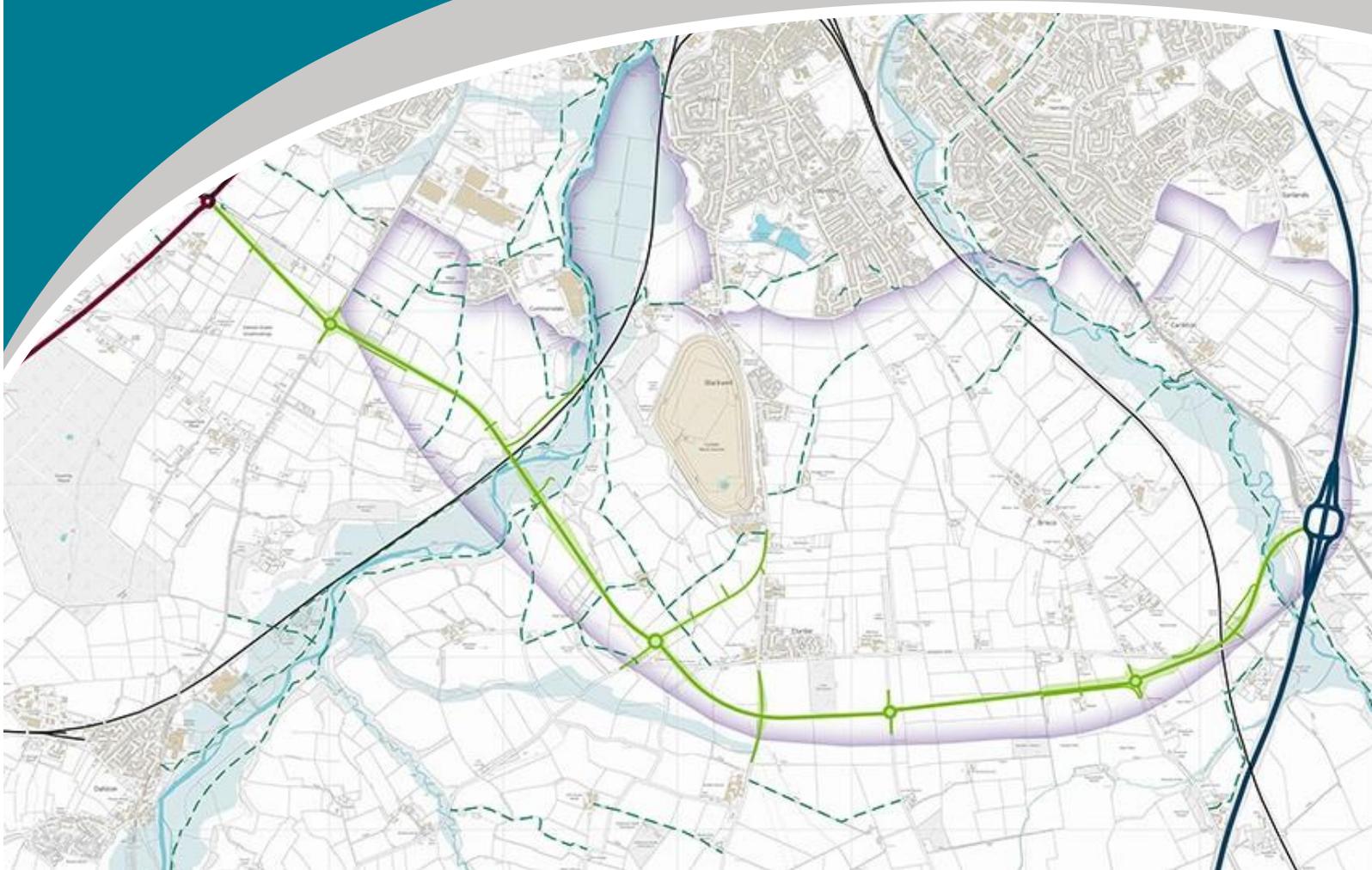


Carlisle Southern Link Road



Appendix 17.1 Mitigation Schedule

October 2019

Ref	Impact/Effect	Receptor/s	Magnitude of Impact (without mitigation)	Mitigation / Enhancement	Residual Effect
Air Quality					
	Dust soiling (human and ecological) and human health impacts from construction dust.	All human receptors within 350m of the scheme and/or within 50m of roads 500m from the site entrance(s).	Moderate	Mitigation from IAQM guidance documents to be implemented	Not significant
		River Eden SAC Cummersdale Shingle Banks SIS	Major		
Cultural Heritage/Archaeology					
CH01	Alignment of scheme could result in total loss of a number of heritage assets of unknown significance, but with a potential value higher than 'low'	HA01: Cropmark of settlement site	Major	Evaluation trenching pre-construction phase	Not significant
		HA05: Cropmark of ditch	Major		
		HA07: Neolithic findspot and ridge and furrow and medieval findspot	Major		
		HA10: Enclosure and findspot	Major		
		HA12: Cropmark of two ditches, enclosure and trackway	Major		
		HA13: Cropmark of ditch and track	Major		
		HA19: Site of T-shaped building	Major		
		HA26: Trackway	Major		
		HA32: Area of ridge and furrow	Major		
		HA33: Bank and ditch feature	Major		
		HA76: Undated ditch	Major		
		HA77: Remains of further field boundary	Major		
		HA90: Agricultural features	Major		
		HA91: Soil filled feature	Major		
		HA94: Geophysical anomalies	Major		
		HA96: Soil filled feature	Major		
		HA97: Agricultural features	Major		
		HA99: Agricultural features	Major		
		HA100: Agricultural features	Major		
		HA101: Agricultural features	Major		
		HA102: Dipolar anomaly	Major		
		HA103: Agricultural features	Major		
HA104: Agricultural features	Major				
HA105: Agricultural features	Major				
HA106: Soil filled features	Major				
HA107: Agricultural features	Major				
HA108: Agricultural features	Major				
HA109: Probable former pylon site	Major				
HA110: Probable former pylon site	Major				
HA111: Agricultural features	Major				
HA112: Soil filled features	Major				
HA120: Agricultural features	Major				
HA121: Agricultural features	Major				

		HA122: Dipolar anomaly	Major		
		HA123: Agricultural features	Major		
		HA125: Agricultural features	Major		
		HA126: Agricultural features	Major		
		HA127: Dipolar anomaly	Major		
		HA128: Soil filled features	Major		
		HA129: Dipolar anomaly	Major		
		HA130: Soil filled features	Major		
		HA131: Dipolar anomaly	Major		
		HA132: Soil filled features	Major		
		HA133: Agricultural features	Major		
		HA134: Agricultural features	Major		
		HA138: Agricultural features	Major		
		HA139: Agricultural features	Major		
		HA147: Dipolar anomaly	Major		
		HA152: Geophysical anomaly	Major		
		HA153: Former building	Major		
		HA158: Possible former road	Major		
		HA160: Soil filled feature	Major		
		HA161: Soil filled feature	Major		
		HA162: Soil filled feature	Major		
		HA163: Soil filled feature	Major		
		HA164: Soil filled feature	Major		
		HA165: Soil filled feature	Major		
CH02	Alignment of scheme could result in total loss of an area of known ridge and furrow	HA150: Area of known ridge and furrow	Major	Topographic survey pre-construction phase	Not Significant
CH03	Alignment of scheme could result in total loss of a number of important hedgerows protected under hedgerow regulations 1997 and historic hedgerows known to predate 1840	HA39: Historic Hedgerow	Major	Photographic survey pre-construction phase	Not significant
		HA40: Historic Hedgerow	Major		
		HA44: Important Hedgerow	Major		
		HA46: Historic Hedgerow	Major		
		HA54: Historic Hedgerow	Major		
		HA56: Important Hedgerow	Major		
		HA68: Historic Boundary	Major		
		HA72: Important Hedgerow	Major		
CH04	Alignment of scheme will result in requirement to demolish/relocate known cultural heritage assets of low value	HA36: Victorian gravestones	Major	Archaeological recording of structures to occur prior to demolition, pre-construction phase	Not significant
		HA151: Former Brisco railway station	Major		
CH05	Alignment of scheme could result in total loss of a number of important hedgerows protected under hedgerow regulations 1997 and historic hedgerows known to predate 1840	HA38: Important Hedgerow	Major	Post ES photographic survey pre-construction phase and archaeological watching brief to occur during demolition, during construction phase	Not significant
		HA53: Historic Hedgerow	Major		
		HA55: Historic Hedgerow	Major		
		HA62: Important Hedgerow	Major		
		HA67: Important Hedgerow	Major		
CH06	Alignment of scheme could result in total loss of a number of important hedgerows protected under hedgerow regulations 1997	HA41: Important Hedgerow	Major	Archaeological recording of structures to occur prior to demolition, pre-construction phase, followed by archaeological recording of surviving kest	Not significant
		HA42: Important Hedgerow	Major		

