

Great Western Main Line Electrification Project

Environmental Statement Volume 2: Appendices A-D, South Oxfordshire District Council

Network Rail

December 2012



Notice

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Appendix A – Stakeholder Engagement Responses



A.1 Comments from Natural England and Project Team Response

Natural England Comments	Project Response
Landscape	
With respect to Table 7.1, we advise that it is not necessarily the location of the works that should form the column headings, but the potential for these works to affect these different landscapes (especially AONBs).	The potential for the works to affect sensitive landscapes is described in the column Justification for Inclusion / Exclusion in EIA Scope (Table 7.1). We can confirm that the potential effects upon all sensitive landscapes, including AONBs will be assessed.
We note in Table 7.1 that there are a number of cells which exclude from scope works in places where we believe there is significant potential for a landscape or visual impact (or at least we do not believe there is adequate justification for excluding these works in these areas from the EIA scope). For example, support structures (which, incidentally, we presume includes the overhead wires) may have significant potential to affect the urban landscape, and should be treated as within scope. While some aspects of the works can be regarded as out of scope in some places, we advise that this table is reviewed on the basis of the above.	Based on our experience of previous OLE projects, we have found that support structures do not result in a significant effect unless they are located within a particularly sensitive landscape or are adjacent to particularly sensitive visual amenity receptors. It should be noted that all of the assumptions contained in Table 7.1 are flexible and subject to information gathered during the site survey. The proposed scope was based on the information available to us at the time of writing, and will continue to evolve.
Section 7.6 discusses landscape mitigation. It would be helpful to know what approach will be taken to offsetting any residual landscape impacts. This is of particular importance with respect to AONBs. We would wish to see no net detriment to protected landscapes, which may involve off site compensation, and advise that the relevant AONBs are involved at an early stage to discuss off site options.	The approach taken to offset residual landscape effects will be developed in conjunction with the scheme design team and as the landscape and visual impact assessment identifies areas where mitigation is particularly important.
In determining the level of mitigation/compensation need to ensure no net negative impact, we advise that a higher than 1:1 replacement ratio is required (whether for biodiversity or landscape), due to loss of function due to time delay, and the EIA should consider this.	Our approach to mitigation is to suggest mitigation planting where there is a particular landscape or visual function. For example, where loss of vegetation would result in a significant effect upon visual amenity. Our approach will also be developed in conjunction with the scheme design team and our ecology colleagues. The amount of replacement biodiversity habitat needs to be related to the value of the habitat. We do not feel, for such as large scheme, that it is appropriate to replace all vegetation lost, regardless of its location, extent or value. The vegetation loss will be localised across the scheme to areas which are required for works, and the majority of habitats which would be affected are anticipated to be

Natural England Comments	Project Response
	common and widespread in the UK. We would only propose to replace habitat where this is particularly notable (such as within a designated area) or has a notable wildlife function. It should also be noted that vegetation clearance within the railway boundary would fall under permitted maintenance activities and would not require planning permission.
Geology	
We note that para 11.3.7 says that 8 of the 26 SSSIs within 1 km are Geological, and as such are not considered further. We advise that they should be considered further, because:	We are will consider these issues in the EIA.
the works have the potential to make management of geological SSSIs more difficult (e.g. scrub management), making favourable condition more difficult to attain;	
the electrification works present an opportunity to undertake works to attain favourable condition where works might require (for example) closure of the line, and;	
Network Rail may wish to undertake stabilisation works as part of these works as future stabilisation works may be more difficult once the lines are installed.	
We note that there is no consideration of Regionally Important Geological Sites (RIGS) or other local geological sites within the scoping document. Although of less importance than SSSIs the same points apply.	
Biodiversity	
We note that in para 11.5.2, the proposal is to gather desk based data on bats for 500m. We advise that this should be expanded to 5km, given vegetation clearance has the potential to affect bats over a much wider area than 500m.	Internationally important bat sites have been included where within 5 km due to the potential for such species to travel large distances to foraging areas. Bradford-on-Avon Bats SAC is the only SAC selected for bats that is within 5 km of the Scheme.
	Where bat roosts are confirmed within the project site, such as within railway structures that would be affected, we may extend the search area for bat records from the roost to help with specific assessment. However, we do not feel it is appropriate to obtain and analyse all bat records within the 5 km of the scheme. It is unlikely that localised vegetation clearance, even where this is along such a large scheme, would have the potential to significantly affect

Natural England Comments	Project Response
	foraging and commuting bat populations.
We note that in para 11.5.11, no surveys of the site for foraging or commuting bat use is proposed. We advise that this should be explicitly considered, and conclusion justified.	The scoping report does not specifically mention surveys for foraging and commuting bats and it is not considered appropriate to carry out surveys for foraging and commuting bats along the entire scheme. However, bat surveys would be targeted in locations where the desk study and initial assessment indicate potential for significant impacts to bat populations without mitigation such as roosts within structures affected along the scheme and commuting routes from/to Bradford-on-Avon Bats SAC.
For information, our standing advice on protected species can be found at http://www.naturalengland.org.uk/ourwork/planningtransportlocalgov/spatialplanning/standingadvice/default.aspx .	We are aware of this standing advice.
Para 3.2.18 highlights that significant amount of vegetation will be cleared. It is not clear whether the impact of this clearance will be assessed on biodiversity features that are neither BAP habitats nor protected species, for example on BAP species such as nesting birds. We advise that such features (species of principal importance) should be considered in line with PPS9.	Our desk study search has included a search for habitats listed on the UKBAP. Effects of the scheme on such habitats would be assessed. For protected species such as great crested newts and reptiles, precautionary methods of working would be implemented which would reduce impacts to insignificant levels and reduce the risk of wildlife offences being committed. All nesting birds are protected in the UK and a precautionary approach to vegetation clearance would take this into account.
We advise that all new records are submitted to local record centres.	We propose that if we find any evidence of European protected species (i.e. bats, great crested newts) we would forward these records to the appropriate local records centre. However it is not practicable to forward all ecological records collected for the entire scheme to the records centre. Any ecological information that is collected will be publically available within the published Environmental Statements.
Finally, we remind you that Network Rail, as a statutory undertaker, has duties under section 40 of the Natural Environment and Rural Communities Act 2006, most generally to have regard for conserving biodiversity.	Agreed.

A.2 Comments from the Environment Agency and Project Team Response

Environment Agency Comments	Project Response
Flood Risk	
Track Lowering	
It is indicated that sections of the track embankments will have to be lowered to allow for the fitting of the overhead lines. Care should be taken to where this is undertaken within the floodplain as many raised rail embankments act as informal flood defences. By lowering sections within the floodplain, new flow routes can be created, increasing the risk of flooding	With regard to flood risk and track lowering the ES will include further assessment of areas of the track which are to be lowered and any potential effects this will have on the flood plain. Where necessary mitigation will be included in the design to limit such risks identified. (See also Flood Defence Consent requirements below.)
Foundations	
The piling work to construct the foundations for pillions may impact upon any culverts that run under the embankments. A survey of the embankments should be undertaken, identifying their location and dimensions. It is indicated within the scoping statement that there is some leeway in the spacing of the support pylons. Ideally no pylons and their associated foundations should be located over or near (within ~5m) a culverted watercourse.	The issue of foundations will be dealt with in the design. It has been recommended within the Flood Risk Assessment that liaison with the appropriate Water Authority is undertaken regarding foul and surface water sewer locations to ensure the proposed development will not affect these structures. Liaison with the local Water Authority and the Environment Agency will be required to ensure that the appropriate easements are provided for both sewers and any culverted watercourses. (See also Flood Defence Consent requirements below.)
Tunnel Widening	
If there are any tunnels within the floodplain that could currently convey water during a flood, consideration should be given to the impacts of widening the tunnels on the floodplain, i.e. the widening of a tunnel may increase the conveyance capacity, potentially increasing the risk of flooding beyond the tunnel.	There are works proposed in tunnels which includes the lowering of track. The ES will include further assessment of any track lowering in tunnels and the potential effects this will have on the tunnel and any impacts it will have on flood risk. Where necessary liaison with the Environment Agency will help to identify what form of mitigation will need to be included in the design to limit such risks. (See also Flood Defence Consent requirements below.)
Bridge Work	

