

A38 Derby Junctions

TR010022

Volume 6

**6.3 Environmental Statement
Appendices**

**Appendix 8.20(a): Summary of
Biodiversity Effects**

Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

March 2020

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms
and Procedure) Regulations 2009**

A38 Derby Junctions
Development Consent Order 202[]

**6.3 Environmental Statement Appendices
Appendix 8.20(a): Summary of Biodiversity Effects**

Regulation Number	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010022
Application Document Reference	6.3
Author	A38 Derby Junctions Project Team, Highways England

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2	March 2020	DCO Application

Appendix 8.20a: Biodiversity - summary of effects during Scheme construction

Note: The EIA definition of a significant biodiversity effect is: a 'moderate or greater' adverse or beneficial significant effect (at the County or Unitary Authority scale or above) on an important biodiversity feature (refer to Chapter 8: Biodiversity, Table 8.4 [TR010022/APP/6.1])

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
Construction phase									
Statutory designated sites	Gang Mine SAC, Bees Nest and Green Clay Pits SAC, Peak District SAC, South Pennine Moors SAC and SPA, River Mease SAC; and West Midlands Mosses SAC and Ramsar	International or European	✓	✓	None	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP
	Kedleston Park SSSI	UK or National	✓	*	None	Located upstream of the Scheme. Located >200m from the Scheme in terms of potential air quality effects. No qualifying features sensitive to noise disturbance.	None	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	N/A
	Breadsall Railway Cutting SSSI and LNR	UK or National	✓	*	None	Located upstream of the Scheme. Located >200m from the Scheme in terms of potential air quality effects. No qualifying features sensitive to noise disturbance.	None	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	N/A
	Mickleover Meadows LNR	County or Unitary Authority	✓	*	None	Located upstream of the Scheme. Located >200m from the Scheme in terms of potential air quality effects. No qualifying features sensitive to noise disturbance.	None	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	N/A
	Allestree Park LNR; and Chaddesden Woods and Lime Lane Wood LNR	County or Unitary Authority	*	✓	None	No hydrological or habitat links from the site to the Scheme. Located >200m from the Scheme in terms of potential air quality effects. No qualifying features sensitive to noise disturbance.	None	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	N/A
	Darley and Nutwood LNR	County or Unitary Authority	*	✓	Disturbance through pollution surface runoff/particulate loading from	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP

¹ SI (Sign): PO (Probability): CO (Complexity): EC (Extent): SZ (Size i.e. Magnitude): RE (Reversibility): DU (Duration): TF (Timing and Frequency)

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
					construction				
Non-statutory designated sites	A38 Roundabout LWS	County or Unitary Authority	✓	*	Habitat loss	Translocation/appropriate planting of species-rich grassland in Markeaton Park. Best practice construction methods as detailed in the CEMP.	SI: Negative PO: Certain/near-certain CO: Direct EC: Approximately 3.8ha of habitat lost (100% of the LWS lost; approximately 0.28ha/7% of the LWS is species rich grassland which the site is designated). Approximately 0.28ha of the species –rich grassland lost to be mitigated. SZ: As above ² RE: Permanent DU: Long-term TF: Potential for nesting birds and terrestrial invertebrates (see below). Sensitive timing to be considered when undertaking habitat removal.	Moderate significant adverse effect <i>Confidence:</i> Certain/near-certain	N/A – refer to species rich semi-improved grassland receptor below for post-construction monitoring requirements relating to the translocated and enhanced grassland habitats.
	Bramble Brook and Margins LWS	County or Unitary Authority	✓	*	Disturbance through pollution surface runoff/particulate loading from construction	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	As per CEMP
	Markeaton Park LWS	County or Unitary Authority	✓	*	Habitat Loss	Scheme alignment avoids loss of veteran trees (for which the designated site is designated) to ensure functional integrity of the site remains. Landscape planting for the Scheme includes tree planting to compensate for that lost.	SI: Negative PO: Certain/near-certain CO: Direct EC: Approximately 0.93ha of habitat temporarily lost. SZ: As above RE: Temporary DU: Short term TF: Potential for nesting birds and roosting bats (see	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	As per CEMP and HEMP for habitats.

² When the ecological feature being considered is habitat itself, size (magnitude) and extent may be synonymous

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
							below). Sensitive timing to be considered when undertaking habitat removal.		
					Disturbance through pollution surface runoff/particulate loading from construction	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP
	Markeaton Brook System LWS	County or Unitary Authority	✓	*	Disturbance through pollution surface runoff/particulate loading from construction	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP
					Disturbance caused by the temporary bridge crossing over Middle Brook	The bridge would span 10m to avoid direct impacts on the watercourses. The foundations of the bridge would be installed as from the bank-top as possible. Freshwater sponge would not be affected by shading from the bridge. Habitat is already heavily shaded.	None.	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	
	Mickleover Railway Cutting LWS	County or Unitary Authority	✓	*	Disturbance through pollution surface runoff/particulate loading from construction	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP.
	Alfreton Road Grassland LWS	County or Unitary Authority	*	✓	Habitat loss	The extent of permanent habitat loss has been minimised within Alfreton Road Rough Grassland LWS. The Scheme avoids loss of habitat in association with the inundation/drawdown zone which is of the most botanical and ornithological value in that field. Suitable grassland habitat reinstatement/creation has been included in the landscape design. Bio control of invasive non-native species (New Zealand pigmyweed) present within the LWS within the Scheme boundary.	SI: Negative PO: Certain/near-certain CO: Direct EC: Approximately 0.876ha of habitat temporarily lost; approximately 0.644-23ha permanently lost SZ: As above RE: Temporary and permanent DU: Short term and long-term TF: Potential for nesting birds and wintering birds	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP and HEMP for habitats.

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
							(see below). Sensitive timing to be considered when undertaking habitat removal.		
					Disturbance through pollution surface runoff/particulate loading from construction	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP.
	The River Derwent LWS	County or Unitary Authority	*	✓	Disturbance through pollution surface runoff/particulate loading from construction	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not Significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP.
	Watermeadows Ditch LWS; Nooney's Pond LWS; and Darley Park LWS	County or Unitary Authority	*	✓	Disturbance through pollution surface runoff.	Pollution prevention control measures. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP.
	Allestree Park LWS; Nutwood and Darley Abbey Wildlife Site LWS; Chaddesden Wood and Lime Lane Wood LWS	County or Unitary Authority	*	✓	Designated sites overlap with statutory designated site Allestree Park LNR; Darley and Nutwood LNR; and Chaddesden Wood and Lime Lane Wood LNR respectively. See above.				
Non-designated sites of interest	Land off Kingsway PLWS	County or Unitary Authority	✓	*	Disturbance through pollution surface runoff/particulate loading from construction	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP.
	A38 Scrub Other Site of Interest	County or Unitary Authority	*	✓	Habitat loss	The Scheme design minimises removal of habitat in association with the A38 Scrub. Habitat loss (as a result of needing space to move excavated material from the flood storage area to the A38 during construction) would be re-instated.	SI: Negative PO: Certain/near-certain CO: Direct EC: Approximately 0.17ha of habitat temporarily lost. SZ: As above RE: Temporary DU: Short term TF: Potential for nesting birds and bats (see below).	Not significant (neutral) <i>Confidence: Certain/near-certain.</i>	As per CEMP and HEMP for habitats.

