LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

Off-route effects supporting information (CT-007-000)

November 2013

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Department for Transport

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1 Introduction

1.1.1 This environmental assessment summary appendix for Volume 4: Off-route effects (Section 5, Modification to WCML between Lichfield and Colwich) comprises the following topic information:

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- air quality baseline data and assessment (Section 3);
- community baseline data and assessment (Section 4);
- cultural heritage baseline data and assessment (Section 5);
- ecology baseline data and assessment (Section 6);
- land quality baseline data and assessment (Section 7);
- landscape and visual baseline data and assessment (Section 8);
- socio-economics baseline data and assessment (Section 9);
- sound, noise and vibration baseline data and assessment (Section 10); and
- water resources and flood risk baseline data and assessment (Section 11).

1.1.2 In addition, Section 12 contains information on committed consents and development allocations in the vicinity of the Proposed Scheme, used in the assessment of future baseline. Maps referred to throughout this appendix are contained in the Volume 4 Map Book.

1.1.3 Due to the linear nature of the modification works to the West Coast Main Line (WCML), for most topics the works have been split into six geographical areas to assist with the assessment process. These areas, named Area A to Area F are set out in Table 1 and are used throughout this appendix.

Table 1: Reporting areas used in this appendix

Area reference	Location description	Summary of proposed works
A	The existing WCML between Lichfield Junction (Map CT-05-148, I4) and A515 Lichfield Road (Map CT-05-129b-L1, E2).	Use of the existing railway sidings at Lichfield during construction (Map CT-05-148, G4 and H4). Track modifications to the WCML in the approximate areas illustrated on map series CT-06 (Volume 4: Off-route effects).
B	The existing WCML between B5014 Lichfield Road (Map CT-05-130b, B6) and the Trent and Mersey Canal (Map CT-05-142, F6). The area is wholly within Handsacre.	The only works in this area are associated with the set up and use of the Armitage Shanks satellite compound (Map CT-05-142, G6).
C	The existing WCML between the Trent and Mersey Canal (Map CT-05-142, F6) and a location just north of Cawarden Springs Farm, north-east of Rugeley Power Station (Map CT-05-144, H4).	Provision of access routes and crane platforms for installation and removal of signal gantries as illustrated on map series CT-05 (Volume 4: Off-route effects). There are no track modifications in this area.
D	The existing WCML between a location just north of Cawarden Springs Farm, north-east of Rugeley Power Station (Map CT-05-144, H4) and a location north of Rugeley Trent Valley Station near Bellamour Lodge Farm (Map CT-05-145, C6).	The set up and use of the A51 satellite compound. Provision of access routes and crane platforms for installation and removal of signal gantries as illustrated on map series CT-05 (Volume 4: Off-route effects). Track modifications to the WCML and the Chase Line in the approximate areas illustrated on map series CT-06 (Volume 4: Off-route effects). Installation of three relocatable equipment buildings (Map CT-06-145, H6, F6 and D6) including construction of a permanent access route to one of these buildings, just north of the railway sidings at Rugeley (see Map CT-06-145, G6). Use of the existing railway sidings at Rugeley during construction (Map CT-05-148, H6).
E	The existing WCML between a location north of Rugeley Trent Valley Station near Bellamour Lodge Farm (Map CT-05-145, C6) and a location just west of Bishton Lane Farm (Map CT-05-147, I5).	Provision of access routes and crane platforms for installation and removal of signal gantries as illustrated on map series CT-05 (Volume 4: Off-route effects). Track modifications to the WCML in the approximate areas illustrated on map series CT-06 (Volume 4: Off-route effects).

Area reference	Location description	Summary of proposed works
F	The existing WCML and North Staffordshire Line between a location just west of Bishton Lane Farm (Map CT-05-147, I5) and Colwich Junction.	Provision of access routes and crane platforms for installation and removal of signal gantries as illustrated on map series CT-05 (Volume 4: Off-route effects). Track modifications to the WCML and North Staffordshire Line in the approximate areas illustrated on map series CT-06 (Volume 4: Off-route effects). The installation of one relocatable equipment building (Map CT-06-147, D6).

2 Agriculture, forestry and soils

2.1.1 Agricultural, forestry and soils assessment for Areas A and B have been scoped out as there will be no agricultural land impacted.

Table 2: Agriculture, forestry and soils baseline data and assessment – Area C

Category	Section	Subsection (if necessary)	Summary text
1.0 Baseline:	1.1 Soil and land resources	1.1.1 Topography and drainage	From the floodplain of River Trent at 65m above Ordnance Datum (AOD) the land rises through level terraces and low hills to 80m AOD.
		1.1.2 Geology and soil	The Trent valley contains loamy textured alluvium, which is flanked by loamy and sandy soils over gravel on river terraces. Mercia Mudstone and Bromsgrove Sandstone form the low hills flanking the floodplain and river terraces.
		1.1.3 Soil types (according to 1:250,000 scale National Soil Map)	561a (Wharfe association) on Trent floodplain; deep, well-drained clay loam with some associated soils affected by groundwater. 541r (Wick association) on river terraces; deep, well-drained sandy loam soils, locally over sand and gravel. 572f (Whimple association) on Mercia Mudstone; reddish medium or heavy clay loam topsoils over clay. Slight or occasional seasonal waterlogging. 541b (Bromsgrove association) on Bromsgrove Sandstone. Well-drained reddish sandy loam over sandstone, deep in places.
	1.2 Soil and land use interactions	1.2.1 Agricultural land quality. (Best and most versatile (BMV) land is in Grades 1-3a)	Wharfe association: Grade 4 due to flood risk. Wick association: Mainly Grade 2 or 3a due to droughtiness, but locally 3b where gravel is at shallow depth. Whimple association: Mainly Subgrade 3a due to topsoil texture and wetness, but locally 3b where topsoil is a heavy clay loam. Bromsgrove association: Mainly Grade 2 or 3a, but locally 3b where sandstone is at shallow depth.
		1.2.2 Other soil interactions	Land flanking the River Trent is a functional flood environment and so the soils have an important flood storage capacity. All affected land is in a designated nitrate vulnerable zone designed to protect the quality of groundwater.

Category	Section	Subsection (if necessary)	Summary text
	1.3 Land use	1.3.1 Land use description	Mainly permanent grassland on the Trent floodplain (reflecting flood risk). Mixed arable and grassland on the surrounding land. No woodland or forestry is affected. Farm holding types are mainly arable and livestock.
		1.3.2 (Number) type and size of holding/s	The two farms affected by the Proposed Scheme are outlined below: Land within farm holding Wade Lane Farms (see Map CT-19-204, C6) is 265ha of mainly arable and livestock. Sensitivity has been assessed as high, as the holding is irrigated. There is approximately 145ha at this location and 120ha of other outlying land. Arable enterprise is rotated potato crop which is supported by a surface abstraction licence from the River Trent. Land within farm holding Cawarden Springs Farm (see Map CT-19-204, C6) is approximately 170ha of mainly arable and livestock (suckler beef herd). Sensitivity has been assessed as medium.
	1.4 Future baseline	N/A	No committed developments have been identified in this area (see Section 12 of this appendix) that will materially alter the baseline conditions with the 2017 (construction) or 2026 (operational) timeframes for agriculture, forestry or soils. The future of agri-environmental schemes is uncertain at present due to on-going reform of the Common Agricultural Policy.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	Soils and land resource: Adoption of good practice techniques in handling, storing and reinstating soils. Some land with heavier textured soils (Whimple association) may require more careful management. Agricultural business: Compliance with the draft Code of Construction Practice (CoCP) will avoid or reduce environmental impacts during construction. Of particular relevance to agriculture, forestry and soils are issues relating to soil disturbance, land drainage, agricultural access, fencing and water supply (see Volume 5: Appendix CT-003-000).
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Agricultural land quality	Soils and land resource: On land where agricultural or uses are to be resumed, there will be no reduction in the long-term capability which will downgrade the quality of disturbed land.

Category	Section	Subsection (if necessary)	Summary text
		2.2.2 On agricultural/ forestry land	Temporary area of land required for the Proposed Scheme will be approximately 3.8ha which comprises agricultural access tracks and a small amount of agricultural land. The temporary use of the existing agricultural access tracks will not preclude their use for agricultural access during construction.
		2.2.3 Soil to be disturbed	Soils and land resource: Some land with heavier textured soils (Whimple association) may require careful management during the aftercare period to ensure land is restored to the desired quality. Other land with sandy loam and medium clay loam textures is less susceptible to smearing and compaction during handling.
		2.2.4 On holdings	Agricultural business: Compliance with the draft CoCP will avoid or reduce environmental impacts during construction. Of particularly relevance to agriculture, forestry and soils are issues relating to soil disturbance, land drainage, agricultural access, fencing and water supply (see (see Volume 5: Appendix CT-003-000).
		2.2.5 Cumulative	There are no cumulative effects on agriculture, forestry and soils in this study area.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Agricultural land quality	Soils and land resource: No permanent impacts on soil or land expected. Agricultural business: No permanent impacts to land within the farm holdings. It is assumed that temporary access routes and crane platforms would be removed, and that land would be reinstated to the correct standard after construction has taken place.
		2.3.2 On agricultural/ forestry land	
		2.3.3 Soil to be disturbed	
		2.3.4 On holdings	No permanent issues identified.
		2.3.5 Cumulative	No permanent cumulative issues identified.
	2.4 Other mitigation measures (resulting from construction and permanent)	N/A	Fencing, drainage, access, irrigation and water supply issues do arise as a result of construction but these can be dealt with effectively under the draft CoCP (see Volume 5: Appendix CT-003-000).

Category	Section	Subsection (if necessary)	Summary text
	2.5 Summary of likely significant residual effects (resulting from construction and permanent impacts)	N/A	Agricultural business: None of the agricultural holdings will experience temporary significant adverse effects. The short duration of the proposed works will be managed in accordance with the CoCP and compensation where appropriate to accommodate farming activity and the needs of associated diversified businesses.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	Soils and land resource: No impacts are identified as there is no change from the present operation of the WCML.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No impacts are identified as there is; no change from the present operation of the WCML.
	3.3 Other mitigation measures	N/A	No additional measures required apart from weed management (see section 3.1 above).
	3.4 Summary of likely significant residual effects	N/A	No likely significant residual effects.

Table 3: Agriculture, forestry and soils baseline data and assessment – Area D

Category	Section	Subsection (if necessary)	Summary text
1.0 Baseline:	1.1 Soil and land resources	1.1.1 Topography and drainage	North-west of Rugeley the floodplain of River Trent is at 68m AOD rising to a near level terrace at 70m AOD. South-east of Rugeley, around Rugeley Junction, the land is hilly, rising to 80m AOD.
		1.1.2 Geology and soil	The Trent valley contains loamy textured alluvium, which is flanked by loamy and sandy soils over gravel on river terraces. Bromsgrove Sandstone forms the low hilly ground at Rugeley Junction.
		1.1.3 Soil types (according to 1:250,000 scale National Soil Map)	561a (Wharfe association) on Trent floodplain; deep, well-drained clay loam with some associated soils affected by groundwater. 541r (Wick association) on river terraces; deep, well-drained sandy loam soils, locally over sand and gravel. 541b (Bromsgrove association) on Bromsgrove Sandstone. Well-drained reddish sandy loam over sandstone, deep in places.
	1.2 Soil and land use interactions	1.2.1 Agricultural land quality. (BMV land is in Grades 1-3a)	Wharfe association: Grade Subgrade 4 due to flood risk. Wick association: Mainly Grade 2 or 3a due to droughtiness, but locally 3b where gravel is at shallow depth. Bromsgrove association: Mainly Grade 2 or 3a, but locally 3b where sandstone is at shallow depth.
		1.2.2 Other soil interactions	Land flanking the River Trent is a functional flood environment and so the soils have an important flood storage capacity. All affected land is in a designated nitrate vulnerable zone designed to protect the quality of groundwater.
	1.3 Land use	1.3.1 Land use description	Mainly permanent grassland on the Trent floodplain (reflecting flood risk). Mixed arable and grassland on the surrounding land. No woodland or forestry is affected. Farm holding types are mainly arable and livestock.

Category	Section	Subsection (if necessary)	Summary text
		1.3.2 (Number) type and size of holding/s	The two farms affected by the Proposed Scheme are outlined below: Land within farm holding Colton Mill Farm (see Map CT-19-204, C6): Mainly arable and livestock (sheep and cereals) estimated to be approximately 23ha in size. Sensitivity has been assessed as medium. Land within farm holding Woodhouse Farm, Rugeley (see Map CT-19-204, C6): General cropping (cereals and potatoes) estimated to be approximately 160ha in size. Sensitivity has been assessed as high.
	1.4 Future baseline	N/A	No committed developments have been identified in this area (see Section 12 of this appendix) that will materially alter the baseline conditions with the 2017 (construction) or 2026 (operational) timeframes for agriculture, forestry or soils. The future of agri-environmental schemes is uncertain at present due to on-going reform of the Common Agricultural Policy.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	Soils and land resource: Adoption of good practice techniques in handling, storing and reinstating soils. Agricultural business: Compliance with the draft CoCP will avoid or reduce environmental impacts during construction. Of particular relevance to agriculture, forestry and soils are issues relating to soil disturbance, land drainage, agricultural access, fencing and water supply (see Volume 5: Appendix CT-003-000)For some compounds access tracks could be aligned more closely to field boundaries to minimise field severance and land loss. This includes the access track off the minor track connecting Colton Road and the A51 (relating to the Woodhouse Farm holding)-, and the access track off Blithbury Road (relating to the Colton Mill Farm holding).
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Agricultural land quality	Soils and land resource: On land where agricultural uses are to be resumed, there will be no reduction in the long-term capability which will downgrade the quality of disturbed land. Agricultural business: The Colton Mill Farm holding consists of land likely to be Grade 2 agricultural land and the Woodhouse Farm holding consists of land likely to be Grade 1 agricultural land. The Colton Mill Farm holding will have about 5% of the land within the known holding affected, and the Woodhouse Farm holding about 0.5% of the land within the known holding affected.

Category	Section	Subsection (if necessary)	Summary text
		2.2.2 On agricultural/ forestry land	The land required temporarily for construction of the Proposed Scheme is approximately 4.0ha. It comprises an agricultural access track and a small amount of agricultural land.
		2.2.3 Soil to be disturbed	Soils and land resource: All the affected soil is free draining sandy loam or medium clay loam and so is not particularly at risk from smearing and compaction during handling. Agricultural business: Approximately 1.8ha of agricultural land to be disturbed for laying temporary access tracks, construction compounds.
		2.2.4 On holdings	Agricultural business: Compliance with the draft CoCP will avoid or reduce environmental impacts during construction. Of particularly relevance to agriculture, forestry and soils are issues relating to soil disturbance, land drainage, agricultural access, fencing and water supply (see (see Volume 5: Appendix CT-003-000).
		2.2.5 Cumulative	The cumulative effect of temporary impacts on agriculture, forestry and soils is not significant.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Agricultural land quality	Soils and land resource: Loss of a small amount of mainly BMV land on land flanking the Trent floodplain Soil affected by the land required permanently for the construction and operation of the Proposed Scheme will either remain in situ and be lost as an agricultural resource, or be stripped and utilised for landscaping. Agricultural business: Approximately 0.1ha of agricultural land to be lost to permanent access and car park on Colton Road. This is currently rough pasture (Grade 2).
		2.3.2 On agricultural/ forestry land	
		2.3.3 Soil to be disturbed	
		2.3.4 On holdings	The Colton Road site (0.1ha) will be a permanent construction as an access route and car park (see Section 2.4 mitigation for access issues).
		2.3.5 Cumulative	The cumulative effect of temporary impacts on agriculture, forestry and soils is not significant.

Category	Section	Subsection (if necessary)	Summary text
	2.4 Other mitigation measures (applicable to construction and permanent impacts)	N/A	Access issues may arise as a result of the permanent construction, but these can be dealt with effectively under the draft CoCP (see Volume 5: Appendix CT-003-000).
	2.5 Summary of likely significant residual effects (resulting from construction and permanent impacts)	N/A	No likely significant residual effects.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	No impacts are identified as there is no change from the present operation of the WCML.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No impacts are identified as there is no change from the present operation of the WCML.
	3.3 Other mitigation measures	N/A	No additional measures required apart from weed management (see section 3.1 above).
	3.4 Summary of likely significant residual effects	N/A	No likely significant residual effects.

Table 4: Agriculture, forestry and soils baseline data and assessment –Area E

Category	Section	Subsection (if necessary)	Summary text
1.0 Baseline:	1.1 Soil and land resources	1.1.1 Topography and drainage	Level terraces of the River Trent at 70m AOD.
		1.1.2 Geology and soil	Loamy and sandy soils over gravel on river terraces.
		1.1.3 Soil types (according to 1:250,000 scale National Soil Map)	541r (Wick association) on river terraces; deep, well-drained sandy loam soils, locally over sand and gravel.
	1.2 Soil and land use interactions	1.2.1 Agricultural land quality. (BMV land is in Grades 1-3a)	Wick association: Mainly Grade 2 or 3a due to droughtiness, but locally 3b where gravel is at shallow depth.
		1.2.2 Other soil interactions	All affected land is in a designated nitrate vulnerable zone designed to protect the quality of groundwater.
	1.3 Land use	1.3.1 Land use description	Mixed arable and grassland on the surrounding land. No woodland or forestry is affected. Farm holding types are mainly arable and livestock.

Category	Section	Subsection (if necessary)	Summary text
		1.3.2 (Number) type and size of holding/s	The three farms affected by the Proposed Scheme are outlined below: Land within farm holding Upper Moreton Farm (see Map CT-19-204, C6): Heavily diversified grassland farm with commercial coarse fishery and educational facilities. The farm is spread over at least two sites, one (Carney Pools) is next to the railway; however, the main farm is further to the north on Bishton Lane. Estimated from a desk study to be approximately 38ha in size. Sensitivity has been assessed as medium. Land within farm holding Bishton Hall Farm (see Map CT-19-204, C6): Mixed arable and livestock (probably including dairy). Diversified activities include a pony club. Next door is Bishton Hall which is a wedding venue and a school. Estimated from a desk study to be approximately 23ha in size. Sensitivity has been assessed as high because of the dairy business. Land within a farm holding of unknown ownership: Assumed arable farm.
	1.4 Future baseline	N/A	No committed developments have been identified in this area (see Section 12 of this appendix) that will materially alter the baseline conditions with the 2017 (construction) or 2026 (operational) timeframes for agriculture, forestry or soils. The future of agri-environmental schemes is uncertain at present due to on-going reform of the Common Agricultural Policy.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	Soils and land resource: Adoption of good practice techniques in handling, storing and reinstating soils. Agricultural business: Compliance with the draft CoCP will avoid or reduce environmental impacts during construction. Of particular relevance to agriculture, forestry and soils are issues relating to soil disturbance, land drainage, agricultural access, fencing and water supply (see Volume 5: Appendix CT-003-000).
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Agricultural land quality	Soils and land resource: On land where agricultural uses are to be resumed, there will be no reduction in the long-term capability which will downgrade the quality of disturbed land. Agricultural business: Farm holdings consist of a high proportion of land that is likely to be Grade 2 and 3a lands. This is approximately equal to or less than 0.5% of the land within each of the holdings.

Category	Section	Subsection (if necessary)	Summary text
		2.2.2 On agricultural/ forestry land	The land required temporarily for construction of the Proposed Scheme is approximately 0.5ha. It comprises agricultural access tracks and a small amount of agricultural land.
		2.2.3 Soil to be disturbed	Soils and land resource: The affected soils are free draining with sandy loam texture and are not particularly at risk from smearing and compaction during handling. Agricultural business: Approximately 0.27ha of agricultural land to be disturbed for laying temporary access tracks, construction compounds.
		2.2.4 On holdings	Compliance with the draft CoCP will avoid or reduce environmental impacts during construction. Of particularly relevance to agriculture, forestry and soils are issues relating to soil disturbance, land drainage, agricultural access, fencing and water supply (see (see Volume 5: Appendix CT-003-000).
		2.2.5 Cumulative	The cumulative effect of temporary impacts on agriculture, forestry and soils is not significant.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Agricultural land quality	Soils and land resource: No permanent impacts on land or soil expected. Agricultural business: No permanent impacts to land within the farm holdings. It is assumed that temporary access routes and crane platforms would be removed, and that land would be reinstated to the correct standard after construction has taken place.
		2.3.2 On agricultural/ forestry land	
		2.3.3 Soil to be disturbed	
		2.3.4 On holdings	No permanent issues identified.
		2.3.5 Cumulative	No cumulative permanent issues identified.
	2.4 Other mitigation measures (applicable to construction and permanent impacts)	N/A	Fencing and water supply issues do arise as a result of construction but these can be dealt with effectively under the draft CoCP (see Volume 5: Appendix CT-003-000).

Category	Section	Subsection (if necessary)	Summary text
	2.5 Summary of likely significant residual effects (resulting from construction and permanent impacts)	N/A	Agricultural business: None of the agricultural holdings will experience temporary significant adverse effects. The short duration of the proposed works will be managed in accordance with the CoCP and compensation where appropriate to accommodate farming activity and the needs of associated diversified businesses.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	No impacts are identified as there is no change from the present operation of the WCML.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No impacts are identified as there is no change from the present operation of the WCML.
	3.3 Other mitigation measures	N/A	No additional measures required apart from weed management (see section 3.1 above).
	3.4 Summary of likely significant residual effects	N/A	No likely significant residual effects.

Table 5: Agriculture, forestry and soils baseline data and assessment – Area F

Category	Section	Subsection (if necessary)	Summary text
1.0 Baseline:	1.1 Soil and land resources	1.1.1 Topography and drainage	At Colwich the floodplain of River Trent is at 70m AOD rising to a near level terrace at 72m AOD.
		1.1.2 Geology and soil	The Trent valley contains loamy textured alluvium, which is flanked by loamy and sandy soils over gravel on river terraces.
		1.1.3 Soil types (according to 1:250,000 scale National Soil Map)	561a (Wharfe association) on Trent floodplain; deep, well-drained clay loam with some associated soils affected by groundwater. Only a small area south of Colwich is affected. 541r (Wick association) on river terraces; deep, well-drained sandy loam soils, locally over sand and gravel. These comprise nearly all the affected soils .
	1.2 Soil and land use interactions	1.2.1 Agricultural land quality. (BMV land is in Grades 1-3a)	Wharfe association: Grade Subgrade 3b due to flood risk. Wick association: Mainly Grade 2 or 3a due to droughtiness, but locally 3b where gravel is at shallow depth.
		1.2.2 Other soil interactions	Land flanking the River Trent is a functional flood environment and so the soils have an important flood storage capacity. All affected land is in a designated nitrate vulnerable zone designed to protect the quality of groundwater.
	1.3 Land use	1.3.1 Land use description	Permanent grassland on the Trent floodplain (reflecting flood risk). Mixed arable and grassland on the terraces. No woodland or forestry is affected. Farm holding types are mainly livestock (cattle).
		1.3.2 (Number) type and size of holding/s	The only farm affected by the Proposed Scheme is outlined below: Land within farm holding Church Farm, Colwich (see Map CT-19-204, C6): Livestock farm (mainly cattle). This is the assumed landowner based on an internet search. The holding area is estimated to be 49ha. Sensitivity has been assessed as medium.

Category	Section	Subsection (if necessary)	Summary text
	1.4 Future baseline	N/A	No committed developments have been identified in this area (see Section 12 of this appendix) that will materially alter the baseline conditions with the 2017 (construction) or 2026 (operational) timeframes for agriculture, forestry or soils. The future of agri-environmental schemes is uncertain at present due to on-going reform of the Common Agricultural Policy.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	Soils and land resource: Adoption of good practice techniques in handling, storing and reinstating soils. Agricultural business: No measures considered necessary.
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Agricultural land quality	Soils and land resource: On land where agricultural uses are to be resumed, there will be no reduction in the long-term capability which will downgrade the quality of disturbed land. Agricultural business: Farm holdings consist of a high proportion of land that is likely to be a mix of Grades 1, 2 and 5 land. The Proposed Scheme will impact on land likely to have Grades 1 and 5 classification. This is approximately less than 0.5% of the land within each of the holdings.
		2.2.2 On agricultural/ forestry land	The land required temporarily for construction of the Proposed Scheme is approximately 0.2ha. It comprises an agricultural access track and a small amount of agricultural land.
		2.2.3 Soil to be disturbed	Soils and land resource: All the affected soil is free draining sandy loam or medium clay loam and so is not particularly at risk from smearing and compaction during handling. Agricultural business: Approximately 0.1ha of agricultural land to be disturbed for laying temporary access track and a construction compound.

Category	Section	Subsection (if necessary)	Summary text
		2.2.4 On holdings	Compliance with the draft CoCP will avoid or reduce environmental impacts during construction. Of particularly relevance to agriculture, forestry and soils are issues relating to soil disturbance, land drainage, agricultural access, fencing and water supply (see (see Volume 5: Appendix CT-003-000).
		2.2.5 Cumulative	The cumulative effect of temporary impacts on agriculture, forestry and soils is not significant.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Agricultural land quality	Soils and land resource: No permanent impacts on land or soil expected. Agricultural business: No permanent impacts to land within the farm holding. It is assumed that temporary access routes and crane platforms would be removed, and that land would be reinstated to the correct standard after construction has taken place.
		2.3.2 On agricultural/ forestry land	
		2.3.3 Soil to be disturbed	
		2.3.4 On holdings	No permanent issues identified.
		2.3.5 Cumulative	No cumulative permanent issues identified.
	2.4 Other mitigation measures (applicable to construction and permanent impacts)	N/A	Fencing, water supply and sharing of access issues do arise as a result of construction but these can be dealt with effectively under the draft CoCP(see Volume 5: Appendix CT-003-000).
	2.5 Summary of likely significant residual effects (resulting from construction and permanent impacts)	N/A	No likely significant residual effects.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	No impacts are identified as there is no change from present operation of the WCML.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No impacts are identified as there is no change from present operation of the WCML.
	3.3 Other mitigation measures	N/A	No additional measures required apart from weed management (see section 3.1 above).
	3.4 Summary of likely significant residual effects	N/A	No likely significant residual effects.

