

# Ashford Strategic Housing Development

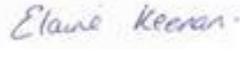
Stage 3: Planning Application  
Outline Construction Environmental Management Plan

Ardstone Homes Limited

Project reference: PR-252947

March 2020

## Quality information

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## Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	02.09.2019	Draft Pre-App to An Bord Pleanála	MD	Michael Dunne	Regional Director
1	11.09.2019	Pre-App Issue to An Bord Pleanála	MD	Michael Dunne	Regional Director
2	23.03.2020	Full SHD Application to ABP	MD	Michael Dunne	Regional Director

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## 1. Introduction

### 1.1 Background

This Outline Construction Environmental Management Plan (Outline CEMP) sets out the procedures, standards, work practices and management responsibilities to address potential environmental effects that may arise from construction of 133 residential units as part of the Ashford Strategic Housing Development.

The Outline CEMP outlines the approach that will be adopted to environmental management throughout the Project works at the Site, with the primary aim of reducing any adverse effects from construction on the environment. It could therefore form part of the Contract Documents for the construction stage. The Outline CEMP remains at all times a live document, subject to amendment including the revision and addition of content throughout the works. In this context, the values and information presented herein is subject to change and refinement through the selection of the contractor and the delivery of the Project.

This plan shall be further refined and expanded by the appointed Contractor (hereafter referred to as the Contractor) into a full Contractor CEMP as more certainty and more information becomes available in terms of the proposed layout, construction methods, programme and potential environmental impacts to be mitigated against. The elements contained within this plan will be included in the Contractor's CEMP, which will be prepared prior to construction by the appointed Contractor and approved by the Client.

At the end of the construction phase, the Contractor shall prepare a Handover Environmental Management Plan (HEMP) that shall contain essential environmental information needed by the bodies responsible for the future maintenance and operation of the asset.

With this purpose in mind, it therefore follows that this Outline CEMP should be treated as a live document throughout the Project lifecycle, requiring regular review and update as necessary.

### 1.2 Objectives

The objectives of this Outline CEMP and any subsequent Contractor CEMP are therefore to:

- Act as a continuous link and reference document for environmental issues between the design, construction, testing and commissioning stages of the Project;
- Demonstrate how construction activities and supporting design shall properly integrate the requirements of environmental legislation, planning consent conditions, policy, good practice, and those of the environmental regulatory authorities and third parties;
- Record environmental risks and identify how they will be managed during the construction period;
- Record the objectives, commitments and mitigation measures to be implemented together with programme and date of achievement;
- Identify key staff structures and responsibilities associated with the delivery of the Project and environmental control and communication and training requirements as necessary;
- Describe the Contractor's proposals for ensuring that the requirements of the environmental design are achieved, or are in the process of being achieved, during the Contract Period;
- Act as a vehicle for transferring key environmental information at handover to the body responsible for operational management. This shall include details of the asset, short and long-term management requirements, and any monitoring or other environmental commitments; and
- Provide a review, monitoring and audit mechanism to determine effectiveness of, and compliance with, environmental control measures and how any necessary corrective action shall take place.

## 1.3 Scope

The scope of this Outline CEMP covers the design and construction of the Project Ashford Strategic Housing Development located in Ashford, Co. Wicklow.

As described in Section 2 (Project Description) the spatial scope of the Project will cover the:

- Site within the red line boundary;
- Any additional working areas;
- Access to and egress from the Site.

This Outline CEMP considers the following subject areas:

- Environmental Management;
- General Site Management;
- Air Quality;
- Archaeology & Cultural Heritage;
- Ecology;
- Water Quality;
- Noise and Vibration;
- Traffic Management; and,
- Waste Management.

It is noted that the Outline CEMP provides guidance, both descriptive and prescriptive, for the information to be included in the CEMP by the Contractor and the CEMP is the Contractor produced document that describes how the information and conditions provided in the Outline CEMP is incorporated and adhered to respectively.

## 2. Description of the Project

### 2.1 Project Description

AECOM have been appointed to undertake the Outline Construction Environmental Management Plan (CEMP) in support of a proposed Strategic Housing Development (SHD) application to An Bord Pleanála at a greenfield site in Ballinahinch, Ashford, Co. Wicklow. The proposed development comprises of the construction of 117 no. houses and 16 no. of duplex apartments, totalling 133 no. residential units.

The site is bounded to the south by existing residential development, to the north by agricultural lands, the west by the R764 with the eastern boundary made up of the local primary school, church grounds and agricultural lands. The total site area is approximately 5.0 ha however the developable site area is approximately 4.3 ha given the topography at the western portion of the site.

There is an open ditch which flows from north to south along the western boundary of the Site and flows into the River Vartry, a salmonid river, approximately 200 m south of the Site. The Murrough Wetlands (Site Code: 002249) Special Area of Conservation (SAC) and The Murrough (Site Code: 004186) Special Area of Protection (SPA) are located approximately 2.8 km to the east of the Site. See Figure 1 and Figure 2 for site location and site layout (from AECOM drawing no. PR252947-ACM-XX-00-DR-CE-10-0001).

The works will include:

- General site clearance and preparation works;
- Topsoil strip and stockpile;
- The construction of 133 residential properties;
- The construction will also include the development of communal and private open spaces, vehicular access, car parking spaces, surface water attenuation tanks, signage and all related sited development and excavation works above ground and below ground.

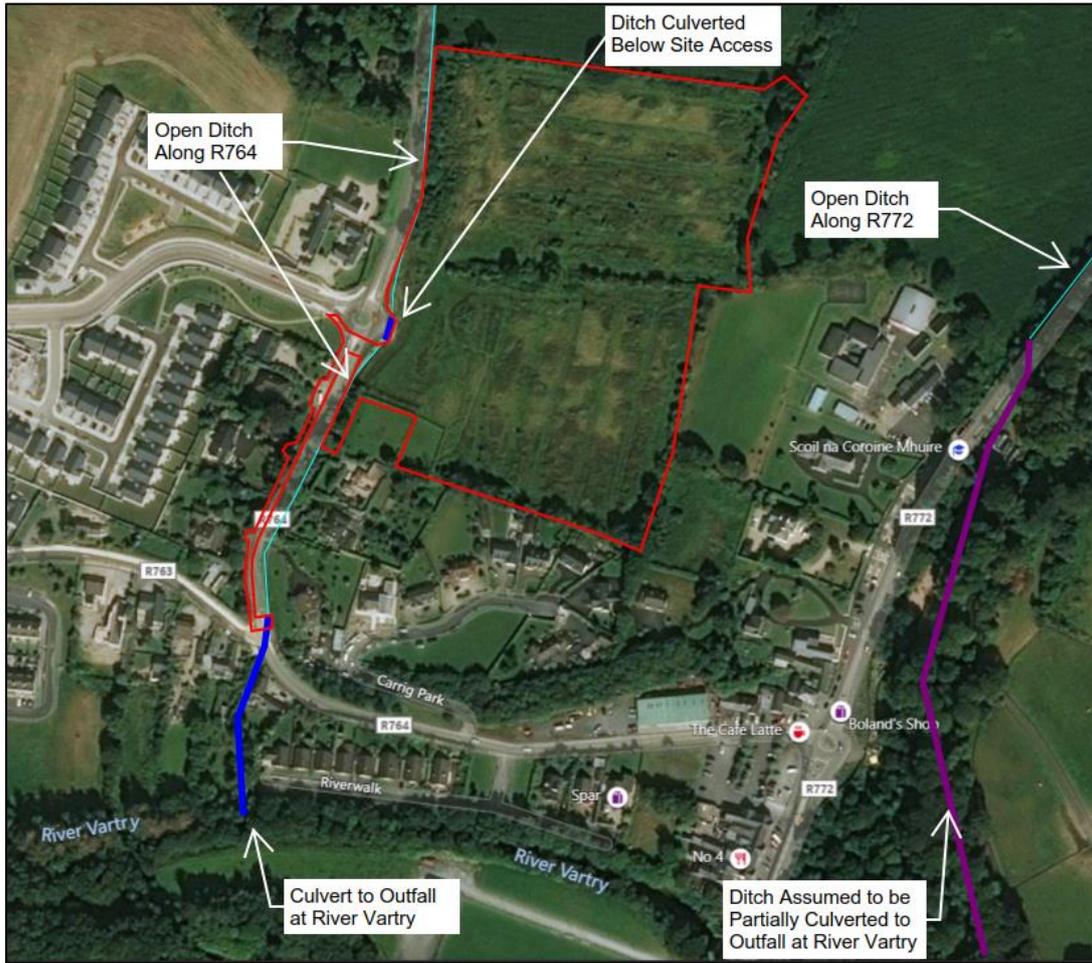


Figure 1: Indicative Red Line Site Boundary



Figure 2: Proposed Site Layout

## 3. Environmental Management

### 3.1 Construction Environmental Management Plan

As noted earlier, the CEMP shall fully address the particular requirements of the Objectives listed in Section 1 of this Outline CEMP, and any updated or new supplementary environmental reports made available to the Contractor as necessary. The CEMP shall also comply with the requirements of the relevant authorities/environmental bodies.

The CEMP shall be prepared by the Contractor and submitted to Inland Fisheries Ireland prior to works commencing on Site. It shall be prepared in sufficient detail to describe the framework of the Contractor's proposed management, control and mitigation strategy for each environmental aspect. Consideration will also be given to relevant adjacent developments in the management of future construction activities on Site. The CEMP should include, where required, specific Method Statements for specific works (e.g. working in or near watercourses).

The CEMP shall be developed/updated as necessary during the course of the design and construction phases and will be reviewed on a regular basis with the Client as necessary.

### 3.2 Roles & Responsibilities

The Contractor shall employ a suitably experienced and qualified Construction Environmental Management Plan Co-ordinator (CEMPC) to undertake co-ordination of monitoring of the works' impacts and implementation of the Contractor's proposals, in respect of all environmental requirements. Further information is provided in Table 1.

A CEMPC or an Environmental Site Representative(s) shall be present on-site for the duration of the Project.

