FEHILY TIMONEY

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

# KILLYCARD CLOSED LANDFILL REMEDIATION PROJECT

## NATURA IMPACT STATEMENT

**Prepared for:**

**Monaghan County Council**

Monaghan County Council

**Date:** **April 2024**

Unit 3/4, Northwood House, Northwood Crescent,
Northwood, Dublin, D09 X899, Ireland

**T: +353 59 972 3800 | E: info@ftco.ie**

**CORK | DUBLIN | CARLOW**

**www.fehilytimoney.ie**

# NATURA IMPACT STATEMENT

## REVISION CONTROL TABLE, CLIENT, KEYWORDS AND ABSTRACT

### User is responsible for Checking the Revision Status of This Document

| Rev. No. | Description of Changes | Prepared by: | Checked by: | Approved by: | Date: |
|---|---|---|---|---|---|
| A | Final Issue | CW/MG/KB | AT | BG | 09/04/2024 |

**Client:** Monaghan County Council

**Keywords:** Appropriate Assessment (AA), Natura Impact Statement (NIS) Article 6 of the Habitats Directive, European (Natura 2000) sites, Historic Landfill at Killycard, Co. Monaghan, Remediation

**Abstract:** This document is to inform the Competent Authority in carrying out their statutory obligations relating to the Habitats Directive requirement for Appropriate Assessment for plans and projects seeking consent. Appropriate Assessment is required under Article 6 (3) of the Habitats Directive for any project or plan that may give rise to significant effects on a European (Natura 2000) site.

# TABLE OF CONTENTS

## LIST OF APPENDICES

## LIST OF FIGURES



## LIST OF TABLES

# 1. INTRODUCTION

## 1.1 Overview

Monaghan County Council has been granted a Certificate of Authorisation (Ref: H0364-01) to control and maintain a closed landfill at Killycard, Co. Monaghan. The Council will be obliged to carry out remediation measures and monitoring at the closed landfill in accordance with conditions set out under the certificate of authorisation. During the certification process, the Environmental Protection Agency determined the need for Appropriate Assessment as part of screening carried out in accordance with Regulation 42 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended). The screening determined potential for significant effects on Dundalk Bay SAC (Site Code: 000455), and Dundalk Bay SPA (Site Code: 004026) on the following basis:

> *"There is a hydrological connection between the historic landfill and Dundalk Bay SAC (Site Code: 000455) and Dundalk Bay SPA (Site Code: 004026)".*

A copy of the EPA screening determination is included in Appendix 1.

Given that the need for Appropriate Assessment has been determined, approval for the proposed activity must be sought from An Bord Pleanála (the Board) under Section 177AE of the Planning and Development Act, as amended. This Natura Impact Statement (NIS) has therefore been prepared as part of the Section 177AE application to the Board and is intended to inform the Board in making their assessment of whether project-related impacts could have an adverse effect on the integrity of the European sites. The 'integrity of the site' is defined as the coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated (European Commission, 2018).

## 1.2 Methodology

### 1.2.1 Guidance

In the preparation of this Natura Impact Statement regard was had to relevant guidance, in particular:

- *Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Commission Notice (2021) Brussels, 28.9.2021 C(2021) 6913 final (European Commission, 2021);*
- *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin (2009, updated 2010);
- *Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC*. European Commission (2018). Brussels, 21.11.2018 C (2018) 7621 final.

### 1.2.2 Process

European Commission notice (2021) prescribes the steps in Appropriate Assessment as follows:

1. Collecting information on the project and on the Natura 2000 site concerned;
2. Assessing the implications of the plan or project in view the site's conservation objectives, individually or in combination with other plans or projects;
3. Ascertaining whether the plan or project can have adverse effects on the integrity of the site;
4. Considering mitigation measures (including their monitoring).

Furthermore, the European Commission Notice C(2018) 7621: prescribes the content of the Appropriate Assessment and notes the following:

- It must be ensured that the appropriate assessment addresses all elements contributing to the site's integrity as specified in the site's conservation objectives and Standard Data Form, and is based on the best available scientific knowledge in the field;
- The information required should be up-to-date;
- The appropriate assessment should also include a comprehensive identification of all the potential effects of the plan or project likely to be significant on the site, taking into account in-combination and other effects likely to arise as a result of the combined action of the plan or project under assessment with other plans or projects.
- It should apply the best available techniques and methods to assess the extent of the effects of the plan or project on the integrity of the site(s).

This NIS has been set out to address these requirements and to present sufficient and up-to-date information to allow the Competent Authority to give full consideration to all elements contributing to the sites' integrity and allowing identification of potential impacts and mitigation.

# 2. EUROPEAN SITE AND PROJECT CHARACTERISTICS

## 2.1 European Site Characteristics

During the certification process, the Environmental Protection Agency determined the need for Appropriate Assessment as part of screening carried out in accordance with Regulation 42 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended). The screening determined potential for significant effects on Dundalk Bay SAC (Site Code: 000455), and Dundalk Bay SPA (Site Code: 004026) on the following basis:

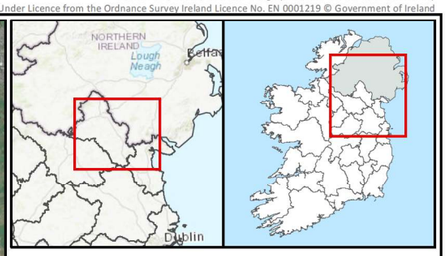
> *"There is a hydrological connection between the historic landfill and Dundalk Bay SAC (Site Code: 000455) and Dundalk Bay SPA (Site Code: 004026)".*

A copy of the EPA screening determination is included in Appendix 1. The NIS therefore focuses on the potential effects related to these sites.

The characteristics of these European sites are set out hereunder including each site's conservation objectives and conservation interests.

Path: R:\Map Production\2022\P22-071\Workspaces\P22-071_GIS_Figxx_European_Sites_A3.mxd




**Legend**

- Site Boundary
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site Boundary 25km Buffer
- Site Boundary 15km Buffer
- Hydrological Pathway

| | | | |
|---|---|---|---|
| **TITLE:** | European Sites | | |
| **PROJECT:** | Killycard | | |
| **FIGURE NO:** | - | | |
| **CLIENT:** | Monaghan County Council | | |
| **SCALE:** | 1:200000 | **REVISION:** | 0 |
| **DATE:** | 29/11/2022 | **PAGE SIZE:** | A3 |

FEHILY TIMONEY
Cork | Dublin | Carlow
www.fehilytimoney.ie

N W E S

0 5 10 20 Kilometers

### 2.1.1 Dundalk Bay SAC

The Dundalk Bay in County Louth is a very large open, shallow sea bay with extensive saltmarshes and intertidal sand/mudflats, extending some 16km from Castletown River on the Cooley Peninsula in the north, to Annagassan/Salterstown in the south. The bay encompasses the mouths and estuaries of the Rivers Dee, Glyde, Fane, Castletown and Flurry.

Dundalk Bay SAC is designated for a variety of special habitats and plant communities. These are: Estuaries, tidal mudflats and sandflats, perennial vegetation of stony banks, *Salicornia* mud, Atlantic salt meadows and Mediterranean salt meadows. See Table 2.1 for conservation objectives of these habitats.

The Natura 2000 – Standard Data Form[1] identified several threats, pressures, and activities with negative impacts on the site, see Table 2-2 for details. Two positive impacts were identified: Wildlife watching (G02.09) inside the site has a low-level positive impact and Migration of species (natural newcomers) (M02.04) has a medium positive impact on the conservation objectives. No management plan exists for this site.