3 Air quality

Table 6: Air quality baseline data and assessment – Area A

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	N/A	Estimates for nitrogen dioxide (NO_2) and fine particulate matter (PM_{10} and $PM_{2.5}$)[1] concentrations have been obtained from UK-wide modelled pollution maps for 2012, published by the Department for Environment and Rural Affairs (Defra)[2] in 2010. These data provide estimates of background concentrations of NO_2, PM_{10} and $PM_{2.5}$ for 1km grid squares across the UK. The average background concentrations in 2012 for Area A were 15.0, 15.3, 10.3 $\mu g/m^3$ for NO_2, PM_{10} and $PM_{2.5}$ respectively. All are less than 75% of air quality standards.
	1.2 Future baseline	N/A	Construction (2017): Future background pollutant concentrations, sourced from Defra background maps for 2017, predict NO_2 and PM_{10} concentrations in 2017 to be lower than in the 2012 baseline. Operation (2026): Future background pollutant concentrations, sourced from Defra background maps for 2026, predict NO_2 and PM_{10} concentrations in 2026 to be lower than in the 2012 baseline.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The assessment has assumed that the general measures detailed in Section 7 of the draft CoCP (Volume 5: Appendix CT-003-000) will be implemented.
	2.2 Assessment of impacts and effects from construction (temporary)	N/A	A construction dust assessment has been undertaken for human and ecological receptors at locations which are at close proximity to the dust generating activities. Residential locations identified in Area A are Fullbrook Farm, Waterly Lane, Lichfield; Dairy House, Nash Lane, Elmhurst, Lichfield; and Mole End House off Wood End Lane, Elmhurst, Lichfield. All of the residential locations are over 100m from the construction activities and therefore the magnitude of impact will be negligible. There are no statutory or non-statutory ecological receptors. Overall, the construction dust assessment has determined that the air quality effects will not be significant. Construction activity could also affect local air quality through the emissions associated with additional traffic generated on roads as a result of construction traffic routes. Screening was undertaken against the criteria given in Section 5 of the SMR (Volume 5: Appendix CT-001-000/1) assessment to identify locations requiring a more detailed assessment. No locations within Area A met the criteria for more detailed assessment. Therefore, the effect of traffic emissions during the construction phase will not be significant.
	2.3 Assessment of impacts and effects from construction (permanent)	N/A	Operational traffic changes have been screened against the criteria given in Section 5 of the SMR (Volume 5: Appendix CT-001-000/1) to identify roads that required more detailed assessment and to confirm the likely effect of the change in emissions from vehicles using those roads in 2026. There are no permanent effects anticipated to arise during construction of the Proposed Scheme.

[1] $PM_{2.5}$ and PM_{10} describe two size fractions of airborne particles that can be inhaled and therefore are of concern for human health. The designations refer to particles of size less than 2.5 and 10 micrometres in diameter.
[2] Department for Environmental and Rural Affairs (Defra); *2010 Based Background Maps for NOx, NO2, PM10 and PM2.5*; http://laqm.defra.gov.uk/maps/maps2010.html; Accessed: 30 July 2013.

Category	Section	Subsection	Summary text
	2.4 Other mitigation measures	N/A	No other mitigation measures during construction are proposed in relation to air quality in Area A.
	2.5 Summary of likely residual significant effects	N/A	Overall, the construction assessment has determined that the air quality effects will not be significant. The methods outlined within the draft CoCP (Volume 5: Appendix CT-003-000) to control and manage potential air quality effects are considered effective in Area A, and no residual significant effects are considered likely.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	No mitigation measures are proposed during operation in relation to air quality in Area A.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	There are no direct atmospheric emissions from the operation of trains that will cause an impact on air quality; these have therefore not been assessed. Impacts from the operation of the Proposed Scheme relate mainly to any changes in the nature of traffic. Operational traffic changes have been screened to identify roads that required more detailed assessment and to confirm the likely effect of the change in emissions from vehicles using those roads in 2026. No locations within Area A met the criteria for more detailed assessment. Therefore, the effect during the operational phase will not be significant.
	3.3 Other mitigation measures	N/A	No other mitigation measures are proposed during operation in relation to air quality in Area A.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are anticipated for air quality in Area A during operation of the Proposed Scheme.

Table 7: Air quality baseline data and assessment – Area B

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	N/A	Estimates for NO2, PM10 and PM2.5 concentrations have been obtained from UK-wide modelled pollution maps for 2012, published by Defra in 2010. These data provide estimates of background concentrations of NO2, PM10 and PM2.5 for 1km grid squares across the UK. The average background concentration in 2012 for Area B are 12.4, 14.5, 9.7µg/m^3 for NO2, PM10 and PM2.5 respectively. All are less than 75% of air quality standards.
	1.2 Future baseline	N/A	Construction (2017): Future background pollutant concentrations, sourced from Defra background maps for 2017, predict NO2 and PM10 concentrations in 2017 to be lower than in the 2012 baseline. Operation (2026): Future background pollutant concentrations, sourced from Defra background maps for 2026, predict NO2 and PM10 concentrations in 2026 to be lower than in the 2012 baseline.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The assessment has assumed that the general measures detailed in Section 7 of the draft CoCP (Volume 5: Appendix CT-003-000) will be implemented.
	2.2 Assessment of impacts and effects from construction (temporary)	N/A	A construction dust assessment has been undertaken for human and ecological receptors at locations which are at close proximity to the dust generating activities. Residential locations identified in Area B are properties along New Road, Handsacre, some of which are within 20m of the Armitage Shanks satellite compound at CT-05-142, G6 and also properties on Old Road, Handsacre which are within 20m of a route used by construction vehicles where there is a potential for mud and dust to be deposited on the public highway by vehicles leaving the site. The magnitude of impact at these locations will be slight adverse. There are no statutory or non-statutory ecological receptors. Overall, the construction dust assessment has determined that the air quality effects will not be significant. Construction activity could also affect local air quality through the emissions associated with additional traffic generated on roads as a result of construction traffic routes. Screening was undertaken against the criteria given in Section 5 of the SMR (Volume 5: Appendix CT-001-000/1) assessment to identify locations requiring a more detailed assessment. No locations within Area B met the criteria for more detailed assessment. Therefore, the effect of traffic emissions during the construction phase will not be significant.
	2.3 Assessment of impacts and effects from construction (permanent)	N/A	Operational traffic changes have been screened against the criteria given in Section 5 of the SMR (Volume 5: Appendix CT-001-000/1) to identify roads that required more detailed assessment and to confirm the likely effect of the change in emissions from vehicles using those roads in 2026. There are no permanent effects anticipated to arise during construction of the Proposed Scheme.
	2.4 Other mitigation measures	N/A	No other mitigation measures during construction are proposed in relation to air quality in Area B.

Category	Section	Subsection	Summary text
	2.5 Summary of likely residual significant effects	N/A	Overall, the construction assessment has determined that the air quality effects will not be significant. The methods outlined within the draft CoCP (Volume 5: Appendix CT-003-000) to control and manage potential air quality effects are considered effective in Area B and no residual significant effects are considered likely.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	No mitigation measures are proposed during operation in relation to air quality in Area B.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	There are no direct atmospheric emissions from the operation of trains that will cause an impact on air quality; these have therefore not been assessed. Impacts from the operation of the Proposed Scheme relate mainly to any changes in the nature of traffic. Operational traffic changes have been screened to identify roads that required more detailed assessment and to confirm the likely effect of the change in emissions from vehicles using those roads in 2026. No locations within Area B met the criteria for more detailed assessment. Therefore, the effect during the operational phase will not be significant.
	3.3 Other mitigation measures	N/A	No other mitigation measures are proposed during operation in relation to air quality in Area B.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are anticipated for air quality in Area B during operation of the Proposed Scheme.

Table 8: Air quality baseline data and assessment – Area C

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	N/A	Estimates for NO2, PM10 and PM2.5 concentrations have been obtained from UK-wide modelled pollution maps for 2012, published by Defra in 2010. These data provide estimates of background concentrations of NO2, PM10 and PM2.5 for 1km grid squares across the UK. The average background concentration in 2012 for Area C are 12.7, 14.1, 9.6µg/m^3 for NO2, PM10 and PM2.5 respectively. All are less than 75% of air quality standards.
	1.2 Future baseline	N/A	Construction (2017) – Future background pollutant concentrations, sourced from Defra background maps for 2017, predict NO2 and PM10 concentrations in 2017 to be lower than in the 2012 baseline. Operation (2026) – Future background pollutant concentrations, sourced from Defra background maps for 2026, predict NO2 and PM10 concentrations in 2026 to be lower than in the 2012 baseline.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The assessment has assumed that the general measures detailed in Section 7 of the draft CoCP (Volume 5 Appendix CT-003-000) will be implemented.
	2.2 Assessment of impacts and effects from construction (temporary)	N/A	A construction dust assessment has been undertaken for human and ecological receptors at locations which are at close proximity to the dust generating activities. Residential locations identified in sections of Area C are Cawarden Springs Farm, Blithbury Road in Rugeley; and Old Road Farm, Armitage in Rugeley. All will be over 100m from construction activities and therefore the magnitude of impact will be negligible. There are no statutory ecological sites. There are two non-statutory ecological sites, which are sensitive to dust deposition. These are the Spring Cawarden Site of Biological Importance (SBI), located 400m north of Rugeley Power Station and the Lawnmeadow Covert and Ridware Hall SBI, The magnitude of impact at these sites will be negligible. Overall, the construction dust assessment has determined that the air quality effects will not be significant. Construction activity could also affect local air quality through the emissions associated with additional traffic generated on roads as a result of construction traffic routes. Screening was undertaken against the criteria given in Section 5 of the SMR (Volume 5: Appendix CT-001-000/1) assessment to identify locations requiring a more detailed assessment. No locations within Area C met the criteria for more detailed assessment. Therefore, the effect of traffic emissions during the construction phase will not be significant.
	2.3 Assessment of impacts and effects from construction (permanent)	N/A	Operational traffic changes have been screened against the criteria given in Section 5 of the SMR (Volume 5: Appendix CT-001-000/1) to identify roads that required more detailed assessment and to confirm the likely effect of the change in emissions from vehicles using those roads in 2026. There are no permanent effects anticipated to arise during construction of the Proposed Scheme.
	2.4 Other mitigation measures	N/A	No other mitigation measures during construction are proposed in relation to air quality in Area C.

Category	Section	Subsection	Summary text
	2.5 Summary of likely residual significant effects	N/A	Overall, the construction assessment has determined that the air quality effects will not be significant. The methods outlined within the draft CoCP (Volume 5: Appendix CT-003-000) to control and manage potential air quality effects are considered effective in Area C and no residual significant effects are considered likely.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	No mitigation measures are proposed during operation in relation to air quality in Area C.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	There are no direct atmospheric emissions from the operation of trains that will cause an impact on air quality; these have therefore not been assessed. Impacts from the operation of the Proposed Scheme relate mainly to any changes in the nature of traffic. Operational traffic changes have been screened to identify roads that required more detailed assessment and to confirm the likely effect of the change in emissions from vehicles using those roads in 2026. No locations within Area C met the criteria for more detailed assessment. Therefore, the effect during the operational phase will not be significant.
	3.3 Other mitigation measures	N/A	No other mitigation measures are proposed during operation in relation to air quality in Area C.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are anticipated for air quality in Area C during operation of the Proposed Scheme.

Table 9: Air quality baseline data and assessment – Area D

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	N/A	Estimates for NO2, PM10 and PM2.5 concentrations have been obtained from UK-wide modelled pollution maps for 2012, published by the Defra in 2010. These data provide estimates of background concentrations of NO2, PM10 and PM2.5 for 1km grid squares across the UK. The average background concentration in 2012 for Area D are 15.8, 17.1, 11.4µg/m^3 for NO2, PM10 and PM2.5 respectively. All are less than 75% of air quality standards.
	1.2 Future baseline	N/A	Construction (2017): Future background pollutant concentrations, sourced from Defra background maps for 2017, predict NO2 and PM10 concentrations in 2017 to be lower than in the 2012 baseline. Operation (2026): Future background pollutant concentrations, sourced from Defra background maps for 2026, predict NO2 and PM10 concentrations in 2026 to be lower than in the 2012 baseline.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The assessment has assumed that the general measures detailed in Section 7 of the draft CoCP (Volume 5 Appendix CT-003-000) will be implemented.
	2.2 Assessment of impacts and effects from construction (temporary)	N/A	A construction dust assessment has been undertaken for human and ecological receptors at locations which are at close proximity to the dust generating activities. Residential locations identified in Area D include the Fog Cottages and Rydal Estate on Colton Road, Rugeley; Cotton Mill Farm, Blithbury Road, Rugeley; Parchfield Farm off Colton Road, Rugeley; and Wharf Cottage, Bellamour, Rugeley. Fog Cottages and Rydal Estate will be within 20m of construction works and a route used by construction vehicles where there will be a potential for mud and dust to be deposited on the public highway by vehicles leaving the site. The magnitude of impact at Fog Cottages and Rydal Estate will be slight adverse. All other locations are over 100m from construction activities and therefore the magnitude of impact will be negligible. There are no statutory or non-statutory ecological receptors, which sensitivity to dust deposition. Overall, the construction dust assessment has determined that the air quality effects will not be significant. Construction activity could also affect local air quality through the emissions associated with additional traffic generated on roads as a result of construction traffic routes. Screening was undertaken against the criteria given in Section 5 of the SMR (Volume 5: Appendix CT-001-000/1) assessment to identify locations requiring a more detailed assessment. No locations within Area D met the criteria for more detailed assessment. Therefore, the effect of traffic emissions during the construction phase will not be significant.
	2.3 Assessment of impacts and effects from construction (permanent)	N/A	Operational traffic changes have been screened against the criteria given in Section 5 of the SMR (Volume 5: Appendix CT-001-000/1) to identify roads that required more detailed assessment and to confirm the likely effect of the change in emissions from vehicles using those roads in 2026. There are no permanent effects anticipated to arise during construction of the Proposed Scheme.
	2.4 Other mitigation measures	N/A	No other mitigation measures during construction are proposed in relation to air quality in Area D.

Category	Section	Subsection	Summary text
	2.5 Summary of likely residual significant effects	N/A	Overall, the construction assessment has determined that the air quality effects will not be significant. The methods outlined within the draft CoCP to control and manage potential air quality effects are considered effective in Area D and no residual significant effects are considered likely.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	No mitigation measures are proposed during operation in relation to air quality in Area D.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	There are no direct atmospheric emissions from the operation of trains that will cause an impact on air quality; these have therefore not been assessed. Impacts from the operation of the Proposed Scheme relate mainly to any changes in the nature of traffic. Operational traffic changes have been screened to identify roads that required more detailed assessment and to confirm the likely effect of the change in emissions from vehicles using those roads in 2026. No locations within Area D met the criteria for more detailed assessment. Therefore, the effect during the operational phase will not be significant.
	3.3 Other mitigation measures	N/A	No other mitigation measures are proposed during operation in relation to air quality in Area D.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are anticipated for air quality in Area D during operation of the Proposed Scheme.

Table 10: Air quality baseline data and assessment – Area E

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	N/A	Estimates for NO2, PM10 and PM2.5 concentrations have been obtained from UK-wide modelled pollution maps for 2012, published by the Defra in 2010. These data provide estimates of background concentrations of NO2, PM10 and PM2.5 for 1km grid squares across the UK. The average background concentration in 2012 for Area E are 12.7, 13.4, 9.2µg/m^3 for NO2, PM10 and PM2.5 respectively. All less than 75% of air quality standards.
	1.2 Future baseline	N/A	Construction (2017): Future background pollutant concentrations, sourced from Defra background maps for 2017, predict NO2 and PM10 concentrations in 2017 to be lower than in the 2012 baseline. Operation (2026): Future background pollutant concentrations, sourced from Defra background maps for 2026, predict NO2 and PM10 concentrations in 2026 to be lower than in the 2012 baseline.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The assessment has assumed that the general measures detailed in Section 7 of the draft CoCP (Volume 5 Appendix CT-003-000) will be implemented.
	2.2 Assessment of impacts and effects from construction (temporary)	N/A	A construction dust assessment has been undertaken for human and ecological receptors at locations which are at close proximity to the dust generating activities. Residential locations identified in Area E are Colwich Lodge on Bellamour Lane, Rugeley; and Bishton Lane Farm on Bishton Lane, Wolseley. Both locations will be over 100m from construction activities. Colwich Lodge will be within 20m of a route that will be used by construction vehicles where there will be a potential for mud and dust to be deposited on the public highway by vehicles leaving the site. The magnitude of impact will be slight adverse. At the other locations the magnitude of impact will be negligible. There are no statutory or non-statutory ecological receptors which are sensitive to dust deposition. Overall, the construction dust assessment has determined that the air quality effects will not be significant. Construction activity could also affect local air quality through the emissions associated with additional traffic generated on roads as a result of construction traffic routes. Screening was undertaken against the criteria given in Section 5 of the SMR (Volume 5: Appendix CT-001-000/1) assessment to identify locations requiring a more detailed assessment. No locations within Area E met the criteria for more detailed assessment. Therefore, the effect of traffic emissions during the construction phase will not be significant.
	2.3 Assessment of impacts and effects from construction (permanent)	N/A	Operational traffic changes have been screened against the criteria given in Section 5 of the SMR (Volume 5: Appendix CT-001-000/1) to identify roads that required more detailed assessment and to confirm the likely effect of the change in emissions from vehicles using those roads in 2026. There are no permanent effects anticipated to arise during construction of the Proposed Scheme.
	2.4 Other mitigation measures	N/A	No other mitigation measures during construction are proposed in relation to air quality in Area E.

Category	Section	Subsection	Summary text
	2.5 Summary of likely residual significant effects	N/A	Overall, the construction assessment has determined that the air quality effects will not be significant. The methods outlined within the draft CoCP to control and manage potential air quality effects are considered effective in Area E and no residual significant effects are considered likely.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	No mitigation measures are proposed during operation in relation to air quality in Area E.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	There are no direct atmospheric emissions from the operation of trains that will cause an impact on air quality; these have therefore not been assessed. Impacts from the operation of the Proposed Scheme relate mainly to any changes in the nature of traffic. Operational traffic changes have been screened to identify roads that required more detailed assessment and to confirm the likely effect of the change in emissions from vehicles using those roads in 2026. No locations within Area E met the criteria for more detailed assessment. Therefore, the effect during the operational phase will not be significant.
	3.3 Other mitigation measures	N/A	No other mitigation measures are proposed during operation in relation to air quality in Area E.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are anticipated for air quality in Area E during operation of the Proposed Scheme.

Table 11: Air quality baseline data and assessment – Area F

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	N/A	Estimates for NO2, PM10 and PM2.5 concentrations have been obtained from UK-wide modelled pollution maps for 2012, published by the Department for Environment and Rural Affairs (Defra) in 2010. These data provide estimates of background concentrations of NO2, PM10 and PM2.5 for 1km grid squares across the UK. The average background concentration in 2012 for Area F are 11.9, 13.1, 9.3µg/m^3 for NO2, PM10 and PM2.5 respectively. All are less than 75% of air quality standards.
	1.2 Future baseline	N/A	Construction (2017): Future background pollutant concentrations, sourced from Defra background maps for 2017, predict NO2 and PM10 concentrations in 2017 to be lower than in the 2012 baseline. Operation (2026): Future background pollutant concentrations, sourced from Defra background maps for 2026, predict NO2 and PM10 concentrations in 2026 to be lower than in the 2012 baseline.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The assessment has assumed that the general measures detailed in Section 7 of the draft CoCP (Volume 5: Appendix CT-003-000) will be implemented.
	2.2 Assessment of impacts and effects from construction (temporary)	N/A	A construction dust assessment has been undertaken for human and ecological receptors at locations which are at close proximity to the dust generating activities. Residential locations identified in Area F include the Station House at Colwich Junction, Railway Cottages on Main Road, Colwich; properties on Dobree Close; properties on Kingfisher Drive; and the Colwich Church of England Primary School. Station House, Railway Cottages, properties on Dobree Close and properties on Kingfisher Drive will be within 20m of routes that will be used by construction vehicles where there will be a potential for mud and dust to be deposited on the public highway by vehicles leaving the site and the magnitude of impact will be slight adverse. Colwich Primary School will be within 20m of construction activities. The magnitude of impact will be slight adverse. There are no statutory or non-statutory ecological receptors, which are sensitive to dust deposition. Overall, the construction dust assessment has determined that the air quality effects will not be significant. Construction activity could also affect local air quality through the emissions associated with additional traffic generated on roads as a result of construction traffic routes. Screening was undertaken against the criteria given in Section 5 of the SMR (Volume 5: Appendix CT-001-000/1) assessment to identify locations requiring a more detailed assessment. No locations within Area F met the criteria for more detailed assessment. Therefore, the effect of traffic emissions during the construction phase will not be significant.
	2.3 Assessment of impacts and effects from construction (permanent)	N/A	There are no permanent effects anticipated to arise during construction of the Proposed Scheme.
	2.4 Other mitigation measures	N/A	No other mitigation measures during construction are proposed in relation to air quality in Area F.

Category	Section	Subsection	Summary text
	2.5 Summary of likely residual significant effects	N/A	Overall, the construction assessment has determined that the air quality effects will not be significant. The methods outlined within the draft CoCP to control and manage potential air quality effects are considered effective in Area F and no residual significant effects are considered likely.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	No mitigation measures are proposed during operation in relation to air quality in Area F.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	There are no direct atmospheric emissions from the operation of trains that will cause an impact on air quality; these have therefore not been assessed. Impacts from the operation of the Proposed Scheme relate mainly to any changes in the nature of traffic. Operational traffic changes have been screened to identify roads that required more detailed assessment and to confirm the likely effect of the change in emissions from vehicles using those roads in 2026. No locations within Area F met the criteria for more detailed assessment. Therefore, the effect during the operational phase will not be significant.
	3.3 Other mitigation measures	N/A	No other mitigation measures are proposed during operation in relation to air quality in Area F.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are anticipated for air quality in Area F during operation of the Proposed Scheme.

4 Community

Table 12: Community baseline data and assessment – Area A

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	N/A	Area A, includes the very northern part of Lichfield, which includes sports pitches at Stychbrook Park and Christian Fields public open space, both located approximately 300m from the existing rail line and Lichfield construction sidings. The remainder of the area is farmland with no public access.
	1.2 Future baseline	N/A	Within the scope of the community assessment, very little change is anticipated to the baseline conditions along the route of the Proposed Scheme in this area (see Section 12 of this appendix).
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The draft CoCP includes a range of provisions that will help mitigate community effects associated with construction within this area, including the following: Appointment of community relations personnel (draft CoCP, Section 5). Community helpline to handle enquires from the public (draft CoCP, Section 5). Sensitive layout of construction sites to reduce nuisance (draft CoCP, Section 5). Specific measures in relation to air quality and noise will also serve to reduce impacts for the neighbouring communities including discretionary noise insulation for sensitive community resources and, in special circumstances, temporary rehousing (draft CoCP, Section 7). Where practicable the avoidance of large good vehicles operating adjacent to schools during drop off and pick up periods (draft CoCP, Section 14).
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Residential properties	The construction of the works will not cause any loss of land, amenity or isolation impacts on residential properties that will give rise to a significant effect.
		2.2.2 Open space, community facilities and recreational PRoW	The construction of the works will not cause any loss of land, amenity or isolation impacts on community facilities, open spaces, key recreational routes or promoted PRoW during the construction phase.
		2.2.3 Cumulative	No inter-project or community wide cumulative effects have been identified during the construction period.

Category	Section	Subsection	Summary text
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Residential properties	The construction of the works will not cause any loss of land, amenity or isolation impacts that will give rise to a permanent and significant adverse effect in this area.
		2.3.2 Open space and recreational PRoW	The construction of the works will not cause any loss of land, amenity or isolation impacts community facilities, open spaces, key recreational routes and promoted PRoW.
		2.3.3 Cumulative	No inter-project or community wide cumulative effects have been identified during the construction period.
	2.4 Other mitigation measures	N/A	The assessment has concluded there are no significant adverse effects arising during construction in relation to community resources therefore no further mitigation measures are proposed.
	2.5 Summary of likely residual significant effects	N/A	The assessment has concluded there are no significant adverse effects arising during construction in relation to community resources within Area A.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	Compliance with the draft CoCP (Volume 5: Appendix CT-003-000) relating to air quality, land quality, landscape and visual assessment, sound, noise and vibration, and traffic and transport.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No operational effects have been identified during operation of the Proposed Scheme.
	3.3 Other mitigation measures	N/A	The assessment has concluded there are no significant adverse effects arising during operation of the Proposed Scheme in relation to community resources therefore no further mitigation measures are proposed.
	3.4 Summary of likely residual significant effects	N/A	The assessment has concluded there are no significant adverse effects arising during operation of the Proposed Scheme in relation to community resources.

