A38 Derby Junctions

TR010022

Volume 6

6.3 Environmental Statement Appendices

Appendix 2.1: Outline Environmental Management Plan (OEMP)

Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

April 2019

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

A38 Derby Junctions Development Consent Order 202[ ]

6.3 Environmental Statement Appendices
Appendix 2.1: Outline Environmental Management Plan (OEMP)

Regulation Number	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010022
Application Document Reference	6.3
Author	A38 Derby Junctions Project Team, Highways England

Version	Date	Status of Version
1	April 2019	DCO Application

Table of contents

List of Appendices

List of Tables

List of Plates

Appendix 2.1 Outline Environmental Management Plan (OEMP)

1 Introduction

1.1 Purpose of the report

1.1.1 This document is the draft Outline Environmental Management Plan (OEMP) for the A38 Derby Junctions scheme (referred to herein as 'the Scheme'). Powers to construct, operate and maintain the Scheme are being sought by Highways England through an application for a Development Consent Order (DCO) (refer to draft DCO [**TR010022/APP/3.1**]).

1.1.2 An Environmental Impact Assessment (EIA) has been undertaken for the Scheme and an Environmental Statement (ES) [**TR010022/APP/6.1**] has been prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended 2018) (the EIA Regulations). In accordance with the requirements of the EIA Regulations, the ES contains the assessment of the potential significant effects on the environment that may be caused during construction, operation and maintenance of the Scheme and describes proposed mitigation measures.

1.1.3 This OEMP is based on the Scheme design for which the DCO is being applied. It has been prepared in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 11 Section 2, Manual of Contract Documents for Highways Works (Highways Agency, 2009) and Interim Advice Notes (IAN) 183/14 Environmental Management Plans (Highways Agency, 2014) and IAN 182/14 Major Schemes: Enabling Handover into Operation and Maintenance (Highways England, 2018).

1.1.4 This OEMP would be developed into a more detailed Construction Environmental Management Plan (CEMP) by the Principal Contractor (PC) once the Scheme detailed design has been finalised (subject to the order for development consent being granted).

1.1.5 The purpose of this OEMP is:

a) To satisfy Highways England's requirement to define mitigation measures which are proposed to be included during Scheme construction, operation and maintenance, including all of those considered in the ES.

b) To provide the equivalent of a Code of Construction Practice (CoCP), a suggested item for inclusion within the DCO application (refer to The Planning Inspectorate's Advice Note 6, Appendix 1 (The Inspectorate, 2016)). The scope of this OEMP is such that it includes all of those measures that would be expected within a CoCP.

c) Provide the "blueprint" for the more detailed CEMP to be prepared by the PC.

d) To enable the Examining Authority and the Secretary of State to identify those mitigation measures proposed by the Scheme which are secured within this OEMP.

1.1.6 The OEMP has been prepared by an iterative process and in parallel with the development of the Scheme design, proposed construction methodologies and the EIA. Measures within this OEMP include proposed design, construction and operational mitigation measures, which have been defined in part by the requirements which arise from the technical assessments presented within the ES. The technical assessments within the ES have taken account of the measures within the OEMP as 'embedded mitigation' prior to the definition of potential Scheme environmental effects. Proposed mitigation measures embedded in the Scheme design are shown on the Environmental Masterplans (refer to ES Figures 2.12a to 2.12h [**TR010022/APP/6.2**]) and detailed in Table 3.2c herein.

1.1.7 The ES and the assessments within it are based on the works proposed in the DCO Works Plans [**TR010022/APP/2.5**] and Engineering Sections drawings [**TR010022/APP/2.10**] and the maximum area of land anticipated as likely to be required, taking into account the proposed limits of deviation (LoD) for the Scheme (refer to ES Chapter 2: The Scheme [**TR010022/APP/6.1**]) and the flexibility of the detailed design provided for in the DCO [**TR010022/APP/3.1**]. All distances, directions, areas and lengths referred to in this document are approximate.

1.1.8 The construction of the Scheme would be subject to measures and procedures defined within a CEMP to be prepared by the PC. The CEMP would be based on, and incorporate, the requirements of this OEMP relevant to that construction phase and the contractor's contractual scope, and would include the implementation of appropriate industry standard practices and control measures for environmental impacts arising during the Scheme works.

1.1.9 Subject to the potential for alternative measures set out in para. 3.2.14, the measures defined in the PC's CEMP would be applied by the contractor as stipulated in the relevant parts of the OEMP, throughout the duration of their contract to provide planning, management and control during the construction phases of the Scheme with the aim of controlling potential impacts upon the natural and historic environment, people and businesses.

1.1.10 All contractors would be required to comply with applicable environmental legislation, together with any additional environmental controls imposed within the DCO. For this reason, the applicable statutory requirements are not stated within this OEMP.

1.1.11 The measures to be implemented in specific areas, such as soil handling and dust management, are set out in each discipline section of this OEMP within the Register of Environmental Actions and Commitments (REAC) tables included in Section 3.

1.1.12 For the purposes of the OEMP, the following definitions apply:

a) **The Authority** is Highways England. The Authority would approve the CEMP, other management plans defined as being required by this OEMP, detailed method statements required by the OEMP, and variations to these and other matters as stated within this OEMP.

b) **The Principal Contractor (PC)** means any contractor appointed by The Authority to deliver the construction works (and shall also include any sub-contractors appointed by the PC to carry out any part of the main construction works).

c) The **maintenance authority** is a body tasked with the maintenance of the Scheme, once the Scheme is operational. Post-construction this would initially be the main works PC (see above), but in the longer term this would be Highways England (although some components of the Scheme may be maintained by Derby City Council (DCiC) or Derbyshire County Council (DCC)).

1.1.13 The CEMP[1] would be a live document that would be maintained by the PC throughout the Scheme construction phase. As a minimum, the CEMP would be reviewed annually to ensure that it is kept up to date.

1.1.14 Towards the end of construction period, likely in late 2023, the PC would develop the CEMP into a Handover Environmental Management Plan (HEMP) for the operational phase of the Scheme, which would be subject to approval of the Authority. The indicative contents of the HEMP are set out in IAN 182/14 (Enabling Handover into Operation and Maintenance) (Highways England, 2018). This HEMP would then be implemented by the maintenance authority responsible for the maintenance of the Scheme during the operational phase.

1.1.15 The relationship between the OEMP, CEMP and HEMP is indicated in Plate 1.1.

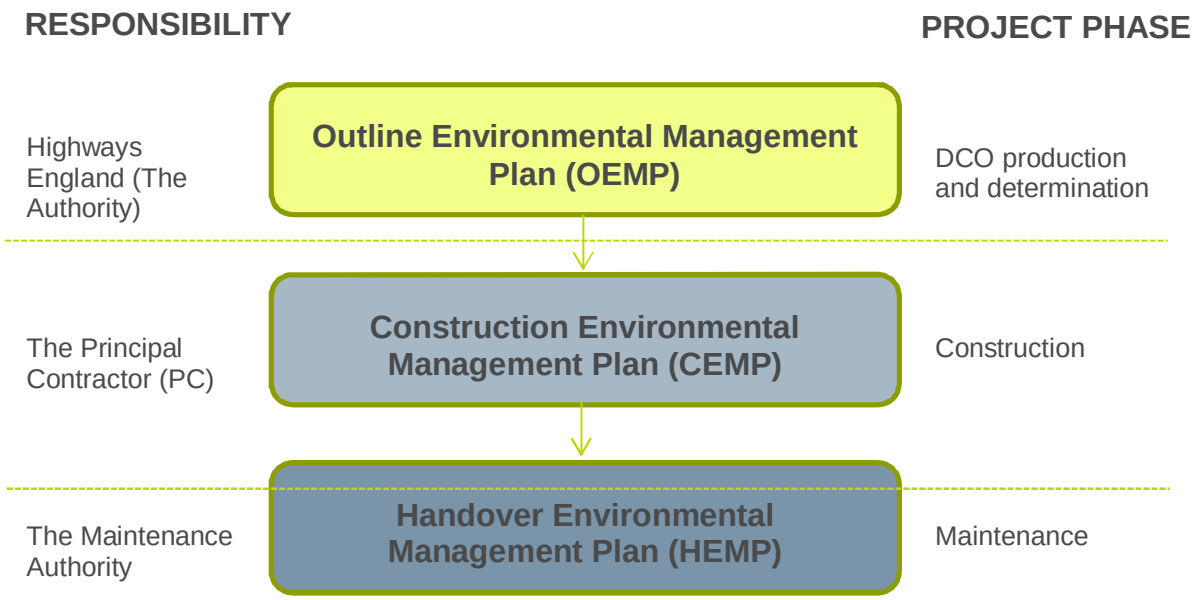


Plate 1.1: Relationship between the OEMP, CEMP and the HEMP

[1] Hereafter any reference to the CEMP is intended to refer to both the CEMP and the associated management plans that would form part of it.

1.2 The Scheme

Scheme location

1.2.1 The Preferred Route for the Scheme was announced by the Secretary of State on 31 January 2018. The three junctions included within the Scheme are located at Kingsway junction (NGR: SK 327 360), Markeaton junction (NGR: SK 334 369) and Little Eaton junction (NGR: SK 364 399). These three junctions span an approximate distance of 5.5km along the A38 to the west and north of Derby – refer to Plate 1.2.

Plate 1.2: Scheme location plan

1.2.2 The Scheme passes through the administrative areas of DCiC, Erewash Borough Council (EBC) and DCC.

1.2.3 Kingsway junction and Markeaton junction are located in a predominantly urban environment, with a mixture of residential housing, commercial, retail, health care and educational establishments. There are a number of public open spaces in the vicinity of the junctions, namely Mackworth Park, open space adjacent to Greenwich Drive South, Markeaton Park and Mill Pond.

1.2.4 Little Eaton junction is set in a semi-rural environment, with the Ford Farm Mobile Home Park, the property Fourways, with commercial and retail facilities located to the north of the existing junction. The Derby Garden Centre occupies the space between the A38 and the B6179 to the north of the junction (accessed off the B6179). The eastern edge of Breadsall village is located approximately 400m to the south-east of the existing junction, whilst the southern edge of Little Eaton village is located approximately 900m to the north of the existing junction. The A38 to the west of the existing junction crosses over the River Derwent and the Sheffield to Derby railway.

1.2.5 The Scheme boundary, which includes land be acquired temporarily and permanently for the construction, operation and maintenance of the Scheme, is shown in ES Figure 2.4a and ES Figure 2.4b [**TR010022/APP/6.2**].

1.2.6 Details of environmental receptors and constraints are detailed in the ES (refer to [**TR010022/APP/6.1**] and the associated figures in [**TR010022/APP/6.2**]) and thus are not repeated herein. However, key environmental constraints are shown on the figures provided in Appendix A.

Need for the Scheme

1.2.7 The Scheme comprises the grade separation of Kingsway junction, Markeaton junction and Little Eaton junction which are the three remaining at-grade junctions on the A38 between the A38/A5148 junction (near Lichfield) and the M1. The interaction between strategic and local trips results in delays at these three roundabout junctions, which is forecast to grow quicker than the national average due to significant expected housing and employment growth in Derby and its immediate surrounding areas.

1.2.8 Grade separation of the three A38 Derby junctions would provide journey time benefits to all vehicles, including those travelling along this strategic route during off-peak periods. The time saving derived from grade separation accumulated across all three junctions, would improve the average journey time for all vehicles travelling through on the A38 trunk road. There would also be benefits to many local trips (including buses), which would result from the overall increase in the capacity of these junctions and resolve conflicts between local traffic and strategic movements using the A38. The Scheme also offers the potential to remove conflicts between pedestrians, cyclists and vehicles using the A38 to the benefit of all.

Brief outline of the proposed works

1.2.9 The Scheme comprises the grade separation of Kingsway junction, Markeaton junction and Little Eaton junction. Grade separation would be achieved by the A38 passing through Kingsway and Markeaton junctions via underpasses, and on an embankment flyover at Little Eaton junction.

1.2.10 Further details of the Scheme are provided within ES Chapter 2: The Scheme [**TR010022/APP/6.1**].

Preliminary works and main works

1.2.11 Subject to securing a DCO, a series of preliminary works would be delivered under the DCO by the PC. These preliminary works are planned to start in late 2020. The preliminary works consist of archaeological works, flood risk and ecological mitigation works, remedial work in respect of any contamination or other adverse ground conditions, erection of temporary fencing, diversion and laying of underground apparatus, and site clearance – further details are provided in Table 1.1.

Table 1.1: List of preliminary works

Preliminary works	Envisaged activities
Utilities	Advance utilities diversions and clearance works.
Ecological surveys and ecological advance works	Undertaking of ecological pre-construction surveys and where applicable ecological advanced works (e.g. ecological clearance, invasive weed treatment or ecological mitigation in advance of main construction works)
Advanced archaeological works	Measures to protect archaeological remains *in situ* and to record archaeological remains through investigation, prior to the construction of the Scheme (refer to ES Chapter 6: Cultural Heritage [**TR010022/APP/6.1**]).
Geotechnical investigations	Collection of additional geotechnical information for areas such as the floodplain compensation area, the historical landfill area at Kingsway junction as well as the former landfill site at Little Eaton junction to be used as the main construction compound.
Site clearance	Vegetation within the Scheme footprint would be cleared outside of the bird breeding season in order to avoid adverse ecological effects (refer to ES Chapter 8: Biodiversity [**TR010022/APP/6.1**]).
Demolition works	Demolition of structures and properties.
Establishment of compounds and satellite compounds	Works to enable the establishment of the main compound at Little Eaton junction and the various satellite compounds (refer to ES Figures 2.11a to 2.11c [**TR010022/APP/6.2**]).
Flood storage works at Kingsway hospital	Excavation works within the Kingsway hospital site to create flood storage areas adjacent to Bramble Brook (refer to ES Chapter 13: Road Drainage and Water Environment [**TR010022/APP/6.1**]). Such works are anticipated to take approximately 2 weeks to complete with excavated material being reused within the Scheme.
Diversion of Dam Brook	Dam Brook would need to be diverted to clear the way for the Little Eaton embankment. The brook diversion works would require the creation of a new brook alignment, followed by appropriate reinstatement and ecological mitigation works (refer to ES Chapter 8: Biodiversity [**TR010022/APP/6.1**]). As part of the brook diversion works, two ecology ponds adjacent to the brook would be created.
Floodplain compensation excavation works to the west of the River Derwent	Excavation works to create a floodplain compensation area to mitigate for the loss of River Derwent floodplain due to the Scheme (refer to ES Chapter 13: Road Drainage and Water Environment [**TR010022/APP/6.1**]). Excavation works would take approximately 10 weeks to complete, with excavated material being reused within the Scheme. Following site profiling, the area would be restored to pasture for continued use by the landowner.

1.2.12 All other works associated with Scheme construction not listed above are considered as 'main works'.

1.2.13 Mitigation measures specific to the preliminary works phase are detailed within Table 3.2a, whilst Table 3.2b defines mitigation measures to be implemented during the main works.

1.2.14 For the avoidance of doubt, the controls set out in this OEMP relate to preliminary and main works carried out pursuant to the powers set out in the DCO, and so do not apply to any works carried out outside of the remit of the DCO (including those commenced prior to the making of the DCO) using The Authority's pre-existing statutory powers.

Programme

1.2.15 Following the preliminary works, the main construction works are planned to commence in early 2021 (subject to securing the DCO), with the Scheme due to be fully open to traffic in 2024. The programme includes provisional key milestones and those relevant to the OEMP are defined in Table 1.2.

Table 1.2: Provisional Scheme delivery milestones

Milestone	Target date
Secretary of State (SoS) DCO decision	August 2020
Land entry effected	November 2020, dependent on powers in DCO
Start of DCO preliminary works	November 2020
Start of main works	March 2021
Full Scheme open to traffic	2024

1.2.16 Whilst these target dates indicate temporal phasing, some phases may overlap both in space and in time, for example:

a) Preliminary works could be undertaken simultaneously in some locations, whilst site establishment and some main works construction activities are being progressed.

b) It is planned that some parts of the Scheme (e.g. Kingsway junction) would already be operational whilst other elements, such as Markeaton junction and Little Eaton junction, would still be under construction.

1.2.17 Plate 1.3 illustrates that construction works would commence across all three junctions simultaneously, with Kingsway junction being completed and opened to traffic first, followed by Little Eaton junction, with Markeaton junction being the last to become operational.

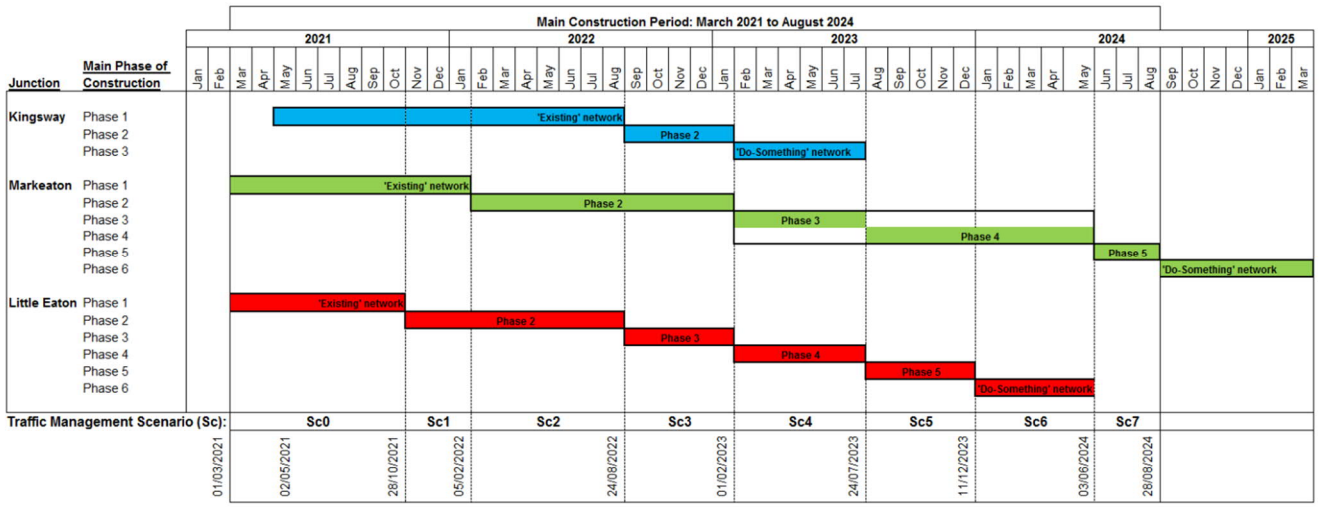


Plate 1.3: High level Scheme construction programme

1.2.18 As the preliminary works are programmed to take place soon after the DCO is made (subject to compulsory purchase of land); the measures set out in this OEMP in relation to those works (Table 3.2a) are, in some cases, more detailed than those set out in Tables 3.2b and 3.2c which relate to the main works and the Scheme design respectively. As such, the specific measures set out in Table 3.2a would be required to be included in the CEMP for the preliminary works, unless otherwise agreed by The Authority.

1.3 Scheme objectives

1.3.1 The Scheme objectives are as follows:

- Supporting economic growth:
  - To reduce delays and increase reliability of journeys on the strategic corridor.
  - Assist in bringing forward development and regeneration opportunities in the surrounding area and immediately adjacent to the Scheme.
  - To minimise traffic disruption due to construction works and incidents.
  - To achieve optimal whole-life cost taking into account future maintenance, operation and disruption to users.
- Environment:
  - To minimise impacts on both the natural and built environment, including designated landscape/biodiversity features.
  - To seek to mitigate impacts on air quality and noise.
  - To ensure effective measures are in place to protect watercourses from pollutant spillage on the highway.
  - To investigate and to encourage the use of environmentally friendly operations and products throughout the project life cycle.

- Society:
  - To improve the safety for all road users.
  - To manage the safety for road workers in accordance with the requirements of GG104 – Standard for the Safety Risk Assessment on the Strategic Road Network and the Health and Safety at Work 1974 Act to be So Far As Is Reasonably Practicable (SFAIRP).
  - To improve safety for residents in the vicinity of the junctions.
  - To facilitate integration with other transport modes where applicable.
  - To ensure a consistent high standard of signing relating to the junctions.
  - To reduce severance by maintaining or providing appropriate facilities for crossing, and travelling along the route for pedestrians and cyclists.
- Public Accounts:
  - To be affordable and represent High Value for Money according to Department for Transport (DfT) appraisal criteria.
- Scheme-specific:
  - Improve integration by supporting the local transport plans.
  - Facilitate regional development and growth in Derby City and its surrounding areas and increase capacity of the strategic road network to absorb growth.

1.3.2 Highways England's strategic outcomes for the Scheme comprise supporting economic growth, providing a safe and serviceable network, providing a more free-flowing network, an improved environment, and an accessible and integrated network.

2 Project team roles and responsibilities

2.1 Site roles and responsibilities

2.1.1 The roles identified in Table 2.1 define the responsibilities associated with the construction works that the PC must establish and maintain. The responsibilities defined in Table 2.1 include those relating directly to the development and implementation of the CEMP, final management plans and also the wider environmental responsibilities. The PC would be required to delegate responsibilities to onsite personnel within key areas of the site and compounds. The delegation of responsibility would be clearly identified within relevant documents and site files.

2.1.2 Individual names and contact details would need to be confirmed and inserted where applicable by The Authority and the PC once appointed and confirmed. The PC would establish a management structure that includes an organisational chart encompassing all staff responsible for delivery of environmental mitigation measures and shall include this chart within the CEMP. The chart would set out the respective roles and responsibilities with regard to the environment (see Table 3.2b, MW-G16).

2.1.3 It is anticipated that prior to the commencement of each main phase of the construction programme, individuals would be identified to fulfil the relevant roles.

Table 2.1: Roles and responsibilities during construction

Role	Responsibilities
The Authority Project Manager	**CEMP responsibilities:** • Approval of the CEMP and management plans (as required by Schedule 2 Requirements of the DCO [**TR010022/APP/3.1**] and any detailed schemes required by this OEMP (for example, protected species protection, invasive species management). **Overall responsibilities:** • To monitor the contractors' performance against the contract including any environmental commitments and targets agreed for the Scheme.
Project Manager[2] (PC)	**CEMP responsibilities:** • Approval of the CEMP, prepared by the Environment Manager (EM) for the relevant phase of the works. • Ensure that all controls specified within the CEMP and associated management plans are implemented by employees and sub-contractors. **Overall environmental responsibilities:** Responsible for the delivery of the Scheme. Has overall responsibility for the environmental performance of the Scheme and all staff. The Project Manager would be required to: • Provide information on contract requirements to the EM following contract award and prior to start of works on site. • Ensure environmental and waste requirements are included on requisitions and in subcontracts and orders. • Ensure that all required consents and licences are in place in line with the relevant project phase. • Log and monitor incidents and non-compliances. Report incidents and non-compliances to The Authority at the earliest possible opportunity. • Ensure that The Authority is informed of all environmental complaints. • Provide an initial point of contact for members of the public and local community who have queries regarding the works. • Ensure employees and sub-contractors receive Induction Training (including environmental) and tool box talks, as appropriate. • Verify actions resulting from non-compliances and observations raised during audits are completed by the deadlines set. • Undertake inspections alongside the EM to ensure that the environmental controls as set out within the CEMP are in place and working effectively. • Ensure all records are retained and readily available on site.

2 'Project Manager' is here defined as the senior individual (not organisation) performing the senior leadership role for the applicable phase of the project, preliminary works, main works or operation/maintenance as relevant. During 'main works construction', this role might be the 'Construction Manager'.

Role	Responsibilities
PC Environment Manager (EM)	**CEMP responsibilities:** • Preparing the CEMP and management plans based on the OEMP. • Undertake site inspections to monitor compliance with the environmental licences and consents for the works and the measures within the CEMP. • Prepare any changes to the CEMP in consultation with the contractor's PM. • Maintaining and updating the CEMP on an ongoing basis as required during the relevant project phase. • Managing the delivery of the various management plans defined within the appendices of the CEMP, using appropriate technical expertise as required. • Managing the delivery of the monitoring required under the CEMP, alongside relevant specialists, and reporting to relevant stakeholders at a frequency to be defined in the CEMP. **Overall responsibilities:** Responsible for ensuring that the Scheme complies with all environmental legislation, consents, objectives, targets and other environmental commitments, including those arising from the ES (refer to [**TR010022/APP/6.1**], [**TR010022/APP/6.2**] and [**TR010022/APP/6.3**]) throughout the relevant project phase. The EM would be required to: • Provide toolbox talks and environmental inductions to all staff involved in the relevant phase of the Scheme. • Deal with queries and correspondence on environmental issues. • Approve by way of sign off, that the environmental elements of the Scheme have been created and maintained in accordance with the OEMP and CEMP to the appropriate standard. • Implement follow-up corrective actions to ensure compliance with UK regulations and legislation. • Keep record of all activities on site, environmental problems identified, transgressions noted and a schedule of all tasks undertaken. • Provide appropriate professional and practical advice to contractors, consultants and project team members associated with environmental and ecological issues and where appropriate resolve issues in a practical and efficient way.
PC Ecological Clerk of Works (ECoW)	**CEMP responsibilities:** • Review of relevant sections of the CEMP. • Responsible for ensuring compliance of all ecological elements of the CEMP. • Preparing a Landscape and Ecology Management Plan (LEMP), together with the Landscape Specialist. • Prepare ecological method statements and other applicable ecological management plans as identified by the OEMP (e.g. Biosecurity

Role	Responsibilities
	Management Plan). **Overall responsibilities:** Responsible for ensuring that the Scheme complies with all ecological legislation and consents, including the DCO and those arising from the ES (refer to [**TR010022/APP/6.1**], [**TR010022/APP/6.2**] and [**TR010022/APP/6.3**]) throughout the relevant project phase. The ECoW would be required to: • Identify any new ecological constraints on site and appropriate mitigation measures for them in accordance with DCO Schedule 2, Requirement 5(2) and DCO Schedule 2, Requirement 10 (1 - 3). • Undertake watching briefs during site clearance activities, to ensure that any unanticipated discoveries of notable flora and fauna are appropriately dealt with. • Approve by way of sign off, that the ecological elements of the Scheme have been created and maintained in accordance with the CEMP to the appropriate standard. • Monitor works during construction at sensitive sites including but not limited to wildlife habitats and corridors and non-statutory designated sites, for example Alfreton Local Wildlife Site (LWS). • Monitor and provide guidance in respect of the LEMP during the creation of ecological habitats. • Give Tool Box Talks, where required, to inform all site personnel of the ecological constraints on site.
Traffic Control Officer (PC)	**CEMP responsibilities:** • Review of relevant traffic sections of the document. • Preparing a Traffic Management Plan (including a Construction Workforce Travel Plan, a Site Access Plan and a Site Travel Plan) and submitting this for approval by the Authority. **Overall responsibilities:** The traffic control officer would ensure compliance with the contractor's traffic management plan in accordance with DCO Schedule 2, Requirement 11 (1, 2). Additional responsibilities would include: • Management and implementation of traffic management measures identified within the Traffic Management Plan (TMP) ([**TR010022/APP/7.4**] - see MW-TRA2). • Ensure compliance with all relevant health and safety (H&S) directives in liaison with the main works contractor's H&S Manager, relating to operations and live traffic. • Management of the layout of site access and egress points for all construction sites and compounds. • Arranging for site inspections at regular intervals, equipment attended to and maintained, and in the case of accidents or incidents having replacement signs, cones, bollards and lights and the like erected without delay.

Role	Responsibilities
	• Maintain log of all complaints received in relation to traffic during Scheme construction.
Site Materials and Waste Manager (PC)	**CEMP responsibilities:** • Review of relevant sections of the CEMP, when prepared by the EM. • Responsible for ensuring that all materials and waste elements of the CEMP are complied with during construction. • Prepare the Site Waste Management Plan (SWMP). • Responsible for ensuring that a Materials Management Plan (MMP) is prepared. **Overall responsibilities:** Responsible for implementing the SWMP throughout the Scheme construction phase and to ensure that waste is disposed of economically and safely in line with the SWMP and MMP.
Archaeological Clerk of Works (ACoW): **(PC)**	**CEMP responsibilities:** • Review of relevant sections of the CEMP, when prepared by the EM. • Ensure compliance with DCO Schedule 2, Requirement 9 (1 - 6). • Responsible for ensuring that all archaeological elements of the CEMP are complied with during construction. • Prepares the Heritage Management Plan (HMP) based upon the Archaeological Mitigation Strategy (AMS) and an accompanying Overarching Written Scheme of Investigation (OWSI), plus Site Specific Written Scheme(s) of Investigation (SSWSI). **Overall responsibilities:** Responsible for ensuring that the Scheme complies with all archaeological and historic environment legislation and consents, including the DCO and those arising from the ES Chapter 6: Cultural Heritage [**TR010022/APP/6.1**] throughout the relevant project phase. The ACoW would be required to: • Monitor and ensure compliance with the AMS. • Give tool box talks, where required, to inform all site personnel of the archaeological and historic environment constraints on site, the protection measures that are required and ensuring that these are put in place and complied with. • Monitor construction works to ensure that the CEMP, the HMP, AMS, OWSI and SSWSIs are carried out. • Monitor protection measures to ensure these are in place and maintained appropriately throughout the construction period in compliance with the AMS. • Liaise and consult closely with The Authority on an ongoing basis throughout the construction works and the handover to the operation phase to ensure compliance with all measures set out in the CEMP, HMP, AMS, OWSI and the SSWSIs.

Role	Responsibilities
Landscape Specialist (PC)	**CEMP responsibilities:** • Review of relevant sections of the CEMP, when prepared by the EM. • Ensure compliance with DCO Schedule 2, Requirement 5 (1 - 4) and Requirement 6 (1 - 3). • Responsible for ensuring that landscape elements of the CEMP are complied with during construction. • Prepare the LEMP, together with the ECoW. **Overall responsibilities:** • Monitors and provides guidance in respect of the LEMP during the creation of the habitats. • Approve by way of sign off, that the landscape elements of the Scheme have been created and maintained in accordance with the OEMP and CEMP (or as varied further to the process described in para. 3.2.14) to the appropriate standard.
Arboricultural Specialist (PC)	**CEMP responsibilities:** • Review of relevant sections of the CEMP, when prepared by the EM. • Ensure compliance with DCO Schedule 2, Requirement 5 (2). • Responsible for ensuring that the elements of the CEMP related to tree works are complied with during construction. • Prepares the Arboricultural Mitigation Strategy for the works. **Overall responsibilities:** • Monitors and provides guidance in respect of the LEMP during the creation of habitats, with specific reference to tree establishment. • Approves, by way of sign off, that the area of tree and scrub planting have been established and maintained in accordance with the OEMP and CEMP (or as varied further to the process described in para. 3.2.14) to the appropriate standard.
All Site Staff (PC including sub-contractors)	**CEMP responsibilities:** • Ensure adherence to all environmental policies, procedures and rules as set out in the CEMP. • Organise work to be carried out to the required standard with the aim of minimum risk to the environment. All site personnel to receive instructions on their responsibilities to ensure correct environmental practice in line with the CEMP. **Overall responsibilities:** To receive general environmental awareness training, and undertake work in accordance with all works method statements and toolbox talks. Only trained personnel are to manage particular tasks such as refuelling plant and equipment, managing the stores, water quality monitoring and supervising the segregation and collection of waste. The responsibilities of all staff on site throughout the construction of the works would include the following:

Role	Responsibilities
	• All staff are to be appropriately trained to carry out their respective tasks. • Adhere to legislation and where appropriate codes of practice and guidance notes relevant to their work.
Community Relations Manager (contractor)	**CEMP responsibilities:** • Review of relevant sections of the CEMP. **Overall responsibilities:** Communications with the public, stakeholders and other interested parties, outreach and education, where appropriate. The role would include the following responsibilities: • Responding to any concerns or complaints raised by the public in relation to the works. • Liaising with the Project Manager and EM on landowner and community concerns relating to the works and act as the main interface with these stakeholders, alongside any The Authority presence that is required. • Maintain a log of complaints relating to the environment. • Ensuring that the Project Manager and the EM are informed of any complaints relating to the environment. • Keeping the public informed of project progress and any construction activities that may cause inconvenience to local communities. • Engaging with local schools and colleges to inform pupils and students about the Scheme, advise on careers within the construction industry and point out the dangers of trespassing on construction sites. • Ensuring that the needs of groups with protected characteristics as identified within the Equality Act 2010 are considered during the construction process.

3 Record of Environmental Actions and Commitments (REAC)

3.1 Introduction

3.1.1 The Record of Environmental Actions and Commitments (REAC), contained in Table 3.2a, Table 3.2b and Table 3.2c, identifies the environmental commitments proposed to address the potential environmental effects of the preliminary works, the main works (including Scheme construction, operation and maintenance) and confirms the key Scheme design elements to which Highways England has committed (and as illustrated in the Environmental Masterplans - refer to ES Figures 2.12a to 2.12h [**TR010022/APP/6.2**]).

3.1.2 The REAC tables would be updated by the PC when the contractor prepares the CEMP relevant to their scope of works and then as required as the Scheme progresses, with each CEMP or update prepared in accordance with the principles of the original OEMP and requiring approval from The Authority (see Table 3.2a PW-G1 for preliminary works and Table 3.2b MW-G5 and MW-G6 for the main works).

3.1.3 The extant version of the CEMP at the end of construction would be developed by the PC into the HEMP (see Table 3.2b MW-G11) which is the main document containing essential environmental information passed to The Authority and to the bodies responsible for the future maintenance and operation of the Scheme.

3.2 Guide to the REAC tables

3.2.1 The tables do not define general legislative requirements. It is required that in addition to compliance with the measures in these tables, that all activities would comply with applicable legislation.

3.2.2 Table 3.1 provides a summary of the scope of each column within the REAC tables.

Table 3.1: Explanatory guide to REAC table columns

Column	Explanation
Reference (Ref.).	A unique identifier defined within these REAC tables to enable simple reference to individual measures.
Source reference (Source Ref.)	An identifier which is directly relevant to the action or commitment, for example a source such as a mitigation reference in the ES. Where no source reference is given, the measure is normally one which is relevant across a range of technical areas and is a broader control measure (e.g. working hours).
Action/commitment (including specific location and any monitoring required)	The action that is required is defined. The location for the action is Scheme wide, unless otherwise stated. Any monitoring that is required in relation to the action is defined.
Objective	The outcome which the defined action is designed to achieve.

Column	Explanation
Assumption on which the action is based	Any assumption which is relevant to the defined action – this could include absence of suitable data or that plans and strategies already in place.
Achievement criteria and reporting requirements (if applicable)	The criteria which define the successful implementation of the action, such as a document approval or an audit which confirms the action has been undertaken.
How the action is to be implemented	The contractual or other relationship between the relevant parties, which ensure that the action would be delivered.
Responsible person(s)	The person or body responsible for delivery of the action; this would often be the contractor.

3.2.3 In order to provide for future flexibility and unless otherwise stated, the REAC tables do not typically define how the action is to be implemented or achieved, other than beyond a contractual obligation, and do not consider the risk management of individual items, unless these elements are implicit within the action.

3.2.4 The REAC tables do not include a column to define the 'source of the action' (e.g. ES, Habitat Regulations Assessment (HRA), Equality Impact Assessment etc.), since this is generally clear from the Source Reference. However, in preparing a CEMP, the PC shall include a new column for this and include within it any confirmation of commitments agreed with stakeholders. In addition, the P C shall include a new column for approval and sign off of the action.

3.2.5 The references to guidance documents within the REAC tables are not intended to be exhaustive and in preparing the CEMP and related topic specific plans, the PC shall have due regard to any relevant technical guidance in individual subject areas and draw upon and reference these as appropriate.

3.2.6 The REAC tables are presented in three parts and defined further in the sub-sections that follow:

a) Table 3.2a: Scheme preliminary works.

b) Table 3.2b: main works – Scheme construction.

c) Table 3.2c: main works – Scheme design.

Table 3.2a: Scheme preliminary works phase

3.2.7 This table includes those actions to be incorporated into the preliminary works for the Scheme by the relevant 'preliminary works contractor' (presumed to be under the management of the PC). These actions are either to: (i) mitigate the effects of other work packages within the preliminary works such as ecological mitigation for utilities works; or (ii) in some cases, deliver advanced mitigation, prior to commencement of the main construction works, such as those works required for archaeology, flood risk, habitat and protected species mitigation.

3.2.8 The preliminary works are likely to be undertaken by a number of 'preliminary works contractors', including but not limited to contractors for utilities, ground investigation, roads, archaeology and ecology. Within Table 3.2a, the term 'preliminary works contractor' does not denote a single entity. Where individual actions are relevant to a limited number of the preliminary works contractors, this is denoted as appropriate. The terms preliminary works contractor (ecology), preliminary works contractor (archaeology), preliminary works contractor (utilities), preliminary works contractor (roads) and preliminary works contractor (ground investigation) are used to denote likely owners of actions, though these would be defined further by contractual requirements.

3.2.9 In preparing a CEMP for the extent of their works and contractual extent, each preliminary works contractor should review the Table 3.2a in its entirety and justify as consistent with the principles of the OEMP to the satisfaction of The Authority where actions have been excluded from their CEMP. Each preliminary works CEMP requires the approval of The Authority.

Table 3.2b: main works – Scheme construction

3.2.10 Excluding the preliminary works phase (described above), Highways England intends to appoint, following a competitive process under The Public Contract Regulations 2015, a main works contractor to design, build, finance, and maintain the Scheme.

3.2.11 Table 3.2b includes those actions to be incorporated into the construction and where relevant the maintenance of the Scheme by the main works contractor (the PC) to mitigate the construction effects.

3.2.12 In preparing a CEMP for the main construction works, the main works contractor shall update the full REAC table for main works (Table 3.2b). Where actions are modified, this should be justified as consistent with the principles of the OEMP to the satisfaction of The Authority. The CEMP requires the approval of The Authority.

Table 3.2c: main works – Scheme design

3.2.13 This table includes those design measures incorporated into the Scheme design in order to mitigate the environmental effects as identified and described in the ES [**TR010022/APP/6.1**]). Such measures are illustrated in the Environmental Masterplans (refer to ES Figures 2.12a to 2.12h [**TR010022/APP/6.2**]).

3.2.14 The main works contractor would deliver each mitigation measure and commitment, unless the contractor is able to define an alternative measure, or measures, which would achieve the same environmental effects at the relevant location. In each such case, the contractor would secure the written approval of The Authority prior to implementing any alternative measures and in so doing, would demonstrate to The Authority that the use of the alternative measures would not lead to any materially new or materially different adverse environmental effects compared to those as presented in the ES [**TR010022/APP/6.1**].

3.2.15 The main works contractor's CEMP should include Table 3.2c or an update thereof, taking account of the Scheme detailed design.

