

# **Construction Environmental Management Plan**

N17 Milltown to  
Gortnagunned  
Realignment





## DOCUMENT DETAILS

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# 1. INTRODUCTION

This Construction Environmental Management Plan (CEMP) has been developed by MKO Ireland on behalf of Galway County Council (GCC) for the proposed road realignment works on the N17 between Milltown and Gortnagunned, Co. Galway.

The CEMP provides the environmental management framework to be adhered to during all phases of the development and it incorporates the mitigating principles to ensure that the work is carried out in a way that minimises the potential for any environmental impacts to occur. This CEMP has been prepared in accordance with the contract documents.

This CEMP identifies the key planning and environmental considerations that must be adhered to and delivered during site construction and operation. This report is intended as a single, amalgamated document that can be used during the future phases of the project, as a single consolidated point of reference relating to all construction, environmental and drainage requirements for the planning authority, developer and contractors alike.

This report has been compiled by Killian McGovern BSc. (Env) and reviewed by Owen Cahill BSc. MSc. (Env) CEnv.

## 1.1

### **Scope of the Construction and Environmental Management Plan**

This report is presented as a guidance document for the construction phase of the N17 . It outlines clearly the mitigation measures and monitoring proposals that are required to be adhered to in order to construct the road scheme in an appropriate manner. The report is divided into ten sections, as outlined below.

**Section 1** provides a brief introduction as to the scope of the report

**Section 2** outlines the site and project details, detailing the targets and objectives of this plan along with providing an overview of anticipated construction methodologies that will be adopted throughout the project.

**Section 3** sets out details of the environmental controls on site which looks at noise and dust controls. Site drainage measures, peat management and a waste management plan are also included in this section.

**Section 4** sets out the construction and demolition waste management plan and the responsibilities and procedures to be followed while dealing with the waste generated during the different phases of this development

**Section 5** sets out a fully detailed implementation plan for the environmental management of the project outlining the roles and responsibilities of the project team

**Section 6** consists of a summary table of all mitigation proposals to be adhered to during the implementation of the project

**Section 7** sets out an anticipated programme for the timing of the works.

**Section 8** outlines the proposals for reviewing compliance with the provisions of this report.

## 2. SITE AND PROJECT DETAILS

### 2.1 Site Location and Description

Galway County Council is currently planning a 3km (approx.) upgrade of the N17 National Primary Route, between the townlands of Milltown and Gortnagunned, located immediately north-west of Milltown, Co. Galway (grid reference: M 40235 63265).

The project is located along N17 from Milltown to Gortnagunned and consists of both online and offline realignment of the existing road. The scheme commences north at Gortnagunned and extends approximately 3.0km south where it ties in at Milltown.

The realignment will take place in the townlands of Milltown, Cartron, Gortnaloura, Cloonnacross, Drum and Gortnagunned. The project will remove a number of substantially deficient bends on this section of the route and in so doing, will improve aspects such as safety, sight distance, cross sectional width and drainage.

The proposed scheme will tie-in on the Northern end with an existing section of the N17 that has already been upgraded and is of a higher standard and on the Southern end will tie in with the town of Milltown.

The project location is provided in Figure 2-1.

#### 2.1.1 Description of the Development

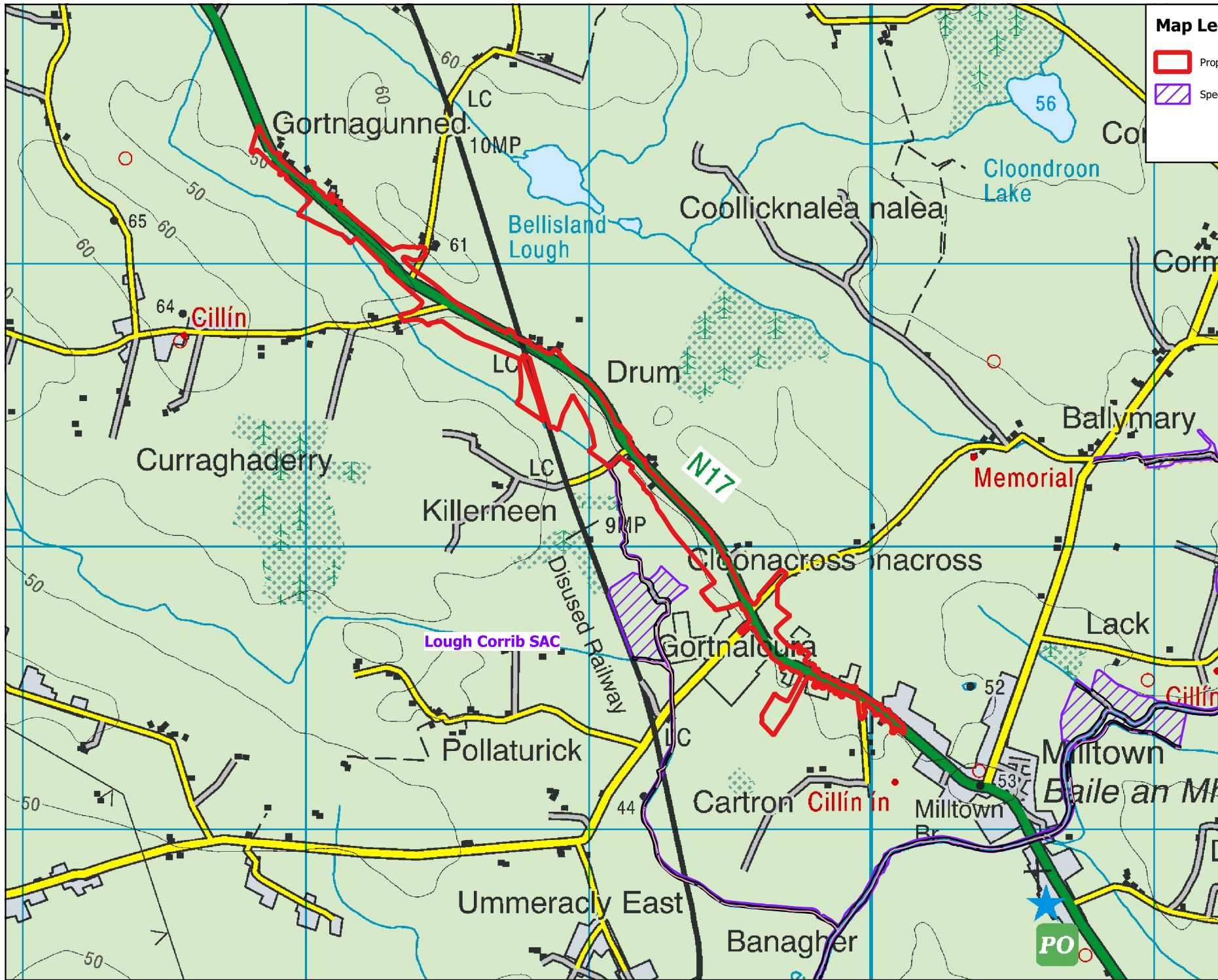
The project will remove a number of substantially deficient bends on this section of the route and in so doing, will improve aspects such as safety, sight distance, cross sectional width and drainage. The road type proposed for the project corresponds to a Type 1 Single Carriageway arrangement. Design drawings are included with the planning application.

The scheme includes the upgrade of 3km of the N17 North of Milltown, Co Galway. The realignment consists of both online and offline construction. The route consists of a Type 1 single carriageway and is designed in accordance with TII TD9. The road will consist of two lanes of 3.65m, a hard shoulder for each carriageway of 2.5m and verges of 3m, this cross section shall extend from Ch + 0 to Ch 2 + 560 of the scheme. Ch 2 + 560 to the end of the scheme is a Single Carriageway Urban Road with footway and cycleway on both sides of the carriageway. The design speeds for the proposed scheme are listed below, which is consistent and designed in accordance with TII DMRB's and DMURS.

- The design speed is 100km CH +0 to CH 2+180
- The design speed is 85km CH 2+180 to CH 2+560
- The design speed is 60km CH 2+560 to CH 2+945

The project will entail:

- > Circa 3km of Realignment to the existing N17 National Primary Route (c. 1550m online and c.1450m offline);
- > Junction Improvements including:
  - 7 no. Simple T Junctions, including one Right/Left Staggered T Junction;
- > Circa 0.775km of realignment to the existing local road network (tie-in works);
- > 34 no. Direct Access connections to the National Primary network (including 17 no. agricultural, 17 Residential); Where the new road has been realigned away from the original N17, the number of local access points have been rationalised to provide one access point onto the main carriageway from a number of access points. This will improve the safety of the route by reducing the number of possible conflicts.



### Map Legend

- Proposed Development Site
- Special Area of Conservation (SAC)



Drawing Title	
Site Location	
Project Title	
GCC N17 Milltown to Gortnagunned	
Drawn By	Checked By
CS	SM
Project No.	Drawing No.
190540	Figure 2.1
Scale: 1:7500	Date
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- Where direct vehicular access to local properties and farmland has to be provided to the realigned road and cannot be mitigated, the minimum SSD will be maintained at all access points, particularly those that agricultural machinery will use.
- It is proposed to provide a footway/cycleway on the Left Hand Side (LHS) from Ch + 0 to Ch 2 + 560, 3m wide with a 2% slope falling towards the carriageway, with a reduced width of 2m from Ch 0 + 120 to Ch 0 + 200. The footway/cycleway is designed in accordance with DN – GEO – 03047 Rural Cycleway Design (Offline). Also, it is proposed to extend the footway/cycleway on both sides of the alignment from an approximate chainage of Ch 2 + 560 to Ch 2 + 945. The footway/cycleway is proposed to be 4.5m wide. This footway/cycleway is then extended on the western side of the alignment and goes offline from Ch 2 + 560 to Ch 2 + 310 utilising the old road corridor providing connectivity to the N17 Store. The footway/cycleway is designed in accordance with TD300/14 of the TII DMRBs.
- The proposed road drainage system will replace the current one where the road run-off is discharging directly to the receiving water courses and groundwater without any pollution control or attenuation. The proposed system will be designed to ensure the speedy removal of surface water in order to provide safe driving conditions and to minimise the impact of runoff on the receiving environment. The preliminary drainage proposals will be developed in accordance with the TII Design Manual for Roads and Bridges and the principles of SuDS (Sustainable Drainage Systems) will be applied throughout. The proposed drainage system includes petrol interceptors and attenuation/sediment ponds, all of which ensure that run off is attenuated and treated before being discharged. This system discharges to a local drainage network which flows south before eventually connecting into the River Clare approximately 1.5 km downstream. The River Clare is included within the Lough Corrib SAC.
- The new scheme intercepts various utility services along its mainline, link roads and side roads. The works required to protect/divert existing services shall be developed further during detailed design. Affected utilities include the following
  - Low and Medium Voltage Electricity Lines
  - Water Supply
  - Telecommunications
  - Irish Rail
- Earthworks operations; Data gained from the ground investigation will be interpreted and utilized during detailed design for the design of the earthworks required in the construction of the scheme. It is expected that the majority of materials required in construction will be imported as it is expected from that there are low volumes of acceptable material available within the site extents. There will be 2 no. Spoil Repository/Borrow Pits. A set back of 25m is provided at the spoil area which is adjacent to the tributary stream of the Clare River.
- As the scheme has sections of work that are both on-line and offline and as such the Contractor shall be responsible to undertake the works in a manner that will cause the least amount of traffic disruption. The haulage of materials to and from the site will create a significant temporary impact to both road users and to residents living this section of the N17. To minimize these impacts, only authorized site access roads, as directed by the Local Authority, will be used by construction vehicles. The construction process will be planned to accommodate existing traffic flows and the daily construction operations adjacent to the scheme.
- The proposed works also include the demolition of five existing building which include residential properties and derelict buildings. The demolition will be undertaken as part of the construction phase of the proposed road realignment works. The demolition works will be completed by means of mechanical excavator with all waste materials managed in accordance with a Demolition Waste Management Plan included in this report.