Environment Agency Comments	Project Response
All works on bridges over watercourse should ensure that their conveyance capacity is maintained and no new obstructions are introduced i.e. any new services should be laid either on or within the bridge structure or conveyed under the watercourse.	The ES will include further assessment of any works on bridges which are over watercourses and any potential effects this will have on the flood risk. Where necessary mitigation will be included in the design to limit such risks. (See also Flood Defence Consent requirements below.), although it is unlikely that any of the works proposed will affect the conveyance capacity under such bridges.
Temporary Compounds	
Although most of the work will be carried out using the train based system, it is indicated that some temporary works compounds will be required for some of the bridge/tunnel works. A sequential approach should be taken when locating these compounds within the floodplain and adjacent to watercourses. Ideally the compounds should be located outside of the floodplain, if this is not feasible then it should be located in the area of lowest risk feasible.	The location of the temporary compounds will be reviewed in the detailed design and the sequential approach will be applied. The potential effects that any identified temporary compounds may have on water resources or hydrogeology will be assessed further in the ES. A number of road-rail access points will be required to construct the scheme, usually utilising existing Network Rail access points. Details of these access points would be provided in the Environmental Statements within the Scheme Description.
Transformers	
A sequential approach should be taken in locating any sensitive equipment within the floodplain. Although a lot of the train line is raised above the floodplain, there may be sections that become inundated during a flood. These areas should be avoided if feasible or flood proofing measures included if not i.e. raising the structure above the predicted flood level.	The power for the Scheme would be provided from the national grid via new Feeder Stations at two locations within the Scheme; Didcot and Thingley Junction near Melksham. Outline plans for each Feeder Station would be provided in the Environmental Statements within the Scheme Description. The assessment of the environmental effects of the cable routes leading to the Feeder Stations would be undertaken by National Grid as part of their consents process. Outline locations and a generic plan for the Switching Stations would be provided in the Environmental Statements within the Scheme Description. Where necessary, mitigation will be included in the design to limit risks from flooding where such facilities cannot practicably be located outside the flood plain.
Flood Defence Consent	

Environment Agency Comments	Project Response
<p>Please be aware that a Flood Defence consent may be required from us for works over a main river (i.e. works to bridges) or within 8m of a main river. We would be happy to discuss this further with you in due course.</p>	<p>With regard to flood defence consent the following was stated in the Scoping Report, paragraph 10.2.4: 'Where works adjacent to watercourses and water bodies are to be carried out, best practice mitigation measures should be implemented to ensure no significant contamination of receptors. In particular, under the terms of the Environmental Permitting Regulations and the Land Drainage Byelaws the prior written consent of the Environment Agency is required for any works, in, under, over or within 8 metres of the bank top of a "main river" watercourse. A flood defence consent would be required for each structure for works within the 8m bank top area including culvert extensions, new culverts or construction works,' including works on or near non-main rivers or tributaries that discharge into main river systems.</p>
Biodiversity	
Non-Statutory wildlife sites	
<p>The approach to EIA outlined in Chapter 11 of the Environmental Scoping Report seems appropriate and includes assessment of impacts to sensitive sites, and protected species. We recommend that as part of the baseline survey the relevant local records centres be contacted to obtain the most up-to-date biological records. There is no mention of non-statutory wildlife sites in the scoping report and we suggest that the inclusion of sites within a 500m radius of the scheme boundary would be sensible.</p>	<p>The scoping report does mention non-statutory wildlife sites and a search area of 500 m for such sites; obtaining biological records from local records centres are also included in the scope. Paragraph 11.5.2 of the Environmental Scoping Report states 'Further information on locally-designated Sites of Importance for Nature Conservation (or site covered by equivalent local non-statutory designations) will be requested from relevant local biological records centres for within 500m of the Scheme. Details of protected and notable species will be requested from record centres and species-interest groups from within 500 m of sites where significant works are to be undertaken, such as bridges or tunnel works, track lowering or slewing, feeder stations, switching stations, site compounds or the HOOB. In particular, further information on the locations of bat roosts at Box Mine SSSI will be sought from Natural England and the local bat group.'</p>
Surveys	

Environment Agency Comments	Project Response
<p>We are pleased to see that an extended Phase 1 habitat survey will be used to identify the presence of habitat suitable for water voles, otters and white-claw crayfish. Should suitable habitat be found then we would expect species surveys and appropriate mitigation to be included in the ES.</p>	<p>Although paragraph 11.5.5 of the Environmental Scoping Report states 'Preliminary ecological walkover surveys will be carried out at sites where significant works are planned, such as [bridges or tunnel works, track lowering or slewing, feeder stations, switching stations, site compounds or the HOOB]' including suitable habitat for water voles, otters and white-clawed crayfish, , paragraph 11.5.15 goes onto state that '...since the works are mostly localised and restricted to existing railway land, detailed survey for [otters and water voles and white clawed crayfish] is not deemed to be necessary'. It is anticipated that further detailed survey for these species would only be required where potentially significant impacts were anticipated; however, the aim of the scheme would be to avoid significant impacts on these species through careful planning and management of the construction work and implementation of both a construction environmental management plan and precautionary methods of working.</p>
<p>Lighting</p> <p>Lighting has the potential to disturb bat foraging, and some species of bats commonly forage around watercourses. Therefore, we recommend that there should be no light spill from external artificial lighting into the watercourse or adjacent river corridor habitat. The Environment Agency considers background levels to be a Lux level of 0-2. Artificial lighting should be directed away from the river corridor and focused with cowlings.</p>	<p>No additional lighting is required as part of the permanent scheme. Lighting would only be required during the construction works and would therefore be temporary. Where required, lighting would be designed to reduce impacts on biodiversity and on other sensitive receptors. Methods to reduce light spill will include directing lighting away from sensitive receptors and the use of hoods which minimise glare and light spill.</p>
<p>Groundwater and Contaminated Land</p> <p>The report is satisfactory from the perspective of groundwater quality and contaminated land. The report is high level and more detailed site investigation will be needed at each site. Generally because of the limited footprint of the electrification support structure we would expect limited environmental impact despite the fact that railways can be related to elevated levels of contaminants particularly hydrocarbons, metals and asbestos. What can sometimes be more of an issue with large linear infrastructure projects is they have a significant number of construction compounds often located in greenfield sites where plant and vehicles can be parked or stored which can lead to leaks and spillages of hydrocarbons. In such locations it would be advisable to</p>	<p>We confirm that these issues will be addressed in the Environmental Statement. Further assessment of groundwater impacts will be included in the ES for each site where any track alterations and development will be undertaken for each of the Local Authorities involved.</p>

Environment Agency Comments	Project Response
carry out some basic site investigation to have a site condition report in advance of occupation.	