3.3 REAC tables (preliminary works, main works and Scheme design)

Table 3.2a: REAC tables for the Scheme preliminary works

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
GENERAL PROVISIONS							
PW-G1	n/a	**CEMP preparation:** The preliminary works contractor (all) shall prepare a CEMP for their works, as applicable to the scope of their contract, prior to the commencement of their works. In preparing the CEMP, the preliminary works contractor (all) shall pay regard to the actions needed to minimise the risks of potential cumulative impacts.	To ensure the CEMP is appropriate to the project phase and the scope of works delivered by the preliminary works contractor.	n/a	The Authority approval of CEMP.	Contractual requirement between The Authority and the preliminary works contractor. DCO Requirement 3.	Preliminary works contractor (all)
PW-G2	n/a	**Single point of contact:** The preliminary works contractor (all) shall identify a person within their CEMP who would be the single point of contact for the regulatory authorities. The preliminary works contractor shall provide the regulatory authorities with relevant contact details prior to the commencement of construction and document this in the CEMP.	To provide a single line of communication between the preliminary works contractor and the regulatory bodies.	n/a	The Authority approval of CEMP.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
PW-G3	n/a	**Management structure:** The preliminary works contractor (all) shall establish a management structure that includes an organisational chart encompassing all staff responsible for delivery of environmental mitigation measures and shall include this chart within their CEMP. The chart would set out the respective roles and responsibilities with regard to the environment.	To provide a clear framework for environmental responsibilities on site.	n/a	The Authority approval.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
PW-G4	n/a	**Core working hours:** The preliminary works contractor (all) shall adhere to the following core working hours, except in case of emergency or in respect of 'additional activities' (see below): 07:30 – 18:00 Monday to Friday 08:00 – 13:00 Saturday with no working on Sundays and Bank Holidays To maximise productivity, a period of up to one hour before and up to one hour	To ensure working hours for surface construction works are defined, but with an opportunity to vary these with the agreement of DCiC and EBC.	These working hours are as set within the ES.	n/a	Contractual requirement between The Authority and the preliminary works contractor. DCO Requirement 3.	Preliminary works contractor (all)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		after normal working hours would be used for start-up and close down of activities. This would include, but not be limited to, deliveries, movement to place of work, unloading, maintenance and general preparation works. These periods would not be considered an extension of core working hours. Some activities with limited durations would be undertaken outside of the core working hours, namely: • Night-time closures for Markeaton footbridge demolition and installation of the new footbridge. • Junction and slip road tie-in works to existing carriageways. • Installation of bridge decks. • Installation of sign gantries. • Installation of temporary and permanent line markings. • Overnight traffic management measures; as agreed with the local highway authority. • Works associated with traffic management and signal changes • Any emergency works. Any other work carried out outside the core working hours, or any extension of the core hours, may be possible with the prior agreement of the local highway authority provided that the activity is materially worse than the activities assessed within the ES.					
PW-G5	n/a	**Method Statements:** The preliminary works contractor (all) shall set out the procedures to address health and wellbeing, safety, site security and environmental issues in method statements prepared as part of their works. The method statements shall define any specific environmental control measures, to be implemented to meet the requirements of their CEMP. The preliminary works contractor shall submit the method statements and risk assessments to The Authority.	To ensure working methods take into account health and wellbeing, safety, site security and environmental issues and are of an appropriate standard.	n/a	The Authority or representative approval of method statements.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
AIR QUALITY							
PW-AIR1	ES Chapter 5, Section 5.9.	**Best Practicable Means (BPM):** The preliminary works contractor (all) shall manage dust, air pollution and exhaust emission during the preliminary works in accordance with Best Practicable Means (BPM). Specific measures shall be based upon industry best practice, including the measures listed in the Institute of Air Quality	To ensure air quality is managed appropriately across the Scheme.	Assessment within the ES assumes BPM means would be incorporated throughout the construction	Implementation of BPM.	Contractual requirement between The Authority and the preliminary works	Preliminary works contractor (all)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		Management's (IAQM) Guidance on the Assessment of Dust from Demolition and Construction. These measures shall be set out in more detail in the CEMP and examples of these measures are listed in the main works table (MW-AIR1). MW-AIR2 details measures to be implemented for high-risk sites, whilst MW-AIR3 details air quality monitoring requirements.		phase.		contractor.	
CULTURAL HERITAGE							
PW- CH1	ES Chapter 6, Section 6.14	**Heritage Management Plan (HMP):** The preliminary works contractor (archaeology) shall produce a Heritage Management Plan (HMP) based on the Archaeological Mitigation Strategy (AMS), indicating how the historic environment is to be protected in a consistent and integrated manner, coordinated with all other relevant environmental topics. The HMP shall be prepared in consultation with the DCC Archaeologist and Derwent Valley Mills World Heritage Site Partnership (DVMWHSP) and shall address: • All temporary and permanent works, which may include, as relevant, boundary fencing, vegetation clearance, ground investigations, demolition, utility diversions, access routes/haul roads and works compounds. • Potential indirect impacts on heritage assets both inside and outside the Derwent Valley Mills World Heritage Site (WHS) from activities which may include, as relevant, ground vibration, light pollution, dust, , dewatering, and the impact on buried archaeological remains of adverse ground conditions caused by weather events (rutting, compaction of soft ground etc.). • Issues of security for vulnerable sites/areas of archaeological interest outside the normal working hours, and at weekends. • Procedures for unexpected archaeological discoveries.	To manage the historic environment and ensure it is protected in a consistent and integrated manner across the Scheme.	Certification of HMP and AMS under the DCO.	The plan shall be prepared in consultation with DCC and DVMWHSP and approved by The Authority prior to works commencing.	Contractual requirement between The Authority and preliminary works contractor (archaeology). DCO Requirement 9.	Preliminary works contractor for archaeology
PW- CH2	ES Chapter 6, Section 6.14	**Works in accordance with Archaeological Mitigation Strategy (AMS):** The preliminary works contractors (all) shall undertake the archaeological works, at all times, in accordance with the AMS.	To ensure that all archaeological works are undertaken in accordance with an approved strategy.	Certification of detailed AMS under the DCO.	Works undertaken in accordance with the AMS.	Contractual requirement between The Authority and the preliminary works contractor. DCO Requirement 9.	Preliminary works contractor (all)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
PW- CH3	ES Chapter 6, Section 6.14	**Site Specific Written Schemes of Investigation (SSWSI):** For sites or areas of interest that have been identified for archaeological investigation, either in the ES, the AMS, or as a result of previous and on-going evaluation surveys, the preliminary works contractor (archaeology) shall prepare a Site Specific Written Scheme of Investigation (SSWSI) that describes the mitigation measures to be carried out.	To protect individual sites and areas by ensuring that appropriate mitigation measures are identified and implemented.	Certification of the AMS.	Production of SSWSIs with DCC archaeologists and approved by The Authority.	Contractual requirement between The Authority and the preliminary works contractor. DCO Requirement 9.	Preliminary works contractor for archaeology
PW- CH4	ES Chapter 6, Section 6.14	**Fencing of heritage assets:** The preliminary works contractor (archaeology) shall ensure all heritage assets identified in the AMS for protective fencing are securely fenced during the early stages of the preliminary works (in conjunction with other mitigation measures). The preliminary works contractor (archaeology) shall consult with DVMWHSP (for works inside the WHS) and DCC (for works outside of the WHS) to determine the type of fencing to be used. The contractor shall separately prepare a method statement for all fencing works which would include details of appropriate archaeological mitigation measures (detailed mitigation requirements shall be set out in a SSWSI).	To ensure that heritage assets are appropriately protected in advance of construction works.	Assessment within the ES is based on the protection of identified heritage assets Certification of AMS under the DCO.	Consultation on method statements/SSWSIs with DVMWHSP (for works within the WHS) and DCC (for works outside of the WHS) and approval from The Authority prior to the start of the work at each location.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (archaeology)
PW- CH5	ES Chapter 6, Section 6.14	**Avoidance of archaeological remains:** Where service and utility corridors require excavation, the relevant preliminary works contractors (utilities) shall avoid significant archaeological remains wherever possible and implement appropriate archaeological mitigation measures where impacts are unavoidable. The contractor shall prepare a SSWSI where service utility corridors cross archaeologically sensitive areas.	To ensure the appropriate identification, preservation and protection/mitigation of archaeological remains.	Certification of the AMS under the DCO.	SSWSIs shall be developed in consultation with DVMWHSP (for works inside the WHS) and DCC (for works outside the WHS) and approved by The Authority prior to works commencing.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
LANDSCAPE AND VISUAL							
PW-LAN1	ES Chapter 7, Section 7.9	**Retained vegetation:** Where trees are to be retained within or immediately adjacent to the order limits, the preliminary works contractor (all) shall adopt the default position that the root protection area (RPA) and canopy spread would form an effective Construction Exclusion Zone, secured with robust fencing where no access would be permitted. Works within the root protection area of trees would be avoided wherever practicable. However, where some works within the RPA cannot be avoided e.g. for access or stockpiling, the contractor shall use cellular confinement systems to minimise/avoid compaction to the ground. Protection would still be required to avoid physical damage to the tree i.e. trunk, branches or crown. In addition, if works are deemed essential within the RPA the length of time of the impact shall be limited.	To ensure vegetation is retained and appropriately protected during the preliminary works.	Retention of certain trees is assumed within the ES assessment.	Consultation with DVMWHSP and approval from The Authority prior to any fencing being installed within the WHS.	Contractual requirement between The Authority and the preliminary works contractor. DCO Requirement 5.	Preliminary works contractor (all)
PW-LAN2	ES Chapter 7, Section 7.9	**Works in accordance with approved landscaping scheme:** The preliminary works contractor would ensure that any landscaping works are carried out in accordance with the approved landscaping scheme and conforms with the DCO requirement.	To mitigate the landscape and visual impacts of the Scheme.	n/a	Works undertaken in accordance with DCO Requirement.	Contractual requirement between The Authority and the preliminary works contractor. DCO Requirement 5.	Preliminary works contractor (roads)
BIODIVERSITY							
PW-BIO1	ES Chapter 8, Section 8.9 and outline Biosecurity Management Plan in Appendix B	**Biosecurity:** The preliminary works contractor (all) shall prepare a Biosecurity Management Plan taking into account the outline Biosecurity Management Plan provided in Appendix B. The preliminary works contractor (all) shall implement measures to promote biosecurity and avoid the risk that invasive non-native species and diseases are spread as a consequence of the Scheme. This includes, toolbox talks, exclusion zones and method statements on the cleaning of equipment (including boots) and vehicles on and off site and between sites.	To prevent the spread of invasive species and diseases. To ensure legal compliance.	Adequate protection measures would be employed throughout the construction period.	Implementation of the identified actions as per Biosecurity Management Plan. No recorded spread of invasive species and high standards of biosecurity maintained.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
PW-BIO2	ES Chapter 8, Section 8.9	**Translocation of species-rich grassland from the A38 Kingsway Roundabout LWS or appropriate species-rich grassland planting:** The preliminary works contractor (ecology) would be responsible for the suitable translocation of species-rich grassland from the A38 Kingsway Roundabout LWS to a suitable receptor site (outline agreement obtained from DCiC for Markeaton Park) or undertake appropriate planting if such grassland translocation is not confirmed to be appropriate or feasible during the detailed design stage. **Monitoring:** Translocated and planted grassland to be monitored to assess the success of habitat establishment pre and during construction.	To translocate and replicate species-rich grassland to be lost within the A38 Kingsway Roundabout LWS.	Assumed grassland is suitable for translocation. Updated surveys and soil testing to inform the mitigation requirements.	Monitoring and reporting as agreed with DCiC and Derbyshire Wildlife Trust. Completion/return of working permits or other relevant approvals. Provision of appropriate seed mix certificates if grassland planting/seeding is determined to be necessary.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (ecology)
PW-BIO3	ES Chapter 8, Section 8.9	**Breeding birds (excluding Schedule 1):** Where practicable, the preliminary works contractor (all) shall undertake vegetation clearance (if required) between September and February inclusive, which is outside of the bird nesting season. If clearance is not possible outside of the bird nesting season, then suitable nesting habitat to be removed shall be checked for nesting birds by the preliminary works contractor (ecology) or an appropriate specialist, immediately prior to its removal. Where active bird nests are present, no works to or in the vicinity (5m) of the bird nests would be undertaken until any young are no longer considered to be dependent on the nest.	To avoid damage or destruction of an active nest. To ensure legal compliance.	n/a	No damage to nests of breeding birds. Completion/return of working permits or other relevant approvals.	Contractual requirement between The Authority and the preliminary works contractor. DCO Requirement 10.	Preliminary works contractor (all)
PW-BIO4	ES Chapter 8, Section 8.9	**Schedule 1 breeding birds:** If works are carried out at a time or location that has the potential to disturb Schedule 1 breeding birds (such as barn owl or little ringed plover if found to be nesting in the vicinity of Little Eaton junction during pre-construction surveys), works should only commence within these areas once suitable mitigation is in place and been agreed with statutory and non-statutory consultees. Such measures may include appropriate working buffer zones (until young have fledged) and suitable siting of alternative nesting sites (where applicable).	To avoid disturbance of any species listed on Schedule 1 of the WCA 1981, while it is nest building or at a nest containing eggs or young, or to disturb the dependent young of such a bird. To ensure legal	The update surveys would inform the mitigation requirements.	Completion/return of licences. Monitoring and reporting arrangements would be made in consultation with Natural England and approved by The Authority (if	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (ecology)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		Potential Nesting Barn Owl: Two potential barn owl nesting sites at Little Eaton junction are not currently in use; however, a pre-construction check should be undertaken by an appropriately licensed ornithologist. If barn owls are found, mitigation measures shall be adopted to minimise disturbance during Scheme construction, such as maintaining appropriate buffer zones during the construction works. **Potential Nesting Little Ringed Plover:** Little ringed plover were not confirmed to be nesting within or in proximity to the Scheme; however, there is potential nesting habitat located to the south-west of Little Eaton junction. Should construction works in the northern part of the Alfreton Rough Grassland LWS need be undertaken during the nesting season, bird deterrents (such as shiny tape attached to canes fixed into the ground) should be implemented prior to the onset of (and during) the nesting season, in order to deter little ringed plover from nesting on the site. Temporary screen fencing shall also be provided prior to construction works to minimise visual disturbance. **Monitoring:** An appropriate specialist shall undertake monitoring of the potential barn owl nesting sites and potential little ringed plover nesting sites within the retained habitat, as associated with the mitigation defined in the ES Chapter 8: Biodiversity. Monitoring also to be conducted on the effectiveness of temporary barriers during Scheme construction and assess the success of habitat establishment. Alternative measures may need to be implemented if barriers are found to be ineffective.	compliance.		applicable).		
PW-BIO5	ES Chapter 8, Section 8.9	**Notable assemblage of farmland birds, nesting lapwing and wintering birds:** The preliminary works contractor (all) would ensure temporary screen fencing is erected along the east, south and south-west of the Little Eaton junction prior to construction to minimise visual disturbance to farmland birds, nesting lapwing and wintering birds. Construction works to the north of the seasonally flooded field to the south-west of Little Eaton junction should be timed where possible for the end of the summer to the early autumn (i.e. late September into October), as this was the period when no target species were recorded using the field during the 2015 and 2017 surveys.	To avoid disturbance to notable assemblages/populations of birds.	n/a	Installation of appropriate screening/fencing and quarterly monitoring.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all).

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		Monitoring: Bird monitoring surveys would be undertaken throughout the construction works in this area to determine the effectiveness of temporary screening. Alternative measures may need to be implemented if barriers are found to be ineffective.					
PW-BIO6	ES Chapter 8, Section 8.9	**Badgers:** The preliminary works contractor (ecology) would apply for a Scheme-wide Natural England badger sett closure licence. This would be based upon the draft outline application already agreed with Natural England (as per the Letter of No Impediment, see ES Appendix 8.19 [**TR010022/APP/6.3**]). The preliminary works contractor (ecology) would be responsible for updating/amending the licence as required. The licence would include provision for the destruction of all setts within the works area and would include a detailed method statement setting out the measures to be implemented. Once vegetation clearance has been undertaken, the preliminary works contractor (ecology) shall resurvey these areas of the site to confirm the total number and extent of known setts affected by the works. Works within 30m of any retained badger sett would fall under the provisions of the method statement. Depending on the timings and activity of such works, an appropriate specialist may need to be present or seasonal restrictions may be required and would be defined under the conditions of the licence. **Monitoring:** Monitoring surveys would be carried out at and around any retained setts to identify any recently dug badger setts or entrances that may be affected by ongoing or planned works.	To avoid disturbing badgers within their setts during construction. To ensure legal compliance.	No main setts identified within the ES would require partial or permanent closure. Currently the creation of artificial setts is not required.	Natural England licence return.	Contractual requirement between The Authority and the preliminary works contractor. Works undertaken under a Natural England badger sett closure licence (if required).	Preliminary works contractor (ecology)
PW-BIO7	ES Chapter 8, Section 8.9	**Bat roosts:** The following confirmed bat roosts would be directly impacted (lost) by the works: a) Queensway Building No. 30 (B8-QW30) with confirmed whiskered and common pipistrelle occasional roost (less than five individuals). b) Tree M2 with a confirmed noctule maternity roost and potential hibernation roost (estimate of 10 individuals)). c) B2 Flood Arch Bridge with confirmed occasional day and feeding roost used by common and soprano pipistrelle bats (less than 10 individuals) and occasional night roost used by brown long-eared bats (less than	To update information for confirmed roosts and identify any other bat roosts present within the Scheme boundary. To prevent disturbance to bats within retained roosts. To ensure roosts are	The updated surveys would be suitable to inform a Natural England EPSML. Trees which remain as negligible or low suitability for bat roosts require no further survey	Application and return of Natural England EPSML (if necessary).	Contractual requirement between The Authority and the preliminary works contractor. Natural England EPSML obtained.	Preliminary works contractor (ecology)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		five individuals). The preliminary works contractor (ecology) would be responsible for the application of a Natural England European Protected Species Mitigation Licence (EPSML) in order to facilitate the works. This should be based upon the draft outline application already agreed with Natural England (as per the Letter of No Impediment see ES Appendix 8.19 [**TR010022/APP/6.3**]) and updated/amended accordingly. Buildings proposed for demolition not previously accessed for survey would be subject to preconstruction surveys and any bat roosts identified included in the licence (where applicable). The preliminary works contractor (ecology) (named licencee) would be responsible for ensuring that all works detailed within the licence are carried out in accordance with the method statements. The named ecologist on the ESPML to advise the licencee and supervise any works. Any works affecting bat roosts, or the building, structure or tree hosting such roost, would follow detailed methods and precautions outlined in the EPSML Method Statement and licence conditions and under direction and supervision of the named licensed ecologist in the EPSML. Where bat roosts are being retained within 50m of the Scheme boundary (B3 River Derwent and B9 Ford Park Static Homes), and in respect of replacement, modified, translocated or new roosts, the following methods should be incorporated: a) Exclusion zones to be established and maintained. b) Any works within 20m of a confirmed roost shall be carried out under the supervision of, or following the advice of, an appropriate specialist. c) Measures shall be applied to maintain dark conditions within 20m of identified roosts, including measures to avoid light spill from construction lighting and avoiding night-time working. d) Works affecting bat roosts shall only commence on receipt of suitable method statements, licences, permits or other relevant approvals. Works involving felling or maintenance of trees with potential for bat roosts would follow best practise methods to protect bats and their roosts. This shall include the following: a) Any works within 20m of a confirmed bat roost in a tree would follow precautions listed above.	closed under a Natural England EPSML, in order to ensure legal compliance.	(data valid for a period of 2 years).			

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		b) All trees within 20m of the works area would be inspected by a Natural England licenced bat ecologist from the ground and categorised for their potential to support bat roosts, in accordance with the current best practice. c) Trees which have no or low suitability can be section felled. d) Trees which are moderate or high suitability would be re-inspected by a Natural England bat licensed ecologist, in line with current best practice guidance, and further surveys may be required. e) Any confirmed roosts would require a Natural England EPSML to be obtained prior to felling. f) Works affecting bat roosts shall only commence on receipt of suitable method statements, licences, permits or other relevant approvals. **Locations:** Confirmed bat roost locations to be lost are Queensway Building No. 30 (B8-QW30) and Tree M2 at Markeaton junction; and B2 Flood Arch Bridge at Little Eaton. Other locations to be confirmed following pre-construction surveys. **Monitoring:** Monitoring as per Natural England licences for bats roosts and to assess the success of habitat establishment for foraging and commuting bats.					
PW-BIO8	ES Chapter 8, Section 8.9	**Water voles:** Water vole field signs were observed on Dam Brook in spring 2018; however, they were absent in summer 2018 during extensive field surveys. Water voles are not considered present and have been scoped out of the ES; however, the preliminary works contractor (ecology) would undertake a pre-commencement survey of Dam Brook to assess any changes in water vole distribution. Should water voles be identified as present within the working area of the Scheme during preconstruction surveys, the preliminary works contractor (ecology) would apply for suitable licences from Natural England in order to facilitate the works. A precautionary mitigation strategy has been developed in relation to Dam Brook realignment: • Creation of ecology ponds at the start of the Scheme construction phase (pre-construction works) followed by habitat planting, plus excavation of the new Dam Brook alignment.	To avoid killing or injuring water voles or damage, destroy or block access to their place of shelter or protection, in order to ensure legal compliance.	No loss of habitat supporting water voles has been identified. Water voles have been scoped out of the assessment as agreed with Natural England. The updated surveys would inform the constraints associated with water vole.	Return of protected species licences from Natural England (if required).	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (ecology)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		• Allowance for ecology pond establishment. • Following pond establishment, water vole trapping from Dam Brook followed by habitat clearance, with any captured water vole transferred to the ecology ponds (which would be appropriately fenced to protect them from the works). • Diversion of Dam Brook into new alignment, with associated habitat creation. • Release of water vole into realigned sections of Dam Brook when appropriate. **Locations:** Dam Brook and Watermeadows Ditch, at Little Eaton junction.					
PW-BIO9	ES Chapter 8, Section 8.9	**Fish:** Fish are present in Dam Brook with three notable species recorded: brook lamprey *Lampetra planeri*, bullhead *Cottus gobio* and brown trout *Salmo trutta.* To facilitate the Dam Brook realignment, the preliminary works contractor (ecology) would apply for suitable permits from the Environment Agency to survey and move fish from Dab Brook prior to brook realignment to suitable available habitat (receptor site) downstream in Watermeadows Ditch and/or the River Derwent. **Locations**: Dam Brook at Little Eaton junction.	To avoid killing or injuring fish during the construction phase in order to ensure legal compliance.	Brook lamprey, bullhead and brown trout within the Dam Brook have been identified within the ES; and suitable receptor sites identified.	Permit to catch and move fish from the Environment Agency (if required).	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (ecology)
PW-BIO10	ES Chapter 8, Section 8.9	**Other notable species (confirmed to be present):** Other notable species present within the Scheme boundary include hedgehog (*Erinaceus europaeus*) and common toad (*Bufo bufo*). The preliminary works contractor (all) shall follow best practice to avoid harm to these species during the preliminary works. This should include: 1) Destructive hand searches of suitable refugia for toads at Markeaton junction with individuals collected and translocated to suitable receptor sites in the vicinity of Markeaton Lake and Mill Ponds. Silt fencing (or similar) used to protect water quality of Markeaton Lake and Mill Ponds would restrict translocated toads from re-entering the working construction area. 2) It is unlikely that vegetation (shrubs and scrub) removal around Markeaton junction (particularly within Markeaton Park) and in the gardens of Queensway properties to be demolished) could be undertaken outside of the hibernation period due to the need for	To avoid killing or injuring other notable species	Recorded onsite and identified in the ES. Preconstruction surveys to reaffirm likely absence of species scoped out of the assessment. Works within the proposed road sign locations are considered un-licensable (to be done under	Implementation of the identified actions.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		vegetation clearance outside the nesting bird season. Clearance works should, therefore, be preceded by a hand search for hedgehogs by a suitably qualified ecologist. 3) Covering and fencing off all open holes at the end of each day to prevent any access from wildlife, or by providing ramps to allow any wildlife to escape. Ramps should be suitable for all sizes of local wildlife. 4) Further mitigation details should be incorporated into a method statement as appropriate.		Method Statement).			
PW-BIO11	ES Chapter 8, Section 8.9	**Other notable species (areas of signage works and road restraint systems):** Minor highway improvement works comprising signage works and associated road restraint systems within the existing highway verges are proposed in locations remote from the main construction works. Preconstruction surveys should be conducted within these areas and appropriate method statements put in place (where applicable). The preliminary works contractor (ecology) shall follow best practice to avoid harm to slow worm which are potentially present (although low risk) during the preliminary works in association with the signage locations at Little Eaton junction. Pre-construction survey checks and appropriate works supervision under method statement should be followed. **Location**: Signage works remote from the main construction works.	To avoid killing or injuring other notable species	Works within the proposed road sign locations would be localised and un-licensable as agreed with stakeholders (to be done under Method Statement).	Implementation of the identified actions.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
PW-BIO12	ES Chapter 8, Section 8.9	**Other notable species (scoped out of the assessment):** Great crested newts, reptiles and otter (potential holt sites) have been scoped out of the ES. None were confirmed to be present across the Scheme and applicable study area during surveys. However, it is acknowledged that given the age of data (>2years old at the proposed construction start date) and mobility/transient nature of these species groups, preconstruction surveys should be carried out to reaffirm likely absence. Surveys shall comprise the following: • Updated Habitat Suitability Index (HSI) and environmental DNA (eDNA) presence/absence surveys of ponds located within 500m of the Scheme (mid-April to June). • Reptile surveys of suitable habitat located on and within 50m of the Scheme (April to June or September).	To avoid killing or injuring other notable species	Preconstruction surveys to reaffirm likely absence of species scoped out of the assessment.	Implementation of the identified actions.	Contractual requirement between The Authority and the preliminary works contractor. DCO Requirement 9.	Preliminary works contractor (all)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		• Otter surveys of watercourses previously surveyed within and adjacent to the Scheme (any time of year). The requirement for any licencing and/or specific method statements should then be reassessed and informed by the preconstruction surveys. Works should only commence when licencing, appropriate permissions and/or method of works are in place with agreed mitigation measures (where applicable). **Locations:** None. To be reaffirmed following preconstruction surveys.					
NOISE AND VIBRATION							
PW–NOI1	ES, Chapter 9, Section 9.9	**Best Practicable Means:** The preliminary works contractor (all) shall minimise noise and vibration during the Preliminary Works by employing Best Practicable Means (BPM), as defined under Section 72 of the Control of Pollution Act (CoPA) 1974 and Section 79 of the Environmental Protection Act 1990, at all times. BPM shall consider the recommendations of BS 5228: Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2 (BSI, 1993) and BS 7385: Evaluation and Measurement for Vibration in Buildings - Guide to Damage Levels from Groundborne Vibration (BSI, 2014). The preliminary works contractor shall detail the application of BPM within the CEMP or Noise and Vibration Management Plan as relevant. BPM should be included in the following order: a) Control of noise and vibration at source - such as the provision of acoustic enclosures and the use of less intrusive alarms and the screening of equipment. b) Should the application of BPM at source not prove effective and noise exposure exceeds the relevant trigger level (as defined in BS 5228-1, Table E.2), the contractor may offer: I. Noise insulation; or if that is not successful. II. Temporary re-housing.	To ensure construction noise and vibration is managed appropriately.	Assessment within the ES assumes BPM means would be incorporated throughout the construction phase.	Implementation of BPM.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
PW–NOI2	n/a	**Section 61 Consents:** Before any works are undertaken outside of core working hours and which comprise noise generating activities, the relevant preliminary works contractor (all) shall consider submission of an application to DCiC/EBC (in a format as agreed) for prior consent under Section 61 of the CoPA. In the event that works for which a Section 61 consent has been applied for have to be rescheduled or modified, e.g. method or working hours, for reasons not envisaged at the time of the Section 61 consent submission, the contractor shall apply for a dispensation or variation from to DCiC/EBC, in advance of the start of those works.	To ensure noise and vibration is managed appropriately at sensitive locations	Section 61 consents could be used in relation to the Scheme.	Agreement of Sections 61s with DCiC/EBC (if required).	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
PW–NOI3	ES, Chapter 9, Section 9.9	**Noise and Vibration Management Plan:** The preliminary works contractor shall prepare a Noise and Vibration Management Plan, detailing the management and monitoring processes to be introduced across all construction sites and compounds. The plan shall include, but not limited to, the following: a) Integration of noise control measures into the preparation of all method statements for the works. b) Details and locations of all site hoardings, screens or bunds that would provide acoustic screening during construction. c) Procedures for the installation of noise insulation (if deemed to be required) or provision of temporary re-housing (if deemed required) and to ensure such measures are in place as early as reasonably practicable. d) Noise and vibration monitoring protocols including monitoring locations, stages during construction at which monitoring would be undertaken, and methods of publishing the results. e) Details of inspection and maintenance schedules to be undertaken. f) Processes to ensure ongoing compliance with all controls and consent for the works. g) Process for implementing corrective actions that may be required to avoid or address a potential non-compliance. h) Consider the need for a noise insulation and temporary rehousing policy for works in close proximity which have the potential to generate noise levels exceeding the relevant trigger level (as defined in BS 5228-1,	To ensure that the effects of noise and vibration are controlled and that BPM are planned and employed during construction period.	The preliminary works contractor's activities are likely to generate noise and vibration which require management.	Approval of Noise and Vibration Management Plan by The Authority.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (utilities, roads and ground investigation)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		Table E.2) for at least 10 days out of any period of fifteen consecutive days or alternatively 40 days in any six-month period.					
PW–NOI4	ES, Chapter 9, Section 9.9	**Vibration:** The preliminary works contractor shall take into account the following guidance when establishing criteria, controls and working methods for vibration management: a) BS 5228 – 2. b) ISO 4866: 2010 Mechanical vibration and shock. Vibration of fixed structures. Guidelines for the measurement of vibrations and evaluation of their effects on structures. c) BS 7385 - 2 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration. *Protection of building occupants from disturbance* No start-up or shut down of large (approx. 13 tonnes) vibratory plant e.g. rollers or compactors, within 50m of receptors and 15m for small vibratory plant (approx. 3.5 tonnes). The preliminary works contractor shall refer to BS 5228-2 for guidance levels in terms of Peak Particle Velocity (PPV). If predicted vibration levels exceed 1mms^{-1} component PPV at occupied residential buildings based on the prediction methodology in BS 5228-2, those potentially affected would be notified as soon as practicably possible in advance of the works. The notification would describe the nature and duration of the works and any associated proposals for vibration monitoring. *Protection of buildings from damage* The preliminary works contractor shall use BPM to control vibration levels so that the PPV, as measured in accordance with BS 7385-2 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration, are generally not exceeded. The preliminary works contractor (utilities, roads and ground investigation) shall carry out a scoping vibration appraisal to determine whether the trigger level of 6 mms^{-1} (refer to ES Chapter 9: Noise and Vibration) is likely to be exceeded. Activities requiring an appraisal could include vibratory compaction. The preliminary works contractor (utilities, roads and ground investigation shall notify and consult DCiC/EBC regarding any works predicted to generate a PPV above 6mms^{-1}. Where it is determined that there is no	To protect buildings and vibration sensitive equipment and processes from physical damage.	Vibration management may be required at sensitive locations to mitigate potential significant effects.	Completion of appropriate assessments, identification of buildings/properties at risk and consultation of actions with relevant parties as applicable.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (utilities, roads and ground investigation)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		reasonable or practicable means to reduce predicted or measured vibration then the contractor shall: • Agree and consult with DCiC/EBC regarding monitoring for vibration and strain induced in the building during the works. • Consult occupiers of properties about: the surveys to be carried out and any consequent actions; and any additional reasonable and practicable mitigation to be provided for occupants; and carry out a condition survey before and after the relevant works. The preliminary works contractor shall identify any buildings that may be unusually vulnerable to vibration, that are located within 50 m of any activities that may give rise to significant vibration. Where the predicted vibration at the foundations of such buildings exceeds 3mms^{-1} PPV then the contractor shall undertake an initial structural survey of the building. Based on the survey, the level of vibration above which condition surveys and continuous vibration monitoring are required would be confirmed with the building owner and DCiC/EBC.					
PW–NOI5	ES, Chapter 9, Section 9.9	**Noise Monitoring:** The preliminary works contractor (all) shall undertake and report noise and vibration monitoring as is necessary to ensure and demonstrate compliance with all noise and vibration commitments and the requirements of the Noise and Vibration Management Plan. The CEMP shall define noise and vibration monitoring requirements, including proposals for survey locations. The preliminary works contractor (all) shall undertake regular onsite observation monitoring and checks/audits to ensure that BPM is being employed at all times. The site reviews would be logged and any remedial actions recorded. Such checks would include: a) Compliance with hours of working. b) Presence of mitigation measures e.g. engines doors closed, airlines not leaking, and site hording in place. c) Number and type of plant. d) Compliance with agreed working methods. e) Compliance with any specific requirements of the Noise and Vibration Management Plan.	To ensure that BPM are being employed at all times, that they are sufficiently mitigating noise and vibration impacts, and to provide the opportunity to implement alternative actions should their objectives be achieved.	Monitoring would be required to ensure BPM are effectively reducing noise and vibration impacts.	Inclusion of monitoring proposal with the Noise and Vibration Management Plan. Adhering to the specified monitoring regime throughout the construction period.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all) *N.B: it is noted that not all preliminary works may have monitoring requirements within the CEMP. To be approved by the Authority.*

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		The monitoring and compliance assurance process shall be set out in the Noise and Vibration Management Plan, as part of the CEMP, including proposals for monitoring locations.					
GEOLOGY AND SOILS							
PW–GEO1	ES Chapter 10, Section 10.9	**Unexploded ordnance (UXO) investigation: Markeaton junction** The preliminary works contractor (all) shall undertake the following risk mitigation measures to support the proposed works at Markeaton junction: • Site specific UXO awareness briefings to all personnel conducting intrusive works (all works). • UXO specialist presence on site to support shallow intrusive works.	To mitigate potential to encounter UXO during construction works.	Potentially contaminated land has been identified (ES Chapter 10, Table 10.9 and ES Appendix 10.1 and 10.2 [**TR010022/APP/6.3**]).	UXO Specialist Report/clearance certificate.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (ground investigation)
PW–GEO2	ES Chapter 10, Section 10.9	**Ground investigations** The preliminary works contractor (ground investigation) shall undertake ground investigations within the DCO limits during the detailed design phase including at sites identified as historic landfills (Kingsway junction and Little Eaton junction) and at the Esso petrol station (Markeaton junction). All ground investigation works shall be undertaken in accordance with UK best practice., including BS 5930:2015 Code of Practice for Ground Investigations (Ref and BS 10175:2011 + A2:2017 Investigation of Potentially Contaminated Sites Code of Practice). The assessment of contaminated land should be risk-based and in accordance with Contaminated Land Report 11 Model Procedures for the Management of Land Contamination (2004).	To mitigate for any unexpected contaminated ground.	Unexpected contamination may exist in areas not previously identified.	Completion of appropriate ground investigation works and preparation of Remediation Strategy.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
PW–GEO3	ES Chapter 10, Section 10.9	**Asbestos** The preliminary works contractor (ground investigation) shall prepare and implement an Asbestos Management Plan to ensure asbestos can be identified, removed and disposed of in a legally compliant manner, primarily for the area of the link road to Kingsway Park Close which would be constructed through the former Rowditch Tip landfill at Kingsway junction.	To mitigate for any asbestos encountered.	Asbestos containing material (ACM) detected at former Rowditch Tip landfill ((Kingsway junction).	Completion of appropriate ground investigation works in accordance with Asbestos Management Plan.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (ground investigation)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
PW–GEO4	ES Chapter 10, Section 10.9	**Monitoring** A monitoring programme would be carried out in accordance with the recommendations of the Remediation Strategy. The monitoring would be focussed around the historical landfill area at Kingsway junction and at the Little Eaton junction main construction compound and would continue until agreement with the relevant stakeholders that no further monitoring is necessary. The monitoring results would be used to assess potential risks related to landfill gas and contaminated groundwater and to identify any additional mitigation measures required to prevent environmental impact related to the Scheme.	To ensure protection of human health, controlled waters, infrastructure and the wider environment.	Ground gas known to be present in the historic landfill at Kingsway junction. Low level groundwater contaminants present at locations along route.	Monitoring Report	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
PW–GEO5	ES Chapter 10, Section 10.9	**Unexpected contamination** In the event that contaminated land, including groundwater, is found at any time, which was not previously identified in the ES, the preliminary works contractor (all) shall follow the provisions of the remediation strategy, Asbestos Management Plan, OEMP and the relevant requirements of the DCO. Where contaminated land cannot be avoided, in association with part of a preliminary works, and/or where significant risks are identified, the relevant preliminary works contractor shall introduce appropriate mitigation (remediation) to reduce to acceptable levels the potential short and long-term health and safety and environmental risks to sensitive receptors.	To prevent contamination related to construction of the Scheme and maintain compliance with national legislation and regulations.	Potentially contaminated land has been identified in the ES Chapter 10 Table 10.9 and ES Appendix 10.2 [**TR010022/APP/6.3**]. There is always a possibility that unidentified contamination may be encountered during earthworks.	Works undertaken in accordance with Remediation Strategy/Asbestos Management Plan/OEMP/DCO.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
PW-GEO6	ES Chapter 10 Section 10.9	**Soils Management Plan:** The preliminary works contractor shall produce a detailed Soil Management Plan that would identify the nature and types of soil that would be affected, including the methods that would be employed for stripping soil and the restoration of agricultural land. The preliminary works contractor shall follow the guidance in Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009) when handling agricultural soils.	To limit the Scheme impact on soils and agricultural land.	The ES assessment assumes the protection of agricultural soils and successful return of land to agriculture where	Production of the Soil Management Plan.	Contractual requirement between The Authority and the main works contractor.	Preliminary works contractor

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
				applicable.			
PW-GEO7	ES Chapter 10, Section 10.9	**Excavated materials management:** To form part of the Soil Management Plan, the preliminary works contractor shall develop a: a) Soils handling strategy with reference to BS3882: 2015 Specification for Topsoil and the Construction Code of Practice for the Sustainable Use of Soils on Construction Site. b) Soil resources plan which would confirm the soil types, the most appropriate re-use for the different types of soils and proposed methods for handling, storing and replacing soils on-site. The preliminary works contractor shall assess excavated soils for any potential risks posed to health and the environment from the reuse of such soils as engineering fill. This would include mitigation of the effects on soils and the spread of contamination to ensure that those soils identified as contaminated are not mixed with uncontaminated soil. All excavated materials proposed for re-use would be required to meet risk-based acceptability criteria. The main works contractor shall ensure soils would be protected from accidental contamination during storage and transit. The preliminary works contractor shall endeavour to return topsoil stripped during the construction of the Scheme as close to its source of origin as possible during restoration. Soils should be reused as soon as is practicable and stored in such a way as to minimise structural damage (so far as reasonably practicable). Additionally, the creation of bare areas of permanently exposed soil that would be vulnerable to erosion processes would be avoided. Topsoil may need to be removed during construction in order to prevent permanent burial beneath other earthworks. Such soils would be stockpiled and re-used, subject to acceptability (to be determined by soil scientist), in the general earthworks such as landscaping and bunds. The re-use of excavated materials shall be governed by a Materials Management Plan (MMP – refer to Materials section) developed by the preliminary works contractor in accordance with the CL:AIRE Definition of Waste: Development Industry Code of Practice. Should off-site disposal in relation to excavated soil be required, the material would be characterised to determine firstly whether it is Hazardous or Non-Hazardous waste in accordance with the Environment Agency's Technical	To ensure that high standards of soil handling and material management are employed during construction.	Assessment within the ES assumes that appropriate soils and material handling would be incorporated throughout the construction phase to mitigate significant effects.	Development of the Soil Management Plan and Asbestos Management Plan adherence to these documents.	Contractual requirement between The Authority and the main works contractor.	Preliminary works contractor