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
							Sensitive timing to be considered when undertaking habitat removal.		
					Disturbance through pollution surface runoff/particulate loading from construction	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP
	Ford Lane Other Site of Interest	County or Unitary Authority	*	✓	Disturbance through pollution surface runoff/particulate loading from construction	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP
	Des Lane Brook Course; Plantation site of interest; Boosemoor Brook; Old Derby Canal; Marsh Area Breadsall PLWS; Holme Nook Ponds; and Haslams Lane Brook course.	County or Unitary Authority	*	✓	Disturbance through pollution surface runoff/particulate loading from construction	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP
Grassland	Species rich semi-improved grassland	County or Unitary Authority	✓	✓	Habitat loss	Translocation/appropriate planting of specie-rich grassland in Mackworth Park to replace that lost within the A38 Roundabout LWS. The layout of the construction compound at Little Eaton junction avoids, or has aimed to minimise, loss of the species-rich grassland. The loss of habitat at the compound would be temporary, with habitat reinstated to pre-works conditions.	SI: Positive PO: Probable CO: Direct EC: Approximately 0.28ha of species-rich grassland habitat from A38 Kingsway Roundabout LWS to be translocated to Markeaton Park LWS. Species-rich grassland within the construction compound at Little Eaton junction would be reinstated and new areas of species-rich grassland planted across the Scheme. Net gain of approximately 7.41ha. SZ: As above. RE: Permanent DU: Long term TF: Potential for nesting	Not significant (neutral) <i>Confidence: Probable</i>	Implementation of CEMP and HEMP. Habitat monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. Implementation would increase the confidence of residual effects to Certain/near-Certain

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
							birds and terrestrial invertebrates (see below). Sensitive timing to be considered when undertaking habitat removal		
	Poor semi-improved grassland	Local	✓	✓	Habitat loss	Species-poor semi-improved grassland areas replaced with species-rich as part of the landscape design (where highways constraints do not prevail).	SI: Negative PO: Certain/near certain CO: Direct EC: Approximately 3.97ha lost; however, species-rich grassland to be planted to replace and enhance that lost (see above). SZ: As above. RE: Temporary and permanent DU: Short term and long term TF: Potential for nesting birds and terrestrial invertebrates (see below). Sensitive timing to be considered when undertaking habitat removal.	Not significant (neutral) <i>Confidence:</i> Probable	Implementation of CEMP and HEMP. Habitat monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. Implementation would increase the confidence of residual effects to Certain/near-Certain
	Marshy grassland	Local	*	✓	Habitat loss	Marshy grassland habitat to be replaced within the construction compound at Little Eaton. Wetland habitat to be created in association with the Dam Brook diversion at Little Eaton.	SI: Negative PO: Certain/near certain CO: Direct EC: Approximately 0.74ha lost within the compound and replaced with species-rich grassland. SZ: As above RE: Permanent DU: Long term TF: Potential for nesting birds. Sensitive timing to be considered when undertaking habitat removal.	Not significant (neutral) <i>Confidence:</i> Certain/near certain	As per CEMP and HEMP.

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
Trees	Veteran trees across the Scheme	Up to County or Unitary Authority	✓	✓	Habitat loss	The Scheme design has aimed to avoid loss of trees where possible. As part of the bat mitigation to compensate for potential roost feature lost in trees to be removed at Markeaton; it is proposed to make bat features typical of veteran trees in retained trees within the Scheme boundary at Markeaton.	SI: Negative PO: Certain/near certain CO: Direct EC: One veteran tree to be lost in association with the Markeaton footbridge. SZ: As above. RE: Permanent DU: Long term TF: Sensitive timing to be considered when removing in relation to nesting birds and potential for roosting bats.	Slight adverse non-significant effect <i>Confidence:</i> Certain/near-certain	N/A
Woodland	Semi-natural broadleaved woodland	Up to County or Unitary Authority	✓	*	Habitat loss	The Scheme design minimises loss of woodland/trees. Woodland to be planted as part of the landscape design would be native broadleaved woodland; with incorporation of a suitable high quality flora understory, including retention of felled trees as features.	SI: Negative PO: Probable CO: Direct EC: Approximately 0.82ha lost; however, approximately 6.4ha of new woodland to be planted across the Scheme of higher quality than that lost. SZ: As above RE: Temporary and Permanent DU: Short term and long term TF: Sensitive timing to be considered when removing in relation to nesting birds and potential for roosting bats.	Moderate significant adverse effect in the short to medium term³; No significant (neutral) in the long term <i>Confidence:</i> Probable	Implementation of CEMP and HEMP. Habitat monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. The confidence of residual effects remains as Probable given the time for woodland to establish/mature.
	Mixed plantation woodland, broadleaved plantation and/or coniferous plantation.	Local	✓	✓	Habitat loss	The Scheme design minimises loss of woodland/trees. Woodland to be planted as part of the landscape design would be native broadleaved woodland; with incorporation of a suitable high quality flora understory, including retention of felled trees as	SI: Negative PO: Probable CO: Direct EC: Approximately 10.56ha of other woodland to be lost; with approximately	Slight adverse non-significant effect in the short to medium term; No significant (neutral) in the long term	Implementation of CEMP and HEMP. Habitat monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity.

³ 'Short term' in regards to woodland is considered to be in the region of 5 to 10 years; 'medium term' 10 to 15 years; and 'long term' >15 years.

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
						features.	6.4ha of new woodland to be planted across the Scheme of higher quality than that lost. SZ: As above RE: Temporary and Permanent DU: Short term and long term TF: Sensitive timing to be considered when removing in relation to nesting birds and potential for roosting bats.	<i>Confidence: Probable</i>	The confidence of residual effects remains as Probable given the time for woodland to establish/mature.
Standing water	A network of water bodies within designated sites; non-designated sites; and including all other ponds within 50m of the Scheme (also includes those assessed for great crested newts up to 500m from the Scheme boundaries).	County or Unitary Authority	✓	✓	Habitat loss	None. Highway drainage design would create 4 ponds. Wildlife ponds would be created at Dam Brook as part of the realignment works.	N/A	Slight adverse non-significant beneficial effect. <i>Confidence: Probable</i>	Implementation of CEMP and HEMP. Habitat monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. Implementation would increase the confidence of residual effects to Certain/near-certain
					Disturbance through pollution surface runoff/particulate loading from construction	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP
Running water	Watercourses within designated sites; non-designated sites; and other watercourses within and/or adjacent to the Scheme.	Up to County or Unitary Authority	✓	✓	Habitat loss	Dam Brook - channel would be realigned within a new more sinuous channel and there would be a net gain in open channel on this watercourse of 197m (current channel length is approximately 290m and the proposed channel length is approximately 260m of new flood alleviation channel and 216m of swale). Backwaters	SI: Positive PO: Probable CO: Direct EC: Loss of approximately 279m of channel, however approximately 260m of new flood alleviation channel	Slight adverse non-significant effect in the short-term⁴; Moderate significant beneficial effect in the medium to long term.	Implementation of CEMP and HEMP. Habitat monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity.

⁴ 'Short term' in regards to watercourses is considered to be in the region of 1 to 2 years; 'medium term' 2 to 5 years; and 'long term' >5 years.

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
						and attenuation ponds would also be provided improving the riparian zone of the channel.	and approximately 216m of swale. Net gain in open channel of approximately 197m SZ: As above RE: Temporary and permanent DU: Short term and long-term TF: Potential for otter. Sensitive timing to be considered when undertaking habitat removal	<i>Confidence:</i> Probable	The confidence of residual effects would increase to Certain/near certain .
						131m of open channel would be lost on the Bramble Brook within the Kingsway Junction as a result of culvert construction. The channel would also be realigned against the proposed north bound slip road. Measures would be implemented to mitigate this loss and further details of this can be found in the accompanying WFD assessment.	SI: Negative PO: Certain/near-certain CO: Direct EC: Approximately 131m loss of open channel; however mitigation as per WFD assessment. SZ: As above RE: Temporary and permanent DU: Short term and long-term TF: Potential for otter. Sensitive timing to be considered when undertaking habitat removal	Slight adverse non-significant effect in the short-term; Not significant (neutral) in the medium to long term. <i>Confidence:</i> Probable	Implementation of CEMP and HEMP. Habitat monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. The confidence of residual effects would increase to Certain/near-certain .
					Disturbance through pollution surface runoff/particulate loading from construction	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	As per CEMP and HEMP
					Disturbance caused by the temporary bridge crossing over Middle Brook and the former Derby canal	The bridge would span 10m to avoid direct impacts on the watercourses. The foundations of the bridge would be installed as from the bank-top as possible.	None.	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
Arable	Arable (field margins)	Local	*	✓	Habitat loss	The Scheme does not result in loss of any notable field margins. Rank grassland would be incorporated into the landscape design strategy for Scheme, particularly adjacent to retained arable habitat linking the Scheme to the wider landscape.	SI: Negative PO: Probable CO: Direct EC: Approximately 11.37ha of arable and improved grassland (pasture) to be lost; however, approximately 9.38ha of land lost to be returned to unrestricted agricultural use post construction. SZ: As above. RE: Temporary and Permanent DU: Short term and long term. TF: Notable farmland bird assemblage. Sensitive timing to be considered when undertaking habitat removal	Not significant (neutral) <i>Confidence:</i> Certain/near-certain.	As per CEMP and HEMP
Hedgerows	Species-poor and species-rich hedgerows	Local	*	✓	Habitat loss	Species-poor hedgerow lost would be replaced in a ratio of at least 1:1 with species-rich hedgerows. Section of species-rich hedgerow to be temporarily lost would be replaced. The planting of species-rich hedgerows would also be undertaken at the earliest opportunity to enable rapid establishment of these linear habitat features and promote wildlife dispersal alongside the Scheme.	SI: Negative PO: Probable CO: Direct EC: Approximately 509m of species-poor hedgerow to be lost; however, approximately 107m of species-rich hedgerow to be planted. SZ: As above RE: Temporary and Permanent DU: Short term and long term TF: Potential for nesting birds and navigational cues for bats. Sensitive timing to be considered when undertaking habitat removal	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	As per CEMP and HEMP.