A.3 Comments from North Wessex Downs AONB

North Wessex Downs AONB Comments	Project Response
Section 2.3 lists the relevant local planning authorities that the route passes through. The North Wessex Downs AONB unit considers that it would have been useful to include the three AONBs.	Noted
The North Wessex Downs AONB unit considers that paragraph 3.2.1 should also mention the future impacts of the route with the arcing that occurs with the use of electrified trains	Minor arcing between the OLE contact wire and the train pantograph can occur when there is a momentary loss of contact (typically less than 50m/s) between the two components or if there is ice on the contact wire. This arcing can produce slight illumination at the interface. The OLE system will be designed and installed to minimise arcing through the use of sophisticated dynamic simulation software developed specifically for this purpose. Major arcing and its associated flashing is generally a symptom of 3rd rail systems and should not occur on a newly installed overhead electrified line. Minor arcing does occur quite frequently but is not considered to require further assessment, as it will not create a significant impact.
Section 5 deals with the scoping of the planning policy context. The North Wessex Downs AONB unit considers that this should also consider the three AONB Management Plans; this should also be reflected in Appendix B	The landscape chapter will also consider the North Wessex Downs AONB Management Plan and its relevant guidance
Paragraph 7.1.4 details that any visual assessment should include analysis of views from various receptors. The North Wessex Downs AONB unit considers that all relevant major types of receptor appear to be included though there will need to be an agreed schedule of specific locations. The North Wessex Downs AONB would like to be involved in the preparation of such a schedule.	Noted.

North Wessex Downs AONB Comments	Project Response
Paragraph 7.2.1 mentions consultation with relevant landscape officers in connection with selection of representative viewpoints. The North Wessex Downs AONB unit considers that this consultation should also involve representatives of AONBs, National Trails, National Trust and others. The list should include the Ridgeway, the Thames Path, the Swan's Way and various specified locations.	There has been a requirement, due to the time constraints associated with the programme for construction, to streamline the methodology to exclude detailed consultation with stakeholders regarding visual amenity receptor locations. We note the list of identified receptors.
Paragraph 7.3.6 states that a 1km study area has been defined. The North Wessex Downs AONB unit considers that this is not wide enough as there may be other areas within the zones of theoretical visibility that would need to be assessed. The study area should not be restrictively applied.	We can confirm that in specific locations, for example where important landscape designations such as AONBs are present, the study area may be extended beyond 1km (para 7.3.3).
Table 7.1 (p48) specifically excludes or generally excludes from the Scope parapet, OLE bridge attachments and other structural clearance operations as part of bridge works. This is considered to be a specific omission as bridge works can often be seen from a distance, particularly if the works involve fundamental change to the appearance of the relevant bridge. These should therefore be included in the scope.	The scope of the LVIA has been determined so that it focuses on the most relevant issues and significant effects. Our previous work on OLE assessment suggests that parapet, OLE bridge attachments and other structural clearance operations are not considered to be likely to result in significant effects
Table 13.1 details potential mitigation for various issues. For diversion routes (associated with bridge and other works) the report states that diversions should be prepared that avoid heritage areas, narrow roads and low bridges. The North Wessex Downs AONB unit considers that any mitigation should also mean that diversion routes are as direct as possible and lengthy diversions are avoided wherever possible.	Noted. Network Rail will endeavour to identify the most direct diversion route available, in the context of traffic levels and types on the routes, and the other constraints identified.
The introduction of both gantries and overhead wires will undoubtedly lead to visual and therefore wider landscape impacts. Clearly these will need to be fully assessed as part of any LVIA work	Based on our experience of previous OLE projects, we have found that support structures, including gantries and overhead wires, do not result in a significant effect unless they are located within a sensitive landscape or are adjacent to a sensitive visual receptor
In addition there are likely to be detrimental impacts arising from work on some bridges (particularly those that are recognised for their architectural or heritage importance). Any changes or replacements should be designed with the local context in mind, particularly if this is within an AONB	Noted

North Wessex Downs AONB Comments	Project Response
As a result the North Wessex Downs AONB unit would look for agreed mitigation measures to be in place despite the fact that much of the proposed work is deemed to be permitted development.	Noted
Network Rail will clearly need to demonstrate that it has taken full account of the purpose of the AONBs (the need to conserve and enhance the natural beauty of each area) in accordance with its statutory duty in the context of Section 85 of the Countryside and Rights of Way Act 2000	Where appropriate, the landscape chapter will take into consideration Section 85 and DEFRA guidance concerning the duties with regard to Areas of Outstanding Natural Beauty. For example, the LVIA will identify where landscape mitigation is most important.
Network Rail should therefore take full account of the "Duties on relevant authorities to have regard to the purposes of National Parks, AONBs and the Norfolk and Suffolk Broads" guidance note. This was published by DEFRA in 2005	Noted

A.4 Comments from Chilterns AONB

Chilterns AONB Comments	Project Response
Section 2.2 (p18) gives a description of the route. The Chilterns and the AONB are mentioned though the North Wessex Downs and the AONB are not (paragraph 2.2.2).	Noted
Paragraph 2.2.5 mentions the North Wessex Downs but not the AONB.	Noted
Section 2.3 lists the relevant local planning authorities that the route passes through. The Board considers that it would have been useful to include the three AONBs.	Noted

Chilterns AONB Comments	Project Response
The Board considers that paragraph 3.2.1 should also mention the future impacts of the use of the route with the arcing that occurs with the use of electrified trains.	Minor arcing between the OLE contact wire and the train pantograph can occur when there is a momentary loss of contact (typically less than 50m/s) between the two components or if there is ice on the contact wire. This arcing can produce slight illumination at the interface. The OLE system will be designed and installed to minimise arcing through the use of sophisticated dynamic simulation software developed specifically for this purpose. Major arcing and its associated flashing is generally a symptom of 3rd rail systems and should not occur on a newly installed overhead electrified line. Minor arcing does occur quite frequently but is not considered to require further assessment, as it will not create a significant impact.
Section 5 deals with the scoping of the planning policy context. The Board considers that this should also include the three AONB Management Plans, relevant other advice such as the Chilterns Buildings Design Guide and supplementary technical notes on local building materials (Flint and Brick in particular), The Environmental Guidelines for the Management of Highways in the Chilterns and relevant landscape character studies (in particular the Countryside Commission work from 1992 for the Chilterns, the Chilterns Historic Landscape Characterisation work and any other landscape characterisation work). This should also be reflected in Appendix B.	These documents will be taken into account as appropriate through the assessment.
Paragraph 7.1.4 details that any visual assessment should include an analysis of views from various receptors. The Board considers that all relevant major types of receptor appear to be included though there will need to be an agreed schedule of specific locations. The Board would like to be involved in the preparation of such a schedule.	There has been a requirement, due to the time constraints associated with the programme for construction, to streamline the methodology to exclude detailed consultation with stakeholders regarding visual amenity receptor locations.
Paragraph 7.2.1 mentions consultation with relevant landscape officers in connection with the selection of representative viewpoints. The Board considers that this consultation should also involve representatives of the AONBs, National Trails, National Trust and others. The list should include the Ridgeway, the Thames Path, the Swan's Way and various specified locations.	There has been a requirement, due to the time constraints associated with the programme for construction, to streamline the methodology to exclude detailed consultation with stakeholders regarding visual amenity receptor locations. We note the list of identified receptors.

Chilterns AONB Comments	Project Response
Paragraph 7.3.6 states that a 1km study area has been defined. The Board considers that this is not wide enough as there may be other areas within zones of theoretical visibility that would need to be assessed. The study area should not be restrictively applied.	We can confirm that in specific locations, for example where important landscape designations such as AONBs are present, the study area may be extended beyond 1km (para 7.3.3).
Paragraph 7.3.9 refers to Appendix C and a summary of published landscape character assessments. Consideration should also be given to the AONB character assessments undertaken by the Countryside Commission (1992 for the Chilterns) and Historic Landscape Characterisation work as well as other landscape character work if not already mentioned and scoped.	These documents will be taken into account as appropriate through the assessment.
Table 7.1 (p48) specifically excludes or generally excludes from the scope parapet, OLE bridge attachments and other structural clearance operations as part of bridge works. This is considered to be a significant omission as bridge works can often be seen from a significant distance, particularly if the works involve a fundamental change to the appearance of the relevant bridge. These should therefore be included in the scope.	The scope of the LVIA has been determined so that it focuses on the most relevant issues and significant effects. Our previous work on OLE assessment suggests that parapet, OLE bridge attachments and bridge jacking operations are not considered to be likely to result in significant permanent effects in most cases; however, this will be checked in locations of acknowledged sensitivity, such as conservation areas.
Paragraph 8.4.1 mentions Bath and its World Heritage Site and the fact that this could be a potentially significant issue. It should also be noted that the GWR is on the tentative list for World Heritage Site status. This is supported by English Heritage. This status should be fully investigated as part of the EIA scoping and report production.	NR are working closely with BANES and English Heritage in respect of the design and assessment of the electrification in the WHS and along the route.