	and historic hedgerows known to predate 1840 which incorporate kest banks	HA47: Important Hedgerow	Major	banks during construction phase once vegetation has been removed but prior to complete removal/demolition	
		HA48: Important Hedgerow	Major		
		HA50: Important Hedgerow	Major		
		HA52: Important Hedgerow	Major		
		HA57: Important Hedgerow	Major		
		HA58: Important Hedgerow	Major		
		HA60: Important Hedgerow	Major		
		HA61: Important Hedgerow	Major		
		HA63: Historic Hedgerow	Major		
		HA64: Historic Hedgerow	Major		
		HA65: Important Hedgerow	Major		
		HA66: Important Hedgerow	Major		
		HA69: Important Hedgerow	Major		
		HA70: Important Hedgerow	Major		
		HA71: Important Hedgerow	Major		
CH07	Alignment of scheme could result in total loss of a number of important hedgerows protected under hedgerow regulations 1997 and historic hedgerows known to predate 1840 which incorporate kest banks	HA43: Important Hedgerow	Major	Archaeological recording of structures to occur prior to demolition, pre-construction phase, followed by archaeological recording of surviving kest banks during construction phase once vegetation has been removed but prior to complete removal/demolition and archaeological watching brief to occur during demolition, during construction phase	Not significant
		HA45: Important Hedgerow	Major		
		HA49: Important Hedgerow	Major		
		HA51: Historic Hedgerow	Major		
		HA59: Important Hedgerow	Major		
Nature Conservation					
NC01	In operation, new road could lead to road traffic accidents for terrestrial mammals such as badger, and riparian mammals such as otter. This could lead to mortality of these animals, and a reduction in local populations.	Badger	Major	<p>Badger fences to be erected in locations, which have been identified as having high levels of badger and/or otter activity. These should be in the following locations:</p> <ul style="list-style-type: none"> On the A595 from the A595 Newby West Roundabout to just past KIngrigg Farm on the west carriageway. On the eastern carriageway, this will go from the field boundary to the new roundabout, and around it and follow the A685 in an easterly direction to the end of the field boundary. Around the new roundabout heading through Ashtip Wood to its current eastern fence line. On the opposite side of the road this will go, from the eastern fence line of Ashtip Wood to the new roundabout. From the embankment on the eastern side of the River Caldew to Durdar Rounabout on both sides of the road, and then heading north east from the existing farm track at Peastree Farm to the end of the copse at Durdar Farm, on the northern side of the Road only. From Buckabank Road to Scalegate Rounabout on the southern edge of the road only. From the field ditch to the east of Scalegate Roundabout to Brisco Roundabout, on both sides of the road. 	Negligible

				There are also cattle grids placed at strategic locations on cycle paths and access tracks to avoid badgers using them and getting on the road.	
NC02	In operation, new road could lead to road traffic accidents barn owl. This could lead to mortality of these animals, and a reduction in local populations.	Barn Owl	Major	Planting of trees, shrubs and hedge planting will be used to deflect barn owls over the carriageway in order to reduce traffic related mortality. These have been proposed in line with existing woodland belts, or newly proposed woodland belts for the road, to help guide barn owls around the scheme. These will be in the following locations: <ul style="list-style-type: none"> The western bound carriageway of the A595 from the entrance to Kingrigg Farm to the field boundary with Ashtip Wood. This planting will follow the boundary of the new road. From the track to the west of Langdale, the Piggeries and the proposed SUDS Pond to the Brisco Roundabout.	Negligible
NC03	Loss of ponds due to increase at Newby West Roundabout and on the right-hand bank of the River Caldew. This will affect breeding amphibian species such as common frogs and smooth newts. It also represents a loss of Standing Water habitat.	Standing Water HPI	Major	There are seven SUDS ponds proposed, all of which will be varied in depth with native planting species to encourage wildlife, however three of these ponds will have no public access, and these are in the following locations: <ul style="list-style-type: none"> To the west of the piggeries To the south of Newbiggin Road, immediately west of the North West Mainline. Out of the floodplain, but close to the eastern (right hand bank) of the River Petheril.	Minor
NC04	In operation, new road could lead to road traffic accidents barn owl. This could lead to mortality of these animals, and a reduction in local populations.	Barn Owl	Major	Verge and grassland management adjacent to the Scheme will include regular mowing of grassland areas to lower sward height, making it less suitable to prey species, and thus discourage barn owls from these areas.	Negligible
NC05	Loss of mixed plantation woodland – Ashtip Wood. Reduction of foraging habitat for badgers, and a loss of woodland habitat.	Woodland Badgers	Moderate	2.45 ha of woodland will be lost in the woodland close to Ashtip Wood, planting of native mixed species planting comprising 5.32 ha will be planted this will compensate for the loss of this habitat.	Negligible
NC06	Loss of dense scrub, particularly gorse. This habitat is a reduction of invertebrate habitat, specifically for pollinators such as bees.	Invertebrates	Moderate	1.33 ha of dense scrub will be removed to the west of the Cumbrian Coastline Railway to construct the bridge, native scrub planting representing 1.97 ha, an increase of 48 % will be planted in the same area.	Minor Positive
NC07	Loss of Lowland Meadows Habitat. This is on the floodplain of the River Caldew, part of the River Eden SAC. This habitat is S41 NERC habitat, which could be lost, and could lead to further erosion of the floodplain, and thus sediment entering the river system.	Lowland Meadows HPI River Eden SAC River Eden and Tributaries SSSI	Major	Avoidance measures in place including minimising vegetation loss to beneath the proposed bridge crossing. Compounds on the right-hand bank being located in an existing area of improved pasture to further minimise this loss. No site compounds will be use within the floodplain on the left-hand bank.	Negligible
NC08	Loss of Alder Woodland in Floodplains (Annexe I Habitat). This has the potential to negatively affect the structure and function of the River Eden SAC	River Eden SAC Wet Woodland HPI	Major	Vegetation clearance has been minimised to beneath the structure itself, and the compounds on the right-hand bank are to be placed within current improved pasture, to further minimise loss. Loss quantified as 0.1175 ha, which represents 0.2% of total SAC habitat, therefore loss insignificant. Restoration of areas post construction to facilitate the natural colonisation of alder woodland. No storage compounds will be in the floodplain on the left-hand bank.	Minor

NC09	<p>Chemicals such as concrete and cement for building the River Caldew and River Petteril bridge or fuel from vehicles could increase siltation levels in the water course impacting eggs, fish (such as Atlantic Salmon). Possible increase in pH levels of fish which can be harmful or fatal.</p>	River Eden SAC	Major	<p>The following measures will be included in the CEMP to avoid pollution to the watercourse:</p> <ul style="list-style-type: none"> • In- river works will only take place between 15th June and 30th September to avoid the fish spawning period. • Works will be phased and undertaken with care so that disturbance to channel material is minimised. • At no time will the watercourse be obstructed in such a way that fish and other aquatic species cannot pass through the bridge. • Standard pollution prevention measures will be applied as practicable, including PPG5: Works in, near or over watercourses • Should the dewatering of an area of the channel be required, the area shall be locally bunded with a portadam cofferdam or sandbag cofferdam, dependent on water levels at the time of works, to divert the flowing water. No water shall be permanently abstracted from the channel. • Bunding shall, where practicable, take place at times of low water flow to reduce the need for pumping. Where practicable the bunding shall be constructed starting from the upstream end, to minimise the chance of aquatic species becoming trapped in the bunded area. • Prior to dewatering of the bunded area, an appropriately qualified electrofishing specialist will conduct a rescue of aquatic species from the bunded area. If at any time the cofferdam is breached, the species rescue will be repeated. • When dewatering the bunded area, pump inlets will be fitted with a mesh screen to prevent uptake of crayfish, fish or other aquatic species. • Water pumped from a bunded area, if needed, will be discharged onto an open area of the riverbank through a sedimat, and allowed to filter into the ground to prevent sedimentation of the channel. • Where necessary, water quality monitoring will be undertaken to ensure pollution and sedimentation of the watercourse is minimised. • Entry to the river channel will be in accordance with all conditions specified by the EA/ NE. • All machinery to be used near the watercourse or within any dry working areas will be cleaned by prior to entering/ leaving site, and will run on biodegradable oil. • All machinery will be subject to standard pollution prevention measures (e.g. checked regularly for oil/ fuel leaks, refuelling done over plant nappies/ drip trays). • All plant/ equipment will be washed down and decontaminated before leaving site to minimise the chance of spreading crayfish plague. Decontamination will only take place within a securely bunded area as far as practically possible from the watercourse. • If fuel is required on site, it will be delivered to site in a bunded bowser and removed at the end of each shift. Adequate spill kits will be available on site always and kept ready to use, with site staff trained in their use and why they are necessary. Any fuelling operations will be only undertaken in a securely bunded area away from any drains or water courses. • If fuel and materials storage is required on site it will be placed as far from the river as reasonably practicable to avoid risk of pollution. • Any operations that will cause unavoidable silt generation will be phased to keep plumes to a minimum. When silt has appeared in the channel, work will cease to allow it to clear. • Temporary silt control measures, such as bales, will be employed to prevent sediment and polluting material from migrating downstream. These will be located at the downstream end of the works and weighed down so that sediment laden water does not pass under them. • Mortar will be mixed in a cement mixer a significant distance from the watercourse and taken to the works area in buckets. The mortar will be determined by the proximity to the water level but in most instances, it will be a lime mortar to clause 2405 (type NHL 3.5 or lime putty) for "dry" areas, 	Negligible
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				<p>a resin grout for larger voids and Rockbond putty for works under and close to the water level.</p> <ul style="list-style-type: none"> • Ground below areas where concrete is used at height is to be protected using for example a Hop up board / young man board / visqueen sheeting, terram or buckets if small enough. • An ecologist will monitor the presence of aquatic species in the work area and advise on works as appropriate. • Any excavations deeper than 0.5m which are to be left exposed overnight will have a mammal escape ramp installed at an angle of no more than 45 degrees to allow trapped individuals to escape. • Vehicles and materials will be inspected prior to use each day to identify any individuals which may have taken shelter. Any individuals identified will be allowed to leave the working area naturally. • No overnight lighting of the site shall be permitted. 	
NC10	Construction activities such as piling and concrete works causing noise and vibration in the rivers which can impact the fish and habitats. This may occur by both the River Caldew and River Petteril	<p>River Eden SAC</p> <hr/> <p>River Eden and Tributaries SSSI</p> <hr/> <p>Cummersdale Shingle Banks (SiS)</p> <hr/> <p>Rivers and Streams HPI</p> <hr/> <p>Otters</p> <hr/> <p>Fish</p>	Major	<p>Works should occur between the 15th June and 30th September to avoid the most sensitive period for fish migration and spawning. This should occur on both the River Caldew and River Petteril</p> <p>The type and location of piling has not been finalised but, it is considered likely that a continuous flight auger piling method will be used. However soft start methods will be implemented to reduce the impact of noise and vibration from the piling works.</p> <p>No time working permitted in the vicinity of water courses.</p>	Negligible
NC11	Artificial lighting during construction can illuminate watercourse riparian zone, and floodplain. This can potentially affect otter and migratory fish behaviour deterring them from using specific areas of watercourses	<p>River Eden SAC</p> <hr/> <p>River Eden and Tributaries SSSI</p> <hr/> <p>Cummersdale Shingle Banks (SiS)</p> <hr/> <p>Rivers and Streams HPI</p>	Major	<p>No artificial lighting shall be used at any time during the construction period within 10 metres of the rivers and tributaries (except where this is essential for security or for health and safety reasons). This shall be extended to a minimum distance of 30 metres around any identified otter holts.</p>	Negligible

