A9 DUALLING
PERTH TO INVERNESS
Pass of Birnam to Tay Crossing

A9 Dualling Programme: Pass of Birnam to Tay Crossing

Environmental Baseline Report

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Glossary

Air Quality Management Area	A non-permanent designation created if monitoring reveals that statutory air quality thresholds are being exceeded or will be exceeded in the near future.
Alluvium	Sediment deposited by a river.
Ancient Woodland	Areas of land that appear as wooded on maps dated pre-1750 (in Scotland) and are considered likely to have been continuously wooded from this date.
Ancient Woodland Inventory	Aims to list all probable ancient semi-natural woodlands on a county basis together.
Aquifer	A body of rock through which appreciable amounts of water can flow.
Assessment	An umbrella term for description, analysis and evaluation.
Attribute	Characteristics of an environmental receptor.
Authority area	The area administered by a local authority for example, District Council, City Council or Unitary Authority.
Baseline	The existing conditions which form the basis or start point of the environmental assessment.
Bedrock	Hard rock that lies beneath a superficial cover of soils and sediments.
Biodiversity	Biological diversity, or richness of living organisms present in representative communities and populations.
Biodiversity Action Plan (BAP)	Sets objectives, along with measurable targets for the conservation of biodiversity.
Broadleaved woodland	An area of woodland with predominantly deciduous tree species (less than 10% coniferous trees in the canopy).
Buffer	A natural, undisturbed strip surrounding a development or land disturbance activity or bordering a stream or permanent water body.
Catchment	The area contributing flow to a point on a drainage system.
Community	Assemblage of interacting populations that occupy a given area.
Coniferous woodland	An area of woodland with predominantly coniferous tree species (less than 10% deciduous trees in the canopy).
Conservation	Preservation or restoration of the natural environment and wildlife.
Conservation Area	Area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. Designated under section 61 Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.
Contaminated land	Land in such condition by reason of substances on or under the land that significant harm is being caused, there is a significant possibility of such harm being caused or pollution of controlled water is being, or likely to be caused.
Core Path	A right of way designated by a Local Authority as being of importance to maintain access and leisure provision.
Couch	Above-ground otter shelter.
Culvert	A metal, wooden, plastic or concrete conduit through which surface water can flow under or across roads.
Deciduous	Trees and shrubs that shed their leaves annually.
Designed Landscape	A designed area of landscape which is identified in the Inventory of Gardens and Designed Landscapes (jointly compiled by Scottish Natural Heritage (SNH) and Historic Environment Scotland (HES)).
Diffuse pollution	Contamination and pollution arising from many dispersed and different sources. These sources are often individually minor, but collectively may be significant.
Drift deposits	Drift geology overlying bedrock.

Earthworks	Works created through the moving of quantities of soil or unformed rock.
Ecology	The branch of biology concerned with the relations of organisms to one another and to their physical surroundings.
Ecosystem	A biological community of organisms interacting with one another and their physical environment.
Effect	The result of change or changes on specific environmental resources or receptors.
Element	A component part of the landscape or environment (e.g. roods, hedges, woodlands).
Flora	Referring to plants of a particular region or habitat.
Floodplain	Land adjacent to a river, which is subject to regular flooding.
Fluvial Geomorphology	The study of landforms associated with river channels and the sediment processes which form them.
Fragmentation	Breaking up of an organisms habitat into smaller fragments that may vary in size.
Freshwater	Bodies of water such as ponds, lakes, rivers and streams containing low concentrations of dissolved salts and other total dissolved solids.
Geomorphology	The branch of geology concerned with the structure, origin and development of topographical features of the earth's crust
Glacial Till	Glacial till is that part of glacial drift which was deposited directly by the glacier. It may vary from clays to mixtures of clay, sand, gravel and boulders.
Glaciofluvial	Pertaining to streams fed by melting glaciers, or to the deposits and landforms produced by such streams.
Glide	Even paced section of river or stream with laminar flow.
Ground Investigation	Exploratory investigation to determine the structure and characteristics of the ground. The collected information is used to establish or predict ground and groundwater behaviour during, and subsequent to, construction.
Groundwater	Water below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.
Habitat	Term most accurately meaning the place in which a species lives, but also used to describe plant communities or agglomerations of plant communities, as used, for example in a Phase 1 Habitat Survey.
Heavy Duty Vehicle (HDV)	Vehicles greater than 3.5 tonnes gross weight.
Holt	Deep underground otter shelter.
Hydraulic	Of, relating to, or operated by the force of liquid in motion.
Hydrocarbon	A chemical compound of hydrogen and carbon.
Hydrogeology	Branch of geology dealing with occurrence, distribution, and effect of groundwater.
Hydrological	The exchange of water between the atmosphere, the land and the oceans.
Improved grassland	Grasslands that have been so modified by fertilisers, drainage or grazing that they have lost most of the species expected in unimproved grassland.
Incidental sighting	Casual observation of a plant or animal of one or more species recorded by whilst performing a non-relevant ecological survey.
Listed Building	Building included on the list of buildings of special architectural or historic interest and afforded statutory protection under the 'Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997' and other planning legislation. Classified categories A-C.
Local Landscape Character Area (LLCA)	An area outlined as having distinct characteristics based on landscape features. Derived from regional landscape studies available from SNH.

Made ground	Ground comprised of material deposited by man i.e. not natural.
Migration	The movement (of an animal) from one habitat to another according to the seasons.
Native	A species occurring in its normal geographic range (not introduced).
Non-motorised users	Pedestrians, cyclists and equestrians.
Non-prime land	Agricultural land of Land Capability for Agriculture (LCA) classes 3.2 to 7.
Notable species	Species which are below Red Data Book species in terms of threat status.
Open space	Any land laid out as public parks or used for the purpose of public recreation, or land which is a disused burial ground.
Outfall	The place of discharge e.g. where a sewage pipe discharges into a river.
Pasture	An area of grassland (or other suitable plants) used to feed grazing animals.
Phase 1 Habitat Survey	This identifies the different habitats that are contained within or make up a site, and the key plant species for each of those habitat types.
Plantation woodland	Woodland of any age that obviously originated from planting.
Prime agricultural land	Agricultural land of Land Capability for Agriculture (LCA) classes 1, 2 and 3.1.
Priority habitat	Those which have been identified as being most threatened and requiring actions under the UK Biodiversity Action Plan.
Qualitative	Concerned only with the nature of the organism/substance being investigated.
RAMSAR sites	Internationally important wetland identified for conservation under the RAMSAR Convention 1971.
Receptor	In this context, an element that is susceptible to being affected (either directly or indirectly) by the proposed scheme. Examples include habitats, species, people, properties, landscape, archaeological remains etc.
Right of way	A public right of way is a defined route which has been used by the general public for at least 20 years and which links two public places (usually public roads).
River basin management plan	A plan setting out actions required within a river basin to achieve set environmental quality objectives, reviewed on a six yearly basis.
Roost	Any resting site used by bats including maternity roosts which are used by females and their young, hibernacula which are used during winter hibernation and transitional roosts which may be used at any time.
Rough grassland	Rank or tussocky grassland. May have been drained, grazed, mown or treated with manure but not so improved by fertiliser or herbicides as to have altered the sward composition greatly. Associated with unenclosed uplands, lowlands with poor access or wet areas, and road verges.
Salmonid	Pertaining or belonging to the family Salmonidae (salmon, trout and charr).
Scheduled Monument (SM)	A monument which has been scheduled by the Scottish Ministers as being of national importance under the terms of the 'Ancient Monuments and Archaeological Areas Act 1979'.
Scottish Planning Policy (SPP)	A statement of Scottish Government policy on nationally important land use.
Sediment	Material carried in particles by water or wind and deposited on the land surface or seabed.
Semi-natural woodland	Woodland that does not obviously originate from planting. The distribution of species will generally reflect the variations in the site and the soil. Planted trees must account for less than 30% of the canopy composition.
Sett	The burrow system of badgers comprising a series of underground tunnels and chambers. There are several categories of sett including a main sett, annexe sett, subsidiary sett and outlier sett.

Site of Special Scientific Interest (SSSI)	Designated areas of national importance. The aim of the SSSI network is to maintain an adequate representation of all natural and semi-natural habitats and native species in the UK. The site network is protected under the provisions of Sections 28 and 19 of the Wildlife and Countryside Act 1981 as well as the Amendment Act 1985 and the Environmental Protection Act 1990.
Spawning	The process of egg release into the water by aquatic animals.
Special Area of Conservation (SAC)	An area designated under the EC Habitats Directive to ensure that rare, endangered or vulnerable habitats or species of community interest are either maintained at or restored to a favourable conservation status.
Stakeholder	A person or group that has an investment, share or interest in something.
Strategic Environmental Assessment (SEA)	The process by which information about the environmental effects of proposed plans, policies and programmes are evaluated.
Swamp	An area of wet spongy land that often supports some trees and vegetation but is too wet for cultivation.
Terrestrial	The environment above the mean high water spring
Viaduct	A bridge that carries a road, railroad etc. over a valley.
Water Framework Directive (WFD)	European environmental legislation (2000/60/EC) relating to inland surface waters, estuarine and coastal waters and groundwater. Fundamental objective to maintain “high status” of waters where it exists, preventing any deterioration in the existing status of waters and achieving at least “good status” in relation to all waters by 2015.
Water quality	The chemical and biological status of various parameters within the water column and their interactions, for example dissolved oxygen, indicator metals such as dissolved copper, or suspended solids (the movement of which is determined by hydrological process and forms geomorphological landforms).
Wildlife and Countryside Act 1981 (WCA)	Principal mechanism for wildlife protection in the UK. Referred to as WCA.

Abbreviations

BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BGS	British Geological Survey
BTO	British Trust for Ornithology
CA	Conservation Area
CROW	National Catalogue of Rights of Way
CRTN	Calculation of Road Traffic Noise
DEFRA	Department for the Environment and Rural Affairs
DMRB	Design Manual for Roads and Bridges
ESG	Environmental Steering Group
FEH	Flood Estimation Handbook
FWPM	Freshwater Pearl Mussel
GDL	Garden and Designed Landscape
GWDTE	Groundwater Dependent Terrestrial Ecosystems
HDV	Heavy Duty Vehicle
HER	Historic Environment Record
HLT	Historic Landscape Type
HMWBs	Heavily Modified Water Bodies
HRA	Habitats Regulations Appraisal
IAN	Interim Advice Note
IEEM	Institute of Ecology and Environmental Management

INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
KM	Kilometre
LAQM	Local Air Quality Management
LCA	Landscape Character Area
LCA	Land Capability for Agriculture
MLURI	Macaulay Land Use Research Institute
NBN	National Biodiversity Network
NCN	National Cycle Network
NCR	National Cycle Route
NMU	Non-Motorised User
NSA	National Scenic Area
NO_2	Nitrogen Dioxide
OS	Ordnance Survey
PCB	Polychlorinated Biphenyls
PKC	Perth & Kinross Council
PKCLDP	The Perth & Kinross Local Development Plan
PM_{10}, $PM_{2.5}$	Particulate Matter
PWS	Private Water Supply
RBMP	River Basin Management Plan
RCAHMS	Royal Commission on the Ancient and Historic Monuments of Scotland
RCR	Regional Cycle Route

RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SBS	Scottish Biodiversity Strategy
SBL	Scottish Biodiversity List
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SPP	Scottish Planning Policy
SSSI	Site of Special Scientific Interest
TDSFB	Tay District Salmon Fisheries Board
TG	Technical Guidance
TPO	Tree Preservation Order
WCA	Wildlife and Countryside Act
WFD	Water Framework Directive

1. Introduction

1.1 Background

1.1.1 This report presents information on the environmental baseline conditions for the A9 Dualling: Pass of Birnam to Tay Crossing Project (also as known as Project 02 of the A9 Dualling Programme) which is being progressed by Jacobs on behalf of Transport Scotland. Baseline conditions describe the existing environmental conditions in defined study areas (and also wider areas where considered relevant) and those reported here are based on surveys and desk-based studies undertaken during the Design Manual for Road and Bridges (DMRB) Stage 2 assessment process.

1.1.2 The A9 Dualling: Pass of Birnam to Tay Crossing Project commences at the northern extent of an existing short section of dualled carriageway at the Pass of Birnam, extending approximately 8.3km north-west, past the communities of Birnam and Dunkeld to the east and Inver to the west. It then continues north and ends approximately 0.5km north of where the single carriageway section of the existing A9 crosses the River Tay.

1.1.3 The approach to presenting the environmental baseline conditions in this report is based on guidance within DMRB Volume 11 (Highways Agency et al., 1993) and generally follows the format adopted for a DMRB Stage 2 assessment. A description of the baseline conditions is provided for each of the following environmental parameters along with an outline of the approach used to identify the conditions and the defined study area:

- Community and Private Assets - residential, commercial and industrial property; community facilities; community land; development land; and agricultural, forestry and sporting land interests.
- Geology, Soils and Groundwater - bedrock and drift geology, soils, contaminated land, groundwater including private water supplies (PWS).
- Water Environment - hydrology, flood risk, fluvial geomorphology and water quality.
- Ecology and Nature Conservation - terrestrial and freshwater species, habitats and ecosystems.
- Landscape - landscape qualities, designations and character.
- Visual - visual amenity and views experienced by people from publicly accessible viewpoints and buildings, including residential properties.
- Cultural Heritage - archaeological remains, historic buildings and the historic landscape.
- Air Quality - concentrations of pollutants in ambient air (oxides of nitrogen (NO_x), nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$).
- Noise - noise environment as influenced predominantly by traffic on the existing A9.
- All Travellers - footpaths, cycle routes, and informal access to land for pedestrians, cyclists and, equestrians (Non-Motorised Users (NMUs)) as well as a consideration of views experienced by vehicle travellers from the A9.

1.1.4 The environmental baseline is drawn from the A9 Dualling: Pass of Birnam to Tay Crossing DMRB Stage 2 Assessment work, using a combination of desk based reviews of relevant reports and data, the results of field surveys and feedback obtained through DMRB Stage 2 consultations with various statutory bodies and stakeholders. This has included consultation with the A9 Dualling Environmental Steering Group (ESG) which consists of Perth & Kinross Council (PKC), Scottish Natural Heritage (SNH), Scottish Environment Protection Agency (SEPA), Historic Environment Scotland, Cairngorms National Park and The Highland Council.

1.1.5 The A9 Dualling Pass of Birnam to Tay Crossing DMRB Stage 2 Assessment considers two further parameters under the headings of ‘Materials’ and ‘Policies and Plans’. These have been excluded from this report as they are more assessment focussed and as such do not have a ‘true’ baseline.

1.1.6 Materials primarily considers material import/export and wastes as a result of route options being assessed, rather than the change from a baseline situation. Policies and Plans describes relevant policy and then goes on to consider potential policy conflicts or compliance for the route options being considered.

1.1.7 The baseline information in this report was compiled over the period 2015 to 2016 providing a snapshot of baseline conditions and recorded in line with the guidance in the DMRB. The purpose of a DMRB Stage 2 assessment is to recommend a preferred route option to be progressed to a more detailed design. The baseline conditions in this report therefore provide an indication of the environmental conditions at the time of assessment. However, the environment is by nature a dynamic system and therefore as progress is made throughout project development, further surveys, along with additional consultation, will be undertaken to inform and update the baseline.

2. Environmental Baseline Conditions

2.1 Community and Private Assets

Study Area

2.1.1 The study area for community and private assets includes:

- residential/commercial/industrial property, community facilities, agricultural and forestry land within 500m from the centreline of the existing A9.

2.1.2 The 500m study area is shown on Figures 1 and 2.

Approach to Determination of Baseline Conditions

2.1.3 Community and private assets can have multiple uses and therefore fall into more than one of the following baseline categories:

- local communities;
- residential, commercial and industrial property;
- community facilities including those provided by public authorities and commercial organisations for use by the whole community (e.g. doctors' surgeries, schools, hospitals, post offices, churches and general stores);
- community land including those that permit public access or other areas identified as Open Space within Local Plans, providing an established public recreational resource (e.g. playing fields, country parks, woodlands);
- land allocated for development through the local development plan;
- commercial agricultural, forestry and sporting land interests (e.g. shooting/stalking or fishing for commercial purposes); and
- waterway restoration projects.

2.1.4 In order to determine the baseline conditions, community and private assets have been allocated to one category and this has been based on their primary or future land use. For example, where forestry land permits access to the public (e.g. community land), this land is considered within the agriculture and forestry category as forestry is considered to be the primary land use.

2.1.5 Similarly, in relation to land that is allocated within the local development plan this land is considered development land. Where a community facility is provided by a privately-owned commercial business (e.g. a local general and convenience shop), this has been categorised as a community facility.

Desk-based Assessment

2.1.6 Baseline conditions for the above receptors were identified through a review of the following:

- aerial photographs;
- Ordnance Survey (OS) maps;
- Scottish Index of Multiple Deprivation (SIMD) Interactive Mapping website (Scottish Government, 2012);
- Macaulay Land Use Research Institute (MLURI), now the James Hutton Institute, Land Capability for Agriculture (LCA) data (2015);
- information provided by Brodies LLP up to October 2015 in relation to land ownership;

- information provided by the District Valuer up to October 2015 in relation to land-take and potential impacts on community and private assets for the DMRB Stage 2 Assessment;
- A9 Route Improvement Strategy – Dualling of Birnam to Tay Crossing, Stage 2 Options Assessment Report, Part 2 Environmental Assessment (Transport Scotland, 2011a);
- TAYplan Strategic Development Plan (TAYplan, 2012);
- Perth and Kinross Local Development Plan (Perth and Kinross Council, 2014);
- online resources of Tay District Salmon Fisheries Board; and
- online based search for commercial and industrial property and community facilities.

2.1.7 Available Land Capability for Agriculture (LCA) data (supplied by James Hutton Institute, 2015) were used to indicate the land capability class within the study area. This classification system ranks land on the basis of its potential productivity and cropping flexibility. This is determined by the extent to which the physical characteristics of the land (soil, climate and relief) impose long term restrictions on its use and capability to grow certain types of crops and grass. Land is classified into seven main classes, some of which have subdivisions, with Class 1 being the best quality land and Class 7 the poorest. These can be simplified into four land use categories which are broadly indicative of the land's agricultural capability:

- arable agriculture (LCA classes 1-3.1);
- mixed agriculture (LCA classes 3.2-4.2);
- improved grassland (LCA classes 5.1-5.3); and
- rough grazing (LCA classes 6.1-7).

2.1.8 Classes 1, 2 and 3.1 are known as prime quality land and Classes 3.2 to 7 are known as non-prime land.

Site Walkover and Surveys

2.1.9 Site walkovers were undertaken between March and June 2015 to verify the baseline information identified during desk based studies.

Consultation

2.1.10 Information in relation to agricultural, forestry and sporting activities was gathered during ongoing consultation with landowner and land managers as part of the landowner consultations undertaken during the DMRB Stage 2 Assessment.

Baseline Conditions – Community and Private Assets

Local Communities

2.1.11 The main communities within the study area are Birnam, Little Dunkeld, Dunkeld and Inver. The location of these communities in relation to the existing A9 is shown on Figure 1.

Residential, Commercial and Industrial Property

2.1.12 Most residential properties are located within the communities referred to above, with the remainder made up of scattered rural dwellings, including a number of farmhouses and their associated cottages.

2.1.13 The Scottish Index of Multiple Deprivation (SIMD) identifies areas of multiple deprivation across all of Scotland and ranks these areas from most deprived (ranked 1) to least deprived (ranked 6,505). None of the communities identified within the study area are listed in the top 20% of multiple deprivation (Scottish Government, 2012).

2.1.14 Details of commercial and industrial property located within the study area are provided in Appendix A (Commercial and Industrial Property).

2.1.15 The main residential areas of Birnam, Little Dunkeld, Dunkeld and Inver along with 30 identified commercial and industrial properties (refer to Appendix A: Commercial and Industrial Property) are shown on Figure 1.

Community Facilities

2.1.16 The majority of community facilities are located within the communities listed above, including:

- Birnam Arts and Conference Centre (art centre, community centre, library, conference centre and café);
- Dunkeld and Birnam Recreation Club (outdoor recreation centre comprising two all-weather tennis courts (not floodlit), bowling green and a grass football pitch) and designated as Open Space (see Photograph 1);
- The Royal School of Dunkeld (nursery and primary school and Community Education/Adult Education base);
- Craigvinean Health Centre;
- Two Churches (St Mary's Episcopal Church and Little Dunkeld Kirk);
- Dunkeld Cathedral;
- Dunkeld and Birnam Station (railway);
- Post Office;
- Fire Station (a retained volunteer service);
- Three children's play areas; and
- The Hermitage (National Trust for Scotland visitor attraction).

2.1.17 Those community facilities identified above are shown on Figure 20.

Photograph 1: Dunkeld and Birnam Recreation Club.

Community Land

2.1.18 The Perth and Kinross Local Development Plan identifies Sports Pitches, Parks and Open Space which have value to the community for either recreational or amenity purposes (Perth and Kinross Council, 2014). Policy CF1 provides the policy framework for development in respect of Open Space and is outlined in Table 1. Areas designated as Open Space are shown on Figure 1 and include Riverside Land (National Trust for Scotland), Dunkeld and Birnam Recreation Club (Community Facility) and Land by Little Dunkeld Manse. The locations of these land interests are shown on Figure 20.

2.1.19 Other land identified as being potentially used by the community for recreation or amenity purposes but not designated as Open Space in the Perth and Kinross Local Development Plan include The Hermitage and Little Dunkeld Recreation Park. These are shown on Figure 20.

Table 1: Open Space Policy Framework in the Perth and Kinross Local Development Plan (Pass of Birnam to Tay Crossing)

Ref	Type/Name	Overview
Community Facilities, Sport and Recreation		
Policy CF1A	Open Space Retention and Provision	The Plan identifies Sports Pitches, Parks and Open Space. These are areas of land which have value to the community for either recreational or amenity purposes. Development proposals resulting in the loss of these areas will not be permitted, except in circumstances where one or more of the following apply: (a) Where the site is principally used as a recreation resource, the proposed development is ancillary to the principal use of the site as a recreational resource. (b) The proposed development involves a minor part of the site which would not affect its continued use as a recreational or amenity resource. (c) In the case of proposals involving the loss of a recreational facility, the facility which would be lost would be replaced by provision of one of comparable or greater benefit and in a location which is convenient for its users, or by the upgrading of an existing provision to provide a better quality facility, either within the same site, or at another location which is convenient for its users. (d) Where a proposal would involve the loss of a sports pitch, a playing field strategy prepared in consultation with Sportscotland has demonstrated that there is a clear excess of sports pitches to meet current and anticipated future demand in the area, and that the site could be developed without detriment to the overall quality of provision.
Policy CF1B	Open Space within New Developments	The Council will seek the provision of appropriate areas of informal and formal open space that is accessible to all users as an integral part of any new development where existing provision is not adequate. Where it is physically impossible or inappropriate to meet the open space provision onsite, consideration may be given to the provision of a suitable alternative. In areas where there is an adequate supply of accessible open space of an appropriate quality in a locality, a financial contribution towards improvement or management of existing open space may be considered an acceptable alternative. Opportunities should be pursued through the development process to create, improve and avoid fragmentation of green networks and core path networks.