Chilterns AONB Comments	Project Response
Paragraph 10.3.22 states that no SACs have been identified within 2km of the route. This is incorrect because Hartslock Wood is less than 1km from the route (this is also partly within a SSSI [Hartslock] which is identified in 10.3.24). An appropriate assessment will also be required and close liaison with Natural England should be undertaken.	<p>Whilst Hartslock Wood SSSI and SAC (ancient yew woodland and chalk grassland/scrub) are within 1 km of the rail line, they are approximately 500 m north east of the rail line (near Lower Basildon). No major works are proposed within 1 km of the woodland and no works will be undertaken outside of Network Rail land (i.e. outside of the railway boundary). The closest major works would be the construction of Pangbourne Switching Station, approximately 1.5 km south.</p> <p>Given the nature and scale of the scheme the zone of influence for Internationally/European designated sites is:</p> <ul style="list-style-type: none"> • 5 km for SACs designated for bat populations because of the mobility of these species; and • Other European sites immediately adjacent to the scheme. Due to the nature of the proposed works it is unlikely that any European sites designated for their habitats will be affected by the Scheme. The majority of works will be confined to within Network Rail land or immediately adjacent. Best practice construction measures will avoid water pollution and downstream impacts. <p>To comply with the Habitats Regulations and at the request of Natural England a Habitats Regulations Assessment (Stage 1) screening exercise will be carried out for Bath and Bradford-on-Avon Bats SAC. It is not currently anticipated that other European sites will undergo HRA screening. This is because any activities due to take place near to these sites can be managed to prevent damage to the special interest features via the processes of Network Rail and their contractors.</p>
Paragraph 11.3.6 mentions three of the five SACs that are within 1km of the route. The other two should also be mentioned and should clearly include Hartslock Wood, virtually all of which is within 1km. This may mean that the number of SACs affected is actually six rather than five.	Hartslock Wood was omitted from the list in paragraph 11.3.6 but will be considered within the relevant Environmental Statement.

Chilterns AONB Comments	Project Response
Table 13.1 details potential mitigation for various issues. For diversion routes (associated with bridge and other works) the report states that diversions should be prepared that avoid heritage areas, narrow roads and low bridges. The Board considers that any mitigation should also mean that diversion routes are as direct as possible and lengthy diversions are avoided wherever possible.	Noted. Network Rail will endeavour to identify the most direct diversion route available, in the context of traffic levels and types on the routes, and the other constraints identified.
The introduction of both gantries and overhead wires will undoubtedly lead to visual and therefore wider landscape impacts. Clearly these will need to be fully assessed as part of any LVIA work.	Based on our experience of previous OLE projects, we have found that support structures, including gantries and overhead wires, do not result in a significant effect unless they are located within a sensitive landscape or are adjacent to a sensitive visual receptor
In addition there are likely to be detrimental impacts arising from work on some of the bridges mentioned (particularly those that are recognised for their architectural and historic importance). Any changes or replacements should be designed with the local context in mind, particularly if this is within an AONB.	Noted
As a result, the Chilterns Conservation Board would look for agreed mitigation measures to be in place despite the fact that much of the proposed work is deemed to be permitted development.	Noted
Network Rail will clearly need to demonstrate that it has taken full account of the purpose of the AONBs (the need to conserve and enhance the natural beauty of each area) in accordance with its statutory duty in the context of Section 85 of the Countryside and Rights of Way Act 2000.	Where appropriate, the landscape chapter will take into consideration Section 85 and DEFRA guidance concerning the duties with regard to Areas of Outstanding Natural Beauty. For example, the LVIA will identify where landscape mitigation is most important.
Network Rail should therefore take full account of the 'Duties on relevant authorities to have regard to the purposes of National Parks, Areas of Outstanding Natural Beauty (AONBs) and the Norfolk and Suffolk Broads' guidance note. This was published by DEFRA in 2005.	Noted
The Board would like to be consulted on any future reports and statements and will make comments on those at the appropriate time.	Noted

Appendix B – Underlying Geology



B.1 Underlying Geology

Table B.1 – Summary of Published Geology Across the Scheme

Solid Strata (Bedrock)	Superficial Deposits*
Maidenhead East Junction (23m58c) to Westbury Line Junction (36m17c)	
Seaford Chalk and Newhaven Chalk Formation	Alluvium, Head, Kempton Park Gravel Formation, Langley Silt Member or absent
Lambeth Group	Taplow Sand and Gravel Formation, Kempton Park Gravel Formation, River Terrace Deposits or absent
Westbury Line Junction (36m17c) to West of Newbury (54m00c)	
Seaford Chalk and Newhaven Chalk Formations	Alluvium, Beenham Grange Gravel Member or absent
Lambeth Group	Alluvium, Peat, Beenham Grange Gravel Member or absent
London Clay Formation	Alluvium, Beenham Grange Gravel Member
Westbury Line Junction (36m17c) to Didcot Parkway (53m10c)	
Seaford and Newhaven Chalk Formation	Alluvium, Langley Silt Member, Kempton Park Gravel Formation or absent
Lewes Nodular Chalk Formation	Kempton Park Gravel Formation, Taplow Sand and Gravel Formation
New Pit Chalk Formation	Alluvium, Taplow Sand and Gravel Formation
Zig Zag Chalk Formation	Taplow Sand and Gravel Formation or absent
West Melbury Marly Chalk Formation	Alluvium, Northmoor Sand and Gravel Formation or absent
Upper Greensand Formation (Sandstone_	Alluvium, Head, Summertown-Radley Sand and Gravel Member
Gault Formation (Clay/Mudstone)	Head
Didcot East Junction (52m66c) to North of Oxford (65m00c)	
Gault Formation (Clay/Mudstone)	Alluvium, Wolvercote Sand and Gravel Member, Northmoor Sand and Gravel Member or absent
Lower Greensand Group (Sandstone)	Northmoor Sand and Gravel Member, Summertown-Radley Sand and Gravel Member or absent
Ampthill Clay and Kimmeridge Clay Formations	Alluvium, Head, Northmoor Sand and Gravel Member, Summertown-Radley Sand and Gravel Member or absent
Stanford Formation (Limestone)	Absent
Kingston Formation (Sandstone)	Absent
West Walton Formation (Mudstone)	Alluvium or absent

Solid Strata (Bedrock)	Superficial Deposits*
Oxford Clay and West Walton Formations	Alluvium, Northmoor Sand and Gravel Member
Didcot Parkway (53m10c) to Swindon East (77m10c)	
Gault Formation (Clay/Mudstone)	Alluvium, Head, Summertown-Radley Sand and Gravel Member, Wolvercote Sand and Gravel Member, Northmoor Sand and Gravel Member or absent
Lower Greensand Group (Sandstone)	Northmoor Sand and Gravel Member or absent
Amphill Clay and Kimmeridge Clay Formations	Alluvium, Northmoor Sand and Gravel Member or absent
Red Down Sand Member (Ferruginous Sandstone)	Absent
Swindon East (77m13c) to Box Tunnel (99m12c)	
Swindon East (77m13c) to Stoke Gifford West Junction (111m73c)	
Amphill Clay and Kimmeridge Clay Formations	Alluvium or absent
Stanford Formation (Limestone)	Absent
Oxford Clay Formation (Clay/Mudstone)	Alluvium, River Terrace Deposits or absent
Kellaways and Oxford Clay Formations (Undifferentiated Clay/Mudstone)	Alluvium, River Terrace Deposits or absent
Kellaways Sand Member (Interbedded Sandstone and Siltstone)	River Terrace Deposits or absent
Kellaways Clay Member (Clay/Mudstone)	Alluvium or absent
Cornbrash Formation (Limestone)	Absent
Forest Marble Formation (Mudstone/Limestone/Ooidal Limestone)	Alluvium or absent
Chalfield Oolite Formation (Limestone)	Absent
Charmouth Mudstone Formation	Absent
Rugby Limestone Member (Interbedded Limestone and Mudstone)	Absent
Saltford Shale Member	Absent
Langport and Wilmcote Limestone Members (Interbedded Limestone and Mudstone)	Absent
Westbury Formation and Cotham Member (Undifferentiated Mudstone)	Absent
Mercia Mudstone Group (Mudstone and Halite Stone)	Alluvium or absent