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
Other habitats	Amenity grassland, improved grassland, scattered and dense scrub, scattered trees, tall ruderal hard standing and buildings	Site (Invasive non-native plant species – illegal to spread into the wild)	✓	✓	Spread of invasive plant species	Biosecurity Management Plan.	None.	N/A	As per CEMP and HEMP
Toads	A population of toads within the network of waterbodies at Markeaton catchment (Ponds Pa6, Pa7 and Pa8).	Local	✓	✗	Habitat loss	The Scheme avoids any loss of ponds. Culvert connecting Markeaton Lake and the Mill Ponds to be unaffected. Most suitable areas of terrestrial amphibian habitat located immediately adjacent to Markeaton Lake and Mill ponds which would be retained. The loss of terrestrial habitat beyond would be replaced and include suitable refugia for amphibians as enhancements.	SI: Negative PO: Probable CO: Direct EC: No ponds lost. Most suitable terrestrial habitat to be retained; however some lost beyond which would be replaced and enhanced. SZ: As above RE: Temporary DU: Short term	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP and HEMP for habitats.
					Risk of mortality/injury/disturbance	Works area appropriately fenced off. Destructive searches of suitable refugia for toads at Markeaton junction by hand during the construction phase and individuals translocated to suitable receptor sites (around the retained ponds at Markeaton Lake and Mill Ponds). Standard pollution prevention controls would also be implemented as part of the CEMP to minimise any potential impact on toads.	None	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP and HEMP for water habitats.
Birds	Barn owl at Little Eaton junction.	County or Unitary Authority	✗	✓	Loss of foraging habitat	Presence of arable land extending east of Little Eaton junction into the wider landscape, providing sufficient alternative habitat. The compensatory habitat to be created for the notable farmland and wading birds would provide foraging habitat for barn owl.	SI: Negative PO: Probable CO: Direct loss of foraging habitat to construction i.e. arable land at Little Eaton junction EC: Approximately 0.87ha of arable land is to be permanently lost. SZ: As above RE: Permanent loss of habitat from construction DU: Long-term	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	N/A

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
							TF: N/A		
					Displacement from barn owl nest site(s) as a result of construction activities	Pre-construction check would be undertaken by an appropriately licensed ornithologist, and mitigation measures adopted to minimise disturbance as appropriate during construction.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
	An assemblage of notable farmland birds on the pastoral land and arable land to the east of the A38 at Little Eaton.	Local	*	✓	Loss of foraging habitat for farmland birds (pastoral and arable land)	The Scheme design minimise loss of pastoral/arable habitat. Some pastoral/arable habitat would be reinstated, and compensatory grassland margins created. Plenty of alternative habitats available in the wider landscape.	SI: Negative PO: Probable CO: Direct EC: Approximately 11.37ha of pastoral/arable land lost however, approximately 9.38ha reinstated; assemblage typically found >100m from the Scheme. Compensatory planting also SZ: As above RE: Temporary/Permanent DU: Short term/long-term TF: N/A	Not significant (neutral) <i>Confidence:</i> Probable	Implementation of CEMP and HEMP. Habitat and bird monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. This would increase the confidence of residual effects to Certain/near-certain .
					Noise and visual disturbance from construction activities	The notable farmland bird assemblage is primarily located >100m from the Scheme boundary. Provision of temporary screening such as fencing during construction to minimise visual disturbance to farmland birds. Regular bird monitoring surveys would be undertaken during construction to thus minimise any potential impact; and see effectiveness of temporary screening installed accordingly during construction. Advance planting, to overlap with construction and operation, of a dense shelterbelt to replace that lost (and the embankment), would minimise any potential disruption to birds nesting in the farmland.	None	Not significant (neutral) <i>Confidence:</i> Probable	As per CEMP. Bird monitoring surveys. This would increase the confidence of residual effects to Certain/near-certain .
	A population of nesting lapwing south-west of Little Eaton junction.	County or Unitary Authority	*	✓	Habitat loss	The Scheme design avoids habitat loss of optimal lapwing nesting Some habitat lost would be replaced, including the dense shelter belt (see details	SI: Negative PO: Probable CO: Direct EC: Approximately 0.876ha	Not significant (neutral) <i>Confidence:</i> Probable	Implementation of CEMP and HEMP. Habitat and bird monitoring surveys

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
						below) and species-rich grassland.	of habitat temporarily lost; approximately 0.644-23 ha permanently lost at Alfreton Road Rough Grassland LWS. SZ: As above RE: Temporary/Permanent DU: Short term/long term TF: N/A		as part of ensuring No Net Loss/Net Gains in biodiversity. This would increase the confidence of residual effects to Certain/near-certain.
					Noise and visual disturbance from construction activities	Provision of temporary screening such as fencing during construction to minimise visual disturbance to nesting lapwing. Regular bird monitoring surveys would be undertaken during construction to minimise any potential impacts; and see effectiveness of temporary screening installed during construction. Advance planting, to overlap with construction and operation, of a dense shelterbelt to replace that lost (and the embankment), would minimise any potential disruption to birds nesting in the flooded fields.	None	Not significant (neutral) <i>Confidence: Probable</i>	As per CEMP. Bird monitoring surveys. This would increase the confidence of residual effects to Certain/near-certain.
					Habitat loss	The Scheme design avoids permanent habitat loss of optimal little ringed plover and oyster catcher habitat. Some habitat lost would be replaced, including the dense shelter belt (see details below) and species-rich grassland.	SI: Negative PO: Probable CO: Direct EC: Not confirmed to be nesting. Potential suitable habitat to the south of the A38 at Little Eaton junction. However, optimal habitat beyond the Scheme boundary to the south. SZ: As above RE: Temporary/Permanent DU: Short term/long term TF: N/A	Not significant (neutral) <i>Confidence: Probable</i>	Implementation of CEMP and HEMP. Habitat and bird monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. This would increase the confidence of residual effects to Certain/near-certain.
	Presence of the Schedule 1 little ringed plover and oystercatcher south-west of Little Eaton junction.	County or Unitary Authority for both species	x	✓	Noise and visual disturbance from construction activities	If proposed construction works are during the nesting season, bird deterrents would be in place to deter little ringed plover nesting (Schedule 1). Provision of temporary screening such as fencing during construction to minimise	None	Not significant (neutral) <i>Confidence: Probable</i>	As per CEMP. Bird monitoring surveys. This would increase the confidence of residual effects to