## 2.2

## Targets and Objectives

The key site targets are as follows;

- Ensure construction works and activities are completed in accordance with mitigation and best practice approach presented in this CEMP:



- Ensure construction works and activities are completed in accordance with all planning conditions for the development and that the CEMP is updated as required;
- Ensure construction works and activities have minimal impact/disturbance to local landowners and the local community;
- Ensure construction works and activities have no adverse effect on the integrity of any sensitive habitats;
- Adopt a sustainable approach to construction; and,
- Provide adequate environmental training and awareness for all project personnel.

The key site objectives are as follows;

- Using recycled materials if possible, *e.g.* excavated stone, clay and overburden material;
- Ensure sustainable sources for materials supply where possible;
- Avoidance of any pollution incident or near miss as a result of working around or close to existing watercourses and having emergency measures in place where necessary;
- Keep impact of construction to a minimum on the local environment, watercourses, and wildlife;
- Correct fuel storage and refuelling procedures to be followed;
- Good waste management and house-keeping to be implemented;
- Air and noise pollution prevention to be implemented; and,
- Monitoring of the works and any adverse effects that it may have on the environment. Construction Methods and designs will be altered where it is found there is the potential for an adverse effect on the environment;
- Comply with all relevant water quality legislation and environmental legislation listed throughout this document;

## 2.3 Construction Management

### 2.3.1 Introduction

The appointed contractors for the construction of the proposed development will be required to comply with this CEMP and any revisions made to this document throughout the construction phase. An overview of the anticipated Construction Methodologies is provided below.

### 2.3.2 Overview of the Proposed Construction Methodology

The full sequence of works will involve vegetation clearance, earthworks, drainage, utilities, pavement, traffic signs and landscaping respectively.

The main elements of the proposed road development include the following: -

- 3.0km of National Primary Road Realignment including online/Offline works (Type 1 Single Carriageway);
- 34 access connections upgraded and Local road improvements/realignments;
- Improvement of 7 simple T-junctions;
- 0.775km of realignment to local roads (tie in works);
- Provision of cycleway and walkway on either side of the alignment
- Demolition Works
- Earthworks and pavements;
- Fencing and Safety Fencing Works;
- Drainage Works;
- Landscaping Works;
- Environmental Mitigation Measures;

- > Utilities and Services Diversion Works;
- > Accommodation Works; and
- > All other Ancillary Works.

The proposed anticipated construction methodology is summarised under the following main headings:

- > Site Establishment
- > Site Excavation
- > Site Clearance
- > Services and Utilities
- > Existing Underground Services
- > Housing Unit Construction
- > Landscaping Works

### 2.3.3 Site Establishment

The site will be accessed off the existing N17 National Primary Route and all associated local access roads. Prior to the commencement of any works the site entrance will need to be fully established with all security gates and the provision of a parking for construction worker's vehicles. For the duration of the project all vehicles will be parked within the confines of the site.

An excavator operator will strip the top soil from the area of ground where the compound will sit. This top soil will be stockpiled for reuse on site. Terram will be rolled out and rock fill placed and tracked in to provide a sound base for the compound and vehicular traffic within it.

GCC shall commence mobilisation of the offices and stores which are to be located onsite and transported by a licensed haulage contractor. GCC shall then start positioning the pedestrian fencing to establish safe routes between offices to segregate staff from vehicular traffic. In addition, GCC shall delineate designated parking areas for staff vehicles and site works vehicles.

GCC shall install an enclosed waste water storage tank adjacent the toilet facilities which will be emptied on a regular basis. The tank will be decommissioned and removed at the end of the contract. GCC shall ensure that water discharge from the office/welfare sinks is discharged separately into a surface water discharge point.

An Electrician shall complete the electrical connections for the compound upon mobilization of the site based generator; the double banded generator shall be positioned on an appropriate drip tray for environmental concerns.

Perimeter security fencing will be placed at areas of particular importance around the site as the development progresses, as a barrier to unauthorised public access. The fencing will be well maintained and appropriate signage will also be put in place to alert drivers of the works

### 2.3.4 Site Excavation

Soil Stripping and temporary stockpiling of soils and subsills will be required around the site as the proposed development progresses. While these works occur, the following will apply:

- > The area where excavations are planned will be surveyed and all existing services will be identified.
- > All relevant bodies i.e. ESB, Gas Networks Ireland, Eir, Galway County Council etc. will be contacted and all drawings for all existing services sought.
- > All plant operators and general operatives will be inducted and informed as to the location of any services.
- > All plant operators and general operatives will be inducted and informed as to the identification of invasive species.

- A tracked 360-degree excavator will be used to strip the topsoil, and a dumper will be used to move the excavated materials to the temporary stockpile location.
- All excavated material will be reused for future landscaping works or for backfill of excavations.
- All stockpiles will be damped down or covered in a sheet of polythene, as required, which will prevent the creation of nuisance dust, and will also prevent sediment runoff in times of heavy precipitation.
- A silt filtration system will be used as appropriate to prevent contamination of any watercourse. Any temporary fills or stockpiles will be covered with polyethylene sheeting to avoid sediment release associated with heavy rainfall.
- Stockpiling of spoil will be contained within designated areas within the works area (site boundary). A silt fence will be erected around the stockpile to prevent any sediment-laden run-off occurring.

### 2.3.5 Site Demolition Works

The existing site contains five existing buildings which include residential properties and derelict buildings all of which are proposed for demolition.

Site demolition works will also include removal of existing walls, fence lines, crash barriers, redundant services and signage. Any existing stone walls will be demolished by an excavator and the stone will be stockpiled for future use, following a general inspection of works by the site Ecologist. Existing fencing to be removed will be removed by hand. All waste material will be removed and disposed of/ recycled in accordance with the demolition waste management plan.

The demolition phase of the proposed development will involve the removal of these structures within the site. The sequencing of the demolition works will be decided by GCC following detailed site survey of the buildings and surrounding area. Such a survey will provide detail on the:

- The condition of the building and demolition methods recommended.
- The location and removal methods for any toxic or hazardous materials.
- The type and location of adjoining and surrounding premises which may be affected by noise, vibration, dust and removal of the building structure.
- A derogation licence must be obtained from the NPWS prior to any demolition works.
- Prior to demolition, the building must be re-examined by a licensed ecologist, for the presence of bats.
- The building must not be demolished during the bat breeding period (late May to mid-August) to reduce the risk of accidental death or injury. 1st October-1st May is the optimum period for carrying out works.
- Existing roof tiles must be removed by hand under the supervision of a licensed ecologist. In the event that any roosting bats are discovered, these will be removed by the licensed ecologist and later released on site.
- A dust suppression system consisting of a fine mist water spray will be available on site.
- All waste products from demolition will be disposed of at a licensed waste facility.
- The site access track will be regularly inspected by site management for cleanliness and cleaned as necessary.
- The transport of crushed stone or other material, which has significant potential to cause dust, will be undertaken in tarpaulin-covered vehicles where necessary.
- When necessary, sections of approach roads to the site will be swept using a street cleaner and / or damped down with water.

The demolition process will generally follow the sequencing shown on Table 2-1

Table 2-1 Typical Demolition Sequence

Demolition Sequence	General Description
Inventory of Hazardous Wastes	e.g. Asbestos
Removal of furniture/Equipment	Plant & Equipment
Removal of asbestos/hazardous materials	Roof coverings and service pipework
Removal of fixtures	Fixtures & fittings
Removal of timber	Floors, trusses, rafters
Demolition of Structures Shells	Manual or mechanical demolition
Removal of groundworks	Foundation, slabs and redundant drainage infrastructure.
Source segregation of material fractions	C&D waste recovery
Transport of materials to authorised facilities	Authorised Waste Collection Permit holders and Waste Facility or Licence holders
Site restoration/landscaping/ security	Landscaping, hoarding etc.

### 2.3.6 Existing Underground Services

An existing local drainage network will absorb the discharged storm and foul water from the proposed drainage system to be put in place as part of the development. This system flows to the south before connecting with the River Clare approximately 1.5 km downstream. The River Clare is included within the Lough Corrib SAC.

Any other underground services encountered during the works will be surveyed for level and where possible will be left in place. If there is a requirement to move the service, then the appropriate body (ESB, GCC, Gas Networks Ireland, etc.) will be contacted, and the appropriate procedure put in place. Back fill around any utility services will be with dead sand/pea shingle where appropriate. All works will be in compliance with required specifications.

### 2.3.7 Planing and Carriageway Removal

The existing pavement is to be removed, reused or disposed of in line with the details in the works requirements.

In this section of the works the following will take place:

- Surfacing course will be planed using a standard road planer and the materials will either be left in situ or removed by road lorry to the existing hard standing adjacent to the site compound.
- During the planing out process, regular inspections are to be made during the operation to identify materials containing cold tars or similar. If this material is encountered, it is to be isolated into a skip or sealed container for onward testing and disposal.

- The follow-on materials such as existing stone pavement materials, where considered suitable, will be isolated from the dig for testing and blending with other materials, stones and planings for reuse as suitable fill or capping.

### 2.3.8 Drainage

The proposed road drainage system will replace the current one where the road run-off is discharging directly to the receiving water courses and groundwater without any pollution control or attenuation. The proposed system will be designed to ensure the speedy removal of surface water in order to provide safe driving conditions and to minimise the impact of runoff on the receiving environment. The preliminary drainage proposals will be developed in accordance with the TII Design Manual for Roads and Bridges and the principles of SuDS (Sustainable Drainage Systems) will be applied throughout. The proposed drainage system includes petrol interceptors and attenuation/sediment ponds, all of which ensure that run off is attenuated and treated before being discharged. This system discharges to a local drainage network which flows south before eventually connecting into the River Clare approximately 1.5 km downstream. The River Clare is included within the Lough Corrib SAC.