**Table 2-1: Qualifying interests of Dundalk Bay SAC**

| Code | Description | Conservation Objectives |
|---|---|---|
| 1130 | Estuaries | Maintain the favourable conservation condition specifically with regard to habitat area and community distribution. |
| 1140 | Mudflats and sandflats not covered by seawater at low tide | To maintain the favourable conservation condition specifically with regard to habitat area and community distribution. |
| 1220 | Perennial vegetation of stony banks | To maintain the favourable conservation condition specifically with regard to habitat area and distribution; physical structure in regard to functionality and sediment supply; vegetation structure in regard to zonation, typical species and sub-communities as well as negative indicator species. |
| 1310 | Salicornia and other annuals colonizing mud and sand | To restore the favourable conservation condition specifically with regard to habitat area and distribution; physical structure in regard to sediment supply, creeks and pans and flooding regime; vegetation structure in regard to zonation, vegetation height and vegetation cover as well as negative indicator species *Spartina anglica*; vegetation composition in regard to typical species and sub-communities. |
| 1330 | Atlantic salt meadows (Glauco-Puccinellietalia maritimae) | To maintain/restore the favourable conservation condition specifically with regard to habitat area and distribution; physical structure in regard to sediment supply, creeks and pans and flooding regime; vegetation structure in regard to zonation, vegetation height and vegetation cover as well as negative indicator species *Spartina anglica*; vegetation composition in regard to typical species and sub-communities. |
| 1410 | Mediterranean salt meadows (Juncetalia maritimi) | To maintain/restore the favourable conservation condition specifically with regard to habitat area and distribution; physical structure in regard to sediment supply, creeks and pans and flooding regime; vegetation structure in regard to zonation, vegetation height |

[1] Source: Lough Carra/Mask Complex Natura 2000- Standard Data Form
https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF001774.pdf

| Code | Description | Conservation Objectives |
|---|---|---|
| | | and vegetation cover as well as negative indicator species *Spartina anglica*; vegetation composition in regard to typical species and sub-communities. |

**Table 2-2: Threats, pressures and activities with impacts on Dundalk Bay SAC; as recorded in Table 4.3 of the standard data form**

| Code | Threats & Pressures | Rank (high, medium, low) | Inside/ outside/ both |
|---|---|---|---|
| E03.01 | Disposal of household / recreational facility waste | H | i |
| E03.03 | Disposal of inert materials | H | i |
| F02.03.01 | Bait digging / collection | H | b |
| F05 | Illegal taking/ removal of marine fauna | M | b |
| G01 | Outdoor sports and leisure activities, recreational activities | M | b |
| G01.01.01 | Motorized nautical sports | L | b |
| G02 | Sport and leisure structures | L | b |
| G05.02 | Shallow surface abrasion/ mechanical damage to seabed surface | M | b |
| H01 | Pollution to surface waters (limnic, terrestrial, marine & brackish) | H | b |
| H01.06 | Diffuse pollution to surface waters due to transport and infrastructure without connection to canalization/sweepers | M | i |
| H02.06 | Diffuse groundwater pollution due to agricultural and forestry activities | M | b |
| H04.02 | Nitrogen-input | L | b |
| H05 | Soil pollution and solid waste (excluding discharges) | L | b |
| H05.01 | Garbage and solid waste | M | b |
| I01 | Invasive non-native species | H | b |
| J02.01.02 | Reclamation of land from sea, estuary or marsh | M | b |
| J02.01.03 | Infilling of ditches, dykes, ponds, pools, marshes or pits | M | b |
| J02.04 | Flooding modifications | M | b |
| J02.04.01 | Flooding | M | b |
| J02.12.01 | Sea defence or coast protection works, tidal barrages | M | b |
| J03.01 | Reduction or loss of specific habitat features | M | b |
| J03.02 | Anthropogenic reduction of habitat connectivity | M | b |
| K01.01 | Erosion | M | b |
| K02 | Biocenotic evolution, succession | M | i |
| K04.01 | Competition | M | i |

### 2.1.2 Dundalk Bay SPA

Dundalk Bay SPA overlaps with a proportion of the Dundalk Bay SAC. Dundalk Bay is a large, open, shallow sea bay with extensive saltmarshes and intertidal sand/mudflats which have a rich fauna of bivalves, molluscs, marine worms and crustaceans which provides the food resource for most of the wintering waterfowl present in this SPA.

Dundalk Bay is an important site for a range of bird species, which are of special conservation interest. These special conservation interest and their conservation objectives are outlined in Table 2-3.

The Natura 2000 – Standard Data Form identified several threats, pressures, and activities with negative impacts as well as with positive impacts on the site, see Table 2-4 for details.

**Table 2-3: Special Conservation Objectives for Lough Mask SPA***

| Code | Description | Conservation Objectives |
|---|---|---|
| A054 | Pintail (*Anas acuta*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A052 | Teal (*Anas crecca*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A053 | Mallard (*Anas platyrhynchos*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A043 | Greylag Goose (*Anser answer*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A046 | Light-bellied Brent Goose (*Branta bernicla hrota*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A149 | Dunlin (*Calidris alpina*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A143 | Knot (*Calidris canutus*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A137 | Ringed Plover (*Charadrius hiaticula*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A130 | Oystercatcher (*Haematopus ostralegus*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A182 | Common Gull *(Larus canus*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |

| Code | Description | Conservation Objectives |
|---|---|---|
| A179 | Black-headed Gull (*Chroicocephalus ridibundus*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A157 | Bar-tailed Godwit (*Limosa lapponica*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A156 | Black-tailed Godwit (*Limosa limosa*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A069 | Red-breasted Merganser *(Mergus serrator*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A160 | Curlew (*Numenius arquata*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A140 | Golden Plover (*Pluvialis apricaria*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A141 | Grey Plover (*Pluvialis squatarola*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A005 | Great Crested Grebe (*Podiceps cristatus*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A048 | Shelduck (*Tadorna tadorna*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A162 | Redshank (*Tringa tetanus*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A142 | A142 Lapwing (*Vanellus vanellus*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A065 | Common Scoter (*Melanitta nigra*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A184 | Herring Gull (*Larus argentatus*) | To maintain or restore the favourable conservation condition of the bird species specifically with regard to population trend and distribution |
| A999 | Wetland and Waterbirds | To maintain the favourable conservation condition of the wetland habitat in Dundalk Bay SPA as a resource for the regularly occurring migratory waterbirds that utilise it. Specific regard is given to the habitat area for these birds, which should be stable. |

**Table 2-4: Threats, pressures and activities with impacts on Dundalk Bay SPA**

| Code | Threats & Pressures causing negative impact | Rank (high, medium, low) | Inside/ outside/ both |
|---|---|---|---|
| A04 | Grazing | L | i |
| A08 | Fertilisation | M | o |
| D01.02 | Roads, motorways | H | o |
| D03.02 | Shipping lanes | M | i |
| E01 | Urbanised areas, human habitation | H | o |
| E01.03 | Dispersed habitation | M | o |
| E02 | Industrial or commercial areas | M | o |
| E03 | Discharges | M | i |
| F02.03 | Leisure fishing | M | i |
| G01.01 | Nautical sports | M | i |
| G01.02 | Walking, horse-riding and non-motorised vehicles | M | i |
| I01 | Invasive non-native species | H | i |
| J02.11 | Siltation rate changes, dumping, depositing of dredged deposits | M | i |
| J02.12 | Dykes, embankments, artificial beaches, general | M | i |
| A04 | Grazing | L | i |
| D01.02 | Roads, motorways | H | o |
| D03.02 | Shipping lanes | M | i |
| E01.03 | Dispersed habitation | M | o |
| F02.03 | Leisure fishing | M | i |
| G01.01 | Nautical sports | M | i |

## 2.2 Project Characteristics

### 2.2.1 Purpose of/ Rationale for the Project

Monaghan County Council (MCC) is responsible for the remediation of Killycard Closed Landfill, located approximately 1.7km to the North-West of Castleblayney town on the R183 Castleblayney to Ballybay Regional Road in accordance with a Certificate of Authorisation (CoA) for the site (Licence number: H0364-01). The Environmental Protection Agency (EPA) issued the CoA to MCC.

Condition 3 of the CoA requires MCC to implement remediation works to this closed landfill in order to ensure *"..proper closure of the activity ensuring protection of the environment".*

The CoA is issued under Regulation 7(6) of the Waste Management (Certificate of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008.

### 2.2.2 The Site

Killycard Closed Landfill is located in the townland of Killycard, approximately 1.7km to the northwest of Castleblayney town on the R183 Castleblayney to Ballybay Regional Road.

The landfill is a closed landfill having accepted waste from approximately 1980 to 1987. Waste deposited at the site is understood to comprise of municipal solid waste to a maximum depth of 4.4m. The application site, as defined by the red line boundary in the accompanying planning drawings, is 2.25 hectares (ha) in size.