The CEMPC shall be the point of contact for dealing with environmental issues for the Contractor's employees, Subcontractors, relevant authorities/environmental bodies, and members of the public. The CEMPC will also be responsible for controlling the construction impacts arising from the activities of the Contractor and his Subcontractors in accordance with the CEMP.

The CEMPC shall prepare, implement, manage, review and revise the CEMP with the sole purpose of ensuring that the environment is safeguarded at all times from anticipated or unexpected adverse impacts during construction.

Within the Contractor's team, the CEMPC shall have the authority to ensure that the CEMP is effectively implemented. The CEMPC must notify the Client of any transgressions in respect of the CEMP so that necessary sanctions can be imposed.

In general, the duties of the CEMPC shall include the following:

- Implementation of the CEMP procedures;
- Routine environmental monitoring, recording and reporting;
- Maintaining and auditing the CEMP and documents that underpin it;
- Environmental training including daily toolbox talks to site staff and design staff;
- Liaison with statutory authorities as required;
- Assist in liaison with the relevant authorities/environmental bodies and local community;
- Any other activities that may be necessary in order to protect wildlife and the environment during the works.

In addition, other environmental specialists as listed in Table 1 must be available to provide advice on the CEMP during construction. The CEMP shall typically place environmental responsibilities on the key roles within the Project as set out below.

**Table1. Key Contractor Team Roles and Responsibilities (indicative)**

Role	Responsibilities
Contractor's Project Director	<ul style="list-style-type: none"> <li>▪ Assign specific environmental duties to competent members of the Contractor's Team.</li> <li>▪ Identify the environmental training needs of personnel under their control and arrange appropriate training programmes and ensure records are being maintained.</li> <li>▪ Ensure that significant environmental aspects identified for the Project are managed.</li> <li>▪ Promote the continual improvement of environmental performance</li> </ul>
CEMP Coordinator	<ul style="list-style-type: none"> <li>▪ Develop, maintain and audit the CEMP (and supporting documents/plans) to ensure all aspects, impacts and statutory requirements etc. are reflected in the CEMP.</li> <li>▪ Develop and implement a programme of regular Project environmental inspections, monitoring, recording and reporting by the Environmental Site Representative(s) in accordance with procedures set out in the CEMP.</li> <li>▪ Ensure that the works are constructed in line with the CEMP.</li> <li>▪ Liaise with statutory authorities.</li> <li>▪ Attend regular construction meetings to ensure environmental issues are discussed and addressed by the Contractor's Team.</li> <li>▪ Liaise with relevant authorities/environmental bodies and the local community as required.</li> <li>▪ Comply with duties under relevant legislation and company procedures in relation to environmental incident investigation and reporting.</li> <li>▪ Provide support and training to the workforce with regard to understanding environmental aspects, impacts, regulatory requirements, best practice, constraints and methods of working.</li> <li>▪ Nominate the Environmental Site Representative(s).</li> <li>▪ Appoint environmental specialists as required.</li> <li>▪ Ensure identified environmental specialists are in attendance on-site as required by the CEMP.</li> <li>▪ Review non-conformance reports provided by the Environmental Site Representative(s) and/or the Inland Fisheries Ireland Environmental Advisors to identify any underlying issues or patterns to identify suitable ameliorative measures</li> </ul>
Contractor's Project Manager	<ul style="list-style-type: none"> <li>▪ Ensure that the CEMP is produced, maintained and implemented and distributed to all relevant parties.</li> <li>▪ Provide an on-call 24hr resource as a first point of contact for environmental issues/incidents.</li> <li>▪ Monitor the completion of corrective actions by the Site Manager and take action as required to expedite completion.</li> <li>▪ Provide regular reports to the Client on environmental performance, including details of any identified incidents or non-conformances and corrective actions.</li> <li>▪ Ensure that all personnel for whom they are responsible are aware of the CEMP and implement the relevant requirements.</li> <li>▪ Evaluate the competence of all subcontractors and suppliers and ensure that they are made aware of and comply with the CEMP and associated procedures.</li> <li>▪ Establish a consultation and communication system with all relevant stakeholders and interested parties associated with the Project, including employees, partners, sub-contractors, designers and third parties, etc., where relevant.</li> </ul>

Role	Responsibilities
Site Manager	<ul style="list-style-type: none"> <li>▪ Ensure that all personnel undergo suitable and sufficient environmental induction before starting work on the Project, and periodic refresher environmental awareness training throughout the construction.</li> <li>▪ Ensure staffs attend the appropriate environmental courses that are organised by the Environmental Manager (CEMPC). Ensure the Environmental Manager is maintaining records of training delivered to site staff.</li> <li>▪ Monitor the performance of personnel and activities under their control and ensure arrangements are in place so that all personnel can work in a manner which minimises risks to them and to the environment.</li> <li>▪ Undertake a programme of regular environmental inspections in liaison with the Environmental Site Representative(s).</li> <li>▪ Complete any corrective actions identified by the Environmental Site Representative(s) and provide status reports as required to the Client</li> <li>▪ Assist and support the Environmental Manager (CEMPC) and statutory bodies in the investigation of any incidents.</li> <li>▪ Notify the Environmental Site Representative(s) of all environmental issues or incidents arising over the course of operations.</li> </ul>
Environmental Specialists (i.e. Ecological Clerk of Works (ECoW))	<ul style="list-style-type: none"> <li>▪ Attend site as required to monitor the protection of asset in accordance with the requirements of relevant legislation, the construction contract and the CEMP.</li> <li>▪ Identify potential risks to wildlife and develop suitable control measures.</li> <li>▪ Provide status reports and updates to the Environmental Site Representative(s) in the completion of their activities.</li> </ul>

## 4. Environmental Management Procedures and Plans

### 4.1 General Site Management

During construction, the compound will likely be situated in the south eastern part of the site, adjacent to the site access from the R764 roundabout. The compound will include the appropriate security measures and welfare facilities for staff.

#### 4.1.1 Working Hours/Periods

- The construction period is expected to require some 16 – 18 months (approximately) to complete from occupation of the site;
- On-site construction works shall be permitted to take place between 08:00hrs and 18:00hrs Monday to Friday and between 08:00hrs and 13:00hrs on Saturdays or as directed by An Bord Pleanála;
- Working outside these hours will only take place in exceptional circumstances or when the Contractor is working adjacent to operational areas and disruption to sensitive receptors and sensitive core activities associated with operation of the other areas is kept to a minimum;
- No works shall take place on Sundays or Bank Holidays. In exceptional cases, Wicklow County Council may permit works to proceed outside the above times/days. This will be subject to the written agreement of the Council prior to such works proceeding. Locations of works that are anticipated to be outside normal working hours will be defined and confirmed.

#### 4.1.2 Site Housekeeping

- Good housekeeping is an important part of good environmental practice and helps to maintain a more efficient and safer site. The site should be tidy, secure, and have clear access routes that are well signposted. The appearance of a tidy, well-managed site can reduce the likelihood of theft,

vandalism, complaints and/or specific hazards that could affect the safe operation of the other businesses in the area, such as bird hazards and wind-blown litter.

- As outlined in the fourth edition of CIRIA's '*Environmental good practice on site guide*' (C741), when considering good housekeeping, the Contractor will implement the following steps:
  - Adequately plan the site with designated areas of materials and waste storage;
  - Segregate different types of waste as it is produced and arrange frequent removal;
  - Keep the site tidy and clean;
  - Ensure that no wind-blown litter or debris leaves the site, use covered skips to prevent wind-blown litter;
  - Keep hoardings tidy – repair and repaint when necessary, removing any fly posting or graffiti;
  - Frequently brush-clean wheel washing facilities and keep haul routes clean from site derived materials;
  - Keep roads free from mud by using a road sweeper;
  - Ensure site is secure.

## 4.2 Air Quality

Negative air quality impacts can come from many sources during construction. Mitigation measures (as described below) shall be required so that construction works are carried out in such a manner that emissions of dust and other pollutants are limited, and that best practicable means are employed to minimise disruption, risks to human health, and to avoid unnecessary impacts on sensitive ecological habitats.

### 4.2.1 Regulatory & Policy Framework

The following legislation and guidance documents are of relevance to the air quality of the Site:

#### Legislation

- Planning and Development Act, 2000, as amended;
- Technische Anleitung zur Reinhaltung der Luft (TA Luft) Regulations (2002).

#### Guidance Documents

- Environmental Protection Agency (2010) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4);
- Environmental Protection Agency Air Quality in Ireland 2017: Indicators of Air Quality.

### 4.2.2 Environmental Control Measures and Proposals

#### 4.2.2.1 General Air Quality Measures

The Contractor will be required to implement measures to minimise the amount of dust and emissions (including odour) produced during the Project. There will be a Duty of Care on the Contractor to ensure that dust-raising activities are located away from sensitive receptors wherever possible, such as nesting birds and residential dwellings as much as feasibly possible and duration kept to a minimum when in proximity to a receptor/activity.

The Contractor shall follow the relevant mitigation measures that are outlined below and any additional mitigation measures from the planning consent document.

The important aspects of air quality mitigation include:

- The assignment of responsibility for dust and emissions (including odour) management to an individual member of the Contractor's staff (i.e. CEMPC);
- Training staff to understand the importance of the issue;
- Communicating with the local community (as necessary).

Regular site inspections shall be undertaken by the Contractor's CEMPC/Environmental Site Representative to monitor compliance with the CEMP and record inspection results.

- The Contractor shall comply with the mitigation measures that may be provided in planning consent documents, relevant documents listed in Appendix A of this Outline CEMP (however this is not an exhaustive list and documents considered should not be limited to the list provided within Appendix A), statutory authority requirements and any updated or new supplementary environmental reports made available to the Contractor as necessary.
- Works shall be planned to take into account the location of sensitive receptors, sensitive core activities associated with operation of other businesses, local topography, wind direction and any potential sources of pollution.
- Discussion with the Client shall be undertaken at an early stage by the Contractor to determine any specific monitoring requirements and to agree to any proposed trigger/action levels.