Solid Strata (Bedrock)	Superficial Deposits*
Mangotsfield Member (Mudstone, Siltstone and Sandstone)	Alluvium or absent
Farrington and Barren Red Members (Undifferentiated) (Mudstone, Siltstone and Sandstone)	Alluvium or absent
Redcliffe Sandstone Member	Absent
Downend Member (Sandstone)	Alluvium or absent
Blue Anchor Formation (Mudstone)	Absent
Stoke Gifford West Junction (111m73c) to Patchway Junction 2 (5m61c) Stoke Gifford West Junction (111m73c) to West of Bedminster (120m00c) Box Tunnel (99m12c) to West of Bedminster (120m00c)	
Bridport Sand Formation (Sandstone)	Absent
Beacon Limestone Formation	Alluvium
Lower Jurassic and Middle Jurassic Rocks (Interbedded Limestone and Mudstone)	Alluvium, River Terrace Deposits or absent
Charmouth Mudstone Formation	Alluvium, River Terrace Deposits, Head or absent
Westbury Formation and Cotham Member (Undifferentiated Mudstone)	Absent
Mercia Mudstone Group (Mudstone and Halite Stone)	Alluvium, Head or absent
Downend Member (Sandstone)	Alluvium
Saltford Shale Member (Mudstone)	Alluvium or absent
Mangotsfield Member (Sandstone)	Head or absent
Farrington and Barren Red Members (Undifferentiated: Sandstone)	Absent
Redcliffe Sandstone Member	Alluvium, Tidal Flat Deposits, Head or absent
Rugby Limestone Member (Interbedded Limestone and Mudstone)	Absent
Wilmcote Limestone Formation (Interbedded Limestone and Mudstone)	Absent
Multiple superficial deposits listed in the table relate to single deposits overlying the bedrock in different areas and do not represent areas where multiple deposits are present.	

Appendix C – Historical Environment Impact Assessment



C.1 Historical Environment Impact Assessment

C.1.1 Table C.1 provides detail on the predicted impact of the proposed development on heritage assets within the railway corridor and on the setting of designated heritage assets within 100m of the railway line. The table contains the following information:

- **Name** – this provides the name of the asset or group of assets under question;
- **Unique ID** – where applicable this lists the unique ID numbers for listed buildings, scheduled monument or Network Rail ID etc;
- **Outline Description** – this provides a brief description of the asset / group of assets and its / their significance at a level of detail sufficient for the purposes of assessing the potential impact of the proposed development on the setting of that asset / group of assets;
- **Potential Impact** – this describes the potential impact of the development on the asset or group of assets; and
- **Scoring** – this provides the value, scale of change and effect scores as per the methodology set out in Chapter 11.

C.1.2 The impact assessment has considered the effects of the Scheme on heritage assets within the study area based on baseline information supplied in the GWML Conservation Statement¹ and Gazetteer².

C.1.3 The location of those assets deemed to be of historic interest (as determined in Chapter 20 of Volume 1B) are shown on Figure SODC 20.1.

¹ Alan Baxter Associates, 2012, History and Significance of the Great Western Main Line, Prepared for Network Rail, April 2012

² Alan Baxter Associates, 2012, Great Western Main Line Route Structures Gazetteer, Prepared for Network Rail, Rev. October 2012



Table C.1 - Heritage Asset Impact Assessment





Name	Unique ID(s)	Photo	Outline Description	Potential Impact	Scoring		
					Value	Scale of Change	Effect
Barn and Stables, Station Road, Goring.	1059557		Grade II Listed Building. Barn. Probably late C17. Flint base with brick bands and quoins. It has large timber framing; weatherboarding; a plain tile roof and central plank doors. The barn has a Queen post roof. The stables have flint walls with brick dressings and a thatch roof.	The stables are approximately 81 metres from the GWML within a residential area. There is intervening development between the building and the GWML which screens views of the track. In addition, there is vegetation at the end of Station Road and along the railway corridor at this location. The installation of the OLE equipment will therefore not affect the significance of the building. It is assumed that vegetation clearance will be minimised around the Goring Station area to maintain screening wherever possible.	Medium	Neutral	Neutral.
Sides Tumble In, Goring Red Cross Road, Goring.	1194214		Grade II Listed Building. Cottage which is a single storey with an attic. C18. Left wall is painted brick. Timber frame on the left with a brick infill. Right wall is roughcast and probably on brick. There is a plain tile roof. Plank door.	Approximately 30m from the railway line with a direct view of the track. The cottage is located between the edge of a predominantly residential area and the GWML. The cottage's main facade faces away from the railway line with a garden at the rear which backs onto the railway. There is some screening provided by shrubs in the garden and vegetation planting in the railway corridor beyond. The OLE equipment is likely to be visible from the rear of the cottage and in views of the cottage itself. This will make the railway a slightly more visible feature, but will hardly affect the significance of the building.	Medium	Minor Adverse	Slight Adverse
49, 51 and 53, Reading Road, Cholsey	1025291 (MLN1 4758)		Grade II Listed Building. 3 cottages possibly Brunel designs from around 1839. They are simple Tudor styles. Made of red brick with flint fronts and stone dressings. The road is possibly Welsh slate. Red brick stacks surround cottages on 3 sides. Cottages are 2 storeys with central gables defined by stone quoins. Moulded string courses to both floors.	Approximately 53 metres from the GWML. The cottages are surrounded by buildings to the west and north and open space to the east. The railway is in a slightly cutting at this location. Therefore the railway line is screened from view and will not be affected by the proposals.	Medium	Neutral	Neutral
The Gables, Reading Road.	1052183 (MLN 4758)		Grade II Listed Building. Former station hotel/tavern. c1841. Painted red brick with stone dressings. Slated roofs with 2 gables, projecting eaves and bargeboards; brick chimney stacks. Square plan of 2 storeys and attic. The entrance arch is in the Tudor style and flanked by transom and mullion windows.	Approximately 11 metres from the GWML. Surrounded by buildings to the north and open land to the south. Although the building is particularly close to the railway, it was originally a railway station building and so was designed to be adjacent to the railway. Its significance will only be affected by the installation of OLE equipment, slightly reducing the appreciation of the building as a station / hotel.	Medium	Minor Adverse	Slight Adverse