Commercial developments have been constructed on site including mushroom houses (now derelict) and an operational industrial building in the eastern portion of the site. The site is bounded to the southwest by the source stream for Corrinshigo Lough, to the west by Corrinshigo Lough itself and to the north by the lake outlet stream.

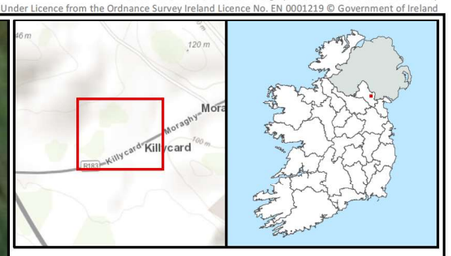
Construction of an engineered cap is required to isolate the waste body from rainfall inputs which contribute to leachate generation which has the potential to contaminate surface and groundwaters. The capping area footprint is 1.34 ha.

The western portion of the site, which is to be capped, consists of Improved agricultural grassland (GA1). This is dominated by rye grass and is heavily fertilised. The verge or bank of the mound is predominantly dry meadow grassy verge habitat (GS2). The remainder of the land to be capped was classified as buildings and artificial surfaces (BL3) with no plant species present. The site is bordered by Corrinshigo Lough to the west and by drains to the south and the north. The northern drain runs along the border of the Killycard townland and drains into the Drumillard Lough which is to the north-east of the site and at an in-stream distance of ca. 1.5 km. Scrubby and wooded areas are also adjacent to the west of the site. Neighbouring land uses include agricultural grassland, industrial and commercial units as well as residential properties.

The in-stream distance between the Killycard Closed landfill and Dundalk Bay is ca. 49 km.

Path: R:\Map Production\2022\P22-071\Workspaces\P22-071_GIS_Fig2-1_Location_of_Killycard_Historic_Landfill_A3.mxd






**Legend**

- Site Boundary
- Area to be Capped

**Habitats**

**Name, Description**

- BL3, Buildings and Artificial Surfaces
- GA1, Improved Agricultural Grassland
- GS2, Grassy Verge
- WS1, Scrub
- Drainage Ditches

N W E S

0 25 50 100 Meters

| | | | |
|---|---|---|---|
| **TITLE:** | Location of Killycard Historic Landfill | | |
| **PROJECT:** | Killycard | | |
| **FIGURE NO:** | 2-1 | | |
| **CLIENT:** | Monaghan County Council | | |
| **SCALE:** | 1:1000 | **REVISION:** | 0 |
| **DATE:** | 18/10/2022 | **PAGE SIZE:** | A3 |

FEHILY TIMONEY
Cork | Dublin | Carlow
www.fehilytimoney.ie

## 2.2.4 Project Description

### *2.2.4.1 Construction Phase*

The proposed remediation works will include:

- The development of a site access;
- The development of a temporary site compound and office area for the duration of the works;
- Invasive species management;
- Site clearance, including the removal of an existing gate, existing timber post and wire fencing and clearance of existing vegetation;
- Grading/profiling of the existing site area;
- Installation of an engineered landfill capping system covering an area of 1.34 ha;
- Installation of surface and subsurface surface water drainage infrastructures;
- Installation of passive landfill gas management infrastructure;
- The installation of stock proof fencing, and a new access gate on-site; and
- Landscaping of the final formation of the capping area using a high value multi species grass cover.

The following operational activities will be undertaken post the proposed development works:

- Ongoing environmental monitoring.
- Ongoing maintenance of engineered cap and drainage systems on-site.
- Ongoing management of Landfill Gas.

The works will take place in accordance with a Construction Environmental Management Plan (CEMP).

The construction period for the proposed development is estimated to be in the region of 5-7 months.

The hours of construction activity will avoid unsociable hours and will be agreed with the planning authority in advance of site start. It is anticipated that this will restrict working hours at the site during the construction phase to between to 07:00 to 19:00 Monday to Saturday inclusive. Work on Sundays or public holidays will only be conducted in exceptional circumstances and subject to prior notification insofar as possible with the local community.

#### *2.2.4.1.1 Development of a Site Access*

Access to the to the closed landfill site shall be via the R183. The Contractor will be required to implement a traffic management plan to manage safe access and egress of construction vehicles from the site.

The Proposed Traffic Management Plan is shown in a drawing enclosed with this planning application. See Drawing Reference: P22-071-0100-0007.

#### *2.2.4.1.2 Development of Temporary Site Compound and Office Area*

The temporary site compound shall comprise a materials storage area, site offices and a parking area. Material storage compound, parking area and site offices in the form of portacabins and site canteen/welfare facilities (Contractor and Employers Representatives) will be provided to the south-east of the site, outside the footprint of the capping area. The temporary site compound shall be mobilised within the existing concrete yard area.

Access to the compound shall be via the existing access to the site off the R183.

Waste from the welfare facilities (i.e., Portaloo(s)) will be stored temporarily prior to disposal at a licensed wastewater treatment plant.

Mobile on-demand fuelling will be utilised for refuelling plant. Mobile refuelling vehicles will be equipped with spill pads and spill kits.

Generators will be used on-site for power supply during the temporary works. Water will be provided via water tankers.

Periodic road sweeping will be required where necessary.

#### *2.2.4.1.3 Invasive Species Management*

Invasive species have been identified at the site and management will form part of the works. The full extent of invasive species rhizomal growth including potential vector material will be removed and encapsulated in a dedicated geocomposite lined invasive species management cell. Upon completion of the excavation works the lined cell will be buried with a minimum 2.0m cover within a dedicated “fill” location within the waste body prior to placing the engineered cap.

Respective areas where invasive species are present will be isolated and have appropriate signage following the completion of the proposed works.

The Proposed Location for the Japanese Knotweed Burial is shown in a drawing enclosed with this planning application. See Drawing Reference: P22-071-0100-0008.

#### *2.2.4.1.4 Site Clearance*

Following completion of the invasive species management, vegetation on site will be cut back, mulched and re-spread on-site. Any vegetation left will be dispatched to an authorized waste facility for disposal.

A Site Clearance Plan enclosed with this application shows the areas of grass that will be cleared from the site. See Drawing Reference: P22-071-0100-0004.

#### *2.2.4.1.5 Grading/Profiling of Existing Profile*

The existing waste body was covered following cessation of waste filling with an intermediate soil cap.

The existing finished surface will require re-profiling to facilitate:

- Surface and sub surface drainage.
- Safe execution of the site remediation works.
- Safe access for maintenance of the cap.

Re-profiling will principally involve the (shallow) cutting of material at local high spots. These "cut" materials will be used as "fill" in local depressions. All cut and fill works will be carried out within the site boundary.

Thereafter imported granular "dust" material 50mm to 100mm thick will be used to provide formation for the engineered cap. The re-profiled surface will provide the foundation for the engineered landfill cap. See Drawing Reference: P22-071-0300-0001.

#### *2.2.4.1.6 Installation of Engineered Landfill Capping System*

The engineered landfill cap "barrier" system will:

- Cover an area of approximately 13,400m².
- Isolate the waste body from rainfall inputs which might otherwise produce leachate. This will protect underlying groundwater and adjacent surface waters.
- Minimise the potential for uncontrolled landfill gas migration to the atmosphere or adjacent lands.
- Provide a physical barrier between the finished surface and buried wastes.
- Facilitate controlled discharge of surface water runoff and sub surface drainage flows into the receiving surface waters.

The cap shall comprise of the following:

- Vertical wells.
- A passive below liner landfill gas venting system.
- A LLDPE barrier to isolate the waste body from rainfall inputs and prevent uncontrolled fugitive gas emissions from the waste body.
- Over liner gas management system.
- A subsurface drainage system.
- A surface drainage system.
- A subsoil layer average thickness 800-850 mm.
- A topsoil layer average thickness 150-200 mm barrier.

The Proposed Landfill Capping Area is shown in a drawing enclosed with this planning application. See Drawing Reference: P22-071-0300-0002.

<u>Below Liner Landfill Gas System</u>

Currently landfill gas as may be present vents gas to atmosphere via diffuse surface emissions. Once the LLDPE barrier is installed this preferential pathway to atmosphere will be isolated.

Below the LLDPE barrier a gas collection geocomposite and pipework system will be constructed to collect and direct landfill gas as may be present to the proposed passive ventilation system.