		Otters	Major		
		Fish	Major		
NC12	Construction of the Bridge over the River Caldew. This represents a risk of disturbance, damage, and pollution to qualifying features of the River Eden SAC. This could affect the structure and function of the SAC, the River Eden and Tributaries SSSI as the River Petteril is hydrologically connected to the SAC	River Eden SAC	Major	<p>The following measures will be included in the CEMP to ensure best practice in terms of working in and near watercourses is adhered to, which should minimise the risk of disturbance, damage and pollution of watercourses:</p> <ul style="list-style-type: none"> The type and location of piling has not been finalised but, it is considered likely that a continuous flight auger piling method will be used. However soft start methods will be implemented to reduce the impact of noise and vibration from the piling works. Piling works will only take place between 15th June and 30th September to avoid the fish spawning period. An ecologist will conduct an ecological walk over prior to works to identify any potential otter habitation within 50m of the works. If any signs of otter activity in and around the site e.g. tracks, feeding signs, road fatalities are found, the ecological checking survey will be repeated prior to works each day on that site. Site staff to be briefed by ecologist (e.g. via toolbox talk) on the importance of otter conservation and the legal issues re: disturbance/ harm of otters. Vigilance will be maintained during works for otter presence. In- river works will only take place between 15th June and 30th September to avoid the fish spawning period. Works will be phased and undertaken with care so that disturbance to channel material is minimised. At no time will the watercourse be obstructed in such a way that fish and other aquatic species cannot pass through the bridge. Standard pollution prevention measures will be applied as practicable, including PPG5: Works in, near or over watercourses Should the dewatering of an area of the channel be required, the area shall be locally bunded with a portadam cofferdam or sandbag cofferdam, dependent on water levels at the time of works, to divert the flowing water. No water shall be permanently abstracted from the channel. Bunding shall, where practicable, take place at times of low water flow to reduce the need for pumping. Where practicable the bunding shall be constructed starting from the upstream end, to minimise the chance of aquatic species becoming trapped in the bunded area. Prior to dewatering of the bunded area, an appropriately qualified electrofishing specialist will conduct a rescue of aquatic species from the bunded area. If at any time the cofferdam is breached, the species rescue will be repeated. When dewatering the bunded area, pump inlets will be fitted with a mesh screen to prevent uptake of crayfish, fish or other aquatic species. Water pumped from a bunded area, if needed, will be discharged onto an open area of the riverbank through a sedimat, and allowed to filter into the ground to prevent sedimentation of the channel. Where necessary, water quality monitoring will be undertaken to ensure pollution and sedimentation of the watercourse is minimised. Entry to the river channel will be in accordance with all conditions specified by the EA/ NE. 	Negligible
		River Eden and Tributaries SSSI			
		Rivers and Streams HPI			

				<ul style="list-style-type: none"> All machinery to be used near the watercourse or within any dry working areas will be cleaned by prior to entering/ leaving site, and will run on biodegradable oil. All machinery will be subject to standard pollution prevention measures (e.g. checked regularly for oil/ fuel leaks, refuelling done over plant nappies/ drip trays). All plant/ equipment will be washed down and decontaminated before leaving site to minimise the chance of spreading crayfish plague. Decontamination will only take place within a securely bunded area as far as practically possible from the watercourse. If fuel is required on site, it will be delivered to site in a bunded bowser and removed at the end of each shift. Adequate spill kits will be available on site always and kept ready to use, with site staff trained in their use and why they are necessary. Any fuelling operations will be only undertaken in a securely bunded area away from any drains or water courses. If fuel and materials storage is required on site it will be placed as far from the river as reasonably practicable to avoid risk of pollution. Any operations that will cause unavoidable silt generation will be phased to keep plumes to a minimum. When silt has appeared in the channel, work will cease to allow it to clear. Temporary silt control measures, such as bales, will be employed to prevent sediment and polluting material from migrating downstream. These will be located at the downstream end of the works and weighed down so that sediment laden water does not pass under them. Mortar will be mixed in a cement mixer a significant distance from the watercourse and taken to the works area in buckets. The mortar will be determined by the proximity to the water level but in most instances, it will be a lime mortar to clause 2405 (type NHL 3.5 or lime putty) for "dry" areas, a resin grout for larger voids and Rockbond putty for works under and close to the water level. Ground below areas where concrete is used at height is to be protected using for example a Hop up board / young man board / visqueen sheeting, terram or buckets if small enough. An ecologist will monitor the presence of aquatic species in the work area and advise on works as appropriate. Any excavations deeper than 0.5m which are to be left exposed overnight will have a mammal escape ramp installed at an angle of no more than 45 degrees to allow trapped individuals to escape. Vehicles and materials will be inspected prior to use each day to identify any individuals which may have taken shelter. Any individuals identified will be allowed to leave the working area naturally. No overnight lighting oof the site shall be permitted. 	
NC13	Vegetation clearance on left hand bank of River Caldew, and on gravel shoal just upstream of proposed bridge. This could reduce available habitat for Nationally Scarce invertebrate species.	Cummersdale Sites for Invertebrate Significance (SIS)	Major	<p>Gravel shoal to be avoided during construction, vegetation removal in the River Caldew corridor to be limited to immediately underneath the bridge structure.</p> <p>Compound on the right bank will be located in what is currently improved grazing pasture, on the left-hand bank there will be no site compound or vehicle storage.</p> <p>Before the vegetation is removed it will be searched for invertebrates and these will be removed to another location in the SIS.</p> <p>Measures to systematically "trap out" the invertebrates from the area to be lost will be considered.</p>	Negligible