### 2.3.9 Landscaping Works

Prior to completion of works on the development site, the landscaping works will be carried out. Landscaping of the constructed road will be carried out in stages as the works progress and will commence as soon as is practicable in each of the outfall catchment areas. This work will be carried out before the completion of each phase in order to ensure that the development will be an aesthetically pleasing. These works will involve the use of plant and machinery in order to carry out tasks such as earth moving. Materials which have been stockpiled for the task will be used as much as possible, and material will only be imported where it is required. During site preparation works, where topsoil is stripped prior to excavation, this material will be retained on site for use in landscaping.

### 3. ENVIRONMENTAL MANAGEMENT

#### 3.1 **Protecting Water Quality**

Prior to the commencement of any subsequent construction activities, the necessary mitigation measures will be put in place to ensure the protection of surface water during the works. This will involve confirming the location of all existing services and delineating between drainage systems. Surface waters will be managed to ensure the prevention of run off from areas where excavation occur does not result in silt laden water entering the existing storm water network. Stockpiled material will be located a minimum of 50m from watercourses and if deemed necessary will be surround by silt fencing where there is a risk of run-off during prolonged rainfall.

Waters will not be discharged directly to any exiting surface water sewer or drains. Particular emphasis will also be placed on hazardous materials entering the surface water management system as well as spills or leaks of fuel oils. Section 4 provides an Emergency Response Plan for dealing with spillages which may result in adverse environmental effects.

Excavation works have the potential to encounter sub-surface and ground water. In the event of encountering groundwaters during excavation, it will be pumped from the excavation to temporary on-site drainage system prior to discharge overland through vegetation. This will ensure any suspended silt or sediment is captured through the use of a silt bag on the pump outlet and a series of silt traps as required prior to discharge.

#### 3.1.1 **Outline Erosion and Sediment Control Plan (OESC)**

An Outline Erosion and Sediment Control Plan (OESC), accompanies this application, and has been prepared as a method of water quality preservation to offset potential construction stage pollution impacts from the N17 project to adjacent watercourses including various tributaries of the River Clare which is protected under Lough Corrib SAC (000297).

The Principal mitigation Measures included in the OESC are summarised below:

##### **General**

- The site will be fenced off, prior to works commencing.
- Before earthworks commence on site - drainage, erosion control and sediment control measures will be in place and functioning.
- Silt Fences will be erected in accordance with the manufacturer's recommendations and in compliance with the Design Criteria outlined in CIRIA C648 Control of Water Pollution from Linear Construction Projects:
- At all sections of road construction where the works are at or above existing ground level
- Along any other identified surface pathways for sediment laden runoff;
- Where land drains intersect the site boundary or where the adjacent land falls towards the construction site – temporary cut-off drains will be provided to intercept this clean runoff water and divert to the nearest watercourse. Small check dams will be constructed in these cut-off drains to trap any sediment and prevent erosion. Silt fences will be provided immediately before the outfall to existing watercourses as a precaution and to allow a response time in the event of an emergency. Trapped sediment will be removed regularly from behind the check dams and deposited >25m from any watercourse and reseeded with grass seed or alternatively removed to licenced waste facility.
- All watercourses will be fenced off with double silt fences located at least 10m back from the watercourse bank until such time as the road crossing is constructed.
- All silt fences at watercourse crossings will be inspected on a daily basis and repairs or replacements carried out as required.

- Dewatering and surface water runoff discharges from the construction site will be controlled, collected and routed via appropriate treatment measures. The measures will include appropriately sized settlement ponds as shown in Drawings DR01 to DR04 of the design drawings submitted with the planning application. Each pond will be provided with a double silt curtain at the outfall from the pond and a further double silt fence located before the discharge point. These facilities will be inspected/ maintained at least on a daily basis.
- Check dams and sediment traps shall be placed along constructed drains to reduce the velocity of concentrated runoff.
- Direct connections between the settlement pond outfalls and the watercourse will not be allowed. Instead, the outfall will be allowed to disperse across at least 3m of undisturbed vegetated ground, covered with a coir mesh or similar matting prior to reaching the watercourse;
- Where these ponds cannot be constructed in the dry, then they shall be formed by constructing bunds and placing an appropriate geotextile liner on top. Any/ all materials arising from the construction of the temporary settlement ponds shall be removed offsite to a licensed facility or used elsewhere in the works if deemed appropriate.
- Landscaping of the constructed road will be carried out in stages as the works progress and will commence as soon as is practicable in each of the outfall catchment areas;
- If seeding of cut/fill slopes is not practical, the use of roughened slope surfaces shall be considered by the contractor which will encourage water infiltration, and decrease runoff velocity;
- Silt fencing shall remain in place until ground vegetation has recovered. Any accumulated silt will then be removed and disposed of to a licensed facility.
- Ensure that control measures are correctly installed and adequately sized prior to commencing site clearance and earthworks;
- Develop a maintenance checklist for control measures and inspect controls measures regularly throughout the project, particularly after heavy rainfall;
- Maintain controls through project such as removing sediment in silt traps once half full.
- Where excavated spoil is temporarily stockpiled on site, it will be stockpiled >25m from any watercourse and surrounded by a silt fence.

#### **Earthworks - Cuts and Embankment Excavation**

- The excavation of peat and other soft materials (if required) will be carried out in a manner that minimises the amount of water entering the face of the works. This will be achieved by placing fill in the excavated area as soon as is practicable (generally the same day).
- Where pumping out of the excavation is necessary, this will be carried out using appropriately sized pumps. A clean stone filled perforated pipe (or similar) will be used as a sump for the pump intake. The pumped out water will be directed to the earthworks drainage system and to the settlement pond (or other) treatment system. The outlet from the pump shall be designed so as not to mobilise additional sediment.
- A secondary pump will be kept on site to replace the primary pump in case of operational.

#### **Earthworks - Subsoil Stabilisation**

Subsoil stabilisation is an activity which involves spreading powdered lime evenly over the surface of thin loose lifts (150-350 mm) of the Class U1 material, mixing it with the clay by rotavating, and then allowing the mix to dry or cure over a short period of time prior to compaction. Should this activity be proposed to be used by the contractor, the following controls will be applied:

- The activity shall only be carried out under calm dry metrological conditions. Lime application shall not be exposed to wind and where any risk occurs will be misted/sprayed down immediately;
- The activity will not take place within 100m of any watercourse;

- Following mixing (which should take place generally within 15 minutes of spreading the lime on the surface) the material shall be compacted within 1 hour and appropriately sealed. In no case will this material be allowed to be left unsealed overnight;

#### Transportation

- Road cleaning will be carried out at least daily to ensure that there is no build-up of sediment on the public road;
- In the event of a substantial quantity of spoil material being required to be exported offsite then a proprietary mobile truck wheel wash system shall be installed at the relevant locations.

#### Stockpiles

- Topsoil stripping over large areas in advance of main excavation works will not be permitted. It will be restricted to the minimum required for efficient earthworks operations and will only be carried out in construction area units where earthworks is on-going.
- Each construction area unit will be topsoiled as the works proceeds thus limiting both the amount and the length of time for which materials have to be stockpiled.
- Stockpiles will not be located within 25m of a watercourse and shall be surrounded with a continuous silt fence.
- Runoff from a stockpile will be collected via a shallow toe drain, located outside the silt fence, which will have check dams at regular intervals and will be designed to have a retention time of at least 5 hours. Prior to outfall straw wrapped in geotextile bags and inset into the base of the drain by at least 100mm shall be provided followed by a silt fence upstream of the outlet.
- Stockpiles of non-granular materials shall be limited in height to not more than 2.5m.
- Where stockpiling of peat or organic clays is required they shall be limited in height to 1m (with 1V:5H side slopes) or fully contained within an appropriately designed bund.

#### Waterbodies and Sensitive Habitats

- All works in proximity to watercourses shall follow the best practice guidance outlined in the following documents:
  - TII/NRA 'Guidelines for the crossing of Watercourses During Construction of National Road Schemes (2008);
  - Inland Fisheries Ireland, Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters, 2016;
- Preserve natural vegetation near watercourses and along the perimeter of the site as much as practically possible.
- Leave a 5m grassed strip next to river banks when stripping topsoil or place grassed soil bunds along river banks to prevent site runoff directly entering watercourses.
- Place straw bales or sand bags along the sides of temporary or existing bridges to prevent runoff entering the watercourse.
- These watercourse crossings will be replaced by piped (or box) crossings of at least 900mm diameter;
- The works will be programmed so that where watercourses are dry for a portion of the year then the crossing will be constructed "in the dry" during that period.
- Crossings in wet watercourses will be provided with a silt trap and a sedi-mat immediately downstream of the crossing point.
- The silt trap shall be left in place for at least 6 weeks following completion of the work and shall be inspected and maintained at least 3 times per week.
- The area of disturbance of the watercourse bed and bank shall be the absolute minimum required for the installation of the crossing.
- Only precast Concrete pipes/ units will be used in the installation of these crossings.



- Where some of these minor watercourses require diversion, cut-off drains will be constructed to divert water away from the construction site. Small check dams will be constructed in these cut-off drains to trap any sediment and silt fences will be provided immediately before the outfall to existing watercourses.

### Concrete Works

Where the use of concrete near and in watercourses cannot be avoided the following control measures will be employed:

- Hydrophilic grout and quick-setting mixes or rapid hardener additives shall be used to promote the early set of concrete surfaces exposed to water.
- When working in or near the surface water and the application of in-situ materials cannot be avoided, the use of alternative materials such as biodegradable shutter oils shall be used.
- There will be no hosing into surface water drains of spills of concrete, cement, grout or similar materials. Such spills shall be contained immediately and runoff prevented from entering the watercourse.
- Concrete waste shall be disposed of in accordance with the site specific Construction & Demolition Waste Management Plan;
  - Concrete waste will be contained and managed on site to prevent pollution of all surface watercourses;
  - On- site concrete batching and mixing activities shall only be permitted following a considered site selection process which shall consider the contents of this plan. Site Selection shall require the approval of the Clients Representative, the NPWS and the IFI;
  - Washout from concrete lorries, with the exception of the chute, will not be permitted on site and will only take place at the batching plant (or other appropriate facility designated by the manufacturer);

### Construction Compounds

- Construction compounds shall be located on dry land and set back a minimum of 25m from lakes, river and stream channels, ecological sensitive areas (internationally and nationally important habitats, wet areas such as wetland habitats, marshes and fens, etc.) and away from potential floodplain areas.
- Construction compounds shall not be located in European Sites or within 50m of the boundary of same.
- Construction compounds shall not be located within other designated environmental sites or other ecologically sensitive sites.
- The storage of fuels, other hydrocarbons, and other chemicals within the construction compounds will not be permitted within 30m of any sensitive watercourse.
- Surface runoff from compounds will be minimised by ensuring that the paved/ impervious area is minimised. All surface water runoff will be intercepted and directed to appropriate treatment systems for the removal of pollutants prior to discharge
- All site compounds will be fenced off and a silt fence erected and maintained on the site boundary.
- Wastewater drainage from all site offices and construction facilities will be contained and disposed of in an appropriate manner to prevent water pollution and in accordance with the relevant statutory requirements.