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
						visual disturbance to potentially nesting little ringed plover and oyster catcher. Regular bird monitoring surveys would be undertaken during construction to minimise any potential impacts; and see effectiveness of temporary screening installed during construction. Advance planting, to overlap with construction and operation, of a dense shelterbelt to replace that lost (and the embankment), would minimise any potential disruption to birds nesting in the flooded fields.			Certain/near-certain.
	Common nesting bird species across the Scheme (incl. notable assemblage within the construction compound at Little Eaton)	Site (nesting birds legally protected)			Habitat loss	Vegetation of local provenance would be planted, representing species which provide nesting and/or food resources for birds, particularly for those Amber and Red List species, such as song thrush and dunnock. Bird nest boxes would be installed within areas retained habitat (approximately 20 bird boxes within Mackworth Park).	SI: Negative PO: Probable CO: Direct EC: Vegetation to be lost within the Scheme boundary SZ: As above RE: Temporary/Permanent DU: Short term/long term TF: See below.	Not significant (neutral) <i>Confidence: Certain/near certain</i>	As per CEMP.
			✓	✓	Risk of mortality/injury	Vegetation clearance would avoid the nesting bird period i.e. March to August (inclusive). If the nesting bird season cannot be avoided then nesting bird checks would be undertaken by an ornithologist prior to any vegetation removal. Appropriate buffer zones would be put in place until the nest is no longer in use. Implementation through CEMP.	None	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP.
	Populations of wintering birds including lapwing, teal, and black-headed gull in the flooded field south-west of Little Eaton junction.	Local		✓	Habitat loss	The Scheme design avoids permanent habitat loss of optimal wintering bird habitat. Some habitat lost would be replaced, including the dense shelter belt (see details below) and species-rich grassland. The Dam Brook diversion and associated highway attenuation ponds, wildlife ponds and permanent wetland habitat would potentially benefit wintering birds.	SI: Negative PO: Probable CO: Direct EC: Approximately 0.876ha of habitat temporarily lost; approximately 0.644-23ha permanently lost within Alfreton Road Rough Grassland LWS. However, optimal habitat beyond the	Not significant (neutral) <i>Confidence: Probable</i>	Implementation of CEMP and HEMP. Habitat and bird monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. This would increase the confidence of
			✗						

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
							Scheme boundary to the south. SZ: As above RE: Temporary/Permanent DU: Short term/Long term TF: N/A		residual effects to Certain/near-certain.
					Noise and visual disturbance from construction activities	Provision of temporary screening such as fencing during construction to minimise visual disturbance to wintering birds. Regular bird monitoring surveys would be undertaken during construction to minimise any potential impacts; and temporary screening installed during construction. Advance planting, to overlap with construction and operation, of a dense shelterbelt to replace that lost (and the embankment), would minimise any potential disruption to birds nesting in the flooded fields.	None	Not significant (neutral) <i>Confidence: Probable</i>	As per CEMP. Bird monitoring surveys. This would increase the confidence of residual effects to Certain/near-certain.
Bats	Roosting bats – Noctule bat maternity roost (and suitable for hibernation) at tree M2.	County or Unitary Authority	✓	✗	Loss of roost; and risk of mortality/injury to bats	All works to confirmed bat roosts would be undertaken under a Natural England European Protected Species Mitigation Licence (EPSML), as outlined in the outline CEMP and as provisionally agreed with Natural England. Translocation of known roosting features from tree M2, noctule maternity roost (and potential hibernation roost), with sections of tree M2 strapped and attached to a nearby tree under direction of a bat licence holder. An eco-rocket box would also be implemented as part of mitigation within the same woodland parcel (G361*) as the noctule roost to provide mitigation for the tree roost. Supervision by a licenced bat worker and timing of works to minimise impacts on summer and potential winter roost.	SI: Negative PO: Certain/near-certain (roost loss); unlikely (mortality/injury to bats) CO: Direct EC Loss of roost; however mitigation to replace that lost and sensitive timing of works under licence. SZ: As above RE: Permanent DU: Long term TF: timing of works to minimise impacts on summer and potential winter roosts. Coordinate with sensitive timing of nesting birds.	Not significant (neutral) <i>Confidence: Probable</i>	Monitoring of installed bat boxes under licence as per CEMP and HEMP. Implementation would increase confidence of residual effects to Certain/near-certain.
	Roosting bats - Common pipistrelle maternity roost at the River Derwent bridge (B3) (outside but adjacent to the Scheme).	County or Unitary Authority	✗	✓	Disturbance to retained roost	There would be no direct impacts to the bridge. A 50m buffer of vegetation would be retained around the roost and additional mitigation measures would include maintaining current conditions (dark areas)	None.	Not significant (neutral) <i>Confidence: Certain/near certain.</i>	As per CEMP. Roost feature however already monitored as part of Area 7 maintenance

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
						around the bridge in order to prevent any potential displacement as a result of works.			regime.
	Roosting bats -a network of transient tree and structure roosts of common species (common pipistrelle, brown long-eared bat and potentially soprano pipistrelle) – two confirmed roosts (B2, QW30) within the Scheme boundary; one small occasional day roost of whiskered bat – listed as a rarer species than pipistrelle and long-eared (QW30 also); and confirmed/potential roosts located within 50m of the Scheme boundary.	Local	✓	✓	Loss of roosts; and risk of mortality/injury to bats	<p>All works to confirmed bat roosts would be undertaken under a Natural England European Protected Species Mitigation Licence (EPSML), as outlined in the outline CEMP and as provisionally agreed with Natural England.</p> <p>QW30: Replacement roosting locations to be created within the noise barrier to be positioned (within the footprint of the Queensway properties once demolished). Noise barrier of 4m high and 286m long would have a lip to the south (facing away from the road), providing a 2cm wooden cavity. The cavity would be sectioned regularly to provide different lengths of cavities available to suit more than one species. A temporary bat box suitable for hibernation would be positioned within the woodland parcel (G361*) in the unlikely scenario that bats are encountered during licenced soft strip and demolition of building QW30.</p> <p>B2 Flood Arch Bridge: Integration of three bat boxes to be installed as part of the bridge extension within the bridge abutment to create replacement roosting locations for the loss of roosting features to the southern section of the bridge.</p> <p>Supervision by a licenced bat worker and timing of works to minimise impacts on summer roosts.</p>	<p>SI: Negative PO: Certain/near-certain (roost loss); unlikely (mortality/injury to bats) CO: Direct EC Loss of two roosts; however, mitigation to replace that lost and sensitive timing of works under licence. SZ: As above RE: Permanent DU: Long term TF: Timing of works to minimise impacts on summer roost. Coordinate with sensitive timing of nesting birds.</p>	Not significant (neutral) <i>Confidence: Probable</i>	Monitoring of installed bat boxes under licence as per CEMP and HEMP. Implementation would increase confidence of residual effects to Certain/near-certain .
					Disturbance to retained roosts	Appropriate buffer zones of at least 50m would be maintained around these confirmed roost features, in line also with tree root protection zones (where applicable). Lighting and vehicle movements would be controlled (where applicable) as implemented through the CEMP.	None	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP.
	Roosting bats – potential roosting features identified in buildings, structures and trees across the Scheme	Up to Local	✓	✓	Loss of potential roosts	Making veteran features in retained trees within the Scheme boundary at Markeaton (proactive management to improve their habitat value by creating features including natural fracture pruning). Approximately	<p>SI: Negative PO: Probable CO: Direct EC Loss of potential roost</p>	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP.

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
	(with no confirmed roost)					<p>10No. trees.</p> <p>From the removal of trees, nature totem poles (approximately 3No.) utilising existing tree features can be created as a feature within Markeaton Park.</p> <p>General enhancement at Mackworth Park in the form of bat boxes such as 4 x Schwegler 2F, 2 x Schwegler 1FF and 2 x schwegler 1FS (no more than 10No.) including hibernation boxes 2 x Schwegler 1FW.</p> <p>Careful soft felling of trees, supervision of works and preconstruction checks by bat licenced worker (where applicable).</p>	<p>features in trees, buildings and structures; however, mitigation to replace that lost and supervision of works.</p> <p>SZ: As above RE: Temporary DU: Short term TF: Coordinate with sensitive timing of nesting birds.</p>		
	<p>Foraging and commuting bats (all species) which includes:</p> <p>Foraging and commuting bats – populations of 'rarer' species (Whiskered, Brandt's, Daubenton's, natterer's, noctule and serotine recorded at Markeaton Park north of the Scheme; Daubenton's and whiskered/Brandt's were recorded foraging along the River Derwent including where the A38 crossed the river; occasional Leisler's or serotine were recorded in the vicinity of the Little Eaton junction).</p> <p>Foraging and commuting bats -populations of 'common' species (common pipistrelle, soprano pipistrelle and brown long-eared).</p>	County or Unitary Authority	✓	✓	<p>Habitat loss</p>	<p>The Scheme design minimises impacts on bat activity hot spots.</p> <p>The footbridge at Markeaton junction would be replaced with a like for like replacement.</p> <p>Creation and enhancement of habitats of value to foraging and commuting bats, taking into account recommended plant species within the Bat Conservation Trust (BCT) Encouraging bats guide 2015.</p> <p>Advance planting and the phasing of vegetation clearance would further reduce construction impacts on foraging and commuting bats, particularly at Little Eaton.</p> <p>Hedgerows (linear habitat features), have also been incorporated into the landscape design to mitigate for that lost and ensure ecological connectivity within and across the Scheme, and into the wider landscape.</p>	<p>SI: Negative PO: Probable CO: Direct EC Loss of habitat across the Scheme; however replacement planting and phased. SZ: As above RE: Temporary DU: Short term TF: N/A</p>	<p>Not significant (neutral) in the short to medium term; slight beneficial in the long term.</p> <p><i>Confidence: Probable</i></p>	<p>As per CEMP and HEMP.</p> <p>Bat monitoring surveys would be undertaken to ensure mitigation measures remain effective and that mitigation planting successfully establishes or is otherwise replaced.</p> <p>Implementation of would increase confidence of residual effects to Certain/near-certain.</p>
					<p>Disturbance to foraging and commuting bats</p>	<p>Best practice measures would be in place to avoid disturbance to foraging and commuting bats through minimising night time working and avoiding direct illumination of retained vegetation which would act as foraging/commuting corridors from confirmed (and potential) roost sites.</p>	<p>None</p>	<p>Not significant (neutral)</p> <p><i>Confidence: Probable</i></p>	<p>As per CEMP.</p> <p>Bat monitoring surveys.</p> <p>This would increase the confidence of residual effects to Certain/near-certain.</p>