Name	Unique ID(s)	Photo	Outline Description	Potential Impact	Scoring		
					Value	Scale of Change	Effect
Broadlands, just off West End.	1193783		Grade II Listed Building. Farmhouse, now house. C17. Red brick with random grey headers to the right. Timber framing. Old plain-tile roof and brick stacks. L-shaped plan. 2-storey. 6-panel. Dentil course to eaves. Roof cross-gabled to left, half-hipped to right. Timber framing with brick infill.	The farmhouse is approximately 62 metres from the railway line set in its own grounds with tall trees to the south and west which largely screen the railway and surrounding development. As the railway is slightly embanked at this location, the installation of OLE equipment will make the railway a more visible feature, slightly diminishing the significance of the structure as a rural farmhouse prior to the installation of railway. It is assumed that there will be limited vegetation clearance along the track at this location.	Medium	Minor Adverse	Slight Adverse
Coaling Stage Great Western Railway Heritage Centre, Station Road.	1389009		Grade II Listed Building. Railway coal stage and water tank. 1931. Brown engineering brick and a sheet iron tank. Tank supported by a cast iron column. Panelled brown brick walls with blue engineering brick. Metal framed window. Pre-cast concrete external staircase.	Its location is between a fork in the track, approximately 63 metres from the track on the eastern side and 110 metres from the track to the southwest. It is located within the wider Didcot railway depot. The building is a tall landmark structure, easily visible from the surrounding area. The installation of OLE equipment along an existing working railway will not detract from the significance of this structure as a historic railway structure dating to the 1930s.	Medium	Neutral	Neutral
Engine Shed Great Western Railway Heritage Centre, Station Road.	1385232		Grade II Listed Building. 1931 Railway engine shed. Still in use by Great Western Society. Brown brick, asbestos sheet and steel. Corrugated iron roof cladding (not original) over timber boards and timber doors. The west wall is plain brick and is abutted by a range of plain brick lean-to offices and workshops accessed individually from the engine shed with steel frame and timber sash windows with reinforced concrete heads and cills under a timber boarded and slated roof. Interior: has an open light steel truss roof with smoke catchers over the roads.	The building is approximately 45 metres from the railway. The track is located to the Engine Shed's east. The installation of OLE equipment along the existing working railway will not detract from the significance of this structure as a historic railway shed.	Medium	Neutral	Neutral
Transfer Shed, Station Road.	1368768		Grade II Listed Building. Transfer shed c.1840. 20th century alterations of engineering brick base; timber framing; corrugated iron roof. Ventilation openings to eaves.	The railway track is located to the northeast of the Transfer Shed and is approximately 65 metres away. The installation of OLE equipment along the existing working railway will not detract its significance as a historic railway shed.	Medium	Neutral	Neutral






Name	Unique ID(s)	Photo	Outline Description	Potential Impact	Scoring		
					Value	Scale of Change	Effect
'Didcot Old Area' Conservation Area, Lydalls Road.			Conservation Area encompassing the old church set on higher ground to the south of railway with the main road in front of the railway line.	The Didcot Conservation Area is approximately 91 metres from the railway track. It is set on much higher ground than the railway with intervening development and the A4130 between the Conservation Area and the railway. The small Conservation Area is also particularly well planted with mature trees. Therefore, there will be no impact as a result of the proposals.	Medium	Neutral	Neutral
Didcot Station Road Conservation Area.			Station Road contains architecturally detailed housing for Great Western Railway employees. The core of this conservation area has been developed and grown considerably particularly with the large A4130 carriageway to the north and the town centre developments including cinema to the north.	Although the conservation area is only approximately 40 metres from the railway track, the separation from the railway track including the station building, large A4130 carriageway and later housing mean that the proposals will not be immediately obvious from within the Conservation Area. The proposals will take place on a working railway line and so will not detract from the character of the conservation area as railway workers housing associated with the Great Western Railway.	Medium	Neutral	Neutral
Gatehampton Conservation Area, Gatehampton Road.			Gatehampton Conservation Area encompasses a small number of historic buildings including cottages, a farmhouse and manor house, which lie outside of the 100m study area.	The Conservation Area is around 24m from the railway track, which is embanked and crosses a viaduct at this location. The railway is clearly visible. Whilst the installation of OLE equipment does not take away the historic connections of the manor house, cottages and farmhouse with each other, it will make the railway a more obvious feature in the wider landscape and will obscure views to the west which are currently possible. The OLE equipment will therefore be a notable feature in the wider landscape.	Medium	Moderate Adverse	Moderate Adverse.
Goring Conservation Area			The Conservation Area encompasses the large village of Goring, which is situated adjacent to the Thames. The railway is located at the very eastern edge of the village. The conservation area includes the station and small section of railway line at Goring.	The installation of OLE equipment will be located away from the historic core of the village and will not affect the key views within the village and to the River Thames. There will be occasional views of the OLE equipment from within the conservation area when located adjacent to the station or from the overbridge looking down to the railway line. This will not affect the conservation area's significance as a riverside historic village.	Medium	Neutral	Neutral

Name	Unique ID(s)	Photo	Outline Description	Potential Impact	Scoring		
					Value	Scale of Change	Effect
Nuneham Courtenay Conservation Area, Oxford Road (B4015) runs south of the area			The Conservation Area includes the Registered Park of Nuneham Courtenay as well as the River Thames to the north of the park and the village to the east. (See Nuneham Courtenay Registered Park and Garden for a more detailed description of the park itself.)	<p>The Conservation area abuts the railway line at its very south western extent. The land slopes down to the west, with views over the Thames and beyond. There is a thickly wooded section at the conservation area's western end, but views over and beyond these woods are possible because of the high topography within the park.</p> <p>The installation of OLE equipment may be visible as a very minor aspect in the wider views from within high points in the park looking west. Whilst, they will be very inconspicuous, glimpses of the OLE equipment will make the railway a more obvious feature in the wider landscape at the western end of the park.</p>	High	Minor Adverse	Slight Adverse
Nuneham Courtenay Park, Oxford Road (B4015)	1000122		Grade I Registered Park. C18th park. Consists of pleasure grounds and listed buildings towards the centre of the park and more woodland areas located largely at the boundaries, to the west of the village. Nuneham Park lies 6km south of Oxford, adjacent to the west side of the village of Nuneham Courtenay. The 470ha estate is bounded to the west by the River Thames and on the other sides largely by agricultural land and woodland. The largely rural setting also includes Culham scientific laboratories to the south. The park overlies low, undulating hills, with a steep slope towards the west boundary where the land drops down to the river. There are long views westwards towards Abingdon and north towards Oxford.	<p>Approximately 4 hectares of this park lies within the 100m buffer of the GWML. On the western slope in the park from the principal house itself, there are extensive views to the west and south.</p> <p>The Registered Park abuts the railway line at its very south western extent. The land slopes down to the west, with views over the Thames and beyond. There is a thickly wooded section at the park's western end (Low Wood), but views beyond and either side of these woods are possible because of the high topography within the park.</p> <p>The installation of OLE equipment may be visible as a very minor aspect in the wider views from within high points in the park looking west, with the principal house being 1.5km from the GWML. It is assumed that vegetation clearance will be limited as far as possible from Culham Station (DCL 5845) to Road Overbridge (DCL 5845) to maintain screening of the railway.</p> <p>Whilst, they will be very inconspicuous new elements, glimpses of the OLE equipment will make the railway a more obvious feature in the wider landscape at the western end of the park and be a very small new aspect of views to the west.</p>	High	Minor Adverse	Slight Adverse