2.1.20 There are a number of footpaths (e.g. Core Paths) within the study area which provide access for the public which may be used by the local community for recreational purposes. Paths identified during the baseline assessment are considered within Section 2.10 (Effects on All Travellers) of this report.

2.1.21 Murthly Castle, Dunkeld House and The Hermitage are all situated within the study area and are recorded on Historic Environment Scotland's Inventory of Gardens and Designed Landscapes in Scotland (Historic Environment Scotland, 2015). The above, including Dunkeld War Memorial are also considered in Section 2.5 (Landscape) and Section 2.7 (Cultural Heritage) of this report.

Agricultural, Forestry and Sporting Interests

2.1.22 The predominant land use in the study area is forestry interspersed with a limited number of agricultural fields. The agricultural land supports a limited range of upland agricultural systems with livestock production, (cattle and sheep), the main farming type. In the case of the forestry land, this is managed for commercial purposes although it also supports other uses, including recreation.

2.1.23 Figure 2 shows the distribution of LCA classes in the study area. Whilst much of the area is shown as LCA Class 3.2 (see Photograph 2), the majority of the land is afforested or urban. Where there are agricultural fields at Newtyle, at the southern end of Birnam, and at Inver Bridge, this is Class 3.2 land (land capable of producing a moderate range of crops). Although the land is capable of growing crops, the fields are predominantly in grass. No prime agricultural land is located within the study area.

2.1.24 Within the study area, 10 agricultural, forestry and sporting land interests have been identified. A summary of affected land interests is provided in Table 2, with their location shown on Figure 2.

Table 2: Agriculture, Forestry and Sporting Land Interests

Land Interest Reference	Type of Land Use
The Forestry Commission Scotland	Tay Forest District comprising Craigvinean Forest. Predominantly mature coniferous coupes managed as continuous forest and lying within the River Tay (Dunkeld) National Scenic Area. Forest first established in 1759. The forest supports recreation through forest walks at The Hermitage and in the lower reaches at Ladywell. Open access for horse riding as well as waymarked mountain bike routes and a competition level downhill mountain bike course.
Atholl Estate	Large farming and sporting estate. Land within study area comprises Rotmell Wood and sporting rights on River Tay. Wider estate activities include: • Agriculture: cattle, sheep and cropping systems. • Forestry: managed for commercial wood production and to support sporting activities, including designated ancient woodland. • Environmental Agreements: land subject to environmental management through agricultural, forestry and environmental subsidy schemes. • Other: renewables (hydro scheme), equestrianism (trekking and horse trials) and tourism.
Murthly Castle and Estate	Large mixed farming and sporting estate incorporating wider business enterprises. Main business activities include farming, forestry, sporting, property lets, sawmilling and commercial activities in and around Murthly Castle. Estate land supports recreational activities including walks and cycle routes. Agricultural interests within the study area include farmland around Byres of Murthly. Forestry interests consist of Byres Wood, Dalpowie Plantation and Birnam Wood. Sporting interests comprise salmon fishing on the Top Water beat on the River Tay. Land is subject to environmental agreements.
Invermill Farm	Land used to support equestrian activities. Comprises grazing land, ménage and covered structure.
Inchmagrannachan Farm	Mixed livestock and arable farm supporting beef and sheep enterprises and arable cropping (mainly cereals). Farm Holiday cottages.
Land at Ladywell	Grassland and amenity forestry land.
Land at Ladywell Bridge	Scrub-land and amenity woodland.
Ladywell Farm	Grassland farm supporting predominantly cattle enterprise.
Tigh Fiodha	Land forming part of farm steading.
Woodlands Cottage and Dalmarnock Fishing Beat	Salmon fishing rights holders (land owned by Atholl Estates) on the River Tay from Dalguise to Rotmell. Self-catering accommodation at Woodlands Cottage.

2.2 Geology and Soils

Study Area

2.2.1 The study area extends to a corridor of at least 250m from the existing A9. For Groundwater Dependant Terrestrial Ecosystems (GWDTE), as agreed with SEPA, a study area extending up to 100m from the existing A9 was used. Impacts on groundwater abstractions have been assessed to a distance of 850m from the existing A9, as corresponding to the minimum study area applied for

groundwater abstractions under The Water Environment (Controlled Activities) (Scotland) (Regulations) 2011 (as amended) (Scottish Government 2011a).

Approach to Determination of Baseline Conditions

2.2.2 Baseline conditions were determined through a desk-based data review and assessment and consultation with statutory and non-statutory bodies.

2.2.3 Baseline conditions cover the following aspects of ground conditions:

- bedrock and drift geology;
- features of geological importance;
- mineral extraction;
- groundwater environment and associated receptors, including PWS; and
- contaminated land.

Desk-based Assessment

2.2.4 The desk-based assessment included a review of the following information:

- British Geological Survey (BGS) data including BGS Drift and Bedrock Geological Maps (BGS, 2014), BGS Geoindex, BGS UK Hydrogeology viewer (BGS, 2015) and other relevant BGS publications.
- Macaulay Institute for Soil Research, Soil Survey of Scotland Map, Sheet 5, Eastern Scotland, 1981.
- Envirocheck data sourced 2015.
- UK Soil Observatory Soils map viewer (1981).
- Ordnance Survey (OS) historical maps dating back to 1866 for information on former land use, any potential contamination and physical hazards and information on PWS (Ordnance Survey, 2015).
- Scottish Environment Protection Agency (SEPA) Groundwater Vulnerability Maps and the interactive River Basin Management Plan (SEPA, 2015).
- Scottish National Heritage designation database (SNH, 2014).

2.2.5 The following previous assessments were also used to inform the baseline conditions:

- Transport Scotland A9 Dualling Strategic Environmental Assessment (SEA) (2013, 2014a, 2014b).
- Soil Engineering Ground Investigation: A9 Dualling: Birnam to Tay Crossing (March 2015).

Consultation

2.2.6 Consultations have been undertaken with a number of statutory and non-statutory bodies. These include the following:

- SEPA for information on licensed groundwater abstractions (via The Water Environment (Controlled Activities) (Scotland) Regulations 2011) (as amended) and on former and current contaminated land use (Scottish Government, 2011a).
- Scottish Natural Heritage (SNH) for information on the location and extent of environmental sensitivities and to establish any future development constraints.
- Perth and Kinross Council (PKC) for information on former and current contaminated land use, PWS, licensed fuel storage and any additional relevant information.

- Private property/landowners to identify the presence of PWS and obtain information on water source location and type, water storage, treatment and intended use.

Ground Investigation

2.2.7 A phase of ground investigation (GI) was undertaken in 2014/2015 (Soil Engineering, 2015) hereafter referred to as "Stage 2 GI". The following targeted review of the data was undertaken for the purpose of this report:

- Review of log descriptions, with a specific focus on evidence and description of made ground; and
- Review of groundwater levels, in particular in areas of proposed cuttings.

Baseline Conditions - Geology and Soils

Soils

2.2.8 The majority of the study area is underlain by humus-iron podzols which may also contain some alluvial soils, associated with the valley floors, terraces and mounds. In the east of the study area near the Pass of Birnam parts of the existing A9 are underlain by alluvial soils of the River Tay floodplain. Also within the study area are brown forest soils with some humus-iron podzols and humic gleys are present on the hills and valley sides.

2.2.9 No peat deposits are recorded on BGS Onshore Geoindex within 250m of the existing A9.

2.2.10 A targeted review of Stage 2 GI data (Soil Engineering, 2015) indicated that peat, was encountered in two boreholes. The first was located in the northern existing A9 embankment at Birnam and the second at the existing Birnam Junction.

2.2.11 At the first location a dark brown to grey, clayey, pseudo fibrous peat, 0.5m thick, was encountered at 6m below ground level (bgl) in-between two silt horizons which both contained peat inclusions. The upper silt (3.90 to 6mbgl) had a thin brown pseudo fibrous peat lamination at 5.5mbgl, while the lower silt (6.5 to 7.6mbgl) contained occasional pockets of brown pseudo fibrous peat.

2.2.12 At the second location a firm greyish brown to dark brown, slightly gravelly pseudo fibrous peat, 0.9m thick, was encountered at 1.9mbgl.

2.2.13 Peaty soils were identified in a further seven borehole locations, predominantly within the Dalpowie Plantation and Ring Wood areas just south of Birnam. The peaty soils were generally encountered in the top 0.1m.

Made Ground

2.2.14 It is likely that made ground is present in the vicinity of the existing A9 and the Highland Main Line railway as both were constructed upon embankment in several sections which are likely to comprise significant deposits of made ground.

2.2.15 The Stage 2 GI (Soil Engineering, 2015) encountered made ground in 116 of 324 boreholes up to a maximum depth of 6.5mbgl. The made ground, where present, generally comprised fine to coarse sand and gravel of mixed igneous and metamorphic lithologies, commonly with tarmacadam and concrete and less commonly with ash, brick, glass and clinker. Chemical odours including hydrocarbon, creosote and solvent odours were noted within the made ground deposits in eight boreholes located across the full length of the existing A9. The majority of the made ground encountered was associated with the existing A9 and Highland Main Line railway. The less common brick, ash and clinker inclusions were generally located within embankments close to the small communities along the A9 route corridor.

Drift Geology

2.2.16 Drift deposits are recorded as alluvium, river terrace deposits, glaciofluvial deposits and Devensian glacial till.

2.2.17 The majority of the existing A9 is underlain by glaciofluvial deposits comprising sand and gravel deposits with local lenses of silt, clay and organic matter. Where the existing A9 is located in close proximity to the River Tay, for example at Inver, the Tay Crossing and west of Little Dunkeld, the underlying drift material comprises river alluvium, a silty clay which can contain layers of silt, sand, gravel and peat.

2.2.18 River terrace deposits are recorded in the west of the study area further up slope on the edge of the floodplain and are generally described as being comprised of sand and gravel with local lenses of silt, clay or peat.

2.2.19 Glacial till is generally recorded on the higher ground of the valley sides and is typically composed of a wide range of poorly sorted clays, sands and gravels.

2.2.20 The Stage 2 GI (Soil Engineering, 2015) encountered a highly variable sequence of glacial, river terrace and alluvial deposits, which predominantly comprised medium dense to very dense, locally silty or clayey sands and gravels with variable cobble and boulder content. Soil Engineering reported that the total thickness of the drift materials ranged from locally absent in an area west of Inver to over 55mbgl at the Tay Crossing. From the boreholes reviewed the total thickness of drift was generally greater than 15m thick with the exception of the area west of Inver where drift deposits were very thin (below 3m) or absent. A strong turpentine odour was noted between 2.2 and 3.65mbgl within a dense to very dense, clayey, very sandy gravel horizon at this location.

Bedrock Geology

2.2.21 The bedrock geology underlying the majority of the study area is low grade metamorphic bedrock of Dalradian age, belonging to the Southern Highland Group. Generally the Southern Highland Group is comprised of interbedded pelites, semipelites, psammities and metasandstones. The BGS Onshore Geoindex indicates a specific area of micaceous psammite at the Tay Crossing).

2.2.22 Sedimentary bedrock of Devonian age belonging to the Craighall Conglomerate Formation of the Arbuthnott-Garvock Group underlies the southern section of the study area at the Pass of Birnam. The Craighall Conglomerate Formation is generally a massive, well rounded, pebble and boulder conglomerate of andesitic lava interbedded with basaltic lava members and minor sandstone, siltstone and mudstone beds.

2.2.23 A single Tholeitic Lava Dyke from the Carboniferous Period is mapped within the study area south of Little Dunkeld.

2.2.24 The Stage 2 GI (Soil Engineering, 2015) substantiated the BGS published data with igneous and conglomerate bedrock encountered at the Pass of Birnam and Birnam Wood and metamorphic and meta-sedimentary bedrock encountered across the remainder of the project. The depth to bedrock varied along the existing A9 between surface outcrop to the west of Inver to over 55mbgl in depth at the Tay Crossing. From the reviewed borehole logs the maximum depth of bedrock encountered was 39mbgl (close to Dunkeld and Birnam Station). The majority of reviewed boreholes did not encounter bedrock and it appears that rockhead is greater than 15mbgl across much of the study area apart from the area of outcrop west of Inver.

Mineral Extraction

2.2.25 There are no records of historic or current coal mining activity within the study area.

2.2.26 Review of historical OS maps recorded five old or disused quarries (PBTC-C7, PBTC-C9, PBTC-C10, PBTC-C22 and PBTC-C28 in Table 3). Information from the Envirocheck report states that PBTC-C7

(Birnam Lower Level) and PBTC-C9 (Birnam) were opencast slate mines which have now ceased to operate. The report also stated that PBTC-C22 (Ladywell Landfill) was an opencast igneous and metamorphic (bedrock) mine with a ceased to operate status. In addition, two gravel pits (PBTC-C4 and PBTC-C15 in Table 3) were recorded. These are shown on Figure 3.

2.2.27 Based on this historical evidence of gravel and bedrock extraction and recorded drift geology, there is potential for further mineral resources to be available within the study area. Future mineral extraction resources are assessed to be of local importance.

Geotechnical Hazards

2.2.28 A previous geotechnical preliminary sources study report for the study area was undertaken in 2011 by Scott Wilson which identified the potential for future landslide risk to the north of the Tay Crossing (Scott Wilson, 2011).

2.2.29 The report identified that after a period of prolonged rainfall a historical landslide (later classified as a debris flow) occurred in August 2004. The primary cause of the landslide was the volume of surface water originating from the woodland above overwhelming the former A9's drainage system, which in turn concentrated surface water flows onto the slopes below causing further erosion and flooded the existing A9. Three distinct scars within the existing A9 cut slopes, estimated at up to 4m deep and 6m wide, had to be filled and covered with armour stone. No remedial measures for the remaining slope areas were documented and therefore it is conceivable that during rainfall events further slope instabilities could occur. Further drainage and topographic surveys were recommended.

Contaminated Land

2.2.30 Forty-six potentially contaminated land sources have been identified within the study area (including the seven historical gravel pits and quarries discussed under Mineral Extraction above). Details of the identified contamination sources are provided in Table 3 and locations shown on Figure 3.

2.2.31 Table 3 incorporates comments on made ground encountered during the Stage 2 GI (Soil Engineering, 2015).

Table 3: Potential Contaminated Land Sources

ID (Source Ref*)	Historical Land use / Source	Source of information	Dates present	Comments
PBTC-C1	Existing A9	OS map	1973 – present	Potential contamination associated with areas of embankment constructed from materials of unknown composition.
PBTC-C2	Highland Railway	OS map	1867 – present	Potential for made ground to be present associated with areas of embankment. Potential for contaminants associated with railway use.
PBTC-C3	Storage Tank	OS map	1977 – 1995	Contents of tank unknown.
PBTC-C4	Gravel Pit	OS map	1867	Potentially infilled with made ground of unknown composition with associated sources of potential contamination.
PBTC-C5	Curling Pond	OS map	1867 - 1938.	Potentially infilled with made ground of unknown composition with associated sources of potential contamination prior to 1977.
PBTC-C6	Infilled pond	OS map	1901 – 1938	Potentially infilled with made ground of unknown composition with associated sources of potential contamination prior to 1977.
PBTC-C7	Quarry (disused)	OS map	1901 – present	Marked as disused from 1983, potentially infilled with made ground of unknown composition with associated sources of potential contamination. The Envirocheck report documents the site as a BGS Recorded Mineral Site which states that the site was a former Slate opencast mine. The operator of the mine is listed as unknown.
PBTC-C8	Ringwood Sawmill	OS map	2006 – present	-
PBTC-C9	Birnam Quarry	OS map Envirocheck Report	1867 – present	The Envirocheck report documents the site as a BGS Recorded Mineral Site which states that the site was a former Slate opencast mine. The operator of the mine is listed as unknown.
PBTC-C10	Old Quarry	OS map	1886 – 1938	Potentially infilled with made ground of unknown composition with associated sources of potential contamination prior to 1983.
PBTC-C11	Curling Pond	OS map	1867 - 1938	Curling pond shown as a marsh/salting on 1977 map. Potentially infilled with made ground of unknown composition with associated sources of potential contamination prior to or as part of the existing A9 construction.
PBTC-C12	Sewage Works	OS map	1983 – present	-
PBTC-C13	Gas Works	OS map	1867 – 1901	-
PBTC-C14	Youngs Garage Fuel Station	OS map Envirocheck Report	1977 – present	Potential source of hydrocarbons.
PBTC-C15	Gravel Pit	OS map	1867 – 1938	Potentially infilled with made ground of unknown composition with associated sources of potential contamination prior to 1977.
PBTC-C16	Electric Substation	OS map	1977 – 1995	Potentially localised source of PCBs

ID (Source Ref*)	Historical Land use / Source	Source of information	Dates present	Comments
PBTC-C17	Storage Tank	OS map	1977 – 1995	Contents of tank unknown.
PBTC-C18	Smithy	OS map	1867 only	-
PBTC-C19	Coach Works and Smithy	OS map	1867 – 1938	-
PBTC-C20	Filter Beds	OS map	1901 - Present	Only within 250m buffer from proposed P2 Option B access road.
PBTC-C21	Fuel Station, Garage and Car Dealer	Envirocheck Report	Present	Birnam Autopoint and Birnam Vehicle Services. Potential sources of hydrocarbons.
PBTC-C22	Quarry (disused) Ladywell Landfill	OS map Envirocheck report	1867– 1983 (marked as disused in 1983)	Owned and operated by Perth and Kinross Council. Small to medium (10,000 to 75,000 tonnes per year) licenced landfill for construction/industrial, household and commercial, industrial non-hazardous wastes and old vehicles and machinery. SEPA indicated that this site holds a waste management licence (WML/E/20050). The Envirocheck report documents the site as a BGS Recorded Mineral Site which states that the site was a former opencast mine, quarrying igneous and metamorphic bedrock. The operator of the mine is listed as unknown.
PBTC-C23	Saw Mill	OS map	1866	-
PBTC–C24	Smithy	OS map	1866	-
PBTC-C25	Saw Mill	OS map	1867 – 1938	-
PBTC-C26	Corn Mill	OS map	1867 – 1938	-
PBTC-C27	Sewage Works	OS Maps	1995 - Present	-
PBTC-C28	Quarry	OS Maps	1867 - 1900	Labelled as old in 1900, potentially infilled with made ground of unknown composition with associated sources of potential contamination.
PBTC-C29	500L Underground Fuel Tank	Transport Scotland Stage 2 Options Assessment Report Part 2 Environmental Assessment	Unknown	Letter from PKC states that a 500 gallon petrol UST licenced to James Robertson was located within a yard on Station Road, Birnam. The tank was to be filled with water in 1969 but this was not confirmed. The most conservative (closest) location on Station Road has been chosen.
PBTC-C30	Olfactory observation of contamination.	Stage 2 GI	Present	-
PBTC-C31	Olfactory observation of contamination.	Stage 2 GI	Present	-

ID (Source Ref*)	Historical Land use / Source	Source of information	Dates present	Comments
PBTC-C32 to PBTC-C41	Septic Tanks	Land owner consultation	Unknown	Exact location of Septic Tanks unknown, landowner parcel shown on figure.
PBTC-C42 to PBTC-C46	Septic Tank discharges	Envirocheck report	Present	--

Groundwater

2.2.32 SEPA has classified the drift deposits of the River Tay Valley within the study area into two separate water bodies; the Tummel and Tay Sand and Gravel Aquifer located west of Little Dunkeld and the Isla and Lower Tay Sand and Gravel aquifer located to the east. The bedrock aquifers are identified as the Killin, Aberfeldy and Angus Glens aquifer and the Bankfoot aquifer, both correlating to the underlying solid geology (Southern Highland Group and Arbuthnott-Garvock Group, respectively). The majority of the study area is underlain by the low permeability Killin, Aberfeldy and Angus Glens aquifer with little potential for groundwater. The southeast corner of the study area (Pass of Birnam) is underlain by the locally important Bankfoot aquifer with reported yields varying between 1l/s and 10-12l/s (The Hydrogeological Map of Scotland, 2015).

2.2.33 SEPA's 2013 Water Body Data Sheets assign the groundwater within the Tummel and Tay aquifer and the Killin, Aberfeldy and Angus Glens aquifer as good with medium confidence for both quantity and quality, with no pollutant trends. Groundwater within the Isla and Lower Tay aquifer has been classified as poor with medium confidence for both quality and quantity, with an upward trend in pollutants attributed to arable farming abstractions and diffuse pollution. Arable farming abstractions were also recognised as a pressure on the Bankfoot aquifer, resulting in a poor with medium confidence classification for groundwater quantity while the groundwater quality was good with medium confidence and showing no trend for pollutants (SEPA, 2015).

2.2.34 Groundwater flow direction within the drift deposits is likely to be controlled by local topography and directed towards the surface watercourses. The direction of bedrock groundwater flow is unknown.

2.2.35 The hydrogeological characteristics of drift and bedrock units within the study area are summarised in Table 4.

Table 4: Hydrogeological Characteristics of Drift and Bedrock Units

Geological/ Hydrological Unit		Geological Characteristic	Hydrogeological Characteristics
Drift Deposits	Peat	Partially decomposed organic material	Very poor groundwater potential and limited spatial extent.
	Made Ground	Variable composition	Poor groundwater potential due to surface/close surface location and variable permeability
	Glaciofluvial Deposits	Sand and gravel, locally with lenses of silt, clay and organic material	Local groundwater potential. Groundwater system is expected to be hydraulically connected to surface water.
	River Terrace Deposits	Sand and gravel, locally with lenses of silt, clay or peat	Local groundwater potential. Groundwater system is expected to be hydraulically connected to surface water.
	Alluvial Fan Deposits	Composed of variable sediments including clay, silt, sand, gravel and peat.	Local groundwater potential. Groundwater system is expected to be hydraulically connected to surface water.
	Glacial Till	Comprised of boulders, sands and gravels in a clay matrix	Poor groundwater potential due to generally low and variable permeability.
Bedrock	Southern Highland Group	Interbedded pelites, semipelites, psammities and metasandstones.	Killin, Aberfeldy and Angus Glens aquifer. Poor groundwater potential except through fractures.
	Arbuthnott-Garvock Group	Craighall Conglomerate Formation: massive, well rounded, pebble and boulder conglomerate of andesitic lava interbedded with basaltic lava members and minor sandstone, siltstone and mudstone beds	Bankfoot Aquifer. Locally yields moderate amounts of groundwater
	Tholeitic Lava Dykes	Intrusive Igneous Rocks	Very poor groundwater potential.

Groundwater Monitoring

2.2.36 As part of the Stage 2 GI, groundwater level data was collected over a four month period from November 2014 to February 2015 (Soil Engineering, 2015). The monitoring data was provided from a total of 27 boreholes installed along the length of the existing A9 in this project. One of these boreholes was screened in drift and bedrock units located where the drift is thin or non-existent (west of Inver). The remaining 26 boreholes were screened entirely within drift deposits.

2.2.37 Recorded groundwater levels are summarised in Table 5 below. Groundwater levels are generally at depth (in excess of 10mbgl) within the study area, with the deepest recorded groundwater level at 26.21mbgl. Shallow groundwater levels were recorded within the drift deposits but were typically encountered close to surface water features (the River Tay and River Braan) and also in an area of especially thin drift deposits sat upon the low permeability metamorphic bedrock.

