




## Appendix B: Road Drainage and the Water Environment – Baseline Conditions

This Appendix provides a detailed description of the baseline conditions of the water features referred to in Section 2.3 (Road Drainage and the Water Environment) and shown on Figure 4.



**Table 1: Baseline Conditions**

Water Feature ID (water body name)	Attribute	Description	Photographs
WF6 (River Tay) Reach: River Tummel to River Isla confluences  3210km <sup>2</sup> catchment  Surrounding land use: development, plantation, grassland, moorland, agriculture, woodland.	Hydrology and flood risk	SEPA Flood Maps show direct flood risk to the Dunkeld and Birnam villages, including a school. 36 properties within flood risk area.	 WF6 (River Tay) – view upstream towards Dunkeld and Birnam.
	Fluvial geomorphology	WFD hydromorphology status: Moderate (2013). Meandering planform with islands. Historical change: erosion and deposition, island development. Riparian buffer: 40m trees. Structures: two bridge structures (A9 and A923). Pebble and cobble bed, predominantly smooth flow, some large riffles, 80m-90m wide.	
	Water quality/supply	WFD overall chemical status: Pass (2013). WFD overall water quality status: Good (2013). Existing pressures: point source pollution from sewage disposal; morphological alterations preventing fish passage (dams/weirs); and alien species (Australian swamp stonecrop – <i>Crassula helmsii</i> ). Drinking water abstractions, abstractions for hydropower. Potential additional pollutant sources: diffuse rural sources, road drainage.	
	Dilution and removal of waste products	High dilution capacity: has the largest volume of water for surface water features in Great Britain (CH2MHill, 2014a).	
	Biodiversity	WFD overall ecological status: Moderate (2013). WFD overall status: Moderate ecological potential (HMWB) (2013). Fisheries status: salmonid waters under WFD. Privately operated salmon fishing rights. Other designations: SACs (River Tay and Shingle Islands), SSSIs (Meikleour Area and Shingle Islands).	
WF1 (Birnam Burn)  4.38km <sup>2</sup> catchment  Surrounding land use: woodland.	Hydrology and flood risk	No flood risk has been identified for this water feature using either the SEPA Flood Maps or OS map.	No photo (not accessed).
	Fluvial geomorphology	WFD hydromorphology status: not classified. Slightly sinuous planform Historical change: No change in planform since 1867. No riparian buffer. Structures: culverted under Highland Main Line railway and the existing A9.	
	Water quality/supply	WFD overall chemical and water quality status: not classified.	



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Water Feature ID (water body name)	Attribute	Description	Photographs
		Fed from three upstream lochs including Rohallion Loch. Potential pollutant sources: diffuse rural sources, rail and road drainage.	
	Dilution and removal of waste products	Medium flow, medium pollutant dilution/dispersal capacity.	
	Biodiversity	WFD overall ecological status: not classified. Fisheries status: not classified.	
WF2 (Birnam Burn secondary channel)  0.24km <sup>2</sup> catchment  Surrounding land use: moorland, woodland.	Hydrology and flood risk	No flood risk has been identified for this water feature using either the SEPA Flood Maps or OS map.	 <p>WF2 – View downstream towards existing A9 culvert inlet.</p>
	Fluvial geomorphology	WFD hydromorphology status: not classified. Slightly sinuous planform. No riparian buffer. Historical change: No change in planform since 1867, culverted under the existing A9 between 1959 and 1981. Structures: culverted under Highland Main Line railway and the existing A9. Silt bed, 0.5m wide, some variations in flow.	
	Water quality/supply	WFD overall chemical and water quality status: not classified. Potential pollutant sources: diffuse rural sources, rail and road drainage.	
	Dilution and removal of waste products	Low flow, possibly ephemeral.	
	Biodiversity	WFD overall ecological status: not classified. Fisheries status: not classified.	
WF4  0.07km <sup>2</sup> catchment  Surrounding land-use: woodland.	Hydrology and flood risk	No flood risk has been identified for this water feature using either the SEPA Flood Maps or OS map.	
	Fluvial geomorphology	WFD hydromorphology status: not classified.	
	Water quality/supply	WFD overall chemical and water quality status: not classified. Mapped by OS (1:25,000 scale) as approximately 30m long and observed during site visit as the confluence of two minor surface water features culverted beneath the B867 flowing northward. Potential pollutant sources: diffuse rural sources, rail and road drainage.	



