars are listed features. Half a kilometre beyond the eastern end of the Proposed Scheme corridor dense woodland marks the presence of the Kinmount Estate; a Designed Landscape listed in the Inventory of Gardens and Designed Landscapes in Scotland.



Photograph 3: Carrutherstown from the East



Photograph 4: Whitecroft Gate, showing the main view to the east and the partial screening to the south

- 8.5.10 Whilst nature conservation interests are represented within the woodland, hedgerows and occasional semi-natural grasslands alongside the roadside margins, this is a landscape that reflects productive and well maintained agricultural activity.

Landscape Evaluation

- 8.5.11 There are no specific landscape designations associated with the Proposed Scheme corridor and the wider area with the exception of Kinmount House and gardens, located 0.6 km to the east of the Proposed Scheme corridor.
- 8.5.12 The combination of undulating landform, woodland and moderately sized fields defined by maintained hedgerows make this a relatively open landscape but one within which there are frequent breaks and localised areas of enclosure that create a sense of intimacy.
- 8.5.13 It is a pleasant rather than remarkable landscape with a character substantially influenced by successful agriculture and where natural characteristics appear in the form of features rather than a consistent theme. Awareness of the existing trunk road is maintained, even in areas broken from view, by the almost ever present awareness of traffic noise.
- 8.5.14 This is a local landscape character area of ordinary quality in which there are occasional locally attractive features.
- 8.5.15 The proposal to keep the proposed new section of trunk road close to the existing A75 would serve to limit the potential for substantial new severance of the local character area between Carrutherstown and the Kinmount Estate. In light of this, the likelihood that awareness of a new line close to the existing road would be broken, in a similar fashion to the existing road, and the potential that severance of land between the existing and new road would be likely to offer opportunities for mitigation. It has been concluded that the local character area would be moderately sensitive to change of the type proposed.

Visual Context

- 8.5.16 Visual receptors associated with the area are primarily located to the north of the existing trunk road; the most concentrated grouping being at Carrutherstown at the western end of the Proposed Scheme corridor. Other receptors comprise farmsteads and houses dispersed throughout the agricultural landscape. Key receptors at Carrutherstown are limited to the southern edge of the village, where the existing trunk road is a close and significant influence on views to the south. There are a small number of properties north of the village on the B725 that have views over much of the Proposed Scheme corridor to the east. Other receptors north of the road, including those closest to the road such as Oakbank, are frequently contained by landform or localised planting which serves to limit the extent of the trunk road corridor that can be seen.
- 8.5.17 Views to the south from the north of the village and from dispersed property north of the existing trunk road vary from being more expansive towards the open landscape broken by moderately sized woodlands and small copses with the traffic on the trunk road in the mid distance, to views that are framed by local planting and are focused on a small part of the existing trunk road.
- 8.5.18 Views from properties south of the corridor are similarly broken and focused on specific sections of the road.

8.6 Predicted Impacts

Landscape Character

- 8.6.1 The principal impacts on local landscape character would relate to:
- the introduction of a second road corridor in close proximity to the existing road, effectively establishing a widened rather than new road corridor within the landscape of the local area;

- the loss of part of the existing woodland at Braehill; and
- the elevation of the central section of the new alignment to accommodate the grade separation of the crossing of the U81a.

- 8.6.2 Notwithstanding the transfer of the large part of the existing traffic from the existing to the new trunk road, the retention of the existing road would serve to extend the overall influence of the transport corridor in the local landscape. The need for cuttings and embankments to facilitate the grade separation of the crossing of the new trunk road and the U81a, and cross the shallow valley at Hardgrove Burn at a point where it would be deeper than the present crossing near the head of the feature, would serve to increase the impacts on landform. This would be most pronounced where there are views from the south along the U81a, though the influence would be relatively locally contained given the undulating landform and dispersed woodland and shelterbelts.
- 8.6.3 There would also be considerable scope to introduce substantial woodland and scrub planting in severed land between the old and new alignment which would both serve to contain the influence of the road, its earthworks and associated traffic from many parts of the local landscape character area, most particularly from the northern part of the area.
- 8.6.4 Beyond this more intrusive central section of the new road, the western and eastern sections (some 40% of the overall route) would be sufficiently close to, or on the line of, the existing road such that there would be no marked change in the way that these parts of the road relate to the local landscape or are perceived in the local context.
- 8.6.5 Loss of some existing roadside planting would result in a medium term impact as new planting replaces an initially exposed and potentially raw edge to the planting that would be retained.
- 8.6.6 The magnitude of change in relation to what is a local landscape character area of medium sensitivity between Carrutherstown and the Kinmount Estate would be medium due to the changes being minor over a wider area and marked in one limited area. The resultant impact upon completion of construction and opening of the new section of road would be 'moderate adverse'.
- 8.6.7 The magnitude of change in relation to the Coastal Plateau Type sub-division would be low due to the changes being minor in relation to a limited part of the sub-division and wider Dumfries Coastland Regional Character area. The sensitivity to change would be low, the contribution of the experience of this part of the A75 corridor not being significant beyond the local level. There would therefore, be a low magnitude of change within a regional character area of low sensitivity to change. The resultant impact upon completion of construction and opening of the new section of road would be 'slight to negligible adverse'.

Visual Impacts

- 8.6.8 Generally, views across the study area are focused and contained by natural landforms and pockets of woodland. The soft undulating topography of the study area offers screening of parts of the proposed alignment and frequently obscures direct views.
- 8.6.9 A total of 65 visual receptors have been identified within the visual envelope. The impact on each of the identified receptors has been evaluated and is detailed in the Visual Impact Tables included in Appendix F with their main direction of view, on Figure 8.3.
- 8.6.10 Eighty properties within the visual envelope have been assessed as being subject to potential impact. The visual impact on each property has been evaluated and is detailed in the Visual Impact Tables (Appendix F), with numbers summarised in Table 8.5.
- 8.6.11 Thirty-six properties have been assessed as having a 'high' sensitivity to change. These comprise visual receptors 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 24, 26, 27, 28, 32, 33, 34, 35, 38B, 38C, 38D, 38E, 38F, 38G, 38H, 38K and 38L.

- 8.6.12 Five properties (receptors 23, 25, 30, 38P and 38T) have been assessed as having a 'medium' sensitivity to change.
- 8.6.13 Twenty-seven properties (receptors 31, 38A, 38Q, 38R, 38S, 38U [6 properties] and A1 [16 properties]) have been assessed as having a 'low' sensitivity to change.
- 8.6.14 Twelve properties (receptors 1,2,18, 29, 36, 37, 38M, 38N [3 properties] A2 and A3) have been assessed as having 'no view' of the scheme.
- 8.6.15 It has been concluded that the Proposed Scheme would initially result in a medium magnitude of impact for two properties; Whitecroft Gate (receptor 16) and Upper Mains (receptor 26). The magnitude of change for the remaining properties would be low for fifty three properties and negligible for thirteen.
- 8.6.16 Table 8.5 schedules the summary of predicted visual impacts for winter in the opening year based on the significance matrix detailed in Table 8.4.

Significance of Visual Impact	Winter year of opening
No visual impact	12
Negligible	1
Slight/Negligible	17
Slight	12
Moderate/Slight	21
Moderate	16
Major/Moderate	1

Table 8.5 – Summary of significance of Visual Impact on properties – opening year

Visual Receptors and Impacts – Roads

- 8.6.17 Traffic on the new section of the trunk road would initially remain as a feature in views for users of the retained section of the existing A75 though the proposed mounding between the roads would conceal views of cars from large sections of the newly nominated local road. This would constitute a new visual relationship for local residents and an improved visual experience when compared to that experienced as joint users of the existing heavily trafficked and 'stressful' trunk road. The magnitude of change would be medium for these receptors, which are considered of medium sensitivity resulting in an initial moderate beneficial impact.
- 8.6.18 The modified earthworks, and traffic approaching and crossing the new underpass would also be initially visible and prominent by users of the U81a as they approach from the north of Hardgrove Farm and south of Braehill. Taking into account the localised nature of the impact in the context of the journey along the road, the magnitude of change would be medium for receptors of medium sensitivity. The impact would accordingly be moderate and adverse in the year of opening.
- 8.6.19 There would be no marked change for users of the other local roads and access tracks that broadly run at right angles to the line of the existing and proposed trunk road; the proposals being limited to a highly localised modification of the trunk road alignment that would effectively retain the visual relationship between traffic on the trunk road and users of the local roads and access tracks. There would be a negligible change for receptors of medium sensitivity. The impact in the opening year would accordingly be negligible.

8.7 Mitigation

8.7.1 Proposed mitigation of the landscape and visual impacts beyond measures implicit in the selection of the horizontal and vertical alignment for the Proposed Scheme comprise a combination of landscape earthworks and planting (Figure 8.4).

Earthworks

8.7.2 The principal landscape earthworks involve the introduction of low mounding between the proposed new section of trunk road and the retained local road to reinforce the differentiation of the routes, aid integration and avoid potential distraction between users of the two routes. Mounding varying in height from 1.0 to 2.5 m would be provided between the following chainages:

- 500 – 1100; and
- 1500 – 3100.

8.7.3 The proposals also allow for the use of excess material derived from the site cut and fill to extend and relax the embankment slopes where the new alignment crosses the realigned U81a.

Planting

8.7.4 The planting proposals involve the use of dense scrub planting, stands of intermittent trees and hedgerows.

8.7.5 Dense scrub planting has been proposed on mounding between the new section of trunk road and the retained local road to reinforce the differentiation of the routes, reduce the visual impact of the two roads in close proximity to each other and substantially screen the traffic on the new road from a small number of visual receptors located to the north of the existing road. It has also been proposed at the grade separated crossing of the U81a beneath the new section of trunk road to mask the engineered embankments and new structure thus reducing the impact of this most complex part of the Proposed Scheme.

8.7.6 A beech hedge is proposed along the southern highway boundary for the new section of trunk road between the western terminal point for the Proposed Scheme and the north western corner of Braemoss Wood. A quickthorn hedge is proposed along the southern highway boundary between the north eastern corner of Braemoss Wood and the eastern terminal point for the Proposed Scheme. Two lengths of beech hedgerow are proposed along the northern highway boundary, one enclosing the existing open space between Carrutherstown and the existing line of the A75 to the east of the B725 as it provides access to the village, and one along the northern boundary of the new section of local road providing access between the retained local road and the proposed Stenriesgate junction with the new section of trunk road.

8.7.7 The objective is to establish a highway boundary that complements the established pattern of field hedgerows, link severed sections of hedgerow and reinforce the ecological linkages between areas of woodland and existing hedgerows in the local area. Small groupings of native hedgerow trees would be introduced into the new sections of hedgerow.

8.7.8 Open stands of intermittent alder and wild cherry would be introduced in verges at the western tie-in for the Proposed Scheme and to the east of Carrutherstown where the new section of local road links the village and the retained section of existing trunk road.

8.7.9 There will be approximately 3,200 m of newly established roadside verge that would be seeded with a native species-rich grassland mix of local provenance where possible.

8.8 Residual Effects

Landscape Effects

- 8.8.1 Once the dense woodland, scrub and hedgerow planting are established the initial impact of the new alignment would reduce both in terms of the prominence of the route and its traffic as a substantial component within the landscape. Established planting would both screen the road and traffic from many parts of the surrounding landscape and would extend and enhance the influence of woodland and scrub in the area whilst linking established planting areas and enhancing the availability of ecological corridors within the landscape.
- 8.8.2 In relation to local landscape character there would be a reduction in the magnitude of impact from medium towards low within a landscape of medium sensitivity to change. There would be a consequent decrease in the significance of the impact on landscape character to a residual effect of moderate/slight and adverse.
- 8.8.3 In relation to regional landscape character the magnitude of impact would remain low within a landscape of low sensitivity to change. The residual effect would be slight/negligible and adverse.

Visual Effects

Properties

- 8.8.4 Table 8.6 makes a comparison between the winter year of opening impacts and the residual effects in the fifteenth year after opening. The table demonstrates that with the establishment of the proposed mitigation planting there would be no residual effects greater than slight and adverse other than for a single property which would be subject to moderate/slight adverse impact.

Significance of Visual Impact	Winter year of opening	Winter year 15
No visual impact	12	12
Negligible	1	36
Slight/Negligible	17	3
Slight	12	28
Moderate/Slight	21	1
Moderate	16	0
Major/Moderate	1	0

Table 8.6 – Residual effects upon properties

Roads and Paths

- 8.8.5 As mass planting establishes on the approach embankments and extended flanking embankments to the proposed underpass on the U81a, traffic on the elevated section of the new trunk road would be progressively screened from view for users of the U81a as they approach from the north of Hardgrove Farm and south of Braehill. The magnitude of change would be negligible for receptors of medium sensitivity. The residual effect would accordingly be negligible.

9 Land Use

9.0 Introduction

9.0.1 This Chapter reports the findings of the assessment into the implications of the Proposed Scheme on existing land uses.

9.1 Scope of the Assessment

9.1.1 The Stage 1 and 2 assessment identified a number of potentially significant impacts that would require detailed assessment during the development of the Proposed Scheme and preparation of compulsory purchase orders:

- demolition of existing residential property;
- loss of existing agricultural land including best and most versatile land;
- severance and consequent impacts on the viability and/or efficiency of existing agricultural holdings;
- temporary loss of agricultural land subject to reinstatement upon completion of construction;
- temporary severance or disruption of access to established residential, commercial or industrial properties, communal facilities or agricultural holdings during construction; and
- disruption to existing services, drainage and irrigation regimes.

9.2 Statutory and Planning Context

9.2.1 The following guidelines, legislation and planning policy documents provide the framework for land use and development within Scotland and more locally within Dumfries and Galloway.

- Town & Country Planning (Scotland) Act (1997).
- Planning & Compulsory Purchase Act (2004).
- Planning and Compensation Act (Scotland) (1973).
- SPP15 - Planning for Rural Development (2005).
- SPP17 – Planning for Transport (2005).
- Dumfries and Galloway Structure Plan (Adopted December 1999).
- Annandale and Eskdale Local Plan (Adopted October 2006).
- Dumfries and Galloway Community Plan (2000).

9.3 Assessment Methodology

9.3.1 The assessment has been undertaken in accordance with the guidelines detailed in the DMRB, Volume 11, Section 3, Part 6 (June 1993 – August 2001).

9.3.2 It has involved the following key tasks:

- a review and analysis of existing land use associated with the Proposed Scheme corridor (baseline data);
- an appreciation of the nature, forms and features of the proposals;
- an evaluation of the predicted impacts in terms of loss of property and land-take categorised according to existing use
- an evaluation of severance and disruption to access in relation to continuing use;
- identification of appropriate mitigation to avoid, reduce or compensate identified impacts; and

- description of the residual effects and their significance, taking into account proposed mitigation.

Baseline Environment

- 9.3.3 The establishment of the baseline environment involved a combination of desk based review, consultation and validation by way of site survey. The following data sources have been used:
- 1:50,000 and 1:10,000 Ordnance Survey mapping for the study area;
 - the Stage 1 assessment containing provisional constraints; and
 - records obtained from the Macaulay Institute relating to the agricultural land capability of the study area²⁰.
- 9.3.4 The following statutory authorities, bodies and organisations have been consulted:
- Dumfries and Galloway Council;
 - Forest Enterprise;
 - Scottish Executive (Environment and Rural Affairs Department) (SEERAD); and
 - The Macaulay Institute.

