



CELBRIDGE HAZELHATCH MOBILITY CORRIDOR

Outline Construction Environmental Management Plan



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Outline Construction Environmental Management Plan

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PREFACE

This Outline CEMP has been prepared having regard to the National Roads Authority (NRA) “Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan” (NRA, 2007). The Outline CEMP will be updated by the appointed contractor and will be updated prior to and during construction on an as-needed basis to manage environmental risks and mitigation.

1 INTRODUCTION

RPS was commissioned by Kildare County Council (KCC) to prepare an Outline Construction Environmental Management Plan (CEMP) with respect to the Celbridge Hazelhatch Mobility Corridor, hereafter referred to as the Proposed Scheme.

The project is situated in the south west of Celbridge, County Kildare. The proposed route is approximately 2km long, beginning at a proposed junction with Clane Road and heading in a south easterly direction, predominantly through greenfield lands until it ties into the existing R405 Hazelhatch Road, before terminating at the existing Loughlinstown Road Roundabout near Hazelhatch Train Station. The route also includes proposed junctions with Newtown Road, Simmonstown Manor Road and R405 Hazelhatch Road. A new bridge crossing is required over the River Liffey, located approximately 200m south of the beginning of the route at Clane Road.

This report has been prepared to inform the planning application for the Celbridge Hazelhatch Mobility Corridor Project.

This Outline CEMP has been prepared having regard to the National Roads Authority (NRA) “*Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan*” (NRA, 2007).

1.1 Purpose of the CEMP

The purpose of this CEMP is to document and describe the main activities that will be undertaken to facilitate the Proposed Scheme and the procedures for the delivery of environmental mitigation and monitoring measures detailed in the statutory approvals and for addressing general day-to-day environmental issues that can arise during the construction phase of the Proposed Scheme, assisting the contractor in preventing, managing and/or minimising potential significant environmental effects during the construction phase.

The CEMP is a key construction contract document, which will ensure that all mitigation measures, which are considered necessary to protect the environment, are implemented.

It is intended that the CEMP will be a “live” document which will be updated by the appointed contractor and will be updated prior to and during construction on an as-needed basis to manage environmental risks and mitigation. The appointed contractor will be responsible for ensuring that all sub-contractors adhere to and implement the procedures and measures included in the CEMP.

1.2 Scope of the CEMP

The Outline CEMP contains all the Environmental Commitments that are set out in Environmental Report (ER) and the Natura Impact Statement (NIS) for the Proposed Scheme, and it will be further updated with any conditions and/or modifications imposed by the Competent Authority, An Coimisiún Pleanála.

The following elements of the CEMP will be provided by the Contractor once appointed:

- Roles and responsibilities of the staff working for the Contractor based on the Contractor’s organisational structure;
- Procedures for communicating with the public;
- Procedures for communicating with relevant site personnel;
- Procedures for Environmental Awareness Training for the Contractor’s staff;
- Procedures for monitoring and responses to monitoring results, where it is contractually required; and
- Provide a system for audit to be effective during the construction phase.

1.3 Contractor’s Environmental Policy Statement

Once appointed, the Contractor shall include their Environmental Policy Statement to this section.

2 GENERAL PROJECT DETAILS

This section provides key details of the proposed Scheme.

2.1 Location of the Scheme

The project is situated in the south west of Celbridge, County Kildare as outlined in **Figure 2-1** below.



Figure 2-1: Site Location

2.2 Overview of the Proposed Scheme

The project is situated in the south west of Celbridge, County Kildare.

The proposed route is approximately 2km long, beginning at a proposed junction with Clane Road and heading in a south easterly direction, predominantly through greenfield lands until it ties into the existing R405 Hazelhatch Road, before terminating at the existing Loughlinstown Road Roundabout near Hazelhatch Train Station. The route also includes proposed junctions with Newtown Road, Simmonstown Manor Road and R405 Hazelhatch Road. A new bridge crossing is required over the River Liffey, located approximately 200m south of the beginning of the route at Clane Road.

A new bridge crossing over the River Liffey is required between approximately Ch.0+ 170 to Ch. 0+265.

2.2.1 Road Cross-Section

The proposed road cross-section for the project's mainline is a single carriageway with 3.5m wide lanes in each direction for a total pavement width of 7.0m.

The majority of the route includes 2.0m wide one-way cycle tracks and 2.0m wide footpaths on both sides of the road. The portion of the route between Hazelhatch Road Junction and Loughlinstown Road roundabout includes a 2.0m wide footpath and 3.0m wide two-way cycleway on the northbound side of the road only due to space restrictions and desire line requirements.

On both sides of the mainline, it is typically proposed to provide a 2.0m wide grassed verge between the cycle facility and the carriageway, and 1.0m wide grassed verge between the back of the footpath and adjacent earthwork slopes. The exception to this is across the proposed River Liffey Bridge, where no additional verge width is proposed between the cycle tracks and the carriageway or between the footpaths and bridge parapets.

2.2.2 Design Speed, Speed Limit and Geometry

The design speeds and corresponding posted speed limits proposed for the new road are as follows:

- Ch. 0+000 to Ch. 0+350: 50km/h
- Ch. 0+000 to Ch. 1+1959: 60km/h

The road geometry is designed to the standards contained in the Design Manual for Urban Roads and Streets May 2019.

2.3 Site Access

The site will likely be accessible from each existing road that interfaces with the project.

It is expected that HGV site access, e.g. for import of earthworks material, shall generally be limited to the R403 Clane Road for site access north of the River Liffey, and the R405 Hazelhatch Road for site access south of the river.

2.4 Site Compound

It is proposed that main compound will be located on the south east side of Newtown Road between approximately Ch. 0+425 to Ch. 0+545. This compound will include welfare facilities and vehicle parking for site staff and will allow for the storage of materials. Temporary land take has been included to accommodate this compound and the compound will remain in place for the duration of the works. The compound will have appropriate levels of security. The Contractor will be required to manage parking and deliveries at the compound and other areas in such a manner as to ensure that there is no obstruction to general traffic or sightlines during construction.

It is likely that an additional smaller compound will be required for the site to the north of the River Liffey. Also, localised welfare facilities and vehicle parking for site staff may be provided along the scheme.

Following completion of the proposed scheme, the site compounds will be decommissioned and all materials removed from the site. The temporary land take will be returned back to its original use.

2.5 Construction Duration of the Scheme

It is estimated that the overall duration of the construction programme will be approximately 24 months.

A detailed construction programme will be developed by the appointed Contractor and will be included in this section.

3 CONTACT SHEETS

It is crucial that environmental incidents (if any) are reported properly and in time during the construction phase, with details of the responses undertaken and documented.

For this purpose, it is required that the contact details of the relevant personnel employed at the site are available and updated on a regular basis. The following subsections provide examples on how on the important contact information can be put on record.

3.1 Main Contractor's Details

Table 3.1 provides an example record of contact details of the main Contractor and its staff. Once appointed, the Contractor shall the necessary details to this section.

Table 3.1: Contact Information of Main Contractor and Other Relevant Staff (Example)

Position Title	Name	Mobile Phone Number	Email
Project Manager			
Site Manager (Representative)			
Site Environmental Manager (Environmental Clerk of Works)*			
Contractor's Site Ecologist (CSE)			
Forepersons			
Safety Officers*			
Site Emergency Number*			
Other, as appropriate			

**24 hour contact details required.*

3.2 Employer Contacts

Table 3.2 provides an example record of contact details of the employer for the proposed Scheme.

Table 3.2: Contact Information of the Employer (Example)

Organisation	Position Title	Name	Mobile Phone Number	Email
Employers Representative	Project Resident Engineer			

Organisation	Position Title	Name	Mobile Phone Number	Email
Employer	Executive Engineer			
Employer	Senior Executive Engineer			
Employer	Liaison Officer			

3.3 Third Party Contacts

Table 3.3 provides an example record of contact details of any third party involved in the development of the scheme.

Table 3.3: Contact Information of the Third-Party Personnel (Example)

Organisation	Position Title	Name	Mobile Phone Number	Email
Inland Fisheries Ireland				
National Parks and Wildlife Service				
Health and Safety Authority				
Environmental Protection Agency				
Emergency Services				
Others, as appropriate				

4 ORGANISATIONAL STRUCTURE / ROLES AND RESPONSIBILITIES

4.1 Organisational Structure

The Contractor is required to develop an organogram to be added to this CEMP that will set out the roles and responsibilities of the relevant personnel.

4.2 Employer

Kildare County Council will be the employer responsible for procurement of the appointed Contractor and will involve the determination that the Contractor is competent to carry out the works.

The appointed Contractor will be required to plan and construct the proposed Development in accordance with the Employer's Requirements.

The Employer is responsible for ensuring that the Contractor manages the construction activities in accordance with this CEMP.

4.3 Contractor

The Contractor is responsible for implementing the CEMP, including updating the document to reflect any changes in environmental management and/or practices. The Contractor will use the CEMP to inform all Method Statements and ensure that Method Statements include the controls and mitigation measures outlined in this document. The Contractor is responsible for ensuring all necessary consents, licences and permissions for all activities as required by current legislation governing the protection of the environment have been obtained. The Contractor will consult with the Ecological Clerk of Works (ECoW) and Project Archaeologist as relevant regarding any derogation licence or archaeological monitoring licence applications.

The Contractor will approve the CEMP and Method Statements which will also be approved by the ECoW prior to commencement of any works. The Contractor ensures that the ECoW is informed in a timely manner of all site activities, including all programme changes, to ensure advanced checks and monitoring can be arranged. This includes any preliminary works.

The Contractor will consider the mitigation measures and good practice construction methods detailed within this document in the Contractor's design and in any detailed environmental plans as required by the Contract.

Where the Contractor has standard documents within its own Environmental Management System or Environmental Management Plan, that cover a particular requirement of this CEMP, they will either be inserted or cross-referenced within the relevant section of the final CEMP.

4.3.1 Contractor's Environmental Manager

The Contractor shall appoint an Environmental Manager with appropriate experience and expertise for the duration of the construction phase to ensure that all the environmental design, control and mitigation measures outlined in the CEMP / Environmental Report and supporting planning documentation in relation to all aspects of the environment are implemented. The Environmental Manager together with an environmental team and in consultation with the ECoW, will be responsible for implementation of all mitigation measures and monitoring. This Environmental Manager will be awarded a level of authority and will be allowed to stop construction activity if there is potential for adverse environmental effects to occur.

4.3.2 All Site Personnel

The following applies to all personnel attending the site:

- All personnel will attend Environmental Induction Training before commencing work on site.
- Personnel will adhere to the Environmental Control Measures and relevant site-specific Method Statements set out in this Plan.

- Personnel will report immediately to the Contractor's Environmental Manager any incidents where there has been a breach of agreed procedures including: a spillage of a potentially environmentally harmful substance; an unauthorised discharge to ground, water or air, damage to a protected habitat etc. Depending on circumstances it may be appropriate for general operatives and machinery operators to report directly to their Foreperson who will then report to the Contractor's Environmental Manager.

4.4 Community Liaison Officer

The Community Liaison Officer (CLO) will be appointed by the Contractor and will be responsible for managing tasks such as the following:

- Alerting neighbouring residents of the works or activities commencing in their area;
- Briefing neighbours on progress and issues likely to affect them, such as traffic management measures, as necessary;
- Liaison with Kildare County Council and emergency services as appropriate; and
- Liaison with local Gardaí, particularly in relation to traffic movements and permits where necessary.

4.5 Community Engagement Manager

The Community Engagement Manager is employed by the Employer. The dedicated role is in place right through the Project phases to facilitate engagement with the community. The Community Engagement Manager will work closely with the CLO.

4.6 Correspondence and General Communication

The Contractor will provide a complete record of all relevant communication and reports associated with all aspects of environmental management and implementation of this document. The following records will be maintained:

- Minutes and attendance records of start-up meetings (onsite meeting prior to commencement of construction works). Attendance required by KCC, Contractor, ECoW and all other relevant personnel responsible for environmental management during the proposed Scheme (as required);
- Weekly rolling Environmental Risk Log – including look ahead activities with required mitigation (including weather forecasts), discussed and recorded at scheduled weekly construction meetings. This will cover all environmental sensitivities, including ecology, archaeology, and water quality/drainage mitigation locations/measures.
- Contractor Audit Reports (according to respective corporate procedures);
- Water Quality Monitoring Records, documenting the Contractor's visual checks of waterbodies;
- Licences and Consents - copies of all permissions, consents, licenses, and permits, including related correspondence;
- Waste Management Records; and
- General Correspondence - all other relevant internal and external communication records relating to environmental management issues and implementation of the CEMP.

4.7 Risk Assessment and Method Statements

The Contractor will undertake Risk Assessments and Method Statements (RAMS) for all works and tasks prior to these being undertaken. Such assessments are to consider and address all the environmental aspects of the planned works and will include proposed mitigation measures.

Method Statements will be submitted in full to the EcOW at least one week in advance of such works starting.

5 ENVIRONMENTAL AWARENESS TRAINING

All the site personnel will have appropriate knowledge for successful implementation of the CEMP and environmental awareness training is therefore essential and will be provided.

5.1 Briefing on CEMP and Contractual Requirements

The Contractor's Environmental Manager will provide a briefing on the CEMP and the Environmental commitments to the Contractor's senior personnel, namely the Project Manager, Site Manager, Contractor Ecologist and any other key personnel.

5.2 Environmental Induction Training

Environmental induction training will be provided to all categories of personnel working and visiting the site. This can take place in conjunction with the health and safety induction. More detailed training will be carried out with staff or subcontractors with specific environmental responsibilities.

As a minimum, the following information will be provided to all inductees:

- Identification of specific environmental risks associated with the work to be undertaken onsite by the inductee;
- Summary of the main environmental aspects of concern:
 - i. Nearby sensitive receptors;
 - ii. Species and/or habitat protection requirements;
 - iii. Archaeological features for protection;
 - iv. Pollution prevention and protection of the water environment (e.g., silt mitigation measures and refuelling);
 - v. Measures to minimise impacts on air quality and noise;
 - vi. Waste management e.g. requirements for storage and removal of hazardous material;
 - vii. Construction traffic management; and
 - viii. Plant service and repair procedures, specifically service location and the disposal of waste oils and service components
- Environmental Incident and Emergency Response Plan; and
- Contact details for the Environmental Manager.