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		Guidance WM3. The appropriate disposal facility will, where required, be determined through Waste Acceptance Criteria (WAC) analysis, as required. Asbestos contaminated material would be handled in accordance with the Asbestos Management Plan.					
PW–GEO8	ES Chapter 10, Section 10.9	**Biosecurity (agriculture):** The preliminary works contractor shall comply with the requirements of DEFRA and appropriate guidance to avoid, as far as possible, the spread of soil borne, crop and animal diseases. Refer to PW- BIO1 regarding the Biosecurity Management Plan. The preliminary contractor shall implement appropriate measures to control run-off to reduce any risks associated with disease transmission.	To limit the Scheme impact on soils and agricultural land.	The ES assessment assumes the protection of agricultural soils and successful return of land to agriculture where applicable.	Implementation of appropriate measures as per Biosecurity Management Plan.	Contractual requirement between The Authority and the main works contractor.	Preliminary works contractor
PW–GEO9	ES Chapter 10, Section 10.9	**Restoration of agricultural land and aftercare (Little Eaton junction):** Where land is to be restored to agriculture the main works contractor shall liaise with the landowner/tenant and set out the detail for restoration on each specific area of farmland. The land restoration will proceed with full consultation between the landowner/tenant and the main works contractor including inspection of works where applicable and in accordance with requisite site health and safety procedures.	To limit the Scheme impact on soils and agricultural land.	The ES assessment assumes the protection of agricultural soils and successful return of land to agriculture where applicable.	Effective communication with landowners/tenants and the production of the Soil Management Plan and adherence to measures within.	Contractual requirement between The Authority and the main works contractor.	Preliminary works contractor
PW–GE10	ES Chapter 10, Section 10.9	**Monitoring of agricultural land (Little Eaton junction):** The main works contractor shall undertake further inspections of restored agricultural land with the landowner/tenant and Highways England's soils experts (and valuer, if required) to assess the progress of the restoration. These will be carried out with timing appropriate to any perceived issues or concerns. Concerns will be assessed by all parties and appropriate remedial actions or compensation agreed within the parameters of the compensation code and/or any previous agreements made at the time of acceptance of the initial restoration works and handover to the landowner/tenant.	To limit the Scheme impact on soils and agricultural land.	The ES assessment assumes the protection of agricultural soils and successful return of land to agriculture where applicable.	Implementation of the specified actions.	Contractual requirement between The Authority and the main works contractor.	Preliminary works contractor

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MATERIALS							
PW-MAT1	ES Chapter 11, Section 11.9	**Materials and waste management:** Adherence to the requirements defined for the main works contractor as detailed in in MW-MAT1 to MW-MAT6 as application to preliminary works contractor activities.	To ensure suitable management of materials and waste arising from the construction of the Scheme.	ES assumes materials and waste appropriately managed throughout Scheme construction phase.	The Authority approval of plans.	Contractual requirement between The Authority and the main works contractor.	Preliminary works contractor (all)
PEOPLE AND COMMUN ITIES							
PW–COM1	n/a	**Notification of works:** The preliminary works contractor (all) shall liaise with landowners, occupiers and agents, as appropriate, and agree the programme of works and access routes to be used by both the construction traffic.	To reduce impacts on landowners affected by the Scheme.	Assessment within the ES assumes that appropriate measures would be incorporated to reduce effects on landowners.	Appropriate communication with landowners/occupiers/agents.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
PW–COM2	n/a	**Liaison with farm holdings (Little Eaton junction):** The preliminary works contractor shall liaise with farm holdings, occupiers and agents, as appropriate, to establish: • Measures to be implemented to protect and maintain livestock water supplies which may be affected due to construction works. • The protection of agricultural land adjacent to the construction site both during and post-construction, including the provision and maintenance of appropriate stock-proof fencing. • Arrangements for the maintenance of farm and field accesses affected by construction (including arrangements for the continued use of the Flood Relief Arch beneath the A38 by the turf production site). • Locations of potential carcass burial sites.	To reduce impacts on farm holdings affected by the Scheme.	Assessment within the ES assumes that appropriate measures would be incorporated to reduce effects on farm holdings.	Appropriate communication with landowners/occupiers/agents.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
PW–COM3	n/a	**Footpath and cycleway diversions:** The main works contractor shall plan the Scheme construction works to minimise the need to close and divert footpaths and cycleway facilities, and minimise closures and diversion durations. Where the closure of public footpaths and cycle routes would be required, safe and appropriate alternative means of access shall be provided to ensure access would be maintained at all times in order to minimise temporary severance. The main works contractor shall agree temporary diversion routes in advance with DCiC, EBC and DCC as applicable. Appropriate signage for all closures and diversion of footpaths and cycleways shall be used to inform pedestrians and cyclists, with sufficient notice of such closures and diversions being provided.	To minimise disruption to pedestrians and cyclists.	ES assumes appropriate provisions are put in place to minimise disruption to pedestrians and cyclists.	Agreement of actions with DCiC, EBC and DCC as applicable.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
WATER ENVIRONMENT							
PW–WAT1	ES Chapter 13, Section 13.9	**Pollution control:** The preliminary works contractor (all) shall develop and implement appropriate measures within the CEMP for their works to control the risk of pollution due to construction works, materials and extreme weather events, including change to flow, flood storage volume, water levels and quality. This would be completed having regard to industry guidance.	To ensure the protection of the water environment.	Assessment within the ES assumes adequate protection measures would be employed throughout preliminary works.	The Authority approval of the CEMP.	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
PW-WAT2	ES Chapter 13, Section 13.9	**Flood storage works – Kingsway junction** The preliminary works contractor shall create the required flood storage areas adjacent to Bramble Brook within the Kingsway hospital site, taking appropriate measures to protect Bramble Brook during the works.	To ensure flood storage provision and to mitigate flood risk during construction.	Assessment within the ES assumes adequate flood storage provided during the Preliminary Works.	Works undertaken in accordance with FRA and the WFD assessment for Kingsway junction (refer to ES Chapter 13: Road Drainage and the Water Environment).	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
PW-WAT3	ES Chapter 13, Section 13.9	**Diversion of Bramble Brook (Kingsway junction) and Dam Brook (Little Eaton junction)** The preliminary works contractor shall complete the diversion of Bramble Brook and Dam Brook, including the creation of new brook alignments and associated habitat restoration works.	To ensure brooks are diverted to facilitate construction.	Assessment within the ES assumes brook would be diverted during preliminary works and facilitate construction works.	Works undertaken in accordance with FRAs and the WFD assessments (refer to ES Chapter 13: Road Drainage and the Water Environment).	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
PW WAT4	ES Chapter 13, Section 13.9	**Floodplain compensation area – Little Eaton junction** Preliminary works contactor to complete excavation works to create a floodplain compensation area to mitigate for the loss of River Derwent floodplain due to the Scheme.	To ensure loss of floodplain mitigated and to mitigate for flood risk during construction.	Assessment within the ES assumes adequate floodplain storage provided during the preliminary works.	Works undertaken in accordance with the FRA for Little Eaton junction (refer to ES Chapter 13: Road Drainage and the Water Environment).	Contractual requirement between The Authority and the preliminary works contractor.	Preliminary works contractor (all)
PW WAT5	ES Chapter 6, Section 6.14	**Old Derby Canal:** *Temporary bridge crossing* Access into the main construction compound to the north of Little Eaton junction would require a temporary bridge to cross the former Derby Canal (the temporary bridge would be used for the duration of the construction compound use). The temporary bridge shall be installed in accordance with the requirements detailed in MW-CH5 and MW- BIO5.	Minimisation of impacts upon former canal.	ES assumes impacts upon former canal would be minimised.	Adherence to main compound layout requirements and canal crossing location.	Contractual requirement between The Authority and the main works contractor.	Preliminary works contractor
TRAFFIC MANAGEMENT							
PW–TRA1	n/a	**Traffic management measures:** The preliminary works contractor (all) shall implement appropriate traffic management measures during any relevant preliminary works, where these works could impact on all public roads and upon pedestrians and cyclists. This shall be in accordance with the Traffic Management Plan (TMP) provided in [**TR010022/APP/7.4**]. This includes restricting HGV movements to the strategic highway network – namely the A38 (north and south), the A61 (south), the A6 (north), the A52 (west) and the A5111 Kingsway. A notice period may be required prior to the implementation of certain temporary traffic management measures including the occupation or	To reduce the potential for impacts upon the public road network.	The Scheme cannot be constructed without traffic management.	Provision of appropriate traffic management measures.	Contractual requirement between The Authority and the preliminary works contractor. DCO Requirement 11.	Preliminary works contractor (all)

Ref	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		temporary closure of existing roads. Traffic management works would be required to comply with the provisions of the DCO and the Traffic Signs Manual: Chapter 8: Traffic Safety Measures and Signs for Road Works and Temporary Situations. Traffic signs would comply with the Traffic Signs Regulations and General Directions.					

Table 3.2b: REAC tables for the Scheme main works (measures to be included in the main works contractor's CEMP)

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
GENERAL PROVISIONS – EMS and CCS							
MW- G1	n/a	**BS EN 14001:** The main works contractor shall have an Environmental Management System (EMS) certified to BS EN ISO14001. The main works contractor's EMS would define appropriate control measures and monitoring systems to be employed during the planning and constructing of the works for all relevant topic areas. Where the lead main works contractor is a joint venture, the EMS would be certified to cover the activities of the joint venture. The main works contractor's EMS shall cover the activities of all their sub-contractors. The main works contractor would also be required to coordinate with other contractors and relevant parties that may affect their works. This would be documented in their EMS, as appropriate. As part of their EMS, the main works contractor shall commit to planning works in advance to ensure that, in so far as is reasonably practicable, measures to reduce environmental effects are integrated into the construction methods.	To ensure the main works contractor's processes and procedures are fully aligned with BS EN ISO14001, so as to ensure effective management of environmental issues in accordance with client expectations.	n/a	Project EMS certification to ISO140001, maintained for duration of construction. The Authority approval of the EMS.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW- G2	n/a	**Environmental Policy:** The main works contractor shall develop a Scheme-specific environmental policy, prior to the EMS, and to be included as part of the EMS. This policy would be developed in line with Highways England's environmental policies and the Scheme objectives and would set out how the main works contractor would: • Adhere to the requirements of environmental legislation during the works. • Commit to mitigating the impacts associated with the works. • Commit to good practice in environmental performance throughout the phase of works. • Identify opportunities to improve the Scheme's whole life performance in terms of environmental and social implications.	To establish an environmental policy which would encapsulate the objectives and commitments for the relevant project phase.	n/a	The Authority approval of policy.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW- G3	n/a	**Monitoring of actions:** The main works contractor's EMS and CEMP shall include procedures to monitor compliance with the Schemes environmental actions and requirements (as set out in these REAC tables) together with provisions for any corrective actions required.	To ensure performance against the actions and requirements is monitored and corrective actions identified where required.	n/a	Inclusion of commitment in approved EMS and CEMP.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW- G4	n/a	**Considerate Constructors Scheme:** The main works contractor shall sign up to and adhere to the Considerate Constructors Scheme (CCS).	To ensure that impacts of the Scheme are managed in accordance with a well-recognised standard.	n/a	Certification to CCS standard.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
GENERAL PROVISIONS – CEMP AND RELATED PLANS, METHOD STATEMENTS							
MW- G5	n/a	**Preparation of a CEMP:** The main works contractor shall prepare a CEMP, in accordance with this OEMP, prior to the commencement of the relevant project phase. In preparing the CEMP, the main works contractor shall consult with relevant local authorities and the Environment Agency. In preparing the CEMP, the main works contractor shall pay regard to the actions needed to minimise the risks of potential cumulative impacts.	To ensure the CEMP is appropriate to the project phase.	n/a	The Authority approval of the CEMP.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 3.	Main works contractor
MW- G6	n/a	**Revision of the CEMP:** The main works contractor shall consult with relevant local authorities and the Environment Agency if the CEMP is to be updated or revised.	To discuss any changes to the approved CEMP with stakeholders and to then secure Authority approval.	n/a	The Authority approval of proposed revisions.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW- G7	n/a	**Management Plans:** The main works contractor shall prepare Management Plans for certain environmental topic areas as the detailed design is developed, to include at least the following plans: • Biosecurity Management Plan. • Asbestos Management Plan	To provide more targeted environmental management plans applicable to the relevant topic area.	Plans can be submitted individually for approval rather than in aggregate.	The Authority approval of plans.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		• Site Waste Management Plan (SWMP). • Emergency Preparedness and Response Plan. • Heritage Management Plan. • Arboricultural Mitigation Strategy. • Landscape and Ecology Management Plan (LEMP). • Noise and Vibration Management Plan. • Noise Insulation and Temporary Rehousing Policy. • Soils Management Plan. • Water Management Plan. • Groundwater Management Plan. • Materials Management Plan (MMP). • Traffic Management Plan (TMP). • Construction Workforce Travel Plan. These plans shall be appended to the CEMP as appropriate. The plans can be submitted and approved individually and no direct inter-dependency between these plans and the CEMP should be inferred in the approval process. Some plans may require additional approvals as defined under the DCO Schedule 2: Requirements.				DCO Requirement 3.	
MW- G8	n/a	**Method Statements:** The main works contractor shall set out the procedures to address health and wellbeing, safety, site security and environmental issues in method statements prepared as part of the construction process. The method statements shall define any specific environmental control measures, to be implemented to meet the requirements of the CEMP, any relevant topic specific plans, and would consider the cumulative effects of concurrent construction activities.	To ensure working methods take into account health and wellbeing, safety, site security and environmental issues and are of an appropriate standard.	n/a	The Authority or representative approval of method statement.	Contractual requirement between The Authority and the contractor.	Main works contractor
MW- G9	n/a	**Piling Risk Assessments:** The contractor shall undertake environmental risk assessments for piling activities which shall include consideration of the environmental constraints shown on the Environmental Constraints Plan (refer to Appendix A).	To avoid adverse environmental impacts.	n/a	The Authority or representative approval of risk assessment.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW- G10	ES	**Unexploded Ordnance (UXO) Risk Assessments:** The main works contractor shall carry out risk assessments for the possibility of UXO being found within construction areas. The main works contractor shall prepare and implement an emergency response procedure to respond to the discovery of UXO (see also MW-G20). This would include notifications to DCiC/DCC and the emergency services.	To minimise the risks of unexploded ordnance.	Unexploded ordnance could be present in the area.	Risk Assessments approved by The Authority or representative.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW- G11	n/a	**Handover Environmental Management Plan (HEMP):** During the later stages of the construction phase of the Scheme (or separate construction phase), as relevant the main works contractor shall prepare a HEMP in consultation with Highways England. This would then be implemented by the body responsible for the long-term management of the operational Scheme. The HEMP shall be based on the CEMP and the LEMP at the time and would provide the relevant information on existing and future environmental commitments and objectives that would need to be honoured and define on-going actions and risks that need to be managed. The HEMP would include as built information and other details in a form that can be utilised by the body responsible for long term management and maintenance so that body can prepare environmental management plans for the maintenance of the Scheme for the operational phase – this includes the long term maintenance and management of landscaping, ecological and environmental mitigation features. Once all construction phases are complete, the main works contractor shall produce a consolidated HEMP, which would then be the main document containing essential environmental information passed to The Authority and the maintenance authority. The HEMP shall include an action plan specific to the use of pesticides (and herbicides) within the surface water safeguard zone at Little Eaton junction taking into account guidance provided in Environment Agency webpages (Environment Agency, 2018; Voluntary Initiative, 2018).	To ensure that any relevant commitments and objectives defined during preceding project phases are clearly defined for the subsequent operation of the Scheme and to secure approval for these measures.	A separate EMP is required for the operational Scheme, given the environmental control measures and management requirements are very different from construction.	The Authority approval of HEMPs.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 3.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
GENERAL PROVISIONS – WORKING HOURS							
MW- G12	ES	**Core working hours:** The main works contractor shall adhere to the following core working hours, except in case of emergency or in respect of 'additional activities' (see below): 07:30 – 18:00 Monday to Friday 08:00 – 13:00 Saturday with no working on Sundays and Bank Holidays To maximise productivity, a period of up to one hour before and up to one hour after normal working hours would be used for start-up and close down of activities. This would include, but not be limited to, deliveries, movement to place of work, unloading, maintenance and general preparation works. These periods would not be considered an extension of core working hours. Some activities with limited durations would be undertaken outside of the core working hours, namely: • Night-time closures for Markeaton footbridge demolition and installation of the new footbridge. • Junction and slip road tie-in works to existing carriageways. • Installation of bridge decks. • Installation of sign gantries. • Installation of temporary and permanent line markings. • Overnight traffic management measures; as agreed with the local highway authority. • Works associated with traffic management and signal changes • Any emergency works. Any other work carried out outside the core working hours, or any extension of the core hours, may be possible with the prior agreement of the DCiC and EBC environmental health officers (as applicable) so long as the activity is demonstrated to be not environmentally worse than the activities that have been assessed within the ES.	To ensure working hours for surface construction works are defined, but with an opportunity to vary these with the agreement of DCiC/EBC.		n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 3.	Main works contractor
MW- G13	n/a	**Abnormal Deliveries:** The main works contractor shall seek approval from The Authority for delivery of abnormal loads or those that require a police escort if these are to be delivered outside core working hours.	To limit the potential for impacts on residential receptors.	n/a	Approval from The Authority.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
GENERAL PROVISIONS – PERSONNEL AND TRAINING							
MW-G14	n/a	**Personnel:** The main works contractor shall appoint suitably qualified and experienced personnel to supervise the Main Construction Works. These shall include professionally qualified environmental management staff, with relevant experience in the environmental disciplines included in this OEMP. The roles (minimum requirements) are defined in Table 2.1 of this OEMP.	To ensure staff with appropriate qualifications and experience are present to supervise works and monitor the implementation of mitigation measures.	n/a	The Authority audit finds implementation meets objectives.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-G15	n/a	**Training:** The main works contractor shall develop and deliver a programme of training on environmental and social issues relevant to the project. As part of the site induction and prior to commencing work on site, all staff would be made aware of their environmental and social obligations, roles and responsibilities and any site restrictions/requirements. The main works contractor shall be responsible for identifying the additional training needs of their personnel to enable appropriate training to be provided and engaging suitably qualified and experienced professionals for this purpose. Training would include site briefings and toolbox talks to equip relevant staff with the necessary level of knowledge on health, safety, community relations and environmental topics, and an ability to follow environmental control measures and to advise employees of changing circumstances as work progresses. The environmental scope should focus on the constraints relevant to any particular part of the works at that time and the relevant controls.	To ensure all staff are briefed on relevant environmental constraints, procedures and mitigation measures.	n/a	The Authority approval of training programme.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW- G16	n/a	**Management structure:** The main works contractor shall establish a management structure that includes an organisational chart encompassing all staff responsible for delivery of environmental mitigation measures and shall include this chart within the CEMP. The chart would set out the respective roles and responsibilities with regard to the environment and identify the nominated Environmental Manager, the ECoW, the Community Relations Manager and other relevant roles (see Table 2.1 for roles). In this structure, the main works contractor shall identify a person at each	To provide a clear framework for environmental responsibilities on site including a single line of communication between the main works contractor and the regulatory bodies.	n/a	The Authority approval of CEMP.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		construction site who would be the single point of contact for the regulatory authorities. The main works contractor shall provide the regulatory authorities with relevant contact details prior to the commencement of construction and document this in the CEMP.					
GENERAL PROVISIONS – EMERGENCY PREPAREDNESS AND INCIDENT RECORDS							
MW- G17	n/a	**Emergency Preparedness and Response Plan:** As part of the CEMP, the main works contractor shall develop an Emergency Preparedness and Response Plan to cover incidents on site, environmental hazards (flooding, heavy rain, high winds), and other risks that may occur on site. The plan would take into account any specific requirements determined by The Authority. The plan would include the following as a minimum: • 24 hour contact details for all emergency response personnel and the emergency services. • The location of the nearest hospitals and GP practices including directions from site. • The procedures for reporting and documenting emergency incidents, including a pollution incident control plan. • The responsibilities of all staff during an emergency event. • The location of all hazardous materials located on site and within the site compounds. The emergency procedures would be produced in consultation with the emergency services and for works on the existing highway network would be produced in accordance with established industry procedures.	To ensure processes and plans are in place to deal with emergencies on site.	n/a	The Authority approval of CEMP, including the Emergency Preparedness and Response Plan.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW- G18	n/a	**Emergency Access:** The main works contractor shall ensure that the requirements of the relevant fire authority are followed for the provision of site access points. The accesses may vary over time and shall also be suitable for ambulances.	To ensure emergency accesses are provided in agreement with the emergency services.	n/a	Letter of agreement with relevant fire authority.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW- G19	n/a	**Fire prevention and control:** The main works contractor shall ensure all construction sites and associated accommodation and welfare facilities have in place appropriate plans and management controls to prevent fires.	To ensure fire prevention measures are in place.	n/a	Letter of agreement with relevant fire authority.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW- G20	n/a	**Extreme weather events:** The main works contractor shall so far as reasonably practicable ensure appropriate measures are implemented to ensure the resilience of the proposed mitigation of impacts during extreme weather events. The main works contractor shall ensure the CEMP identifies all measures deemed necessary and appropriate to manage extreme weather events and would specifically cover training of personnel and prevention and monitoring arrangements. Method statements should also consider extreme weather events where risks have been identified.	To minimise the impacts of extreme weather events.	n/a	The Authority approval of CEMP.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW- G21	n/a	**Non-conformance and incidents register:** As part of the CEMP, the main works contractor shall establish systems and procedures for responding to environmental incidents. As a minimum, two registers would be set up to include: • A Non-Conformance & Corrective Action Register (which forms part of the main works contractor's Quality Procedures and is not exclusively for environmental issues). • An Environmental Incidents Register.	To maintain a record of incidents alongside the corrective actions, to provide a robust record and help inform future decision making.	n/a	The Authority approval of CEMP.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW- G22	n/a	**Environmental documentation:** Copies of all environmental documentation relevant to the works would be filed on site, and made available for internal inspection.	To maintain a record of all relevant documents, to provide a robust record and help inform future decision making.	n/a	The Authority audit finds implementation meets objectives.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
GENERAL PROVISIONS – SITE MANAGEMENT							
MW- G23	n/a	**Construction site management:** The main works contractor shall use the following approaches to construction site management and define the approach to site management in the CEMP.	To reduce the likelihood of either an environmental incident or nuisance occurring.	n/a	The Authority audit finds implementation meets objectives.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW- G24	n/a	**Worksite security:** The main works contractor shall define within the CEMP the proposed approach to worksite security and trespass risk at each site and implement appropriate control measures in accordance with the approved CEMP.	To prevent unauthorised access to the site and so reduce the potential for both accidents and crime.	n/a	The Authority approval of CEMP.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW- G25	n/a	**Site hoardings around construction compounds:** The main works contractor shall define within the CEMP the proposed approach to hoardings around construction compounds, giving consideration to the WHS context (refer also to MW-CH3) and other environmental constraints, including: • Maintenance of adequate hoardings to an acceptable condition to prevent unwanted access to the construction compounds. • Painting the side of hoardings facing away from the site, and to keep them free of graffiti or posters. • Providing site information boards. • Displaying notices on site boundaries to warn of hazards on site. • Providing signage to indicate re-routed pedestrian/cycle paths. • Retaining existing walls, fences, hedges and earth banks for the purpose of screening as far as reasonably practicable and ensure fencing and hoarding is located such that it does not damage sensitive habitats, trees or hedgerows. In order to minimise landscape impacts of the compounds, the main works contractor shall follow the below measures in relation to construction compounds: • Buffer zones shall be created between the compounds and construction works and existing retained vegetation through construction exclusion	To prevent unauthorised access to the site, provide appropriate signage and ensure hoarding is appropriate to the site context.	n/a	The Authority approval of CEMP.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		zones and suitable perimeter fencing. • Any temporary earth bunds, created from excavated soil, shall be located around the perimeter of the compounds. • All buildings within compounds shall be restricted to one storey in height and rendered/painted in suitable colours to aid in their integration within the landscape. • Solid hoarding shall be installed around the perimeter of the compounds, stained dark green, or a similar approved colour, to aid in its integration within the landscape. • Construction compounds and satellite compounds shall be well-managed and kept tidy. • Ensuring that materials are delivered to site on an “as and when” basis to minimise unnecessary stockpiles. • Stockpiles would be approximately 2m to 3m in height, and may be sown with grass seed to reduce their visual impact should they be present for extended periods of time. • Lighting kept to be to a minimum luminosity necessary and make use of low energy consumption fittings. Where appropriate, lighting would be activated by motion sensors to prevent unnecessary usage. Lighting shall be directional, and positioned sympathetically, to minimise light spill and disturbance for sensitive receptors. • Fencing and hoarding shall be kept well maintained throughout construction. Where footways are required, the main works contractor shall provide footways of adequate width to facilitate pedestrian flows with signs provided to facilitate safe access around the site boundary and provide adequate lighting near hoardings to illuminate these footways. The main works contractor shall ensure that hoarding and fencing in areas at risk of flooding, would be permeable to floodwater, unless otherwise agreed with the Environment Agency, to ensure that the fluvial floodplain and areas liable to other sources of flooding continue to function effectively for storage and conveyance of floodwater.					

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW- G26	ES Chapter 7, Section 7.9	**Site lighting:** The main works contractor shall define within the CEMP the proposed approach to site lighting around construction compounds and elsewhere along the route alignment, giving consideration to environmental constraints. Lighting should be at the minimum luminosity necessary and use low energy consumption fittings and should avoid light spillage. Lighting should also be designed, positioned and directed so as not to unnecessarily intrude on adjacent buildings, ecological receptors, structures used by protected species and other land uses to prevent unnecessary disturbance, interference with local residents, or passing motorists. This provision would apply particularly to sites where night working would be required.	To provide safe working areas and safe walking routes, whilst minimising light spill to minimise impacts to the people and wildlife.	n/a	The Authority approval of CEMP.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW- G27	n/a	**Clearance and re-instatement of sites on completion** The main works contractor shall ensure that on completion of construction works, plant, materials, equipment, temporary buildings and vehicles not required during subsequent activities are removed from the site and that land is restored to its former use or in accordance with the design as appropriate.	To ensure the order limits are restored to the current condition, unless otherwise used as part of the hard or soft estate within the final design.	n/a	The Authority audit finds implementation meets objectives.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
GENERAL PROVISIONS – COMMUNITY ENGAGEMENT, COORDINATION							
MW- G28	n/a	**Community Engagement:** The main works contractor shall take reasonable steps to engage with local residents. The main works contractor shall use the following materials to engage with residents and other stakeholders: • Online: the main works contractor shall provide materials to update the Highways England's website. The sites shall be updated to reflect the status of the Scheme, including the latest information on the progress of the construction works, areas affected by construction, mitigation in place to reduce adverse effects of construction, information regarding planned construction works, road closures, works recently completed and an enquiry procedure. • Newsletter: the main works contractor shall prepare a Scheme newsletter and issue it on a regular basis to provide information covering the whole project, the progress to date and the planned construction	To understand the concerns of residents. To keep residents informed of forthcoming construction works. To ensure the Scheme does not interfere with Army Reserves Centre activities.	Communities and places of business close to the Scheme.	The Authority approval of approach. Consultation with the Army Reserves Centre.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		works. • Works Notices: the main works contractor shall notify occupiers of nearby or affected properties, businesses and adjacent or affected parish councils, at least two weeks in advance, of the nature and anticipated duration of planned construction works. Information included in the notifications would include, as appropriate: I. The location of the planned works. II. The activities to be carried out. III. The duration of the planned works and the periods within which works would be undertaken (i.e. whether during normal working hours, during the evening or overnight). IV. The anticipated effects of the planned works. V. The measures to be implemented in line with the CEMP to mitigate the impact of the planned works. • The main works contractor shall regularly liaise with the Derby Tourist Information Centre and shall maintain/update information at the centre to advise visitors of the works taking place. **Liaison with the Army Reserves Centre** The main works contractor shall consult with the MoD to ensure that the construction design and plant e.g. cranes, do not interfere with their operations.					
MW- G29	n/a	**Coordination:** The main works contractor shall co-ordinate activities outside of any individual (sub-) contractor's site boundaries, so far as is reasonably practicable, notably in respect of: • Community liaison: communicating upcoming activity to affected communities and responding to questions/concerns raised, using the role of Community Liaison Officer (see Table 2.1) and other support staff as relevant. • Emergency response: maintaining communication with emergency services and ensuring that emergency response plans do not conflict. • Traffic management: working collaboratively with the aim of avoiding potential conflict in arrangements and minimising disruption to road users.	To reduce the risk of conflict and to maximise opportunities for reducing overall impact on surrounding communities and the environment.	n/a	The Authority approval.	Contractual requirement between The Authority and the main works contractor England.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		• Access to site: communication and collaboration in respect of arrangements for site access and abnormal loads with highway authorities and emergency services. • Construction workforce: monitoring the impact of the workforce on the community in its travel to and from work. • Other construction projects: maintaining communication between the works on the Scheme and those of other construction projects in the vicinity. **Environmental interface management between adjacent construction areas:** The main works contractor shall put in place measures to manage any issues which are relevant to adjacent construction areas, including the boundaries between areas under the control of different (sub-) contractors or where reasonably practicable other third-party contractors. An aim of the interface management activities shall be the identification, interception and mitigation of potential cumulative effects.					
AIR QUALITY							
MW-AIR1	ES Chapter 5, Section 9.	**Best Practicable Means (BPM):** The main works contractor shall manage dust, air pollution and exhaust emission during the construction works in accordance with BPM. Specific measures shall be based upon industry good practice, including the measures listed in the Institute of Air Quality Management's (IAQM) Guidance on the Assessment of Dust from Demolition and Construction. These measures would be set out in more detail in the CEMP and could include: • Developing and implementing a series of dust management measures and monitoring measures. The level of detail would include as a minimum the measures set out in this table. Monitoring may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections. • Undertaking periodic on-site inspections, where receptors are nearby, to monitor dust, record inspection results, and make the log available to the local authority etc. when asked. • Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	To ensure air quality is managed appropriately across the Scheme.	Assessment within the ES assumes BPM would be incorporated throughout the construction phase.	Implementation of BPM.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		• Keep site fencing, barriers and scaffolding clean using wet methods where there is the risk of dust accumulation. • Remove materials that have the potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. • Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided). • Ensure all vehicles (HGVs and mobile plant) switch off engines when stationary or not in use - no idling vehicles. • All construction plant would use fuel equivalent to ultra-low sulphur diesel (ULSD) where possible. • Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. • Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses when attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. • Avoid explosive blasting where possible, using appropriate manual or mechanical alternatives. • Comply with measures set out in any Asbestos Management Plan if one is required. • Surfacing equipment (e.g. planer) only to be operated with any manufacturers dust abatement measures in place. • Avoid scabbling (roughening of concrete surfaces) if possible. • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. • Use water-assisted dust sweeper(s) on access and local roads, to remove, as necessary, any material tracked out of the site. This may					

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		require the sweeper being continuously in use. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. • Record all inspections of haul routes and any subsequent action in a site log book. • Implement a wheel washing system. • Avoid bonfires and burning of waste materials. • Soft strip inside buildings before demolition.					
MW-AIR2	ES Chapter 5, Section 9.	**Good practice measures at high-risk sites:** All high-risk site works close to sensitive receptors are to employ further best practice mitigation measures, which may include: • Display the name and contact details of person(s) accountable for air quality and dust issues on the construction site boundaries. This may be the environment manager/engineer or the site manager. • Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the local authority etc. as soon as reasonably practicable. • Record any exceptional incidents that cause dust and/or air emissions, either onsite or offsite, and the action taken to resolve the situation in the log book. • If applicable, hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. In particular, it is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes. • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. • Plan site layout so that machinery and dust causing activities are	To ensure air quality is managed appropriately across the Scheme.	Assessment within the ES assumes BPM would be incorporated throughout the construction phase.	Implementation of BPM.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		located away from receptors, as far as is possible. • Erect solid screens or barriers around particularly dusty activities or the site boundary that are at least as high as any stockpiles on site for higher risk areas. • Avoid site runoff of water or mud. • Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. • Where stationary generators are required ensure these are sited as far from sensitive receptors as possible. • Operate stationary generators within manufacturer guidelines, under optimum load for periods of operation and regularly service equipment to maintain efficient operation. • Manage the sustainable delivery of goods and materials through careful programming of delivery. • Implement a travel plan that supports and encourages sustainable travel (e.g. public transport, cycling, walking, and car-sharing). • Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction (e.g. suitable local exhaust ventilation systems). • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. • Use hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. • Where possible, only remove the cover in small areas during work and not all at once. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.					