#### 4.2.2.2 Vehicle and Plant Emissions

- Emissions to the atmosphere, in terms of gaseous and particle pollutants from vehicles and plant used on-site, should be controlled and limited, as far as reasonably practicable, using measures and appropriate control techniques as listed below:
  - The engines of all vehicles and plant on-site should not be left running unnecessarily (i.e. idling) to minimise exhaust emissions (and noise);
  - Vehicles and plant shall adhere to applicable emissions standards;
  - Plant, equipment and emission control apparatus shall be selected to minimise the engine exhaust emissions, taking into consideration economic constraints and practicability;
  - Vehicles and plant shall be in good working order and certified where applicable, with servicing completed in line with manufacturer's recommendations. Records of servicing shall be maintained and visual checks carried out to ensure that black smoke is not emitted at times other than at ignition;
  - Haul routes and plant shall be situated and operated away from sensitive receptors and sensitive core activities associated with operation of other businesses (where possible);
  - The use of diesel or petrol-powered generators shall be minimised, with mains electricity or battery powered equipment used as an alternative (where feasible);
  - Movement of vehicles and plant shall be minimised around the site;
  - Vehicle/plant exhausts shall be directed away from the ground to minimise risk of re-suspension of ground dust;
  - Maximise energy efficiency, which may include using alternative modes of transport, maximising vehicle utilisation by ensuring full loading and efficient routing.

#### 4.2.2.3 Control of Dust

##### 4.2.2.3.1 Generation of Dust

- The Contractor should take all necessary measures to minimise disturbance caused by dust, during construction works.
- As per industry standard for the construction phase, the TA Luft Regulations limit value of 350mg/m<sup>2</sup>/day (as accepted by the Irish EPA) will be adhered to by the Contractor.
- Visual inspections shall be undertaken regularly by the Contractor when dust-raising activities are occurring. Inspections should consider prevailing meteorological conditions, and results shall be recorded and maintained.
- Measures to minimise the amount of dust produced might include, dampening haul roads and stockpiles, keeping roads clean and using covers to minimise dust blow from haulage vehicles. Appropriate measures should reflect the nature of the construction activity (type, dust source points, construction operation periods and time of year) as well as ameliorating conditions (such as prevailing wind directions and speeds, typical precipitation and the dampening effect of retained soil moisture. Possible methods of reducing and controlling dust emissions during construction are listed in Table 2 and detailed further in sub-sections below.

**Table 2. Possible Dust Control Measures**

<b>Operation</b>	<b>Dust Control Measure</b>
Drilling	<ul style="list-style-type: none"> <li>▪ Use dust-extraction equipment such as filters, on exhaust air emissions from drill rigs</li> </ul>
Loading/Unloading	<ul style="list-style-type: none"> <li>▪ Reduce drop heights wherever practicable</li> <li>▪ Protect activities from wind</li> </ul>
Material storage	<ul style="list-style-type: none"> <li>▪ Dampen material.</li> <li>▪ Protect from wind and store under cover.</li> <li>▪ Screen material to remove dusty fractions prior to external storage.</li> </ul>
Overburden handling	<ul style="list-style-type: none"> <li>▪ Protect exposed material from wind (by keeping material within voids or protecting them by topographical features)</li> <li>▪ Spray exposed surfaces of mounds regularly to maintain surface moisture unless mound surface has formed a crust after rainfall or is grassed</li> <li>▪ Minimise handling.</li> </ul>
Soil handling and storage	<ul style="list-style-type: none"> <li>▪ Restrict the duration of the activity. Seal and seed storage mound surfaces as soon as is practicable.</li> <li>▪ Protect surfaces from winds until disturbed areas are sealed and stable.</li> </ul>
Transport by vehicle within and off-site	<ul style="list-style-type: none"> <li>▪ Restrict vehicle speed.</li> <li>▪ Water unsurfaced roads and paved roads.</li> <li>▪ Wheel or body wash at an appropriate distance from site entrance. This should always be within the site, and the roadway from the washing facility to the road shall be hard-surfaced.</li> <li>▪ Load and unload in areas protected from wind.</li> <li>▪ Minimise drop heights.</li> <li>▪ Sheet or cover loaded vehicles.</li> <li>▪ Use water sprays/spray curtains to moisten material.</li> <li>▪ Sweep/wash paved roads.</li> <li>▪ Use paved roads where practicable.</li> </ul>

#### 4.2.2.3.2 Vehicle and Plant Dust

- Adherence to site speed limits helps to avoid excessive dust emissions.
- Care shall be taken to ensure that machinery or dust-causing activities shall be sited away from sensitive receptors and sensitive core activities associated with operation of other businesses where practicable.
- The production of dust shall be taken into account when selecting plant equipment, with apparatus with emission controls being chosen, as far as economically practical.
- Vehicles shall not be overloaded, and all loads entering and leaving the construction site and carrying waste and other dusty materials shall be adequately sheeted to prevent the spillage of material during transport.
- Any cutting and grinding operations to be carried out should use equipment and techniques which incorporate dust suppression measures and reduce emissions.
- Facilities for vehicle washing/wheel washing shall be provided on site, as well as procedures for effective cleaning and inspection of vehicles, to keep dust and mud off the public road network.

#### 4.2.2.3.3 Earthwork Dust.

- Exposed earthworks shall be kept damp at all times to prevent airborne dust emissions. Should this not be possible, windbreaks shall be used to minimise the potential for dust generated by wind erosion.
- Dust generation shall be minimised from earthworks by sealing or seeding of surfaces to stabilise them as soon as possible.

#### 4.2.2.3.4 Site Fires

- No site fires are permitted.

#### 4.2.2.3.5 Dust arising from Haul Roads, Compounds and Works Areas

- Haul roads will be damped down using water (Please note that no water will be extracted from the Vartry River or open culvert to the west of the Site). Spraying will be repeated regularly and frequently during warm and sunny weather (including treatment for any run-off containing suspended solids). Refer to Section 4.5.4.2 for further information on managing runoff.
- Hard standing surfaces used within the construction site shall be regularly maintained and kept clean.
- An approved mechanical road cleaner shall be employed to clean the site's hard standing area and the public roads in the vicinity of the site.
- Wheel washing facilities shall be provided and used by all vehicles leaving the site and should be checked and maintained regularly. A record of all checks and maintenance should be kept by the Contractor and should be available for inspection at any time. Refer to Section 4.5.4.2 for further information on managing runoff.

#### 4.2.2.3.6 Dust arising from Materials Handling and Storage

- Materials stockpiles on site shall be designed so as to minimise dust generation by wind erosion (i.e. no steep-sided stockpiles or mounds or those that have sharp changes in shape), covered securely, or damped down or suitably treated to prevent the emission of dust.
- Stockpiles and mounds shall be located away from the Site boundary, sensitive receptors, watercourses and surface drains and sited to take into account the predominant wind direction.
- Stockpiles shall be maintained at suitable heights.
- Double handling of material shall be avoided wherever reasonably practicable.
- Drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment shall be minimised, with fine water sprays used on such equipment wherever appropriate.
- Where drop heights are greater than 2 m, suitable dust suppression measures shall be utilised to control dust emissions.
- Stockpiled materials that are likely to remain undisturbed for a significant duration shall be vegetated or covered. In the case of long-term stockpiles, they can be seeded, re-vegetated or turfed to stabilise surfaces.
- Any construction materials stored within the site shall be located away from the site boundary and downwind of sensitive receptors unless used for the purposes of screening.
- The site shall be regularly inspected by the Contractor for spillages of dusty or potentially dusty materials and shall have procedures in place for prompt clearance of any such spillage.
- The frequency of site inspections shall be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

#### 4.2.2.3.7 Concrete Work

- Ready-mixed concrete will be brought to the Proposed Development by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.
- The pouring of concrete will take place within a designated area using a geosynthetic material to prevent concrete runoff into the soil/groundwater media. Washout of concrete transporting vehicles will take place at an appropriate facility offsite where possible, alternatively, where wash out takes place on-site, it will be carried out in carefully managed on-site wash out areas.

- Before concrete pours, the pour structure shall be cleaned, and fine non-ferrous debris shall be removed from the pour area.

## 4.3 Archaeological and Cultural Heritage Considerations

### 4.3.1 Regulatory & Policy Framework

The following legislation and guidance documents are of relevance to the archaeology and cultural heritage of the site:

#### Legislation:

- National Monuments Act, 1930, as amended in 1954, 1987, 1994, 2004 and 2012 (S.I. 249 of 2012);
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999;
- Planning and Development Act, 2000, as amended; and,
- The Heritage Act 1995.

#### Guidance documents:

- Department of Arts, Heritage, Gaeltacht and Islands (1999a), Framework and Principles for the Protection of the Archaeological Heritage; and,
- Architectural Heritage Protection Guidelines (2004).

### 4.3.2 Archaeological and Cultural Heritage Considerations

An archaeology and cultural heritage study was conducted at the Site by Archer Heritage Planning Ltd. Results of this study showed no recorded monuments situated within the Site boundary, and no potential archaeological features were recorded in either historic mapping or in aerial photos of the subject site. Historical maps showed the Site was in use as agricultural land and site survey confirmed that much of the Site is overgrown. Evidence for Bronze Age activity was discovered in recent archaeological excavations to the immediate west. This study concludes that a moderate potential for the survival of buried archaeological remains at the Site. Therefore, the greatest threat to unrecorded, buried archaeological sites features occur during the construction stage and include all ground disturbance works undertaken at construction stage (excavations and other groundworks including the provision of access roads and service trenches), movement of machines and storage of material in sensitive areas.

### 4.3.3 Environmental Control Measures and Proposals

#### 4.3.3.1 General Cultural Heritage Measures

- The Contractor will agree with the planning authority details regarding any further cultural heritage requirements (including, if necessary further testing) prior to commencement of construction works and demolition on the Site.
- Archaeological monitoring of all earthmoving works for site preparation will be undertaken to ensure that any features of an archaeological nature that may be revealed are identified, recorded and fully resolved. Hoardings, additional support and temporary weathering will be provided, if required for protected structures on site.

#### 4.3.3.2 Awareness and Training

During the project induction meeting, all contractors will be made aware of the presence of a Project Archaeologist who will monitor earthmoving and excavation activities.