NC14	Site clearance and construction practices potentially spreading non-native species such as Himalayan balsam.	River Eden (SAC)	Major	A pre-commencement survey will be undertaken by an ecologist prior to works commencing to ensure that no invasive species have spread or established. Known invasive species that have the potential to be impacted by the construction footprint will be eradicated in accordance with best practice guidelines prior to works commencing utilising specialist sub-contractors. If any work is undertaken within the vicinity of invasive species, a cordon of 7 metres will be marked out. No works should be undertaken in this area. All plant, footwear and equipment will be checked and cleaned prior to entry to site and prior to leaving site at the end of each working day	Negligible
		River Eden and Tributaries SSSI	Major		
		Cummersdale Sites for Invertebrate Significance (SiS)	Moderate		
		Rivers and Streams HPI	Major		
NC15	There are records of American signal crayfish. This means that construction activities within, and adjacent to the watercourse present a risk of transfer of the disease crayfish plague which is a disease that is fatal to white – clawed crayfish, to other parts of the SAC with populations of white clawed crayfish within them. This could wipe out populations of these species within the SAC	River Eden SAC	Major	All plant and footwear will be regularly inspected and cleaned to prevent the introduction/ spread of Crayfish Plague and Signal Crayfish. The check- clean-dry methodology will be followed as far as practicable. All site staff will be made aware of the need to prevent Crayfish Plague introduction/ spread. All plant/ equipment will be washed down and decontaminated before leaving site to minimise the chance of spreading crayfish plague. Decontamination will only take place within a securely bunded area as far as practically possible from the watercourse.	Negligible
NC16	Vegetation Clearance for construction – 114 hedgerows will be lost or partly damaged during the site clearance and construction phase. This includes 57 hedgerows defined as 'Important' in the Hedgerow Regulations 1997, 15 are considered to be Grade 1 hedgerows meaning they hold high to very high ecological value, and 50 are deemed to be grade 2 hedgerows, which means they hold moderately high to high ecological value. The loss of hedgerows means there would be a reduction locally of a HPI habitat – hedgerows. Furthermore, loss of connectivity of hedgerows could also affect species relying on the network of hedgerows such as foraging and commuting bats, breeding birds, and badgers.	HPI - Hedgerows	Moderate	Hedgerows that are to be removed and that have been classified as Grade 1 i.e. very high to high ecological value will be removed and translocated.	Minor
NC17	Vegetation Clearance for construction – 114 hedgerows will be lost or partly damaged during the site clearance and construction phase. This includes 57 hedgerows defined as 'Important' in the Hedgerow Regulations 1997, 15 are considered to be Grade 1 hedgerows meaning they hold high to very high ecological value, and 50 are deemed to be grade 2 hedgerows, which means they hold moderately high to high ecological value. The loss of hedgerows means there would be a reduction locally of a HPI habitat – hedgerows. Furthermore, loss of connectivity of hedgerows could also affect species relying on the network of hedgerows such as foraging and commuting bats, breeding birds, and badgers.	HPI - Hedgerows	Moderate	A variety of hedgerows will be planted throughout the Scheme. These will include hedgerows with standard trees, and will all be species-rich – with included five or more woody species.	Minor

NC18	Retained hedgerows, or their root zones may be damaged, by the creation of storage compounds. This could lead to further habitat loss or degradation.	HPI - Hedgerows	Moderate	Retained hedgerows will be identified on the ground, and any hedgerows that are highlighted as in direct proximity of areas identified as storage compounds, or areas of materials or vehicle storage, should incorporate a buffer zone, at least as wide as the hedgerow's height, to minimise the risk of damage to the hedgerow or its root zone.	Negligible
NC19	Vegetation clearance for construction of the road. Lead to a loss of x ha of mature lowland deciduous woodland with ancient characteristics, a habitat of principal importance. Will reduce structure and function of woodland, and reduce habitat available for supporting species such as badgers, breeding birds and bats	Lowland Mixed Deciduous Woodland (with Ancient Woodland Characteristics) HPI	Major	Translocation of existing ground flora to area adjacent to current woodland to the south. New native woodland will be planted with the flora comprising species characteristic of the existing woodland, with a high canopy, but with fewer shrubs to give the ground flora the best chance of establishment. The remaining woodland will be protected in line with British Standard BS5837:2012 Trees in Relation to Design, Demolition and Construction.	Minor
NC20	Vegetation clearance – will lead to the loss of active subsidiary sett (S4), currently inactive setts (S10, S15, and S18). May lead to some disturbance to a main sett (S2). Badger paths may be cleared, deterring badgers from using them. The establishment of the construction zone, including the erection of construction fencing, may prevent badgers from accessing foraging areas. Excavations necessary for the foundation of the road, if left open at night, may lead to badgers being trapped, injured or even killed. Vegetation clearance will lead to a loss of habitat that could be used to dig new setts (banked hedgerows), and foraging habitat (arable, improved fields, broadleaved woodland and semi – improved grassland). This will negatively affect badgers, as there will be a loss of at least one active sett, fragmentation of foraging habitat, and loss of foraging habitat, and there is the potential of badgers becoming trapped, injured or even killed by uncovered excavations.	Badgers	Major	A Natural England sett exclusion and destruction licence including a fully detailed mitigation strategy will be needed before the work can commence. Measures will be taken to minimise disturbance (i.e. by limiting duration of work) but a Natural England disturbance licence may be needed. Badger paths will be maintained throughout construction. The construction zone fence will need to be badger proofed to stop badgers entering excavations. Breaks in the fence will need to be created to allow badgers to use their paths to access foraging land on both sides of the Scheme. To facilitate badgers using the badger paths during construction they should be seeded, and exposed trenches should be covered overnight and made accessible at the end of each day. An ecologist will monitor the presence of badgers in the work area and advise on works as appropriate. Any excavations deeper than 0.5m which are to be left exposed overnight will have a mammal escape ramp installed at an angle of no more than 45 degrees to allow trapped individuals to escape. Vehicles and materials will be inspected prior to use each day to identify any individuals which may have taken shelter. Any individuals identified will be allowed to leave the working area naturally.	Negligible.
NC21	During Operation of the road otter passage may be affected in the following watercourses: River Caldeu, River Petteiril, Calflins Beck, and Fairy Beck. Calflins Beck will include the addition of a culvert underneath Durdar Bridge, and the A595 Roundabout will be extended in size.	Otter	Major	<ul style="list-style-type: none"> The bridge at the River Caldeu has been designed to be approximately 13m above the ground level, this means otters will be able to pass under the bridge, and otter passage near the river will not be affected. The bridge at the River Petteiril will include an otter ledge on the right-hand bank pier to maintain otter passage on the bankside at this location. The culvert at Calflins Beck will contain an otter pass so that otter passage within the watercourse is maintained. <p>Fairy Beck is to be diverted from its current course underneath the A595 Newby West Roundabout, under the A595 to the South West and then under the Scheme to the north east before heading underneath Peter Lane. Each of</p>	Negligible

				the crossing points at these locations will contain culverts with otter passes to maintain otter passage within the watercourse.	
NC22	Vegetation clearance to construct the bridge will lead to the loss of an otter holt on the right-hand bank of the River Petteril. This will lead to a reduction in available resting places for the species, and may potentially affect the species distribution and extent within the downstream SAC.	Otter	Major	<p>Vegetation clearance of this site will need to be undertaken under a Natural England EPS Licence. It is expected that as a condition of the licence three artificial otter holts will need to be created within the Scheme's site clearance. These holts will be located in the following locations:</p> <ul style="list-style-type: none"> To the north of the proposed crossing in an area of proposed broadleaved woodland, at the bottom of the proposed embankment on the right-hand bank, close to the position of the existing holt. Approximately 100m upstream in an area of proposed broadleaved woodland planting the bottom of the new embankment. <p>To the south of the proposed embankment in an area of proposed broadleaved woodland planting on the left-hand bank.</p>	Negligible
NC23	<p>Vegetation clearance in the vicinity of the River Caldew, River Petteril, and Fairy Beck may lead to a loss of riparian habitat. This will affect the amount of habitat available for otters, and may negatively affect their distribution and extent within these watercourses, and thus the River Eden SAC</p> <p>Excavations of the piers at both the River Caldew, and River Petteril crossing may, if left open at night, lead to otters being trapped, injured or even killed.</p>	Otter	Major	<p>At the River Caldew vegetation clearance will be minimised to that directly beneath the proposed bridge and this will be allowed to restore naturally following construction to facilitate the natural colonisation of alder woodland.</p> <p>No storage compounds will be in the floodplain on the left-hand bank, and no storage compounds will be within the floodplain habitat on the right-hand bank as these will be placed in improved pasture.</p>	Negligible
NC24	Vegetation clearance in the vicinity of the River Petteril lead to a loss of riparian habitat. This will affect the amount of habitat available for otters, and may negatively affect their distribution and extent within these watercourses, and thus the River Eden SAC	Otter	Major	At the River Petteril some trees, and associated riparian habitat will be lost when the bridge is constructed, however this will be compensated by the planting of alder trees upstream and downstream of the proposed bridge, and an area of broadleaved woodland planting will be undertaken adjacent to the existing footpath, between the footpath and the SUDS pond.	Negligible
NC25	Vegetation clearance in the vicinity of the Fairy Beck lead to a loss of riparian habitat. This will affect the amount of habitat available for otters, and may negatively affect their distribution and extent within these watercourses, and thus the River Eden SAC	Otter	Major	At Fairy Beck, some riparian habitat will be lost for the extension of the A595 Newby West Roundabout, however when Fairy Beck is diverted, an area of broadleaved woodland will be planted south of the Scheme, and an area of native mixed woodland planting north of the Scheme.	Negligible
NC26	Excavations of the piers at both the River Caldew, and River Petteril crossing may, if left open at night, lead to otters being trapped, injured or even killed. Any excavations needed in order to construct the road that are close to other watercourses, specifically Fairy Beck and Calfins Beck, also may lead to otters being trapped, injured or even killed.	Otter	Major	<p>During construction, the following will be undertaken to minimise the risk of disturbance, injury or mortality to otters:</p> <ul style="list-style-type: none"> No artificial lighting of the watercourse permitted. No working will be permitted during construction in the hours of darkness within the corridors of the River Caldew or River Petteril An ecologist will monitor the presence of otters in the work area and advise on works as appropriate. 	Negligible