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		• For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust. • For cement batching plants enclose as much of the plant as possible to minimise emissions of dust during preparation and identify measures to minimise emissions at loading points (e.g. pre-mixing). • Maintain and inspect on-site haul routes for integrity and operate a programme of routing maintenance and where necessary carry out repairs to the surface as soon as reasonably practicable. • Install hard surfaced haul routes if possible, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and are regularly cleaned. • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. • In locations without hard standing it may be necessary to clean the vehicle bodies in addition to wheels. • Access gates to be located at least 10m from receptors where possible. The details of the further standard best practice mitigation would be outlined in the CEMP produced by the contractor.					
MW-AIR3	ES Chapter 5, Section 5.9	**Air quality monitoring:** The main works contractor shall establish a baseline prior to construction at specific sections of the Scheme. This would be determined, where specifically required (i.e. locations of higher risk works closer to sensitive receptors). The duration of baseline monitoring, locations and techniques to be used are to be consulted upon with DCiC/EBC. However, it is anticipated based on the baseline environment (i.e. low ambient particulate concentrations) that monitoring is likely to focus on dust deposition/soiling) with a minimum period of 3 months data collection. The main works contractor shall ensure inspections and monitoring are carried out to assess the effectiveness of measures to prevent dust and air pollutant emissions during works. Monitoring approaches during the construction phase would be consulted upon with DCiC/EBC, including locations and techniques.	To identify any deterioration in air quality arising as a result of construction activities and the identification of appropriate actions to be implemented to reduce adverse effects.	Assessment within the ES assumes that appropriate dust and air quality monitoring would be incorporated throughout the construction phase.	Establishment of air quality baseline prior to construction. The Authority audit finds implementation meets objectives.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		Monitoring would be continued until the site is deemed to be low risk (i.e. higher risk activities have ceased). The approach to the reporting of air quality monitoring information is to be discussed with DCiC/EBC.					
CULTURAL HERITAGE							
MW-CH1	ES Chapter 6, Section 6.14	The main works contractor shall ensure that Markeaton Park boundary wall is carefully dismantled and rebuilt on a new alignment according to an approved design that is agreed with the DCiC conservation officer.	Works in accordance with the HMP.	ES assumes boundary wall suitably relocated.	The plan shall be prepared in consultation with DCiC and DVMWHSP and approved by The Authority prior to works commencing.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-CH2	ES Chapter 6, Section 6.14	Areas that were unavailable at the preliminary works stage (for example due to health & safety issues or no access) where archaeological survey (evaluation) or mitigation was required shall be subject to investigation as set out in the HMP.	Works in accordance with the HMP, Archaeological Mitigation Strategy and SSWSIs.	Monitoring in accordance with the HMP.	Compliance with the Detailed Archaeological Mitigation Strategy.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-CH3	ES Chapter 6, Section 6.14	Archaeological sites, areas of sensitivity including historic structures such as Markeaton Park boundary wall and the renovated park gates and pillars the entrance to Markeaton Park that require protection or preservation in situ during construction or utility diversions shall be dealt with as set out in the HMP and method statements.	Consultation on Method Statements with Park authorities and DCiC conservation officer and approval from The Authority prior to works commencing.	ES assumes archaeological sites are protected during the works.	consultation with DCC and DVMWHSP and approved by The Authority prior to works commencing with regard to fencing within the WHS.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-CH4	n/a	The main works contractor shall undertake an appropriate level of monitoring of all heritage assets (designated and non-designated) within and close to the Scheme boundary during the construction programme.	Monitoring arrangements shall be prepared in consultation with DCC and DCiC (for sites outside of the WHS) and DVMWHSP (for sites inside the	Monitoring required to ensure resources are being protected.	Adherence to main compound layout requirements and building height restrictions.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
			WHS) and approved by The Authority prior to works commencing.				
MW-CH5	ES Chapter 6, Section 6.14	**Old Derby Canal:** *Temporary bridge crossing* A temporary bridge to cross the Old Derby Canal for the proposed access into the main construction compound. Foundations for such temporary bridge structures to be installed back from the edge of the line of the former canal to avoid impacting on the existing vegetation and the canal profile. The design of the foundations would be dependent on ground conditions and loading requirements, but may comprise pad foundations or a simple piled foundation. The bridging systems would be removed upon completion of the works, with the affected footprint areas being reinstated to their former conditions.	Minimisation of impacts upon the former canal.	ES assumes impacts upon the former canal would be minimised.	Adherence to main compound layout requirements and canal crossing location.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
LANDSCAPE AND VISUAL							
MW-LAN1	ES Chapter 7, Section 7.9	**Landscape and Ecology Management Plan (LEMP):** The main works contractor shall prepare a Scheme-wide LEMP, developed in accordance with industry good practice.	To ensure landscape works are undertaken in accordance with good practice and in a consistent basis across the Scheme.	The year 15 assessment scenario is achieved.	The Authority approval of LEMP.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-LAN2	ES Chapter 7, Section 7.9	**Arboricultural Mitigation Strategy:** The arboricultural specialist shall prepare an Arboricultural Mitigation Strategy to protect those trees retained within and immediately adjacent to the order limits. This shall consider the following standards: • BS 3936-1: Nursery stock. Specification for trees and shrubs. • BS 3936-4: Nursery stock. Specification for forest trees, poplars and willows. • BS 3882: Specification for topsoil and requirements for use. • BS 3998: Tree Work. Recommendations. • BS 4428: Code of practice for general landscape operations (excluding hard surfaces). • BS8545 Trees from nursery to independence in the landscape.	To ensure existing trees to be retained are appropriately protected during the construction works and that newly planted trees are appropriate and successfully established.	The year 15 assessment scenario is achieved. Successful retention of trees and hedgerows/vegetation is assumed within the ES Trees not identified within the original Arboricultural	Approval of the strategy by the Authority	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		• BS 5837: Trees in relation to design, demolition and construction. • BS 6031: Code of practice for earthworks. Alternatively, where a British Standard does not exist, works would follow industry good practice, e.g. Natural England's Advice on managing, restoring, and creating grassland and agreement would be sought from DCiC. The AMS shall also define: • The root protection area (RPA) and Construction Exclusion Zones (CEZ) of trees to be retained within or immediately adjacent to the order limits and wherever practicable. • The approach for working within RPAs, where this cannot reasonably be avoided required. • The approach to inspecting, maintaining and managing trees and scrub to be retained. • The approach for felling where otherwise not identified in the ES.		Impact Assessment may require removal.			
MW-LAN3	ES Chapter 7, Section 7.9	**Planting and seeding:** In planning planting, seeding, wildflower seeding and other landscape works, the main works contractor shall consider the recommendations of the latest version of industry standards, including Natural England's Advice on managing, restoring, and creating grassland. **Early planting:** The main works contractor shall implement planting/seeding as early as is reasonably practicable (and where there is no conflict with construction activities or other requirements of the Scheme), so as to be more established in advance of the operation of the Scheme. The main works contractor would consider where these measures can be implemented as described and programme them accordingly. This includes advanced planting of dense shelterbelt of trees to the east, south and south-west of the new A38 mainline to replace habitats that would be lost – refer to ES Chapter 8: Biodiversity. **Maintenance:** The main works contractor shall undertake appropriate maintenance of planting and seeding works and implementation of management measures, through the construction period as landscape works are completed. The main works contractor shall monitor the progress of these works throughout	To protect and mitigate adverse effects on sensitive and valued landscape features and characteristics To ensure successful establishment of planting and seeding areas.	The successful completion of mitigation measures is assumed within the ES assessment. Early establishment of planting/seeding areas would reduce visual impact.	Successful establishment of all planting and seeding areas, throughout the Scheme.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		the construction period. Any failures of landscape planting and seeding would be managed via the specification and works requirements. This would ensure annual replanting and reseeding works are undertaken (as required) to achieve successful establishment of the landscape and ecology mitigation proposals at completion of the construction works and during the agreed defects liability period.					
MW-LAN4	DCO Requirement 5 **[TR010022/APP/3.1]**	The main works contractor shall ensure that landscaping works are carried out in accordance with the approved landscaping scheme and in conformity with DCO Requirement 5.	To mitigate the landscape and visual impacts of the Scheme.	n/a	Works undertaken in accordance with DCO Requirement 5.	Contractual requirement between The Authority and the preliminary works contractor. DCO Requirement 5.	Main works contractor
BIODIVERSITY							
MW-BIO1	OEMP Table 3.2(a)	**Protected and notable species:** The main works contractor shall review the measures identified in Table 3.2a PW-BIO1-12 and the results of the preliminary works contractor's pre-construction ecological surveys for the following: • Nesting birds (Schedule 1). • Bat. • Water vole. • Badger. • Fish. • Great crested newt, reptile and otter. The main works contractor shall have responsibility to ensure that works for protected and notable species undertaken during the preliminary works phase, and which are intended to be maintained throughout the main works phase, are appropriately managed. Where protection measures have been identified which need to be managed, monitored and maintained throughout the main works construction period, the main works contractor shall adhere to these	To ensure the protection of protected and notable species.	The ES assessment assumes protected species would be identified and adequately protected from adverse effects.	No recorded injury or mortality of protected species.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		measures. This may include the maintenance of habitat in an unsuitable condition for species (to discourage ecological species from using such areas) and the maintenance and monitoring of exclusion zones and seasonal constraints. The main works contractor's ECoW (or appropriate specialist), shall undertake regular site surveys to determine whether any protected or notable species have recolonised sites checked/cleared during the preliminary works. Should such species be identified, appropriate measures to ensure their protection/prevention of recolonisation shall be adopted; this may include supervised site clearance, works under method statements or application for appropriate licences, as per the preliminary works.					
MW-BIO2	ES Chapter 8, Section 8.9	**Habitat creation:** The main works contractor shall establish new habitats identified within the Environmental Masterplans (ES Figures 2.12a - 2.12h [**TR010022/APP/6.2**]). These habitats shall be managed accordingly to ensure their establishment and develop to achieve their target purpose(s), through to any handover of the Scheme.	To ensure habitats are established in accordance with the Environmental Masterplans.	The ES assumes establishment of specified habitats.	Successful delivery of habitats.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-BIO3	ES Chapter 8, Section 8.9	**Dam Brook ecological mitigation:** *Dam Brook Channel Construction* The main works contractor would have proven experience in river restoration and construction for the benefit of biodiversity and shall establish and maximise the new habitats identified within the Environmental Masterplans (ES Figures 2.12a - 2.12h [**TR010022/APP/6.2**]) according to the Scheme design. These habitats shall be managed accordingly to ensure their establishment and developed to achieve their target purpose(s), through to any handover of the Scheme. *Vegetation* The main works contractor shall ensure the planting and successful establishment of vegetation within the realigned Dam Brook channel and new ecology ponds. On-going monitoring of vegetation during both the construction and operation phases shall be undertaken by the ECoW (or appropriate specialist), until such time as the habitat has been appropriately established to the satisfaction of the Authority. The main works contractor shall re-establish any habitats lost as a result of temporary land-take in the Dam Brook valley, including alignment of any	To ensure the successful establishment of vegetation and minimise any adverse impacts on the habitats and species within the Dam Brook.	The ES assumes the stated requirements to mitigate potential impacts to protected and priority species recorded in the Dam Brook.	Interim monitoring reports.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		haul route and material storage areas, following construction. On-going monitoring of vegetation during both the construction and operation phases shall be undertaken by the ECoW (or appropriate specialist), until such time as the habitat has been restored to the satisfaction of the Authority. *Otters* The main works contractor shall provide, where reasonably practicable and when water is flowing, allowance for the passage of otters along one or both banks of the Dam Brook within the temporary works arrangements.					
MW-BIO4	ES Chapter 8, Section 8.9	*Bramble Brook Channel Construction* The main works contractor would have proven experience in river enhancement and construction for the benefit of biodiversity and shall establish and maximise the new habitats identified within the Environmental Masterplan (ES Figures 2.12a - 2.12h [**TR010022/APP/6.2**]) according to the Scheme design. These habitats shall be managed accordingly to ensure their establishment and development to achieve their target purpose(s), through to any handover of the Scheme. *Vegetation* The main works contractor shall ensure the planting and successful establishment of vegetation within applicable sections of Bramble Brook channel and adjacent wet grassland habitats (within the flood storage areas). On-going monitoring of vegetation during both the construction and operation phases shall be undertaken by the ECoW (or appropriate specialist), until such time as the habitat has been appropriately established to the satisfaction of the Authority. The main works contractor shall re-establish any habitats lost as a result of temporary land-take in the Bramble Brook valley, following construction. On-going monitoring of vegetation during both the construction and operation phases shall be undertaken by the ECoW (or appropriate specialist), until such time as the habitat has been restored to the satisfaction of the Authority. *Otters* The main works contractor shall provide, where reasonably practicable and when water is flowing, allowance for the passage of otters along one or both banks of the Bramble Brook within the temporary works arrangements.	To ensure the successful establishment of vegetation and minimise any adverse impacts on the habitats and species within the Bramble Brook.	The ES assumes the stated requirements to mitigate potential impacts to protected and priority species recorded in the Bramble Brook.	Interim monitoring reports.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-BIO5	ES Chapter 8, Section 8.9	**Old Derby Canal ecological mitigation:** *Temporary bridge crossing* A temporary bridge to cross the Old Derby Canal for the proposed access into the main construction compound. Foundations for such temporary bridge structures to be installed back from the edge of the line of the former canal to avoid impacting on the existing vegetation and the canal profile. The design of the foundations would be dependent on ground conditions and loading requirements, but may comprise pad foundations or a simple piled foundation. The bridging systems would be removed upon completion of the works, with the affected footprint areas being reinstated to their former conditions..	Avoid direct effects upon the former canal.	ES assumes no direct effects on the Old Derby Canal.	Implementation of the identified actions. Monitoring and reporting arrangements would be made with the ECoW.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-BIO6	ES Chapter 8, Section 8.9	**Lighting at important ecological sites:** The main works contractor shall, if site lighting is required near the River Derwent, adjacent to the known bat roost use directional lamps/hoods/cowls, to ensure that light-spill to the watercourses and their banks is minimised. There should be no lighting spill on the underside of B3 River Derwent Bridge where a maternity bat roost is located.	To minimise lighting of watercourses and reduce impacts on nocturnal species including otters, bats and fish.	Nocturnal species are sensitive to lighting.	Implementation of the identified actions.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-BIO7	ES Chapter 8, Section 8.9, Appendix B in the OEMP	**Biosecurity:** The main works contractor shall prepare a Biosecurity Management Plan taking into account the outline Biosecurity Management Plan provided in Appendix B. The main works contractor shall implement measures to promote biosecurity and avoid the risk that invasive non-native species and diseases are spread as a consequence of the project. This would include, toolbox talks, exclusion zones, method statements on the cleaning of equipment (including boots) and vehicles on and off site and between sites, and audit compliance.	To prevent the spread of invasive species and diseases. To ensure legal compliance.	Adequate protection measures would be employed throughout the construction period.	Implementation of the identified actions as per the Biosecurity Management Plan.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-BIO8	ES Chapter 8, Section 8.9, Appendix B in the OEMP	**Invasive species:** The main works contractor shall be cognisant of the invasive species survey undertaken by the preliminary works contractor ((ecology) refer to PW-BIO1) and adhere to the associated Biosecurity Management Plan (if relevant).	To prevent the spread of invasive species. To ensure legal compliance.	All invasive species would have been identified prior to the commencement of works.	No recorded spread of invasive species.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-BIO9	ES Chapter 8, Section 8.9, Section 8.12 and ES Figures 8.17 and 8.20 [**TR010022/ APP/6.2**]	**Potential Nesting Barn Owl and Little Ringed Plover:** A licenced ECoW (or an appropriate specialist) would conduct regular monitoring of the potential nesting sites and ensure effectiveness of temporary screening through construction as outlined in PW-BIO4.	To avoid disturbance of any species listed on Schedule 1 of the WCA 1981, while it is nest building or at a nest containing eggs or young, or to disturb the dependent young of such a bird. To ensure legal compliance and good practice.	Monitoring would be required to ensure barn owls and little ringed plover are unaffected by the works.	Implementation of the identified actions. Monitoring and reporting arrangements would be made with the ECoW.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-BIO10	ES Chapter 8, Section 8.9, Section 8.12 and ES Figures 8.17 and 8.20 [**TR010022/ APP/6.2**]	**Notable assemblage of farmland birds, nesting lapwing and wintering birds:** As outlined in PW-BIO5, the ECoW would conduct regular monitoring of temporary screening to assess its effectiveness and oversee the advanced planting of the shelterbelt (as detailed also for bats) and early installation of the noise and screening barriers at Little Eaton junction.	To ensure good practice.	The ES identified notable farmland bird assemblage, nesting lapwing and wintering bird population at Little Eaton.	Implementation of monitoring regime.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-BIO11	ES Chapter 8, Section 8.9 and ES Figures 8.23 and 8.24 [**TR010022/ APP/6.2**]	**Badgers:** All retained badger setts within the Scheme boundary would be subject to regular monitoring and appropriate action would be taken under the provisions of a licence to deter badgers from establishing new setts in these areas or to close newly established setts in areas which would be disturbed by further works. Suitable working methods would be employed in order to reduce the risk of harm to badgers and disturbance of badgers within their setts (as per the preliminary works).	To ensure good practice and legal compliance.	Badgers may establish new setts in locations where works are scheduled.	Implementation of working methods and monitoring regime.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-BIO12	ES Chapter 8, Section 8.9 and ES Figures 8.21 and 8.22 [**TR010022/**	**Bats:** Replacement landscape planting south of the existing A38 between the River Derwent and the Midland Mainline Railway to be incorporated as advanced planting to allow for re-growth to maintain habitat connectivity. Bat monitoring as per the Natural England EPSML shall be undertaken on the following mitigation features:	To follow current good practice guidelines. To undertake monitoring surveys at the Markeaton footbridge (potential	To minimise impacts on foraging and commuting bats The ES identified a number of areas	Implementation of working methods Completion of surveys and subsequent interim reports of surveys.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
	APP/6.2]	• M2: The known roosting features translocated onto a retained tree within the same woodland parcel as the noctule roost and the eco rocket. • B8-QW30: Replacement roosting features along sections of the noise barrier at the Royal School for the Deaf. • B2 Flood arch bridge: Three integral bat boxes within the bridge structure. The retained roost within the River Derwent bridge would continue to be monitored by the Highways Maintenance team through construction (and beyond). The main works contractor's ECoW (or an appropriate specialist) shall undertake landscape scale transect surveys across the Scheme yearly during the construction phase. This would also assist with the monitoring of the advanced planting at Little Eaton junction (which forms bat and bird mitigation). A crossing point survey of the Markeaton footbridge shall be undertaken prior to, during and post construction. Bat trapping survey sessions also to be conducted during and post construction to determine any potential changes on the bat population. **Locations:** Advanced planting south of the existing A38 between the River Derwent and the Midland Mainline Railway. Monitoring surveys as per the EPSML shall be undertaken at the retained woodland near M2 and the noise barrier at Markeaton junction; and the B2 Flood Arch Bridge at Little Eaton junction. The crossing point survey would be undertaken at the Markeaton footbridge (which is noted as a potential navigational cue for bats). Bat trapping surveys in Markeaton Park. The landscape scale transect locations would be confirmed prior to the surveys along suitable PRoWs or where landowner consent can be agreed. The crossing point, landscape scale surveys and bat trapping surveys would follow current good practice, and the survey methodology defined in the ES in the supporting bat reports. Bat trapping survey sessions would also to be conducted during and post	navigational cue for bats) throughout the main construction Phase. Landscape scale monitoring surveys should be undertaken yearly throughout the construction phase.	used by bats for roosting, foraging and commuting.	Monitoring and reporting arrangements would be made with the ECoW and licence returns submitted (where applicable).		

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		construction to determine any potential changes on the bat population. **Locations:** Advanced planting south of the existing A38 between the River Derwent and the Midland Mainline Railway. Monitoring surveys as per the EPSML would be undertaken at the retained woodland near M2 and the noise barrier at Markeaton junction; and the B2 Flood Arch Bridge at Little Eaton junction. The crossing point survey would be undertaken at the Markeaton footbridge (which is noted as a potential navigational cue for bats). Bat trapping surveys in Markeaton Park. The landscape scale transect locations would be confirmed prior to the surveys along suitable PRoWs or where landowner consent can be agreed. The crossing point, landscape scale surveys and bat trapping surveys would follow current good practice, and the survey methodology defined in the ES (refer to supporting bat survey reports provided in ES Appendix 8.9 [**TR010022/APP/6.3**]).					

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-BIO13	ES Chapter 8, Section 8.9, ES Figures 8.28 and 8.29 [**TR010022/APP/6.2**]	**Otters:** The ECoW (or an appropriate specialist) shall carry out monitoring of otter (*Lutra lutra*) to determine if there are any changes in otter distribution across the site and to determine if there are any new holts or resting places in use by otters within the Scheme boundary. Where an otter resting place or holt is present or suspected, a suitably qualified ecologist would prepare a method statement for the works to avoid disturbance of otters and ensure the works are legally compliant. Where required, a Natural England EPS licence would be obtained in order to facilitate the works (noting that at present such a license is not considered to be required, although pre-construction surveys shall confirm that this is the case). All works within proximity of suitable otter habitat would be undertaken in accordance with a method statement. Monitoring surveys in association with Bramble Brook and Dam Brook would also aim to assess the success of habitat establishment for riparian mammals. **Locations:** River Derwent, Watermeadows Ditch, Dam Brook, Boosemoor Brook at Little Eaton junction. Bramble Brook at Kingsway junction; Markeaton Brook, Markeaton Lake, Mill Pond 1 and 2, and Mackworth Brook at Markeaton junction.	To prevent disturbance to otters and their resting places, in order to ensure legal compliance. To ensure good practice and assess success of habitat establishment.	The locations of potential otter resting places and areas of suitable otter habitat have been identified within the ES.	Application and return of Natural England EPS licence (if necessary).	Contractual requirement between The Authority and the main works contractor. Natural England EPS licence obtained by the main works contractor.	Main works contractor
MW-BIO14	ES Chapter 8, Section 8.9, ES Figures 8.34 to 8.36 [**TR010022/APP/6.2**]	**Aquatic Invertebrate and Fish:** The ECoW (or an appropriate specialist) shall carry out monitoring of watercourses during construction, particularly Bramble Brook and Dam Brook which would be directly affected to assess success of habitat establishment. **Locations:** Bramble Brook, Dam Brook.	To ensure good practice and assess success of habitat establishment.	Assessment within the ES assumes mitigation measures are achieving their objectives (to avoid pollution or deterioration of watercourses/waterbodies; and habitat establishment).	Implementation of the identified monitoring requirements.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-BIO15	ES Chapter 8, Section 8.9 and ES Figures 8.32 and 8.33 [**TR010022/ APP/6.2**]	**Botanical and terrestrial invertebrate monitoring:** The ECoW (or an appropriate specialist) would undertake a programme of botanical monitoring to assess the establishment and development particularly of species-rich grassland and woodland within the Scheme as part of ensuring No Net Loss and potentially Net Gains in biodiversity. The ECoW (or an appropriate specialist) would undertake a programme of botanical and terrestrial invertebrate monitoring (where applicable) to assess the establishment and development of the species-rich grassland translocation within Markeaton Park to compensate for the loss of the A38 Roundabout LWS; and woodland across the Scheme in accordance with the ES. The ECoW (or an appropriate specialist) would liaise with consultees (namely DCiC and Derbyshire Wildlife Trust) in developing the details of methods. The results would then be made available to these consultees for review. Results of monitoring from the preliminary works period and subsequent recommendations from consultees would be used to inform habitat creation and subsequent management. Management action informed by monitoring may include, but is not restricted to, increase or decrease in the frequency, extent or duration of grazing or mowing, control of scrub, specific habitat management to create or maintain conditions **Locations:** Across the Scheme.	To ensure the ecological objectives described within the LEMP are met.	The ES assessment assumes the successful establishment of ecological and landscape mitigation including species-rich grassland and woodland.	Successful establishment of the landscape and ecology requirements.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
NOISE AND VIBRATION							
MW-NOI1	ES Chapter 9, Section 9.9	**Best Practicable Means (BPM) for noise:** BPM as outlined in PW-NOI1 should be applied during the main works by the main works contractor.	Refer to PW-NOI1.	Refer to PW-NOI1.	Refer to PW-NOI1.	Refer to PW-NOI1.	Main works contractor
MW-NOI2	n/a	**Section 61 Consents:** Refer to PW-NOI2.	Refer to PW-NOI2.	Refer to PW-NOI2.	Refer to PW-NOI2.	Refer to PW-NOI2.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-NOI3	ES Chapter 9, Section 9.9	**Noise and Vibration Management Plan** The main works contractor shall prepare a Noise and Vibration Management Plan detailing the management and monitoring processes to be introduced across all construction sites and compounds. Refer to PW-NO13 for details on what the plan should include.	Refer to PW-NOI3.	Refer to PW-NOI3.	Refer to PW-NOI3.	Refer to PW-NOI3.	Main works contractor
MW-NOI4	n/a	**Noise insulation and temporary re-housing:** The main works contractor shall have a Noise Insulation and Temporary Rehousing Policy for the Scheme. The policy would set out all roles, responsibilities and actions required in respect of these measures. Notwithstanding the measures set out in this OEMP and any agreements with DCiC/EBC, noise insulation or temporary re-housing would be offered to qualifying parties when: • Noise levels are predicted or measured by the main works contractor to exceed the relevant trigger level (as defined in BS 5228- 1, Table E.2) for at least 10 days out of any period of fifteen consecutive days or alternatively 40 days in any six month period at affected properties. • The property complies with all other requirements of the Noise Insulation (Amendment) Regulations 1988. • The property is lawfully occupied as a permanent dwelling. • Noise insulation does not already exist that is of an equivalent standard to that which would be allowed for under the Noise Insulation (Amendment) Regulations 1988. The main works contractor shall consider all applications supported by evidence for noise insulation or temporary rehousing from occupiers who may have special circumstances. Special circumstances could include night workers, those working in home occupations, local businesses or buildings that provide community facilities requiring a particularly quiet environment and those with a medical condition which would be seriously aggravated by construction noise, and provide noise insulation or temporary re-housing where it is demonstrated that this is necessary.	To ensure that additional protection for residents is in place in the event that it is not practicable to mitigate airborne noise to tolerable levels during the construction works.	Insulation and temporary re-housing may be required to protect residents form significant effect.	Implementation and adherence to the policy.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-NOI5	ES Chapter 9, Section 9.9	**Vibration** Details on the management of vibration to be implemented by the main works contractor during the main works are detailed in PW-NOI4.	Refer to PW-NOI4.	Refer to PW-NOI4.	Refer to PW- NOI4.	Refer to PW- NOI4.	Main works contractor

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-NOI6	ES Chapter 9, Section 9.9 and Section 9.11	**Monitoring of noise and vibration:** Noise and vibration monitoring as outlined in PW-NOI5, shall be implemented by the main works contractor during the main works, where applicable.	Refer to PW-NOI5.	Refer to PW-NOI5.	Refer to PW-NOI5.	Refer to PW-NOI5.	Main works contractor
MW-NOI7	ES Chapter 9, Section 9.9	**Early installation on noise barriers:** 4m high noise barrier at the Royal School for the Deaf shall be constructed following demolition of the houses on Queensway. Early installation of the noise barrier would reduce noise effects upon the Royal School for the Deaf and other receptors to the east of the works. Such works would be undertaken before the southbound diverge slip would be used for A38 mainline traffic. Noise barrier at the southbound diverge slip road at Little Eaton junction shall be installed early, once the earthworks to construct the new A38 mainline and slip road are complete. Installation shall be before the new slip road would be used for A38 mainline traffic during the construction works. Early installation would assist in reducing construction noise effects upon Breadsall village.	To reduce noise impacts upon nearby residents (including school pupils and staff).	ES assumes advanced installation of noise barriers.	Noise levels as detailed in ES.	Contractual requirement between the Authority and the main works contractor.	Main works contractor
GEOLOGY AND SOILS							
MW-GEO1	ES Chapter 10, Section 10.9	**Contamination Risks:** The main works contractor shall implement measures on site, in accordance with CIRIA C741 4th Edition Environmental Good Practice, to assess and control risks to humans, e.g. construction workers, site visitors and nearby residents, resulting from the disturbance of contaminated land.	To minimise the risks to construction workers and others.	Potential for contaminated land (ES Chapter 10: Geology and Soils, Table 10.9 and ES Appendix 10.1 [**TR010022/APP/6.3**]).	The Authority approval of CEMP, Method Statements (including measures to protect construction workers), and audit finds implementation meets objectives.	Contractual requirement between the Authority and the main works contractor.	Main works contractor
MW-GEO2	ES Chapter 10, Section 10.9	**Detailed Quantitative Risk Assessments (DQRA):** DQRA shall be undertaken taking account of additional geotechnical investigations to assess the existing contamination risks identified at the junctions. This DQRA shall be used to inform the remediation strategy which would be prepared in advance of the Scheme construction works. This remediation strategy shall be developed to identify any mitigation measures required to reduce any identified impacts to controlled waters and to mitigate	To mitigate the presence of potentially contaminated materials.	Potentially contaminated land has been identified ES Chapter 10: Geology and Soils, Table 10.9	The Authority approval of DQRA.	Contractual requirement between The Authority and the main works contractor. DCO Requirement	Main works contractor

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		any future impacts related to the construction and operational phases of the Scheme.		and ES Appendix 10.2 [**TR010022/APP/6.3**].		8.	
MW-GEO2	ES Chapter 10, Section 10.9	**Remediation Work:** The main works contractor would carry out any required remediation works and would comply with any other relevant mitigation measures identified in the remediation strategy and Asbestos Management Plan. This would include measures to ensure that any disturbance of the former landfill at Kingsway junction does not create new pathways (either temporary or permanent) for migration of contamination to controlled waters; migration of ground gas or disturbance and mobilisation in air of asbestos fibres that could impact human receptors and building infrastructure.	To mitigate the presence of potentially contaminated materials and of unexpected contaminated land (if any) encountered during construction.	Potentially contaminated land has been identified ES Chapter 10: Geology and Soils, Table 10.9 and ES Appendix 10.2 [**TR010022/APP/6.3**].	Validation report, Asbestos Management Plan.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 8.	Main works contractor
MW-GEO3	ES Chapter 10, Section 10.9	**Soils Management Strategy:** The main works contractor shall produce a detailed Soils Management Strategy that would identify the nature and types of soil that would be affected, including the methods that would be employed for stripping soil and the restoration of agricultural land. The main works contractor shall follow the guidance in Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009) when handling agricultural soils.	To protect soils and agricultural land impacted by the Scheme.	The ES assessment assumes the protection of agricultural soils and successful return of land to agriculture where applicable.	Production of the Soils Management Strategy.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW–GEO4	ES Chapter 10, Section 10.9	**Asbestos** The main works contractor shall prepare and implement an Asbestos Management Plan to ensure asbestos can be identified, removed and disposed of in a legally compliant manner.	To mitigate for any asbestos encountered.	Asbestos containing material (ACM) detected at former Rowditch Tip landfill ((Kingsway junction).	Completion of appropriate ground investigation works in accordance with Asbestos Management Plan.	Contractual requirement between The Authority and the preliminary works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-GEO5	ES Chapter 10, Section 10.9	**Unexpected contamination:** In the event that unexpected soil or groundwater contamination is encountered during construction, the main works contractor is to quantify the extent of the potential risk from the contamination and follow a risk-based approach in accordance with Contaminated Land Report 11, Model Procedures for the Management of Land Contamination (2004). Where significant risks from soil or groundwater contamination are identified, appropriate mitigation (remediation) to reduce to acceptable levels the potential short and long-term health and safety and environmental risks to sensitive receptors would be identified and implemented. Any required additional ground investigations would be undertaken in accordance with UK good practice, including BS 5930:2015 Code of Practice for ground investigations and BS 10175:2011 + A2:2017 Investigation of Potentially Contaminated Sites Code of Practice.	To prevent contamination related to construction of the Scheme and maintain compliance with national legislation and regulations.	Potentially contaminated land has been identified ES Chapter 10: Geology and Soils. There is always a possibility that unidentified contamination may be encountered during earthworks.	Completion of appropriate GI works and remediation measures.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 8.	Main works contractor
MW-GEO6	ES Chapter 10, Section 10.9	**Hazardous substances:** The contactor shall control all potentially contaminative materials in accordance with the Control of Substances Hazardous to Health (COSHH) Regulations. All potentially contaminative materials would be properly isolated and bunded. Bunds and trays would be regularly checked and maintained. All surface water or other contaminated water, which accumulates in the bund, would be removed by manually controlled positive lift pumps and not by means of a gravity drain. This water would be discharged in an off-site public sewer in consultation with the relevant water companies.	To prevent contamination related to construction of the Scheme.	Assessment within the ES assumes that preventative controls would be implemented to avoid contamination.	Agreement with water companies for the disposal of contaminated water.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-GEO7	ES Chapter 10, Section 10.9	**Excavated materials management:** To form part of the Soils Management Strategy, the main works contractor shall develop a: • Soils Handling Strategy, with reference to BS3882: 2015 Specification for Topsoil and the Construction Code of Practice for the Sustainable Use of Soils on Construction Site. • Soil Resources Plan, which would confirm the soil types, the most appropriate re-use for the different types of soils and proposed methods for handling, storing and replacing soils on-site.	To ensure that high standards of soil handling and material management are employed during construction.	Assessment within the ES assumes that appropriate soils and material handling would be incorporated throughout the construction phase to mitigate significant effects.	Development of the Soils Management Strategy and Asbestos Management Plan adherence to these documents.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		The main works contractor shall assess excavated soils for any potential risks posed to health and the environment from the reuse of such soils as engineering fill. This would include mitigation of the effects on soils and the spread of contamination to ensure that those soils identified as contaminated are not mixed with uncontaminated soil. All excavated materials proposed for re-use would be required to meet risk-based acceptability criteria. The main works contractor shall ensure soils would be protected from accidental contamination during storage and transit. The main works contractor shall endeavour to return topsoil stripped during the construction of the Scheme as close to its source of origin as possible during restoration. Soils should be reused as soon as is practicable and stored in such a way as to minimise structural damage (so far as reasonably practicable). Additionally, the creation of bare areas of permanently exposed soil that would be vulnerable to erosion processes would be avoided. Topsoil may need to be removed during construction in order to prevent permanent burial beneath other earthworks. Such soils would be stockpiled and re-used, subject to acceptability, in the general earthworks such as landscaping and bunds. The re-use of excavated materials shall be governed by a Materials Management Plan (MMP – refer to Materials section) developed by the main works contractor in accordance with the CL:AIRE Definition of Waste: Development Industry Code of Practice. Should off-site disposal in relation to excavated soil be required, the material would be characterised to determine firstly whether it is Hazardous or Non-Hazardous waste in accordance with the Environment Agency's Technical Guidance WM3. The appropriate disposal facility will, where required, be determined through Waste Acceptance Criteria (WAC) analysis, as required. Asbestos contaminated material would be handled in accordance with the Asbestos Management Plan.					
MW-GEO8	ES Chapter 10, Section 10.9	**Construction on or adjacent to land affected by contamination** The main works contractor shall implement control measures for construction activities on or adjacent to the land identified as being affected by contamination. This would include the following, as appropriate: • Wheel wash facilities. • Redundant services near potentially contaminated areas would be either	To prevent the spread of contaminated materials and risks to health of residents/workers of adjacent properties, controlled waters and	Assessment within the ES assumes that land to be restored to agriculture would be suitable for purpose and that the Scheme can	Implementation and audit of the monitoring procedures.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		removed or cut off and sealed. • Material known or suspected to be contaminated would be stockpiled (depending on the source of the material and the nature of the contamination) and tested prior to reuse or disposal. Stockpiles would be placed on a low permeability liner, suitably protected from damage by earthmoving plant. Known or suspected contamination stockpile areas would be tested adequately prior to and after use to ensure that no cross-contamination has occurred. • Prior to reuse of site-won materials, pre- classification testing of soils would be undertaken. • Imported fill materials would be required to meet soil and leachate acceptance criteria derived in the detailed design stage. • Piled foundations and ground improvement works located within 50m of potential or known areas of land contamination or with potential to impact Source Protections Zones would require a site-specific environmental risk assessment, and would be identified within the relevant management plans. The main works contractor would adhere to appropriate guidance, including the Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention; • Within areas of known or suspected contamination, measures would be introduced to ensure that buried services would be protected from the ingress of mobile and aggressive contaminants. In the case of drainage runs, the infiltration of surface water into the underlying contaminated ground would be prevented and clean or lined service corridors would be installed to provide a suitable barrier to migrating ground gases adjacent to known/potential sources. • Materials used for the Scheme would be proven 'suitable for use' by adoption of acceptance criteria and would be deposited under either environmental permitting regulations or the Definition of Waste: Development Industry Code of Practice. • Construction activities would follow good practice guidelines to avoid contamination from leaks, spillages and inappropriate storage of materials on site. Appropriate control measures would be identified and implemented through the CEMP. • Measures to prevent the dispersal of asbestos fibres would be taken in accordance with the CEMP and the Asbestos Management Plan.	the wider environment.	be built safely.			