The below liner gas collection geocomposite is a cuspated synthetic product that is rolled out above the granular "dust" material overlying the re-profiled intermediate cap which overlies the waste. The gas collection geocomposite forms a "cavity" to intercept gas emissions from the underlying body.

Gas collection pipework will be slotted and laid in gravel surround below the gas collection geocomposite and it will facilitate collection of landfill gas; and soakage, if required, of condensate or other as may collect in pipework.

The Proposed Under Liner Gas Collection System has been enclosed with this planning application (Drawing Reference: P22-071-0700-0001.

LLDPE Barrier

The LLDPE barrier will be a 1.0 mm thick "plastic" sheet that is impermeable to both water and gas. It prevents gas escaping into the overlying soils and stops water from rainfall entering the underlying waste body.

The LLDPE sheets will be welded at joints and will terminate in a vertical cut-off trench about the perimeter of the site.

Subsurface Drainage

The over liner sub surface drainage collection geocomposite is a cuspated synthetic product that is rolled out above the LLDPE barrier. It forms a "cavity" to intercept rainfall inputs into the cap. Subsurface drainage flows from the drainage geocomposite are transferred via a supporting pipework system to a surface drainage outfall manhole and outlet at Corrinshigo Lough.

Drawings showing the proposed surface and subsurface drainage system is enclosed with this planning application. See Drawing Reference: P22-071-0500-0001, P22-071-0500-0002 and P22-071-0500-0003.

Surface Drainage

French drains around the capping perimeter will collect and direct surface water flows to the subsurface drainage network ultimately outfalling at the same location. French drains will be provided with HDPE SDR 17 slotted pipes.

A drawing showing the proposed surface and subsurface drainage system is enclosed with this planning application. See Drawing Reference: P22-071-0500-0001.

Subsoil Layer

Suitably sourced subsoils will then be imported to the site and placed atop of the sub surface drainage geocomposite and /or geogrid on side slopes. The subsoil layer will generally be 800-850mm deep.

The purpose of the subsoil layer will be to protect the synthetic geocomposite materials and to support landscaping.

Topsoil Layer

Suitable sourced topsoil will be placed atop the subsoil. The topsoil will have no stones greater than 50mm diameter. Stones greater than 50mm will be removed by a proprietary stone picker or similar prior to seeding.

The topsoil layer will be 150-200 mm deep.

Recovered stones will be reused on site as fill to sub surface drains.

#### *2.2.4.1.7 Temporary Works*

Leachate Management

Storage tanks will be provided for the safe storage of any leachate arisings during the construction works. Leachate arising during construction works will be disposed at a licensed wastewater treatment plant.

Daily Cover of Exposed Waste

In the unlikely event that waste is exposed it will be covered with soil or similar approved at the close of each working day.

Suspended Solid Management

Suspended solids will be prevented from entering watercourses by installing silt fences around the site perimeter and around stockpiles.

Odour Management

Odour management is not expected to be an issue due to the age of the interred waste is older than 25 years. The proposed works have been designed to reduce the risk of exposing waste.

In the event that it is exposed, waste will be covered up at the end of each working day.

Traffic Management

The Contractor will be required to implement a traffic management plan to manage safe access and egress of construction vehicles from the site. The Proposed Draft Traffic Management Plan is shown in a drawing enclosed with this planning application. See Drawing Reference: P22-071-0100-0007.

Stock Proof Fencing

Clearance of shrub on the perimeter will result in damage to exiting stock proof fencing. Following placement of the cap a replacement perimeter stock proof fence 1.3m high will be installed around the landfill footprint.

The existing access gate to the site will be replaced. Redundant fences and gates will be transported and disposed of offsite in a licenced facility.

#### *2.2.4.1.8 Permanent Works: Management and Monitoring Infrastructure*

Installation of Passive Landfill Gas Management Infrastructure

The development will include the installation of a landfill gas ventilation trench along the entire eastern boundary of the site. The ventilation trench will mitigate the risk of landfill gas migration to the neighbouring commercial properties. The ventilation trench will be constructed by excavating a trench to the depth of the waste body and backfilling with rounded drainage stone. Vertical standpipes will be installed at 20m centres along the trench to provide a pathway for landfill gas to vent to the atmosphere. The standpipes shall be fitted with rotating stainless-steel cowls and a carbon filter pack. The rotation of the cowls (by wind power) will induce a negative pressure or suction within the pipe network aiding ventilation. The carbon filter pack will neutralise any potential odours prior to exhaust to atmosphere.

See Drawing Reference: P22-071-0700-000 for proposed location and details.

Installation of Additional Environmental Monitoring Infrastructure

The following additional monitoring infrastructure will be installed as part of the development:

- Perimeter Landfill Gas Migration Monitoring Boreholes.
- Continuous Emissions Monitoring Infrastructure.
- Additional Groundwater Monitoring Location.
- Additional Leachate Monitoring Locations.

Seven new perimeter landfill gas monitoring boreholes (LFGM1 – LFGM7) shall be installed at maximum 50m centres maximum along the eastern edge of the capping boundary and southern site boundary. The monitoring points shall be installed to detect the presence of otherwise of migrating landfill gas.

Continuous gas monitoring infrastructure shall be installed within the two commercial buildings to the east of the capping boundary. The monitoring infrastructure will consist of a small wall mounted control panel and a number of isolated continuous gas monitoring sensors.

Three additional groundwater monitoring (GW04 – GW06) will be installed to monitor groundwater. Three existing wells (GW01 – GW03) as are present within the waste footprint will be retained and incorporated into the cap to support future environmental monitoring as may be required by the EPA.

Arisings from all borehole installations will be managed on site below the LLDPE barrier and gas collection geocomposite.

Monitoring wells will have a chamber and a cover atop the wells at the same elevation as the surrounding ground. The wells will have monitoring ports to support monitoring of landfill gas quality and or groundwater quality as may be required.

A drawing showing all existing and proposed monitoring wells locations is enclosed with this planning application, see Drawing Reference: P22-071-0100-0005.

Grass Cover/Landscaping for Pasture

Post capping and placement of the subsoils and topsoil layers it is proposed to landscape the site using a high value multi species grass cover. Grass is used to prevent erosion of the soils and to provide an attractive final visual appearance for the site.

#### *2.2.4.2 Operational/Post Construction Phase*

The Operational/Post Construction works will include:

- Ongoing environmental monitoring.
- Ongoing maintenance of engineered cap and drainage systems on-site.
- Ongoing management of Landfill Gas.

##### *2.2.4.2.1 Environmental Monitoring*

Monitoring staff will be required to access installed infrastructure (wells and surface water monitoring locations) to take samples and/or monitor gas quality during the aftercare period post construction.

##### *2.2.4.2.2 Maintenance of Cap, Passive Landfill Gas Management Infrastructure **and Surface Drainage***

The grass cover will require maintenance. This may be provided either by light animal grazing and/or by mowing. Fertiliser supplements may also be required periodically during the aftercare period subject to stocking density.

Landfill gas ventilation pipes may require periodic inspection and replacement of carbon filter media for the control of odours.

Sub surface drainage pipes may require periodic inspection and jetting of pipes if they become compromised with roots or silt.

#### *2.2.4.2.3 Management of Landfill Gas*

Post completion of the works and installation of the proposed landfill gas management infrastructure, there will be an on-going requirement to:

- Monitor landfill gas within and external to the facility at dedicated periodic and continuous monitoring locations.

## 2.3 Relationship Between the Project and European Sites

As identified by the EPA in their screening for Appropriate Assessment, there is a hydrological connection between the closed landfill at Killycard and the Dundalk Bay SAC and SPA. This connectivity is set out hereunder.

The Closed Landfill is located within the Newry, Fane, Glyde and Dee catchment[2], sub catchment Fane_SC_010[3] (Code: 06_8[4]). The site is adjacent to a drain which flows from the Corrinshigo Lough into the Drumillard Lough (segment code: 06_231). This Lough is drained by the Fane (EPA code: 06F01) which flows into Lough Muckno (segment code: 06_56). The Fane continues on not the south-east after Lough Muckno and flows into Lough Ross (segment code: 06_GBNI3NB0020_1). Upon leaving Lough Ross, the Fane continues to flow in a south-eastern direction until it drains into the Dundalk Bay, which is ca. 49 km downstream from the closed landfill site.