## 4.4 Ecology

### 4.4.1 Regulatory & Policy Framework

#### 4.4.1.1 Policy and Guidance

The following policy and guidance documents are of relevance to ecological constraints present within the Site.

## Legislation

- European Communities (EC) (Birds and Natural Habitats) Regulations 2011 (as amended) which make it an offence to disturb the breeding or resting site of any bat species potentially roosting within the Site (even where an individual(s) are unaware of the presence of any bat roosts).
- Wildlife Act 1976, as amended which make it an offence to wilfully destroy, injure or mutilate the eggs or nest of any bird species – including several species of conservation concern or to wilfully disturb any such bird species on or near a nest containing eggs or unable to fly young.

### 4.4.2 Key Ecological Impacts

According to a Bat Assessment report completed by Brian Keeley of Wildlife Surveys Ireland in July 2019, the activities associated with the development of the Site will have the following potential impacts on the bat fauna:

- Potential roost loss due to tree removal: This could lead to injury or death to a species protected under the Wildlife Act and Habitats Directive (if a roost were present and not identified) and would therefore constitute a breach of the Irish and EU legislation. However, it is noted in the report that at the time of the survey there was no evidence that the trees within the Site are in use as bat roosts. It is stated that bats may move in and out of roosts on a regularly basis and individuals may be present at times during the construction phase.
- Disturbance from lighting: Use of light at the Site for the purposes of access, safety and security may affect light-intolerant bat species during foraging. Light at emergence points would affect all bat species, including those that will feed in illuminated areas.
- Reduced feeding: Reduced vegetation including the removal of any of the trees within the Site may lead to reduced insect abundance.

A Screening Report for Appropriate Assessment for the subject Site was completed by Pádraic Fogarty of Openfield Ecological Services. An assessment of the significance of the effects as a result of the proposed development are outlined below:

- Habitat Loss: As the Site is physically remote (2.8 km) from the boundary of the SAC and SPA, there can be no loss or direct disturbance of habitats or species in this area.
- Indirect Habitat Disturbance: The distance to the Murrough SPA (2.8 km) is considered too great for any negative effect to occur to birds using the wetland from noise or other disturbance effects.

An Ecological Impact Assessment for the proposed development was completed by Openfield Ecological Services in August 2019. The survey outlined potential impacts of the proposed development as detailed below:

- Site clearance will see the removal of grassland, scrub and treeline/hedgerow habitats. These are assessed as being of low local value and high local value to biodiversity respectively.
- The direct mortality of species during land clearance. This impact is most acute during the bird breeding season which can last from March to August inclusive.
- Following the site survey, there was no direct evidence of any mammal species. There was no badger activities noted in an extensive search of the hedgerow and treeline.

### 4.4.3 Roles and Responsibilities

#### Environmental Manager

The following duties in relation to ecology should be included under the Environmental Manager Responsibilities:

- Ensure that the Project Ecologist implements ecological mitigation and control measures satisfactorily;
- Liaise with the Project Ecologist on all matters relating to ecology (particularly protected species including badgers, roosting bats and nesting birds);

- Engage and consult with the Project Ecologist and a bat specialist prior to any felling or removal of trees within the Site and if bats are unexpectedly encountered during any element of construction works.

### **Project Ecologist**

The Project Ecologist will be responsible for advice and provision of services in relation to implementation of ecological mitigation measures described in the planning package in addition to any required as a condition of any consent(s). The Project Ecologist will be engaged and consulted on a regular basis by the Environmental Manager. The responsibilities and duties of the Project Ecologies will include the following:

- Provision of specialist input and supervision (licensed or otherwise), where necessary, of construction in relation to protected species including roosting bats;
- Training of construction staff regarding measures to protect nesting birds and roosting bats;
- Liaison with the National Parks and Wildlife Service (NPWS), Wicklow County Council and other nature conservation agencies on ecological matters where required.

#### **4.4.4 Ecological Mitigation Measures**

##### **4.4.4.1 General Measures**

According to the Bat Assessment referenced above, proposed mitigation includes the following:

- Incorporation of 12 bat boxes (Schwegler types 2F or 2FN or equivalent) is proposed into the site to provide bat roost opportunities. All bat boxes must be unlit and should be at least 2.5 metres above ground height and preferably 3 metres or higher. The bat boxes shall be installed on mature trees that are to be retained or on buildings (or poles if there are no options of the above type). Three boxes shall be attached to each of two trees unless there are better opportunities created by modifying this arrangement according to the bat specialist.
- All the mature trees within the site shall be examined for the presence of bats prior to felling by a bat specialist. Should bats be noted in any tree, it is a protected structure and a derogation must be sought.
- Where there is an opportunity to provide vegetative cover, native and local plant species should be employed including typical plants such as oak (the greatest value for most wildlife), hawthorn, blackthorn, elder, gorse, bramble, in addition to other species such as dog rose with an encouragement of species attractive to moths.
- Lighting should be controlled to avoid light pollution of green areas and should be targeted to areas of human activity and for priority security areas. Motion-activated sensor lighting is preferable to reduce light pollution.
  - None of the remaining mature trees or trees proposed for planting shall be illuminated.
  - Dark corridor for movement of bats along the grounds of the site. Lighting should be directed downwards away from the treetops.
  - All luminaires shall lack UV elements when manufactured and shall be LED
  - A warm white spectrum (ideally <2700Kelvin but as low as the Council limitations allow) shall be adopted to reduce blue light component
  - Luminaires shall feature peak wavelengths higher than 550nm
  - Tree crowns shall remain unilluminated
  - Planting shall provide areas of darkness suitable for bats to feed and commute through the site.
- The Contractor shall comply with ecological mitigation measures described in the planning package and ecological pre-construction reports in addition to any measures required as a condition of consent, and any updated or new supplementary environmental reports made available to the Contractor as necessary.

- Works should be planned to take account of the location of identified sensitive ecological receptors and any seasonal restrictions and/or surveys that are required prior to construction works commencing. It is the responsibility of the Contractor to do this in a timely manner.
- Any external lighting to be installed to facilitate night-time working or security lighting on the Site during construction activities should be kept to a minimum of that required for security, health and safety purposes and should be positioned and directed in such a manner as to minimise impacts on adjacent areas outside the site boundary.
- Any temporary construction lighting should be reviewed by the Project Ecologist to determine its potential to disturb nesting birds or roosting bats, and in accordance with:
  - Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2011);
  - Bats and Lighting – Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, December 2010).
- As birds and bats are mobile, additional nests or roosts could become established within the construction site during construction works, a ‘watching brief’ must be maintained by the Contractor throughout the construction period. If any nesting birds or roosting bats are encountered during works or if it is suspected that protected fauna may be utilising the construction site, the Contractor shall cease works in the area immediately and consult with the Project Ecologist.
- Possible methods of reducing and controlling dust emissions which may impact negatively on sensitive ecological receptors during construction are listed in Table 2, however this is not an exhaustive list.

### Protection of Nesting Birds

- Any clearance of woody vegetation (including scattered vegetation will take place between September and February inclusive, outside of the bird breeding season).
- If any vegetation clearance is planned to be undertaken during the bird breeding season (March - August) then the Contractor must consult with the Project Ecologist in advance of works. Clearance of vegetation in the bird breeding season will require breeding bird surveys to confirm presence/absence of breeding birds and may require a derogation licence from NPWS to remove or destroy nests prior to vegetation clearance.
- All cleared vegetation and other material of bird nesting potential must be chipped or mulched or removed off-site to ensure that birds cannot use the material for nesting during the bird breeding season (March-August).
- The Contractor’s programme shall clearly indicate any areas of existing vegetation to be removed and their programmed schedule for removal.
- The Contractor should appoint an ecologist to monitor nesting at the Site during construction. The Contractor will be responsible for the monitoring of the construction area and the possible requirement to amend working practices or timescales for certain construction activities as a result of the monitoring if found to be necessary.
- The contractor must ensure all appropriate licences are in place, notices given and required surveys have occurred prior to felling.

## 4.5 Water Quality

### 4.5.1 Regulatory & Policy Framework

#### 4.5.1.1 Policy and Guidance

The following legislation and guidance documents are of relevance to the water quality of the Site:

#### Legislation:

- Planning and Development Act, 2000, as amended;
- European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2015 S.I. No. 386 of 2015;

- European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2010 S.I. No. 327 of 2012;
- European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2009 S.I. No. 272 of 2009;
- European Union Environmental Objectives (Groundwater) (Amendment) Regulations 2016 S.I. No. 366 of 2016;
- European Union (Drinking Water) Regulations 2014. S.I. No. 122 of 2014; and,
- Environmental Protection Agency's Draft Interim Guidelines Values (IGVs) for the Protection of Groundwater, 2003.

#### **Guidance Documents:**

- CIRIA guidance documentation C648 'Control of Water Pollution from Linear Construction Projects';
- CIRIA guidance documentation C532 'Control of water pollution from construction sites: guidance for consultants and contractors';
- CIRIA guidance documentation C741 'Environmental good practice on site guide
- CIRIA guidance documentation R164 'Design of Containment Systems for the Prevention of Water Pollution from Industrial Accidents'; and,
- Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, National Roads Authority (NRA).

#### **4.5.1.2 Sources**

The construction works at the Site have the potential to impact on groundwater directly underlying the Site along with surface water. The Contractor shall identify all of the activities within the construction works with the potential to impact on groundwater or surface water. These activities and sources may include:

- Excavation of soil and disturbance of soil and potentially contaminated material;
- Disturbance of soils by vehicle activities;
- Rainwater runoff from excavated areas (including erosion) and from stockpiles of excavated material;
- Excavation of potentially contaminated material, either from made ground or underlying soil;
- Potential leakage or spillage of construction-related materials;
- Rainwater runoff from stockpiles of construction materials;
- Generation of construction and demolition wastes in the vicinity of excavated/open ground; and,
- And storage of soil and construction wastes in proximity to watercourses and drainage systems (including ditches).