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
Badger	Several badger social groups present within or in the vicinity of the Scheme.	Local	✓	✓	Loss of setts	No loss of any main setts is proposed. An appropriate mitigation strategy would be implemented in line with Natural England licensing requirements. Pre-construction badger surveys would be undertaken. Appropriate working buffers around retained setts.	SI: Negative PO: Certain/near-certain CO: Direct EC: Five setts would be lost SZ: As above RE: Permanent DU: Long term TF: N/A	Not significant (neutral) <i>Confidence: Certain/near certain</i>	As per CEMP.
					Disturbance and damage to badger setts (incl. risk of mortality and injuring badgers whilst occupying a sett)	An appropriate mitigation strategy would be implemented in line with Natural England licensing requirements. Appropriate working buffers around retained setts.	None	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP.
					Loss of badger foraging habitat across the Scheme (incl. habitat fragmentation)	There is considered to be suitable foraging habitat in the wider area for badger. The Scheme design has minimised loss of foraging habitat within known badger territory ranges. Appropriate planting has been incorporated into the landscape design to account for loss of foraging resources.	SI: Negative PO: Certain/near-certain CO: Direct EC: Approximately 3.8ha of foraging habitat lost at Kingsway, however suitable habitat available in the wider area; habitat would be reinstated in association with the construction compound, and approximately 0.95ha of arable land lost would be returned to agricultural use at Little Eaton junction. SZ: As above RE: Permanent/Temporary DU: Long term/short-term TF: N/A	Not significant (neutral) <i>Confidence: Probable</i>	As per CEMP and HEMP. Habitat and badger monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. This would increase the confidence of residual effects to Certain/near-certain .
					Disturbance to foraging and commuting badger	The layout of the construction compound at Little Eaton junction has ensured a buffer of vegetation is retained around the periphery.	None	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP.

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
Hedgehogs	A notable population of hedgehogs at Markeaton in association with urban habitats (Markeaton Park and Queensway gardens)	Local	✓	✘	Habitat loss	Replacement planting of mixed urban habitat mosaic is proposed within the landscape design. This includes suitable planting within the area of public open space; and within Markeaton Park.	SI: Negative PO: Certain/near-certain CO: Direct EC: Private gardens at Queensway and Markeaton Park. SZ: As above RE: Temporary DU: Short term TF: N/A	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	As per CEMP and HEMP.
					Risk of mortality/injury	Vegetation clearance (particularly garden shrubs/scrub, and tree stumps) in the area at Markeaton junction would aim to avoid the sensitive hibernation period or be proceeded by a hand search by the ECoW, as implemented through the CEMP.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	As per CEMP.
Otter	A population of otter across the Scheme	County or Unitary Authority	✓	✓	Habitat loss	Marginal habitat loss in the vicinity Bramble Brook due to culvert proposals. Retained habitats would be enhanced to improve foraging potential. The existing channel would be retained until the new realigned channel has been constructed at Dam Brook. The Dam Brook realignment would be enhanced.	SI: Negative and Positive PO: Probable CO: Direct EC: Approximately 131m loss of open channel at Bramble Brook; and loss of approximately 279m of channel, however, approximately 260m of new flood alleviation channel and approximately 216m of swale. Net gain in open channel of approximately 197m at Dam Brook. Mitigation as per WFD assessment with beneficial riparian habitats. SZ: As above RE: Temporary and Permanent DU: Short term and long term. TF: N/A	Not significant (neutral) short to medium term⁵; Moderate significant beneficial in the long term. <i>Confidence:</i> Probable	As per CEMP and HEMP. Habitat and otter monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. This would increase the confidence of residual effects to Certain/near-certain.

⁵ As per watercourses, 'Short term' in regards to otters it is considered to be in the region of 1 to 2 years; 'medium term' 2 to 5 years; and 'long term' >5 years.

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
					Disturbance to commuting and foraging otter	Pre-construction surveys of impacted watercourses would be undertaken to determine likely presence of otter prior to commencement of works. Working area to be fenced. There should be limited night working and ramps would be placed into any excavations over night to allow any otters which enter working area to escape. Standard pollution prevention controls would also be implemented as part of the CEMP to minimise any potential impact on otter food source.	None	Not significant (neutral) <i>Confidence:</i> Probable	As per CEMP and HEMP. Otter monitoring surveys. This would increase the confidence of residual effects to Certain/near-certain .
Terrestrial invertebrates	An assemblage of terrestrial invertebrates, including notable species recorded at various locations within the extent of the Scheme	Local	✓	✓	Habitat loss	The mitigation proposed for the loss of species-rich grassland would provide essential mitigation for terrestrial invertebrates. Opportunities for enhancing habitat have been explored, including road side verges, varied topography and log piles. Felled trees would be retained on site as whole boughs and trunks which would benefit invertebrates. Plant species planted would be beneficial for notable terrestrial invertebrate species. The landscape design has incorporated disease resistant elms near Markeaton Park and Mackworth Park, which would be beneficial and hopefully ensure the survival of white-letter hair-streak.	SI: Negative PO: Certain/near-certain CO: Direct EC: Approximately 0.28ha of grassland habitat that supports terrestrial invertebrates is to be lost at Kingsway junction. Grassland supporting terrestrial invertebrates would be temporarily lost at Little Eaton junction and reinstated. SZ: As above RE: Temporary DU: Short-term TF: N/A	Not significant (neutral) in the short to medium term; slight non-significant beneficial in the long term . <i>Confidence:</i> Probable	As per CEMP and HEMP. Habitat and terrestrial invertebrate monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. This would increase the confidence of residual effects to Certain/near-certain .
					Risk of mortality	Direct mortality caused by construction is unlikely to constitute a significant impact, as the population dynamics of the invertebrate community are unlikely to be permanently affected There is notable habitat for invertebrates adjacent to the Scheme which would remain unaffected and available for invertebrates at Kingsway and Little Eaton junction. Pollution prevention control measures and standard best practice measures to control construction dust would be in place and implemented through the CEMP.	SI: Negative PO: Probable CO: Direct mortality from construction activities EC: During removal of grassland habitat within the extent of the proposed scheme SZ: As above RE: Temporary DU: Short-term TF: N/A	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
Aquatic macro-invertebrates	An assemblage of aquatic macroinvertebrates, recorded in Markeaton, Brook, Middle Brook Bramble Brook, Dam Brook and the River Derwent.	County or Unitary Authority	✓	✓	Habitat loss – Bramble Brook	The realignment and culverting of Bramble Brook has also been assessed in the WFD Assessment, which concluded that there would be no deterioration in the WFD status of the waterbody as a result of the Scheme.	SI: Negative PO: Certain/near-certain CO: Direct EC: Approximately 131m loss of open channel; mitigation as per WFD assessment. SZ: As above RE: Temporary DU: Short term TF: N/A	Not significant (neutral) <i>Confidence:</i> Probable	As per CEMP and HEMP. Habitat and aquatic invertebrate monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. This would increase the confidence of residual effects to Certain/near-certain .
					Habitat loss – Dam Brook	The proposed realignment and restoration of Dam Brook, and the provision of additional habitat in the long term would benefit aquatic invertebrates.	SI: Positive PO: Probable CO: Direct EC: Loss of approximately 279m of channel, however, approximately 260m of new flood alleviation channel and approximately 216m of swale. Net gain in open channel of approximately 197m. SZ: As above RE: Temporary and permanent DU: Short term and long-term TF: N/A	Not significant (neutral) short to medium term⁶; Moderate significant beneficial in the long term. <i>Confidence:</i> Probable	As per CEMP and HEMP. Habitat and aquatic invertebrate monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. This would increase the confidence of residual effects to Certain/near-certain .
					Risk of mortality	Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	As per CEMP and HEMP for water habitats.