				<ul style="list-style-type: none"> Any excavations deeper than 0.5m which are to be left exposed overnight will have a mammal escape ramp installed at an angle of no more than 45 degrees to allow trapped individuals to escape. <p>Vehicles and materials will be inspected prior to use each day to identify any individuals which may have taken shelter. Any individuals identified will be allowed to leave the working area naturally</p>	
NC27	Alignment of the road may lead to severance and loss of habitat and territory for badgers, in locations with high badger activity, such as around the Durdar Roundabout, between Buckabank Road and Scalegate Roundabout, and around Langdale and the Piggeries to Brisco Roundabout.	Badger	Moderate	<p>Although the road has been designed with badger fencing in places, there should be permanent mitigation installed in the following places to allow badgers to safely navigate the road:</p> <ul style="list-style-type: none"> The overbridge on the footpath close to Peastree Farm will have an area that is green, and this will be seeded for use by badgers to allow them to cross the scheme. A badger tunnel will be provided within the embankment of Durdar Bridge to the south of the Scheme, this will allow badgers safe passage from east to west across the scheme. Badgers will be excluded from land to the north of the Scheme in this location, as it is earmarked within the St. Cuthbert's Garden Village Stage 2 Masterplan design for development. The culvert to the east of Scalegate Roundabout will be used as a badger tunnel. <p>The cycle bridge at Brisco Roundabout will be seeded to persuade badgers to use the bridge to persuade badgers to cross the Scheme.</p>	Minor
NC28	Alignment of the road may lead to loss of habitat, or habitat fragmentation for Brown Hares, particularly in the Peastree Farm area and to the South of Newbiggin Road.	Brown Hare	Moderate	<p>Although the road has been designed with mammal fencing, predominantly for otters and badgers, there are places within it that brown hares could use to cross.</p> <ul style="list-style-type: none"> The overbridge on the footpath close to Peastree Farm will have an area that is green, and this will be seeded for use by badgers to allow them to cross the scheme, however brown hares could use this in order to cross the scheme. <p>A badger tunnel will be provided within the embankment of Durdar Bridge to the south of the Scheme, this will allow badgers safe passage from east to west across the scheme, and could be used by brown hares in this area also. Mammals will be excluded from land to the north of the Scheme in this location, as it is earmarked within the St. Cuthbert's Garden Village Stage 2 Masterplan design for development</p>	Minor
NC29	<p>Site clearance and construction activities, including the establishment of construction zones may disturb breeding birds and could result in the destruction of active birds' nests if undertaken during the breeding bird season (March to September inclusive).</p> <p>Increased levels of noise and vibration through construction period could make it more difficult for territorial song to be heard, and increase stress levels within breeding birds, which may affect breeding success.</p> <p>The Scheme will lead to the loss or damage of 114 hedgerows, an area of floodplain meadow by the River Caldew, four areas of lowland mixed deciduous woodland and large areas of improved pasture, arable fields, and dense scrub This will cause a reduction</p>	Breeding Birds	Moderate	<p>Site clearance to be completed between the months of September and February to avoid bird nesting season. If nesting habitat needs to be removed during the nesting bird season, then it should be checked by the ECoW before it is removed. Only after the nest is no longer in use will the nesting habitat be removed.</p> <p>Bird nest boxes will be erected during site clearance to provide nesting opportunities for the farmland bird species.</p> <p>Habitats in the construction zones should be managed to dissuade nesting birds.</p> <p>The total loss of species rich hedgerows and hedgerows with trees hedgerows is 12.6 km, arable farm land 30.17 ha, lowland mixed deciduous woodland 23.33</p>	Negligible

	in diversity and abundance of breeding habitat of breeding bird habitat in the local area.			ha and improved pasture 30.29 ha. However, the Scheme design incorporates the addition of 17.25km of species rich hedgerows and hedgerows with trees, 24.32 ha of native broadleaved woodland, a of dense scrub and 5.32 ha of native mixed woodland. All of which means there will a net increase in the diversity and abundance of breeding habitat from the Scheme.	
NC30	Operational lighting can impact upon the behavioural patterns of fauna, for example affecting migratory patterns of fish, as well as modifying the flowering and development of flora.	River Eden SAC	Major	<p>The lighting design for the scheme shows no lighting from Cummersdale Roundabout to Durdar Roundabout, meaning there should be no operational light from the Scheme upon the River Eden SAC. Furthermore, the bridge is approximately 13.4m from the ground, therefore there is negligible increase in light from cars whilst using the road.</p> <p>The lighting has been designed so that beyond the boundary of the road surface, the horizontal illuminance does not exceed 1.0 lux, this is excluding the screening effect of buildings, trees, hedgerows etc.</p> <p>The bridge at the River Petteril is approximately 7m from the ground level, therefore the level of light reaching the watercourse should be negligible.</p>	Negligible
		River Eden and Tributaries SSSI			
		Cummersdale Shingle Banks SiS			
		Rivers and Streams HPI			
		Otters			
		Fish			
		Bats			
		Badgers			
		Brown hare	Moderate		
NC31	Operational Noise and Vibration may affect the behaviour of taxa close to watercourses specifically fish and otter, and could deter spawning fish from migrating upstream, and otter from using the area	River Eden SAC	Major	<p>The bridge across the River Caldew is approximately 13.4m from the ground, therefore there is negligible risk of significant disturbance from noise and vibration during operation.</p> <p>The bridge across the River Petteril is approximately 7m from the ground, therefore there is negligible risk of significant disturbance from noise and vibration during operation.</p>	Negligible
		River Eden and Tributaries SSSI	Major		Negligible
		Otter	Moderate		Negligible

		Fish	Major		Negligible
NC32	Watercourses could be polluted during operation from road run – off and drainage, this could affect water quality and lead to mortality of aquatic taxa along large distances of the following watercourses; River Caldew, River Petteril, Fairy Beck.	River Eden SAC	Major	There are 4 SUDS ponds proposed near to both the River Caldew and River Petteril, and one close to Fairy Beck, which could allow drainage from the road to enter these watercourses during operation. These will require permits from the Environment Agency will require that pollution levels are compliant with legal requirements	Negligible
		River Eden and Tributaries SSSI	Major		Negligible
		Cummersdale Shingle Banks SiS	Major		Negligible
		Rivers and Streams HPI	Major		Negligible
		Fish	Major		Negligible
		Otter	Moderate		Negligible
NC33	Vegetation clearance in order to construct the road will lead to the loss of five bat roosts, these are T8315, immediately to the west of the West Coast Mainline, T8320, in a hedge line close to the proposed Brisco Roundabout. T8442 and T8447, which are in a hedge line immediately to the north of the Scheme, and T8489, which is adjacent to Peter Lane, and close to the proposed A595 Newby West Roundabout	Bats	Major	An EPS licence will be required as part of the removal of these trees., and the full mitigation required will be finalised con conditioned within this licence. Mitigation will include the provision of a suitable roosting location. The replacement tree should be in a suitable condition, and of sufficient size and health for the feature, and it should be surveyed to ensure that no existing roosts are present and would be affected. The current proposed trees are: T8315 – Approximately 40 metres to the north of tree, in a hedgerow at the edge of the field boundary. T8320 – Approximately 150m to the south of the existing tree, at an existing field boundary. T8447 and T8444 – There is a singular tree to the south of the existing trees, and a group of trees further south towards the River Caldew. T8489 – There are some remaining trees further south along Peter Lane, or potentially within Ashtip Wood. B111 – There are a group of mature trees approximately 100m to the east. These roosting locations are to be finalised during final design stage following appropriate ground truthing and necessary surveys.	Negligible
	A further roost identified at B111 – Oak Dene – will be completely surrounded by the road. Current designs show the area to be lighted. The proposed Durdar Roundabout is approximately 100m of this roost. This increased level of disturbance will effectively lead to the loss of the roost site, as the increased levels of disturbance would render the site unusable for bats. This would lead to a loss of roosting habitat for local bat species, which would represent a large significant effect at the local level				
NC34	The current route alignment will sever two areas of very high bat activity – the River Petteril, and the River Caldew, and four areas of low bat activity, Ashtip Wood, Peastree, the area to the south of Newbiggin Road between Durdar Road and Scalegate Roundabout, and the area surrounding Langdale and the Piggeries. This severance of habitat would reduce available foraging and commuting routes for bat species, including two very important sites. This would represent a very significant negative effect at the county level.	Bats	Major	In order to maintain these foraging and commuting corridors landscape design could include the creation of “bat hop overs”, by planting vegetation that will direct bats up and over the road or deflect them in a direction away from the Scheme. These should be discussed in the following areas: <ul style="list-style-type: none"> Land surrounding Langdale and the Piggeries. Land to the south of Tarn Plantation between Durdar Road and Scalegate Roundabout. Ashtip Wood. 	Negligible