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Water Feature ID (water body name)	Attribute	Description	Photographs
	Dilution and removal of waste products	Low flow, ephemeral.	WF4 – downstream view from B867 towards A9.
	Biodiversity	WFD overall ecological status: not classified. Fisheries status: not classified.	
WF5  0.75km <sup>2</sup> catchment  Surrounding land use: woodland.	Hydrology and flood risk	No flood risk has been identified for this water feature using either the SEPA Flood Maps or OS map.	 <p>WF5 – downstream view from B867 towards A9.</p>
	Fluvial geomorphology	WFD hydromorphology status: not classified. Straight planform. Silt bed, limited flow variation, 0.4m wide.	
	Water quality/supply	WFD overall chemical and water quality status: not classified. Mapped by OS (1:25,000 scale) as a discontinuous linear feature terminating north of the B867. However, it was noted that a dry channel exists to the north leading to the embankment of the existing A9. Potential pollutant sources: diffuse rural sources, road and rail drainage.	
	Dilution and removal of waste products	Low flow, low pollutant dilution/dispersal capacity.	
	Biodiversity	WFD overall ecological status: not classified. Fisheries status: not classified.	
WF7  0.59km <sup>2</sup> catchment  Surrounding land use: woodland, moorland.	Hydrology and flood risk	No flood risk has been identified for this water feature using either the SEPA Flood Maps or OS map.	
	Fluvial geomorphology	WFD hydromorphology status: not classified. Sinuous planform. Gravel and pebble bed, ephemeral downstream section, 1.2m wide, step-pool sequence.	
	Water quality/supply	WFD overall chemical and water quality status: not classified. Potential pollutant sources: diffuse rural sources.	
	Dilution and removal of waste products	Low flow, low pollutant dilution/dispersal capacity.	
	Biodiversity	WFD overall ecological status: not classified. Fisheries status: not classified.	



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Water Feature ID (water body name)	Attribute	Description	Photographs
			WF7 – view upstream from Highland Main Line railway.
WF186  0.3km <sup>2</sup> catchment  Surrounding land-use: woodland.	Hydrology and flood risk	No flood risk has been identified for this water feature using either the SEPA Flood Maps or OS map.	 <p>WF186 – upstream view from Birnam Glen access road.</p>
	Fluvial geomorphology	WFD hydromorphology status: not classified. Straight planform.	
	Water quality/supply	WFD overall chemical and water quality status: not classified. Potential pollutant sources: diffuse rural sources.	
	Dilution and removal of waste products	Low flow, likely to be ephemeral.	
	Biodiversity	WFD overall ecological status: not classified. Fisheries status: not classified.	
WF8 (Inchewan Burn)  5.77km <sup>2</sup> catchment  Surrounding land use: development, woodland, plantation, moorland.	Hydrology and flood risk	SEPA Flood Maps show direct flood risk to the surrounding properties in Birnam.	 <p>WF8 (Inchewan Burn) – downstream view of restored section underneath A9 overbridge.</p>
	Fluvial geomorphology	WFD hydromorphology status: not classified. Sinuous planform. Riparian buffer: 10m-20m trees. Historical change: erosion and deposition, meander migration, straightened near the existing A9. Structures: bridge crossing under the existing A9 and Highland Main Line railway, culverted under local access routes. Upstream section includes a dynamic bedrock cascade. Downstream section: gravel and cobble bed, 3m wide, step-pool sequence.	
	Water quality/supply	WFD overall chemical and water quality status: not classified. Potential pollutant sources: diffuse rural sources and urban, road and rail drainage.	
	Dilution and removal of waste products	Low to medium flow with falls and weirs upstream of the existing A9. Low to medium pollution dilution/dispersal capacity.	
	Biodiversity	WFD overall ecological status: not classified. Fisheries status: not classified. Historic man-made barriers to fish passage under existing A9 now removed after river restoration works in 2007 (River Restoration Centre, 2013). Considered to be salmonid waters in its lower reaches; upper sections have falls, which are likely to block fish	