Table 5: Recorded Groundwater Level Information

Area	Maximum Recorded Groundwater Level (mbgl)	Minimum Recorded Groundwater Level (mbgl)
Birnam	24	24.99
Inver	5.5	>25
Dunkeld	6.43	24.1
Dalguise	6.35	26.21

Groundwater Quality

2.2.38 The Envirocheck report indicates that there are thirteen discharge consents within the route corridor. Eight of these (located near Birnam) are associated with Dunkeld and West Birnam pumping stations and Birnam and Dunkeld Sewage Treatment Works (PBTC-C18). The remaining five are all linked to discharge of treated water from private septic tanks, primarily clustered around Inver (PBTC-C42 to PBTC-C46). Ten additional septic tanks have been recorded as part of the early land owner consultation responses (PBTC-C32 to PBTC-C41). The locations of these are shown in Figure 3.

Abstractions

2.2.39 Table 6 summarises groundwater abstraction features identified within the study area.

Table 6: Summary of identified abstraction/springs/PWS

PWS Reference	Feature Type	Distance from existing A9 and/or main property of relevance	Comments
PBTC-S1	Spring noted on OS map	100m	n/a
PBTC-S2	Spring noted on OS map	600m	n/a
PBTC-S3	Spring noted on OS map	130m	n/a
PBTC-W1	Well noted on OS map	350m	n/a
TB-PWS1	Statutory Consultation (PKC)	(290m north-east) Woodlands	Borehole Supply

Ecological receptors with potential groundwater component

2.2.40 Preliminary assessment of ecological receptors based upon information provided by URS (now AECOM) has identified eight habitats which are potentially at least partially supported by groundwater inflows. However, it is not determined at this stage whether any of these receptors have the potential to be GWDTEs as noted in Section 2.4. The identified habitats are summarised in Table 7 below and shown on Figure 3. It should be noted that the spatial extent of these potential receptors is currently unknown. All ecological receptors are identified and described further in Section 2.4 (Ecology and Nature Conservation).

Table 7: Summary of Identified Ecological Receptors with a Potential Groundwater Component

Phase 1 Target Note Reference	Easting	Northing	Wetland Typology
TN127	304497	740163	Other Wet Woodland
TN119	304203	740421	Swamp
TN113	304068	740783	Swamp
TN84	302659	741764	Marshy Grassland/Swamp
TN22	300555	743424	Swamp
TN14	300547	743796	Swamp
TN41	300848	742461	Other Wet Woodland
TN117	304182	740792	Other Wet Woodland/Swamp

Surface Water Features

2.2.41 Surface water features are expected to have a groundwater baseflow component, and groundwater may be a contributor to the River Tay flooding mechanism.

2.2.42 The main watercourse within the study area is the River Tay, which crosses the existing A9 north-west of Inver. The River Tay is assigned Special Area of Conservation (SAC) status due to the fish and otter species it supports.

2.2.43 The main tributary of the River Tay within the study area is the River Braan, itself assigned SAC status, which flows parallel and in close proximity to the A9 near Inver and subsequently crosses the existing A9 between Inver and Little Dunkeld.

2.3 Road Drainage and Water Environment

Study Area

2.3.1 The baseline study area extends approximately 500m from the existing A9. For flood risk, the study area is determined by the natural processes of the water feature and floodplain and the location of flood receptors, which can extend for some distance from the existing A9. The hydrological inputs to this study area are affected by processes across the whole of the River Tay basin. Identified water features and flood inundation extents within the 500m study area are shown on Figure 4. For ecological designations, refer to Figure 5.

Approach to Determination of Baseline Conditions

2.3.2 Baseline conditions were identified through a combination of consultation with relevant stakeholders, desk-based assessment and field surveys.

Desk-based Assessment

2.3.3 The desk-based assessment has taken into account relevant DMRB guidance, legislation and regulations, including those listed below:

- European Commission (2000). Council Directive (2000/60/EC) Water Framework Directive;
- DMRB Volume 11, Section 3, Part 10 (HD 45/09): Road Drainage and the Water Environment (Highways Agency et al., 2009) hereafter referred to as 'HD 45/09';
- Water Environment Water Services (WEWS) Act 2003 (Scottish Government, 2003);
- Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR) (Scottish Government, 2011a);

- Scottish Planning Policy (SPP) (Scottish Government, 2014);
- The Climate Change (Scotland) Act 2009 (Scottish Government, 2009a);
- The Flood Risk Management (Scotland) Act 2009 (Scottish Government, 2009b);
- Technical Flood Risk Guidance for Stakeholders (SS-NFR-P-002) (SEPA, 2014a); and
- Water Framework Directive (WFD) policy guidance 'The Future for Scotland's Waters, Guiding Principles on the Technical Requirements of the Water Framework Directive' (SEPA, 2002).

2.3.4 The results of previous assessments were also utilised, including the DMRB Stage 1 assessment report (A9 Dualling: Preliminary Engineering Support (PES); Transport Scotland, 2014a) and related Strategic Environmental Assessment documents (Transport Scotland, 2013a; 2014b; 2014c).

2.3.5 Data were collated from the following sources:

- Aerial photography (Transport Scotland, 2013b).
- Ordnance Survey (OS) Maps (1:25,000 Explorer Maps 379 and 386), and 1:1,250 to 1:10,000 MasterMap data.
- Online/web-based historical maps.
- British Geological Survey (BGS) Digital Mapping.
- LIDAR topographical survey data.
- Flood Estimation Handbook (FEH) CD-ROM Version 3, Centre for Ecology and Hydrology (CEH, 2009).
- SEPA Flood Maps (SEPA, 2014b).
- SEPA River Basin Management Plan (RBMP) data and associated Water Body Information Sheets available on Scotland's Environment Interactive Map (Scottish Government, 2015a) and classification results (SEPA, 2014c).

2.3.6 The Water Framework Directive (WFD) (2000/60/EC) is a substantial piece of EU water legislation that came into force in 2000, with the overarching objective for all waterbodies to attain at least Good Ecological status by year 2027. SEPA is the competent authority in Scotland responsible for delivering the WFD and utilises a risk-based classification system for each monitored waterbody, comprising five quality classes (High, Good, Moderate, Poor and Bad). The status of waterbodies is assessed by SEPA using a range of parameters including physico-chemical, biological and hydromorphological elements. In addition, artificial waterbodies (AWBs) or heavily modified waterbodies (HMWBs) need to achieve at least 'Good Ecological Potential' over the same timescales, which comprise the following five 'ecological potential' classes (Maximum, Good, Moderate, Poor and Bad).

Surveys

2.3.7 Surveys of the study area were undertaken in April 2015 to visually inspect surface water features to gain an understanding of the local topography, hydrological regime and to gather field data in relation to water quality, geomorphology and flood risk. Conditions during and leading up to the surveys were dry and warm, leading to observed low flow conditions in small catchments, dry soils and limited overland flow to water features.

2.3.8 Surface water catchment areas were also investigated if uncertainty was identified regarding the catchment boundary, and the land topography was visually checked during the surveys where there were known flooding issues.

2.3.9 A number of other surveys were undertaken, including river channel cross-section and hydraulic structure surveys using conventional topographical survey techniques, and inspections of minor culverts crossing the existing A9.

Consultation

2.3.10 Consultations were undertaken with regulatory bodies and key stakeholders including SEPA. SEPA provided the following information which informed the baseline:

- water quality data for monitored water bodies;
- licensed abstractions and discharges to water bodies; and
- historical flood flows, flood area extents and river flow data.

Baseline Conditions - Road Drainage and the Water Environment

2.3.11 Within the 500m study area there are 16 water features, which range from large waterbodies with European-level ecological designations to minor straightened road and field drains, which provide only a functional drainage benefit.

2.3.12 All of the identified water features within the southern section A9 projects have been referenced sequentially from south to north. The first water feature falling within the study area for the A9 Dualling Pass of Birnam to Tay Crossing project is water feature 6 (River Tay). Of the 16 water features, there are two large water features which are monitored by SEPA, as follows:

- River Tay (Reach: River Tummel to River Isla confluences) (WF6); and
- River Braan (WF11).

2.3.13 These two water features are part of the River Tay SAC, designated primarily for Atlantic salmon. Sea lamprey, brook lamprey, river lamprey and otter are also qualifying features of this designated site.

2.3.14 A description of the baseline conditions including photographs of the water features identified within the 500m study area is provided in Appendix B (RDWE Baseline Conditions). Related information on groundwater and private water supplies (PWS) is provided in Section 2.2 (Geology, Soils and Groundwater) and ecological designations and protected species in Section 2.4 (Ecology and Nature Conservation).

2.3.15 Photographs 2-7 provide examples of the range of water features and their typical size identified within the study area.

2.3.16 The locations of the water features and corresponding identification reference (IDs), water feature crossing points and flood inundation extents are shown on Figure 4. For ecological designations, refer to Figure 5.

2.3.17 From the SEPA consultation responses received, there are a number of licenced surface water discharges, abstractions and other engineering works affecting four water features within the study area, which include:

- River Tay (WF6):
    i. four private septic tank effluent discharges (NGR NO 04302 40815, NO 04168 41411, NO 03505 42035 and NO 03211 42233);
    ii. six combined sewer overflow discharges (NGR NO 04181 41355, NO 04106 41556, NO 03923 41749, NO 03170 42224, NO 02634 42443 and NO 02617 42444);
    iii. three emergency overflow of sewage discharges (NGR NO 03935 41739, NO 03178 42250 and NO 02634 42443);
    iv. four sewage treatment works discharges (NGR NO 04259 41038, NO 01706 42362 NO 01195 42479 and NO 00419 44213); and
    v. one abstraction for agricultural irrigation (NGR NO 00449 44434).
- Inchewan Burn (WF8):
    vi. Engineering works (channel straightening) (NGR NO 03007 41711).

- River Braan (WF11):
    vii. One private septic tank effluent discharge (NGR NO 01552 42140).
- Mill Lade/Mill Stream (WF12):
    viii. One private sewage treatment works discharge (NGR NO 01718 42235).

2.3.18 The baseline for flooding has been developed from flood modelling and screening calculations undertaken for this project, in conjunction with the SEPA Flood Maps (SEPA, 2014b). Greater emphasis has been placed on the results of the detailed flood modelling for this project than the SEPA Flood Maps when determining baseline conditions. The flood extents based on Jacobs refined flood modelling are shown on Figure 4.

Existing Road Drainage Network

2.3.19 Road drainage treatment on the existing A9 between Pass of Birnam and Tay Crossing is generally limited, consisting of kerbs and gullies which direct untreated road run-off to an outfall into the nearest water feature. Photographs 2-7 show some of the existing baseline features in the study area.

2.3.20 In certain areas there are lengths of filter drain in the verges that provide initial treatment for some of the run-off from the road and/or adjacent earthworks slopes.

Photograph 2: River Tay (WF6) – view upstream towards Dunkeld and Birnam (typical example of a large WFD waterbody)

Photograph 3: River Braan (WF11) – view upstream from footbridge, immediately upstream of A9 bridge crossing (example of a medium/large WFD waterbody).

Photograph 4: Inchewan Burn (WF8) – downstream view of restored section underneath A9 bridge (typical example of a medium water feature).

Photograph 5: Water feature 9 – downstream view from existing A9 culvert outlet towards River Braan (typical example of a small water feature).

Photograph 6: Water feature 13 – upstream view towards existing A9 culvert outlet (typical example of a small water feature)

Photograph 7: Water feature 4 – downstream view from B867 towards A9 (typical example of a minor ephemeral drain)

2.4 Ecology and Nature Conservation

Study Area

2.4.1 The study area extends to 500m from the existing A9 and is shown on Figure 5.

2.4.2 National Biodiversity Network (NBN) searches were undertaken up to 10km from the existing A9 to take into account the highly mobile nature of some species and the level at which some data are available (10km grid square).

2.4.3 The study area for specific ecological receptors was amended following consultation with the consultees listed in paragraph 2.4.7 below.

Approach to Determination of Baseline Conditions

Desk Based Assessment

2.4.4 A desk study was undertaken to review existing relevant literature and to obtain ecological information within the study area. This included a review of, and updates to, data collated to inform an earlier environmental assessment (Transport Scotland, 2011a), including:

- the extended Phase 1 habitat survey and targeted species surveys (Transport Scotland, 2011a);
- A9 Dualling Programme SEA Addendum Report and Post-Adoption Statement (Transport Scotland, 2014b-c);
- A9 Dualling Programme Habitats Regulations Appraisal (HRA), Programme Level Appropriate Assessment, Updated Issue (Transport Scotland, 2015);
- survey data from Scottish Badgers (received 2015);
- aquatic data from Scottish Environment Protection Agency (SEPA); and
- protected species information from SNH.

2.4.5 Information for the desk study was also obtained from the following online resources:

- Joint Nature Conservation Committee (JNCC) website (JNCC, 2015);
- NBN gateway website (National Biodiversity Network, 2015);
- Scotland's Environment website (Scotland's Environment Web Partnership, 2015);
- SEPA River Basin Management Plans Interactive Map (SEPA, 2015); and
- SNH Information Service (SNH, 2015a).

Site Surveys

2.4.6 Targeted ecology surveys were undertaken by Jacobs between January and July 2015 to supplement the extended Phase 1 habitat survey data provided by Transport Scotland (2014d) (shown on Figure 6) as well as desk study and consultation data. Surveys comprised the following:

- assessment surveys for bat habitat within 50m of the existing A9 to identify any roosting potential of suitable buildings, structures (such as bridges) and trees, which were categorised according to the Bat Conservation Trust (BCT) Good Practice Guidelines (Hundt, 2012); and
- terrestrial and aquatic walkover surveys to characterise and identify suitable habitats for protected flora and fauna, including badger, otter, water vole, reptiles, freshwater pearl mussel (FWPM) and fish species within 100m of the existing A9.

Consultation

2.4.7 Consultation via the Environmental Steering Group (ESG) included agreement on the survey scope, methods and study areas for the receptors. Input was provided by the following key statutory consultees:

- SEPA;
- SNH; and
- Perth and Kinross Council (PKC).

2.4.8 Data requests also formed part of the consultation process. The statutory consultees provided some of the data, and requests for data were also made to:

- Marine Scotland;
- British Trust for Ornithology (BTO);
- Forestry Commission;
- Perth and Kinross Red Squirrel Project;
- Perth Museum Biological Records Centre;
- Raptor Study Groups;
- Royal Society for the Protection of Birds (RSPB);
- Scottish Badgers;
- Scottish Wildcat Association;
- Scottish Wildlife Trust (SWT);
- Tay District Salmon Fisheries Board (TDSFB);
- Tayside Bat Group; and
- Tayside Biodiversity Partnership.

Baseline Conditions – Ecology and Nature Conservation

2.4.9 Ecological receptors within the study area are described in Table 8. The legislation and conservation status of habitats and species is also indicated in Table 8 where relevant. Targeted species and habitat walkover surveys were undertaken by Jacobs in 2015 to complement the desk-based data used for this assessment.

Designated Sites

2.4.10 Two statutory designated sites lie within the study area (Table 8, Figure 5). The River Tay Special Area of Conservation (SAC) (SNH, 2015a) is located north of the existing A9 and is crossed by the A9 at the northern end of the study area. The Craig Tronach SSSI (SNH, 2015b) is located on the northern bank of the River Tay.

2.4.11 There are no locally designated sites of nature conservation interest identified within the study area.

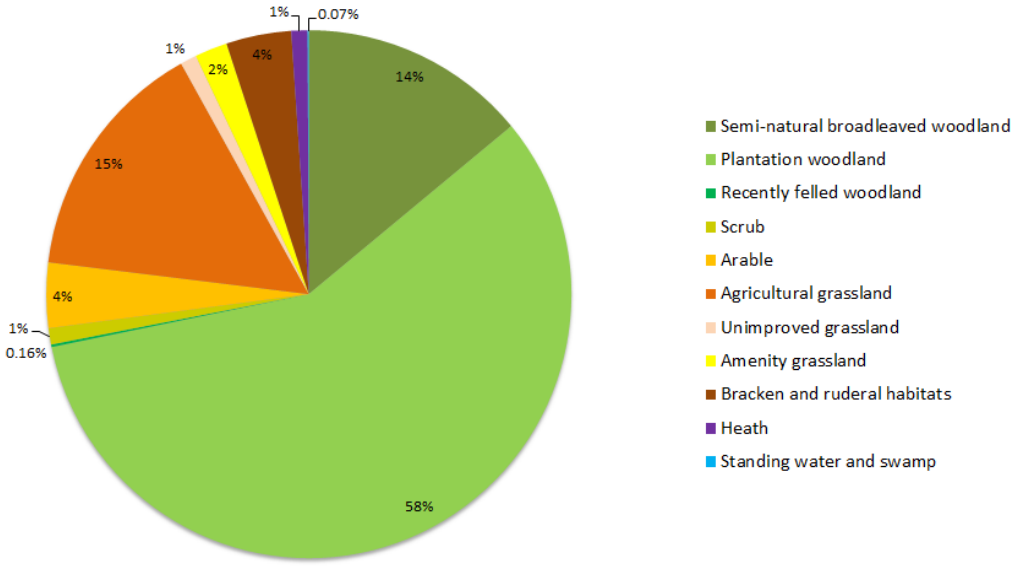
Biodiversity Action Plans

2.4.12 The study area is covered by the regional Tayside Biodiversity Action Plan (Tayside BAP) (Tayside Biodiversity Partnership, 2015).

Terrestrial Habitats

2.4.13 Habitats within 150m of the existing A9 are summarised in Diagram 2.4.1 and comprise mainly woodland (approximately 72%); with a predominance of coniferous plantation (58%) and agricultural land of different types. Only those habitats of authority area importance and above are noted in Table 8.

Diagram 2.4.1: Habitats identified within 150m of the existing A9



2.4.14 The study area is predominantly covered by woodland listed as Ancient (of semi-natural origin) and long established (of plantation origin). Twelve sites listed on the Ancient Woodland Inventory (AWI) (SNH, undated; 2008) within both ancient (of semi-natural origin) (1a and 2a), and long-established (of plantation origin) (1b and 2b) categories (Figure 5) were identified in the updated desk study. These areas contain 25 pockets of woodland categorised as part of the Native Woodland Survey of Scotland (NWSS) (Patterson et al., 2014). Some of these sites were coincident or overlapping, or entirely separate. A further six areas included in Figure 5 were identified as Category 3 (other woodland on 'Roy' maps). Habitats of authority area importance or greater are included in Table 8, together with justification for their inclusion. The walkover and Phase 1 data did not indicate the presence of any Annex 1 (Habitats Directive) habitats which may be sensitive to changes in groundwater flow. Preliminary assessment of ecological receptors based upon Phase 1 habitat mapping target notes undertaken prior to this assessment by URS (now AECOM) (Transport Scotland, 2014d) had identified habitats which are potentially partially supported by groundwater. However, it is not determined at this stage whether any of these receptors have the potential to be GWDTE as defined in Land Use Planning System Guidance Note 31 (SEPA, 2014d).

Notable Plants

2.4.15 Juniper is listed on the Scottish Biodiversity Strategy (SBS) and its associated Scottish Biodiversity List (SBL). Some plants were recorded within the study area during field surveys (Transport Scotland, 2011).

Aquatic Habitats

2.4.16 Four major watercourses are crossed by the A9 in the study area: Inchewan Burn, the River Braan, Mill Stream and the River Tay. Five smaller, unnamed watercourses were identified as also being crossed by the A9 in the study area. Both the River Braan and River Tay form part of the River Tay SAC (Figure 5).

2.4.17 The most recent SEPA monitoring data from 2013 classifies the River Tay as Moderate overall status; and the River Braan as Good overall status (Scotland's Environment Web Partnership, 2015). However, the River Braan monitoring point is approximately 6km upstream of the A9 so may not be representative of the conditions at the existing crossing point.

2.4.18 Suitable habitat for all life stages of Atlantic salmon, freshwater pearl mussel, lamprey species, trout and European eel was found to be present throughout the study area (Transport Scotland 2011a).

Protected Species

2.4.19 Desk-based reviews and survey data identified the presence of the following protected species in the study area:

- otter: found throughout the River Tay catchment (NBN, 2015) and holts identified during Jacobs field surveys of 2015;
- freshwater pearl mussel: NBN (2015), Transport Scotland (2014d) and SKM (2013) records in study area;
- Atlantic salmon: found throughout the River Tay catchment (TDSFB, 2009);
- river, brook and sea lamprey: NBN (2015) records in study area and suitable habitat identified in River Tay catchment during walkover surveys;
- trout (brown/sea): NBN (2015) records in study area and suitable habitat identified in River Tay catchment during field surveys;
- Scottish wildcat: NBN (2015) records within a 10km radius of the study area. Priority areas for Wildcat conservation are established at Angus Glens, Dulnain, Morvern, Strathavon, Strathbogie and Strathpeffer; however, there are no priority areas within the study area (as defined in Littlewood et al., 2014);
- European eel: widespread in River Tay catchment (TDSFB, 2009);
- bats: six of Scotland's nine species noted in desk records of study area and 22 trees, 19 buildings and seven structures with high roost potential were found in 2015 field surveys;
- badger: records in study area (Scottish Badgers, 2015) and identified during walkover surveys;
- pine marten: NBN (2015) records in study area and expanding range in Tayside (Croose et al., 2014);
- red squirrel: NBN (2015) records along project route and priority habitats recorded within the study area at Craigvinean directly adjacent to the existing A9 to the west of Inver (Poulsom et al., 2005);
- water vole: records within a 10km radius of the study area; undergoing widespread declines nationally (SNH, 2015c); and
- reptiles: slow worm and common lizard were recorded in the study area (Transport Scotland, 2014d) and field surveys of 2015 indicate some suitable habitat for these species.

2.4.20 Additionally, habitats suitable for breeding bird, including those presented in Diagram 2.4.1 above, were noted from the Phase 1 survey data (Transport Scotland, 2011a) and from walkover surveys.

The only Schedule 1 (Wildlife and Countryside Act 1981 (as amended in Scotland)) protected bird species identified from desk study data were located outside of the study area.

2.4.21 Freshwater pearl mussels (FWPM) are known to be present in some watercourses in the study area. Due to their international importance, their vulnerability to exploitation, and listing on the Wildlife and Countryside Act 1981 (as amended in Scotland), detailed information on their status is included in a confidential appendix. Other Species of Ecological Interest

2.4.22 Other species of interest, such as deer and invasive non-native species (INNS) are not included in this baseline report. Deer are not protected for nature conservation reasons or included on the Tayside BAP.

2.4.23 INNS present a threat to biodiversity and are therefore not protected (Secretariat of the Convention on Biological Diversity, 2001).