Evaluation Criteria

Demolition of Private Property and Associated Land-take

- 9.3.5 The assessment quantifies the number of residential properties that would be subject to demolition should the Proposed Scheme proceed as proposed.

Loss of Land Used by the Community

- 9.3.6 The assessment considers the likely physical impacts on publicly accessible land and community resources in the study area. Examples of such resources include public open space, allotments, schools, churches and rights of way.
- 9.3.7 Estimates of likely land-take and severance are made, supported by information of existing levels of usage by the community where available. Information on any cultural, historic or literary associations is also noted.

Effects on Development Land

- 9.3.8 The assessment takes account of potential future changes in land use as a result of development that would occur in the absence of the proposals, for example vacant or derelict land which may be reserved for future committed development. Account is also taken of approved planning permissions, firm planning allocations and pending applications that may affect the future baseline context of the study area.

Effects on Agricultural Land

- 9.3.9 Assessing the impact on agricultural land as a national resource involved quantifying the land loss under the agricultural land classifications (ALCs) recorded and mapped by the Macaulay Institute²¹. The assessment has been made against the criteria defined in the DMRB, which refer to the requirement to consult with SEERAD where there would be a predicted loss of prime agricultural land greater than 2 ha or of lower grade land greater than 10 ha.

²⁰ Bibby, J.S., Douglas, H.A., Thomasson, A.J., & Robertson, J.S. (1982) Land Capability Classification for Agriculture, the Macaulay Institute, Aberdeen. The classification provides for seven grades of land based on its agricultural, forestry and recreational potential. The methodology considers climate, gradient, soil, wetness, erosion and pattern.

²¹ The identification of land capable for general agricultural uses in Scotland is based on a seven class system. This system seeks to identify areas where certain uses, such as agriculture, forestry or recreation, may be carried out most easily. The methodology considers climate, gradient, soil, wetness, erosion and pattern.

- 9.3.10 The significance of impacts on individual agricultural holdings has been based on the land taken at each holding, the consideration of this as a percentage of the total holding in the context of the forms of husbandry practiced, the extent to which the severance of established fields would compromise efficiency of operation, and the viability and the impact of diverted access to overcome severance in terms of journey time and consequent efficiency of operation.
- 9.3.11 The issues are considered both during and following construction. In addition, consideration has been given to the implications for temporary disturbance and the need for longer term design solutions related to disruption to existing drainage and service supply for each holding.

Impact Ratings

- 9.3.12 Impact significance has been rated using a descriptive scale ranging from large/moderate/slight and adverse through neutral to an ascending scale of slight and beneficial²².

Slight Beneficial Impact

- 9.3.13 This would apply where inconvenience associated with severance related to the existing road is relieved by re-routing the road with benefit to operational viability and efficiency or user comfort and enjoyment.

Neutral

- 9.3.14 This would apply where land-take associated with the Proposed Scheme would neither impinge on the operational viability and efficiency of a specific use or pattern of use nor would the proposal compromise recognised development potential for a site or area of uses.

Slight Adverse Impact

- 9.3.15 This would typically occur where a proposed route would involve minor land-take or severance resulting in low levels of inconvenience in relation to operational viability and efficiency or user comfort and enjoyment.

Moderate Adverse Impact

- 9.3.16 This would typically apply where a proposed route would involve land-take or severance between uses that would noticeably, but not substantially, influence operational viability and efficiency or user comfort and enjoyment.

Large Adverse Impact

- 9.3.17 This would typically apply where a proposal involves land-take or severance that would substantially influence operational viability and efficiency or user comfort and enjoyment. It may also compromise recognised development potential for a site or area of uses.

Impact Application and Evaluation

- 9.3.18 Each of the above assessment categories have been assessed using available information derived from current land use data and survey data.
- 9.3.19 Account has been taken of the effects of mitigation in compensating potential impacts, either in the case of exchange land or by way of accommodation works, and in determining the resultant effects and their associated significance.
- 9.3.20 The assessment concludes with a summary statement of the effect of the Proposed Scheme on each of the above interests, taking into account mitigation.

²² No moderate or large beneficial impacts were identified during the assessment.

9.4 *Baseline Conditions*

Settlement

- 9.4.1 Carrutherstown is a small village located 100m to the north-west of the western end of the Proposed Scheme on the original line of the A75. The existing A75 bypasses the village to the south. Local facilities comprise a school, village hall and post office.
- 9.4.2 Outside of Carrutherstown, development is in the form of dispersed farmsteads and private houses. These include Searigg Cottage, Windsor Cottage (on the eastern periphery of Carrutherstown), Whitecroftgate Cottage, Whitecroft Gate Lodge, Oakbank, Stenriesgate and Stenries View.

Community Land

- 9.4.3 Community land is limited to a primary school playing field and play area located some 250m north of the existing A75 in Carrutherstown.

Development Land

- 9.4.4 The current development plan does not make provision for development land along the A75 corridor, but land to the north east of the village has been zoned for future development. This has been taken into account during the design of the scheme proposals. Additionally, the settlement boundary as defined in the current Annandale and Eskdale Local Plan encompasses land immediately adjacent to the proposed link road at Carrutherstown.

Agricultural Land Classification

- 9.4.5 Agriculture represents the principal land use within the Proposed Scheme corridor.
- 9.4.6 Figure 9.1 details the agricultural land capability for the area based on the Macaulay Institute agricultural land classification for Dumfries and Galloway. The principal grades of land within the corridor comprise some 60% of class 3.2 land followed by 25% of class 3.1 land. There is 15% of class 5.2 land, and less than 1% of 4.2 and 6.2.
- 9.4.7 Land in grades 1, 2 and 3.1 qualify as prime agricultural land and require greater consideration.
- 9.4.8 Category 3 land is capable of producing a moderate range of crops.
Category 3.1 land is capable of producing consistently high yields of a narrow range of crops (cereals, grass) and moderate yields of a higher range (root crops). Short grass leys are common.
Category 3.2 land is capable of average production but high yields of barley, oats and grass are often obtained. Other crops are limited to potatoes and forage crops. Grass leys are common and reflect the increasing growth limitations for arable crops and degree of risk involved in their production.
- 9.4.9 Category 4 land is capable of producing a narrow range of crops. Category 4.2 is primarily grassland with some limited potential for other crops. Grass yields can be high but difficulties of conservation or utilisation may be severe; especially in areas of poor climate or on very wet soils. Some forage cropping is possible and, when extra risks involved can be accepted, an occasional cereal crop.
- 9.4.10 Category 5 land is only capable of supporting improved grassland and rough grazing, with 5.2 capable of establishing sward. However, moderate or low trafficability, patterned land and/or strong slopes cause maintenance problems. Growth rates are high, and despite some problems of poaching, satisfactory stocking rates are achievable.
- 9.4.11 Category 6 land is solely suited to rough grazing. Moderate quality herbage, such as white and flying bent grasslands, rush pastures and herb-rich moorlands or mosaics of high and low grazing values, characterise land in the division.

Agricultural Holdings

- 9.4.12 The local area comprises several farmsteads including: Searigg Farm; Fostermeadow Farm; Hardgrove Farm; Braehill Farm; Stenries Farm; Nether Stenries Farm; Topmuir Farm; and Upper Mains Farm.
- 9.4.13 Figure 9.2 shows the extent of holdings within the scheme corridor. Table 9.1 details the land-take required for the scheme in relation to these farmsteads.
- 9.4.14 The main access to Searigg Farm is via the B725, whilst the main access to Fostermeadow Farm is via the A75; approximately 200m east of the junction leading to Carrutherstown but on the opposite side of the A75.
- 9.4.15 The junction of the U81a and A75 is utilised on a daily basis by both Braehill and Hardgrove Farms, which receive deliveries, milk tankers and farm vehicles. Correspondingly, the U82a/A75 junction provides access for any deliveries, milk tankers and farm vehicles that require access to Stenries Farm. Nether Stenries Farm can be accessed directly from the A75 some 400m east of the U82a junction.
- 9.4.16 Topmuir Farm is also accessed directly from the A75. This access is utilised not only by farm vehicles but also by a number of private cars who require access to the associated Bed and Breakfast. The Upper Mains Farm access from the A75 also serves as vehicular access to Upper Mains Cottages.

Forestry

- 9.4.17 There are no extensive areas of commercial forestry immediate to the Proposed Scheme. There are, however, a small number of woodland areas located immediately adjacent to the existing section of the A75 between Carrutherstown and Upper Mains:
- Whitecroft Gate (mixed plantation) immediately to the east of Carrutherstown;
 - Braemoss Wood (coniferous), adjacent to the westbound carriageway, 0.5 km east of Carrutherstown;
 - Braehill Oak Wood (mixed) 0.2 km east of the A75 and U81a Hardgrove junction and Nether Stenries (a small area of the wood is recorded in the SNH Inventory of Semi-Natural Woodland - 1997);
 - An area of coniferous plantation at Stenriesgate immediately south of the existing road; and
 - Kelhead Moss Plantations (coniferous) immediately to the north of the existing A75 0.15 km to the east of the U82a junction.
- 9.4.18 There are also more extensive areas of mixed and coniferous woodland associated with the designed landscape at Kinmount House to the east of the Proposed Scheme.
- 9.4.19 600m to the south east of the scheme is Kelhead Wood (mixed), which is a component of Kinmount House designed landscape.

9.5 *Impacts of the Proposed Scheme*

- 9.5.1 The total land-take for the Proposed Scheme would be 21.9 hectares (ha).

Demolition of Private Property and Associated Land-take

- 9.5.2 The Proposed Scheme would require the demolition of one residential property and outbuildings at Stenriesgate. This would constitute a large adverse impact.

Community Land

9.5.3 There would be no direct or indirect impact on the primary school playing field and play area at Carrutherstown.

Development Land

9.5.4 There would be no impacts on designated development land, approved planning applications yet to be activated or applications pending determination.

Agricultural Land

Prime Agricultural Land as a National Resource

9.5.5 The Proposed Scheme would involve the permanent loss of some 18.1ha of agricultural land. 2.9 ha of this would comprise grade 3.1 land at the western end of the corridor. The land would be on the margins of existing land adjoining the existing trunk road and along the margins of an established track that would become the new principal access to Fostermeadow Farm. A further 1.5 ha of grade 3.1 land at Braemoss Wood would also be taken by the proposals. This latter land has been in use as woodland for some considerable time. The loss of this overall area of prime agricultural land would result in a slight adverse impact.

Farm Holdings

9.5.6 The required land-take in relation to each of the existing agricultural holdings affected by the Proposed Scheme is provided in Table 9.1. The table demonstrates that there would be a low level percentage of loss for the 5 holdings directly affected.

Location (ref from map)	Holding size (m ²)	Land-take (m ²)	Ratio (%)
Forest Meadow Farm (2)	623,518	13,483	2.2%
Hardgrove Farm (4)	2,467,300	101,517	4.1%
Topmuir Farm (17E)	544,290	19,333	3.6%
Upper Mains (13A)	23,319	953	4.1%
Searrigg Farm (1)	Unknown	910	-

Table 9.1 – Agricultural Land-take

9.5.7 The widening of the existing highway corridor and retention of the existing road as a segregated local road would not involve any increased agricultural severance.

9.5.8 The Proposed Scheme would result in the removal of existing private access from the trunk road to farmsteads or other private property, other than at Topmuir. It would also provide for a new underpass to establish a grade separated crossing for the U81a beneath the improved trunk road such that access from the side road onto the improved A75 would be available either at a remodelled junction at Carrutherstown to the west or at Stenries to the east.

9.5.9 Access to the farmsteads identified in the baseline studies would be affected as indicated in Table 9.2

Farm Holding	Severance and Access
Searigg Farm	No severance – No change in access distance
Fostermeadow Farm	No severance – Existing access directly onto A75 closed. New access via improved track to B725 and improved staggered junction south of Carrutherstown. Increased delivery and service vehicle access approximately 0.3 km. Improved safety in access and egress to trunk road.
Braehill Farm	No severance – Existing access via U81a directly onto A75 closed. New access via section of existing A75 retained as local road by way of improved junctions at Carrutherstown or Upper Mains. Increased delivery and service vehicle access between 1.5-3 km. Improved safety in access and egress to trunk road.
Hardgrove Farm	No severance – Existing access via U81a directly onto A75 closed. New access via underpass beneath new A75 and section of existing A75 retained as local road by way of improved junctions at Carrutherstown or Upper Mains. Increased delivery and service vehicle access between 1.5-3 km. Improved safety in access and egress to trunk road.
Stenries Farm	No severance – Existing access via U82a directly onto A75 closed. New access along U82a and section of existing A75 retained as local road by way of improved junctions at Carrutherstown or Upper Mains. No marked increase in access to farmstead. Improved safety in access and egress to trunk road.
Nether Stenries Farm	No severance – Existing access via private track onto A75 closed. New access along U82a and section of existing A75 retained as local road by way of improved junctions at Carrutherstown or Upper Mains. No marked increase in access to farmstead. Improved safety in access and egress to trunk road.
Topmuir Farm	No severance – Existing access via private track onto A75 modified. No marked increase in access to farmstead. Improved safety in access and egress to trunk road.
Upper Mains Farm	No change.

Table 9.2 - Severance and Access of farm holdings

9.5.10 The overall impact on individual farm holdings would be slight and adverse.

Forestry

9.5.11 The Proposed Scheme would result in the loss of 3.3 ha of existing woodland; the large part of which relates to some 1.54 ha at Braemoss Wood (5% of the interest) and 1.3 ha at Kelhead Moss Plantation (20% of the interest). None of the woodland is, however, managed as a commercial concern. The loss would accordingly not be significant in relation to forestry as a land use.

9.6 Mitigation

9.6.1 The assessment has concluded that the nature and significance of the predicted impacts identified do not call for further mitigation beyond the access and junction proposals incorporated

in the Proposed Scheme. Compensation related to the loss of property would be addressed in accordance with statutory procedures.

9.7 Residual Effects

9.7.1 The assessment has concluded that:

- the loss of one residence and associated buildings at Stenriesgate would be significant;
- there would be no significant residual effects on community land;
- there would be no significant residual effects on development land;
- there would be the loss of some 4.4 ha of 'best and most versatile' agricultural land, which would not be significant in the context of agricultural land as a national resource; and
- there would be no significant residual effects on individual farm holdings arising from loss of land, severance or modifications to access.

10 Pedestrians, Cyclists, Equestrians and Community Effects

10.0 Introduction

10.0.1 This Chapter reports the findings of the assessment of potential impacts on journeys made by pedestrians (including ramblers), equestrians and cyclists. Consideration has also been given to local vehicle movements in relation to their use and access to community facilities.

10.0.2 In this context pedestrians, equestrians and cyclists as an overall group are referred to as non-motorised users (NMUs)

10.1 Scope of the Assessment

10.1.1 Based on the scoping of potentially significant impacts described in Section 5.1 the implications of the Proposed Scheme primarily relate to changes in established severance by virtue of the segregation of strategic and local traffic and the opportunity for improved NMU use of local roads and tracks within the area as a result of the proposed segregation.