				These hop over locations have been chosen based on information about impacts on bat foraging and commuting routes gained from surveys, however exact final locations will be discussed, and agreed at the final design stage.	
NC35	The current design of the road shows lighting in all areas except between Cummersdale Roundabout and Durdar Roundabout. The lighting in the River Petteril corridor will deter bats from using this area, and it currently shows a very high level of bat activity. It will also effect areas with lower levels of bat activity in land adjacent to the Piggeries and Langdale Cottage, South of Newbiggin Road between Buckabank Road and Scalegate Roundabout, and around Ashtip Wood. This could reduce the availability of favourable foraging and commuting habitat for local bat species.	Bats	Major	The effects of operational light spill at the River Petteril, Ashtip Wood, the River Caldew, Peastree, the fields between Durdar Road and Scalegate Roundabout, and the fields surrounding Langdale and the Piggeries where bat activity has been noted, should be minimised by looking at the lighting design and incorporating some changes at the final design stage. This could involve lowering the height of the lighting, using hoods and cowls on the lights in these areas, or looking to remove lighting in these areas This has not been undertaken yet, and would need to be done at the final design stage.	Negligible
NC36	T8444 and T8447 are currently down as being removed in order to undertake essential utility diversion works. These trees contain bat roosts within them, likely occasional roosts. This loss of bat roosts will lead to a reduction in available roosting sites for local bats.	Bats	Major	Once contractor is appointed, discussions to ascertain if it is possible to avoid the loss of these trees should be undertaken. These discussions will take place at final design	Negligible
NC37	The alignment of the road will lead to a loss of foraging and commuting habitat for bats utilising the areas at Langdale and the Piggeries. This will affect the bats at the roosts, B85, B86e and the unmarked tree at NY 42297 50550, as there will be a reduction in available foraging and commuting habitat in this location.	Bats	Major	Alongside a bat hop over it may also be pertinent to look at planting areas that may deflect the bats east - west along the proposed scheme itself in this location. This will need to be refined at final design stage, and this may form one of a number of possibilities in this location to reduce the impact on bats utilising this area.	Negligible
NC38	Vegetation clearance to create the bridge at the river Petteril may result in loss of linear vegetation that bats are using within this very important foraging and commuting corridor. This could affect bats utilising this corridor, by reducing foraging habitat available, as well as effecting bats roosting at Newbiggin Old Bridge and B124a. It is likely bats in these roosts are using the river corridor to forage and commute.	Bats	Major	Consideration of the design and reinstating of the foraging and commuting corridor should be undertaken at the detailed design stage. The landscaping should be designed to direct bats beneath the underpass and not up onto the road. This is to be refined at detailed design stage.	Negligible
NC39	Loss of ponds and terrestrial vegetation could lead to mortality of amphibians species	Amphibians	Moderate	Although Great Crested Newts were not found breeding frogs, toads, and other newt species found in close proximity to the Scheme. Therefore, a Reasonable Avoidance Method Statement (RAMS) will form part of the final CEMP in relation to amphibians during the construction period, especially in relation to works in the River Caldew river valley and close to the pond by the A595 Newby West Roundabout.	Negligible.
NC40	Flood flows at 1:1000 yr events due to presence of the River Caldew bridge may lead to stripping of vegetation, and loss of riparian habitat, including potentially alder woodland in floodplain habitat from the River Eden SAC	River Eden SAC Wet Woodland HPI	Major	Modelling shows that the use of a 2m x 2m culvert with the invert set at bed level of the paleo-channel on the edge of the agricultural land lowers the average velocity through the 3rd span at the 1:1000-yr flow from 1.7 m/s to 1.65 m/s (baseline condition is 0.9 m/s). It makes little difference to the highest peak velocity which is in a localised paleo-channel with a baseline of 2.2 m/s which rises to 2.4 m/s with the bridge. The alluvial forest is unlikely to be impacted by the bridge as the velocities all remain below the threshold of 2.44 m/s which marks tree instability. The small area where velocities get close to this are in an existing relic channel.	Negligible.
Landscape Character					
LC01	Alignment of route will detract from the rectilinear field patterns Loss of mature hedgerows and hedgerow trees.	Carlisle urban fringe: low land ridge and valley farmland and transport corridor	Varies	Species rich, native hedgerows with standard, native broadleaf tree planting.	Varies

		Gently rolling low land ridge and valley farmland and industrial Cummersdale			
		Sub-urban Carlisle: Busy linear settlements, race course and irregular field patterns			
		Agricultural Brisco and historic parkland			
LC02	Alignment of route will detract from the rectilinear field patterns Loss of mature hedgerows and hedgerow trees.	Carlisle urban fringe: low land ridge and valley farmland and transport corridor. Gently rolling low land ridge and valley farmland and industrial Cummersdale. Sub-urban Carlisle: Busy linear settlements, race course and irregular field patterns. Agricultural Brisco and historic parkland. Petteril river valley green wedge and transport corridor.	Varies	Species rich, native hedgerows with standard, native broadleaf tree planting.	Varies
LC03	Loss of plantation woodland.	Carlisle urban fringe: low land ridge and valley farmland and transport corridor	Varies	Mixed native coniferous and broadleaf woodland planting.	Varies
LC04	Loss of large continuous areas of both mature deciduous woodland Introduction of engineered slopes that are uncharacteristic of the natural topography and typical vegetation.	Caldew river valley green corridor, mill and print works Petteril river valley green wedge and transport corridor	Varies	Native broadleaf woodland planting.	Varies
LC05	Loss of large continuous areas of both mature deciduous woodland on the valley sides and semi-mature riparian woodland on the valley floor; loss of an intimate and secluded character, that is a result of minimal urban influences and an enclosed wooded landscape. Introduction of engineered slopes that are uncharacteristic of the natural topography and typical vegetation.	Caldew river valley green corridor, mill and print works	Varies	Scattered tree and scrub planting, to mitigate loss of vegetation and to better integrate engineered slopes into the landscape.	Varies
LC06	Alignment of route will detract from the rectilinear field patterns Increase in generic urban features and presence of road vehicles (traffic) that detract from landscape character, including lighting columns, signage and wider road network.	Gently rolling low land ridge and valley farmland and industrial Cummersdale. Sub-urban Carlisle: Busy linear settlements, race course and irregular field patterns. Agricultural Brisco and historic parkland.	Varies	Rectilinear areas of woodland planting to mitigate the effect of roundabouts, overbridge and associated infrastructure and traffic on the landscape.	Varies
LC07	Increase in generic urban features and presence of road vehicles (traffic) that detract from landscape character, including lighting columns, signage and wider road network.	Carlisle urban fringe: low land ridge and valley farmland and transport corridor. Gently rolling low land ridge and valley farmland and industrial Cummersdale Sub-urban Carlisle: Busy linear settlements, race course and irregular field patterns. Agricultural Brisco and historic parkland.	Varies	Roundabout designed to reflect local landscape character, using hard and soft landscape design.	Varies

LC08	Large bridges at river crossings introducing urban features in the landscape.	Caldew river valley green corridor, mill and print works.	Varies	Sensitive and creative design of bridges to create a “gateway” to Carlisle. Bridges designed to be slender in form and maximise span widths and heights to maintain some visual connectivity.	Varies
	Increase in traffic resulting in a loss of tranquillity. Damaging the intimate and secluded character found within the Caldew valley. Damaging the open river corridor characteristics.	Petteril river valley green wedge and transport corridor.			
LC09	Foot and road overbridges to introduce large, vertical urban features into these landscapes.	Carlisle urban fringe: low land ridge and valley farmland and transport corridor.	Varies	Bridges designed to reflect local landscape character, using locally sourced materials and materials that visually recede into the landscape.	Varies
		Gently rolling low land ridge and valley farmland and industrial Cummersdale.			
		Sub-urban Carlisle: Busy linear settlements, race course and irregular field patterns.			
		Agricultural Brisco and historic parkland.			
LC10	Generic, urban transport corridor being introduced to a predominantly rural landscape, damaging character and sense of place.	Petteril river valley green wedge and transport corridor.	Varies	An artwork strategy to be developed to provide reference to local history, culture and the natural environment that is specific to each affected character area.	Varies
		Carlisle urban fringe: low land ridge and valley farmland and transport corridor.			
		Gently rolling low land ridge and valley farmland and industrial Cummersdale.			
		Caldew river valley green corridor, mill and print works.			
		Sub-urban Carlisle: Busy linear settlements, race course and irregular field patterns.			
		Agricultural Brisco and historic parkland.			
LC11	Change to the natural topography through creation of engineered slopes.	Petteril river valley green wedge and transport corridor.	Varies	Grading out of slopes to a 1:10 gradient to allow these to be returned to agricultural use.	Varies
		Carlisle urban fringe: low land ridge and valley farmland and transport corridor.			
		Gently rolling low land ridge and valley farmland and industrial Cummersdale.			
		Sub-urban Carlisle: Busy linear settlements, race course and irregular field patterns.			
		Agricultural Brisco and historic parkland.			
LC12	Loss of trees from the banks of the River Petteril.	Petteril river valley green wedge and transport corridor.	Varies	Riparian tree planting to river banks.	Varies
LC13	Loss of individual parkland trees.	Agricultural Brisco and historic parkland.	Varies	Replacement individual tree planting.	Varies
Visual Impact					
VI01	Potential loss of existing mature trees and vegetation. The removal of trees will expose the receptor to the proposed scheme.	Viewpoints: 1 Cummersdale	Moderate	Any lost trees and/or shrubs will be replaced as part of the landscape planting proposals and where appropriate, the replacement vegetation will include large stock size trees.	Slight
		2 Cumbria Way/NCN7/ River Caldew	Major		Moderate