Name	Unique ID(s)	Photo	Outline Description	Potential Impact	Scoring		
					Value	Scale of Change	Effect
South Moreton Conservation Area, Church Lane.			South Moreton encompasses the historic core of the village. This includes a number of timber framed thatched cottages. At its closest extent the conservation area abuts the railway track on its north eastern boundary.	The majority of the conservation area will be unaffected by the proposals as they will not be visible as intervening development and planting to the north of the High Street will screen views. Along Papermill Lane, particularly at its northern end the railway is visible and is at grade in this location. The presence of the railway at the edge of this village will slightly detract from the rural edge of village character feel along this lane, however views within the rest of the Conservation Area will remain unaffected.	High	Minor Adverse	Slight Adverse
Whitchurch Conservation Area, Whitchurch Road (B471).			Whitchurch on Thames is a village adjacent to the River Thames. The river is crossed and connected to the land to the south by a toll bridge (with existing tollhouse). There is considerable thick tree planting at the very southern edge of the village. There is also planting on the Whitchurch Lock island.	The conservation area is approximately 72 metres from the railway track beyond the River Thames. The considerable planting to the south of the village, together with the planting of the northern edge of Pangbourne village on the other side of the river means that views of the railway are not possible. Therefore, the installation of OLE equipment will not be visible or affect the character of the conservation area.	Medium	Neutral	Neutral
Goring & Streatley Station	MLN1 4460		A wayside station dating from the quadrupling of the GWML here in 1890-93, with brick-single storey buildings and a footbridge. Built from purple and red brick. The design is typical of many similar stations designed by the GWR at the end of the 19th century.	The station is a relatively typical GWR station, and has been altered through the addition of lift shafts and modern footbridges over the platforms. The additional OLE equipment will slightly erode the remaining historic feel of the station. The proposal to reconstruct the footbridge, presents a positive opportunity to provide a more sympathetic style of structure, which is more in keeping with the historic station. On balance, the installation of OLE equipment, together with the reconstruction of the modern footbridge will not affect the significance of the station.	Low	Neutral	Neutral
Mill Road Underbridge	MLN1 4523		Underbridge road. Built from purple and red brick. Typical brick semi-elliptical single-arch underbridge, built 1835-38. Alteration to original structure when line quadrupled in 1890-93.	The installation of OLE equipment will not physically harm the structure. In addition, the proposals will not affect the character or setting of this typical example of a railway underbridge.	Low	Neutral	Neutral

Name	Unique ID(s)	Photo	Outline Description	Potential Impact	Scoring		
					Value	Scale of Change	Effect
Townsend Cottages Underbridge	MLN1 4631		Underbridge road built of purple and red brick. Typical semi-elliptical single-arch underbridge, built 1835-38. Alteration to original structure when line quadrupled in 1890-93.	The installation of OLE equipment will not physically harm the structure. In addition, the proposals will not affect the character or setting of this typical example of a railway underbridge.	Low	Neutral	Neutral
Cross Keys Road Underbridge	MLN1 4642		Typical brick semi-elliptical single-arch underbridge road. Built between 1835-38 of red brick. Alteration to original structure when line quadrupled in 1890-93 done in purple brick.	The installation of OLE equipment will not physically harm the structure. In addition, the proposals will not affect the character or setting of this typical example of a railway underbridge.	Low	Neutral	Neutral
Ferry Road Underbridge	MLN1 4655		Underbridge road originally built of red brick with purple brick alterations. Typical brick semi-elliptical single-arch underbridge, built 1835-38. Alteration to original structure when line quadrupled in 1890-93. Of low architectural and historic interest, and no archaeological or artistic interest.	The installation of OLE equipment will not physically harm the structure. In addition, the proposals will not affect the character or setting of this typical example of a railway underbridge.	Low	Neutral	Neutral
Moulsford Railway Viaduct	MLN1 4730 1285970 & 1193611		Grade II* Listed Building. An elegant Brunel Railway Viaduct in a picturesque Thames landscape. c.1838. The viaduct consists of four 62 ft semi-elliptical skewed arches, built of red brick with fall bramley stone dressing. It was adapted for four lines in 1890-93 with great sympathy by the erection of a matching relief viaduct on the upstream side.	The Moulsford Viaduct is a clear landmark structure in the landscape, crossing the Thames. The installation of OLE equipment along the viaduct will interrupt its current form and character. It is assumed that the spacing of the OLE masts will reflect the rhythm and spacing of the viaduct arches to give a coherent response to the structure's form. The addition of the OLE equipment will be a noticeable addition to the structure affecting its significance as an early railway structure in an open setting, however it will not fundamentally compromise its significance	High	Minor Adverse	Slight / Moderate Adverse
Appleford Viaduct	DCL 5725		A large, riveted steel bow-truss structure of 1929, with a single 167ft span to improve river navigation. A structure of some size, but of unexceptional design for its date, and therefore of only low historic and architectural interest.		Low	Neutral	Neutral

Name	Unique ID(s)	Photo	Outline Description	Potential Impact	Scoring		
					Value	Scale of Change	Effect
Track Access Overbridge (Silly Bridge)	MLN1 4779		Grade II Overbridge accommodation. Brunel single lane three semi-elliptical arch red brick bridge of c. 1840 with north side arch rebuilt in purple brick for line quadrupling 1890-93. Well preserved in parts but with substantial alteration during widening phase.	The installation of OLE equipment will slightly affect the character and appreciation since it is a large scale structure, visible in the wider landscape but it will hardly affect its appreciation. The parapet works will involve the removal of some historic fabric, but the structure has already been subject to substantial alteration. This will slightly alter its significance, but it will not be noticeable.	Medium	Minor Adverse	Slight Adverse
Cholsey Station	MLN1 4833		A wayside station dating from the quadrupling of the GWML here in 1890-93, with red and purple brick-built single-storey buildings and a footbridge. The design is typical of many similar stations designed by the GWR at the end of the 19th century. There have been numerous alterations to this building.	The installation of OLE equipment along this small relatively typical alter station will slightly affect its character as a historic station. It will not however, noticeably affect its significance.	Low	Minor Adverse	Slight Adverse
Hithercroft Road Underbridge	MLN1 5011		Underbridge road. Skew red brick semi-elliptical single-arch underbridge, built 1835-38. Alteration to original structure when line quadrupled in 1890-93 with purple brick arch and wing walls.	The installation of OLE equipment will not physically harm the structure. In addition, the proposals will not affect the character or setting of this typical example of a railway underbridge.	Low	Neutral	Neutral
Mill Brook Underbridge	MLN1 5026		Fairly typical small scale underbridge over the mill brook. Constructed in red brick.	The installation of OLE equipment will not physically harm the structure. In addition, the proposals will not affect the character or setting of this typical example of a railway underbridge.	Low	Neutral	Neutral
Sadgroves Underbridge	MLN1 5032		Underbridge accommodation. Typical red brick semi-elliptical single-arch underbridge, built 1835-38. Alteration to original structure when line quadrupled in 1890-93 built with purple brick.	The installation of OLE equipment will not physically harm the structure. In addition, the proposals will not affect the character or setting of this typical example of a railway underbridge.	Low	Neutral	Neutral
Didcot Parkway Station	MLN1 5310		Station dating from c.1885 with some alterations. Built from purple and red brick. Overall, a large but much-altered station retaining substantial fragments of historic fabric. The station is a relatively altered example of a later station structure. Although fragments of historic fabric survive, much of the surrounding immediate character has been much altered and modernised including introduction of modern footbridges, the station approach and construction of the road carriageway to the south.	The canopy alterations would involve the loss of small portions of historic fabric. This will slightly degrade the significance of the structure.	Low	Minor Adverse	Slight Adverse

