

High Speed Rail (Crewe – Manchester) Environmental Statement

Volume 5: Appendix CT-006-00000

Cross-topic

Wider effects report

HS2

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Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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1 Introduction

1.1 Overview

- 1.1.1 The Environmental Statement (ES) that accompanies the deposit of the High Speed Rail (Crewe – Manchester) hybrid Bill contains mapping within the Volume 2 and 5 map books, which shows the Proposed Scheme on the centre line for the permanent works. Limits of deviation (LOD) shown on the Parliamentary plans and sections and described in the hybrid Bill enable the Proposed Scheme to deviate slightly from the centre line of the works as may be required following detailed design. This Appendix assesses whether the power to deviate within these statutory limits would alter the significant predicted effects reported elsewhere in the ES by creating new or different (usually increased) significant effects.
- 1.1.2 The powers contained within the hybrid Bill allow for changes within the statutory LOD to occur where it is found that the spatial position of the Proposed Scheme may need to be adjusted, mainly for reasons of engineering practicability.
- 1.1.3 A summary of the extent of the LOD is described in Volume 1, Section 1. In essence these comprise lateral limits within the lines shown on the Parliamentary plans and vertical limits not exceeding 3m upwards, and downwards to any extent, from the levels shown on the deposited sections, except for certain buildings, such as stations, depots and shafts where an upper height limit is specified. The LOD for tunnels allow them to deviate so that an appropriate clearance from any unexpected obstruction in the ground can be provided. The degree of adjustment is constrained by the LOD, but also by key design elements of the Proposed Scheme, such as the alignment of the track system, which must allow for high-speed trains to operate to the proposed timetable, the position of tunnel portals, the height of viaducts and the location of significant third party infrastructure.
- 1.1.4 The power to deviate the vertical or horizontal alignment within statutory limits requires assessment for its likely significant environmental effects at various locations along the route of the Proposed Scheme.

1.2 Analysis and assessment

- 1.2.1 A sensitivity analysis has been undertaken to identify where such spatial changes are feasible and assess the environmental implications of such changes, taking account of the reported assessment of likely significant effects and the environmental baseline described for the Proposed Scheme in the Volume 2 Community Area reports. Where information may be incomplete, this assessment has been based on a precautionary approach using worst-case assumptions, which is consistent with the approach to the overall environmental impact assessment (EIA).
- 1.2.2 The following sections describe locations within the relevant community area, which have been subject to further assessment. A commentary is provided on the likely significant

environmental effects, which could result from a change in alignment within the statutory LOD.

- 1.2.3 An assessment of the likely significant effects of raising the height of stations, shafts or depots up to the upper limit shown on the sections is reported, as the assessment elsewhere in the ES has assumed a height lower than the upper limit.
- 1.2.4 Locations where amendments to the alignment within the statutory LOD are judged not to give rise to new or different predicted significant effects are not considered further in the report.
- 1.2.5 The changes to the predicted effects in this report have considered residual effects only (i.e., allowing for the adoption of mitigation). In the event that variations to the alignment occur within the statutory limits, references have been made to further potential mitigation that could be considered in specific locations. Such mitigation could only be confirmed following further assessment and discussion with relevant stakeholders as part of the detailed design process for any alignment modifications.

1.3 Environmental Minimum Requirements

- 1.3.1 In order to ensure that the environmental effects of the Proposed Scheme will not exceed those assessed in the ES, the Secretary of State for Transport will establish a set of controls known as Environmental Minimum Requirements (EMR). The EMR will be contained in a set of documents that will sit alongside the provisions set out in the hybrid Bill itself. The nominated undertaker is the body to be appointed to take forward the detailed design and implementation of the Proposed Scheme after the hybrid Bill has been enacted. The nominated undertaker will be required to comply with the EMR and the other hybrid Bill controls.
- 1.3.2 During the passage of the hybrid Bill, the Secretary of State will confirm to Parliament the scope of, and the documents forming, the EMR; and will make a commitment to Parliament to take whatever steps are considered reasonable and necessary to secure compliance with them.
- 1.3.3 The EMR, together with the controls in the hybrid Bill, will ensure that the impacts identified in the ES will not be exceeded, unless this results from a change in circumstances that was not likely at the time the ES was prepared; or any such changes will be unlikely to have significant adverse environmental effects; or will be subject to a separate consent process and further EIA
- 1.3.4 The EMR will also impose a general requirement on the nominated undertaker to use reasonable endeavours to adopt measures to reduce the reported adverse environmental effects, provided that this does not add unreasonable cost or delay to the construction or operation of the Proposed Scheme.