The storage of fuels, other hydrocarbons and other chemicals within the construction compounds shall be in accordance with relevant legislation and with best practice. In particular:

- All fuel/ Hydrocarbon/ Chemical (fluid) storage areas shall be bunded to 110% of storage capacity.
- Storage of these materials within a compound shall be organised so as to be as far away from all water bodies as is practicable.

- The Emergency Response Plan shall include arrangements for dealing with accidental spillage and relevant staff shall be trained in these procedures.

### **Environmental Monitoring**

- The contractor will assign a member of the site staff as the environmental officer with the responsibility for ensuring the environmental measures prescribed in this document are adhered to. Any environmental incidents or non-compliance issues will immediately be reported to the project team.
- An Environmental Manager, Environmental Clerk of Works (ECoW) and suitably qualified Project Ecologist will be appointed by the contractor to monitor the construction work.
- Prior to the commencement of works the Environmental Manager, Environmental Clerk of Works (ECoW) and Project Ecologist shall provide a Toolbox Talk to all operatives on site, making them aware of any environmental ecological sensitivities.
- A pre-commencement otter survey and invasive species survey will be undertaken by the Project Ecologist.

## 3.1.2 Prevention Pollution Control Measures

The following measures will be put in place to prevent the transportation of silt laden water or pollutants from entering any of the watercourses on site or any of the wider environments including downstream watercourses.

- Works will not take place during periods of high rainfall, and shall be scaled back or suspended if heavy rain is forecast during excavation works;
- There will be no release of suspended solids to any watercourse as a direct or indirect result of the proposed works.
- Any requirement for temporary fills or stockpiles will be damped down or covered with polyethylene sheeting as required to avoid sediment release associated with heavy rainfall.
- Prior to the commencement of groundworks silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered;
- Ground disturbance should be kept to a minimum, water from excavations should be filtered, other sediment trapping technologies such as silt fences can prevent sediment leaving the site. Exposed surfaces should be re-vegetated as soon as possible following construction.
- Silt Fences will be erected in accordance with the manufacturer's recommendations and in compliance with the Design Criteria outlined in CIRIA C648 Control of Water Pollution from Linear Construction Projects:
  - At all sections of road construction where the works are at or above existing ground level
  - Along any other identified surface pathways for sediment laden runoff;
- Where land drains intersect the site boundary or where the adjacent land falls towards the construction site – temporary cut-off drains will be provided to intercept this clean runoff water and divert to the nearest watercourse. Small check dams will be constructed in these cut-off drains to trap any sediment and prevent erosion. Silt fences will be provided immediately before the outfall to existing watercourses as a precaution and to allow a response time in the event of an emergency.
- All watercourses will be fenced off with double silt fences located at least 10m back from the watercourse bank until such time as the road crossing is constructed.
- All silt fences at watercourse crossings will be inspected on a daily basis and repairs or replacements carried out as required.

- Dewatering and surface water runoff discharges from the construction site will be controlled, collected and routed via appropriate treatment measures. The measures will include appropriately sized settlement ponds. Each pond will be provided with a double silt curtain at the outfall from the pond and a further double silt fence located before the discharge point. These facilities will be inspected/ maintained at least on a daily basis.
- Check dams and sediment traps shall be placed along constructed drains to reduce the velocity of concentrated runoff.
- Direct connections between the settlement pond outfalls and the watercourse will not be allowed. Instead, the outfall will be allowed to disperse across at least 3m of undisturbed vegetated ground, covered with a coir mesh or similar matting prior to reaching the watercourse;
- Where these ponds cannot be constructed in the dry, then they shall be formed by constructing bunds and placing an appropriate geotextile liner on top. Any/ all materials arising from the construction of the temporary settlement ponds shall be removed offsite to a licensed facility or used elsewhere in the works if deemed appropriate.
- Landscaping of the constructed road will be carried out in stages as the works progress and will commence as soon as is practicable in each of the outfall catchment areas;
- If seeding of cut/fill slopes is not practical, the use of roughened slope surfaces shall be considered by the contractor which will encourage water infiltration, and decrease runoff velocity;
- Silt fencing shall remain in place until ground vegetation has recovered. Any accumulated silt will then be removed and disposed of to a licensed facility.
- Ensure that control measures are correctly installed and adequately sized prior to commencing site clearance and earthworks;
- Develop a maintenance checklist for control measures and inspect controls measures regularly throughout the project, particularly after heavy rainfall;
- Maintain controls through project such as removing sediment in silt traps once half full.

### 3.1.3 Cement Based Products Control Measures

The complete washing out of concrete trucks will not be permitted at the site. Suppliers will be directed back to their own facility to complete the washout process. However, a washout area for chute cleaning will be provided at various locations in close proximity to the concrete pour locations.

The following mitigation measures are proposed to avoid release of cement leachate from the site:

- No batching of wet-cement products will occur on site;
- Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place. Where possible pre-cast elements for culverts and concrete works will be used;
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;
- Where concrete is delivered on site, only chute cleaning will be permitted, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed.
- Use weather forecasting to plan dry days for pouring concrete;
- Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event;

### 3.1.4 Refuelling, Fuel and Hazardous Materials Storage

The following measures are proposed to avoid release of hydrocarbons at the site:

- Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling should occur at a controlled fuelling station;
- On-site refuelling will take place by direct refuelling from the delivery truck or using a mobile double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off site and will be towed around the site as required. The fuel bowser will be parked on a level area in the construction compound when not in use. Only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations.
- Fuel volumes stored on site should be minimised. Any fuel storage areas will be bunded appropriately for the volume of fuel stored. volume for the time period of the construction. The bunded area will be roofed to prevent the ingress of rainwater;
- The plant used should be regularly inspected for leaks and fitness for purpose; and,
- Spill kits will be available to deal with and accidental spillage in and outside the refuelling area. Spill control measures are outlined in the section that follows.
- Harmful materials shall be stored on site for use in connection with the construction works only. These materials shall be stored in a controlled manner, with a silt fence being erected around any stockpiling of material to prevent any sediment-laden run-off occurring.
- Where on site fuelling facilities are used, there shall be a bunded filling area using a double bunded steel tank at a minimum. No materials to be stored in the designated exclusion zone.

### 3.1.5 Spill Control Measures

It is not proposed to store any large volumes of oils/fuels for the purpose of refuelling on the site. A bunded fuel tank will be stored at the temporary construction compound which will be used for smaller plant and equipment i.e. site dumpers and teleporters. This will be stored on an impermeable surface and will be equipped with spill kit. Onsite plant (excavator) will be refuelled by an external contractor who will call to site as required. Road vehicles will not be refuelled at the site.

In the event of minor spills and leaks from road vehicles and the onsite excavator the following steps provide the procedure to be followed in the event of any significant spill or leak.

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill.
- If possible, cover or bund off any vulnerable areas where appropriate such as drains or watercourses.
- If possible, clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the applicant immediately giving information on the location, type and extent of the spill so that they can take appropriate action and further investigate the incident to ensure it has been contained adequately.

- External consultants will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.
- The applicant will notify the appropriate regulatory body such as Galway County Council if deemed necessary

## 3.2 Dust Control Measures

Construction dust can be generated from many on-site activities such as excavation and backfilling. The extent of dust generation will depend on the type of activity undertaken, the location, the nature of the dust, i.e. soil, sand, etc and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or, periods of dry weather. Construction traffic movements also have the potential to generate dust as they travel along the haul route. The measures below will also prevent construction debris arising on the public road network.

Proposed measures to control dust include:

- The minimum criteria to be maintained shall be the limit for Environmental Protection Agency (EPA) specification for licensed facilities in Ireland, which is 350mg/m<sup>2</sup>/day.
- The contractor shall put in place and monitor dust levels in the vicinity using a Bergerhoff gauge instrument.
- Any site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions;
- The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by Site Management for cleanliness, and cleaned as necessary;
- Material handling systems and material storage areas will be designed and laid out to minimise exposure to wind;
- The use of barriers such as debris netting on scaffolding around the building to block dust escaping where the building is within 10m of the site boundary where residential properties exist.
- Water misting or bowsers will operate on-site as required to mitigate dust in dry weather conditions;
- The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary;
- Daily inspection of construction sites to examine dust measures and their effectiveness.
- When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper; and,
- All vehicles leaving the construction areas of the site will pass through a wheel cleansing area prior to entering the local road network.

## 3.3 Noise and Vibration Control

The operation of plant and machinery, including construction vehicles, is a source of potential noise impacts. Noise levels shall be kept below those levels specified in the National Roads Authority – “Guidelines for the Treatment of Noise and Vibration in National Roads Schemes” or such further limits as imposed by Galway County Council. The proposed development shall comply with BS 5228 “Noise Control on Construction and open sites Part 1: Code of practice for basic information and procedures for noise control.” During the works, any plant introduced to the site will not be excessively noisy. Exhaust and silencer systems on plant will be maintained in a satisfactory condition and operating correctly at all times. Defective silencers will be immediately replaced.

Proposed measures to control noise include:

- Construction equipment for use outdoors shall comply with the European Communities Regulations– Noise Emission by Equipment for Use Outdoors – SI 241 - 2006.
- Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts;
- Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All construction plant and equipment to be used on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations;
- Plant with the potential of generating noise or vibration will be placed as far away from sensitive properties as permitted by site constraints.
- If work activities have the potential to result in vibration, the appointed contractor shall source vibration monitoring equipment immediately from a specialist company who specialise in monitoring equipment.
- Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works;
- Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Machines, which are used intermittently, will be shut down during those periods when they are not in use;
- Training will be provided by the Site Management to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation; and,
- Local areas of the haul route will be condition monitored and maintained if necessary.
- Random monitoring (if required) shall be undertaken at the site boundary, by the use of a Sound Level Meter which has the capabilities to store data and produce records and issued to the appropriate parties upon request.

It is recommended that drivers of heavy goods vehicles (HGVs) associated with the development extend due care and courtesy to other road users. Excessive use of and unnecessary engine racing will be avoided.

The proposed construction working hours are as follows:

08:00 – 19:00 Monday to Saturday

Closed Sunday and Public Holidays

Deviation from these times will only be allowed in exceptional circumstances where written approval has been received from the planning authority.

