

Local Environmental Management Plan for London Borough of Hillingdon

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1 Introduction

- 1.1.1 This Local Environmental Management Plan (LEMP) sets out site- specific control measures to be adopted by the HS2 Contractors working within the London Borough of Hillingdon (LBH) that will be developed further following consultation with relevant Stakeholders. This LEMP builds upon but does not repeat the HS2 general environmental requirements set out in the Code of Construction Practice (CoCP) (available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/593592/Code_of_Construction_Practice.pdf).
- 1.1.2 This LEMP contains control measures and the standards to be implemented within LBH. The sections within this LEMP should not be read in isolation from the other sections due to the interconnected nature of the measures between disciplines
- 1.1.3 For ease of reference, the LEMP mirrors the topic headings in the CoCP.
- 1.1.4 Information of relevance to the formation and development of this LEMP (as shown in Figure 1) is contained within this document, or links are provided to where it can be accessed. This includes:
- Information from traffic, environmental surveys and ground investigation works. This could either be seasonal ecological surveys, tree surveys, air quality monitoring, noise monitoring, ground settlement or the results of ground investigations detailing levels of contamination (where present) and the nature of the ground;
 - Feedback on pertinent information from on-going engagement; and
 - Results of petitions of the Parliamentary process which have resulted in amendments to the mitigation measures contained within the CoCP.



Figure 1: Key work streams that will provide additional information for the LEMPs.

- 1.1.5 This LEMP has been prepared taking into account findings of the Environmental Statement (ES); the Additional Provision ES (AP ES); the Supplementary Environment Statement (SES) and AP2 ES; the SES3 and AP4 ES; and the SES4 and AP5 ES, where relevant. It has evolved during the Parliamentary process and engagement with the Local Authority and other Stakeholders, such as members of the National Environment Forum, which have informed its development. This LEMP may be subject to further refinement, amendment, and expansion as necessary as the project design progresses.
- 1.1.6 The Contractors will implement the requirements of the LEMPs and the CoCP through their own Environmental Management System (EMS), which will be certified to BS EN ISO 14001.
- 1.1.7 The Nominated Undertaker (HS2 Ltd)¹ and/or its Contractors will continue to engage with the local Stakeholders. This will take the form of engagement events which will be carried out to introduce and brief the communities on local environmental information, management, and mitigation as detailed within this document.
- 1.1.8 The HS2 Environmental Memorandum identifies key worksites along the route of HS2 Phase One that are environmentally sensitive in terms of nature conservation,

¹ HS2 Ltd is the Nominated Undertaker. The two terms are used interchangeably throughout this LEMP.

terrestrial and aquatic ecology, water resources, geomorphology, recreation and amenity, landscape, public open space, and agricultural land. The criteria for inclusion are 'worksites where a key significant impact (that has been agreed with the HS2 National Environment Forum² members) is generated in any of the environmental topics' as mentioned above.

- 1.1.9 The Nominated Undertaker will prepare site-specific management plans for these identified key environmentally sensitive worksites, focusing on mitigation, compensation, and monitoring requirements, with opportunities for enhancement in relation to the identified environmental topics as outlined within the Environmental Memorandum. There is one such site within the LBH: the Mid-Colne Valley Site of Special Scientific Interest (SSSI), due to the following key environmental sensitivities; recreation, nature conservation, terrestrial and aquatic ecology, water resources and flood risk, and landscape. The plan for this SSSI can be found in Appendix 3 of this LEMP.
- 1.1.10 The controls within this LEMP, as with those in the CoCP, are in line with HS2's Safe at Heart health and safety brand. Safe at Heart seeks to ensure that health and safety are at the heart of everything that we do including the design, construction, and operation of the Scheme. This aim stretches beyond the Scheme itself, through instruments such as this LEMP, into the communities along the Scheme to ensure that we protect their health, safety, and wellbeing.
- 1.1.11 HS2 documents referenced within this LEMP can be found on the www.gov.uk website.

1.2 Area and Scope

- 1.2.1 Plans showing an overview of LBH areas covered by this LEMP are shown within the Environmental Statement (ES) maps (CFA 6 and CFA 7, between chainages 19+000 to 28+500):
- CT-05-015b to CT-05-019a in Volume 2, for CFA 6 (Ref: ES 3.2.2.6); and
 - CT-05-019b to CT-05-023a for CFA7 (Ref: ES 3.2.2.7).

² The National Environment Forum comprises Government departments and statutory bodies and was established to advise on environmental policy for HS2, including project-wide strategies for reducing the environmental impact of the line and principles for a Code of Construction Practice

- 1.2.2 Updated plans are also shown in the Volume 2 map books of the AP ES (September 2014), the SES and AP2 ES (July 2015), the SES3 and AP4 ES (October 2015) and the SES4 and AP5 ES (December 2015).
- 1.2.3 Construction worksites and areas required for construction works are shown within the CT-05 maps

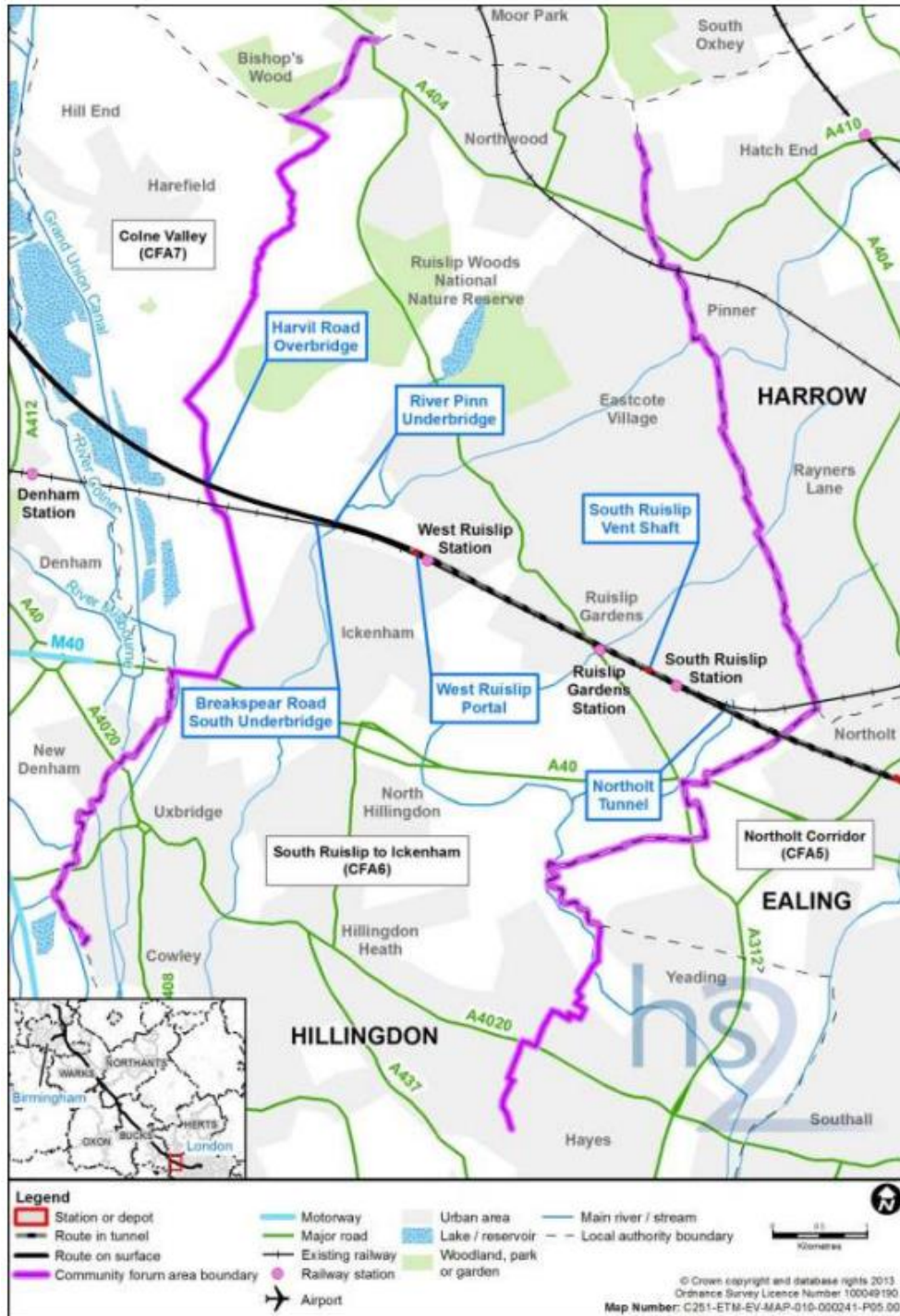


Figure 2: London Borough of Brent Area Context Map

1.2.4 It is anticipated that the following general descriptions of work activities are to take place during core and non-core working hours during the construction period within the LBH:

- Advance works, including site investigations further to those already undertaken; preliminary mitigation works; preliminary enabling works;
- Enabling works, including utilities works in the wider area including National Grid's new Grid Supply Point (GSP) near Dews Lane; highway and public right of way (PRoW) diversions, building demolitions; site clearance, habitat removal, creation, and environmental mitigation measures;
- Civil engineering works, including establishment of construction compounds; site preparation and enabling works; main earthworks and structure works such as bored tunnel and vent shafts, earthworks, retaining structures and erection of bridges and viaducts; site restoration; and removal of construction compounds;
- High speed rail installation works, including: establishment of construction compounds; infrastructure installation such as laying ballasted tracks in open sections and slab track in tunnel sections, traction power supplies, overhead line equipment and communications features; connections to utilities; changes to the existing rail network and, removal of construction compounds; and
- System testing and commissioning.

1.2.5 The Main Works Civils Contractors (MWCC), Skanska Costain STRABAG Joint Venture (SCSJV) Railways mobilised to site in November 2019 to undertake preparation works. MWCC were given full notice to proceed with the Main Works on 15th April 2020.

1.2.6 SCSJV have been and are continuing to undertake construction works in the borough including:

- Construction of the WRP I and portal ramp which is approximately 480m long and will be divided into three main sections; the TBM launch chamber with head house above; a section of cut and cover tunnel (which contains the portal) and an open retained cut.
- Two Tunnel Boring Machine (TBM) will set off from the tunnel portal at West Ruislip, driving east towards the Green Park Way shaft to complete the western section of the tunnel. The tunnel route is punctuated at 3km intervals by vent shafts and headhouses. All TBM arising material will be removed via conveyor to a storage area for treatment. Phase 1 of the Conveyor (short term) will be located within the Ruislip Golf Course, adjacent to the WRRE, while the long-term storage areas will be located south of the Chiltern line and Copthall Tunnel into the North and South Sustainable Placement Areas.

- West Ruislip Retained Embankment (WRRE) -Construction of the WRRE including excavation works and soil importation to replace existing made ground with more suitable soil for the embankment. Stone columns and soil stabilisation to take place including landscape planting.
- Breakspear Road South Underbridge (BSRU) - A single span integral bridge (clear span of 20.5m, with a deck that is 18.4m wide and 1.35m deep.) carrying the HS2 tracks over the existing Breakspear Road South will consist of precast prestressed beams, an in-situ concrete slab and reinforced concrete abutments on piled foundations.
- River Pinn Underbridge (RPU) (temporary and permanent), including sheet piling installation within the riverbanks A single span integral bridge carrying the HS2 tracks over the River Pinn and several public rights of way. The Bridge consists of precast beams, an in-situ concrete slab and reinforced concrete abutments on piled foundations.
- West Ruislip Golf Course (WRGC) – Newt Ponds works and Landscaping A GCN pond is to be installed in the northwest of the golf course there will be latterly some other ponds built more centrally to the course, but this particular pond is to receive the current population of GCN SCS have identified on the golf course.

1.2.7 The following assets to be delivered by MWCC in the borough include:

- Northolt Tunnels West and associated cross passages
- South Ruislip Vent Shaft;
- Copthall Tunnel
- West Ruislip Portal
- West Ruislip Retained Embankment;
- Gatemead Embankment;
- Breakspear Road Underbridge;
- River Pinn Underbridge (and Footbridge)
- Harvil Road Overbridge (Over Network Rail Chiltern Lines);
- Harvil Road Stream Underbridge;
- Harvil Road General Highway Works;
- Ruislip Golf Course, and

- North and South Sustainable Placement Areas.

1.2.8 To support the delivery of these assets, there may be associated ground investigations works and utilities works across the borough which may require temporary site compounds.

1.2.9 Required ground investigation work is to inform detailed design and will include but is not limited to:

- Survey Control Network;
- Geospatial Monitoring;
- Topographical Surveys;
- Utility Surveys
- Condition Surveys
- Obstructions; and
- Temporary Works.

1.2.10 Utilities include water, gas, electricity, and telecommunication. The utility work is required to facilitate the Main Works and will consist of but is not limited to:

- Diversions;
- Protection;
- Removals; and
- New Connections.

1.2.11 The Main Works Civils Contractors (MWCC), Align JV will also be working within the borough to construct the Colne Valley Viaduct. Works being undertaken by Align to construct the Colne Valley Viaduct (CVV) include:

- Remaining ground investigation works;
- Compound construction and maintenance
- Utility works;
- Construction of a CVV-wide haul road;
- Realignment of the River Colne and New Year's Green Bourne;
- Harfield No.2 Lake and New Year's Green Bourne Flood compensation;

- Pier foundation piling works;
- Jetty construction;
- Cofferdam construction and Pile caps;
- Pier construction; and
- Viaduct Deck Erection.

2 Purpose of the Local Environmental Management Plan

- 2.1.1 This LEMP focuses on the area specific control measures by topic as relevant to construction works within the LBH area. The measures described will be applied by the Nominated Undertaker and its Contractors throughout the construction period to reduce the potential environmental and community impacts within the LBH area during construction.
- 2.1.2 The Nominated Undertaker's Contractors will develop detailed environmental site management mitigation through their EMS, taking into account this LEMP and the Environmental Minimum Requirements (EMRs).

3 Policy and Environmental Management Principles

- 3.1.1 Information relating to the HS2 Ltd sustainability policy and environmental management principles is provided in Section 3 of the CoCP.

4 Implementation

- 4.1.1 Details relating to implementation, such as enforcement and site management measures, are provided in Section 4 of the CoCP.

5 General Requirements

- 5.1.1 General control measures relating to community relations, hours of work, pollution incident control and security etc. are identified in Section 5 of the CoCP.
- 5.1.2 To reduce the likelihood of an environmental incident or nuisance occurring, measures from Section 5 of the CoCP will be implemented, including:

- Effective preventative pest and vermin control and prompt treatment of any pest and vermin infestation on site, including arrangements for disposing of food waste or other attractive material. If infestation occurs, the Contractor will take action to eliminate the infestation and prevent further occurrence.

5.1.3 General control measures are detailed in sections 5.2 to 5.16 below.

5.1.4 To reduce the likelihood of an environmental incident or nuisance occurring, measures from Section 5 of the CoCP will be implemented, as detailed in sections 5.2 to 5.16 below.

5.2 Community Relations

- 5.2.1 As detailed within Section 5 of the CoCP, the Nominated Undertaker and its Contractors will implement the Community Engagement Framework. The Framework will focus on engagement during construction with the local communities and on the specific needs of protected groups (as defined in the Equalities Act 2010) especially those who may be affected by construction impacts in the immediate vicinity of the works. A range of tools will be used to achieve this that will tailor engagement to local needs.
- 5.2.2 Successful management of the project will involve understanding communities and their needs, actively engaging, listening and responding. The arrangements for this are set out in the HS2 Community Engagement Framework. Liaison with the local community will take place to consistently provide timely, clear tailored information on the construction programme, updates on forthcoming works. It will also provide the opportunity for members of the public to respond, discuss issues and provide feedback that can be acted upon. This information will be included in the local area plan for community engagement.
- 5.2.3 The local area plan will take account both of distinct geographic distribution of the communities throughout LBH and will involve the Contractors and any relevant third parties³ and Stakeholders, for which there will be co-ordination arrangements.

³ For the purposes of this LEMP, a third party is an organisation with whom HS2 Ltd has entered into a legal agreement to undertake works on its behalf, to be delivered under the powers of the High-Speed Rail (London – West Midlands) Act (the Act), or the third party's own powers (e.g., permitted development). Such agreements require the third parties to comply with the requirements of the Act and the EMRs, including the CoCP. Third parties relevant to this LEMP include, Highways England, and utility companies such as National Grid.