1.4 Operational sound, noise and vibration

Surface sections

- 1.4.1 To avoid or reduce significant airborne noise effects during operation, the Proposed Scheme incorporates noise barriers in the form of landscape earthworks and/or noise fence barriers. Noise barrier locations are shown in the Volume 2: Sound, noise and vibration Map Book (SV-05 series) and are described in the Volume 2 Community Area reports. These maps also identify engineering cuttings and retaining walls as noise barriers where they will avoid or reduce significant adverse noise effects.
- 1.4.2 The effective height of the noise barriers is described relative to the rail level. Therefore, any amendment to the vertical rail level will move the noise barrier by an equivalent amount, so that the extent of noise reduction is maintained.
- 1.4.3 The Volume 2: Sound, noise and vibration Map Book (SV-05 series) also identifies other earthworks which may reduce noise effects but do not materially affect the outcomes of the sound, noise and vibration assessment. Removal or amendment of these features, or reducing their attenuation by raising the vertical alignment, would not materially alter the assessment of sound, noise and vibration reported elsewhere in the ES.
- 1.4.4 There are locations where existing features such as hills, roads and railways will provide a degree of attenuation to operational noise levels. If the alignment were to be raised vertically in these locations, this attenuation could be reduced, potentially resulting in new or different adverse likely significant noise effects.
- 1.4.5 Following any change in alignment within the LOD, further detailed modelling would be undertaken to confirm the predicted noise effects described in this report. If significant effects are confirmed, suitable mitigation, such as in the form of noise barriers, would be provided within the LOD. With this mitigation in place, no additional residual significant noise effects are considered to be likely. The introduction of new noise barriers may require additional visual mitigation in the form of earthworks, planting or external finish.

Tunnelled sections

- 1.4.6 Following any change in alignment within the LOD, detailed modelling would be undertaken to confirm the ground-borne noise effects. If any significant effects are confirmed, all reasonably practicable steps will be taken to mitigate them.

2 Assessment of likely significant effects

2.1 Introduction

2.1.1 This section of the report assesses the potential for the creation of new or different likely significant effects, or the removal of such effects, at specific locations along the route of the Proposed Scheme. A potential for variations in horizontal or vertical alignment within the limits shown on the plans and sections and to the extent permitted in Schedule 1 to the Bill have been identified in relation to the following scheduled works, which could lead to new or different significant effects:

- MA01: Hough to Walley's Green:
 - Crewe tunnel; and
 - Crewe tunnel – Middlewich Street vent shaft;
- MA02: Wimboldsley to Lostock Gralam:
 - Crewe North rolling stock depot and associated reception tracks;
 - Walley's Green embankment to Stanthorne North embankment;
 - Dane Valley embankment and Puddinglake Brook viaduct;
 - Gad Brook viaduct; and
 - Rudheath embankment;
- MA03: Pickmere to Agden and Hulseheath:
 - Pickmere embankment to Heyrose embankment; and
 - Hoo Green South embankment No. 2 to Hoo Green North cutting and Hoo Green South embankment No. 2 to Peacock Lane viaduct;
- MA04: Broomedge to Glazebrook:
 - Warburton cutting and Warburton embankment; and
 - Manchester Ship Canal viaduct and Glazebrook embankment south;
- MA06: Hulseheath to Manchester Airport:
 - Birkin Brook embankment to Thorns Green embankment;
- MA07: Davenport Green to Ardwick:
 - Manchester tunnel – Altrincham Road vent shaft;
 - Manchester tunnel – Palatine Road vent shaft;
 - Manchester tunnel – Wilmslow Road vent shaft; and
 - Manchester tunnel – Birchfields Road vent shaft.

2.1.2 Sections 2.2 to 2.7 describe the new or different significant effects that could arise within each community area along the route of the Proposed Scheme. Each location has a common structure, as set out below:

- Overall summary, outlining the potential for movements within the LOD and the implications these would have for the assessed environmental effects reported in the Volume 2 Community Area reports of the ES;
- A description of the significant effects assessed at this location and reported in the Volume 2 Community Area reports of the ES;
- A description of any new or different significant effects generated by movements within the LOD;
- A description of potential mitigation options and their efficacy; and
- Operational noise effects (if applicable).

2.2 MA01 – Hough to Walley’s Green

Crewe tunnel

- 2.2.1 Raising the vertical alignment of the Crewe tunnel by up to 3m would result in new significant operational ground-borne noise effects on individual residential properties, residential communities and non-residential receptors located above the Crewe tunnel. Conversely, lowering the vertical alignment of the Crewe tunnel would remove some of the predicted significant operational ground-borne noise effects. A horizontal movement to the east or west is possible at Crewe tunnel south portal but is unlikely to change the predicted significant effects. The presence of the West Coast Main Line (WCML) limits the opportunity for horizontal change at the Crewe tunnel north portal.
- 2.2.2 As described in the Volume 2, Community Area report: Hough to Walley’s Green (MA01), significant residual adverse effects are likely to remain for 35 individual residential properties in Crewe, due to ground-borne noise effects. At a community level, significant residual adverse effects are likely to remain due to increased ground-borne noise levels at approximately 265 residential properties. Six non-residential properties in Crewe would also experience likely significant ground-borne noise effects (Best Western Crewe Arms Hotel, Eurosales and Eurocard Centre (offices), ChuffChuff (Dance Studio), Cooperative Funeral Services (offices), Bentley Manor Care Home and Sherborne Court Neurological Centre).
- 2.2.3 Raising the vertical alignment of the Crewe tunnel would be likely to lead to an increase in operational noise levels in the area and to new significant groundborne noise effects on nearby residential and non-residential receptors in Crewe. Further detailed noise modelling would be undertaken to confirm whether new significant effects are likely to occur. HS2 Ltd would seek reasonably practicable measures to reduce or avoid any new or increased significant effects. If such mitigation is not available, affected landowners would be entitled to make a claim in line with the compensation code.
- 2.2.4 Lowering the vertical alignment would remove some of the predicted significant ground-borne noise effects to individual residential properties and non-residential receptors located above the Crewe tunnel. A lowering, however, is unlikely to change the predicted significant noise effects at a community level.