5.3 Toolbox Talks

During construction, to provide on-going reinforcement and awareness training, tool box talks will be carried out on Environmental Control Measures associated with site-specific method statements to those with will undertake the work. They will depend on the type of works being undertaken and the environmental impacts that may result from these activities.

The tool box talks will be delivered by designated personnel onsite (e.g. Environmental Manager) as required and will also cover environmental issues particular to the scheme and any other environmental issues which arise onsite including but not limited to:

- Oil/Diesel spill prevention and safe refuelling practice and fuel handling procedures;
- Storage of materials including oil/diesels and cement;
- Materials handling, including excavation, segregation, storage, and reuse/disposal of excavated materials;
- Waste management, including waste storage, waste segregation and littering;
- Emergency response procedures used to deal with spills including training on use of spill kits; and

- Emergency response protocols.

The Contractor will maintain a record of all toolbox talks and training and make these records available to the Employer if requested.

5.4 Notice Boards

The Contractor will provide and maintain project environmental notice board(s) which are to be positioned to ensure that all construction employees including sub-contractors can review the notice board daily. As a minimum, this is to include one notice board at the site compound.

Environmental labelling and signage are to be used onsite to inform project personnel of key environmental requirements or restrictions, including information to assist good environmental practice across the site.

The environmental notice boards are maintained by the Contractor and will be reviewed, and updated as required, at least weekly. As a minimum, the notice boards will contain:

- A description of the key environmental risks and intended risk mitigation measures,
- Environmental Risk Map illustrating the location of the key risks and required exclusion zones / buffer zones and location of emergency response equipment, and
- Key contact numbers and responsible personnel identified within the Environmental Incident and Emergency Response Plan (see **Section 8**).

6 COMMUNICATION

A communication strategy for both internal and external communications to promote awareness, education and sharing of information on the progress of the proposed Scheme will be prepared by the Contractor.

6.1 Internal

The CEMP will be distributed to the project team, including sub-contractors, to ensure that the environmental requirements are communicated effectively. Key activities and environmentally sensitive operations shall also be briefed to staff and Contractors. Project, client and company environmental policies, where available, will be displayed on site.

During the construction phase, internal communication will include regular progress meetings, which shall cover:

- Training undertaken;
- Progress report;
- Inspections, audits and non-conformance;
- Complaints received;
- Visits by external bodies and the outcome or feedback from such visits;
- Objective / target achievement, including reporting on environmental performance.

6.2 External

The contractor will be required to provide details on how the local community, road users and affected residents will be notified in advance of the scheduling of major works, temporary traffic diversions and road closures and the progress of the construction works.

6.2.1 Community Liaison

The contractor shall appoint a key contact person during the construction phase to facilitate communications between the contractor, affected landowners, key stakeholders and members of the public. .

Contact details (email, phone) for the CLO will be included in the CEMP for the Proposed Development. The CLO will be involved throughout construction on all aspects of community engagement. Where communications are related to environmental issues, the Environmental Manager/ Environmental Clerk of Works will be involved, if appropriate.

6.2.2 Enquiries and Complaints

The Contractor will establish a process for handling all enquires including complaints which will be agreed with the Employer/ Employer's Representative. All enquiries will be recorded, and a log will be maintained to include details of the response and action taken. The log will be available for inspection if requested. All observations, queries and complaints will be dealt with in a timely manner.

The Employer will be immediately informed of any environmental-related issues that have been raised. The Contractors' Environmental Manager will be responsible for informing relevant stakeholders, and statutory bodies, as appropriate, about such issues.

7 INSPECTIONS, AUDITING AND MONITORING COMPLIANCE

7.1 Inspections

The Contractor's Environmental Manager will undertake environmental inspections on a weekly basis and will provide relevant records to the Project Manager when and as requested. The Contractor's Environmental Manager will be accompanied by qualified and accredited environmental specialists (e.g. ecologists, landscape architects, noise specialists etc.) when appropriate and where required during inspections.

A digital log of all reports from environmental inspections will be kept and will be available for inspection at all times.

7.2 Monitoring

The proposed Development requires certain types of monitoring during construction e.g. noise and vibration monitoring, archaeological monitoring etc. The Contractor shall carry out the required monitoring as specified in the relevant environmental assessment reports submitted as part of the Section 177AE application. The Contractor shall ensure that all the monitoring is carried out by appropriately qualified and competent environmental personnel.

7.3 Audit

For successful implementation of the CEMP by the Contractor, the Contractor's Environmental Manager will carry out monthly audits. The audit reports will be submitted to the Employers Representative for review and comment within two weeks of the audit being undertaken. The Contractor's Environmental Manager should update the CEMP as necessary and advise site personnel accordingly based on the results of these audits. A digital log of all audits will be kept and will be available for inspection at all times.

This CEMP shall also be revised between audits as deemed appropriate, particularly with an update of environmental control measures or environmental legislation.

Environmental audits may be completed at any time by the Employer, but at least at quarterly intervals to ensure the Contractor is complying with the environmental provisions of the contract.

7.4 Non-Conformance, Corrective and Prevention Action Plan

Non-conformances are generally issued in a situation where legal or contractual limits associated with activities on the project are exceeded, or there is an internal/external complaint associated with environmental performance.

Non-conformance occurs when essential components of the CEMP are absent or dysfunctional, or where there is insufficient control of the activities and processes to the extent that the functionality of the CEMP (i.e., in terms of the policy, objectives and management programmes) is compromised.

Correction is the act of developing or improving where non-conformances have been identified. Prevention is the act of ensuring that non-conformance does not (re)occur.

In the event of non-conformance with any of the above, the following shall be investigated:

- Cause of the non-compliance: a Non-Conformance Report (NCR) will be prepared to record any environmental incident and work that has not been carried out in accordance with the CEMP or Method Statement(s);
- Develop a plan for correction of the non-compliance: a Corrective Action Report (CAR) will be prepared where a non-conformance is identified as a result of monitoring, inspection, surveillance and valid complaints;
- Determine preventive measures and ensure they are effective: any actions identified shall nominate an owner to follow through the action to be taken, along with a specified timescale for it to be closed out;
- Verify the effectiveness of the correction of the non-compliance; and
- Ensure that any procedures affected by the corrective action taken are revised accordingly.

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Responsibility shall be designated for the investigation, correction, mitigation and prevention of nonconformance. The contractor and the Employer's Representative teams will monitor and investigate nonconformances relating to environmental issues.

8 ENVIRONMENTAL INCIDENT AND EMERGENCY RESPONSE

8.1 General Requirements

The Contractor is responsible for reporting, recording and investigating environmental incidents for the duration of the contract and to ensure that in the unlikely event of an incident, response efforts are prompt, efficient, and suitable for the particular circumstances.

The Contractor will prepare a detailed Environmental Incident and Emergency Response Plan. The plan will contain details of emergency scenarios and relevant procedures and actions that will apply. The Contractor will communicate the plan as part of the site induction to all staff and visitors.

The Contractor will ensure that the Environmental Incident and Emergency Response Plan contains contact details of relevant staff / external authorities such as:

- Environmental Protection Agency and EPA 24-hour emergency incident line 0818 33 55 99;
- Specialist clean-up contractor;
- Emergency Services;
- Inland Fisheries Ireland;
- Local Authority Environmental Officers;
- An Garda Síochána; and
- National Parks and Wildlife Services.

In the event of spillage of any polluting substance and/or pollution of a watercourse, the relevant local authority, Inland Fisheries Ireland, and the NPWS are to be notified by the Contractor. A set of standardised emergency response procedures will govern the management of emergency incidents.

8.2 Safety and Environmental Awareness Reports and Environmental Auditing

The Contractor will complete a Safety and Environmental Awareness Report for all potential (near miss) or actual environmental incident or emergency which occur on site.

8.3 Pollution / Spill Incident

An emergency-operating plan will be established to deal with incidents or accidents. This will include means of containment in the event of accidental spillage of hydrocarbons or other pollutants (e.g. oil booms, soakage pads). The Contractor will provide a one-page summary sheet containing the key information for incidents response to be used as a quick reference for any on-site personnel witnessing an incident. A laminate copy of this summary sheet will be located with all plant / machinery / on-site vehicles.

Key information to be provided to the Contractor Project Manager and the ECoW within 30 minutes of an incident (irrespective of the scale / severity of the incident) will include:

- What substance was spilled (Material Data Safety Sheet);
- Approximate volume and time of spillage;
- Accurate location of spill (GPS/grid reference or ID/number referenced on map etc.);
- All measures taken to clean up the spill;
- Help required, i.e., manpower, machinery, expert advice, disposal, etc.; and
- Whether the spill has reached a watercourse or the marine environment.

The Contractor in updating the Environmental Incident and Emergency Response Plan, will consider the impacts of pollution/spill incidents during construction and will note the actions to be taken in the event of a pollution incident, including the following:

- Containment measures;
- Emergency discharge routes;
- List of appropriate equipment and clean-up materials;
- Maintenance schedule for equipment;
- Details of trained staff, location, and provision for 24-hour cover;
- Details of staff responsibilities;
- Notification procedures to inform the relevant environmental protection authority;
- Audit and review schedule;
- Telephone numbers of statutory water undertakers and local water company; and
- List of specialist pollution clean-up companies and their telephone numbers.

The Contractor will ensure that adequate means to absorb or contain any spillages of chemicals, pollutants are available at all times.

8.3.1 Emergency Access

The Contractor will be required to maintain access routes for the emergency services in all work areas for the duration of the construction phase and to identify the emergency site access points to each work area.

These will be developed in consultation with the emergency services and documented by the Contractor in the updated CEMP prior to construction commencing, as well as being identified in the updated Environmental Incident and Emergency Response Plan.

8.3.2 Extreme Weather Events and Flood Risk

The Contractor will consider the impacts of extreme weather events, flood risk and related conditions during construction. The Contractor will be required to use the short to medium range weather forecasting service from Met Éireann, or other approved meteorological data and weather forecast provider, to inform short to medium term scheduling of the works, environmental controls, and mitigation measures.

The updated CEMP will include appropriate contingency measures to manage extreme weather events (red weather warnings from Met Éireann), including the suspension of work, where required. The measures will include training of personnel and prevention and monitoring arrangements for weather events. Where relevant risks have been identified, the detailed construction method statements will consider extreme weather events.

8.3.3 Fire and Explosion Risk

Even though the fire and explosion risks during construction are very low, the updated CEMP will include appropriate contingency measures to manage such risks. The measures will include training of personnel in fire and explosion risk awareness, risk prevention and risk monitoring.

Portable fire extinguishers, suitable for the activities at the working area, checked and maintained in working order, will be available for use at each of the working areas.

Potentially flammable or hazardous substances will be stored appropriately, and quantities stored will be limited to the minimum volume required to meet the immediate requirements.

Appropriate site personnel will be trained as first aiders and fire marshals. Monitoring of site activities to minimise fire and explosion risk will be a key part of the duties of the site safety officer and fire marshals.

9 GENERAL SITE MANAGEMENT AND POLLUTION PREVENTION

The contractor will be responsible for the implementation of the following environmental management requirements to prevent, manage and/or minimise potential significant environmental effects during the construction phase.

9.1 General Site Management and Pollution Prevention

9.1.1 Responsibility

The Contractor is responsible for pollution prevention for the duration of the contract and until such time as permanent measures, such as permanent drainage and silt mitigation controls, are deemed to be adequate and appropriately constructed.

The Contractor ensures that all staff and subcontractors working on site will be familiar with pollution prevention and mitigation measures as detailed in this document. This includes subcontractors, Employer's direct contractors and other Employer's representatives working on the site.

It is the responsibility of the Contractor to contact the relevant statutory and non-statutory bodies and stakeholders in the vicinity of the Project, so that the requirements and interests of these parties are adhered to and protected throughout the duration of the Contract.

Prior to works commencing on site, the Contractor will prepare a Pollution Prevention Plan (PPP) in line with the below requirements (as a minimum) and will communicate the contents to all staff (induction / toolbox talks). The PPP covers all potentially polluting activities, considering good practice standards. The Contractor provides the PPP to the Employer prior to start of works on site.

The Contractor monitors, and records in an onsite log, adherence to the PPP throughout the works. The Contractor communicates the PPP and any changes/updates of the PPP to all personnel on site.

9.1.2 Good Housekeeping and General Pollution Prevention Measures

Proper site management during construction shall be carried out to ensure that all necessary measures are taken to prevent silt-laden run-off and pollutants from entering any watercourse, with cognisance of the proximity of the proposed works to the River Liffey.

The Contractor will ensure "good housekeeping" at all times. The following points (not exhaustive) indicate general pollution prevention measures in accordance with published guidance and project commitments. Pollution prevention measures relating to specific tasks are also detailed in the respective sections of this document. This will include, but not necessarily be limited to, the following measures:

- General maintenance of working areas and cleanliness of welfare facilities and storage areas;
- Provision of site layout map showing key areas such as first aid posts, spill kits, material and waste storage and welfare facilities;
- Maintaining all plant, material and equipment required to complete the construction work in good order, clean, and tidy;
- Keeping construction compounds, access routes and designated parking areas free and clear of excess dirt, rubbish piles, scrap wood, etc. and maintaining dust suppression always;
- Provision of signs giving details of site management contact numbers, including out of hours, and public information at the boundaries of the working areas;
- Provision of adequate welfare facilities for site personnel;
- Installation of appropriate security, lighting, fencing, and hoarding at each working area;
- Effective prevention of oil, grease or other objectionable matter being discharged from any working area;

- Provision of appropriate waste management at each working area and regular collections to be arranged;
- Prevention of infestation from pests or vermin including arrangements for regular disposal of food and material attractive to pests. If infestation occurs the Contractor will take appropriate action to eliminate and prevent further occurrence;
- Maintenance of wheel washing or other similar systems and other contaminant measures as required in each working area;
- No discharge of site runoff or water discharge without agreement of the relevant authorities.
- Prohibition of open fires always;
- Use of less intrusive noise alarms, which meet the safety requirements, such as broadband reversing warnings, or proximity sensors to reduce the requirement for traditional reversing alarms;
- Maintenance of public rights of way, diversions and entry/ exit areas around working areas for pedestrians and cyclists where practicable and to achieve inclusive access;
- All loading and unloading of vehicles will take place off the public network wherever this is practicable; and
- Material handling and/or stockpiling of materials, where permitted, will be appropriately located to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.
- On completion of the works, all plant, tools, offices, storage containers, surplus materials, waste and temporary welfare facilities will be removed from the site by the Contractor.