Hydrological linkages (surface waters and groundwater flows) between impact sources (the Site) and receptors (water bodies, habitats and species) can often result in potential for impacts to occur at a significant distance from the Site. The distances over which waterborne pollutants are likely to remain in sufficient concentrations to have a significant impact on receiving waters is difficult to quantify and highly site-specific.

It is vital to manage water on site to ensure protection and maintenance of water quality in water bodies within, adjacent to and downstream of the construction site and thus ensure protection of surface and groundwater quality and the habitats and species therein. For example, the River Vartry is located approximately 200m south of the Site. There is an open culvert located along the western boundary of the Site which flows in a southerly direction into the Vartry River. The Vartry River is classified as a Salmonid River (EU Code: IE\_EA\_10V010300) under S.I. 293: European Communities (Quality of Salmonid Waters) Regulations, 1988.

With reference to water quality and ecology and nature conservation, the following issues are of relevance:

- Control of sediment run-off from the Site into groundwater and surface water. This could be as a result of, but is not limited to, run-off from stockpiles, dewatering of excavations, pooling of water and over-land flow of water during adverse weather; and,
- Control of polluting substances, for example, hydrocarbons, chemicals and sediments. This could be as a result of, but is not limited to, re-fuelling of vehicles, pouring of concrete and improper storage of chemicals on Site.

#### 4.5.2 Key Water Quality Impacts

A Screening Report for Appropriate Assessment for the subject Site completed by Pádraic Fogarty of Openfield Ecological Services considered potential impacts on the aquatic environment. An assessment of the significance of the effects as a result of the proposed development are outlined below:

- **Pollution from Construction:** The open culvert may act as a pathway for surface water to reach the wetlands of the Murrough SAC and SPA during construction. Coastal wetlands are not sensitive to silt pollution in the way that rivers are and effects from this Project cannot affect the qualifying interests of the SAC and SPA. While pollution will be avoided during the construction phase these measures are not considered to be mitigation in an Appropriate Assessment context as they are not being employed to reduce or minimise impacts to any Natura 2000 sites.
- **Pollution from Operation:** The development will increase the loading of foul wastewater to the municipal wastewater treatment plant for Wicklow which is operated by Irish Water under licence from the Environmental Protection Agency (Licence No. D0012-01). It discharges treated effluent to the Irish Sea and in 2017 the Annual Environmental Report (AER) showed that it was fully in compliance with its emission limit standards. The report states that the discharge is not having an 'observable negative impact on water quality'. The point of discharge is not within any SAC or SPA and there is no evidence that negative effects from pollution are arising to coastal ecosystems in this area. This effect is therefore considered not to be significant.

The Ecological Impact Assessment for the proposed development completed by Openfield Ecological Services in August 2019 outlined potential negative impacts of the proposed development on the aquatic environment both during construction and during the operation of the Site as detailed below:

- **Pollution of water courses through the ingress of silt, oils and other toxic substances.** Construction pollutants can affect fish and other aquatic life both directly and indirectly by degrading river habitat.
- **Pollution of water from foul wastewater arising from the development.** Wastewater will be sent to the municipal treatment plant for Wicklow. According to the Annual Environmental Report, there have been no exceedances of the emission limit values stated in the licence and ambient monitoring indicates that the discharge is not having a perceptible impact upon the receiving waters.
- **Pollution of water from surface water run-off.** The Greater Dublin Strategic Drainage Study (2005) identified issues of urban expansion leading to increased risk of flooding in the city and a deterioration of water quality. This arises where soil and natural vegetation, which is permeable to rainwater and slows its flow, is replaced with impermeable hard surfaces. The implementation of sustainable drainage systems to the greatest degree feasible, as well as attenuation measures to store rainwater and limit its outfall rate, will ensure that negative effects to water quality do not occur.

#### 4.5.3 Water Quality

This section prescribes the mitigation measures necessary for the Contractor to minimise impacts and monitor effects upon the water environment during construction. In order to do this, the Contractor shall be responsible for managing its construction activities and those of any sub-contractors under its control.

The Contractor shall ensure that mitigating measures outlined in the Outline CEMP, planning consent and in the documents listed in Appendix A, Wicklow County Council's requirements, and any updated or new supplementary environmental reports are included in the CEMP.

Water quality management details, including monitoring, shall be developed in consultation with and approved by the Client, Wicklow County Council and Inland Fisheries Ireland (IFI) as necessary to ensure that potential for significant impact upon the water environment is addressed and appropriate mitigation measures are employed. The Contractor shall adhere to guidelines stated in the Inland Fisheries Ireland document entitled 'Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Water'.

The mitigation measures shall include, without limitation, the following:

- The measures to be taken to protect watercourses and associated wildlife from, for example, chemical spillages or the introduction of sediment-laden run-off; and performance standards for site run-off;
- An emergency pollution response plan including Spill Response & Control Plan which will prescribe measures and procedures to be undertaken to minimise the risk of adverse impacts upon surface waters and groundwater as a result of accidental spillage incidents, flooding or other emergencies;
- Procedures for investigating environmental incidents and incident notification procedures shall involve both the Client and relevant authorities/environmental bodies;
- Assessment of the earthworks that are likely to give rise to sediment-laden run-off, the routes this is likely to take, and the methods to prevent silt entering the Vartry River;
- Procedures for dewatering the Site during construction works including licensing requirements, monitoring requirements, discharge points and maintenance requirements of water treatment plant;
- Establishment of contingency measures to cater for impacts to unknown services underlying the construction site (for example, old sewers, culverts);
- Fuel handling (including oil) procedures during the works, in particular, in unsurfaced areas of the site and in areas near rivers, streams and watercourses;
- How mud and dust will be controlled and the frequency for road cleaning and dust suppression required at different times of the year; and,
- How gravel aquifers, groundwater and any water supply boreholes and wells will be protected.

The Ecological Impact Assessment completed by Openfield Ecological Services provides proposed mitigation measure to minimise the impact of the proposed development on the aquatic environment as follows:

- Pollution of the river during the construction phase: The guidance from the Inland Fisheries Ireland for the prevention of pollution during construction along a riparian zone should be followed.

This documentation comprehensively details issues that present the risk of adverse impacts occurring within the water environment and how to mitigate such impacts.

#### 4.5.4 Environmental Control Measures and Proposals

##### 4.5.4.1 General Control Measures

For each of the potential sources of an environmental impact on the groundwater and soil, the Contractor shall identify the control and protection measures to be implemented. These measures may include the following:

- Materials and equipment to implement the Spill Response & Control Plan must be available adjacent to all watercourses (for example, spill kits, booms). These should be in clearly marked response points, which can be accessed by all staff. They must be checked on a daily basis to ensure that all required materials are in place. All staff on site must be aware of these items and be trained on procedures to implement in the case of a spill. Any used spill kits will be disposed of using a hazardous waste disposal contractor and in accordance with all relevant EU and Irish waste management legislation;
- Storage of oils and diesel, along with the general maintenance and refuelling of plant, will be restricted to impermeable bunded areas with a minimum 110% storage capacity and away from surface waters or areas where any spillages could easily reach surface water. All fuel, chemicals

and oils will be stored within bunded areas in accordance with PPG2 – Above ground oil storage tanks, and PPG26 – Storage and handling of drums and intermediate bulk containers;

- Leaking or empty oil drums shall be removed from site immediately and disposed of via an appropriately licensed waste disposal contractor;
- Drip trays will be utilized on site for pumps situated within 25m of the watercourse and spill kits will be available at these locations for the duration of the contract. Any used spill kits will be disposed of using a hazardous waste disposal contractor and in accordance with all relevant EU and Irish waste management legislation;
- Drip trays will be used underneath mobile plant and drums whilst in use on site;
- All hazardous substances on-site shall be controlled within an enclosed storage compounds that shall be fenced off and locked when not in use to prevent theft and vandalism;
- Refuelling of plant and machinery shall take place at least 15m away from the open culvert using a mobile fuel bowser and restricted to designated areas on hard standing. Only double bunded fuel bowsers shall be used. Vehicles must not be left unattended during refuelling operations;
- Fixed plant shall be self-bunded. Mobile plant must be in good working order, kept clean and fitted with drip trays where appropriate. The Contractor will regularly inspect these drip trays and empty the contents into a treatment system. All water runoff from designated refuelling areas shall be channelled to an oil interceptor or an alternative treatment system prior to discharge;
- Spill kits and oil absorbent material must be carried with mobile plant and located at vulnerable locations to reduce risk of spillages entering the sub-surface or groundwater environment. Booms shall be held on-site for works near drains or dewatering points. Any used spill kits will be disposed of using a hazardous waste disposal contractor and in accordance with all relevant EU and Irish waste management legislation;
- Care must be taken whilst using shuttering oils when preparing formwork. This requires operatives to be trained in the proper handling of materials, the sensitive nature of the wider drainage system, and the consequences of accidental spillage;
- Concrete mixing will not occur on site and will be brought to site by truck;
- Equipment, batching and ready-mix lorry washing and cleaning shall be washed-out on-site into a designated area that has been designed to contain wet concrete / wash waters (see PPG6 – Working at construction and demolition sites). The washout facilities should be checked and maintained on daily basis. A record of all checks and maintenance should be kept by the Contractor and should be available for inspection at any time. The washout facility must be in good condition, must not overflow or leak and must be easily accessible to the vehicle. pH of the wash waters should be checked regularly.
- Only concrete delivery truck chutes may be washed out in this location.