10.2 Statutory and Planning Context

10.2.1 In Scotland, there is no statutorily based record of rights of way. A national Catalogue of Rights of Way is however, compiled by the Scottish Rights of Way and Access Society (Scotways), in partnership with SNH and with the cooperation of local authorities.

10.2.2 The Catalogue of Rights of Way schedules three categories of rights of way:

- vindicated (1% of total) – routes declared to be rights of way by the courts or other legal process;
- asserted (15% of total) – routes that have been accepted as rights of way by the landowner or where local authorities have indicated they would take legal action to protect them if necessary; and
- claimed (84% of total) – routes that appear to meet the common law conditions necessary to be regarded as rights of way, but have not been formally vindicated or asserted.

10.3 Assessment Methodology

10.3.1 The assessment has been undertaken in accordance with the guidelines detailed in Volume 11 Section 3 Part 8 of the DMRB (1993 and amendments).

10.3.2 This has involved the following tasks;

- Establishment of the extent, nature and use of the existing NMU network within the proposed study area (baseline environment);
- Identification of existing community facilities within the study area and the means of community access to the identified facilities (baseline environment);
- Evaluation of the extent to which the Proposed Scheme would impact on use of the NMU network and access to community facilities;
- Identification of appropriate mitigation, where potentially significant impacts are predicted; and
- Description of the residual effects on NMUs and access to community facilities taking proposed mitigation into account.

Baseline Environment

- 10.3.3 The baseline environment has been defined through a combination of document review, consultation and site validation to determine the location, use and nature of the NMU network and local community facilities.
- 10.3.4 Information relating to rights of way and other community routes has been sourced from the Dumfries and Galloway Council database and through review of structure and local plans. The Byways and Bridleways Trust, Cyclists' Touring Club Scotland and Scottish Cyclists Union have also been consulted²³.
- 10.3.5 Information relating to the location and nature of existing community facilities has been gained through reference to Ordnance Survey Explorer Series (1:25,000) Map 322 for Annandale, consultation with officers of Dumfries and Galloway Council and site survey.
- 10.3.6 Formal user surveys have not been undertaken, it having been identified during preliminary assessments that the existing A75 is viewed as a considerable barrier to NMU use and that existing levels of use are understood to be low. Records of NMU activity have, however been recorded by site survey teams evaluating other environmental and engineering issues over the three-year planning and design programme for the project. A walkover survey was undertaken during 2006; the objective being to evaluate the amenity value for the small number of users accessing identified community facilities. Amenity value was principally based on considerations of the change people's exposure to traffic in terms of fear/safety, noise, dust/dirt and air quality along with the road's visual intrusion.

Evaluation Criteria

- 10.3.7 The evaluation of potential impacts has involved consideration of changes in journey length and time along with user safety for NMU routes where existing opportunity or use would be modified or new opportunity would be established. The assessment includes a judgement relating to user amenity as well as accessibility.
- 10.3.8 Where 'new severance' is created it has been described as slight, moderate or severe in accordance with the recommendations of the DMRB Volume 11, Section 3, Part 8, Chapter 6. Where 'relief from severance' has been identified it has been described as slight, moderate or substantial again in accordance with the recommendations of the DMRB Volume 11, Section 3, Part 8, Chapter 7.
- 10.3.9 Severance is determined on the following using a three point scale viz, Slight, Moderate or Severe severance.
- Slight: This is where pedestrians using at-grade crossing are subject to a new road carrying below 8,000 vehicles per day (AADT), or a new bridge will need to be climbed or a subway traversed, or journeys will be increased by up to 250 m.
 - Moderate: This is where pedestrians using at-grade crossing are subject to a new road carrying between 8,000 – 16,000 vehicles per day (AADT) in the opening year, or two or more of the hindrances set out under 'Slight' applying to single trips, or journeys will be increased by 250-500 m.
 - Severe: This is where pedestrians using at-grade crossing are subject to a new road carrying over 16,000 vehicles per day (AADT) in the opening year, or three or more of the hindrances set out under 'slight' or two or more set out under 'moderate', or an increase in length of journeys of over 500 m.

²³ Relevant responses are provided in Appendix B.

10.4 Baseline Environment

Rights of Way and the Local Road Network

- 10.4.1 There are no vindicated, asserted or claimed public rights of way associated with the Proposed Scheme corridor.
- 10.4.2 The network of roads associated with the Proposed Scheme corridor comprises the existing section of the A75, the B725, U81a, and U82a. There are also a number of private driveways and tracks that provide access to individual farmsteads and houses. These roads, driveways and tracks are shown in Figure 9.1.
- 10.4.3 Fostermeadow Farm and Whitecroft Gate stable horses. There is, however, no evidence of hacking along the local road network, drives or tracks. Pedestrian and cyclist use of the existing network, driveways and/or tracks within the Proposed Scheme corridor is of a very low order. Fewer than 10 NMUs have been observed over the planning, design and assessment period for the Proposed Scheme.
- 10.4.4 There are no dedicated NMU crossing points along the existing A75 within the study area.

Community Facilities

- 10.4.5 Table 10.1 schedules the existing community facilities identified within the study area. The location of the facilities is shown in Figure 10.1.

Name	Address / Location	Distance to Proposed Scheme
Education		
Carrutherstown Primary School	Dumfries – DG1 4LD	185 m
Community Services and Institution		
Carrutherstown Village Hall	-	78 m
Post Office	Carrutherstown - DG1 4LA	144 m

Table 10.1 – Community Facilities

- 10.4.6 All three facilities identified are located to the north of the existing A75. Carrutherstown primary school, the post office and village hall are both located within the village.
- 10.4.7 There are between 35-40 pupils registered at the school with a catchment taking in Carrutherstown, the village of Dalton (some 2.5 km north east of Carrutherstown) and farmsteads and households in the countryside surrounding the villages.
- 10.4.8 The village hall is administered by the Carrutherstown Community Council. The Council holds weekly meetings at the hall. Other events include parish meetings. The number of people using the facility varies depending on the event in question.
- 10.4.9 Access to the village hall and school for residents within Carrutherstown and for other members of the community living north of the A75 and north and west of the village is available via the B725 and local lanes without a requirement to use or cross the existing A75. Access for individual properties located within the countryside north of the trunk road and east of the village is available via the U81a, U82a and local lanes/tracks, and subsequently the existing A75 as far as the existing Carrutherstown junction on the trunk road. Access for individual properties located within the countryside south of the trunk road is available via the B725 and U82a or private driveways and track onto and across the A75 to access the village at the existing A75 junction.
- 10.4.10 The potential members of the local community involved in journeys to the school, post office or village hall is small. There are some six properties north of the A75 and east of the village and ten south of the trunk road. How many have children of primary school age or are active members of the community council has not been established.

10.4.11 It can be reasonably concluded that the facility most affected by the need to use the current A75 as a means of access is the village school. Throughout term time, and thus over most of the year, users gaining access from the east or south of the village encounter daily difficulty accessing and crossing the busy A75. Similar difficulties are experienced by users of the village hall, though the frequency of these movements cannot be as readily identified.

10.5 *Impacts of the Proposed Scheme*

10.5.1 The key aspects of the Proposed Scheme with implications for local journeys undertaken by NMUs or local traffic seeking access to community facilities are:

- the re-routing of U81a underneath the proposed A75 by means of an underpass;
- the closure of the existing access for Fostermeadow Farm off the A75 and the upgrading of an existing westbound track from the farm onto the B 725; and
- the retention of the existing section of the A75 as a local road.

10.5.2 The modification of the alignment of the U81a beneath the proposed section of the A75 would not involve any increase in journey length for local traffic seeking access to the community facilities nearing and around Carrutherstown from the south of the proposed trunk road corridor. There would however, be a potential for time savings and, an improvement in amenity and safety given the removed need to gain access to the A75 to cross it. This could benefit the small number of properties using the local road to access the identified community facilities.

10.5.3 The closure of direct access from Fostermeadow Farm onto the A75 and the creation of a new access via the B725 would involve an increase in journey length (of some 0.5 km²⁴) for the farm's residents wishing to use the identified community facilities. The existing requirement for two turning movements onto and off the trunk road would remain. Volumes of traffic for the Do-Minimum and Do-Something scenarios would be of a similar order (see Appendix C). There would be a negligible difference in the amenity value of the journey under either scenario. Overall, there would be a slight increase in severance for residents at the farm seeking to gain access to the community facilities.

10.5.4 For other properties with access onto the B725 south of the existing and proposed section of trunk road there would be no material change in journey length or any provision for crossing the new trunk road to gain access to the village and its associated facilities. There would accordingly be no difference in travel time, perception of safety or amenity value. The impact for this small number of properties would be neutral.

10.5.5 The retention of the existing section of the trunk road as a local road and construction of a short length of connecting carriageway to provide access directly to Carrutherstown would not result in any material increase in journey length for properties to the north and east of the village. There would be potential time savings and an improvement in amenity and safety given the removed need for drivers to gain access onto the busy trunk road and cross over the trunk road at the existing junction serving the village. The number of affected properties and journeys would be small. The benefit to amenity and safety would be marked though. This would result in a substantial reduction in severance for a small number of properties.

10.5.6 The retention of the existing section of trunk road as a local road would also serve to provide an informal recreational route or a means of gaining access to the local community facilities. There would be a marked improvement in amenity value for such users and provide an increased opportunity for NMu uptake. Current NMu activity has been established as being very low. The number of local properties for which the new opportunity would become available is also small. There is also no significant local network of rights of way that would be reinforced or linked by

²⁴ The new route adds 275 m to the journey length; thus in total any round-trip to Carrutherstown is extended by approximately 0.5 km.

the retained section of road. The assessment has accordingly concluded that the impact of this element of the Proposed Scheme for NMUs generally would be slight and beneficial.

Do Minimum Scenario

- 10.5.7 Should the Proposed Scheme not proceed, issues of severance related to access from properties on both sides of the existing trunk road and east of Carrutherstown would be likely to deteriorate as traffic volumes on the trunk road increase and conflicts between strategic and local traffic increase. Similarly, the A75 would remain as an unattractive proposition for NMUs and discourage the use of the wider network of local connecting roads.

10.6 Mitigation

- 10.6.1 No additional mitigation is proposed.

10.7 Residual Effects

- 10.7.1 The identified reduction in severance as a result of the proposals to grade-separate the crossing of the proposed section of the A75 and the U81a and the retention of the existing section of the trunk road for use by local traffic would be significant in the context of the local community. There would also be a slight benefit for NMUs as a result of the increased opportunity for safer use and improved amenity associated with the retention of the existing A75 as a local road.

11 Vehicle Travellers

11.0 Introduction

11.0.1 This chapter reports the findings of the assessment of the predicted impacts on vehicle travellers (vehicle road users). The assessment considers two aspects; driver stress and view from the road.

11.1 Scope of the Assessment

11.1.1 The Proposed Scheme comprises part of a broader strategy for upgrading the A75 as the principal route to the important ferry terminals at Stranraer and Cairnryan (see Section 1.0). The trunk road is also an important route for tourists seeking access to the south west of Scotland. Conflicts between strategic, tourist and local traffic are an everyday occurrence (see Section 2.1.4). Restricted opportunities for overtaking induce risk, which contributes to high levels of stress.

Driver Stress

11.1.2 The guidelines refer to a number of ways in which development of the type proposed can influence driver stress.

- Route uncertainty - caused by a lack of, or inadequate signing.
- Fear of potential accidents - caused by the presence of other vehicles and inadequate sight distances.
- Frustration - caused by a driver's inability to drive at a speed consistent with his or her own wishes in relation to the general standard of the road. This may be a result of road layout, geometry, surface riding characteristics, junction frequency and speed and flow per lane.

View from the Road

11.1.3 There are a number of ways in which development can have an adverse or beneficial effect on views from the road.

- They can change the extent and availability of the traveller's view, which is dictated by the relative level of the road and the surrounding landform, buildings, vegetation, associated structures and environmental barriers.
- They can enhance or detract from the travellers experience by the removal of existing features, such as mature trees and distinctive townscape elements or derelict buildings and existing eyesores.
- They can introduce new features and landscape/townscape to the benefit of the traveller's experience.

11.2 Statutory and Planning Context

11.2.1 There are no statutory or planning-specific guidelines related to driver stress or the view from the road; however there is a strong correlation to elements of the landscape character, which are appraised in Chapter 8. Safe and stress-free travel opportunities are, however, integral to transport policy and the design standards adopted by Transport Scotland in their capacity as the agency responsible for the national trunk road network.

11.3 Assessment Methodology

11.3.1 The assessment has been undertaken in accordance with the methods outlined in the Volume 11, Section 3, Part 9 of the DMRB.

Driver Stress

- 11.3.2 The assessment of driver stress is based on the traffic and road conditions encountered and driver certainty. The following factors have been considered: traffic flows; journey speed; frustration; fear; and uncertainty.
- 11.3.3 In relation to traffic flows and journey speed, the DMRB provides guidance relating levels of driver stress to the average hourly flow per lane, average journey speed, the urban or rural location of the road, and taking account of the type of road (motorway, dual carriageway or single carriageway).
- 11.3.4 It is realised that environmental assessments, providing the speeds and flows exist during peak hour flows for at least one kilometre of a route the following figures presented in Table 11.1 can be used. The DMRB assessment also requires an assessment to be made between the 'do-nothing' and 'do-something' options. In this regard the scheme switches from a single-carriageway to a widened single-carriageway with alternating overtaking sections. The assessment is made for the worst year in the first fifteen after opening.

Average peak hourly flow per lane ²⁵ , Flow Units/1 Hour	Average Journey Speed – km/hr		
	Under 50	50 – 70	Over 70
Under 600	High	Moderate	Low
600 - 800	High	Moderate	Moderate
Over 800	High	High	High

Table 11.1 – Stress ratings for single carriageway roads

N.B. A car or light van equals 1 flow unit. A commercial vehicle over 1.5 tons unladen weight or a public service vehicle equals 3 flow units.

View from the Road

- 11.3.5 The assessment of views from the road has considered those aspects discussed in Paragraph 11.1.3. Views have been categorised as follows:
- No view –where the road is in deep cutting or contained by earth bunds, environmental barriers or adjacent structures.
 - Restricted view – frequent cutting or structures would block the view.
 - Intermittent view – the road would generally be at ground level but with shallow cuttings or barriers at intervals.
 - Open view – an unobstructed view.
- 11.3.6 Impacts have been evaluated based on a comparison of the views for travellers using the existing road compared with travellers who would use the proposed road. Changes in the extent, availability and nature of the views have been quantified in terms of the length of affected road.
- 11.3.7 The assessment concludes with a statement of the order of impact, assuming the proposed road to be operational and that proposed landscape measures have been established for 15 years (the design year). The order of impact is based on a three point scale of better/neutral/ worse.

²⁵ The provided traffic data for the worst-case year represent 18-hour two-way Average Annual Weekly Traffic (AAWT) flows. They have been used to provide an average hourly flow, which includes the peak periods.