Name	Unique ID(s)	Photo	Outline Description	Potential Impact	Scoring		
					Value	Scale of Change	Effect
Foxhall Road Overbridge	MLN1 5341		Overbridge road. Built from red brick and steel. Brunel single lane three semi-elliptical arch bridge of c. 1840 with north side arch rebuilt for line quadrupling 1890-93 and again during 20th century. Well preserved in parts but with substantial alteration during widening phase.	The proposals involve the reconstruction of the bridge. The bridge has been substantially altered and is barely recognisable as a historic railway bridge. Therefore, although the proposals will involve the loss of some historic fabric, the structure's character has been degraded to such an extent that its loss will not be an adverse effect.	Low	Large Adverse	Slight Adverse
Nuneham Viaduct	DCL 5725		Viaduct. A skewed bow-string girder bridge of c.1929, crossing the River Thames, similar in many ways to Appleford Viaduct (DCL 5538) and must be of similar date. However, because it crosses the river in two rather than one span, it is a less impressive and exceptional piece of engineering. Nevertheless, it is a substantial feature in the landscape of the Thames and little altered, and therefore of low architectural and historic interest, and no archaeological or artistic interest.	The installation of OLE equipment along the viaduct will interrupt its current form and character of as a bow-truss designed engineering feature. The addition of the OLE equipment will not however noticeably alter the significance of the bridge. It is assumed that the spacing of the OLE masts will reflect the spacing and rhythm of the bridge piers and upper girder structure as far as possible.	Low	Minor Adverse	Slight Adverse
Culham Old Road Overbridge	DCL 5616		Grade II Road overbridge. Typical Brunel-designed, single-arch, semi-elliptical bridge dating from the construction of the line in c.1844. Largely unaltered and with group value with Grade II* Culham Station, it is of medium architectural and historic interest.	The installation of the OLE equipment will not affect the bridge's significance and character. The parapet works, would however remove historic fabric and slightly change the character of this largely unaltered structure.	Medium	Minor Adverse	Slight Adverse
Culham Railway Station – Ticket Office and Waiting Room, Abingdon Road.	DCL 5618 1059789		Grade II* Listed Building. Ticket office and Waiting room, c.1844. Now disused. Neo-Tudor style of red brick with stone dressings and an all round timber canopy supported by cast iron brackets. Both platforms have modern steel shelters and steps up to a modern steel footbridge. Southwest of the station on Station Road is a Tudorbethan style house. The station is a small station with attractive architectural styling set within a relatively quaint setting.	The installation of the OLE equipment will not affect the historic fabric of the station. It will slightly affect the significance of the station as a relatively unaltered attractive rural station, with small scale changes to its setting.	High	Minor Adverse	Slight Adverse
Thame Lane Overbridge	DCL 5657		Grade II Red brick overbridge flying arch with parapet. Built c.1844. This is an elegant example of a less common Brunel design. Though it does not quite date from the 'Pioneering Phase' of railway construction, it is well preserved and forms part of a group around Culham Station of little altered Brunel designed structures dating from the construction of his Didcot and Oxford line.	The proposals involve the reconstruction of the overbridge. Whilst it is not of the pioneering phase of the line's development, it is still part of the railway's early history. Its reconstruction would involve a total loss of significance.	Medium	Large Adverse	Moderate / Major Adverse

Appendix D – Geology and Soils



D.1 Data from South Oxfordshire Council

Table D.1 – Potentially Contaminated Sites within 250m of Railway. The Location of the Sites can be Found on Figure SODC 21.1 (Volume 3).

Ref	Figure / Sheet	Site Type	Comments
1	8	Goods Shed	Goods shed present adjacent to the railway in 1979
2	8	Garages	50m to the west of the railway off Red Cross Road in Gorling in 1969
3	8	Works	50m to the east of the railway off Gatehampton Road in 1978
4	8	Coal Yard	Adjacent to the railway to the east in 1978
5	9	Works (later marked as sewage works)	Adjacent to the railway to the east in 1963
6	11	Goods shed and Coal Yard	Adjacent to the site to the east in 1970
7	15	Old Gravel pit	Adjacent to the site to the east in 1877
8	16	Sidings and associated tanks	Adjacent to the north of the site in 1960
9	16	Sub Station	10m to the south of the site
10	17	Gas Works	Adjacent to the site in Didcot to the north of the railway in 1968
11	17	Sidings with coal yard, joinery, depots and tanks	40m to the south of the site in Didcot from 1968
12	18	Goods sheds, engine sheds, carriage sheds, gas works and gasometer	Adjacent to the site at Didcot Junction from 1878
13	18	Goods shed, provender store and pumping engine	Adjacent to the site at Didcot Junction from 1878
14	18	Barracks – Vauxhall Camp	Adjacent to the site to the south of the railway at Didcot Junction from 1968
15	20	Industrial buildings/warehouses	Adjacent to the site to the east of the railway on current aerial maps
16	23	Gravel pit	50m to the east of the railway in 1875
17	23	Storage depots, tanks and government buildings	Adjacent to the site to the east of the railway from 1972
18LF	11	Manor Farm	Accepted inert, household, commercial and industrial waste date of filling unknown but not beyond 1970
19LF	1	Dean Farm, Readlands Pit	Licence no. 86148 (no details provided)

D.2 Construction CSM

Table D.2 - Construction Conceptual Site Model and Risk Assessment

Source	Receptor	Pathway	Likelihood	Consequence	Risk Level
<p>Existing contaminants in the ballast, embankments and underlying soils and groundwater at the site. Including diesel leaks/spills from trains.</p> <p>On-site contaminants which have migrated from adjacent off-site sources (including landfill sites).</p> <p>Contaminants could include: metals, PAH, TPH, VOC, SVOC, asbestos.</p> <p>Ground/landfill gas and vapours</p>	Human health (Construction workers along route, but assume ground investigation and appropriate PPE/working methods).	Inhalation/ingestion of contaminants in soils/dust and inhalation of vapours, ground/landfill gas and asbestos fibres.	Low	Medium	Moderate/Low risk
		Dermal contact with contaminants in soils/dust/water.	Likely	Medium	Moderate risk
	Controlled waters (Groundwater within Superficial Deposits Secondary A Aquifer and the Chalk and Upper Greensand Principal Aquifers)	Leaching and migration of contaminants (free and dissolved phase) from soils in the unsaturated zone into the groundwater in Secondary A and Principal Aquifers followed by vertical and lateral migration.	Likely	Mild	Moderate/Low risk
	Surface Water Courses (Assumes surface water run-off is appropriately managed).	Surface run-off to adjacent surface watercourses and surface drainage infrastructure.	Likely	Mild	Moderate/Low risk
		Migration via preferential pathways such as service runs.	Low	Mild	Low risk
		Lateral migration in groundwater to surface water courses.	Likely	Mild	Moderate/Low risk
	Property (Railway services, structures and foundations).	Direct contact with foundations and services with contaminants in soil and shallow groundwater.	Low	Medium	Moderate/Low Risk
		Migration of ground/landfill gas/vapours into site chambers and enclosed spaces such as electrical cabinets and drainage chambers.	Low	Medium	Moderate/Low Risk

D.3 Operation CSM

Table D.3 – Operational Conceptual Site Model and Risk Assessment

Source	Receptor	Pathway	Likelihood	Consequence	Risk Level
Existing contaminants in the ballast, embankments and underlying soils and groundwater at the site. Including diesel leaks/spills from trains.	Human health (Future railway workers along route and assumes appropriate PPE/working methods).	Inhalation/ingestion of contaminants in soils/dust and inhalation of vapours, ground/landfill gas and asbestos fibres.	Low	Medium	Moderate/Low risk
		Dermal contact with contaminants in soils/dust/water	Likely	Medium	Moderate risk
On-site contaminants which have migrated from adjacent off-site sources (including landfill sites).	Controlled waters (Groundwater within Superficial Deposits Secondary A Aquifer and the Chalk and Upper Greensand Principal Aquifers)	Leaching and migration of contaminants (free and dissolved phase) from soils in the unsaturated zone into the groundwater in Secondary A and Principal Aquifers followed by vertical and lateral migration	Likely	Mild	Moderate/Low risk
Contaminants could include: metals, PAH, TPH, VOC, SVOC, asbestos. Ground/landfill gas and vapours	Surface Water Courses (Assumes surface water run-off is appropriately managed).	Surface run-off to adjacent surface watercourses and surface drainage infrastructure	Likely	Mild	Moderate/Low risk
		Migration via preferential pathways such as service runs.	Low	Mild	Low risk
		Lateral migration in groundwater to surface water courses	Likely	Mild	Moderate/Low risk
PAH, TPH, ground/landfill gas and vapours	Property (Railway services, structures and foundations).	Direct contact with foundations and services with contaminants in soil and shallow groundwater	Low	Medium	Moderate/Low Risk
		Migration of ground/landfill gas/vapours into site chambers and enclosed spaces such as electrical cabinets and drainage chambers.	Low	Medium	Moderate/Low Risk

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