Table 13: Community baseline data and assessment – Area B

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	N/A	Handsacre merges with the adjoining settlement of Armitage. The following community receptors have been identified within Area B: Handsacre Methodist Church; Handsacre Village Green; Pinfold Drive allotments; Armitage with Handsacre village hall; Armitage general practice surgery and clinic; and two public houses (The Crown Inn and The Olde Peculiar). None of these facilities are located directly adjacent to the existing railway tracks.
	1.2 Future baseline	N/A	Within the scope of the community assessment, very little change is anticipated to the baseline conditions along the route of the Proposed Scheme in this area (see Section 12 of this appendix).
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The draft CoCP includes a range of provisions that will help mitigate community effects associated with construction within this area, including the following: Appointment of community relations personnel (draft CoCP, Section 5). Community helpline to handle enquires from the public (draft CoCP, Section 5). Sensitive layout of construction sites to reduce nuisance (draft CoCP, Section 5). Specific measures in relation to air quality and noise will also serve to reduce impacts for the neighbouring communities including discretionary noise insulation for sensitive community resources and, in special circumstances, temporary rehousing (draft CoCP, Section 7). Where practicable the avoidance of large good vehicles operating adjacent to schools during drop off and pick up periods (draft CoCP, Section 14).
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Residential properties	The construction of the works will not cause any loss of land, amenity or isolation impacts on residential properties that will give rise to a significant effect.
		2.2.2 Open space and recreational PRoW	The construction of the works will not cause any loss of land, amenity or isolation impacts on community facilities, open spaces or promoted PRoW during the construction phase.
		2.2.3 Cumulative	Within the scope of the community assessment, very little change is anticipated to the baseline conditions along the route of the Proposed Scheme in this area.
	2.3 Assessment of impacts and effects from	2.3.1 Residential properties	The construction of the works will not cause any loss of land, amenity or isolation impacts that will give rise to a permanent and significant adverse effect in this area.

Category	Section	Subsection	Summary text
	construction (permanent)	2.3.2 Open space and recreational PRoW	The construction of the works will not cause any loss of land, amenity or isolation impacts community facilities, open spaces, key recreational routes and promoted PRoW.
		2.3.3 Cumulative	No cumulative effects have been identified during construction.
	2.4 Other mitigation measures	N/A	The assessment has concluded there are no significant adverse effects arising during construction in relation to community resources therefore no further mitigation measures are proposed.
	2.5 Summary of likely residual significant effects	N/A	The assessment has concluded there are no significant adverse effects arising during construction in relation to community resources within Area B.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	Compliance with the draft CoCP (Volume 5: Appendix CT-003-000) relating to air quality, land quality, landscape and visual assessment, sound, noise and vibration, and traffic and transport.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No operational effects have been identified during operation of the Proposed Scheme in relation to community resources.
	3.3 Other mitigation measures	N/A	The assessment has concluded there are no significant adverse effects arising during operation of the Proposed Scheme in relation to community resources therefore no further mitigation measures are proposed.
	3.4 Summary of likely residual significant effects	N/A	The assessment has concluded there are no significant adverse effects arising during operation of the Proposed Scheme in relation to community resources.

Table 14: Community baseline data and assessment – Area C

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	N/A	Several community facilities are located within 1km of the route, including Royal British Legion Club; Handsacre Cricket Ground; Armitage Dental Practice; Armitage United Reform Church; The Croft Primary School; and Armitage Youth Centre and allotment gardens. The Trent and Mersey Canal and tow path cross the WCML within the area. The small village of Mavesyn Ridware lies approximately 300m to the north of the existing rail way and north of Handsacre, where the Church of St Nicholas is located. St. John the Baptist Church is located within approximately 20m of the rail tracks to the eastern end of Handsacre. Further west, the Lakeside Golf Club is located north of the power station, approximately 60m from the railway line.
	1.2 Future baseline	N/A	Within the scope of the community assessment, very little change is anticipated to the baseline conditions along the route of the Proposed Scheme in this area (see Section 12 of this appendix).
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The draft CoCP includes a range of provisions that will help mitigate community effects associated with construction within this area, including the following: Appointment of community relations personnel (draft CoCP, Section 5). Community helpline to handle enquires from the public (draft CoCP, Section 5). Sensitive layout of construction sites to reduce nuisance (draft CoCP, Section 5). Specific measures in relation to air quality and noise will also serve to reduce impacts for the neighbouring communities including discretionary noise insulation for sensitive community resources and, in special circumstances, temporary rehousing (draft CoCP, Section 7). Where practicable the avoidance of large good vehicles operating adjacent to schools during drop off and pick up periods (draft CoCP, Section 14).
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Residential properties	The construction of the works will not cause any loss of land, amenity or isolation impacts on residential properties that will give rise to a significant effect.
		2.2.2 Open space and recreational PRoW	The construction works will not cause any loss of land, amenity or isolation impacts on community facilities, open spaces or promoted PRoW during the construction phase.
		2.2.3 Cumulative	No inter-project or community wide cumulative effects have been identified during the construction period.

Category	Section	Subsection	Summary text
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Residential properties	The construction of the works will not cause any loss of land, amenity or isolation impacts that will give rise to a permanent and significant adverse effect in this area.
		2.3.2 Open space and recreational PRoW	The construction of the works will not cause any loss of land, amenity or isolation impacts to community facilities, open spaces, key recreational routes and promoted PRoW.
		2.3.3 Cumulative	No inter-project or community wide cumulative effects have been identified during the construction period.
	2.4 Other mitigation measures	N/A	The assessment has concluded there are no significant adverse effects arising during construction in relation to community resources therefore no further mitigation measures are proposed.
	2.5 Summary of likely residual significant effects	N/A	The assessment has concluded there are no significant adverse effects arising during construction in relation to community resources within Area C.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	Compliance with the draft CoCP (Volume 5: Appendix CT-003-000) relating to air quality, land quality, landscape and visual assessment, sound, noise and vibration, and traffic and transport.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No operational effects have been identified during operation of the Proposed Scheme.
	3.3 Other mitigation measures	N/A	The assessment has concluded there are no significant adverse effects arising during operation of the Proposed Scheme in relation to community resources therefore no further mitigation measures are proposed.
	3.4 Summary of likely residual significant effects	N/A	The assessment has concluded there are no significant adverse effects arising during operation of the Proposed Scheme in relation to community resources.

Table 15: Community baseline data and assessment – Area D

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	N/A	The market town of Rugeley is located to the south of the existing tracks. Rugeley has a wide range of facilities including a high street, a number of convenience shops, several schools, recreational open spaces and play areas. The majority of these facilities are some distance from the proposed works within which a combination of significant amenity impacts could potentially occur. Several residential properties, Colton Mill farm and The Yorkshire Man public house are located north of the rail tracks.
	1.2 Future baseline	N/A	Within the scope of the community assessment, very little change is anticipated to the baseline conditions along the route of the Proposed Scheme in this area (see Section 12 of this appendix).
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The draft CoCP includes a range of provisions that will help mitigate community effects associated with construction within this area, including the following: Appointment of community relations personnel (draft CoCP, Section 5). Community helpline to handle enquires from the public (draft CoCP, Section 5). Sensitive layout of construction sites to reduce nuisance (draft CoCP, Section 5). Specific measures in relation to air quality and noise will also serve to reduce impacts for the neighbouring communities including discretionary noise insulation for sensitive community resources and, in special circumstances, temporary rehousing (draft CoCP, Section 7). Where practicable the avoidance of large good vehicles operating adjacent to schools during drop off and pick up periods (draft CoCP, Section 14).
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Residential properties	The construction of the works will not cause any loss of land, amenity or isolation impacts on residential properties that will give rise to a significant effect.
		2.2.2 Open space and recreational PRoW	The construction of the works will not cause any loss of land, amenity or isolation impacts on community facilities, open spaces or promoted PRoW during the construction phase.
		2.2.3 Cumulative	No inter-project or community wide cumulative effects have been identified during the construction period.

Category	Section	Subsection	Summary text
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Residential properties	The construction of the works will not cause any loss of land, amenity or isolation impacts that will give rise to a permanent and significant adverse effect in this area.
		2.3.2 Open space and recreational PRoW	The construction of the works will not cause any loss of land, amenity or isolation impacts to community facilities, open spaces, key recreational routes and promoted PRoW.
		2.3.3 Cumulative	No inter-project or communitywide cumulative effects have been identified during the construction period.
	2.4 Other mitigation measures	N/A	The assessment has concluded there are no significant adverse effects arising during construction in relation to community resources therefore no further mitigation measures are proposed.
	2.5 Summary of likely residual significant effects	N/A	The assessment has concluded there are no significant adverse effects arising during construction in relation to community resources within Area D.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	Compliance with the draft CoCP (Volume 5: Appendix CT-003-000) relating to air quality, land quality, landscape and visual assessment, sound, noise and vibration, and traffic and transport.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No operational effects have been identified during operation of the Proposed Scheme.
	3.3 Other mitigation measures	N/A	The assessment has concluded there are no significant adverse effects arising during operation of the Proposed Scheme in relation to community resources therefore no further mitigation measures are proposed.
	3.4 Summary of likely residual significant effects	N/A	No operational effects have been identified during operation of the Proposed Scheme.

Table 16: Community baseline data and assessment – Area E

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	N/A	The village of Bishton is the only settlement in Area E, located approximately 400m from the existing railway line and is therefore beyond the study area for the assessment of land required for construction of the works. Bishton Sports ground and Saint Bedes Preparatory School are located within the village but beyond the study area for amenity assessment. Bishton relies upon Rugeley for the majority of their day-to-day services.
	1.2 Future baseline	N/A	Within the scope of the community assessment, very little change is anticipated to the baseline conditions along the route of the Proposed Scheme in this area (see Section 12 of this appendix).
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The draft CoCP includes a range of provisions that will help mitigate community effects associated with construction within this area, including the following: Appointment of community relations personnel (draft CoCP, Section 5). Community helpline to handle enquires from the public (draft CoCP, Section 5). Sensitive layout of construction sites to reduce nuisance (draft CoCP, Section 5). Specific measures in relation to air quality and noise will also serve to reduce impacts for the neighbouring communities including discretionary noise insulation for sensitive community resources and, in special circumstances, temporary rehousing (draft CoCP, Section 7). Where practicable the avoidance of large good vehicles operating adjacent to schools during drop off and pick up periods (draft CoCP, Section 14).
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Residential properties	The construction of the works will not cause any loss of land, amenity or isolation impacts on residential properties that will give rise to a significant effect.
		2.2.2 Open space and recreational PRoW	The construction works will not cause any loss of land, amenity or isolation impacts on community facilities, open spaces or promoted PRoW during the construction phase.
		2.2.3 Cumulative	No inter-project or communitywide cumulative effects have been identified during the construction period.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Residential properties	The construction of the works will not cause any loss of land, amenity or isolation impacts that will give rise to a permanent and significant adverse effect in this area.
		2.3.2 Open space and recreational PRoW	The construction of the works will not cause any loss of land, amenity or isolation impacts to community facilities, open spaces, key recreational routes and promoted PRoW.

Category	Section	Subsection	Summary text
		2.3.3 Cumulative	No inter-project or communitywide cumulative effects have been identified during the construction period.
	2.4 Other mitigation measures	N/A	The assessment has concluded there are no significant adverse effects arising during construction in relation to community resources therefore no further mitigation measures are proposed.
	2.5 Summary of likely residual significant effects	N/A	The assessment has concluded there are no significant adverse effects arising during construction in relation to community resources within Area D.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	Compliance with the draft CoCP (Volume 5: Appendix CT-003-000) relating to air quality, land quality, landscape and visual assessment, sound, noise and vibration, and traffic and transport.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	The assessment has concluded there are no significant adverse effects arising from the operation of the Proposed Scheme.
	3.3 Other mitigation measures	N/A	The assessment has concluded there are no significant adverse effects arising during operation of the Proposed Scheme in relation to community resources therefore no further mitigation measures are proposed.
	3.4 Summary of likely residual significant effects	N/A	No operational effects have been identified during operation of the Proposed Scheme.

Table 17: Community baseline data and assessment – Area F

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	N/A	Little Haywood and Colwich are located either side of the existing rail line and share amenities. Between them they provide a range of community facilities, notably a church, a village hall, a primary school, a general store, two public houses and a children's play area. The Trent and Mersey Canal crosses the existing rail tracks at Colwich Lock between Colwich and Little Haywood.
	1.2 Future baseline	N/A	Within the scope of the community assessment, very little change is anticipated to the baseline conditions along the route of the Proposed Scheme in this area (see Section 12 of this appendix).
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The draft CoCP includes a range of provisions that will help mitigate community effects associated with construction within this area, including the following: Appointment of community relations personnel (draft CoCP, Section 5). Community helpline to handle enquires from the public (draft CoCP, Section 5). Sensitive layout of construction sites to reduce nuisance (draft CoCP, Section 5). Specific measures in relation to air quality and noise will also serve to reduce impacts for the neighbouring communities including discretionary noise insulation for sensitive community resources and, in special circumstances, temporary rehousing (draft CoCP, Section 7). Where practicable the avoidance of large good vehicles operating adjacent to schools during drop off and pick up periods (draft CoCP, Section 14).
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Residential properties	The construction of the works will not cause any loss of land, amenity or isolation impacts on residential properties that will give rise to a significant effect.
		2.2.2 Open space, community facilities and recreational PRoW	An area of land is shown as being potentially required during construction at Colwich Church of England Primary School, this is understood to be for accessing the crane platform for installing the signal gantries to the rear of the school site. Part of the land potentially required for access is the playground of the school which is their only on-site outdoor space. Any works and/or access across the playground will be conducted outside of school hours, which would avoid any loss of lands effects to users of the school during construction; therefore, there will be no residual effects.
		2.2.3 Cumulative	No inter-project or community wide cumulative effects have been identified during the construction period.

Category	Section	Subsection	Summary text
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Residential properties	The construction of the works will not cause any loss of land, amenity or isolation impacts that will give rise to a permanent and significant adverse effect in this area.
		2.3.2 Open space and recreational PRoW	The construction of the works will not cause any loss of land, amenity or isolation impacts to community facilities, open spaces, key recreational routes and promoted PRoW.
		2.3.3 Cumulative	No inter-project or community wide cumulative effects have been identified during the construction period.
	2.4 Other mitigation measures	N/A	The use of the school playground for site access should be restricted to non-school hours.
	2.5 Summary of likely residual significant effects	N/A	No residual effects.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	Compliance with the draft CoCP (Volume 5: Appendix CT-003-000) relating to air quality, land quality, landscape and visual assessment, sound, noise and vibration, and traffic and transport.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	The assessment has concluded there are no significant adverse effects arising from the operation of the Proposed Scheme.
	3.3 Other mitigation measures	N/A	The assessment has concluded there are no significant adverse effects arising during operation of the Proposed Scheme in relation to community resources therefore no further mitigation measures are proposed.
	3.4 Summary of likely residual significant effects	N/A	The assessment has concluded there are no significant adverse effects arising from the operation of the Proposed Scheme.

5 Cultural heritage

Table 18: Cultural heritage baseline data and assessment – Area A

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Designated assets	N/A	The following designated assets lie within the study area: Brownsfields Farm listed Grade II, is of moderate value; Elmhurst Hall Farm listed Grade II, is of moderate value; and Tomhay Wood Ancient Woodland, is of high value.
	1.2 Non-designated assets	N/A	The following non-designated assets lie within the study area: Porch Cottage, in the village of Elmhurst, a 15th century timber framed house with later alterations including replacement of outer walls in brick and 19th century/20th century extensions is of low value; and New Farm, a farm located on the site of a cottage built after 1813. The present farmhouse dates from the 1870s. The site of a timber-framed building with post-hole footings is recorded north of the current farm,(Staffordshire County Council historic environment record (HER) reference MST2199), while at the farm itself a brick built cow house is reputed to be built on the site of an earlier, timber-framed building (MST2200). New Farm is of low value.
	1.3 Cultural heritage overview	N/A	The landscape north of Lichfield is predominantly an 18th and 19th century rural landscape with isolated examples of earlier (medieval and post-medieval) buildings. Apart from the canals and associated structures further to the east, the built heritage of the area is largely represented by dispersed settlement between villages, predominantly farmsteads and rural buildings, as well as the remains of the estates and grounds of some grander houses such as Elmhurst Hall.
	1.4 Future baseline	N/A	There are no known committed developments which will change the baseline against which the Proposed Scheme has been assessed prior to construction works (see Section 12 of this appendix).
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The draft CoCP (Volume 5: Appendix CT-003-000) sets out the proposed mitigation measures.
	2.2 Assessment of impacts and effects from construction (temporary)	N/A	There will be no impact on the significance of any identified assets or their settings as a result of the construction works.
	2.3 Assessment of impacts and effects from construction (permanent)	N/A	There will be no permanent impacts on the significance of any identified assets or their settings as a result of the construction of the Proposed Scheme.

Category	Section	Subsection	Summary text
	2.4 Other mitigation measures	N/A	There is no mitigation proposed.
	2.5 Summary of likely residual significant effects	N/A	There are no likely significant effects.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	There is no mitigation proposed.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	There are no significant impacts or effects.
	3.3 Other mitigation measures	N/A	There is no mitigation proposed.
	3.4 Summary of likely residual significant effects	N/A	There are no likely significant residual impacts or effects.

Table 19: Cultural heritage baseline data and assessment – Area B

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Designated assets	N/A	The following designated assets lie within the study area: Stonehouse Cottages, 17th century, listed Grade II (national heritage list (NHL) 1038768) over 100m from the site, moderate value; 1 Old Road, mid-19th century, listed Grade II, moderate value (NHL 1038769) over 100m from the site and screened by intervening buildings, moderate value; Bridge 59 on the Trent and Mersey canal, listed Grade II, moderate value (NHL 1277567) over 100m from the site and screened by intervening buildings, moderate value; Conservation Area on the Trent and Mersey Canal between Armitage and Brereton is of moderate value; and Conservation Area at Mavesyn Ridware is of moderate value.
	1.2 Non-designated assets	N/A	The following non-designated assets lie within the study area: Milepost (MST12645) is located over 100m from the site and is of low value; Manorial Mill pond (MST957) is located over 400m from the site and is of low value; Cropmark complex, Mavesyn Ridware, a ring ditch and causewayed enclosure (MST1554), is located 200m north of the Trent and Mersey Canal, 400m from the site and is of moderate value; Trent and Mersey Canal (MST4765) adjacent to the site is of moderate value; and Potential archaeological remains associated with Trent Valley prehistoric settlement on any land that has previously been undeveloped around the Proposed Scheme is of low to moderate value.
	1.3 Cultural heritage overview	N/A	The landscape of Armitage is within the Trent Valley. The River Trent was a focus of settlement in the prehistoric and Roman periods. Significant evidence of the later prehistoric periods has been found within 400m of the Proposed Scheme in the form of the Neolithic causewayed enclosure at Mavesyn Ridware. Medieval settlement is recorded at Handsacre in the Domesday survey (but not at Armitage). The site of a manorial water mill and associated mill pond is recorded on Longdon Brook, the remains of which survived to the north-west of Handsacre Hall in the late 18th century. It is possible that this mill was built on the site of an earlier mill building, which is recorded in the HER to have burnt down in 1399. The village of Armitage is largely of 18th and 19th century date, with examples of earlier survivals along Old Road and on Church Lane.
	1.4 Future baseline	N/A	There are no known committed developments which will change the baseline against which the Proposed Scheme has been assessed prior to construction works (see Section 12 of this appendix).

Category	Section	Subsection	Summary text
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The draft CoCP (Sections 8.1 to 8.3) sets out proposed mitigation measures.
	2.2 Assessment of impacts and effects from construction (temporary)	N/A	There are no significant impacts or effects.
	2.3 Assessment of impacts and effects from construction (permanent)	N/A	Possible permanent adverse impacts on currently unknown archaeological remains within the land required, temporarily and permanently, for the construction of the Proposed Scheme. Potential due to proximity of the River Trent which was a focus of settlement in the prehistoric and later periods.
	2.4 Other mitigation measures	N/A	There is no mitigation proposed.
	2.5 Summary of likely residual significant effects	N/A	Potential for minor adverse effects as a result of impacts on currently unknown archaeological remains.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	There is no mitigation proposed.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	There are no significant impacts or effects.
	3.3 Other mitigation measures	N/A	There is no mitigation proposed.
	3.4 Summary of likely residual significant effects	N/A	There are no significant impacts or effects.

Table 20: Cultural heritage baseline data and assessment – Area C

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Designated assets	N/A	The following designated assets lie within the study area: 1 Old Road, mid 19th century, listed Grade II, moderate value (NHL 1038769) over 200m from the railway line and screened by intervening buildings; Bridge 59 on the Trent and Mersey canal, listed Grade II, moderate value (NHL 1277567) over 100m from the railway line and screened by intervening buildings; Bridge 60 on the Trent and Mersey Canal, listed Grade II, moderate value (NHL 1373925), over 100m from the new gantry. Moderate value; Armitage United Reform Chapel, listed Grade II, moderate value (NHL 1382060), 400m from the railway line; Lodge Cottage, listed Grade II, moderate value (NHL1293814), 400m from the new gantry; Church Farm, 17th century farmstead (MST 14072), farmhouse listed Grade II, moderate value (NHL1374296), 100m from the railway line, south of the canal; and Church of St John listed Grade II*, high value (NHL1374295) with cross listed Grade II (NHL1038765), and cemetery (MST6543), less than 100m from the railway line, south of the canal and over 500m from satellite compound sites.
	1.2 Non-designated assets	N/A	The following non-designated assets lie within study area: Cropmark complex, Mavesyn Ridware – ring ditch and causewayed enclosure (MST1554), 200m north of the railway line, moderate value; Site of find of a spearhead and axe hoard, probable bronze age date (MST1576) at Armitage School 200m south of the railway line, low value; Trent and Mersey Canal (MST4765) adjacent to the railway line, moderate value; Accommodation bridge on the Trent and Mersey Canal (MST2873), 400m from new gantry, moderate value; Barn at Upper Lodge Farm (MST12725), 300m from the railway line, low value; Rugeley Road stone cross, medieval (MST958), 400m from the railway line, low value; Armitage Park, landscape park 17th century (MST6429) 300m south of the railway line, moderate value; Mavesyn Ridware Mill (MST966) sluice and mill stream, possibly medieval origin near Manor Farm and crossing the railway line, low value;

Category	Section	Subsection	Summary text
			Prehistoric enclosure and ring ditch at Hill Ridware (MST1550) 200m north west of the railway line at Lawnmeadow Covert, low value; Enclosure or unknown date (MST964) at Cawarden spring, possibly associated with a holy well, perhaps medieval – adjacent to the railway line, low value; Ring ditch (MST4750), probably bronze age – adjacent to the railway line west of Cawarden Springs Farm, low value; Mound (MST4792), probably bronze age – adjacent to the railway line west of Cawarden Springs Farm, low value; and Potential archaeological remains associated with Trent Valley prehistoric settlement on any land that has previously been undeveloped, low to moderate value.
	1.3 Cultural heritage overview	N/A	The landscape north of Armitage is within the Trent Valley. The River Trent was a focus of settlement in the prehistoric and Roman periods. Evidence of the later prehistoric periods has been found adjacent to the railway line at Cawarden Springs Farm and nearby at Lawnmeadow Covert. The Neolithic causewayed enclosure at Mavesyn Ridware is only 400m from the line. The village of Armitage is largely of 18th and 19th century date, contemporary with the canal network, with examples of earlier survivals along Old Road and on Church Lane.
	1.4 Future baseline	N/A	There are no known committed developments which will change the baseline against which the Proposed Scheme has been assessed prior to construction works (see Section 12 of this appendix).
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The draft CoCP (Sections 8.1 to 8.3) sets out proposed mitigation measures.
	2.2 Assessment of impacts and effects from construction (temporary)	N/A	There are no significant impacts or effects.
	2.3 Assessment of impacts and effects from construction (permanent)	N/A	Features of the following sites may extend into land required for the Proposed Scheme: Ring ditch (MST4750), and Mound (MST4792). Possible permanent adverse impacts on currently unknown archaeological remains within the land required, temporarily and permanently, for the construction of the Proposed Scheme. Potential due to proximity of the River Trent which was a focus of settlement in the prehistoric and later periods.
	2.4 Other mitigation measures	N/A	There is no mitigation proposed.

Category	Section	Subsection	Summary text
	2.5 Summary of likely residual significant effects residual significant effects	N/A	There is the potential for minor adverse effects as a result on impacts on currently unknown archaeological remains.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	There is no mitigation proposed.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	There are no significant impacts or effects.
	3.3 Other mitigation measures	N/A	There is no mitigation proposed.
	3.4 Summary of likely residual significant effects	N/A	There are no significant impacts or effects.

Table 21: Cultural heritage baseline data and assessment – Area D

Category	Section	Subsection (if necessary)	Summary text
1.0 Baseline:	1.1 Designated assets	N/A	The following designated asset lies within the study area: The Trent and Mersey Canal Conservation Area, of moderate value, is within the study area and is adjacent to the WCML; and Colton Mill Bridge (NHL1190563) is listed Grade II, of moderate value and is adjacent to the existing railway line, over 100m from proposed crane platforms at Rugeley Junction.
	1.2 Non-designated assets	N/A	The following non-designated assets lie within the study area: Ring ditch (MST4750), probably bronze age is adjacent to the railway line, west of Cawarden Springs Farm, and is of low value; Mound (MST4792), probably bronze age is adjacent to the railway line west of Cawarden Springs Farm and is of low value; MST18591 is a possible site of a medieval deer park at Colton Hall, first recorded in 1359 and on maps in 1724. It is of low value; MST1002 Colton Mill, former watermill, is adjacent to the railway line and is of low value; Water meadow MST13635, drainage MST13610 is of low value; Trent and Mersey Canal (MST4765) is of moderate value; Accommodation bridge on the Trent and Mersey Canal (MST2868) is of moderate value; Wharf Cottage, 19th century (MST2867) is of low value; Bellamour Hall and Landscape Park, 17th century (MST3693), is of moderate value; and Potential archaeological remains associated with Trent Valley prehistoric settlement on any land that has previously been undeveloped is of low to moderate value.