Crewe tunnel – Middlewich Street vent shaft

- 2.2.5 Raising the height of the Middlewich Street headhouse by up to 3m, or repositioning the headhouse north, south, east or west within the limits of deviation at this location would introduce or increase significant operational visual effects for a number of existing receptors surrounding the site. It would not introduce any newly affected receptors. Lowering of the headhouse is precluded by the operational requirements of the railway.
- 2.2.6 As described in the Volume 2, Community Area report: Hough to Walley's Green (MA01), the significant visual effects of the Proposed Scheme in this area will be major adverse (significant) during construction for all affected viewpoints and moderate adverse (significant) during operation year 1 and year 15, becoming non-significant in operation year 30 for all affected viewpoints as mitigation planting matures.
- 2.2.7 Moving the headhouse horizontally north, south, east or west within the limits of deviation at this location would increase the prominence of the Proposed Scheme in some local views. It would result in an increase in the reported significant visual effects for residential receptors west of the B5027 Middlewich Street and from areas of public open space adjacent to the site during operation year 1.
- 2.2.8 Landscape mitigation planting is proposed on all sides of the headhouse to reduce its visibility to sensitive receptors and to integrate it into the landscape. If the height of the headhouse were to be increased, mitigation planting would take longer to become sufficiently mature to provide screening. Should a horizontal change be made within the limits of deviation, it would reduce the amount of landscape mitigation planting surrounding the headhouse and there is insufficient space to provide more planting. Consequently, the effects in operation year 30 would remain significant for viewpoints where sufficient screening is unachievable.

2.3 MA02 – Wimboldsley to Lostock Gralam

Crewe North rolling stock depot and associated reception tracks

- 2.3.1 Due to constraints to the north of the site, such as the Clive Green Lane overbridge, the vertical alignment of the Crewe North rolling stock depot (RSD), and its associated reception tracks, cannot be raised by more than 2m in height in relation to that assessed in Volume 2 of the ES. Such a change would increase the predicted significant operational visual effects for receptors at a number of viewpoints located in Wimboldsley and increase the effects on one designated heritage asset (Grade II listed Park Farmhouse). It would also create a new significant effect on a non-designated heritage asset (Dairy House Farm, now known as Stanthorne Park Mews). Lowering the vertical alignment by up to 2m would be possible but is unlikely to change the predicted significant effects. A horizontal movement east within the limits of deviation would compromise the proposed landscape mitigation earthworks, and

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the presence of the WCML to the west restricts the opportunity for horizontal deviation. Repositioning north or west, or reconfiguring, of the Crewe North RSD 12-track maintenance shed within the limits of deviation at this location would change the predicted operational significant visual effects for a number of receptors surrounding the site, depending on their position and distance in relation to the Crewe North RSD 12-track maintenance shed.

- 2.3.2 As described in the Volume 2, Community Area report: Wimboldsley to Lostock Gralam (MA02), the visual effects of the Crewe North RSD on viewpoints in Wimboldsley will in general be major adverse (significant) during construction and operation year 1, predominantly becoming moderate adverse (significant) by operation year 30 as mitigation planting matures. The predicted significant effects on the Grade II listed Park Farmhouse and the non-designated asset of Dairy House Farm, now known as Stanthorne Park Mews, due to changes to their setting will be moderate adverse (significant).
- 2.3.3 A raised vertical alignment would necessitate raising and lengthening the reception tracks and would require an increase in the height of the proposed Clive Green Lane overbridge. Raising the height of these elements of the Proposed Scheme would increase the prominence of the depot in local views and would give rise to an increase in significant visual effects in operation year 15 and year 30 for those receptors already identified within the ES.
- 2.3.4 Moving the Crewe North RSD 12-track maintenance shed horizontally north or west within the limits of deviation in this location would increase the prominence of the Proposed Scheme in local views from the north and west and would give rise to an increase in significant visual effects for the associated receptors in operation years 15 and 30. It would decrease the significant visual effects experienced from viewpoints to the east of the Proposed Scheme, south of Wimboldsley.
- 2.3.5 Landscape earthworks are proposed to the east of the Proposed Scheme and mitigation planting is proposed to both the east and west in this location to provide screening for sensitive receptors and to integrate the Proposed Scheme into the landscape. Mitigation planting is also proposed to the west of the WCML. If the vertical alignment of the Proposed Scheme were to be raised, mitigation planting would take longer to become sufficiently mature to provide screening.
- 2.3.6 The layout of landscape earthworks and mitigation planting around the boundaries of the Proposed Scheme relates specifically to the arrangement of buildings and structures within the RSD. Moving the 12-track maintenance shed horizontally north or west within the limits of deviation in this location would require the mitigation design to be revisited.
- 2.3.7 Given the scale of the proposed infrastructure at the RSD, the extent to which the existing mitigation could be refined or increased to account for a potential increase in height, would be restricted by the availability of additional land within the limits of deviation.