- 5.2.4 In addition, information on the construction of HS2 in LBH will be made available to the local community through the HS2 website (available online at: <https://www.hs2.org.uk/in-your-area/local-community-webpages/>).
- 5.2.5 Ongoing engagement with local interests and community groups will occur during construction, as listed in Appendix 2 of this LEMP. (NB: This list is indicative and will be subject to change as more information becomes available).

Advanced notice works

- 5.2.6 The Nominated Undertaker and its Contractors are committed to informing communities on matters of interest and relevance. Therefore, they will ensure that Stakeholders affected by the proposed construction works, as outlined in the ES, will be informed in advance of works by methods outlined in the Community Engagement Framework and as per Section 5.1.4 of the CoCP.

5.3 Working Hours

Consents

- 5.3.1 The Framework for seeking consents from LBH for working hours under Section 61 of the Control of Pollution Act 1974 is set out in the CoCP.

Core Working Hours

- 5.3.2 Core working hours will be from 08:00 – 18:00 on weekdays (excluding bank holidays) and 08:00 – 13:00 on Saturdays. See also HS2 Information Paper D4: Working Hours.
- 5.3.3 A period of up to one hour before and up to one hour after core working hours will be required for start-up and close down activities as detailed within the CoCP. To maximise the productivity within the core working hours, the 1hr start up and close down periods will include activities such as deliveries, workforce arrival/departure, unloading, maintenance and general preparation works etc. During this period plant and machinery that is likely to cause disturbance to local residents will not be allowed to operate. This period will not be an extension of the core working hours. Working outside of these hours would need to be agreed through the section 61 consenting process with LBH. Emergencies (not repairs and maintenance) may be undertaken outside core hours.
- 5.3.4 Certain work activities at specific locations within the LBH area will need to take place outside of the core working hours for safety and engineering purposes. These work activities (which may include construction associated with

infrastructure and rail works, including possessions) will be covered by the section 61 process and are likely to include:

- The Colne Valley Viaduct and the South Embankment;
- Demolitions, vegetation clearance, site preparation, reinforced wall construction, general earthworks, foundation and bridge works;
- West Ruislip Portal construction (other civil/structural works);
- Possessions on the Network Rail (Chiltern) Lines;
- Continuous surface tunnelling activities;
- Excavated material handling for railhead formation and transport of excavated material;
- Harvil Road pre-casting facility;
- Continuous operation of conveyors, pumping equipment and essential generators; and
- The movement of trains into and out of the railhead in the Northolt tunnel and earthworks main compound during the day, evening and night.

5.4 Construction Site Layout and Good Housekeeping

5.4.1 The measures set out in Section 5.3 of the CoCP will be used to reduce the likelihood of an environmental incident or nuisance occurring.

5.5 Site Lighting

5.5.1 All construction sites will be lit in accordance with the requirements of the CoCP as detailed within Section 5.4 and approval of site lighting in Schedule 17 Part 1 of the Act.

5.5.2 Site lighting will be designed to avoid light pollution to surrounding buildings, ecological receptors, local residents, railway operations, passing motorists, pedestrians, cyclists and other sensitive land uses, where reasonably practicable.

5.6 Worksite Security

5.6.1 The intention is to achieve safe and secure worksites, with balanced and appropriate security measures that are commensurate with the risk, as detailed within Section 5.5 of the CoCP.

- 5.6.2 A security plan will be required for each site and where appropriate, security fencing and gates provided to perimeters of construction locations and site compounds. Fence type and construction will be appropriate to the level of security required and depend upon the likelihood of intruders, level of danger and visual impact to the environment.
- 5.6.3 Contractors will be responsible for ensuring that the site/working areas and plant and materials are secure from use by unauthorised persons at all times and plant machinery will be securely locked away and immobilised each night. Securing sites will involve the use of physical, electronic, and human resources in a proportionate and cost-effective manner.
- 5.6.4 In some situations, particularly in an urban setting, consideration will be given to extra visibility for the public and workforce at night e.g., use of half-timber / half-infill (i.e., Perspex) at hoarding corners together with convex mirror to prevent blind spots. All sites will have security lighting to ensure the safety of passing pedestrians and other traffic.
- 5.6.5 Security provisions will be deployed at all HS2 sites and working areas on a 24/7 basis, this may include CCTV cameras, alarms, and security personnel. This approach will help protect assets with measures that deter, delay, and detect intrusion.

5.7 Hoardings, Fencing and Screening

- 5.7.1 The site perimeter will generally be fenced with 2.4m high solid hoardings that will be appropriately decorated, in line with measures described within Section 5.6.1 of the CoCP, if appropriate.
- 5.7.2 Hoardings up to 3.6m high may, on occasions, be used to control construction noise. At locations where existing fencing may need to be removed a suitable alternative will be used. Specific hoarding heights in LBH will be included in this LEMP as and when the hoarding designs are finalised.
- 5.7.3 Where there are earthworks along the track, such as cuttings and embankments, or low impact works, temporary fencing will be erected along the site boundaries. The type of fence will be dependent upon the nature of use of the adjacent land, as well as environmental, design and safety considerations.
- 5.7.4 Opportunities to include temporary landscaping measures including but not limited to green hoardings, ivy screens, artificial ivy and instant hedging will be

considered and where reasonably practicable implemented where there are clear benefits to local air quality, biodiversity, and visual appearance of the area, taking into account costs, longevity, and ease of maintenance.

5.7.5 An advanced planting site has been identified on the west side of Harvil Road, to the south of the residents in South Harefield in order to screen their views of the Grid Supply Point facility.

5.8 Unexploded Ordonnance

5.8.1 A risk assessment for the possibility of unexploded ordnance being found within construction areas will be carried out, as detailed within Section 5.7 of the CoCP.

5.9 Electromagnetic Interference

5.9.1 The impacts of electromagnetic interference during design and construction will be undertaken, as detailed within Section 5.8 of the CoCP.

5.10 Temporary Living Accommodation

5.10.1 The provision of on-site workers' temporary living accommodation will be considered within CFA7 within the LBH and approved in advance by the Local Authority, as detailed within Section 5.9 of the CoCP.

5.11 Occupational Healthcare

5.11.1 The Nominated Undertaker will ensure there is provision for access to either on-site or near site occupational healthcare for site workers, as detailed within Section 5.10 of the CoCP.

5.12 Clearance and Re-instatement of Sites on Completion

5.12.1 This will be carried out as detailed within Section 5.11 of the CoCP.

5.13 Pollution Incident Control and Emergency Preparedness

5.13.1 The Contractors' pollution incident control and emergency preparedness plan(s) will need to have due regard to local receptors as detailed in Sections 6 to 16 of this LEMP.

5.13.2 The Contractors will also consider measures and processes to be implemented in the event of environmental non-conformances.

Local control measures

5.13.3 The Contractor's pollution incident control and emergency preparedness plan(s) will need to include the following pollution prevention and control mechanisms:

- Static plant will be used with secondary containment measures such as plant nappies to retain any leakage of fuel or oil to reduce the risk of pollution;
- Spill kits will be provided where appropriate at four main and ten satellite compounds, to reduce the risk pollution; and;
- The use of oil interceptors at site offices and work compounds.

The Contractors' pollution incident control and emergency preparedness plan(s) will need to have due regard to local context, such as the fact that the whole area is a nitrate vulnerable zone which is an area where nitrate pollution is a potential problem.

5.14 Fire Prevention and Control

5.14.1 The Contractors' will ensure all construction sites and associated accommodation and welfare facilities will have in place appropriate plans and management controls to prevent fires. See also section 5.13 of the CoCP.

5.15 Extreme Weather Events

5.15.1 The Contractors' pollution incident control plan and emergency preparedness plan will need to have due regard to the potential for extreme weather events and subsequent impacts on key receptors taking into account any proposed risk management or mitigation measures. See also Section 5.14 of the CoCP. Where necessary, the statutory bodies will be consulted with regards to emergency planning.

5.16 Carbon Management Plans

5.16.1 The Contractors will produce carbon management plans, in accordance with the HS2 Carbon Minimisation Policy as detailed within Section 5.15 of the CoCP.

5.17 Interface Management between Adjacent Construction Areas

The Nominated Undertaker will oversee the interface between the Contractors as detailed within Section 5.16 of the CoCP, which may be within the same or adjacent Local Authority boundaries.

6 Agriculture, Forestry and Soils

6.1.1 General control measures relating to agriculture, forestry and soils are provided in Section 6 of the CoCP.

6.2 Sensitive Receptors

- 6.2.1 Approximately 176ha of agricultural land will lie within the construction boundary in the LBH area. All of this land is of moderate quality land in Subgrade 3b.
- 6.2.2 Approximately 145ha will be required permanently for the Scheme, with 31ha restored to agriculture.
- 6.2.3 The generally high-quality soils that will be permanently displaced and reused in the design of the Scheme for agriculture and other uses, represent a sensitive receptor.
- 6.2.4 Some land uses situated adjacent to the construction boundary may be considered sensitive receptors, particularly in respect of farm infrastructure and crops. Potential impacts include interruptions to drainage systems, livestock water supplies and irrigation systems, the potential for dust deposition on crops, particularly field vegetables; interruptions to farm and field accesses; and the maintenance of appropriate stock-proof fencing. This also applies to approximately 31ha of land within the construction boundary in LBH that is to be restored to agriculture.

6.3 Local Control Measures

- 6.3.1 Where topsoil and subsoil will be stripped across the site, a Soil Resources Plan (SRP) will be prepared. The SRP will establish the type and volume of the topsoil and subsoil to be stripped, the designated location of the stockpiles and the proposed use of conserved soils for land restoration. There is a commitment in the ES for the reuse of soils on the Scheme.
- 6.3.2 In areas where compounds are to be created, it is envisaged that the area will be stripped of topsoil. Temporary material stockpiles will be clearly recorded, and the topsoil will be reinstated.
- 6.3.3 In respect of storage areas for soil and excavated materials, and within the wider construction site, the presence and spread of invasive, non-native species (plants and animals) and noxious weeds will be controlled through the adoption of an

appropriate management regime. This will identify and effectively treat areas which might also threaten adjoining agricultural areas.

- 6.3.4 Appropriate construction, handling, treatment, and disposal procedures will be implemented in relation to invasive species and noxious weeds. Route-wide measures will also be implemented to promote biosecurity and minimise the risk that invasive non-native species and diseases are spread as a consequence of the project. Further details are provided in the CoCP.
- 6.3.5 Measures for the protection of farm infrastructure and crops will be the subject of liaison with landowners, occupiers, and land agents.
- 6.3.6 Following consultation with individual farmers, arrangements are being made with the farmers and documented in Farmers and Growers' packs. Details on the scope of these packs is included in the HS2 Guide for Farmers and Growers.

6.4 Air Quality

- 6.4.1 General control measures relating to air quality are provided in Section 7 of the CoCP.
- 6.4.2 Contractors will be required to manage dust, air pollution, odour and exhaust emissions during the construction works in accordance with Best Practicable Means (BPM) and refer to current publications on 'best practice'⁴.

6.5 Sensitive Receptors

- 6.5.1 The Contractors' working methods will have due regard to local sensitive receptors where there may be impacts due to dust emissions from construction works and exhaust emissions of air pollutants from construction traffic vehicles travelling to and from construction areas.
- 6.5.2 For air quality, relevant sensitive receptors include locations where there are residential properties, other types of property where there is human exposure over extended periods, for example hospitals and schools, and locations where there are designated ecological sites with sensitive vegetation. The potential impacts are considered in terms of dust soiling on people and property; human

⁴ Guidance on the assessment of dust from construction and demolition: Institute of Air Quality Management (IAQM), February 2014
Air Quality Monitoring in the Vicinity of Demolition and Construction Sites: IAQM, November 2012
The Control of Dust and Emissions during Demolition and Construction: GLA Supplementary Planning Guidance Document, July 2014

health effects of dust and air pollutant emissions; and effects of dust deposition on vegetation.

6.5.3 Within the LBH the local sensitive receptors are mainly residential properties close to construction sites and along construction traffic routes. There are also a number of schools, hospitals and care centres including, Blenheim Day-care Centre, Ruislip High School, the Breakspear School and the Sacred Heart Catholic Primary School.

6.5.4 The construction works within LBH have been assessed to determine the risk of impacts due to construction dust. The construction sites have been classified as 'low', 'medium' and 'high' risk using the Institute of Air Quality Management (IAQM) methodology⁵. In Hillingdon, the construction sites that have been assessed as high risk are Cophall South and the South Sustainable Placement Area; and those assessed as medium risk sites are West Ruislip Portal and North Cophall, for the current stage of work. The sites are near to a large number of high sensitivity residential receptors in properties on The Greenway, Breakspear Road South Harvil Road, Ickenham Road and Harwell Close in West Ruislip and Dew's Farm Cottages in the Colne Valley.

6.5.5 Construction traffic emissions will have an impact at receptors adjacent to routes used by construction vehicles and where traffic is diverted or rerouted. Sensitive receptors adversely affected by changes in road traffic emissions during construction include the following:

- Ickenham High Road, Ickenham.

6.5.6 In addition, consideration should be given to air quality impacts on the following ecologically designated sites:

- Ruislip Woods Site of Special Scientific Interest (SSSI): a temporary material stockpile is proposed adjacent to Bayhurst Wood, which forms part of Ruislip Woods SSSI. The design incorporates a 25m buffer, which will not be used by construction traffic, between the stockpile area and Bayhurst Wood. Due to the use of this buffer, the dust control measures in the CoCP and the temporary nature of the works, there will be a low risk of impacts from dust deposition and negligible impacts due to construction traffic emission. The woodland for which the site is designated and therefore the integrity of the site will remain unaffected;

⁵ Guidance on the assessment of dust from construction and demolition: Institute of Air Quality Management (IAQM), February 2014

- The Fray's Meadow SSSI is located within the Colne Valley, extending north from the A40. The proposed Uxbridge Golf Course haul road will cross an area at the eastern extent of the SSSI. The Contractor's working methods should ensure dust emissions are managed effectively and in accordance with the CoCP where construction activities are occurring within and adjacent to the boundaries of the SSSI. Construction traffic emissions are expected to result in potentially significant effects due to increases in NOx concentrations within 50m of the A40 and increases in nutrient nitrogen deposition within 20m of the A40 at the southern extent of the SSSI. There are also expected to be increases in NOx concentrations and nitrogen deposition in the northern part of the SSSI, but these changes will not be significant. Most of the SSSI is set back at greater distances from roads and any changes in air quality will be for the duration of the construction period only. As a result, the impact will be of limited duration and will affect a small part of the SSSI and is not likely to affect the integrity of the SSSI; and
- The Mid-Colne Valley SSSI is crossed by the route and construction traffic routes are along the boundaries of the site. The Contractor's working methods should ensure dust emissions are managed effectively and in accordance with the CoCP where construction activities are occurring within the boundaries of the SSSI. Construction traffic emissions are expected to result in potentially significant effects due to increases in NOx concentrations within 20m of the A412 Denham Way / North Orbital Road. The impact is predicted to be of limited duration and will affect a small part of the SSSI so is not likely to affect the integrity of the SSSI.

6.6 Local Control Measures

6.6.1 All the relevant methods outlined within the CoCP will be applied to control and manage potential air quality effects. These methods are considered sufficiently effective within areas in and around those listed in Section 7.2.2. In the LBH the key measures will include:

- compliance with construction vehicle emission requirements;
- the provision of dust suppression measures to be carried out in all areas of the site that are likely to generate dust;
- measures to keep roads, accesses and vehicles clean;
- covering materials, deliveries or loads entering and leaving the construction site; and,
- the enclosure, shielding or provision of filters on plant likely to generate excessive quantities of dust beyond the site boundaries.