#### 4.5.4.2 Managing Runoff and Silty Water

In terms of specific mitigation measures relating to sedimentation the CEMP must include:

- Procedures for dewatering the site during construction works including licensing requirements, monitoring requirements, discharge points and maintenance requirements of water treatment plant;
- Put in place measures that will minimise erosion by reducing disturbance and stabilising exposed materials.
- Consider, and document, control measures to minimise the release of mobilised sediment which results, despite the erosion control measures;
- Preventing of silt pollution from the Project shall be carried out by minimising the generation of silt-laden runoff. This can be achieved by the Contractor carefully planning the site works so that activities likely to generate silt-laden runoff are carried out during drier weather and erosion of surface soils and excavations is controlled;

- Stockpiles will be kept to a minimum, to control erosion areas of exposed ground. Stockpiles shall be minimised to reduce silty runoff and located well away from watercourses, drains and dewatering points;
- Consideration shall be given to ground water level and ground saturation to prevent excessive overland flow and associated scouring and mobilisation of suspended solids. The area to be stripped shall be kept to a minimum and phased during the planning and construction phase to reduce the amount of land exposed;
- Mud shall be controlled at entry and exits to the site using wheel washes and/or road sweepers, and tools and plant must be washed out and cleaned in designated areas. Consideration of containment of wheel washings for treatment prior to discharge shall be given; and,
- A silt fence will be erected along the western boundary of the Site to prevent silt entering the open culvert. This will be similar in nature to the silt fence which was erected during the diversion of the open culvert during Ballinahinch Phase I works.

#### 4.5.4.3 In-Stream Works

There will be no in-stream works to the Vartry River or the open culvert along the western boundary of the Site. If in-stream works are required they should only be carried out during the period July to September (to avoid the salmon spawning period). Any in-stream works should be communicated and agreed with Inland Fisheries Ireland and other interested parties in advance of works.

At concept design stage the possibility of installing a footpath on the east side of the R764 from the subject Site to the junction of R763 was considered, however, having assessed the potential negative impact on the existing open culvert in this area, it was decided to install the footpath on the western boundary of the R764.

#### 4.5.4.4 Awareness and Training

Induction training should be provided to Site construction personnel to inform them of their responsibilities and liabilities with reference to water quality and ecology and nature conservation. Training could be provided via various methods and the most appropriate method of delivery must be decided by the Contractor, for example, workshops prior to commencement of site works, Environmental Toolbox talks during the works or by use of notice boards in site offices to display important information.

#### 4.5.4.5 Monitoring

A water quality monitoring programme shall be implemented by the Contractor and discharges monitored in accordance with the consents held. Routine monitoring shall be undertaken at watercourses upstream and downstream of the works, and at all discharge points to measure water quality and presence of sediment or oil film and to ensure they are free from litter and debris.

Monitoring of the open culvert along the western boundary will take place prior to construction to determine a water quality baseline for the open culvert. During construction, a water sampling regime will be put in place where results will be compared to the baseline data. The following parameters will be monitored during the baseline and monitoring period:

**Table 3. Monitoring parameters for baseline and water quality monitoring**

Parameter	Parameter
pH	Conductivity
Temperature	Total Phosphorus (P)
Mineral Oil (C10-C40)	Sulphate
Nitrate	Total Ammonia
Total Alkalinity	BOD
COD	Total Solids

Suspended Solids

Results will be assessed against the European Communities (Surface Water) Regulations, S.I. 272 of 2009 (as amended).

## 4.6 Noise and Vibration

### 4.6.1 Regulatory & Policy Framework

#### 4.6.1.1 Policy and Guidance

The following legislation and guidance documents are of relevance to the noise and vibration of the Site:

#### Legislation

- Environmental Protection Agency Act 1992 (Noise) Regulations 1994.

#### Guidance Documents

Unless otherwise specified, the Contractor shall ensure that all activities associated with the works are carried out in accordance with best practice for the management and control of noise and vibration from construction sites as per:

- The recommendations in British Standards Institution BS 5228: (2009+A1:2014), 'Code of practice for noise and vibration control on construction and open sites',
- Wicklow County Council Noise Action Plan 2013;
- CIRIA guidance document C741 'Environmental good practice on site guide'; and,
- National Roads Authority guidance 'Guidance for the treatment of noise and vibration in National Road Schemes'.

Noise and vibration may arise from a wide variety of sources during construction and to varying degrees during the course of the works, depending upon the stage of construction (i.e. ground works, etc.).

The Contractor shall identify potential sources of noise and vibration from selected plant and equipment and from activities that will be carried out during the works. This shall also include off-site noise and vibration generation from road traffic directly associated with the works (e.g. deliveries to the Site, waste transportation from the Site, etc.).

### 4.6.2 Environmental Control Measures and Proposals

#### 4.6.2.1 General Noise and Vibration Measures

This section prescribes the mitigation measures necessary for the Contractor to minimise and monitor noise and vibration impacts and effects associated with the construction project.

- The Contractor shall comply with mitigation measures that may be provided in a planning consent, the documents listed in Appendix A, Wicklow County Council requirements, and any updated or new supplementary environmental reports made available to the Contractor as necessary;
- The Contractor shall select construction plant with low inherent potential for generation of noise and/or vibration;
- The Contractor shall be responsible for implementing noise and vibration mitigation on site related to construction activities. The Plan shall apply to all works carried out by the Contractor and any sub-contractors under its control;
- It will be necessary for the Contractor to liaise with Wicklow County Council to ensure that noise and vibration during construction is effectively managed. This will include communicating details of the various phases of work, demonstrating how good site practices will be adopted in order to mitigate construction noise and vibration impacts;
- The Contractor shall designate an Environmental Manager/Responsible Person (i.e. CEMPC) who, amongst a range of other responsibilities, will liaise with environmental advisors, relevant authorities/environmental bodies and the local community as required with respect to noise and vibration impacts during the construction phase.
- The Contractor will highlight through method statements and/or risk assessment specific activities that will create significant noise and vibration levels. Contractors will demonstrate how they will mitigate/manage these emissions. Where significant noise or vibration levels are expected, this will be communicated with any affected parties.

#### 4.6.2.2 Methods of Work and Noise Reduction

- The following noise control measures shall be employed on site as a minimum:
  - All equipment shall be maintained in good mechanical order and fitted with the appropriate silencers, mufflers or acoustic covers where applicable; all plant and vehicles used in the works shall have exhaust silencers in good working order and diesel plant shall be fitted with effective air intake silencers. All ancillary pneumatic percussive tools shall be fitted with mufflers or silencers as recommended by the manufacturer;
  - Stationary noise sources shall be located as far away as possible from residential noise sensitive receptors (NSR), and where necessary acoustic barriers shall be used to shield them; and,
  - Any machinery which is in intermittent use shall be shut down in intervening periods of non-use or where this is impracticable, it shall be throttled back to a minimum.
- Site staff shall be informed about the need to minimise noise and shall be supervised to ensure compliance with the noise control measures adopted.

#### 4.6.2.3 Noise Limits

- With regard to Noise limits (unless otherwise agreed with Wicklow County Council), the construction phase noise guidance as provided in the National Roads Authority Guidance document: 'Guidelines for the treatment of Noise and Vibration in National Road Schemes' shall be adhered to.
- The following noise limits to be used as maximum permissible noise levels at the façade of dwellings during construction may be used:

**Table 4. Maximum Permissible Noise Levels**

Days	Times	L <sub>Aeq</sub> (1 hour) <sup>dB</sup>	L <sub>pA(max)slow</sub> <sup>dB</sup>
Monday to Friday	07:00 to 19:00 hrs	70	80
Monday to Friday	19:00 to 22:00 hrs	60	65
Saturday	08:00 to 16:30 hrs	65	75
Sundays and Bank Holidays	08:00 to 16:30 hrs	60	65

#### 4.6.2.4 Vibration Control

Vibration predictions will assist the selection of steps to minimise vibration and other activities where it is not practical to do this at source. Activities for which vibration prediction may be required include, but are not limited to:

- Vibratory compaction;
- Cable percussive testing (for additional ground investigations);
- Dynamic compaction;
- Impact breakers.
- Vibration levels shall be predicted in accordance with the methods set out in National Roads Authority guidance 'Guidance for the treatment of noise and vibration in National Road Schemes', which shall be used to establish criteria, controls and working methods unless otherwise agreed with Wicklow County Council.
- The following limits may be applicable in certain circumstances.

**Table 5. Allowable vibration during road construction in order to minimise the risk of building damage**

Allowable vibration velocity (Peak Particle Velocity) at the closest part of any sensitive property to the source of vibration, at a frequency of:		
<10Hz	10 to 50Hz	50 to 100Hz (and above)
8mm/s	12.5mm/s	20mm/s

- Note: Imperceptibility generally equates to a peak particle velocity of less than 0.15mm/s p.p.v.

#### 4.6.2.5 Monitoring Requirements

- The Contractor shall be responsible for compliance with any noise and vibration levels as prescribed in this Outline CEMP or the requirements of Wicklow County Council, including any ongoing monitoring required in this regard.
- Monitoring is necessary in order to highlight any potential noise nuisance arising from the works. In order to minimise and effectively respond to situations that may cause nuisance, real time measurements are necessary to permit immediate remedial actions to be taken.
- The Contractor shall develop a monitoring plan that demonstrates compliance with applicable regulation, conditions, and best management practices. This monitoring plan shall:
  - Describe how the Contractor proposes to carry out monitoring, including equipment, locations, baselining of existing noise levels and validations techniques.
  - Include information on the frequency of monitoring and the method and frequency of providing monitoring results to the client.
- All operators of noise monitoring equipment shall be trained and competent to undertake the measurements.
- Prevailing weather conditions (including wind direction and speed, air temperature, incidence of precipitation and degree of cloud cover) shall be recorded with each set of monitoring results. Wind speed and direction shall be recorded daily using a portable anemometer and compass.
- The requirement whether or not to undertake vibration monitoring will be agreed with Wicklow County Council.

## 4.7 Traffic Management

This section prescribes the mitigation measures necessary for the Contractor to minimise impacts upon construction operatives, the local community, residents and landowners directly affected by the works and associated traffic, travel management and vehicle usage.

This section will provide an overview of the likely routing of construction vehicles, based on a most likely scenario of construction. It should be noted that the impacts of the construction will be temporary.

### 4.7.1 Regulatory & Policy Framework

#### 4.7.1.1 Policy and Guidance

Guidance for the temporary control of traffic at construction works to facilitate the safety of the public during the works is provided below:

- Addendum Transport Chapter 8, Temporary Traffic Measures and Sign Roadworks (2008);
- Traffic Signs Manual Chapter 8 Temporary Traffic Measures and Sign Roadworks (2008);
- Traffic Management Guidelines, Department of Transport (2003).