Category	Section	Subsection (if necessary)	Summary text
	1.3 Cultural heritage overview	N/A	The landscape of Rugeley is within the TrentValley. The River Trent, which runs less than 500m from the railway line through Rugeley, was a focus of settlement in the prehistoric and Roman periods. Water meadows, possibly in use since the medieval period, still line the banks of the Trent between the railway line and the main conurbation of Rugeley. Evidence of the later prehistoric periods has been found adjacent to the railway line at Cawarden Springs Farm and nearby at Lawnmeadow Covert. The town of Rugeley developed in the post medieval period with significant growth towards the railway line and with major industrial development in the 20th century. The Trent and Mersey Canal here is a designated Conservation Area.
	1.4 Future baseline	N/A	There are no known committed developments which will change the baseline against which the Proposed Scheme has been assessed prior to construction works (see Section 12 of this appendix).
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The draft CoCP (Sections 8.1 to 8.3) sets out the proposed mitigation measures.
	2.2 Assessment of impacts and effects from construction (temporary)	N/A	There are no significant impacts or effects. Temporary crane platforms will be constructed adjacent to the WCML, on the opposite side of the railway from the Trent and Mersey Canal Conservation Area. These are not considered to have any significant adverse effects to the conservation area or its setting, as they would be separated from the canal by the existing railway. The A51 construction compound will be situated approximately 50m east of the Trent and Mersey Canal Conservation Area. This will result in a negligible adverse impact to the setting of the conservation area.
	2.3 Assessment of impacts and effects from construction (permanent)	N/A	Features of the following sites may extend into land required for the Proposed Scheme: Water meadow MST13635, and MST13610. A relocatable equipment building will be constructed between the Trent and Mersey Canal Conservation Area and the WCML at Map CT-06-145, D6. This will result in a negligible adverse impact to the setting of the conservation area. Possible permanent adverse impacts on currently unknown archaeological remains within the land required, temporarily and permanently, for the construction of the Proposed Scheme. Potential due to proximity of the River Trent which was a focus of settlement in the prehistoric and later periods.
	2.4 Other mitigation measures	N/A	No mitigation measures are proposed.
	2.5 Summary of likely residual significant effects	N/A	There is the potential for minor adverse effects as a result of impacts on archaeological remains.

Category	Section	Subsection (if necessary)	Summary text
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	There is no mitigation proposed.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	There are no significant impacts or effects.
	3.3 Other mitigation measures	N/A	There is no mitigation proposed.
	3.4 Summary of likely residual significant effects	N/A	There are no significant impacts or effects.

Table 22: Cultural heritage baseline data and assessment – Area E

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Designated assets	N/A	The following designated assets lie within the study area: Scheduled monument – circular earthwork at Bishton Hall (NHL1006074) 400m south of the railway line, high value. Conservation area around the Trent and Mersey Canal north of Rugeley, moderate value. Bishton Hall Grade II* (NHL1116588), garden walls and terrace Grade II* (NHL1273003), orangery Grade II (NHL 1243335), stables and coach house Grade II (NHL1243219), 400m south of the railway line and well screened from the track – assets of high value.
	1.2 Non-designated assets	N/A	The following non-designated assets lie within study area: Water meadow (MST14106), Bishton, 200m south of the railway line, low value; Bishton Lane Farm (MST18629) late 19th century 100m north of the line, low value; Ring ditch at Bishton (MST4265) less than 100m north of the railway line, moderate value; Ridge and Furrow, Bishton (MST5365) adjacent to the railway line, low value; Bishton Hall Park (MST6025), 200m south of the railway line, moderate value; Possible medieval settlement within Bishton Park (MST 2374), low value; Formal gardens within Bishton Park (MST10981), moderate value; Trent and Mersey Canal (MST4765), 200m south of the railway line, moderate value; Taft bridge on the Trent and Mersey Canal (MST2866), moderate value; Wharf Cottage, 19th century (MST2867), low value; Bellamour Hall and Landscape Park, 17th century (MST3693) north of the railway line at Bellamour Lane, moderate value; and Potential archaeological remains associated with Trent Valley prehistoric settlement on any land that has previously been undeveloped, low to moderate value.

Category	Section	Subsection	Summary text
	1.3 Cultural heritage overview	N/A	This area between Rugeley and Colwich is within the Trent Valley. The Trent and Mersey Canal here is a designated Conservation Area. The River Trent, which runs approximately 500m from the railway line to the south, was a focus of settlement in the prehistoric and Roman periods. Water meadows, possibly in use since the medieval period, still line the banks of the Trent including at Bishton. Evidence of the later prehistoric periods has been found adjacent to the railway line, also at Bishton. Bishton Hall Park is an 18th century estate just south of the railway line, with a hall and landscaped gardens, dating to the later 18th century and containing two Grade II* structures including the hall itself. It may have earlier medieval origins as a village or settlement.
	1.4 Future baseline	N/A	There are no known committed developments which will change the baseline against which the Proposed Scheme has been assessed prior to construction works (see Section 12 of this appendix).
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	The draft CoCP (Sections 8.1 to 8.3) sets out proposed mitigation measures.
	2.2 Assessment of impacts and effects from construction (temporary)	N/A	Intrusion on historic landscape setting of Bellamour Hall and Landscape Park and noise during construction. Temporary medium adverse impact on an asset of moderate vale, resulting in a moderate adverse effect.
	2.3 Assessment of impacts and effects from construction (permanent)	N/A	Potential for minor adverse effects as a result on impacts on currently unknown archaeological remains.
	2.4 Other mitigation measures	N/A	There is no mitigation proposed.
	2.5 Summary of likely residual significant effects	N/A	Potential for minor adverse effects as a result on impacts on currently unknown archaeological remains.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	There is no mitigation proposed.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	There are no significant impacts or effects.
	3.3 Other mitigation measures	N/A	There is no mitigation proposed.
	3.4 Summary of likely residual significant effects	N/A	There are no significant impacts or effects.

Table 23: Cultural heritage baseline data and assessment – Area F

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Designated assets	N/A	The following designated assets lie within the study area: The Colwich and Little Haywood Conservation Area, an asset of moderate value, includes a section within the land required for the Proposed Scheme; There is one designated heritage asset adjacent to land required for the Proposed Scheme: Colwich Church of England Primary School, listed Grade II (NHL1273481), moderate value, lying south of the railway track ; Bishton Hall Grade II* (NHL1116588), garden walls and terrace Grade II* (NHL1273003), orangery Grade II (NHL 1243335), stables and coach house Grade II (NHL1243219), 400m south of the railway line and well screened from the track – assets of high value; The Great Haywood and Shugborough Conservation Area is immediately to the north and west of the Colwich and Haywood Heath Conservation Area, and is an asset of moderate value;Old School (NHL1273402), listed Grade II, south of the primary school, moderate value; Parish Church of St Michael and All Angels Colwich, listed Grade II*, high value, lying south of the Main Road in Colwich (NHL 1116585); Former railway station house, listed Grade II (NHL1116586), moderate value; The Trent and Mersey Canal Conservation Area, of moderate value; and Moated site (Scheduled Monument) south of St Michael and All Angels Church (NHL1007616).
	1.2 Non-designated assets	N/A	The following non-designated assets lie within the study area: Bishton Lane Farm (MST18629) late 19th century 100m north of the line, low value; Bishton Hall Park (MST6025), 200m south of the railway line, moderate value; Possible medieval settlement within Bishton Park (MST 2374), low value; Formal gardens within Bishton Park (MST10981), moderate value; Cropmarks near Bishton Hall (MST1419), low value; Trent and Mersey Canal (MST4765), 400m south of the railway line, moderate value; and Potential archaeological remains associated with Trent Valley prehistoric settlement on any land that has previously been undeveloped, low to moderate value.

Category	Section	Subsection	Summary text
	1.3 Cultural heritage overview	N/A	Colwich is within the Trent Valley, adjacent to the River Trent and Trent and Mersey Canal (conservation area). It was a medieval village and is known for its Abbey (St. Mary's) and its parish church of St Michael. The historic core of Colwich, along with the neighbouring village of Little Haywood, linked by the old A51, is designated as the Colwich and Little Haywood Conservation Area. Bishton Hall Park is an 18th century estate on the outskirts of Colwich just south of the railway line, with a hall and landscaped gardens, dating to the later 18th century and containing two Grade II* listed structures including the hall itself. It may have earlier medieval origins as a village or settlement.
	1.4 Future baseline	N/A	There are no known committed developments which will change the baseline against which the Proposed Scheme has been assessed prior to construction works (see Section 12 of this appendix).
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	Trees within the Conservation Area will be protected in accordance with measures detailed in Section 12 of the CoCP (Volume 5: Appendix CT-003-000).
	2.2 Assessment of impacts and effects from construction (temporary)	N/A	No significant impacts or effects. A crane platform will be temporarily constructed within the Colwich and Little Haywood Conservation Area, but will be removed and the land returned to its original condition. Track modifications will also be undertaken within the Conservation Area. None of these works will result in any significant temporary or permanent effects on the Conservation Area. There is one designated heritage asset adjacent to land required for the Proposed Scheme: the Colwich Church of England Primary School, listed Grade II. The School's setting is already characterised by proximity to the railway line. A crane platform will be constructed temporarily behind the school but will be removed and land returned to its original condition. There will be no significant temporary or permanent effects on the significance of the school's setting.
	2.3 Assessment of impacts and effects from construction (permanent)	N/A	There are no significant impacts or effects.
	2.4 Other mitigation measures	N/A	There is no mitigation proposed.
	2.5 Summary of likely residual significant effects	N/A	There are no significant impacts or effects.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	There is no mitigation proposed.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	There are no significant impacts or effects.
	3.3 Other mitigation measures	N/A	There is no mitigation proposed.

Category	Section	Subsection	Summary text
	3.4 Summary of likely residual significant effects	N/A	There are no significant impacts or effects.

6 Ecology

Table 24: Ecology baseline data and assessment – Area A

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Existing baseline	Designated sites	No statutory designated sites of importance for nature conservation are present within 500m of this area of the Proposed Scheme. No non-statutory designated sites or habitats of principal importance, as identified in section 41 of the Natural Environment and Rural Communities Act 2006[3], are present within the land required for construction of the Proposed Scheme in this area. There are a number of non-statutory designated sites close to the WCML in this area, as shown on Maps CT-19-200 and CT-19-201. Of these, only Fullbrook Farm (Hedge 3) Biodiversity Alert Site (BAS) is immediately adjacent to the railway corridor in an area where track modifications will take place. All works at this location will be undertaken within the existing WCML boundary using track mounted plant and there will be no land required for construction of the Proposed Scheme within the BAS.
		Habitats present	Aerial photography shows that the works are located entirely within the existing WCML boundary, existing Lichfield sidings and an existing paved Network Rail access road to the sidings. No semi-natural habitats are present within the proposed works area.
		Protected species	There is limited potential for common reptiles to bask on the ballast of the railway sidings. There are three records of individual badgers present within 500m of this area of the Proposed Scheme. There is a low possibility that badger setts may be present within the vicinity of this area of the Proposed Scheme. The habitats present are unlikely to support other protected species.
	1.2 Future baseline	N/A	A summary of the known developments which are assumed to be mostly built and occupied prior to construction of the Proposed Scheme is provided in Section 12 of this appendix. It is not anticipated that these developments will significantly affect the character and value of ecological resources within the area.
2.0 Effects during construction	2.1 Avoidance and mitigation	N/A	Works will follow measures within the draft CoCP (Volume 5: Appendix CT-003-000). Measures to avoid the potential killing, injury and disturbance of protected species will be provided in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2).
	2.2 Assessment of impacts and effects from construction	N/A	No significant effects on the integrity of designated sites or on the conservation status of habitats and habitats are expected.

[3] *Natural Environment and Rural Communities Act 2006* (Chapter 16). London. Her Majesty's Stationery Office.

Category	Section	Subsection	Summary text
	2.3 Other mitigation measures	N/A	There are no other mitigation measures currently identified Additional mitigation and/or compensation that is required to address potential effects on protected species receptors that may occur within areas where there has been no or limited access available for field survey will be provided in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2). Following incorporation of these measures any effects on conservation status of the populations concerned are likely to reduce to a level that is not significant.
	2.4 Summary of likely residual significant effects	N/A	No residual significant effects have been identified.
3.0 Effects arising from operation	3.1 Avoidance and mitigation	N/A	There are no avoidance or mitigation measures identified.
	3.2 Assessment of impacts and effects from operation	N/A	No significant effects are expected.
	3.3 Other mitigation measures	N/A	There are no other mitigation measures required.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are expected.

Table 25: Ecology baseline data and assessment – Area B

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	Designated sites	No statutory designated sites of importance for nature conservation are present within 500m of this area of the Proposed Scheme. Trent and Mersey Canal: Armitage Church to Tuppenhurst Road SBI passes beneath the WCML at Handsacre (Map CT-19-202, B7), approximately 70m north-west of the Armitage Shanks satellite compound. There are no track modifications at this location. There are no habitats of principal importance within or adjacent to this area of the Proposed Scheme.
		Habitats present	One pond is present approximately 370m to the south-west but is located on the opposite side of the A513 New Road and has very limited connectivity to the proposed storage and laydown area. Other ponds may be present within the gardens of nearby residential properties. Aerial photography shows that the Armitage Shanks satellite compound is located within an existing hard-standing yard. There are small areas of scattered scrub and tall ruderal plants around the edge of the yard where the proposed satellite construction compound will be located. The rail embankment appears to support rough grass and scattered scrub. The works area is bordered by residential gardens with some mature trees and hedgerows.
		Protected species	Potential for common reptiles and nesting birds to be present within the areas of scattered scrub and ruderal plants around the proposed compound area. Limited suitable terrestrial habitat for great crested newts or other amphibians within the compound area or on the rail embankment. Limited potential for badger setts to be present on the narrow rail embankment between the WCML and the proposed compound area.
	1.2 Future baseline	N/A	A summary of the known developments which are assumed to be mostly built and occupied prior to construction of the Proposed Scheme is provided in Section 12 of this appendix. It is not anticipated that these developments will significantly affect the character and value of ecological resources with the area.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	Works will follow measures within the draft CoCP (Volume 5: Appendix CT-003-000). Measures to avoid the potential killing, injury and disturbance of protected species will be provided in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2).

Category	Section	Subsection	Summary text
	2.2 Assessment of impacts and effects from construction	N/A	No significant effects on the integrity of designated sites or on the conservation status of habitats and habitats are expected.
	2.3 Other mitigation measures	N/A	There are no other mitigation measures currently identified. Additional mitigation and/or compensation that is required to address potential effects on protected species receptors that may occur within areas where there has been no or limited access available for field survey will be provided in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2). Following incorporation of these measures any effects on conservation status of the populations concerned are likely to reduce to a level that is not significant.
	2.4 Summary of likely residual significant effects	N/A	No residual significant effects are expected.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	There are no avoidance or mitigation measures identified.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No significant effects are expected.
	3.3 Other mitigation measures	N/A	There are no other mitigation measures required.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are expected.

Table 26: Ecology baseline data and assessment – Area C

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	Designated sites	No statutory designated sites of importance for nature conservation are present within 500m of this area of the Proposed Scheme. Lawnmeadow Covert and Ridware Hall SBI is located 60m to the south of the un-paved existing access track. The site is a shallow lake with extensive marginal vegetation and an adjoining area of woodland. Cawarden Springs Wood SBI and ancient semi-natural woodland is located approximately 50m to the north of two proposed temporary crane platforms (Map CT-05-144, I4 and J3). The site is a remnant of ancient semi-natural woodland with mature standard trees. The temporary crane platform at Map CT-05-143, F4 is located adjacent to an area of floodplain grazing marsh (a habitat of principal importance). A site survey from a PRoW which passes through the area has found that the habitat present within the works footprint at this location comprises poor semi-improved grassland which is heavily grazed by sheep and cows. The works will not result in loss of, or changes to, the hydrological setting of the grazing marsh.
		Habitats present	All of the proposed signal gantries are located within the existing WCML boundary which comprises bare ballast. The majority of the access road from Wade Lane House follows an existing un-paved access track. The access track passes through arable fields with some hedgerows on either side of the track. The access track passes immediately adjacent to four ponds which are surrounded by small patches of woodland and mature trees. The crane platform at Map CT-05-143, F4 is within mainly species poor semi-improved pasture which is heavily grazed by cows and sheep with no ditches or drains in close proximity to the works site. The adjacent WCML embankment supports rough grassland, tall ruderal and scattered scrub. The crane platforms at Maps CT-05-143, A6 and CT-05-144, I4 and the temporary access route to it are located within an arable field. The adjacent WCML embankment supports a strip of woodland with a mixture of mature and young trees and scrub. There are 12 ponds which may support breeding populations of great crested newts and other amphibians within 250m which have habitat connectivity to the proposed works. Four of these ponds are located immediately adjacent to the un-paved existing access track and suitable terrestrial habitat for amphibians including great crested newt is present immediately adjacent to the access routes.

Category	Section	Subsection	Summary text
		Protected species	Potential for common reptiles and nesting birds to be present within the areas of scattered scrub and ruderal on the rail embankment immediately adjacent to all three rail systems satellite compounds as well as for reptiles to use the ballast on the railway line for basking. Suitable terrestrial habitat for great crested newts and other amphibians on the rail embankment adjacent to all three temporary crane platform areas. The improved grassland field and arable fields within the proposed crane platform areas have low suitability to support great crested newts and other amphibians. The bare ballast and features within the WCML boundary such as cable troughing may provide suitable refuges for great crested newts and other amphibians. There are mature trees present on the rail embankment adjacent to the crane platforms at Maps CT-05-143, A6 and CT-05-144, I4 and within hedgerows beside the access routes which may have potential to support roosting bats. Badger setts may be present throughout the proposed works area, with particular potential on the WCML embankment. A large active badger sett is present approximately 30m to the north of one the crane platforms. There are records of otter, water vole and freshwater crayfish within the River Trent which at its closest is approximately 140m to the south-west of this area of the Proposed Scheme. These species are unlikely to use the terrestrial habitat which is within the land required for construction of the Proposed Scheme at this location. Species-rich hedgerows which may qualify under the wildlife and landscape criteria as 'important' under The Hedgerows Regulations (1997)[4] may be present along either side of the existing access track.
	1.2 Future baseline	N/A	A summary of the known developments which are assumed to be mostly built and occupied prior to construction of the Proposed Scheme is provided in Section 12 of this appendix. It is not anticipated that these developments will significantly affect the character and value of ecological resources with the area.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	Works will follow measures within the draft CoCP (Volume 5: Appendix CT-003-000). Any hedgerows and trees along the temporary access road routes which will be lost during construction will be replaced with planting following completion of construction. Measures to avoid the potential killing, injury and disturbance of protected species will be provided in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2).

[4] *The Hedgerows Regulations 1997* (No. 1160). London. Her Majesty's Stationery Office.

Category	Section	Subsection	Summary text
	2.2 Assessment of impacts and effects from construction	N/A	No works will be undertaken within Lawnmeadow Covert and Ridware Hall SBI or Cawarden Springs Wood SBI and there are no anticipated impacts on either of these sites. The Proposed Scheme will cause minor loss of habitats which have potential to support common reptiles, nesting birds and provide suitable terrestrial habitat for great crested newts. No potential great crested newt breeding ponds will be affected by the Proposed Scheme. Mature trees with potential to support roosting bats may also be present within the footprint of the Proposed Scheme. A large badger sett is present approximately 30m to the north of crane platform sites. Work at this location may result in some temporary disturbance to the sett due to noise, vibration and light from night working on the nearby railway line. No significant effects on the integrity of designated sites or on the conservation status of habitats and habitats are expected.
	2.3 Other mitigation measures	N/A	There are no other mitigation measures currently identified. Additional mitigation and/or compensation that is required to address potential effects on protected species receptors that may occur within areas where there has been no or limited access available for field survey will be provided in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2). Following incorporation of these measures any effects on conservation status of the populations concerned are likely to reduce to a level that is not significant.
	2.4 Summary of likely residual significant effects	N/A	No residual significant effects are expected.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	There are no avoidance or mitigation measures identified.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No significant effects are expected.
	3.3 Other mitigation measures	N/A	There are no other mitigation measures required.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are expected.

Table 27: Ecology baseline data and assessment – Area D

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	Designated sites	No statutory designated sites of importance for nature conservation are present within 500m of this area of the Proposed Scheme. Brereton Works SBI is located immediately adjacent to the WCML and Chase Line in the middle of Rugeley Junction. The site is a disused sandstone quarry with importance for invertebrates with species rich vegetated areas. Works at this location will be confined to the existing track and will not extend into the SBI. There are no habitats of principal importance within or adjacent to this area of the Proposed Scheme.
		Habitats present	All of the proposed signal gantries and track alterations are located within the existing WCML and Chase Line track which comprises bare ballast. The crane platforms at Map CT-05-144, D6 and CT-05-144, E6 are located within grazed grassland field. The temporary access route leading from Blithbury Road follows an existing un-paved farm track which passes between fields with hedgerows on both sides of the track. Closer to the crane platforms referenced above the temporary access road passes through a semi-improved grassland field and through a gappy hedgerow/line of trees. The route passes immediately adjacent to a pond. The crane platform at Map CT-05-144, A6 is located partly within the hard standing car park at Rugeley station. It extends into a small patch of large trees adjacent to the car park. The crane platform at Map CT-05-145, I6 is located within an existing hard-standing yard. There are small areas of scattered scrub and tall ruderal plants around the edge of the yard where the proposed crane platform would be located. The existing Rugeley sidings (Map CT-05-145, H6) are mainly ballast with some small patches of ruderal vegetation. The proposed permanent access, turning head, and relocatable equipment building (REB) at Map CT-06-145, F6 and G6 are located partially within an existing area of hard standing and partly within the edge of a fallow arable field immediately adjacent to the WCML. The A51 satellite compound (see Map CT-05-145, E6, F6 and E7) is located within a small improved grassland field between the A51 and the WCML. The two crane platforms at CT-055-145, C6 and D6 are located within an arable field. The temporary access route from B5013 Colton Road follows an existing un-paved farm track which passes between fields and hedgerows on both sides. Close to the crane platform the route crosses the arable field. The WCML embankments within and adjacent to the Proposed Scheme in this area supports a mosaic of rough grassland, tall ruderal vegetation, trees and scattered scrub. There are three ponds which may support breeding populations of great crested newts and other amphibians within

Category	Section	Subsection	Summary text
			250m which have habitat connectivity to the Proposed Scheme. One pond is located immediately adjacent to the proposed access road to the crane platform at CT-05-144, D6. No ponds are present within the areas required for the access routes or crane platforms.
		Protected species	Potential for common reptiles and nesting birds to be present within the areas of scattered scrub and ruderal on the rail embankment immediately adjacent to the crane platforms and access routes and for reptiles to use the ballast on the railway line for basking. Nesting birds may also be present within the area of trees at the crane platform at Rugeley Station (Map CT-05-144, A6). Suitable terrestrial habitat for great crested newts and other amphibians on the rail embankment adjacent to the crane platforms at Maps CT-05-143, F4, CT-05-145, F6, C6 and D6 and the A51 satellite compound. The grassland and arable fields within the proposed crane platform and compound areas have low suitability to support great crested newts and other amphibians. The bare ballast and features within the WCML boundary such as cable troughing may provide suitable refuges for great crested newts and other amphibians. No ponds will be affected by the Proposed Scheme. There are mature trees present on the rail embankment adjacent to the crane platforms at Maps CT-05-143, F4 and CT-05-145, I6 and within hedgerows beside the access routes which may have potential to support roosting bats. Badger setts may be present throughout the proposed works area, with particular potential on the WCML embankment. There are records of otter on the Trent and Mersey Canal and River Trent which at its closest is approximately 30m to the south-west of this area of the Proposed Scheme. These species are unlikely to use the terrestrial habitat which is present within the Proposed Scheme at this location. Species-rich hedgerows which may qualify under the wildlife and landscape criteria as 'important' under The Hedgerows Regulations (1997) may be present along either side of the existing access road.
	1.2 Future baseline	N/A	A summary of the known developments which are assumed to be mostly built and occupied prior to construction of the Proposed Scheme is provided in Section 12 of this appendix. It is not anticipated that these developments will significantly affect the character and value of ecological resources with the area.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	Works will follow measures within the draft CoCP (Volume 5: Appendix CT-003-000). Any hedgerows and trees along the temporary access road routes which will be lost during construction will be replaced with planting following completion of construction. Measures to avoid the potential killing, injury and disturbance of protected species will be provided in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2).

Category	Section	Subsection	Summary text
	2.2 Assessment of impacts and effects from construction	N/A	No works will be undertaken at Brereton Works SBI and there are no anticipated impacts on this site. The Proposed Scheme will cause minor loss of habitats which have potential to support common reptiles, nesting birds and provide suitable terrestrial habitat for great crested newts. No potential great crested newt breeding ponds will be affected by the Proposed Scheme. Mature trees with potential to support roosting bats may also be present within the footprint of the Proposed Scheme. No significant effects on the integrity of designated sites or on the conservation status of habitats and habitats are expected.
	2.3 Other mitigation measures	N/A	There are no other mitigation measures currently identified. Additional mitigation and/or compensation that is required to address potential effects on protected species receptors that may occur within areas where there has been no or limited access available for field survey will be provided in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2). Following incorporation of these measures any effects on conservation status of the populations concerned are likely to reduce to a level that is not significant.
	2.4 Summary of likely residual significant effects	N/A	No residual significant effects are expected.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	There are no avoidance or mitigation measures identified.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No significant effects are expected.
	3.3 Other mitigation measures	N/A	There are no other mitigation measures required.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are expected.