## 3.4 Traffic Management Proposals

Access to the proposed site will be via the N17 National Primary route. This development has sections of work that are both on-line and offline and as such the Contractor shall be responsible to undertake the works in a manner that will cause the least amount of traffic disruption. The haulage of materials to and from the site will create a significant temporary impact to both road users and to residents living this section of the N17. To minimize these impacts, only authorised site access roads, as directed by the Local Authority, will be used by construction vehicles. The construction process will be planned to accommodate existing traffic flows and the daily construction operations adjacent to the scheme. A Traffic management plan will be developed by the appointed contractor and agreed with Galway County Council prior to the commencement of works.

The proposed traffic management plan will at minimum include the following measures which are to be adopted during the construction works.

- 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 HGVs carrying dust producing material;
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds;
- 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 and agreed with Galway County Council;
- A road sweeper will be employed to clean the public roads 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 vehicles to remove any debris prior to leaving the site, to remove any potential debris on the local roads if it is deemed necessary;
- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. All scheduled maintenance will not be carried out on the public highway; and
- 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.
- When vehicles are entering the site, or leaving the site, these movements will be supervised by road marshals. The construction site gates will be kept closed when not in use and monitored by security. Traffic cones and set-back signage will be put in place to warn and safely direct cyclists around obstructions.

### 3.5 Invasive Species Management

A survey will be carried out at the site to identify the presence and location of any invasive species (listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) by a suitably qualified ecologist.

Good construction site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (e.g. Rhododendron, Japanese Knotweed, Giant Rhubarb etc.) by thoroughly washing vehicles prior to entering the site. Any soil and topsoil required on the site will be sourced from a stock that has been screened for the presence of any invasive species and where it is confirmed that none are present.

However, in the case of an invasive species being found on site during the construction phase an invasive species management plan will be prepared. The treatment and control of invasive alien species will follow guidelines issued by the National Roads Authority – The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (NRA 2010) and the Environment Agency (2013) – The Knotweed Code of Practice: Managing Japanese Knotweed on Development Sites (Version 3, amended in 2013). To prevent the introduction of any invasive species to the site best practice control methods are summarised in the following sections.

### 3.5.1 Site Management

As previously mentioned, a survey will be carried out on site to determine if there is the presence of any non-native invasive species. In the event that an invasive species is encountered, an invasive species management plan will be prepared and the following measures will be adopted. Careful preparation of the site and planning of the works is crucial to successful prevention of introduction of invasive species. The following list of guidelines, which is not exhaustive, shall be followed by all on-site personnel. Only those who have been inducted into biosecurity measures on-site may enter the contaminated zones within the works areas.

### 3.5.2 Establishing Good Site Hygiene

- A risk assessment and method statement must be provided by the Contractor prior to commencing works.
- Fences will be erected around areas of infestation, as confirmed by test pits, and warning signs shall be erected.
- A designated wash-down area will be created, where power-washed material from machinery can be contained, collected and disposed of with other contaminated material. This area will contain a washable membrane or hard surface.
- Stockpile areas will be chosen to minimise movement of contaminated soil.
- Stockpiles will be marked and isolated.
- Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery. Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore.
- The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material.
- Any material that is imported onto any site will be verified by a suitably qualified ecologist to be free from any invasive species listed on the 'Third Schedule' of Regulations 49 & 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I 477 of 2011). This will be carried out by searching for rhizomes and plant material.
- Any soils or subsoils contaminated with invasive species will be sent for disposal to an authorized waste facility.
- A suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species remedial works.

Plant and equipment which is operated within an area for the management of materials in contaminated areas will be decontaminated prior to relocating to a different works area. The decontamination procedures will take account of the following:

- Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it.
- Decontamination will only occur within designated wash-down areas.
- Vehicles will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain rhizomes e.g. wheel treads and arches.

All run-off will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas.



## 4. CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

### 4.1 Introduction

The generation of waste as a result of construction and demolition related activity will provide the majority of on-site wastes which will need to be managed under guidelines set out in this document. This section of the CEMP provides a Waste Management Plan which outlines the best practice procedures during the construction and demolition phases of the project.

The plan is based on the European waste hierarchy which sets out the most to least preferred options for waste management. Waste prevention and re-use are viewed as the most desirable options for managing wastes with the least desirable option considered being landfill.

This plan has a number of key objectives as outlined below:

- To set out management prescriptions that adhere to the waste management hierarchy.
- To outline the roles and responsibilities of the Waste Manager.

#### 4.1.1 Legislation

The Waste Management Act 1996 and its subsequent amendments provide for measures to improve performance in relation to waste management, recycling and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

The Act requires that any waste related activity has to have all necessary licenses and authorisations. It will be the duty of the Waste Manager on the site of the proposed development to ensure that all contractors hired to remove waste from the site have valid Waste Collection Permits. It will then be necessary to ensure that the waste is delivered to a licensed or permitted waste facility. The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits and authorisations.

#### 4.1.2 Waste Management Hierarchy

The waste management hierarchy sets out the most efficient way of managing in the following order:

##### **Prevention and Minimisation:**

The primary aim of the CEMP will be to prevent and thereby reduce the amount of waste generated at each stage of the project. The prevention and minimisation of waste of this development will be developed by implementing effective on-site materials management in terms of both material acquisition and storage on site.

##### **Reuse of Waste:**

Reusing as much of the waste generated on site as possible will reduce the quantities of waste that will have to be transported off site to recovery facilities or landfill. Site management will be required to encourage the appropriate reuse of materials where possible as well as identify re-use opportunities to achieve ultimate goal of waste reduction.

The potential for re-use of materials on the site during the works will be minimal however clean inert concrete, rubble and stones may have a re-use potential for landscaping and site restoration.

### Recycling of Waste:

There are a number of established markets available for the beneficial use of construction waste such as using waste concrete as fill for new roads. A designated Waste Storage Area (WSA) will be maintained on site which will cater for segregation and recycling of various waste streams

At all times during the implementation of the CEMP, disposal of waste to landfill will be considered only as a last resort.

## 4.2 Demolition Waste Management

Prior to the commencement of any demolition works at the site a full audit of waste that will be generated on site will be carried out. For the purposes of this Construction and Demolition Waste Management Plan (CDWMP) a list of expected waste types that may be generated has been drawn up and the anticipated quantity of each waste category as well as the European Waste Catalogue Codes pertaining to each waste type is included in Table 4-1. The list has been prepared following a review of the application of the proposed demolition and all available design documents and does not constitute a full waste audit.

Table 4-1 Expected waste types arising from Demolition Phase

Materials Type	Example	EWG Code
Cables	Electrical wiring	17 04 11
Concrete	Surfacing wall and flooring material	17 01 01
Glass	Windows	17 02 02
Tiles and Ceramics	Wall and Floor tiles	17 02 03
Metals	Building frames, steel roof coverings, window frames, electrical equipment , copper	17 04 07
Mixture of inert material	Sand, stones, plaster, rock, blocks	17 01 07
Mixed Municipal Waste	Daily canteen waste from construction workers, miscellaneous	20 03 01
Plastic	Perspex roof covering, PVC frames, electrical fittings, Polystyrene	17 02 03
Wood	Frames and Doors	17 02 01

The majority of the waste generated by the demolition of the existing buildings will consist of concrete rubble and stones from the existing wall structure, floor and foundations. This material will be segregated from all other waste components in accordance with general waste segregation policy. The remaining volume of waste material will be segregated according to type in individual skips or bins pending removal by authorised waste collection contractors.

This waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be further sorted into individual waste streams for recycling, recovery or disposal. It is unlikely that re-use of materials will be possible at the site. However, clean inert concrete, rubble and stones may have a re-use potential for landscaping and raising levels to formation levels.

## 4.3 Construction Waste Management

The first significant quantity of waste to be generated during the construction phase of the project will be the excavation for the realignment. This will generate a significant quantity of soil and subsoil material as a result of the excavation. Although a quantity of this material will be used for landscaping, backfilling and general restoration of excavated areas, it is anticipated that a quantity of this material will be exported off site by a licenced haulier to an authorised waste facility.

Waste generated post excavation on site will be managed in the WSA where the various waste components will be segregated into a number of waste categories in accordance with a general waste segregation policy and placed into individual skips. The categories for segregation will include, timber, metal, cardboard and plastics. This material will be removed by authorised waste collection contractors for recycling and recovery at various licensed facilities. The remaining volume of waste material which cannot be allocated to any of these four waste streams will be disposed of in a general waste skip. This waste material will be transferred to a MRF by a fully licensed waste contractor where the waste will be further sorted into individual waste streams for recycling, recovery or disposal. This general waste will be subject to constant monitoring by site management to ensure that potential reusable and recyclable material is not being disposed of therein. The on-site canteen will include waste receptacles for dry recyclables and food waste which should eliminate the potential of any waste produced within the canteen being sent to landfill. The expected wastes arising from the works including the individual European Waste Catalogue (EWC) codes are outlined in Table 4-2.

Table 4-2 Expected waste types arising from the Construction Phase

Materials	Example	EWC Code
Cables	Underground services	17 04 11
Concrete	Surplus concrete	17 01 01
Metals	Rebar	17 04 07
Mixture of inert material	Sand, stones, plaster, rock, tarmacadam	17 01 07
Plastic	Drainage system pipes	17 02 03
Soil & Stones	Overburden, soil, subsoil	17 05 04
Wood	Timber waste and off-cuts	17 02 01
Canteen Waste	Miscellaneous waste from site staff	20 01 08

The potential for re-use of materials on the site during the works will be minimal however clean inert concrete, rubble and stones may have a re-use potential for landscaping and site restoration.

## 4.4 Implementation

### 4.4.1 Roles and Responsibilities for Waste Management

Prior to the commencement of the proposed development a Waste Manager will be appointed by the project team. The Waste Manager will be responsible for the implementation of the objectives of this plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the proposed development adheres to the management plan. The waste manager will also be required to conduct regular waste audits throughout the site to ensure that the waste management plan is operating effectively.

### 4.4.2 Training

It is important for the Waste Manager to communicate effectively with colleagues in relation to the aims and objectives of the waste management plan. All employees working on site during the construction phase of the project will be trained in materials management and thereby, should be able to:

- Distinguish reusable materials from those suitable for recycling;
- Ensure maximum segregation at source;
- Co-operate with site manager on the best locations for stockpiling reusable materials;
- Separate materials for recovery; and
- Identify and liaise with waste contractors and waste facility operators.

### 4.4.3 Record Keeping

The CDWMP will provide systems that will enable all arisings, movements and treatments of waste to be recorded. This system will enable the contractor to measure and record the quantity of waste being generated. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The CDWMP can then be adapted with changes that are seen through record keeping.