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Water Feature ID (water body name)	Attribute	Description	Photographs
		passage.	 <p data-bbox="1541 783 2121 810">WF8 (Inchewan Burn) – downstream view in Birnam.</p>
WF187  0.06km <sup>2</sup> catchment  Surrounding land-use: woodland/ agriculture.	Hydrology and flood risk  Fluvial geomorphology  Water quality/supply  Dilution and removal of waste products  Biodiversity	No flood risk has been identified for this water feature using either the SEPA Flood Maps or OS map.  WFD hydromorphology status: not classified. Road drain, limited features.  WFD overall chemical and water quality status: not classified. Possible pollutant sources: rail drainage.  Low flow, likely to be ephemeral.  WFD overall ecological status: not classified. Fisheries status: not classified.	No photo (not accessed).
WF9  0.75km <sup>2</sup> catchment  Surrounding land use: development, grassland, plantation, woodland.	Hydrology and flood risk  Fluvial geomorphology  Water quality/supply	No flood risk has been identified for this water feature using either the SEPA Flood Maps or OS map.  WFD hydromorphology status: not classified. Straight planform field drain. Structures: culverted under the existing A9 and local access routes. Silt bed, smooth flow, 1.2m wide, vertical earth banks.  WFD overall chemical and water quality status: not classified. Possible additional pollutant sources: diffuse rural sources, and urban, rail and road drainage.	



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Water Feature ID (water body name)	Attribute	Description	Photographs
	Dilution and removal of waste products	Low to medium flow, low to medium pollutant dilution/dispersal capacity.	WF9 – downstream view from existing A9 culvert outlet towards River Braan.
	Biodiversity	WFD overall ecological status: not classified. Fisheries status: not classified.	
WF11 (River Braan)  211km <sup>2</sup> catchment  Surrounding land use: woodland, plantation, moorland, development, agriculture.	Hydrology and flood risk	SEPA Flood Maps show direct flood risk to properties at Inver and campsite.	 WF11 (River Braan) – view upstream from footbridge, immediately upstream of A9 bridge crossing.
	Fluvial geomorphology	WFD hydromorphology status: High (2013). Historical change: island development, deposition and erosion. Riparian buffer: 20m-30m trees. Structures: a number of bridge crossings, including the existing A9. Pebble and cobble bed, numerous boulders, 10m-12m wide.	
	Water quality/supply	WFD overall chemical status: Pass (2013). WFD overall water quality status: High (2013). Potential additional pollutant sources: diffuse rural sources, road and rail drainage.	
	Dilution and removal of waste products	Medium flow, medium pollutant dilution/dispersal capacity (Q95 at Hermitage is 0.55m <sup>3</sup> /s).	
	Biodiversity	WFD overall ecological status: Good (2013). WFD overall status: Good (2013). Fisheries status: salmonid waters under WFD (associated with River Tay). Other designations: River Tay SAC.	
			