- 6.6.2 Dust suppression measures and works screening will be subject to approval in accordance with Schedule 17 of the Act. Further measures are detailed within Section 7 of the CoCP.
- 6.6.3 HS2 has set emission requirements and targets for the engines of contractor cars, vans, and heavy road vehicles. These have been developed for the whole route and are categorised as follows: London Low Emission Zone, Clean Air Zone and Rest of Route.
- 6.6.4 For the LBH the relevant categories for the vehicle emission standard is the London Low Emission Zone in the area to the east of Harvil Road and Rest of Route for the rest of the Borough. Within the London Low Emission Zone there are requirements for heavy road vehicles to be powered by EURO VI (or cleaner) engines and for cars and vans to be Euro 6 diesel and Euro 4 petrol. There are also targets for the use of Ultra Low Emission Vehicles.
- 6.6.5 HS2 has also set requirements for Non-road Mobile Machinery (NRMM) (i.e., stationary plant and off-road vehicles). These have been developed for the whole route and are categorised as follows: Central Activity Zone, Rest of Greater London and Rest of Country. For the LBH the relevant category of NRMM emission standard is Rest of Greater London, where the requirement is for NRMM to be powered by EU Stage IV ⁶.
- 6.6.6 Further details on emission standards are given in HS2 Information Paper E31: Air Quality.

6.7 Monitoring Procedures

- 6.7.1 An inspection and monitoring programme will be implemented by the Contractors to assess the effectiveness of the control measures as outlined in section 7.3 of the CoCP. In the LBH the monitoring procedures may include monitoring of nitrogen dioxide around highways and continuous automatic monitoring of airborne dust, including setting a relevant site action level for dust (defined as a dust measurement threshold above which investigation will be required). The monitoring being undertaken by HS2 supplements existing air quality monitoring which is part of national and Local Authority surveys.

⁶ Roman numerals are also used within the NRMM EU regulations but are not directly comparable to the road vehicle Euro standards.

- 6.7.2 The HS2 monitoring of nitrogen dioxide around highways commenced in June 2018 and is being undertaken using diffusion tubes. There are currently eleven monitoring locations within LBH. The monitoring of nitrogen dioxide around highways includes locations where the environmental statement, as amended, identified significant effects, locations selected by the community, certain locations not expected to be affected by the Scheme for comparison purposes, and locations co-located with automatic monitoring sites which are part of national and Local Authority surveys for comparison purposes. Monthly air quality monitoring reports, including dust, are publicly available throughout construction on the HS2 website <https://www.gov.uk/government/organisations/high-speed-two-limited> .
- 6.7.3 Further detail on monitoring is included within the HS2 Air Quality Strategy.

7 Cultural Heritage

- 7.1.1 General control measures relating to cultural heritage are provided in Section 8 of the CoCP. Further control measures for Cultural Heritage are provided in the HS2 Phase One Heritage Memorandum within the Environmental Minimum Requirements and the specific documents identified therein.
- 7.1.2 A route-wide Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy (GWSI:HERDS) has been prepared which sets out the general principles for design, evaluation, mitigation, analysis, reporting and archive deposition to be adopted for the design development and construction of the Scheme.
- 7.1.3 Archaeological and built heritage works will be undertaken in Hillingdon. Full details of the works to be undertaken (i.e., archaeological investigations and built heritage recording) will be determined during the detailed design and will be set out in Project Plans, Location-Specific Written Scheme of Investigations (LS-WSI) and Heritage Agreement Method Statements (HAMS).
- 7.1.4 Works associated with the Scheme will impact both designated and non-designated assets in LBH. Full details of the works to be undertaken (i.e., archaeological investigations and built heritage recording) will be determined during the detailed design and will be set out in Project Plans and Location-Specific Written Scheme of Investigations (LS-WSI).
- 7.1.5 Schedule 18 and Schedule 19 to the Act concern how legislation in respect of listed buildings and scheduled monuments respectively apply to the Phase One works.

Schedule 20 to the Act provides a regime for the removal of human remains and related funerary monuments.

7.2 Sensitive Receptors

7.2.1 Details of all designated and non-designated heritage assets within 500m of the land required, temporarily or permanently, for the construction of the Scheme are listed in Volume 5 of the ES (Appendix CH-002-006 and CH-002-007 and the Cultural Heritage Map Books for Euston and London Metropolitan, ES 3.5.1.4.1, and for Country South, ES 3.5.1.4.2).

7.2.2 Contractors will have due regard for the following designated heritage assets:

7.2.3 Four Scheduled Monuments including:

- Brackenbury Farm moated site (RUI002), which is also a Grade II listed building;
- Ruislip motte and bailey (RUI003); and
- Pale Park, Ruislip (RUI004).
- Two Grade I listed buildings of high value including:
 - St Mary's Church in South Harefield (CV062); and
 - Breakspear House in South Harefield (CVA 063).
- Three Grade II* listed buildings including:
 - The Church of St Giles on Swakeleys Road (RUI041);
 - The Great Barn to the west of Manor Farmyard, Ruislip (RUI050);
 - 9-15 High Street, Ruislip (RUI059);
 - The Dovecote at Breakspear House in South Harefield (CV064);
 - A footbridge over the River Colne to the north of Denham Court (CV015); and
 - The Almshouse, Harefield (within asset grouping CVA 068).
- One conservation area of high value due to the presence of Grade I or II* listed buildings at Harefields (asset grouping CV068);
- Three conservation areas that can be considered of high value in their association with the Grand Union Canal (a high value asset) at:
 - Denham Lock (CVA004);

- Blackjacks and Coppermill Lock (CV086); and
- Widewater Lock (CVA037).

- 7.2.4 76 Grade II listed buildings. 15 of these stands in the Ruislip Village Conservation Area, 16 are within the Ickenham Conservation Area whilst 17 are in Harefield. The others include Highway Farm comprising a group of farm buildings (RUI006) and structures associated with the Australian Military Cemetery in Harefield (CVA059 and CVA060). St Leonards Farm and barn to the east (RUI064), Copthall Farmhouse (RUI008) and Crow's Nest Farm (RUI065) are more isolated buildings in the rural part of the study area; and
- 7.2.5 One Grade II registered park and garden of moderate value at Harefield Place (CVA055)
- 7.2.6 Details of all designated and non-designated heritage assets within 500m of the land required, temporarily or permanently, for the construction of the Scheme are listed in Volume 5 of the ES (Appendix CH-002-006 and CH-002-007) and Volume 5 Cultural Heritage Map Books for Euston and London Metropolitan Area, and for Country South (Maps CH-01-018b to CH-01-024).

7.3 Local Control Measures

- 7.3.1 Where practicable, construction methodologies will be required to reduce the impacts on heritage assets. The CoCP sets out the provisions that will be adopted to control those effects, including the use of appropriate equipment and methods to limit ground disturbance and settlement followed by monitoring, protection and remediation. A programme of settlement monitoring and the implementation of avoidance measures where appropriate will be undertaken by the Contractor. Detailed provisions with regard to settlement and listed buildings are outlined in the Settlement Policy / HS2 Information Paper: C3 Ground Settlement.
- 7.3.2 Those listed buildings which may require works to maintain or restore their character, or for the affixing of monitoring apparatus are named in Table 2 of Schedule 18 of the Act. Listed buildings named in Table 2 are also covered by a Heritage Agreement with LBH, which sets out arrangements for obtaining approvals for protective or monitoring works to these buildings
- 7.3.3 Where practicable, below ground assets will be preserved in situ beneath mitigation earthworks through the adoption of appropriate design measures.

7.3.4 Where practicable, construction methodologies will reduce the impacts on buried and upstanding remains.

7.3.5 The programme of archaeological and built heritage works will be undertaken by specialist Contractors appointed by the Nominated Undertaker prior to and during, the construction period in accordance with the provisions of the LS-WSI for archaeology and built heritage.

7.4 Monitoring

7.4.1 Appropriate monitoring of heritage will be undertaken as necessary, as detailed within Section 8.4 of the CoCP.

8 Ecology

8.1.1 General control measures relating to ecology are provided in Section 9 of the CoCP.

8.2 Sensitive receptors

8.2.1 The following locations which lie within or are adjacent to the Scheme in LBH are designated for nature conservation. These locations are shown within the Volume 5 map books of the main ES (ES 3.5.1.5.6 and 3.5.1.5.7) and all reference the chainage section on the route).

- Ruislip Woods Site of Special Scientific Interest (SSSI), which is also a National Nature Reserve (NNR) and a Site of Metropolitan Importance (SMI);
- Fray's Farm Meadows SSSI, land required for the construction of the Scheme will cross the eastern area of the SSSI (Ch25+500);
- Denham Lock Wood SSSI, located approximately 100m south of the Scheme (Ch26+000);
- Mid-Colne Valley SSSI, the land required for the construction of the Scheme will cross Harefield No. 2 Lake, Savay Lake, Korda Lake, Harefield Moor Lake, the Long Pond and is adjacent to Broadwater Lake (Ch27+500 to Ch30+000);
- Ranston Covert and Battlesford Wood, part of which is ancient woodland, comprises the largest extent of woodland in the Mid-Colne Valley SSSI;
- Poor's Field Site of Metropolitan Importance (SMI) is part of the Ruislip Woods SSSI and NNR and is adjacent to land required for the construction of the Scheme (Ch24+000);

- London's Canals SMI, located partly within the land required for construction of the Scheme at the Grand Union Canal, between Harefield No.2 Lake and Savay Lake (Ch26+300 to Ch27+500);
- Mid-Colne Valley SMI, which overlaps most of the Mid-Colne Valley SSSI (Ch27+500 to Ch29+200);
- Ruislip Golf Course and Old Priory Meadows Site of Borough Importance (SBI.I), two sections on opposite banks of the River Pinn (Ch24+000);
- Dew's Dell SBI.I, located partly within land required for construction of the Scheme west of Harvil Road (Ch26+500);
- Victoria Road Railway Banks SBI.II, located partly within the land potentially required for the utilities works associated with the construction of the Scheme (Ch18+000 to Ch20+500);
- Yeading Brook between Roxbourne Park and Ruislip Gardens SBI.II, partly within the land required for utilities works associated with the construction of the Scheme (Ch19+500 to Ch21+400);
- Herlwyn Park Recreation Ground and Railway Banks SBI.II, partly within the land required for utilities works associated with the construction of the Scheme (Ch22+500 to Ch23+000);
- Mad Field Covert, Railway Mead and the River Pinn SBI.II, partly within land required for utilities works associated with the construction of the Scheme (Ch24+000 to Ch24+500);
- Common Plantation and Park Wood SBI.II, adjacent to the land required for utilities works and possible road junction improvements (Ch24+000 to Ch25+000);
- Central Line West Ruislip Branch SBI.II, adjacent to land required for utilities works for the construction of the Scheme (Ch24+600 to Ch26+000);
- Brackenbury Railway Cutting SBI.II, located partly within the land required for the construction of the Scheme (Ch24+800 to Ch25+000);
- New year's Green SBI.II, located partly within the land required for the construction of the Scheme (Ch25+200 to Ch25+800);
- Harefield Hall and The Lodge SBI.II, located within land required for the realignment of the National Grid overhead power lines (Ch24+000);
- Breakspear House Woods SBI.II, adjacent to the Scheme, east of South Harefield (Ch26+800 to Ch27+500);

- Fray's Valley Local Nature Reserve (LNR), located adjacent to land required for construction of the Scheme (Ch25+500 to Ch26+500);
- Denham Quarry Park LNR, crossed by the Scheme at the location where Denham Court Drive passes over the River Misbourne (Ch26+500 to Ch27+600);
- Denham Country Park (LNR) located partly within the land required for construction of the Scheme (Ch27+000);
- The River Colne east of Denham Biological Notification Site, located partly within land required for construction of the Scheme, south of the Chiltern Main Line (Ch27+000);
- Northmoor Hill Wood LNR (8.7ha) is approximately 250m south of the land required for the amendment and is designated for ancient woodland; and
- The northern most section of New year's Green Covert is designated as ancient woodland.

8.2.2 Sensitive habitat receptors outside of designated sites are displayed within the Volume 5 map books of the ES (3.5.1.5.6 and 3.5.1.5.7). These include:

- Areas of mature semi-natural, mainly secondary broadleaved woodland with small areas of plantation are present along the corridor of the River Pinn, Ickenham Green, within agricultural areas in the west at Copthall Covert (Ch24+500 to Ch25+800);
- Bayhurst Wood (Ch25+500 to Ch26+000);
- In addition to the ancient woodland within the designated sites, Pinnocks Wood, a broadleaved ancient semi-natural woodland is partly in land required for the construction of the Scheme (Ch25+800);
- Small areas of woodland including an ancient woodland, Pinnocks Wood (Ch25+500) and woodlands at Widows Cruise Covert and Fragmoor Covert (Ch26+000 to Ch26+700);
- Hedgerows near Bayhurst Wood, Copthall Farm; (Ch25+000);
- An area of relatively species-rich wet grassland is present between the River Pinn and Ruislip Golf Course (Ch23+500 to Ch24+500);
- Rough-grassland swards have developed where agricultural grassland has been left non-grazed and uncut including fields south of the railway between the River Pinn and Breakspear Road South and in the Ickenham Green area (Ch24+500 to Ch24+700);

- Three main types of mosaic and transition habitats have been identified within the railway land. The three types include varying complexes of scrub, rough grassland tall herb ruderal vegetation and bare ground in differing proportions. Victoria Road Railway Banks SBI.II includes this habitat (Ch18+000 to Ch20+500);
- There are extensive stands of species-rich ephemeral vegetation on crushed brick and concrete substrates at the vacant industrial site at the South Ruislip vent shaft main construction compound. This occurs in mosaic with scrub and bare ground (see Volume 5 maps for specific locations);
- The Yeading Brook between Roxbourne Park and Ruislip Gardens SBI.II (Ch19+500 to Ch21+400);
- Ickenham Stream (Ch24+000 to Ch24+500);
- The River Pinn (Ch24+500);
- A short section of the New year's Green Bourne is within the land required for construction of the Scheme, west of Harvil Road, near Dew's Farm (Ch25+800 to Ch26+400);
- There are a number of water bodies in the western part of this area, including ponds and a drain at Ruislip Golf Course (Ch23+700), ponds at Brackenbury Farm (Ch 24+700), ponds at the pharmaceutical research facility (Ch24+800) and ponds in fields to the south and north-west of Bayhurst Wood (Ch25+000 to Ch26+400);
- The complex habitats around the River Pinn include areas of secondary and plantation woodland, thorn and bramble scrub, tall-herb vegetation, rough grasslands and river and water-margin habitats that, in juxtaposition to one another, are unusually extensive for outer London (see Volume 5 maps for specific locations);
- Occasional stands of swamp along the river (Ch28+200);
- Small areas of swamp vegetation are present around Broadwater Lake, Korda Lake and Harefield Moor Lake (Ch27+500 to Ch29+400);
- Approximately 30ha of semi-natural broadleaved woodland in land required for construction of the Scheme in this area. The majority is in either the Mid-Colne Valley SSSI or Mid-Colne Valley SMI (Ch27+500 to Ch30+000);
- Small areas of woodland are present in a number of other designated

wildlife sites and in farmland including Harefield Hall and The Lodge (Ch24+000), Pinnocks Wood (Ch25+500); Widows Cruise Covert and Fragmoor Covert (Ch26+000 to Ch26+700); Dew's Dell (Ch26+300) and Breakspear House (Ch26+800 to Ch27+500);

- Grassland to the south of the Chiltern Main Line, between the River Colne and Grand Union Canal. This habitat is in both the Mid-Colne Valley SMI and Denham Country Park LNR (Ch26+600);
- Ponds in the vicinity of Uxbridge Golf Course (Ch25+700) and east of South Harefield (Ch27+500);
- At least four ditches in Uxbridge Golf Course (Ch25+700) or west of the Grand Union Canal, south of the Chiltern Main Line (Ch26+500);
- Small areas of scrub are present in the vicinity of Dew's Farm (Ch26+300); and
- The Gatemead bridleway and land adjacent to the amendment is used by bats from bat assemblages associated with the Brackenbury Farm and Gatemead Farm area reported in the main ES (assumed to support maternity roosts of common pipistrelles and non-maternity roosts of rarer bat species), which are both of up to county/metropolitan value.

8.2.3 Key protected or important species known or assumed to occur in the vicinity of the works are:

- Bats, including roosts and foraging and commuting routes
- Breeding birds, including barn owl and wintering bird assemblages;
- Great crested newts;
- common reptiles;
- Fish assemblages;
- Otters;
- Badgers;
- Terrestrial invertebrate;
- Aquatic macro-invertebrates; and
- Flora.