9.1.3 Management of Chemicals, Fuels and Oils

The Contractor will prepare and adhere to a Fuel Management Protocol in line with the below requirements (as a minimum) and communicate the contents to all staff (via induction / toolbox talks). The following measures are to be adhered to with respect to the management of chemicals, fuels and oils:

- The Contractor will provide secure oil, fuel, and chemical storage in over-ground bunded areas, limited to the minimum volume required to serve immediate needs with specified delivery and refuelling areas;
- Stockpiling of construction materials shall be strictly prohibited within 15 m of any ditch or water-laden channel;
- The Contractor will ensure protection measures will be put in place to ensure that all hydrocarbons used are appropriately handled, stored and disposed of in accordance with the TII/NRA document "CIRIA Guideline Document C532 Control of Water Pollution from Construction Sites (CIRIA, 2001) and Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016).
- Fuel and oil containers are stored within a secondary containment system (e.g., bund to 110% of volume for static tanks or a drip tray for mobile stores);
- Fuel and oil stores including tanks and drums are regularly inspected for leaks and signs of damage;
- Ancillary equipment such as hoses or pipes are to be contained within the bund;
- All ancillary fuel pipes on plant, outlets at fuel tanks etc. will be regularly checked and maintained to ensure their good state-of-repair and that no drips or leaks to ground occur;
- Only designated trained operators are authorised to refuel plant on site;
- Procedures and contingency plans are set up to deal with emergency accidents or spills;
- Plant and site vehicles are to be well maintained and any vehicles leaking fluids shall be repaired or removed from site immediately. Any servicing operations will take place over drip trays.
- All machinery including hydraulic hoses and fittings will be inspected and cleaned in advance of works and routinely checked and maintained to ensure no leakage of oils or lubricants occurs during the works. Any machinery leaking fluids shall be repaired or removed from site immediately;
- Any servicing operations will take place over interceptor drip trays;

- Refuelling of construction equipment and the addition of hydraulic oil or lubricants to vehicles/equipment will take place on sealed surfaces only, in designated bunded areas (ideally located at the temporary construction compound), using an appropriate fuel dispenser away from drains and other watercourses;
- Interceptor drip trays will be positioned under any stationary mobile plant to prevent oil contamination of the ground surface or water.
- Re-fuelling of plant shall only take place on hardstand and not within 1 m of any watercourse or surface water feature. Spill containment (i.e. drip trays) shall be used, and spill kits shall be kept available and used if necessary;
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the site and properly disposed of;
- Oil booms and oil soakage pads will be kept on site to deal with any accidental spillage;
- Fuels and oils shall be stored in a bunded cabinet and a spill kit containing oil absorbent materials will be available on site;
- Spill-kits and hydrocarbon absorbent packs should be stored in the cabin of vehicles working near watercourse and operators shall be fully trained in the use of this equipment; and
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the site and properly disposed of.
- The Contractor identifies a specialist clean-up specialist emergency contractor to engage with in the case of a significant pollution event on site. Details of the specialist contractor will be provided to the Employer prior to works commencing on site. Details of the specialist contractor will be included in the Environmental Incident and Emergency Response Plan (refer to **Section 8.3**).

9.1.4 Temporary Construction Compounds

As outlined in **Section 2.4**, the construction of the scheme will require one main site compound for the duration of the construction works. An appropriate site has been identified on the south east side of Newtown Road between approximately Ch. 0+425 to Ch. 0+545. The construction compound will be kept to the minimum size required to construct the Scheme. Temporary land take has been included to accommodate this compound. Upon completion of the construction works, all plant, equipment, materials, temporary infrastructure, and vehicles will be removed at the earliest opportunity and the contractor will reinstate the surface of the ground as near as practicable to its original condition.

An additional smaller compound will be required for the site to the north of the River Liffey.

The Contractor shall be responsible for the provision of services, including electric power, water, lighting and heating.

Welfare Facilities - welfare facilities will be provided, as appropriate, for all construction staff and site personnel including locker rooms, drying rooms, toilets, and showers. The welfare facilities will be located at the temporary construction compounds and works areas.

Drinking Water - potable water will be supplied from Irish Water mains where available. The Contractor shall contact Irish Water in relation to the provision of a service connection. If not, potable water will be either transported via tanker to site or via large bottles.

Grey Water - grey water for non-drinking purposes (construction and toilets) will be sourced via rainfall collection or transported via tanker to site.

Wastewater – Sanitary wastewater will be collected and stored in an on-site wastewater treatment unit system, which will be emptied on a regular basis by licensed contractors and disposed of appropriately.

Wheel wash or similar- where a wheel wash is installed, this will be located on impermeable surface, and water will be passed through a silt buster or other appropriate surface water management mechanism.

Deliveries to site - deliveries of materials will be planned and programmed to ensure that the materials are delivered only as they are required at the working areas. Storage of material will be at the supplier premises or at the temporary construction compound, depending on the type of material.

Works requiring multiple vehicle deliveries will be planned to ensure queuing on the public roads around the working areas will be avoided as far as is practical.

9.1.5 Hours of Work

It is proposed that core working hours will apply as follows, with deviation from these times only allowed in exceptional circumstances where prior written approval has been received from the local authority:

- Monday to Friday: 07:00 to 19:00;
- Saturdays: 08:00 to 16:30; and
- Sundays and Bank Holidays: no activities will take place on site.

There are certain works that may benefit from being undertaken outside of normal working hours e.g. delivery and lifting of bridge beams or any other works that require traffic management on existing roads. The bridge beams will be manufactured off-site but will need to be craned into position. This activity will benefit from being undertaken outside of normal working hours. Temporary lighting will be required for any works outside of daylight hours

The removal of waste material off site by road and regular deliveries to site will, where appropriate, be generally confined to outside of peak traffic hours, and will only be undertaken by appropriately permitted hauliers and disposed of in appropriately permitted facilities.

The Contractor may require a period of up to one hour before and one hour after core working hours for start-up and shut down activities in working areas. Activities permitted may include deliveries and unloading of materials, movement of staff to their place of work, maintenance and general preparation works. Except as noted above, the use of plant or machinery likely to cause disturbance will not be permitted outside of the core working hours.

It may be necessary, for example, due to weather constraints, specialist subcontractor availability or the nature of the activity, to undertake certain activities outside of the core working hours. Any construction outside of the core working hours will be agreed by the Contractor in advance with KCC and scheduling of such works will have regard to nearby sensitive receptors, who will be notified in advance.

In the case of work outside of the core working hours required in an emergency or which if not completed would result in an unsafe or harmful situation for workers, the public or local environment, KCC will be informed as soon as reasonably practicable of the reasons and likely duration and timing.

9.1.6 Site Security

The security of the works areas will be the responsibility of the Contractor who will provide adequate security to prevent unauthorised entry to or exit from any working areas. The following measures may be used to prevent unauthorised access.

- Installation CCTV and alarm systems where required;
- CCTV and security systems will be sited and directed so that they do not intrude into occupied residential properties;
- When there is no activity on site, site gates will be closed and locked and appropriate site security provisions will be undertaken; and
- Consultation with neighbouring properties and local crime prevention officers including KCC and An Garda Síochána on site security matters as required.

9.1.7 Hoarding and Fencing

The following measures will be applied in relation to hoarding and fencing:

- Construction compounds will be secured by fencing and provided with lockable gates to prevent unwanted access to temporary compounds and working areas.
- Appropriate sight lines/visibility splays will be maintained around accesses to temporary compounds and working areas from the public road to ensure safety of both vehicles and pedestrians is preserved;

- Temporary Heras fencing will be used in certain areas, such as for short term occupation of working areas;
- Display information boards will be provided with out of hours contact details, a telephone helpline number for comments/complaints and information on the works; and
- Notices to warn of hazards on site such as deep excavations, construction access will be installed on site boundaries.

9.1.8 Services and Lighting

Working areas will be powered preferably by mains supplies and by diesel generators where an electrical supply is not available.

The Employer will require the Contractor to put measures in place to ensure that there are no interruptions to existing services unless this has been agreed in advance with the relevant service provider.

Lighting – site lighting will typically be provided by tower mounted temporary portable construction floodlights. The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting:

- Lighting will be provided with the minimum luminosity sufficient for safety and security purposes. Where practicable, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads, and amenity areas;
- Motion sensor lighting and low energy consumption fittings will be installed to reduce usage and energy consumption; and
- Lighting will be positioned and directed so that it does not unnecessarily intrude on adjacent buildings and land uses, ecological receptors and structures used by protected species, nor cause distraction or confusion to motorists.

10 ENVIRONMENTAL COMMITMENTS

The Schedule of Environmental Commitments will comprise the following:

- The construction phase mitigation and monitoring measures as outlined in the Environmental Report;
- The construction phase mitigation and monitoring measures as outlined in the Natura Impact Statement;
- Any commitments arising from the planning conditions imposed by the Competent Authority, An Coimisiún Pleanála.

The appointed contractor will be required to comply with all Environmental Commitments, and all applicable legislation, including relevant standards, codes of best practice and guidelines.

10.1 Schedule of Environmental Commitments

Table 10.1 summaries the construction phase mitigation (i.e. which the appointed contractor will implement) outlined in the Environmental Report. The table should be read in conjunction with these documents.

Table 10.2 summaries the construction phase monitoring (i.e. which the appointed contractor will implement) outlined in the Environmental Report. The table should be read in conjunction with these documents.

In addition, the mitigation and monitoring measures from the NIS are summarised in Table 10.3.

Table 10.1: Mitigation Measures outlined in the Environmental Report

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
Traffic & Transport (Chapter 4)	4.5.1	Before the construction phase, a Construction Traffic Management Plan (CTMP) will be developed setting out how traffic flow will be managed to mitigate potentially negative impacts. It will be the Contractor's responsibility to develop the CTMP, in compliance with the employer's requirements. The CTMP will be agreed with Planning Authority before commencement of development. It shall be the responsibility of the Contractor to ensure that an agreed CTMP is in place before construction commences and that clear structures/arrangements are in place for full compliance during the course of construction. Potential controls that are typically incorporated into the CTMP include: • No construction related traffic to be permitted to use the road network during peak traffic periods on a 5-day week basis. Any necessary exceptions to this to be agreed in writing with the Planning Authority and in advance, as variations of the CTMP. • Restrictions to apply to all movements; i.e. construction employees, supervisory staff and construction vehicles alike. • If construction related employees are to access or leave construction sites during the specified peak traffic periods than they shall only do so by walking, cycling or bus. Other road related restrictions that are typically included in a CTMP are: • Measures to prevent blocking of roads/inappropriate parking etc. • Truck wheel washing. • Road soiling prevention/road cleaning as required. • Hours of operation. • Pavement damage. • Noise, dust and other nuisance issues. • Advance signage. The CTMP is to be dynamic in nature and varied as required in the light of conditions in the receiving environment.
Noise & Vibration (Chapter 5)	5.5.1	The following mitigation measures will be implemented during the construction works: • Noise barriers (reflective) of at least 2.4 m height up to 3.6 m height shall be installed and maintained at both site compounds for the duration of the construction phase. The noise barriers will, at a minimum, block line of sight between the construction activities and NSLs. Noise barriers at the

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
		site compounds will be installed as early as practicable within the construction programme; - Noise barriers (reflective) of at least 2.4 m height up to 3.6 m height shall be installed and maintained for the duration of the construction phase along the site boundary adjacent to residential properties in the housing estate off Newtown Road to the west of the Proposed Scheme; - Noise barriers (reflective) of at least 2.4 m height up to 3.6 m height shall be installed and maintained for the duration of the construction phase along the southern boundary of the Proposed Scheme along works areas adjacent to the roundabout at Hazelhatch Road and Loughlinstown Road. The noise barriers will, at a minimum, block line of sight between the construction activities and NSLs; - When undertaking vegetation and tree removal and subsequent processing during site clearance works, the distance between removal and processing plant required for site clearance and the nearest NSLs shall be maximised; - Where a hydraulic breaker is required, the following measures shall be implemented: - Fit suitably designed muffler or sound reduction equipment to reduce noise without impairing machine efficiency. - Use dampened bit to eliminate ringing. - Where works are occurring over an extended period, the use of temporary noise barriers/screens or enclosure shall be implemented; - Haul routes shall be well maintained to minimise impulsive noise and vibration from vehicles running over discontinuities in the running surfaces; - Where works (outside of emergency works) need to be completed outside normal working hours or where proposed works indicate that the noise or vibration levels set out in Section 5.2.5.2 (Construction Noise Criteria) or Section 5.2.5.4 (Construction Vibration Criteria) may be exceeded, permission for these works shall be sought from the County Council in advance of any works taking place. The application for such works shall require a detailed noise control plan and follow up report to be prepared by the Contractor. This plan shall include (i) a justification for the works being carried out in the manner proposed, (ii) an assessment indicating what alternatives have been considered, (iii) a statement of the noise control measures from BS 5228 to be adopted and how Best Practicable Means will be used to control noise, (iv) an activity specific noise monitoring programme including contact details for persons with the authority to cease working if required by the County Council. Each follow up report will include details of any complaints received and the action taken to address such complaints; - A noise and vibration monitoring programme shall be implemented for the duration of the construction phase. Monitoring will assess compliance of the construction works with the noise thresholds set out in Table 5.3 and Table 5.4.