Table 28: Ecology baseline data and assessment – Area E

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	Designated sites	No statutory designated sites of importance for nature conservation are present within 500m of this area of the Proposed Scheme. Bishton (north of) Biodiversity Alert Site (BAS) is located approximately 50m to the north of a crane platform on the opposite side of the WCML. The site comprises species rich woody hedges either side of Bishton Lane. There are no habitats of principal importance within or adjacent to this area of the Proposed Scheme.
		Habitats present	All of the proposed new signal gantries and track alterations are located within the existing WCML boundary which comprises bare ballast. A crane platform (Map CT-05-146, I3) is located at the edge of an arable field with habitats present including a bare earth farm track, a tall ruderal vegetation field margin and an arable field. The temporary access route from Belamour Lane follows the existing bare earth farm track. A crane platform (Map CT-05-146, G4) is located within a semi-improved grassland field. The temporary access route leading from the unnamed road which joins Bishton lane follows an existing hard standing track around the edge of Carney Pools fishing lakes. Closer to the crane platform location the temporary access route passes through a semi-improved grassland field and through a gappy hedgerow/line of trees. The route passes immediately adjacent to the fishing lakes. A crane platform (Map CT-05-146, D5 and E5) is located within an arable field to the north of the temporary access route past Carney Pools. A hedgerow separates the crane platform location from the access route. A crane platform (Map CT-05-146, B8) is located in the corner of a grassland field with a short access route linking it to Bishton Lane. Mature trees are present at the field boundaries immediately adjacent to the works location. The WCML embankments within and adjacent to the Proposed Scheme in this area support a mosaic of rough grassland, tall ruderal vegetation, trees and scattered scrub. There are four ponds which may support breeding populations of great crested newts and other amphibians within 500m which have habitat connectivity to the proposed works. Three fishing ponds are located in close proximity to the access route leading to the crane platform at Map CT-05-146, G4 but these are likely to be heavily stocked with fish and, therefore, unsuitable for great crested newts and other amphibians.

Category	Section	Subsection	Summary text
		Protected species	Potential for common reptiles and nesting birds to be present within the areas of scattered scrub and ruderal on the rail embankment immediately adjacent to the Proposed Scheme. There is also potential for reptiles to use the ballast on the WCML for basking. Suitable terrestrial habitat for great crested newts and other amphibians is present on the rail embankment adjacent to all works locations within this area. The grassland and arable fields within the proposed crane platform and access route areas have low suitability to support great crested newts and other amphibians. The bare ballast and features within the WCML boundary such as cable troughing may provide suitable refuges for great crested newts and other amphibians. There are mature trees present on the rail embankment and adjacent to rail the crane platform at Map CT-05-146, B8 and within hedgerows beside the access routes which may have potential to support roosting bats. Badger setts may be present throughout the proposed works area, with particular potential on the WCML embankment. Species-rich hedgerows which may qualify under the wildlife and landscape criteria as 'important' under The Hedgerows Regulations (1997) may be present along either side of the existing access routes.
	1.2 Future baseline	N/A	A summary of the known developments which are assumed to be mostly built and occupied prior to construction of the Proposed Scheme is provided in Section 12 of this appendix. It is not anticipated that these developments will significantly affect the character and value of ecological resources with the area.
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	Works will follow measures within the draft CoCP (Volume 5: Appendix CT-003-000). Any hedgerows and trees along the temporary access road routes which will be lost during construction will be replaced with planting following completion of construction. Measures to avoid the potential killing, injury and disturbance of protected species will be provided in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2).
	2.2 Assessment of impacts and effects from construction	N/A	No works will be undertaken within Bishton BAS (see Map CT-19-205, G3) and there are no anticipated impacts on this site. The Proposed Scheme will cause the loss of habitats which have potential to support common reptiles, nesting birds and provide suitable terrestrial habitat for great crested newts. No potential great crested newt breeding ponds will be affected by the Proposed Scheme. Mature trees with potential to support roosting bats may also be present within the footprint of the Proposed Scheme. No significant effects on the integrity of designated sites or on the conservation status of habitats and habitats are expected.

Category	Section	Subsection	Summary text
	2.3 Other mitigation measures	N/A	There are no other mitigation measures currently identified. Additional mitigation and/or compensation that is required to address potential effects on protected species receptors that may occur within areas where there has been no or limited access available for field survey will be provided in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2). Following incorporation of these measures any effects on conservation status of the populations concerned are likely to reduce to a level that is not significant.
	2.4 Summary of likely residual significant effects	N/A	No residual significant effects are expected.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	There are no avoidance or mitigation measures identified.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No significant effects are expected.
	3.3 Other mitigation measures	N/A	There are no other mitigation measures required.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are expected.

Table 29: Ecology baseline data and assessment – Area F

Category	Section	Subsection	Summary text
1.0 Baseline:	1.1 Existing baseline	Designated sites	No statutory designated sites of importance for nature conservation are present within 500m of this area of the Proposed Scheme. Colwich Brickworks SBI (see Map CT-19-205, E5 and F5) is located approximately 60m to the north of the temporary access road leading to the crane platform at Map CT-05-147, G5. The site is a disused quarry with several typical disturbed ground habitats. There are no habitats of principal importance within or adjacent to this area of the Proposed Scheme.
		Habitats present	All of the proposed signal gantries track alterations works are located within the existing WCML boundary which comprises bare ballast. A crane platform at Map CT-05-147, G5 is located at the edge of a pasture field. The rail cutting adjacent to it supports a strip of woodland. The temporary access route from the A51 uses an existing unpaved farm access track to cross the railway line. From Brickyard Bungalow it passes through pasture fields separated by a hedgerow with a narrow gateway that may have to be enlarged. The proposed crane platforms at Map CT-05-147, E6 are located within an area of dense scrub, trees and bramble adjacent to the WCML. The temporary access route from Main Road passes through the hard standing yard of some industrial premises. A mature tree within the works area may have potential to support roosting bats. The proposed new REB at Mao CT-06-147, D6 is located within an area which has existing rail signalling equipment and a single storey flat roofed brick building. The area is surrounded by rough grass and ruderal vegetation. The building may have potential to support roosting bats. The WCML and North Staffordshire Line embankments within and adjacent to the Proposed Works in this area supports a mosaic of rough grassland, tall ruderal vegetation, trees and scattered scrub. There are three ponds which may support breeding populations of great crested newts and other amphibians within 250m which have habitat connectivity to the proposed works. All of the works locations are within 250m of a pond.

Category	Section	Subsection	Summary text
		Protected species	Potential for common reptiles and nesting birds to be present within the areas of scattered scrub and ruderal on the rail embankment immediately adjacent to the Proposed Scheme. There is also potential for reptiles to use the ballast on the railway lines for basking. Suitable terrestrial habitat for great crested newts and other amphibians is present on the rail embankment adjacent to all works locations within this area and within the crane platform locations at Map CT-05-147, E6. The grassland fields within the crane platform at Map CT-05-147, G5) has low suitability to support great crested newts and other amphibians. The bare ballast and features within the WCML and North Staffordshire Line boundary such as cable troughing may provide suitable refuges for great crested newts and other amphibians. There are mature trees present on the rail embankment, adjacent to the crane platform locations at Map CT-05-147, E6 and within hedgerows beside the access routes which may have potential to support roosting bats. Badger setts may be present throughout the proposed works area, with particular potential on the WCML and North Staffordshire Line embankments. Species-rich hedgerows which may qualify under the wildlife and landscape criteria as 'important' under The Hedgerows Regulations 1997 may be present where the access route from the A51 Tamworth Road passes through a hedgerow.
	1.2 Future baseline	N/A	A summary of the known developments which are assumed to be mostly built and occupied prior to construction of the Proposed Scheme is provided in Section 12 of this appendix. It is not anticipated that these developments will significantly affect the character and value of ecological resources with the area
2.0 Effects during construction:	2.1 Avoidance and mitigation	N/A	Works will follow measures within the draft CoCP (Volume 5: Appendix CT-003-000). Any hedgerows and trees along the temporary access road routes which will be lost during construction will be replaced with planting following completion of construction. Measures to avoid the potential killing, injury and disturbance of protected species will be provided in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2).

Category	Section	Subsection	Summary text
	2.2 Assessment of impacts and effects from construction	N/A	No works will be undertaken within Colwich Brickworks SBI (see Map CT-19-205, E5 and F5) and there are no anticipated impacts on this site. The Proposed Scheme will cause minor loss of habitats which have potential to support common reptiles, nesting birds and provide suitable terrestrial habitat for great crested newts. No potential great crested newt breeding ponds will be affected by the Proposed Scheme. Mature trees and a footbridge with potential to support roosting bats may also be present within the footprint of the Proposed Scheme. No significant effects on the integrity of designated sites or on the conservation status of habitats and habitats are expected.
	2.3 Other mitigation measures	N/A	There are no other mitigation measures currently identified. Additional mitigation and/or compensation that is required to address potential effects on protected species receptors that may occur within areas where there has been no or limited access available for field survey will be provided in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2). Following incorporation of these measures any effects on conservation status of the populations concerned are likely to reduce to a level that is not significant.
	2.4 Summary of likely residual significant effects	N/A	No residual significant effects are expected.
3.0 Effects arising from the operation of the Proposed Scheme:	3.1 Avoidance and mitigation	N/A	There are no avoidance or mitigation measures identified.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	No significant effects are expected.
	3.3 Other mitigation measures	N/A	There are no other mitigation measures required.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are expected.

7 Land quality

Table 30: Land quality baseline data and assessment – Area A

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Existing baseline	1.1.1 Geology, groundwater, surface waters, current and historical land use, other regulatory data, mineral/mining resources, geo-conservation resources and receptors	Area A has been scoped out of assessment because all proposed works are taking place on existing WCML infrastructure and no deep excavations or ground disturbance (such as piling) are proposed.
2.0 Effects during construction	2.1 Assessment of impacts and effects from construction (temporary)	2.1.1 Land contamination, mining/mineral resources, and geo-conservation sites	Area A has been scoped out of assessment because all proposed works are taking place on existing WCML infrastructure and no deep excavations or ground disturbance (such as piling) are proposed.
	2.2 Assessment of impacts and effects from construction (permanent)	2.2.1 Land contamination, mining/mineral resources, geo-conservation sites and cumulative	
	2.3 Other mitigation measures	N/A	
	2.4 Summary of likely residual significant effects	N/A	
3.0 Effects arising from the operation of the Proposed Scheme	3.1 Avoidance and mitigation	N/A	Area A has been scoped out of assessment because all proposed works are taking place on existing WCML infrastructure and no deep excavations or ground disturbance (such as piling) are proposed.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	
	3.3 Other mitigation measures	N/A	
	3.4 Summary of likely residual significant effects	N/A	

Table 31: Land quality baseline data and assessment – Area B

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Existing baseline	1.1.1 Geology, groundwater, surface waters, current and historical land use, other regulatory data, and receptors	Area B Scoped out of assessment because all proposed works are taking place on existing WCML infrastructure or existing compound at Handsacre and no deep excavations or ground disturbance (such as piling) are proposed.
2.0 Effects during construction	2.1 Assessment of impacts and effects from construction (temporary)	2.1.1 Land contamination, mineral/mining resources, and geo-conservation resources	Area B Scoped out of assessment because all proposed works are taking place on existing WCML infrastructure or existing compound at Handsacre and no deep excavations or ground disturbance (such as piling) are proposed.
	2.2 Assessment of impacts and effects from construction (permanent)	N/A	
	2.3 Other mitigation measures	N/A	
	2.4 Summary of likely residual significant effects	N/A	
3.0 Effects arising from the operation of the Proposed Scheme	3.1 Avoidance and mitigation	N/A	Area B Scoped out of assessment because all proposed works are taking place on existing WCML infrastructure or existing compound at Handsacre and no deep excavations or ground disturbance (such as piling) are proposed.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	
	3.3 Other mitigation measures	N/A	
	3.4 Summary of likely residual significant effects	N/A	

Table 32: Land quality baseline data and assessment – Area C

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Existing baseline	1.1.1 Geology	River terrace deposits underlie the western end of Area C. The bedrock comprises the Mercia Mudstone Group and the Bromsgrove Sandstone Formation.
		1.1.2 Groundwater	Where present, the river terrace deposits are classified as a Secondary A aquifer, the Mercia Mudstone Group is a Secondary B aquifer and the Bromsgrove Sandstone Formation is a Principal aquifer.
		1.1.3 Surface waters	The River Trent lies approximately 40m to the south of the WCML in Area C.
		1.1.4 Current and historical land use	The land surrounding the WCML in Area C is predominantly in agricultural use, although sewage settling ponds and a light industrial estate are located to the south of the railway line at the southern end of Area C. Rugeley power station lies to the south of the railway line at the northern end of Area C.
		1.1.5 Other regulatory data	There are historical landfills within approximately 50m of the southern side of Area C, at Rugeley power station. There are no readily available records of dates of operation or the categories of waste accepted.
		1.1.6 Mineral/mining resources	No mining/minerals resources have been identified in Area C.
		1.1.7 Geo-conservation resources	No geo-conservation resources have been identified in Area C.
		1.1.8 Receptors	Receptors in the area include residents and users of off-site properties; people accessing land adjacent to the site; Principal, Secondary A and Secondary B aquifers; the River Trent; and existing property structures and infrastructure.
	1.2 Future baseline	N/A	There are no known committed developments (see Section 12 of this appendix)which could change the baseline against which the Proposed Scheme has been assessed prior to construction works.
2.0 Effects during construction	2.1 Avoidance and mitigation	N/A	No mitigation measures are required over and above those contained within draft CoCP. Within the draft CoCP, measures relevant to this section include: gas mitigation measures such as passive venting for structures containing confined spaces within 250m of landfills; and should piling be required for gantry foundations adjacent to the landfills a ground investigation to identify if landfill leachate is present should be undertaken to assess whether piles are likely to provide a preferential pathway to groundwater.

Category	Section	Subsection	Summary text
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Land contamination	The key area of concern identified in Area C is the presence of a new gantry and temporary crane platforms that would be located approximately 100m to the north of historical landfills at Rugeley power station. The landfills will not be disturbed, but if landfill gas is being produced, then any below-ground works associated with potential piled foundations for the gantry and the establishment of the crane platforms could create a pathway for the migration of gas or landfill leachate. Groundwater is a receptor to landfill leachate which could be mobilised during construction. Piling foundations for the new gantry and potential breaking of ground in establishing the crane platforms could, given the proximity of the landfill to the site, result in a minor adverse effect during construction. As part of the mitigation measures identified in the draft CoCP a ground investigation would be undertaken to identify if landfill leachate/gas is present to assess whether piles are likely to provide a preferential pathway to groundwater.
		2.2.2 Mining/mineral resources	No mining/minerals resources have been identified in Area C.
		2.2.3 Geo-conservation sites	No geo-conservation sites have been identified in Area C.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Land contamination	There are no permanent enclosed structures in which landfill gas could accumulate, and the landfills themselves will remain undisturbed during construction so the risks to receptors post-construction, following the implementation of relevant mitigation measures contained within the draft CoCP, are considered to remain the same as at baseline.
		2.3.2 Mining/mineral resources	No mining/minerals resources have been identified in Area C.
		2.3.3 Geo-conservation sites	No geo-conservation sites have been identified in Area C.
		2.3.4 Cumulative	No cumulative effects have been identified in Area C with regards to land quality.
	2.4 Other mitigation measures	N/A	It may be necessary to install landfill gas control systems, on a temporary or permanent basis, to ensure that landfill gas migration pathways are controlled and do not adversely affect the Proposed Scheme or the wider environment as a consequence of the works.
	2.5 Summary of likely residual significant effects	N/A	With the implementation of potential mitigation measures over and above those contained within the draft CoCP there are considered to be no likely residual significant effects.

Category	Section	Subsection	Summary text
3.0 Effects arising from the operation of the Proposed Scheme	3.1 Avoidance and mitigation measures	N/A	Maintenance and operation of the Proposed Scheme will be in accordance with environmental legislation and good practice whereby appropriate spillage and pollution response procedures will be established.
	3.2 Assessment of impacts and effects from operation	N/A	The permanent works in Area C to be utilised during operation comprise signal gantries. It is considered unlikely that significant contamination would result from this land use.
	3.3 Other mitigation measures	N/A	No other mitigation measures will be required beyond what has already been outlined relating to land quality in Area C. There may be a requirement for ongoing monitoring if it established that landfill gas control measures are required.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are anticipated associated with operation of the Proposed Scheme.

Table 33: Land quality baseline data and assessment – Area D

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Existing baseline	1.1.1 Geology	River terrace deposits underlain by bedrock of the Bromsgrove Sandstone Formation and Mercia Mudstone Group.
		1.1.2 Groundwater	Superficial deposits are a Secondary A aquifer; Bromsgrove Sandstone Formation is classified as a Principal aquifer; Mercia Mudstone Group as a Secondary B aquifer. This is an area of high groundwater vulnerability. An outer groundwater source protection zone (SPZ) approximately 275m to the south-west of the existing line is located to the south-west of Colton.
		1.1.3 Surface waters	The Trent and Mersey Canal is adjacent to the site boundary at its closest point. The River Trent is located 250m from the site at its closest point.
		1.1.4 Current and historical land use	The land either side of the WCML has been and remains predominantly in agricultural use. Rugeley power station lies to the south of the WCML, at the eastern end of Area D. Rydal Industrial Estate is located to the east of the WCML and a light trading estate is located to the west of the WCML.
		1.1.5 Other regulatory data	Historical landfill directly between WCML and Trent and Mersey Canal to the south-west of Colton. Accepted inert and liquid/sludge waste during 1993. Historical landfills located to the south of the WCML at Rugeley power station. There are no readily available details on the dates of operation or the types of waste accepted.
		1.1.6 Mineral/mining resources	This area lies within a Mineral Consultation Area for sand and gravel.
		1.1.7 Geo-conservation resources	No geo-conservation resources are identified.
		1.1.8 Receptors	This area includes: Users of adjacent commercial properties; People accessing land adjacent to the site; Principal, Secondary A and Secondary B aquifers; Trent and Mersey Canal and River Trent; Existing property structures and infrastructure; and Mineral Consultation Area underlying the whole area.
	1.2 Future baseline	N/A	There are no known committed developments (see Section 12 of this appendix) which could change the baseline against which the Proposed Scheme has been assessed prior to construction works.

Category	Section	Subsection	Summary text
2.0 Effects during construction	2.1 Avoidance and mitigation	N/A	Mitigation measures contained within the draft CoCP which are relevant to the identified impacts include: A programme of further desk and site based investigation to identify if landfill leachate/gas is present and to assess whether piles are likely to provide a preferential pathway for groundwater or gas migration (Section 11, draft CoCP); and Provision of passive venting in enclosed structures, should risks from landfill gas be confirmed.
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Land contamination	The key area of concern identified in Area D is the presence of historical landfills adjacent to the Trent and Mersey Canal, directly to the west and east of the proposed A51 Tamworth Road compound and a proposed relay equipment building , respectively. The landfill itself will not be disturbed, but was closed relatively recently (1993) and if it is generating gas, then any below-ground works which may be required for the establishment of the compound and construction of the relay equipment building could create a pathway for the migration of gas or landfill leachate, as could piling for the foundations of a proposed new gantry. New buildings or structures and their users in the satellite construction compound are potential receptors to landfill gas which may accumulate with the potential for explosion and asphyxiation respectively. Groundwater and the nearby watercourses are receptors to landfill leachate which could be mobilised during construction. Piling foundations for the new gantry and potential breaking of ground in establishing the compound and constructing the relay equipment building would, given the proximity of the landfill to Area D, result in a minor adverse effect during construction. A ground investigation will be undertaken to identify if landfill leachate/gas is present to assess whether piles are likely to provide a preferential pathway to groundwater. There are no proposed works in the vicinity of the historical landfills at Rugeley power station within Area D.
		2.2.2 Mining/mineral resources	The Proposed Scheme in Area D encompasses a minor amount of land within the Mineral Consultation Area. The temporary effects on the Mineral Consultation Area are considered negligible.
		2.2.3 Geo-conservation sites	No geo-conservation sites identified in Area D.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Land contamination	The relocatable equipment building is an enclosed space in which landfill gases could accumulate, with the potential for asphyxiation of maintenance workers who may access the building and explosion. Assuming the mitigation measures identified in Section 2.1 are adopted (such as passive ventilation), there is considered to be a negligible effect following construction. The landfills themselves will remain undisturbed during construction so the risks to groundwater post-construction are considered to remain the same as at baseline.

Category	Section	Subsection	Summary text
		2.3.2 Mining/mineral resources	The Proposed Scheme in Area D encompasses a minor amount of land within the Mineral Consultation Area. The permanent effects on the Mineral Consultation Area are considered negligible.
		2.3.3 Geo-conservation sites	No geo-conservation sites identified in Area D.
		2.3.4 Cumulative	No cumulative effects have been identified in Area D with regards to land quality.
	2.4 Other mitigation measures	N/A	It may be necessary to install landfill gas control systems, on a temporary or permanent basis, to ensure that landfill gas migration pathways are controlled and do not adversely affect the Proposed Scheme or the wider environment as a consequence of the works.
	2.5 Summary of likely residual significant effects	N/A	With the implementation of potential mitigation measures there are considered to be no likely residual significant effects.
3.0 Effects arising from the operation of the Proposed Scheme	3.1 Avoidance and mitigation	N/A	Maintenance and operation of the Proposed Scheme will be in accordance with environmental legislation and good practice whereby appropriate spillage and pollution response procedures will be established.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	The permanent works in Area D to be utilised during operation are relocatable equipment building, signal gantries and access routes. It is considered unlikely that significant contamination would result from any of these land uses.
	3.3 Other mitigation measures	N/A	No other mitigation measures will be required beyond what has already been outlined relating to land quality in Area D. There may be a requirement for ongoing monitoring if it established that landfill gas control measures are required.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects will occur with operation of the Proposed Scheme.

Table 34: Land quality baseline data and assessment – Area E

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Existing baseline	1.1.1 Geology, groundwater, surface waters, current and historical land use, other regulatory data, mineral/mining resources, geo-conservation resources and receptors	Area E has been scoped out of the assessment because all proposed works are taking place on existing WCML infrastructure or are over 250m from potential sources of contamination.
2.0 Effects during construction	2.1 Assessment of impacts and effects from construction (temporary)	2.1.1 Land contamination, mining/mineral resources and geo-conservation sites	Area E has been scoped out of the assessment because all proposed works are taking place on existing WCML infrastructure or are over 250m from potential sources of contamination.
	2.2 Assessment of impacts and effects from construction (permanent)	2.2.1 Land contamination, mining/mineral resources, geo-conservation sites and cumulative	
	2.3 Other mitigation measures	N/A	
	2.4 Summary of likely residual significant effects	N/A	
3.0 Effects arising from the	3.1 Avoidance and mitigation	N/A	Area E has been scoped out of the assessment because all proposed works are taking place on existing

Category	Section	Subsection	Summary text
operation of the Proposed Scheme	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	WCML infrastructure or are over 250m from potential sources of contamination.
	3.3 Other mitigation measures	N/A	
	3.4 Summary of likely residual significant effects	N/A	

Table 35: Land quality baseline data and assessment – Area F

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Existing baseline	1.1.1 Geology	River terrace deposits underlie the western end of Area F; bedrock comprises the Bromsgrove Sandstone Formation and the Kidderminster Formation.
		1.1.2 Groundwater	Where present, the river terrace deposits are classified as a Secondary A aquifer; the bedrock is classified as a Principal aquifer. The site is in an area of high groundwater vulnerability. A total catchment SPZ 3 is located approximately 250m to the west of the western end of Area F.
		1.1.3 Surface waters	The WCML crosses the Trent and Mersey Canal and a drain in Area F.
		1.1.4 Current and historical land use	The land either side of the WCML is agricultural at the eastern end of Area F with residential and community buildings in the remainder of the area. To the north of the site was the former location of the Colwich brickworks and associated quarry. The quarry was at least partially infilled as a historical landfill (see Section 1.1.5) and residential properties are now present in the location of the brickworks buildings.
		1.1.5 Other regulatory data	Colwich brickworks historical landfill located approximately 75m to the north of the site at its closest point. It accepted household waste between 1957 and 1962.
		1.1.6 Mineral/mining resources	The Proposed Scheme crosses a Mineral Consultation Area for sand and gravel.
		1.1.7 Geo-conservation resources	No geo-conservation resources identified in Area F.
		1.1.8 Receptors	Residents and users of adjacent properties; People accessing land adjacent to the site; Principal and Secondary A aquifers; Trent and Mersey Canal and drain; Existing property structures and infrastructure; Mineral Consultation Area underlying the whole area.

Category	Section	Subsection	Summary text
	1.2 Future baseline	N/A	There are no known committed developments (see Section 12 of this appendix) which could change the baseline against which the Proposed Scheme has been assessed prior to construction works.
2.0 Effects during construction	2.1 Avoidance and mitigation	N/A	No mitigation measures required over and above those contained within the draft CoCP. Those measures relevant to this section include: gas mitigation measures such as passive venting for structures containing confined spaces within 250m of landfills; and should piling be used for gantry foundations adjacent to the landfills a ground investigation to identify if landfill leachate is present assess whether piles are likely to provide a preferential pathway to groundwater.
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Land contamination	The key area of concern in Area F is the Colwich brickworks historical landfill, to the south-east of which will be an access road and satellite compound and to the south-west of which will be a new signal gantry and two satellite compounds. The landfill itself will not be disturbed but it could be generating landfill gas and below ground works required for piled foundations for the new signal gantry and any ground works required for the crane platforms could create a pathway for the migration of gas. Given the age of the landfill (>50 years) and the 175m distance from the new signal gantry (the nearest works), the probability and consequence of gas migration pathways being realised and the associated risk are considered to remain unchanged from baseline. The groundwater within the bedrock in Area F is classified as a Principal aquifer. New signal gantries are proposed in this area which may require piled foundations. This could create a pathway for potential contamination which could migrate in leachate from the off-site historical landfill to the Principal aquifer. Given the 175m distance from the new signal gantry (the nearest works), the probability and consequence of new contaminant migration pathways being realised and the associated risk are considered to remain unchanged from baseline. However, it is assumed the ground investigation would be undertaken to identify if landfill leachate is present to assess whether piles are likely to provide a preferential pathway to groundwater.
		2.2.2 Mining/mineral resources	The Proposed Scheme in Area F encompasses a minor amount of land within the Mineral Consultation Area. The temporary effects on the Mineral Consultation Area are considered negligible.
		2.2.3 Geo-conservation sites	No geo-conservation sites identified in Area F.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Land contamination	There are no new permanent buildings within 250m of the historical landfill in which gas could accumulate and the probability and consequence of gas migration pathways being realised and the associated risk are considered to remain unchanged from baseline. The risk from contamination which may have migrated in leachate from the off-site historical landfill are considered to remain unchanged from baseline.