### 4.7.2 Project Description

#### 4.7.2.1 Construction Routes

Construction vehicles will travel to and from the Site via the R764 from the west of the Site. Construction access from the public road will vary during the construction phase.

#### 4.7.2.2 Construction Parking

It is proposed that the parking requirements associated with the construction phase will be accommodated within the respective site boundary.

#### 4.7.2.3 Traffic Management Plan

The Contractor shall be required to establish a traffic management system:

- Planning and controlling the movement of vehicles, plant and non-motorised users that are present within the boundaries of the Site made available by the Contractor for the Project, any additional working areas, access to and egress from the Site and on the adjacent road network; and,

- Ensure that safety of construction operatives, motorised and non-motorised users are not compromised.

This shall be achieved by effective implementation of traffic mitigation measures contained within the Outline CEMP. The purpose of such traffic management mitigation measures is to outline measures to manage the expected construction traffic activity during the construction period and it will be the contractor's responsibility to enact the mitigation measures in advance of any works.

Traffic mitigation measures to be considered as part of the CEMP include:

- Minimise journeys to and from the site by the workforce, sub-contractors, suppliers and anyone else who is likely to visit the site regularly;
- Provide protection from traffic hazards that may arise as a result of the construction activities and journeys to and from the site;
- Manage potential adverse impacts on the public road network and ensure network performance is maintained at an acceptable level;
- Minimise adverse impacts on users (motorised and non-motorised) of the public road network and adjacent properties and community facilities;
- Plan deliveries to the site; and,
- Ensure that the roads and footways in the vicinity of the construction site are kept clear of debris, soil and other material.

#### 4.7.3 Environmental Control Measures and Proposals

##### 4.7.3.1 Traffic Management Measures

Construction debris particularly site clearance, spoil removal and dirty water run off can have a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with.

The Contractor shall establish the control measures necessary to manage all traffic activity associated with its works. In identifying the appropriate controls, the Contractor shall conduct a Traffic Risk Assessment (TRA) prior to implementation of traffic management measures. The traffic management measures should enable site-based staff to manage all these risks efficiently and effectively.

In terms of general traffic management measures, typical controls will include barriers defining footways and safety zones to prevent construction vehicles encroaching on pedestrian areas, segregated pedestrian routes (where appropriate), temporary warning signs erected to highlight particular hazards, including site accesses and temporary traffic management measures. Control measures may also include those considered within other sections of the CEMP (i.e. noise and dust control). Below is a list of the proposed traffic management measures to be adopted during the construction works. Please note that this is not an exhaustive list, and that it will be the appointed contractor's responsibility to prepare a detailed construction management plan:

- Warning signs / advanced warning signs will be installed at appropriate locations in advance of the construction access locations;
- Construction and delivery vehicles will be instructed to use only the approved and agreed means of access; and movement of construction vehicles will be restricted to these designated routes;
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material;
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the site;
- Parking of site vehicles will be managed and will not be permitted on public road, unless proposed within a designated area that is subject to traffic management measures;
- A road sweeper will be employed to clean the public roads adjacent to the site of any residual debris that may be deposited on the public roads leading away from the construction works;
- On-site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the site and to remove any potential debris on the local roads;

- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. Spill kits will be available on site. All scheduled maintenance carried out off-site will not be carried out on the public road. Any used spill kits will be disposed of using a hazardous waste disposal contractor and in accordance with all relevant EU and Irish waste management legislation;
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons;
- Use of sustainable modes of transport (i.e. use of public transport, encouraging cycling);
- The health and wellbeing of the workforce;
- Identify sensitive areas (e.g. schools and homes);
- Measures aimed at avoiding disruption and inconvenience to local residents and businesses;
- Safety of vulnerable users (i.e. children, the elderly); and,
- Take into account other developments whose activities could affect the Project.

The mitigation measures identified above will contribute to ensuring there will not be any significant environmental degradation in the vicinity of the proposed works. Furthermore, it is in the interest of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of haulage routes, delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.

The Contractor shall comply with mitigation measures that may be set out in planning consent documents, the documents listed in Appendix A, Wicklow County Council's Requirements, and any updated or new supplementary environmental reports made available to the Contractor as necessary.

Advice on the preparation of Green Travel Plans can be found in 'The Essential Guide to Travel Planning' published by the Department for Transport (DfT). Advice on the preparation of traffic mitigation measures can be found in the fourth edition of CIRIA's 'Environmental good practice on site guide' (C741).

#### 4.7.3.2 Traffic Management Measures Implementation and Monitoring

The traffic management measures shall be implemented from the work start date and shall be monitored on a regular basis to ensure that they are being adhered to and targets are being met. Every effort shall be made to ensure the safety of the local road users is maintained.

The Contractor shall implement and adhere to the conditions set out by Wicklow County Council.

## 4.8 Waste

AWN Consulting have prepared Construction and Demolition Waste Management Plan and an Operational Waste Management Plan, in respect of the proposed development. These documents confirm that the management of wastes from the site during both construction and operational phases will be undertaken in accordance with the current legal and industry standards.

### 4.8.1 Regulations & Policy Framework

The following legislation and guidance documents are of relevance to the noise and vibration of the site:

#### Legislation:

- Directive 2008/98/EC on waste (Waste Framework Directive);
- The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006, 2010 amended;
- Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of Annex II to Directive 1999/31/EC;
- European Waste Catalogue - Council Decision 94/3/EC (as per Council Directive 75/442/EC);

- Hazardous Waste List - Council Decision 94/904/EC (as per Council Directive 91/689/EEC);
- European Waste Catalogue and Hazardous Waste List, 2002, Environmental Protection Agency, Wexford;
- Waste Management Act 1996 (S.I. No. 10 of 1996) as amended by the Waste Management (Amendment) Act 2001; and,
- Litter Pollution Act 1997 and Regulations.

#### **Guidance documents**

- Southern Region Waste Management Plan 2015 – 2021;
- EPA, Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-hazardous, June 2015;
- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction Demolition Projects, Department of Environment, Community and Local Government;
- Environmental Good Practice on site, CIRIA C692; and,
- Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, National Roads Authority

### **4.8.2 Environmental Control Measures and Proposals**

#### **4.8.2.1 Waste Management Plan**

The Contractor shall be responsible for developing the Waste Management Plan (WMP) related to its construction activities. The Plan shall apply to all works carried out by the Contractor and any subcontractors under its control. In preparing the plan, the Contractor shall take into account any measures set out in any planning consent document, the relevant legislation, and industry best practice.

In developing the plan, the Contractor shall also take into account the requirements of Wicklow County Council.

Certain uncontaminated materials (soil) excavated from the site during the works may be reused in the works, and therefore would not require disposal/recovery as waste. In developing the WMP, the Contractor shall consider the reuse of materials where practicable, where permitted under the relevant waste legislation, and where the material meets the engineering requirements.

#### **4.8.2.2 Waste Management Strategy**

The Contractor shall establish a system for the management of wastes in accordance with the Waste Management Hierarchy. This hierarchy outlines that waste prevention and minimisation are the first priority in managing wastes, followed by waste reuse and recycling. Disposal of waste shall only be considered as a last resort.

- Prevention;
- Minimisation;
- Reuse;
- Recycling;
- Disposal.

#### **4.8.2.3 Waste Identification and Classification**

The Contractor shall establish a procedure to identify and classify all waste arising at the site in accordance with the European Waste Catalogue (EWC) Code. The Contractor shall ensure that the waste materials generated during the works are clearly identified as either hazardous or non-hazardous wastes, with reference to the guidance from the Environmental Protection Agency (Paper Tool of the Procedure for the Identification of the Hazardous Components of Waste) where required and shall establish designated waste storage areas for the different types of waste that may arise.

For each waste stream identified by the Contractor, and for each additional waste stream that may arise during the course of the works, the Contractor shall identify the following:

- The appropriate EWC Code;

- A suitable Waste Collection Contractor in possession of a valid Waste Collection Permit for the collection of the particular waste within County Wicklow;
- The waste recovery or disposal site, including the transfer station where the waste may be transferred to upon leaving the site in possession of a valid Waste Facility Permit or Waste License, as appropriate;
- The recovery or disposal method for the waste.

Only Contractors in possession of a valid Waste Collection Permit shall collect wastes from the site. The Contractor responsible for the waste shall ensure that the Waste Collection Contractor:

- Is permitted to collect the particular waste;
- Is permitted to collect waste within County Wicklow;
- Uses a waste collection vehicle identified on the Waste Collection Permit;
- Transfers the waste to a licenced waste facility identified on the Waste Collection Permit.

Prior to the commencement of the Project, the Contractor shall ensure the following information is provided:

- Transfer notes for controlled waste and consignment notes for hazardous waste must include an accurate description of the type, quantity and containment of waste; Standard Industrial Classification; the European Waste Catalogue Number; and details of the waste carrier, who must be licensed;
- Sufficient information must be provided to ensure that the waste disposal operator is aware of the potential hazards of the substance;
- The Trade Contractor should also ensure that returns for consignment notes are collected and retained; and
- All documentation must be retained for a minimum of two years for transfer notes and three years for consignment notes and be available for inspection.

The Logistics Contractor and all Trade Contractors removing waste directly from site must provide the following documentation:

- Waste forecast;
- Licence documentation for all waste carriers removing waste and for all waste destinations receiving waste (to be approved before use);
- Recycling rates from facilities being used;
- Waste consignment notes (for a minimum of three years) for all hazardous waste. These must include the following:
  - Consignment note code;
  - Details of the site that the hazardous waste is removed from;
  - Details of waste disposal site;
  - Waste producer details if different to site details;
  - Description of the waste (written description, EWC code and SIC number);
  - Details of process that has generated this waste;
  - Specific details of the waste- quantity, chemical/ biological components, physical form and hazardous properties Any special handling requirements; and
  - Signature of consignor once completed;
- Waste transfer notes (for a minimum of two years) for all non-hazardous waste. These must include the following and should be reported:
  - Accurate description of the waste type (written description, EWC code and SIC number);
  - Quantity and containment of waste;

- Location, time and date of the waste transfer
- Names of both persons involved in the waste transfer
- Details of the waste carrier and facility, both must be licensed;
- Waste carrier's registration number.