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
PW–GEO9	ES Chapter 10, Section 10.9	**Biosecurity (agriculture):** The main works contractor shall comply with the requirements of DEFRA and appropriate guidance to avoid, as far as possible, the spread of soil borne, crop and animal diseases. Refer to PW- BIO1 regarding the Biosecurity Management Plan. The main works contractor shall implement appropriate measures to control run-off to reduce any risks associated with disease transmission.	To limit the Scheme impact on soils and agricultural land.	The ES assessment assumes the protection of agricultural soils and successful return of land to agriculture where applicable.	Implementation of appropriate measures as per Biosecurity Management Plan.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
PW–GEO10	ES Chapter 10, Section 10.9	**Restoration of agricultural land and aftercare (Little Eaton junction):** Where land is to be restored to agriculture the main works contractor shall liaise with the landowner/tenant and set out the detail for restoration on each specific area of farmland. The land restoration shall proceed with full consultation between with the landowner/tenant and the main works contractor including inspection of works where applicable and in accordance with requisite site health and safety procedures.	To limit the Scheme impact on soils and agricultural land.	The ES assessment assumes the protection of agricultural soils and successful return of land to agriculture where applicable.	Effective communication with landowners/tenants and the production of the Soil Management Plan and adherence to measures therein.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-GEO11	ES Chapter 10, Section 10.10 and Section 10.11	**Monitoring of restored agricultural land (Little Eaton junction):** Land restored to agriculture would be subject to an aftercare period following completion of construction during which responsibility for the condition of the reinstated soil would remain with the main works contractor. A Scheme of management would be prepared as a supplementary document. The main works contractor shall undertake further inspections of restored agricultural land with the landowner/tenant and Highways England's soils experts (and valuer, if required) to assess the progress of the restoration. These would be carried out with timing appropriate to any reported issues or concerns. Concerns would be assessed by all parties and appropriate remedial actions or compensation agreed within the parameters of the compensation code and/or any previous agreements made at the time of acceptance of the initial restoration works and handover to the landowner/tenant.	To ensure reinstated agricultural land has been restored to its original condition or agreed condition.	Assessment within the ES assumes that land to be restored to agriculture would be suitable for purpose.	Restoration as defined.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-GEO12	ES Chapter 10, Section 10.11	**Underground gas monitoring:** The main works contractor would prepare and implement a gas monitoring procedure, as appropriate, based on the potential for presence of underground gases. Gas monitoring would be undertaken in accordance with BS8576:2013 Guidance on investigations for ground gas. The main works contractor would undertake monitoring of the atmosphere within excavations for concentrations of oxygen, carbon dioxide, methane and hydrogen sulphide to assess the development of any potentially explosive and/or asphyxiant conditions.	To ensure the safety construction personnel during confined space activities.	Underground gasses may be present within excavations.	Implementation and audit of the monitoring procedures.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MATERIALS							
MW-MAT1	ES Chapter 11, Section 11.9	**Site Waste Management Plan (SWMP):** The main works contractor shall, in accordance with industry good practice, develop and implement a SWMP which would set out a recording process for the management of waste, including the storage and transport of waste on-site and a recording mechanism for required waste documentation such as Waste Transfer or Consignment Notes (dependent on the waste stream) in order to confirm the assessment of the waste impact and to implement the embedded mitigation measures. The SWMP would include procedures for monitoring the overall construction waste recovery rate and the proportion of secondary and recycled aggregate used in the Scheme, in order to confirm the assessment of materials impacts. The SWMP would: • Identify and record the types, quantities and destination of waste arisings from the Scheme in the SWMP. • Report this information to The Authority on a periodic basis, and update the SWMP as appropriate. • Define measures in the SWMP to minimise waste arisings from the Scheme and to recover waste materials in accordance with the principles of the waste hierarchy.	To ensure suitable management of waste arising from the construction of the Scheme.	A SWMP would be needed to effectively control and manage waste arisings.	The Authority approval of SWMP.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-MAT2	ES Chapter 11, Section 11.9	**Materials Management Plan (MMP):** The main works contractor shall prepare a MMP in accordance with the CL:AIRE Definition of Waste: Code of Practice. The MMP would detail the procedures and measures that would be taken to classify, track, store, reuse and dispose of all excavated materials that would be encountered during the construction phase.	To reduce effects on the availability and use of secondary and recycled construction materials. To reduce effects that on-site generated	Waste would be generated and managed during construction.	The Authority approval of MMP.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
			materials (e.g. soils) and waste arisings have on the existing capacity of waste management facilities.				
MW-MAT3	ES Chapter 11, Section 11.9	**Recovery target:** The main works contractor shall seek to achieve a recovery rate of 70% by weight for non-hazardous construction and demolition waste (excluding uncontaminated excavated soil and stones, European Waste Catalogue (EWC) code 17 05 04.	To reduce effects on the availability and use of secondary and recycled construction materials. To reduce effects that on-site generated materials (e.g. soils) and waste arisings have on the existing capacity of waste management facilities.	Waste would be generated and managed during construction.	Recovery of 70% by weight of non-hazardous construction and demolition waste.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-MAT4	ES Chapter 11, Section 11.9	**Secondary and recycled aggregates target:** The main works contractor shall seek to achieve a rate of 14% use of secondary and recycled aggregates, for those applications for which substitution of primary aggregates is technically and economically feasible.	To reduce effects on the availability and use of secondary and recycled construction materials. To reduce effects that on-site generated materials (e.g. soils) and waste arisings have on the existing capacity of waste management facilities.	Waste would be generated and managed during construction.	14% use of use of secondary and recycled aggregates (where technically and economically feasible).	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-MAT5	ES Chapter 11, Section 11.9	**Waste storage on site:** The main works contractor shall provide suitable containers for reception and temporary storage of waste on site, and shall arrange for waste to be periodically collected and transported to a suitably licensed facility for treatment or disposal. The main works contractor shall be responsible for obtaining any necessary permits or exemptions for on-site management of waste.	To reduce effects on the availability and use of secondary and recycled construction materials. To reduce effects that on-site generated materials (e.g. soils) and waste arisings have on the existing capacity	Waste would be generated and managed during construction.	Provision of storage containers as described.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
			of waste management facilities.				
MW-MAT6	ES Chapter 11, Section 11.9	**Waste monitoring:** The main works contractor shall undertake regular audits and inspection of waste management activities to ensure compliance with the requirements of the approved SWMP, statutory controls and other Scheme policies and procedures relevant to the management of surplus excavated material and waste.	To reduce effects on the availability and use of secondary and recycled construction materials. To reduce effects that on-site generated materials (e.g. soils) and waste arisings have on the existing capacity of waste management facilities.	Waste would be generated and managed during construction.	Implementation of the SWMP and monitoring requirements.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
PEOPLE AND COMMUNITIES							
MW-COM1	n/a	**Notification of works:** The main works contractor shall liaise with landowners, occupiers and agents, as appropriate, regarding the provision of accommodation works and agree the programme of works and access routes to be used by construction traffic.	To reduce impacts on landowners affected by the Scheme.	Assessment within the ES assumes that appropriate measures would be incorporated to reduce impacts on landowners.	Liaison with landowners, occupiers and agents.	Contractual requirement between The Authority and the preliminary works contractor.	Main works contractor
MW–COM2	n/a	**Liaison with farm holdings (Little Eaton junction):** The main works contractor shall liaise with farm holdings, occupiers and agents, as appropriate, to establish: • Measures to be implemented to protect and maintain livestock water supplies which may be affected due to construction works. • The protection of agricultural land adjacent to the construction site both during and post-construction, including the provision and maintenance of appropriate stock-proof fencing. • Arrangements for the maintenance of farm and field accesses affected by construction (including arrangements for the continued use of the Flood Relief Arch beneath the A38 by the turf production site). • Locations of potential carcass burial sites.	To reduce impacts on farm holdings affected by the Scheme.	Assessment within the ES assumes that appropriate measures would be incorporated to reduce effects on farm holdings.	Appropriate communication with landowners/ occupiers/agents.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-COM3	n/a	**Restoration of land and aftercare:** Where land is temporarily required for construction and is to be restored to its former condition the main works contractor shall liaise with the landowner/tenant and set out the detail for restoration on each specific area. The land restoration would proceed with full consultation between with the landowner/tenant and the main works contractor including inspection of works where applicable and in accordance with requisite site health and safety procedures.	To reduce impacts on landowners affected by the Scheme.	Assessment within the ES assumes that appropriate measures would be incorporated to reduce impacts on landowners.	Effective communication with landowners/tenants and the production of the Soil Management Plan and adherence to measures therein.	Contractual requirement between The Authority and the preliminary works contractor.	Main works contractor
MW-COM4	n/a	**Monitoring of restored land:** The main works contractor shall undertake further inspections of restored land with the landowner/tenant and Highways England's experts (and valuer, if required) to assess the progress of the restoration. These would be carried out with timing appropriate to any perceived issues or concerns. Concerns would be assessed by all parties and appropriate remedial actions or compensation agreed within the parameters of the compensation code and/or any previous agreements made at the time of acceptance of the initial restoration works and handover to the landowner/tenant.	To reduce impacts on landowners affected by the Scheme.	Assessment within the ES assumes that appropriate measures would be incorporated to reduce impacts on landowners.	Implementation of the specified actions.	Contractual requirement between The Authority and the preliminary works contractor.	Main works contractor
MW-COM5	n/a	**Footpath and cycleway diversions:** The main works contractor shall plan the Scheme construction works to minimise the need to close and divert footpaths and cycleway facilities, and minimise closures and diversion durations. Where the closure of public footpaths and cycle routes would be required, safe and appropriate alternative means of access shall be provided to ensure access would be maintained at all times in order to minimise temporary severance. This includes minimising the duration of any required closure to the River Derwent bridge on Ford Lane. The main works contractor shall agree temporary diversion routes and closures in advance with DCiC, EBC and DCC as applicable. Appropriate signage for all closures and diversion of footpaths and cycleways shall be used to inform pedestrians and cyclists, with sufficient notice of such closures and diversions being provided.	To minimise disruption to pedestrians and cyclists.	ES assumes appropriate provisions are put in place to minimise disruption to pedestrians and cyclists.	Agreement of actions with DCiC, EBC and DCC as applicable.	Contractual requirement between The Authority and the preliminary works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-COM6	n/a	**Royal School for the Deaf liaison regarding access** The main works contractor shall liaise with the Royal School for the Deaf regarding school access. If access issues become apparent, the contractor shall investigate development of a school drop off for cars at the end of Markeaton Street at the back of the school, within land owned by Derby University. Any such arrangements shall be undertaken by agreement between affected parties.	To minimise disruption to school access during Scheme construction.	ES assumes alternative access provisions can be put in place.	Agreement of actions with the Royal School for the Deaf.	Contractual requirement between The Authority and the preliminary works contractor.	Main works contractor
WATER ENVIRONMENT							
MW-WAT1	ES Chapter 13, Section 13.9	**Surface water and groundwater protection:** The main works contractor shall undertake the works and implement working methods to protect surface water and groundwater from pollution and other adverse impacts, including change to flow, flood storage volume, water levels and quality. Such actions would aim to protect all water resources, including the surface water safeguard zone at Little Eaton junction. The main works contractor shall consider the need to use pesticides (and herbicides) within the surface water safeguard zone – if there is deemed to be such a need, an action plan shall be prepared taking into account guidance provided in Environment Agency webpages (Environment Agency, 2018; Voluntary Initiative, 2018). Measures shall be completed having regard to industry guidance including applicable Guidance for pollution prevention documents: http://www.netregs.org.uk/environmentaltopics/pollution-prevention-guidelines-ppgs-and-replacment-series/guidance-for-pollution-prevention-gpps-full-list/	To ensure the protection of the water environment.	Assessment within the ES assumes adequate protection measures would be employed throughout the construction period.	Implementation of the identified actions.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-WAT2	ES Chapter 13, Section 13.9	**Water Management Plan:** The main works contractor shall produce a Water Management Plan to include identification of watercourses and aquifers, and taking into account the guidance contained within the relevant information on pollution prevention provided by the Environment Agency, the Guidance for Pollution Prevention (GPPs) available on the NetRegs website and other Construction Industry Research and Information Association (CIRIA) documents. Specific receptors in the water environment would be listed in the plan. Where appropriate, integrated aquatic ecology and water quality plans shall be developed. The Emergency Preparedness and Response Plan and	To ensure the protection of the water environment.	The main works activities are likely to generate effects on the water environment which would need to be managed.	Production of the Water Management Plan and the overarching Emergency Preparedness Plan.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		Pollution Incident Control Plan, detailed in MW-G19 and MW-WAT5 respectively, would include effects on water resources. Environment Agency guidance on pollution incident response planning would be reflected in the emergency plan.					
MW-WAT3	ES Chapter 13, Section 13.9	**Groundwater Management Plan:** The main works contractor shall develop a Scheme wide Groundwater Management Plan, outlining how groundwater resources are to be protected in a consistent and integrated manner. The plan shall address potential effects on groundwater resources and quality in particular in relation to dewatering during construction works and the potential for contamination of groundwater during the construction works. The Groundwater Management Plan shall include reference to relevant measures included in the Water Management Plan with regards pollution prevention and shall also describe the measures to be implemented to avoid adverse effects on groundwater during dewatering (refer to MW-WAT9).	To manage and protect groundwater resources.	The Scheme has the potential to adversely affect groundwater resources.	Approval by The Authority.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-WAT4	ES Chapter 13, Section 13.9	**Site drainage:** The main works contractor shall utilise sustainable methods for construction discharges including site drainage, surface runoff, and dewatering discharges. This includes discharge to water courses subject to water quality, rate of discharge and scour assessments. For discharges to mains foul or combined sewers relevant permissions would be obtained from the statutory undertaker. Discharge to watercourses shall, insofar as not dealt with in the DCO, only be permitted where permits or other relevant approval has been obtained. Sufficient time would be made for the Environment Agency to issue permits in accordance with relevant legislation. The main works contractor shall ensure that site drainage meets the effluent and flood risk standards required by the sewerage undertaker and the Environment Agency, as appropriate, in accordance with the relevant permit, and would provide and maintain holding or settling tanks, separators and other measures as may be required to meet those standards. The main works contractor shall ensure that access is provided to the undertaker and Environment Agency so that samples of discharge can be obtained and analysed, and the flows verified as required. The main works contractor shall incorporate the following measures during the construction works:	To ensure the protection of the water environment.	Assessment within the ES assumes adequate site drainage methods are employed throughout the construction period.	Granting of any permits/consents (if required outside of the DCO). Adherence to the most current standards.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		• All temporary land-take would include adequate areas of land set aside for robust control measures, for example sustainable drainage control. • Any discharge to sewers and controlled waters would be required to be in accordance with the DCO provisions, having regard to the relevant licensing body's requirements. • Water flows from sites would be limited during construction to existing runoff rates, unless otherwise agreed with the Environment Agency in accordance with relevant legislation. • The relevant sections of BS 6031: Code of Practice for Earthworks for the general control of site drainage would be followed.					
MW-WAT5	ES Chapter 13, Section 13.9	**Spill response:** The main works contractor shall include spill response procedures in the Emergency Preparedness and Response Plan (refer to MW- G19). This would include a Pollution Incident Control Plan, as part of the CEMP, which recognises the risk of pollution from construction activities and presents pro-active management practices to ensure that any pollution incident that may occur, such as a diesel spillage, is minimised, controlled, reported to relevant parties and remediated. The plan would define the criteria for implementing the relevant measures. Environment Agency guidance on pollution incident response planning would be reflected in the emergency plan. These procedures shall include the provision of appropriate incident response equipment, e.g. spill kits, would be available next to particularly sensitive activities or areas of a site (such as fuel storage areas). In the preparation of local pollution incident response measures, the main works contractor shall consult with relevant organisations, including, but not limited to, statutory bodies and other relevant parties, such as the Health and Safety Executive (HSE) (Construction), the Fire Authority, the Ambulance Service, the Environment Agency, Natural England, utilities companies and DCiC (emergency planning and pollution control functions). Reference should also be made to the Environment Agency's Pollution Prevention Guidelines 21 (Incident Response Planning) and Construction Industry Research and Information Association's (CIRIA's) Environmental good practice – site guide.	To ensure processes and equipment are in place to deal with oil and chemical spills on site.	Assessment within the ES assumes adequate monitoring and emergency measures would be employed throughout the construction period.	Production of the Pollution Incident Control Plan, in consultation with the identified relevant organisations. The Authority approval of the plan.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-WAT6	ES Chapter 13, Section 13.9	**Pollution incident monitoring:** The contractor shall have in place effective arrangements to investigate and provide reports on any potential or actual significant pollution incidents, including: • A description of the pollution incident, including its location (and Ordnance Survey (OS) grid reference), the type and quantity of contaminant and the likely receptor(s). • Contributory causes. • Adverse effects. • Measures implemented to mitigate adverse effects. • Any recommendations to reduce the risk of similar incidents occurring.	To ensure processes are in place to monitor any potential or actual significant pollution incidents.	Assessment within the ES assumes adequate monitoring and emergency measures would be employed throughout the construction period.	The Authority approval of CEMP.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-WAT7	ES Chapter 13, Section 13.9 and ES Figures 13.1 to 13.3 [**TR010022/ APP/6.2**]	**Protection of watercourses:** The contactor shall incorporate protection measures for works in or adjacent to watercourses in accordance with requirements set out by the Environment Agency. Insofar as it is not dealt with in the DCO, approval would be obtained in advance for all crossings of, diversions to, and work affecting watercourses from the Environment Agency. Sufficient allowance would be made for the Environment Agency to issue a flood risk activity environmental permit. Insofar as it is not dealt with in the DCO, appropriate protective provisions would be agreed with the Environment Agency for works under, over or within a river channel and within 8m of a non-tidal river. The main works contractor shall adopt measures to prevent the deposition of silt or other material in any existing watercourse, lake, borehole, aquifer or catchment area, arising from work operations. The measures would accord with the principles set out in industry guidelines, including CIRIA's report C532: Control of water pollution from construction sites, and GPP 5: Works and maintenance on and near water. The main works contractor shall incorporate the following measures during the construction works: • Watercourses, including land and/or road drainage, within the construction sites would be maintained. • Protection measures e.g. fencing, would be in place to protect existing water features from degradation and physical damage during construction.	To prevent the degradation and pollution of watercourses.	Assessment within the ES assumes that adequate protection of watercourses would be employed throughout the construction period.	Granting of any permits/consents (if required outside of the DCO). Adherence to the most current standards.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		• All areas with the potential to generate contaminated water would be bunded to prevent the release of contaminants. • No work in the channels of the River Derwent are planned, and measures would be taken with regard to works in the rivers' wider floodplains to limit the release of suspended sediment and solids into the water column.					
MW-WAT8	ES Chapter 13, Section 13.9	**Control of pollution to waterbodies:** The main works contractor shall ensure that protection measures to control the risk of pollution are included within the Water Management Plan; these would be consistent with the Environmental Permitting (England and Wales) Regulations 2016, including: • Provision of maps showing the locations, together with address and contact details, of local emergency services facilities such as police stations, fire authorities, medical facilities and other relevant authorities. • Ensure that site drainage plans and flood risk management plans are available on site and are kept up-to-date. • Ensure that pollution shut- off valves are used in compounds with formal drainage. • Ensure staff competence and awareness in implementing plans (including how sources are to be isolated, and contaminated materials removed) and using pollution response kit. • Provision of contact details for the relevant authorities, such as the Environment Agency, and the persons responsible on the construction site and within the main works contractors' organisation for pollution incident response. • Provision of contacts with a competent spill response company which can be contacted at short notice for an immediate response (where appropriate). The main works contractor shall consult with the relevant regulatory bodies regarding specific requirements in relation to establishing and operating the concrete batching plant(s). Wash water from any batching plants would not be discharged to the water environment without the approval of the relevant authority. The main works contractor shall ensure that the handling of contaminated excavated material, treatment processes required and the storage of	To prevent pollution of waterbodies.	Assessment within the ES assumes that adequate pollution prevention measures would be employed throughout the construction period.	Consultation with the Environment Agency where required (concrete batching plant). The Authority approval of the Water Management Plan.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		excavated material does not affect surface water or groundwater. Measures would be put into place to prevent contaminated run off reaching open ground. The main works contractor shall avoid using materials in the permanent or temporary works that could result in direct or indirect discharge of hazardous substances or non-hazardous pollutants to groundwater, as defined under the Environmental Permitting (England and Wales) Regulations 2016. The main works contractor shall incorporate the following measures during the construction works: • Any containers of contaminating substances onsite would be leak-proof and kept in a safe and secure building or compound from which they cannot leak, spill or be open to vandalism. The containers would be protected by temporary impermeable bunds (or drip trays for small containers) with a capacity of 110% of the maximum stored volume. Areas for transfer of contaminating substances (including refuelling areas) would be similarly protected. • Any permanent oil storage tanks and temporary storage of 201 litres or more of oil in drums and mobile bowsers, and ancillary pipe work, valve, filters, sight gauges and equipment requiring secondary containment, e.g. bunding or drip trays, as defined in the Control of Pollution (Oil Storage) (England) Regulations 2001. Environment Agency guidance on oil storage regulations for business and preventing groundwater pollution from underground fuel storage tanks would be complied with. • No oil would be stored within 10m of a watercourse or within a Source Protection Zone (SPZ) 1 (nominal minimum 50m provided around all licensed abstractions). Storage within an SPZ 2 (nominal minimum 250m distance) or beyond requires secondary containment, e.g. secondary bunding impermeable to water and oil, with no drainage valve fitted for draining of rainwater. The secondary containment must be sufficient to contain at least 110% of the maximum contents of an oil tank, mobile bowser or intermediate bulk container. • Above -ground pipework would be properly supported, and underground pipework would be protected from physical damage and have adequate leakage detection. All mechanical joints on oil pipes must be easy to inspect. Oil and hydrocarbon underground pipes would not extend into the groundwater saturated zone, unless approval is obtained from the Environment Agency and with risk acceptably mitigated.					

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		• All refuelling, oiling and greasing would take place above drip trays or on an impermeable surface with sealed drainage or oil interceptor which provides protection to underground strata and watercourses and away from drains as far as is reasonably practicable. Vehicles and plant would not be left unattended during refuelling. • Only construction equipment and vehicles free of oil/fuel leaks which could cause material contamination would be permitted onsite. Drip trays would be placed below static mechanical plant. • Spillage kits would be stored at key locations on site (and defined within the Emergency Preparedness Plan) and in particular at refuelling areas. Spillage kits would also be kept with mobile bowsers and staff would be trained in their use. • All wash down of vehicles (including wheel washing) and equipment would take place in designated areas, and wash water would be prevented from passing untreated into watercourses and groundwater. • Only biodegradable hydraulic oils would be used in equipment working in or over watercourses, and appropriate measures are to be taken to protect erodible earthwork surfaces. • A secant form of pile construction, combined with a water excluding reinforced concrete base slab shall be used for construction of the cutting at Markeaton junction, where the cutting would extend below monitored groundwater levels. • The main construction compound at Little Eaton junction and the various satellite compound areas shall be connected in foul water system connections. However, should such connections not be available, foul water shall be stored in double skinned tanks on site and transported to a local sewage treatment works (STW) by tanker for treatment.					
MW-WAT9	ES Chapter 13, Section 13.9	**Dewatering and abstraction:** The main works contractor shall adopt construction techniques which minimise, so far as reasonably practicable, the need for and extent of dewatering and groundwater abstraction. The main works contractor shall be responsible for obtaining the necessary approvals and permits to enable and abstraction and discharge of pumped water in an approved manner.	To limit, and where required, mitigate potential impacts on water flow and quality from dewatering activities.	Assessment within the ES assumes that dewatering would be minimised, where possible, and where dewatering is required, adequate	Granting of any permits/consents (if required outside of the DCO).	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
				measures to mitigate potential impacts would be employed throughout the construction period.			
MW-WAT10	ES Chapter 13, Section 13.9	**Flood Risk Management Plan** The main works contractor shall prepare a Flood Risk Management Plan to the Authority for approval, as part of the Water Management Plan. The plan would summarise: • Areas within Flood Zones 2 and 3, areas susceptible to surface water or groundwater flooding, and other flood risk sources, such as sewer flooding. • Any applications made, or likely to be made, for an environmental permit, where required in relation to flood defence, for temporary and permanent works and the status of the works. • Any specific requirements or conditions of the approval that would be obtained from the relevant consenting bodies. • Any flood risk management or mitigation measures implemented, or to be implemented, in support of temporary and permanent works proposals.	To reduce and mitigate flood risk.	Assessment within the ES assumes that adequate flood risk measures would be employed throughout the construction period.	Approval of the plan by the Authority Agency.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-WAT11	ES Chapter 13, Section 13.9	**Flood Risk – general provisions:** The main works contractor shall ensure that flood risk is managed safely throughout the construction and implementation period, and that all designs do not cause increased risk levels from those assessed in the Flood Risk Assessments (FRAs) included in the ES (refer to ES Appendices 13.2A, 13.2B and 13.2C [**TR010022/APP/6.3**]), and include the provision of a safe refuge during a flood event. The main works contractor shall be responsible for providing and maintaining continuous flood defence provision, where relevant, for both permanent and temporary works, to the statutory flood defence level as detailed within the FRAs. The main works contractor shall consider and implement appropriate measures to manage the potential risks of flooding from rivers, localised perched groundwater, overland surface water flows and sewer surcharging, in accordance with the details provided within the FRAs. This would include consideration of potential flow paths within the site which could become active in the event of extreme rainfall and/or sewer surcharging, particularly during temporary works. Overland flow paths would be determined by site topography, therefore vulnerable operations and materials would be located within elevated parts of the site where reasonably practicable, away from potential flow paths. If this is not possible, other appropriate protection measures would be incorporated. The main works contractor shall assess potential build-up of groundwater on the upstream side of below ground structures, as this may lead to a rise in groundwater levels and in severe occurrences of groundwater flooding. Any such issues shall be mitigate where appropriate. At the end of construction, where temporary support, such as sheet piling and secant piles, do not form part of the operational structure, pile walls where required would be removed, cut-down or piped through routes provided to prevent the potential build-up of groundwater.	To reduce and mitigate flood risk.	Assessment within the ES assumes that adequate flood risk measures would be employed throughout the construction period.	Implementation of stated measures.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-WAT12	ES Chapter 13, Section 13.9	**Surface water drainage:** The main works contractor shall ensure that the surface water drainage system reflects the mitigation measures identified within the ES.	To ensure the protection of the water environment.	n/a	Works undertaken in accordance with mitigation in ES.	Contractual requirement between The Authority and the preliminary works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-WAT13	ES Chapter 13, Section 13.11	**Monitoring of water resources:** The main works contractor shall carry out regular monitoring to identify: • Pollution risks that are unacceptably high. • Spillages and leakages. • Non-compliance with environmental permits/consents. • Suspected pollution incidences. The main works contractor shall consult with the relevant regulatory body regarding the pollution incident control plan which would set out the measures to be implemented to address any adverse findings from the monitoring procedures during and following completion of construction works. Monitoring requirements shall be set out within the Water Management Plan.	To ensure measures are performing to the required level and provide opportunity to implement additional actions (if required).	Assessment within the ES assumes mitigation measures are achieving their objectives (to avoid pollution or deterioration of watercourses/ waterbodies).	Implementation of the identified monitoring requirements.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
CLIMATE CHANGE							
MW-CC1	ES Chapter 14, Section 14.9	**Climate change GHG mitigation:** The main works contractor shall implement measures to reduce emissions during the construction of the Scheme, for example through materials specification and the management and minimisation of energy use. The construction contractor shall develop and implement a plan to reduce energy consumption and associated carbon emissions. This could include the consideration of renewable and/or low or zero carbon energy sources and record percentage of savings implemented. Where practicable, measures would be implemented to manage material resource use during construction including: • Using materials with lower embedded greenhouse gas emissions and water consumption. • Using sustainably sourced materials. • Using recycled or secondary materials. Energy consumption and materials use would be recorded and reported on an ongoing basis during the construction phase of the Scheme using Highways England Carbon Reporting Tool.	To minimise the impacts of the construction of the Scheme on climate change.	n/a	Measures implemented as indicated.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-CC2	ES Chapter 14, Section 14.9	**Climate change resilience mitigation:** The main works contractor shall improve the resilience of the Scheme to climate change through a range of design and material specification measures including where practicable: the procurement and use of construction materials with superior properties (such as increased tolerance to fluctuating temperatures), and incorporation of current road design standards and future climate change allowances.	To improve the resilience of the Scheme to future climate change.	n/a	Measures implemented as indicated.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
TRAFFIC MANAGEMENT							
MW-TRA1	n/a	**Traffic management measures (general):** The main works contractor shall implement traffic management measures during the construction of the Scheme on all public roads and pedestrian and cyclist routes. A notice period may be required prior to the implementation of certain temporary traffic management measures including the occupation or temporary closure of existing roads. Temporary signs erected during the works would be consistent with the Traffic Signs Manual: Chapter 8: Traffic Safety Measures and Signs for Road Works and Temporary Situations. Traffic signs would comply with the Traffic Signs Regulations and General Directions and would be located where they are clearly visible to road users and cause minimum disruption.	To reduce the potential for impacts upon the public road network.	The Scheme cannot be constructed without traffic management.	Provision of appropriate traffic management measures.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-TRA2	n/a	**Traffic Management Plan (TMP):** The main works contractor shall prepare and implement a detailed TMP, developed with reference to the Traffic Management Act 2004, based upon the TMP provided in [**TR010022/APP/7.4**]. The contractor's detailed TMP would restrict HGV movements to the strategic highway network – namely the A38 (north and south), the A61 (south), the A6 (north), the A52 (west) and the A5111 Kingsway. The main works contractor shall consult with the following agencies/organisations when developing the detailed TMP: • Relevant roads authorities, including Highways England, DCiC/EBC, and the police force. • Public transport operators. • The organisers of any major or significant local events, and owners of significant local visitor attractions (including the National Trust). • Other relevant organisations regarding traffic management and control	To ensure the safe transition for road users from existing roads to the traffic managed sections of road.	The Scheme cannot be constructed without traffic management.	The Authority approval of the contractor's detailed TMP.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 11.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		measures to be implemented to accommodate abnormal traffic. The contractor's detailed TMP shall include: • Measures to provide for the safety of traffic, the public and construction staff during traffic management works and temporary traffic control measures. • A programme of traffic management measures to be implemented and details of traffic management proposals for the works on or adjacent to public roads. • Procedures to be followed for the temporary or permanent closure or diversion of roads or accesses, including demonstration to the relevant authorities that the construction work cannot be carried out safely without the road closure and agreed diversion routes. • Existing pedestrian, equestrian and cyclist routes, including whether the routes are used by one or more of these groups of road users. • Traffic management layouts, signing and apparatus to be implemented on all affected PEC routes. • Procedures for informing local communities of all traffic management schemes in advance and the works. • Measures to be implemented to reduce construction traffic impacts or impacts associated with over-parking on residential streets. • The name and contact details of the main works contractor's Traffic Control Officer and information and advice for the public regarding ways to raise complaints or request information. • A register of applications for consents associated with temporary traffic management measures. • An organogram identifying the named Traffic Control Officer and their lines of reporting.					
MW-TRA3	n/a	**Construction Workforce Travel Plan:** The main works contractor shall prepare a Construction Workforce Travel Plan. The plan shall include: • Identification of a travel plan coordinator and a description of their responsibilities. • Key issues to consider for each compound/construction site or group of sites.	To encourage the use of sustainable modes of transport to reduce the impact of workforce travel on local residents and businesses.	There is no provision of construction worker accommodation and the workforce would be travelling to site.	The Authority approval of plan.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		• Site activities and surrounding transport network including relevant context plans. • Anticipated workforce trip generation and how it may change during the construction process. • Travel mitigation measures that would be introduced to reduce the impact of construction workforce on the transport network. • Target to reduce individual car journeys by the construction workforce. • Methods for surveying workforce travel patterns. • The process for monitoring and reviewing the Construction Workforce Travel Plan.					
MW-TRA4	n/a	**Site Access Plan:** The main works contractor shall develop a Site Access Plan (to be included within the contractor's detailed TMP) identifying site access and egress routes that may be used by the main works contractor and the mechanisms for how they can be varied. The main works contractor shall keep site access/egress points clear at all times and would design and construct site access/egress points to a suitable standard to enable the smooth access/egress of vehicles in a forward direction to limit disruption to road users due to use of the access points.	To reduce the potential for impacts upon the public road network.	Assessment within the ES assumes that the majority of construction traffic would arrive to site via the strategic road network.	The Authority approval of plan.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-TRA5	n/a	**Site Travel Plan:** The main works contractor shall develop a Site Travel Plan (to be included within the contractor's detailed TMP). The plan shall identify routes to site for materials and plant. Final agreed routes would be detailed within the contractor's detailed TMP and all sub-contractors would be provided with copies throughout the duration of the works. Access routes for construction traffic would be via special and trunk road network(s) and main roads on the local road network unless it is considered necessary for other local roads to be used. Access along residential roads would generally be prohibited unless there are clear reasons for their use. Where residential roads are to be utilised, the residents would be kept informed of the timing of the works in advance.	To reduce the potential for impacts upon the public road network.	Assessment within the ES assumes that the majority of construction traffic would arrive to site via the strategic road network.	The Authority approval of plan.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/ APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-TRA6	n/a	**Traffic management measures:** Where deemed necessary, following consultation, the main works contractor shall: • Provide speed detection cameras at temporary traffic management schemes and undertake road safety audits in accordance with DMRB. • Install CCTV cameras at agreed locations to monitor the traffic management schemes. • During construction on the line of the existing trunk road, operate a vehicle recovery system to minimise the impact of breakdowns or accidents on the flow of traffic.	To ensure safety on the road network is a priority consideration.	Various bodies would have regard to traffic management and safety.	Consultation with the relevant bodies and implementation of actions (if required).	Contractual requirement between The Authority and the main works. contractor.	Main works contractor
MW-TRA7	n/a	**Haul routes:** The main works contractor shall provide haul routes through the works for use by construction vehicles (refer to ES Figures 2.11a/b/c [**TR010022/APP/6.2**]). Site access points shall be positioned where possible to enable the use of haul routes to be maximised throughout the works, rather than using public roads. Traffic management measures would be provided by the main works contractor where the crossing of public roads is required.	To reduce the potential for impacts upon the public road network.	The Scheme cannot be constructed without traffic management.	Provision of haul routes within the works.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-TRA8	n/a	**Abnormal loads:** Where abnormal loads are required for the works the main works contractor shall inform the police, the highway authorities or bridge and structure owners, as appropriate. The procedures for the movement of abnormal loads would be set out in the contractor's detailed TMP. Movement of abnormal loads is controlled by MW- G17.	To reduce the potential for impacts upon the public road network.	The Scheme is anticipated to require abnormal loads delivered to site.	Development of the contractor's detailed TMP in consultation with the identified agencies and organisations.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-TRA9	n/a	**Temporary roads/accesses:** Where the main works contractor proposes to provide a temporary or substitute road or access or the like, the width and standard of construction and any lighting and signage required shall be suitable for the traffic anticipated to use the route. Temporary or substitute road access shall be maintained by the main works contractor throughout the works to provide adequately for the traffic using the affected routes. The main works contractor would apply for any consent required for temporary traffic management schemes.	To reduce the potential for impacts upon the public road network.	Temporary roads would be required during the construction period.	The provision of suitable temporary roads and application/granting of required consents.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source Ref. [TR010022/APP/6.1]	Action/commitment (including specific location and any monitoring required)	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
MW-TRA10	n/a	**Mitigation for traffic management measures:** Where the proposed traffic management measures may affect the flow of public transport vehicles and the location of public transport stops or shelters appropriate mitigation measures would be implemented. This would take in account the particular needs of groups with protected characteristics as defined under the Equality Act 2010. Where separate routes used by pedestrians and other PEDs are affected, the main works contractor shall provide (and identify within the contractor's detailed TMP) alternative appropriate and accessible routes within the traffic management scheme being implemented. Once agreed, the specific right of way affected would be scheduled with appropriate nomenclature and diversion routes suitably signposted throughout the works.	To reduce impacts on public transport and PEDs.	Assessment within the ES assumes that appropriate measures would be employed to reduce adverse effects on the public transport network and PEDs.	Provision of the specified actions.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
MW-TRA11	n/a	**Monitoring of traffic management measures, traffic flows, and public services:** The main works contractor shall outline a monitoring regime within the detailed TMP, to include the below points: • The main works contractor shall monitor traffic management schemes, traffic levels on roads and site accesses and public roads adjacent to access points to maintain their effectiveness and condition throughout the works and to provide for the safety of traffic, the public and construction staff during traffic management works. • The main works contractor shall monitor public transport services with regards to journey times and reliability as well as location of public transport stops or shelters to determine the level of impact. The main works contractor would also liaise with bus service providers and DCiC and EBC to identify any changes in public transport passenger numbers as a consequence of service alterations. The main works contractor would provide information regarding any delays to traffic or public transport services due to construction works to The Authority and DCiC and EBC.	To ensure traffic management is effective and in good condition throughout the works and to provide for the safety of traffic, the public and construction staff during traffic management works.	Assessment within the ES assumes that traffic management measures would adequately mitigate the effects of construction related traffic issues.	Application of an appropriate monitoring regime and implementation of remedial actions (if required).	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Table 3.2c: REAC tables for the main works – Scheme design (measures to be included in the Scheme design by the main works contractor – refer to the Environmental Masterplans - Figures 2.12a to 2.12h **[TR010022/APP/6.2]**)

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
CULTURAL HERITAGE							
D-CH1	ES Chapter 6, Section 6.14 (Environmental Masterplan ES Figure 2.12c)	Existing access to Markeaton Park to be closed and the existing exit on the A51 Ashbourne Road made into a combined access and exit (signalised).	To provide landscape integration and to create a new park entrance that is sympathetic to the significance of the park.	Re-designed park entrance.	Effective design and construction of a new park entrance.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor.
D-CH2	ES Chapter 6, Section 6.14 (Environmental Masterplan ES Figure 2.12c)	Removal of the closed toilet facilities block within Markeaton Park.	To remove an adverse impact upon the park entrance setting.	Re-designed park entrance.	Effective design and construction of a new park entrance.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-CH3	ES Chapter 6, Section 6.14 (Environmental Masterplan ES Figure 2.12c)	Dismantling a section of the Markeaton Park boundary wall and rebuilding it on a new alignment.	To provide landscape integration and to ensure that the rebuilt wall is sympathetic to the significance of Markeaton Park.	Re-designed park entrance.	Effective design and construction of a new park entrance.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor.
D-CH4	ES Chapter 6, Section 6.14 (Environmental Masterplan ES Figure 2.12e)	Naturalistic profile for the floodplain compensation area at Little Eaton junction to ensure that it blends in with the surrounding valley profile as well as enabling the land to be returned to agricultural use. No residual spoil heaps would be left at the site.	To reduce the visual intrusion of the floodplain compensation area within the World Heritage Site (WHS) and to blend it into the existing landscape.	Integration of floodplain compensation area into surrounding landscape.	Effective design and construction of the floodplain compensation area.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor.
LANDSCAPE AND VISUAL							
D-L1	ES Chapter 7, Landscape design ES Figures 7.8a, b (Environmental Masterplan ES Figures 2.12a – c)	New A38 in underpasses at Kingsway junction and Markeaton junction to reduce visual intrusion.	For landscape integration.	Impacts on local landscape character and visual amenity.	Effective design	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor/ Maintenance authority

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
D-L2	ES Chapter 7 (Environmental Masterplan Figure 2.12f/g)	Combined noise and visual screening barriers approximately 2.5m high along the northbound mainline A38 in the vicinity of the Ford Farm Mobile Home Park, and along the southbound mainline A38 and associated diverge slip-road as the Scheme passes Breadsall village.	For landscape integration and habitat connectivity along the Scheme.	Impacts on local landscape character and visual amenity.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 15.	Main works contractor/ Maintenance authority
D-L3	ES Chapter 7, Landscape design ES Figures 7.8a – c (Environmental Masterplan Figures 2.12a – 2.12h)	Provision of a landscape design that include areas of amenity grassland, grassland with bulbs, species rich grassland, and native planting/Planting would include: individual trees, woodland, woodland edge, shrubs with intermittent trees, shrubs, hedgerows, hedgerows with trees, ornamental shrubs and wetland plants. Refer to landscape design Figures 7.8a – 7.8c [**TR010022/APP/6.2**]. Key elements of the landscape design are detailed below.	For landscape integration and habitat connectivity along the Scheme.	Impacts on local landscape character and visual amenity.	Effective design and landscape integration.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 5.	Main works contractor/ Maintenance authority
		• Wetland habitat creation at the flood storage areas located adjacent to Bramble Brook at Kingsway junction. • Species rich grassland to be located adjacent to the southbound merge slip road and the earthworks adjacent to the northbound diverge slip road at Kingsway junction. • Semi-mature tree planting between A38 southbound carriageway and southbound merge slip road at Kingsway junction to provide instant impact visual screening and landscape integration. • Native woodland and shrub planting between A38 southbound carriageway and southbound merge slip road at Kingsway junction to provide visual screening and landscape integration. • Habitat creation to be included as part of the highway runoff attenuation pond between the north and southbound carriageways to the south of Kingsway junction. • Native woodland planting between A38 southbound carriageway and southbound merge slip road at Kingsway junction to provide visual screening and landscape integration. • Native woodland planting and shrubs with intermittent trees between the A38 and Mackworth Park, at Kingsway junction to provide visual screening and landscape integration. • Native woodland planting and native shrub planting between the northbound carriageway and northbound diverge slip road at Kingsway junction. • Two dumbbell roundabouts at Kingsway junction to incorporate species rich grassland and native shrub planting to enhance biodiversity and landscape integration. • Woodland edge planting in front of existing woodland adjacent to the northbound merge slip road at Kingsway junction to provide visual screening and promote landscape integration. • Semi-mature tree planting, native woodland planting and native shrub planting between A38 northbound carriageway and northbound merge slip road at Kingsway junction to provide visual screening and landscape integration. • Native woodland planting between A38 northbound and southbound carriageways to the north of Kingsway junction to provide visual screening and landscape integration.					

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		• Native shrub planting adjacent to the new link road to Kingsway Park Close and Kingsway junction to promote visual amenity and landscape integration. • Native woodland planting adjacent to the northbound and southbound carriageways to the north of Brackensdale Avenue and Kingsway junction to provide visual screening and landscape integration. • 1.5m high noise barriers on both the northbound and southbound A38 mainline between Brackensdale Avenue underbridge and Markeaton junction to be planted with climbing plants to promote biodiversity and landscape integration. • Semi-mature tree planting adjacent to the southbound carriageway, to the south of Markeaton junction to provide instant impact, visual screening and landscape integration. • Native shrub planting adjacent to the northbound diverge slip road at Enfield Road and land at the ESSO petrol station site, Markeaton junction to promote landscape integration and visual amenity. • Native woodland planting adjacent to the southbound merge slip road at Markeaton junction for visual screening and landscape integration. • Reinstatement of planting at Markeaton Park boundary following works to the utilities corridor to include native tree and shrub planting and semi-mature avenue planting incorporating disease resistant Elm trees to promote biodiversity, provide instant visual screening and landscape integration. • Native scattered trees and shrubs to be planted within Markeaton junction for landscape integration and visual amenity. • Native woodland planting adjacent to northbound carriageway and northbound merge slip road at Markeaton junction for visual screening and landscape integration. • 4m high noise barrier along the boundary of the Royal School for the Deaf at Markeaton junction to be planted with climbing plants to promote biodiversity and landscape integration. • Creation of public open space and combined cycleway and footpath link from A52 to the new footbridge, to the north of Markeaton junction. Public open space to incorporate areas of wildflower grassland, semi-mature tree planting and ornamental planting to promote biodiversity, provide instant screening and landscape integration. • Creation of new species rich grassland within Markeaton Park. • Native woodland planting to the south of the A38 at Little Eaton junction to provide visual screening and landscape integration. • Native woodland planting on the embankment adjacent to the southbound diverge slip road at Little Eaton junction for visual screening and landscape integration. • Native woodland planting on the embankment between the southbound merge slip road and southbound carriageway Little Eaton junction for visual screening and landscape integration. • Linear belts of shrubs and trees on the embankment between the northbound diverge slip road and northbound carriageway at Little Eaton junction for visual screening and landscape integration. • Native woodland planting on the cuttings adjacent to the southbound carriageway and southbound diverge slip road at Little Eaton junction to provide visual screening and landscape integration. • Scattered trees, native woodland and species rich grassland located adjacent to the northbound merge slip road at Little Eaton junction for visual screening and landscape integration.					