8.2.4 Further information on designated sites and legally protected species occurring in this area can be found within Volumes 2 and 5 of the ES.

8.2.5 Contractors will check whether any protected species licences are required prior to work commencing or where such licences have been obtained, to ensure compliance with the requirements of the licence.

8.2.6 All actions required to comply with licences, will be undertaken by suitably qualified specialist ecologists licensed to undertake the work.

8.3 Local control measures

8.3.1 The standard ecological issues and associated control measures outlined in Table 1 are of particular relevance to this area

Table 1: Standard ecological issues and control measures relevant to LBH

Species/species group	Issue	Standard control measure
Designated Sites	The Scheme affects SSSI, LNR and non-statutory wildlife sites.	<p>Where practicable, measures to reduce habitat loss should be included in planning of construction works, such as avoiding siting temporary material stockpiles, construction materials and vehicle parking within designated sites;</p> <p>Potentially hazardous materials should also be located away from designated sites and stored correctly; and</p> <p>Specific measures for control of surface water and for air and water-borne pollution should also take account of the proximity of these designated sites.</p>
Bats	All UK bat species and their roosts (even if bats are not present) are fully protected	Adhere to requirements of licensed and, where relevant, Ecology Site Management Plans.

	<p>under both UK and European legislation.</p> <p>The Scheme will result in the loss of confirmed bat roosts in trees and buildings.</p>	
	<p>Retained bat roosts are present in close proximity to the Scheme. Caution is required to ensure that these roosts are not disturbed during works.</p>	<p>Where practicable, undertake activities causing disturbance during seasonal periods when bats are absent;</p> <p>Ensure lighting is directed away from known roosts;</p> <p>Reduce night-time working in close proximity to retained roosts; and</p>
		<p>Where practicable, temporary structures will be erected to screen the exit of retained roosts from construction areas.</p>
	<p>The Scheme will result in the loss of trees and buildings identified as having moderate or high potential to support roosting bats, but no evidence of their use has been identified to</p>	<p>Adopt precautionary approach. Follow appropriate Working Method Statement for demolition of buildings and felling of trees.</p>

	<p>date through survey work.</p>	
	<p>The Scheme will result in the loss of and disruption to bat foraging areas and commuting routes.</p>	<p>Where practicable, undertake activities causing loss or disruption during seasonal periods when bats are likely to be less active.</p> <p>Retain as much of the key habitat for as long as possible and establish new areas as quickly as possible to reduce the effects.</p> <p>Ensure lighting is directed away from foraging areas and commuting routes.</p> <p>Reduce night-time working in close proximity to foraging areas and commuting routes.</p>
<p>Breeding birds</p>	<p>The nests and eggs of all bird species are legally protected against being damaged, disturbed or taken.</p> <p>Some species are specially protected against disturbance whilst nesting.</p> <p>The Scheme will result in the loss of nesting bird habitat, including vegetation, buildings and structures.</p>	<p>Habitat clearance will be conducted outside of the bird nesting season (March to August inclusive) where practicable.</p> <p>If habitat clearance is carried out during the nesting season, then an appropriate Working Method Statement shall be completed in place in advance of clearance works commencing.</p>

<p>Great crested newt</p>	<p>Great crested newts and their habitats are fully protected under both UK and European legislation.</p> <p>The Scheme will result in the loss of water bodies and terrestrial habitat associated with great crested newt populations.</p>	<p>Adhere to requirements of HS2 great crested newt organisational licence, method statements, and Ecology Site Management Plans.</p>
<p>Otter</p>	<p>Otters are fully protected under both UK and EU legislation.</p> <p>All major watercourses crossed by the Scheme have otters present or are potentially suitable to support them. It is not expected that there will any fragmentation of otter movement routes, however, there is the potential for disturbance during construction along some parts of the Scheme.</p>	<p>Adhere to requirements of licences and, where relevant, Ecology Site Management Plans;</p> <p>Ensure that route of safe passage for otters is maintained throughout construction at crossing points;</p> <p>Use fencing as required to prevent otters being forced over existing road crossing; and</p> <p>Reduce light spill onto watercourses.</p>
<p>Common reptiles</p>	<p>Common species of reptile (grass snake, adder, common lizard and slow worm) are protected</p>	<p>Where works have the potential to kill or injure reptiles, but there is suitable habitat immediately adjacent to the work site that could support a viable population (with enhancements where necessary) the Habitat</p>

	<p>from intentional killing or injury.</p> <p>Common reptiles are widespread, and the Scheme will result in the loss of confirmed and potential reptile habitat.</p>	<p>Manipulation and Displacement approach should be followed. A Working Method Statement should be produced in advance of works commencing.</p> <p>Where there is no suitable habitat immediately adjacent to the work site, the Reptile Translocation approach should be followed. A Working Method Statement should be produced in advance of works commencing. This will include details of the approach, any exclusion fencing required, and details of the receptor site.</p>
Badger	<p>Badgers and their setts are protected under the Protection of Badger Act 1992.</p> <p>Badgers are widespread, and the Scheme will result in the loss of badger habitat, including setts.</p>	<p>Adhere to the requirements of the HS2 badger organisational license, method statements and Ecology Site Management Plans.</p> <p>Avoid badger setts to reduce disturbance where they do not need to be closed.</p> <p>Badgers are a mobile species and can create new setts in a short period of time. Contractors to be aware of the potential for badger setts to be present within or adjacent to work sites – works to be stopped if potential setts are identified and an ecologist contacted for advice.</p>
Hazel dormouse	<p>Hazel dormice and their habitat are fully protected under both UK and EU legislation. The Scheme will result in the loss of habitats that are suitable for hazel dormouse, although this species has not been recorded</p>	<p>Where relevant adhere to requirements of licences and Ecology Site Management Plans.</p>

	along the Scheme to date.	
Water vole	<p>Water voles are fully protected under UK legislation.</p> <p>The Scheme will result in the loss of confirmed and potential water vole habitat.</p>	<p>An appropriate Working Method Statement should be produced in advance of works commencing, where relevant.</p> <p>Adhere to requirements of translocation licence, where relevant.</p> <p>Contractors to be aware of the potential for water voles to be present within or adjacent to work sites – works to be stopped if water vole evidence is identified and an ecologist contacted for advice.</p>
Invasive species	<p>There is a risk of work sites and adjacent land supporting invasive non-native species (INNS), as defined in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), in particular Japanese knotweed.</p> <p>INNS have been already recorded along some parts of the Scheme through previous survey work.</p>	<p>All land required for the works, and immediately adjacent land (where practicable) shall be surveyed for the presence of INNS, with a focus on high-risk species.</p> <p>A Biosecurity Management Plan shall be produced in advance of works commencing, where required.</p>
General	<p>Unexpected discovery of legally protected species during works.</p>	<p>There will be a procedure to follow in the unexpected event that protected species are identified during construction. This will include seeking appropriate licences and consulting with Natural England.</p>

		Unexpected finds of great crested newts or badgers are covered by the organisational licences and works must be in accordance with those licences.
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8.3.2 Further information on the control of ecological impacts is provided in HS2 Information Paper E2: Ecological Impact, Section 9 of the CoCP, in Technical Note: Ecological principles of mitigation within Volume 5 of the SES2 and AP3 ES (Scope and methodology report addendum (CT-001-000/2)).

8.4 Monitoring

8.4.1 Contractors will be required to undertake appropriate monitoring of the consequences of construction works on ecological resources and of the effectiveness of the management measures designed to control ecological effects, as detailed within Section 9.3 of the CoCP.

9 Ground Settlement

9.1.1 General control measures relating to ground settlement are provided in Section 10 of the CoCP. Specific measures to reduce and repair settlement and requirements with regard to assessment, surveys and monitoring are contained in the Settlement Policy / HS2 Information Paper C3: Ground Settlement.

9.1.2 Requirements for monitoring will be confirmed by the settlement report prepared during the detailed design stage. Where determined as necessary, monitoring will be undertaken on selected adjacent buildings, structures and the conventional railway tracks. Baseline readings will be taken prior to the commencement of excavation.

9.1.3 The monitoring strategy, methodology and programme, including the choice and location of monitoring equipment, will be discussed and agreed with the local authorities and land/building owners prior to commencement of construction.

9.1.4 Where significant building movement is predicted to be caused by excavation induced ground movements, ground treatment/improvement techniques might be required to ensure that if ground movement occurs, it stays within agreed and acceptable limits thereby limiting the impacts on buildings.

- 9.1.5 Monitoring may be required where existing sensitive buildings/structures/utilities are in close proximity to the planned excavation works. An assessment of the sensitivity of each building/structure/utility in close proximity to the excavation works will be carried out at the detailed design stage. This will then inform the design/specification of the monitoring system for that building/structure/utility and will also inform the design of any movement mitigation works if these are deemed necessary by the designer.
- 9.1.6 Prior to the commencement of construction, structural surveys and condition/defect surveys are commissioned where structures are at risk of potentially damaging settlements.

10 Land quality

- 10.1.1 Further land quality study work including intrusive ground investigation (where needed) and analysis will be conducted prior to construction in order to confirm areas of suspected land contamination that could be disturbed or encountered during construction of the Scheme. Contaminated sites beyond the Scheme will be considered only in terms of their potential impact on the Scheme. If new constraints are identified then the LEMP would be updated accordingly, to date none have been identified. No contaminated sites (in accordance with the meaning defined in Part IIa of the Environmental Protection Act, 1990) have been formally identified by the Regulator (in accordance with the Contaminated Land (England) Regulations 2000) within the Scheme.
- 10.1.2 General control measures relating to land quality are provided in Section 11 of the CoCP.

10.2 Potential Contamination Sources and Sensitive Receptors

- 10.2.1 The following land with potentially contaminative existing or historical uses has been identified as a possible contaminative risk to HS2 works (and can be seen in Volume 5 map book of the main ES (LQ-01-008a – LQ-01-012):
- Oil depot south of New year's Green Covert;
 - The existing Chiltern Main Line;
 - Historical infilled gravel pit;
 - Historical landfill on land off Harvil Road;

- Dew's Farm historical landfill;
- Harefield Marina historical landfill;
- Various former works and depots that now form part of Victoria Road trading estates (at the location of the South Ruislip vent shaft);
- Railway land located in the far western part of the study area; and
- The pharmaceutical research facility along Breakspear Road South.

10.2.2 With regard to the above identified contaminative risks, the Contractors will have due regard to the following sensitive receptors:

- People, including residents in existing properties, local employees, e.g., at the existing railway, construction and/or maintenance workers;
- Controlled waters, including groundwaters in The Chalk bedrock (principal aquifer) and various Secondary A aquifers;
- The built environment, including buildings, property and underground structures and services;
- The natural environment ; including ecological receptors of Ruislip Woods SSSI, Fray's Farm Meadows SSSI, Mid-Colne Valley SSSI and Denham Lock Wood SSSI;
- People, including construction and/or maintenance workers and end users of the railway; and
- The Rivers Pinn, Yeading Brook, Ickenham Stream and their tributaries.

10.3 Local Control Measures

10.3.1 Ground investigations are being undertaken to confirm areas of potential contamination within the Scheme. Following development of a conceptual ground model, risk assessment and a remedial strategy will be prepared, as needed. Consultation with the LBH and the Environment Agency should take place, as appropriate, during the formulation of the remedial strategy, which will include measures to be taken if unexpected contamination is encountered as outlined in Section 11 of the CoCP.

10.3.2 Contaminated soils or groundwater excavated from the site are to be separated from other materials and, wherever reasonably practicable, will be reused within the Scheme, where needed and suitable for use. Treatment techniques are likely to

include stabilisation methods, soil washing and appropriately permitted bioremediation to remove oil contaminants. Contaminated soil disposed off-site will be taken to a soil treatment facility, another construction site (for licensed treatment, as necessary, and reuse) or an appropriately permitted landfill site.

10.3.3 Excavation through Dew's Farm historical landfill and Harefield Marina historical landfill will be required. Should the ground investigation discover contaminated materials within the area required to construct the cutting in these locations, it will be excavated, then treated and re-used, or removed, as appropriate. In addition, ground (landfill) gas and/or leachate control systems will be constructed where necessary to manage ingress to the Scheme or control migration pathways external to the works where pathways have been affected adversely by the construction.

10.3.4 Similar measures will be undertaken at other sites where contaminated soils or groundwater are identified during the investigation and / or construction processes.

10.4 Minerals

10.4.1 There are no mineral safeguarding areas, preferred areas or areas of search in the LBH. No mitigation measures have been identified.

11 Landscape and Visual

11.1.1 General control measures relating to landscape and visual are provided in Section 12 of the CoCP.

11.2 Sensitive Receptors

11.2.1 With reference to the set-up and location of temporary works, the Contractors will have due regard to limiting impacts of the character of the following landscape character areas (LCAs):

- Ruislip Golf Course LCA;
- Harefield Farmland Valley Slopes LCA; and
- Colne River Valley LCA.

11.2.2 The Contractors will also have due regard to limiting visual intrusion on the following visual receptors:

- Residents in the area, particularly on Trenched Avenue, Portal Close, West Ruislip station, Ickenham Road Bridge, Josiah Drive, Ickenham Park, Ickenham Close, Hoylake Crescent, The Greenway, residents of St. Leonards farm, and along the perimeter of the settlements of South Harefield and Harefield;
- Users of Blenheim Care Centre, Ruislip Golf Course club house, Hillingdon Outdoor Activities Centre (HOAC) and the pharmaceutical research facility;
- People travelling through Public Right of Way (PRoW) (Footpath U45 Celandine), PRoW (Footpath U38) connecting Breakspear Road South with New year's, PRoW (Footpath U49) between Harvil Road and Breakspear Road South, to the south of the Chiltern Main Line, PRoW (Footpaths U36 and U37) connecting Bayhurst Wood with New year's Green Lane, Grand Union Canal PRoW, Harvil Road, and Moorhall Road;
- Business units on Ickenham Road;
- Viewpoint AP4.049.2.008: view south and west from The Drive and Georgian Close;
- Viewpoint 049.3.005: view west from PRoW (Footpath U50);
- Viewpoint 049.2.007: view north and east from dwelling on Harvil Road and from Harvil Road;
- Viewpoint 051.3.002: view north along the Grand Union Canal PRoW (Footpath U72) and the Colne Valley Trail PRoW (Footpath U75);
- Viewpoint 051.4.003: view north from Chiltern Main Line;
- Viewpoint 052.4.001: view south from Harvil Road;
- Viewpoint 052.3.002 view south from the northern edge of Harefield No.2 Lake from PRoW (Footpath U34);
- Viewpoint 052.6.003: view south from Dogs Trust Harefield including Highway; and
- Farmhouse, grade II listed (in CFA6).

11.2.3 The Contractors will be made aware of the location of the following sensitive sites:

- Vegetation removal along the southern boundary of the Ruislip Golf Course;
- Partial clearance of vegetation from New year's Green Covert;
- Removal of lakeside vegetation within the Colne Valley, woodland vegetation along the River Colne; and

- Removal of vegetation as the Scheme crosses the Grand Union Canal

11.2.4 The Contractors shall also discuss the possibility of advance planting off-site with landowners, and the LBH to further screen the locations listed above.

11.3 Local Control Measures

11.3.1 Measures that have been incorporated into the CoCP to avoid or reduce landscape and visual effects during construction include the following (see Volume 5):

- Maximising the retention and protection of existing trees and vegetation where possible;
- Use of well-maintained hoardings and fencing;
- Designing lighting to avoid unnecessary intrusion onto adjacent buildings and other land uses;
- Replacement of any trees felled as a consequence of construction works;
- Appropriate implementation, establishment and maintenance of planting and seeding works and implementation of landscape management measures, to continue through the construction period as landscape works are completed;
- Temporary bunds to be positioned to screen views to the route construction;
- Involvement in the specific location of construction compound layouts and site access in relation to existing vegetation to reduce visual impacts where practicable; and
- The specific location of temporary material stockpiles to reduce visual impacts.

11.4 Trees

11.4.1 The Contractors will give consideration to where trees and other planting can be established early in the construction programme. For example, where trees require removal due to utility works early in the programme, replacement trees will be provided at the earliest possible opportunity, where reasonably practicable. The Nominated Undertaker will ensure any early planting during construction is maintained to promote healthy growth.