		3 Durdar North	Major		Slight
		4 Durdar South	Major		Slight
		5 River Petteril PRow	Major		Moderate
		7 Morton	Moderate		Slight
		8 Newbiggin Hall Cottages	Moderate		Slight
VI02	The new, wide link road and associated traffic movements becoming a dominant feature in the view.	Viewpoints: 1 Cummersdale	Moderate	Proposed hedgerow planting.	Slight
		2 Cumbria Way/ NCN7/ River Caldew	Major		Moderate
		3 Durdar North	Major		Slight
		4 Durdar South	Major		Slight
		5 River Petteril PRow	Major		Moderate
		7 Morton	Moderate		Slight
		8 Newbiggin Hall Cottages	Moderate		Slight
VI03	Potential for embankments to introduce engineered form into the landscape	Viewpoints: 1 Cummersdale	Moderate	Larger embankment slopes to be planted to soften the impact on the landscape.	Slight
		2 Cumbria Way/ NCN7/ River Caldew	Major		Moderate
		3 Durdar North	Major		Slight
		4 Durdar South	Major		Slight
		5 River Petteril PRow	Major		Moderate
		7 Morton	Moderate		Slight
		8 Newbiggin Hall Cottages	Moderate		Slight
VI04	Loss of vegetation to the riverbanks along the Caldew due to the new bridge crossing. Engineered slopes and large urban bridge structure forming large features in the view.	Viewpoints: 2 Cumbria Way/NCN 7/ River Caldew	Major	Mixed native scrub planting and scattered trees.	Moderate
VI05	Introduction of bridges forming a dominant urban feature in the view.	Viewpoints: 1 Cummersdale	Moderate	Bridges designed to visually recede into the landscape, using slender design, locally sourced materials. Bridges designed to be locally distinct, reinforcing a sense of place.	Slight
		2 Cumbria Way/ NCN7/ River Caldew	Major		Moderate
		3 Durdar North	Major		Slight
		4 Durdar South	Major		Slight
		5 Petteril PRow	Major		Moderate
		7 Morton	Moderate		Slight
		8 Newbiggin Hall Cottages	Moderate		Slight
VI06	Potential for embankments to introduce engineered form into the landscape	Viewpoints: 1 Cummersdale	Moderate	Slopes on the backside of embankments to be slackened and returned to agricultural land. (embedded in the design for the assessment)	Slight
		2 Cumbria Way/ NCN7/ River Caldew	Major		Moderate
		3 Durdar North	Major		Slight
		4 Durdar South	Major		Slight
		5 River Petteril PRow	Major		Moderate
		7 Morton	Moderate		Slight
		8 Newbiggin Hall Cottages	Moderate		Slight
Land Use: Agricultural Land					
LU01	Damage to agricultural land and soil during construction	All agricultural land within site construction boundary	Minor	Retention of stripped top soil and re-use in structural landscaping following Defra's Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites guidelines. Use of appropriate vegetation and planting to help restore soil functionality over time.	Not significant

				<p>Measures such as tracked runways and weight-spreading plant tyres/ tracks to minimise soil compaction and preserve soil integrity.</p> <p>The implementation of a Soil Management Plan, to be adhered to through the works.</p> <p>Wetting of heaped soils to minimise dust generation and contamination.</p> <p>The storage of soils within the ownership of the land from where they were excavated to prevent cross-farm disease transmission and/or contamination.</p> <p>Installation of pre-construction drains where applicable.</p> <p>Access and services to be maintained throughout construction process in consultation with landowners and farmers and implemented, where appropriate, though traffic and construction management plans.</p> <p>Appropriate control of construction noise and disturbance e.g. noise-reducing hoarding.</p>	
LU02	Severance of agricultural land during construction	Durdar Farm	Moderate	<p>Access and services to be maintained throughout construction process in consultation with landowners and farmers and implemented, where appropriate, though traffic and construction management plans.</p> <p>Provision of temporary cattle handling facilities and access tracks where required.</p> <p>Purchase of land enabling farmer to vacate and relocate or retire as required.</p>	Not significant
		Peastree Farm			
LU03	Land take of agricultural land during construction	Brisco Hall	Moderate	<p>Access and services to be maintained throughout construction process in consultation with landowners and farmers and implemented, where appropriate, though traffic and construction management plans.</p> <p>Provision of temporary cattle handling facilities and access tracks where required.</p> <p>Purchase of land enabling farmer to vacate and relocate or retire as required.</p>	Not significant
		Durdar Farm			
		High Brownelson			
		Durdar House			
		Floshes Farm			
LU04	Permanent severance of agricultural land	Durdar Farm	Major	<p>Access points to roads provided as required.</p> <p>Provision of accommodation bridges/ underpasses where required.</p> <p>Implementation of new access tracks and access points where required.</p> <p>Reinstatement of drainage, water troughs and stock handling facilities as required.</p> <p>Removal and/ or realignment of fences, walls and hedges where identified by landowner to make field parcels viable again.</p>	Moderate
		Peastree Farm	Major		Moderate
		High Brownelson	Major		Minor
		Park Fauld Farm	Moderate		Negligible
LU05	Permanent land take of agricultural land	Brisco Hall	Major	Return of land, where possible (e.g. highway earthworks), to agricultural use.	Moderate
		Durdar Farm			Major
		High Brownelson			Moderate
		Durdar House			Moderate
		Peastree Farm			Moderate
LU06	Farm business viability – the above impacts/effects feed into this	Brisco Hall	Major	Combination of all of the above mitigation measures.	Moderate
		Durdar Farm			Major
		High Brownelson			Moderate
		Durdar House			Moderate

		Peastree Farm			Moderate
Noise and Vibration					
NV01	1.3 dB increase. Above SOAEL. Noise perception present and disruptive.	West House (southwest façade)	Minor adverse in the short term becoming negligible adverse in the long term	Noise insulation under the NIR	Neutral to slight beneficial (interior noise levels in sensitive rooms on the façade facing the scheme will decrease)
NV02	2.8 dB increase. At or above LOAEL but below SOAEL. Noise perception present and intrusive.	Properties by Peter Lane: 50 Peter Lane (southwest façade)	Minor adverse in the short term becoming negligible adverse in the long term	Noise barrier in the form of an earth bund	Neutral
	Up to 11.3 dB decrease. Below LOAEL. Noise perception present and not intrusive, or not present.	Properties by Peter Lane: 49 Peter Lane and 13 to 31 Meadow Lane (even no.s)	Moderate to Major beneficial in the short term becoming Minor to Major beneficial in the long term		Moderate to large beneficial
NV03	8.8 dB increase. At or above LOAEL but below SOAEL. Noise perception present and intrusive.	Properties at 42 to 43 Dalston Road	Major adverse (short term) becoming Moderate adverse (long term)	Noise barrier in the form of an earth bund	Moderate (No. 42) to slight (No. 43) adverse
NV04	Up to 9.6 dB increase. Below LOAEL. Noise perception present and not intrusive, or not present.	Park Fauld Farm	Major to moderate adverse (short term) becoming moderate to minor adverse (long term)	Increase of the cutting depth from 2 to 3m above road level	Neutral to slight adverse
NV05	11.7 dB increase. At or above LOAEL but below SOAEL. Noise perception present and intrusive.	Oak Dene (north façade)	N façade: Major adverse S façade: Major beneficial	Noise barrier in the form of an earth bund	Slight adverse
NV06	6.6 dB increase. At or above LOAEL but below SOAEL. Noise perception present and intrusive.	Langdale (south façade)	N façade: Major beneficial (short term) becoming moderate beneficial (long term) S façade: Major adverse (short term) becoming moderate adverse (long term)	Noise barrier in the form of an earth bund	Slight adverse (S façade faces garden with amenity value)
NV07	4.9 dB increase. At or above LOAEL but below SOAEL. Noise perception present and intrusive.	The Keep (north façade)	Moderate adverse (short term) becoming minor adverse (long term)	Noise barrier in the form of an earth bund	Slight adverse
Outdoor Access and Recreation					
OA01	New bridge crossing introduced over the Caldew valley: Route closed for up to 12 months during construction of new bridge. Disruption with pedestrians and cyclists diverted to other routes.	Cumbria Way National Trail	Major	Ensure route is kept open for maximum amount of time possible during construction with existing proposed 12-month period reduced. Appropriate pedestrianised diversion put in place during closure with signage to direct walkers to an alternative footpath (new temporary footpath close to railway line to be considered or use of Footpath 129002 on east side of River Caldew). Appropriate temporary diversion put in place during closure via Cummersdale and Dalston Road or new temporary footpath close to railway line to be considered, with signage to direct cyclists and warn motorists of cyclist's presence. Details of closure periods will be advertised on site notices as well as the Sustrans website.	Moderate
		NCN 7/ C2C / Reiver's Route	Major		