Category	Section	Subsection	Summary text
		2.3.2 Mining/mineral resources	The Proposed Scheme in Area F encompasses a minor amount of land within the Mineral Consultation Area. The permanent effects on the Mineral Consultation Area are considered negligible.
		2.3.3 Geo-conservation sites	No geo-conservation sites identified in Area F.
		2.3.4 Cumulative	No cumulative effects have been identified in Area D with regards to land contamination.
	2.4 Other mitigation measures	N/A	None identified.
	2.5 Summary of likely residual significant effects	N/A	There are considered to be no likely residual significant effects.
3.0 Effects arising from the operation of the Proposed Scheme	3.1 Avoidance and mitigation	N/A	Maintenance and operation of the Proposed Scheme will be in accordance with environmental legislation and good practice whereby appropriate spillage and pollution response procedures will be established.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	The permanent works in Area F to be utilised during operation are the new relocatable equipment building and signal gantries. It is considered unlikely that significant contamination would result from any of these land uses so the effect is negligible.
	3.3 Other mitigation measures	N/A	No other mitigation measures will be required beyond what has already been outlined relating to land quality in Area F.
	3.4 Summary of likely residual significant effects	N/A	No residual significant effects are anticipated associated with operation of the Proposed Scheme.

8 Landscape and visual assessment

8.1 Baseline

Landscape character

8.1.1 Between Lichfield and Handsacre, the WCML runs through gently undulating mixed farmland with some substantial woodland areas; north of Handsacre it runs through the valley of the River Trent, often close to the river, as far as Colwich. The valley is bordered by productive farmland with small villages and hamlets to the north and north-east and by the higher ground of Cannock Chase to the west, with Handsacre, Armitage and the main town of Rugeley on the gently rising western valley slopes (see map series CT-19 in the Volume 4 Map Book).

8.1.2 The valley to the north of Handsacre is dominated by Rugeley, which has an extensive industrial area and business park, including a substantial power station, which occupy a considerable area of land between the river and railway and the Trent and Mersey Canal. The A51 Rugeley bypass also passes through this area and runs between Rugeley and Rugeley railway station, just north of Rugeley Junction. The town of Rugeley has a 19th century character and street layout is on higher ground to the south-west of the industrial area.

8.1.3 To the north of Rugeley, the landscape becomes more attractive, with the higher ground of a wooded spur of the Cannock Chase Area of Outstanding Natural Beauty (AONB), causing the river valley to narrow, within which the canal, railway and roads all run as far as Colwich. The valley area has some significant residential properties, notably Bishton Hall, and is a focus for leisure activities.

Existing views

8.1.4 The existing WCML comprises a four-track railway with overhead line equipment and signal gantries, which are substantial lattice structures bridging either two or four tracks. The railway is a noticeable element in views from some of the residential properties close by where it passes through Handsacre, Armitage, Rugeley Station and Colwich. There are also views from several of the isolated farms and houses near the route and from some houses in nearby villages – Hill Ridware, Rake End and Colton above the valley and Mavesyn Ridware and Bishton within the valley.

8.1.5 The floor of the river Trent valley is wide past Rugeley, where the power station is the dominant feature and electricity transmission pylons are prominent in the landscape to the east of the WCML. Although housing within Rugeley is on higher ground, local views of the WCML are largely screened by the industrial buildings.

Viewpoints/receptor groups

8.1.6 The local baseline features and the assessment are described together for the six sections A to F of the Proposed Scheme along the WCML between Lichfield and Colwich.

Proposed Scheme

8.1.7 Works to the existing WCML will take place in various locations along the railway (see map series CT-05, Volume 4 Map Book). The works that could influence the local

landscape and views will be the addition of fourteen signal gantries and one permanent access to the WCML, plus the removal of six existing signal gantries. There will also be some localised changes to the track configuration within the existing railway footprint and the addition of four relocatable equipment buildings. The temporary construction compounds, accesses and works areas and the movement of construction plant could also affect some views, but the effects at the work sites for erection and/or removal of signal gantries would be short-term in any one location.

8.2 Assessment of impacts and effects

Effects on landscape character

8.2.1 The landscape setting ranges from woodland and sparsely populated farmland to urban and industrial townscapes with extensive residential elements. The area lies within Cannock Chase and Cank Wood, Needwood and South Derbyshire Claylands, and the Trent Valley Washlands National Landscape Character Areas. At the far north end of the works in Colwich, the WCML passes into the Cannock Chase AONB and a small section of the track modification works will be within this designated landscape.

8.2.2 The character and scale of the Proposed Scheme will not diverge significantly from those of the existing railway and the cumulative impact of the various works locations on both landscape character and the nature of the AONB is considered to be negligible. Landscape character areas have, therefore, not been assessed for this area, beyond those described in the report for Whittington to Handsacre (CFA22).

Visual assessment

Area A

8.2.3 The works in this location will entail the temporary use of the existing Lichfield sidings within a cutting of the WCML, together with use of the existing access route from the adjacent industrial area. The visual receptors are limited to industrial workplace buildings and their views towards the sidings and will not change substantially from those experienced at present. The negligible magnitude of impact assessed alongside the low sensitivity of the receptor will result in a negligible effect during construction. There will be no effect during operation.

Area B

8.2.4 Handsacre is a large village with several areas of housing in the vicinity of the WCML. The housing is mostly two storey and the rears or sides of some of these houses have views of the railway, often limited by other buildings or by noise fencing.

8.2.5 The works in the north part of Handsacre will be limited to the temporary use of existing hard standings as a construction compound (the Armitage Shanks satellite compound), along with use of an existing rail access point for maintenance, just to the south of Old Road. These uses will appear little different to the existing uses and will be seen from some of the nearby houses in the context of the existing railway. The negligible magnitude of impact assessed alongside the high sensitivity of the receptor will result in negligible effect during construction. There will be no effect during operation.

Area C

8.2.6 Rising ground to the north east of Handsacre offers some relatively distant views from the residential farms and other houses in the vicinity of Hill Ridware and Rake End; Mavesyn Ridware is closer and has some direct views that extend towards the WCML. PRoW extending north-eastwards run parallel to the WCML and within 500m of the track. They, together with parts of Hill Ridware, have views of the WCML where it is on an embankment close to the River Trent. Views of the WCML from the southern areas of Rugeley are screened by the intervening industrial area and power station.

8.2.7 Works in this location will entail removal of four twin-track signal gantries and installation of two four-track signal gantries in similar positions, plus temporary construction accesses from Wade Lane, and work sites. These localised changes will be seen at some distance and/or in the context of the existing WCML, electricity transmission pylons and Rugeley Power Station. The low adverse magnitude of impact considered alongside the high sensitivity of the receptors will result in a minor adverse effect during construction. There will be no effect during operation.

Area D

8.2.8 This group of receptors largely consists of industrial workplaces, houses on Colton Road near the WCML, the railway station and the more distant housing near the Trent and Mersey Canal in the northern area of Rugeley.

8.2.9 Works in this location will entail provision of five new four-track signal gantries, some localised changes to the tracks of the WCML and Chase Line and provision of three relocatable equipment buildings, one of which will have a new maintenance access from Colton Road. There will be a construction compound between the A51 and the WCML, largely enclosed by the embankments of the A51 crossing of the canal and a farm access crossing the railway. The works will be seen in the context of the existing railway, including the station, footbridge and sidings, and adjacent industrial buildings. More distant views will also include electricity transmission pylons. The low adverse magnitude of impact considered alongside the high sensitivity of the receptors will result in minor adverse effect during construction and operation.

Area E

8.2.10 A number of houses and farms in the Colton area have westward views down to the WCML. The railway swings briefly away from the canal, river and A51 Tamworth Road and is also visible across the fields of the valley floor from the hamlet of Bishton. There are three farms and three isolated houses nearby with views of the railway, partially screened by vegetation.

8.2.11 Works in this location will entail provision of five new signal gantries between Rugeley and Colwich. The construction activity and the new gantries will be distantly visible from the Colton and Bishton areas in this farmland landscape, with single gantries being visible from the nearby properties, all in the context of the existing railway. The high sensitivity of the receptors assessed alongside the low adverse magnitude of impact will result in minor adverse effects during construction and operation.

Area F

8.2.12 The settlement of Colwich extends to the west of the A51 Tamworth Road, under which the WCML runs in cutting to pass through the village at its southern end and cross over Main Road, passing to the rear of residential houses in several locations as well as a primary school. The North Staffordshire Line diverges from the WCML just north of the Main Road bridge and curves northwards alongside the canal.

8.2.13 Works in this location will entail provision of two signal gantries, removal of one signal gantry, some localised changes to the tracks on the WCML and the North Staffordshire Line, and provision of a relocatable equipment building within an existing railway compound. Existing vegetation within and to the rear of many of the residential properties or alongside the railway will screen views of the works, but there will be filtered winter views from several houses in Dobree Close, along with views of the gantry removal and some track work from the rear of the primary school and from the adjacent footpath. These will be in the context of the existing similar views of the WCML, footbridge and A51 Tamworth Road overbridge. The low magnitude of impact considered alongside the high sensitivity of the receptors will result in minor adverse effect during construction. During operation, the magnitude of impact will be low adverse for Dobree Close and, when assessed alongside the high sensitivity of the receptors, will result in a minor adverse effect. There would be no operational effect on other receptors in Colwich.

9 Socio-economics

9.1 The area

9.1.1 This section sets out socio-economic baseline tables for each CFA which provides a general overview of the area in terms of employment, economic structure and labour market.

9.1.2 Where possible, baseline data has been gathered on demographic character areas (DCA) to provide a profile of local communities. DCA have been determined through an understanding of local context and aim to be aligned as closely as possible to groups of lower super output areas (LSOA).

9.1.3 Between Lichfield and Colwich the WCML passes through the Armitage and Handsacre[5], Rugeley[6] and Colwich[7] DCA). The WCML also passes through the boundaries of three local authorities – Lichfield, Cannock Chase and Stafford. Where available, baseline data depicting the business and labour market profile of the area has been collected at these two levels.

9.2 Business and labour market profile

9.2.1 Table 36shows the range of business activity within the Lichfield District, Cannock Chase District and Stafford Borough compared to the average in the West Midlands region and England, by type of activity.

Table 36: Business sector composition in Lichfield District, Cannock Chase District, Stafford Borough, the West Midlands and England[8]

Sector	Lichfield (%)	Cannock Chase (%)	Stafford (%)	West Midlands (%)	England (%)
Accommodation and food services	5.0	6.2	5.4	5.9	6.3
Agriculture, forestry and fishing	5.3	0.7	10.8	5.6	4.2
Arts, entertainment, recreation and other services	6.8	5.5	6.6	6.4	7.1
Business administration and support services	7.2	6.6	6.6	6.9	7.1
Construction	12.4	17.3	10.1	10.3	10.5
Health	4.9	4.7	5.8	5.9	5.7
Other	21.9	20.6	21.3	21.6	22.7
Production	7.6	9.5	6.2	7.8	5.8
Professional, scientific and technical	15.1	9.7	11.4	12.2	14.8
Retail	8.7	12.9	10.5	11.8	10.8
Wholesale	5.0	6.2	5.3	5.5	4.9

The data in the tables does not always sum to 100% due to rounding.

[5] Consisting of lower super output areas (LSOAs): Lichfield 001A, Lichfield 001B, Lichfield 001C.
[6] Consisting of LSOA: Cannock Chase 001E, Cannock Chase 002E, Cannock Chase 003A.
[7] Consisting of LSOA: Stafford 008B, Stafford 008C, Stafford 008E.
[8] Office for National Statistics (ONS), (2012) *UK Business: Activity, Size and Location* 2012.

9.2.2 Table 37 shows the size of employment in the DCA which the WCML passes through between Lichfield and Colwich.

Table 37: Employment in the Armitage and Handsacre, Colwich and Rugeley demographic character areas[9]

	Armitage and Handsacre DCA	Colwich DCA	Rugeley DCA
Employees	962	685	3,280

9.2.3 Table 38 shows the proportion of employment in LDC and the average in the West Midlands region and England, by industrial sector.

Table 38: Proportion of employment by industry

Sector	Armitage and Handsacre DCA	Colwich DCA	Rugeley DCA	Lichfield	Cannock Chase	Stafford	West Midlands	England
Manufacturing	9.3%	6.2%	19.4%	11.7%	13.1%	10.5%	11.7%	8.5%
Retail	3.7%	10.7%	17.2%	10.6%	12.2%	9.6%	9.7%	10.2%
Health	20.0%	7.6%	14.2%	11.6%	10.2%	19.6%	13.5%	12.4%
Accommodation and food services	6.0%	14.8%	8.8%	6.1%	7.2%	6.6%	5.9%	6.8%
Transport and storage (including postal)	4.4%	1.9%	8.8%	4.7%	6.7%	5.3%	4.8%	4.6%
Professional, scientific and technical	18.0%	4.4%	6.6%	7.4%	3.7%	4.0%	5.8%	7.8%
Construction	1.7%	8.2%	3.9%	6.7%	8.0%	3.7%	4.9%	4.7%
Other	36.9%	46.4%	21.0%	41.3%	39.0%	40.8%	43.7%	45.0%

Source – ONS, Business Register and Employment Survey 2011

9.2.4 Table 39 shows the count of employment and employment rate[10] in LDC, the West Midlands region and England.

Table 39: Employment rates (all usual residents aged 16 to 74)[11]

	Armitage and Handsacre DCA	Colwich DCA	Rugeley DCA	Lichfield	Cannock Chase	Stafford	West Midlands	England
Employment (Count)	2,625	2,295	2,393	49,016	47,476	64,494	2,536,876	25,162,721
Employment (%)	66.1%	66.4%	64.5%	65.6%	65.7%	66.3%	62.4%	64.7%

[9] ONS (2012), *Business Register and Employment Survey 2011*.
[10] The proportion of working age (16-74 years) of residents that are in employment. Employment is comprised of the proportion of total resident population who are 'in employment' and includes full-time students who are employed.
[11] ONS (2012), *2011 Census*.

9.2.5 Table 40 shows the unemployment rate and count for in LDC, the West Midlands region and England.

Table 40: Unemployment rates (Economically active residents aged 16 to 74)

	Armitage and Handsacre DCA	Colwich DCA	Rugeley DCA	Lichfield	Cannock Chase	Stafford	West Midlands	England
Unemployment (Count)	155	82	159	2,531	3,311	3,028	207,415	1,702,847
Unemployment (%)	3.9%	2.4%	4.3%	3.4%	4.6%	3.1%	5.1%	4.4%

Source – ONS, 2011 Census

9.2.6 Table 41 details the qualifications levels[12] of the resident population of working age (16-64 years old) within LDC, the West Midlands region and England.

Table 41: Resident workforce qualifications

	Armitage and Handsacre DCA	Colwich DCA	Rugeley DCA	Lichfield	Cannock Chase	Stafford	West Midlands	England
Level 4 and above	21.8%	34.8%	18.9%	28.4%	17.2%	30.3%	23.3%	27.4%
Level 3 and above	12.3%	12.2%	11.6%	11.8%	12.7%	12.9%	12.3%	12.4%
Level 2 and above	16.6%	15.8%	17.2%	16.0%	17.8%	15.8%	15.4%	15.2%
Level 1 and above	14.3%	11.3%	15.3%	13.7%	16.3%	12.7%	13.7%	13.3%
Apprenticeship	3.5%	4.0%	3.6%	3.5%	3.6%	3.5%	3.3%	3.6%
Other qualifications	3.9%	3.5%	4.4%	4.1%	4.2%	4.4%	5.4%	5.7%
No qualifications	27.7%	18.2%	28.9%	22.4%	28.2%	20.4%	26.6%	22.5%

Source – ONS, 2011 Census.

[12] No qualifications: No formal qualifications held; Other qualifications: includes foreign qualifications and some professional qualifications; Level 1 is equivalent to fewer than 5 GCSEs at grades A-C, foundation GNVQ, NVQ; Level 2 is equivalent to 5 or more GCSEs at grades A-C, intermediate GNVQ, NVQ 2; Level 3 is equivalent to 2 or more A levels, advanced GNVQ, NVQ 3; Level 4 is equivalent to HND, Degree and Higher Degree level qualifications or equivalent.

10 Sound, noise and vibration

Table 42: Sound, noise and vibration baseline data and assessment

Category	Section	Subsection	Summary text
1.0 Introduction	1.1 Introduction	N/A	The assessment of the change in rail noise from the WCML as a result of the introduction of the Proposed Scheme has been undertaken using the in-direct sound assessment methodology defined in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1), which is clarified in a number of areas by the SMR Addendum (Volume 5: Appendix CT-001-000/2) and is detailed in Appendix SV-001-000. Construction noise has been assessed using the methodology defined in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1), which is clarified in a number of areas by the SMR addendum (Volume 5: Appendix CT-001-000/2) and is detailed in Appendix SV-001-000.
	1.2 Environmental baseline	1.2.1 Existing baseline	The existing baseline sound environment at receptors or specifically the facades of receptors that could be affected by noise from the Proposed Scheme is currently shaped primarily by sound from the existing rail services. These include intercity and stopping services on the WCML, as well as regular freight movements, including movements at night. The assessment of likely noise effects from the operation of the Proposed Scheme has focused on the change in railway sound levels. These changes have been forecast using, for example, the change in rail traffic patterns that would result as a consequence of the Proposed Scheme. It is likely that the majority of receptors adjacent to the line of route are not currently subject to appreciable vibration[13]. Vibration at all receptors from the Proposed Scheme has therefore been assessed using specific thresholds, below which receptors will not be adversely affected by vibration. Further information is provided in Volume 1, Section 8.

[13] Further information is available in the Volume 5: Appendix SV-001-000, the SMR and the SMR Addendum.

Category	Section	Subsection	Summary text
2.0 Baseline	2.1 Key receptors and locations	N/A	There are several large communities and isolated properties located in proximity to the existing WCML and the proposed modification works. Assessment locations have been selected to represent the communities and isolated properties.
		2.1.2 Baseline noise measurements	Baseline noise measurements were undertaken at four locations along the length of the works. These locations are described below: Location 1 – Bellamour Lane Day-time – Measurements were taken at 12:45 and 15:35 on the 5th September 2013. A 62dB LpAeq was recorded within the noise climate dominated by road traffic noise from A51 and frequent bird song. An 89dB LpAFmax was the result of passing car on the road adjacent to the measurement location. Night-time – A measurement of the night time noise level was taken at 23:00 on the 5th September 2013. A level of 54dB LpAeq was recorded with the noise climate dominated by road traffic noise from A51, with frequent rail traffic noise from WCML and the noise of rustling trees consistent throughout the measurement period. 74dB LpAFmax was recorded as a result of a passing vehicle. Location 2 – Blithbury Road Day-time – Measurements were taken at 13:30 and 16:15 on the 5th September 2013. A 63dB LpAeq was recorded within the noise climate dominated by road traffic noise from A51 and frequent bird song. Frequent rail traffic from the WCML and infrequent local road traffic contributed to the recorded levels. Passing aircraft also feature. An 89dB LpAFmax was the result of passing HGV on the road adjacent to the measurement location. Night-time – A measurement of the night time noise level was taken at 23:40 on the 5th September 2013. A level of 58dB LpAeq was recorded with the noise climate dominated by road traffic noise from A51, and rustling trees, with very infrequent local traffic. 86dB LpAFmax was recorded as a result of a passing car.

Category	Section	Subsection	Summary text
		2.1.2 Baseline noise measurements	Location 3 - Church Lane, Armitage Day-time – A measurement was taken at 14:20 on the 5th September 2013. A 46 dB LpAeq was recorded within the noise climate dominated by road traffic noise from A51 and industrial noise from the power station. Rail traffic on the WCML and local road traffic contributed to recorded levels. Bird songs also feature throughout. A 71dB LpAFmax was the result of passing HGV on the road adjacent to the measurement location. Night-time – A measurement of the night time noise level was taken at 00:22 on 6 September 2013. A level of 37dB LAeq was recorded with the noise climate dominated by industrial noise from the power plant, although it was only just audible. 40dB LA10 and 33dB LA90 were also recorded. 49dB LpAFmax was recorded. The measured noise levels were used to determine baseline noise conditions at the assessment locations used to consider construction noise. The baseline methodology is provided in Volume 5: Appendices SV-001-000 and the SV-002-appendices for each of the CFA reporting areas. The assessment locations and defined baseline levels are set out in Table 43.

Category	Section	Subsection	Summary text
2.0 Effects arising during construction	2.1 Local assumptions and limitations	N/A	The line side and modification works to the existing railway infrastructure between Lichfield and Colwich and construction arrangements are described in Volume 4. The works associated with the new high speed rail infrastructure, its tie-in to the WCML at Handsacre and the associated construction arrangements are presented in Volume 2 CFA Report 22. The majority of construction activities between Lichfield and Colwich will need to be undertaken during the night-time for reasons of safety, engineering practicability or to reduce the impact on existing transport. Track modification works are assumed to occur intermittently over a four month period at any one receptor with noise emitting activities not taking place for 10 nights or more over 15 consecutive nights or more than a total of 40 nights in any six month period. Solid hoarding, or other comparable mitigation, which blocks line of sight between the works and the receptor have been assumed at the communities on New Road (A513), Handsacre, Blithbury Road, Rugeley and Dobree Close, Colwich, and also at the individual properties Colton Mill Farm, 6 Colton Road, Rugeley and Overdale, Colwich. The assessment takes into consideration the time of day that noise will be generated: noise at night is assessed against a more stringent criterion than that in the evening; and that in the evening against a more stringent criterion that that created during the day. It is expected that adverse noise effects would be limited in duration. Any noise effects arising from these short term construction activities will be controlled and reduced by the management processes set out in the draft CoCP.
	2.2 Avoidance and mitigation measures	N/A	The assessment assumes the implementation of the principles and management processes set out in Volume 1 and Volume 4.
	2.3 Assessment of impacts and effects from construction (temporary)	2.3.1 Description	The methodology is set out in Volume 5: Appendix SV-001-000.
		2.3.2 Indicative activity noise levels	A summary of the identified adverse effects on a community basis is provided in Table 45 and on individual residential properties is provided in Table 46. Based on the night time nature of the works no adverse effects are anticipated on the small number of non-residential receptors in close proximity to the works.

Category	Section	Subsection	Summary text
		2.3.3 Residential	Please refer to Table 45 and Table 46 for results of the assessment. A summary of the significant effects is presented in Volume 4.
		2.3.4 Non-residential	Based on the night time nature of the works no adverse effects are anticipated on the small number of non-residential receptors in close proximity to the works.
		2.3.5 Cumulative	None - Assumption that only one construction activity will be taking place at any one time and work happens linearly along the route, rather than multiple teams at multiple locations. No inter-project cumulative effects have been identified during the construction period for the Proposed Scheme within the study area.
	2.4 Summary of likely residual significant effects	2.4.1 Direct noise and vibration effects	Refer to Volume 4.
		2.4.2 Indirect noise and vibration effects	None.
3.0 Effects arising from the operation of the Proposed Scheme	3.1 Local assumptions and limitations	3.1.1 Local assumptions – service pattern	Refer to Volume 4.
	3.2 Avoidance and mitigation measures	3.2.1 Airborne noise	Refer to Volume 4.
		3.2.2 Ground-borne noise and vibration	Significant ground-borne noise or vibration effects will be avoided or reduced through the design of the track and track-bed for the Proposed Scheme (including realigned track on the WCML).
	3.3 Assessment of impacts and effects from operation of the scheme	3.3.1 Residential receptors and communities: direct effects	Refer to Volume 4.
		3.3.2 Residential receptors and communities: indirect effects	Refer to Volume 4.
		3.3.3 Non-residential receptors: direct effects	Refer to Volume 4.

Category	Section	Subsection	Summary text
		3.3.4 Non-residential receptors: indirect effects	Refer to Volume 4.
	3.3 Other mitigation measures	N/A	Refer to Volume 4.
	3.4 Summary of likely residual significant effects	N/A	Refer to Volume 4.
4.0 Limitations	4.1 Specific limitations	N/A	

Table 43: Assessment locations and baseline sound levels

Area represented	Existing baseline sound level (dB) free-field							Data source coding[14]
	For operational sound assessment				For construction sound assessment			
	Daytime $L_{pAeq,16hr}$	Night-time $L_{pAeq,8hr}$	Arithmetic average of night-time $L_{pAFmax,5min}$	Highest night-time $L_{pAFmax,5min}$	Daytime L_{pAeq}	Evening / Weekend L_{pAeq}	Night-time L_{pAeq}	
Old Road, Handsacre - Map CT-05-142, G5	40	30	30	N/A	40	N/A	30	2,A,i,b
Ford Way, Handsacre - Map CT-05-142, G5	40	30	30	N/A	40	N/A	30	2,A,i,b
73b New Road (A513), Handsacre - Map CT-05-142, G6	40	30	30	N/A	40	N/A	30	2,A,i,b
Farm off Church Lane, Mayesyn Ridware - Map CT-05-143, J1	40	30	30	N/A	40	N/A	30	2,A,i,b
Farm off Church Lane, Mayesyn Ridware - Map CT-05-143, J1	40	30	30	N/A	40	N/A	30	2,A,i,b
Cawarden Springs Farm - Map CT-05-143, A4	40	30	30	N/A	40	N/A	30	2,A,i,b
Cawarden Springs Farm - Map CT-05-143, A4	40	30	30	N/A	40	N/A	30	2,A,i,b
Colton Mill Farm - Map CT-05-144, C6	40	30	30	N/A	40	N/A	30	2,A,i,b

[14] Table 44 provides a data source coding key.