11.4.2 Where practicable, the Contractors will carry out surveys and determine the details of tree retention and protection measures, in accordance with BS 5837:2012 Trees

in relation to design, demolition and construction – Recommendations, in advance of any works in the vicinity of trees.

11.5 Site Buildings for Office Welfare

11.5.1 Site buildings will generally be of a temporary modular type; they will typically be multi-storey to maximise construction space and limit land take.

12 Noise and Vibration

12.1.1 General control measures relating to noise and vibration are provided in Section 13 of the CoCP and additional information is provided in Information Paper E23: Control of construction noise and vibration.

12.2 Sensitive Receptors

12.2.1 Noise insulation or temporary rehousing will mitigate residents being significantly affected by levels of construction noise inside their dwellings.

12.2.2 Noise insulation qualifications are under a routine yearly review. Currently no properties have been identified as being eligible for noise insulation or temporary rehousing as per the policy within information paper E23.

12.2.3 The avoidance and mitigation measures in this area will avoid airborne construction noise adverse effects on the majority of residential receptors and communities. The ES has reported likely adverse impacts at the following residential sensitivities:

- The Greenway;
- Ickenham Road;
- Harwell Close; and
- Breakspear Rd South.

12.2.4 Non-residential sensitive receptors for which the ES has reported likely adverse impacts from construction noise are located at;

- Ruislip Golf Club;
- The Fairways Carvery Restaurant;
- The Church of Jesus Christ of Latter-Day Saints; and
- Hillingdon Outdoor Activities Centre (HOAC).

12.3 Local control measures

12.3.1 Site-specific best practicable means measures to control noise and vibration have been identified through the Parliamentary process and discussions with the LBH and reflected in this document. Furthermore, site-specific measures will be identified by the Contractor on a site-by-site and activity-by-activity basis and agreed with LBH through the Section 61 process. As identified in the ES, examples of best practicable means measures that may be employed by the Contractor to control noise and vibration include:

- Controlling noise and vibration at source - for example the selection of low vibration methods i.e., floor sawing concrete slabs; review of construction programme and methodology to consider quieter methods i.e., use of hydraulic pulverisers for demolition;
- Arranging the layout of compounds to reduce noise impacts where construction compounds are in close proximity to noise sensitive receptors. This may include placing any stacked portacabins between noisy works and sensitive receptors; and
- Additional height hoardings which may, on occasion, be used to control construction noise. These will be subject to approval in accordance with the requirements of Schedule 17 Part 1 of the Act.

12.3.2 In addition to the above measures, localised noise mitigation in the form of Noise Blankets/Barriers have been erected to control noise from fixed plant items such as conveyor motors, conveyor return stations and motor stacks.

12.3.3 One residential building (Oak Farm on Breakspear Road South) is forecast to experience noise levels higher than the noise insulation trigger levels as defined in the CoCP (Section 13) or are identified in the ES as qualifying for a noise insulation package as detailed within the Noise Insulation and Temporary Rehousing Policy.

12.3.4 Local control measures will be periodically reviewed, including following any material changes in the proposed construction method and appointment of the Contractor.

12.4 Monitoring

12.4.1 The Nominated Undertaker requires its Contractors to undertake and report such monitoring as is necessary to ensure and demonstrate compliance with all noise and vibration commitments and the requirements of the CoCP.

- 12.4.2 As set out in section 4.3.10 of the CoCP, where the Nominated Undertaker's Contractors are monitoring noise, dust and air quality with equipment capable of streaming data in real time, this will be made available to the LBH if a written request is received by the Nominated Undertaker. In addition, monthly noise monitoring reports and data will be made publicly available throughout construction on the HS2 website <https://www.gov.uk/government/organisations/high-speed-two-limited> and <https://data.gov.uk/dataset/24542ae7-dd44-444f-b259-871c4cc43b5e/environmental-monitoring-data> respectively. The monthly reports will include information such as measurement methodology and monitoring locations.
- 12.4.3 All noise and vibration monitoring equipment should hold a valid calibration certificate issued by either a United Kingdom Accreditation Service (UKAS) accredited calibration laboratory or equipment manufacturer.

13 Traffic and transport

- 13.1.1 Route-wide, local area and site-specific traffic management measures will be implemented during the construction of the project on or adjacent to public roads, bridleways, footpaths and other PRow affected by the Scheme as necessary. These measures are guided by Section 14 of the CoCP.
- 13.1.2 The CoCP sets out a number of measures to ensure the impacts from construction traffic on the local community are reduced by its Contractors where reasonably practicable:
- A Route-wide Traffic Management Plan (RTMP) setting out generic traffic management measures to be implemented during the construction of the project;
 - The Local Traffic Management Plans (LTMP) will set out matters such as planned worksites, lorry routes and the programme of major traffic management measures expected to be necessary within particular areas along the route;
 - Contractors will prepare site- specific traffic management measures, which will be subject to consultation and, as necessary, consent;
 - Contractors will prepare construction workforce travel plans with the aim of

encouraging the use of sustainable modes of transport to reduce the impact of workforce travel on local residents and businesses;

- For road cleanliness Contractors will be required to use all reasonably practicable measures to avoid/limit and mitigate the deposition of mud and other debris on the highway; and
- HS2 will require its Contractors to undertake such appropriate monitoring as is necessary to ensure compliance with the requirements of the CoCP, and this will include the maintenance of records of traffic management measures installed.

13.1.3 Information relating to construction traffic is also provided in the following Information papers:

- D11: Maintaining access to residential and commercial property during construction;
- E13: Management of traffic during construction;
- E14: Highways and traffic during construction – legislative provisions; and
- E30: Vehicle flow management and safety requirements during construction.

13.2 Local Control Measures

Sensitive Receptors

- 13.2.1 In relation to traffic and transport, key sensitive receptors will need to be considered when the Contractor develops the overall programme within the LTMP and the site-specific traffic management Schemes.
- 13.2.2 In the LBH, these include Swakeleys Road, Breakspear Road South, Harvil Road, Ickenham Road, Ladygate lane, B467 Swakeleys Road, Harvil Road and Moorhall Road/Moorfield Road, the A412 Denham Avenue/Moorfield Road junction, A412 North Orbital Road/Denham Green Lane junction, A412 Denham Way/North Orbital Road, and A40/Swakeleys Roundabout and Swakeleys Road/Harvil Road junction and local roads that are affected by the Scheme.
- 13.2.3 Requirements for considering how impacts can be mitigated, as far as reasonably practicable, will be addressed appropriately through the development of the LTMPs or site-specific measures and discussed at the Local Traffic Liaison Group meeting, established in accordance with the CoCP and the Route-wide Traffic Management Plan.

Site Access

- 13.2.4 A number of vehicle access points to the construction sites will be required and so the construction vehicle movements will be spread over a number of roads within the area of the works. Highway access notifications and/or approvals will be undertaken in accordance with Schedule 4 of the Act.
- 13.2.5 Routes for construction traffic will be subject to approval of the relevant planning authority in accordance with Schedule 17 of the Act when large construction vehicle movements exceed 24 single movements (12 two-way movements) per day and/or from a site.
- 13.2.6 Any permanent highway works outside the limits of deviation as outlined in the Act will be subject to normal Highways legislation and Highway Authority powers.

13.3 Works to the Highway and Access Measures

13.3.1 Temporary road closures and diversions of the following roads will be required:

- Temporary short-term closure (up to approximately six months) of Chalfont Lane requiring a temporary traffic diversion of approximately 6.1km via A412 Denham Way/North Orbital Road, Woodland Road, Hornhill Road, Shire Lane, Rickmansworth Lane, Denham Lane and West Hyde Lane; and
- Temporary long-term closure (up to approximately five years and six months) of Chalfont Lane requiring a temporary diversion of approximately 1.6km via A412 Denham Way/North Orbital Road, Woodland Road, Hornhill Road and the new temporary link road between Hornhill Road and Shire Lane/Chalfont Lane, temporary closure of Tilehouse Lane (up to one year six months) requiring a temporary traffic diversion of approximately 5.2km via A412 Denham Way/North Orbital Road and Denham Green Lane.

13.3.2 Alternative routes for the following PRow will be required, namely:

- A temporary alternative route for Footpath U34, to the east for a period of approximately three years and nine months;
- A temporary alternative route for the Grand Union Canal western tow path, to the east for a period of approximately three years and nine months;
- A temporary alternative route for Footpath U49, along the eastern boundary of the Northolt Tunnel and Earthworks Main Compound, for a period of approximately 9 years;
- There will be a temporary diversion of Footpath U50 around the stockpile areas, adding 350m to the length of the footpath, west of Harvil Road and

east of Uxbridge Golf Course in CFA7, as part of AP4 proposals;

- Temporary diversion of footpaths U36, U37 and U38, over a period of approximately one year, during deposition of surplus excavated materials north of New year's Green Lane; and
- Temporary diversion of footpaths U43, U45 and U47, along a route parallel to Breakspear Road South and under the existing Chiltern Line underbridge.

13.3.3 All temporary closures and diversions will be subject to submissions and notifications to the relevant highway authority.

14 Waste and Materials

14.1.1 All waste will be managed in accordance with the waste hierarchy which aims to reduce waste at source and to reduce the quantity that requires final disposal to landfill. This applies to excavated material arising on-site, which will be reused within the Scheme as far as reasonably practicable, as well as material from demolition and construction activities. This approach is described in greater detail in the HS2 Phase One Information Paper E3: Excavated Material and Waste Management and in Section 15 of the CoCP.

14.2 Local Control Measures

Testing and classification of materials

14.2.1 The 'basic characterisation'⁷ of excavated material will be determined by the Contractor to ascertain the potential for reuse, recycling, recovery or disposal to inert, non-hazardous or hazardous landfill.

14.2.2 15.2.2 A Materials Management Plan will be developed in accordance with the Definition of Waste: Development Industry Code of Practice⁸ to set out the processes to be adopted in respect of the reuse of excavated materials either on the Scheme or transferred to another development site.

⁷ Basic characterisation' refers to the characterisation of excavated material to help define the type of re-use for which it is suitable (e.g., DMRB soil classes). Characterisation of waste would include the allocation of an EWC code (in accordance with The List of Wastes (England) Regulations 2005 SI No. 895) and a detailed evaluation of the waste properties. The latter is based on a combination of the detailed knowledge of the source process and chemical testing.

⁸ CL:AIRE Definition of Waste: Development Industry Code of Practice, version 2, March 2011

14.2.3 In the event that excavated material is to be sent for disposal, which shall be the option of last resort, testing and classification of will be undertaken by the Contractor in line with the Environment Agency's guidance. This includes:

- Waste Sampling and Testing for Disposal⁹; and
- WM3 – Guidance on the classification and assessment of waste (1st edition 2015)¹⁰.

Transport of Waste and Materials

14.2.4 Copthall Cut & Cover Tunnel construction and Harvil Road realignment will excavate 852,000m³ of arisings, a substantial portion of this material will be placed in the Sustainable Placement Areas (SPA) this is a permitted inert landfill (under separate permit with the Environment Agency), 140,000m³ of excavated material will be stored for use as protection for the newly constructed Copthall Tunnel concrete walls and cover slabs.

Specific quantities of excavated tunnel materials will be reused using the CLAIRE DoWCoP.

Excavated arisings will also be used as an inert structural fill material to raise the realigned Harvil Road embankment to a sufficient level to cross over the new HS2 rail alignment

The excavated material will be tested prior to its use in sensitive areas

15 Water resources and flood risk

15.1.1 General control measures relating to water resources and flood risk are provided in Section 16 of the CoCP.

15.2 Sensitive Receptors

15.2.1 The Contractors will have due regard to the following sensitive local water resource receptors:

- Local aquifers;
- Alluvium (Secondary A aquifer); Shepperton Gravel (Secondary A aquifer); Lambeth Group (Secondary A aquifer); Seaford Chalk (Principal aquifer) and

⁹ Environment Agency (2013), Waste Sampling and Testing for Disposal to Landfill, March 2013.

¹⁰ Environment Agency (2015), Technical Guidance WM3 – Guidance on the classification and assessment of waste (1st edition 2015) (1st Edition 2015).

Newhaven Chalk (Principal aquifer);

- Eight licensed groundwater abstractions are present within the area;
- Source Protection Zones (SPZs): The route passes through Zone 1 and Zone 2 of a SPZ in this area;
- Surface water features: Yeading Brook (East and West Arms), Ickenham Stream and tributaries, River Pinn, New year's Green Bourne, River Colne, Grand Union Canal, Harefield No.2 Lake, Savay Lake and unnamed pond adjacent to Savay Lake, Korda Lake, Harefield Moor Lake, Long Pond, Broadwater Lake Nature Reserve, one small pond at Lord Halsbury Memorial Playing Fields, two drains and one small pond at Ruislip Manor, several small ponds and drains at Ruislip Gold Course, three small drains and pond south east of New year's Green covert, and numerous small ponds within 1km radius of the Scheme; and
- Water dependent habitats: River Colne, adjacent flooded gravel pits (including Savay Lake which is an important fishery), the Grand Union Canal and the Mid-Colne Valley SSSI.

15.2.2 The Contractor's pollution incident control plan will have due regard to the local flood risk sources (i.e., surface, artificial, groundwater and sewers) and key receptors and take into account any proposed risk management and/or mitigation measures.

15.2.3 The Contractors will have due regard to the River Pinn, the River Colne and New year's Green Bourne within Environment Agency Flood Zones 2 and 3, which is an area that is at risk of river flooding.

15.3 Potential Sources of Contamination

15.3.1 Potential sources of contamination are detailed within Section 11 of this LEMP.

15.4 Local Control Measures

15.4.1 Measures identified in Section 16 of the CoCP, including detailed method statements, will aim to reduce potential adverse effects on surface water or groundwater quality or flows associated with construction. This will include release to groundwater, watercourses of surface water sewers in the surrounding receptors and could require the use of appropriate measures such as bunds of non-erodible material or silt or sediment fences adjacent to watercourses, such as Ickenham Stream, River Pinn, New year's Green Bourne, the Grand Union Canal and the River Colne.

- 15.4.2 As outlined in the CoCP, best practice measures will be used (e.g., through the use of silt traps and appropriate attenuation, if required) prior to the discharge of water to watercourses, groundwater or surface water sewers, subject to obtaining the required permits or consents. This could apply to runoff from wheel washing facilities or from general construction activities. As noted in Section 5.12 of this document, a pollution incident control management system will incorporate procedures for alerting relevant water supply companies and reducing impacts to public supply SPZ's and local private abstractions in this area.
- 15.4.3 Where there is the possibility that work may affect aquifers, a groundwater monitoring plan will be implemented, as outlined in Section 16 of the CoCP.
- 15.4.4 A programme of groundwater and surface water monitoring will be undertaken prior to, during and following completion of the construction works. The monitoring programme scope and duration will be developed and agreed with the Environment Agency and where appropriate in consultation with relevant Stakeholders.
- 15.4.5 If dewatering from excavations is required, it will be carried out in consultation with the Environment Agency and will take into consideration risks posed to water quality or quantity.
- 15.4.6 If required, appropriate guidance will be adhered to, including the Piling and Preventative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention¹¹. Groundwater and surface water monitoring plans will be prepared, where piling could affect below ground contamination.
- 15.4.7 Temporary excavated material stockpiles, construction compounds and site offices will be located outside of areas at risk of flooding where reasonably practicable, to avoid having an impact on the risk of flooding. Where construction compounds cannot be located outside flood risk areas, there will be a site- specific flood risk management plan prepared prior to construction to manage the potential risks. These plans will take account of the flood risk assessments produced for the ES and include any proposed risk management or mitigation measures, if required.
- 15.4.8 16.4.8 Drainage from the works will be attenuated and discharged to watercourses or sewers, under agreement, at a controlled rate and, where required, with

¹¹ Environment Agency (2001), Piling and Preventative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution

approval of the Environment Agency and, where appropriate, the drainage authority in accordance with Schedule 33 Part 5 of the Act.