Walley's Green embankment to Stanthorne North embankment

- 2.3.8 Raising the vertical alignment by up to 3m between Walley's Green embankment and Stanthorne North embankment would increase the visual effects for receptors at a number of viewpoints to the east and west of the Proposed Scheme at this location. The predicted significant effect on heritage assets in these locations would also increase due to impacts arising from a change to their setting. Lowering the vertical alignment by up to 2m is possible, but is unlikely to change the predicted significant effects. An eastward movement within the limits of deviation would reduce the area available for the proposed landscape earthwork mitigation, whilst the presence of the WCML restricts the opportunity for westward movement.
- 2.3.9 As described in the Volume 2, Community Area report: Wimboldsley to Lostock Gralam (MA02), the visual effects of the Proposed Scheme in this section will in general be major or moderate adverse (significant) during construction and operation year 1, remaining major adverse (significant) or reducing to moderate adverse (significant) in operation year 15. For more distant receptors, visual effects become minor adverse (non-significant) by operation year 30 as mitigation planting matures. The predicted significant effect of the Proposed Scheme on Grade II listed Park Farmhouse and non-designated Dairy House Farm, now known as Stanthorne Park Mews, will be moderate adverse, due to impacts on the value of these assets as a consequence of a change to their setting.
- 2.3.10 Raising the vertical alignment in this section would necessitate raising Clive Green Lane overbridge and A530 Nantwich Road overbridge. The sections of roads approaching these overbridges may also need to be raised (or become steeper, subject to compliance with design standards and the space available within the limits of deviation). This would increase the prominence of the Proposed Scheme in local views and would create new and increased significant visual effects in operation years 15 and 30 for those receptors already identified in the ES. The increased visual prominence of the Proposed Scheme would result in a greater impact on the heritage assets of Park Farmhouse and Dairy House Farm, now known as Stanthorne Park Mews, due to a change in their settings and would result in an increase in the significant effect on each receptor.
- 2.3.11 Landscape earthworks and mitigation planting are proposed on either side of the Proposed Scheme in this area to reduce its visibility to sensitive receptors and to integrate it into the landscape. Given the proximity of properties to the Proposed Scheme in this area, it could be difficult to increase the scale of the proposed landscape earthworks in order to maintain the current standard of proposed mitigation screening. Consequently, significant effects would persist into operation years 15 and 30 for the affected viewpoints.

Dane Valley embankment and Puddinglake Brook viaduct

- 2.3.12 Raising the vertical alignment by up to 3m between Dane Valley embankment and Puddinglake Brook viaduct would increase the predicted significant effect on the Grade II* listed Whatcroft Hall, located to the west of the Proposed Scheme. The requirement to provide watercourse, public right of way and farm accommodation crossings beneath the Proposed Scheme at this location restricts the opportunity for lowering of the vertical alignment. The limits of deviation in this section restrict the potential for any substantial horizontal movement of the Proposed Scheme.
- 2.3.13 As described in the Volume 2, Community Area report: Wimboldsley to Lostock Gramam (MA02), the Proposed Scheme is predicted to have a moderate adverse (significant) effect on the Grade II* listed Whatcroft Hall due to the change in the setting of this asset.
- 2.3.14 Landscape earthworks are proposed to the west and mitigation planting is proposed to both the east and west of the Proposed Scheme in this area, to reduce its visibility to sensitive receptors and to integrate it into the landscape.
- 2.3.15 Raising the height of the Proposed Scheme by up to 3m in this location would increase the prominence of the Proposed Scheme in local views. The limits of deviation at this location could not accommodate landscape earthworks or mitigation planting sufficient to maintain the standard of mitigation screening included in the current Proposed Scheme design for any raised infrastructure in this location. Consequently, significant effects on the Grade II* listed Whatcroft Hall due to the change in the setting of this asset would increase to major adverse (significant).

Gad Brook viaduct

- 2.3.16 Raising the vertical alignment of the Gad Brook viaduct by up to 3m would increase the predicted operational visual effects for the users of the surrounding public right of way network in this area. While lowering the vertical alignment by up to 2m is possible, it is unlikely to change the significant effects predicted. A small horizontal deviation east or west within the limits of deviation is also possible at this location, but would be unlikely to create new or different significant effects.
- 2.3.17 As described in the Volume 2, Community Area report: Wimboldsley to Lostock Gramam (MA02), the visual effects of the Proposed Scheme on the users of Footpath Whatcroft 5 at Park Farm will be moderate adverse (significant) during construction and operation years 1 and 15, becoming minor adverse (non-significant) by operation year 30.
- 2.3.18 Raising the height of the Proposed Scheme by up to 3m in this location would increase the prominence of the viaduct in local views and would be difficult to mitigate, due to the height of the structure in relation to the existing landform. There is limited scope to provide additional landscape earthworks or planting beyond that which is already proposed. Consequently, significant visual effects for users of Footpath Whatcroft 5 at Park Farm would

increase during construction and operation years 1 and 15. A new significant visual effect (i.e. increased from minor (non-significant) to moderate adverse (significant)) would be introduced in operation year 30 at this viewpoint, due to the difficulty in maintaining the same standard of landscape mitigation.