OA02	<p>Construction of new road across existing footpaths:</p> <p>Closure of sections of path during construction, five footpaths severed during construction (129024, 129003, 129004, 129005, 129001) with no access for pedestrians likely, with diversions via FP129002 to the north of the Racecourse adding 4 km between Durdar and the River Caldeu path.</p>	PRoW between the River Caldeu and Durdar Road	Major / Moderate	<p>Appropriate pedestrianised diversion put in place during closure with signage to direct walkers to alternative footpaths.</p> <p>Mitigation planting used to screen the Scheme and reduce impacts on landscape quality to reduce negative impacts on amenity value of PRoW.</p>	Moderate
OA03	<p>Construction of sections of footway on Durdar Road and construction works on Newbiggin Road.</p> <p>Access to FP129010 from Durdar Road likely to be restricted for short period.</p> <p>Vehicle access to car park and picnic site to access FP129018 likely to be restricted for periods during construction works on Newbiggin Road.</p> <p>Minimal effects on FP129021.</p>	PRoW east of Durdar Road	Minor / Moderate	<p>Appropriate pedestrianised diversion put in place during closure with signage to direct walkers to alternative footpaths.</p> <p>Vehicle access to car park and picnic site to access FP129018 kept open for maximum amount of time possible during construction.</p> <p>Mitigation planting used to screen the scheme and reduce impacts on landscape quality to reduce negative impacts on amenity value of PRoW.</p>	Neutral
OA04	<p>New bridge over Petteril Valley and FP129017 (Miller's Way):</p> <p>Route closed during construction of new bridge with pedestrians diverted to an existing path to the east of the Premier Inn Hotel with crossings of the M6 Junction 42 roundabout. Diversion adding 250m incorporating carriageway crossings.</p>	Miller's Way Walking Route	Major / Moderate	<p>Ensure route is kept open for maximum amount of time possible during construction.</p> <p>Appropriate pedestrianised diversion put in place during closure with signage to direct walkers to A6 Roman Road and Newbiggin Road and warning signs to motorists where any highway crossings are required.</p>	Moderate
OA05	<p>Construction of sections of footway / shared use on Durdar Road:</p> <p>Footways closed during construction works with pedestrians diverted to temporary footway adjacent to existing footway. Some disruption with temporary footway surfaces and ramps likely to effect vulnerable pedestrians.</p>	Footways Durdar Road	Minor / Moderate	<p>Ensure pedestrian access is retained throughout construction with appropriate pedestrianised diversion put in place adjacent to existing footway with signage to direct pedestrians.</p> <p>Temporary footway surface to be suitable for vulnerable users, including wheelchair users and pedestrians with pushchairs.</p>	Moderate
OA06	<p>New road and roundabouts constructed over existing minor roads. Cyclists likely to be redirected onto alternative roads.</p> <p>Durdar Road to be kept open during construction, with construction of new overbridge offset from existing highway.</p>	Six minor roads affected (Dalston Road, Peter Lane, Newbiggin Road, Durdar Road, Sclegate Road and Brisco Road).	Moderate / Major	<p>Durdar Road to be kept open during construction with other north / south routes diverted to Durdar Road through appropriate signage.</p> <p>Appropriate traffic management to be implemented during construction on Dalston Road, Peter Lane, Newbiggin Road, Sclegate Road and Brisco Road with full closure periods kept to a minimum.</p>	Moderate
OA07	<p>Construction of a new river crossing:</p> <p>Use of river likely to be restricted during construction of bridge crossing. Some users, are likely to be dissuaded from making trips with trips made longer and less attractive.</p>	River Petteril	Moderate / Major	<p>Closure of river kept to a minimum with appropriate signage to give notice of closure to river users.</p> <p>Access to be retained during peak fishing periods wherever possible.</p>	Moderate
OA08		River Caldeu	Moderate / Major		
OA09	<p>Operation of new bridge over Petteril Valley and FP 129017 (Miller's Way). Vehicle access to existing car park from M6 junc. 42 stopped off with car park relocated to west of river and new access.</p> <p>Slight deviation to existing path with underpass of new bridge structure.</p> <p>Revised access for pedestrians from relocated car park to FP129018 to Wreay Woods. Footpath link to FP129017 from shared use path on north side of new highway.</p>	Miller's Way Walking Route	Minor / Moderate	<p>New car park to offer improved vehicle access to the existing with enhanced facilities such as picnic tables / information board and new pedestrian access to FP129018.</p>	Neutral

OA10	Operation of new roundabouts constructed over three existing roads (Dalston Road, Scalegate Road and Brisco Road) with a bridge constructed over Durdar Road. Peter Lane stopped up to vehicles with shared use link to new highway. Some hindrance to cyclists' access and slight increase in journey times with three new roundabouts to cross (Dalston Road, Scalegate Road and Brisco Road).	Dalston Road, Scalegate Road, Brisco Road and Peter Lane: On road cycling on minor roads	Moderate / Minor	Design of roundabouts to be sympathetic to cyclists in relation to deflection and sight lines in order to improve accessibility and safety for cyclists.	Moderate
Water Environment					
WE01	Addition of hard bank materials for bridge abutments and bank protection impacting trees along the river bank. Alders along the banks of the Petteril currently define the hydromorphology of the river.	River Petteril	Moderate	Aim to protect tree roots during construction through implementation of best practice guidance.	Minor
WE02		Minor watercourses	Moderate	Provide compensation for loss of habitat within the reach upstream or downstream.	Minor
WE03	Discharge of sediment and contaminants into the watercourses, changes to surface water runoff rates and volumes discharged to the watercourses. Effects on ecology, depth, flow velocities, flood risk, and geomorphology.	River Petteril	Moderate	Control of run-off from construction sites through use of best practice methods on the construction compound sites to reduce contamination of the watercourses.	Negligible
WE04		River Caldew	Moderate		Negligible
WE05		Minor watercourses	Moderate		Negligible
WE06	Amendments to natural flow paths, potential changes to the flood risk up and downstream, effect on geomorphology, reduction in diversity of flow patterns, effects on ecology.	River Petteril	Moderate	Suitable culverts, bridges or alternative structures implemented over watercourse shall be designed to minimise the impact on geomorphology and ecology in the vicinity of each of the structures.	Negligible
WE07		River Caldew	Moderate		Negligible
WE08		Minor watercourses	Moderate	A Scour assessment to be completed to ensure new structure is not undermined by large flows	Negligible
WE09	Restriction on the development of hydromorphology in the crossed reach	River Caldew	Moderate	Set-back of the embankment for the crossing and/or remove the existing revetments along the railway line and around the National Grid pylon upstream.	Negligible
Geology & Soils					
GS01	Reduction in the local groundwater table level due to potential cuttings below the level of the principal aquifer bedrock.	Hydrogeology	Major	Groundwater monitoring to better understand seasonal fluctuations in the water table. Ground investigations to identify the depths to bedrock along the route alignment. Earthworks drainage to be installed no deeper than the minimum required depth.	Slight
GS02	Groundwater contamination.	Hydrogeology	Major	Highway drainage to be designed to discharge into either combined sewers or controlled attenuation ponds to reduce the risk of contaminants entering the principal sandstone aquifer. Depending on the nature of contamination, cut-off drains, or impermeable walls may be necessary, particularly adjacent to landfill areas.	Slight
GS03	Route alignment will require the removal of topsoil from agricultural land.	Topsoil quality	Moderate	Suitable soil management methods to be employed during construction (Measures to be outlined in the Soil Handling Strategy and Soil Management Plan during construction phase).	Not Significant
GS04	Route alignment will require the removal of superficial soils in the locations of cuttings, as well as removal for road formation level.	Superficial soils	Negligible	Suitable soil management methods to be employed during construction (Measures to be outlined in the Soil Handling Strategy and Soil Management Plan during construction phase).	Not significant

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