Environmental Report Section Chapter Reference Reference	Description of mitigation measure / commitment for implementation
	The noise and vibration programme shall also include actions for exceedances in the noise thresholds should they arise; • Full details of the Contractor's provision for noise and vibration monitoring and procedures including provisions for publication of monitoring results shall be submitted to and approved by the County Council prior to commencement of work. The County Council shall have discretion to vary the monitoring requirements and publication of results during the course of construction; and • Works will be carried out using Best Practicable Means (BPM) to minimise noise and vibration, such measures shall include: – Limiting the hours of construction set out in Section 2.18.7 Hours of Work in the Chapter 2 Project Description, except in certain circumstances as set out in Section 5.2.5.2. – Work practices, equipment noise control and screening shall be in compliance with BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (together referred to as BS 5228). Typical work practices which shall be implemented include: ○ Noisy works shall be scheduled to normal working hours; ○ Quiet working methods, using plant with lower noise emission levels shall be used; ○ Working methods that minimise vibration generation particularly with regard to demolition activities and piling shall be adopted; ○ Plant such as pumps and generators used on or near sensitive locations will be contained within an acoustic enclosure and comply with the noise levels in Table 5.3 and Table 5.4. ○ Plant and machinery used on-site will comply with the EC (Construction Plant and Equipment) Permissible, Noise Levels Regulations, 1988 (S.I. No. 320 of 1988); ○ All noise producing equipment will comply with S.I. No 632 of 2001 European Communities (Noise Emission by Equipment for Use Outdoors) Regulations 2001 and S.I. No. 241/2006 - European Communities (Noise Emission by Equipment for Use Outdoors) (Amendment) Regulations 2006; ○ All plant shall be properly maintained, (mechanisms properly lubricated, faulty silencers replaced, worn bearings replaced, cutting tools sharpened etc.); ○ Acoustic covers to engines shall be closed when in use or idling;

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
		○ For electricity generation at the construction compounds, hydrogen generators or electrified plant shall be utilised over traditional diesel generators. This will also apply to lower powered mobile plant as appropriate; ○ Hydraulic equipment shall be used in preference to pneumatic equipment; ○ Wheeled plant shall be used in preference to tracked plant; ○ Plant shall be located as far away from noise and vibration sensitive receptors as practicable; ○ Site hoardings or perimeter noise barriers shall be installed; ○ Temporary acoustic enclosures or screens around specific noisy static plant shall be used; ○ The unnecessary revving of engines shall be avoided and equipment shall be switched off when not in use; ○ Starting-up plant and vehicles sequentially shall be used rather than at the same time; ○ Internal haul routes shall be well maintained to minimise impulsive noise and vibration from vehicles running over discontinuities in the running surfaces; ○ Rubber linings shall be fitted to chutes, hoppers and dumper vehicles to reduce impact noise from material transfer; ○ Drop heights of materials shall be minimised; ○ Regular inspections of mitigation measures (BPM audits) shall be carried out to ensure compliance with noise and vibration commitments; ○ Regular briefings shall be provided for all site-based personnel so that noise and vibration issues (including the requirement to employ BPM at all locations at all times) are understood and that generic and site-specific mitigation measures are explained and adhered to; ○ Unloading shall be carried out within the worksite rather than on adjacent roads or laybys; ○ Phasing of materials deliveries shall be controlled on a 'just in time' basis to minimise noise and congestion on roads around the site; ○ A formal stakeholder engagement process shall be put in place for the duration of the construction phase, including the provision of information to local residents about noise and vibration monitoring results, works likely to cause significant noise or vibration and/or works planned to take place outside of core working hours; ○ Channels of communication between the Contractor, Kildare County Council Planning

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
		Section (County Council) and residents shall be established at project commencement; and Records of any noise complaints relating to the construction operations will be investigated as soon as possible and reported to the County Council.
Air Quality (Chapter 6)	6.5.1	Before commencing relevant works, a Dust Management Plan (DMP) shall be prepared by the appointed main contractor and submitted for approval to the relevant planning authority. The plan shall include all appropriate dust and emissions mitigation measures, applicable to the circumstances of the relevant site, based on the mitigation in this assessment and local authority requirements and industry best practices. The plan will be developed by the main contractor and for each worksite shall include: • An inventory and timetable of activities which may give rise to emissions or dust; • Alert levels; • Alert system to be used (including notification process); • Details of control measures; • Details of dust monitoring arrangements, including the location of sensitive receptors, monitoring locations, and monitoring equipment to be used. • Details of the air quality reporting requirements. To reduce dust nuisance, a series of measures will be implemented including: • Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods. • Liaison with local authorities and community groups. • Hoarding will be provided around the construction compounds. • It is anticipated that methods of collecting rainwater and recycling for general site use, will be adopted where practical. Strict dust prevention will be always in place, to minimise any potential emissions and these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
		Monitoring of construction dust deposition at nearby sensitive receptors that are identified based on potential risk of dust nuisance during the construction phase of the proposed Scheme is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m²/day (for non-hazardous dusts) during the monitoring period between 28 – 32 days.
Climate (Chapter 7)	7.5.1	Embodied carbon in the materials employed in the construction phase dominate the impact. As such, to mitigate these impacts the use of the following will be required: • As a replacement for traditional precast concrete materials made with Portland cement mixes, the Proposed Scheme will use 50% ground granulated blast-furnace slag (GGBS) cement for all structural and non-structural precast structures; • Similarly, all concrete poured in-situ for the proposed Scheme will consist of 50% GGBS cement; • All reinforcing steel employed on site will be 85% minimum recycled steel; and The use of these low embodied carbon materials in construction will reduce the construction phase emissions and comply with the requirements of CAP24. In addition to the above mitigation regarding material choices, there are a series of additional construction mitigation measures that will also be adopted as follows: • The use of non-concrete assets shall be optimised in the design e.g., gravel footpaths, grassed drains etc. to minimise the need for concrete. • All aggregates shall be secondary aggregates. Virgin aggregates shall only be employed where it is demonstrated that secondary aggregates are unsuitable for structural reasons and/or they are unavailable. • Wherever available, the contractor shall secure construction materials from local/regional sources or sources within the State to minimise material transport emissions and reduce life cycle carbon emissions associated with the construction materials. • For electricity generation at the construction compounds, hydrogen generators or electrified plant shall be utilised over traditional diesel generators. This shall also apply to lower powered mobile plant, as appropriate.

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
		• A regular maintenance schedule for all construction plant machinery shall be undertaken to maintain optimum machinery efficiency. • Sustainable timber post fencing will be specified over steel in boundary treatments where possible. • Engines will be turned off when machinery is not in use. • The use of private vehicles by construction staff to access the site will be minimised through the encouragement of use of public transport, encouragement of car sharing, and maximising use of local labour to reduce transport emissions.
		These measures will be tracked through the development of a Project Carbon Management Plan (PCMP) which will be prepared in accordance with PAS 2080 (Carbon Management in Infrastructure). This Plan will be devised by Kildare County Council at detailed design stage and then transferred for ownership to the Contractor for construction and handover. The Plan will be used to monitor and report on the above committed carbon management measures and all other measures adopted during the design, procurement and construction phases.
Landscape & Visual (Chapter 8)	8.5.2	• The construction contractor will, during the construction phase of the Proposed Scheme, adhere to the NRA's Guidelines on the Implementation of Landscape Treatments on National Road Schemes in Ireland; • Topsoil, subsoil and other materials for re-use within the Proposed Scheme will be located in areas to avoid impacting on residential properties; • Retained trees, retained woodland and retained hedgerows will be amalgamated with new planting to strengthen these existing landscape features; • Construction compounds and storage areas used during the construction phase will be fully decompacted and re-instated to former usage (prior to the end of the construction phase); • The removal of important landscape features, such as hedgerows, will be limited as far as practically possible to reduce both direct and indirect impacts on landscape character. Any losses will be replaced with locally native and characteristic plant species and species mixes; • Existing trees will be retained wherever possible, with protective measures implemented in accordance with current guidance e.g. BS 5837(2012) – Trees in Relation to Design, Demolition and Construction. • All existing tree losses will be mitigated by replacement planting; and

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation														
		Topsoil, stripped as part of the construction operations, will be stored in low mounds and reused in accordance with best practice guidance.														
	8.5.3.1	Specific Landscape Measures (SLM) The location and details of where SLMs will be implemented are set out in Table 8.15. Where cuttings and embankments are not present, the SLM will require the implementation of a new mixed species hedgerow to define the boundary together with locally appropriate, native species mixed woodland planting. Table 8.15: Specific Landscape Measures (SLM) <table><tr><th>Location</th><th>Description of SLM</th></tr><tr><td>Sitewide</td><td>During construction phase operations, the site compounds and road diversions will be located where the least environmental impacts will be experienced and located to avoid the excessive removal of existing vegetation. Where vegetation is to be removed, it will be replaced with similar species following completion of the Proposed Scheme.</td></tr><tr><td>Sitewide</td><td>The land take will be minimised as far as practically possible to reduce both direct and indirect landscape impacts. Gradients of slopes are to be maintained to allow for planting (cuttings and embankments).</td></tr><tr><td>Sitewide</td><td>Cuttings and embankments will be as natural as possible and graded and shaped to integrate with the adjacent landform. Slopes will be graded to minimise land take in so far as reasonably practical.</td></tr><tr><td>Sitewide</td><td>Areas requiring re-profiling will be stripped of their existing soils and will be stockpiled for re-use. Existing soils will be re-used on new embankments to retain the seedbank of localised vegetation communities.</td></tr><tr><td>Sitewide</td><td>Where access road closures occur or where the old road corridors become surplus to requirements, such areas of former road makeup will be fully excavated, removed and re-profiled to allow for planting or seeding with appropriate native species mixtures to continue the existing vegetation adjacent to the former roadside. This will help screen views of the Proposed Scheme and further integrate the new road corridor into the surrounding landscape</td></tr><tr><td>Sitewide</td><td>The removal of mature trees, mature hedgerows with trees and mixed species woodland will be avoided as far as possible to reduce both direct and indirect impacts. New woodland planting will be provided to compensate for losses of woodland, hedgerows, and trees adjacent to the Proposed Scheme during construction operations and to accommodate the improvements. Different woodland types will be established to reflect the existing woodland composition and promote integration with the existing character.</td></tr></table>	Location	Description of SLM	Sitewide	During construction phase operations, the site compounds and road diversions will be located where the least environmental impacts will be experienced and located to avoid the excessive removal of existing vegetation. Where vegetation is to be removed, it will be replaced with similar species following completion of the Proposed Scheme.	Sitewide	The land take will be minimised as far as practically possible to reduce both direct and indirect landscape impacts. Gradients of slopes are to be maintained to allow for planting (cuttings and embankments).	Sitewide	Cuttings and embankments will be as natural as possible and graded and shaped to integrate with the adjacent landform. Slopes will be graded to minimise land take in so far as reasonably practical.	Sitewide	Areas requiring re-profiling will be stripped of their existing soils and will be stockpiled for re-use. Existing soils will be re-used on new embankments to retain the seedbank of localised vegetation communities.	Sitewide	Where access road closures occur or where the old road corridors become surplus to requirements, such areas of former road makeup will be fully excavated, removed and re-profiled to allow for planting or seeding with appropriate native species mixtures to continue the existing vegetation adjacent to the former roadside. This will help screen views of the Proposed Scheme and further integrate the new road corridor into the surrounding landscape	Sitewide	The removal of mature trees, mature hedgerows with trees and mixed species woodland will be avoided as far as possible to reduce both direct and indirect impacts. New woodland planting will be provided to compensate for losses of woodland, hedgerows, and trees adjacent to the Proposed Scheme during construction operations and to accommodate the improvements. Different woodland types will be established to reflect the existing woodland composition and promote integration with the existing character.
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Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
	Sitewide	A species-rich, low maintenance grassland mix will be used within all planting areas on embankments and slopes to enhance the overall biodiversity value associated with the Proposed Scheme.
	Sitewide	Drainage elements, such as SuDs ponds, swales, ditches and the like, where they occur, will be naturalistic and sensitively integrated into the wider landscape setting
	Sitewide	Materials for the construction of the accommodation tracks will be selected to integrate with the existing material in the area. In addition, locally sourced materials will aid integration into the landscape and promote sustainability.
	Sitewide	The ongoing maintenance and management of the landscape planting and seeding will be an integral part of the Proposed Scheme. The Council will ensure that all mitigation and monitoring committed to in the planning application documentation, will be enforced on the appointed contractor through express terms of the contract, and will be overseen by an official engaged by the Council.

8.5.4

Mitigation Specification**Trees Hedgerows and Shrub Planting**

All trees, shrubs, transplants/whips, hedging material and ground cover planting shall conform fully to the specification, prepared by the appointed and suitably qualified landscape architect, in respect of species, size and quality, which shall be designed to deliver on the mitigation as set out in this assessment.

All plants shall be well grown, sturdy and bushy according to species type, use and shall be free from all diseases and defects.

The plants shall be made available for inspection prior to planting works commencing.

Any plant material that does not conform to the specification will be automatically rejected and will be removed from site.

All trees, shrubs and other plant material shall comply with the standards set out in National Plant Specification (NPS) prepared by the Committee on Plant Supply and Establishment and published with the backing of the Joint Council of Landscape Industries (JCLI, 1989).

Defective Plant Material

All trees, shrubs, transplants, hedging material and ground cover planting shall be maintained and guaranteed for a period of five years against death, deformation, die-back, or disease other than that caused by malicious damage, to ensure successful establishment of hedgerows, screen planting and development of habitats.