Rudheath embankment

- 2.3.19 Raising the vertical alignment of the Rudheath embankment by up to 3m, or an eastward change in its horizontal alignment, would increase the predicted operational visual effects for a number of viewpoints in Lostock Green and create new significant effects on a non-designated heritage asset in Lostock Green. While lowering the vertical alignment by up to 3m, or a westward change in its horizontal alignment, are possible, this would be unlikely to change the predicted significant effects.
- 2.3.20 As described in the Volume 2, Community Area report: Wimboldsley to Lostock Gralam (MA02), the visual effects of the Proposed Scheme at viewpoints in proximity to the embankment on the outskirts of Rudheath and in Lostock Green are generally predicted to be major adverse (significant) during construction and operation year 1, becoming moderate (significant) during operation years 15 and 30 as landscape mitigation planting matures. However, one viewpoint within Lostock Green (Birch Grove) is predicted to become non-significant by year 15 as mitigation planting matures and the viewpoint also benefits from the realignment of the A556 eastwards. More distant viewpoints are either too far from the Proposed Scheme to experience significant effects or become non-significant by year 15, again as mitigation planting matures. The non-designated heritage asset, Robin Hood Cottage in Lostock Green, is not expected to experience any significant effects related to changes to its setting.
- 2.3.21 Raising the height of the Proposed Scheme by up to 3m in this location would increase its prominence at viewpoints to the east and west and would increase already predicted significant visual effects. New significant effects would be created at and possibly beyond year 15 at the viewpoint at Birch Grove, Lostock Green, as mitigation planting would take longer to become effective to screen the more visually prominent Proposed Scheme and the extent of mitigation planting would be reduced by the increased footprint of the larger embankment. A new significant effect on a non-designated heritage asset, Robin Hood Cottage in Lostock Green, would occur due to a change in setting.
- 2.3.22 Landscape earthworks and mitigation planting are proposed on either side of the Proposed Scheme in this area to reduce its visibility from sensitive receptors and to help integrate it into the landscape.
- 2.3.23 Given the proximity of properties to the Proposed Scheme in Lostock Green, and the proposed utility diversions in this location, it may be difficult to increase the scale and extent of the proposed landscape earthworks throughout this section in order to maintain the effectiveness of mitigation screening. Consequently, new significant visual effects would occur in operation years 15 and 30.

2.4 MA03 – Pickmere to Agden and Hulseheath

Pickmere embankment to Heyrose embankment

- 2.4.1 Raising the vertical alignment by up to 3m between Pickmere embankment and Heyrose embankment would increase the predicted operational visual effects for a number of receptors located to the east and west of the Proposed Scheme throughout this area. The presence of the B5391 realignment and three underbridges restricts the opportunity for lowering of the alignment. A horizontal deviation to the east or west within limits of deviation is possible, but is unlikely to change the predicted significant effects.
- 2.4.2 As described in the Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03), the visual effects of the Proposed Scheme in this section will in general be major adverse (significant) during construction and operation year 1, predominantly becoming or remaining moderate adverse (significant) in operation year 15 and moderate adverse or non-significant in operation year 30 as mitigation planting matures.
- 2.4.3 Landscape earthworks and mitigation planting are proposed on both sides of the Proposed Scheme in this area to reduce its visibility to sensitive receptors and to integrate it into the landscape. It is likely that a combination of additional landscape planting and landscape earthworks would be required to mitigate the effects of raising the Proposed Scheme by up to 3m and to maintain the effectiveness of mitigation screening. In the event of an increase in the vertical alignment of the Proposed Scheme, mitigation planting would take longer to become sufficiently mature to provide screening for the more visually prominent embankment. Consequently, significant visual effects would persist into operation years 15 and/or 30 for the affected viewpoints, generating both new and increased significant effects.

Hoo Green South embankment No. 2 to Hoo Green North cutting and Hoo Green South embankment No. 2 to Peacock Lane viaduct

- 2.4.4 Raising the vertical alignment by up to 3m from Hoo Green South embankment No.2 to Hoo Green North cutting and from Hoo Green South embankment No.2 to Peacock Lane viaduct would increase the predicted operational significant visual effects for receptors in and around Hulseheath. In addition, it would increase the predicted operational noise effects on properties in Hoo Green, potentially create a new significant noise effect on nearby residential receptors and increase the visibility of moving trains, further reducing tranquillity in the area. The presence of Bridleway Mere 1/1 accommodation underbridge and Winterbottom culvert would restrict the opportunity for lowering the Proposed Scheme. A horizontal movement within the limits of deviation is possible, but is unlikely to change the predicted significant effects.
- 2.4.5 As described in the Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03), the visual effects of the Proposed Scheme in this area will in general be major

adverse (significant) during construction and operation year 1, either remaining as major or reducing to moderate in operation year 15, and remaining moderate or becoming non-significant by operation year 30 as mitigation planting matures.