Table 8: Summary of Ecological Receptors Recorded in the Study Area

Receptor	Data Sources	Legal/BAP Status	Justification	Importance
Designated Sites				
River Tay SAC (8366 UK0030312) (NN 818 481) (Figure 5)	SEPA (2015) SNH (2015a)	Natura 2000 site under Conservation (Natural habitats andc) Regulations 1994 (as amended in Scotland). WFD watercourse (in part) Salmonid watercourse (in part) Tayside BAP lists rivers and burns as priority habitats.	A 9497.72ha site, designated for its clear-water lakes, Atlantic salmon, river lamprey, brook lamprey, sea lamprey and otter. SNH has indicated that freshwater pearl mussel should also be included in the citation. For this reason the species is further considered in the HRA (Transport Scotland, 2015).	international
Craig Tronach SSSI (423) (NO 053 402) (Figure 5)	SNH (2015b)	Designated under the Nature Conservation (Scotland) Act 2004 (NCSA 2004)	A 5.62ha site that supports forked spleenwort and the SSSI is in favourable condition. Three other notable species of spleenwort are found on site with an even rarer hybrid of forked spleenwort with maidenhair spleenwort.	national
Habitats and Ecosystems				
Inchewan Burn (Figure 6)	SEPA (2015) Transport Scotland (2014d)	Designated under WFD (2000/60/EC) as salmonid watercourse Tayside BAP lists rivers and burns as priority habitats.	Salmon known to spawn in lower reaches. European eel also utilise this habitat. Directly connected to River Tay SAC.	national
Mill Stream and un-named watercourses [1, 7, 10, 12, 13] (Figure 6)	Jacobs field surveys (2015) SEPA (2015)	Designated under WFD (2000/60/EC) as salmonid watercourses Tayside BAP lists rivers and burns as priority habitats.	All directly connected to the River Tay SAC. In the un-named watercourses there is no suitable habitat confirmed for protected species but likely to provide indirect supporting functional habitat through provision of food resource for designated species. For Mill Stream: currently no records of fish available and not accessible for migratory salmonids despite designation. No suitable habitat for protected species.	authority area
Ancient woodland (Figure 5)	Patterson et al. (2014) SNH (2008; undated)	SBL priority habitat (including a variety of semi-natural broadleaved woodland types). Tayside BAP priority to protect, restore and enhance woodlands as identified in the SNH Ancient Woodland Inventory.	Twelve sites listed on the Ancient Woodland Inventory (AWI) account for 82% of all woodland habitat, and including 25 pockets of woodland listed on the Native Woodland Survey of Scotland (NWSS). Ancient woodland or plantation woodland of ancient origin is not readily replaceable if lost and SNH has asked that all AWI sites, whether they currently support ancient woodland or not, be treated as protected. There are some AWI areas where trees have been felled, but which may retain biodiversity value.	national

Receptor	Data Sources	Legal/BAP Status	Justification	Importance
Coniferous, mixed or broadleaved plantation woodland (Figure 6)	Transport Scotland (2014d)	Lowland mixed deciduous woodland is listed in the SBL. The Tayside BAP lists planted coniferous woodlands and lowland mixed broadleaved woodland as priority habitats.	This habitat covers approximately 58% of the study area and includes 10% of the study area which is not also categorised under the AWI. Plantation woodland is generally of low diversity, with a poorly developed ground flora and shrub layer. It is widespread in the area but can also provide important habitat for species such as pine marten and red squirrel in the area.	regional
Broadleaved semi-natural woodland (Figure 6)	Transport Scotland (2014d)	Lowland mixed deciduous woodland is listed in the SBL. The Tayside BAP lists lowland mixed broadleaved woodland and wet woodland.	This habitat covers approximately 14% of the study area and includes 2% of the study area which is not also categorised under the AWI. It can provide important habitat for species such as pine marten and red squirrel.	regional
Species				
Otter	Jacobs field surveys (2015) NBN (2015)	European Protected Species (EPS) under the Conservation (Natural habitats andc) Regulations1994 (as amended in Scotland). It is a qualifying feature of the River Tay SAC. Tayside LBAP lists otter as an LBAP protected species.	The species is at carrying capacity in the study area (Strachan, 2007) (i.e. maximum population size of the species that the environment can sustain indefinitely taking account of food, habitat availability etc.) within the River Tay SAC area and the wider catchment. Six couches and three holts found in 2015 surveys.	international
Atlantic salmon	Gilvear et al. (2010) NBN (2015) SKM (2013) SNH (2015a) TDSFB (2009) Transport Scotland (2014d)	Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003 Listed under Schedule 3 of the Conservation (Natural Habitats andc) Regulations 1994 (as amended in Scotland) and Annex II and V of Council Directive 92/43/EEC. A qualifying feature of the River Tay SAC. Listed on the SBL. Tayside LBAP lists Atlantic salmon as an LBAP protected species.	Occurs throughout the wider Tay catchment. Evidence of spawning habitats on main rivers and major tributaries.	international
Brook and sea lamprey	NBN (2015) SNH (2015a) Transport Scotland (2011c) Watt et al. (2008)	Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003 Listed under Annex II of Council Directive 92/43/EEC. A qualifying feature of the River Tay SAC. Listed on the SBL. Tayside LBAP lists brook and sea lamprey as an LBAP protected species.	Known to occur in the wider catchment.	international

Receptor	Data Sources	Legal/BAP Status	Justification	Importance
River lamprey	NBN (2015) SNH (2015a) Transport Scotland (2011) Watt et al. (2008)	Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003 Listed under Schedule 3 of the Conservation (Natural Habitats andc) Regulations 1994 (as amended in Scotland) and Annex II and V of Council Directive 92/43/EEC. A qualifying feature of the River Tay SAC. Listed on the SBL. Tayside LBAP lists river lamprey as an LBAP protected species.	Known to occur in the wider catchment. Undertake migrations between freshwater and estuarine habitats.	international
Brown trout/sea trout	NBN (2015) TDSFB (2009)	Sea trout listed on SBL. Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003 Tayside LBAP lists brown trout as an LBAP protected species.	Widespread throughout the River Tay SAC. Potential host species for FWPM and therefore plays an essential role in the ecosystem that supports the integrity of that species.	international
European eel	Scottish Government (2015) TDSFB (2009)	European Commission (2007) Council Regulation (1100/2007/EC) Establishing measures for the recovery of the stock of European eel. Listed on the SBL. Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003	Widespread in Tay catchment. Has undergone major decline in numbers. Listed Critically Endangered on IUCN Red List.	international
Bats (all species)	Jacobs field surveys 2015 NBN (2015) Transport Scotland (2011) Transport Scotland (2014d)	All UK bat species are European Protected Species (EPS) under the Conservation (Natural habitats andc) Regulations1994 (as amended in Scotland). All nine species that occur in Scotland are listed on the SBL. Tayside LBAP lists brown long-eared, Natterer's, Daubenton's and pipistrelle bats as LBAP protected species.	The majority of the species recorded within the study area and 10km surrounding the project are widespread and found throughout Scotland: Daubenton's bat, common pipistrelle, soprano pipistrelle, Natterer's bat and brown long-eared bat. Noctule bats were recorded within the wider 10km area but not within the study area. Noctule bats are not widely distributed within Scotland with only a few records within Perth and Kinross. 2015 field surveys indicate 22 trees with the potential to support large roosts (Category 1* *sensu* Hundt, 2012), 19 buildings and seven structures with high bat roost potential within 50m of the existing A9.	national
Pine marten	Croose et al. (2014) NBN (2015) Transport Scotland (2014d)	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended in Scotland) (WCA). Listed on the SBL. Tayside LBAP lists pine marten as an LBAP protected species.	Pine marten was recorded within the study area. The species is widespread throughout Scotland and has continued to expand its range throughout Perthshire and Tayside.	regional

Receptor	Data Sources	Legal/BAP Status	Justification	Importance
Red squirrel	NBN (2015) Poulsom et al. (2005) Transport Scotland (2014d)	Schedule 5 of the WCA. Listed on the SBL as a species for which conservation action is needed. Tayside LBAP lists red squirrel as an LBAP protected species.	Red squirrels have been recorded along the whole of the project route within the study area. The species is widespread within Scotland although there has been widespread decline in population and range. Priority woodland has been identified within the study area at Craigvinean (NN 983 453) which directly abuts the project.	regional
Slow worm	NBN (2015) Transport Scotland (2014d)	Schedule 5 of the WCA. Listed on the SBL. Tayside LBAP lists slow worm as an LBAP protected species.	Recorded within the study area. Five sites were assessed as being suitable reptile habitat within the study area during walkover survey.	regional
Common lizard	NBN (2015) Transport Scotland (2014d)	Schedule 5 of the WCA. Listed on the SBL. Tayside LBAP lists common lizard as an LBAP protected species.	Recorded within the study area. Five sites were assessed as being suitable reptile habitat during the walk over and one incidental sighting has been recorded	regional

2.5 Landscape

Study Area

2.5.1 The study area for the landscape assessment is shown on Figure 7 as an area up to 5km in distance from the existing A9.

Approach to Determination of Baseline Conditions

Desk-based Assessment

2.5.2 Baseline information was collected through a desk study including review of the following information sources:

- 1:5,000, 1:10,000, 1:25,000 and 1:50,000 Ordnance Survey (OS) mapping;
- web-based photography;
- aerial photography;
- Jacobs GIS environmental constraints datasets (obtained through consultation with relevant stakeholders);
- A9 Dualling Programme. Strategic Environmental Assessment (SEA) Environmental Report and Appendix F (Strategic Landscape Review) of the Addendum;
- Perth and Kinross Council: Landscape Supplementary Guidance (2015);
- Perth and Kinross Council: Highland Area Local Plan (2000);
- Perth and Kinross Council Local Development Plan (2014);
- TAYplan: Scotland's SusTAYnable Region. Strategic Development Plan 2012- 2032;
- Tayside Landscape Character Assessment: Scottish Natural Heritage Review 122; and
- Perth and Kinross Council Local Landscape Designations Review (2014).

Surveys

2.5.3 Site surveys were carried out on 22-23 April 2015 by three landscape architects. During the site surveys, information on landscape features and characteristics was collected, as well as photographs of landscape features and photographs to/from key viewpoints.

Consultation

2.5.4 Consultation has been undertaken with statutory consultees including SNH and PKC as part of a Landscape Forum established for the A9 Dualling programme.

Baseline Conditions - Landscape

Landscape and other Designations

Landscape and other designations that fall within the study area are detailed below and are shown on Figures 8 and 9, as are other designations with relevant heritage or recreational value such as Conservation Areas, Forest Parks and areas of Ancient Woodland.

River Tay (Dunkeld) National Scenic Area

2.5.5 Between Birnam and Dunkeld, the existing A9 lies wholly within the River Tay (Dunkeld) National Scenic Area (NSA). The NSA is characterised by its natural and semi-natural scenery and cultural influences, where the highland features of rivers, straths and haughlands are balanced with farmland,

settlements and managed woodland over hills and across policies and designed landscapes. It includes the settlements of Dunkeld and Birnam and extends north to parts of Craigvinean Forest and the Loch of Lowes. The nine special qualities of the NSA are identified in The Special Qualities of the National Scenic Areas. Scottish Natural Heritage Commissioned Report No.374 (2010) as follows:

1. The beauty of cultural landscapes accompanying natural grandeur;
2. The 'Gateway to the Highlands';
3. Characterful rivers, waterfalls and kettle-hole lochs;
4. Exceptionally rich, varied and beautiful woodlands;
5. The picturesque cathedral town of Dunkeld;
6. Drama of The Falls of Braan and The Hermitage;
7. Dunkeld House policies;
8. Significant specimen trees; and
9. The iconic view from King's Seat.

2.5.6 These Special Qualities can be summarised as follows:

- scenic and cultural landscapes, combining and balancing managed policies, designed landscapes, forest and farmland;
- the picturesque, cathedral town of Dunkeld is referred to as the 'Gateway to the Highlands' and from here the landscape transitions from lowland scenery to highland. This is most noticeable in winter, when low-lying areas of green and brown contrast snow covered summits beyond. Travelling north on the existing A9, road users experience the 'gateway feel' where vistas of Strath Tay open to the Highland hills;
- rivers, lochs and waterfalls are found throughout the NSA and vary greatly, adding to the interest, atmosphere and experience of the landscape. The River Tay meanders in loops with alternating swift glides and long pools, in contrast to the turbulent and tumbling rapids and waterfalls of the River Braan. Scenic views to these rivers and the dramatic falls of the Braan are experienced along walks in The Hermitage GDL. Within the GDL, woodland restricts long distance views and hides and reveals built features including Ossian's Hall, Hermitage Bridge and Ossian's Cave;
- woodland within the NSA consists of a variety of tree species with different management history and age structure, with some woodland set within and adjoining areas of open field and pasture, at times allowing long range views. Notable areas of woodland within the NSA include the Hermitage woodland, Craigvinean Forest, policy woodlands at Craig a barns and Crieff Hill and ornamental planting and policy woodlands within Dunkeld House GDL;
- specimen and ornamental trees not only add to the countryside character and visual variety, they also have historic connections to the area. Significant individual trees and tree groups include those along rivers, beech trees forming The Bishop's Walk at Dunkeld Cathedral as well as the Birnam Oak, Niel Gow's Oak and The Hermitage's Douglas Fir;
- Dunkeld (refer to Image 1) is found at the NSA's centre and given its compact built form, rich cultural and religious history and setting on the River Tay's north haughlands makes it a popular tourist destination; and
- to the south of Dunkeld is the viewpoint at the (King's) Seat, marked by a cairn on the top of Birnam Hill. From the King's Seat, the surrounding landscape is dominated by fertile farmland and pasture on open fields contrasting woodland with views north of the glens and the Highlands. Existing views of the A9 road corridor from the King's Seat are restricted by the intervening landform and vegetation.

Image 1: Aerial photograph of Dunkeld, Dunkeld Bridge, Little Dunkeld, the River Braan crossing and A9 road corridor at the existing Dunkeld Junction

Murthly Castle GDL

2.5.7 The north-western extents of Murthly Castle GDL are located within the study area. The Highland Main Line railway and the existing A9 run through the GDL. The main entrance is from the B9099 in the east, with another entrance from the existing A9 providing access to a few private properties within the western part of the estate. Although the estate is privately owned, publicly accessible core paths are located throughout and towards the periphery of the designation, and there are fragmented views to the existing A9 from paths along the western side of the estate.

2.5.8 The GDL is the setting for numerous listed buildings and structures of notable architectural value, including the A- and B-listed features of the 15th-17th century Castle, The Chapel of St Anthony the Eremite, the Walled Garden, Garden House and the Roman Bridge over Birnam Burn. Several other lodges, gates and bridges are also listed. The Castle is located on a knoll in the centre of the GDL and, although surrounded by woodland, long views can be obtained from it towards the foothills of the Highlands.

2.5.9 The designation consists of over 400 acres of amenity woodland including the Muir of Thorn in the south, which forms the setting of the central listed buildings. The garden between the Castle and the Chapel has a strong north-to-south axial design and some of the oldest trees in the estate are found in the east, along the banks of the River Tay. The extent of policy woodlands along the Tay Valley, and the range, age and size of trees within them, make Murthly Castle GDL particularly notable for its scenic value.

2.5.10 Although located within the western part of the policies, the existing A9 has a limited influence on its key features as visibility to the existing road corridor is fully or partially screened by intervening woodland and roadside vegetation. From the GDL, views are dominated by the parkland and surrounding hills covered in woodland and plantation.

The Hermitage GDL

2.5.11 The Hermitage GDL is located on the western bank of the River Braan, south-west of Dunkeld. This 18th-century rugged picturesque landscape extends over 71 acres and was built as part of the

'sublime' experience of the time. The Hermitage was originally designed as part of the Dunkeld Estate, but is now separate from it.

2.5.12 The designation consists of buildings, paths, woodland and viewpoints within the dramatic Highland gorge. The A- and B-listed structures of Ossian's Hall, Hermitage Bridge and Ossian's Cave are set within woodland, which creates a great sense of seclusion and enclosure and contains fine stands of Douglas firs, including of one Britain's tallest trees. In addition to woodland within the designation, the afforested slopes of Craigvinean Forest and Birnam Wood also contribute to the setting of these features and the overall GDL.

2.5.13 The existing A9 is located towards the eastern edge of the GDL, but has no effect on the key features of the designation, which are located towards the River Braan. Views are generally internalised and those to Ossian's Hall, Hermitage Bridge and Ossian's Cave, accompanied by the sound of the Falls of Braan, dominate the experience along woodland walks. The scenic value afforded by the woodlands of the GDL to the wider landscape of the NSA that it sits within is visually restricted by its secluded valley setting.

Dunkeld House GDL

2.5.14 Dunkeld House is an 18th century formal designed landscape, which was informalised in the 19th century. The GDL lies to the west of Dunkeld and is accessed from the A923 in the east as well as via National Cycle Route (NCR) 77 and designated paths (Photograph 8), which run in a general north-south direction through the designation.

2.5.15 Listed and other architecturally notable buildings/structures are scattered across the GDL and include Dunkeld House (which is currently managed as a hotel), Dunkeld Cathedral, the Terraced Walled Garden and the East Grotto. Buildings are generally orientated to take advantage of views to the River Tay and the policies, with vantage points also found at Bishop's Hill and Stanley Hill. The GDL extends north and west to woodland including that on Craig a Barns and at King's Seat Wood. In addition to woodland, the River Tay is important to the setting of Dunkeld House, which is positioned to take advantage of views towards it. Some of the oldest larch trees in Britain are found within the woodland, and the policies also contain some fine parkland and other specimen trees.

Photograph 8: Cycle path/core path panorama, Dunkeld House Hotel GDL

2.5.16 The existing A9 is located to the west of the GDL, and there are fragmented views to the road corridor from the western extents including from designated paths, although these would be reduced when trees are in leaf. Views from the GDL are generally of the policies and the River Tay, and are dominated by the hills enclosing the Tay and Braan valleys.

Tay Forest Park

2.5.17 Craigvinean Forest, which forms part of the Tay Forest Park, lies immediately to the west of the existing A9 corridor and covers the hill slopes flanking Strath Tay. Craigvinean was one of the first 'Big

Tree Country'[1] forests in Perthshire; one of several planted by the Dukes of Atholl, and is one of Scotland's oldest managed forests. The forest includes numerous trails and some viewpoints overlooking Strath Tay.

2.5.18 Within the study area, the Tay Forest Park extends from the Craigvinean Forest across The Hermitage GDL and south of the settlements of Inver and Little Dunkeld (Figure 8). The existing A9 is located within 500 metres (approx.) of the Tay Forest Park. Views to the forest park are currently restricted by dense woodland within the designation and intervening roadside vegetation and embankment, with more open views to wooded hill slopes at and on approach to the Tay Crossing. Visibility of the existing A9 from the forest park is mainly limited to a few clearings within the forest, with the majority of the trails enclosed by woodland.

Dunkeld Conservation Area

2.5.19 Birnam and Dunkeld Conservation Areas (CAs) both lie within the study area. PKC has produced an appraisal for Dunkeld CA (Image 2) to act as supplementary guidance, but as yet has not published an appraisal for Birnam CA. The locations of both CAs are illustrated on Figure 8 and shown in greater detail on Figure 9.

Image 2: Aerial photograph illustrating the extent of the Dunkeld Conservation Area

2.5.20 The town of Dunkeld is dramatically sited in a bowl-shaped valley on the River Tay, to the north of the river and surrounded by the steep, wooded slopes of Craig a Barns, Crieff Hill, Newtyle Hill, Birnam Hill and Craig Vinean. Much of the town lies within the CA boundary.

[1] Perthshire is known as 'Big Tree Country' by virtue of *'boasting some of Europe's most remarkable trees and woodlands'* and having some of the largest trees in Britain (http://www.perthshirebigtreecountry.co.uk/ accessed 23/07/15).

2.5.21 The Dunkeld CA Appraisal states that, due to the town's historical importance as an early ecclesiastical centre of Scotland, the rich and varied townscape character, the A-listed buildings of Dunkeld Cathedral and Thomas Telford's Dunkeld Bridge, the Dunkeld House Garden and Designed Landscape and the magnificent setting comprising a natural amphitheatre of woodlands and forested hills, the CA is assessed as outstanding.

2.5.22 The Tay River separates the main area of the CA from the existing A9, which lies to the south and west. As the CA is set towards the river and due to dense intervening vegetation, views from the designation to the existing A9 are limited.

Birnam Conservation Area

2.5.23 Birnam is located on the southern bank of the River Tay to the south of Dunkeld and is backed by the steep Birnam Hill to the south and the hills of Craig a Barns, Crieff Hill and Newtyle Hill to the north. These hills and the banks of the River Tay are covered by dense mature woodland, and this scenic setting makes a significant contribution to the character and special qualities of the CA.

Image 3: Aerial photograph illustrating the extent of the Birnam Conservation Area

2.5.24 Birnam CA (Image 3) is bound to the north by the southern bank of the River Tay, to the east by the Birnam Caravan Park, to the south by Birnam Hill and to the west by the Inchewen Burn. The CA is bisected by the existing A9, the two sections of the CA being 'linked' by the minor road underpass at Birnam Glen. The CA incorporates many notable Victorian listed buildings including Birnam House

Hotel, St Mary's Episcopal Church and Dunkeld and Birnam Railway Station in addition to mature trees. Some of these trees are situated on either side of the existing A9.

2.5.25 From southern parts of the CA the existing A9 and vehicles on it are visible, although these views will vary depending on when trees are/are not in leaf. From the northern section of the CA views of the existing A9 and associated traffic are limited.

Tree Preservation Orders (TPOs)

2.5.26 There are no TPOs recorded within 1km of the existing A9 in the PKC area (data received from PKC April 2015). It should be noted however that the Council has the right to consider making a TPO for any tree within a Conservation Area which is proposed to be cut, lopped, topped, uprooted, wilfully damaged or destroyed.

Landscape Character

2.5.27 Landscape character across the study area is shown on Figure 7. Generic SNH Landscape Character Types (LCTs)[2] are keyed, with the location-specific names of individual Landscape Character Areas (LCAs)[3] from both SNH assessments and the A9 Dualling SEA labelled.

Landscape Character Areas

Strath Tay (Lower) LCA

2.5.28 The southern part of the project lies just within the westernmost end of the Strath Tay (Lower) LCA, categorised by SNH as a Lowland River Corridor. The key features are summarised below:

- 'well-defined river corridors in broader lowland landscapes;
- meandering, often incised course through softer sandstones;
- semi-natural woodland on steeper slopes; [and]
- rapids, weirs and mills where harder rocks cross the valley'.

2.5.29 The lower part of the Strath Tay corridor is primarily underlain by sandstones, and the river therefore becomes more meandering than in its upper reaches, occupying a wide flat farmed floodplain near Murthly. Igneous intrusions result in occasional falls and rapids.

2.5.30 Woodland forms an essential component of this part of the LCA, comprising a combination of semi-natural woodland, forestry, farm woodlands, field boundary trees and the policies surrounding Murthly Castle and Dalbeathie House.

2.5.31 South of the river, the existing A9 cuts through the western end of the Murthly policies, with the dense woodland on either side generally containing views. Visibility along the Old Military Road to the north of the river is also often constrained by woodland, with occasional more open aspects.

Lower Highland Glens LCA

2.5.32 The remainder of the existing A9 is located within the Lower Highland Glens LCA as defined in the A9 Dualling SEA. The key features of the Lower Highland Glens LCA are summarised below:

- 'lower sections of the principal Highland glens;
- comparatively large-scale landscapes;
- combinations of upland and lowland attributes;

2 Landscape character assessment produced by SNH has informed the LCAs identified along the existing A9 corridor in the SEA. For consistency, the SEA combines LCAs that overlap in multiple assessments and only makes reference to Landscape Character 'Areas' rather than 'areas', 'types' or 'units'.
3 LCA names are derived from the SEA and/or Perth & Kinross Council's Landscape Supplementary Guidance.

- broad floodplains, often with meandering rivers, interspersed with narrower, gorge-like sections where harder rocks cross the glens;
- the most settled parts of the glens;
- farmland on valley floor and slopes;
- substantial and varied woodland cover; and
- influence of large estates, castles and Victorian development'.