Area represented	Existing baseline sound level (dB) free-field							Data source coding[14]
	For operational sound assessment				For construction sound assessment			
	Daytime $L_{pAeq,16hr}$	Night-time $L_{pAeq,8hr}$	Arithmetic average of night-time $L_{pAFmax,5min}$	Highest night-time $L_{pAFmax,5min}$	Daytime L_{pAeq}	Evening / Weekend L_{pAeq}	Night-time L_{pAeq}	
Colton Mill Farm - Map CT-05-144, C6	40	30	30	N/A	40	N/A	30	2,A,i,b
Colton Mill Farm - Map CT-05-144, C6	40	30	30	N/A	40	N/A	30	2,A,i,b
1 Blithbury Road, Rugeley - Map CT-05-144, B5	40	30	30	N/A	40	N/A	30	2,A,i,b
1 Blithbury Road, Rugeley - Map CT-05-144, B5	40	30	30	N/A	40	N/A	30	2,A,i,b
1 Blithbury Road, Rugeley - Map CT-05-144, B5	40	30	30	N/A	40	N/A	30	2,A,i,b
6 Colton Road, Rugeley - Map CT-05-145, I6	40	30	30	N/A	40	N/A	30	2,A,i,b
6 Colton Road, Rugeley - Map CT-05-145, I6	40	30	30	N/A	40	N/A	30	2,A,i,b
6 Colton Road, Rugeley - Map CT-05-145, I6	40	30	30	N/A	40	N/A	30	2,A,i,b
Rycot Cottage, Rugeley - Map CT-05-145, F5	40	30	30	N/A	40	N/A	30	2,A,i,b
Rycot Cottage, Rugeley -Map CT-05-145, F5	40	30	30	N/A	40	N/A	30	2,A,i,b
Rycot Cottage, Rugeley -Map CT-05-145, F5	40	30	30	N/A	40	N/A	30	2,A,i,b
Rugeley Lodge, Rugeley - Map CT-05-145, D3	40	30	30	N/A	40	N/A	30	2,A,i,b
Rugeley Lodge, Rugeley - Map CT-05-145, D3	40	30	30	N/A	40	N/A	30	2,A,i,b
Rugeley Lodge, Rugeley - Map CT-05-145, D3	40	30	30	N/A	40	N/A	30	2,A,i,b
Wharf Cottage,Rugeley - Map CT-05-145, B8	40	30	30	N/A	40	N/A	30	2,A,i,b
Wharf Cottage,Rugeley - Map CT-05-145, B8	40	30	30	N/A	40	N/A	30	2,A,i,b
Wharf Cottage,Rugeley - Map CT-05-145, B8	40	30	30	N/A	40	N/A	30	2,A,i,b
Wharf Cottage,Rugeley - Map CT-05-145, B8	40	30	30	N/A	40	N/A	30	2,A,i,b

Area represented	Existing baseline sound level (dB) free-field							Data source coding[14]
	For operational sound assessment				For construction sound assessment			
	Daytime $L_{pAeq,16hr}$	Night-time $L_{pAeq,8hr}$	Arithmetic average of night-time $L_{pAFmax,5min}$	Highest night-time $L_{pAFmax,5min}$	Daytime L_{pAeq}	Evening / Weekend L_{pAeq}	Night-time L_{pAeq}	
Property on Bellamour Lane, east of road overbridge, Rugeley Map CT-05-145, B5	40	30	30	N/A	40	N/A	30	2,A,i,b
Property on Bellamour Lane, east of road overbridge, Rugeley Map CT-05-145, B5	40	30	30	N/A	40	N/A	30	2,A,i,b
Property on Bellamour Lane, west of road overbridge, Rugeley CT-05-146, H5	40	30	30	N/A	40	N/A	30	2,A,i,b
Farm on Bellamour Lane, west of road overbridge, Rugeley CT-05-146, H5	40	30	30	N/A	40	N/A	30	2,A,i,b
Bishton Hall, Rugeley - Map CT-05-146, D9	40	30	30	N/A	40	N/A	30	2,A,i,b
Bishton Hall, Rugeley - Map CT-05-146, D9	40	30	30	N/A	40	N/A	30	2,A,i,b
Bishton Lane Farm - Map CT-05-146, B7	40	30	30	N/A	40	N/A	30	2,A,i,b
Bishton Lane Farm - Map CT-05-146, B7	40	30	30	N/A	40	N/A	30	2,A,i,b
Overdale, Colwich - Map CT-05-147, F6	40	30	30	N/A	40	N/A	30	2,A,i,b
Overdale, Colwich - Map CT-05-147, F6	40	30	30	N/A	40	N/A	30	2,A,i,b
Overdale, Colwich -Map CT-05-147, F6	40	30	30	N/A	40	N/A	30	2,A,i,b
Dobree Close, Colwich - Map CT-05-147, E6	40	30	30	N/A	40	N/A	30	2,A,i,b
Dobree Close, Colwich - Map CT-05-147, E6	40	30	30	N/A	40	N/A	30	2,A,i,b
Dobree Close, Colwich - Map CT-05-147, E6	40	30	30	N/A	40	N/A	30	2,A,i,b

Area represented	Existing baseline sound level (dB) free-field							Data source coding[14]
	For operational sound assessment				For construction sound assessment			
	Daytime $L_{pAeq,16hr}$	Night-time $L_{pAeq,8hr}$	Arithmetic average of night-time $L_{pAFmax,5min}$	Highest night-time $L_{pAFmax,5min}$	Daytime L_{pAeq}	Evening / Weekend L_{pAeq}	Night-time L_{pAeq}	
Colwich Church of England Primary School, Colwich - Map CT-05-147, E6	40	30	30	N/A	40	N/A	30	2,A,i,b
Colwich Church of England Primary School, Colwich - Map CT-05-147, E6	40	30	30	N/A	40	N/A	30	2,A,i,b
Colwich Church of England Primary School, Colwich - Map CT-05-147, E6	40	30	30	N/A	40	N/A	30	2,A,i,b
Burial ground, Colwich - Map CT-05-D6	40	30	30	N/A	40	N/A	30	2,A,i,b
Youth centre, Colwich - Map CT-05-147, D6	40	30	30	N/A	40	N/A	30	2,A,i,b
Youth centre, Colwich - Map CT-05-147, D6	40	30	30	N/A	40	N/A	30	2,A,i,b
Station House, Colwich - Map CT-05-147, D6	40	30	30	N/A	40	N/A	30	2,A,i,b
Station House, Colwich - Map CT-05-147, D6	40	30	30	N/A	40	N/A	30	2,A,i,b

Table 44: Data source coding key

Code	Data source type
1	Long-term measurement location
2	Short-term (linked to simultaneous long-term)
3	Short-term (using profile from non-simultaneous long-term)
4	Short-term using standard (National Noise Incidence Study[15] or other) 24hr profile
5	Specific validated prediction
6	Predictions from other sources (Defra noise maps[16], etc.).
7	Generic levels
Code	**Corrections applied**
A	Data from above source applied directly
B	Correction applied for screening
C	Correction applied for distance from source
D	Minimum level cut-off applied.
Code	**Distance from measurement**
i	Data applied from a measurement at or very close to the assessment location.
ii	Data applied from a local measurement location at a greater distance but noted to have equivalent acoustic climate.
iii	Data applied from a distant measurement location where sound levels would be expected to be similar.
Code	**Uncertainty**
a	Data are considered highly representative of the prevailing sound climate
b	Data are considered representative of the prevailing sound climate, but variations in measured levels indicate that there may be a higher degree of uncertainty than for (a).

[15] BRE, (2002), *National Noise Incidence Study, 2000/2001*
[16] Department for Environment, Food and Rural Affairs (Defra);*Noise Mapping England*; http://services.defra.gov.uk/wps/portal/noise/; Accessed October 2013.

Code	Data source type
c	Data are considered to be an estimate of the sound climate, (e.g. taken from Defra noise maps, etc.).

Table 45: Assessment of construction noise on a community basis

Significant effect	Type of significant effect	Time of day	Location	Cause (construction activities)	Assumed duration of impact	Noise insulation?
New Road (A513), Handsacre	Construction noise	Night	Approximately 30 dwellings on New Road (A513), Handsacre	Armitage Shanks satellite compound with highest noise levels of around 49dB assuming solid hoarding blocks line of sight	13 months	No
Blithbury Road, Rugeley	Construction noise	Night	Approximately 6 dwellings on Blithbury Road, Rugeley	Track modifications with highest noise levels of around 54dB assuming solid hoarding blocks line of sight	Intermittent over four months	No
Dobree Close, Colwich	Construction noise	Night	Approximately 10 dwellings on Dobree Close	Track modifications with highest noise levels of around 52dB assuming solid hoarding blocks line of sight	Intermittent over four months	No

Table 46: Assessment of construction noise at individual properties (outside of residential community areas)

Adverse effect	Type of significant effect	Time of day	Location	Cause (construction activities)	Assumed duration of impact	Noise insulation?
Colton Mill Farm	Construction noise	Night	1 dwelling at Colton Mill Farm	Track modifications with highest noise levels of around 55dB assuming solid hoarding blocks line of sight	Intermittent over four months	No
6 Colton Road, Rugeley	Construction noise	Night	1 dwelling at Colton Road	Construction of piled foundation for signal gantry and track modifications, with highest noise levels of around 55 dB assuming solid hoarding blocks line of sight	Intermittent over four months	No
Wharf Cottage, Rugeley	Construction noise	Night	1 dwelling at Wharf Cottage	Track modifications with highest noise levels of around 52 dB	Intermittent over four months	No
Overdale, Colwich	Construction noise	Night	1 dwelling Overdale	Track modifications with highest noise levels of around 45 dB assuming solid hoarding blocks line of sight	Intermittent over four months	No
Station House, Colwich	Construction noise	Night	Station House, Colwich	Track modifications with highest noise levels of around 76 dB	Intermittent over four months	No

11 Water resources and flood risk assessment

Table 47: Water resources and flood risk baseline data and assessment – Area A

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Surface water resources	1.1.1 Surface water features	There are three watercourses crossed by the route in Area A; Curborough Brook, Full Brook and an unnamed watercourse. Curborough Brook is classified as a Main River.
		1.1.2 Water Framework Directive status	There is one Water Framework Directive (WFD) catchment within Area A. This is Pyford Brook Catchment, which is currently of moderate status.
		1.1.3 Abstraction/discharge consents/licences	There are eight listed environmental permits for discharge to surface water within Area A and one licensed abstraction from surface water.
	1.2 Groundwater resources	1.2.1 Geology and hydrogeology	The Bromsgrove Sandstone Formation is designated as a Principal aquifer. The Mercia Mudstone Group is designated as a Secondary B aquifer.
		1.2.2 Superficial deposits	The alluvium deposit is designated as a Secondary A aquifer. The glaciofluvial sheet deposits are designated as a Secondary A aquifer.
		1.2.3 Bedrock aquifers	The Bromsgrove Sandstone Formation is a Principal aquifer and is the dominant bedrock to the south of Area A. At the northern end of Area A is bedrock of the Mercia Mudstone Group, which is a Secondary B aquifer.
		1.2.4 Water Framework Directive status	The Bromsgrove Sandstone Formation is categorised as having a High WFD status. The Mercia Mudstone Group is categorised as having a Moderate WFD status.
		1.2.5 Abstraction/discharge consents/licences, wells	There are four environmental permits for discharge to groundwater within Area A and no listed abstractions.
		1.2.6 Surface water/ groundwater interaction	Dewatering is not expected to be required for any of the WCML modifications, therefore no ponds and springs have been detailed within the assessment.

Category	Section	Subsection	Summary text
		1.2.7 Water dependant habitats	Stowe Pools is the only Site of Special Scientific Interest (SSSI) in the study area. There are five biodiversity action sites (BAS) and one LWS which lies adjacent to the route at the northern end of Area A. All of these water dependant habitats are located outside of the boundary of land required for construction, and hence are unlikely to be affected.
	1.3 Flood risk	1.3.1 River flooding	Environment Agency mapping shows that there is a low risk of river flooding within Area A.
		1.3.2 Surface water flooding	The Environment Agency's Flood Maps for Surface Water indicate that an area to the southern end of Area A is at medium risk of flooding from surface water. The existing railway sidings at Lichfield are within this area, and hence may be susceptible. The rest of Area A is classified as having no risk of surface water flooding.
		1.3.3 Sewer flooding	There are two sewer overflow valves located within Area A. One is located on Nash Lane in Elmhurst and the other is at the very southern end of Area A, adjacent to the A5192 in Streethay. Neither overlap with the land required for construction or operation of the Proposed Scheme. However, a sewer line crosses beneath the existing rail sidings at Lichfield, and hence the risk of sewer flooding is considered to be medium/high.
		1.3.4 Artificial water bodies	To the southern end of Area A, the route is susceptible to flooding from Stowe Pool. Due to the robust maintenance and inspection regime applied to reservoirs it is considered that the risk is low.
		1.3.5 Groundwater flooding	The Preliminary Flood Risk Assessment (PFRA)[17]reports that no instances of groundwater flooding are known to LDC or SCC. Therefore the risk is considered to be low.
	1.4 Future baseline	N/A	Due to the limited extent of the works within this area, it is not expected that any other development within the vicinity will significantly change the baseline. The potential impacts of climate change on flood risk have been considered in line with the guidance within the National Planning Policy Framework (NPPF).

[17] Staffordshire County Council (2011), *Staffordshire Preliminary Flood Risk Assessment*. Completed by Royal Haskoning on behalf of Staffordshire County Council.

Category	Section	Subsection	Summary text
2.0 Effects during construction	2.1 Avoidance and mitigation	N/A	The construction assessment takes into account the mitigation measures contained within Section 16 of the draft CoCP. (see Volume 5: Appendix CT-003-000) The draft CoCP sets out the measures and standards of work that will be applied to the construction of the Proposed Scheme. It will require the effective management and control of work in respect of flood risk and the protection of water resources. Watercourse crossings and culverts will be designed in accordance with the CIRIA Culvert Design Manual[18]. The culvert will be adequately sized for the 1 in 100 (1%) annual probability flood event, including an allowance for climate change. Therefore the works will not significantly alter the flood risk arising from these watercourses.
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Surface water	The assessment has identified no significant temporary effects on surface water from construction.
		2.2.2 Ground water	The assessment has identified no significant temporary effects to groundwater from construction.
		2.2.3 Flood risk	The temporary works interact with various sources of flood risk; however, the works will be completed in line with the measures set out within the draft CoCP which ensures that the temporary works are not at an unacceptable flood risk and that the works do not cause an increase in flood risk elsewhere. It is considered that there will be no significant temporary effects in respect of flooding either from or to the Proposed Scheme.
		2.2.4 Cumulative effects	The assessment has identified no cumulative significant temporary effects from construction.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Surface water	The assessment has identified no significant permanent effects on surface water.
		2.3.2 Ground water	The assessment has identified no significant permanent effects on groundwater from construction.
		2.3.3 Flood risk	The Proposed Scheme is within areas identified as being at risk of flooding from several sources. The design of the Proposed Scheme, including the mitigation measures, ensures that the construction works are at an acceptable level of risk and do not result in an increased flood risk elsewhere, including an allowance for climate change.
		2.3.4 Cumulative effects	The assessment has identified no cumulative significant permanent effects from construction.
	2.4 Other mitigation measures	N/A	As no significant effects have been identified no other mitigation is considered necessary.

[18] Construction Industry Research and Information Association (2010), *Culvert Design and Operation Guide (C689)*.

Category	Section	Subsection	Summary text
	2.5 Summary of likely significant residual effects	N/A	No significant residual effects are considered likely.
3.0 Effects arising from the operation of the Proposed Scheme	3.1 Avoidance and mitigation	N/A	The operation assessment assumes that good practice measures with regard to pollution prevention will be applied, for example those set out with the Environment Agency's Pollution Prevention Guidance[19].
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	With the implementation of good practice measures it is considered that the impact to water resources from the operation of the Proposed Scheme is not significantly different to that presented by the existing infrastructure. The effect of the Proposed Scheme is negligible.
	3.3 Other mitigation measures	N/A	As no significant effects have been identified no other mitigation is considered necessary.
	3.4 Summary of likely significant residual effects	N/A	No significant residual effects are considered likely.

[19] Environment Agency; Pollution prevention advice and guidance (PPG); http://www.environment-agency.gov.uk/business/topics/pollution/39083.aspx; Accessed 10 October 2013.

Table 48: Water resources and flood risk baseline data and assessment – Area B

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Surface water resources	1.1.1 Surface water features	There are four watercourses within Area B; two unnamed tributaries of the River Trent, the Trent and Mersey Canal and an unnamed ordinary watercourse. One of the unnamed tributaries is classified as a Main River.
		1.1.2 Water Framework Directive status	There are three WFD catchments within Area B. These include: The River Trent from Moreton Brook to River Tame (GB104028047290) – Currently poor status; Longdon/Armitage Catchment – tributary of Trent (GB104028047260) – Currently moderate status; and Trent and Mersey Canal, summit to Alrewas (GB70410142) – Currently good potential.
		1.1.3 Abstraction/discharge consents/licences	There are eight listed environmental permits for discharge to surface water within Area B. There are two licensed surface water abstractions.
	1.2 Groundwater resources	1.2.1 Geology and hydrogeology	The Bromsgrove Sandstone Formation is designated as a Principal aquifer. The Mercia Mudstone Group is designated as a Secondary B aquifer.
		1.2.2 Superficial deposits	The glaciofluvial sheet deposits are designated as a Secondary A aquifer. The alluvium deposit is designated as a Secondary A aquifer.
		1.2.3 Bedrock aquifers	The bedrock varies between two lithologies within Area B. The dominant lithology consists of the Mercia Mudstone Group and underlies most of Area B. The Bromsgrove Sandstone Formation only appears in a small section at the very northern end of Area B.
		1.2.4 Water Framework Directive status	The Mercia Mudstone Group is categorised as having a Moderate WFD status. The Bromsgrove Sandstone Formation is categorised as having a High WFD status.
		1.2.5 Abstraction/discharge consents/licences, wells	There are four environmental permits for discharge to groundwater within Area B and no listed abstractions.
		1.2.6 Surface water/ groundwater interaction	Dewatering is not expected to be required for any of the WCML modifications, therefore no ponds and springs have been detailed within the assessment.
		1.2.7 Water dependant habitats	The Trent and Mersey Canal: Armitage Church to Tuppenhurst Road SBI is the only LWS within Area B. This SBI is located outside of the footprint of the proposed works, and hence is unlikely to be affected.

Category	Section	Subsection	Summary text
	1.3 Flood risk	1.3.1 River flooding	Environment Agency mapping shows that the area is located within flood zone 1 and hence there is a low risk of river flooding within Area B.
		1.3.2 Surface water flooding	The majority of Area B is at no risk of surface water flooding. However, the Environment Agency's Flood Maps for Surface Water indicate a small area immediately adjacent to the route at the northern end of Area B which is at medium risk of surface water flooding. This overlaps with the location of a satellite compound that is currently in use.
		1.3.3 Sewer flooding	There is one sewer overflow valve within Area B. This is located in the allotment gardens, adjacent to the Trent and Mersey Canal at Handsacre. This is maintained by Severn Trent Water Ltd and does not impose on any of the land required for the construction of the Proposed Scheme. The sewer network crosses beneath the existing compound discussed in section 1.3.2. Sewer manholes will also be present within this compound area. Therefore, the site will be at a high risk of sewer flooding.
		1.3.4 Artificial water bodies	Environment Agency mapping shows that Area B is not susceptible to flooding from reservoirs.
		1.3.5 Groundwater flooding	The PFRA reports that no instances of groundwater flooding are known to Lichfield District Council or Staffordshire County Council. Therefore the risk is considered to be low.
	1.4 Future baseline	N/A	Due to the limited extent of the works within this area, it is not expected that any other development within the vicinity will significantly change the baseline. Walton Homes Ltd has proposed future construction in Armitage (see Section 12 of this appendix), adjacent to where the existing compound is to be utilised. These works propose demolishing the existing structures (i.e. roads and buildings) and rebuilding new houses in replacement. It is unlikely to result in any significant effect on water resources or flood risk in this area. The potential impacts of climate change on flood risk have been considered in line with the guidance within the NPPF.
2.0 Effects during construction	2.1 Avoidance and mitigation	N/A	The construction assessment takes into account the mitigation measures contained within Section 16 of the draft CoCP. The draft CoCP sets out the measures and standards of work that will be applied to the construction of the Proposed Scheme. It will require the effective management and control of work in respect of flood risk and the protection of water resources. Watercourse crossings and culverts will be designed in accordance with the CIRIA Culvert Design Manual. The culvert will be adequately sized for a 1 in 100 (1%) annual probability event, including an allowance for climate change. Therefore the works will not significantly alter the flood risk arising from these watercourses.
	2.2 Assessment of Impacts	2.2.1 Surface water	The assessment has identified no significant temporary effects on surface water.

Category	Section	Subsection	Summary text
	and effects from construction (temporary)	2.2.2 Groundwater	The assessment has identified no significant temporary effects on groundwater.
		2.2.3 Flood risk	The temporary works interact with various sources of flood risk. However, the works will be completed in line with the measures set out within the draft CoCP, which ensures that the temporary works are not at an unacceptable flood risk and that the works do not cause an increase in flood risk elsewhere. It is considered that there will be no significant temporary effects in respect of flooding either from or to the Proposed Scheme.
		2.2.4 Cumulative effects	The assessment has identified no cumulative significant temporary effects from construction.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Surface water	The assessment has identified no significant permanent effects on surface water.
		2.3.2 Ground water	The assessment has identified no significant permanent effects on groundwater.
		2.3.3 Flood risk	The Proposed Scheme is within areas identified as being at risk of flooding from several sources. The design of the Proposed Scheme, including the mitigation measures, ensures that the construction works are at an acceptable level of risk and do not result in an increased flood risk elsewhere, including an allowance for climate change.
		2.3.4 Cumulative effects	The assessment has identified no cumulative significant permanent effects from construction.
	2.4 Other mitigation measures	N/A	As no significant effects have been identified no other mitigation is considered necessary.
	2.5 Summary of likely significant residual effects	N/A	No significant residual effects are considered likely.
3.0 Effects arising from the operation of the Proposed Scheme	3.1 Avoidance and mitigation	N/A	The operation assessment assumes that good practice measures with regard to pollution prevention will be applied, for example those set out with the Environment Agency's Pollution Prevention Guidance.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	With the implementation of such good practice it is considered that the impact to water resources from the operation of the Proposed Scheme is not significantly different to that presented by the existing infrastructure. The effect of the Proposed Scheme is negligible.
	3.3 Other mitigation measures	N/A	As no significant effects have been identified no other mitigation is considered necessary.
	3.4 Summary of likely significant residual effects	N/A	No significant residual effects are considered likely.

Table 49: Water resources and flood risk baseline data and assessment – Area C

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Surface water resources	1.1.1 Surface water features	There are five watercourses within Area C; an extended culvert, the Trent and Mersey Canal, Bourne Brook, the River Trent and an unnamed ordinary watercourse. The River Trent is a Main River.
		1.1.2 Water Framework Directive status	There are two catchments within Area C. These are: River Trent from Moreton Brook to River Tame (GB104028047290) – Currently poor status; and Trent and Mersey Canal, summit to Alrewas (GB70410142) – Currently good status.
		1.1.3 Abstraction/discharge consents/licences	There are 15 listed environmental permits for discharge to surface water within Area C. There are six licensed abstractions from surface water. No unlicensed potable abstractions are recorded in the area.
	1.2 Groundwater resources	1.2.1 Geology and hydrogeology	The Kidderminster Formation is designated as a Principal aquifer. The Bromsgrove Sandstone Formation is designated as a Principal aquifer. The Mercia Mudstone Group is designated as a Secondary B.
		1.2.2 Superficial deposits	The alluvium deposit is designated as a Secondary A aquifer. The river terrace deposits are designated as a Secondary A aquifer. The till (diamicton) is designated as Unproductive Strata.
		1.2.3 Bedrock aquifers	The bedrock varies between three lithologies within Area C; Bromsgrove Sandstone Formation, Kidderminster Formation and Mercia Mudstone Group.
		1.2.4 Water Framework Directive status	The Kidderminster Formation is categorised as having a High WFD status. The Bromsgrove Sandstone Formation is categorised as having a High WFD status. The Mercia Mudstone Group is categorised as having a Moderate WFD status.
		1.2.5 Abstraction/discharge consents/licences, wells	There are six environmental permits for discharge to groundwater. There are three licensed abstractions from groundwater. No unlicensed potable abstractions are recorded in the area.