15.4.9 16.4.9 In certain instances, the excavated retained cut is at a level below the natural ground water table. Mitigation, where necessary with continuous piles or grouting, will ensure that any changes to local groundwater levels and flow are minimised through the use of cut-offs and applying relatively short timescales for dewatering.

15.4.10 16.4.10 Additional information, such as how the Scheme complies with the Water Framework Directive, as well as further provisions for engagement with Stakeholders, monitoring and protection of local water resources are outlined in HS2 Information Paper E1: Control of Environmental Impacts and HS2 Information Paper E4: Water resources and flood risk.

16 Appendix 1 : Glossary of Terms

Abbreviation	Definition
AP	Additional Provision
CFA	Community Forum Area
CoCP	Code of Construction Practice
CoPA	Control of Pollution Act 1974
Contractor	The Contractor on a construction site responsible for planning, managing and co-ordinating themselves and/or the works and all other Contractors working on their site, or any other contractor directly employed by the Nominated Undertaker to undertake key construction works on site.
ES	Environmental Statement
EMS	Environmental Management System
HGVs	Heavy Goods vehicles
HS2	High Speed 2
HS2 Ltd	High Speed Two Limited - is a company wholly owned by the Department for Transport, established in 2009 to develop plans for a new high-speed network and present a proposed route connecting London - West Midlands.
IAQM	Institute of Air Quality Management
IP	Information Paper
LBH	London Borough of Hillingdon
LCAs	Landscape character areas
LEMP	Local Environmental Management Plan
LTMP	Local Traffic Management Plan
MWCC	Main Works Civils Contractor
Nominated Undertaker	The body or bodies appointed to implement the powers of the Act to construct and maintain the railway.
PRoW	Public rights of way

Abbreviation	Definition
RRVs	Road Rail Vehicles. A vehicle which can operate both on rail tracks and road, often used for railway maintenance
RTMP	Route-wide Traffic Management Plan
SBI	Site of Biological Importance
Scheme	The Scheme to which this LEMP relates is the proposed high-speed railway between London - West Midlands. This is a high-speed railway between London - West Midlands with a connection via the West Coast Main Line at conventional speeds to the Northwest and Scotland. It includes four high speed rail stations at London Euston, Old Oak Common (West London), Birmingham Airport (Birmingham Interchange) and Birmingham (Curzon Street).
SCS	Skanska Costain STRABAG
Section 61	Section 61 of the Control of Pollution Act 1974 (which sets out procedures seeking and obtaining Local Authority consent to measures for the control of noise and vibration on construction sites).
SES	Supplementary Environmental Statement
SLI	Site of Local Importance
SMI	Site of Metropolitan Importance
SPZ	Source Protection Zone
SRP	Soil Resources Plan
SSSI	Site of Special Scientific Interest

17 Appendix 2: Non-exhaustive List of Local Interest and Community Groups in Hillingdon

Businesses:

- Colne Valley Regional Park Community Interest Company;
- Groundwork South;
- Harleyford Aggregates Ltd;
- The Ruislip Rifle Club;
- Ruislip Golf Course (owned by LBH) and associated golf club;
- Uxbridge Golf Course (owned by LBH) and associated golf club;
- Hillingdon Outdoor Activities Centre;
- Blenheim Day-care Centre;
- AR Hendricks;
- West London Composting Ltd.;
- West London Waste Authority;
- parade of shops on West End Road next to Ruislip High School;
- Thames Water Utilities Ltd.;
- Affinity Water;
- National Grid;
- Network Rail;
- Chiltern Railways;
- Affinity Water;
- Scottish and Southern Energy (SSE);
- British Telecom (BT); and
- Merck Sharpe Dohme.

Organisations:

- London Borough of Hillingdon;
- Transport for London;
- Greater London Authority;
- Harefield Hospital;
- Inland Waterways Association;
- London Wildlife Trust;
- Harefield Infant School;
- Harefield Junior School;
- The Ruislip Chamber of Commerce;
- Governing Body of the Breakspear School;
- Governing Body of Vyners School;
- Ruislip High School;
- Governing Body of Sacred Heart Catholic Primary School;
- St. Giles Church;
- South Ruislip Christian Fellowship Centre;
- Church of Jesus Christ, Ickenham Road;
- Latter Day Saints, Ickenham Road;
- West London Tutorial College;
- Canal and Rivers Trust;
- Ramblers Association;
- Stop HS2; and
- HS2 Action Alliance.

Residents Groups:

- Harefield Residents and Tenants Association;
- Ickenham Residents' Association;

- Ruislip Residents Association;
- South Ruislip Residents Association; and
- North Ruislip Residents Association

(NB: This list is indicative and will subject to change as more information becomes available).

18 Appendix 3: Environmentally Sensitive Sites: Site Specific Management Plan

Colne Valley Regional Park – Environmentally Sensitive Worksite Management Plan

Document no.: 1EW03-FUS-EV-PLN-C000-001021

Revision	Date approved	Author	Checked by	Approved by	Reason for revision
P01	12/10/17	C Hutson	J McGillicuddy	J Ely	For Information
C02	01/12/17	C Hutson	M Knight	M Knight	For Information
C03	01/08/18	W Burke	L Greenaway	E Day	For acceptance

A report prepared for High Speed Two (HS2) Limited.

Introduction

19 Background

- 19.1.1 17.1.1 The HS2 Environmental Memorandum (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/593596/Environmental_Memorandum.pdf) identifies key worksites along the Phase One route that are environmentally sensitive. These sites are considered particularly environmentally sensitive in relation to the following environmental topics: nature conservation, terrestrial and aquatic ecology, water resources, geomorphology, recreation and amenity, landscape, public open space, and agricultural land. The criteria for their selection is set out in the HS2 Environmental Memorandum.
- 19.1.2 The key environmentally sensitive worksites across Phase One of HS2, from south to north, are:
- Colne Valley;
 - Chilterns Area of Outstanding Natural Beauty (AONB);
 - Bernwood Forest;
 - Radstone and Helmdon Disused Railway; and
 - Berkswell Marsh.
- 19.1.3 The management plans for these key environmentally sensitive worksites are being prepared and published prior to the commencement of works which may affect them. The preparation and publication of these plans is, therefore, determined by the Phase One construction programme. These plans will be developed as HS2 Contractors develop their designs and programme.
- 19.1.4 This management plan is for the Colne Valley Regional Park, focusing particularly on the Mid-Colne Valley Site of Special Scientific Interest (SSSI).

19.2 The Colne Valley Regional Park in the Context of HS2

- 19.2.1 The Colne Valley Regional Park (CVRP) stretches over 40 square miles, with 200 miles of river and canal and more than 60 lakes. The central section of the park contains the Mid-Colne Valley SSSI, which consists of open standing water and woodland habitats of value for breeding birds, along with a smaller area of calcareous grassland. All relevant authorities must have regard to the purpose of

conserving and enhancing the areas natural beauty when performing their functions, as required under Countryside and Rights of Way Act 2000.

- 19.2.2 The HS2 Phase One route enters the area in cutting, travels over a viaduct through the majority of the area and then returns to near grade at the northern end of the Colne Valley. A map of the Colne Valley Regional Park and Mid-Colne Valley SSSI in relation to the HS2 Phase One route is shown on drawing reference PH1-HS2-GI-MAP-C000-000002.
- 19.2.3 The Colne Valley Viaduct is a 3.4km long structure that will be constructed to carry HS2 over the water features of the Colne Valley, including Harefield No. 2 Lake, Savay Lake, Korda Lake and Long Pond, the Grand Union Canal, the River Colne and the New year's Green Bourne. The lakes and ponds were formed following gravel extraction and many of these water features now make up the Mid Colne Valley SSSI. The viaduct will be orientated southeast to northwest, beginning at the South Embankment that will be constructed to the west of Harvil Road. At the northwest end of the viaduct the North Embankment will be constructed to the west of the A412 North Orbital Road.
- 19.2.4 The CVRP falls within the scope of three Environmental Statement (ES) Community Forum Area (CFA) Boundaries: CFA 6 South Ruislip to Ickenham; CFA 7 Colne Valley and CFA 8 The Chalfonts and Amersham. The Mid-Colne Valley SSSI lies within CFA 7. These documents provide detail of the assessment of the route, outline of the work and sensitive receptors.
- 19.2.5 The CVRP falls within Chiltern District, London Borough of Hillingdon, Buckinghamshire County Council, South Bucks District Council, Hertfordshire County Council and Three Rivers District Council. The majority of the Mid-Colne Valley SSSI is within the London Borough of Hillingdon.
- 19.2.6 The Colne Valley is identified in the HS2 Environmental Memorandum as being a key environmentally sensitive worksite in relation to the following environmental topics:
- Landscape;
 - Nature conservation, terrestrial and aquatic ecology;
 - Water resources and flood risk; and
 - Recreation, amenity and public open space.

19.3 Purpose of the Management Plan

19.3.1 The purpose of this management plan is to:

- Identify future works potentially affecting the CVRP from HS2 Contractors and third parties in relation to HS2;
- Focus on mitigation, compensation and monitoring requirements and opportunities for enhancement in relation to specific environmental topics; and
- Identify synergies between different stakeholder organisations in terms of opportunities.

19.3.2 This management plan has been prepared to satisfy the commitments set out within the HS2 Environmental Memorandum and to support the Local Environmental Management Plans (LEMP) for the Chilterns, Three Rivers and South Bucks and the London Borough of Hillingdon. The management plan is part of a suite of documents which identify environmental issues, controls and opportunities in relation to the CVRP including:

- The Environmental Minimum Requirements which contains the Code of Construction Practice (CoCP) and the HS2 Environmental Memorandum;
- Schedule 17 controls under the HS2 Act 2017 (the Act). KESWMP's will support Schedule 17 submissions and Town and Country Planning Applications within the CVRP and where appropriate, heritage applications under Schedule 18, 19 and 20;
- This management plan supports the Mitigation Plan developed by the CVRP Panel as set out in the High Speed 2: Additional Mitigation Plan for the Colne Valley (October 2017);
- Biosecurity Management Plans, Ecology Site Management Plans (ESMP) and Landscape Maintenance, Management and Monitoring Plans (LMMMP). The site-specific ESMP and LMMMP provide the maintenance, management and monitoring requirements for ecological mitigation and landscape planting sites;
- Groundwater Management Strategy;
- Protective provisions. The Act also contains provisions which give protection to bodies affected by the Scheme. These include: highway authorities, utility undertakers, the Environment Agency, the Canal and Rivers Trust, and harbour and airport authorities. Typically, these provisions enable HS2 Contractors to undertake works affecting their

infrastructure but require approval of the details to be obtained. Paragraph 12 of Schedule 31, Part 1 of the Act requires the Nominated Undertaker not to deposit soil or material, or store any plant, or erect scaffolding or other structures, in or over a highway without the consent of the highway authority;

- Legally binding consenting and licensing process. Hs2 Limited will be submitting licenses and consents in accordance with the Schedules of the Act; and
- The Environmental Management Systems implemented by HS2 Contractors (as defined in the CoCP) including contract level and site level environmental management plans.

19.4 Process of developing the management plan

19.4.1 On 16 November 2016 contracts were awarded to three Enabling Works Contractors (EWC) working across Phase One of HS2. The EWC contracts run until November 2020 with an option for HS2 to extend these for a further two years.

19.4.2 Fusion are the EWC for Area Central. Area Central covers an area of the Phase One route from east of Harvil Road in the London Borough of Hillingdon to Southam in Warwickshire and is split into three sectors (C1, C2 and C3). Fusion is a joint venture between Morgan Sindall Infrastructure Services, BAM Nuttall Ltd and Ferrovial Agroman. Costain Skanska Joint Venture (CSJV) are the EWC for Area South. Area South covers the Phase One route from Euston Station in London Borough of Camden to Harvil Road in the London Borough of Hillingdon. Area South is split into four sectors (S1 and S2 being the main areas and S3 and S4 covering Euston Station and Old Oak Common Station).

19.4.3 On 17 July 2017 contracts were awarded for HS2's Main Works Civils Contractors (MWCC). The MWCC covering the majority of the CVRP and the Mid-Colne Valley is Align in sector C1. Align is a joint venture between Sir Robert McAlpine, Bouygues TP and Volker Fitzpatrick.

19.4.4 The Skanska Costain STRABAG (SCS Railways) joint venture is the MWCC who will also be working within the CVRP for sector S2 which affects the southern side of the CVRP around Harvill Road. SCS Railways covers the Phase one route from Euston Station in London Borough of Camden to Harvil Road in the London Borough of Hillingdon. The MWCC's Align and SCS Railways are both currently developing their Scheme design and programme for the main civils construction works.

- 19.4.5 The approximate boundaries of the Area Central sectors relevant to the CVRP are shown on drawing reference: PH1-HS2-GI-MAP-C000-000002. For the purpose of HS2 Ltd procurement the CVRP falls across two contractual boundaries: South (S2) and Central (C1).
- 19.4.6 Fusion have produced this management plan, with input from CSJV, Align and SCS Railways, on behalf of HS2. Fusion have produced this plan as they are the first Contractor to carry out works within the vicinity of the CVRP.
- 19.4.7 It is anticipated that the MWCC, Align started the early works programme in March 2019. It is anticipated that Align will take the lead on updating this management plan for the next revision as they will be implementing the majority of above ground construction works affecting the CVRP. Fusion will continue with their works up to December 2019, where it is expected that Align will receive the Notice to Proceed.
- 19.4.8 HS2 Contractors are working collaboratively, along with relevant third parties such as utilities companies, in relation to works within the CVRP, such as Cadent Gas.
- 19.4.9 As the MWCC are still developing their design and construction programme this management plan currently focuses on works being undertaken by the EWC within the CVRP which includes surveying, surface and groundwater monitoring, creation of ecological mitigation sites, tree planting, utilities diversions and minor road works, as well as site and vegetation clearance. It is expected that the majority of opportunities to reduce environmental effects or improve environmental outcomes within the CVRP will be identified by the MWCC through the design process. Therefore, the opportunities identified at this stage are limited.
- 19.4.10 This management plan is intended to be reviewed prior to any construction works taking place within the CVRP and whenever there is a significant change to works proposed in line with the revision of the LEMPs or on a six-monthly basis, whichever is soonest. Updates of publication will be in line with publication of the LEMP.

19.5 Consultation

- 19.5.1 National Environment Forum (NEF) members and relevant planning authorities will be consulted on the KESWMP following requirements within the HS2 Environmental Memorandum. In addition, the CVRP Panel will be consulted on this plan.

- 19.5.2 Copies of the updated plan will be made available for consultees following each revision. Comments from the consultees will be collated for consideration of further updates and amendments. Comments and discussions from attendance by HS2 and its Contractors at the CVRP Panel will also be taken into account for updates and amendments.
- 19.5.3 Following the Environmental Memorandum commitments, the management plan will be submitted with relevant Schedule 17 submissions to local planning authorities and, where appropriate, heritage applications.
- 19.5.4 HS2 Contractors will work closely with the CVRP Panel, communicating and consulting as appropriate on works within the area. The Panel provides recommendations on design and mitigation proposals for their section of the HS2 route. Regular representation at the CVRP Panel, the HS2 Contractor leading on production and updates of the KESWMP is beneficial to all parties to identify areas of concern, possible mitigation and compensation planting or alternatives that can be incorporated into design.

20 Overview of upcoming works within the Colne Valley Regional Park

20.1 Early works

- 20.1.1 Fusion and CSJV have been carrying out a range of survey and investigation works within the vicinity of the CVRP including the Mid-Colne Valley SSSI which commenced in early 2017 and will continue throughout 2018. Works include:
- Environmental surveys such as ecological surveys, groundwater monitoring and surveys to support hydrological modelling;
 - Surveys to identify invasive species, such as Japanese knotweed, and to support plans for future treatment and control;
 - Engineering surveys, including soil surveys;
 - Construction of ecological mitigation sites;
 - Design and construction of advanced planting sites;
 - Site clearance and demolition;
 - Haul road and minor road works;

- Utility diversions; and,
- Archaeological investigations.

20.1.2 There are other survey works anticipated to be carried out by the EWC for which the details and programme are currently being developed:

- Translocation of protected species into the ecological habitat creation sites at Tilehouse Lane Colne Valley Wetland and Grassland and Harvil Road; and,
- Assessment of hedgerow translocation and carrying out habitat translocation.