2.5.33 Woodland is a key characteristic of the LCA and extensive managed areas are mainly associated with designed landscapes. Broad-leaf semi-natural woodland is found on steep slopes with coniferous areas on valley slopes. The interplay of designed landscapes, farmland and woodland make up the rich character of the LCA, in contrast to the adjoining lowland and upland landscapes. A network of hedges, hedgerow trees and stone walls adds variety and texture to the patchwork of farmland on the valley floor, although in parts, these features are fragmented and replaced with less visible timber post-and-wire fencing.

2.5.34 The LCA is the most settled of the Highland glens, and historical communication routes to the Highlands can be found, including General Wade's Military Road. Roads and the Highland Main Line railway follow a similar course to these historical routes, including the existing A9. The existing A9 is set towards the glen and woodland and roadside vegetation reduces visibility beyond the immediate road corridor, with the exception of the Tay Crossing, where it appears as a prominent feature.

2.5.35 From within the study area, particularly from the edges of settlements and parallel designated paths and roads, there are views to vehicles on the existing A9, although these views are limited when intervening trees are in leaf. Due to the high speed of vehicles along this road, views are generally focused along the road corridor towards the Highlands and enclosed by dense woodland.

Birnam/Dunkeld LCA (subsidiary)

2.5.36 It is suggested in the SEA that the variation within the Lower Highland Glens LCA is such that it could be divided into three subsidiary character areas – Birnam/Dunkeld, Tay Valley and Tummel Valley. These sub-areas are not mapped in the SEA, however, it is clear that the majority of the existing A9 road corridor within which the project is located lies within the Birnam/Dunkeld sub-area, which is described as having 'a more enclosed character with little agricultural land and the heavily wooded valley slopes dominating the landscape experience'.

Tay Valley LCA (subsidiary)

2.5.37 The Tay Valley sub-area is described in the SEA as an 'open strath with large agricultural fields' and begins north of the Tay Crossing. The northern end of the project extends to the southern end of this sub-area but remains within a relatively enclosed part of the strath, more in keeping with the Birnam/Dunkeld sub-area.

Landscape Elements and Features

Landform and Drainage

2.5.38 The study area is characterised by the varied landscape of the Tay valley. The River Tay meanders through the glen and is transitional in character as it flows between highland and lowland landscapes. Visibility along the glen is directed by the surrounding rugged and craggy top hills and views to the Highlands further north create a strong sense of enclosure. Valley sides are adjoined by gradually increasing hills covered in dense woodland that extend to more prominent peaks, which are characteristic of the Highlands.

2.5.39 Roads, including the existing A9 and A984, and the Highland Main Line railway run parallel to the River Tay, with the designed landscapes of Murthly Castle, Dunkeld House and The Hermitage oriented to take advantage of views to the rivers Tay and Braan. Waterfalls and tributaries of both

rivers and elevated lochs drain towards the valley and are important features that connect designed landscapes to the surrounding natural and perceived natural landscape.

Land-cover and Vegetation

2.5.40 Land-cover within the study area comprises fields and settlements in valley areas, and dense woodland within designed landscapes and on hill slopes. The enclosing landform and vegetation directs views along the strath towards rugged hills, with northbound road users of the existing A9 experiencing views towards the Highlands, particularly from the northern edge of the study area.

2.5.41 Extensive and varied woodlands and forests are found within and surrounding the study area. These areas were developed by the Forestry Commission and by private landowners including the 3rd Duke of Atholl, who created Craigvinean Forest, the first 'Big Tree Country' forest. Craigvinean Forest is located to the west of the study area and is formed by a number of woods, consisting of mainly beech and Scots pine on eastern hill slopes and rocky peaks. Widespread woodland and forest is mirrored to the east of the study area, across hill slopes and summits and surrounding elevated lochs. Much of this is designated in the Ancient Woodland Inventory (AWI), and listed as ancient or long-established, with woodland identified in the Native Woodland Survey of Scotland (NWSS) also being widespread, and the predominance and maturity of woodland along the existing A9 is a key landscape characteristic of the study area.

2.5.42 Although managed, these areas of woodland form a perceived natural setting as they have been successfully integrated into the landscape. In contrast, farmland is found along the Tay Valley and designed landscapes add to the rich character of the area. In addition to woodland and forestry, riverine and roadside vegetation creates a sense of enclosure within the study area and reduces visibility from settlements to road corridors, including the existing A9 and the A984, although seasonal changes in vegetation alters visibility of roads and traffic.

Settlement and Built Elements

2.5.43 The settlement within the study area consists of small towns, scattered individual houses and farmsteads, which are generally accessed by the existing A9 and the A984. The main settlements include Dunkeld, Little Dunkeld, Birnam and Inver, which are located on either side of the River Tay. Built and natural features connect the area to its rich history, religion and literature including Dunkeld Cathedral, which once housed the bones of St Columba and was the location of the Battle of Dunkeld, and The King's Seat on Birnam Hill, which was popularised in Shakespeare's Macbeth.

2.5.44 In addition to settlements, the main built elements within the study area are the existing A9 and A984 roads and the Highland Main Line railway. Although visible from properties and GDLs, views to/from these elements are partly screened by intervening dense vegetation.

2.6 Visual

Study Area

2.6.1 The study area extends to an area of up to 5km in distance from the existing A9.

Approach to Determination of Baseline Conditions

Desk-based Assessment

2.6.2 Baseline information was collected through a desk study, including review of the following information sources:

- 1:5,000, 1:10,000, 1:25,000 and 1:50,000 Ordnance Survey (OS) maps;
- web-based photography;
- aerial photography;

- Jacobs GIS datasets (obtained through consultation with relevant stakeholders);
- A9 Dualling Programme. Strategic Environmental Assessment (SEA) Environmental Report and Appendix F (Strategic Landscape Review) of the Addendum (Transport Scotland, 2014b);
- Perth and Kinross Council: Landscape Supplementary Guidance (2015);
- Perth and Kinross Council: Highland Area Local Plan (2000);
- Perth and Kinross Council Local Development Plan (2012);
- TAYplan: Scotland's SusTAYnable Region. Strategic Development Plan (2012 – 2032); and
- Tayside Landscape Character Assessment: Scottish Natural Heritage Review 122 (2012).

Site Surveys

2.6.3 Site surveys were carried out on 22-23 April and 17 September 2015 by two landscape architects. Information was collected using a standardised checklist, as well as photographs of landscape features that may be physically affected and photographs to/from a selection of key viewpoints.

Consultation

2.6.4 Consultation has been undertaken with statutory consultees including SNH and PKC as part of a Landscape Forum established for the A9 Dualling Programme. This included identification of viewpoint locations.

Baseline Conditions - Visual

Visual Receptors

2.6.5 Visual receptors within the study area comprise residents of small settlements and scattered clusters of residential properties located on the valley floor in addition to road users and cyclists as well as visitors to places of interest. From many locations, views of the existing A9 are partially restricted by mature mixed woodland bordering the road corridor; however, views of the carriageway are possible from elevated locations or where the woodlands are thinned.

Viewpoint Locations

2.6.6 Following a desk-based assessment, a draft list of potential viewpoints within the study area was compiled. A selection of these were then visited on-site in order to confirm or revise locations as necessary and to record and photograph the existing baseline views.

2.6.7 Eighteen viewpoints were identified within the study area. These viewpoints are considered to be representative of the range of visual receptors at publicly accessible locations in the study area, and are located at different distances, directions and heights in accordance with good practice guidance.

2.6.8 The 18 representative visual receptors and viewpoints selected for assessment within the study area are listed in Table 9 and shown on Figure 10. Photographs of a selection of the viewpoints that were accessible at the time of the site surveys are provided in Figures 11 to 13.

2.6.9 Table 9 provides a summary of the representative receptors.

Table 9: Representative Viewpoints

Representative Viewpoint	Receptor Type
1: West Entrance to Murthly Castle Garden and Designed Landscape	residents, recreational users accessing the private road
2: A9 Layby near Ringwood	road users
3: A984, near Newtyle Farm	road users

Representative Viewpoint	Receptor Type
4: B867/NCR 77	road users, cyclists
5: South-west of Newtyle Hill	walkers
6: Perth Road and Core Path, Birnam	residents, road users, walkers, cyclists
7: Footbridge at Dunkeld and Birnam Station	rail users
8: Telford Gardens, Little Dunkeld	residents
9: Stanley Hill Core Path and NCR 77, Dunkeld	walkers, cyclists, visitors
10: Perthshire Tourist Route	residents, road users
11: Inver Bridge Caravan site	road users, visitors
12: Core Path and car park off A822, south of Inver	walkers
13: Core Path, northern edge of Inver	residents, walkers
14: Car park at The Hermitage Garden and Designed Landscape	visitors
15: Core Path west of Dunkeld House Hotel Garden and Designed Landscape	walkers, visitors
16: Core Path and NCR 77, south of Tay Crossing	walkers, cyclists
17: Core Path and NCR 77, north of Tay Crossing	walkers, cyclists
18: B898 and NCR77, Inchmagrannachan Farm	residents, road users, cyclists

Residential Receptors

2.6.10 The main settlements within the study area comprise the towns of Dunkeld and Birnam, which lie close to each other, located on the north and south banks of the River Tay respectively. The village of Inver lies to the west of Birnam and the hamlet of Inchfield to the north of the study area. In addition to these settlements, scattered clusters of properties and individual farmsteads are located on the lower hill slopes and along the valley floor.

Dunkeld (Viewpoint 9)

2.6.11 The town of Dunkeld lies on the northern bank of the River Tay, with the adjacent Little Dunkeld set across the river on the southern bank. The town is set within mature woodlands, which cover the surrounding hills and line the river valley. It contains a historically important cathedral, and the renowned 19th-century Dunkeld Bridge (designed by Thomas Telford) forms an important crossing point across the River Tay.

2.6.12 The existing A9 lies to the south of the settlement at a distance of approximately 0.5km. Views from the town are generally short-distance and internal in nature with more long-distance views obtained from locations close to the river, where attention is focussed upon the wooded hills surrounding the town and linear views along Strath Tay. Views of the existing A9 road corridor are generally screened by mature woodland that lines the banks of the River Tay.

Birnam and Little Dunkeld (Viewpoints 6 and 8)

2.6.13 The town of Birnam lies on the southern bank of the River Tay to the south of Dunkeld, adjacent to Little Dunkeld. It is bounded by the steep wooded Birnam Hill, which lies immediately to the south. The existing A9 and the Highland Main Line railway together form a similarly aligned transport corridor delineating the southern boundary of the town, with Dunkeld and Birnam Railway Station located at the base of Birnam Hill.

2.6.14 Views from the town are generally short in range. Longer-distance views can be obtained close to the river, where views are focussed upon the wooded hills surrounding the town and linear views along the River Tay. The A9 runs along the southern edge of the settlement, and is set on embankment adjacent to Birnam and in cutting adjacent to Little Dunkeld. Views towards the A9 from the town are generally screened by landform, buildings and roadside trees.

Photograph 9: View looking south east towards the existing A9 from Perth Road, Birnam (Viewpoint 6)

Inver (Viewpoints 11 and 13)

2.6.15 Inver is a small village located on a low-lying wooded strip of land between the southern bank of the River Tay and the northern bank of the River Braan. The existing A9 corridor runs to the north of the village on embankment at a distance of .approximately 0.1km, with views of the existing A9 largely screened by the intervening roadside woodland, although some properties on the northern edge of the settlement experience visibility of the road corridor.

Inchfield and Inchmagrannachan Farm (Viewpoint 18)

2.6.16 Inchfield is a linear hamlet and Inchmagrannachan Farm and holiday cottages are located to the north of the study area and set along the western side of the B898. The properties are orientated eastwards within an open landscape, and long-distance views are focussed across Strath Tay. Views of traffic on the existing A9 are in part filtered or screened by roadside vegetation. The Tay Crossing is also obliquely visible from the settlement, seen within the setting of the wooded valley to the south.

Other residential receptors (Viewpoints 1 and 10)

2.6.17 Scattered individual residential properties and farms are also found within the study area. These properties are generally oriented to take advantage of long-distance views along and across Strath Tay.

2.6.18 Deans Bank, Roman Bridge Cottage, Ringwood Cottage, Ringwood and Bee Cottage are properties within and to the west of Murthly Castle Garden and Designed Landscape (GDL) that are set within woodland, which reduces their existing visibility of the A9. On the northern bank of the Tay close to Dunkeld, the properties of Clunie Cottage, Eastwood and Eastferry also have views of the existing A9 restricted by intervening woodland, whilst Haughend – which lies above the Old Military Road - experiences some filtered views towards the existing A9 route corridor.

2.6.19 Properties at Ladywell and Ladywell Cottage, which lie to the south-west of Little Dunkeld, are set within a more open landscape.

Road Users

A822 (Viewpoint 10)

2.6.20 The A822 follows the historic route of the Old Military Road and the Perthshire Tourist Route along Strathbraan and joins the existing A9 0.3km to the west of Little Dunkeld. The route rises from the Tay valley and passes through farmland set to pasture, which allows for largely open views. However, on the section of the A822 closest to the existing A9 route corridor from the rail bridge to Ladywell, the undulating landform limits views towards the existing A9.

A923

2.6.21 The A923 is the main route from Dunkeld to Blairgowrie, and joins the existing A9 at Little Dunkeld. The route crosses the River Tay at Dunkeld Bridge, passes through the centre of Dunkeld, and continues uphill through woodland and farmland lined with roadside trees. Filtered views of the A9 may be obtained from some locations close to the river by southbound travellers, but in general views towards the existing A9 from the A923 are screened by intervening vegetation.

A984 (Viewpoint 3)

2.6.22 The A984 runs east from the centre of Dunkeld along the northern bank of the River Tay to Caputh. From Dunkeld to Newtyle the land to the south of the A984 is heavily wooded and thus views of the existing A9 are screened by the intervening vegetation. To the east of Newtyle the landscape becomes more open, but here views are limited by the roadside vegetation bounding the A9.

Photograph 10: View looking south west towards the existing A9 from the A984 near Newtyle Farm (Viewpoint 3)

B867 (Viewpoint 4)

2.6.23 Prior to construction of the existing A9, the B867 was the original main route between Perth and Dunkeld, and runs through the Pass of Birnam. The road passes under the Highland Main Line railway bridge to the north of the Pass, and then runs parallel with both the railway to the south and the existing A9 to the north for approximately 2km until terminating at a wide at-grade T-junction with the existing A9, 0.4km to the south of Birnam. The B867 is edged by woodland and views to both the rail line and the existing A9 are filtered by trees.

B898 (Viewpoint 18)

2.6.24 The B898 joins with the existing A9 immediately to the south of the Tay Crossing within the northern part of the study area, and continues north along the western bank of the River Tay passing the linear hamlet of Inchfield and Inchmagrannachan. The road follows the flat River Tay floodplain and initially passes through woodland at its southern end, which opens out to fields set to pasture surrounded by low wooded hills. Views to the existing A9 are partial and glimpsed through intervening vegetation, with the Tay Crossing seen in oblique views along Strath Tay to the south.

Minor roads (Viewpoints 6 and 12)

2.6.25 The Old Military Road runs parallel to the A984 within and to the east of Dunkeld and continues along the route to join the A-road. It is enclosed by dense woodland and roadside trees along the majority of the road and views towards the existing A9 are limited by intervening vegetation on either side of the River Tay. The Old Military Road is also located between Little Dunkeld and Inver, and follows the route of the A822 and Perthshire Tourist Route, as mentioned above.

2.6.26 Perth Road runs through Birnam and Little Dunkeld and is enclosed by buildings within these settlements, roadside vegetation, dense woodland and the surrounding hills. Views along the road are directed by the built form and vegetation towards more distant hills in the west and visibility of the existing A9 is limited.

Rail Users

Highland Main Line (Viewpoint 7)

2.6.27 The Highland Main Line railway follows a broadly similar route to the existing A9, running in parallel with it and alternating to the north and south of the road corridor through the study area.

2.6.28 From the Pass of Birnam to the foot of Creag na Buire, the two routes are separated by a strip of dense woodland, which restricts views. North of this point, the Highland Main Line railway and existing A9 run parallel and in close proximity over approximately 2km-long section passing the settlements of Birnam and Little Dunkeld, which are served by Dunkeld and Birnam Station (Category A Listed Building). Over this stretch of the shared route corridor, the proximity of the two routes ensures that there are clear views of the existing A9 for rail travellers and vice versa.

2.6.29 To the north of Little Dunkeld the routes then diverge, with the Highland Main Line railway taking a route to the south of Inver, passing over the River Braan and through a tunnel that cuts under the existing A9. The two routes then once again run closely parallel following the western side of the Tay valley, with the existing A9 on the more elevated route, until just south of the Tay Crossing. The route corridor is shared over a section of approximately 2km, allowing rail passengers to obtain mostly undisrupted views of the A9.

Photograph 11: View looking north towards the existing A9 from the Dunkeld and Birnam Station Footbridge (Viewpoint 7)

Cyclists on Designated Routes

National Cycle Network Route 77 (NCR 77) (Viewpoints 4, 9, 15, 16, 17 and 18)

2.6.30 NCN Route 77 runs between Dundee and Pitlochry via Perth, and is known as the Salmon Run route. In the southern part of the study area the route follows the B867 north from the Pass of Birnam to the junction with the existing A9. Route 77 then changes to an off-road cycle path, which runs adjacent to the existing A9 and Highland Main Line railway and passes underneath the existing A9 at Birnam Glen, turning east to follow the A923 across Dunkeld Bridge. At Stanley Hill in Dunkeld the cycle route leaves the main road and follows an off-road path through Cathedral Park and downhill to the grounds of the Dunkeld House Hotel. The route then skirts the east bank of the River Tay on an off-road path, surrounded by dense woodland, and reaches the northern boundary of the study area by passing underneath the Tay Crossing.

2.6.31 Direct views to the existing A9 are obtained from NCR 77 along a short section that runs adjacent to the existing A9, from the junction with the B867 to the turning for Birnam. Views are open, with the sparse roadside vegetation allowing cyclists clear views of the main carriageway and traffic. Over much of the rest of the route, views to the existing A9 are filtered by intervening vegetation either surrounding the cycle route or by the roadside trees adjacent to the A9. In the northern section of the route, direct views of the Tay Crossing are obtained by users of NCN Route 77 as it approaches the bridge before passing underneath.

Photograph 12: View looking north west towards the existing A9 from NCR 77, south of the Tay Crossing (Viewpoint 16)

Regional Cycle Route 83 (RCR 83)

2.6.32 The RCR 83 runs from the north of Dunkeld to beyond the northern extents of the study area. It is in part located with Dunkeld House (GDL) and the majority of the RCR runs through dense woodland, limiting visibility beyond the route extents.

Walkers on Designated Routes (Viewpoints 6, 9, 12, 13, 15, 16 and 17)

2.6.33 Within the study area, core paths generally coincide with local roads and tracks, and cover the hills and the banks of the River Tay and River Braan. Core paths on hill slopes within the study area largely pass through woodland, where views of the existing A9 are therefore limited. Similarly, views from the core paths that follow the banks of the River Tay are generally restricted, with glimpsed views to the A9 route corridor from some locations that are more open in nature.

2.6.34 Direct views towards the existing A9 are obtained from the core path that runs adjacent to the A9 from the junction with the B867 to the turning for Birnam. From this path views are open, allowing walkers to experience clear views of the main carriageway. Direct views of the existing A9 will also be experienced from some locations by walkers on the core paths surrounding Inver.

2.7 Cultural Heritage

Study Area

2.7.1 The study area for the Cultural Heritage baseline which considers archaeological remains, historic buildings and historic landscapes, extends 500m in all directions from the existing A9. The location of the study area is shown on Figures 14 to 17.

Approach to Determination of Baseline Conditions

2.7.2 To establish the cultural heritage baseline the following sources of information were consulted:

- Historic Environment Scotland (HES)[4] for information on designated sites comprising Scheduled Monuments, Listed Buildings, Conservation Areas, sites included on the Inventory of Gardens and Designed Landscapes in Scotland, and sites included on the Inventory of Historic Battlefields;
- Royal Commission on the Ancient and Historic Monuments of Scotland (RCAHMS). Records held by the RCAHMS were accessed through the PASTMAP and Canmore websites;
- Historic Landuse Assessment undertaken by RCAHMS;
- the Perth and Kinross Heritage Trust's Historic Environment Record (HER);
- historical mapping available online; and

[4] In October 2015 Historic Scotland merged with the Royal Commission on the Ancient and Historical Monuments of Scotland to form Historic Environment Scotland. The title Historic Scotland has been retained for references to bibliographic sources published prior to October 2015.

- for Ladywell Cropmarks (Asset 49) and Inchmagrannachan Cropmark (Asset 190), aerial photographs from the National Collection of Aerial Photography were reviewed on the 28 November 2014.

2.7.3 A site inspection of Newtyle Standing Stone, Scheduled Monument (Asset 8), Dunkeld and Birnam Station including Footbridge, Category A Listed Building (Asset 26), The Lodge, Birnam, Category B Listed Building (Asset 19), Elsey Cottage, Category C Listed Building (Asset 17), Birnam Bank Cottage, Category C Listed Building (Asset 18) and Birnam Bank House, Category C Listed Building was undertaken on 6 July 2015.

2.7.4 Based on the guidance provided in HA 208/07 (Highways Agency et al., 2007a) cultural heritage was considered under the sub-topics of 'Archaeological Remains', 'Historic Buildings' and 'Historic Landscape'. To determine the importance of all three sub-topics, an assessment of the value of each heritage asset was undertaken on a six-point scale of Very High, High, Medium, Low, Negligible and Unknown, this was based on professional judgment and guided by the criteria provided in HA 208/07 as presented in Table 10.

2.7.5 The results of the cultural heritage baseline have also been informed by information provided in Section 2.5 (Landscape) and Section 2.6 (Visual) in relation to landscape and visual receptors.

Table 10: Criteria to assess the value of archaeological remains, historic buildings and historic landscape types

Value	Criteria
Archaeological Remains	
Very High	World Heritage Sites (including nominated sites). Assets of acknowledged international importance. Assets that can contribute significantly to acknowledged international research objectives.
High	Scheduled Monuments (including proposed sites). Undesignated assets of schedulable quality and importance. Assets that can contribute significantly to acknowledged national research objectives.
Medium	Designated or undesignated assets that contribute to regional research objectives.
Low	Designated and undesignated assets of local importance. Assets compromised by poor preservation and/or poor survival of contextual associations. Assets of limited value, but with potential to contribute to local research objectives.
Negligible	Assets with very little or no surviving archaeological interest.
Unknown	The value of the site has not been ascertained.
Historic Buildings	
Very High	Structures inscribed as of universal importance as World Heritage Sites. Other buildings of recognised international importance.
High	Scheduled Monuments with standing remains. Category A Listed Buildings. Other listed buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the category. Conservation Areas containing very important buildings. Undesignated structures of clear national importance.
Medium	Category B Listed Buildings. Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical associations. Conservation Areas containing buildings which contribute significantly to their historic character. Historic Townscape or built-up areas with important historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).