⁶ As per watercourses, 'Short term' in regards to aquatic invertebrates it is considered to be in the region of 1 to 2 years; 'medium term' 2 to 5 years; and 'long term' >5 years.

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ¹	Significance of residual effect	Monitoring requirements
Fish	A population of protected/notable species in Dam Brook (brook lamprey <i>Lampetra planeri</i> , bullhead <i>Cottus gobio</i> and brown trout <i>Salmo trutta</i>)	County or Unitary Authority	*	✓	Habitat loss	Translocation of fish from Dam Brook into a suitable receptor site. Greater length of watercourse to be reinstated and the opportunity to restore a greater diversity and quality of fish habitat. Dam Brook has also been assessed in the WFD Assessment, which concluded that there would be no deterioration in the WFD status of the waterbody as a result of the Scheme.	SI: Positive PO: Probable CO: Direct EC: Loss of approximately 279m of channel, however, approximately 260m of new flood alleviation channel and approximately 216m of swale. Net gain in open channel of approximately 197m at Dam Brook. SZ: As above RE: Temporary and permanent DU: Short term and long-term TF: N/A	Not significant (neutral) short to medium term⁷; Moderate significant beneficial in the long term. <i>Confidence: Probable</i>	As per CEMP and HEMP. Habitat and fish monitoring surveys as part of ensuring No Net Loss/Net Gains in biodiversity. This would increase the confidence of residual effects to Certain/near-certain.
					Risk of mortality	Translocation of fish from Dam Brook into a suitable receptor site. Pollution prevention control measures and standard best practice measures to control construction dust. Implementation through the CEMP.	None.	Not significant (neutral) <i>Confidence: Certain/near-certain</i>	As per CEMP and HEMP for water habitats.

⁷ As per watercourses, 'Short term' in regards to fish is considered to be in the region of 1 to 2 years; 'medium term' 2 to 5 years; and 'long term' >5 years.

Appendix 8.20b: Biodiversity - summary of effects during Scheme operation

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ⁸	Significance of residual effect	Monitoring requirements
Operational phase									
Statutory Designated Sites	Gang Mine SAC, Bees Nest and Green Clay Pits SAC, Peak District SAC, South Pennine Moors SAC and SPA, River Mease SAC; and West Midlands Mosses SAC and Ramsar	International or European	✓	✓	None	N/A	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
	Kedleston Park SSSI	UK or National	✓	✗	None	Located upstream of the Scheme. Located >200m from the Scheme in terms of potential air quality effects. No qualifying features sensitive to noise disturbance.	None.	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
	Breadsall Railway Cutting SSSI and LNR	UK or National	✗	✓	None	Located upstream of the Scheme. Located >200m from the Scheme in terms of potential air quality effects. No qualifying features sensitive to noise disturbance.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
	Mickelover Meadows LNR	County or Unitary Authority	✓	✗	None	Located upstream of the Scheme. Located >200m from the Scheme in terms of potential air quality effects. No qualifying features sensitive to noise disturbance. There are habitat links from the designated site to the Scheme via Mickleover Railway cutting LNR; however, construction of the Scheme would not result in any habitat fragmentation indirectly affecting this LNR.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
	Allestree Park LNR; and Chaddesden Woods and Lime Lane Wood LNR	County or Unitary Authority	✗	✓	None	Located >200m from the Scheme in terms of potential air quality effects. No qualifying features sensitive to noise disturbance.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
	Darley and Nutwood LNR	County or Unitary Authority	✗	✓	Surface water run-off	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1].	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A

⁸ SI (Sign): PO (Probability): CO (Complexity): EC (Extent): SZ (Size i.e. Magnitude): RE (Reversibility): DU (Duration): TF (Timing and Frequency)

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ⁸	Significance of residual effect	Monitoring requirements
Non-statutory designated sites	A38 Roundabout LWS	County or Unitary Authority	✓	*	None	N/A This designated site would no longer be present following construction of the Scheme.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
	Bramble Brook and Margins LWS	County or Unitary Authority	✓	*	Surface water run-off and damage or disturbance from salt spray/emissions on habitats adjacent to the Scheme boundary	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. De-icing operations would be undertaken in accordance with standard highway maintenance practice, with residual salt residues within highway runoff being collected by the highway drainage system. Change in levels of nitrogen deposition from operational traffic is considered to be not significant. Refer to Chapter 5: Air Quality [TR010022/APP/6.1] for details.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
	Markeaton Park LWS	County or Unitary Authority	✓	*	Surface water run-off and damage/disturbance from salt spray/emissions on habitats adjacent to the Scheme boundary	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. De-icing operations would be undertaken in accordance with standard highway maintenance practice, with residual salt residues within highway runoff being collected by the highway drainage system. Change in levels of nitrogen deposition from operational traffic is considered to be not significant. Refer to Chapter 5: Air Quality [TR010022/APP/6.1] for details.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain.	N/A
	Markeaton Brook System LWS	County or Unitary Authority	✓	*	Surface water run-off and damage/disturbance from salt spray/emissions on habitats adjacent to the Scheme boundary	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. De-icing operations would be undertaken in accordance with standard highway maintenance practice, with residual salt residues within highway runoff being collected by the highway drainage system. No habitats sensitive to nitrogen deposition.	None	Not significant (neutral) <i>Confidence:</i> Probable	Regular maintenance to remove accumulated sediments would be undertaken throughout proposed scheme operation as per the HEMP. Implementation would increase the confidence in the prediction to

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ⁸	Significance of residual effect	Monitoring requirements
									Certain/near-certain.
	Mickleover Railway Cutting LWS	County or Unitary Authority	✓	*	Surface water run-off and damage/disturbance from salt spray/emissions on habitats adjacent to the Scheme boundary	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. De-icing operations would be undertaken in accordance with standard highway maintenance practice, with residual salt residues within highway runoff being collected by the highway drainage system. Change in levels of nitrogen deposition from operational traffic is considered to be not significant. Refer to Chapter 5: Air Quality [TR010022/APP/6.1] for details.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain.	N/A
	Alfreton Road Grassland LWS	County or Unitary Authority	*	✓	Potential change in hydrology impacting the inundation/drawdown zone as a result of the drainage design	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1].	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain.	N/A
Surface water run-off and damage/disturbance from salt spray and emissions on habitats adjacent to the Scheme boundary					Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. De-icing operations would be undertaken in accordance with standard highway maintenance practice, with residual salt residues within highway runoff being collected by the highway drainage system. No habitats sensitive to nitrogen deposition.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain.	N/A	
	The River Derwent LWS	County or Unitary Authority	*	✓	Surface water run-off and damage/disturbance from salt spray and emissions on habitats adjacent to the Scheme boundary	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. De-icing operations would be undertaken in accordance with standard highway maintenance practice, with residual salt residues within highway runoff being collected by the highway drainage system.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain.	N/A

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ⁸	Significance of residual effect	Monitoring requirements
						No habitats sensitive to nitrogen deposition.			
	Watermeadows Ditch LWS Nooney's Pond LWS; Darley Park LWS	County or Unitary Authority	*	✓	Surface water run-off	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. Darley Park LWS no water dependant habitats.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain.	N/A
	Allestree Park LWS; and Nutwood and Darley Abbey Wildlife Site LWS	County or Unitary Authority	*	✓	Designated sites overlap with statutory designated site Allestree Park LNR; Darley and Nutwood LNR; and Chaddesden Wood and Lime Lane Wood LNR respectively. See above.				
Non-designated sites of interest	Land off Kingsway PLWS	County or Unitary Authority	✓	*	Surface water run-off and damage/disturbance from emissions on retained habitats within 200m of the Scheme boundary	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. No habitats sensitive to nitrogen deposition.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain.	N/A
	A38 Scrub Other Site of Interest	County or Unitary Authority	*	✓	Surface water run-off and damage/disturbance from salt spray and emissions on habitats adjacent to the Scheme boundary	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. De-icing operations would be undertaken in accordance with standard highway maintenance practice, with residual salt residues within highway runoff being collected by the highway drainage system. Change in levels of nitrogen deposition from operational traffic is considered to be not significant. Refer to Chapter 5 Air Quality [TR010022/APP/6.1] for details.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain.	N/A
	Ford Lane Other Site of Interest	County or Unitary Authority	*	✓	Surface water run-off and damage/disturbance from salt spray and emissions on habitats	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. De-icing operations would be undertaken in	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain.	N/A