Plant Mixes

Environmental Report Section Chapter Reference Reference	Description of mitigation measure / commitment for implementation
	Essentially road verge or bank planting will consist of 'bare root transplants', 'whips' and 'feathered trees' which, due to their smaller stock size at time of planting, will adapt more easily to the disturbed ground and exposed site conditions. All plants are to be positioned in the locations and in the required numbers and centres indicated on the agreed planting plan.
	Woodland Mix Landscape mitigation planting of road verges and slopes and as compensation for loss of existing woodland, individual trees, scrub shrub and hedgerows along the Proposed Scheme will exclusively use Irish native species that reflect the existing vegetation of the area. Core species will include oak, hawthorn, hazel, holly, blackthorn, goat willow, alder, rowan, beech, and birch. Woodland Mix areas will be planted as whips and feathered transplants at a standard size of 60-90 cm or 90-120 cm augmented by larger, individual tree planting appropriate to final locations. Species shall be planted randomly in groups to mirror local woodlands. Most species used will be quickly maturing species and will have formed dense woodland within ten years. The canopy will reach at least 7 to 10 m, in places where groups of trees are planted. In addition to whip and feathered transplants individual semi-mature trees shall be used to provide screening at locations where limited roadside space is available or where early effect is required.
	Individual Tree Planting Individual tree planting using standard trees shall be included in the locations identified in Dwg. MDT0902-RPS-01-XX-DR-Z-LA0000 to MDT0902-RPS-01-XX-DR-Z-LA0008 inclusive.
	Native Shrub Planting Shrub planting shall consist of native species from the core and additional species listed above to provide a woodland understorey and/or woodland edge. Shrub planting mixes shall complement areas of woodland and be used at locations consistent with the surrounding landscape. All existing hedgerows shall be reinstated at interrupted field boundaries or where new boundaries with fields and adjacent residential properties are created using native hawthorn, blackthorn and holly that shall be the predominant species used.
	Grass and Wildflower Mixes The road verges will be seeded with a robust, low-maintenance grass seed mix. Areas away from designated sight lines where mowing regimes are not required to be of a regular nature will be seeded with a low maintenance semi-natural species rich seed mix appropriate to final location. Areas lying adjacent to ponds will be seeded with a low maintenance, species rich, wet meadow seed mixture, using seed from Irish native sources as appropriate to final location. Grass and wildflower mixes using seed from Irish native sources

Environmental Report Section Chapter Reference Reference	Description of mitigation measure / commitment for implementation
Biodiversity (Ecological 9.5.1 Impact Assessment) (Chapter 9)	shall be employed to provide quality areas of low maintenance, rapid establishment, and visual appearance. Measures incorporated into the design The following measures have been incorporated and integrated into the Proposed Scheme design as described in Chapter 2 (of the Environmental Report) and illustrated on drawings MDT902-RPS-01-XX-DR-Z-GA0001 – GA0015 (General Arrangement), MDT0902-RPS-01-XX-DR-Z-LA0000-LA0008 (Landscape Design) and MDT0902-RPS-01-XX-DR-C-DR0000 to DR0007 (Surface Water Drainage) which are provided under separate cover. The key measures are: • The bridge abutments will be back from River Liffey banks by at least 5 m; • The bridge abutments will be a minimum of 1 m distance from the foul sewer pipes on either side of the River Liffey crossing. Foul sewers will be protected in place during construction activities; • The working platforms for the construction of the bridge will be located outside the extent of the fluvial flooding from the River Liffey; • Where possible, riparian vegetation at the River Liffey crossing will be retained; • Various SuDS features will be integrated, including attenuation basins, attenuation swales, bio-retention trenches, infiltration trenches and hydrocarbon interceptors will treat and attenuate the surface water run-off before it discharges to the receiving watercourse at greenfield run-off rates. This will reduce operational phase pollutant run-off into watercourses, pollutant infiltration into groundwater and potential hydraulic changes; • Aside from at the Liffey crossing, the earthworks do not include significant cuttings, and therefore dewatering of excavations will generally not be required. However, suitable sediment and erosion controls will be implemented for the runoff from the earthworks to ensure that the sediment load in water discharging to the receiving watercourses is kept below permissible levels; • Measures included in the design of the Proposed Scheme to allow otter and badger to commute under the proposed road and prevent their access onto the proposed road are as follows: – The proposed bridge abutments will be set back from the riverbanks, allowing for commuting badger and otter; and – Box culverts at the unnamed Simmonstown Stud stream and the R405 drainage ditch will include ledges suitable for use by otter and badger to commute under the Proposed Scheme along streams and ditches;

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
		- Construction activities will be undertaken during daylight hours. It is proposed that the normal permitted working times will be 07.00 to 19.00 hours. Floodlights will be cowled and angled downwards to minimise light spillage outside of works areas. Lighting will be provided with the minimum luminosity sufficient for safety and security purposes and will be shut off at night when not in use or when works cease at the end of the day in order to minimise the effects of light pollution and disturbance to nocturnal species; and - A preliminary landscape plan has been prepared for the scheme (see MDT0902-RPS-01-XX-DR-Z-LA0000-LA0008 provided under separate cover). A detailed Landscape Design Plan will be prepared at the detailed design stage. It is proposed that standard trees, native hedgerow, native woodland mixes, native shrub mix and areas be planted along the length of the Proposed Scheme in varying proportions. It is also proposed to provide tree and vegetation planting in other available green spaces, so long as it does not impact on sightlines and safe operation of the scheme, or maintenance requirements. Over time, the landscaping will reduce the impacts of habitat loss, fragmentation, degradation and alteration.
	9.5.2	Framework Measures
	9.5.2.1	Ecological Roles A Project Ecologist shall be appointed by Kildare County Council before the commencement of works. This suitable qualified and experienced ecologist (hereafter referred to as 'the Project Ecologist') shall be utilised in the implementation of the mitigation measures and survey requirements outlined here. The ecologist shall be a full member of a relevant institution, such as the Chartered Institute of Ecology and Environmental Management (CIEEM) or similar, have relevant experience in the management of mitigation measures and ecological constraints on construction sites/restoration projects, and hold or have previously held a protected species derogation licence in the Republic of Ireland. It shall be their responsibility to supervise and provide recommendations on the execution of any works which have the potential to give rise to negative or positive effects on biodiversity. The Project Ecologist shall be suitable qualified and experienced and have a minimum of five years' experience completing similar tasks on linear infrastructure projects. The Contractor shall appoint an Environmental Manager / Clerk of Works (hereafter referred to as the 'ECoW') before the commencement of works. This person shall be responsible for carrying out environmental monitoring of the works and ensuring that the mitigation measures, proposed in this EcIA and identified by the Project Ecologist, are adhered to. The ECoW shall be suitable qualified and experienced and have a minimum of five years' experience completing similar tasks on linear infrastructure projects.

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
	9.5.3.1	IEF Mitigation Designated Sites for Nature Conservation Sites of Dublin Bay Potential significant adverse effects on designated sites of Dublin Bay are associated with water pollution. Mitigation relating to water pollution is discussed in Section 9.5.3.1.2. Liffey Valley pNHA Potential significant adverse effects on Liffey Valley pNHA are associated with water pollution. Mitigation relating to water pollution is discussed in Section 9.5.3.1.2.
	9.5.3.1.2	Habitats and Flora Riparian Woodland The following measures are required to lessen or avoid the identified or potential significant effects on riparian woodland caused by biodiversity loss, fragmentation and alteration: • In addition to the fencing of the Compulsory Purchase Order (CPO) boundary as part of the enabling works, any other vegetation within the CPO boundary which is capable of being retained during the construction works will be fenced-off with suitable protective fencing; to be specified by the ECoW. This includes the retention of trees, hedgerow, woodland, aquatic features etc. The same measures as stipulated below with respect to avoiding unintended incursion will also be applied to these areas; • To avoid unintended incursion by personnel, equipment and materials, the construction site boundary will be fenced off and site access/egress points constructed. Only site access/egress points will be used by personnel and equipment; • Signage will be placed at intervals along the fencing stating, “no access or storage of materials beyond this point” (or similar). The signage is to face inwards into the construction site; and • As part of the on-site ECoW induction for construction personnel, it will be stated that there will be no access to personnel or equipment and no storage of construction materials beyond the fenced construction boundary. Depositing Lowland Rivers The following measures are required to lessen or avoid the identified or potential significant effects on depositing lowland rivers caused by pollution to water, air and/or soil. Pollution prevention control measures The following mitigation is for the general protection of watercourses: • Stockpiling of construction materials shall be strictly prohibited within 15 m of any ditch or water-laden channel; • Hazardous materials including diesel, fuel oils, solvents, paints and/or lubricants stored on temporary or permanent

Environmental Report Section Chapter Reference Reference	Description of mitigation measure / commitment for implementation
	lands made available shall be stored on hardstand and within suitably designed bunded areas with a bund volume of 110% of the capacity of the largest tank/container; • Re-fuelling of plant shall only take place on hardstand and not within 1 m of any watercourse or surface water feature. Spill containment (i.e. drip trays) shall be used, and spill kits shall be kept available and used if necessary; • Oils, fuel, chemicals, hydraulic fluids, etc. will not be stored outside construction compounds. They will be stored in designated bunded areas at construction compounds in accordance with established guidelines. Refuelling of construction equipment and the addition of hydraulic oil or lubricants to vehicles/equipment will take place in these designated bunded areas only; • Waste oils and hydraulic fluids shall be collected in leak-proof containers and removed from the site for disposal or recycling at licensed facilities; • Waste materials shall be stored in designated areas that are isolated from surface water drains and watercourses. Waste materials will be carefully managed including covering stockpiles during rainfall. Skips shall be closed or covered to prevent materials being blown or washed away; • All machinery will be routinely checked to ensure no leakage of oils or lubricants occurs during the construction phase. Any spillages will be immediately contained, and the contaminated soil removed from the site and disposed of properly; • Wash down water from exposed aggregate surfaces, cast-in-place concrete and from concrete trucks will be trapped on-site to allow sediment to settle out before clarified water is released to a drain system; • No waste will be buried, burnt, or dumped on-site or in land adjacent to the site; • Only emergency breakdown maintenance shall be carried out on site. Emergency procedures and spill kits will be readily available at strategic and/or sensitive site locations and all relevant personnel will be familiar with emergency procedures; and • Any contaminated soil shall be removed from the site and disposed of in a licensed facility. For the protection of watercourses from pollution via surface water run-off, the following measures shall be employed: • Before works commence, a detailed method statement shall be prepared by the Contractor for works within or adjacent to the River Liffey, Loughlinstown Stream, the unnamed Simmonstown Stud stream and the drainage ditch along the R405. The method statement shall include a map showing the locations of surface water features, works exclusion zones, site compounds, stockpiles, settlement tanks/ponds, temporary percolation areas and silt fencing. The method statement and maps will be submitted to the Project Ecologist and ECoW for approval and any further requirements deemed necessary shall be agreed with the

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
		Project Ecologist and ECoW, no less than 6 weeks in advance of works commencing. • Together with the ECoW, environmental triggers for safe undertaking of the high-risk work items will be agreed between the Contractor and Project Ecologist as well as any other experts or technical specialists needed for high risk aspects of the project and understood and transferred to a spreadsheet by the ECoW. An experienced freshwater ECoW may assist with determining these values, but the responsibility rests with the developer / employer. Triggers for the commencement and abandonment of works will be set. The triggers shall be very clearly defined for each work item. The work items will include but will not be limited to the following: – Site set-up and materials/equipment delivery; – Earthworks and excavation; – Instream and bankside works at all watercourses; and – Concrete pouring. Commencement and abandonment triggers for the above items will be agreed for the following parameters: – Rainfall; – Water levels; – Onsite weather conditions; – Soil wetness; and – Integrity of mitigation measures • Where works are required within 15 m of a watercourse, an ecologist shall assess and verify that appropriate demarcation and signage is in place before works commence. Demarcation shall be physically marked out using post and rail/post and rope/bunting, or equivalent, and be signposted to identify the ecological sensitivity; • Silt fencing shall be installed for all work within 15 m of the River Liffey, Loughlinstown Stream, the unnamed Simmonstown Stud stream, and the drainage ditch along the R405. Silt fencing shall consist of a maintainable geotextile membrane (equivalent to Terrastop™ Premium; 250 microns; 45 l/m2/sec). Installation, maintenance, and removal shall follow the manufacturers' specifications. The geotextile membrane will be inspected at least once a week and following any period of heavy rainfall (i.e. Met Éireann orange rain warning); • The Contractor will monitor weather forecasts for heavy rain and where required, certain works, in particular excavations/earthworks, will cease in order to minimise exposed soil entering surface water run-off; and • Soil excavation will not be completed during periods of prolonged or heavy rain (i.e. Met Éireann orange rain warning). Control and response to environmental incidents and accidents

Environmental Report Section Chapter Reference Reference	Description of mitigation measure / commitment for implementation
	In the case of environmental incidents or accidents occurring during the construction phase of the Proposed Scheme, the following measures will be applied: • An appropriate emergency response plan will be in place for any spillage of fuels, lubricants or hydraulic oils to ensure they are immediately contained; • The Contractor will be required to have available on-site spill kits and hydrocarbon absorbent materials to deal with any accidental spillages; • An Environmental Incident and Emergency Response Plan will be established by the Contractor to deal with incidents or accidents during construction that may give rise to pollution in watercourses proximal to the works. This will include means of containment in the event of accidental spillage of hydrocarbons or other pollutants (e.g. oil booms and soakage pads); • Throughout all stages of the construction phase the Contractor will ensure that all site personnel are made aware of the importance of the freshwater environments and the requirement to avoid pollution of all types; • All hazardous materials on site will be stored within secondary containment designed to retain at least 110% of the total storage contents; • Temporary bunds for oil/diesel storage tanks will be used off-site during the construction phase of the Proposed Scheme as appropriate; • Safe handling of all potentially hazardous materials will be emphasised to all construction personnel employed during this phase of the Proposed Scheme; and • Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the site and properly disposed of at a suitable licensed facility. <i>Measures to Protect Biodiversity Features during Instream Works</i> The following mitigation shall be applied during any instance where instream works are being conducted: • To minimise adverse impacts on watercourses, instream works shall be carried out during the period July to September; • Prior to any instream works, the appointed contractor(s) will ensure that all construction equipment is mechanically sound to avoid leaks of oil, fuel, hydraulic fluids, and grease; • Any instream works area will be isolated and de-watered using a gravity/flume system (or similarly effective method). A whole section of the channel is isolated using barriers that span the full width of the watercourse. This keeps a stretch of the watercourse dry, and the water is transferred downstream of the works area through gravity fed flumes/pipes. The flume(s) is normally placed on the bed of the watercourse through the works area and outfalls at the