Value	Criteria
Low	Category C Listed Buildings. Historic (unlisted) buildings of modest quality in their fabric or historical association. Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).
Negligible	Buildings of no architectural or historical note; buildings of an intrusive character.
Unknown	Buildings with some hidden (i.e. inaccessible) potential for historic significance.
Historic Landscape	
Very High	World Heritage Sites inscribed for their historic landscape qualities. Historic landscapes of international value, whether designated or not. Extremely well preserved historic landscapes with exceptional coherence, time-depth, or other critical factors.
High	Designated historic landscapes of outstanding interest, including Inventory Gardens and Designed Landscapes and Inventory Battlefields. Undesignated landscapes of outstanding interest. Undesignated landscapes of high quality and importance, and of demonstrable national value. Well preserved historic landscapes, exhibiting considerable coherence, time-depth or other critical factors.
Medium	Designated special historic landscapes. Undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value. Averagely well preserved historic landscapes with reasonable coherence, time-depth or other critical factors.
Low	Robust undesignated historic landscapes. Historic landscapes with importance to local interest groups. Historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.
Negligible	Landscapes with little or no significant historical interest.

2.7.6 Scheduled Monuments are by definition of national importance and are protected by law under the Ancient Monuments and Archaeological Areas Act 1979 (as amended by the Historic Environment (Amendment) (Scotland) Act 2011). It is a criminal offence to damage a Scheduled Monument, and consent must be obtained from the Scottish Ministers before any works affecting a Scheduled Monument may take place.

2.7.7 Listed Buildings are protected under the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 (as amended by the Historic Environment Scotland Act 2011), and are recognised to be of special architectural or historic interest. Under the Act, planning authorities are instructed to have special regard to the desirability of preserving a Listed Building, its setting, or any features of special architectural of historic interest which it possesses (Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997, Section 66(1)). Designation as a Listed Building confers additional controls over demolition and alteration through the requirement for Listed Building Consent to be gained before undertaking alteration or demolition.

2.7.8 The Historic Environment (Amendment) (Scotland) Act (2011) made it a statutory duty for Historic Scotland (now Historic Environment Scotland) to compile and maintain an Inventory of Historic Battlefields on behalf of Scottish Ministers. While listing on the Inventory does not confer statutory designation on an Historic Battlefield, protection is provided under schedule 5 paragraph 5(5) of The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013, whereby local authorities are required to consult Scottish Ministers, and thereby Historic Environment Scotland on development proposals which may affect a historic battlefield.

2.7.9 The Historic Environment (Amendment) (Scotland) Act (2011) made it a statutory duty for Historic Scotland to compile and maintain an Inventory of Gardens and Designed Landscapes on behalf of Scottish Ministers. While listing on the Inventory does not confer statutory designation on a Garden or Designed Landscape, protection is provided under schedule 5 paragraph 5(4) of The Town and

Country Planning (Development Management Procedure) (Scotland) Regulations 2013, whereby local authorities are required to consult Scottish Ministers, and thereby on development proposals (other than householder development) which may affect a garden or designed landscape.

Consultation

2.7.10 Consultation regarding cultural heritage assets was carried out with both HES and Perth and Kinross Heritage Trust.

2.7.11 In a letter of 23 March 2015, Jacobs requested from Historic Environment Scotland information on any additional sites within 500m of the existing A9 that were not included in their online dataset. In a letter of 10 April 2015, HES identified newly designated assets or assets whose designation was being reviewed; however, none of these assets are relevant to this project.

2.7.12 HER data was received from the Perth and Kinross Heritage Trust on 25 March 2015.

Baseline Conditions – Cultural Heritage

Summary

2.7.13 A total of 210 cultural heritage assets have been identified within the study area, as shown in Table 11. Of these, 42 are archaeological remains, 153 are historic buildings and 15 are historic landscape types (HLTs), as summarised in the final column of Table 11. Further information on each cultural heritage asset is detailed in the accompanying gazetteer (Appendix D: Cultural Heritage Assets Gazetteer) and on Figures 14 to 17.

Table 11: Summary of Cultural Heritage Asset Values within the Study Area

Sub-topic	Unknown	Negligible	Low	Medium	High	Very High	Total
Archaeological Remains	0	21	8	9	4 (4 Scheduled Monuments)	0	42
Historic Buildings	1	0	84 (59 Category C Listed Buildings)	64 (59 Category B Listed Buildings)	4 (4 Category A Listed Buildings)	0	153
Historic Landscape Types	0	5	5	1	4 (1 Inventory Battlefields and 3 Gardens and Designed Landscapes)	0	15
TOTAL	1	26	97	74	12	0	210

High Value Archaeological Remains

2.7.14 Of the 42 archaeological remains which have been identified within the study area, four are designated as Scheduled Monuments, and assessed to be of high value, as identified below:

- Newtyle Standing Stones (Asset 8) (approximately 430m from the existing A9);
- Torrvald Farmstead (Asset 85) (approximately 200m from the existing A9);
- Little Dunkeld Graveyard, Adam and Eve Tombstones (Asset 93) (approximately 290m from the existing A9); and
- King's Seat Fort (Asset 187) (approximately 450m from the existing A9).

2.7.15 Dunkeld Cathedral (Asset 116), which is both a Scheduled Monument and Category A Listed Building, is considered as part of the Historic Buildings sub-topic.

2.7.16 Newtyle Standing Stones (Asset 8) comprises a pair of standing stones located to the north-east of and visible from the A984. At the foot of a steep slope and to the rear of a terrace they overlook the

River Tay. Standing stones were constructed throughout much of prehistory, but the majority are thought to have been erected in the Neolithic and Bronze Age periods (3000 BC to 1000 BC) and form part of the larger megalithic culture that thrived throughout much of north-west Europe. The exact function of these monuments is not known but interpretations vary from territorial markers to ritual locations. In consideration of its designation and its important contribution to our knowledge and understanding of prehistoric ritual activity the value of this asset has been assessed as high.

2.7.17 Torrvald Farmstead (Asset 85) is a Scheduled Monument which was first documented in 1566 but is probably of medieval origin (AD 900 to AD 1500). The farmstead once stood in open farmland within the River Tay valley below Craigvinean Hill but after a major programme of tree planting covered Craigvinean Hill and the farmland below it in woodland, Torrvald Farmstead was cleared. In consideration of its designation, good state of preservation and potential to contribute to our knowledge and understanding of medieval and post medieval settlement the value of this asset has been assessed to be high.

2.7.18 The Adam and Eve Tombstones (Asset 93) are located within Little Dunkeld churchyard. Dated AD 1744 and AD 1762, they represent rare examples of tombstone carvings depicting the couple standing either side of the apple tree with entwined snake. Throughout the 18th century, farmers and tradesmen set up elaborate kirkyard memorials. A popular theme of the many carved emblems and epitaphs representing the teachings of the church included Adam and Eve's Temptation and their Expulsion from the Garden. There are only approximately 60 similar stones in Scotland (Willsher, 1992) and based on their rarity, their designation as a Scheduled Monument and in consideration of their important contribution to our knowledge and understanding of 18th century folk art sculpture the value of this asset has been assessed to be high.

2.7.19 Defined by four concentric ramparts and terraces enclosing the central walled citadel, King's Seat Fort (Asset 187) is a later prehistoric or early historic hillfort or defended enclosure located on a low summit at 150m Ordnance Datum to the north of the River Tay. It is likely that this position was chosen for its commanding views over the Tay valley to the north-west, south and east. These views make a significant contribution to our understanding of the monument. Defended enclosures of this type were in use from the Iron Age to the Early Historic period (800 BC to AD 900) and as well as defensive structures they had wider social and economic functions. In consideration of its designation as a Scheduled Monument, and as a good example of monuments of this type, the value of this asset has been assessed to be high.

Medium Value Archaeological Remains

2.7.20 The sites of three former ecclesiastical buildings have been identified within Dunkeld. Believed to be located within the confines of Dunkeld Cathedral, the Chapel of St Ninian's (Asset 119) has been assessed to be of medium value as, although its exact location is unknown, it has the potential to increase our knowledge and understanding of the development of Dunkeld Cathedral. Holy Trinity Chapel (Asset 109) and a Friary (Asset 114) are both thought to be located within Dunkeld between the high street and the River Tay. While their exact location is unknown, they have the potential for increasing our knowledge and understanding of local medieval ecclesiastical activity and have been assessed to be of medium value.

2.7.21 The site of the Bishops Tower House (Asset 107) is located to the west of the Cathedral precinct. The building has long since been removed and its location landscaped as part of the development of the designed landscape at Dunkeld House. Although construction was abandoned in 1842 the foundations of Dunkeld House, (Asset 178) commissioned by the 4th Duke of Atholl, can still be discerned. The remains of a 17th century structure interpreted as a tower have been identified as part of a volunteer lead archaeological excavation (Asset 185) within the grounds of the former Dunkeld House. While these assets are poorly preserved, based on their potential to increase our knowledge and understanding of the development of Dunkeld as a religious administrative centre and Dunkeld's association with the Dukes of Atholl, Assets 107, 178 and 185 have been assessed to be of medium value.

2.7.22 Unlike modern hospitals, medieval hospitals were more akin to hostels and alms houses. The site of St George's Hospital (Asset 148) once stood on the corner of Cathedral Street and High Street in

Dunkeld, it had gone out of use by 1750 when it was demolished. The site of Dalpowie Hospital (Asset 5) is believed to be of late 18th century origin, but by 1854 the Ordnance Survey 1st edition map depicts but does not name a building on the site as a hospital. While any remains associated with these assets are likely to be poorly preserved, both hospital sites have been assessed to be of medium value having the potential to increase our understanding and knowledge of the development of institutions associated with Dunkeld as an ecclesiastical centre and later medical practice.

Low Value Archaeological Remains

2.7.23 Two further assets associated with transport provide evidence for early crossing points of the River Tay. Asset 105 is an early 16th century bridge while Asset 99 is the location of the Dunkeld to Inver ferry crossing which operated until 1808. While both assets provide evidence of the local importance of Dunkeld and Inver as a crossing point of the River Tay, based on their poor state of preservation or lack of material remains the value of these assets has been assessed to be low.

2.7.24 The site of Dunkeld Gaol (Asset 111) and Dunkeld windmill (Asset 104) have the potential for increasing our knowledge and understanding of early civic and commercial activity within the settlement of Dunkeld and have been assessed to be of low value. At the site of Birnam Gas Works (Asset 11) there remains the potential for the survival of features that could increase our knowledge of local industrial archaeology and consequently the value of this asset has been assessed to be low.

2.7.25 The cropmark sites at Ladywell (Asset 49) and Inchmagrannachan (Asset 190) are the remains of track ways associated with the construction of the Highland Main Line Railway, and a cropmark of unknown origin that does not appear to form coherent structures and may be geological in origin. Both identified from aerial photographs. They have been assessed to be of low value, the first as it may expand our knowledge and understanding of 19th century railway construction, and the second in consideration of its uncertain provenance.

Negligible Value Archaeological Remains

2.7.26 The 18th century Dunkeld to Inverness Military Road (Asset 192) was constructed in response to the 1715 Jacobite rebellion. As remains of this earlier road may survive within later estate tracks, the value of this asset has been assessed to be medium. While the Coupar Angus to Amulree Military Road (Asset 101) dates to the same period, any associated remains are likely to have been damaged or removed by later road construction on the same alignment and therefore the value of this asset has been assessed to be low. It is likely that later road construction has wholly or partially removed archaeological remains associated with two further non-military post-medieval roads (Assets 30 and 40) and these assets have been assessed to be of negligible value.

2.7.27 Eleven findspots have been identified within the survey area, mainly coins and other metal objects they represent a selection of unstratified material culture associated with Dunkeld, Little Dunkeld, Birnam and Inver (Assets 82, 83, 92, 97, 102, 106, 118, 122, 125, 126 and 147). As these finds were unstratified, their potential to contribute to our knowledge and understanding of the development of these settlements is limited, and they have been assessed as negligible value. Other recorded assets include a fragment of a Cross Slab (Asset 130) the location of which is unknown and a set of wrought iron gates now housed in a museum collection (Asset 170). Due to their limited contribution to our knowledge and understanding of the development of cross slab sculpture, and the townscape of Dunkeld they have been assessed as negligible value.

2.7.28 Asset 498, the location of now abandoned 20th century allotments, and Asset 499 a reference to Dykes, drystone or turf walls forming a linear barrier are located within The Hermitage designed landscape. Given their poor preservation and limited time depth these assets have been assessed to be of negligible value.

2.7.29 The Mercat Cross in Dunkeld (Asset 168) was removed at the turn of the 19th century, and the now lost Deans Cross (Asset 12), is believed to have been erected by one of the deans of Dunkeld near Newtyle (now Deanscross) Cottage. Given the lack of material remains these assets have been assessed to be of negligible value.

2.7.30 A slate quarry at Newtyle (Asset 9) has an associated building marked on the 1867 Ordnance Survey map as 'ruin', and a quarry at The Hermitage is depicted on the 1st edition Ordnance Survey map. They are unlikely to contribute greatly to our knowledge and understanding of the local 19th century minerals industry and have been assessed to be of negligible value.

Historic Buildings

2.7.31 One hundred and fifty-three historic buildings have been identified within the study area. Of these, four are designated as Category A Listed Buildings and therefore assessed to be of high value, 59 are Category B Listed Buildings, 59 are Category C Listed Buildings and two are Conservation Areas. The remaining 29 buildings are undesignated.

2.7.32 Of the four Category A Listed Buildings assessed to be of high value, three are related to transport, the Roman Style Bridge (Asset 4) over Birnam Burn, Dunkeld Road Bridge (Asset 100), and Dunkeld and Birnam Station (Asset 26). The setting of Dunkeld and Birnam Station includes the public forecourt consisting of the ornamental front porch and carpark (Photograph 13). Originally the station would have been linked to Birnam by Station Road, but this connection was severed by the construction of the existing A9. Based on their designation, historical associations, often with named architects, engineers or landowners and high quality design and fabric, the value of these assets has been assessed to be high.

2.7.33 Dunkeld's early growth as a settlement is linked to its development as a focus of medieval pilgrimage and as a centre of ecclesiastical administration. Dunkeld Cathedral (Asset 116) is designated as both a Category A Listed Building and a Scheduled Monument. Construction of the current cathedral began in 1260 and continued into the 16th century, with the cathedral showing elements of Norman and Gothic architecture. The cathedral was badly damaged during the Battle of Dunkeld in 1689 (HLT 11). The Cathedral fell into ruin during the Protestant Reformation of the 1560s, with the 13th century choir surviving intact as the parish church. Due to its architectural qualities as one of the most complete Scottish cathedrals which is supported by documented written accounts of its construction the Cathedral has been assessed to be of high value. The 19th century cathedral precinct gates (Asset 123) reflect the continual development of the Cathedral precinct and are designated as a Category B Listed Building, and have been assessed to be of medium value.

Photograph 13: Dunkeld and Birnam Station (Asset 26), a Category A Listed Building, showing the public forecourt including the porch of the north-facing elevation and carpark, July 2015

2.7.34 Large parts of pre-17th century Dunkeld were destroyed by fire as a consequence of the 1689 battle of Dunkeld (HLT 11) after which the town was rebuilt. Buildings dating to the 18th century include Evan Haxton's Property 6 Cathedral Street (Asset 134), 1 Cathedral Street (Asset 156) and The Ell House, The Cross, High Street (Asset 160). These have been assessed to be a mixture of medium to low value as representative of the post-medieval economic and commercial development of Dunkeld, and reflecting their designations as Category B and C Listed Buildings. Later commercial and civic buildings include the Category C Listed Post Office (Asset 163), 19th century shops including the Category B Listed K. Stanley and Sons on the High Street (Asset 161) and The Bank of Scotland (Asset 157), a Category C Listed Building. These and other commercial buildings contribute to our understanding of the economy of the town and as Category B or Category C Listed Buildings have been assessed to be of medium and low value.

2.7.35 The majority of historic buildings in Birnam reflect a significant period of urban expansion related to the arrival of the Perth and Dunkeld Railway in 1856, and the subsequent growth of the early-mid Victorian Highland tourism industry. These include large mid-19th century villas, such as the Category B Listed Building The Lodge, Birnam (Asset 19) and the Category C Listed Buildings Oakbank House and Birnam Bank House (Assets 15 and 22). Domestic housing of various styles, include cottages such as Elsey and Birnam Bank Cottages (Assets 17 and 18; Category C Listed Buildings; Photography 14) and the Category B Listed Buildings of Murthly Terrace, Birnam (Assets 51, 53, 54 and 55), and Category C Listed Buildings forming Birnam Terrace (Assets 31, 34, 35, 36 and 37), and commercial buildings such as the Birnam Hotel (Asset 64). Reflecting their contribution to our understanding of the development of the town and their designation as Category B or Category C Listed Buildings these and other buildings have been assessed to be of medium and low value.

Photograph 14: Elsey Cottage and Birnam Bank Cottage (Assets 17 and 18), Category C Listed Buildings, within Birnam Conservation Area (Asset 103), July 2015.

2.7.36 The Conservation Areas of Dunkeld and Birnam (Assets 44 and 103) reflect their contribution to our knowledge and understanding of these periods of development and have been assessed to be of medium value.

2.7.37 In addition to the Category A Listed Building Dunkeld and Birnam Station (Asset 26), other historic buildings associated with the railway include the 1919 Dunkeld and Birnam Station Signal Box (Asset 16; a Category B Listed Building), the viaduct at Inver (Asset 71), which was designed to complement The Hermitage Gardens and Designed Landscape (HLT 20), the bridge over Hermitage Road and associated tunnel entrance (Asset 75; a Category C Listed Building), and the tunnels at Byres Of Murthly and The Hermitage (Assets 1 and 89).

2.7.38 Due to their contribution to our knowledge and understanding of the development of Scottish railway architecture, and their designation as Category B or Category C Listed Buildings they have been assessed to be of medium or low value.

2.7.39 The collection of 18th and 19th century domestic and agricultural buildings which form the core of Inver have been assessed to be of low value as examples of local vernacular architecture, and their designation as Category C Listed Buildings. In consideration of its wider cultural associations with the late 18th century Scottish fiddler and bard Neil Gow, and designation as a Category B Listed Building, Neil Gow's Cottage (Asset 88) has been assessed to be of medium value.

2.7.40 The historic buildings located outside the settlements within the study area include Rohallion Buffalo Hut (Asset 6) once home to two Native Americans. As an interesting example of estate architecture, its unusual historical associations, and as a Category B Listed Building it has been assessed to be of medium value. Ringwood Lodge (Asset 7) a former lodge associated with the western drive to Murthly Castle but now divorced from it by the existing A9; the buildings at Deans Park (Asset 13) and Inchmagrannachan Farmstead (Asset 191) are good examples of local vernacular architecture and have been assessed to be of low value.

2.7.41 Birnam War Memorial (Asset 497) is a 20th century memorial to the fallen of both World Wars in the form of a rubble stone cairn. Given its contribution to our knowledge and understanding of the impact of conflict on the local community this asset has been assessed to be of low value.

2.7.42 Ladywell Milestone (Asset 43) is the only asset to be assessed as being of unknown value as despite the record of a milestone at this location it is unclear from the data available as to whether the milestone is still in place.

Historic Landscape

2.7.43 Table 12 below provides summary information on the 15 historic landscape types (HLT) identified within the study area, along with an assessment of their value. The locations of the historic landscape types are shown on Figure 17.

Table 12: Historic Landscape Types*

Number	Historic Landscape Type	Value
HLT 1	17th – 19th Century Rectilinear Fields and Farms	Low
HLT 2	Managed Woodland	Low
HLT 3	19th Century to Present Coniferous Plantation	Negligible
HLT 4	19th Century to Present Urban Area	Negligible
HLT 5	17th -18th Century Industrial Planned Village	Low
HLT 6	Recreation Area	Low
HLT 7	Medieval Village	Medium
HLT 10	Rough Grazing	Low
HLT 11	Dunkeld Battlefield	High
HLT 12	19th Century to Present Quarry	Negligible
HLT 14	Murthly Castle Gardens and Designed Landscape	High
HLT 15	Transport	Negligible
HLT 17	Freshwater Area	Negligible
HLT 19	Dunkeld House Gardens and Designed Landscape	High
HLT 20	The Hermitage Gardens and Designed Landscape	High

* Please note that Historic Landscape Types 8, 9, 13, 16, 18, 21, 22, 23 and 24 lie outside the study area for the project.

2.7.44 Of the 15 historic landscape types identified within the study area four have been assessed to be of high value, one has been assessed to be of medium value and five have been assessed to be of low value. The remaining five historic landscape types have been assessed to be of negligible value.

2.7.45 Recorded on the Inventory of Battlefields, Dunkeld Battlefield (HLT 11) is located on the north bank of the River Tay. The inventory battlefield stretches to the east and west of Dunkeld including the level ground to the north of the Cathedral, much of which was occupied by Dunkeld House and elements of the town in 1689. The hills to the north including Gallow Hill where the Jacobite cannons were located and the hills to the west of the town provided important vantage points for the Jacobites as they advanced. The ground to the east and north-east including Shiochies Hill was the location of some of the early stages of the battle prior to the Cameronians withdrawal into the town where the majority of the fighting took place. In consideration of its historic interest and inclusion on the Inventory of Battlefields, Dunkeld Battlefield has been assessed to be of high value.

2.7.46 Recorded on the Inventory of Gardens and Designed Landscapes, Dunkeld House Gardens and Designed Landscape (HLT 19) has been in existence for more than 250 years, initially as a formal 18th century design which was then informalised in the 19th century. It plays an important part in the surrounding scenery and hosts an interesting collection of conifers, and the east and west grottos. Dunkeld House Gardens and Designed Landscape is situated on the north bank of the River Tay approximately 1 mile (1.5km) west of Dunkeld. The River Tay is important in the setting of the Dunkeld House Gardens and Designed Landscape, and the policies on the north bank are highly significant from the riverside although the coniferous woodlands and mountains beyond on either side of the Tay and Braan valleys dominate the overall landscape. In consideration of its historic interest and inclusion on the Inventory of Gardens and Designed Landscapes, Dunkeld House Gardens and Designed Landscape has been assessed to be of high value.

2.7.47 Recorded on the Inventory of Gardens and Designed Landscapes, The Hermitage Gardens and Designed Landscape (HLT 20) is an outstanding example of the 18th century picturesque landscape style, comprising buildings, paths, trees and viewpoints which exploit the naturally dramatic Highland Gorge setting. The Hermitage is situated on the west bank of the River Braan approximately 1km south-west of its confluence with the River Tay, to the south of Dunkeld. It was designed as part of Dunkeld House Gardens and Designed Landscape but is considered here as a separate historic landscape type, since it is now outwith the Dunkeld Estate. The existing A9 separates The Hermitage Gardens and Designed Landscape from Dunkeld today. In consideration of its historic interest and inclusion on the Inventory of Gardens and Designed Landscapes, The Hermitage Gardens and Designed Landscape has been assessed to be of high value.

2.7.48 Recorded on the Inventory of Gardens and Designed Landscapes, Murthly Castle Gardens and Designed Landscape (HLT 14) is an outstanding landscape which makes a major contribution to the Tay Valley and provides an attractive setting for several Category A Listed Buildings. Today's early 19th century layout overlays an early 17th century one, and some early trees can still be seen. Murthly Castle lies in the centre of the policies which extend over some 862 hectares. Map regression indicates that the extent of the landscape has remained consistent since the 18th century. In consideration of its historic interest and inclusion on the Inventory of Gardens and Designed Landscapes, Murthly Castle Gardens and Designed Landscape has been assessed to be of high value.