As such a hydrological connection exists between the Killycard closed landfill and the Dundalk Bay SAC and SPA. Any impacts on water quality are unlikely to cause significant effects on the conservation interests of the Dundalk Bay SAC and SPA; the nature, scale and timeline of the potential effects from the proposed remediation works combined with the substantial indirect hydrological pathway – ensure that there are significant dilution effects to remediate any potential effects to the European sites. Nonetheless, the EPA have identified the need for mitigation measures in this regard – thus following the precautionary principal further considerations are made.

### 2.3.1 Existing Effects of the Closed Landfill on Water Quality

#### *2.3.1.1 Surface Water Sampling*

Surface water quality monitoring locations were selected upstream and downstream of the closed landfill site. SW1 was selected as the sampling location upstream and samples the Corrinshigo Lough to the west of the landfill. SW2 is located along the northern boundary of the landfill and samples from a drainage channel downstream of the landfill. The sampling took place in two rounds and were carried out on the 2nd and 9th of October 2018. The results of the surface water sampling have been assessed against the Maximum Admissible Concentration (MAC) and the Environmental Quality Standard (EQS) for Surface Waters as set out in the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (as amended).

[2] Name; WFD Catchments: EPA Maps (mapviewer); https://gis.epa.ie/EPAMaps/ viewed 15/03/22

[3] Name; WFD Sub Catchment: EPA Maps (mapviewer); https://gis.epa.ie/EPAMaps/ viewed 15/03/22

[4] Sub catchment code; WFD Sub Catchment: EPA Maps (mapviewer); https://gis.epa.ie/EPAMaps/ viewed 15/03/22

The results of the surface water monitoring from SW1 and SW2 show 2 No. exceedances of the EQS (2009) guideline limit values for ammonia and BOD. Results from sampling location SW1 detected an ammonia and BOD concentrations of 0.318 mg/l and 3.73 mg/l respectively. Given that the determined groundwater flow direction is west-south-west from the waste body, the detected ammonia and BOD at these levels may be evidence of impact from the landfill.

The presence of ammonia and BOD at these levels may also be an indication of slurry spreading runoff from the surrounding agricultural fields in the area, rather than direct impact from the landfill. Surface water runoff from the steep agricultural fields north of the landfill feed into Corrinshigo Lough and may be deteriorating water quality in the lake.

The remaining results of the surface water laboratory analysis as presented in Table 2.5, when assessed against the MAC (1989) and EQS (2009) quality standards were found to be below the guideline values in all assessments:

**Table 2-5: Surface water sampling**

| Parameter | Units | MAC [1]/EQS [2] | 2nd – 9th October 2018 | |
|---|---|---|---|---|
| | | | SW1 Upstream | SW2 Downstream |
| pH (Laboratory) | pH Units | 6.0<pH<9.0[2] | 7.84 | 7.43 |
| Dissolved Oxygen | mg/l | <9 – 6 [1] | 9.9 | 9.04 |
| Conductivity | µS/cm | 1 [1] | 0.421 | 0.434 |
| BOD, unfiltered | mg/l | ≤2.6 (95%ile)[2] | **3.73** | <1 |
| COD, unfiltered | mg/l | 40 [1] | 35.5 | 20.8 |
| Sulphate | mg/l | 200 [1] | 7.63 | 7.40 |
| Chloride | mg/l | 250 [1] | 46.9 | 46.6 |
| Ammoniacal Nitrogen as N | mg/l | ≤0.140(95%ile) [2] | **0.318** | <0.140 |
| Potassium | mg/l | -- | 5.02 | 5.07 |
| Sodium | mg/l | 200 [1] | 33.4 | 30.4 |

**Notes:**

[1] Maximum Admissible Concentration (MAC), as classified by European Communities (Quality of Surface Water intended for abstraction of drinking water) Regulations 1989 (S.I No. 294 of 1989)

[2] Environmental Quality Standard (EQS), European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I No. 272 of 2009)

* Items shaded in orange are in exceedance of the 2009 EQS Regulations.

#### *2.3.1.2 Surface Water Quality*

The results of the surface water monitoring from SW1 and SW2 show 2 No. exceedances of the EQS (2009) guideline limit values for ammonia and BOD. Results from sampling location SW1 detected an ammonia and BOD concentrations of 0.318 mg/l and 3.73 mg/l respectively. Given that the determined groundwater flow direction is west-south-west from the waste body, the detected ammonia and BOD at these levels may be evidence of impact from the landfill.

The presence of ammonia and BOD at these levels may also be an indication of slurry spreading runoff from the surrounding agricultural fields in the area, rather than direct impact from the landfill. Surface water runoff from the steep agricultural fields north of the landfill feed into Corrinshigo Lough and may be deteriorating water quality in the lake.

The remaining results of the surface water laboratory analysis as presented in Table 2-5, when assessed against the MAC (1989) and EQS (2009) quality standards were found to be below the guideline values in all assessments.

#### *2.3.1.3 Groundwater*

The Closed Landfill is located within the area of the Louth Groundwater body (Code: GWB No. IEGBNI_NB_G_019). Groundwater WFD status has been defined as 'good'.

Groundwater monitoring was undertaken from three boreholes (GW01, GW02, GW03) on the 2nd and 9th of October 2018 the boreholes were drilled to a total depth of 10.0m bgl at the site. The boreholes were drilled for installing groundwater monitoring installations.

The results of groundwater samples analysed from the 3 No. boreholes (GW01 – GW03) at the site have been assessed against the EPAs Interim Guideline Values (IGVs) and the European Groundwater Regulations (2010) assessment criteria. A summary of the maximum results reported for each parameter over two monitoring rounds undertaken on the 2nd and 9th October is outlined in Table 2-7.

The results of the groundwater monitoring from GW01 – GW03 have reported several exceedances of the IGVs and European Groundwater limit values.

Samples recovered monitoring wells GW01, GW02 and GW03 reported elevated ammonia concentrations of 19.2 mg/l, 1.13 mg/l and 4.1 mg/l respectively, which exceed guideline threshold values. Given that all monitoring wells were installed within the waste body and screened in bedrock, it is considered that the landfill is contributing to a deterioration in groundwater quality locally.

The presence of peat underlying the waste body across the site may also be contributing to the elevated ammonia concentrations detected in the groundwater locally. The combined presence of elevated ammonia and coliform concentrations in all monitoring wells GW01 to GW03 may also be evidence of localised contamination due to agricultural land spreading or poorly functioning septic tanks in the area.

Based on the presence of elevated ammonia concentrations typical of landfill leachate, the shallow soil cap is not considered suitable at preventing rainfall infiltration into the waste body. The groundwater table also appears to be intersecting the waste body and contributing to leachate migration from the landfill.

The detection of elevated lead concentrations of 0.168 mg/l and 0.0743 mg/l at monitoring locations GW02 and GW03 and slightly elevated nickel concentration at GW01 are considered to be evidence of the localised groundwater hydrochemistry based on the presence of historical lead mining north of Castleblayney.

Reference is made to several small metallic mineral deposits, most notably lead and zinc, located near Castleblayney as detailed in the EPA's Historic Mine Sites - Inventory and Risk Classification (2009). Despite the detection of lead in the localised groundwater, the elevated lead concentrations at GW02 and GW03 may also be attributable to the landfill.

According to the EPA publication *'Assessing and Developing Natural Background Levels for Chemical Parameters in Irish Groundwater'*, barium concentrations have been recorded throughout Ireland over four orders of magnitude and appears to be controlled by both lithology and location. The study shows that high concentrations tend to be associated with the Dinantian Sandstones and shales derived from those parent materials, which the Killycard site is founded on. Similar to the naturally occurring lead levels in groundwater, the barium concentration detected at monitoring locations GW01 and GW03 are considered to be evidence of the localised groundwater hydrochemistry.

The slightly elevated manganese concentrations ranging from 0.172 mg/l to 1.92 mg/l across all monitoring wells are considered to be typical of the local bedrock hydrochemistry.

The iron concentration of 6.22 mg/l detected in upgradient borehole GW01 is 30-times the groundwater threshold value and is likely a result of leachate from the waste body. The elevated arsenic concentration of 0.0147 mg/l at GW01 is twice the GTV and may also be an indication of leachate migration from the waste body to this location.