- 2.4.6 Raising the height of the Proposed Scheme by up to 3m in this location would increase the prominence of the Proposed Scheme in local views and would give rise to an increase in significant visual effects in operation years 15 and 30 for some of the receptors already identified within the ES, creating new and different (increased) significant effects.
- 2.4.7 Landscape earthworks and mitigation planting are proposed on either side of the Proposed Scheme in this area to reduce its visibility to sensitive receptors and to integrate it into the landscape. A raised alignment would be more visually prominent and would necessitate an increase in landscape earthworks and mitigation planting to maintain the effectiveness of the mitigation screening currently proposed. In the event of an increase in the vertical alignment of the Proposed Scheme, mitigation would take longer to become effective as the planting matures. Some significant predicted effects would persist into operation year 15 and/or year 30, creating new significant effects for the affected viewpoints.
- 2.4.8 As described in the Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03), the predicted noise effects of the Proposed Scheme on the community of Hulseheath will be significant during the operational phase, affecting occupants of residential properties on Thowler Lane, Back Lane and Peacock Lane. Raising the Hoo Green and Hulseheath South embankments would be likely to result in an increase in operational noise levels in the vicinity, further reducing the level of tranquillity of the landscape. Additionally, there would be an increased noise impact on properties in Hoo Green and a potential for new significant effects on nearby residential receptors. Further detailed noise modelling would be undertaken to confirm whether new significant effects are likely to occur, potentially requiring the provision of new noise barriers in this location. If noise barriers were required, it is expected that the new significant noise effects would be mitigated so that they would no longer be significant at any location.

2.5 MA04 – Broomedge to Glazebrook

Warburton cutting and Warburton embankment

- 2.5.1 Raising the vertical alignment of Warburton cutting and Warburton embankment by up to 3m would change the Warburton cutting from a shallow cut to a low embankment and increase the height of the Warburton embankment. It would also necessitate the raising of Paddock Lane overbridge and Footpath Warburton 3 accommodation overbridge. These changes would increase the visual effects for receptors at a number of viewpoints in and around Warburton and Mossbrow, and increase the effects on three Grade II listed buildings: Onion Farm, St Werburgh's New Church and Church House. It would also result in an increase in noise levels experienced by nearby receptors in Warburton, giving rise to new significant effects. Vertical clearance requirements for the River Bollin and Manchester Ship Canal, to the south and north respectively, restrict the potential to lower the Proposed

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Scheme in this location. The presence of residential buildings and the Saracens Head Pub in Mossbrow has constrained the limit of deviation at this location and as such the scope for horizontal deviation within those limits is not of sufficient scale to create new or different significant effects.

- 2.5.2 As described in the Volume 2, Community Area report: Broomeedge to Glazebrook (MA04), the visual effects of the Warburton cutting and Warburton embankment on viewpoints in Warburton and Mossbrow will be major adverse (significant) during construction and operation year 1, becoming either moderate adverse (significant) in operation year 15 and moderate (significant) or minor adverse (non-significant) in operation year 30. The three Grade II listed buildings within 300m of the Proposed Scheme (Onion Farm, St Werburgh's New Church and Church House), are not predicted to experience significant effects during the construction or operational phases. Landscape earthworks and mitigation planting are proposed on either side of the Proposed Scheme in this area to reduce its visibility to sensitive receptors and to integrate it into the landscape.
- 2.5.3 Raising the height of the Proposed Scheme by up to 3m in this location would increase its prominence in local views and would give rise to an increase in visual effects at those receptors already identified in the ES. It would also generate significant adverse effects on the three Grade II listed buildings located close to the Proposed Scheme (Onion Farm, St Werburgh's New Church and Church House). All three listed structures would be subject to the same change in setting.
- 2.5.4 It is likely that additional landscape planting would be required to mitigate the impacts of a higher alignment at this location. Given the proximity of properties to the Proposed Scheme in Mossbrow, there is limited land available to maintain the effectiveness of the proposed mitigation screening. An increase in the vertical alignment of the Proposed Scheme by up to 3m would cause mitigation to take longer to become effective as the planting matures, such that increased visual impacts would persist to operation year 30 for all the affected viewpoints, resulting in new and different (increased) significant effects.
- 2.5.5 As described in the Volume 2, Community Area report: Broomeedge to Glazebrook (MA04), there will be no significant operational phase noise effects on the community of Mossbrow. Raising the Warburton cutting and Warburton embankment would result in an increase in noise levels experienced by nearby receptors in Warburton, giving rise to new significant effects. Further detailed modelling would be undertaken to confirm the predicted noise effects. If any new or increased significant effects were to be confirmed, suitable mitigation would be identified, which could include the provision of noise barriers. If noise barriers were required, it is expected that the new significant noise effects would be mitigated so that they would no longer be significant at any location.