2.7.49 While the medieval village historic landscape type (HLT 7) is characterised by domestic buildings of early 18th century date it often preserves the original layout of the village in the road system. In consideration of its historic interest and time depth, this type has been assessed as being of medium value.

2.7.50 Five historic landscape types have been assessed to be of low value. These comprise 17th to 19th century rectilinear fields and farms (HLT 1), managed woodland (HLT 2), 17th to 18th century industrial planned village (HLT 5), recreation area (HLT 6) and rough grazing (HLT 10). In consideration of their historic interest and legibility, the value of these five types has been assessed to be low.

2.7.51 Five historic landscape types have been assessed to be of negligible value. These comprise 19th century to present coniferous plantation (HLT 3), 19th century to present urban area (HLT 4), 19th century to present quarry (HLT 12) and transport (HLT 15). These types have been created or significantly altered in the 20th century. In consideration of their limited time depth and lack of rarity these types have been assessed to be of negligible value. Freshwater area (HLT 17), which includes Lochs or rivers over 50m wide, are recorded as a historic landscape type, this type has also been assessed to be of negligible value.

2.8 Air Quality

Study Area

2.8.1 The study area comprises receptor locations sensitive to air quality (primarily residential properties but also schools) that lie within 200m of the existing A9 and to a limited distance either side of this on connecting major roads (those that meet HA 207/07 guidance) (Highways Agency et al., 2007b).

Approach to Determination of Baseline Conditions

Desk Based Assessment

2.8.2 A desk-based review of available air quality information was undertaken to establish the baseline conditions for key traffic related pollutants which, for the purposes of this report are considered to be nitrogen dioxide (NO_2) and Particulate Matter (PM_{10} and $PM_{2.5}$). Information reviewed included monitoring data within local air quality management reports prepared by PKC and Scottish Government and Defra background pollutant maps. Information on Air Quality Management Areas (AQMAs) was also obtained through reference to Air Quality in Scotland (Air Quality in Scotland, www.scottishairquality.co.uk). AQMAs are areas designated by the local authority which do not (or are unlikely to) meet air quality objectives. These along with other sources of baseline information used, are provided below in Table 13.

Table 13: Sources of Baseline Information

Information Source	Reference
Scottish Government	Local Air Quality Management 1km x 1km grid background pollutant maps (Scottish Government, 2011)
Department for the Environment Food and Rural Affairs (Defra)	Interactive Monitoring Networks Map (Defra, accessed 2015a)
	Local Air Quality Management 1km x 1km grid background pollutant maps (Defra, 2015)
PKC	Progress Reports (PKC, 2016)
	Updating and Screening Assessments (PKC, 2015)
Air Quality in Scotland www.scottishairquality.co.uk	Air Quality Management Areas locations

2.8.3 The threshold values set for human health in national air quality regulations are shown in Table 14. The objectives adopted in Scotland for the purpose of Local Air Quality Management (LAQM) are set out in the Air Quality (Scotland) Regulations 2000, the Air Quality (Scotland) Amendment Regulations 2002 and the Air Quality (Scotland) Amendment Regulations 2016. Similar targets are set at EU level, where they are called limit or target values. These are set out in the European 2008 Ambient Air Quality Directive (2008/50/EC) and transposed into Scottish legislation by the Air Quality Standards (Scotland) Regulations 2010. It is the responsibility of EU Member States to achieve the limit and target values.

Table 14: Objectives of Key Traffic Related Pollutants

Pollutant	Air Quality Threshold Concentrations	Threshold Value ($\mu g/m^3$)
Nitrogen Dioxide (NO_2) (for human health)	Annual Mean	40

Particulate Matter (PM_{10}) (for human health)	Annual Mean	18
Particulate Matter ($PM_{2.5}$) (for human health)	Annual Mean	10

2.8.4 The baseline review was carried out using professional judgement drawing on guidance detailed in DMRB (Highways Agency et al., 2013a) and associated Interim Advice Notes (IANs), and Local Air Quality Management (LAQM) Technical Guidance (TG(16)), where appropriate.

2.8.5 In addition to the desk-based review, monitoring of NO_2 by diffusion tube was undertaken over a period of six months (between February 2015 to August 2015) at three locations within the study area (Figure 18). The monitoring was carried out in accordance with the Defra guidance "Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance (2008)".

Baseline Conditions – Air Quality

Background Pollutant Concentrations

2.8.6 Background annual mean concentrations of NO_2, and PM_{10} were obtained from Scottish Government air quality maps (Scottish Government, 2011). These maps include a component from local A-road emission sources. To avoid double-counting of these emissions, the A-road component was removed from the background concentration values, using Defra's sector removal tool (NO_2 Adjustment for NO_x Sector Removal Tool v4.0) for NO_2 concentrations.

2.8.7 Background annual mean pollution concentration estimates for 2015 and predictions for 2026 are presented in Table 15.

Table 15: Background Annual Mean Pollutant Concentrations

Pollutant	2015	2026	Objective Threshold
	($\mu g/m^3$)		
NO_2	3.3	2.3	40
PM_{10}	8.5	8.1	18
$PM_{2.5}$	5.9	5.7	10

2.8.8 As explained previously, UK and EU threshold values are set for each pollutant to protect human health. As shown in Table 15, background annual mean pollutant concentrations for both years are well below threshold values.

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2.8.9 There are no AQMAs within the study area. The nearest AQMAs encompass the main built-up areas of Perth and Crieff, located approximately 13km south and 23km to the south west. The AQMA for Perth was declared in 2006 for exceedances of the NO_2 and PM_{10} annual mean objectives. The Crieff AQMA was declared in 2013 for exceedances of NO_2 and PM_{10} annual mean objectives.

Local Authority Monitoring Data

2.8.10 PKC operates a network of 66 diffusion tubes across the local authority area. The network of diffusion tubes is broken down into the following areas: Perth, Glencarse, Kinross, Auchterarder and Crieff.

Sensitive Receptor Locations

2.8.11 The majority of sensitive air quality receptor locations are identified within the populated areas of Little Dunkeld and Birnam, between the River Tay and the existing A9.

NO_2 Monitoring Survey

2.8.12 The results of the NO_2 Monitoring Survey are presented in Table 16.

Table 16: Jacobs NO_2 Diffusion Tube Monitoring

Name	Coordinates		Height (cm)	Type	Estimated Annual Mean Equivalent (µg/m^3)
	X	Y			
Location 1 (Figure 18) Give way sign at junction before bridge	301794	742051	230	Background	5.1
Location 2 (Figure 18) Bus stop on A9 NB c/way	301716	742296	280	Kerbside	30.3
Location 3 (Figure 18) Bus stop on A9 SB c/way	301627	742283	290	Kerbside	44.2

2.8.13 Monitoring results indicate the annual mean NO_2 objective is met at all kerbside and background locations except at Location 3 (bus stop on the A9 southbound carriageway).

2.9 Noise and Vibration

Study Area

2.9.1 The study area for the road traffic noise assessment was defined with reference to HD 213/11 (Highways Agency et al., 2011) and comprises an area within approximately 1km of the existing A9 as shown in Figure 19.

Approach to Determination of Baseline Conditions

2.9.2 Sensitive receptors to noise within the study area were identified using OS AddressBasePlus data which provides use classifications for properties. A total of 835 residential dwellings and 48 other noise sensitive receptors were identified within the study area. The majority of the dwellings are located within the settlements of Birnam (approximately 426 dwellings), Dunkeld (approximately 167 dwellings) and Little Dunkeld (approximately 56 dwellings). The remainder of the road traffic noise study area is sparsely populated, particularly to the north end, with isolated and small clusters of dwellings (generally situated close to the existing A9).The other receptors include six hotels, one guest house, three caravan parks, the Royal School of Dunkeld, five parks, three play areas and three churches.

2.9.3 Baseline road traffic noise levels were assessed at all of the sensitive receptors identified within the study area. Of these sensitive receptors, a sub-set of 11 sample receptors was selected for reporting purposes (Table 17 and Figure 19). These sample receptors are considered to have noise environments representative of those at other nearby receptors and are located where people are particularly sensitive to noise. These locations have been selected where it has been anticipated that receptors are most likely to experience perceptible changes in noise level.

Table 17: Sample Receptors

Reference No.	Receptor Name
R2.01	Auchreddie, Gauls of Murthly, Murthly
R2.02	Inkpot Cottage, Birnam
R2.03	Ballincrieff House, Perth Road, Birnam
R2.04	11 Torllee Road, Birnam
R2.05	The Old Bakehouse, Birnam Terrance, Birnam
R2.06	35 Stell Park Road, Birnam
R2.07	Telford Gardens, Birnam
R2.08	Braeknowe, Birnam
R2.09	Braan Cottage, Little Dunkeld
R2.10	Dundonachie Coach House, Trochry
R2.11	Rose Cottage, Inver

2.9.4 Noise levels were calculated using the CadnaA noise modelling package, which implements the methodology contained in the Calculation of Road Traffic Noise 1988 (CRTN). All calculated noise levels are in terms of the façade incident $L_{A10,18hr}$ noise indicator which is used to quantify road traffic noise levels in the UK.

2.9.5 The heights of buildings within the noise model were derived from online imagery. To ensure conservative screening effects, two storey high buildings were assumed to be 5.7m, and one storey buildings such as bungalows were assumed to be 3.2m tall. For buildings with more than two storeys, building heights are assumed to increase 2.5m per storey.

2.9.6 CRTN predictions were based on typical weekday traffic flows during the 18 hour period from 6am to midnight (18-hour AAWT flows) and take into account the following variables:

- percentage of Heavy Duty Vehicles (HDVs);
- traffic speeds;
- road gradient;
- local topography;
- the nature of the ground surface between the road and the receptor;
- shielding effects of any intervening structures, including allowances for limited angles of view from the road and any reflection effects from relevant surfaces; and
- the type and texture depth of the road surface.

2.9.7 Traffic data for the noise model were generated by traffic models using an S-Paramics Microsimulation. These traffic models represent the actions and inter-actions of individual vehicles as they travel through the road network.

2.9.8 Physical features such as building outlines, existing road alignments and widths, and ground surface characteristics were imported into the CadnaA noise models from the Ordnance Survey (OS) MasterMap Topography Layer digital mapping. Terrain heights are derived from filtered (bare earth) LiDAR data which have been used to generate contour lines at 2m vertical intervals.

2.9.9 Noise levels at the façades of receptors were calculated at first floor (4m above ground level), except for bungalows, applicable churches, schools, doctor surgeries, other single storey receptors and

outdoor receptors which are all calculated at 1.5m above ground level. Noise levels at buildings were predicted at a distance of 1m from the most exposed façade and include a 2.5 dB façade correction. Noise levels for sensitive receptors positioned in open spaces are free-field values (i.e. there are no obstructions). The baseline year for the modelled calculations was taken as 2026, representing the projected opening year of the A9 dualling in this section. The year of opening is used because the traffic flows may be different to present day levels, regardless of whether this section of the A9 is dualled.

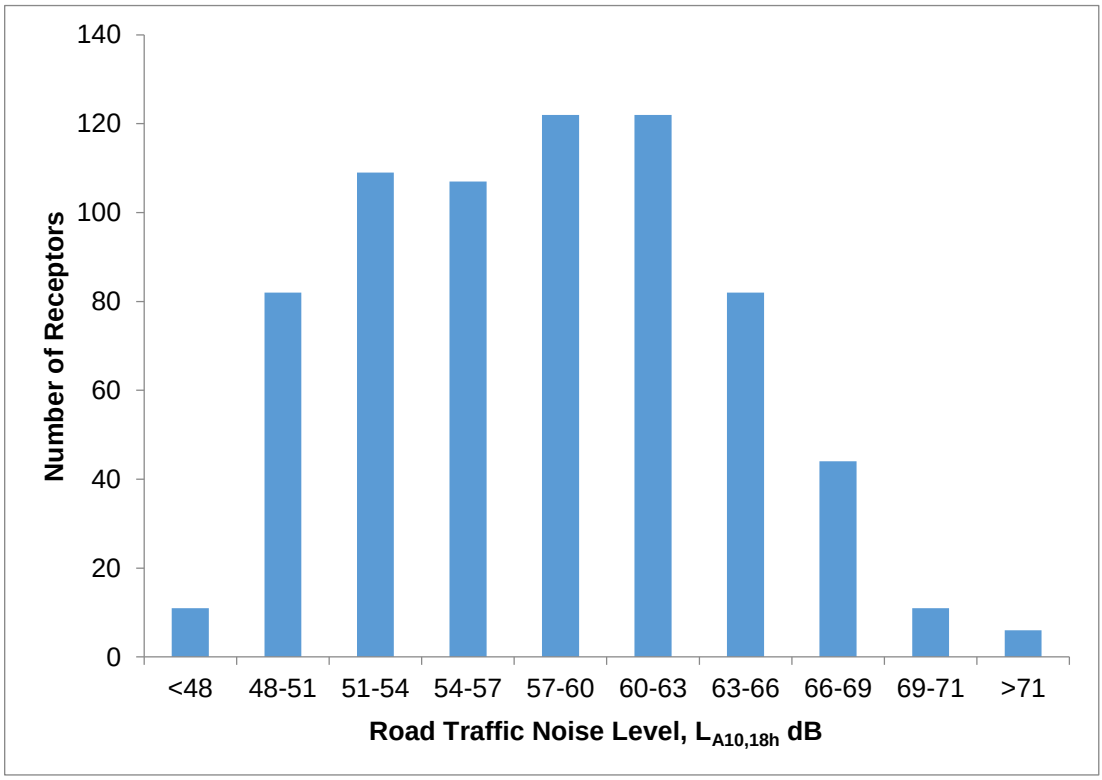
2.9.10 Generally, calculated road traffic noise levels are considered preferable to measurements of noise at properties, as the calculated levels are based on annual average conditions while noise measurements can show variation in noise levels day to day. Therefore all of the noise levels presented in this report are calculated.

Baseline Conditions - Noise

2.9.11 Road traffic using the existing A9 is identified as the primary source of noise in the study area.

2.9.12 The predicted daytime noise levels at the most exposed facades of dwellings range from 44.8 to 75.0 dB $L_{A10,18hs}$, for the 2026 baseline scenario, with the majority of properties exposed to noise levels below 63 dB $L_{A10,18hs}$ as can be seen from Diagram 2.9.1.

Diagram 2.9.1: Distribution of road traffic noise levels at receptors in 2026



2.9.13 The 2026 baseline noise levels predicted at each of the sample receptors is shown in Table 18.

Table 18: Predicted 2026 baseline noise levels at Sample Receptors

Reference No	Receptor Name	2026 Baseline $L_{A10,18hr}$ (dB)
R2.01	Auchreddie, Gauls of Murthly, Murthly	60.6
R2.02	Inkpot Cottage, Birnam	65.6
R2.03	Ballincrieff House, Perth Road, Birnam	61.2

Reference No	Receptor Name	2026 Baseline $L_{A10,18hr}$ (dB)
R2.04	11 Torllee Road, Birnam	58.7
R2.05	The Old Bakehouse, Birnam Terrance, Birnam	62.6
R2.06	35 Stell Park Road, Birnam	61.2
R2.07	Telford Gardens, Birnam	63.2
R2.08	Braeknowe, Birnam	60.4
R2.09	Braan Cottage, Little Dunkeld	64.9
R2.10	Dundonachie Coach House, Trochry	69.6
R2.11	Rose Cottage, Inver	74.9

2.10 Effects on All Travellers

Study Area

2.10.1 The study area was defined as approximately 500m from the existing A9 as shown on Figure 20.

Approach to Determination of Baseline Conditions

Desk-based Assessment

2.10.2 The desk-based study included a review of digital Ordnance Survey (OS) maps (provided by Transport Scotland in 2015), Perth and Kinross Council's (PKC) Core Paths Plan (PKC, 2012) and a web-based search to identify existing paths including core paths, public rights of way and local paths, as well as outdoor areas. The leaflets 'Countryside Trails – Dunkeld', 'Explore Dunkeld Path Network' and 'Tay Forest Park – Tall Trees and Big Views Information' were used to identify promoted walking routes that pass through the study area and provide access to outdoor areas (Atholl Estates Website, 2015; Dunkeld and Birnam Tourist Association Website, 2015; Forestry Commission Scotland Website, 2015). In addition, aerial photography provided by Transport Scotland was reviewed (BLOM Survey, 2013).

2.10.3 Figure 20 shows the paths identified in this baseline review. It should be noted that local paths have generally only been identified within the study area, however, the data sets for core paths, rights of ways and cycle routes extend beyond 500m.

2.10.4 The Land Reform (Scotland) Act 2003 establishes statutory rights of responsible access on and over most land. The outdoor areas identified in paragraph 2.10.22 therefore include areas of privately owned land that may be used informally by the community in addition to the Community Land identified in Section 2.1 (Community and Private Assets).

2.10.5 The baseline assessment was also informed by a review of the following documents:

- Accessibility Audit – Objectives Setting and Context Report. A9 Dualling Preliminary Engineering Services (Jacobs, 2014); and
- Cycle Audit – Objectives Setting and Context Report. A9 Dualling Preliminary Engineering Services (Jacobs, 2014).

2.10.6 The following URS (now AECOM) documents were also reviewed as part of the baseline assessment:

- A9 Route Improvement Strategy – Dualling of Birnam to Tay Crossing, Stage 2 Options Assessment Report, Part 2 Environmental Assessment, Volume 1 Environmental Report (June 2011; Transport Scotland, 2011a);

- A9 Route Improvement Strategy – Dualling of Birnam to Tay Crossing, Stage 2 Options Assessment Report, Part 2 Environmental Assessment, Volume 2 Figures (June 2011; Transport Scotland, 2011b);
- A9 Route Improvement Strategy – Dualling of Birnam to Tay Crossing, Stage 2 Options Assessment Report, Part 2 Environmental Assessment, Volume 3 Appendix (June 2011; Transport Scotland, 2011c);

2.10.7 DMRB Volume 11, Section 3, Part 8, paragraph 9.7 advises that to avoid '*unnecessary anxiety amongst local people, and even the blighting of properties'*, origin/destination surveys are not required at DMRB Stage 2; therefore, no origin/destination surveys have been undertaken. The type of user, and where possible the usage levels, have been determined from information provided through a desk based assessment and the consultation process and is noted in Table 19 where paths in the study area are described.

Site Surveys

2.10.8 To verify the baseline data collected through desk based assessment, a visual inspection of NMU routes was undertaken within the study area on 10 and 11 March 2015.

Consultation

2.10.9 Consultation was undertaken with various access, cycling, equestrian and walking groups to inform the baseline assessment and ensure the path network described and assessed is accurate. The consultees provided information regarding the locations and usage of paths and key crossing points. Rights of way data received from ScotWays were digitised by Jacobs at a larger scale to enable the paths to be accurately displayed on the figures accompanying this assessment. ScotWays were issued the revised dataset and confirmed that the data were appropriate for the purpose of this assessment.

2.10.10 Consultation was undertaken with various access, cycling, equestrian and walking groups to inform the baseline assessment. The consultees provided information regarding the locations and usage of paths and key crossing points. Consultation with various stakeholders also took place in two NMU forums (in November 2014 and May 2015). Any information gained from stakeholders during these discussions was used to inform the baseline in this assessment (Capital Value and Risk, 2015).

Baseline Conditions – Effects on All Travellers

Non-motorised Users (NMUs)

2.10.11 The baseline conditions for the study area are described below, listed in Table 19 and shown on Figure 20.

Core Paths

2.10.12 Core paths may include the following: public rights of way, footpaths, tracks, cycle tracks, paths which are, or may be, covered by path agreements or path orders under the Land Reform (Scotland) Act 2003 (Sections 20 and 21), waterways, or other means by which persons may cross land. In establishing the Core Paths Plan, consideration of likely usage and desirability of paths is balanced with landowner interests.

2.10.13 Local authorities have a duty to prepare a Core Paths Plan under the Land Reform (Scotland) Act 2003. The local authority responsible for access within the study area is PKC. The PKC Core Paths Plan was adopted on 25 January 2012 and aims to satisfy the basic needs of local people and visitors for general access and recreation, and provide links to the wider path network throughout (PKC, 2012). The core path network is meant to cater for all types of users including walkers, cyclists, horse riders, canoeists and people with disabilities, and is a key part of outdoor access provision. The majority of the core paths are situated around communities and are valued by both locals and tourists. Photograph 15 shows a core path (Path 35) crossing the River Braan.

2.10.14 There are 33 paths designated as core paths within the study area, as shown on Figure 20.

Photograph 15: Core path across River Braan (Path 35)

Public Rights of Way

2.10.15 A public right of way is a defined route which has been used by the general public for at least 20 years and which links two public places (usually public roads). Public rights of way vary from long hill routes (often historical drove or kirk roads) to local routes or as short cuts to shops, schools and other local amenities.

2.10.16 ScotWays maintains the National Catalogue of Rights of Way (CROW), in partnership with SNH. In addition, many local authorities also have their own records. Access along public rights of way is protected by the Countryside (Scotland) Act 1967, Section 46, requiring the local authority to *'assert, protect and keep open and free from obstruction or encroachment any public rights of way'*. Diversions can be considered if the proposed diversion is deemed suitable by the planning authority. Photograph 16 shows a right of way (also a core path) which forms part of Birnam Riverside Path

2.10.17 There are eight paths designated as public rights of way within the study area, as shown on Figure 20.

Photograph 16: Core path and right of way forming part of Birnam Riverside Path (Path 24)

Local Paths

2.10.18 Unlike core paths and public rights of way, local paths hold no statutory designation. Local paths can either be pavements adjacent to roads or off-road paths.

2.10.19 There are 18 paths that have been identified as local paths within the study area, as shown on Figure 20.

National and Regional Cycle Routes

2.10.20 The National Cycle Network is a UK network of cycle routes (national and regional) and was created by Sustrans. The routes are a combination of pedestrian routes, disused railways, minor roads, canal towpaths and traffic calmed routes. In some cases, National Cycle Routes (NCRs) and/or Regional Cycle Routes (RCRs) are also designated as core paths or public rights of way. National Cycle Routes form part of the National Long Distance Cycling and Walking Network, a National Development in the Scottish Government's Third National Planning Framework.

2.10.21 There is one National Cycle Route (NCR77) that passes through the study area, as shown on Figure 20 and in Photograph 17. Paths NCR 77, 22, 28, 34, 38, 43 and 48 are all part of this route.

Photograph 17: National Cycle Route 77

Crossing Points

2.10.22 There are six existing A9 NMU crossing points (CP) listed as follows (see Table 19 for details of paths described and Figure 20 for locations of CPs and paths):

- **CP01** – NMUs cross the existing A9 via an at-grade crossing using Path 7 (Photograph 18).
- **CP02** – NMUs cross the existing A9 via an at-grade crossing using Path 23 (Photograph 19).
- **CP03** – NMUs cross underneath the existing A9 via the Birnam Glen Underbridge using Path 28 / NCR 77.
- **CP04** – NMUs cross underneath the existing A9 via the River Braan Underbridge using Path 35 on both the east and west sides of the River Braan and utilise the existing NMU bridge to cross the river (Photograph 20).
- **CP05** – NMUs cross underneath the existing A9 via the existing bridge over the River Tay on the south bank of the river using Path 35.
- **CP06** – NMUs cross underneath the existing A9 via the existing bridge over the River Tay on the north bank of the river using Path 38 / NCR 77.