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
D-L4	ES Chapter 7, Landscape design ES Figure 7.8a (Environmental Masterplan ES Figure 2.12b)	Access closure at Brackensdale Avenue to be reinstated and landscaped to integrate with existing area of open space.	For landscape integration along the Scheme.	Impacts on local landscape character and visual amenity.	Effective design and landscape integration.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 5.	Main works contractor/Maintenance authority
D-L5	ES Chapter 7, Landscape design ES Figure 7.8b (Environmental Masterplan ES Figure 2.12c/d)	New semi-mature tree planting to replace trees to be removed along the boundary of Markeaton Park. Trees to include disease resistant Elms to promote biodiversity in the area.	For landscape integration and habitat connectivity along the Scheme.	Impacts on local landscape character and visual amenity.	Effective design and landscape integration.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 5.	Main works contractor/Maintenance authority
D-L6	ES Chapter 7, Landscape design ES Figure 7.8b (Environmental Masterplan ES Figure 2.12c)	Reconfiguration of Markeaton Park entrance and associated landscaping.	For landscape integration and habitat connectivity along the Scheme.	Impacts on local landscape character and visual amenity.	Effective design and landscape integration.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 5.	Main works contractor/Maintenance authority
D-L7	ES Chapter 7, Landscape design ES Figure 7.8b (Environmental Masterplan ES Figure 2.12c)	New area of public open space at Queensway to incorporate a combined cyclepath and footpath, plus planting to promote local habitats.	For landscape integration along the Scheme.	Impacts on local landscape character and visual amenity.	Effective design and landscape integration.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 5.	Main works contractor/Maintenance authority
D-L8	ES Chapter 7, Landscape design ES Figure 7.8b (Environmental Masterplan ES Figure 2.12c/d)	Landscaping around the replaced Markeaton footbridge.	For landscape integration along the Scheme.	Impacts on local landscape character and visual amenity.	Effective design and landscape integration.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 5.	Main works contractor/Maintenance authority

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
D-L9	ES Chapter 7, Landscape design Figure 7.7c (Environmental Masterplan Figure 2.12e)	Naturalistic profile for the floodplain compensation area at Little Eaton junction to ensure that it blends in with the surrounding valley profile as well as enabling the land to be returned to agricultural use. No residual spoil heaps would be left at the site.	To reduce the visual intrusion of the floodplain compensation area within the World Heritage Site (WHS) and to blend it into the existing landscape.	Integration of floodplain compensation area into surrounding landscape.	Effective design and construction of the floodplain compensation area.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 5.	Main works contractor.
D-L10	ES Chapter 7, Landscape design ES Figure 7.8c (Environmental Masterplan ES Figure 2.12e)	Closure of Ford Lane access and reinstated as landscape area.	For landscape integration and habitat connectivity along the Scheme.	Impacts on local landscape character and visual amenity.	Effective design and landscape integration.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 5.	Main works contractor/Maintenance authority
D-L11	ES Chapter 7, Landscape design ES Figures 7.8b/c (Environmental Masterplan ES Figures 2.12c and 2.12g)	Landscaping of closed sections of A38 – includes existing northbound A38 from Markeaton junction and a section of existing A38 mainline carriageway located to the north of Little Eaton junction.	For landscape integration and habitat connectivity along the Scheme.	Impacts on local landscape character and visual amenity.	Effective design and landscape integration.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 5.	Main works contractor/Maintenance authority
BIODIVERSITY							
D-B1	ES Chapter 8, Section 8.9, Landscape design ES Figures 7.8a-c (Environmental Masterplan ES Figures 2.12a – 2.12h)	Provision of native species-rich grassland habitat, wet woodland creation, woodland and scrub replacement within the Scheme boundary (order limits), including along the highway verges, cuttings, embankments etc. for landscape integration and ecological connectivity.	To provide habitat connectivity and provide landscape integration.	Maintaining habitat connectivity.	Habitat monitoring surveys to be undertaken yearly up to a maximum of 5 years post construction to inform management intervention.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor/Maintenance authority
D-B2	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figures 2.12a – 2.12d)	Incorporation of disease resistant elms near Mackworth Park and Markeaton Park to aim to assist the continued survival of white-letter hairstreak (*Satyrium w-album)* (although not recorded during surveys, this species is known in the area).	Planting of disease resistant elms to assist the continued survival of white-letter hairstreak.	Although not recorded during surveys white-letter hairstreak is known in the area.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	The Authority/Maintenance Authority

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
D-B3	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figures 2.12d)	Translocation of species-rich grassland soils from the A38 Roundabout LWS into Markeaton Park. If during detailed design stage translocation is not deemed suitable (for example, following detailed analysis of soil testing of the receptor site), then planting of a bespoke native seed mix would be undertaken instead to achieve the same ecological outcome.	To mitigate for the loss of the A38 Roundabout LWS species-rich grassland.	Complete loss of the A38 Roundabout LWS.	Habitat monitoring surveys to be undertaken yearly up to a maximum of 5 years post construction to inform management intervention.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B4	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12f)	Area of Alfreton Road Rough Grassland LWS at Little Eaton junction lost during construction would be reinstated with species-rich grassland planting and non-native invasive plant species controlled in the vicinity.	Mitigate for loss of habitat within Alfreton Road Rough Grassland LWS to protect integrity.	Create grasslands for the mitigation of loss of Alfreton Road Rough Grassland LWS.	Habitat monitoring surveys to be undertaken yearly up to a maximum of 5 years post construction to inform management intervention.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B5	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12e)	Section of woodland lost within the non-designated site of interest A38 Scrub Other Site of Interest DE05.03 at Little Eaton junction (to provide an access route to the proposed floodplain compensation area) to be reinstated.	Reinstate habitat lost within A38 Scrub Other Site of Interest DE05.03 to protect integrity.	Woodland lost to be reinstated and handed back to the landowner.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B6	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12g)	Area of species-rich grassland, marshy grassland and scrub of terrestrial invertebrate, bird and badger interest, located within the Little Eaton junction main construction compound to be reinstated post-construction.	Reinstate habitat within the main construction compound to pre-existing conditions.	Habitat reinstated and handed back to the landowner.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B7	ES Chapter 8, Section 8.9 (Environmental Masterplan Figures 2.12a – 2.12h)	Planted native broadleaved woodland, with high-quality flora understory and timber from felled trees. Timber would be used to provide dead wood habitats for saproxylic (dead wood loving) species, placed in the understorey of woodland.	To mitigate for the loss of woodland and trees.	Habitat loss resulting in the loss of woodland and trees.	Habitat monitoring surveys to be undertaken yearly up to a maximum of 5 years post construction to inform management intervention.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
D-B8	ES Chapter 8, Section 8.9 (Environmental Masterplan Figure 2.12d)	Timber from felled trees to provide suitable amphibian hibernacula and log piles near new ponds to be created, and within areas of public open space and soft estate near Markeaton Lake and Mill Pond at Markeaton junction.	To provide shelter and refugia for amphibians.	Impacts on toads due to terrestrial habitat loss.	Habitat monitoring surveys to be undertaken yearly up to a maximum of 5 years post construction to inform management intervention.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B9	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12c)	The veteran tree to be lost by Markeaton footbridge (with its existing potential bat roost features retained) to be made into a totem pole feature and installed at the edge of Markeaton Park as part of the bat mitigation strategy.	Loss of veteran tree to be utilised as part of bat mitigation.	Loss of veteran tree by Markeaton footbridge.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B10	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figures 2.12a – 2.12h)	Retained trees to be protected as per British Standard BS: 5837 Trees in relation to design, demolition and construction – Recommendations (BSI, 2012). This includes: • Veteran trees near floodplain compensation area and temporary soil storage area at Little Eaton junction. • Woodland blocks at Markeaton Park LWS and near Mill Pond at Markeaton junction; Mackworth Park and A38 southbound (adjacent to Kingsway hospital) at Kingsway junction; and west of the A38 northbound (near the Derby Garden Centre), north and south of the A38 at the River Derwent bridge, and to the north of the Flood Arch Bridge and Railway Bridge at Little Eaton junction.	To protect trees (including veteran trees and woodland) to be retained.	Potential to damage retained habitat during construction activities.	Fencing to be approved by competent arborist or ecologist.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B11	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12a)	Design and build Bramble Brook realignment to include the following: • A series of inset alternate berms to improve flow variation, help to reduce fine sediment deposition and provide suitable available habitat for in-channel macrophytes. • The base of the four flood storage areas	To mitigate the loss of Bramble Brook; which supports aquatic invertebrates and riparian mammal habitat.	Impacts on Bramble Brook and associated aquatic invertebrate and riparian mammal habitat.	Habitat and species monitoring surveys to be undertaken yearly up to a maximum of 5 years post construction to inform management	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		located adjacent to Bramble Brook to be kept wet (to a depth of 100mm) to provide wetland habitat within the riparian corridor.			intervention.		
D-B12	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12f)	Design and build Dam Brook realignment, associated wildlife ponds and wetland habitat to include the following: • Sinuous channel form within a vegetated corridor. • In-channel features, regularly wetted berm, inset berms and point bars, to improve bed and bank structure. • Where the bed of the watercourse is raised, encourage a more natural bed formation. • Backwaters (wildlife ponds) to improve the habitat for both coarse and salmonid fish and brook lamprey. • Flood alleviation channel planted to form a wet woodland connecting to the realigned Dam Brook. • Two attenuation ponds for collection and treatment of highway drainage, and new section of open swale.	To mitigate and enhance the loss of Dam Brook which supports fish, aquatic invertebrates, and riparian mammal habitat; and creates new wetland habitat of potential benefit to birds.	Impacts on Dam Brook and associated fish, aquatic invertebrate riparian mammal, and potentially wetland bird habitat.	Habitat and species monitoring surveys to be undertaken yearly up to a maximum of 5 years post construction to inform management intervention.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B13	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figures 2.12e – 2.12g)	Rank grassland incorporated into the landscape design adjacent to retained arable habitat linking the Scheme to the wider landscape at Little Eaton junction; however away from the road (to avoid potential attraction of barn owl).	To provide grassland field margins for lost arable habitat.	No notable field margins to be lost. Arable land however to be lost.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B14	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figures 2.12f/g)	Planting of species-rich hedgerow to mitigate and enhance for species-poor hedgerow lost.	To mitigate and enhance for loss of species-poor hedgerow.	Loss of species-poor hedgerow.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
D-B15	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figures 2.12a – 2.12h)	Scheme design incorporates highway drainage system that includes one attenuation pond at Kingsway junction, a wet sedimentation pond at Markeaton junction, plus two highway runoff attenuation ponds at Little Eaton junction. In addition, the Scheme would provide two new ecology ponds at Little Eaton junction as part of the works to realign of Dam Brook.	Biodiversity enhancement/drainage strategy/landscape integration.	No ponds to be lost. Ponds to be created.	Habitat monitoring surveys to be undertaken yearly up to a maximum of 5 years post construction to inform management intervention.	Contractual requirement between The Authority and the main works contractor.	Main works contractor
D-B16	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12d)	The culverts connecting Markeaton Lake and Mill Pond/Middle Brook to be retained thus ensuring habitat connectivity is maintained for amphibians (toads).	Maintain habitat connectivity for amphibians (toads) at Markeaton junction.	Culvert connecting Markeaton Lake and Mill Ponds/Middle Brook to be retained.	n/a	Contractual requirement between The Authority and the main works contractor.	Main works contractor
D-B17	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figures 2.12d)	Scheme kerb design at Markeaton junction would allow amphibians to bypass gully gratings minimising the risks of them getting trapped if they follow the kerb of the road.	To minimise killing and injury to amphibians during operation.	No amphibian crossing points to be severed.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B18	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figures 2.12c – 2.12d)	Mixed urban planting, including shrubs, scrub, trees and grassland incorporated into the landscape design at Markeaton junction for benefit of hedgehogs.	To provide shelter and food resource for hedgehogs.	Habitat loss at Markeaton junction.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B19	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figures 2.12e – 2.12g)	Dense woodland shelterbelt to be created to the east, south and south-west of the A38 at Little Eaton junction to: • Encourage barn owls in the wider area to fly up and over the road. • Screen the new road from the notable farmland bird assemblage, nesting lapwing, potential nesting little ringed plover and oyster catcher and wintering birds in the pastoral and flooded fields.	To minimise visual disturbance to notable birds from operational traffic.	Existing shelterbelt to be lost.	Habitat and species monitoring surveys to be undertaken yearly up to a maximum of 5 years post construction to inform management intervention.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
D-B20	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12a)	Installation of 20 No. bird boxes within Mackworth Park.	To replace common nesting bird habitat lost (primarily crevice dwelling species).	Impacts on birds due to habitat loss (trees and buildings).	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B21	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12c)	Translocation of known roosting features from tree M2, noctule maternity roost (and potential hibernation roost), with sections of the tree M2 being strapped and attached to a nearby tree (G361*) under direction of a bat licence holder. An eco-rocket box also to be implemented within the same woodland parcel (G361*) as the noctule roost.	To mitigate for loss of maternity and hibernating noctule roost at Tree M2.	Tree M2 to be lost.	Monitoring as per Natural England EPSML.	Contractual requirement between The Authority and the main works contractor. Implemented through Natural England EPSML. DCO Requirement 12.	Main works contractor
D-B22	ES Chapter 8, (Environmental Masterplan ES Figure 2.12c)	Integration of bat roost features onto the 4m high noise barrier along the Scheme boundary with the Royal School for the Deaf. Sections of the noise barrier (facing away from the road) provided with a 2cm wooden cavity sectioned regularly to provide different lengths of cavities available to suit more than one bat species. Replacement roosting features would comprise approximately 6 no. along the length of noise barrier.	To mitigate for loss of roost at building B8-QW30.	B8-QW30 to be lost.	Monitoring as per Natural England EPSML.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B23	ES Chapter 8, (Environmental Masterplan ES Figure 2.12c)	A bat box suitable for hibernation positioned within the woodland parcel (G361*) in the unlikely scenario that bats are encountered during licenced soft strip and demolition of building QW30. This would be a temporary feature if it was not utilised by bats during the construction period.	To mitigate for loss of roost at building B8-QW30.	B8-QW30 to be lost.	Monitoring as per Natural England EPSML.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B24	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12e)	Three bat boxes would be installed as part of the bridge extension works at B2 Flood Arch Bridge within the bridge abutment to create replacement roosting locations.	To mitigate for loss of roost at B2 Flood Arch Bridge.	B2 Flood Arch Bridge to be extended.	Monitoring as per Natural England EPSML.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
D-B25	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12d)	Creating suitable roost features in approximately 10 retained trees within the Scheme boundary at Markeaton Park (proactive management to improve their habitat value by creating features including natural fracture pruning).	To mitigate for loss of potential roost features across the Scheme.	Impacts on potential roost features.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B26	ES Chapter 8, Section 8.9 (Environmental Masterplan Figure 2.12c)	Creation of three totem poles within Markeaton Park using trees with existing roost features retained that would be felled due to the Scheme.	To mitigate for loss of potential roost features across the Scheme.	Impacts on potential roost features.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B27	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12a)	Installation of 10 bat mitigation features within Mackworth Park, namely: bat boxes such as 4 x Schwegler 2F, 2 x Schwegler 1FF and 2 x Schwegler 1FS, and hibernation boxes 2 x Schwegler 1FW.	To mitigate for loss of potential roost features across the Scheme.	Impacts on potential roost features.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B28	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12d)	Markeaton footbridge to be replaced to recreate navigational cue for bats at known flyway.	To replace existing footbridge.	ES assumes navigational cue for bats would be temporarily lost and then reinstated.	Bat crossing point survey to be undertaken yearly up to a maximum of 5 years post construction.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B29	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figure 2.12e – 2.12g)	Scheme provided with an appropriate lighting design – includes no lighting columns along A38 mainline at Little Eaton junction, plus taking account of guidance provided by IAN 116/08 (Highways England, 2008) and guidance provided by the Institute of Lighting (2018) regarding minimising lighting risks to bats.	To minimise light impacts upon bats.	ES assumes lighting designed to minimise impacts upon bats.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-B30	ES Chapter 8, Section 8.9 (Environmental Masterplan ES Figures 2.12a/b, 2.12e – 2.12g)	Install and maintain permanent badger fencing at Kingsway junction and Little Eaton junction to avoid badgers crossing the road and entering the highway.	Fencing to avoid badgers crossing over the road.	Impacts on badger territory/commuting.	Provision of suitable mammal fencing, to be approved by competent ecologist. Annual checks to monitor state of	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
					fencing and check for breaches in the fence.		
NOISE							
D-N1	ES Chapter 9, Section 9.9 (Environmental Masterplan ES Figures 2.12a – 2.12g)	Thin road surfacing installed on the mainline of the new A38 and its associated slip roads (low noise surface).	To reduce noise impacts from the Scheme, including on residential receptors.	Reduction of noise impacts upon nearby receptors.	Details of the thin noise surfacing at detailed design.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 15.	Main works contractor
D-N2	ES Chapter 9, Section 9.9 (Environmental Masterplan ES Figures 2.12b – 12.12c)	Approximate 1.5m absorptive barriers on both the northbound and southbound mainline between Brackensdale Avenue underbridge and Markeaton junction.	To reduce noise impacts within Mackworth and New Zealand.	Reduction of noise impacts upon nearby receptors.	Details of the absorbent noise barriers at detailed design. Minimum specification category A3 and B3 as defined in accordance with BS EN 1793 part 1 and 2.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 15.	Main works contractor
D-N3	ES Chapter 9, Section 9.9 (Environmental Masterplan ES Figures 2.12b)	Approximate 1.5m reflective noise barrier on the east side of Kingsway Park Close, which becomes an access link onto Kingsway junction.	To reduce noise impacts at properties on Cheviot Street, which back on to Kingsway Park Close.	Reduction of noise impacts upon nearby receptors.	Details of the noise barriers at detailed design. Minimum specification category B3 as defined in accordance with BS EN 1793 part 1 and 2.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 15.	Main works contractor
D-N4	ES Chapter 9, Section 9.9 (Environmental Masterplan ES Figure 2.12c)	Approximate 4.0m reflective noise barrier on the western boundary of the Royal School for the Deaf north of Markeaton junction.	To reduce noise impacts within the Royal School for the Deaf.	Reduction of noise impacts upon nearby receptors.	Details of the noise barriers at detailed design. Minimum specification category B3 as defined in accordance with BS EN 1793 part 1 and 2.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 15.	Main works contractor
D-N5	ES Chapter 9, Section 9.9 (Environmental Masterplan ES Figure 2.12e – 2.12g)	Approximate 2.5m reflective noise barrier on the southbound diverge slip road at Little Eaton junction; approximate 2.5m reflective/absorptive noise barrier on the southbound mainline at Little Eaton junction; and approximate 2.5m reflective	To reduce noise impacts within Breadsall village and Ford Farm Mobile Home Park.	Reduction of noise impacts upon nearby receptors.	Details of the noise barriers at detailed design. Minimum specification category A3 (for absorbent	Contractual requirement between The Authority and the main works contractor. DCO Requirement 15.	Main works contractor

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		noise barrier on the northbound mainline at Little Eaton junction.			section) and B3 as defined in accordance with BS EN 1793 part 1 and 2.		
PEOPLE AND COMMUNITIES							
D-PC1	ES Chapter 12: (Environmental Masterplan ES Figure 2.12a – 2.12g)	Provision of rights of way in accordance with the Streets, Rights of Way and Access Plans [**TR010022/APP/2.7**] and as detailed in Chapter 12: People and Communities (Section 12.9) [**TR010022/APP/6.1**].	To maintain and enhance footpath and cycleway connectivity.	Provision of suitable facilities for pedestrians and cyclists.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-PC2	ES Chapter 12: (Environmental Masterplan ES Figure 2.12c)	Provision of replacement public open space at Queensway, Markeaton Park and at the closed A38 Brackensdale Avenue access (refer to ES Figures 2.8 and 2.9 [**TR010022/APP/6.2**]).	To replace public open space lost to the Scheme.	Area of public open space equal to or greater than the area of public open space lost provided as part of Scheme.	n/a	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-PC3	ES Chapter 12: (Environmental Masterplan ES Figure 2.12c)	Relocation of sensory garden within the Royal School for the Deaf.	To replace the sensory lost to the Scheme.	Sensory garden to be relocated within the grounds of school as agreed with the school management team.	Agreement of actions with the Royal School for the Deaf.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
ROAD DRAINAGE AND FLOOD RISK							
D-RD1	ES Chapter 13,Section 13.9 – refer to ES Appendix 13.4 [**TR010022/APP/6.3**]; (Environmental Masterplan ES Figures 2.12a – 2.12g)	Drainage treatment areas provided in accordance with ES Appendix 13.4 Road Drainage Strategy [**TR010022/APP/6.3**].	Provision of flood and pollution control.	Refer to Road Drainage Strategy ES Appendix 13.4 [**TR010022/APP/6.3**].	In accordance with Road Drainage Strategy ES Appendix 13.4 [**TR010022/APP/6.3**].	Contractual requirement between The Authority and the main works contractor. DCO Requirement 13.	Main works contractor
D-RD2	ES Chapter 13, Section 13.9 (Environmental Masterplan ES Figure 2.12a)	Realignment of Bramble Brook, Culvert base set below the channel bed to allow substrate conveyance, improved flow capacity and improved species passage. Berms within the realigned channel to improve flow variation,	Provision of flood control and habitat creation.	Flood risk modelling as per ES Appendix 13.2A [**TR010022/APP/6.3**].	Flood management and habitat creation – refer to ES Appendix 13.3A.	Contractual requirement between The Authority and the main works contractor.	Main works contractor

Ref.	Source [TR010022/APP/6.1] [TR010022/APP/6.2]	Mitigation/commitment	Objective	Assumption on which the action is based	Achievement criteria and reporting requirements (if applicable)	How the action is to be implemented	Responsible person(s)
		reduce fine sediment deposition and provide suitable habitat for in-channel macrophytes.			[**TR010022/APP/6.3**].	DCO Requirement 12.	
D-RD3	ES Chapter 13, Section 13.9 (Environmental Masterplan ES Figure 2.12a)	Provision of four flood storage areas located adjacent to the realigned Bramble Brook at Kingsway junction. Base of flood storage areas to remain wet providing wetland habitat (water piped from Bramble Brook).	Provision of flood control.	Flood risk modelling as per ES Appendix 13.2A [**TR010022/APP/6.3**].	Flood management in accordance with ES Appendix 13.2A [**TR010022/APP/6.3**].	Contractual requirement between The Authority and the main works contractor. DCO Requirement 14.	Main works contractor
D-RD4	ES Chapter 13, Section 13.9 (Environmental Masterplan ES Figure 2.12c)	Secant retaining walls along each side of the cutting, combined with a reinforced concrete base slab to exclude groundwater from the cuttings and avoid post-construction groundwater pumping.	Prevention of impacts upon groundwater flows.	Prevention of impacts upon groundwater flows.	Groundwater flows as detailed in ES Chapter 13: Road Drainage and the Water Environment.	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-RD5	ES Chapter 13, Section 13.9 (Environmental Masterplan ES Figure 2.12e)	Provision of floodplain compensation area to the west of the River Derwent (and south of the A38).	Provision of flood control.	Flood risk modelling as per ES Appendix 13.2C [**TR010022/APP/6.3**].	Flood risk modelling as per ES Appendix 13.2C [**TR010022/APP/6.3**].	Contractual requirement between The Authority and the main works contractor. DCO Requirement 14.	Main works contractor
D-RD6	ES Chapter 13, Section 13.9 (Environmental Masterplan ES Figure 2.12a)	Realignment of Dam Brook to create a more sinuous channel form with a vegetated corridor.	Provision of flood control and habitat creation.	Flood risk modelling as per Appendix 13.2C [**TR010022/APP/6.3**].	Flood management and habitat creation – refer to Appendix 13.3B [**TR010022/APP/6.3**].	Contractual requirement between The Authority and the main works contractor. DCO Requirement 12.	Main works contractor
D-RD7	ES Chapter 13, Section 13.9 (Environmental Masterplan ES Figure 2.12f)	Creation of a multi-stage flood alleviation channel within a wet woodland to connect unnamed stream emanating from Breadsall Manor to the realigned Dam Brook.	Provision of flood control and habitat creation.	Flood risk modelling as per ES Appendix 13.2C [**TR010022/APP/6.3**].	Flood management and habitat creation – refer to ES Appendix 13.3B [**TR010022/APP/6.3**].	Contractual requirement between The Authority and the main works contractor. DCO Requirement 14.	Main works contractor

4 Consents and permissions

4.1 Consents and agreement position statement

4.1.1 As part of the DCO application, a Consents and Agreement Position Statement has been prepared and submitted [**TR010022/APP/3.3**]. This document sets out Highways England's intended strategy for obtaining the consents and associated agreements needed to implement the Scheme.

4.1.2 This chapter identifies the consents, permissions and agreements (outside of the DCO) that would be, or are likely to be, sought by either the preliminary works contractor (all) or the main works contractor in relation to the environmental aspects of the Scheme.

4.2 Consents and permissions

4.2.1 The principal consent for the Scheme would be a DCO. The DCO provides development consent for the works and enables land acquisition and temporary possession, along with many consents and powers to be dealt with at the same time. However, there may be a need to supplement the DCO with additional applications. Several additional consents and permissions that relate directly to measures within the OEMP may need to be sought separately from the DCO. These are outlined in Table 4.1.

4.2.2 The preliminary works contractor (all) and main works contractor shall update this chapter within the CEMP, to cover developments through the Scheme detailed design stage and throughout the construction phase, to ensure all relevant consents and permissions are captured.

Table 4.1: Consents and permissions that may be required (April 2019)

Issue:	Consent/Licence/ Agreement & Legislation	Consenting Authority	Requirement	Current position
Protected species licensing	A licence under section 10 of the Protection of Badgers Act 1992	Natural England	Permanent closure and destruction of confirmed badger sets.	Extensive discussions have been undertaken with Natural England. A draft licence application has been submitted to Natural England and they have confirmed acceptance in principal to the proposed works. A letter of no impediment has been issued by Natural England confirming that they would be minded to grant a formal licence for the works – refer to ES Appendix 8.19 [**TR010022/APP/6.3**].
	Bats - European Protected Species Licence under The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations); Wildlife and Countryside Act 1981	Natural England	Destruction of confirmed bat roosts.	Extensive discussions have been undertaken with Natural England. A draft licence application has been submitted to Natural England and they have confirmed acceptance in principal to the proposed works. A letter of no impediment has been issued by Natural England confirming that they would be minded to grant a formal licence for the works – refer to ES Appendix

Issue:	Consent/Licence/ Agreement & Legislation	Consenting Authority	Requirement	Current position
				8.19 [**TR010022/APP/6.3**].
	Permit to 'catch the fish' (FR2): an application for authorisation to use fishing instruments other than rod and line in England. Salmon and Freshwater Fisheries Act 1975 (as amended)	Environment Agency	For use of electrofishing equipment in Dam Brook.	A permit application would be made prior to the commencement of development. The permit application is determined within a statutory period of 28 days by the Environment Agency. The Environment Agency has advised that the permit applications can be made following a decision being made on the DCO application.
	Permit to 'move the fish' (SP1) Keeping and Introduction of Fish Regulation 2015	Environment Agency	To move fish from Dam Brook to a suitable receptor site.	A permit application would be made prior to the commencement of development. The permit application is determined within a statutory period of 28 days by the Environment Agency. The Environment Agency has advised that the permit applications can be made following a decision being made on the DCO application.
Environmental/ water/waste/ drainage	Water Abstraction: Licence under sections 24 and 25 of the Water Resources Act 1991 (restrictions on abstraction and impounding; restrictions on impounding)	Environment Agency	Consent may be required, typically if more than 20m^3 of water per day is being taken or if the abstraction is to be longer than 28 days. The Environment Agency has a regulatory position statement on temporary dewatering within the stated exemptions of part 2 regulation 5 of the Water and Abstraction and Impounding (Exemptions) 2017.	Dewatering is likely to be required during the construction of the cutting at Markeaton and in addition for any other cutting within the Scheme that intersects with groundwater including perched groundwater. The extent of dewatering and need for consent will be discussed with the Environment Agency during the preliminary works phase and any necessary consent secured at that time.
	An Environmental Permit for the disposal of waste materials under the Environmental Permitting Regulations as amended (2016).	Environment Agency	Disposal of waste materials.	It is considered that the majority of the earthworks materials excavated during the works would be re-used within the works following the guidance in CL:AIRE (2011) Definition of Waste: Development Industry Code of Practice (v.2) (DoWCoP). Agreement will be sought from the Environment Agency that they are satisfied that the DoWCoP route is acceptable for the earthworks proposed at the site and that the correct procedures have been followed.
Environmental/ water/waste/ drainage	Discharge to controlled water and/or groundwater under Environmental Permitting (England and Wales) Regulations 2016	Environment Agency	Discharge of water from excavation dewatering activities	Where dewatering of excavations is required, the collected water will require discharge to surface water (alternatively to foul sewer). A permit is required from the Environment Agency setting out agreed volumes and allowable determinand[3] concentrations. This will be sought by the contractor prior to works taking place.

[3] Determinand

Issue:	Consent/Licence/ Agreement & Legislation	Consenting Authority	Requirement	Current position
	Control of Asbestos Regulations 2012	Health and Safety Executive (HSE)	Work with asbestos	The former landfill at Kingsway junction accepted asbestos waste, confirmed during the ground investigation. Work (removal work) with asbestos is likely to require a licence from HSE for the earthworks to create the cutting at the former Kingsway landfill. A licence will be sought by the contractor prior to removal work taking place.
	Trade Effluent Discharge Consent. Water Industry Act 1991 (as amended)	Severn Trent Water	Possible discharge to public foul sewers.	For discharges over 6 months duration full consent would be required. At this stage it is considered unlikely to be needed, but may be required for the temporary discharge of construction site runoff, should the contractor decide to drain to a public sewer. As applicable, consent would be sought from Severn Trent Water by the construction contractor.
	Environmental Permit for Flood Risk Activity. Environmental Permitting (England and Wales) Regulations 2016	Environment Agency	Works to be undertaken on or near a Main River, on or near a flood defence structure, or in a flood plain.	This consent is likely to be sought once detailed design work is undertaken. The Environment Agency has been consulted extensively on the Scheme proposals from a flood risk perspective and therefore they are aware of the works to be undertaken within the floodplain. The Environmental Agency has confirmed that the floodplain compensation provisions at Little junction would be appropriate. Discussions will continue prior to a permit application being made.
Environmental/ water/waste/ drainage	Section 61 (Part III of The Control of Pollution Act 1974	Derby City Council and Derbyshire County Council	Consent offers the applicant protection from any subsequent action by the local authority under Section 60 or Section 66 of the Control of Pollution Act 1974 or under the Environmental Protection Act 1990 to impose further controls on noise from the site.	This consent is not mandatory, but allows the main contractor to obtain consent from the local authority regarding noise requirements. This will be considered for the Scheme and discussions will take place with Derby City Council and Erewash Borough Council as to whether this consent will be sought.

5 Environmental asset data and as built drawings

5.1 The Authority environmental information system

5.1.1 The Authority Environmental Information System (EnvIS) consists of specific environmental data supplied by service providers, The Authority and other bodies which is collated and displayed in Highways England's HAGIS geographical information system. This data is used to assist in managing the environment, within and surrounding the strategic road network, and in the review and reporting of the environmental performance of both service providers and Highways England.

5.1.2 The aim of EnvIS is to assist Highways England and service providers in designing and managing the strategic road network in an accurate, consistent and environmentally sound manner. Specifically, it aims to achieve the following key strategic and operational objectives:

a) Enable consistent and accurate recording and retrieving of specific environmental data about the strategic road network.

b) Assist in the review and reporting of environmental performance of both The Authority and service providers.

c) Improve understanding of the environmental issues and opportunities that must be considered at different stages of trunk road and motorway management.

d) In line with ensuring a value for money approach, assist in the prioritisation of environmental management actions based on an understanding of the condition of the Element[4] and environmental objectives.

e) Assist in the handover of environmental data from Designers to Network Management Agents (and vice versa) and the transfer of environmental data from an outgoing Network Management Agent to its successor.

f) Assist Designers and Network Management Agents in the collection of environmental data, and use this information to develop specific environmental management programmes and strategies, including Environmental Management Plans (EMPs).

[4] IAN 84/10 (Highways Agency, 2010) defines an Environmental Element (or Element) as a man-made or natural Element, comprising the environment within and surrounding the strategic road network, for example, a listed building, noise barrier or hedgerow.

5.2 Collection and submission of EnvIS data

5.2.1 As stated within IAN 84/10 (Highways Agency, 2010), the identifying and recording of EnvIS data is an ongoing process. Service providers should record and submit EnvIS data in the form of environmental inventory and environmental management information data, stored on their own systems. For designers, the frequency of EnvIS data submission, to Highways England, is in line with the end point of the following milestones:

- **Development phase:** environmental data resulting from the statutory or non-statutory assessment of the proposed project. Designers collect and submit EnvIS data for Elements that have influenced or are influenced by the design of the project (including environmental survey data).
- **Construction phase (construction) - as built drawings:** environmental data detailing the completion of the project prior to handover. Designers collect and submit EnvIS data detailing all Elements associated with the construction of the project and planned environmental management actions that are required to be undertaken by the network management agent as part of operating and maintaining the network area.

5.2.2 At this stage, EnvIS data would be submitted through the publication of the ES as part of the DCO application. This would include the submission of species data and the results of other surveys, such as the archaeological surveys and soil surveys undertaken to inform the ES.

5.2.3 This section should be updated by the main works contractor at the development phase (construction preparation) milestone stage to outline the submission arrangements of EnvIS data.

6 References

British Standards Institution (1993) BS 7385-2: 1993 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground borne vibration.

British Standards Institution (2014) BS 5228: 2009+A1: 2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites'.

Highways Agency (2009) Design Manual for Roads and Bridges (DMRB) Volume 11 Section 2, Manual of Contract Documents for Highways Works.

Highways Agency (2010) Interim Advice Notes (IAN) 84/10 Environmental Design and Management Highways Agency Environmental Information System – EnvIS.

Highways Agency (2014) Interim Advice Notes (IAN) 183/14 Environmental Management Plans.

Highways England (2018) Interim Advice Notes (IAN) 182/14 Major Schemes: Enabling Handover into Operation and Maintenance.

IAQM (2014) Guidance on the assessment of dust from demolition and construction (v1.1), IAQM.

The Planning Inspectorate (2016) Advice note six: Preparation and submission of application documents Advice Note 6.

Appendix A: Environmental constraints plans

NIA 8245*
NIA 7976
NIA 11627
NIA 11628*
NIA 8005
NIA 8003
NIA 8004
NIA 8006

Markeaton Park
Markeaton Junction
Mickleover Railway Cutting LWS
Kingsway Junction
Mickleover Meadows LNR
Mackworth Park

Leylands Estate
Friar Gate

Mackworth
Mickleover
Markeaton
DERBY
Little Chester
Rose Hill
California
Common End

N

0 125 250 500 750 1,000 Metres

NOTES

1.THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.

2.DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.

3.ALL DIMENSIONS IN METRES, ALL CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.

LEGEND

- THE SCHEME
- SCHEME BOUNDARY
- 500M STUDY AREA
- CONSERVATION AREA
- GRADE I LISTED BUILDING
- GRADE II* LISTED BUILDING
- GRADE II LISTED BUILDING
- DERWENT VALLEY MILLS WORLD HERITAGE SITE
- NOISE IMPORTANT AREA
- TREE PRESERVATION ORDER (TPO)
- WATERCOURSE
- CULVERT
- SITE OF SPECIAL SCIENTIFIC INTEREST (SSSI)
- LOCAL NATURE RESERVE (LNR)
- LOCAL WILDLIFE SITE (LWS)
- PUBLIC OPEN SPACE
- AIR QUALITY MANAGEMENT AREA (AQMA)
- HISTORIC LANDFILL
- FLOOD ZONE 3 - LAND HAVING A 1 IN 100 OR GREATER ANNUAL PROBABILITY OF RIVER FLOODING
- FLOOD ZONE 2 - LAND HAVING BETWEEN A 1 IN 100 AND 1 IN 1,000 ANNUAL PROBABILITY OF RIVER FLOODING

Revision Details	By	Check	Date	Suffix
FIRST ISSUE	GB	SW	18/03/19	P01

Purpose of Issue: DCO SUBMISSION

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

highways england

Development Consent Order Number: TR010022

Project Title: A38 DERBY JUNCTIONS

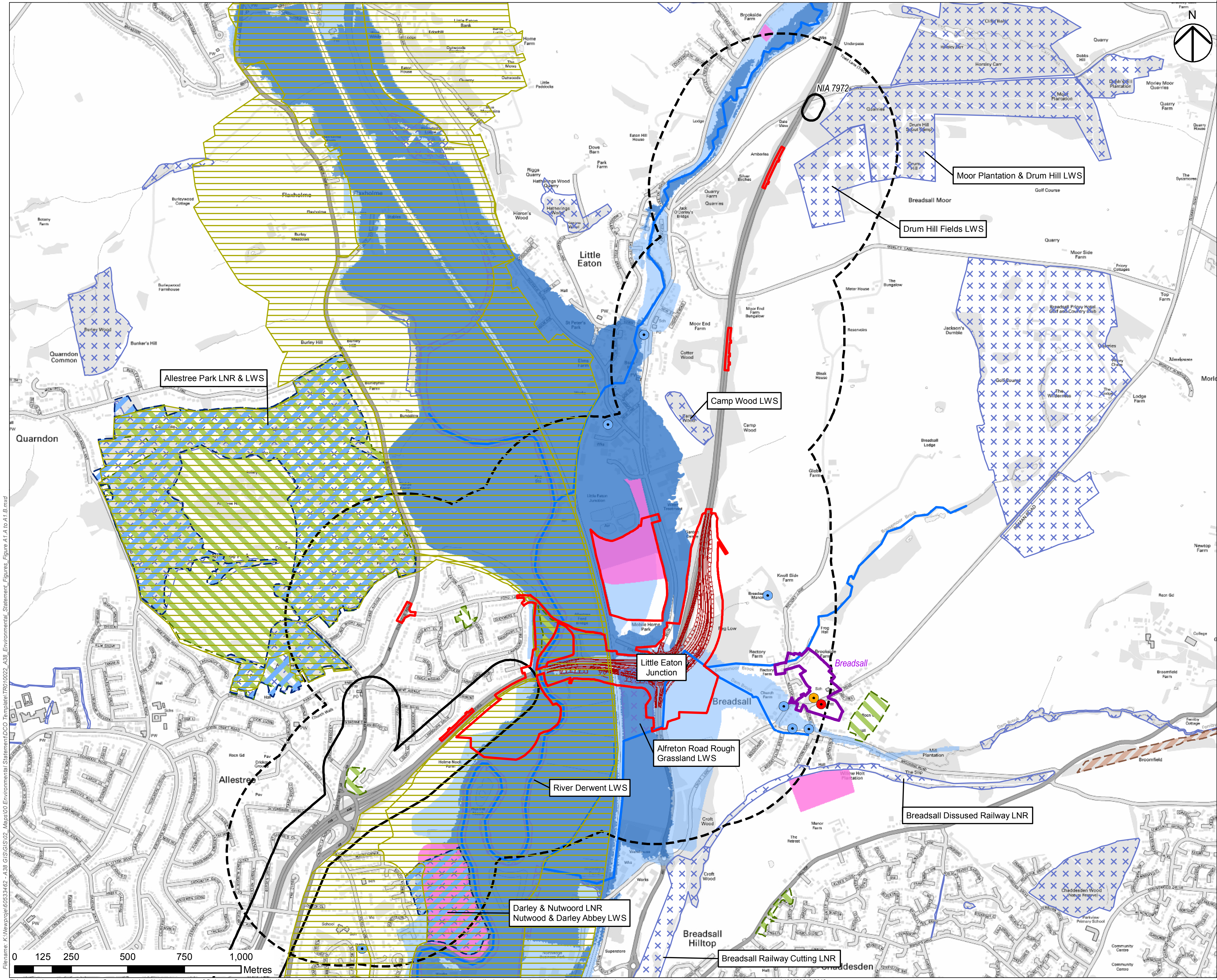
Drawing Title: FIGURE A1.A KINGSWAY & MARKEATON JUNCTIONS ENVIRONMENTAL CONSTRAINTS

Designed	Drawn	Checked	Approved	Date
SW	GB	SW	SW	18/03/19

Internal Project No	Suitability
60533462	D7
Scale @ A3	Zone
1:15,000	A38

Drawing Number	Originator	Volume	Rev
Highways England Pin: HE514503	-ACM	-EGN-	P01
Location: A38_SW_PR_ZZ	Type: -DR-	Role: -LE-	Number: -0031

Filename: K:\Newproje\60533462 - A38 GIS\GIS\02 Maps\00 Environmental Statement\DCO Template\TR010022_A38_Environmental_Statement_Figures_Figure A1.A to A1.B.mxd



NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.

2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.

3. ALL DIMENSIONS IN METRES, ALL CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.

LEGEND

- THE SCHEME
- SCHEME BOUNDARY
- 500M STUDY AREA
- CONSERVATION AREA
- GRADE I LISTED BUILDING
- GRADE II* LISTED BUILDING
- GRADE II LISTED BUILDING
- DERWENT VALLEY MILLS WORLD HERITAGE SITE
- NOISE IMPORTANT AREA
- TREE PRESERVATION ORDER (TPO)
- WATERCOURSE
- CULVERT
- SITE OF SPECIAL SCIENTIFIC INTEREST (SSSI)
- LOCAL NATURE RESERVE (LNR)
- LOCAL WILDLIFE SITE (LWS)
- PUBLIC OPEN SPACE
- AIR QUALITY MANAGEMENT AREA (AQMA)
- HISTORIC LANDFILL
- FLOOD ZONE 3 - LAND HAVING A 1 IN 100 OR GREATER ANNUAL PROBABILITY OF RIVER FLOODING
- FLOOD ZONE 2 - LAND HAVING BETWEEN A 1 IN 100 AND 1 IN 1,000 ANNUAL PROBABILITY OF RIVER FLOODING

Revision Details	By / Check	Date	Suffix
FIRST ISSUE	GB / SW	18/03/19	P01

Purpose of Issue

DCO SUBMISSION

Client

Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

Development Consent Order Number

TR010022

Project Title

A38
DERBY JUNCTIONS

Drawing Title

FIGURE A1.B
LITTLE EATON JUNCTION
ENVIRONMENTAL CONSTRAINTS

Designed	Drawn	Checked	Approved	Date
SW	GB	SW	SW	18/03/19

Internal Project No	Suitability
60533462	D7
Scale @ A3	**Zone**
1:15,000	A38

Drawing Number

Highways England Pin | Originator | Volume

HE514503 -ACM -EGN-

A38_SW_PR_ZZ -DR-LE-0032

Location | Type | Role | Number

Rev

P01

Appendix B: Outline biosecurity management plan

Outline biosecurity management plan

1.1 Scope

1.1.1 An Invasive Species Assessment (ISA) has been undertaken, resulting in the production of this outline Biosecurity Management Plan for invasive non-native species (INNS) as listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) or Invasive Alien Species of Union Concern (as per EU IAS Regulation 1143/2014).