Manchester Ship Canal viaduct and Glazebrook embankment south

- 2.5.6 Raising the vertical alignment of the Manchester Ship Canal viaduct and Glazebrook embankment south by up to 3m would increase the predicted significant landscape effects on the Rixton Undulating Enclosed Farmland Landscape Character Area (LCA), would increase the significant visual effects reported in the ES and would introduce new significant visual effects on receptors in the communities of Partington and Cadishead. In addition, a raising of the vertical alignment would be likely to result in an increase in operational noise levels experienced by receptors in Hollins Green, Partington and Cadishead, giving rise to new significant effects. Vertical clearance requirements for the Manchester Ship Canal would restrict any opportunity to lower the height of the viaduct and embankment at this location. A horizontal movement within the limits of deviation is possible but is unlikely to change the predicted significant effects.
- 2.5.7 As described in the Volume 2, Community Area report: Broomedge to Glazebrook (MA04), the visual effects of the Manchester Ship Canal viaduct and Glazebrook embankment south will be major adverse or moderate adverse (significant) during the construction and year 1 operational phase for the majority of the receptors identified in this area. Significant adverse effects are predicted to persist for visual receptors in and around Hollins Green, while effects for more distant receptors in Glazebrook and Cadishead will become non-significant by operation year 15. Landscape mitigation planting is proposed to filter views of this section of the route and to integrate it into the surrounding landscape. However, given the proposed scale of the viaduct, opportunities to screen views towards the Proposed Scheme are limited.
- 2.5.8 Raising the height of the viaduct by up to 3m would increase the visual prominence of the viaduct on local and more distant views. This would increase visual effects at receptors already identified as being significantly affected and would introduce new significant visual effects on receptors such as residential properties in Partington and Cadishead, which were previously not significantly affected.
- 2.5.9 New and increased significant landscape and visual effects would be difficult to mitigate, due to the height of the viaduct in relation to the existing landform. There would be limited scope to provide additional landscape earthworks or planting beyond that which is already proposed.
- 2.5.10 Raising the Manchester Ship Canal viaduct would be likely to result in an increase in operational noise levels experienced by receptors in Hollins Green, Partington and Cadishead, giving rise to new significant effects. Further detailed modelling would be undertaken to confirm the predicted noise effects. If any new or increased significant effects were confirmed, suitable mitigation would be identified, which could include increasing the height and/or length of the proposed noise barriers. If changes to the noise barriers were required, it is expected that the new significant noise effects would be mitigated so that they would no longer be significant at any location.

2.6 MA06 – Hulseheath to Manchester Airport

Birkin Brook embankment to Thorns Green embankment

- 2.6.1 Raising the vertical alignment by up to 3m between the Birkin Brook embankment and the Thorns Green embankment would increase the predicted operational noise effects. This section of the route will comprise a series of embankments, a retaining wall and a viaduct, as well as the Ashley infrastructure maintenance base – rail (IMB-R), which would be located adjacent to the Birkin Brook embankment and Ashley embankment retaining wall. The presence of the Mid-Cheshire Railway Line and the realignment of Mobberley Road prevents the opportunity for any lowering of the alignment in this location. A horizontal movement north or south within limits of deviation is possible but is unlikely to change the predicted significant effects.
- 2.6.2 As described in the Volume 2, Community Area report: Hulseheath to Manchester Airport (MA06), there is one significant operational noise effect on office facilities at Cherry Tree House at this location. Raising the vertical alignment of the Proposed Scheme in this area would result in an increase in noise levels and give rise to new significant operational noise effects on receptors in Ashley and individual properties in the vicinity. There is currently no noise mitigation proposed on the embankments. If changes in vertical alignment were proposed, detailed modelling would be undertaken to confirm the impacts from operational noise, and whether new noise barriers would be required to mitigate any new significant effects. It is anticipated that the installation of such barriers would mitigate any new significant effects such that they were no longer significant.

2.7 MA07 – Davenport Green to Ardwick

Manchester tunnel – Altrincham Road vent shaft

- 2.7.1 Raising the height of the Altrincham Road headhouse by up to 3m, or repositioning the headhouse north, south or west within the limits of deviation at this location, would introduce new construction phase significant visual effects and would introduce significant operational visual effects for a number of receptors surrounding the site. Lowering of the headhouse is precluded by the operational requirements of the railway.
- 2.7.2 As described in the Volume 2, Community Area report: Davenport Green to Ardwick (MA07), there are no significant visual effects of the Proposed Scheme at this location.
- 2.7.3 Raising the height of the headhouse by up to 3m, or moving it horizontally north, south or west within limits of deviation in this location, would increase the prominence of the Proposed Scheme in local views. This would give rise to new significant visual effects for the receptors, primarily residential properties, located adjacent to the site.

2.7.4 Landscape mitigation planting is proposed on three sides of the headhouse to reduce its visibility and to integrate it into the landscape. It is likely that a combination of additional landscape planting and landscape earthworks would be required to mitigate the effects of raising the Proposed Scheme by up to 3m and to maintain the effectiveness of mitigation screening. If the height of the headhouse were to be raised, mitigation planting would take longer to provide screening. Should a horizontal change be made within the limits of deviation, it would reduce the space available for landscape mitigation planting around the headhouse. Consequently, new significant effects would be introduced during construction and at operation year 1 for receptors adjacent to the site.