Environmental Report Section Chapter Reference Reference	Description of mitigation measure / commitment for implementation
	downstream barrier, if present, or far enough downstream to prevent the water backing up into the work area; - There shall be a licenced, experienced and qualified ecologist on-hand at the time the contained area is dewatered. Eels, lamprey ammocoetes and crayfish that emerge during the water draw down shall be collected in clean buckets of water and returned to the channel, a short distance upstream of works. Crayfish shall not be transferred to another watercourse. - The duration of the isolation works should be kept as short as possible; - The intake should be screened to prevent fish being drawn into the flume; - Before the isolated area is de-watered, appropriate measures should be taken to relocate any stranded wildlife, with transplanting or watering sensitive aquatic vegetation in isolated areas to be considered; - To minimise debris and sediment accumulation at the upstream end, inspect the flume pipe (including the inlet and outlet) regularly for damage or blockage. Clear blockages and repair any damage immediately; - The flume pipe should be protected from crushing or any impact damage. This may include: - Aligning it away from plant movement and areas where works will be carried out; and - Using temporary barriers or protective covers; - Before the removal of the upstream barrier, any silt or trash that has accumulated against the barrier should be removed and disposed of properly. The downstream barrier should be removed first; and - Isolated works areas must never be de-watered directly into adjacent or nearby watercourses or ditches. Measures at the River Liffey crossing - The ECoW shall be present for any bankside works. - The locations of the foul sewer pipes are to be clearly demarcated. The foul sewers are to be protected in place. The detailed method statement for works at the Liffey bridge crossing shall set out appropriate measures to ensure effective protective measures (e.g. tool box talks, signage, barriers and buffer areas) are in place at all times during construction. An appropriate emergency response plan will be in place in case of a leak to ensure it is immediately contained; - Water pumped from excavations shall be passed through pre-fabricated settlement tanks. The pond/tank shall be appropriately sized and located on a flat vegetated area, downstream of the works area and well away from the watercourse. This pond/tank will be designed and maintained in accordance with CIRIA C532, 'Control of water pollution from construction sites – Guidance for consultants and Contractors'. The surface water at the top of the tank/pond will flow by gravity to adjacent greenfield lands for

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
		infiltration to ground. A silt sock or bag will be positioned at this exit point as an additional control measure. A specialist Contractor will be required to remove the settled materials at the base of this pond. Trenched silt fencing must be installed around the area designated for infiltration to capture any silt from overland flow. • Discharge water from the pond will be inspected on a daily basis and if it is found to be silted, the flow will be stopped immediately and appropriate remedial works (e.g. use of a mobile siltbuster) will be carried out. • Should water pumped from excavations become contaminated (e.g. from a hydrocarbon spill or leak), pumped water shall be tankered off site and treated at an appropriately licensed facility. • If large amounts of water leak into the contained area, works shall stop until a more secure system is installed. • Machinery shall operate from the bankside and not instream.
	9.5.3.1.3	Fauna Bats (commuting and foraging) No significant effects on commuting and foraging bats are anticipated. Nonetheless, the following measures shall be implemented to lessen or avoid the identified or potential insignificant effects on commuting and foraging bats caused by biodiversity loss, fragmentation and alteration and disturbance from noise, vibration, lighting: • All works shall be restricted to daylight hours to minimise impacts to these nocturnal species. Where this is not possible, a construction phase lighting design should be compliant with the following: – The use of directional lighting is required to reduce disturbance to bats, especially at previously unlit features such as buildings or trees and hedgerows, treelines and watercourses (which are frequently used as foraging corridors) as determined by EcoW. – For previously unlit areas, the aim would be to maintain a lux level of 0 to the areas where bats would forage and roost. This will be done through the use of baffles, hoods or louvres to reduce light spill and direct it only to where it is needed (see ILP's guidance note GN08/23 (2023) <i>Bats and Artificial Lighting at Night</i>). • The proposed landscape plan includes the retention of existing trees, hedgerows and other woodland habitats as far as is practicable. As suitable commuting and foraging habitat will require removal, the proposed landscape plan includes the planting of native hedgerows, woodland and shrubs that will mature into valuable commuting and foraging habitat (see MDT0902-RPS-01-XX-DR-Z-LA0000-LA0008 provided under separate cover). Bats (roosting)

Environmental Report Section Chapter Reference Reference	Description of mitigation measure / commitment for implementation
	The following measures are required to lessen or avoid the identified or potential significant effects on roosting bats caused by biodiversity loss, fragmentation and alteration: • The bat roost potential of any buildings to be demolished and trees to be felled to enable construction will be confirmed through the completion of update surveys by the ECoW (and appropriately qualified personnel, if required). The surveys will be completed with reference to the following guidance (or relevant guidance at time of survey): – <i>Bat Surveys for Professional Ecologists: Good Practice Guidelines</i> (Collins, 2023) – <i>Bat Mitigation Guidelines for Ireland</i> (Marnell <i>et al.</i>, 2022); and – <i>UK Bat Mitigation Guidelines</i> (Reason and Wray, 2023); • The findings of the pre-construction survey will be reviewed with respect to the Proposed Scheme in relation to whether the updated findings trigger a requirement for a species derogation licence from NPWS. Based on the current baseline, derogation licensing is deemed necessary for felling two trees with confirmed roosts (i.e. BT17 and BT27); • The findings of the pre-construction survey will be reviewed with respect to the Proposed Scheme in relation to whether precautions (e.g. section-felling) are required for trees that have low roost potential, but the absence of bats cannot be confirmed; • No demolition of buildings or the removal of any trees with bat roost potential (potential to be determined by the ECoW based on findings of pre-construction surveys) will be undertaken unless the ECoW has confirmed that the buildings or trees do not support roosting bats (confirmed via survey) or unless the demolition/removal is completed under the provisions of a derogation licence; • Following the pre-construction survey, bat roosts located within the CPO boundary will be clearly identified to all personnel working in the vicinity of the roost. Temporary boundary tape fencing (or similar) will be used at the discretion of the ECoW to identify such roosts, subject to such measures themselves not impacting on the use of the roost; • In the event that roosts are removed or significantly disturbed (wholly or partially), this will be completed in accordance with the necessary derogation licence to be obtained from NPWS and with reference to the <i>Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes</i> (NRA, 2006a), <i>Guidelines for the Treatment of Bats during the Construction of National Road Schemes</i> (NRA, 2005a) and <i>Bat Mitigation Guidelines for Ireland</i> (Marnell <i>et al.</i>, 2022). The need for licencing will be determined by the ECoW. The need for additional mitigation for derogation licensing purposes shall be reviewed and determined by the ECoW. Currently, three confirmed roosts are located within the CPO boundary. One of these roosts is not proposed to be disturbed, while the other two will require closure in accordance with a derogation licence;

Environmental Report Section Chapter Reference Reference	Description of mitigation measure / commitment for implementation
	- In the unlikely event that unknown roosting or stranded bats are encountered on the Proposed Scheme, works shall immediately cease in that area and the local NPWS Conservation Ranger shall be contacted. If present, bats shall only be removed under licence from the NPWS; and - The confirmed roosts occur on the south bank of the River Liffey and in Simmonstown Stud at approximately chainage 1+060. To mitigate to loss of roost features, 4 no. bat boxes will be erected in the vicinity of the identified roosts at suitable locations within the CPO boundary. Suitable locations will be determined by the ECoW based on proximity to artificial lighting and connectivity to foraging and commuting habitats. In the absence of suitable structures to erect the boxes (e.g. retained trees or bridge structures), they will be pole-mounted in suitable locations. The bat boxes will be Schwegler-type (woodcrete) type boxes (or similar) and a range of different type boxes (e.g. 2FN, 3FN, 1FD, 1FF, 3FF, 1FW, 1FE and 1FTH) will be used. These will be provided in addition to any mitigation required with respect to any derogation requirements which may be identified as a result of pre-commencement surveys. Otter The impact assessment identified potential significant adverse effects on otter caused by pollution to water, air, and/or soil. Mitigation relating to water pollution is discussed in Section 9.5.3.1.2. No other significant effects on otter are anticipated. Nonetheless, the following measures shall be implemented to lessen or avoid the identified or potential insignificant effects on otter caused by biodiversity loss, fragmentation and alteration and disturbance from noise, vibration, lighting. Potential evidence of otter was recorded along the River Liffey and the unnamed Simmonstown Stud stream. No currently used breeding or resting sites were recorded within 150 m of the Proposed Scheme. However, because otter is a mobile species, a pre-construction otter survey will be carried out to ensure that otter has not taken up residence or established any new territories within or in close vicinity to the footprint of the Proposed Scheme. The survey will be completed within the footprint of the proposed scheme and 150 m up and downstream of this footprint. The survey will confirm the presence/absence of otter holts, resting sites (couches) and any other signs of otter activity within the survey area. The survey will be completed with reference to <i>Guidelines for the Treatment of Otter Prior to the Construction of National Road Schemes</i> (NRA, 2008). The survey will be completed during optimal seasonal/weather conditions and will be completed by a competent, experienced otter surveyor(s). The findings of the pre-construction survey will be reviewed with respect to the Proposed Scheme in relation to whether the updated findings trigger a requirement for a species derogation licence from NPWS. Based on current baseline, no such derogation licensing is necessary.

Environmental Report Section Chapter Reference Reference	Description of mitigation measure / commitment for implementation
	If any holts are identified during pre-construction surveys, the following measures will be implemented: • No construction personnel or machinery will be used within 150 m of otter holts unless subject to the provisions of a derogation licence. Holts will be clearly identified to all personnel working in the vicinity of the holt. Temporary boundary tape fencing (or similar) will be used at the discretion of the ECoW to identify such holts, subject to such measures themselves not impacting on the use of the holt; • Neither blasting nor pile-driving will be undertaken within 150 m of active holts during the breeding season, unless subject to provisions of a derogation licence; • In the event that holts are to be closed (wholly or partially), this will be completed in accordance with the necessary derogation licence which will be obtained from the NPWS and with reference to the NRA guidelines (2008). The need for a licence is to be determined by the ECoW. The need for additional mitigation for derogation licensing purposes will be reviewed and determined by the ECoW and relayed to the appointed Environmental Team. It is assumed that all holts active at the time of construction and within the CPO boundary will need to be closed in accordance with a derogation licence. Currently, no active holts are located within the CPO boundary and no derogation licence is required; and • Where required, evacuation and destruction of holts setts will be carried out under the supervision of an appropriately qualified ecologist under licence from the NPWS. In the event that derogation licence(s) are required, these could require the loss of holt(s) to be compensated through the construction of artificial holt(s). The locations of such holts will be determined by the ECoW and the requirement of any derogation licence. Otters may potentially be affected during the construction phase of the development during foraging activities. The potential for fatalities from accidents on site or becoming trapped within open works could pose a direct impact. Mitigation measures to protect from the accidental killing/injury of otter during the construction phase are detailed as follows and will be implemented: • Maintain the set-back zone from both banks of the River Liffey to ensure the free movement and safe passage of otter along the watercourse during construction phase; • With reference to the NRA guidelines (2008), mammal-resistant fencing will be incorporated along the boundary of construction compounds and working areas to ensure no otters can access or become trapped within open works. Mammal-resistant fencing will adhere to the relevant specifications as set out by the NRA (2008); • Once installed, the mammal-resistant fencing will be inspected by the ECoW to ensure that fencing is fit for purpose; and

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
		- Excavations will be covered overnight and/or temporary access ramps from excavations will be installed if they are too large or not possible to cover overnight. Common kingfisher The impact assessment identified potential significant adverse effects on kingfisher caused by pollution to water, air, and/or soil. Mitigation relating to water pollution is discussed in Section 9.5.3.1.2. Birds (breeding) The following measures are required to lessen or avoid the identified or potential significant effects on breeding birds caused by biodiversity loss, fragmentation and alteration: - The removal of existing vegetation (scrub, rough grassland, trees, treeline, and hedgerow) will avoid the bird nesting season (March to August, inclusive); - If this seasonal restriction cannot be accommodated, a suitably qualified ornithologist will be required to confirm presence/absence of breeding birds at least 3 days prior to removal/trimming and seek a derogation licence from NPWS as necessary. - If any active nests are discovered, then work in the immediate vicinity of the nest should cease and an appropriate buffer zone should be established which should be left in place until it has been confirmed that the young have fledged. - All retained vegetation within the works corridor shall be kept clear of machinery and materials shall not be stored against them as per the recommendations in BS5837 (2012) – <i>Trees in Relation to Design, Demolition and Construction</i>. White-clayed crayfish The impact assessment identified potential significant adverse effects on white-clawed crayfish caused by pollution to water, air, and/or soil. Mitigation relating to water pollution is discussed in Section 9.5.3.1.2. Fish The impact assessment identified potential significant adverse effects on fish caused by pollution to water, air, and/or soil. Mitigation relating to water pollution is discussed in Section 9.5.3.1.2.
	9.5.3.2	Non IEF Mitigation
	9.5.3.2.1	Pre-construction Ecology Surveys At least one month in advance, but no greater than six months in advance, of commencing any enabling or advance works, a pre-construction survey for protected and invasive alien species shall be undertaken (within a suitable season) within the Proposed Scheme area, including areas which could not be accessed during the establishment of the baseline. The surveys shall be