The Contractor shall advise Wicklow County Council or its representatives in advance if it proposes to act as the Waste Collection Contractor, subject to agreement. In the event that the Contractor acts as the Waste Collection Contractor, it shall ensure that it has the relevant Waste Collection Permit(s) in place prior to commencement of the Project.

#### 4.8.2.4 Management of Excavated Materials

The Contractor shall develop a Soil Management Plan (SMP) set out within the Waste Management Plan, or other suitable location within the CEMP, its proposal for the management and reuse of excavated materials from the site, where permitted in accordance with the relevant legislation, and provided that the reuse meets the engineering requirements for material used within the works.

Where the Contractor proposes to maximise the reuse of excavated soil in order to minimise the generation of waste, it shall set out how it proposes to manage and document this reuse to the satisfaction of Wicklow County Council or its representatives. This shall include the following:

- Identification and recording of the location from where the material was excavated;
- Delineation of areas where excavated soil is intended for disposal as waste, and where it is intended for reuse (where permitted);
- Delineation of areas of contaminated and uncontaminated soil (if present);
- Sampling of excavated soil (the number and location of soil samples);
- The proposal for the laboratory to carry out the testing;
- The suite of parameters for which the soil is to be tested;
- The criteria for assessing whether the soil is contaminated or uncontaminated.
- The Contractor shall establish the controls necessary to manage the generation, handling and storage of waste at the site.

These controls may rely on other mitigation measures within the CEMP, for example the protection of stockpiles of contaminated soil against rainwater ingress and leachate runoff, the bunding of hazardous waste storage areas containing liquids (e.g. oils, paints), and the management of waste collection vehicles both within the site and when leaving the site (dust and noise). Non-hazardous and hazardous waste will not be mixed and contaminated or hazardous materials will be suitably and safely stored on site and disposed of offsite as soon as possible by a licenced waste carrier.

The Soil Management Plan should be developed for the site which should indicate waste soil classifications to enable Wicklow County Council or appointed contractor to identify appropriate disposal/transfer routes for proposed excavated material, based on the nature of the material i.e. made ground or natural soil.

Excavated material should be segregated, stockpiled on site and sampled. Soil waste classification should be completed on these materials in order to identify an appropriate waste receiving facility.

Prior to the transfer of material from the site for export or to a specific waste permitted/licenced site, the appropriate waste classification data should be submitted to the permit/licence holder to confirm the suitability of the material in writing for the transfer to their facility.

In order to control off-site soil movements and undertaken appropriate waste disposal/recovery, a comprehensive docketing system should be detailed in the site construction waste management plan and implemented on the site. A daily record (including preparing and reconciling waste transfer notes) of soil excavation at the site should be maintained by the appointed contractor.

The documentation to be maintained in relation to soil wastes includes the following:

- The names of the agent(s) and the transporter(s) of the wastes;

- The name(s) of the person(s) responsible for the ultimate recovery or disposal of the wastes;
- The ultimate destination(s) of the wastes;
- Written confirmation of the acceptance and recovery or disposal of any hazardous waste consignments;
- The tonnages and EWC (European Waste Catalogue) Code for the waste soil materials;
- Details of each individual consignment dispatched from site:
  - Description of waste (grid cell number, stockpile number or type and origin of soil);
  - Date and time of dispatch from site;
  - Name of haulage company;
  - Details of Contractor and Haulier docket numbers;
  - Vehicle registration number and driver name;
  - Volume/weight of waste removed;
  - Name of waste receiving facility;
  - Date and time of arrival at waste receiving facility;
  - Details of any rejected consignments;
- The Waste Transfer Forms for hazardous soil wastes transferred from the site (stamped at receiving facility);
- The Trans-frontier Shipment of Waste forms for hazardous soil wastes transferred abroad; and,
- The results of any analysis conducted on excavated soil.

#### 4.8.2.5 Documentation of Waste

The Contractor shall develop a Waste Documentation System within the overall documentation system for the works. The documentation to be maintained in relation to wastes includes the following (where applicable):

- The names of the agent(s) and the transporter(s) of the wastes;
- The name(s) of the person(s) responsible for the ultimate recovery or disposal of the wastes;
- The ultimate destination(s) of the wastes;
- Written confirmation of the acceptance and recovery or disposal of any hazardous waste consignments;
- The tonnages and European Waste Catalogue (EWC) Code for the waste materials;
- Details of any rejected consignments;
- The Waste Transfer Forms for hazardous wastes transferred from the site;
- The Transfrontier Shipment of Waste forms for hazardous wastes transferred abroad;
- The Certificates of Recycling, Reuse or Disposal for all wastes transferred from the site;
- The results of any analysis conducted on wastes; and,
- The results of any analysis conducted on excavated soil.

The Contractor shall provide a report of all waste arising at the Site to include the information set out above. Information on the management of waste at the site shall be made available to the Client or its representatives upon request. The original documentation relating to the management of waste shall be maintained at the site.

#### 4.8.2.6 Litter or Debris

- The Contractor shall be required to maintain a tidy site as far as practicable and shall be required to dispose of materials in a controlled and responsible manner. These measures should assist in reducing the potential for adverse impacts on surface waters arising from construction activities.

- Areas of hard standing and surface roads shall be swept regularly to prevent the build-up of material which could be washed into watercourses.
- A high standard of housekeeping will be maintained at all times and waste materials will be stored in waste bins or skips only.

## Appendix A Example List of Relevant Guidance

Area	Publication
Advanced Works	<ul style="list-style-type: none"> <li>• Control of Water Pollution from Construction Site. Guidance for consultants and contractors (C532), CIRIA;</li> <li>• Environmental good practice on site guide (C741), CIRIA;</li> <li>• National Monuments Legislation (1930-1994);</li> <li>• Policy Guidelines on Archaeological Excavation, 1999, Department of Arts, Heritage, Gaeltacht and the Islands;</li> <li>• The Essential Guide to Travel Planning, 2008, Department for Transport (DfT).</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>• Environmental Protection Agency. (2010) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4);</li> <li>• Environmental Protection Agency Air Quality in Ireland 2017: Indicators of Air Quality.</li> </ul>
Archaeology and Cultural Heritage	<ul style="list-style-type: none"> <li>• National Monuments Act, 1930, as amended in 1954, 1987, 1994, 2004 and 2012 (S.I. 249 of 2012);</li> <li>• Planning and Development Act, 2000, as amended;</li> <li>• Department of Arts, Heritage, Gaeltacht and Islands (1999a), Framework and Principles for the Protection of the Archaeological Heritage;</li> <li>• Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999;</li> <li>• Architectural Heritage Protection Guidelines (2004).</li> </ul>
Ecology	<ul style="list-style-type: none"> <li>• EU Birds Directive 2009/147/EEC;</li> <li>• EU Habitats Directive 92/43/EEC (as amended);</li> <li>• European Communities (EC) (Birds and Natural Habitats) Regulations 2011 (as amended);</li> <li>• Planning and Development Act 2010 (as amended);</li> <li>• Wildlife Acts 1976 to 2012 (as amended);</li> <li>• Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London;</li> <li>• Kelleher, C. &amp; Marnell, F. (2006). Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>• Guidelines on protection of fisheries during construction works in and adjacent to waters, Inland Fisheries Ireland, 2016.</li> <li>• Control of water pollution from construction sites: guidance for consultants and contractors (C532), CIRIA;</li> <li>• Control of Water Pollution from Linear Construction Projects (C648), CIRIA;</li> <li>• Control of water pollution from linear construction projects (C649), CIRIA;</li> <li>• Environmental Good Practice (C962), CIRIA;</li> <li>• R164 Design of Containment Systems for the Prevention of Water Pollution from Industrial Accidents, CIRIA;</li> <li>• Greater Dublin Strategic Drainage Study ,2004, Regional Policies, Volume 2, New Development;</li> <li>• Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, 2007, National Roads Authority (NRA).</li> </ul>
Noise and Vibration	<ul style="list-style-type: none"> <li>• Guidelines for the Treatment of Noise and Vibration in National Road Schemes, 2005, National Roads Authority;</li> <li>• Limerick City and County Council's draft Noise Action Plan;</li> <li>• BS 5228: 1992, Noise and vibration control on construction and open sites. Code of practice for noise and vibration control applicable to piling operations;</li> <li>• BS 5228: 2009, Code of practice for noise and vibration control on construction and open sites, Part 1: Noise and Part 2: Vibration;</li> <li>• BS 6472: 2008, Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting;</li> <li>• BS 7385:1993, Evaluation and measurement for vibration in buildings. Guide to damage levels from ground borne vibration;</li> <li>• Environmental Good Practice (C962), CIRIA;</li> <li>• Guidelines for Community Noise, 2003, World Health Organisation (WHO);</li> </ul>

Area	Publication
Traffic Management Plan	<ul style="list-style-type: none"> <li>• Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, National Roads Authority (NRA).</li> <li>• Environmental good practice on site guide (C741), CIRIA;</li> <li>• Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, 2007, National Roads Authority (NRA);</li> <li>• The Essential Guide to Travel Planning, 2008, Department for Transport (Dft).</li> </ul>
Waste Management Plan	<ul style="list-style-type: none"> <li>• Southern Region Waste Management Plan 2015 – 2021;</li> <li>• EPA, Waste Classification, List of Waste &amp; Determining if Waste is Hazardous or Nonhazardous, June 2015;</li> <li>• Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects, 2006, Department of Environment, Community and Local Government;</li> <li>• Environmental Good Practice on Site (C962), CIRIA;</li> <li>• European Waste Catalogue (EWC) Codes;</li> <li>• Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, 2007, National Roads Authority (NRA);</li> <li>• Paper Tool of the Procedure for the Identification of the Hazardous Components of Waste, 2004, Clean Technology Centre;</li> <li>• WRAP Northern Ireland.</li> </ul>
Working Hours / Periods	<ul style="list-style-type: none"> <li>• Environmental good practice on site guide (C741), CIRIA</li> </ul>