Manchester tunnel – Palatine Road vent shaft

- 2.7.5 Raising the height of the Palatine Road headhouse by up to 3m, or repositioning the headhouse north, south, east or west within the limits of deviation at this location, would introduce new construction phase significant visual effects and either introduce or increase significant operational visual effects for a number of existing receptors surrounding the site. It would not introduce any newly affected receptors. Lowering of the headhouse is precluded by the operational requirements of the railway.
- 2.7.6 As described in the Volume 2, Community Area report: Davenport Green to Ardwick (MA07), the visual effects of the Proposed Scheme in this location will be a mix of major adverse (significant), moderate adverse (significant) and non-significant during construction and operation year 1, with the effects on all but one receptor reducing to non-significant by operation year 15.
- 2.7.7 Raising the height of the headhouse by up to 3m, or moving it horizontally north, south, east or west within the limits of deviation at this location, would increase the prominence of the Proposed Scheme in local views. This would give rise to an increase in significant visual effects for receptors, primarily residential properties, already identified in the ES.
- 2.7.8 Landscape mitigation planting is proposed on all sides of the headhouse to reduce its visibility and to integrate it into the landscape. It is likely that a combination of additional landscape planting and landscape earthworks would be required to mitigate the effects of raising the Proposed Scheme by up to 3m and to maintain the effectiveness of mitigation screening. If the height of the headhouse were to be raised, mitigation planting would take longer to become sufficiently mature to provide screening. Should a horizontal change be made within the limits of deviation, it would reduce the space available for landscape mitigation planting around the headhouse. Consequently, new and increased significant effects would be introduced during construction and in operation year 1, whilst the significant effects currently predicted would increase for the affected viewpoints.

Manchester tunnel – Wilmslow Road vent shaft

- 2.7.9 Raising the height of the Wilmslow Road headhouse by up to 3m or repositioning the headhouse westwards within the limits of deviation at this location, would introduce new

construction phase significant visual effects and introduce or increase the significant operational visual effects for a number of existing receptors surrounding the site. It would not introduce any newly affected receptors. Lowering of the headhouse is precluded by the operational requirements of the railway.

- 2.7.10 As described in the Volume 2, Community Area report: Davenport Green to Ardwick (MA07), the visual effects of the Proposed Scheme in this section will in general be moderate adverse (significant) during construction for receptors in closest proximity to the site. Operational visual effects for those nearest receptors will be moderate adverse in operation year 1, reducing to non-significant in operation year 15.
- 2.7.11 Raising the height of the headhouse by up to 3m or moving it horizontally west within the limits of deviation at this location, would increase the prominence of the Proposed Scheme in local views. This would give rise to an increase in visual impacts for receptors, primarily residents of properties, already identified in the ES, creating new and different (increased) significant effects.
- 2.7.12 Landscape mitigation planting is proposed on all sides of the headhouse to reduce its visibility to sensitive receptors and to integrate it into the landscape. It is likely that a combination of additional landscape planting and landscape earthworks would be required to mitigate the effects of raising the headhouse by up to 3m and to maintain the effectiveness of mitigation screening. If the height of the headhouse were to increase, mitigation planting would take longer to become sufficiently mature to provide screening. The consequence of this would be that significant visual effects would persist for longer in the absence of effective mitigation. Should a horizontal shift be made within the limits of deviation, it would reduce the amount of landscape mitigation planting surrounding the headhouse. Consequently, new and different significant effects would be introduced in operation year 1 and the significant effects currently predicted would increase for the affected viewpoints.

Manchester tunnel – Birchfields Road vent shaft

- 2.7.13 Raising the height of the Birchfields Road headhouse by up to 3m, or repositioning the headhouse north, south or west within the limits of deviation at this location, would introduce new construction phase significant visual effects and introduce or increase the significant operational visual effects for a number of existing receptors surrounding the site. It would not introduce any newly affected receptors. Lowering of the headhouse is precluded by the operational requirements of the railway.
- 2.7.14 As described in the Volume 2, Community Area report: Davenport Green to Ardwick (MA07), the visual effects of the Proposed Scheme in this location will in general be moderate adverse (significant) or minor adverse (non-significant) during construction and operation year 1, with the effects reducing to non-significant by operation year 15.
- 2.7.15 Raising the height of the headhouse by up to 3m, or moving it horizontally north, south or west within the limits of deviation at this location, would increase the prominence of the

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Proposed Scheme in local views. This would give rise to an increase in significant visual effects for receptors, primarily residential properties, already identified in the ES.

- 2.7.16 Landscape mitigation planting is proposed on all sides of the headhouse to reduce its visibility and to integrate it into the landscape. It is likely that a combination of additional landscape planting and landscape earthworks would be required to mitigate the effects of raising the Proposed Scheme by up to 3m and to maintain the effectiveness of mitigation screening. If the height of the headhouse were to be increased, mitigation planting would take longer to become sufficiently mature to provide screening. As a result, significant visual effects would persist for longer in the absence of effective mitigation. Should a horizontal shift be made within the limits of deviation, it would reduce the space available for landscape mitigation planting around the headhouse. Consequently, new and increased significant effects would be introduced during construction and at operation year 1, and the significant effects currently predicted would increase for the affected viewpoints.

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