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
		undertaken by a suitable qualified and experienced ecologist. The ecologist shall also advise, in writing, on any additional relevant protective measures and/or licensing requirements resulting from the pre-construction survey findings.
	9.5.3.2.2	Terrestrial Habitats The riparian woodland mitigation measures, described in Section 9.5.3.1.2, to protect retained vegetation will be implemented over the entire area of the Proposed Scheme to protect all retained vegetation. IAPS were identified in the study area, predominantly in the vicinity of the River Liffey. IAPS along watercourses is particularly significant, as contaminated soil or vegetative material washed from an infected area can result in the spread of this species downstream. Appropriate mitigation measures including management and control measures are required within the proposed works area where each of these species are encountered for the prevention of spread of these species. Works to eradicate invasive species will be completed and signed off by suitably experienced personnel. At the time of writing, the works will be completed with reference to the following guidance: • Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010); • Guidelines for the Management of Waste from National Road Construction Projects (NRA, 2014); and • Invasive Species Northern Ireland guidance¹; and No vegetation removal or works resulting in earth disturbance will be completed in any area known to support invasive alien species until the eradication of the invasive alien species has been completed and signed off by suitably experienced personnel.
	9.5.3.2.3	Tree Protection Prior to construction commencement, Root Protection Areas (RPAs) for retained trees shall be put in place. The purpose of protective barriers is to avoid any harmful construction activity that may damage the retained trees. Tree protection barriers shall be fit for the purposes of excluding construction activities and be durable to withstand an impact. The extent of the RPA shall be an area equivalent to a circle with a radius 12 times the stem diameter (stem diameter measured at 1.5 m above ground level) (NRA, 2006b).
	9.5.3.2.4	Badger Update badger surveys will be completed for all potential setts (active or inactive) and to identify any newly established setts within 150 m of the CPO boundary, including areas which could not be accessed during the establishment of the baseline. The surveys shall be undertaken by a suitable qualified and experienced ecologist. The level of survey will be sufficient to

¹ Available at invasivespeciesni.co.uk

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
		confirm and classify whether setts are active (or not) and to confirm if they are main, annexe, subsidiary or minor setts. The survey will be completed with reference to <i>Guidelines for the Treatment of Badgers prior to the construction of National Road Schemes</i> (NRA, 2005b). The findings of the pre-construction survey will be reviewed with respect to the Proposed Scheme in relation to whether the updated findings necessitate the preparation of a detailed method statement for works with potential to disturb a sett. If any setts are identified as active and are to be closed (wholly or partially), the following measures will be implemented: • The setts will be evacuated in line with NRA guidelines (2005b); • Active setts within the footprint of the Proposed Scheme will be clearly marked with temporary fencing and signage and construction activities will be prohibited until the setts have been evacuated; and • Evacuation and destruction of setts will be undertaken under the supervision of a qualified and licensed ecologist and will be undertaken during the period of July to November, inclusive. If any identified active setts will not be lost but could be subject to disturbance, the following measures will be implemented: • No construction personnel or machinery will be used within 30 m of badger setts (extended to 50 m for active setts during the breeding season of December to June, inclusive) unless those works are carried out in line with a method statement detailing the treatment of the sett; • During the pre-construction survey, setts located within 50 m of the Proposed Scheme will be clearly marked with temporary fencing and the extent of bounds prohibited for vehicles clearly marked by fencing and signage; and • Neither blasting nor pile-driving will be undertaken within 150 m of active setts during the breeding season. There is potential for badgers to be killed or injured during construction through accessing areas of construction, including excavations. In addition to the measures set out in Section 6.3.1.3.3 to exclude mammals from the construction site, temporary badger fencing (doubling up with other fencing as necessary) in line with NRA guidelines (2005b) will be used to enclose all construction working areas. The fencing shall be maintained throughout the construction period to provide a robust barrier to avoid movement of badger into and through the construction working areas. Badger fencing will be checked by the ECoW to ensure compliance with specifications.
Cultural Heritage (Chapter 10)	10.5.1	Mitigation of the impact of development on the archaeological resource can take the form of 'preservation by record' (full hand excavation, i.e. sterilisation of archaeological area); and 'preservation in situ' (excluded from development, i.e. avoidance through design in a location where the future protection and interpretation of the site can be assured) or a combination of both.

Environmental Report Section Chapter Reference Reference	Description of mitigation measure / commitment for implementation
	All archaeological works will take place under Ministerial Direction or Section 26 Consent Licence to the Department of Housing, Local Government and Heritage (DHLGH).
	Archaeological Excavation It is recommended that an area measuring 10m x 10m around pit feature GS2 be subject to preservation by record or full archaeological excavation. This will be carried out under licence to the National Monuments Service DHLGH well in advance of main construction works. Archaeological excavation ensures that the removal of any archaeological soils, features, finds and deposits is systematically and accurately recorded, drawn and photographed, providing a paper and digital archive and adding to the archaeological knowledge of a specified area (i.e. preservation by record). As archaeological excavation involves the removal of the archaeological soils, features, finds and deposits, following this mitigation measure there is no further impact on the archaeological heritage.
	Archaeological Testing It is recommended that the land acquisition boundary of the fields either side of the river crossing (Fields 11-13) are subject to archaeological testing well in advance of main construction works. The disturbance noted in these fields in the geophysical survey may mask in-situ archaeological sites or features in these fields. Archaeological testing within Field 10 where structure AP2 is recorded on historic mapping, is also recommended in order to identify and record any surviving features. Any archaeological features revealed by the test-trenching, which will be directly impacted by the proposed works, will be preserved by record by means of archaeological excavation, recording and publication of results.
	Archaeological Monitoring Licensed archaeological monitoring of earthmoving works in the remaining greenfield areas is also recommended to be carried out. The purpose of monitoring is to establish the presence or absence, as well as the nature and extent, of any archaeological deposits, features or sites that may be present within the land acquisition boundary of the Project. In the event of the discovery of archaeological finds or remains, the NMS and the National Museum of Ireland (NMI) will be notified immediately. If features are revealed, the immediate area will be investigated, allowing no further development to take place until the site is fully identified, recorded and excavated the satisfaction of the statutory authorities. If archaeological features are identified, provision (time and funding) should be made for the full recording and, if necessary, excavation of the archaeological material in compliance with any

Environmental Report Chapter	Section Reference	Description of mitigation measure / commitment for implementation								
		measures that the DHLGH and the relevant local authority deem appropriate. This possibility will be accounted for in the Project programme and budget and will be undertaken at the earliest phases of the development to allow the archaeologists sufficient time to record/excavate as required. Monitoring includes all groundwork associated with the development including the placement of construction compounds, access and maintenance roads, landscaping, drainage and topsoil stripping within the permanent and temporary land-take to ensure that no features are damaged or removed without proper recording. The licensed archaeologist will have provision to inspect all excavation to the formation level for the proposed works and to temporarily halt the excavation work, if and as necessary. They will be given provision to ensure the temporary protection of any features of archaeological importance identified. The archaeologist will be afforded sufficient time and resources to record and remove any such features identified. Kildare County Council will make provision to allow for, and to fund, the necessary archaeological monitoring, inspection and excavation works that will be needed on-site during and prior to construction, either directly or indirectly via the appointed contractor.								
		Site Protection The location of the possible barrow site (GS1) in Field 9, outside of the land acquisition boundary but in the same field as the proposed development, should be made known to the site contractors. If necessary, the site should be cordoned off under the supervision of the monitoring archaeologist. This will involve the erection of a robust fence around the circumference of the site, positioned 10m from its outer ditch. The fencing should be accompanied by signage indicating the presence of an archaeologically sensitive area.								
Material Assets: Agricultural Properties	11.5.1	Details of specific measures that are required for individual properties are specified in Table 11.5. Summary is provided below <table><tr><th>Farm Id</th><th>Specific Mitigation Measures</th></tr><tr><td>105</td><td>None required</td></tr><tr><td>107</td><td>Provide access to the severed lands via staggered field gates. Provide permanent stockproof boundary.</td></tr><tr><td>109</td><td>Provide field access to retained lands. Provide permanent stockproof boundary.</td></tr></table>	Farm Id	Specific Mitigation Measures	105	None required	107	Provide access to the severed lands via staggered field gates. Provide permanent stockproof boundary.	109	Provide field access to retained lands. Provide permanent stockproof boundary.
Farm Id	Specific Mitigation Measures									
105	None required									
107	Provide access to the severed lands via staggered field gates. Provide permanent stockproof boundary.									
109	Provide field access to retained lands. Provide permanent stockproof boundary.									

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
	112	None required
		Temporary Landtake Following the completion of relevant construction works, lands temporarily acquired will be reinstated to existing agricultural condition. Measures will be considered on a site-by-site basis, subject to proposed construction works. Where construction compounds will involve installing a hard-core surface it will be necessary for topsoil to be removed and stored. Where new access is proposed affecting existing property boundaries these will be reinstated on a like for like basis. This may require storage of stone wall material during construction or replanting of hedgerow / trees, as required. Construction Noise Measures to mitigate noise impacts on sensitive receptors are detailed in the Noise and Vibration Assessment (provided in Chapter 5). Good communication between the contractor and adjacent landowners during the construction phase, especially when excessively loud activities are programmed, will prevent undue disturbance to farm animals. It will also facilitate farm enterprises so that livestock can be moved away from the construction work during critical times. Dust Measures to control the production of dust will be put in place by the contractor (as detailed in the Air Quality Assessment (provided in Chapter 6) which presents a series of measures to control dust. Good communication between the contractor and the farmers in the proximity of construction activities will facilitate on-going farm enterprises so that livestock may be kept as far as possible from the construction work during critical times. Restricted Access to Land Access will be restored, as soon as possible, to lands where it is removed or restricted by the Proposed Scheme. The location of such access will be at a suitable location and, where possible, with the agreement of the landowner. Good communication between individual farmers and the contractor will minimise difficulties caused by the restriction of access to land. Temporary fencing will be erected as required to delineate the site boundary and to minimise disturbance to adjacent lands. Temporary access gates may be required until such time as permanent access arrangements are in place. Disturbance of Field Drainage In cases where drainage is impeded during construction and causes obvious difficulty to a particular landowner, temporary measures will be considered on a site-specific basis. This may include allowing waters to drain to less critical areas, so as to minimise the impact. Disturbance of Services Where required, an alternative source of water / electricity will be provided to ensure that disruption to farming is minimised during the construction phase.

Environmental Report Chapter Reference	Section Reference	Description of mitigation measure / commitment for implementation
Material Assets: Non-Agricultural Properties (Chapter 12)	12.5.1	Temporary Land take Following the completion of relevant construction works, lands temporarily acquired will be reinstated where necessary. Access to Property Access will be maintained to all affected property as much as possible and if interrupted will be restored without unreasonable delay. Traffic management measures will be put in place during construction where temporary or minor diversions are required. Noise and Vibration Timing of works and noise and vibration limit values are amongst the main measures to mitigate noise impacts on sensitive receptors. These measures are detailed in the Noise and Vibration Assessment (refer to Chapter 5). Good communication between the contractor and property owners during the construction phase will reduce undue disturbance due to noise. Dust Dust suppression measures to mitigate the production of dust are detailed in the Air Quality Assessment (provided in Chapter 6). Good communication between the contractor and property owners during the construction phase will reduce undue disturbance due to dust. 1.6.1.5 Disturbance of Drainage In cases where drainage is impeded during construction and causes obvious difficulty to a particular property owner, temporary measures will be considered on a site-specific basis. This may include allowing waters to drain to less critical areas, so as to minimise the impact. 1.6.1.6 Disturbance of Services Where required, an alternative source of water / electricity will be provided to ensure that disruption to properties is minimised during the construction phase.

Table 10.2: Monitoring Measures outlined in the Environmental Report

Environmental Report Chapter Reference	Section Reference	Description of monitoring measure / commitment for implementation
Traffic & Transport Assessment	4.7.1	Construction traffic management measures will be monitored throughout the construction phase by the appointed contractor to respond to dynamic conditions in the receiving environment and

Environmental Report Section Reference Chapter Reference		Description of monitoring measure / commitment for implementation
(Chapter 4)		measures will be adjusted to match construction sequencing where appropriate and necessary.
Noise & Vibration (Chapter 5)	5.7.1	During the construction phase, a noise and vibration monitoring programme shall be implemented to assess compliance of the construction works with the noise criteria set out in Section 5.2.5.2. Full details of the Contractor's provision for noise and vibration monitoring and procedures including provisions for publication of monitoring results will be submitted to and approved by the County Council prior to commencement of work. The appointed Contractor's Construction Environmental Management Plan (CEMP) for the Proposed Scheme will detail channels of communication between the Contractor, Kildare County Council and residents including a system for recording and investigating noise complaints relating to the construction operations.
Air Quality (Chapter 6)	6.7.1	Monthly monitoring of dust deposition levels will be undertaken for the duration of construction for comparison with the guideline of 350 mg/m²/day (for non-hazardous dusts). This monitoring shall be carried out at a series of locations based on potential risk of dust nuisance during the construction phase of the Proposed Scheme. This monitoring should be carried out at a minimum of three locations at construction compounds with medium to high risk of dust nuisance and further monitoring locations at sensitive receptors around the proposed works. Where dust levels are measured to be above the guideline of 350 mg/m²/day, the mitigation measures in the area shall be reviewed and improved to ensure that dust deposition is reduced to below 350 mg/m²/day. Should high dust levels continue to occur following these improvements, the contractor will provide alternative mitigation measures and/or will modify the construction works taking place.
Biodiversity (Chapter 9)	9.7.1	Construction works will be monitored to ensure that environmental best practice and the measures included in this document are fully and effectively adhered to. The ECoW will be responsible for ensuring the mitigations prescribed in this document are adhered to. The Contractor's ECoW will liaise directly with the Project Ecologist appointed by Kildare County Council to oversee the ecological aspects of the work. A checklist will be filled in on a weekly basis to show how the measures above have been complied with. Any environmental incidents or non-compliance issues will immediately be reported to the project team.

Environmental Report Chapter Reference	Section Reference	Description of monitoring measure / commitment for implementation
		The project manager will be continuously monitoring the works and will be fully briefed and aware of the environmental constraints and protection measures to be employed; Surface water monitoring procedures will be undertaken to ensure environmental protection and management requirements are being implemented. In order to ensure the effectiveness of the exclusion of otter and badger from open works during the construction phase, mammal-resistant fencing requires monitoring and maintenance at regular intervals. If personnel identify problems with fencing, the ECoW will be notified. The ECoW will perform monthly inspections to identify any potential problems with the fencing. Any identified problems will be rectified immediately.