1.1.2 The details as presented herein should be used by the contractor to development the Biosecurity Management Plan for the Scheme.

1.2 Relevant legislation and policy

1.2.1 There are several legislative instruments which apply within the UK and domestic legislation which relate to INNS (as detailed below and Annex B), with the aim of preventing or reducing the negative economic and environmental impacts of these species. Essentially, this legislation makes it an offence to plant, or otherwise cause to grow (including allowing to spread), the listed plant species in the wild (as per the Wildlife and Countryside Act 1981 - WCA), and, if transported off the proposed site, there is a duty of care with regards to the disposal of any part of the plant that may facilitate establishment in the wild and cause environmental harm (as per the Environmental Protection Act 1990). Additionally, it is an offence to release into the wild animals listed in Schedule 9 of the WCA or animals of a kind not ordinarily resident in, or not a regular visitor to, the UK. Furthermore, such animals should not be transferred between locations. This is best practice unless the animal becomes captured or contained as part of transport, in which case it becomes an offence.

1.2.2 The EU Invasive Alien Species Regulation 1143/2014 (EU IAS Regs) imposes restrictions on species which are listed as a ‘Species of Union Concern’. These are species which pose a risk of adverse impacts across the EU, such that targeted action across EU member states is required. Restrictions applying to these species mean they cannot be imported, kept, bred, transported, sold, used or exchanged, allowed to reproduce, grown or cultivated, or released into the environment. Under certain circumstances a Species Control Order can be served on a land owner to require the removal of a given species (see Infrastructure Act 2015).

1.2.3 If charged with committing an offence, it is a defence against prosecution to prove that all reasonable steps were taken and all due diligence exercised in attempting to avoid committing the offence. Therefore, to reduce the potential of breaching legislation and fines/prosecution, a management plan should be in place for INNS on a project site and contractors should be able to demonstrate that they are following the management plan.

1.2.4 A summary of the legislation relevant to INNS in England is presented in Annex B.

1.3 Method – invasive species assessment (ISA)

Site assessment

1.3.1 ISA as part of an Extended Phase 1 Habitat survey and which have been undertaken for the Scheme between February and June 2017 (Highways England, 2018a). All surveys were undertaken by a suitably experienced AECOM ecologist.

1.3.2 ISAs can be undertaken throughout the year; however, it should preferably be carried out during the active growth season as the winter remains of certain species are inconspicuous (for example, Himalayan balsam *Impatiens glandulifera*). The optimum survey time is during late May through to October. Although some surveys were undertaken outside of the optimum survey period, this is not considered to represent a significant constraint.

1.3.3 The primary remit of the survey was to identify invasive non-native species which could present a constraint to the Scheme, with a focus on:

- Invasive species listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) (WCA).
- Invasive Alien Species of Union concern (as per EU IAS Regulation 1143/2014)

1.3.4 The survey comprised:

- A walkover of areas within the Scheme boundary (plus a 50m buffer).
- An inspection of the immediate surrounding of such areas.
- An assessment of features that might affect biosecurity.
- An assessment of all apparent features that may affect control action.

1.3.5 The location of any invasive species observed was recorded along with:

- The location.
- The level of establishment.
- The health of plants.

1.3.6 Locations of INNS were recorded using a hand-held GPS device.

Quality assurance

1.3.7 The ISA was undertaken in accordance with current good practice published by the Environment Agency (Environment Agency, 2013), Royal Institute of Chartered Surveyors (RICS, 2012 – withdrawn in 2019) and the Property Care Association (PCA, 2018). All work was subject to verification, and technical review by a qualified person.

Limitations

1.3.8 The survey in 2017 was constrained by access restrictions associated within parts of the highway verge to the south of Kingsway junction. The immediate surrounding area was however surveyed. This constraint is not considered to significantly impact the approach for the biosecurity management.

1.4 Results

Invasive non-native INNS plants (scheduled species)

1.4.1 Five INNS (plants) listed on Schedule 9 of the WCA were identified during the 2017 survey (as detailed in Table 1). Two listed knotweed species were identified:

- Japanese knotweed (*Reynoutria japonica* (*Fallopia japonica*))
- Giant knotweed (*Reynoutria sachalinensis* (*Fallopia sachalinensis*))
- Himalayan balsam (*Impatiens glandulifera*)
- Variegated yellow-archangel (*Lamiastrum galeobdolon* subspecies *argentatum*)
- New Zealand pigmy weed (*Crassula helmsii*)

1.4.2 A description of each stand or group of stands is detailed in Table 1. Also refer to Figures 1 and 2 in Annex A for location details.

Table 5: Non-native stand/stand-group descriptions and observations

Species	Code	Grid reference	Notes
Japanese knotweed	JK1	SK 32574 35765	Large stand, approximately 2,000m^2 in area. Very mature. Within 50m of the Scheme boundary.
Japanese knotweed	JK2	SK 32979 36127	Small stand, approximately 50m^2 in area, Within the Scheme boundary.
Japanese knotweed	JK3	SK 33033 36005	Small stand, approximately 30m^2 in area. Within 50m of Scheme.
Japanese knotweed	JK4	SK 33752 37336	Stand on bank of Markeaton Lake. Within 50m of the Scheme boundary, high risk of dispersal due to proximity to watercourse.
Japanese knotweed	JK5	SK 33037 36151	Small immature stand, approximately 10m^2 in area, within the Scheme boundary.

Species	Code	Grid reference	Notes
Japanese knotweed	JK6	SK 32920 36104	Small stand, 3 single stems possibly propagated spring 2015. Likely to have spread. Located within the Scheme boundary
Japanese knotweed	JK7	SK 32839 36076	Small stand, approximately 50m^2 in area. Within the Scheme boundary.
Japanese knotweed	JK8	SK 32943 36208	Small stand, approximately 30m^2 in area. Within 50m of the Scheme boundary.
Japanese knotweed	JK9	SK 32931 36162	Small stand, approximately 50m^2 in area. Within the Scheme boundary.
Japanese knotweed	JK10	SK 34057 36890	Stand on bank of Mill Dam. Within 50m of the Scheme boundary, high risk of dispersal due to proximity to watercourse.
Japanese knotweed	JK11	SK 33489 37761	Stand on bank of Markeaton Brook. Within 50m of the Scheme boundary, high risk of dispersal due to proximity to watercourse.
Japanese knotweed	JK12	SK 33354 37738	Stand on bank of Mackworth Brook. Within the Scheme boundary, high risk of dispersal due to proximity to watercourse.
Japanese knotweed	JK13	SK 33702 37462	Stand on bank of Markeaton Lake. Within 50m of the Scheme boundary, high risk of dispersal due to proximity to watercourse.
Japanese knotweed	JK14	SK 36356 40557	Large stand, approximately 1,500m^2 in area. Very mature. Within the Scheme boundary.
Japanese knotweed	JK15	SK 36368 40177	Small stand, approximately 10m^2 in area, within the Scheme boundary,
Japanese knotweed	JK16	SK 36188 40143	Large stand, approximately 700m^2 in area. Very mature. Within the Scheme boundary, likely to spread.
Japanese knotweed	JK17	SK 36168 40011	Small stand, approximately 20m^2 in area, Within 50m of the Scheme boundary, on Network Rail land.
Japanese knotweed	JK18	SK 36199 40011	Small stand, approximately 10m^2 in area, within the Scheme boundary, on Network Rail land.
Japanese knotweed	JK19	SK 36439 39972	Small immature stand on footpath – regrowth in area previously cleared for pinch point scheme. Located within the Scheme boundary.
Japanese knotweed	JK20	SK 36132 40504	Large stand, approximately 700m^2 in area. Very mature. Within the Scheme boundary.
Japanese knotweed	JK21	SK 36236 40482	Small stand, approximately 20m^2 in area, within 50m of the Scheme boundary, likely to spread.
Japanese knotweed	JK22	SK 36315 40552	JK14 spread under the path in 2018. 5 new stems recorded at JK22. Located within the Scheme boundary
Giant knotweed	GK1	SK 35920 40025	Mature stand on bank of River Derwent. Within the Scheme boundary, high risk of dispersal due to proximity to watercourse.
Giant knotweed	GK2	SK 35946 40066	Mature stand on bank of River Derwent. Within the Scheme boundary, high risk of dispersal due to proximity to watercourse.
Giant knotweed	GK3	SK 36159 39946	Small stand, approximately 10m^2 in area. Immature stand, within 50m of the Scheme boundary. On Talbot Turf Farm land.

Species	Code	Grid reference	Notes
Himalayan balsam	HB1	SK 32807 36117 (approx.)	Dense growth present throughout the banks of the watercourses within the A38 Kingsway junction island. Within the Scheme boundary.
Himalayan balsam	HB2	SK 32699 35989 (approx.)	Dense growth present throughout the banks of the watercourses within the A38 central reservation south of the Kingsway junction. Within the Scheme boundary.
Himalayan balsam	HB3	SK 32589 35721	Dense growth present along the banks of Bramble Brook, within the Scheme boundary.
Himalayan balsam	HB4	SK 32301 35564	Dense growth present along the banks of Bramble Brook, within the Scheme boundary.
Himalayan balsam	HB5	SK 33956 36982	Sporadic growth along Mill Dam banks. Now under management by Earl of Harrington's Angling Club. Within the Scheme boundary.
Himalayan balsam	HB6	SK 35884 40090	Extensive growth present throughout and along the banks of the River Derwent. Within the Scheme boundary.
Himalayan balsam	HB7	SK 35888 39936	Extensive growth present along the banks of the River Derwent. Within the Scheme boundary.
Himalayan balsam	HB8	SK 36133 40121	Sporadic growth adjacent to rail line boundary fence, within the Scheme boundary.
Himalayan balsam	HB9	SK 36182 39847	Extensive growth along rail line in wetted area. Within 50m of the Scheme boundary.
Himalayan balsam	HB10	SK 36334 39668	Extensive growth present along the banks of Watermeadows Ditch, within 50m of the Scheme boundary (this area is downstream of the Scheme boundary and is unlikely to pose any constraint to the Scheme).
Himalayan balsam	HB11	SK 36412 39834	Extensive growth present along the banks of Dam Brook and extending into field to east, within the Scheme boundary.
Himalayan balsam	HB12	SK 36520 40025	Extensive growth present along the banks of Boosemoor Brook/ Dam Brook and extending into field to south, within the Scheme boundary.
Himalayan balsam	HB13	SK 36631 40186	Extensive growth present along the channel of heavily schemed un-named brook and extending into fields to north, within the Scheme boundary.
Himalayan balsam	HB14	SK 36487 40225	Extensive growth present along the channel of a remnant section of Derby Canal, canal now derelict. Within 50m of the Scheme boundary.
Himalayan balsam	HB15	SK 36419 40254	Extensive growth present along the channel of heavily silted un-named brook and extending into fields to west, within 50m of the Scheme boundary.
Himalayan balsam	HB16	SK 36229 40549	Extensive growth present along the channel of ditch Pb1 and Severn Trent settling lagoons, within 50m of the Scheme boundary. All vegetation was removed along this ditch in 2018 with woodchip scattered on the banks. This will not have removed the seed bank of Himalayan balsam and plants will likely regrow.
Himalayan balsam	HB20	SK 33750 37390	Extensive growth present throughout along the banks of Markeaton Lake. Within the Scheme boundary.

Species	Code	Grid reference	Notes
Himalayan balsam	HB21	SK 33681 37683	Extensive growth present throughout along the banks of Markeaton Brook. Within 50m of the Scheme boundary.
Himalayan balsam	HB22	SK 36290 39956	Extensive growth throughout field margins. Within the Scheme boundary.
Variegated Yellow Archangel	VA1	SK 36448 40059	Dense growth, within the Scheme boundary.
New Zealand pigmyweed	NZP1	SK 36291 39893	Extensive area dominating this seasonally inundated wet grassland field within the Scheme boundary.
Cherry laurel*	CL1	SK 32978 35970	Planted extensively along Kingsway Hospital access road, within 50m of the Scheme.
Cherry Laurel*	CL2	SK 32896 36001	Dense growth along Kingsway Road verges, within 50m of the Scheme.
Cherry Laurel*	CL3	SK 32639 35997	Present within the Scheme, at Kingsway South island.
Snowberry*	SN2	SK 35483 39712	Small stand, within 50m of the Scheme boundary. Likely garden escape.
* Not Schedule 9 species, however this species is recognised as invasive and is listed by the Great Britain Invasive Non-Native Species Secretariat			

Invasive non-native animals (scheduled species)

1.4.3 One INNS (animal) listed on Schedule 9 of the WCA was identified (refer to Table 2), namely Signal crayfish (*Pacifastacus leniusculus*). This species has been identified in the wider area and in waterbodies transecting the Scheme, specifically (refer to Figures 1 and 2 in Annex A for locations):

- Markeaton Lake western end inlet (Markeaton junction).
- Dam Brook (Little Eaton junction) in the vicinity of the junction roundabout.
- Watermeadows Ditch (downstream of the A61 road culvert – Little Eaton junction).

1.4.4 Signal crayfish were recorded in a tributary of Markeaton Lake in 2012 and a well-established signal crayfish population was recorded at the inlet of the Markeaton Lake in the survey undertaken in 2015 (Highways England, 2016), likely indicating the whole stretch had been invaded. As white-clawed crayfish were historically abundant in Markeaton Lake, but were not recorded downstream of Markeaton Park in 2012, an outbreak of crayfish plague (*Aphanomyces astaci*) is the most likely reason for the loss, indicating this non-native fungus is also present (also see Table 2). This system includes Mill Pond, Mill Dam and the connecting Middle Brook that flows into the lower Markeaton Brook. The system has been widely colonised by signal crayfish and the population is expected to continue to expand and increase in abundance.

1.4.5 In Dam Brook, the 2017 and 2018 crayfish surveys recorded the presence of signal crayfish upstream and downstream of the A61 road culvert (Highways England, 2018b/c). In the Dam brook sub-catchment signal crayfish were also recorded in the Watermeadows Ditch, adjacent to an agricultural concrete access culvert which eventually connects to the River Derwent. The surveys undertaken in 2017 and 2018 between a weir (at SK 36499 40033) and Breadsall village (where the watercourse is inaccessible in the urban area) covered an approximate 330m stretch of Dam Brook. Signal crayfish were found downstream and upstream of the weir within Dam Brook adjacent to the A61 and A38 junction roundabout (at SK3651040038) where previously white-clawed crayfish had been recorded. It is thus considered that the weir does not present a barrier to crayfish movement.

Relevant characteristics

1.4.6 Characteristics of invasive species identified within the Scheme boundary are detailed in Table 2.

Table 6: Relevant characteristics of invasive non-native species identified

Species	Relevant traits
Japanese knotweed and Giant Knotweed	Two a long-lived, perennial plants that spread and persist via an underground rhizome (underground shoots) network. Tiny fragments of rhizome, weighing as little as 0.7 g, can produce new plants. Rhizome fragments spread in contaminated soil attached to vehicles, equipment and clothing. Rhizome fragments are frequently carried by water flow, particularly after flood events. Fragments of Japanese knotweed shoot can root and form new plants; however, spread by this means is relatively rare as such fragments required very specific conditions to establish. For small stands (less than 4 square metres in area), the mean spread of Japanese knotweed rhizome is 1.4m from visible above ground plants and is typically (75th percentile) found within 2 m (Fennell et al., 2018). For large stands (greater than 4 square metres in area), the mean spread of Japanese knotweed rhizome is 2m from visible above ground plants and is typically (75th percentile) found within 2.5m of above ground plants (Fennell et al., 2018). Rhizome spread beyond 4 is untypical of the species and is very rare. Japanese knotweed rhizome can spread up to 3m downwards; however, rhizome typically does not spread vertically beyond 1.5m.
Himalayan balsam	An annual plant that spreads and persists via seed. It completes its entire life cycle in one year, dying in winter and re-growing from seeds the following year. The seeds are spread by explosive seed pods (propelling seeds up to 6m), water flow, propelled through the air, and in contaminated soil. The seed bank can persist for up to 3 years, usually between 18 and 24 months. New plants can readily sprout from cut stems during the growing season provided the roots remain intact. Plants removed from the soil can re-root at nodes and regrow.
Variegated yellow-archangel	A short (approximately 20cm tall), hairy, frequently evergreen, perennial creeping herb. In the UK, the plant spreads vegetatively via creeping runners (fragments of which can grow into new plants). Reproduction from seed has not been observed in the UK. The species can become highly invasive in woodland understory layers, blanketing out desirable native species such as bluebells.

Species	Relevant traits
New Zealand pigmy weed	A high-impact transformer INNPS that, in slow flowing to still fresh water bodies, can out-compete most native submerged, emergent and marginal UK species. Crassula is a small aquatic perennial that spreads and persists via vegetative growth and fragmentation. Spread by seed has not been observed in the UK. The species possesses submerged, emergent and marginal growth forms. As little as 5mm of vegetative material can establish (with only one node required) and form a new infestation. Vegetative fragments readily attach to vehicles, equipment, clothing, footwear, water fowl and other animals (e.g. the beaks, feet and hooves of animals drinking from infested water bodies). The root system is extremely shallow.
Signal crayfish	A highly invasive freshwater crayfish that is now widespread in the UK. The species can exacerbate soil erosion on river banks due to tunnelling activity and spreads the crayfish plague (fatal to native white-clawed crayfish). The species spreads by walking/swimming from one waterbody to another and by producing huge quantities of tiny larvae which can spread in water by water flow and attached to vehicles, equipment and clothing.

Additional non-native species recorded

1.4.7 Two other notable non-native plant species were identified during the surveys which are known to act invasively in the UK. These species are not listed on relevant legislation, although they are listed on the Great Britain Invasive Non-Native Species Secretariat's website:

- Cherry laurel (*Prunus laurocerasus*)
- Snowberry (*Symphoricarpos album*)

1.4.8 While no action is required in relation to these species, their removal would benefit native biodiversity and would likely reduce estate management costs over time.

1.5 Risk assessment

General risks

1.5.1 The primary impacts associated with INNS, relating to infrastructure development, are provided below (a letter is assigned to each impact for reference in Table 3):

a. Breaches of legislation (failure to observe duty of care), with exposure to prosecution (civil and/or criminal) and fines (unlimited).
b. Delays (with associated financial implications), particularly if INNS are encountered unexpectedly.
c. INNS control costs, which can increase rapidly in the absence of appropriate mitigation.
d. Damage to built structures, with associated costs and liabilities.
e. Reductions in property value and/or difficulty attaining mortgages.
f. Reputational risk.
g. Disease spread.
h. Loss of amenity/recreation space.
i. Health and safety (exposure to plants toxins/irritants).

j. Visual impacts on landscaping.
k. Potential significant waste disposal costs/issues regarding infested soils.
l. Soil erosion on riverbanks.

Site specific risks

1.5.2 All INNS identified within or adjacent to the Scheme boundary present a risk to the implementation of the Scheme, risks that could escalate quickly in the absence of appropriate mitigation. It is, therefore, important to respond to infestations as quickly as possible. The risks posed by listed INNS can be divided into the three ratings shown in Table 3, with risk descriptions provided in Table 4.

Table 7: Species, associated risks and risk rating

Species	Associated impacts	Rating
Japanese knotweed and Giant knotweed	a, b, c, d, e, f, h, j, k, l	1
Himalayan balsam	a, b, c, f, j, k, l	1
Variegated yellow-archangel	a, b, c, f,	3
New Zealand pigmyweed (crassula)	a, b, c, f, h, j	3
Signal crayfish	a, b, c, g, l	3

Table 8: Description of ratings

Rating	Description
1	**High risk of impact:** Concerted and dedicated action is required to prevent spread and reduce control costs. Control action should commence as far in advance of works as is practical
2	**Medium risk of impact:** Concerted and dedicated action is required to prevent spread and reduce control costs; however, with forward planning there should be no impact on works.
3	**Low risk of impact:** It is unlikely that the presence of the species will impact development works; however, precautions should be taken to prevent accidental spread, particularly offsite, and long tern control should be considered.

1.5.3 Japanese knotweed, giant knotweed and Himalayan balsam have the highest risk rating as they are located within the footprint of the Scheme. In the case of the former two species, they are located in places near to a watercourse, and in the case of the latter, it is located in dense patches along the banks of several waterbodies with increased risk of spread.

1.5.4 Himalayan balsam was also present on the embankments of the Midland Mainline railway line.

1.5.5 Management of these high risk rate species is necessary in order to construction the Scheme with minimum impacts. Without appropriate management in place, these species can quickly spread within and off the Scheme site, with associated liabilities and constraints to development and, or/waste management, which can lead to delays in the programme.

1.5.6 There is a dense growth of variegated yellow archangel within the Scheme boundary which requires management. In addition, there are extensive patches of New Zealand pigmyweed (crassula) dominating open ground flora within a seasonally inundated wet grassland field within the Scheme boundary, the spread of which must be prevented. Water is held in the field after receiving flood water from Watermeadows Ditch.

1.5.7 Signal crayfish must not be spread from waterbodies within the Scheme from which the species has been recorded, to waterbodies within the Scheme footprint where the species has not been recorded, or off site. To prevent the spread of signal crayfish and associated crayfish plague, all equipment and Personal Protective Equipment (PPE) used must be checked, cleaned and dried thoroughly prior to use elsewhere. This would require biosecurity implementation when working in affected waterbodies. Eradication is not feasible. If any signal crayfish was to be accidentally captured, it must not be returned to the watercourse or waterbody and must be killed and disposed of appropriately (refer to Annex D).

Pathway analysis

1.5.8 The Japanese/giant knotweed and Himalayan balsam could have colonised areas within and adjacent to the Scheme by:

- Natural spread along watercourses that transect the Scheme or via rhizome (Japanese/giant knotweed)/seed (Himalayan balsam) from adjacent land.
- Transmission of rhizome fragments (Japanese/giant knotweed) and/or seeds (Himalayan balsam) on tyres or machinery/plant which has traversed or been used to work along this area.
- Fly tipping of waste which includes rhizome.

1.5.9 Fly tipping, particularly of garden waste, could also explain the occurrence of variegated yellow-archangel and New Zealand pigmyweed (crassula), as these plants are grown as ornamentals. All are, or were, popular garden plants which typically grow abundantly in gardens/ponds, often resulting in removal by fly tipping, which is a common way of disposing of the unwanted plants.

1.5.10 Signal crayfish were likely introduced to the area by natural diffusion and water flow from elsewhere in the River Derwent catchment.

1.5.11 The primary pathways by which these species can be spread on, around and off the Scheme site are summarised in Table 5.

Table 9: Primary pathways of spread for INNS identified and risk category

Spread	Propagules attached to footwear	Propagules attached to equipment of vehicles	Natural spread onto the Scheme (assuming onsite plants are controlled)
Japanese knotweed and Giant knotweed	● High risk during development, via rhizome infested soil (where soil is disturbed and access is not restricted).	● High risk during development, via rhizome infested soil (where equipment/vehicles are used in infested areas).	● High risk, as Japanese knotweed was identified on land within 50m of the Scheme.
Himalayan balsam	● High risk during development, via seed infested soil.	● High risk during development, via seed infested soil.	● High risk during development, via seed spread from plants in the environs of the Scheme.
Variegated yellow-archangel	● Low risk.	● Medium risk, via runner infested soil.	● Medium risk, via runners.
New Zealand pigmyweed (crassula)	● Medium risk, if movement between infested area and waterbodies is not prevented.	● Medium risk, if movement between infested area and waterbodies is not prevented.	● Low risk, not identified off site in close proximity.
Signal crayfish	● High risk (via larvae), if access to water is required.	● High risk (via larvae), if access to water is required.	● High risk during and following development, due to abundance presence in the wider area.

1.6 Biosecurity management plan

Objectives

1.6.1 This outline biosecurity management plan identifies feasible mitigation and how it should be implemented. The main objectives of the management plan are:

- To remove the risks associated with INNS presence including prevention of spread off-site.
- To reduce the probability of re-infestation.

Identification of appropriate management options

1.6.2 A wide range of options is available for the management of INNS (see Annex C for a review of control options and their relative merits and limitations). All of the management measures summarised in Annex C have been considered in identifying the most appropriate management regime relevant in the context of the Scheme. Table 6 provides an overview of the recommended management options.

1.6.3 The optimal approach to managing the INNS recorded on the Scheme site would involve a combination of:

- Avoidance measures.
- Herbicide treatment.
- Physical removal, with arisings being managed appropriately.

1.6.4 On-site disposal of INNS arisings is preferable, as per Environment Agency guidance (2016), and is the recommended approach. However, given the constrained nature of the Scheme, off-site disposal may be unavoidable.

1.6.5 Where INNS (specifically Japanese/giant knotweed and Himalayan balsam) are located upstream in/adjacent to a watercourse/waterbody that passes through the Scheme, eradication of the species at the intersection point is unlikely to be feasible as reintroduction would likely rapidly occur. Accordingly, in such areas management should focus on containment.

1.6.6 Given that a significant quantity of soil containing INNS propagules may be required to be excavated, it would be pragmatic to designate a specific location within the boundary of the Scheme where all such soil could be stockpiled, essentially consolidating the issue. This area should be clearly signed and fence, monitored, treated and landscaped.

Table 10: Optimal management options

Species	On-site disturbed	On-site undisturbed	Off-site (adjacent)
Japanese knotweed and giant knotweed	Herbicide treatment, followed by mechanical removal and disposal of arisings (e.g. stockpile, burial or landfill).	Herbicide treatment, and avoidance.	Herbicide treatment, and avoidance.
Himalayan balsam	Hand pulling in advance of development with mechanical removal of any soils likely to contain viable seeds.	Hand pulling	Hand pulling if within 20m, otherwise monitor and, following development, prevent on site establishment as part of landscape vegetation management.
Variegated yellow archangel	n/a	Avoidance	Herbicide treatment and avoidance.
New Zealand pigmyweed (crassula)	Mechanical removal	Avoidance	n/a
Cherry laurel	n/a	n/a	Mechanical removal and follow up herbicide treatment of stumps.
Snowberry	n/a	n/a	Herbicide treatment, and avoidance.

Species	On-site disturbed	On-site undisturbed	Off-site (adjacent)
Signal crayfish	Avoidance and containment.	Avoidance and containment.	Avoidance

Control programme

Japanese knotweed and giant knotweed

1.6.7 A control programme should be initiated as far in advance of Scheme construction works as possible. The primary aims are to use herbicide to kill as much of the underground rhizome network as possible and/or reduce its viability and hence risk of spread during subsequent mechanical removal. Control is considered complete once two full growth seasons have passed without any re-growth.

1.6.8 All areas containing or potentially containing Japanese knotweed must be fenced off with appropriate signage installed before any works commence on the site including any site investigations. Fencing must create a buffer zone around visible plants due to the potential presence of underground rhizomes. However, depending on soil type and condition and if agreed by a suitably qualified Ecological Clerk of Works (ECoW), then the fence can be reduced to no closer than 2.5m from visible plants.

1.6.9 To inform the management plan any treatment records and the original extent of any Japanese knotweed stands would need to be obtained from land managers. It is this area that should be fenced and subjected to controls, as viable rhizome may be buried in the soil.

1.6.10 If Japanese knotweed is located in areas not likely to be disturbed by the Scheme works, herbicide treatment alone is sufficient for control. Treatment should ideally be carried out once per year towards the end of the growth following the methods detailed in Section 1.9. With regard to large stands, where it is not possible to reach all plants when fully grown, such stands may require two treatments in the first year of management, with the first taking place when the plants are between 1m to 1.5m high. The likely duration of herbicide treatment (including monitoring) is typically three to five years; however, it can take longer for larger more mature stands.

1.6.11 If Japanese knotweed is located where the land would be required for, or disturbed by, the Scheme works, it should be treated with herbicide as far in advance of the site works as is practicable. This would reduce the vigour of the plant and minimise the risks associated with subsequent mitigation works. Subsequently, once proposed site works commence in the area, impacted material must be mechanically excavated (as described in Section 1.9) and (in order of decreasing priority):

- Stockpiled, treated with herbicide and landscaped (Section 1.9),
- Buried (see Section 1.9),

- Disposed of to an appropriately licensed landfill (Section 1.9).

1.6.12 Where herbicide treatment has been carried out, only the quantity of soil that is required to be excavated to facilitate the Scheme need be removed. If rhizome is left in the soil, biosecurity precautions would need to remain in place and the area should be monitored for at least two years with any regrowth being treated with herbicide. The water table in the area may preclude deep excavation as an option.

1.6.13 Where Japanese knotweed and giant knotweed (knotweed) have been identified in close proximity (within 10m) to the Scheme boundary, then control must be carefully considered as the species may spread over time by natural processes onto the Scheme site. In this case, such plants should be monitored and ideally treated with herbicide at least once per year until control is achieved. If an on-going control programme is not possible, a single well-timed herbicide application would greatly reduce the risk of spread onto and/or within the Scheme footprint. Approval for such treatment must be granted by the owner of the land containing knotweed outside of the Scheme boundary.

1.6.14 Areas where knotweed control has taken place, or where knotweed treated soil has been used in landscaping, must be monitored until two full growth seasons have passed without re-growth, regardless of what control method was used. Any regrowth must be treated with herbicide (see Section 1.7). To establish whether Japanese knotweed has not regrown should involve a monitoring survey carried out twice per year in May and August during and post-construction.

Himalayan balsam

1.6.15 A control programme should be initiated as far in advance of Scheme works as is possible. The primary aims are to remove all plants before flowering and seeding (preventing seed production) and deplete or remove the seed bank. Any Himalayan balsam should be fenced off, with appropriate signage. Fencing should create a 6m buffer zone around visible plants (due to the explosive nature of seed pods).

1.6.16 Control carried out after the plants have set seed is unlikely to have long-term benefits; in fact, spread would likely be facilitated by carrying out control action when seed pods are present and mature. If plants containing seeds must be removed, great care should be taken not to facilitate seed dispersal by triggering off the expulsion of seeds from the seed pods by bagging off the seed heads.

1.6.17 Manual removal, or herbicide treatment, of plants that have already shed their seeds should not be carried out as a control option as the plants would die at the end of the growing season regardless (i.e. such works would have no effect on control).

1.6.18 If Himalayan balsam is located in areas required to construct the Scheme, or where it would be disturbed as part of the Scheme construction works, then it should be controlled *in situ* preferably by hand pulling or herbicide treatment (see Section 1.9) as far in advance of site works as is practicable. This would start the process of depleting the seed bank and minimise the risks associated with subsequent mitigation works. Himalayan balsam can usually be effectively controlled in two years; however, an additional two years of monitoring would be required to ensure control has been successful.

1.6.19 If control is complete once Scheme site works commence in the area, then no further precautions are required.

1.6.20 If management is not complete once Scheme site works commence in the area, any soil which contains or might contain seeds must be mechanically excavated (to a depth of 30cm) and in order of decreasing priority:

- Stockpiled, treated with herbicide and landscaped (Section 1.9),
- Buried (see Section 1.9), or
- Disposed of to an appropriately licensed landfill (Section 1.9).

1.6.21 Where Himalayan balsam has been identified in close proximity (within 20m) to the Scheme boundary, then control on these areas outside the Scheme boundary should be carefully considered. If Himalayan balsam is present within 6m of the Scheme boundary, seeds may be propelled onto the Scheme footprint by exploding seedpods. The species would spread by natural processes over time into and across the Scheme footprint, as well as further afield. Plants in close proximity to the Scheme should, therefore, be monitored and ideally managed such that seed production is prevented, ultimately removing the species, as detailed in Sections 1.7 and 1.8 Approval must be granted by the owner of the impacted land before treating Himalayan balsam outside of the Scheme boundary.

1.6.22 All areas where Himalayan balsam control has taken place must be monitored until two full growth seasons have passed without re-growth. Management is considered complete once two full growth seasons have passed without new seedlings sprouting.

New Zealand pigmyweed (crassula)

1.6.23 It is unlikely that the crassula could be reliably eradicated from the areas within the Scheme boundary where it is located as, even if the plants in the affected area are removed, re-introduction would likely rapidly occur. However, the species must not be spread due to the site works.

1.6.24 Fencing should be installed to create a 2m buffer zone around the area(s) in which the plant is present.

1.6.25 Strict biosecurity protocols (Section 1.8) should be implemented in such areas. Additionally, where wetland sites are to be created in the vicinity, for example the ecology ponds in the vicinity of the realigned Dam Brook, crassula would likely spread to such locations over time, which could impact the establishment of desirable vegetation. A monitoring programme (twice per year in May and August) during and post construction should be set up for such sites. Where the species is identified, such occurrences should be treated with herbicide or physically removed before they can become well established. Such monitoring should continue at least until the vegetation at the ecology ponds is well established and robust.

Variegated yellow archangel, cherry laurel and snowberry

1.6.26 A control programme should be initiated as far in advance of Scheme works as is possible where variegated yellow archangel, cherry laurel and snowberry have been identified in close proximity (within 20m) to the Scheme boundary. This would remove the risk of these plants spreading onto the Scheme e.g. by natural processes over time. Approval must be granted by the owner of the impacted land before treating these plants outside of the Scheme boundary.

1.6.27 In the cases of variegated yellow archangel and snowberry, the recommended mode of control is herbicide application, optimally in August/September, for at least two consecutive seasons.

1.6.28 For cherry laurel, the plants should be stripped of any fruits (berries) and then cut down and the material chipped for disposal off site. The stumps should be treated with herbicide.

1.6.29 All areas where these plants have been controlled must be monitored during and post-construction for regrowth until five full growth seasons have passed without re-growth. Management is considered complete once these criteria are met.

Signal crayfish

1.6.30 Signal crayfish must not be spread from infested waterbodies to un-infested waterbodies within the Scheme footprint.

1.6.31 Due to the abundance of this species in the surrounding area, local control would have no long-term impact (re-infestation would occur rapidly) and is not recommended.

1.6.32 Access to infested waterbodies which are not being directly impacted by the Scheme should be restricted using fencing were feasible.

1.6.33 If machinery or PPE enters signal crayfish infested waterbodies, they must do so under supervision from an ECoW. Any portions of the machinery or PPE that come in contact with the water must be washed down using a jet-wash. This is to remove signal crayfish larvae (which would not be visible to the naked eye) and fragments of any plant material. Machinery should be

disinfected with Virkon and allowed to dry thoroughly prior to being used in or near another waterbody.

1.6.34 If signal crayfish are removed from infested waterbodies, they must not be returned to the water, rather they must be killed humanely (see Annex D).

1.7 Management programme

1.7.1 All works involving the management of INNS should be carried out by an appropriately qualified specialist or be overseen by an appropriately experienced ECoW who is trained in the management of INNS.

1.7.2 Method statements, which include appropriate biosecurity protocols, should be produced prior to any Scheme construction works in areas where INNS have been identified. Contractors involved in such works should be members of an appropriate trade association and liaise with an INNS specialist, who would validate all method statements and ensure that current best practice is followed. Best practice dictates that work should follow 'Regulatory Position Statement 178 - treatment and disposal of invasive non-native plants' (Environment Agency, 2016).

1.7.3 Any workers likely to enter an area where INNS are present should be informed of the presence and associated restrictions and biosecurity measures (also see Section 1.9).

1.7.4 Following the completion of Scheme works, a report should be produced in the form of an update to the management plan, which details all control works carried out and includes any deviations from the management plan.

1.7.5 Table 7 provides an overview of the best practice that should be followed during the Scheme construction phase - further information on specific methods is provided in Section 1.9.

Table 11: Overview of optimal actionable control options of each INNS

Species	Recommendations
Japanese knotweed and giant knotweed	If possible, obtain a full treatment history for all stands (if treatment has taken place) and the original extent of the stands should be determined. Install fencing around all stands creating a 4m buffer zone from visible above ground plants. If the size of the original (pre-treatments) stands is determined to be larger than what is currently visible, then the fence should be extended to form a buffer zone around the area of the original infestation. **Ideal:** Avoid spread during Scheme construction works. This could be achieved by the use of fencing and/or ground protection (e.g. geotextile covered in an aggregate layer). Treat with herbicide until control is achieved (see Section 1.6 and Table 8). Control is considered complete once at least two full growth years have passed without regrowth. Carry out monitoring until control is complete. **Alternate:** *Prior to Scheme development works* The knotweed should treated/continue to be treated with herbicide in advance of works to prevent further spread and reduce the probability of accidental spread of viable material. Avoid spread prior to Scheme development works.

Species	Recommendations
	Prior to, or at the onset of, Scheme development works Impacted soils should be excavated (refer to Table 9) and, in order of preference, either: (i) stockpiled on-site and continue to be treated with herbicide; (ii) buried on the Scheme site; or (iii) disposed of to landfill. Full biosecurity precautions (refer to Section 1.8) should be implemented for works carried out inside Knotweed buffer zones until the knotweed has been removed. *Following Scheme development* Monitoring should be carried out and any regrowth treated with herbicide (refer to Table 8) until control is achieved (control is considered complete once two full growth seasons have passed without regrowth).
Himalayan balsam	**Ideal:** Avoid spread during Scheme development works. This can be achieved by the use of fencing and/or ground protection (e.g. geotextile covered in an aggregate layer). Manually remove all plants before they begin to set seed i.e. in early stages of flowering until control is achieved, and leave *in situ* to dry out. Control is considered complete once at least one full growth year has passed without regrowth. Carry out monitoring until control is complete. **Alternate:** *Prior to Scheme development works* Avoid spread prior to development works. Himalayan balsam could be treated with herbicide or manually removed in advance of works to prevent further spread and reduce the probability of accidental spread of viable material. *Prior to, or at the onset of, Scheme development works* Impacted soils should be excavated (refer to Table 9) and, in order of preference, either: (i) stockpiled on-site and continue to be hand pulled or treated with herbicide; (ii) buried on the Scheme site; or (iii) disposed of to landfill. Full biosecurity precautions should be implemented for works carried out inside Himalayan balsam buffer zones until the plant has been removed. *Following Scheme development* Monitoring should be carried out and any regrowth hand pulled or treated with herbicide until control is achieved (control is considered complete once one full growth season has passed without regrowth).
Variegated Yellow archangel	**Ideal:** Avoid spread during development works. This can be achieved by the use of fencing. Treat with herbicide (refer to Table 8) in advance of works to prevent further spread and reduce the probability of accidental spread of viable material. Control is considered complete once at least two full growth years have passed without regrowth. Carry out monitoring until control is complete. **Alternate:** *Prior to Scheme development works* Manually remove all plants assisted by gently forking around the stand. Avoid spread prior to development works. *Prior to, or at the onset of, Scheme development works* Full biosecurity precautions should be implemented for works carried out inside variegated yellow-archangel buffer zones until the plant has been removed. *Following Scheme development* Monitoring should be carried out and any regrowth hand pulled or treated with herbicide (refer to Table 8) until control is achieved (control is considered complete once minimally two but ideally five full growth seasons have passed without regrowth).