The elevated potassium concentrations of 15.6 mg/l detected in upgradient borehole GW01 exceeds the guideline threshold value. The significant concentration difference between the upgradient and downgradient monitoring locations suggests that the waste body is contributing to the increased potassium concentrations in groundwater quality at this location.

The results of groundwater monitoring have returned one slight exceedance of the groundwater threshold value for mineral oil at monitoring location GW02. Mineral oil was detected at a concentration of 0.181 mg/l which exceeds the guideline threshold value of 0.01 mg/l.

Elevated alkalinity (CaCO3) is consistent across all three sampling locations. The alkaline groundwater quality within the range 305 mg/l to 405 mg/l is considered to be a factor of local bedrock hydrochemistry.

The results of groundwater monitoring when assessed against typical leachate constituents (List 1 and List 2 substances – SVOCs, pesticides, herbicides, organics) shows all results are below the laboratory limit of detection in all assessments across all three sampling locations.

In summary, based on the presence of elevated ammonia, coliform concentration, arsenic and potassium, it can be assumed that the landfill waste body intercepts with the groundwater body and that the current soil cover is not sufficient to limit leachate production and prevent ground water contamination.

## Table 2-6: Groundwater Sampling Results

| Parameter | Units | EPA IGV Standards [1] | S.I. No. 9 of 2016 Standards [2] | GW01 | GW02 | GW03 |
|---|---|---|---|---|---|---|
| | | | | US | CG | DS |
| pH | pH units | **6.5 - 9.5** | -- | 7.66 | 7.68 | 7.59 |
| Conductivity | mS/cm | **1** | **1.875** | 0.736 | 0.473 | 0.708 |
| Dissolved Oxygen | mg/l | **no abnormal change** | -- | 7.76 | 6.01 | 8.34 |
| Alkalinity as CaCO3 | mg/l | **200** | -- | **377** | **305** | **405** |
| Ammoniacal Nitrogen as N | mg/l | **0.15** | **0.175** | **19.2** | **1.13** | **4.1** |
| Total Coliforms | cfu/100ml | **0** | -- | **1990** | **549** | **2420** |
| Nitrite as N | mg/l | -- | **0.375** | <0.0152 | <0.0152 | <0.0152 |
| BOD | mg/l | -- | -- | 2.7 | 2.04 | <1 |
| COD | mg/l | -- | -- | 48.7 | 115 | 9.93 |
| Sodium | mg/l | **150** | **150** | 59.4 | 17.1 | 64.8 |
| Sulphate as SO4 | mg/l | **200** | **250** | 49.7 | 4.4 | 15.3 |
| Total Oxidised Nitrogen | mg/l | -- | -- | 0.119 | 0.203 | 0.111 |
| Total Organic Carbon | mg/l | -- | -- | 12.3 | 4.66 | 3.15 |
| Arsenic | mg/l | **0.01** | **0.0075** | **0.0147** | 0.00367 | 0.00215 |
| Barium | mg/l | **0.1** | -- | **0.294** | 0.0761 | **0.119** |
| Boron | mg/l | **1.0** | **0.75** | 0.106 | 0.0283 | 0.0161 |
| Cadmium | mg/l | **0.005** | **0.005** | <0.0008 | <0.0008 | <0.0008 |
| Calcium | mg/l | **200** | -- | 115 | 71.2 | 105 |
| Chloride | mg/l | **30** | **187.5** | 42.3 | 15.2 | 15.5 |
| Chromium | mg/l | **0.03** | **0.05** | <0.001 | <0.001 | <0.001 |
| Copper | mg/l | **0.2** | **2** | 0.00077 | 0.00148 | 0.00236 |
| Cyanide | mg/l | **0.01** | **0.0375** | <0.01 | <0.01 | <0.01 |
| Fluoride | mg/l | **1.0** | **0.8** | <0.5 | 1.04 | <0.5 |
| Iron | mg/l | **0.2** | -- | **6.22** | 0.0546 | 0.0936 |
| Lead | mg/l | **0.01** | **0.025** | 0.00052 | **0.168** | **0.0743** |
| Magnesium | mg/l | **50** | -- | 20.2 | 21.5 | 21 |
| Manganese | mg/l | **0.05** | -- | **1.92** | **0.172** | **0.36** |
| Mercury | mg/l | **0.001** | **0.001** | <0.00001 | <0.00001 | <0.00001 |
| Nickel | mg/l | **0.02** | **0.02** | **0.0228** | 0.00452 | 0.00579 |
| Phosphorus (ortho as PO4) | mg/l | **0.03** | **0.035** | <0.05 | <0.05 | <0.05 |
| Potassium | mg/l | **5** | -- | **15.6** | 3.49 | 3.59 |
| Uranium | mg/l | **0.009** | -- | 0.0017 | <0.001 | 0.0053 |
| Zinc | mg/l | **0.1** | -- | 0.0387 | 0.0683 | 0.025 |
| Mineral Oil | mg/l | -- | **0.01** | <0.1 | **0.181** | <0.1 |

| Parameter | Units | EPA IGV Standards [1] | S.I. No. 9 of 2016 Standards [2] | GW01 | GW02 | GW03 |
|---|---|---|---|---|---|---|
| | | | | US | CG | DS |
| MTBE | mg/l | -- | -- | <0.001 | <0.001 | <0.001 |
| **Semi-Volatile Organic Compounds (SVOCs)** | | | | | | |
| 1,2,4-Trichlorobenzene | µg/l | **0.40** | -- | <0.01 | <0.01 | <0.01 |
| 2,4,6-Trichlorophenol | µg/l | **200** | -- | <10 | <10 | <10 |
| 2-Chlorophenol | µg/l | **200** | -- | <10 | <10 | <10 |
| Benzo(k)fluoranthene | µg/l | **0.05** | -- | <0.01 | <0.01 | <0.01 |
| Hexachlorobenzene | µg/l | **0.03** | -- | <0.01 | <0.01 | <0.01 |
| Hexachlorobutadiene | µg/l | **0.1** | -- | <0.01 | <0.01 | <0.01 |
| Nitrobenzene | µg/l | **10** | -- | <1 | <1 | <1 |
| n-Nitroso-n-dipropylamine | µg/l | -- | -- | <1 | <1 | <1 |
| Pentachlorophenol | µg/l | **2** | -- | <0.01 | <0.01 | <0.01 |
| Phenol | µg/l | **0.5** | -- | <0.01 | <0.01 | <0.01 |
| **Combined Pesticides / Herbicides** | | | | | | |
| Aldrin | µg/l | **0.01** | -- | <0.01 | <0.01 | <0.01 |
| Atrazine | µg/l | -- | **0.075** | <0.01 | <0.01 | <0.01 |
| Chlorfenvinphos | µg/l | **5** | -- | <1 | <1 | <1 |
| Dichlorvos | µg/l | **0.001** | -- | <0.01 | <0.01 | <0.01 |
| Dieldrin | µg/l | -- | **0.075** | <0.01 | <0.01 | <0.01 |
| Permethrin I | µg/l | **20** | -- | <1 | <1 | <1 |
| Permethrin II | µg/l | **20** | -- | <1 | <1 | <1 |
| Simazine | µg/l | -- | **0.075** | <0.01 | <0.01 | <0.01 |
| 4,4 – DDT | µg/l | -- | **0.075** | <0.01 | <0.01 | <0.01 |
| **Organics** | | | | | | |
| Benzo(alpha)pyrene | µg/l | -- | **7.5** | <1 | <1 | <1 |
| Vinyl Chloride | µg/l | -- | **0.375** | <0.01 | <0.01 | <0.01 |
| Benzene | µg/l | -- | **0.75** | <0.01 | <0.01 | <0.01 |
| Total Trichloroethane | µg/l | -- | **7.5** | <1 | <1 | <1 |
| Total Tetrachloroethene | µg/l | -- | **7.5** | <1 | <1 | <1 |
| 1,2-Dichloroethane | µg/l | -- | **2.25** | <1 | <1 | <1 |

[1] EPA - Towards Setting Guideline Values for the Protection of Groundwater in Ireland (2003) – Interim Guideline Values.

[2] European Communities Environmental Objectives (Groundwater) Regulations (2016) – SI No. 366 of 2016.

* Items shaded in **bold** are in exceedance of both EPA IGV Standards.

* Items shaded in **orange** are in exceedance of the Drinking Water Regulations.