11.4 *Baseline Conditions*

View from the Road

- 11.4.1 Driver views along the existing section of the A75 comprise a mixture of open vistas across farmland and restricted views due to the presence of plantation woodland adjacent to the carriageway. Driving east from the Carrutherstown there are views to the north of the village of Carrutherstown and to the south over agricultural fields in the vicinity of Fostermeadow Farm. From Whitecroft Gate, on the eastern periphery of the village where the route moves gently south-eastwards, Braemoss Wood, adjacent to the south of the carriageway, obscures views for approximately 0.5 km. To the north are extensive views of the rolling agricultural landscape. At this point where the straight road alignment provides views ahead to Kiln Knowe where the road gently rises.
- 11.4.2 From Kiln Knowe to the U81a and beyond, to the western edge of Braehill Oak Wood, there are extensive views of arable and rough grazing farmland both north and south over the undulating topography. As the existing alignment is fairly straight there are clear views ahead to the brow of the hill approximately at Oakbank. Whilst open views are generally retained to the south, with the exception of a small cluster of mature trees at Popin Well, views to the north around Oakbank are obscured by Braehill Oak Wood for approximately 0.2 km.
- 11.4.3 From Oakbank east to Stenriesgate there are generally open views of the agricultural landscape, with hedgerow field boundaries in the north. There are occasional clusters of trees and scrub along the southern edge of the carriageway. Despite the relatively straight alignment of the route, accesses, including the U81a road junction, are not clear from a distance and obscured from view by the presence of small hedges running parallel with the northern verge.
- 11.4.4 Views of the route ahead (looking east) are possible along the existing alignment from Oakbank to Stenriesgate and possibly beyond. Approximately 0.2 km east of Stenriesgate, views to the north are totally obscured to the end of the route section under consideration i.e. to Upper Mains access road. This is due to the presence of woodland, namely, Kelhead Moss Plantation, which form a continuous curtain. Whilst views to the north are obscured over this section of the route, in contrast, to the south unbroken views over farmland to Topmuir Farm are observed. From approximately Stenries View access road, where the land raises slightly, the remainder of the route ahead to Upper Mains is visible.

Driver Stress

- 11.4.5 The current A75 comprise a single carriageway over the 3.6 km section covered by the Proposed Scheme (see Figure 2.1). Accordingly, the average predicted two-way peak hourly flows are calculated at 1013 with a 19.7% HGV split and a speed of 75 kph. The flow unit per lane is correspondingly 706 (see footnote²⁶). The level of driver stress is therefore assessed as being 'moderate' under the worst-case do-nothing scenario.
- 11.4.6 Slow moving farm vehicles, lorry convoys and tourist traffic coupled with restricted overtaking opportunities and concealed junctions/property entrances are features of this route that may result in driver frustration, fear and uncertainty.

²⁶ Traffic flows are recorded for the 15-year post opening (the design year). This is the average 18-hour AAWT flow of 18231 across the 3.6 km section. This comprises a 19.7% HGV component (see Appendix C). Therefore, the number of units is $((1013 \times 19.7\%) \times 3) + (1013 - (1013 \times 19.8\%)) = 1412$ units. Therefore, the flow per lane is 706.

11.5 Impacts of the Proposed Scheme

View from the Road

- 11.5.1 On the whole, the scheme is not anticipated to significantly affect vehicle-travellers view's as it runs adjacent to the south of the existing A75. The most apparent change to driver views relate to where cuttings and embankments are proposed and where mounding is proposed. A cutting of less than 100 m in length in the vicinity of Whitecroft Gate will result in a lowering of the new carriageway, by a maximum of 2.5 m below the existing ground level. A similar situation will arise at Kiln Knowe where the route will be confined to a cutting for an approximate distance of 150 m and, at its maximum, 2.5 m below the existing ground level. A further cutting of approximately 200 m in length will begin at Popin Well Wood where the maximum height difference between existing levels and the new carriageway will be approximately 4.6 m. In addition; the construction of an embankment at Hardgrove to accommodate the proposed underpass will see the new carriageway raised some 7 m above the existing ground surface. Finally, excess fill will be mounded. This will be used between the new and existing A75 between Chainage 500–1100 and 1500–3100 creating a relative mound height of between 1.0 to 2.5 m at its apex.
- 11.5.2 The proposed realignment of the A75 and the anticipated vegetation clearance required to facilitate the progression of the carriageway will provide vehicle-travellers with greater open views of the wider landscape. Utilising DMRB criteria, views from the road for the existing and the proposed realignment are considered to be of moderate importance to vehicle travellers.
- 11.5.3 Views from the road experienced by vehicle-travellers are anticipated to change with the realignment of U81a and the associated underpass at Hardgrove. The biggest change will be to the fore-ground views where vegetation is cleared; once the vegetation has established the views from the road shall be similar to pre-construction of the alignment.
- 11.5.4 The new side road links to the existing A75 from the B725 at Carrutherstown, and from the proposed new A75 carriageway at Stenries, will result in temporary scarring whilst the proposed access to Fostermeadow will follow an existing track that will minimise visual impacts.
- 11.5.5 The Proposed Scheme will alter the driver views. The planting and mounding proposed along large sections to the north of the new alignment will provide a clear distinction between the characteristics and views experienced along the retained section of the A75 offset that of the new trunk road. Principally, views to the north from the new alignment will be intermittent and restricted given its slightly higher elevation around the U81a, whilst those views to the south will remain consistent with the current situation. Equally, views to the south from the retained section of the A75 will become restricted over a large section of the route whilst views to the north are maintained. Overall however, the generated views are consistent with the remainder of the A75 and are therefore assessed as negligible and not significant.

Driver Stress

- 11.5.6 Most modern road improvements designed in accordance with current standards are normally classified as inducing moderate-to-low levels of driver stress (DMRB Volume 11, Section 3, Part 9, Chapter 4).
- 11.5.7 The Proposed Scheme comprises an offline alignment with the provision of structured overtaking opportunities and rationalisation of existing accesses; including development of safer offline arrangements. The scheme's aim is to provide coherent and structured opportunities for access and egress to and from the A75 from properties in conjunction with safe and clear overtaking opportunities. Meeting these aims will reduce driver frustration and fear of accidents as well as uncertainty in relation to the route being followed.
- 11.5.8 Despite the scheme proving a residual level of moderate driver stress, which as highlighted in Paragraph 11.5.7, is common to roads of this nature and design, the third-lane and improved

access to and from the A75 will inherently improve levels of driver stress through providing safer over-taking opportunities and accesses/egresses from the road.

11.6 Mitigation and Monitoring

11.6.1 The assessment has concluded there would be no requirement for mitigation relating to driver stress of view from the road.

11.7 Residual Effects

11.7.1 The impact assessment has determined that without requirement for mitigation specific to vehicle-travellers the associated impacts on driver-views and driver-stress will be 'slight' and 'moderate' respectively; noting the limitations to the assessment method in relation to the scheme proposals. As such, it is determined that there will be no significant residual effects.

12 Road Drainage and the Water Environment

12.0 Introduction

12.0.1 This chapter reports the findings of the assessment into the predicted impacts on the water environment associated with the Proposed Scheme corridor and the neighbouring area, principally resultant from the effects of road drainage.

12.0.2 In this context the water environment includes surface watercourses, water bodies, groundwaters and aquifers.

12.1 Scope of the Assessment

12.1.1 The purpose of the assessment has been to establish the nature and significance of the predicted impacts that occur as a result of the construction and operation phases of the Proposed Scheme. Such impacts relate to changes in flow characteristics, flooding regimes and the existing water quality.

12.1.2 The Stage 1 and 2 assessments identified a number of minor watercourses flowing north to south across the Proposed Scheme corridor, all of which form part of a local catchment drained by the River Pow. These surface waters form part of the wider Solway Firth greater catchment area located to the south of the study area. The Solway Firth is a SSSI and is designated under the Habitats Directive as an SPA and candidate SAC (refer to Chapter 7).

12.1.3 The Stage 1 and 2 assessments also identified a number of water bodies within 1 km of the Proposed Scheme corridor; the principal ones being at Kelhead Quarry and Kinmount House. It also established that the nearest designated floodplain and groundwater abstraction points were located 7 km to the east at Annan.

12.1.4 The assessments concluded that the ES should accordingly focus on the implications of the potential modification to the flow regimes and characteristics of the existing watercourses and the prospective impacts on water quality associated with potential sedimentation and contamination by pollutants (including accidental spillage) should the Proposed Scheme become operational. Sedimentation and contamination issues have been accordingly addressed in Chapter 15, Disruption Due to Construction. Potential consequent impacts on aquatic and marginal habitats and aquatic dependent species are addressed in Chapter 7, Ecology and Nature Conservation.

12.1.5 Whilst it was concluded there was no need to undertake a detailed flood risk assessment, consideration has been given to the effectiveness of the existing culverted watercourses under the A75 to determine if there is the potential for localised flooding upstream and by association if this risk would be transferred to the proposed culverts associated with the new alignment. Such a consideration extended to assessing the combined effect of having two proximal culverted sections along each affected watercourse; one serving the existing A75 and the other the Proposed Scheme.

12.1.6 In summary, the assessment has addressed the following topics identified in the DMRB:

- effect of routine run-off on surface waters;
- effect of routine run-off on groundwaters; and
- pollution impacts from accidental spillages.

12.2 Statutory and Planning Context

12.2.1 The assessment has been informed by reference to the following directives and statutes.

- EC Freshwater Fish Directive 75/659/EEC (1975).
- EC Groundwater Directive 80/68/EEC (1980).
- Water Resources (Scotland) Act (1991).
- Water Drainage (Scotland) Act (1997).
- Flood Prevention & Land Drainage (Scotland) Act (1997).

12.2.2 The Water Environment (Controlled Activities) (Scotland) Regulations (2005), or Controlled Activities Regulations (CAR), bring into effect the requirements of Section 20 of the Water Environment and Water Services Act (2003) insofar that, from the 1st April 2006, authorisation from SEPA will be required for the following activities:

- discharges to all wetlands, surface waters and groundwater (replacing the Control of Pollution Act (CoPA) (1974));
- disposal to land (replacing the Groundwater Regulations (1998));
- abstractions from all wetlands, surface waters and groundwater;
- impoundments (dams and weirs) of rivers, lochs, wetlands and transitional waters; and
- engineering works in inland waters and wetlands.

12.3 *Assessment Methodology*

12.3.1 The assessment for the Proposed Scheme has been undertaken in accordance with the guidelines in Volume 11 Section 3, Part 10 of the DMRB (HA 216/06).

Consultation

12.3.2 The following organisations have been consulted to determine existing data related to surface waters and groundwater within the study area:

- Dumfries and Galloway Council; and
- Scottish Environment Protection Agency (SEPA).

12.3.3 The corresponding responses are contained within Appendix B.

Effect of Routine Run-off on Surface Waters

12.3.4 The DMRB provides both a simple and detailed approach for assessing the impact of routine run-off on surface waters. The Proposed Scheme was initially subject to 'simple assessment' to determine if more a 'detailed assessment' would be required in light of potentially significant impacts. The assessment concluded that there would be a low risk of significant impact; thus a detailed assessment was accordingly not required.

12.3.5 The simple assessment method is based on Construction Industry Research and Information Association (CIRIA) Report 142²⁷. The method assesses the dilution potential²⁸ of the receiving waters and traffic flow²⁹ as key parameters and is modified to allow for rivers having different River Quality Objectives.

²⁷ CIRIIA Report 14 on Highways Pollutants (1994)

²⁸ The dilution potential is expressed as the river flow during low flow conditions divided by the flow from the road during a typical storm.

²⁹ Traffic flow may be based on actual counts or predicted levels of use.

Effect of Routine Run-off on Groundwater

- 12.3.6 The assessment is based on the consideration of the source/pathway/receptor protocol (a risk assessment approach to the evaluation of contaminated land³⁰). The principles of the approach are that for there to be a risk of impact there must be:
- a *source*, being a contaminant or a potential contaminant;
 - a *receptor*, being something or someone that may be 'harmed' by contaminants; these include ground and surface waters (grouped as Controlled Waters), ecological environment and most importantly human health; and
 - a *pathway* being a route taken by a source of contamination to cause harm to a receptor, where either:
 - the contaminant is causing significant harm to that receptor, or
 - there is a significant possibility of such harm being caused by that contaminant to that receptor.
- 12.3.7 Where the above approach is adopted for the water environment the resultant effect is that of pollution over contamination.
- 12.3.8 Where a source or pathway is identified, the assessment considers how the said source or pathway might be modified to reduce the risk/impact. In the case of the Proposed Scheme, the source has been accepted as being fixed; there being predicted levels of traffic and a consequent level of associated contaminants associated with the traffic. The assessment is conservative in that no allowance is made for the potential lowering of generated contaminants that are likely to be achieved as vehicle technology improves.
- 12.3.9 Where the source is identified as being discernibly harmful, modification or breakage of the pathway remains the basis for mitigation.

Pollution Impacts from Accidental Spillages

- 12.3.10 The assessment is based on a preliminary evaluation of the risk that there could be an accident involving the spillage of potentially polluting substances. This is followed by consideration of the risk that such an accident would result in the pollutant reaching the receptor.
- 12.3.11 Table 2.4 of Part 10 of Volume 11 of the DMRB defines three categories of pollution incident in which categories 1 and 2 are considered serious pollution incidents. The risk of a serious incident is expressed in terms of the annual probability of such an incident, which is in turn used as a basis for determining the acceptability of the risk or if mitigation is required to reduce the risk.
- 12.3.12 The norm adopted under the DMRB is a 1%-risk provided the identified receptor is not classed as being of exceptional sensitivity.
- 12.3.13 The method is based on an analysis of spillage incidents on motorways and trunk roads in England and Wales. It assumes that spillage accidents are distributed across the network in the same way as personal injury accidents involving HGVs are.
- 12.3.14 The DMRB provides a standard formula for assessing the annual probability of a spillage accident for each individual section of road:

$$P_{ACC} = RL \times SS \times (AADT \times 365 \times 10^{-9}) \times (\%HGV \div 100)$$

³⁰ Introduced through Part IIA of the Environmental Protection Act (1990).

Where:

- P_{ACC} = the annual probability of an accidental spillage with the potential to cause a serious pollution incident.
- RL = Road Length in kilometres.
- SS = Spillage rates. Values are provided in Table D.1, Annex 1, Part 10 DMRB Vol. 11. 11.
- AADT = Annual Average Daily Traffic (design year for new road).
- %HGVS = percentage of Heavy Goods Vehicles.

12.3.15 It further provides a formula for calculating the predicted annual probability of a serious pollution incident for each section of road:

$$P_{INC} = P_{ACC} \times P_{POL}$$

Where:

- P_{INC} = the probability of a spillage incident with an associated risk of a serious pollution incident occurring
- P_{POL} = the probability, given an accident, that a serious pollution event will result. The value is dependent on the sensitivity of the water course and how soon it can be reached by the emergency services. Values are provided in Table D.2, Annex 1 Part 10, Volume 11 of the DMRB.

12.3.16 The annual probabilities for each section of road draining into a watercourse are then added. If the risk does not exceed the acceptable risk, no further assessment is required under the simple assessment.

Significance of Effects

12.3.17 The significance of the effects arising from the impacts identified by the three components of the assessment are determined by the magnitude and probability of the impacts and the importance of the affected receptor.