Category	Section	Subsection	Summary text
		1.2.6 Surface water/ groundwater interaction	A permanent access route is proposed towards the northern end of Area C, approximately 300m south-east of Cawarden Springs Wood. This road will follow an existing dirt track, which passes very close to four ponds. The Environment Agency's Flood Maps for Surface Water indicate that this area is at no risk of surface water flooding. As there is a dirt track already here, the ponds are unlikely to be significantly affected by the new road.
		1.2.7 Water dependant habitats	Within Area C there are three LWS and one biodiversity action site (BAS). All of these potentially water dependant habitats are located outside of the land required for construction and operation of the Proposed Scheme, and hence are unlikely to be disrupted by this.
	1.3 Flood risk	1.3.1 River flooding	Environment Agency mapping shows that the area is located within flood zone 1 and hence there is a low risk of river flooding within Area C.
		1.3.2 Surface water flooding	The Environment Agency's Flood Maps for Surface Water indicate that a small area of land near Lawnmeadow Covert is at medium/high risk from surface water flooding. A crane platform will overlap with this area of land. Another small area of land near Cawarden Springs Wood is at a low risk of flooding and will be covered by a crane platform.
		1.3.3 Sewer flooding	Information relating to the sewer network was not available when this analysis was undertaken. However, due to the limited extent of the works in the area interaction with areas at risk of sewer flooding is likely to be limited.
		1.3.4 Artificial water bodies	Environment Agency mapping shows that Area C is not susceptible to flooding from reservoirs.
		1.3.5 Groundwater flooding	The PFRA reports that no instances of groundwater flooding are known to Lichfield District Council or Staffordshire County Council. Therefore the risk is considered to be low.
	1.4 Future baseline	N/A	Due to the limited extent of the works within this area, it is not expected that any other development within the vicinity will significantly change the baseline. The potential impacts of climate change on flood risk have been considered in line with the guidance within the NPPF.

Category	Section	Subsection	Summary text
2.0 Effects during construction	2.1 Avoidance and mitigation	N/A	Where practicable, Sustainable Drainage Systems (SuDS) have been included to manage runoff rates and reduce the risk of pollution arising from roads and other activities. The construction assessment takes into account the mitigation measures contained within Section 16 of the draft CoCP. The draft CoCP sets out the measures and standards of work that will be applied to the construction of the Proposed Scheme. It will require the effective management and control of work in respect of flood risk and the protection of water resources. Watercourse crossings and culverts will be designed in accordance with the CIRIA Culvert Design Manual. The culvert will be adequately sized for the 1 in 100 (1%) annual probability event, including an allowance for climate change. Therefore the works will not significantly alter the flood risk arising from these watercourses.
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Surface water	The assessment has identified no significant temporary effects on surface water from construction.
		2.2.2 Ground water	The assessment has identified no significant temporary effects to groundwater from construction.
		2.2.3 Flood risk	The temporary works interact with various sources of flood risk; however, the works will be completed in line with the measures set out within the draft CoCP which ensures that the temporary works are not at an unacceptable flood risk and that the works do not cause an increase in flood risk elsewhere. It is considered that there will be no significant temporary effects in respect of flooding either from or to the Proposed Scheme.
		2.2.4 Cumulative effects	The assessment has identified no cumulative significant temporary effects from construction.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Surface water	The assessment has identified no significant permanent effects on surface water.
		2.3.2 Ground water	The assessment has identified no significant permanent effects on groundwater from construction.
		2.3.3 Flood risk	The Proposed Scheme is within areas identified as being at risk of flooding from several sources. The design of the Proposed Scheme, including the mitigation measures, ensures that the construction works are at an acceptable level of risk and will not cause an increased flood risk elsewhere, including an allowance for climate change.
		2.3.4 Cumulative effects	The assessment has identified no cumulative significant permanent effects from construction.
	2.4 Other mitigation measures	N/A	As no significant effects have been identified no other mitigation is considered necessary.
	2.5 Summary of likely significant residual effects	N/A	No significant residual effects are considered likely.

Category	Section	Subsection	Summary text
3.0 Effects arising from the operation of the Proposed Scheme	3.1 Avoidance and mitigation	N/A	The operation assessment assumes that good practice measures with regard to pollution prevention will be applied, for example those set out with the Environment Agency's Pollution Prevention Guidance.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	With the implementation of such good practice it is considered that the impact to water resources from the operation of the Proposed Scheme is not significantly different to that presented by the existing infrastructure. The effect of the Proposed Scheme is negligible.
	3.3 Other mitigation measures	N/A	As no significant effects have been identified no other mitigation is considered necessary.
	3.4 Summary of likely significant residual effects	N/A	No significant residual effects are considered likely.

Table 50: Water resources and flood risk baseline data and assessment – Area D

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Surface water resources	1.1.1 Surface water features	There is one watercourse crossed by the route in Area D called Moreton Brook, which is classified as a Main River.
		1.1.2 Water Framework Directive status	There is one WFD catchment within Area D. This is Moreton Brook from Source to River Trent (GB104028047380) in the Humber and the Severn River Basin – currently moderate status.
		1.1.3 Abstraction/discharge consents/licences	There are 25 listed environmental permits for discharge to surface water within area D. There are four licensed abstractions from surface water. No unlicensed potable abstractions are recorded in the area.
	1.2 Groundwater resources	1.2.1 Geology and hydrogeology	The Bromsgrove Sandstone Formation is designated as a Principal aquifer. The Mercia Mudstone Group is designated as a Secondary B Aquifer.
		1.2.2 Superficial deposits	The alluvium deposit is designated as a Secondary A aquifer. The river terrace deposits are designated as a Secondary A aquifer.
		1.2.3 Bedrock aquifers	Bromsgrove Sandstone Formation is a Principal aquifer and is the dominant bedrock to the south of Area D. At the northern end of Area D is bedrock of the Mercia Mudstone Group, which is a Secondary B aquifer.
		1.2.4 Water Framework Directive status	The Bromsgrove Sandstone Formation is categorised as having a High WFD status. The Mercia Mudstone Group is categorised as having a Moderate WFD status.
		1.2.5 Abstraction/discharge consents/licences, wells	There is one listed environmental permit for discharge to groundwater in area D. There are no licensed abstractions from groundwater. No unlicensed potable abstractions are recorded in the area.
		1.2.6 Surface water/ groundwater interaction	Dewatering is not expected to be required for any of the WCML modification, and no ponds or springs have been identified within the land required for construction or operation of the Proposed Scheme.

Category	Section	Subsection	Summary text
		1.2.7 Water dependant habitats	There are no designated SSSI within Area D. There are two LWS which lie adjacent to the route within Area D, Cawarden Springs Wood to the south and Bereton Works which lies central within the area. None of these potentially water dependent habitats lies within the boundary of land required for construction or operation of the Proposed Scheme and so are unlikely to be impacted.
	1.3 Flood risk	1.3.1 River flooding	The Environment Agency flood mapping shows that some of the works including construction of a storage laydown area along with a new relay equipment building and the existing Rugeley sidings are within Flood Zones 2 and 3 demonstrating that along the extent of this area various works maybe at moderate and high risk from river flooding from Moreton Brook and the River Trent.
		1.3.2 Surface water flooding	The Environment Agency Flood Maps for Surface Water indicate that a small area adjacent to Colton Road in Rugeley is at a medium/high risk of flooding from surface water. A new permanent access route and car park will be located in this area and hence may be susceptible. A crane platform will be situated slightly further north in another area at medium/high risk of surface water flooding adjacent to Colton Road (Map CT-05-144, A6).
		1.3.3 Sewer flooding	Information relating to the sewer network was not available when this analysis was undertaken. However, due to the limited extent of the works in the area interaction with areas at risk of sewer flooding is likely to be limited.
		1.3.4 Artificial water bodies	Environment Agency Reservoir Flood Maps do not indicate that the Proposed Scheme is at risk from reservoir flooding.
		1.3.5 Groundwater flooding	The PFRA reports that no instances of groundwater flooding are known to Staffordshire County Council. Therefore the risk is considered to be low.
	1.4 Future baseline	N/A	Due to the limited extent of the works within this area, it is not expected that any other development within the vicinity will significantly change the baseline. The potential impacts of climate change on flood risk have been considered in line with the guidance within the NPPF.

Category	Section	Subsection	Summary text
2.0 Effects during construction	2.1 Avoidance and mitigation	N/A	Use of SuDS will be implemented to mitigate the effects of runoff and contamination during construction. The construction assessment takes into account the mitigation measures contained within Section 16 of the draft CoCP. The draft CoCP sets out the measures and standards of work that will be applied to the construction of the Proposed Scheme. It will require the effective management and control of work in respect of flood risk and the protection of water resources. Watercourse crossings and culverts will be designed in accordance with the CIRIA Culvert Design Manual. The culvert will be adequately sized for a 1 in 100 (1%) annual probability event, including an allowance for climate change. Therefore the works will not significantly alter the flood risk arising from these watercourses.
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Surface water	The assessment has identified no significant temporary effects to surface water from construction operations.
		2.2.2 Ground water	The assessment has identified no significant temporary effects to groundwater from construction operations.
		2.2.3 Flood risk	The temporary works interact with various sources of flood risk; however, the works will be completed in line with the measures set out within the draft CoCP which ensures that the temporary works are not at an unacceptable flood risk and that the works do not cause an increase in flood risk elsewhere. It is considered that there will be no significant temporary effects in respect of flooding either from or to the Proposed Scheme.
		2.2.4 Cumulative effects	The assessment has identified no cumulative significant temporary effects from construction operations.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Surface water	The assessment has identified no significant permanent effects on surface water from construction operations.
		2.3.2 Groundwater	The assessment has identified no significant permanent effects on groundwater from construction operations.
		2.3.3 Flood risk	The Proposed Scheme is within areas identified as being at risk of flooding from several sources. The design of the Proposed Scheme, including the mitigation measures, which may include provision of flood plain compensation, ensures that the construction works are at an acceptable level of risk and will not cause an increased flood risk elsewhere, including an allowance for climate change.
		2.3.4 Cumulative effects	The assessment has identified no significant cumulative effects as a result from construction operations.
	2.4 Other mitigation measures	N/A	The assessment has identified no further areas requiring mitigation measures.

Category	Section	Subsection	Summary text
	2.5 Summary of likely significant residual effects	N/A	No significant residual effects have been identified.
3.0 Effects arising from the operation of the Proposed Scheme	3.1 Avoidance and mitigation	N/A	Use of SuDS maybe implemented to mitigate the negative effects of runoff and contamination during operation. Operation and maintenance of the Proposed Scheme will be subject to controls agreed with the regulators, such as the Environment Agency, to provide effective control and management of impacts during the operational period.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	The assessment has been carried out assuming that best practice will be used during the operation and maintenance of the Proposed Scheme.
	3.3 Other mitigation measures	N/A	The assessment has identified no further mitigation measures required during the operation of the Proposed Scheme.
	3.4 Summary of likely significant residual effects	N/A	No significant residual effects are identified to be associated with operation of the Proposed Scheme.

Table 51: Water resources and flood risk baseline data and assessment – Area E

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Surface water resources	1.1.1 Surface water features	There are no water courses crossed by the route in Area E.
		1.1.2 Water Framework Directive status	River Trent from River Sow to Moreton Brook (GB104028047300) in the Humber and the Severn River Basin – poor status.
		1.1.3 Abstraction/discharge consents/licences	There are eight listed environmental permits for discharge to surface water within area E. There is one licensed abstractions from surface water. Two unlicensed private water supplies are located within the study area. The source of water is not known.
	1.2 Groundwater resources	1.2.1 Geology and hydrogeology	The Mercia Mudstone Group is designated as a Secondary B aquifer.
		1.2.2 Superficial deposits	The river terrace deposits are designated as a secondary A aquifer.
		1.2.3 Bedrock aquifers	The Mercia Mudstone Group forms a Secondary B aquifer and is the underlying bedrock across the extent of Area E.
		1.2.4 Water Framework Directive status	The Mercia Mudstone Group is categorised as having a Moderate WFD status.
		1.2.5 Abstraction/discharge consents/licences, wells	There are no listed environmental permits for discharge to groundwater or licensed abstractions from groundwater in the area. No unlicensed potable abstractions are recorded in the area.
		1.2.6 Surface water/ groundwater interaction	Dewatering is not expected to be required for any of the WCML modifications, and no ponds or springs have been identified within the land required for construction and operation of the Proposed Scheme.
		1.2.7 Water dependant habitats	There are no sites with protected status within Area E.
	1.3 Flood risk	1.3.1 River flooding	Environment Agency mapping demonstrates that there is no risk of flooding posed by rivers across the extent of Area E.
		1.3.2 Surface water flooding	The Environment Agency Flood Maps for Surface Water indicate that a temporary access route will cross an area at medium/high risk of surface water flooding near Bishton. Also, a crane platform will be on land at a low risk of surface water flooding in the same area.

Category	Section	Subsection	Summary text
		1.3.3 Sewer flooding	Information relating to the sewer network was not available when this analysis was undertaken. However, due to the limited extent of the works in the area interaction with areas at risk of sewer flooding is likely to be limited.
		1.3.4 Artificial water bodies	Environment Agency Reservoir Flood Maps do not indicate that the Proposed Scheme is at risk from reservoir flooding.
		1.3.5 Groundwater flooding	The PFRA reports that no instances of groundwater flooding are known to Staffordshire County Council. Therefore the risk is considered to be low.
	1.4 Future baseline	N/A	Due to the limited extent of the works within this area, it is not expected that any other development within the vicinity will significantly change the baseline. Network Rail has proposed building a vehicle parking compound on the land at Bellamour Lane in the future (see Section 12 of this appendix). This area of land does not overlap with any of the land required for construction or operation of the Proposed Scheme and hence is unlikely to have a significant effect on the baseline in this area. The potential impacts of climate change on flood risk have been considered in line with the guidance within the NPPF.
2.0 Effects during construction	2.1 Avoidance and mitigation	N/A	Use of SuDS will be implemented to mitigate the effects of runoff and contamination during construction. The construction assessment takes into account the mitigation measures contained within Section 16 of the draft CoCP. The draft CoCP sets out the measures and standards of work that will be applied to the construction of the Proposed Scheme. It will require the effective management and control of work in respect of flood risk and the protection of water resources. Watercourse crossings and culverts will be designed in accordance with the CIRIA Culvert Design Manual. The culvert will be adequately sized for a 1 in 100 (1%) annual probability event, including an allowance for climate change. Therefore the works will not significantly alter the flood risk arising from these watercourses.
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Surface water	The assessment has identified no significant permanent effects on surface water from construction operations.
		2.2.2 Groundwater	The assessment has identified no significant permanent effects on surface water from construction operations.

Category	Section	Subsection	Summary text
		2.2.3 Flood risk	The temporary works may be at risk from various sources of flood risk; however, the works will be completed in line with the measures set out within the draft CoCP which ensures that the temporary works are not at an unacceptable flood risk and that the works do not cause an increase in flood risk elsewhere. It is considered that there will be no significant temporary effects in respect of flooding either from or to the Proposed Scheme.
		2.2.4 Cumulative effects	The assessment has identified no significant permanent effects on surface water from construction of the Proposed Scheme.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Surface water	The assessment has identified no significant permanent effects on surface water from construction of the Proposed Scheme.
		2.3.2 Ground water	The assessment has identified no significant permanent effects on surface water from construction of the Proposed Scheme.
		2.3.3 Flood risk	The Proposed Scheme is within an area identified as being at risk of flooding from several sources. The design of the Proposed Scheme, including the mitigation measures, ensures that the construction works are at an acceptable level of risk and will not result in an increased flood risk elsewhere, including an allowance for climate change.
		2.3.4 Cumulative effects	The assessment has identified no significant cumulative effects as a result from construction operations.
	2.4 Other mitigation measures	N/A	The assessment has identified no further areas requiring mitigation measures.
	2.5 Summary of likely significant residual effects	N/A	No significant residual effects have been identified.
3.0 Effects arising from the operation of the Proposed Scheme	3.1 Avoidance and mitigation	N/A	Operation and maintenance during of the Proposed Scheme will be subject to controls agreed with the regulators, such as the Environment Agency, to provide effective control and management of impacts during the operational period.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	The assessment has been carried out assuming that best practice will be used during the operation and maintenance of the Proposed Scheme.
	3.3 Other mitigation measures	N/A	The assessment has identified no further mitigation measures required during the operation of the Proposed Scheme.
	3.4 Summary of likely significant residual effects	N/A	No significant residual effects are identified to be associated with operation of the Proposed Scheme.

Table 52: Water resources and flood risk baseline data and assessment – Area F

Category	Section	Subsection	Summary text
1.0 Baseline	1.1 Surface water resources	1.1.1 Surface water features	There are two watercourses crossed by the route in Area F; the River Trent and the Trent and Mersey Canal. The River Trent is a Main River.
		1.1.2 Water Framework Directive status	River Trent from River Sow to Moreton Brook (GB104028047300) in the Humber and the Severn River Basin – poor status.
		1.1.3 Abstraction/discharge consents/licences	There are three listed environmental permits for discharge to surface water in area F. There is one licensed surface water abstraction. No unlicensed potable abstractions are recorded in the area.
	1.2 Groundwater resources	1.2.1 Geology and hydrogeology	The Bromsgrove Sandstone Formation is designated as a Principal aquifer. The Kidderminster Formation is designated as a Principal aquifer.
		1.2.2 Superficial deposits	The river terrace deposits are designated as a Secondary A aquifer.
		1.2.3 Bedrock aquifers	The Bromsgrove Sandstone Formation is a Principal aquifer and is the dominant bedrock to the east of Area F. The Kidderminster Formation is a Principal aquifer and is the dominant bedrock to the west of Area F.
		1.2.4 Water Framework Directive status	The Bromsgrove Sandstone Formation is categorised as having a High WFD status. The Kidderminster Formation is categorised as having a High WFD status.
		1.2.5 Abstraction/discharge consents/licences, wells	There is one listed environmental permit for discharge to groundwater. There is one licensed groundwater abstractions. No unlicensed potable abstractions are recorded in the area.
		1.2.6 Surface water/ groundwater interaction	Dewatering is not expected to be required for any of the WCML modifications, and no ponds or springs have been identified within the land required for construction or operation of the Proposed Scheme. Therefore none have been identified for assessment.
		1.2.7 Water dependant habitats	Cannock Chase is the only SSSI. This potentially water dependant habitat is located outside of the footprint of the proposed works, at approximately 500m south of the existing WCML, and is unlikely to be disrupted.

Category	Section	Subsection	Summary text
	1.3 Flood risk	1.3.1 River flooding	Environment Agency mapping demonstrates that area F is within a flood zone area 2 which lies between the River Trent and the Trent and Mersey Canal which includes no areas of intended construction. This demonstrates that parts of area F as being at moderate risk of river flooding.
		1.3.2 Surface water flooding	The Environment Agency Flood Maps for Surface Water indicate that the WCML itself is at a medium/high risk of surface water flooding in Colwich. In this area, a temporary access route will utilise an existing track that crosses the route. Two crane platforms and an access route will overlap an area at low risk of surface water flooding in Colwich also. A new relay equipment building will be built on land at medium/high risk of surface water flooding, adjacent to an existing access point in Colwich and hence may be susceptible to flooding.
		1.3.3 Sewer flooding	Information relating to the sewer network was not available when this analysis was undertaken. However, due to the limited extent of the works in the area interaction with areas at risk of sewer flooding is likely to be limited.
		1.3.4 Artificial water bodies	Environment Agency Reservoir Flood Maps do not indicate that the Proposed Scheme is at risk from reservoir flooding.
		1.3.5 Groundwater flooding	The PFRA reports that no instances of groundwater flooding are known to Staffordshire County Council. Therefore the risk is considered to be low.
	1.4 Future baseline	N/A	Due to the limited extent of the works within this area, it is not expected that any other development within the vicinity will significantly change the baseline. The potential impacts of climate change on flood risk have been considered in line with the guidance within the NPPF.
2.0 Effects during construction	2.1 Avoidance and mitigation	N/A	Use of SuDS will be implemented to mitigate the effects of runoff and contamination during construction. The construction assessment takes into account the mitigation measures contained within Section 16 of the draft CoCP. The draft CoCP sets out the measures and standards of work that will be applied to the construction of the Proposed Scheme. It will require the effective management and control of work in respect of flood risk and the protection of water resources.
	2.2 Assessment of impacts and effects from construction (temporary)	2.2.1 Surface water	The assessment has identified no significant permanent effects on surface water from construction operations.
		2.2.2 Ground water	The assessment has identified no significant permanent effects on surface water from construction operations.

Category	Section	Subsection	Summary text
		2.2.3 Flood risk	The temporary works may be at risk from various sources of flood risk; however, the works will be completed in line with the measures set out within the draft CoCP which ensures that the temporary works are not at an unacceptable flood risk and that the works do not cause an increase in flood risk elsewhere. It is considered that there will be no significant temporary effects in respect of flooding either from or to the Proposed Scheme.
		2.2.4 Cumulative effects	The assessment has identified no significant permanent effects on surface water from construction of the Proposed Scheme.
	2.3 Assessment of impacts and effects from construction (permanent)	2.3.1 Surface water	The assessment has identified no significant permanent effects on surface water from construction of the Proposed Scheme.
		2.3.2 Ground water	The assessment has identified no significant permanent effects on surface water from construction of the Proposed Scheme.
		2.3.3 Flood risk	The Proposed Scheme is within an area identified as being at risk of flooding from several sources. The design of the Proposed Scheme, including the mitigation measures, ensures that the construction works are at an acceptable level of risk and will not cause an increased flood risk elsewhere, including an allowance for climate change.
		2.3.4 Cumulative effects	The assessment has identified no significant cumulative effects as a result from temporary construction operations.
	2.4 Other mitigation measures	N/A	The assessment has identified no further areas requiring mitigation measures.
	2.5 Summary of likely significant residual effects	N/A	No significant residual effects have been identified.
3.0 Effects arising from the operation of the Proposed Scheme	3.1 Avoidance and mitigation	N/A	Use of SuDS maybe implemented to mitigate the negative effects of runoff and contamination during operation. Operation and maintenance of the Proposed Scheme will be subject to controls agreed with the regulators, such as the Environment Agency, to provide effective control and management of impacts during the operational period.
	3.2 Assessment of impacts and effects from operation of the Proposed Scheme	N/A	The assessment has been carried out assuming that best practice will be used during the operation and maintenance of the Proposed Scheme.

Category	Section	Subsection	Summary text
	3.3 Other mitigation measures	N/A	The assessment has identified no further mitigation measures required during the operation of the Proposed Scheme.
	3.4 Summary of likely significant residual effects	N/A	No significant residual effects are identified to be associated with operation of the Proposed Scheme.

12 Planning data

Table 53: Committed consents and development allocations as of 31 August 2013

Reference identification	Local planning authority including planning reference	Type (Application or allocation)	Description	Site address	Applicant
LICHFIELD-COLWICH/1	Stafford Borough Council 12/16928/FUL	Application	Vehicle parking compound, including new access to Bellamour Lane; change of use to operational land for railway.	Land At Bellamour Lane Wolseley Bridge Stafford Staffordshire. Location is immediately adjacent to the south west of the WCML, Map CT-05-146, B9.	Network Rail (Agent)
LICHFIELD-COLWICH/2	Lichfield District Council 11/00487/FULM	Application	Demolition of 87 New Road, formation of new access and erection of 14 no terraced and semi-detached houses (8 no 4 bedroom and 6 no 3 bedroom) with associated works.	Land Rear 87 New Road Armitage Rugeley Staffordshire WS15 4BH. Location is approximately 50m south-west of the WCML, Map CT-05-142, G6.	Walton Homes Ltd
LICHFIELD-COLWICH/3	Lichfield District Council 10/01201/REMM	Application	Proposed development of 219 residential dwellings and associated works, roads, public open space and drainage (Phases 4 and 5).	Former Rugeley Power Station Armitage Road Armitage Rugeley Staffordshire. Location is approximately 800m south-west of the WCML.	Persimmon Homes North Midlands
LICHFIELD-COLWICH/4	Lichfield District Council 10/01200/REMM	Application	Proposed development of 117 residential dwellings and associated works, roads, public open space and drainage (Phase 3).	Former Rugeley Power Station Armitage Road Armitage Rugeley Staffordshire. Location is approximately 800m south-west of the WCML.	Persimmon Homes North Midlands
LICHFIELD-COLWICH/5	Lichfield District Council 11/00783/FULM	Application	Erection of agricultural building.	Land Rear Of Windmill Farm Stockings Lane Upper Longdon Rugeley Staffordshire. Location is approximately 2km south-west of the WCML.	Windmill Farm

Reference identification	Local planning authority including planning reference	Type (Application or allocation)	Description	Site address	Applicant
LICHFIELD-COLWICH/6	Cannock Chase Council CH/09/0016	Application	Residential development (Outline including access) (Illustrative layout) (Resubmission of planning application CH/08/0170).	Land north east of Wolseley Road, between junction of Bower Lane and Brindley Bank Pumping Station, Rugeley Location is approximately 730m south-west of the WCML.	Seabridge Property
LICHFIELD-COLWICH/7	Cannock Chase Council CH/10/0087	Application	New superstore, units for A3-A5 food and drink uses, cafe bar, petrol station and car wash, associated car parking, landscaping, servicing and access.	Power Station Road, Rugeley Location is approximately 430m south-west of the WCML, Map CT-05-144, E10.	Tesco Stores Ltd
LICHFIELD-COLWICH/8	Cannock Chase Council CH/12/0220	Application	Residential development - erection of 10 town houses.	Land rear of, The Vine Public House, Sheep Fair, Rugeley Location is approximately 1km south-west of the WCML.	Bromford Group
LICHFIELD-COLWICH/9	Cannock Chase Local Plan 1997 Policy EP.1.6 Land at Wharf Road, Rugeley Employment	Allocation	This 1.1 hectare site is located at the western closed end of Wharf Road. The District Council envisages the site being capable for accommodating a range of businesses.	Wharf Road, Rugeley Location is approximately 1.4km south-west of the WCML.	N/A

13 References

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