# 3. IMPLICATIONS OF THE PROJECT IN VIEW OF THE SITE'S CONSERVATION OBJECTIVES

## 3.1 Impact Prediction: Source-Pathway-Receptor Assessment

The S-P-R model is a standard tool in environmental assessment to determine links between sensitive features and sources of impacts. For an effect to occur, all three elements of this mechanism must be in place. The absence of one of the elements of the mechanism means there is no likelihood for the effect to occur e.g., if there is no ecological pathway or functional link between the proposed development and the European site, there is no potential for impact and as such no potential for an effect.

An impact may occur without having an effect. An impact is essentially the 'source' in the S-P-R assessment. It is the biophysical change caused to the environment by the project e.g., increase in sediment runoff due to ground disturbance. For the impact to have an effect on site integrity, the Qualifying Interests / Special conservation objectives of the European site must be sensitive to the biophysical change.

The conservation objectives of the Dundalk Bay SAC and SPA which might be affected by the project are identified through the S-P-R process as set out in Table 3.1.

## Table 3-1: Source-Pathway-Receptor Assessment for Killycard Closed Landfill

| Source (Potential Impacts) | Pathway | Potential effect(s) | Qualifying features (QI's and SCI's) further considered for negative effects |
|---|---|---|---|
| **Land-take & Scale of Development & physical change to the environment.**<br>Site clearance, remediation and removal of invasive species will result in localised areas of terrestrial habitat loss. | There will be no land take from, or physical change to, any European sites.<br>The Closed Landfill is outside the core foraging range for the SCI species of Dundalk Bay SPA. (Johnson, Schmidt, and Taylor, 2014; Scottish Natural Heritage, 2016). | None | None |
| **Resource Requirements**<br>There will be no resources required from European Sites. | None | None | None |
| **Wastes and Residues**<br>The contractor compound is to have mess facilities, toilet, and waste receptacles. All site compound waste is to be stored and disposed of by the contractor to a licensed facility. Therefore, there is no potential impact from waste emissions.<br>Leachate is currently generated at the closed landfill. Remediation works will restrict the production (from rainwater) and free movement of leachate | None | None | None |

| Source (Potential Impacts) | Pathway | Potential effect(s) | Qualifying features (QI's and SCI's) further considered for negative effects |
|---|---|---|---|
| into groundwater limiting any continued and future contribution of leachate to the underlying aquifer. | | | |
| **Emissions to Air**<br>The Institute of Air Quality Management 'Guidance on the Assessment of dust from demolition and construction' (Holman et al., 2014) identifies the likely spatial scale of dust effect relative to the size of a development. The landfill remediation project would be considered a medium scale earthworks project. As such the zone of potential dust effects are defined as 500m from the project boundary. | The conservation interests of the European sites are not located within the potential zone of dust effects. | None | None |
| **Emissions to Water during Remediation (Surface Water)**<br>Silt will be produced during site clearance, reprofiling of 13,400m$^3$ of the existing capping as well as the placement of subsoil and topsoil, and installation of drainage and infrastructure. Hazardous materials such as concrete, | The Closed Landfill has an indirect hydrological pathway to Dundalk Bay via a drain, which enters the River Fane sub-catchment, which also flows through Drumillard Lough, Lough Muckno and Lough Ross, covering a distance of ca. 49km before entering Dundalk Bay. | Given that the impact pathway is a hydrological one via surface waters, the qualifying interests of the Dundalk Bay SAC and SPA which may be vulnerable to such impacts are those reliant on the maintenance or restoration of surface water quality.<br>There is a very low possibility of sedimentation occurring in Dundalk Bay due to the proposed rehabilitation works given the hydrological distance (ca. 49km) between the proposed works and Dundalk Bay. Additionally, the catchment area of the Newry, Fane, Glyde and Dee rivers is 2,125 km$^2$, while the footprint of the landfill capping area is ca 13,400m$^2$ (This equates to ca. 0.00063% | Estuaries [1130]<br>Mudflats and sandflats not covered by seawater at low tide [1140]<br>*Salicornia* and other annuals colonizing mud and sand [1310] |

| Source (Potential Impacts) | Pathway | Potential effect(s) | Qualifying features (QI's and SCI's) further considered for negative effects |
|---|---|---|---|
| hydrocarbons from machinery and leachate from the waste body may also enter the surface water network during construction. All works related to the construction phase will be temporary (5-7 months) and the operational phase will be inert in terms of sedimentation and hazardous materials. | | of the catchment area. Temporary disturbance to soil within 0.00063% of the river catchment would not result in extensive sedimentation of the watercourse, or of the downstream Dundalk Bay.<br>The scale and nature of the works introduce potential sources for effects to local waterways through hydrological interactions. The effects identified relate to the construction phase only – as the operational phase effects will be consistent with the receiving environment and existing land uses within the area. The hydrological pathway introduces substantial dilution effects – however, following the precautionary principal mitigation measures have been developed to avoid and minimise associated effects. | Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]<br>Mediterranean salt meadows (*Juncetalia maritimi*) [1410]<br>Wetland & Waterbirds [A999] (including all bird species listed in Table 2-3). |
| **Emissions to Water from Landfill Waste (Groundwater)**<br>The Closed Landfill is producing leachate which is freely entering groundwater. Remediation works will restrict the production (from rainwater) and free movement of leachate into groundwater limiting any continued and future contribution of leachate to the underlying aquifer. Works will occur above inferred waste only; the contamination of groundwater will not occur. | None | None | None |

| Source (Potential Impacts) | Pathway | Potential effect(s) | Qualifying features (QI's and SCI's) further considered for negative effects |
|---|---|---|---|
| **Transportation Requirements**<br>No potential impacts are identified because of transportation requirements.<br>The increase in traffic volumes fall below the screening criteria set out in the UK Design Manual for Roads and Bridges guidance. The guidance states that road links meeting one or more of the following criteria can be defined as being 'affected' by a project and should be included in the local air quality assessment:<br>• Road alignment change of 5 metres or more.<br>• Daily traffic flow changes by 1,000 AADT or more.<br>• HGVs flows change by 200 vehicles per day or more.<br>• Daily average speed changes by 10 km/h or more<br>• Peak hour speed changes by 20 km/h or more. | None | None | None |

| Source (Potential Impacts) | Pathway | Potential effect(s) | Qualifying features (QI's and SCI's) further considered for negative effects |
|---|---|---|---|
| **Duration of Construction**[5] Construction will occur over a period of 5-7 months. | The Closed Landfill is outside the core foraging range for the SCI species of Lough Mask SPA. (Johnson, Schmidt, and Taylor, 2014; Scottish Natural Heritage, 2016). | None | None. |

[5] In general, the duration of all sources for potential effects (outlined above) are considered throughout the assessment process.

## 3.2 Potential In-combination Effects with Other Plans and Projects

Article 6(3) of the Habitats Directive requires that:

> '*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.'.*

It is therefore required that the potential effects of the proposed remediation works are considered in combination with any other relevant plans or projects.

The potential effects of the proposed project are identified as temporary hydrological interactions such as increased dust, sedimentation and/or run off of hazardous materials etc. Plans and projects limited to an area within a 1km radius around the site (listed in Appendix 2) which have been granted permission in the last 5 years have been assessed for potential for combined effects.

This radius of 1 km was chosen due to the small scale of the remediation works, zone of influence and impact.

The plans and projects assessed are deemed not to have potential for significant in combination effects on the Dundalk Bay SAC and SPA, on the basis of the small scale of the developments and temporary nature of the sedimentation and other pollution risks relative to the overall Dundalk Bay catchment, in stream distance and dilution effects.

# 4. POTENTIAL FOR ADVERSE EFFECTS ON EUROPEAN SITE INTEGRITY

The potential for the proposed remediation works and the post-remediated landfill to have an adverse effect on the integrity/conservation objectives of the Dundalk Bay SAC and SPA are discussed hereunder.

The assessment is made relative to the potential for the effects to impact the maintenance or restoration of the favourable conservation conditions of the relevant qualifying interests/special conservation interests of the European Sites. The impact under consideration relate to hydrological interactions with Dundalk Bay.