Importance of Identified Features/Attributes

12.3.18 Importance criteria adopted are detailed in Table 12.1³¹.

Importance	Criteria	Examples
Very High	Attribute with a high quality and rarity on a regional or national scale	<p>Surface Water: EC Designated Salmonid/Cyprinid fishery; RQO River Ecosystem Class RE1; Site protected under EU; UK wildlife legislation (SAC, SPA, SSSI, Ramsar site)</p> <p>Groundwater: Major aquifer providing regionally important resource or supporting site protected under wildlife legislation; SPZ1.</p>
High	Attribute with a high quality and rarity on a local scale	<p>Surface Water: RQO River Ecosystem Class</p>

³¹ The table is an abstract from Table 5.3, Part 10, Volume 11 of the DMRB.

Importance	Criteria	Examples
		<p>RE2; Major Cyprinid Fishery; Species protected under EU or UK wildlife legislation.</p> <p>Groundwater: Major aquifer providing locally important resource or supporting river ecosystem SPZII.</p>
Medium	Attribute with a medium quality and rarity on a local scale	<p>Surface Water: RQO River Ecosystem Class RE3/RE4;</p> <p>Groundwater: Aquifer providing water for agricultural or industrial use with limited connection to surface water; SPZIII.</p>
Low	Attribute with a low quality and rarity on a local scale	<p>Surface Water: RQO River Ecosystem Class RE5</p> <p>Groundwater: Non-aquifer</p>

Table 12.1 – Criteria for Evaluating Importance

Magnitude of Impact

12.3.19 The adopted magnitude criteria are detailed in Table 12.2³². The assessment criteria range from major, moderate, minor and adverse to negligible and minor beneficial; there being no moderate and/or major benefits as assessed.

Magnitude	Criteria	Example
Major Adverse	Results in loss of attribute and/or quality and integrity of attribute	<p>Surface Water: Potential high risk (Method A) and potential failure of Total Zinc and Dissolved Copper (Method B); calculated risk of pollution from an accidental spillage >2% annually (Method D); loss or extensive change to a designated fishery.</p> <p>Groundwater: Loss of aquifer; potential high pollution risk score >250 (Method C); risk of pollution from accidental spillage >2% annually (Method D).</p>
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	<p>Surface Water: Potential high risk (A) and either potential failure of Total Zinc or Dissolved Copper (B); risk of pollution from accidental spillage >1% but <2% annually (D); partial loss of fishery.</p>

³² The table is an abstract from Table 5.4, Part 10, Volume 11 of the DMRB.

Magnitude	Criteria	Example
		Groundwater: Partial loss or change to an aquifer; medium pollution risk from run-off, score 150-250 (C); pollution risk from spillage >1% but <2% annually (D)
Minor Adverse	Results in some measurable change in attributes quality or vulnerability	Surface Water: Potential high risk (A) and no change in Total Zinc and Dissolved Copper (B); risk of pollution from spillage >0.5% and >1% annually (D) Groundwater: Low risk of pollution from routine run-off (C), score <150; risk of pollution from spillage >0.5% and <1% (D)
Negligible	Results in an impact on attribute but of insufficient magnitude to affect the use/integrity	Surface Water: Low risk or pollution from routine run-off (A) or spillage risk <0.5%. Groundwater: No measurable impact upon aquifer and pollution risk from spillage <0.5%.
Minor Beneficial	Results in some beneficial effect on attribute or a reduced risk of negative effect occurring	Surface Water: Low risk (A) and risk of pollution from spillage <0.5%. Groundwater: No measurable impact and risk of pollution from spillage <0.5%

Table 12.2 – Magnitude of Impacts

Significance

12.3.20 By combining the importance of the attribute and the magnitude of the predicted impact, the significance of the effects has been determined in accordance with the matrix shown in Table 12.3³³. The significance ratings can be adverse or beneficial. The same ratings have been used for effects prior to and with mitigation in place.

Magnitude of potential impact	Importance of attribute			
	Very High	High	Medium	Low
Major	Very Large	Large/Very Large	Large	Slight/Moderate
Moderate	Large/Very Large	Moderate/Large	Moderate	Slight
Minor	Moderate/Large	Slight/Moderate	Slight	Neutral
Negligible	Neutral	Neutral	Neutral	Neutral

Table 12.3 – Significance of Potential Effects

³³ The table replicates Table 5.5, Part 10, Volume 11 of the DMRB

12.4 *Baseline Conditions*

Catchment Area

- 12.4.1 The Proposed Scheme is located within a wider area that falls within the catchment of the River Annan, which itself discharges into the Solway Firth some 4 km south of the existing and proposed sections of the A75. The immediate study area for the Proposed Scheme is contained within the local catchment of the Pow River (Figure 11.1) A number of tributaries of Pow Water, including Hardgrove Burn, Stenries Burn and Glen Burn are located within the study area along with various drainage ditches.
- 12.4.2 The River Annan and Pow Water are both protected under EC Directive 78/659/EEC, and as such, are classified under the River Classification System.

Pow Water

- 12.4.3 Pow Water originates north of the existing A75 and to the west of Carrutherstown. It flows in a south-easterly direction discharging into the Solway Firth at Powfoot. The watercourse is culverted beneath the A75 at Whitecroft Gate; some 0.2 km east of Carrutherstown. In its lower sections, Pow Water is a classified salmonid watercourse with an important sea trout population. However, locally it was displaced and culverted as part of the original A75 and subsequently it has been extensively culverted in the fields to the north of the existing road. These works have reduced the attractiveness of the watercourse to wildlife; including fish (see Chapter 7).
- 12.4.4 Furthermore, there remains a potential unqualified risk, given the expanse of agricultural activity in the area, for diffuse pollutants from surrounding farmland to have impacted on the local water quality with consequent implications for Pow Water's biodiversity.

Hardgrove Burn

- 12.4.5 Hardgrove Burn is a small tributary of Pow Water originating immediately north of the existing A75. It follows a north-south course close to the U81a. The watercourse is carried in a culvert beneath the A75 immediately to the east of the existing U81a past the point where it crosses the existing A75. No evidence of flooding upstream of the existing culvert has been observed or recorded throughout the planning and design phases of the Proposed Scheme.

Glen Burn

- 12.4.6 Also a tributary of Pow Water, the Glen Burn flows from farmland to the east of Nether Stenries, south to the A75, where it is culverted beneath the carriageway. No evidence of flooding upstream of the existing culvert has been observed or recorded throughout the planning and design phases of the Proposed Scheme. South of the A75, the burn flows south-westwards towards Upper Mains Farm. The confluence with Pow Water is some 3 km to the south of the A75. The north side of the burn within the study area is mostly fenced and has a mix of aquatic and bank side vegetation.

Stenries Burn

- 12.4.7 Stenries Burn is a minor tributary of Glen Burn. It runs alongside the existing access road from the farm to the existing A75. There is large seasonal wetland associated with the burn north of the existing A75, suggesting that the existing culvert beneath the trunk road is no longer capable of addressing changes in the upstream catchment/flow characteristics. South of the A75 the burn flows south towards Topmuir Farm. The watercourse throughout the study area is unfenced. Its banks show signs of poaching by livestock; a factor that is likely to contribute to sedimentation within the watercourse.

Water Quality

- 12.4.8 SEPA do not monitor water quality within the watercourses identified in the study area though investigations undertaken during route selection process did identify that one of the tributaries of the Pow Water was classified as B (Fair).

Existing Road Drainage

- 12.4.9 Other than for the short section of the existing A75 at the western end of the Proposed Scheme, surface water run-off from the existing carriageway flows across roadside verges and is collected via existing drainage ditches that run along each side of the trunk road; ultimately discharging to the local watercourses. There is neither provision for treatment, interception of runoff to mitigate the impacts of traffic related pollutants contained therein nor to address the potential for accidental spillage.

Groundwater

- 12.4.10 The sedimentary deposits that make up the underlying geology within the study area (see Chapter 13, Geology and Soils) form aquifers where flow is predominantly through fissures and discontinuities. They tend to be highly productive but are usually only of local importance; i.e. they are not extensive. There is also the potential for surficial shallow groundwaters to be associated with the peat deposits in the area.
- 12.4.11 The geotechnical desk study (Mouchel Parkman, 2004) indicated the presence of a number of issues and sinks to the north of the existing A75 beyond the western end of the route section. No such evidence was found within the Proposed Scheme corridor.

12.5 Predicted Impacts

- 12.5.1 The following components of the Proposed Scheme would have implications for water quality: pollutant contamination associated with road related runoff and potential accidental spillage; local modifications to channel alignments and profiles; and temporary loss of vegetation cover leading to increased sedimentation during and immediately post construction.

Routine Run-off and Surface Waters

- 12.5.2 Calculation of the potential pollution impacts based on the simple assessment method provided in DMRB assumed the following. The assessment disregards the associated drainage mechanism that will be employed.

95%-ile river flow (Q95) – 0.15m³

River Ecosystem Class B (equivalent of RE2)

Road width – 13.2m

Road length – 2,800m

AADT two-way traffic flow – 15,380 vehicles/day (average value across the 3.6 km improvement section in 2010)

Run-off coefficient – 0.5

Rainfall depth – 12mm (based on Figure A1 in Annex 1, Part 10, Volume 11 DMRB)

Resultant road area – 36,960m²

Run-off volume from the road – 0.5 x (12 ÷ 1,000) x 36,960 = 221.76m³

River daily flow – 0.15 x 3600 x 24 = 12,960m³

Dilution rate – 12960 ÷ 221.76 = 58.44

- 12.5.3 Based on the diagram in Annex II, Part 10, Volume 11 DMRB a dilution rate of 58.44 for a Class B (RE2) watercourse with daily traffic flows of 15,380 vehicles would present a low risk to the local environment, with there being no requirement for further assessment.
- 12.5.4 Given the lack of any gauging data for any of the watercourses, no assessment of the impact of routine run-off to surface waters has been undertaken as part of this assessment.

Routine Run-off and Groundwater

- 12.5.5 The assessment has demonstrated that there is a pollutant derived source associated with the Proposed Scheme in the form of the surface water run-off. It has also demonstrated that there is a receptor in the form of a productive aquifer valued as being of local importance. The Proposed Scheme design includes balancing ponds, which serve to remove any potential pollutant pathways linkages. The balancing ponds will be sealed and made impermeable, with the outlets comprising simple interceptor points where the waters, once settled, would be further treated/screened prior to discharge. However, the potential risk to a local aquifer thus would be low and the impact accordingly slight in accordance with Table C.3, Annex 1, Part 10, Volume 11 of the DMRB.

Pollution Impacts from Accidental Spillage

- 12.5.6 Two sections of road have been included in the calculation of the annual risk of an accidental spillage resulting in a serious pollution incident; namely the 3.6 km length of new trunk road and the 0.8 km length of the modified U81a. These comprise the limits of the Proposed Scheme.
- 12.5.7 The calculations for the annual probability of an accidental spillage with the potential to cause a serious pollution incident using the formula detailed in Paragraph 12.3.4 and the traffic data within Appendix C are indicated below (see footnote³⁴).

$$P_{ACC} = 3.6 \times 0.29 \times (15,380 \times 365 \times 10^{-9}) \times 0.186 = 1.09 \times 10^{-3}$$
$$P_{ACC} = 0.8 \times 0.93 \times (129 \times 365 \times 10^{-9}) \times 0.046 = 1.61 \times 10^{-6}$$

- 12.5.8 The probability of a spillage accident with an associated risk of a serious pollution incident is calculated below.

$$P_{INC} = 1.09 \times 10^{-3} \times 0.6 = 0.07\%$$
$$P_{INC} = 1.61 \times 10^{-6} \times 0.6 = 0.0001\%$$

- 12.5.9 The sum of the annual probabilities has been calculated as being 0.07%; this representing the risk of a serious pollution incident occurring in any given year. This is based on a worst-case assumption that all the spillage will go to the same reach of the receiving watercourse.
- 12.5.10 The result is negligible in comparison to the acceptable threshold of 1% identified in the DMRB. The assessment concluded there would be no need for further work and that there would be no requirement for further mitigation.

12.6 Mitigation

- 12.6.1 Under Proposed Scheme proposals the existing A75 would be retained as a local road, whilst a new carriageway alignment is constructed to the south. This would result in an increase in total surface area and consequent increase in the volume of road derived surface-water run-off between Carrutherstown and Upper Mains. Transferring the existing trunk road traffic to a new section of road which will incorporate contemporary interception measures decreases the risk of establishing a pollutant pathway and a resultant impact on any of the local watercourses identified above.

³⁴ The average AADT for the opening year along the 3.6 km section is 15380 with an average %HGV component of 18.6%. The U81a average AADT is 129 and a 4.6% HGV component.

- 12.6.2 These measures include filter strips in the roadside verges that carry the water to balancing ponds containing reed beds in the vicinity of the U81a and north of the trunk road near Upper Mains prior to discharge to local watercourses. Aside from the above measures there is no requirement for further mitigation as proved through the assessment above.
- 12.6.3 The contractor would be required to detail outfalls to ensure that appropriate angles of entry are achieved and baffles provided to dissipate the flow impacts on entry to the existing channels with the objective of avoiding undue erosion and scour at the outfalls.
- 12.6.4 Maintenance and management of the proposed drainage system and future maintenance works for the Proposed Scheme, which would involve working in proximity to watercourses, would be subject to SEPA's Pollution Prevention Guidelines (PPGs).

12.7 Residual Effects

- 12.7.1 The assessment has demonstrated that there would be no significant residual effects in relation to road drainage and the water environment. It is noted that the transfer of vehicles onto a road with effective drainage provisions would constitute an improvement.

13 Geology and Soils

13.0 Introduction

- 13.0.1 The Stage 1 and 2 assessments demonstrated that there are no geologically designated sites, areas of contaminated land or past mining activities associated with the local environment, which takes in the Proposed Scheme development footprint. The assessments concluded that potential impacts for online schemes within the corridor would be negligible. As the detailed assessment progressed the above conclusions held in relation to the Proposed Scheme despite being located offline. As such, a detailed assessment of geology and soils was scoped-out.
- 13.0.2 It was however recognised that baseline data related to geology and soils would be of value to the understanding of the baseline environment when considering other topics of environmental interest, such as landscape, ecology and water quality, which remains the purpose of the inclusions within this Chapter.
- 13.0.3 The Stage 1 and 2 assessment did however recognise the potential impact on soil quality where top-soils would be stripped and replaced to allow earthworks to be modified along with the associated loss of productive agricultural land to the new road and areas severed between the existing trunk road and proposed new section of trunk road. Accordingly, the loss of agricultural land is addressed in Chapter 9, Land Use and the effect of stripping and topsoil-removal are discussed in Chapter 15, Disruption due to Construction.

Data Sources

- 13.0.4 The following data sources were consulted to establish the baseline environment related to geology and soils.
- British Geological Survey (BGS), Scotland Sheet 10W, Lochmaben (Drift Edition), 1:50,000, (1983) and associated memoir.
 - BGS, Scotland Sheet 6, Annan (Drift Edition) 1:50,000, (1983).
 - BGS Sheet NY17SW Dumfries (Solid Edition), 1:10,000 (6": 1 mile), (2000).
 - BGS, Sheet NY16NW Dumfries (Solid and Drift), 1:10,000, (1994).
 - BGS, Sheet 62 Dumfries (Solid and Drift), 1:10,000 (2000).
 - The Macaulay Land Use Research Institute, Soil Survey of Scotland, Sheet 85, Carlisle and Solway Firth, 1:50,000 (1986).
 - Mouchel Parkman, A75 Hardgrove to Kinmount Improvements Geotechnical Desk Study (June 2006).