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Water Feature ID (water body name)	Attribute	Description	Photographs
			WF11 (River Braan) – view downstream from railway bridge.
WF12 (Mill Lade/Mill Stream)	Hydrology and flood risk	SEPA Flood Maps show direct flood risk to properties at Inver and campsite.	 <p>WF12 (Mill Lade/Mill Stream) – view downstream towards existing A9 culvert inlet.</p>
0.02km <sup>2</sup> catchment	Fluvial geomorphology	WFD hydromorphology status: not classified. Meandering planform between River Braan and River Tay. Structures: culverted under the existing A9 and local access route. Gravel and cobble bed, 1.5m-2m wide, incised, bank reinforcement.	
Surrounding land use: development, residential/recreational (caravan park).	Water quality/supply	WFD overall chemical and water quality status: not classified. Potential pollutant sources: road drainage.	
	Dilution and removal of waste products	Low flow, low pollution dilution/dispersal capacity.	
	Biodiversity	WFD overall ecological status: not classified. Fisheries status: not classified.	
WF13	Hydrology and flood risk	No flood risk has been identified for this water feature using either the SEPA Flood Maps or OS map.	 <p>WF13 – view upstream towards existing A9 culvert outlet.</p>
1.33km <sup>2</sup> catchment	Fluvial geomorphology	WFD hydromorphology status: not classified. Historical change: erosion and deposition, meander migration. Structures: culverted under the existing A9, Highland Main Line railway and local access routes. Gravel and sand bed, riffles, approximately 0.7m wide.	
Surrounding land use: woodland, moorland.	Water quality/supply	WFD overall chemical and water quality status: not classified. Potential pollutant sources: diffuse rural sources, road and rail drainage.	
	Dilution and removal of waste products	Low flow, low pollution dilution/dispersal capacity.	
	Biodiversity	WFD overall chemical status: not classified. Fisheries status: not classified.	

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Water Feature ID (water body name)	Attribute	Description	Photographs
WF14  0.64km <sup>2</sup> catchment  Surrounding land use: woodland	Hydrology and flood risk	No flood risk has been identified for this water feature using either the SEPA Flood Maps or OS map.	 <p>WF14 – view upstream towards arch structure under Highland Main Line railway.</p>
	Fluvial geomorphology	WFD hydromorphology status: not classified. Predominantly sinuous planform. Historical change: erosion and deposition, meander migration. Structures: bridge crossing under the existing A9 (Tay Bridge) and culverted under B898 road, Highland Main Line railway and local access routes. Gravel and sand bed, riffle-pool sequence, approximately 1m wide.	
	Water quality/supply	WFD overall chemical and water quality status: not classified. Potential pollutant sources: diffuse rural sources, road and rail drainage.	
	Dilution and removal of waste products	Low flow, low pollution dilution/dispersal capacity.	
	Biodiversity	WFD overall ecological status: not classified. Fisheries status: not classified.	
WF16  0.29km <sup>2</sup> catchment  Surrounding land use: woodland.	Hydrology and flood risk	No flood risk has been identified for this water feature using either the SEPA Flood Maps or OS map.	 <p>WF16 – view downstream towards A9.</p>
	Fluvial geomorphology	WFD hydromorphology status: not classified. Predominantly sinuous planform. Structures: culverted under the existing A9, General Wade's Military Road and forest tracks. Gravel and cobble bed, step-pool sequence, approximately 0.8m-1m wide.	
	Water quality/supply	WFD overall chemical and water quality status: not classified. Potential pollutant sources: diffuse rural sources.	
	Dilution and removal of waste products	Low flow, low pollution dilution/dispersal capacity.	
	Biodiversity	WFD overall ecological status: not classified. Fisheries status: not classified.	
WF17  0.11km <sup>2</sup> catchment	Hydrology and flood risk	No flood risk has been identified for this water feature using either the SEPA Flood Maps or OS map.	No photo (not accessed).
	Fluvial geomorphology	WFD hydromorphology status: not classified. Straight planform, road drain.	



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Water Feature ID (water body name)	Attribute	Description	Photographs
Surrounding land use: woodland.	Water quality/supply	WFD overall chemical, water quality, ecological and fisheries status: not classified. Potential pollutant sources: road drainage.	
	Dilution and removal of waste products	Water feature 17 is approx. 21m long. Ephemeral road drain.	
	Biodiversity	WFD overall ecological status: not classified. Fisheries status: not classified.	