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ⁸	Significance of residual effect	Monitoring requirements
					adjacent to the Scheme boundary	accordance with standard highway maintenance practice, with residual salt residues within highway runoff being collected by the highway drainage system. No habitats sensitive to nitrogen deposition.			
	Des Lane Brook Course; Plantation site of interest; Boosemoor Brook; Old Derby Canal; Marsh Area Breadsall PLWS; Holme Nook Ponds; and Haslams Lane Brook course.	County or Unitary Authority	✘	✓	Surface water run-off, damage/disturbance from salt spray and emissions on habitats adjacent to the Scheme boundary	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. Change in levels of nitrogen deposition from operational traffic is considered to be not significant. Refer to Chapter 5 Air Quality [TR010022/APP/6.1] for details. De-icing operations would be undertaken in accordance with standard highway maintenance practice, with residual salt residues within highway runoff being collected by the highway drainage system.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain.	N/A
Grassland	Species rich semi-improved grassland	County or Unitary Authority	✓	✓	Surface water run-off, damage/disturbance from salt spray and emissions on habitats adjacent to the Scheme boundary	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. Retained habitats adjacent to the Scheme, may be sensitive to increases in nitrogen deposition, particularly woodland and grassland habitats. Change in levels of nitrogen deposition are considered to be not significant. De-icing operations would be undertaken in accordance with standard highway maintenance practice, with residual salt residues within highway runoff being collected by the highway drainage system.	None	Not significant (neutral) <i>Confidence:</i> Probable	Monitoring of watercourses and habitat planting including road verges as per the HEMP. Implementation of the above would increase the confidence of residual effects to Certain/near-certain.
	Poor semi-improved grassland	Local	✓	✓					
	Marshy grassland	Local	✘	✓					
Trees	Veteran trees across the Scheme	Up to County or Unitary Authority	✓	✓					
Woodland	Semi-natural broadleaved woodland	Up to County or Unitary Authority	✓	✘					
	Mixed plantation woodland, broadleaved plantation and/or coniferous plantation.	Local	✓	✓					
Standing water	A network of water bodies within designated sites; non-designated sites; and including all other ponds within 50m of the Scheme	County or Unitary Authority	✓	✓					

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ⁸	Significance of residual effect	Monitoring requirements
	(also includes those assessed for great crested newts up to 500m from the Scheme boundaries).								
Running water	Watercourses within designated sites; non-designated sites; and other watercourses within and/or adjacent to the Scheme.	County or Unitary Authority	✓	✓					
Arable	Arable (field margins)	Local	✘	✓					
Hedgerows	Species-poor and species-rich hedgerows	Local	✘	✓					
Other habitats	Amenity grassland, improved grassland, scattered and dense scrub, scattered trees, tall ruderal hard standing and buildings	Site (Invasive non-native plant species – illegal to spread into the wild)	✓	✓	No impact	N/A. Invasive plant species would be managed during the construction phase.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
Toads	A population of toads within the network of waterbodies at Markeaton catchment (Ponds Pa6, Pa7 and Pa8).	Local	✓	✘	Surface water run-off	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1].	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A Watercourses to be monitored and managed (see above).
					Risk of mortality from collision with motor vehicles	A culvert/underpass under the existing A38 at Markeaton junction would be retained and would maintain existing habitat links. Kerb design to allow amphibians to bypass gully gratings.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
Birds	Barn owl at Little Eaton junction.	County or Unitary Authority	✘	✓	Risk of mortality from collision with motor vehicles	Barn owls do not currently occupy the previously known nesting sites. A dense shelterbelt is to be incorporated within the landscape design to protect barn owls foraging/commuting in the wider area from operational traffic.	None	Not significant (neutral) <i>Confidence:</i> Certain/near certain	N/A
	An assemblage of notable farmland birds on the pastoral land and arable	Local	✘	✓	Risk of mortality from collision with motor	A dense shelterbelt would be planted along the southern and eastern edges of the new A38 alignment at Little Eaton to screen	None	Not significant (neutral)	Habitat to be managed in the long term as per the HEMP to maintain

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ⁸	Significance of residual effect	Monitoring requirements
	land to the east of the A38 at Little Eaton junction.				vehicles	species such as lapwing, yellow wagtail, linnet, reed bunting, skylark and yellowhammer, which are using and potentially nesting in these surrounding habitats, from the Scheme and operational traffic.		<i>Confidence: Probable</i>	an effective barrier for farmland birds from operational traffic, noise and visual disturbance. Monitoring of the effectiveness of the screening measures to be carried out by an ornithologist. Implementation would increase confidence in the prediction to Certain/near-certain.
					Reduced population sizes and breeding success due to traffic noise and visual disturbance	A dense shelter belt to visually screen (as described above). No significant effects from operational noise.	None	Not significant (neutral) <i>Confidence: Probable</i>	
	A population of nesting lapwing south-west of Little Eaton junction.	County or Unitary Authority	*	✓	Risk of mortality from collision with motor vehicles	A dense shelterbelt would be planted along the southern edges of the new A38 alignment at Little Eaton to screen lapwing from the Scheme and operational traffic.	None	Not significant (neutral) <i>Confidence: Probable</i>	Habitat to be managed in the long term as per the HEMP to maintain an effective barrier for lapwing from operational traffic, noise and visual disturbance. Monitoring of the effectiveness of the screening measures to be carried out by an ornithologist. Implementation would increase confidence in the prediction to Certain/near-certain
					Reduced population size and breeding success due to traffic noise and visual disturbance	A dense shelter belt to visually screen (as described above). No significant effects from operational noise.	None	Not significant (neutral) <i>Confidence: Probable</i>	
	Presence of the Schedule 1 little ringed plover and oystercatcher south-west of Little Eaton junction.	County or Unitary Authority for both species	*	✓	Risk of mortality from collision with motor vehicles	A dense shelterbelt would be planted along the southern edges of the new A38 alignment at Little Eaton junction to screen lapwing from the Scheme and operational traffic.	None	Not significant (neutral) <i>Confidence: Probable</i>	Habitat to be managed in the long term as per the HEMP to maintain an effective barrier for little ringed plover from operational traffic, noise and visual disturbance. Monitoring of the effectiveness of the screening measures to be carried out by an ornithologist.
					Reduced population size and breeding success due to traffic noise and visual disturbance	A dense shelter belt to visually screen (as described above). No significant effects from operational noise.	None	Not significant (neutral) <i>Confidence: Probable</i>	

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ⁸	Significance of residual effect	Monitoring requirements
									Implementation would increase confidence in the prediction to Certain/near-certain
	Common nesting bird species across the Scheme (including notable assemblage within the construction compound at Little Eaton junction)	Site (nesting birds legally protected)	✓	✓	None	N/A Applicable to the construction phase only.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
	Populations of wintering birds including lapwing, teal, and black-headed gull in the flooded field south-west of Little Eaton junction.	Local	✗	✓	Risk of mortality from collision with motor vehicles	A dense shelterbelt would be planted along the southern edges of the new A38 alignment at Little Eaton to screen lapwing from the Scheme and operational traffic.	None	Not significant (neutral) <i>Confidence:</i> Probable	Habitat to be managed in the long term as per the HEMP to maintain an effective barrier for wintering birds from operational traffic, noise and visual disturbance. Monitoring of the effectiveness of the screening measures to be carried out by an ornithologist. Implementation would increase confidence in the prediction to Certain/near-certain
Reduced population size and breeding success due to traffic noise and visual disturbance					A dense shelter belt to visually screen (as described above). No significant effects from operational noise.	None	Not significant (neutral) <i>Confidence:</i> Probable		
Bats	Roosting bats – Noctule bat maternity roost (and suitable for hibernation) at tree M2.	County or Unitary Authority	✓	✗	Risk of bat mortality through collision with motor vehicles	Replacement roosts have been carefully sited to ensure there is no/low risk of bat mortality through collision with motor vehicles. The translocation of known roosting features and the installation of the eco rocket is proposed within the same woodland parcel as the noctule roost >50m from the road. Planting, including linear features across the Scheme would be undertaken to compensate for that lost and reinstate navigational cues.	None	Not significant (neutral) <i>Confidence:</i> Probable	Habitat to be managed and monitored in accordance with the HEMP. Implementation would increase confidence in the prediction to Certain/near-certain .
					Disturbance	Lighting strategy reviewed to minimise	None	Not significant (neutral)	