20.1.3 Construction works in the CVRP by the EWC include ecological mitigation sites, advance landscape planting, utilities works, archaeological investigations and vegetation clearance which are discussed in more detail below.

20.1.4 **Design and creation of ecological mitigation sites.** The first construction works by the EWC in the CVRP was the creation of the Tilehouse Lane Cutting Woodland and the Harvil Rd Woodland ecological mitigation sites in early 2018. Habitat creation works, including pond construction and advanced planting, took place in early 2018, north of the MSD site in New Year's Green. The planting was only partially successful as a result of the unseasonal and persistent dry weather, re-planting is to commence in early 2019. Reptile fencing was installed around the MSD site to secure the material stockpiles, preventing protected species from overwintering. Material stockpiles are to be managed and inspected to ensure protected species are not harmed. Colne Valley Wetland ecological mitigation site is scheduled for construction in mid-2019 and is principally designed to help integrate the Ickenham Auto Transformer Feeder Station (IFTS) into the landscape as well as providing replacement tree planting and wetland vegetation compensation. Colne Valley Grassland ecological mitigation site is proposed for construction in early 2019. The site has the objectives to be a receptor site for reptiles and great crested newts, providing replacement pond provision and provide compensation for rank grassland lost elsewhere. See section 0n Nature Conservation, Terrestrial and Aquatic Ecology for further information.

20.1.5 **Advance landscape planting** by EWC is currently anticipated to start in late 2018 (see Landscape section below).

20.1.6 **Utilities works** for HS2 will either be carried out by HS2 Contractors (contestable utilities) or by Utilities Companies (non-contestable utilities). Non-contestable

utility works will be carried out by the MWCC as part of the main civils works. There are two non-contestable works being carried out by utility companies in relation to HS2 within CVRP: Cadent Gas diversions at Harvil Road (West) and west of Breakspear Road Underbridge (in Sector S2) and National Grid electric power line diversion works west of Hillingdon Outdoor Activities Centre, east of Denham (sector C1). There are utility diversions proposed between 2018 and 2020. The National Grid work will be carried out in 2018 and Fusion will provide environmental support including species translocations, where required.

- 20.1.7 CSJV have been conducting site clearance for non-contestable utilities works near Dews Lane relating to diversion of two gas mains in the vicinity of Harvil Road and a water main in the vicinity of Breakspear Road South (commenced October 2018), all within the CVRP but outside of the Mid-Colne Valley SSSI. CSJV works commenced late 2017 and will continue till mid-2018.
- 20.1.8 Site clearance and utility diversion works, currently underway, this is to enable the haul road construction through MSD work site linking to Breakspear Road South, and to facilitate waste movement arising from demolition in the MSD pharmaceutical site from late 2018 for SCS works on the Gatemead Embankment and Brackenbury Cutting.
- 20.1.9 **Archaeological investigations** including geophysical (non-intrusive) surveys and trial trenching was undertaken in early 2018 and will continue in 2019 at a number of sites in the CVRP. Trenching works are currently proposed 2019 at the Harvil Road and Colne Valley ecological habitat sites off Harvil Road and Dews Lane respectively. The results of geophysical surveys and trial trenching will determine whether further archaeological excavations are required. Some tree and scrub vegetation clearance may be undertaken during these works.
- 20.1.10 The main **vegetation clearance** within the CVRP for the construction of the main civils works (specifically in the test pile locations at the Denham Ski Club) is due to start in 2019 and will be undertaken by ALIGN. Fusion will have vegetation clearance to accommodate access for the construction the haul road leading the 275kv cable diversion and some minor vegetation clearance which includes scrub. It is currently anticipated that Fusion will carry out erection of security fencing, and species translocations in the area prior to MWCC carrying out construction.
- 20.1.11 The EWC ecology mitigation and advance planting sites are being created in advance of MWCC construction activities. There have been no in-combination impacts or multiple consenting process impacts identified from the EWC scope of

work prior to MWCC mobilising on site. There have been no other development projects identified which are considered to lead to in-combination impacts on the CVRP with the proposed HS2 works.

20.1.12 Early civils works by the EWC include the design & build of a temporary access road and bridge over the River Colne from Denham Court Lane through Buckinghamshire County Golf course. The access road is to facilitate National Grid with temporary access for their overhead line diversion works. Works is due to start in late 2018, ending early 2019.

20.2 Main works

Align

20.2.1 The earliest date that Align are anticipated to start on site for construction of the main works within the Mid-Colne Valley SSSI is 2019 for site clearance and for test piling at two locations which are mentioned below. Natural England were consulted in relation to the works within the SSSI and a section 28 was applied for by ALIGN. However, Align have already undertaken ground investigation within the CVRP in 2018 and are proposing additional investigation works in advance of the main construction works starting in 2019.

20.2.2 The additional site investigation will include:-

- Ground investigation including boreholes at each of the piers for the Colne Valley viaduct; and
- Test piles at three locations Harvil Road (outside of the Mid Colne Valley SSSI), Moorhall Road and at Denham SKI where the Affinity Water site and associated turbidity migration trial will commence in April 2019. The Moorhall Road site is currently excluded from the scope and is not anticipated to return to be part of the Early Works programme if the Load Test Pile trials yield good results at Harvil Road and Denham Ski.

20.2.3 The test pile will inform the design of the foundations for the viaduct.

20.2.4 The main works on the Colne Valley Viaduct will commence in 2020 the first works within the SSSI boundary will be between the A412 and the River Colne. The main works will include construction compounds, temporary access, pier foundations and construction of the viaduct deck.

20.2.5 Construction compounds will include:-

- The main compound is located north of the northern abutment (A58) at the

portal to the Chiltern Tunnel; and. The main compound is located north of the northern abutment (A58) at the portal to the Chiltern Tunnel; and

- The satellite compounds at the following locations:
- CVV North Embankment Satellite Compound, located at the northern embankment,
- CVV Laydown Satellite Compound, located East of the northern embankment,
- CVV Storage Satellite Compound, located at Moorhall road crossing,
- CVV Jetty Satellite Compound, located East of the Moorhall road crossing,
- CVV HOAC Satellite Compound, located at Hillingdon Outdoor Activities Centre,
- CVV South Embankment Satellite Compound, located at the southern embankment,
- CVV ATFS Compound, located on the ATFS.

20.2.6 Temporary Access will consist of a new 8m wide 'road' or 'platform' alongside the viaduct. The design of this is being developed but is expected to a combination of temporary piled jetty and earth embankments.

20.2.7 The pier foundations will be constructed by building a sheet piled coffer dam at each pier location. This will then be de-watered and a series of concrete piles will be inserted with a pile cap put on top. The pier will then be built on top of the pile cap.

20.2.8 The deck of the viaduct will be built in 3m sections. Each section will be made in the pre-casting site at the main compound. This will then be moved along the viaduct using a launching girder and placed at the end of the viaduct. The girder will then move and place the next segment in a west to east direction across the lakes.

SCS Railways

20.2.9 The S2 area falls within the boundary of the CVRP, however not within the boundary of the Mid- Colne Valley SSSI.

20.2.10 Since August 2018, SCS Railways have been undertaking a suite of ground investigation works along the S2 route which is anticipated to be completed by

February 2019. However, to date SCS have not undertaken any ground investigation works within the boundary of the CVRP.

- 20.2.11 All ground investigation works planned to take place within the CVRP of S2 are proposed to take place in 2021. This ground investigation includes a series of window samples required to be completed to inform temporary works design of which are required early in the construction programme. This will include temporary bridges and structures such as conveyors to support tunnelling operations. Further detail of these window samples will be provided in a later revision of this management plan prior to the start of these works.
- 20.2.12 It is important to note that the scope of the ground investigation works is not fixed and is subject to change during the works. This management plan will be updated accordingly owing to any change in the scope and timescales for completion of this ground investigation works.
- 20.2.13 No construction compounds are required as part of the Ground investigation works.
- 20.2.14 The earliest date that the main works construction is anticipated to start within the CVRP in S2 is June 2019. Further detail with regards to the proposed construction phase will be updated as part of the next six-monthly revision of this management plan.

21 Environmental Topics

21.1 Landscape and Visual

21.1.1 Within the Colne Valley Region Park the following Landscape Character Areas (LCA) have been identified;

- Harefield Farmland Valley Slopes;
- Colne River Valley;
- Colne Valley;
- Colne Valley Gravel Pits; and
- Maple Cross Slopes South.

21.1.2 The settlement pattern in the Colne Valley is relatively sparse, although the valley is more densely developed to the south. On the valley sides mixed farmland is a dominant feature within the landscape.

21.1.3 The corridors of open space that follow the River Colne, Grand Union Canal and the lakes that these waterways support are dominant landscape features in the valley bottom. There is concentrated residential and industrial development around Uxbridge. The Chiltern Main Line spans the Colne Valley and has a distinctive influence upon settlements along its route; either forming a perimeter boundary to urban development or travelling directly through the settled area, forming a green corridor due to adjacent line-side vegetation.

21.1.4 The M25 corridor is a major urban feature within the landscape to the west of the area. Conservation areas, registered parks and gardens and listed buildings are located within the area. The vegetation patterns within the area comprise woodland, scrub and meadow within open space, trees and shrubs within river corridors, hedgerows including Old Shires Way ancient hedgerow and small woodlands.

Temporary Effects

21.1.5 Temporary effects to LCA and visual receptors during construction arising from the presence of construction plant, construction compounds, demolition, temporary overhead power lines and pylon diversions, removal of existing vegetation, temporary access routes, earthworks and stockpiles and severance of agricultural land.

Permanent Effects

21.1.6 Permanent landscape and visual effects during operation arising from the presence of new engineered landforms within the existing landscape. These will include a viaduct, embankments, Proposed Scheme in cutting, tunnel portal, highway infrastructure, noise fence barriers, overhead power line diversions, auto-transformer feeder stations, auto-transformer stations, a sustainable placement area and regular passing of high-speed trains. The majority of permanent effects will reduce over time as planting established as part of the Proposed Scheme matures. This is with the exception of the diverted overhead power line, Colne Valley viaduct and associated passing high-speed trains which will remain prominent in certain locations.

Impacts

21.1.7 The enabling works that has been programmed to take place within the CVRP is as follows;

- Construction of an access road to enable the diversion of a 275kv cable located to the east of the Buckinghamshire Golf Course;
- Archaeology investigation works are being undertaken throughout the CVRP and have minimal impact on the local landscape; and.
- A substation is being construction adjacent to the M25 in the West Hyde area. Due to the location and topography of the area, minimal impact is anticipated on the landscape.

21.1.8 The MWCC work to be programme in for the CVRP is as follows;

- Construction of a compound to accommodate welfare accommodation and batching plant for the construction of the tunnel;
- Construction of Satellite compound along the route of the viaduct;
- Entry portal to accommodate the Tunnel Boring Machine; and
- A viaduct which will be constructed over the Colne Valley.

Mitigation

21.1.9 The EWC is undertaking advance landscape planting designed to provide early screening to local residents, businesses and for public amenity value in advance of the MWCC works.

21.1.10 Advance landscape planting by EWC is currently anticipated to start in the winter 2018/19 season. The designs for these planting sites will take account of the Detailed Design Principles being developed by the CVRP Panel. In the CVRP the proposed advanced landscape planting site is:

- **MSD** at New Year's Green. – to provide advanced planting and is acting as a receptor site for ecology. Planting date TBD.

21.1.11 The construction of the haul road will be undertaken in an area currently occupied by woodland. There will be some vegetation clearance during the construction of the road however some of the woodland will be left in situ to provide natural cover.

- 21.1.12 The substation will be constructed on an existing arable field. All soil stripped in this area will be used to act as an earth bund. This bund will be formed to ensure that that it fits in with the local landscape.
- 21.1.13 The MWCC design for the viaduct has been designed to consider the landscape and visual context and where practicable the visual mass has been reduced to try and reduce the level of visual intrusion. This has led to consideration of measures including:
- **arched piers** – over water sections of the viaduct.
 - **noise barriers** with a transparent, hybrid or opaque components.
- 21.1.14 The design of the viaduct has not been finalised at this stage and a final decision will be made on these matters and details such as concrete finishes to inform a future Schedule 17 consent application.
- 21.1.15 On the western valley slopes landscape earthworks will be used to integrate the railway and the Chiltern Tunnel South Portal into the existing environment and reduce some of the visual effects. A landscape proposal has been developed and was part of the public engagement held in 2018.
- 21.1.16 Screening planting has been included within the Proposed Scheme design and is planned for sensitive landscape locations. This includes extensive planting on the Western Valley Slopes. However, no screen planting is planned for 2019.
- 21.1.17 The CVRP Panel is working alongside HS2 and communicating with Fusion on additional integration and enhancement measures to reduce the landscape and visual effects of the Scheme within the CVRP and its setting. The plans being developed by the CVRP Panel are in their early design phase but are welcomed by Fusion and will be taken on board with future Work Packages.
- 21.1.18 Standard construction mitigation measures as detailed in the CoCP will be applied during construction. The MWCC is currently working on the proposals for temporary works and for example, the lighting needed for construction. Further information will be provided in future updates of the KESWMP.

Monitoring

- 21.1.19 The advanced landscape planting will be monitored in accordance with LMMMP which will be produced at detailed design stage for these sites by the EWC. Long term the MWCC will implement a landscape planting contract as part of the reinstatement of the working areas.

Opportunities for Enhancement

- 21.1.20 Further opportunities for enhancement will also be highlighted and developed during design, especially when designing permanent infrastructure. The views of the CVRP Panel will be included as appropriate and consultation will be local authorities and other interested parties. Suggestions received from any party will be considered and discussed between the EWC or MWCC (or both) and HS2 for the practicality and impacts and adopted or incorporated wherever feasible.

21.2 Nature Conservation, Terrestrial and Aquatic Ecology Impacts

- 21.2.1 Based on the design in the published ES the limits of land to be acquired and used within the CRVP includes the valley of the River Colne where past mineral extraction has created a series of large lakes. These lakes support important populations of breeding birds and waterfowl as well as wetland and wet woodland habitats. Many of the lakes are used for angling and Tilehouse Lake South, Harefield No. 2 Lake and the northern part of Broadwater Lake are all used for water sports. Lafarge Aggregates operates on the eastern side of Broadwater Lake and Harefield Moor Lake is a gravel washing lagoon. Large areas of arable farmland are present to the west of the A412 Denham Way/North Orbital Road and farmland is present between Harefield No. 2 Lake and Harvil Road; both areas are crossed by hedgerows. There are several areas where work will be undertaken in close proximity to ancient woodlands.

Mitigation and Compensation

- 21.2.2 Ecological mitigation sites have been identified to mitigate for the loss of habitat due to the construction of HS2. Ecological mitigation sites being provided early by Fusion, largely to act as species receptor sites, have been designed with the intention of maximising the potential quality of the available habitat on each site. All ecological mitigation sites have a bespoke maintenance, management and monitoring requirements to achieve the ecological objectives of that site. The ecological mitigation sites which have or are being constructed early in the programme by EWC within the CVRP are:

- **Tilehouse Lane Cutting Woodland and Harvil Road Woodland** – constructed in 2018. These will provide suitable habitat for reptiles as well as compensation to replace loss of woodland in the CVRP. The sites contain woodland, scrub and hedgerow planting and will include artificial bat

roosts. The objectives for these sites is to form part of the replacement woodland habitat to the west of the new high-speed railway to compensate for similar habitat lost;

- **Colne Valley Grassland** – to be constructed in 2019. The site has the objectives to be a receptor site for reptiles and great crested newts, providing replacement pond provision and provide compensation for rank grassland lost elsewhere;
- **MSD site in New Year's Green Bourne** – constructed in 2018. The MSD site includes pond construction and advanced planting and is acting as a receptor site for great crested newts. Advanced planting failures mean that re-planting is needed in early 2019 to replace those saplings impacted by the exceptionally dry 2018 summer; and.
- **Colne Valley Wetland** - scheduled for construction in mid-2019. This site is principally designed to help integrate the Ickenham Auto Transformer Feeder Station (IFTS) into the landscape as well as providing replacement tree planting and wetland vegetation compensation.

21.2.3 The wider ecological habitat creation outlined in the ES is still being developed. In response to feedback from member of the CVRP options for improving the package of ecological measures is being considered and will be detailed in future updates of the KESWMP.