Table 10.3: Summary Table of Mitigation and Monitoring Measures in the Natura Impact Statement

NIS Section Reference	Description of Mitigation and Monitoring Measures in the Natura Impact Statement
7.1	Measures Incorporated into the design The following measures have been incorporated and integrated into the Proposed Scheme design as described in Section 2 (of the NIS) and illustrated on drawings MDT902- RPS-01-XX-DR-Z-GA0001 – GA0015 (General Arrangement) and MDT0902-RPS-01-XX-DR-C-DR0000 to DR0007 (Surface Water Drainage). The key measures are: • The bridge abutments will be back from River Liffey banks by at least 5 m; • The bridge abutments will be a minimum of 1 m distance from the foul sewer pipes on either side of the River Liffey crossing. Foul sewers will be protected in place during construction activities; • The working platforms for the construction of the bridge will be located outside the extent of the fluvial flooding from the River Liffey; • Aside from at the Liffey crossing, the earthworks do not include significant cuttings, and therefore dewatering of excavations will generally not be required. However, suitable sediment and erosion controls will be implemented for the runoff from the earthworks to ensure that the sediment load in water discharging to the receiving watercourses is kept below permissible levels; and • Various SuDS features will be integrated, including attenuation basins, attenuation swales, bio-retention trenches, infiltration trenches and hydrocarbon interceptors will treat and attenuate the surface water run-off before it discharges to the receiving watercourse at greenfield run-off rates. This will reduce operational phase pollutant run-off into watercourses, pollutant infiltration into groundwater and potential hydraulic changes.
7.2	Framework Measures Ecological Roles A Project Ecologist shall be appointed by Kildare County Council before the commencement of works. This suitable qualified and experienced ecologist (hereafter referred to as 'the Project Ecologist') shall be utilised in the implementation of the mitigation measures and survey requirements outlined here.

NIS Section Reference	Description of Mitigation and Monitoring Measures in the Natura Impact Statement
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The ecologist shall be a full member of a relevant institution, such as the Chartered Institute of Ecology and Environmental Management (CIEEM) or similar, have relevant experience in the management of mitigation measures and ecological constraints on construction sites/restoration projects, and hold or have previously held a protected species derogation licence in the Republic of Ireland. It shall be their responsibility to supervise and provide recommendations on the execution of any works which have the potential to give rise to negative or positive effects on biodiversity. The Project Ecologist shall be suitable qualified and experienced and have a minimum of five years' experience completing similar tasks on linear infrastructure projects.

The Contractor shall appoint an Environmental Manager / Clerk of Works (hereafter referred to as the 'ECoW') before the commencement of works. This person shall be responsible for carrying out environmental monitoring of the works and ensuring that the mitigation measures, proposed in this EclA and identified by the Project Ecologist, are adhered to. The ECoW shall be suitable qualified and experienced and have a minimum of five years' experience completing similar tasks on linear infrastructure projects.

Construction Phase

7.3.1 Surface Water and Groundwater Protection Measures

The following measures are required to lessen or avoid the potential impacts of surface water or groundwater pollution:

Pollution prevention control measures

The following mitigation is for the general protection of watercourses:

- Stockpiling of construction materials shall be strictly prohibited within 15 m of any ditch or water-laden channel;
- Hazardous materials including diesel, fuel oils, solvents, paints and/or lubricants stored on temporary or permanent lands made available shall be stored on hardstand and within suitably designed bunded areas with a bund volume of 110% of the capacity of the largest tank/container;
- Re-fuelling of plant shall only take place on hardstand and not within 1 m of any watercourse or surface water feature. Spill containment (i.e. drip trays) shall be used, and spill kits shall be kept available and used if necessary;
- Oils, fuel, chemicals, hydraulic fluids, etc. will not be stored outside construction compounds. They will be stored in designated bunded areas at construction compounds in accordance with established guidelines. Refuelling of construction equipment and the addition of hydraulic oil or lubricants to vehicles/equipment will take place in these designated bunded areas only;
- Waste oils and hydraulic fluids shall be collected in leak-proof containers and removed from the site for disposal or recycling at licensed facilities;
- Waste materials shall be stored in designated areas that are isolated from surface water drains and watercourses. Waste materials will be carefully managed including covering stockpiles during rainfall. Skips shall be closed or covered to prevent materials being blown or washed away;
- All machinery will be routinely checked to ensure no leakage of oils or lubricants occurs during the construction phase. Any spillages will be immediately contained, and the contaminated soil removed from the site and disposed of properly;
- Wash down water from exposed aggregate surfaces, cast-in-place concrete and from concrete trucks will be trapped on-site to allow sediment to settle out before clarified water is released to a drain system;

NIS Section Reference Description of Mitigation and Monitoring Measures in the Natura Impact Statement

- No waste will be buried, burnt, or dumped on-site or in land adjacent to the site;
- Only emergency breakdown maintenance shall be carried out on site. Emergency procedures and spill kits will be readily available at strategic and/or sensitive site locations and all relevant personnel will be familiar with emergency procedures; and
- Any contaminated soil shall be removed from the site and disposed of in a licensed facility.

For the protection of watercourses from pollution via surface water run-off, the following measures shall be employed:

- Before works commence, a detailed method statement shall be prepared by the Contractor for works within or adjacent to the River Liffey, Loughlinstown Stream, the unnamed Simmonstown Stud stream and the drainage ditch along the R405. The method statement shall include a map showing the locations of surface water features, works exclusion zones, site compounds, stockpiles, settlement tanks/ponds, temporary percolation areas and silt fencing. The method statement and maps will be submitted to the Project Ecologist and ECoW for approval and any further requirements deemed necessary shall be agreed with the Project Ecologist and ECoW, no less than 6 weeks in advance of works commencing.
- Together with the ECoW, environmental triggers for safe undertaking of the high-risk work items will be agreed between the Contractor and Project Ecologist as well as any other experts or technical specialists needed for high risk aspects of the project and understood and transferred to a spreadsheet by the ECoW. An experienced freshwater ECoW may assist with determining these values, but the responsibility rests with the developer / employer. Triggers for the commencement and abandonment of works will be set. The triggers shall be very clearly defined for each work item. The work items will include but will not be limited to the following:
 - Site set-up and materials/equipment delivery;
 - Earthworks and excavation;
 - Instream and bankside works at all watercourses; and
 - Concrete pouring.

Commencement and abandonment triggers for the above items will be agreed for the following parameters:

- Rainfall;
- Water levels;
- Onsite weather conditions;
- Soil wetness; and
- Integrity of mitigation measures
- Where works are required within 15 m of a watercourse, an ecologist shall assess and verify that appropriate demarcation and signage is in place before works commence. Demarcation shall be physically marked out using post and rail/post and rope/bunting, or equivalent, and be signposted to identify the ecological sensitivity;
- Silt fencing shall be installed for all work within 15 m of the River Liffey, Loughlinstown Stream, the unnamed Simmonstown Stud stream, and the drainage ditch along the R405. Silt fencing shall consist of a maintainable geotextile membrane (equivalent to Terrastop™ Premium; 250 microns; 45 l/m2/sec). Installation, maintenance, and removal shall follow the manufacturers' specifications. The geotextile membrane will be inspected at least once a week and following any period of heavy rainfall (i.e. Met Éireann orange rain warning);

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- The Contractor will monitor weather forecasts for heavy rain and where required, certain works, in particular excavations/earthworks, will cease in order to minimise exposed soil entering surface water run-off; and
- Soil excavation will not be completed during periods of prolonged or heavy rain (i.e. Met Éireann orange rain warning).

Control and response to environmental incidents and accidents

In the case of environmental incidents or accidents occurring during the construction phase of the Proposed Scheme, the following measures will be applied:

- An appropriate emergency response plan will be in place for any spillage of fuels, lubricants or hydraulic oils to ensure they are immediately contained;
- The Contractor will be required to have available on-site spill kits and hydrocarbon absorbent materials to deal with any accidental spillages;
- An Environmental Incident and Emergency Response Plan will be established by the Contractor to deal with incidents or accidents during construction that may give rise to pollution in watercourses proximal to the works. This will include means of containment in the event of accidental spillage of hydrocarbons or other pollutants (e.g. oil booms and soakage pads);
- Throughout all stages of the construction phase the Contractor will ensure that all site personnel are made aware of the importance of the freshwater environments and the requirement to avoid pollution of all types;
- All hazardous materials on site will be stored within secondary containment designed to retain at least 110% of the total storage contents;
- Temporary bunds for oil/diesel storage tanks will be used off-site during the construction phase of the Proposed Scheme as appropriate;
- Safe handling of all potentially hazardous materials will be emphasised to all construction personnel employed during this phase of the Proposed Scheme; and
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the site and properly disposed of at a suitable licensed facility.

Measures to Protect Biodiversity Features during Instream Works

The following mitigation shall be applied during any instance where instream works are being conducted:

- To minimise adverse impacts on watercourses, instream works shall be carried out during the period July to September;
- Prior to any instream works, the appointed contractor(s) will ensure that all construction equipment is mechanically sound to avoid leaks of oil, fuel, hydraulic fluids, and grease;
- Any instream works area will be isolated and de-watered using a gravity/flume system (or similarly effective method). A whole section of the channel is isolated using barriers that span the full width of the watercourse. This keeps a stretch of the watercourse dry, and the water is transferred downstream of the works area through gravity fed flumes/pipes. The flume(s) is normally placed on the bed of the watercourse through the works area and outfalls at the downstream barrier, if present, or far enough downstream to prevent the water backing up into the work area;
- There shall be a licenced, experienced and qualified ecologist on-hand at the time the contained area is dewatered. Eels, lamprey ammocoetes and crayfish that emerge during the water draw down shall be collected in clean buckets of water and returned to the

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channel, a short distance upstream of works. Crayfish shall not be transferred to another watercourse.

- The duration of the isolation works should be kept as short as possible;
- The intake should be screened to prevent fish being drawn into the flume;
- Before the isolated area is de-watered, appropriate measures should be taken to relocate any stranded wildlife, with transplanting or watering sensitive aquatic vegetation in isolated areas to be considered;
- To minimise debris and sediment accumulation at the upstream end, inspect the flume pipe (including the inlet and outlet) regularly for damage or blockage. Clear blockages and repair any damage immediately;
- The flume pipe should be protected from crushing or any impact damage. This may include:
 - Aligning it away from plant movement and areas where works will be carried out; and
 - Using temporary barriers or protective covers;
- Before the removal of the upstream barrier, any silt or trash that has accumulated against the barrier should be removed and disposed of properly. The downstream barrier should be removed first; and
- Isolated works areas shall never be de-watered directly into adjacent or nearby watercourses or ditches.

Measures at the River Liffey crossing

- The ECoW shall be present for any bankside works.
- The locations of the foul sewer pipes are to be clearly demarcated. The foul sewers are to be protected in place. The detailed method statement for works at the Liffey bridge crossing shall set out appropriate measures to ensure effective protective measures (e.g. tool box talks, signage, barriers and buffer areas) are in place at all times during construction. An appropriate emergency response plan will be in place in case of a leak to ensure it is immediately contained;
- Water pumped from excavations shall be passed through pre-fabricated settlement tanks. The pond/tank shall be appropriately sized and located on a flat vegetated area, downstream of the works area and well away from the watercourse. This pond/tank will be designed and maintained in accordance with CIRIA C532, '*Control of water pollution from construction sites – Guidance for consultants and Contractors*'. The surface water at the top of the tank/pond will flow by gravity to adjacent greenfield lands for infiltration to ground. A silt sock or bag will be positioned at this exit point as an additional control measure. A specialist Contractor will be required to remove the settled materials at the base of this pond. Trenched silt fencing shall be installed around the area designated for infiltration to capture any silt from overland flow.
- Discharge water from the pond will be inspected on a daily basis and if it is found to be silted, the flow will be stopped immediately and appropriate remedial works (e.g. use of a mobile siltbuster) will be carried out.
- Should water pumped from excavations become contaminated (e.g. from a hydrocarbon spill or leak), pumped water shall be tankered off site and treated at an appropriately licensed facility.
- If large amounts of water leak into the contained area, works shall stop until a more secure system is installed.
- Machinery shall operate from the bankside and not instream.

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7.3.2	Monitoring
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Construction works will be monitored to ensure that environmental best practice and the measures included in this document are fully and effectively adhered to.

The ECoW will be responsible for ensuring the mitigations prescribed in this document are adhered to. The Contractor's ECoW will liaise directly with the Project Ecologist appointed by Kildare County Council to oversee the ecological aspects of the work. A checklist will be filled in on a weekly basis to show how the measures above have been complied with. Any environmental incidents or non-compliance issues will immediately be reported to the project team.

The project manager will be continuously monitoring the works and will be fully briefed and aware of the environmental constraints and protection measures to be employed.

Surface water monitoring procedures will be undertaken to ensure environmental protection and management requirements are being implemented.

Operational Phase

7.4.1	Monitoring
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During the operational phase, Kildare County Council will be responsible for the commission of a suitably experienced ecologist to monitor the effectiveness of water drainage features.

No further mitigation measures are proposed, as measures incorporated into the design are sufficient to avoid/minimise operational phase impacts on European Sites.

11 REQUIRED CONTRACTOR'S INFORMATION

The information listed in the table below will be provided by the Contractor to the *Employer* according to the provisions of the contract, as indicated.

Table 11.1: Required Contractor's Information

Documents / Information (and updates thereof) required	Pre-construction	During and after construction
Consents, licences, and permissions for activities as required by current legislation governing the protection of the environment	Yes	Yes
Completed / updated contacts sheet	Yes	Updates
Pollution Prevention Plan	Yes	Updates
Fuel Management Plan	Yes	Updates
Weekly Environmental Risk Log		Yes
Environmental Risk Map	Yes	Updates
Toolbox Talk Schedule	Yes	Updates
Environmental Inspection Schedule	Yes	Updates
Risk Assessment & Method Statements	Yes	Yes
Construction Waste Management records and related information	Yes	Yes
Inspection and Audit Reports		Yes
Environmental Incident and Emergency Response Plan	Yes	Updates

Note: The above list only relates to requirements of this CEMP and is not exhaustive. As part of the Contract, other information provisions will also be required from the Contractor.