Photograph 18: At-grade crossing point CP01, Path 7. Image from Google Streetview, 2015

Photograph 19: At-grade crossing point CP02, Path 23. Image from Google Streetview 2015

Photograph 20: Grade separated crossing point CP04, Path 35 (view of crossing on east bank of River Braan)

Access to Outdoor Areas

2.10.23 Outdoor areas comprise local open space and green space that are used by the public for recreational purposes. For further details on community land reference should be made to Section 2.1 (Community and Private Assets). The key outdoor areas are listed below:

- Atholl Wood (Figure 20);
- Birnam Hill (Figure 20);
- Birnam Wood (Figure 20);
- Byres Wood (Figure 20);
- Dalpowie Plantation (Figure 20);
- The Hermitage (Figure 20);
- Polney Loch (Figure 20);
- Ring Wood (Figure 20);
- River Braan (Figure 20);
- River Tay (Figure 20);
- Rochanroy Wood (Figure 20);
- Rohallion Loch (Figure 20);
- Tay Forest Park – Craigvinean Plantation (Figure 20); and
- Tay Forest Park - Ladywell Plantation (Figure 20).

2.10.24 The NMU paths that provide access to these outdoor areas, as well as promoted walking/cycling routes are listed in Table 19.

Table 19: Path Network within Study Area

Path Reference	Designation	Main Users	Description	Access to Outdoors Link
NCR 77 Fig.20	National Cycle Route NCR77 (south / Dunkeld / north)	Pedestrians Cyclists	NCR 77 utilises the B867 in the south of the study area. The route connects into Paths 8, 16, 20 and 22 / NCR 77. NCR 77 is then on-road through Dunkeld before continuing north using the B898. Connects into Paths 34 / NCR 77, 38 / NCR 77, 43 / NCR 77 and 45.	Provides access to Birnam Wood, Rohallion Loch, Ring Wood, Tay Forest Park – Craigivean Plantation and the River Tay.
1 Fig.20	Local Path (non-designated)	Pedestrians	Path 1 is an access track through Byres Wood. Connects into Path 2.	Provides access to Byres Wood.
2 Fig.20	Local Path (non-designated)	Pedestrians	Path 2 is an access track through Byres Wood. Connects into Path 1.	Provides access to Byres Wood.
3 Fig.20	Core Path SPIT/108	Pedestrians	Path 3 connects into Paths 4 and 7 in the south of the study area.	No direct access to outdoor areas.
4 Fig.20	Core Path SPIT/109	Pedestrians	Path 4 is a riverside path connecting into Paths 3 and 7.	Provides access to the River Tay.
5 Fig.20	Core Path SPIT/113	Pedestrians	Path 5 provides access from Bee Cottage to Byres of Murthly. Connects into Paths 6 and 8.	Provides access to Birnam and Byres Wood.
6 Fig.20	Local Path (non-designated)	Pedestrians	Path 6 is an access track through Byres Wood. Connects into Paths 5 and 8.	Provides access to Byres Woods.
7 Fig.20	Local Path (non-designated)	Pedestrians	Path 7 is an access track located parallel to the existing A9. Provides local access to an at-grade crossing point of the A9 (CP01) and connects into Paths 3 and 4.	Provides access to the Dalpowie Plantation.
8 Fig.20	Core Path SPIT/105	Pedestrians	Path 8 provides a link to Paths 5, 6, 9, 10, 12 and 13 and NCR 77.	Provides access to Birnam Wood.
9 Fig.20	Core Path SPIT/114	Pedestrians	Path 9 provides access from Rohallion path to Birnam Wood path over Court Hill. Provides a connection to Paths 8, 10 and 12.	Provides access to Birnam Wood.
10 Fig.20	Local Path (non-designated)	Pedestrians	Path 10 is an access track through Birnam Wood. Connects into Path 8.	Provides access to Birnam Wood.
11 Fig.20	Right of Way TP104	Pedestrians	Path 11 provides access through the village of Birnam to the River Tay.	Provides access to the River Tay.

Path Reference	Designation	Main Users	Description	Access to Outdoors Link
12 Fig.20	Local Path (non-designated)	Pedestrians	Path 12 is an access track through Birnam Wood. Connects into Path 8.	Provides access to the Birnam Wood.
13 Fig.20	Core Path DUNK/102	Pedestrians	Path 13 is the Birnam Wood northern path, providing links to Path 8, 14 and 16.	Provides access to Birnam Wood and Rochanroy Wood.
14 Fig.20	Local Path (non-designated)	Pedestrians	Path 14 is an access track through Birnam Wood. Connects into Path 13.	Provides access to Birnam Wood and Rochanroy Wood.
15 Fig.20	Local Path (non-designated)	Pedestrians	Path 15 is an access track through the Dalpowie Plantation.	Provides access to the Dalpowie Plantation and the River Tay.
16 Fig.20	Local Path (non-designated)	Pedestrians	Path 16 is an access track through Rochanroy Wood. Connects into Paths NCR 77 and 13.	Provides access to the Rochanroy Wood.
17 Fig.20	Local Path (non-designated)	Pedestrians	Path 17 is an access track through Ring Wood. Connects into Path 18.	Provides access to Rochanroy Wood.
18 Fig.20	Core Path DUNK/14	Pedestrians	Path 18 forms part of the Birnam Hill Path. Connects into Paths 17 and 20.	Provides access to Birnam Wood. Part of the 'Birnam Hill Path' walking route.
19 Fig.20	Local Path (non-designated)	Pedestrians	Path 19 is an access track connecting into Paths NCR 77 and 20.	Provides access to Ring Wood.
20 Fig.20	Core Path DUNK/69	Pedestrians	Path 20 forms part of the Birnam Hill Path. Provides access to the Birnam Quarry car park to the railway underpass south of Craigbeithe. Connects into Paths NCR 77,19 and 23.	Provides access to Birnam Wood. Part of the 'Birnam Hill Path' walking route.
21 Fig.20	Local Path (non-designated)	Pedestrians	Path 21 is an access track connecting into Path 24.	Provides access to the River Tay.
22 / NCR 77 Fig.20	Core Path DUNK/142 National Cycle Route NCR77	Pedestrians Cyclists	Path 22 / NCR 77 is a footpath/cycleway, providing access from Dunkeld Station to B867 near Birnam Quarry. Connects into NCR 77 and Paths 23 and 28.	No direct access to the outdoors provided.
23 Fig.20	Core Path DUNK/57 Right of Way 32/10	Pedestrians Equestrians	Path 23 provides access from Birnam Glen to Perth Road at Sewage Works via Craigbeithe, railway underpass and across the A9. Path 23 crosses the existing A9 via an at-grade crossing at CP02. CP02 is also a known crossing point for equestrians. Connects into Paths 20, 22, 24, 25 and 30.	Provides access the Birnam Wood. Part of the 'Birnam Hill Path' walking route.

Path Reference	Designation	Main Users	Description	Access to Outdoors Link
24 Fig.20	Core Path DUNK/10 Right of Way Code TP102	Pedestrians	Path 24 forms part of the Birnam Riverside Path. Provides access from the River Braan at the Bowling Green to Perth Road at Sewage Works via Birnam Oak. Connects into Paths 21, 23, 25, 26, 27, 33, 34 and 35.	Provides access to the River Tay and the River Braan. Part of the 'Birnam Riverside Path' walking route.
25 Fig.20	Core Path DUNK/103	Pedestrians	Path 25 is the Birnam Riverside Path. Provides access to the Perth Road footway from Birnam Hotel to the Sewage Works. Connects into Paths 23, 24, 26, 28 and NCR77.	No direct access to the outdoors provided. Part of the 'Birnam Riverside Path' walking route.
26 Fig.20	Core Path DUNK/56 Right of Way 32/10	Pedestrians	Path 26 provides access from Birnam Hotel via St Mary's Road to Riverside Path behind St Mary's Towers. Connects into Paths 24, 25 and 27.	Provides access the River Tay.
27 Fig.20	Core Path DUNK/55 Right of Way TP105	Pedestrians	Path 27 forms part of the Birnam Riverside Path. Provides access to Birnam Hotel via Oak Road to Riverside path at Birnam Oak. Connects into Paths 24 and 26.	Provides access the River Tay. Part of the 'Birnam Riverside Path' walking route.
28 / NCR 77 Fig.20	Core Path DUNK/11 Right of Way Code TP106 National Cycle Route NCR77	Pedestrians Cyclists Equestrians	Path 28 / NCR 77 forms part of the Birnam Hill Path and Inchewan Path. Provides access from the Perth Road at Birnam Glen to Birnam Hill and King's Seat. Path 28 / NCR 77 crosses the existing A9 via the Birnam Glen Underbridge at CP03. CP03 is also a known crossing point for equestrians. Connects into Paths 25, 29, 30 and NCR 77.	Provides access to Inchewan Burn. Part of the 'Inchewan Path' and 'Birnam Hill Path' walking route.
29 Fig.20	Core Path DUNK/24	Pedestrians	Path 29 forms part of the Inchewan Path. Provides access along Inchewan Burn from Birnam Glen to Glen Garr path, via Balhomish. Connects into Path 28 / NCR 77.	Provides access to Inchewan Burn. Part of the 'Inchewan Path' walking route.
30 Fig.20	Core Path DUNK/115	Pedestrians	Path 30 forms part of the Birnam Hill Path walking route. Provides a link path at Birnam Bank. Connects into Paths 23, 28 / NCR 77and 30.	Provides access to Inchewan Burn. Part of the 'Birnam Hill Path' walking route.
31 Fig.20	Local Path (non-designated)	Pedestrians	Path 31 is an access track through the Tay Forest Park – Ladywell Plantation.	Provides access to the Tay Forest Park - Ladywell Plantation.
32 Fig.20	Local Path (non-designated)	Pedestrians	Path 32 is an access track through the Tay Forest Park – Ladywell Plantation.	Provides access to the Tay Forest Park - Ladywell Plantation.
33 Fig.20	Core Path DUNK/59	Pedestrians	Path 33 forms part of the Fiddlers Path and Birnam Riverside Path. Provides access to the River Braan at Bowling Green to A923 at Little Dunkeld. Connects into Path 24 and Path 34 / NCR 77.	Provides access the River Braan. Part of the 'Fiddler's Path' and 'Inver Path' walking routes.
34 / NCR 77 Fig.20	Core Path DUNK/144 National Cycle Route NCR77	Pedestrians Cyclists	Path 34 NCR 77 is known as the Fiddlers and Loch of the Lowes Paths. Provides access from the A923 footway to Little Dunkeld and then over Dunkeld Bridge to Atholl Park. Connects into Paths 24, 33, 40, 50 and NCR 77.	Provides access to the River Tay Part of the 'Birnam Riverside Path' walking route.

Path Reference	Designation	Main Users	Description	Access to Outdoors Link
35 Fig.20	Core Path DUNK/23	Pedestrians Equestrians	Path 35 forms part of the Fiddlers and Inver Paths. Provides access from the River Braan at Bowling Green to Newton Craig car park. Path 35 passes underneath the existing A9 three times. Two of these are via the River Braan Underbridge at the crossing of the River Braan (CP04) and the other is via the River Tay Underbridge to the south of the River Tay (CP05). Both CP04 and CP05 are known crossing points for equestrians. Connects into Paths 24, 33, 36, 45, 52 and NCR 77.	Provides access to the River Tay and the River Braan. Part of the 'Inver Path' and 'Fiddler's Path' walking routes. Provides crossing point of the River Braan.
36 Fig.20	Core Path DUNK/63	Pedestrians	Path 36 forms part of the Inver Path. Provides access to the Inver road footway east of Inver Bridge. Connects into Paths 35 and 41.	Provides access to the River Braan.
37 Fig.20	Core Path DUNK/60	Pedestrians	Path 37 forms part of the Braan Path. Provides access to the Inver car park to Ladywell Plantation, crossing A822.	Provides access to Tay Forest Park - Ladywell Plantation. Part of the 'Braan Path' walking route.
38 / NCR 77 Fig.20	Core Path DUNK/145 National Cycle Route NCR77	Pedestrians Cyclists	Path 38 NCR 77 forms part of the Fiddlers Path. Provides access to the A9 footway/cycleway over bridge at Newton Craig. Crosses underneath the existing A9 at CP05. Connects into Paths 40, 43 / NCR 77, 48 / NCR 77 and Path 53.	Provides access to the River Tay. Part of the 'Fiddler's Path' walking route.
39 Fig.20	Core Path DUNK/137	Pedestrians	Path 39 forms part of the Inver Path. Provides access from Inver Park to River Braan footbridge beside A9 bridge. Connects into Paths 35 and 41	Provides access to the River Braan. Part of the 'Inver Path' walking route.
40 Fig.20	Core Path DUNK/25	Pedestrians	Path 40 forms part of the Bishops and Fiddlers Paths. Provides access from the A923 at car park via Bishop's Hill to Hilton Hotel driveway. Connects into Paths 34 / NCR 77, 38 / NCR 77 and 43 / NCR 77.	Provides access to the River Tay. Part of the 'Fiddler's Path' walking route.
41 Fig.20	Core Path DUNK/64	Pedestrians Equestrians	Path 41 forms part of the Braan Path and Inver Path. Provides access to the Inver Bridge via Hermitage car park and Ossian's Hall to Old Military Road above The Hermitage. Path 41 is also known to be used by equestrians. Connects into Paths 36, 39 and 44.	Provides access to the River Braan and the Hermitage. Part of the 'Inver Path' and 'Braan Path' walking route.
42 Fig.20	Core Path DUNK/22	Pedestrians	Path 42 forms part of the Braan Path. Provides access from Inver car park via Hermitage Bridge to Craigvinean Cottage.	Provides access to the River Braan and the Hermitage. Part of the 'Braan Path' walking route.
43 / NCR 77 Fig.20	Core Path DUNK/70 National Cycle Route NCR77	Pedestrians Cyclists	Path 43 / NCR 77 forms part of the Bishops Path. Provides access to the Hilton Hotel driveway from A923 to 250m east of hotel. Connects into Paths 38 / NCR 77 and 40.	Provides access to the River Tay. Part of the 'Bishops Path' walking route.
44 Fig.20	Core Path DUNK/15 Right of Way TP94	Pedestrians	Path 44 forms part of the Braan Path. Provides access from the Hermitage car park on route of Old Military Road to Rumbling Bridge. Connects into Paths 41 and 45.	Provides access to the River Braan and the Hermitage. Part of the 'Inver Path' walking route.

Path Reference	Designation	Main Users	Description	Access to Outdoors Link
RCR83 Fig.20	Regional Cycle Route RCR83	Pedestrians Cyclists	Path RCR83 is an on-road route that begins north of Dunkeld and runs parallel alongside the existing A9. Connects into Path 49.	Provides access to Atholl Woods.
45 Fig.20	Core Path DUNK/65	Pedestrians	Path 45 forms part of the Inver Path. Provides access to the Old Military Road above The Hermitage to Newton Craig car park. Connects into Path 38 / NCR 77, 44, 46, 47, 52 and NCR 77.	Provides access to Tay Forest Park – Craigvinean Plantation. Part of the 'Inver Path' walking route.
46 Fig.20	Core Path DUNK/130	Pedestrians	Path 46 is the Craigvinean Forest track, Newton Craig to Dalguise. Connects into Path 45.	Provides access to the Tay Forest Park – Craigvinean Plantation.
47 Fig.20	Local Path (non-designated)	Pedestrians	Path 47 is a forest track that connects into Path 45.	Provides access to the Tay Forest Park – Craigvinean Plantation.
48 / NCR 77 Fig.20	Core Path DUNK/100 National Cycle Route NCR77	Pedestrians Cyclists	Path 48 / NCR 77 forms part of the Bishops and Fiddlers Paths. Provides access from Bishop's Hill to the north of the River Tay. Provides links to Paths 35, 38 / NCR 77 and 53.	Provides access to the River Tay. Part of the 'Fiddler's Path' walking route.
49 Fig.20	Core Path DUNK/26	Pedestrians	Path 49 forms part of the Atholl Wood Path. Connects into Paths 51 and RCR83.	Provides access to Atholl Wood.
50 Fig.20	Right of Way TP101	Pedestrians	Path 50 provides access along the River Tay to Path 34 / NCR 77.	Provides access to the River Tay.
51 Fig.20	Local path (un-designated)	Pedestrians	Path 51 is part of the Atholl Wood path network. Provides a link to Path 49.	Provides access to Atholl Wood.
52 Fig.20	Local path (un-designated)	Pedestrians	Path 52 is provides access to the Tay Forest Park- Craigvinean Plantations and provides a link to Path 45.	Provides access to Tay Forest Park – Craigvinean Plantation.
53 Fig.20	Local Path (non-designated)	Pedestrians	Path 53 provides direct access to the River Tay from the existing A9. Connects to Path 38 / NCR 77 and 48 / NCR 77	Provides access to the River Tay.

View from the Road

Views from the Existing A9

2.10.25 The existing A9 runs through the Lower Highland Glens Landscape Character Area (LCA) from the Pass of Birnam to Tay Crossing. The existing A9 corridor was previously upgraded in the 1970's with the construction of a new section of road. This section required major engineering works and rock cutting in order to create the existing alignment which has resulted in a high quality landscape corridor and has contributed to the sense of arrival and 'gateway' into the Highland Landscape. Further description of the landscape baseline of the area is contained in Section 2.5 (Landscape).

2.10.26 The landscape seen from the road is the first view of the Highlands for many tourists, and the Pass of Birnam with its wooded slopes and narrow "pinch point" topography, forms a significant gateway into the lower highland landscape. The entire section of the route falls within the River Tay (Dunkeld) National Scenic Area (NSA), the southern extents of the section also passing through the Murthly Castle Gardens and Designed Landscape from Byres Wood to Birnam (Photograph 21). The quality of the landscape for which these designations have been applied are appreciable from the road, particularly in respect of northbound views.

Photograph 21: Wooded section of A9 between Byres Wood and Birnam. Image from Google Streetview, 2015

2.10.27 Travelling from Byres Wood to the north, as the dualled section of the existing carriageway comes to an end, views to the northbound side are restricted mainly with woodland comprising of tall dense conifers close to the road. Views on the southbound side are intermittent at the start gaining glimpse of the hills through roadside planting of birch trees. The approach to the Pass of Birnam is a 'Primary View' as identified in the A9 Dualling SEA (Transport Scotland, 2013, 2014B-C). This is within the NSA and the views are tightly constrained by tall conifers which create an enclosed atmosphere reinforced by the wooded crags rising above the road corridor. The road twists through the Pass with limited forward visibility.

2.10.28 Travelling from the Pass of Birnam towards Creag na Buire (Photograph 22), views from both sides are restricted with the Dalpowie Plantation screening the River Tay on the southbound side. The dense woodland corridor on both sides comes close to the road and long views are gained ahead towards distant hills creating a sublime landscape experience. The Pass of Birnam continues to provide a sense of dramatic enclosure. Direct sunlight is often excluded by the hills and tall dense conifers close to the road. There are some areas where the woodland is further away from road verge, creating a brief sense of openness although longer distance views are still restricted.

Photograph 22: Restricted views between Pass of Birnam and Creag na Buire. Image from Google Streetview, 2015

2.10.29 The Pass of Birnam is one of several passes along the route but has the most restricted character. The road is close to the River Tay but the river is not visible. As Birnam is approached the railway line appears and draws close. As the route passes Birnam views to the northbound side are restricted by woodland on rising hillside with exposed rock cuttings and woodland belt screening the railway parallel to the road. Views on the southbound side are intermittent with roadside birch trees and glimpsed views of Birnam and Dunkeld and the surrounding wooded hills. While there are only glimpsed views of the two settlements the Victorian signal box and station serving Birnam and Dunkeld are clearly visible on the northbound side of the road (Photograph 23).

Photograph 23: View of Dunkeld and Birnam Station. Image from Google Streetview, 2015

2.10.30 The route travels from Dunkeld and Birnam Station alongside the existing railway on the northbound side with intermittent views to both sides, the views being restricted by mixed woodlands which rise up the hillsides. Glimpsed views of Little Dunkeld are gained through roadside birch trees, towards the River Tay, although the river is not visible. Ahead, the looming hill and crags of Craig a Barns closes the vista and there is no immediate indication of how the road proceeds through the hills for the traveller.

2.10.31 As the road crosses the River Braan, views start to open up on the northbound side overlooking an area of rough grassland, towards the Tay Forest Park and shelterbelt screening the caravan park at Inver. Views on the southbound side are restricted by the dense woodland lining the roadside (Photograph 24).

Photograph 24: Shelterbelt screening caravan park at Inver and dense southbound roadside woodland. Image from Google Streetview, 2015

2.10.32 Ahead, the route through the Pass becomes more evident with the landmark rock face of Polney Crag rising above the A9 and Craigvinean Forest forming the backdrop beyond. Views towards the designed landscape of The Hermitage with its large Douglas firs are briefly experienced however views are largely screened by roadside trees and only the summit of Creag Bheag is visible, providing a visual reference point.

2.10.33 As the road passes round the bend below Craig Vinean, views on the northbound side are predominantly restricted by woodland and tall exposed rock cuttings. Views on the southbound side are intermittent around Dunkeld House Hotel with a strip of woodland belt screening the River Tay, opening up to overlook rough grassland towards distant wooded hills. Some views are still obscured intermittently by woodland and the River Tay continues to be screened.

2.10.34 The road travels to the east of Inver wood parallel to the railway line with restricted views on the northbound side and open views over the woodland valley and railway line on the southbound side.

2.10.35 On approach to the Tay Crossing, views extend across attractive enclosed fields next to the road but the trees return to create a pinch-point just before the bridge. Crossing the bridge there are magnificent views over the River Tay curving away through woodland on both the northbound (Photograph 25) and southbound sides of the bridge. Beyond the bridge the road curves to the north, views largely restricted by the woodlands to the west and the wooded slopes to the east however for northbound travellers glimpsed views of the River Tay and surrounding hills are occasionally experienced.

Photograph 25: View over the River Tay from northbound side of Tay Crossing Bridge. Image from Google Streetview, 2015

Views from Existing A9 Lay-bys

2.10.36 The locations of the 6 existing A9 lay-bys in the study area are indicated on Figure 21 and described below:

- Two lay-bys (Lay-bys 1 (Photograph 26) and 2) situated close together on either side of the carriageway between Dalpowie Plantation and Ring Wood offer short distance views, the views restricted by the surrounding woodland.

Photograph 26: Lay-by Ref no 1. Image from Google Streetview, 2015

2.10.37 Just north of Inver Park, two lay-bys on either side of the carriageway (Lay-bys 3 and 4), offer open views of the neighbouring mixed species woodland between the road and the Highland Mainline Railway on the northbound side, and distant views of the wooded slopes of Roebuck's Seat and Newton Craig. Views are restricted by roadside woodland on the southbound side for both lay-bys.

2.10.38 Two lay-bys on either side of the carriageway at Inver Wood (Lay-bys 5 and 6 (Photograph 27)) have restricted views along the northbound side due to the dense forestry plantation. Open views of the immediately adjacent railway line and the west-facing wooded slopes of Craig a Barns are available along the southbound side from both lay-bys.

Photograph 27: Lay-by Ref no 6. Image from Google Streetview, 2015

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