The fully licensed waste contractor employed to remove waste from the site will be required to provide documented records for all waste dispatches leaving the site. Each record will contain the following:

- Consignment Reference Number
- Material Type(s) and EWC Code(s)
- Company Name and Address of Site of Origin
- Trade Name and Collection Permit Ref. of Waste Carrier
- Trade Name and Licence Ref. of Destination Facility
- Date and Time of Waste Dispatch
- Registration no. of Waste Carrier vehicle
- Weight of Material
- Signature of Confirmation of Dispatch detail
- Date and Time of Waste Arrival at Destination
- Site Address of Destination Facility

## 4.5 Waste Management Plan Conclusion

The WMP will be properly adhered to by all staff involved in the project which will be outlined within the induction process for all site personnel. The waste hierarchy will always be employed to ensure that the least possible amount of waste is produced during the construction phase. Reuse of certain types of



construction wastes will cut down on the cost and requirement of raw materials therefore further minimising waste levels.

## 5. ENVIRONMENTAL MANAGEMENT IMPLEMENTATION AND EMERGENCY RESPONSE

### 5.1 Environmental Manager

The main contractor appointed to carry out the works on site will be required to provide a level of supervision on site in the form of an Environmental Manager who will also fulfil the role of Waste Manager. Due to the scale of activity proposed for the site, this role can be adopted by a Site Manager/Foreman as part of their duties. In general, this Environmental Manager will maintain responsibility for monitoring the works and Contractors/Sub-contractors from an environmental perspective. The Environmental Manager will be assisted by an Environmental Clerk of Works (ECoW) will act as the regulatory interface on environmental matters by reporting directly to the client and liaising with Galway County Council and other statutory bodies as required. The duties of the appointed Environmental Manager/ ECoW are summarised as follows:

- Maintain and update as required the Construction Phase CEMP and supporting environmental documentation and review/approval of contractor method statements;
- Undertake inspections and reviews to ensure the works are carried out in compliance with the CEMP;
- Monitor the implementation of the CEMP, particularly all proposed/required Environmental Monitoring;
- Generate environmental reports as required to show environmental data trends and incidents and ensure environmental records are maintained throughout the construction period;
- Advise site management/contractor/sub-contractors on:
  - Prevention of environmental pollution and improvement to existing working methods;
  - Changes in legislation and legal requirements affecting the environment;
  - Suitability and use of plant, equipment and materials to prevent pollution;
  - Environmentally sound methods of working and systems to identify environmental hazards;
- Ensure proper mitigation measures are initiated and adhered to during the construction phase;
- Liaise with Project Team and present the findings of site audits/inspections that are completed;
- Ensure adequate arrangements are in place for site personnel to identify potential environmental incidents;
- Ensure that details of environmental incidents are communicated in a timely manner to the relevant regulatory authorities, initially by phone and followed up as soon as is practicable by email;
- Support the investigation of incidents of significant, potential or actual environmental damage, and ensure corrective actions are carried out, recommend means to prevent recurrence and communicate incident findings to relevant parties;
- Identify environmental training requirements and arrange relevant training for all levels of site-based staff/workers; and
- Fulfil the role of Waste Manager and implement the objectives of the Waste Management Plan as set out in Section 4 above.

#### 5.1.1 Project Ecologist

The Project Ecologist will be available to support the ECoW on matters relating to the protection of sensitive habitats and species encountered prior to or during the construction phase of the project. The

Project Ecologist will not be full time on site but will undertake pre-commencement surveys and visit the site as required.

## 5.2 Emergency Response Plan

### 5.2.1 Emergency Response

The Emergency Response Plan (ERP) is presented in this section of the CEMP. It provides details of procedures to be adopted in the event of an emergency in terms of site health and safety and environmental protection. The site ERP includes details on the response required and the responsibilities of all personnel in the event of an emergency. The ERP will require updating and submissions from the contractor/PSCS and suppliers as the proposed project progresses. Where sub-contractors that are contracted on site are governed by their own emergency response procedure a bridging arrangement will be adopted to allow for inclusion of the sub-contractor’s ERP within this document.

This is a working document that requires updating throughout the various stages of the project.

### 5.2.2 Roles and Responsibilities

The chain of command during an emergency response sets out who is responsible for coordinating the response. The Site Manager will lead the emergency response which makes him responsible for activating and coordinating the emergency response procedure. The other site personnel who can be identified at this time who will be delegated responsibilities during the emergency response are presented in Figure 5-1. In a situation where the Site Manager is unavailable or incapable of coordinating the emergency response, the responsibility will be transferred to the next person in the chain of command outlined in Figure 5-1. This will be updated throughout the various stages of the project.

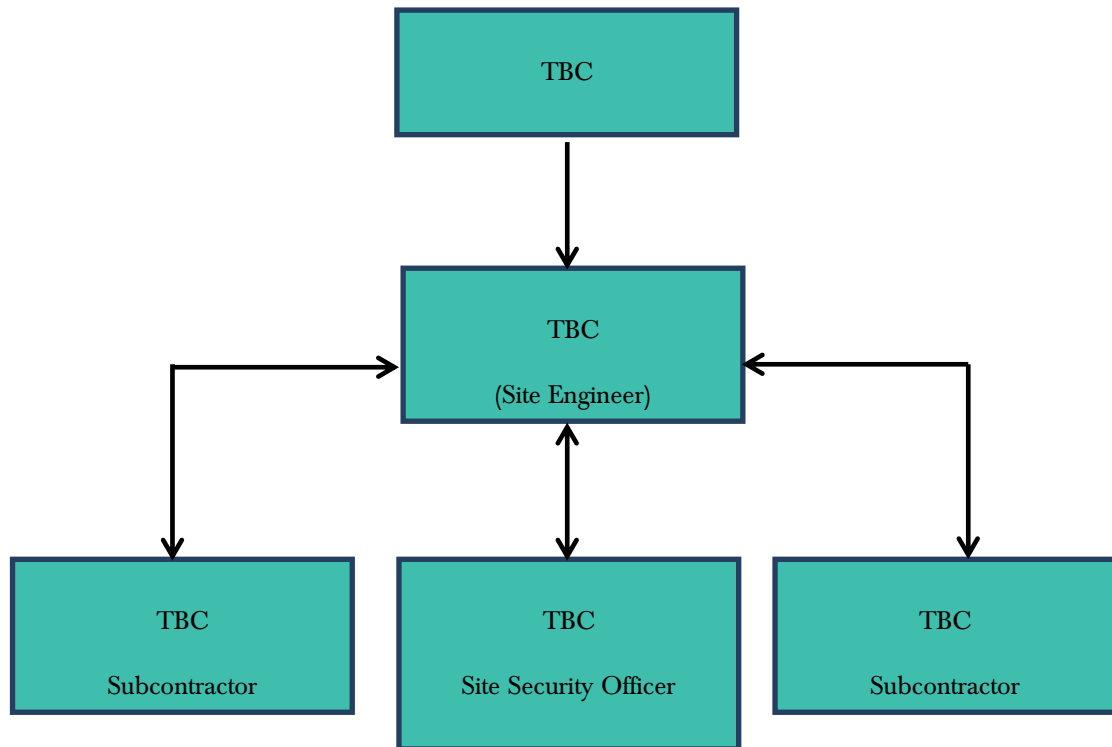


Figure 5-1 Emergency Response Procedure Chain of Command.

### 5.2.3 Initial Steps

In order to establish the type and scale of potential emergencies that may occur, the following hazards have been identified as being potential situations that may require and emergency response in the event of an occurrence.

Table 5-1 Hazard Associated with Potential Emergency Situations

Hazard	Emergency Situation
Construction Vehicles: Dump trucks, tractors, excavators, cranes etc.	Collision or overturn which has resulted in operator or third-party injury.
Abrasive wheels/Portable Tools.	Entanglement, amputation or electrical shock associated with portable tools.
Contact with services.	Electrical shock or gas leak associated with an accidental breach of underground services.
Fire	Injury to operative through exposure to fire.
Falls from heights including falls from scaffold towers, scissor lifts, ladders and roofs.	Injury to operative after a fall from a height.
Sickness	Illness unrelated to site activities of an operative e.g. heart attack, loss of consciousness, seizure.

In the event of an emergency situation associated with, but not restricted to, the hazards outlined in Table 5-1 the Site Manager will carry out the following:

- Establish the scale of the emergency situation and identify the number of personnel, if any, have been injured or are at risk of injury.
- Where necessary, sound the emergency siren/foghorn that activates an emergency evacuation on the site.
- Make safe the area if possible and ensure that there no identifiable risk exists with regard to dealing with the situation e.g. if a machine has turned over, ensure that it is in a safe position so as not to endanger others before assisting the injured.
- Contact the required emergency services or delegate the task to someone if he is unable to do so. If delegating the task, ensure that they follow the procedures for contacting the emergency services as set out in Section 4.2.6.
- Take any further steps that are deemed necessary to make safe or contain the emergency incident e.g. cordon off an area where an incident associated with electrical issues has occurred.
- Contact any regulatory body or service provider as required e.g. ESB Networks the numbers for which as provided in Section 4.2.6.
- Contact the next of kin of any injured personnel where appropriate. The procedure for this is outlined in Section 4.2.6.



## 5.2.4 Site Evacuation/ Fire Drill

A site evacuation/fire drill procedure will provide basis for carrying out the immediate evacuation of all site personnel in the event of an emergency. The following steps will be taken:

- Notification of the emergency situation. Provision of a siren or foghorn to notify all personnel of an emergency situation.
- An assembly point will be designated in the construction compound area and will be marked with a sign. All site personnel will assemble at this point.
- A roll call will be carried out by the Site Security Officer to account for all personnel on site.
- The Site Security Officer will inform the Site Manager when all personnel have been accounted for. At this time the Site Manager will decide the next course of action which will be determined by the situation that exists at that time. The Site Manager will advise all personnel accordingly.

All personnel will be made aware of the evacuation procedure during site induction. The Fire Services Acts of 1981 and 2003 require the holding of fire safety evacuation drills at specified intervals and the keeping of records of such drills.

## 5.3 Environmental Emergency Response Procedure

### 5.3.1 Spill Control Measures

Every effort will be made to prevent an environmental incident during the construction and operational phase of the proposed project. Oil/Fuel spillages are one of the main environmental risks that will exist on the proposed site which will require an emergency response procedure. The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. The following steps provide the procedure to be followed in the event of such an incident.

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill.
- If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats.
- If possible, clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the Environmental Manager immediately giving information on the location, type and extent of the spill so that they can take appropriate action.
- The Environmental Manager will inspect the site and will assist by providing any advice possible to ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.
- The Construction Manager will notify the appropriate regulatory body such as Galway County Council and Environmental Protection Agency (EPA) etc. if deemed necessary.

Environmental incidents are not limited to just fuel spillages. Therefore, any environmental incident must be investigated in accordance with the following steps.