Consultation

- 13.0.5 The following bodies were consulted with specific reference to contaminated land:
- Dumfries and Galloway Council; and
 - The Scottish Environment Protection Agency (SEPA).
- 13.0.6 Their associated responses are contained within Appendix B.

13.1 Baseline Conditions

Solid Geology

- 13.1.1 The Proposed Scheme corridor is underlain by sedimentary deposits from the Carboniferous period. The sequence of deposits comprises:
- Tyne Limestone;

- Fell Sandstone;
- Annandale Sandstone; and
- The Ross Formation.

- 13.1.2 Tyne Limestone of the Liddesdale Group is found at the top of the sequence. The deposit is characterised by mainly fine-to-medium grained sandstone, seatearth³⁵, siltstone and thin limestone. This solid deposit extends across the site from the current A75/U82a junction to the A75/Upper Mains junction.
- 13.1.3 The Fell Sandstone Formation lies below the Tyne Limestone and is present as medium-to-thinly-bedded, mainly coarse-grained and cross-bedded sandstones with seatearth, mudstone and siltstone. The deposit extends from the A75/U82a junction to the junction with Cuddie Lane.
- 13.1.4 The Annandale Sandstone beds lie below the Fell Sandstone and comprise red, fine to coarse-grained sandstone and locally derived conglomerate. This deposit is present between Cuddie Lane crossroads and the position of Kiln Knowe. It is truncated at Kiln Knowe by the Gillhall Fault that runs northeast/southwest across the line of the A75, with the downthrow to the southeast (of unknown depth). Running northwest and intersecting the Gillhall Fault 30 m north of Kiln Knowe is the Dalton Fault with a downthrow to the east.
- 13.1.5 Fell Sandstone and Annandale Sandstone beds; both belonging to the Border Group.
- 13.1.6 The Ross formation, a Silurian deposit of the Hawick Group, is found at the bottom of the sequence. The formation is present as grey and red wacke siltstone. The oldest of the solid deposits, the formation is represented to the west of the Gillhall and Dalton Fault intersection at Kiln Knowe, and extends beneath Carrutherstown.

Drift Geology

- 13.1.7 There is a difference in the drift deposits east and west of the existing Nether Stenries junction. To the east, the drift largely comprises glacial till, though there is the likelihood that isolated mounds of sands and gravels may be found along the Proposed Scheme construction corridor.
- 13.1.8 To the west, fluvio-glacial sands and gravels overlies glacial till. The glacial till is characterised by grey to red-brown deposits containing cobbles of greywacke³⁶, sandstone and local granite.

Soils

- 13.1.9 Soil types and their extent are shown in Figure 13.1.
- 13.1.10 Most of the local area has a cover of brown forest soils and brown forest soils with gleying of the Canonbie Association. At the eastern end of the study area (Kelhead Moss Plantation area) peat is found, also of the Canonbie Association. Approximately 25% of the soils associated with the corridor are classified as being of prime agricultural capability (class 3.1), 60% are of class 3.2 and only 15% are of relatively low agricultural quality. This is discussed further in Chapter 9.
- 13.1.11 The Geotechnical Desk Study Report (June 2006) indicates that localised deposits of peat have been identified between Carrutherstown and A75/U81a Junction to the north of the Proposed Scheme footprint. The report goes on to state that made ground is also present at several locations adjacent to the existing A75, though there was nothing to indicate the potential presence of contaminants or visual signs of contamination.

³⁵ A clay-rich fossil soil

³⁶ An impure sandstone consisting of rock fragments and grains of quartz and feldspar in a matrix of clay-sized particles.

Hydrogeology

- 13.1.12 The solid carboniferous deposits of a sedimentary nature comprise aquifers where flow is predominantly through fissures and discontinuities. They tend to be highly productive but usually only of local importance.
- 13.1.13 These calciferous sandstone measures consist of medium grained sandstone with subordinate mudstones, siltstones and limestone. Borehole yields are generally moderate and not greater than 10 l/s. Groundwater chemistry is dominated by calcium and bicarbonate with magnesium, and occasional sulphate. Iron may be present in deleterious amounts where reducing conditions prevail.
- 13.1.14 To comply with the Water Framework Directive, SEPA has produced a map denoting 'Vulnerability of Groundwater in the Uppermost Aquifer'³⁷. Aquifer vulnerability has been categorised on a scale of 1-5 (least-to-most). The aquifer vulnerability beneath the site rates as 4b (whereby the uppermost aquifer is vulnerable to those pollutants not readily absorbed or transformed). The vulnerability classification has been derived from a risk assessment of pollutants entering the aquifer vertically from ground surface level.
- 13.1.15 The average annual rainfall for the area is within the range 800-1200 mm/year. Average estimated infiltration ranges between 100-300 mm/year.

Mining and Mineral Extraction

- 13.1.16 There is no evidence of underground workings in the area, and based on knowledge of local geology, underground workings are unlikely locally. Some surface sand and gravel extraction is likely to have taken place along the existing alignment; however no formal gravel or sand quarries were shown on the historical maps within the footprint of the Proposed Scheme. It is also likely that waste deposits comprising a mixture of spoil, arising from previous road construction works, may be located along the verges of the current footprint.

³⁷ These are regional maps taken from www.sepa.gov.uk

14 Policies and Plans

14.0 Introduction

14.0.1 This Chapter provides a review of the extent to which the Proposed Scheme would accord or conflict with planning policies relevant to the Proposed Scheme and the local environment.

14.1 Scope of the Assessment

14.1.1 The review considers land use planning policies as developed and applied at a national, regional and local level.

14.2 Statutory and Planning Context

14.2.1 National Planning Policy Guidelines (NPPGs) and Scottish Planning Policies (SPPs) provide statements of Scottish Executive policy on land use and planning. There is an ongoing programme of replacement of NPPGs with updated SPPs.

14.2.2 The Scottish Executive also publishes Circulars that provide statements of policy and guidance on policy implementation, and Planning Advice Notes (PANs) that provide advice on good practice

14.2.3 Planning Authorities are required to establish Development Plans (DPs) that interpret and apply national policies regionally and locally.

14.2.4 Government advice to planning authorities relating to the preparation of structure and local plans (two key components of development plans) is provided in Scottish Development Department (SDD) Circular 32/1983 (as amended 1997) and PANs 37 and 49.

14.2.5 Structure Plans are required to address strategic land use planning and development constraints within each Council in the context of national and regional planning guidance. Local Plans are required to identify specific and detailed policies/proposals for development and land use in general conformity with structure plans. In the context of the Proposed Scheme responsibility for the production of both structure and local plans lies with Dumfries and Galloway Council.

14.2.6 In November 2006 The Planning etc (Scotland) Act (2006) received Royal Assent. The Act significantly reforms the planning system with a new hierarchy of national, regional and local planning and development policies that were effective as of spring 2007. The Act makes provision for the establishment of a National Development Framework (NDF) underscored by area strategic development plans and local development plans. An initial NDF was published in 2004. Pending the preparation and adoption of area strategic development plans and local development plans, policies formalised in structure plans and local plans continue to inform the planning process in relation to land use and development.

14.3 Assessment Methodology

14.3.1 The assessment has been undertaken in accordance with the Volume 11, Section 3, Part 12 of the DMRB, Policies and Plans.

14.3.2 The DMRB provides guidance on appropriate national, regional and local policy documents (as revised) that should be considered when undertaking the assessment. These include appropriate NPPGs, SPPs, Circulars and PANs and structure and local plans relevant to the Proposed Scheme location.

14.3.3 The assessment has involved the following tasks:

- the identification of policies of relevance to the Proposed Scheme and the associated local environment;
- a review of the environmental impacts and predicted residual effects identified by the various assessments reported in Chapters 6 to 13 and 15; and
- an evaluation of the impacts and predicted residual effects against the identified policies.

Impact Criteria

14.3.4 The impact relative to each of the policies identified is reported as being positive, negative or neutral where:

- a *positive* impact indicates that the Proposed Scheme would conform to or contribute to the realisation of policy or plan objectives and commitments;
- a *negative* impact indicates that the Proposed Scheme would be in conflict with policy or plan objectives and commitments; and
- a *neutral* impact indicates that the Proposed Scheme would represent instances where, on assessment, the policy or plan objectives and commitments are either not in conformance or conflict with the proposals or they are not relevant in the context of the proposals.

14.4 Policy Review

National Planning Policy

National Planning Framework for Scotland

14.4.1 The National Planning Framework provides an analysis of the underlying trends in Scotland's development, key drivers of change and the challenges to be faced. It guides the spatial development of Scotland and sets the context for development plans and planning decisions.

SPP 1: The Planning System

14.4.2 SPP1 sets out the key planning objectives in relation to sustainable development, the economy, social justice, environmental quality, development design and integrated transport. The guidance states that:

"The planning system is important in delivering the Executive's commitment to a more sustainable, effective, integrated transport system.... Integrated and sustainable transport is necessary to help improve air quality, address climate change and protect environmental resources from the damage caused by pollution."

NPPG5: Archaeology and Planning and NPPG18 Planning and the Historic Environment

14.4.3 NPPG5 and NPPG18 set out the requirements for developments likely to affect the historic environment. These have been considered within the assessment of impacts on cultural heritage contained within Chapter 6.

NPPG14: Natural Heritage

14.4.4 NPPG14 sets out policy on the assessment of development proposals showing due concern for natural heritage. It deals, in detail, with requirements for development likely to affect sites of national and international importance. Chapter 7 (Ecology and Nature Conservation) has considered the objectives of NPPG14 and, where appropriate, incorporated these into proposed mitigation measures to address any predicted significant adverse impacts on nature conservation.

SPP15: Planning for Rural Development

- 14.4.5 The document sets out the approach, key messages and objectives that should underpin planning policies and decisions affecting rural areas. It also describes the increasingly important links between development planning and community planning.

SPP 17: Planning for Transport

- 14.4.6 SPP 17 sets out the national focus on transport policy as the delivery of transport projects and the positive role land use and transport planning takes in supporting and building upon the Scottish Executive's transport delivery agenda.

- 14.4.7 Objectives of SPP 17 of relevance to the Proposed Scheme comprise the following.

The transport network to support the economy, assist in reducing the need to travel, create the right conditions to promote sustainable transport modes and restrict adverse environmental impacts.

The interaction of accessibility, transport and the development strategy to be considered early in the planning process with land allocations taking into account transport opportunities alongside economic competitiveness and sustainable development.

Strategic land use plans to co-ordinate with Regional and Local Transport Strategies, and settlement strategies and identify where economic growth or regeneration requires additional transport infrastructure.

Planning Advice Notes (PANs) and Circulars

- 14.4.8 Relevant PANs and circulars include PAN 56: Planning and Noise, PAN 58: Environmental Impact Assessment, SEDD Circular 18/1987 on Agricultural Land, SEDD Interim Guidance on European Protected Species, Development Sites and the Planning System and SE Revised Guidance updating Circular 6/95, Nature Conservation: Implementation in Scotland of EEC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna and the Conservation of Wild Birds ('The Habitats and Birds Directives'). The guidance provided in these documents has been taken into account during the assessment process.

- 14.4.9 SPP 17 is accompanied by Planning Advice Note (PAN) 75 that sets out background information and good practice advice and by Transport Assessment and Implementation: A Guide, which explains to developers how they should demonstrate the transport effects of their proposed development.

Approved Dumfries and Galloway Structure Plan

- 14.4.10 The Dumfries and Galloway Structure Plan's stated aim is '*to encourage the growth and development of sustainable communities in Dumfries and Galloway*' by:

- supporting development of the local economy;
- supporting urban and rural communities;
- supporting and protecting the natural and built environment; and
- making best use of services and facilities.

- 14.4.11 Key themes detailed in the strategy statements for the plan reference the need to make best use of existing transport links and service provision, recognise the importance of the natural and built environment to the quality of life, and develop a partnership involving the Council, public and private agencies, local people and communities to facilitate and encourage development. General policies and the implications of the Proposed Scheme are detailed in Table 14.2.

Annandale and Eskdale Local Plan

- 14.4.12 There are two areas of policy of relevance to the Proposed Scheme; Community Policies and General Policies specific to Carrutherstown.

- 14.4.13 Issues and priorities identified by the community within Carrutherstown include the safeguarding of valuable local facilities (General Policy 75), which specifically refers to the school and village hall.
- 14.4.14 The Proposed Scheme will benefit the community of Carrutherstown (particularly those properties closest to the existing A75 in the vicinity of Whitecroft Gate at the eastern end of the village) by displacing the A75 to the south and consequently further away from residential properties. The Local Plan indicates the desirability of retaining an open space between the road and the village to conserve the current amenity value (General Policy 43: Areas of Local Environmental Importance). Although a link road is proposed to connect the existing A75 with Carrutherstown at this location, vehicular traffic flow on this access route will be low and the surrounding area will be landscaped to provide screening from the proposed new A75 alignment as discussed in Chapter 8.
- 14.4.15 General policies and the implications of the Proposed Scheme are detailed below.

Policy	Statement	Policy Assessment
D38 Environmental Assessment and Monitoring	Environmental Assessments will be required in accordance with government regulations. The Council may require the impact of the development to be monitored following its implementations where an environmental assessment indicates this would be appropriate.	An Environmental Impact Assessment in accordance with government regulations has been undertaken. NEUTRAL
E3 Landscape Character	The policy requires the Council to take into account the guidance set out in the Landscape Assessment when assessing development proposals likely to have a significant impact on the landscape. It further commits the Council to encourage and where resources permit, support initiatives to conserve and enhance the landscape character of Dumfries and Galloway.	The EIA has been informed by reference to the Dumfries and Galloway Landscape Assessment (published by SNH). NEUTRAL
E6 Conservation of Habitats and Species	When assessing development proposals, the Council will seek to ensure that the impact on any habitat which is valued for its nature conservation interests is fully considered. Particular attention will be given to those habitats and species which are identified in Circular 6/1995, but which do not fall within the boundaries of national or international nature conservation designations. Where important nature conservation interests would be adversely affected, the Council will consider the use of Section 75 agreements to maintain existing interests or in exceptional circumstances encourage the creation of new or replacement habitats where possible. Where resources are available the Council will continue to give consideration to the establishment of appropriate management measures, including assisting with the voluntary management of sites, and where appropriate, the designation of Local Nature Reserves, in conjunction with other agencies, organisations and local communities to ensure that nature conservation interests are safeguarded.	Consideration has been given to nature conservation during design process. The value of habitats has been evaluated and potential impacts of the scheme on ecology and nature conservation assessed (Chapter 7). Appropriate mitigation has been recommended. NEUTRAL
E9 Listed Buildings	The policy confirms the Council's support and encouragement for the retention, preservation, re-use and renovation of listed buildings. It further indicates the Council will resist development proposals which would destroy or adversely affect the character, appearance, or setting of a listed building and stipulates strict criteria to be met prior to approval of demolition.	Listed buildings would not be affected by the scheme. NEUTRAL
E11 Historic Gardens and Designed Landscapes	Development in or affecting the setting of a site listed in the Inventory of Historic Gardens and Designed Landscapes or	Historic Gardens and Designed Landscapes will not be affected by the scheme.