21.2.4 Part of the construction of the Viaduct will affect Battlesford Wood and Ranston Covert Ancient Woodland within the CVRP. There is a specific Undertaking and Assurance regarding this (U&A 1238). This states that 'The Secretary of State will require the Nominated Undertaker: to use reasonable endeavours to seek to reduce the physical impacts of HS2 Works on the Ancient Woodland located within Battlesford Wood and Ranston Covert.... such that no such that no more than 0.1 hectare of the Ancient Woodland area is permanently or temporarily acquired or used for the Proposed Scheme.' Align have considered whether there is an option to avoid any loss of woodland within the designated area however, this would have had a major effect on the River Colne and consequently was not considered viable. Align are continuing to investigate ways to reduce the loss within the woodland. There will be some removal of trees within the designated area and so a translocation site is being investigated adjacent to the A412. Align's current design avoids the Ancient Woodland soils and they now expect to have minimal impact if any on the Ancient Woodland.

21.2.5 Other mitigation measures being explored by Align include:

River Colne – reducing the habitat loss associated with a realignment of the river. The re-alignment of the river has been re-designed to avoid habitat losses. The current design places eddies in the riverbed as part of the Viaduct pile cap design, thus improving the flow of the water and fish habitats;

Habitat reinstatement – chalk grassland to be created as part of the reinstatement of the main compound on the Western Valley Slopes;

Habitat reinstatement – creating wetland habitat at certain piers along the viaduct; and.

Habitat planting – increased planting areas at Ickenham ATFS.

- 21.2.6 In addition, Align have identified that the proposed load test pile proposed will affect a number of existing bat boxes at Moorhall Road. Align operating under a Natural England licence in agreement with the Wildlife Trust relocated the bat boxes in January 2019.
- 21.2.7 Standard construction control measures specific to nature conservation receptors have been outlined in Table 1 of the Three Rivers and South Bucks District Council Local Environmental Management Plan, Table 1 of the South Bucks District Council Local Environmental Management Plan and Table 1 of the London Borough of Hillingdon Local Environmental Management Plan and support the ecological mitigation as specified in the Environmental Statement (ES). Contractors will use method statements and construction management plans to ensure ecological effects associated with construction are identified, planned for and managed in addition to those identified in consents and licenses. The Contractors and HS2 assure that these controls are being implemented through regular site visits, inspections and audits.
- 21.2.8 Creation of all the ecological mitigation sites will contribute to the HS2 aim of “no net loss” in relation to biodiversity. For the Colne Valley there is a further specific Undertaking and Assurance (U&A_9532) regarding no net loss. This states ‘The Promoter will consider an area within the Hillingdon, Denham, Ickenham, Harefield and Ruislip environs within which a no net biodiversity loss target will be applied.’ The improvements in the quality of the habitat expected to be delivered in accordance with the Align design for the Western Valley Slopes has shown an overall increase in the number of biological units of gain in the Colne Valley compared with the ES design.

Monitoring

- 21.2.9 Monitoring requirements for protected species, and habitats, are determined through the licence application processes and through the ESMP for ecological mitigation sites. Monitoring of mitigation measures is required in the EMR's (para 6.5). Fusion will comply with HS2 Limited's route-wide licence for great crested newts and badgers and will implement licences for other protected species where relevant. The early ecological mitigation sites are being created as receptors for protected species such as great crested newt as required under the HS2 route-wide licence.
- 21.2.10 The site-specific ESMP will be consistent with the requirements of the Environmental Minimum Requirements (CS498E, March 2016) on management and monitoring (section 4.8). Section 4.8.6 states:
- 21.2.11 "Monitoring of the ecology mitigation and compensation measures is necessary to measure the extent to which the ecological objectives of the proposals are being met. The approach to monitoring will depend on which management option is adopted for a particular area of habitat and will be agreed on a site-specific basis".

Opportunities for Enhancement

- 21.2.12 At the current time, opportunities for enhancement within the CVRP in conjunction with EWC works are being sought. Opportunities for enhancement will be identified during detailed Scheme design and through discussion with consultees including the CVRP Panel and local authorities. Align have considered that improved public access could be achieved through a new pedestrian access bridge over the River Colne however currently there is no funding mechanism identified for this opportunity.
- 21.2.13 Vegetation (lower grade timber) from clearances in the area will be chipped and used to shore up footpaths in the local area, maximising social value by allowing the local community, especially those with mobility limitations, easier access to the local green spaces. Opening up access via Ruislip Golf Course, surrounding residential areas, and parks to the Celandine walks.

21.3 Water Resources and Flood Risk

Impacts

Groundwater

- 21.3.1 The ES identified the potential for significant effects on water resources as a result of the permanent works and the construction of the permanent works.
- 21.3.2 The area is underlain by Cretaceous chalk of the White Chalk Subgroup, made up of the Seaford Chalk and the Newhaven Chalk. At the extreme south-eastern tip of the viaduct the Chalk is overlain by the Lambeth Group which is comprised of clay, silt and sand with minor limestone bands. Superficial deposits in the vicinity of the viaduct consist of alluvium; comprised of clay, peat, silt, sand and gravel associated with the River Colne; the Shepperton Gravel Member, underlying the lakes of the Colne valley and the Taplow Gravel Member, present between the River Colne and the A412 North Orbital Road.
- 21.3.3 The Chalk is classified as a Principal aquifer and is extensively used for groundwater abstraction, including a significant quantity of public water supply. The Chalk aquifer is a dual permeability aquifer which is characterised by very low flow rates through the rock matrix and much higher rates of flow through fissures. In some areas these fissures are enlarged by solutional weathering which can result in extremely fast flow rates. The Chalk is likely to be heterogeneous with the principal mechanism for groundwater flow to occur through a dendritic network of interconnected fractures.
- 21.3.4 Permeability is typically highest in the valleys and lowest in the interfluvial areas. Once further ground investigation data are available from ongoing EWC monitoring and Align's additional ground investigations more specific permeability data will be available for the Colne Valley.
- 21.3.5 Along its length the viaduct will be supported by a number of piers. Each pier will be supported by a number of deep piles. The final design of the piles will be subject to the results of piling tests, but they will penetrate the Chalk.
- 21.3.6 The emplacement of piles within the Chalk, in an area used for public water supply, introduces a risk to groundwater quality in the immediate vicinity of the piles, principally generation of turbidity as a result of the through the release of very fine particles of Chalk during the construction process.

21.3.7 There is not considered to be a significant risk to surface waters due to that fact there are no major springs feeding the watercourses in this area, which indicates that baseflow supporting these features is largely diffuse and so less sensitive to any increased turbidity carried within it. None of the EWC works is anticipated to affect ground water.

21.4 Flood Risk and Water Framework Directive

21.4.1 The Flood Risk Zone is defined by areas located in areas of flood risk (Flood Zone 2 or Flood Zone 3) or greater than 1ha in area and where required in support of a consent and/or approval application. For HS2 works the Environment Agency grant the consent and the Local Authority are consulted.

21.4.2 The whole of the Colne Valley is subject to flood risk with all of the lakes within Flood Zone 3. Additionally, the viaduct will cross two watercourses, the River Colne and New Years' Greene Bourne.

21.4.3 A flood risk assessment will be undertaken for all works to allow consent for works in the Floodplain to be granted by the Environment Agency. Following CoCP requirements, there are no anticipated impacts within the CVRP on water resources and flood risk.

21.5 Mitigation and Compensation

Groundwater

21.5.1 Align have been engaging with Affinity Water and the Environment Agency regarding the strategy for managing and monitoring potential effects on groundwater. The mitigation for the main civils works is focused on:-

- Selection of the tunnel boring machine (TBM). A variable density TBM has been selected to manage water pressure and reduce the risk of pollution of groundwater;
- enhanced treatment capacity at public water supply sources; and
- selection of optimal pile construction techniques following the piling tests.

Flood Risk and Water Framework Directive

21.5.2 The Colne Valley Viaduct South Embankment Wetland, Grassland, Harvil Road and Tilehouse Lane ecological mitigation sites to be constructed within the CVRP are in Flood Zone 1 (fluvial flooding). The siting of the ponds has been designed outside the flood zone to prevent incursion by flood waters increasing the likelihood of

introducing non-desirable species. Monitoring of the sites for flood incursion will be undertaken as part of the ongoing monitoring of all the sites.

21.5.3 Within the main works mitigation measures will include:-

- Reducing the extent of works to the River Colne;
- Designing the pier bearings to be above flood level; and
- Floodplain compensation to be provided.

21.5.4 The potential for any direct effects of construction on these watercourses is limited as they will be managed through measures outlined in the CoCP.

Monitoring Requirements

21.5.5 Monitoring requirements will be agreed as part of Scheme design dependant on the locality and severity of the flood risk in discussion with HS2 Limited, the Environment Agency and the Local Authority as appropriate. The consenting process will ensure appropriate monitoring is agreed and implemented. Hydrological monitoring is still being undertaken and when complete hydrological models will be included in future assessments.

21.5.6 The requirement for extended groundwater monitoring prior to construction has been defined in conjunction with the Environment Agency and Affinity Water. This is currently being managed by EWC and will, subsequently, be delivered by Align through the construction phase. Construction phase monitoring will be more detailed, adapting to the programme of works and associated risks.

Opportunity for Enhancement

21.5.7 Enhancement opportunities have been considered within the design and construction process and includes such opportunities as additional swales for the habitat mitigation sites and placement of reptile banks and hibernacula outside the floodplain or areas at risk.

21.5.8 Opportunities for further enhancement will be identified through consultation with consultees including the CVRP Panel and Lead Local Authorities Forum (LLFA) will continue to identify opportunities to reduce areas traditionally known to flood throughout the project.

21.6 Recreation and Amenity Impacts and Public Open Space

Impacts

- 21.6.1 Main works civils construction of HS2 within the CVRP will result in significant impacts, including loss of woodland, ancient woodland, grassland and impacts on landscape views.
- 21.6.2 The works proposed by the EWC are not anticipated to cause significant effects within the CVRP.
- 21.6.3 According to the environmental statement, the CVRP will be crossed by the Colne Valley viaduct. The construction of the viaduct will result in land being required for the Colne Valley viaduct storage and jetty satellite compounds (off Moorhall Road) and Colne Valley viaduct laydown satellite compound (off the A412 Denham Ski/North Orbital Road, south-west of West Hyde House) for approximately three years and nine months. It is not anticipated that there will be any significant impact.
- 21.6.4 The construction works for piling and erection of the viaduct piers and decking will, in parallel, also take approximately two and a half years within the Regional Park. Providing opportunities for countryside recreation and encouraging community participation are key objectives for the CVRP.
- 21.6.5 The Park is accessible to communities in west London as well as providing a recreational resource for nearby communities. Although land within the park will be required for two and a half years, it is considered that the park is sufficiently large that the construction works will not affect the ability of the park to retain its function. Therefore, it is considered that there will not be a significant effect on the Colne Valley Regional Park.
- 21.6.6 The study area, including Colne Valley Regional Park, has a number of PRoW through it. These include the Colne Valley Trail and Hillingdon Trail along the banks of the Grand Union Canal, the Old Shire Lane Circular Walk and the South Bucks Way, as well as other informal routes. Those routes that will be intersected will re-routed, either temporarily or permanently and therefore no significant effects on recreational PRoW are predicted.
- 21.6.7 Impacts on the Grand Union Canal have been avoided through the placement of piers on either bank rather than in the canal. The section of the Old Shire Lane

Circular Walk from the junction with the A412 Denham Way/North Orbital Road near West Hyde House, west and north-west, to its intersection with the M25 runs alongside areas of construction activity including the Chiltern tunnel main construction compound. This part of the walk is approximately 2.5km in length. Part of this route will be temporarily diverted to the south of the existing route, adding 1.2km to the route. The section of the route that heads north toward the crossing of the M25 at Chalfont Lane will be closed during the construction period for five and a half years.

- 21.6.8 This requirement for land is considered to result in a moderate adverse effect on the Old Shire Lane Circular Walk and therefore its users, which is significant. In addition, the users of the remaining section of the route within this study area are predicted to experience a change in amenity when using the alternative route, principally as a result of the views of and noise from, the construction activity.

Mitigation and Compensation

- 21.6.9 Woodland and ancient woodland loss will be minimised through the exploration of alternative options which are also being informed by tree and arboricultural surveys. Areas of amenity lost permanently through the Scheme are being mitigated through design supported by the EWC, the MWCC in time and through HS2 Limited's support of the CVRP Additional Projects being developed by the CVRP Panel.
- 21.6.10 Public Rights of Way (PRoW) will be affected by the construction of HS2. The EWC and MWCC will work with the community and interest groups to mitigate for these disruptions through the provision of additional routes where possible linking sections of curtailed path and by enhancing PRoW with additional planting also if possible.
- 21.6.11 The EWC have been consulted and have contributed to opportunities to develop the PRoW network within the Colne Valley as part of the enhancement.
- 21.6.12 The PRoW network where it could be extended from Old Shires Lane across the ecological mitigation site known as Tilehouse Lane. A member of Fusion has met with the CVRP to discuss the plans. Fusion changed the design of the planting to accommodate the intention by the CVRP to open a PRoW though the Painsfield land at a later date through their mitigation package proposals.
- 21.6.13 Current mitigation measures include:
- The reinstatement of the working area alongside the northern section of

the viaduct (between the River Colne and the A412) will include new public access;

- The design of the Chiltern Tunnel South Portal has been modified to reduce the effects on Old Shire Lane; and
- Explore alternative diversion route for a PRoW at Ickenham ATFS.

21.6.14 It is not anticipated that any PRoW will be closed by the EWC. Any PRoW or bridleways affected by the works will be considered in order to minimise impacts on users of these public amenities.

Monitoring

21.6.15 During any temporary closures and or diversions, PRoWs will be kept under regular review by both Fusion and ALIGN. Monitoring shall be undertaken during the construction phase of the project. PRoWs will be reopened when it is deemed practicable

Opportunities for Enhancement

21.6.16 Comments received from the CVRP Panel, Local Authorities, Parish councils, community groups and interest groups during design and any opportunities identified for enhancement will be explored with the CVRP Panel, HS2 and local authorities.

21.6.17 Interested parties can propose enhancement opportunities to the EWC and the MWCC who will endeavour to work with these parties to develop and deliver the enhancements if practicable. All Contractors are committed to providing community investment and the provision of PRoW and recreation and amenity improvements will be enthusiastically received to incorporate into the Contractor's suggestions.

22 Summary

- 22.1.1 This document addresses the impacts associated with the CVRP, with emphasis on the Mid-Colne Valley SSSI through the activities of HS2, its Contractors and third parties. The nature conservation, terrestrial and aquatic ecology, water resources, geomorphology, recreation and amenity, landscape, public open space and agricultural impacts have been assessed and opportunities for enhancement within the CVRP and Mid-Colne Valley SSSI will be identified in future.
- 22.1.2 In-combination adverse impacts and the need for multiple consenting requirements during the EWC scope of works have been avoided within the CVRP through planning and communication with other EWC Contractors and third parties including the CVRP Panel. Each consent has been reviewed in accordance with the contract scope and the ES and HS2 Undertakings and Assurances but with widely spaced and disparate requirements the holistic nature of the consenting requirements is being assessed and will be addressed through the incorporation of a scoping matrix integrating topics and cross cutting themes and opportunities.
- 22.1.3 To date four ecological mitigation sites have been constructed in the CVRP to compensate for the future loss of habitat for protected species. These will be managed and maintained by the enabling works Contractors until their work is completed on HS2.
- 22.1.4 Advanced planting has been proposed in the Mid-Colne Valley and along Denham Way. These will act as either visual screening of construction sites and or compensation for loss of vegetation in the Colne Valley Regional Park. However, this activity is not due to take place in 2019.
- 22.1.5 Civils work which includes the construction haul roads, substations viaducts and construction compounds have been proposed to commence in 2019.
- 22.1.6 The above has taken into consideration the environmental impacts identified in the Environmental Statement and has incorporated mitigation measures to ensure that minimal impact will or has occurred.
- 22.1.7 The KESWMP will be reviewed and revised as appropriate and on a six-monthly basis by HS2 and its Contractors.