- The Environmental Manager must be immediately notified.
- If necessary, the Environmental Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.
- The details of the incident will be recorded on an Environmental Incident Form which will provide information such as the cause, extent, actions and remedial measures that were used following the incident. The form will also include any recommendations made to avoid reoccurrence of the incident.
- If the incident has impacted on an ecologically sensitive receptor, such as a sensitive habitat, protected species or designated conservation site, (pSPA or cSAC), the Environmental Manager will liaise with an Ecologist.
- If the incident has impacted on a sensitive receptor such as an archaeological feature the Environmental Manager will liaise with the Project Archaeologist.
- A record of all environmental incidents will be kept on file by the Environmental Manager and the Main Contractor. These records will be made available to the relevant authorities such as Galway County Council and the EPA if required.

The Environmental Manager will be responsible for any corrective actions required as a result of the incident e.g. an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Main Contractor as appropriate.

## 5.3.2 Contacting Emergency Services

### 5.3.2.1 Emergency Communications Procedure

In the event of requiring the assistance of the emergency services the following steps should be taken:

Stay calm. It is important to take a deep breath and not get excited. Any situation that requires 999/112 is, by definition, an emergency. The dispatcher or call-taker knows that and will try to move things along quickly, but under control.

Know the location of the emergency and the number you are calling from. This may be asked and answered a couple of times but do not get frustrated. Even though many emergency call centres have enhanced capabilities meaning they are able to see your location on the computer screen they are still required to confirm the information. If for some reason you are disconnected, at least emergency crews will know where to go and how to call you back.

Wait for the call-taker to ask questions, then answer clearly and calmly. If you are in danger of assault, the dispatcher or call-taker will still need you to answer quietly, mostly "yes" and "no" questions.

If you reach a recording, listen to what it says. If the recording says your call cannot be completed, hang up and try again. If the recording says all call takers are busy, WAIT. When the next call-taker or dispatcher is available to take the call, it will transfer you.

Let the call-taker guide the conversation. He or she is typing the information into a computer and may seem to be taking forever. There is a good chance, however, that emergency services are already being sent while you are still on the line.

Follow all directions. In some cases, the call-taker will give you directions. Listen carefully, follow each step exactly, and ask for clarification if you do not understand.

Keep your eyes open. You may be asked to describe victims, suspects, vehicles, or other parts of the scene.

Do not hang up the call until directed to do so by the call taker.

Due to the remoteness of the site, it may be necessary to liaise with the emergency services on the ground in terms of locating the site. This may involve providing an escort from a designated meeting point that may be located more easily by the emergency services. This should form part of the site induction to make new personnel and sub-contractors aware of any such arrangement or requirement if applicable.

### 5.3.2.1 Contact Details

Table 5-2 Emergency Contacts

Hazard	Emergency Situation
Emergency Services – Ambulance, Fire, Gardaí	999/112
Doctor – Sweeney Family Practice	094 930 0110
Hospital – Galway University Hospital	091 524 222
ESB Emergency Services	1850 372 999
Bórd Gais Emergency	1850 20 50 50
Gardaí – Ballindine Garda Station	094 936 4219
Health and Safety Coordinator - Health & Safety Services	TBC
Health and Safety Authority	1890 289 389
Project Supervisor Construction Stage (PSCS): TBC	TBC
Project Supervisor Design Stage (PSDS): TBC	TBC
Client – Galway County Council	091 509 000

### 5.3.2.2 Procedure for Personnel Tracking

All operatives on site without any exception will have to undergo a site induction where they will be required to provide personal contact details which will include contact information for the next of kin.

In the event of a site operative becoming involved in an emergency situation where serious injury has occurred, and hospitalisation has taken place, it will be the responsibility of the Site Manager or next in command if unavailable to contact the next of kin to inform them of the situation that exists.

### 5.3.2.3 Induction Checklist

Table 5-3 provides a list of items highlighted in this ERP which must be included or obtained during the mandatory site induction of all personnel that will work on the site. This will be updated throughout the various stages of the project.

Table 5-3 Emergency Response Plan Items Applicable to the Site Induction Process

ERP Items to be included in Site Induction	Status
<p>All personnel will be made aware of the evacuation procedure during site induction.</p>	
<p>Due to the location of the site it may be necessary to liaise with and assist the emergency services on the ground in terms of locating the site. This may involve providing an escort from a designated meeting point that may be located more easily by the emergency services. This should form part of the site induction to make new personnel and sub-contractors aware of any such arrangement or requirement if applicable.</p>	
<p>All operatives on site without any exception will have undergone a site induction where they will be required to provide personal contact details which will include contact information for the next of kin.</p>	

## 6. MITIGATION PROPOSALS

The Mitigation Measures which will be implemented are presented in this section of the CEMP. The CEMP will be finalised subsequent to any permission granted by Galway County Council and will be updated prior to construction to include, inter alia, any additional requirements pursuant to relevant planning conditions imposed.

By presenting the mitigation proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the future phases of the project.

Table 6-1 Mitigation measures for the Pre-commencement and Construction phases

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
<b>Pre-Commencement Phase</b>				
1	CEMP Section 1	All measures identified in this Construction Environmental Management Plan, which will be finalised subsequent to any permission granted and updated prior to construction will include all mitigation measures identified to be adhered to during the pre-commencement and construction phases of the proposed development.		
2	CEMP Section 5.1	Construction Manager engaged who will also fulfil the role of Environmental Manager (EM), and to monitor all site works and to ensure that methodologies and mitigation are followed throughout construction to avoid negatively impacting on the receiving environment.		
3	CEMP Section 2.3.4	<ul style="list-style-type: none"> <li>➤ Fencing will be erected around the boundaries of the development site. All works will be located within the confines of this fencing where practicable.</li> <li>➤ A site compound will be established within the site boundary. The exact location of the site compound will be established by the contractor.</li> <li>➤ Access routes will be clearly marked / identified. Access during construction to any working areas will be restricted to land within the outlined works area.</li> </ul>		
<b>Construction Phase</b>				
<b>Construction Management</b>				
4	CEMP Section 3.1.2	<ul style="list-style-type: none"> <li>➤ No batching of wet-cement products will occur on site;</li> <li>➤ Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place. Where possible pre-cast elements for culverts and concrete works will be used;</li> <li>➤ No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;</li> </ul>		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>➤ Where concrete is delivered on site, only chute cleaning will be permitted, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed.</li> <li>➤ Use weather forecasting to plan dry days for pouring concrete;</li> <li>➤ Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event;</li> </ul>		
<b>Fuel and Oil Control</b>				
5	CEMP Section 3.1.3	<ul style="list-style-type: none"> <li>➤ Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling should occur at a controlled fuelling station;</li> <li>➤ On-site refuelling will take place by direct refuelling from the delivery truck or using a mobile double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off site and will be towed around the site as required. The fuel bowser will be parked on a level area in the construction compound when not in use. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations.</li> <li>➤ Vehicles will never be left unattended during refuelling. Only dedicated trained and competent personnel will carry out refuelling operations and plant refuelling procedures shall be detailed in the contractor's method statements.</li> <li>➤ All fuels, lubricants and hydraulic fluids will be stored at the site compound. The storage area will contain a small bund lined with an impermeable membrane in order to prevent any contamination of the surrounding soils and vegetation.</li> <li>➤ Fuel volumes stored on site should be minimised. Any fuel storage areas will be bunded appropriately for the volume of fuel stored for the duration of the construction period. The bunded area will be roofed to prevent the ingress of rainwater.</li> </ul>		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>➤ Fuels, lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment.</li> <li>➤ All site plant will be inspected at the beginning of each day prior to use. Defective plant shall not be used until the defect is satisfactorily fixed. All major repair and maintenance operations will take place off site.</li> <li>➤ Potential impacts caused by spillages etc. during the construction phase will be reduced by keeping spill kits and other appropriate equipment on-site.</li> <li>➤ Spill kits will be available to deal with and accidental spillage in and outside the refuelling area. Spill control measures are outlined in the section that follows.</li> <li>➤ Harmful materials shall be stored on site for use in connection with the construction works only. These materials shall be stored in a controlled manner. Where on site refuelling facilities are used, there shall be a bunded filling area using a double bunded steel tank at a minimum.</li> </ul>		
6	CEMP Section 3.1.4	<ul style="list-style-type: none"> <li>➤ Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.</li> <li>➤ If applicable, eliminate any sources of ignition in the immediate vicinity of the incident</li> <li>➤ Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill.</li> <li>➤ If possible, cover or bund off any vulnerable areas where appropriate such as drains or watercourses.</li> <li>➤ If possible, clean up as much as possible using the spill control materials.</li> <li>➤ Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.</li> <li>➤ Notify the applicant immediately giving information on the location, type and extent of the spill so that they can take appropriate action and further investigate the incident to ensure it has been contained adequately.</li> </ul>		



Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
<b>Surface Water Mitigation</b>				
7	CEMP Section 3.1.1	<ul style="list-style-type: none"> <li>➤ Works will not take place during periods of high rainfall, and shall be scaled back or suspended if heavy rain is forecast during excavation works;</li> <li>➤ There will be no release of suspended solids to any watercourse as a direct or indirect result of the proposed works.</li> <li>➤ Any requirement for temporary fills or stockpiles will be damped down or covered with polyethylene sheeting as required to avoid sediment release associated with heavy rainfall.</li> <li>➤ Prior to the commencement of groundworks silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered;</li> <li>➤ Ground disturbance should be kept to a minimum, water from excavations should be filtered, other sediment trapping technologies such as silt fences can prevent sediment leaving the site. Exposed surfaces should be re-vegetated as soon as possible following construction.</li> <li>➤ Silt Fences will be erected in accordance with the manufacturer’s recommendations and in compliance with the Design Criteria outlined in CIRIA C648 Control of Water Pollution from Linear Construction Projects:               <ul style="list-style-type: none"> <li>○ At all sections of road construction where the works are at or above existing ground level</li> <li>○ Along any other identified surface pathways for sediment laden runoff;</li> </ul> </li> <li>➤ Where land drains intersect the site boundary or where the adjacent land falls towards the construction site – temporary cut-</li> </ul>		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		<p>off drains will be provided to intercept this clean runoff water and divert to the nearest watercourse. Small check dams will be constructed in these cut-off drains to trap any sediment and prevent erosion. Silt fences will be provided immediately before the outfall to existing watercourses as a precaution and to allow a response time in the event of an emergency.</p> <ul style="list-style-type: none"> <li>➤ All watercourses will be fenced off with double silt fences located at least 10m back from the watercourse bank until such time as the road crossing is constructed.</li> <li>➤ All silt fences at watercourse crossings will be inspected on a daily basis and repairs or replacements carried out as required.</li> </ul>		
8	CEMP Section 3.1.1	<ul style="list-style-type: none"> <li>➤ Dewatering and surface water runoff discharges from the construction site will be controlled, collected and routed via appropriate treatment measures. The measures will include appropriately sized settlement ponds. Each pond will be provided with a double silt curtain at the outfall from the pond and a further double silt fence located before the discharge point. These facilities will be inspected/ maintained at least on a daily basis.</li> <li>➤ Check dams and sediment traps shall be placed along constructed drains to reduce the velocity of concentrated runoff.</li> <li>➤ Direct connections between the settlement pond outfalls and the watercourse will not be allowed. Instead, the outfall will be allowed to disperse across at least 3m of undisturbed vegetated ground, covered with a coir mesh or similar matting prior to reaching the watercourse;</li> <li>➤ Where these ponds cannot be constructed in the dry, then they shall be formed by constructing bunds and placing an appropriate geotextile liner on top. Any/ all materials arising from</li> </ul>		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		<p>the construction of the temporary settlement ponds shall be removed offsite to a licensed facility or used elsewhere in the works if deemed appropriate.</p> <ul style="list-style-type: none"> <li>➤ Landscaping of the constructed road will be carried out in stages as the works progress and will commence as soon as is practicable in each of the outfall catchment areas;</li> <li>➤ If seeding of cut/fill slopes is not practical, the use of roughened slope surfaces shall be considered by the contractor which will encourage water infiltration, and decrease runoff velocity;</li> <li>➤ Silt fencing shall remain in place until ground vegetation has recovered. Any accumulated silt will then be removed and disposed of to a licensed facility.</li> <li>➤ Ensure that control measures are correctly installed and adequately sized prior to commencing site clearance and earthworks;</li> <li>➤ Develop a maintenance checklist for control measures and inspect controls measures regularly throughout the project, particularly after heavy rainfall;</li> <li>➤ Maintain controls through project such as removing sediment in silt traps once half full.</li> </ul>		
9	CEMP Section 3.1.3	<p>Storage/refuelling in a designated area of the construction site, located a suitable distance from excavation works. This area should be underlain by concrete hard standing and tanks should be inspected for leaks regularly. Spill kits should be supplied at these stations and staff should be trained in their use and in spill control. Drainage from these areas shall be diverted for collection and not discharged into waterbodies without treatment and other best management practices.</p>		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
<b>Air Quality and Dust Control</b>				
11	CEMP Section 3.2	<ul style="list-style-type: none"> <li>➤ Any site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions;</li> <li>➤ Site roadways will be maintained in a stoned hard core condition not allowing soil to accumulate which when dry can create dust.</li> <li>➤ The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by Site Management for cleanliness, and cleaned as necessary;</li> <li>➤ Material handling systems and material storage areas will be designed and laid out to minimise exposure to wind;</li> <li>➤ The use of barriers such as debris netting on scaffolding around the building to block dust escaping where the building is within 10m of the site boundary where residential properties exist.</li> <li>➤ Water misting or bowsers will operate on-site as required to mitigate dust in dry weather conditions;</li> <li>➤ The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary;</li> <li>➤ All construction related traffic will have speed restrictions on un-surfaced roads to 15 kph;</li> <li>➤ Daily inspection of construction sites to examine dust measures and their effectiveness.</li> <li>➤ When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper; and,</li> <li>➤ All vehicles leaving the construction areas of the site will pass through a wheel cleansing area prior to entering the local road network if it is deemed that it will be effective.</li> </ul>		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
<b>Noise</b>				
12	CEMP Section 3.3	<ul style="list-style-type: none"> <li>➤ Construction equipment for use outdoors shall comply with the European Communities Regulations– Noise Emission by Equipment for Use Outdoors – SI 241 - 2006.</li> <li>➤ Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts;</li> <li>➤ Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All construction plant and equipment to be used on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations;</li> <li>➤ Plant with the potential of generating noise or vibration will be placed as far away from sensitive properties as permitted by site constraints.</li> <li>➤ If work activities have the potential to result in vibration, the appointed contractor shall source vibration monitoring equipment immediately from a specialist company who specialise in monitoring equipment.</li> <li>➤ Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers;</li> <li>➤ All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works;</li> <li>➤ Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;</li> <li>➤ Machines, which are used intermittently, will be shut down during those periods when they are not in use;</li> </ul>		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>➤ Training will be provided by the Site Management to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation; and,</li> <li>➤ Local areas of the haul route will be condition monitored and maintained if necessary.</li> <li>➤ Random monitoring (if required) shall be undertaken at the site boundary, by the use of a Sound Level Meter which has the capabilities to store data and produce records and issued to the appropriate parties upon request.</li> </ul>		
<b>Traffic Management</b>				
14	CEMP Section 3.4	<ul style="list-style-type: none"> <li>➤ Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access locations;</li> <li>➤ 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;</li> <li>➤ Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on HGVs carrying dust producing material;</li> <li>➤ Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds;</li> <li>➤ 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 and agreed with Galway County Council;</li> <li>➤ A road sweeper will be employed to clean the public roads of any residual debris that may be deposited on the public roads leading away from the construction works;</li> <li>➤ On site wheel washing will be undertaken for construction vehicles to remove any debris prior to leaving the site, to remove any potential debris on the local roads if it is deemed necessary;</li> </ul>		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>➤ All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. All scheduled maintenance will not be carried out on the public highway; and</li> <li>➤ 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.</li> </ul>		
<b>Invasive Species Management</b>				
15	CEMP Section 3.5.1	<ul style="list-style-type: none"> <li>➤ In the event an invasive species is encountered, this management plan will be prepared and the following measures adopted. Only those who have been inducted into biosecurity measures on-site may enter the contaminated zones within the works areas.</li> </ul>		
16	CEMP Section 3.5.2	<ul style="list-style-type: none"> <li>➤ A risk assessment and method statement must be provided by the Contractor prior to commencing works.</li> <li>➤ Fences will be erected around areas of infestation, as confirmed by test pits, and warning signs shall be erected.</li> <li>➤ A designated wash-down area will be created, where power-washed material from machinery can be contained, collected and disposed of with other contaminated material. This area will contain a washable membrane or hard surface.</li> <li>➤ Stockpile areas will be chosen to minimise movement of contaminated soil.</li> <li>➤ Stockpiles will be marked and isolated.</li> <li>➤ Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery. Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore.</li> </ul>		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>➤ The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material.</li> <li>➤ Any material that is imported onto any site will be verified by a suitably qualified ecologist to be free from any invasive species listed on the ‘Third Schedule’ of Regulations 49 &amp; 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I 477 of 2011). This will be carried out by searching for rhizomes and plant material.</li> <li>➤ Any soils or subsoils contaminated with invasive species will be sent for disposal to an authorized waste facility.</li> <li>➤ A suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species remedial works.</li> </ul>		
17	CEMP Section 3.5.2	<p>Plant and equipment which is operated within an area for the management of materials in contaminated areas will be decontaminated prior to relocating to a different works area. The decontamination procedures will take account of the following:</p> <ul style="list-style-type: none"> <li>➤ Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it.</li> <li>➤ Decontamination will only occur within designated wash-down areas.</li> <li>➤ Vehicles will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain rhizomes e.g. wheel treads and arches.</li> <li>➤ All run-off will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas.</li> </ul>		
<b>Construction &amp; Demolition Waste Management</b>				
18	CEMP Section 4.2, 4.3	<ul style="list-style-type: none"> <li>➤ Waste generated post excavation on site will be managed in the WSA where the various waste components will be segregated into a number of waste</li> </ul>		



Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		<p>categories in accordance with a general waste segregation policy and placed into individual skips.</p> <ul style="list-style-type: none"> <li>➤ The categories for segregation will include, timber, metal, cardboard and plastics. This material will be removed by authorised waste collection contractors for recycling and recovery at various licensed facilities. The remaining volume of waste material which cannot be allocated to any of these four waste streams will be disposed of in a general waste skip.</li> <li>➤ This waste material will be transferred to a MRF by a fully licensed waste contractor where the waste will be further sorted into individual waste streams for recycling, recovery or disposal. This general waste will be subject to constant monitoring by site management to ensure that potential reusable and recyclable material is not being disposed of therein.</li> <li>➤ The on-site canteen will include waste receptacles for dry recyclables and food waste which should eliminate the potential of any waste produced within the canteen being sent to landfill.</li> <li>➤ Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling.</li> <li>➤ All construction waste materials will be stored within the confines of the site, prior to removal from the site to a licensed waste facility.</li> <li>➤ A self-contained port-a-loo with an integrated waste holding tank will be used at the site compounds, maintained by the providing contractor, and removed from site on completion of the construction works;</li> <li>➤ No wastewater will be discharged on-site during the construction phase.</li> </ul>		

## 7. PROGRAMME OF WORKS

### 7.1 Construction Programme

The construction phase will take approximately 12-18 months to complete. This is typically broken down into several phases. An example of the programme of works is outlined in Table 7-1 below. The construction programme will be finalised on appointment of a contractor before commencement of the development.

Table 7-1 Phasing Scope of Works

Phase No.	Description	Scope of works
Phase 1	Site Setup	This occurs from months 1 - 3 and includes laying the matting or gravel for the temporary construction compound, the construction compound setup and machinery mobilisation.
Phase 2	Drainage and culverting	Months 6 – 10. This involves any upgrade works to drainage infrastructure and culverting
Phase 3	Earthworks and Pavement Foundations	This occurs from months 4 -14. It includes site excavation and road pavement foundation construction
Phase 4	Site Reinstatement and Landscaping	This occurs from months 13 - 15.
Phase 5	Resurfacing and road finishes	This occurs from months 16 - 18.

## 8. COMPLIANCE AND REVIEW

### 8.1 Site Inspections and Environmental Audits

Routine inspections of activities will be carried out on a daily and weekly basis by the Construction Manager as appointed by the applicant to ensure all controls to prevent environmental impact.

Environmental inspections will ensure that the works are undertaken in compliance with this CEMP and will be carried out by suitably trained staff.

### 8.2 Environmental Compliance

The following definitions shall apply in relation to the classification of Environmental Occurrences during the infilling works:

**Environmental Near Miss:** An occurrence which if not controlled or due to its nature could lead to an Environmental Incident.

**Environmental Incident:** Any occurrence which has potential, due to its scale and nature, to migrate from source and have an environmental impact beyond the site boundary.

**Environmental Non-Compliance:** Non-fulfilment of a requirement and includes any deviations from established procedures, programs and other arrangements related to the CEMP.

### 8.3 Corrective Action Procedure

A corrective action is implemented to rectify an environmental issue on-site. Corrective actions will be implemented by the Construction Manager, as advised by the Site Environmental manager. Corrective actions may be required as a result of the following;

- > Environmental Audits;
- > Environmental Inspections and Reviews;
- > Environmental Incidents; and,
- > Environmental Complaints.

A Corrective Action Notice will be used to communicate the details of the action required to the main contractor. A Corrective Action Notice is a form that describes the cause and effect of an environmental problem on site and the recommended corrective action that is required. The Corrective Action Notice, when completed, will include details of close out and follow up actions.

If an environmental problem occurs on site that requires immediate attention direct communications between the Construction Manager and the personnel undertaken the specific task. This in turn will be passed down to all other site staff involved.