Policy	Statement	Policy Assessment
	mentioned in the list of Non-Inventory Sites will require an evaluation of the proposal's impact on the site and its setting. There will be a presumption against development which would adversely affect the landscape features, character and setting of these sites and the approaches and environs of Inventory Sites.	NEUTRAL
E12 Development Affecting Archaeological Sites	There will be a presumption against development which would destroy or adversely affect the appearance, fabric or setting of Scheduled Ancient Monuments, sites of national importance and other areas of significant archaeological interest. In exceptional circumstances, where it is not possible to secure the preservation of archaeological remains, the Council will require an appraisal of the impact of the development on the site. The developer will be responsible for securing an agreed programme of archaeological work to the satisfaction of the council.	Scheduled Ancient Monuments will not be affected by the scheme. NEUTRAL
E13 Archaeologically Sensitive Areas	The policy requires the Council to safeguard the character and archaeological interest of "archaeologically sensitive areas.	No archaeologically sensitive areas would be affected by the Proposed Scheme. NEUTRAL
S7 A75 Upgrading	The Council will continue to press the government to undertake a rapid review of its policy for the A75 to reflect its national and international role and resolve deficiencies along the route.	The scheme directly addresses this issue. POSITIVE
S14 Pedestrian and Cycle Facilities	The Council, in conjunction with other agencies and groups, and subject to funding being available, will support the development of facilities for cyclists and pedestrians in towns, villages and the countryside.	The existing A75 route will be suitable for cyclists once the new section of carriageway is operational. POSITIVE

Table 14.1 – Dumfries and Galloway Structure Plan Policies

Policy	Statement	Policy Assessment
General Policy 1 Development Principle	There will be a general presumption against development which would give rise to a material degree of land use conflict, which would materially detract from and/or be incompatible with the character or amenity of the locality.	The Proposed Scheme has been rigorously assessed during the design process and the proposed design has been selected to minimise any potential conflicts. NEUTRAL
General Policy 2 Development Considerations	<p>As part of the assessment of development proposals, including those on sites identified in the Plan, developers will be required to satisfy the Planning Authority with regards to their proposals in terms of all of the following:</p> <ul style="list-style-type: none"> • access, ground conditions and stability, contamination, foul and surface water drainage and water supply; • traffic generation onto the adjacent road network; • flooding; (see Policy 58 on Flood Risk and Development); • environmental impact. <p>When assessing planning applications, the Planning Authority will take into account the provisions of any site guidance, site specifications, or development brief as set out in Section 3 of the Plan. Where further information is required, the Planning Authority may apply the provisions of Article 13 of Town and Country Planning (General Development Procedure) (Scotland) Order 1992 or Article 4(3) in respect of outline applications.</p>	These issues have been addressed during the Environmental Impact Assessment process. NEUTRAL
General Policy 12 Potentially Polluting Development	The policy defines the criteria which must be satisfied prior to the Council considering the granting of planning permission where a development has the potential to cause pollution of water, air, soil or pollution through noise, dust, odour, vibration, light and heat. Specific reference is made to approval by regulatory authorities.	The Council is not the competent planning authority for the Proposed Scheme. The potential impacts identified in the policy have been evaluated as part of the EIA for the Proposed Scheme. Regulatory authorities have been consulted. NEUTRAL

Policy	Statement	Policy Assessment
General Policy 37 Public Rights of Way	The policy details the Council's commitments to asserting, safeguarding and investigating Public Rights of Way. It confirms the Council will not normally grant permission to development proposals which would result in the loss of a Right of Way unless a satisfactory alternative route or mitigating measures can be secured.	The Council is not the competent planning authority for the Proposed Scheme. No Rights of Way would be affected. NEUTRAL
General Policy 38 Access Routes	The Planning Authority will work with landowners, local communities and the relevant agencies to protect, and where necessary develop new or alternative access routes in the countryside. Where an access route is adversely affected by a proposal the Council will consider the use of access agreements and encourage the use of grant schemes to secure alternative or mitigating measures.	Alternative access routes have been provided to the affected properties. POSITIVE
General Policy 43 Areas of Local Environmental Importance	There will normally be a presumption against development having a materially adverse effect on areas of local environmental importance defined on the Inset Maps.	This has been considered during the Environmental Impact Assessment. NEUTRAL
General Policy 46 Nature Conservation Sites of Local Importance	The policy requires the Council to consider development proposals which are likely to affect the sites identified by the Council as Nature Conservation Sites of Local Importance against Structure Plan Policy E6.	The assessment has taken account of all ecological interests locally and accordingly mitigated any adverse effects. NEUTRAL
General Policy 51 Listed Buildings:	The policy places obligations on the planning authority relating to proposal for the re-use, modification or change of use for listed buildings. Of particular relevance to the Proposed Scheme is the requirement to ensure that development proposals that would harm the setting of a listed building are not permitted.	The cultural heritage assessment has concluded the Proposed Scheme would not harm the setting of any listed buildings. NEUTRAL
General Policy 53a Historic Gardens and Designed Landscapes	The policy requires the planning authority to assess development proposals in or affecting the setting of a site against Structure Plan Policy E11.	The Inventory Designed Landscape of Kinmount House Estate is located over 600m to the east of the Proposed Scheme and is unlikely to be significantly affected NEUTRAL

Policy	Statement	Policy Assessment
General Policy 54 Known Archaeological Sites – Including Scheduled Ancient Monuments	The policy requires the planning authority to assess development proposals within or adjacent to known archaeological sites, including scheduled ancient monuments, in accordance with Structure Plan Policy E12.	Potential impacts on relevant sites have been assessed as part of the cultural heritage assessment. The assessment has concluded there would be no significant impact on the features. NEUTRAL
General Policy 56 Protecting the Quality of Groundwater	Proposed development which may cause contamination of the groundwater in areas defined on the Proposals Map will not be permitted unless mitigation measures are carried out as part of the development to prevent such contamination taking place.	SUDS techniques will be incorporated into the scheme design to protect groundwater and pollution prevention measures will be in place during the construction period. NEUTRAL
General Policy 57 Sustainable Urban Drainage Systems (SUDS)	<p>The Council as Planning Authority will encourage the use of SUDS and other appropriate innovative methods such as reed beds, as a means of treating surface water run-off from development sites. In particular SUDS methods will normally be required where development involving significant surface water run-off is proposed in areas:</p> <ul style="list-style-type: none"> • where diffuse pollution can reach a watercourse without adequate prior filtering, • which lie upstream from an area prone to flooding and where the slowing down of surface water would avoid exacerbating the problem, and/or • where the existing drainage system is restricted in its ability to accept the development proposal. <p>The Council will use conditions and/or Section 75 Agreements to ensure that the long term maintenance of any SUDS scheme is secure.</p>	SUDS are incorporated into the scheme design. Discussions with SEPA have taken place. POSITIVE
General Policy 70 Cycling	The Planning Authority recognises that cycling has an increased role to play within an overall transport strategy and will develop measures to promote and facilitate cycling wherever it is considered appropriate.	The existing A75 route will be suitable for cyclists (<100 vehicles per day) once the new section of carriageway is operational. However, there is negligible NMU use recorded locally. NEUTRAL/POSITIVE

Policy	Statement	Policy Assessment
General Policy 75 Safeguarding of Land for Community Facilities –	As discussed within the main text of the Chapter, safeguarding of community facilities such as Carrutherstown school and village hall are priorities.	The Proposed Scheme will not impact upon these community facilities (see Chapter 10 for further details), and will improve access to them through the retention of the existing A75 as a local access route coupled with the upgrade of the U81a junction. POSITIVE

Table 14.2 – Annandale and Eskdale Local Plan Policies

14.5 *Impact Summary*

- 14.5.1 The Proposed Scheme has either a natural effect of positive accord with the assessed policies. This is due, in part, to the various design proposals and mitigation measures included within the scheme design.
- 14.5.2 Environmental aspects have been taken into consideration during the design process through identifying sensitive areas (and receptors) in terms of ecology, hydrology, land use, landscape and the associated visual impact and archaeology. Where avoidance of impacts has not been possible through design specification alone, specific mitigation has been developed.
- 14.5.3 An improved drainage network will ensure that water quality is appropriately managed and the landscaping proposals will mitigate the Proposed Scheme's potential visual effects. The alignment has also been designed to minimise the loss of prime agricultural land and avoid areas of particular ecological and archaeological sensitivity. Where closure of existing junctions and accesses is necessary, alternatives have been developed that aim to minimise disruption to users. The existing A75 will be used to this end and will provide an opportunity for improved access to the community facilities in Carrutherstown and the provision of safer routes for potential NMU use.

15 Disruption due to Construction

15.0 Introduction

- 15.0.1 This Chapter reports the findings of the assessment undertaken to determine predicted significant impacts that would occur during the construction of the Proposed Scheme.
- 15.0.2 Whilst it is recognised that such impacts are by definition temporary, they can prove significant over the longer-term (for example, excessive sedimentation of watercourses associated with earthworks could, for instance, result in a significant impact well beyond the construction period).
- 15.0.3 Many such predicted impacts have been addressed as an integral part of principal environmental topic areas considered in Chapters 6-13. Where this is the case these are briefly referenced in this chapter.

15.1 Scope of the Assessment

- 15.1.1 Potential impacts associated with the construction stage of the Proposed Scheme include:
- limited disruption to road users and local travel patterns associated with traffic management to enable construction to proceed;
 - disruption to settlements associated with movements of construction plant and delivery vehicles;
 - temporary closures or diversions;
 - severance of agricultural accesses and disruption to existing services (water, power and drainage)
 - dust deposition arising from site works such as earthworks;
 - a contaminant/pollutant risk associated with materials handling and storage along with vehicle standing areas;
 - visual impacts associated with plant and contractor's activity on site;
 - noise and vibration arising from plant operation, on and offsite vehicle movements (including HGVs); and
 - water quality and ground-related impacts associated with excavations, surface water runoff and temporary discharges to watercourses.
- 15.1.2 The principal interests addressed in this chapter relate to:
- property;
 - air quality;
 - noise and vibration;
 - water quality;
 - land use;
 - pedestrians, equestrians and cyclists;
 - ecology and nature conservation;
 - visual impact; and
 - existing roads.

15.2 Statutory and Planning Context

- 15.2.1 The legal and regulatory context within which construction related activities, their impacts and mitigation are encompassed and controlled is extensive and covers such aspects as health and safety, the Control of Substances Hazardous to Health (COSHH), traffic management, waste disposal, noise emissions and pollution prevention. A host of best practice guidance documents, codes of practice and British Standards exist regarding construction activities on development sites. They have been identified and referenced where required.

15.2.2 The statutory and planning context outlined in other sections of this ES identifies other applicable construction-related legislation. Where required, cross-references are provided below.

15.3 Assessment Methodology

15.3.1 The assessment has been undertaken in accordance with the guidance contained within Volume 11, Section 3, Part 3 of the DMRB along with the mitigation and control measures advocated within various guidance such as those produced by the Construction Industry Research and Information Association (CIRIA) and Building Research Establishment (BRE). Further specific guidance in relation to the assessment of construction-related effects is contained within the various environmental topic Chapters.

15.3.2 The DMRB guidelines acknowledge the relationship between construction-related activities, the receiving environment and overall experience of people/users in the locality of the proposed works. The guidelines also recognise that disruption may be caused beyond the site by other factors such as HGV traffic movements, utility company works and essential offsite works.

15.3.3 The guidance also acknowledges that the distance of sensitive receptors, taken to be residents living in the vicinity of the proposed works, is a good indicator of the potential for the works to result in statutory nuisance. Within the DRMB this distance is set at 100 m from the proposed works; however the guidance further requires that particularly sensitive receptors should be identified beyond this definition.

Stages in the Assessment Process

15.3.4 There have been four key stages in the assessment.

- An estimation of the number of properties within and 100 m beyond the proposed 'working footprint'; including sensitive receptors within this area and beyond (e.g. schools).
- The identification of the presence of any ecological and culturally sensitive areas and features within 100 m of the route alignment.
- The identification of construction-related activities and machinery that may give rise to temporary detrimental effects on the receiving environment.
- An assessment of the likely impacts in respect of the proposals, taking account of available construction mitigation strategies.

15.3.5 Through applying knowledge and experience of other similar trunk road improvement schemes as adopted into the DMRB guidance documents, the likely range, magnitude and significance of potential effects has been accordingly determined.

15.3.6 The assessment has been undertaken in advance of the identification of a contractor who would be responsible for implementing the works upon approval of the Proposed Scheme by Scottish Ministers. Assumptions relating to the form and extent of the construction activities have accordingly been based on inputs from the planning and design teams responsible for developing the scheme proposals and knowledge.

Impact Criteria

15.3.7 For the purposes of measurement of the significance of predicted impacts, a three-point scale has been adopted. The scale describes predicted impacts as being Major, Moderate or Minor and Adverse.

- Major Impacts would affect sensitive sites of high conservation interest and/or large areas or numbers of people for the entire period of the contract. The magnitude would be such that there would be noticeable disruption for a substantial part of the construction period.
- *Moderate Impacts* would affect sites of moderate conservation interest areas and/or notable numbers of people. The magnitude would be such that there would be noticeable disruption for a relatively long, but not substantial, part of the construction period.

- *Minor Impacts* would be localised, of low magnitude, short duration and would affect few people or other sensitive receptors.

15.4 *Baseline Conditions*

Sensitive Receptors

- 15.4.1 A total of 16 private dwellings (farmsteads and houses), 1 commercial properties and 3 community facility (the village hall, school and post office at Carrutherstown) are located within 100 m of the construction envelope for the Proposed Scheme. These are all regarded as sensitive receptors. There only other sensitive property beyond the 100 m study area is Oakbank located near the current A75/U81a Junction.
- 15.4.2 A network of local roads and access tracks are contained within the 100 m study area. Some private tracks, which currently serve the farmsteads and residential properties, have direct access onto the existing trunk road; namely Fostermeadow Farm, Whitecroft Gate, Oakbank, Topmuir Farm, Stenries View and Upper Mains and Stenriesgate. The principal roads are the U81a, U82a, and B725.
- 15.4.3 There are no public rights of way or dedicated cycleways, crossing or following the line of the Proposed Scheme corridor. Despite the presence of the local road network there is no evidence of regular, or significant, NMU use.
- 15.4.4 There are four watercourses that cross the Proposed Scheme corridor; Pow Water, Stenries Hardgrove Burn and Glen Burn.
- 15.4.5 As described in Chapter 7, certain sensitive habitats within the considered survey area are assessed as being of value at the local level, i.e. broad-leaved semi-natural woodland; coniferous plantation and mixed plantation. The scheme area is also of value for farmland birds, badger, otter and red squirrel.
- 15.4.6 Known archaeological and built heritage interests are represented immediately north of the existing trunk road. Those that are considered sensitive in relation to the Proposed Scheme include Braehill Fort and Settlement, Braehill Enclosure, and Whitecroft Gate Piers.