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ⁸	Significance of residual effect	Monitoring requirements
					from operational lighting and noise	impacts on bats. No significant effects from operational noise.		Confidence: Certain/near-certain	
	Roosting bats - Common pipistrelle maternity roost at the River Derwent bridge (B3) (outside but adjacent to the Scheme).	County or Unitary Authority	*	✓	Risk of bat mortality through collision with motor vehicles	None. River Derwent habitat and commuting corridor retained.	None	Not significant (neutral) Confidence: Certain/near-certain	N/A Roost feature however already monitored as part of highway maintenance regime.
					Disturbance from operational lighting and noise	Lighting strategy reviewed to minimise impacts on bats. Removal of lighting columns along the mainline at Little Eaton junction. No significant effects from operational noise.	None	Not significant (neutral) Confidence: Certain/near-certain	N/A
	Roosting bats -a network of transient tree and structure roosts of common species (common pipistrelle, brown long-eared bat and potentially soprano pipistrelle) – two confirmed roosts (B2, QW30) within the Scheme boundary; one small occasional day roost of whiskered bat – listed as a rarer species than pipistrelle and long-eared (QW30 also); and confirmed/potential roosts located within 50m of the Scheme boundary.	Local	✓	✓	Risk of bat mortality through collision with motor vehicles	Replacement roosts have been carefully sited to ensure there is no/low risk of bat mortality through collision with motor vehicles: B8-QW30: Replacement roosting features within the noise barrier would be installed on the side facing away from the road. B2 Flood Arch Bridge: Mitigation includes integration of bat boxes into the bridge structure to replace those features lost. Planting, including linear features across the Scheme would be undertaken to compensate for that lost and reinstate navigational cues.	None	Not significant (neutral) Confidence: Probable	Habitat and roost features within Highways boundary to be managed and monitored in accordance with the HEMP. Implementation would increase confidence in the prediction to Certain/near-certain.
					Disturbance from operational lighting and noise	Lighting strategy reviewed to minimise impacts on bats. Removal of lighting columns along the mainline at Little Eaton junction. No significant effects from operational noise. The installation of bat features within the concrete structure of the B2 Flood Arch bridge would assist bats acoustically (and thermally) at that location. The translocation and installation of bat roost features within the retained woodland at Markeaton (G361*) is also within an area of minimal noise change, which bats would be considered to adapt to.	None	Not significant (neutral) Confidence: Certain/near-certain	N/A
	Roosting bats – potential	Up to Local	✓	✓	No impact.	N/A	N/A	Not significant (neutral)	N/A

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ⁸	Significance of residual effect	Monitoring requirements
	roosting features identified in buildings, structures and trees across the Scheme (with no confirmed roost)					No features in current use by bats.		<i>Confidence:</i> Certain/near-certain.	
	Foraging and commuting bats (all species) which includes: Foraging and commuting bats – populations of ‘rarer’ species (Whiskered, Brandt’s, Daubenton’s, natterer’s, noctule and serotine recorded at Markeaton Park north of the Scheme; Daubenton’s and whiskered/Brandt’s were recorded foraging along the River Derwent including where the A38 crossed the river; occasional Leisler’s or serotine were recorded in the vicinity of the Little Eaton junction). Foraging and commuting bats -populations of ‘common’ species (common pipistrelle, soprano pipistrelle and brown long-eared).	County or Unitary Authority	✓	✓	Risk of bat mortality through collision with motor vehicles	Planting, including linear features across the Scheme would be undertaken to compensate for that lost and reinstate navigational cues.	None	Not significant (neutral) <i>Confidence:</i> Probable	Habitat to be managed and monitored in accordance with the HEMP. Roost features monitored as per the above. Implementation would increase confidence in the prediction to Certain/near-certain.
					Disturbance from operational lighting and noise	Lighting strategy was reviewed to minimise impacts on bats. No lighting columns along the new A38 mainline at Little Eaton junction. No significant effects from operational noise.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
Badger	Several social groups present within or in the vicinity of the Scheme.	Local	✓	✓	Risk of mortality through collision with motor vehicles	Badger fencing would be installed. Effective fencing would be beneficial for the local badger population and the public; minimising the risk of badgers colliding with vehicles.	SI: Positive PO: Probable CO: Direct EC: Badger fencing SZ: As above RE: Permanent DU: Long term TF: N/A	Slight beneficial non-significant effect <i>Confidence:</i> Probable	Badger fencing would require regular inspection throughout the operational life span of the Scheme to ensure it remains functional. Monitoring is particularly important during the first two years when badgers would be habituating to new dispersal corridors. Any fencing defects would be repaired

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ⁸	Significance of residual effect	Monitoring requirements
									immediately. Implementation would be through the HEMP. This would increase the confidence in the prediction to Certain/near-certain.
					Disturbance through increased flood events	It is considered that the slight increase in flood risk (i.e. 1 in 100 year flood event) is not significant to impact badgers at Little Eaton junction. They already adapt their movements/use of setts dependent on ground conditions.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
Hedgehogs	A notable population of hedgehogs at Markeaton in association with urban habitats (Markeaton Park and Queensway gardens)	Local	✓	*	None	N/A	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
Otter	A population of otter across the Scheme	County or Unitary Authority	✓	✓	Surface water run-off (affecting food resources) and traffic noise	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road Drainage and Water Environment [TR010022/APP/6.1]. De-icing operations would be undertaken in accordance with standard highway maintenance practice, with residual salt residues within highway runoff being collected by the highway drainage system. See aquatic invertebrates and fish.	None	Not significant (neutral) <i>Confidence:</i> Probable	N/A Watercourses to be monitored and managed (see above).
					Risk of mortality from collision with motor vehicles	Design avoids severance of foraging/commuting routes. No requirement for mammal ledges within culvert design or underpasses suitable for otter. Also no requirement for permanent fencing.	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A Habitats to be monitored and managed (see above).
Terrestrial Invertebrates	An assemblage of terrestrial invertebrates, including notable species recorded at various locations within the extent of the Scheme	Local	✓	✓	None	N/A	None	Not significant (neutral) <i>Confidence:</i> Certain/near-certain	N/A
Aquatic Macro-	An assemblage of aquatic macroinvertebrates, recorded in Markeaton,	County or Unitary	✓	✓	Risk of mortality through surface	Operational run-off would be appropriately managed in accordance with drainage strategy. Refer to Chapter 13: Road	None	Not significant (neutral)	Monitoring of road runoff to receiving watercourses via

Designated and non-designated sites/habitats/species	Ecological feature	Importance of ecological feature	Kingsway and Markeaton junctions	Little Eaton junction	Impact description	Design and mitigation measures (refer to Chapter 8: Biodiversity, Section 8.9 [TR010022/APP/6.1])	Characterisation of the mitigated impact on the ecological feature ⁸	Significance of residual effect	Monitoring requirements
invertebrates	Brook, Middle Brook Bramble Brook, Dam Brook and the River Derwent.	Authority			water run-off	Drainage and Water Environment [TR010022/APP/6.1]. De-icing operations would be undertaken in accordance with standard highway maintenance practice, with residual salt residues within highway runoff being collected by the highway drainage system.		<i>Confidence: Probable</i>	attenuation features to be implemented to inform a maintenance regime and monitor potential effects on macroinvertebrate assemblages and fish in receiving watercourses. Implementation would be through the HEMP. This would increase the confidence in the prediction to Certain/near-certain.
Fish	A population of protected/notable species in Dam Brook (brook lamprey <i>Lampetra planeri</i> , bullhead <i>Cottus gobio</i> and brown trout <i>Salmo trutta</i>)	County or Unitary Authority	x	✓					