Species	Recommendations
New Zealand pigmyweed (crassula)	**Ideal:** Avoid spread during development works. Monitor created wetland ecology ponds until vegetation is well established and robust. Immediately control (herbicide or physical removal) crassula if identified. **Alternate:** *Prior to Scheme development works* Avoid spread prior to *Scheme* development works. Treat with herbicide (refer to Table 8) in advance of works to prevent further spread and reduce the probability of accidental spread of viable material. *Prior to, or at the onset of, Scheme development works* Excavate and bury the crassula under 20cm soil. Full biosecurity precautions should be implemented for works carried out inside New Zealand pigmyweed buffer zones until the plant has been removed. *Following Scheme development* Monitoring should be carried out and any regrowth hand pulled or treated with herbicide until control is achieved (control is considered complete once minimally two but ideally five full growth seasons have passed without regrowth).
Cherry laurel	**Ideal:** Avoid spread during Scheme development works. This can be achieved by the use of fencing. Strip plants of any fruits (berries) and then cut down chipping the material disposal off site. Remove mechanically by cutting 50cm above ground and treating the stump with herbicide. Scrape the top 20cm of soil and, in order of decreasing priority cut plants and soil should be buried (see Section 1.9 and Table 9), stockpiled and treated (Section 1.9),or disposed of to an appropriately licensed landfill. Control is considered complete once at least three full growth years have passed without regrowth. Carry out monitoring until control is complete. **Alternate:** Treat all plants with herbicide using an appropriate adjuvant and be prepared to retreat regrowth in subsequent years. *Prior to Scheme development works* Avoid spread prior to development works. *Prior to, or at the onset of, Scheme development works* Full biosecurity precautions should be implemented for works carried out inside cherry laurel buffer zones until the plant has been removed. *Following Scheme development* Monitoring should be carried out and any regrowth hand pulled or treated with herbicide until control is achieved (control is considered complete once minimally two but ideally five full growth seasons have passed without regrowth).
Snowberry	**Ideal:** Avoid spread during development works. This can be achieved by the use of fencing. Treat with herbicide in advance of works (refer to Table 8) to prevent further spread and reduce the probability of accidental spread of viable material. Follow up treatment would be required in at least the second year. Control is considered complete once at least three full growth years have passed without regrowth. Carry out monitoring until control is complete. **Alternate:** Mechanically remove (refer to Table 9) all plants and use herbicide for any regrowth. *Prior to Scheme development works* Avoid spread prior to development works. *Prior to, or at the onset of, Scheme development works* Full biosecurity precautions should be implemented for works carried out inside snowberry

Species	Recommendations
	buffer zones until the plant has been removed. *Following Scheme development* Monitoring should be carried out and any regrowth hand pulled or treated with herbicide (refer to Table 8) until control is achieved (control is considered complete once minimally two but ideally five full growth seasons have passed without regrowth).
Signal crayfish	**Ideal:** Avoid entering watercourses which would not be impacted by the Scheme during construction works. This could be achieved by the use of fencing. **Implementation of strict biosecurity protocols if waterbodies are entered:** If machinery or any PPE enters infested waterbodies, they must do so under supervision from an ECoW. Any portions of the machinery that comes in contact with the water must be washed down using a jet-wash. This is to remove fragments of plant material and signal crayfish larvae (which would not be visible to the naked eye). Such machinery should be disinfected with Virkon and allowed to dry thoroughly prior to being used in or near another waterbody. **Humane killing if accidentally captured:** If signal crayfish are removed from infested waterbodies, they must not be returned to the water; rather they must be killed humanely by the ECoW (see Annex D).

1.8 General biosecurity requirements

1.8.1 Biosecurity protocols should be implemented when working in infested areas. All works involving the excavation of INNS should be overseen by an appropriately experienced ECoW who is responsible for advising on all biosecurity measures with respect to the invasive species on the Scheme.

1.8.2 The following biosecurity measures should be implemented when working within INNS buffer zones:

- A toolbox talk must be provided by a suitably qualified ECoW at the onset of works, providing details on identification, location and the required biosecurity precautions.
- Vehicles, in particular plant used for excavation, that are brought into the area of works, should be clean and free from soil and mud including tyres and tracks.
- Cleaning stations must be set up at designated entry/exit points to INNS demarcated areas. A jet wash should be available for vehicles and brushes and buckets of water should be available for clothing and equipment. Disinfectant (such as Virkon) should be available if working in waterbodies.
- Any vehicles, equipment and clothing that may have come into contact with potentially contaminated soils/water should be inspected and thoroughly cleaned/disinfected prior to leaving the infested area.

- Personnel should be reminded of biosecurity requirements at the start of each work day and should be updated on any changes to management plans i.e. information on the locations of any newly identified stands.
- Soil brought into the area of works should only be sourced from a reputable source with a good track record relating to not providing soil contaminated with invasive species propagules.

1.9 Management (additional details)

Herbicide treatment

1.9.1 Only an approved herbicide may be used and must be applied in accordance with all directions on the product label. The user is responsible for the risks that arise from use of herbicide products. Any person involved in the professional application of herbicides should possess the appropriate pesticides certificate of competence for the safe use of herbicide and hand-held herbicide applicators, for example, National Proficiency Tests Council (NPTC) Level 2 award in the safe use of pesticides PA1 and PA6 (aw). Herbicide application should be carried out when plants are dry and when there is a high likelihood of no rain in the next six hours (preferably 24 hours) post application. Soft water should be used for the herbicide/adjuvant mix if available.

1.9.2 All appropriate information (including name of operative, qualification of operative, site address, date of application, target species, reason for treatment, method of application, product used, application rate, quantity applied, total product used, any environmental risks identified, start time, finish time, weather conditions, and PPE worn) should be recorded following each herbicide application and these records retained in an approved manner within the recording system for the works.

1.9.3 Plants should not be disturbed for at least three weeks post herbicide application. It is only after such a time that the plants would show the full effect of the herbicide i.e. the effect is not immediate. Prior to, and for the duration of, herbicide treatments a no disturbance buffer zone should be maintained around plants. Such a no disturbance zone would:

- Allow any below ground material to be treated or show itself.
- Decrease the probability of inadvertently facilitating spread.
- Reduce the chance of missing material during control action.

1.9.4 There should be no digging or other disturbance to the ground/soil within buffer zones and ideally proposed site personnel and equipment should not enter these zones.

Foliar application

1.9.5 An approved systemic glyphosate based herbicide can be used, specifically Roundup ProVantage 480. The application must be prepared as directed on the product label.

1.9.6 An adjuvant can be added to the mix (Companion Gold is recommended for treating Japanese knotweed). These should be prepared to the appropriate concentration as stated on the label. This would enhance the amount of herbicide absorbed. All directions on the product label for appropriately mixing these viscous adjuvants must be followed.

1.9.7 Herbicide should only be applied on windless or low wind days to reduce the extent of impact on non-target vegetation. Herbicide should be applied generously to both upper and lower surface of leaves and to the stems.

1.9.8 Application to the lower surface of Japanese knotweed is critical.

1.9.9 The recommended treatment schedule is outlined in Table 8.

Table 12: Herbicide application schedule

Species	Treatments per year	Timing	Likely duration
Japanese knotweed and Giant knotweed	1*-2	*June/July and August/September	2 to 3 years
Himalayan balsam*	1-3	June, August and October	2 to 3 years
Variegated Yellow archangel	1-3	May, July, August/September	2 to 4 years
Cherry laurel*	1-3	May, July, August/September	2 to 4 years
Snowberry	1-3	May, July, August/September	2 to 4 years

* = if herbicide is used

Excavation

General information

1.9.10 Where immediate removal is required, for example in a location that is shortly to be developed, the most appropriate control option is likely to be mechanical excavation. All works involving the excavation, transport and disposal of Schedule 9 species should be monitored by an appropriately experienced ECoW.

1.9.11 Only the quantity of soil required for the construction of the Scheme should be removed. Soils that do not need to be removed can be left in place. It would be pragmatic to take steps to prevent growth from such retained soil, e.g. geomembrane can be placed on top of the material prior to backfill. Japanese knotweed (especially following herbicide treatment) would not

grow through a well laid road and does not pose a significant risk to its structural integrity.

Pre-commencement measures

1.9.12 Given that excavation based remediation of all/some Japanese knotweed would likely be required (as per Regulatory Position Statement 178 – 'treatment and disposal of invasive non-native plants' (Environment Agency, 2016)), if the following requirements are complied with, a permit is not required for managing Japanese knotweed waste on site:

- A Biosecurity Management Plan must be produced and maintained, which sets out how the material would be excavated, treated or buried so that further growth and/or spread of the invasive species beyond the Scheme site is prevented. The document must be available to the Environment Agency on request.
- Where burial takes place, it must take place on land that is of low habitat value, in an area that is likely to be undisturbed, more than 7m away from an adjacent landowner's site.
- The material must not contain pollutants likely to pose a threat to groundwater quality.
- Once excavated, the material should be stored for less than 12 months prior to burial.
- Japanese knotweed material is buried, either with at least 5m of cover, or encapsulated in a geotextile membrane and buried with at least 2m of cover.
- The Environment Agency must are notified at least one week prior to the burial of Japanese knotweed.
- Where Japanese knotweed containing materials cannot be suitably re-used (i.e. stockpiled and used for landscaping) or disposed of on-site, it must go to an appropriately permitted landfill site or incineration facility. The Environment Agency must be notified of Japanese knotweed removal from the Scheme site and its destination.

During excavation

1.9.13 Mechanical excavation on the Scheme should be to a depth and area determined by an experienced ECoW and should continue, subject to ecological, physical, infrastructural, health and safety and other site-specific constraints, until all visible Japanese knotweed material is removed (if complete removal is the aim). See Table 9 for area and depth requirements relating to identified INNS. Excavation depths are provided for all species for reference; however, excavation has not been recommended for variegated yellow-archangel.

Table 13: Excavation area and depth requirements

Species	Depth	Distance from above ground plants
Japanese knotweed and Giant knotweed	Extremely variable. Rhizome can spread down to 3m; however, 1.5m or less is more typical.	Extremely variable. Rhizome can spread outward to 7m; however, less than 2.5m is more typical. The presence of built structures can facilitate spread due to the presence of gaps between walls and soil etc.
Himalayan balsam	Variable, though not exceeding 30cm.	6m due to explosive character of seed pods.
Variegated Yellow archangel	30cm would remove all rhizome capable of re-growth.	2m to remove soil with rhizome.
Crassula	20cm would remove all material capable of re-growth.	2m to ensure no fragments are missed.

1.9.14 Inspection by the ECoW of the area being excavated for plant material that might persist in the soil should take place regularly at the face of the excavation activities. All reasonable precautions should be taken not to facilitate the spread of the species during control action. Tracked vehicles are more likely to facilitate the spread of INNS than vehicles with tyres and extra precautions must be taken when they are used in infestation areas (regular inspection of tracks for plant material and cleaning).

1.9.15 Where excavations take place inside Root Protection Areas (RPAs), all appropriate steps must be taken not to damage the root system. Any works in such areas must be undertaken following the guidance provided in British Standard 'BS 5837:2012 Trees in relation to design, demolition and construction', which outlines the regulations regarding RPAs. If excavations are required within an RPA, extra precautions are required i.e. hand tools should be used to remove the soil around roots and the primary roots should not be damaged.

Post excavation

1.9.16 Following remediation works, all plant material and potentially contaminated soil should be removed from all equipment, clothing, vehicles involved in the control action before leaving the infested area. If contaminated material is being transported elsewhere on the Scheme site or off-site, a haulage route should be set out in advance and precautions should be taken to prevent the spillage of contaminated soil and the spread of invasive plant material.

Stockpiling, burial and off-site disposal

1.9.17 Following excavation, if possible, impacted soils should be retained on-site, for example, stockpiled or buried. As per Environment Agency (2016) and Defra guidance, the amount of waste generated, to be taken off-site, that contains invasive plants, or their seeds and rhizomes, should be minimised.

Stockpiling

1.9.18 Low bunds created with soils containing Schedule 9 invasive species must be no more than 50cm, ideally no more than 30cm, in height, though bunds can be placed in a depression such that the top of the bund is flush to the ground.

1.9.19 Good bund design is critical. Rhizome and seed infested soil should be concentrated into the upper surface of the bund, where it would grow and subsequently controlled. If rhizome or seeds are buried deeper in the bund, they may become dormant and regrow only if the bund is subsequently disturbed. Any regrowth from the bund must be treated with herbicide (as detailed in Section 1.9). Such bunds should be fenced off to prevent access and bunded soils can form the basis of landscaped areas once control is achieved.

Burial

1.9.20 Where possible, a non-persistent herbicide should be applied to the material at least once before burial, ideally three weeks before burial. Burial should be carried out is such a way that it prevents the regrowth of the species. See Table 10 for burial requirements relating to INNS identified on the Scheme site.

1.9.21 The location of any buried Schedule 9 invasive species must be recorded as part of the proposed site management system and these records must be retained in an approved manner. If large pieces of plant material are being buried, a structural engineer should be consulted to determine if there is a risk of subsidence following burial. Ideally larger pieces of plant material should be removed prior to burial for off-site disposal by a registered waste carrier in accordance with a waste disposal licence.

Table 14: Burial requirements

Species	Depth
Japanese knotweed	Healthy rhizome/crown should be buried: • With 5m of soil on top. • Completely encapsulated in a root barrier membrane cell at 2m. Rhizome/crown subjected to an extensive herbicide treatment programme (as validated by a suitably qualified ecologist) can be safely buried at 1m from surface level under well-constructed hard standing. The Environment Agency must be consulted and approval must be granted for reduced depth burial; otherwise, the depths above should be used.
Himalayan balsam	Soils containing seeds should be buried with 2m soil on top. Seeds can be safely buried beneath 50cm of soil under hard standing. The Environment Agency must be consulted and approval must be granted for reduced depth burial; otherwise, the depth above should be used.
Variegated Yellow archangel	Soils containing rhizome and stolon should be buried with 2m soil on top. Such material can be safely buried beneath 0.5m of soil. The Environment Agency must be consulted and approval must be granted for reduced depth burial; otherwise, the depths above should be used.

Species	Depth
Crassula	Soils containing vegetative material should be buried with 0.2m to 1m soil on top, depending on the likelihood of disturbance.

Off-site disposal

1.9.22 All Schedule 9 invasive species plant material and impacted soils due to be disposed off-site must be taken to a waste disposal facility that is licensed to receive controlled waste (for example, non-hazardous or green waste). The waste facility should supply evidence of its licence.

1.9.23 Before any soil waste is moved off-site, soil samples from the affected area may have to be tested by a suitable laboratory, and the results sent to the receiving landfill site for their approval before they would accept the waste. There is a standard turnaround time of two weeks for laboratories to assess soil samples. The range of contaminants for which testing is required would depend on the existing and previous use of the site and surrounding area. If the material contains hazardous waste, then a Waste Acceptance Criteria (WAC) analysis would be required.

1.9.24 All waste material should be removed from the site by a suitably licensed carrier. All waste removed from the site should be accompanied by a Waste Transfer Note, or, if hazardous, a Consignment Note, which clearly states the presence of the species in the waste's destination. All tickets should be checked by the ECoW before signing and copies of all transfer and consignment documentation should be filed and kept for the legally required time. All producers, carriers and waste facilities have a duty of care to ensure that the waste is handled and treated properly.

Table 15: Off-site disposal requirements

Species	Off-site disposal requirement
Japanese knotweed	Plant material and infested soil can be disposed of off-site as non-hazardous waste to a suitably licences waste disposal facility.
Himalayan balsam	Plant material and infested soil can be disposed of off-site as non-hazardous waste to a suitably licences waste disposal facility.
New Zealand pigmyweed (crassula)	Plant material can be disposed of as green waste for composting. Infested soil can be disposed of off-site as non-hazardous waste to a suitably licenced waste disposal facility
Variegated Yellow archangel	Plant material can be disposed of as green waste for composting. Infested soil can be disposed of off-site as non-hazardous waste to a suitably licenced waste disposal facility
Cherry laurel	Plant material can be disposed of as green waste for composting. There are no restrictions with respect to infested soils; however, such soils should be disposed of in a manner that would not facilitate the spread of the species into susceptible habitats.
Snowberry	Plant material can be disposed of as green waste for composting. There are no restrictions with respect to infested soils; however, such soils should be disposed of in a manner that would not facilitate the spread of the species into susceptible habitats.

Hand pulling (Himalayan balsam)

1.9.25 Where plants do not produce a deep underground root or rhizome system, manual removal by hand puling or digging using hand tools (spade or fork) can be the most appropriate control method. As herbicide is not used, such control action may be more environmentally friendly.

1.9.26 Himalayan balsam can easily be hand pulled as the species has very shallow roots, only growing to a depth of 10cm - 15cm and being weakly bound to the soil. This method is particularly useful for smaller infestations and in high ecological value areas where the use of herbicides, or indiscriminate cutting, needs to be avoided. While hand pulling is time consuming, the re-establishment of native vegetation can often be more easily facilitated by using this approach.

1.9.27 Gloves should be worn to avoid injury, including stings from nettles (*Urtica dioica*) which are often found growing beside Himalayan balsam.

1.9.28 Hand pulling should be carried out three times per year in June, August and October during and post-construction. Repeat visits and treatments should continue until one full growth season has passed without regrowth. Control would likely take between two to three years (including monitoring).

1.9.29 Pulled plants should not be placed on soil or in damp areas as they may readily re-root. The plants can be allowed to dry out or be disposed of as green waste (if no seeds are present). Once dried, the remains can be left on site to decompose if fully desiccated and seedless, disposed of as inert waste, or burnt (where this is permitted).

Incidental signal crayfish capture

1.9.30 Any signal crayfish incidentally caught on site should be humanely dispatched in accordance with guidance provided in Annex D. All works which take place in and around water environments should be supervised by an ECoW.

1.10 References

Highways England (2018a) A38 Derby Junctions, Extended Phase 1 Habitat Survey 2017 Report. (Report Number: HE514503-ACM-EBD-A38_SW_PR_ZZ-RP-EG-0004).

Highways England (2018b) A38 Derby Junctions White-Clawed Crayfish Survey 2017 Report (Report Number: HE514503-ACM-EBD-A38_SW_PR_ZZ-RP-EG-0011).

Highways England (2018c) A38 Derby Junctions White-Clawed Crayfish Survey 2018 Report HE514503-ACM-EBD-A38_SW_PR_ZZ-RP-EG-0019).

Highways England (2016) A38 Derby Junctions White-Clawed Crayfish Survey 2015 Report (Report Number: 47071319-URS-05-RP-EN-017).

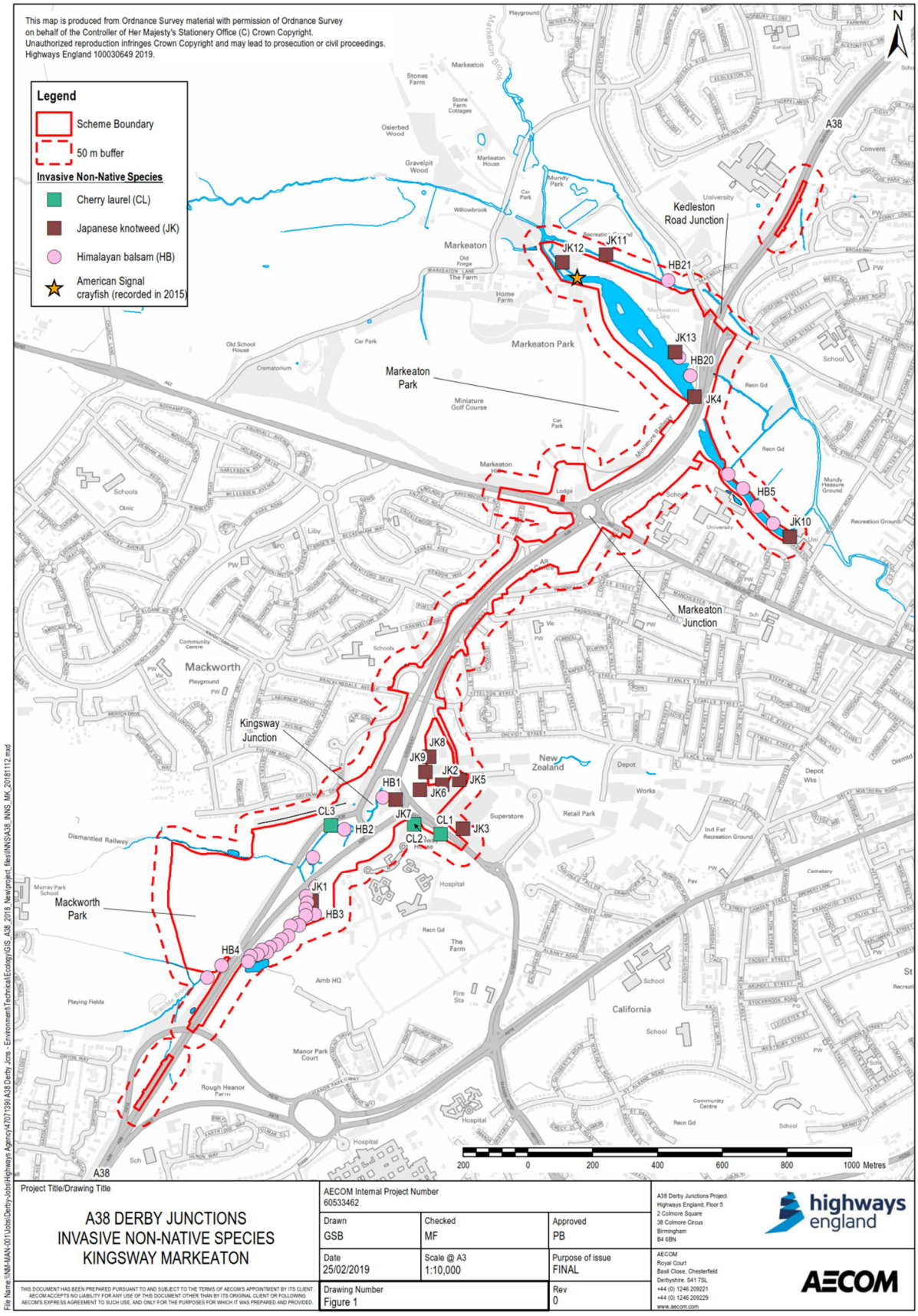
Environment Agency (2016) Treatment and disposal of invasive non-native plants: RPS 178 23 November 2016.

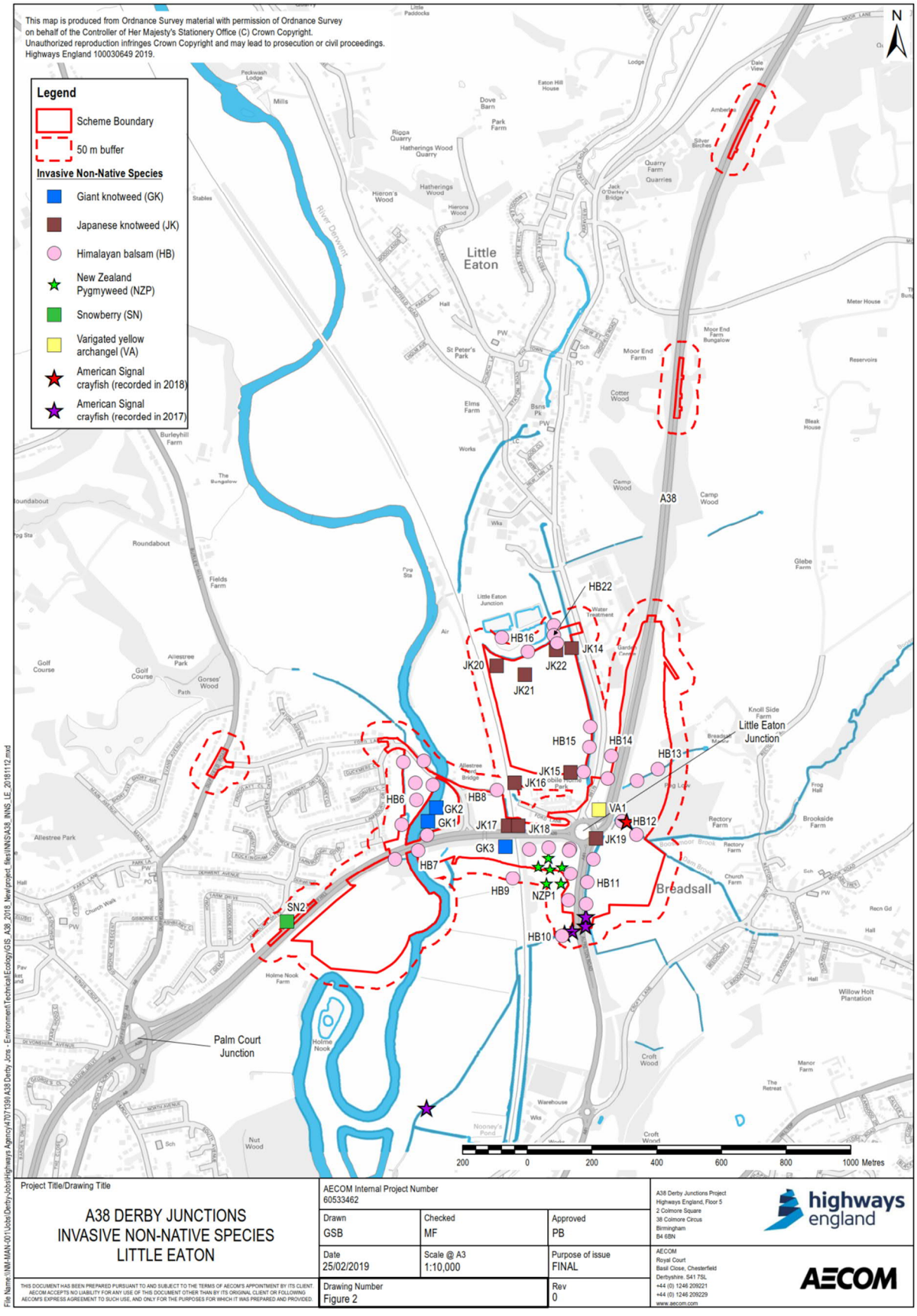
Fennell, M., Jones, L. and Wade, P.M. (2018) Practical management of invasive non-native weeds in Britain and Ireland. PCA, Packard, Chichester.

Home Office (2014) Reform of anti-social behaviour powers Japanese Knotweed and other invasive non-native plants. Accessible from:https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/364846/Japanese_Knotweed_information_note.pdf

UK (2016) The EU Invasive Alien Species Regulation – Frequently Asked Questions. Accessible from: http://www.nonnativespecies.org/index.cfm?sectionid=7

Annex A: Figures


This map is produced from Ordnance Survey material with permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office (C) Crown Copyright. Unauthorized reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Highways England 100030649 2019.
Legend
Scheme Boundary
50 m buffer
Invasive Non-Native Species
Cherry laurel (CL)
Japanese knotweed (JK)
Himalayan balsam (HB)
American Signal crayfish (recorded in 2015)
N
A38
Kedleston Road Junction
Markeaton
Markeaton Park
Markeaton Junction
Kingsway Junction
Mackworth
Mackworth Park
JK1
JK2
JK3
JK4
JK5
JK6
JK7
JK8
JK9
JK10
JK11
JK12
JK13
HB1
HB2
HB3
HB4
HB5
HB20
HB21
CL1
CL2
CL3
200 0 200 400 600 800 1000 Metres
Project Title/Drawing Title
A38 DERBY JUNCTIONS
INVASIVE NON-NATIVE SPECIES
KINGSWAY MARKEATON
AECOM Internal Project Number
60533462
Drawn GSB
Checked MF
Approved PB
Date 25/02/2019
Scale @ A3 1:10,000
Purpose of issue FINAL
Drawing Number Figure 1
Rev 0
A38 Derby Junctions Project
Highways England, Floor 5
2 Colmore Square
38 Colmore Circus
Birmingham
B4 6BN
AECOM
Royal Court
Basil Close, Chesterfield
Derbyshire, S41 7SL
+44 (0) 1246 209221
+44 (0) 1246 209229
www.aecom.com
THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM'S APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM'S EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.
File Name:\\MM-MAN-001\Jobs\Derby Jobs\Highways Agency\47071090\A38 Derby Jcns - Environment\Technical\Ecology\GIS_A38_2018_New\project_files\INNS\A38_INNS_MK_20181112.mxd


This map is produced from Ordnance Survey material with permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office (C) Crown Copyright. Unauthorized reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Highways England 100030649 2019.
Legend
Scheme Boundary
50 m buffer
Invasive Non-Native Species
Giant knotweed (GK)
Japanese knotweed (JK)
Himalayan balsam (HB)
New Zealand Pygmyweed (NZP)
Snowberry (SN)
Varigated yellow archangel (VA)
American Signal crayfish (recorded in 2018)
American Signal crayfish (recorded in 2017)
N
Little Eaton
Little Eaton Junction
Breadsall
Palm Court Junction
A38
River Derwent
HB22
HB16
JK14
JK20
JK22
JK21
HB15
HB14
HB13
JK15
JK16
HB8
HB6
GK2
GK1
JK17
JK18
VA1
HB12
JK19
GK3
HB7
HB9
NZP1
HB11
HB10
SN2
200 0 200 400 600 800 1000 Metres
Project Title/Drawing Title
A38 DERBY JUNCTIONS
INVASIVE NON-NATIVE SPECIES
LITTLE EATON
AECOM Internal Project Number
60533462
Drawn GSB
Checked MF
Approved PB
Date 25/02/2019
Scale @ A3 1:10,000
Purpose of issue FINAL
Drawing Number Figure 2
Rev 0
THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM'S APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM'S EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.
A38 Derby Junctions Project
Highways England, Floor 5
2 Colmore Square
38 Colmore Circus
Birmingham
B4 6BN
AECOM
Royal Court
Basil Close, Chesterfield
Derbyshire, S41 7SL
+44 (0) 1246 209221
+44 (0) 1246 209229
www.aecom.com
File Name:\\NM-MAN-001\Jobs\Derby\Jobs\Highways Agency\47007190\A38 Derby Junc - Environment\Technical\Ecology\GIS_A38_2018_New\project_files\INNS\A38_INNS_LE_20181112.mxd

Annex B: Summary of relevant INNS legislation

Legislation	Summary of key aspects
EU Invasive Alien Species Regulation 1143/2014 (EU IAS Regulations)	This regulation imposes restrictions on species of animals and plants listed as 'Species of Union Concern'. These are species which pose a risk of adverse impacts across the EU, such that targeted action across EU member states is required. Restrictions applying to these species mean they cannot not be imported, kept, bred, transported, sold, used or exchanged, allowed to reproduce, grown or cultivated, or released into the environment. Under certain circumstances a Species Control Order can be served on a land owner to require the removal of a given species (see Infrastructure Act 2015).
Wildlife and Countryside Act 1981 (as amended) Schedule 9, Section 14 (WCA Schedule 9)	It is an offence to plant or otherwise cause to grow in the wild any species listed on Schedule 9.
Infrastructure Act 2015	Environmental authorities may issue control orders under which landowners can be obligated to carry out species control operations for invasive non-native animal and plant species.
Anti-social Behaviour, Crime and Policing Act 2014 and Community Protection Notices	Local councils and the police have the power to issue Community Protection Notices against "individuals who are acting unreasonably and who persistently or continually act in a way that has a detrimental effect on the quality of life of those in the locality" including for invasive non-native species. Breach of any requirement of a Community Protection Notice, without reasonable excuse, would constitute an offence.
Environmental Protection Act 1990, Sections 33 and 34	If taken away from the site of origin, certain Schedule 9 species and associated material, e.g. soil, may be classified as Controlled Waste and must be disposed following a duty of care. Such waste that is disposed of at a landfill site must be accompanied by appropriate waste transfer documentation.
Town and Country Planning Act 1990	Although this Act does not make specific reference to specific weeds, it provides local authorities with power to serve notices on owners or occupiers of land to control weeds that may be harming the amenity of the surrounding area. If the owners and occupiers fail to remedy the situation, they may be liable to a fine or have to repay the costs of action taken by the local authority to control the weeds.
Common Law	There is provision within Common Law to take civil action against neighbouring landowners where the spread of invasive species is considered to be a private or public nuisance.

Additional information and guidance: Anti-social Behaviour, Crime and Policing Act

Guidance released by the Home Office provides information on the reformed Anti-social Behaviour, Crime and Policing Act 2014. The guidance note, primarily aimed at Japanese knotweed, giant knotweed and Himalayan balsam, provides information on how best to proceed if a neighbour is unwilling to control INNS on their property i.e. they will not treat it with herbicide or remove it. The updated legislation means that if a neighbour 'fails to act' regarding controlling, or preventing the growth of INNS, then a Community Protection Notice can be issued requiring action to be taken. Breach of any requirement of a Community Protection Notice, without reasonable excuse, would be a criminal offence, subject to a fixed penalty notice (which attracts a penalty of £100) or prosecution. On summary conviction, an individual would be liable to a level 4 fine (£2,500). An organisation, such as a company, is liable to a fine not exceeding £20,000.

Additional information and guidance: EU Invasive Alien Species Regulation 2015

The UK has produced an FAQ document for UK stakeholders outlining the key aspects of the legislation and the obligations of stakeholders in relation to the species on the list of species of EU concern. This includes guidance in the impact of the EU referendum on the newly issued EU legislation. It also states that if the containment of plant species of Union concern cannot be guaranteed, their safe removal should be considered.

Additional information on national strategy: The Great Britain Invasive Non-native Species Strategy aims to address invasive non-native species (INNS) issues in Great Britain, maintaining the approach of the 2008 Strategy and the 2003 policy review (The Great Britain Non-native Species Secretariat 2015). The Strategy covers the terrestrial, freshwater and marine environments and also species native to one part of a country that become invasive in areas outside their natural range. INNS species, such as signal crayfish, are identified within this strategy as a species which disrupt habitats and ecosystems, preying on or out-competing native species and spreading disease.

Annex C: Management options

As per Environment Agency Guidance in relation to controlling INNS, the available control options should be evaluated prior to implementing control. A range of remediation options are available for the management of invasive plants, as outlined below and detailed in guidance produced by the Environment Agency, the Property Care Association, and various management guidance documents produced by local, regional, and national agencies in a range countries. The various options can be used in isolation or in combination. The recommended control options are detailed in Section 1.6. Many remediation options are available for the management of Schedule 9 invasive species, as outlined below and detailed in guidance by the Environment Agency (2013, 2016) and the Property Care Association (2018) and Defra. The various options can be used in isolation or in combination.

Control:

1. **Herbicide treatment:** Spraying the affected area with chemicals, achieving control over a period of around 1 to 5 years (depending on species, maturity and area covered).
2. **Crown removal and herbicide treatment (Japanese knotweed only):** When treating Japanese knotweed with herbicide a large amount of the active chemical is absorbed by this dense crown material (if present), which can reduce the amount of herbicide that reaches buried rhizome and can greatly increase the time required for control. These crowns can be removed prior to herbicide treatment.
3. **Physical removal using hand pulling:** Removal of plant material by gently pulling plants by hand (not suitable for Japanese knotweed).
4. **Physical removal using hand tools**: Removal of plant material using spades and soil forks (generally not suitable for Japanese knotweed).
5. **Physical removal using machinery**: Large scale removal of plant material and associated soils using heavy machinery.
6. **Light exclusion:** Plant material can be covered using a light impermeable barrier (e.g. polythene) or a semi-impermeable physical barrier (e.g. jute matting) resulting in destruction of the plant material or prevention of germination (not suitable for Japanese knotweed).
7. **Draw down:** Water bodies are drained and plant material is left to dry out and die. Can be combined with herbicide application. Water bodies are subsequently re-filled. Only suitable for aquatic plants.
8. **Biological control:** A biological control agent (e.g. fungus or insect) is introduced to a habitat and eats or kills/damages the target species (non-target species are not affected).
9. **Root barrier membrane (Japanese knotweed only):** Prevents the horizontal growth of Japanese knotweed by installing a vertical membrane barrier. This is usually used

on site boundaries to prevent underground rhizomatous spread from neighbouring sites. A thin trench is dug and the barrier is installed to a depth of around 3m. The membrane can be reinforced with plywood before backfilling takes place.

Management of arisings:

10. **Stockpiling:** Moving excavated material to an area of the site where it can be treated with chemicals over a period of approximately 1 to 3 years. After this, soil can be left in situ or re-used on the proposed site.
11. **Screening (Japanese knotweed only):** Excavating the Japanese knotweed stands and screening (sieving) the material through a 25mm mesh to remove the larger rhizome fragments, which are then incinerated in an approved manner. The material containing the smaller rhizome fragments, which passed through screening, is then spread out onto a controlled area on the site. The regrowth from these fragments is then treated with herbicide. As the Japanese knotweed is re-growing from small rhizome fragments, the time taken to achieve eradication is reduced.
12. **Burial:** Excavating impacted soils and burying the material on the site. Some restrictions may apply both where material can be buried and what can happen above the buried area.
13. **Disposal as green waste:** Some plant material (species dependant) can be taken off the site and disposed of as green waste for composting or incineration.
14. **Removal to landfill:** Excavating impacted soils stands and removing the material to a landfill registered to receive such waste using covered haulage vehicles.

A summary of the advantages and disadvantages of each of these control options is presented in Table C1.

Table: C1: Evaluation of the pros and cons of potential mitigation options

Treatment	Advantages	Disadvantages
Screening	• Moderately cost effective • Allows the Scheme to progress whilst treatment takes place elsewhere on-site	• Requires incineration to take place – potential issues gaining consent to burn • Only reduces level of infestation, does not rapidly eliminate the plant • Requires set-aside area on-site for spreading out of smaller rhizome fragments
Crown removal	• Removes the vast majority of underground biomass • Increases the effectiveness of herbicide treatment • Reduces the time required for herbicide treatment	• Not suitable for all species • Can be expensive or time consuming, particularly for large infestations • An area to store the removed crown may be required • The area must be left undisturbed • Restrictions remain on site
Herbicides	• Cost effective • Treatment can be carried out in situ without risk of spreading plant further	• Takes 1 - 5 years • Must be left undisturbed • Restrictions can remain on site • Restricted use near valuable vegetation and waterways

Treatment	Advantages	Disadvantages
Mechanical Removal	• Removes underground biomass, leaving only seeds, regrowth from which can be easily treated with herbicide • Reduces the time required for herbicide treatment	• Can be expensive or time consuming, particularly for large infestations • Removed plant material must be disposed of appropriately
Stockpiling	• Cost effective • Allows the Scheme to progress whilst treatment takes place elsewhere onsite	• Requires undisturbed area • Soil from stockpile must remain on site • Restrictions remain in stockpile area
Burial	• Does not require a set-aside area for control • Work can continue immediately after burial	• Restrictions remain on site • Limits use of area above burial site • Can requires a large hole to receive material
Disposal Off-Site	• No restrictions left on site • Work can continue immediately after removal	• Relatively expensive

Annex D: Humane killing of signal crayfish

Any signal crayfish found must not be returned to the water. They must be disposed of properly (see below). If the specimen is carrying eggs i.e. 'berried', special care must be taken: immediately place the crayfish into a polythene bag and seal up/tie off so that eggs are not washed into the river. Make others aware of this invasive animal and report any findings to the ECoW.

Killing and disposal

The way to kill a signal crayfish is to:

- Place a single crayfish in a transparent polythene bag and wedge it into a corner at the bottom of the bag.
- Using a rubber or wooden headed mallet/lump hammer, strike the crayfish with a single heavy blow to crush it.
- In the case of larger specimens, it may be necessary to strike the crayfish more than once to ensure that the body is completely crushed.
- Tie off or otherwise seal the polythene bag and put it into the landfill or incineration (general waste) collecting bin/stream.
- Ensure that a mallet/lump hammer is available along with a stock of suitable polythene bags.
- The bag should be large enough to enable the crayfish to be crushed and to be tied off/sealed and robust enough to withstand being struck in this manner and not rupture. If it does rupture, place in a second bag, tie off/seal and dispose as above. Improperly sealed bags are likely to cause an unpleasant smell.