15.5 *Predicted Impacts*

- 15.5.1 The principal construction activities likely to result in disruption during construction comprise:
- soil stripping and earthworks to establish the proposed horizontal and vertical alignment of the new section of road offline and south of the existing trunk road;
 - construction of the underpass to provide grade separation between the new section of trunk road and the U81a;
 - construction of new culverts to accommodate watercourses crossing the line of the Proposed Scheme corridor;
 - construction of the tie-ins to the existing trunk road at the western and eastern ends of the Proposed Scheme;
 - import of essential construction materials, including stone, aggregate, concrete and reinforcement; and
 - movement and activity associated with construction plant and delivery vehicles.
- 15.5.2 Based on the indicative design proposals, it is anticipated there would be a potential excess of cut over fill of some 46,000m³. It is not anticipated there would be a requirement for break out or blasting of rock. This fill would be accommodated within the scheme's landscape proposals (see Chapter 8).

- 15.5.3 The anticipated timescale for construction is 52 weeks. Specific short-term operations involving larger plant and delivery of larger loads during this period would involve the use of cranes to move and locate heavy construction components during the construction of the U81a underpass and the culverts. Such operations would last approximately two-to-three days. Of slightly longer duration would be the need for traffic management and temporary disruption to strategic and local traffic flows as the two tie-ins are constructed. It is anticipated there would be short-term disruption in the order of 4-6 weeks as flows are temporarily managed to maintain movement whilst merging the new and existing sections of road. There is also a requirement for more limited traffic management levels at the start of the construction phase to establish site accesses and set out the construction site.

Impacts on Property

- 15.5.4 The principal impact on property would relate to noise, dust deposition and visual impact as the works proceed.

Air Quality

- 15.5.5 There would be a significant potential for dust generation and deposition particularly during site stripping and bulk earthworks movements. There would also be potential for dust transport and deposition where there is a requirement for temporary soil stockpiling. Other sources could include deposition where soils and fine materials associated with construction materials are transported to and from site. Such impacts would be primarily related to nuisance associated with deposition on property and loss of amenity where dust impinges on open areas used by members of the community; namely the school playing fields. Potential impacts would vary according to prevailing weather conditions; the impact being potentially greatest during periods of moderate to high winds.
- 15.5.6 Potential impacts associated with the operation of construction vehicles, site plant and the requirements for traffic management during the construction of the two tie in sections at each end of the Proposed Scheme would involve short-term increases in vehicle emissions; where a proportion of the passing vehicles would be idling as priority is given to passing in each direction of travel. The order of increase would be relatively low and not significant in relation to the volume of traffic currently contributing to local emissions.

Traffic Noise and Vibration

- 15.5.7 Fifteen of the 16 sensitive receptors identified within the 100 m threshold defined in the DMRB would be located at or close to Carrutherstown, whilst the principal part of the Proposed Scheme where noise generating activity would be of greatest duration (approximately 26 weeks) would be in the vicinity of the existing A75/U81a junction close to the Oakbank property. There are no other receptors closer than 300 m to any of the proposed working areas in this location³⁸.
- 15.5.8 Much of the construction noise for activities in the vicinity of Carrutherstown would be experienced in the context of existing ambient noise levels dominated by traffic flows on the A75. These have been calculated as being of an order between 60-66 dB(A)³⁹. Whilst there would undoubtedly be instances when construction activity would involve levels in excess of these, they would be of short duration and for a limited period in the construction programme. Existing levels at Oakbank have been calculated at 66 dB(A). Construction activity would similarly be likely to result in episodes of higher noise levels, which would be of relatively short duration though for a longer overall period in the contract programme; noting that the ambient noise levels associated with the current A75 remain for much of the construction programme until the

³⁸ This is the screening criterion presented in DMRB Volume 11, Section 3, Part 7 as representing the distance beyond which the varying effects of wind and temperature render forecasting difficult in more circumstances.

³⁹ As part of an interim assessment various noise calculations were produced in accordance with the CRTN methods in relation to key properties local to the Proposed Scheme.

switch over point to the new alignment. This will only occur approximately 2-3months before the end of the construction phase.

Visual Impacts

- 15.5.9 The assessment has concluded that there would be substantial visual impacts for those properties identified within 100 m of the working areas. The impact would therefore be temporary, major and adverse.

Water Quality

- 15.5.10 There would be the potential for increased sedimentation in watercourses during the construction of the proposed culverts and the undertaking of earthworks close to the watercourses. There would also be the potential for pollution associated with accidental spillage and contamination by construction material such as cement and concrete.

Cultural Heritage

- 15.5.11 There are 19 listings on the SMR within 1 km of the site, three of which are listed buildings. These include Braehill Fort and Settlement, Braehill Enclosure, and Whitecroft Gate Piers, which are sufficiently close to the scheme to be considered sensitive under the definitions of the DMRB. There would be no direct construction-related impacts on these known features during the construction period.
- 15.5.12 The potential for impacts on unknown sites and features considered in Chapter 6 would occur during the construction stage of the contract and would be determined during the pre-construction surveys administered by HS. The assessment in Chapter 6 concluded that the likelihood of such impacts would be low.
- 15.5.13 Should artefacts/remains be encountered during construction, these would be dealt with in accordance with procedures set out in 'Special Requirements in Relation to Historic Scotland' (see Appendix D) and agreed with HS, SNH and TS.

Ecology and Nature Conservation

- 15.5.14 Actual habitat loss and associated impacts on faunal species, which will first occur during the construction period but will be felt throughout the life of the scheme, is covered under the assessment of impacts in Chapter 7.
- 15.5.15 Given the nature of the Proposed Scheme and its removed location from the nearest statutorily designated and non-statutory sites; no significant impacts on any designated nature conservation sites are anticipated.
- 15.5.16 The risk of sedimentation and pollution discussed in Paragraph 15.5.10 is assessed in ecological terms as being potentially significant at the local level (unlikely).
- 15.5.17 Construction activity could potentially encourage the spread of Japanese knotweed, e.g. fragments of stems or rhizomes could be moved during earth movements or become attached to the wheels of construction machinery and thereby spread. The impact associated with the spread of this species could potentially be significant in legal terms although the impact is likely to be not significant in nature conservation terms.
- 15.5.18 If undertaken during the bird nesting season, construction activity could result in the damage/destruction of birds' nests, which has associated legal implications.
- 15.5.19 The potential impact associated with otters becoming trapped in deep excavations during the construction period is assessed as potentially significant in legal terms. Since all construction activity will take place during daylight hours, potential disturbance impacts on otters passing along the watercourses within the construction area are assessed as not significant.

Land Use and Access

- 15.5.20 The Proposed Scheme sees the retention of the existing trunk road and associated accesses north of the existing road for the substantial part of the anticipated contract period as the new section of road is built offline.
- 15.5.21 There would be disruption to existing accesses to the retained section of trunk road as the offline section is built for property located south of the new alignment. The principal properties involved would be Upper Mains, Topmuir Farm and Hardgrove Farm. Users of the U81a travelling north to the existing trunk road would also be disrupted as the offline section is built and the proposed grade-separated crossing is constructed and there would be further disruption along the route of the U81a as the new alignment arrangement is developed and the overpass constructed.
- 15.5.22 It is envisaged that access for Fostermeadow Farm would be transferred to the proposed new link to the B725 at an early stage in the works.
- 15.5.23 There would be disruption to all properties with existing access from the north and south onto the existing road during the latter part of construction as the merging sections between the existing trunk road either side of the section are tied into the new offline section of road and the new linking sections of road onto the retained section of the existing trunk road are built, which, as discussed, will take in the region of 4-6 weeks.
- 15.5.24 The disruption in this latter stage of the work would relate to main traffic management period, which might include localised short diversions to maintain movement along the trunk road and access via roads and private access tracks to the north and south of the construction corridor.
- 15.5.25 The impact on existing access would occur in the context where there are existing difficulties experienced by local-road users and those using private access tracks seeking access onto the existing trunk road

Other Predicted/Potential Impacts

- 15.5.26 There would be the potential for the spread of Japanese knotweed given that the construction works encroach on areas where the species is established. There are legal obligations relating to the control and eradication of the species.
There would be the potential for accidental damage to existing trees within, or close to, the working areas.

15.6 Mitigation

- 15.6.1 The implementation of proposed mitigation measures during construction would be managed and monitored as part of the Construction Environmental Management Plan (cEMP) introduced in Paragraph 4.2.9.
- 15.6.2 The cEMP provides a framework for:
- the statutory context under which construction related impacts would be controlled;
 - the nature of sensitive receptors and environmental assets;
 - aspects of the work that would potentially prove detrimental;
 - potential risks and impacts related to receptors, assets and aspects of the work;
 - procedures for evaluating, avoiding and/or managing potential impacts related to specific construction tasks and site operations;
 - method statements for construction tasks; and
 - a management and monitoring structure for implementing the plan.

15.6.3 Specific measures, which the contractor would be required to include within the cEMP, are described below.

Air Quality

15.6.4 Mitigation to minimise dust generation and deposition would include:

- the daily use of a road sweeper on paved areas affected and the use of water spraying on unpaved access routes;
- using wheel washers when required for vehicles leaving the site;
- sheeting of all vehicles carrying material prone to wind blow;
- containment of storage areas for materials prone to wind blow;
- enforcement of low speed limits on unmade surfaces;
- temporary seeding of soil stockpiles where storage timescales permit;
- seeding of completed earthworks as soon as is reasonably practicable; and
- cessation of relevant works during periods of high wind.

15.6.5 Dust-monitoring would be undertaken before, and during construction at representative sensitive receptors within 100 m of the working areas to determine the impact and determine the need for additional temporary control measures importantly including the cessation of work.

15.6.6 Whilst the contribution to local emissions associated with the temporary construction phase would be low, limits would set on the permissible idling periods for operational vehicles and plant.

Traffic Noise & Vibration

15.6.7 The contractor would be required to agree a noise management plan with Dumfries and Galloway Council's Environmental Health Officer. Limits will be agreed relating to timing and levels of specific noise generating operations in proximity to properties and communal facilities; with specific regard to the Oakbank property. The plan would be informed with reference to BS 5228: Part 2: 1997, Construction Noise on Construction Sites. Specific measures would include:

- vehicles and equipment to be fitted with effective exhaust silencers, maintained in good working order and operated to minimise noise emissions in accordance with BS 5228;
- compressors to be fitted with properly lined and sealed acoustic enclosures where environmental noise disturbance may arise and these should be kept closed whenever the machines are in use;
- pneumatic percussive tools to be fitted with mufflers or silencers in accordance with the manufacturer's recommendations;
- machines in intermittent use to be shut down in the intervening periods between work or throttled down to a minimum (including HGVs waiting to access the site);
- where practicable, all plant to conform with the noise limits presented in the EC Noise Emission in the Environment by Equipment for use Outdoors Directive 2000/14/EC; and
- noise monitoring to be undertaken by the Contractor in proximity to Oakbank and two representative receptors at Carrutherstown to ensure the levels stipulated in the noise management plan are adhered to.

Water Quality

15.6.8 Mitigation would involve adoption of SEPA's PPGs that include specific recommendations in relation to: working in proximity to watercourses; the management of waste-water associated with construction; and the storage, handling and incorporation of potentially polluting materials. The measures would also allow for ensuring that all site-staff are fully conversant with the guidelines through the use of toolbox talks prior to commencement of any potentially sensitive works. Specific measures would include;

- bunded fuel storage areas;
- specific working distance constraints relating to sensitive locations;
- refuelling guidelines;
- temporary drainage and settlement ponds; and
- vehicle standing areas.

Cultural Heritage

- 15.6.9 Subject to the findings of the pre-construction surveys proposed in Chapter 6 there may be a requirement to agree and implement stand off areas should currently unknown sites or features be identified in close proximity to the proposed working areas. A suitable allowance within the construction-programme for this eventuality has been made.

Ecology and Nature Conservation

- 15.6.10 The contractor would be required to prepare a species protection plan based on the framework detailed in 15.6.2 as an integral part of the cEMP.
- 15.6.11 The cEMP will also cite best practice working procedures, including the need to correctly store hazardous/harmful materials/chemicals, such as the use of double-bunded 110% storage-capacity containers and drip-trays, along with methods to prevent spillages and ensure control of dust emissions in the vicinity of sensitive habitats, e.g. watercourses (see paragraph 15.6.4).
- 15.6.12 The construction working width will be clearly defined in order to prevent unnecessary encroachment into adjacent areas of woodland.
- 15.6.13 In order to ensure legal compliance, potential bird nesting habitat, e.g. trees, scrub and buildings, will be undertaken outside the main bird nesting season of March-August if possible (see Section 7.7.5). Where this is not possible, works affecting potential bird nesting habitat will be checked by a suitably experienced ecologist. If bird nests are found, work will be postponed until the young birds have fledged.
- 15.6.14 As described in the confidential Appendix G3, in order to prevent badgers and otters becoming trapped in deep excavations, wooden boards will be placed in any excavations left overnight in order to allow any trapped animals to climb out. Any pipes and culverts exposed during construction would be capped and checked at the end of each working day to prevent mammal species being trapped.

Land Use and Access

- 15.6.15 The contractor would be required to retain temporary access for the properties, which currently have direct access onto the existing A75 and for users of the U81a throughout the construction period. This would be implemented and monitored under the cEMP with reference to a contract requirement that the contractor must prepare and agree a traffic and access management plan for all stages of the work with the Regulatory Authority.

Other Proposed Mitigation

- 15.6.16 A programme of spraying the Japanese knotweed identified within the proposed land-take for the scheme has commenced. Subject to scheme approval and should complete eradication not been achieved by the time of construction, an associated method statement would be prepared, detailing methods to be employed and ensure compliance with legal obligations related to the species.
- 15.6.17 Where existing trees are to be retained within or near to the working areas, the contractor would be required to evaluate the risk to them in light of the required construction operations and apply the principles of BS 5837: Trees in Relation to Construction.

15.7 *Residual Effects*

15.7.1 Taking into account proposed mitigation the assessment has concluded that the effects during construction would be as follows.

The risk of increased sediment/pollution-laden run-off reaching watercourses would be low and consequent impacts would not be significant.

Given the mitigation measures for the eradication of Japanese knotweed, no significant impact associated with the spread of this species is predicted.

The standard approach to mitigation to avoid impacts on birds' nests whilst in use is considered to result in a potential residual impact that is assessed as not significant in legal terms.

Given the safeguards to prevent animals becoming trapped in exposed excavations and pipes, it is anticipated there would be no significant impact on otters or badgers.

There would be substantial visual impacts for those properties identified within 100 m of the working areas. The impact would be temporary, major and adverse not resulting in an overall long-term residual effect.

Notwithstanding the proposed mitigation of noise impacts during construction there would be occasional episodes of moderate to high noise events. In the context of the contract period and existing background noise levels, these would not be significant.

Despite the general safeguards relating to the control and minimisation of dust there would be an unavoidable level of deposition. This would be further limited by the proposed mitigation and as such would not be significant in the context of the relatively short periods of high risk. The resultant impact therefore is assessed as not being significant.

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