Favourable conservation status of the conservation interest habitats of the SAC are achieved when:

- Permanent habitat area is stable or increasing, subject to natural processes including erosion;
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future;
- the natural circulation of sediment and organic matter are maintained/restored without any physical obstruction;
- characteristic communities are maintained/restored subject to natural variation including succession;
- negative indicator and invasive species are stable, decreasing, not spreading to new areas and where they occur are not increasing at a rate more than 1% a year.

The favourable conservation status of SPA species is achieved when:

- long term population trend is stable or increasing;
- no long-term decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation;
- The permanent area occupied by the wetland habitat is stable and not significantly less than the areas of 8136, 4374 and 649 hectares respectively for subtidal, intertidal, and supratidal habitats, other than that occurring from natural patterns of variation.

There is a low possibility that sedimentation from the remediation works of the closed landfill at Killycard could have a negative effect on the conservation interests of the Dundalk Bay SAC and SPA. Due to the long in-stream distance between the site and the bay (ca 49 km) and the fact that the water passes through three lake systems on the way, this possibility is considered negligible. However, adopting the precautionary principle, mitigation measures are laid out in Section 5 below.

# 5. MITIGATION MEASURES

Mitigation is prescribed in accordance with the EPA draft guidance on EIAR (EPA, 2017) which requires mitigation by avoidance as a first approach. Where this is not feasible, measures to prevent impacts from giving rise to adverse effects should be adopted (e.g., design of bunded storage for chemicals). Where impacts cannot be avoided, mitigation by reduction of impact is required to limit the exposure of the receptor to an acceptable level (often achieved by interrupting the pathway between the source and receptor) such that adverse effects on site integrity of the European site does not occur.

The licence granted by the EPA had a set of conditions associated with it; this included measures intended to avoid effects to European sites. Namely condition 3 – Management and Monitoring which is presented in Appendix I. Key elements of this include 'remove waste deposited in the Corrinshigo Lough and Corrinshigo Stream' or install a vertical cut-off and leachate interception trench'. All conditions of the licence must be complied with and have been considered within the NIS assessment process.

Additional measures integrated into the proposed project are identified below:

**Table 5-1: Details of Mitigation Measures to be implemented for the proposed project.**

| No. | Mitigation Measure | How Measure Will Avoid/Reduce Adverse Effects | Implementation of Mitigation Measure and Level of Success | Monitoring Scheme to Prevent Mitigation Failure |
|---|---|---|---|---|
| **MITIGATION MEASURES TO BE IMPLEMENTED PRIOR TO CONSTRUCTION** | | | | |
| 1 | Toolbox Talk | Toolbox talks will be undertaken with construction staff on operation and maintenance of hydrological interaction control measures | Toolbox talks will be provided to all staff upon induction and at site meetings thereafter | The Project Manager will deliver talks as required. |
| **MITIGATION MEASURES TO BE IMPLEMENTED DURING CONSTRUCTION** | | | | |
| 2 | Compact surface of stored soils during reprofiling and capping works | Minimise generation of suspended solids, dust and any other contaminant mobilisation which may enter the nearby open watercourse. | Mitigation measures will be implemented by the Client through the Contractor awarded the contract to carry out remedial works in combination with competent supervisory staff overseeing the works. High probability of success. | A suitably qualified person will be appointed to ensure the effective operation and maintenance of mitigation measures during the construction process. |
| 3 | Weather forecasts will be reviewed daily, and earthworks will not be undertaken during periods of heavy rainfall. | Minimise generation of suspended solids, dust and any other contaminant mobilisation which may enter the | Mitigation measures will be implemented by the Client through the Contractor awarded the contract to carry out remedial works in combination with competent supervisory staff overseeing the | A suitably qualified person will be appointed to ensure the effective operation and maintenance of mitigation measures |

| No. | Mitigation Measure | How Measure Will Avoid/Reduce Adverse Effects | Implementation of Mitigation Measure and Level of Success | Monitoring Scheme to Prevent Mitigation Failure |
|---|---|---|---|---|
| | | nearby open water source | works. High probability of success. | during the construction process. |
| 4 | Minimise disturbance of the waste body and cover any exposed waste at the end of each working day. | Minimize risk of materials and substances from the waste body entering into adjacent waterbodies. | Mitigation measures will be implemented by the Client through the Contractor awarded the contract to carry out remedial works in combination with competent supervisory staff overseeing the works. High probability of success. | A suitably qualified person will be appointed to ensure the effective operation and maintenance of mitigation measures during the construction process. |
| 5 | Temporary silt fences will be installed along the site perimeter and around soil stockpiles. | Minimise ingress of suspended solids into adjacent waterbodies | Mitigation measures will be implemented by the Client through the Contractor awarded the contract to carry out remedial works in combination with competent supervisory staff overseeing the works. High probability of success. | A suitably qualified person will be appointed to ensure the effective operation and maintenance of mitigation measures during the construction process. |
| 6 | The access track will be resurfaced with Clause 804 with minimal fines. | Minimise generation of suspended solids | Mitigation measures will be implemented by the Client through the Contractor awarded the contract to carry out remedial works in combination with competent supervisory staff overseeing the works. High probability of success. | A suitably qualified person will be appointed to ensure the effective operation and maintenance of mitigation measures during the construction process. |
| 7 | Any diesel, fuel or hydraulic oils stored on site will be stored in bunded storage tanks – the bund area will have a volume of at least 110 % of the volume of such materials stored. | Reduce the risk of hydrocarbons reaching the waterways within the catchment of the proposed remediation works. | Mitigation measures will be implemented by the Client through the Contractor awarded the contract to carry out remedial works in combination with competent supervisory staff overseeing the works. High probability of success. | A suitably qualified person will be appointed to ensure the effective operation and maintenance of mitigation measures during the construction process. |

| No. | Mitigation Measure | How Measure Will Avoid/Reduce Adverse Effects | Implementation of Mitigation Measure and Level of Success | Monitoring Scheme to Prevent Mitigation Failure |
|---|---|---|---|---|
| 8 | Appropriate spill control equipment, such as oil soakage pads, will be kept within the construction area and in each item of plant to deal with any accidental spillage. | Reduce the risk of hydrocarbons reaching the waterways within the catchment of the proposed remediation works. | Mitigation measures will be implemented by the Client through the Contractor awarded the contract to carry out remedial works in combination with competent supervisory staff overseeing the works. High probability of success. | A suitably qualified person will be appointed to ensure the effective operation and maintenance of mitigation measures during the construction process. |
| 9 | Portaloos and/or containerised toilets and welfare units will be used to provide toilet facilities for site personnel. Sanitary waste will be removed from site by a licensed waste disposal contractor | Ensure that no sanitary waste enters the waterways within the catchment of the proposed remediation works. | Mitigation measures will be implemented by the Client through the Contractor awarded the contract to carry out remedial works in combination with competent supervisory staff overseeing the works. High probability of success. | A suitably qualified person will be appointed to ensure the effective operation and maintenance of mitigation measures during the construction process. |
| 10 | Daily road sweeping and maintenance will prevent soil from earthworks being deposited to the R183. | Minimise generation of suspended solids. | Mitigation measures will be implemented by the Client through the Contractor awarded the contract to carry out remedial works in combination with competent supervisory staff overseeing the works. High probability of success. | A suitably qualified person will be appointed to ensure the effective operation and maintenance of mitigation measures during the construction process. |
| **OPERATIONAL PHASE MITIGATION MEASURES** | | | | |
| 11 | The capped surface will be vegetated post-construction to prevent the generation of silted runoff. | Minimise generation of suspended solids | Mitigation measures will be inspected by a suitably qualified person appointed by the client. High probability of success | Inspection by a suitably qualified person appointed by the client. |
| 12 | The constructed surface drainage system will filter surface water before it enters the receiving watercourses. | Minimise generation of leachate | Mitigation measures will be inspected by a suitably qualified person appointed by the client. High probability of success | Inspection by a suitably qualified person appointed by the client. |

# 6. CONCLUSION

For the reasons set out in detail in this report, in the light of the best scientific knowledge in the field, all aspects of the proposed project which, by itself, or in combination with other plans or projects, which may affect the relevant European Sites have been considered.

The risks to the safeguarding and integrity of the QIs, SCIs and conservation objectives of the European sites have been addressed by the inclusion of mitigation measures that will prioritise the avoidance of effects in the first place and mitigate potential effects where these cannot be avoided. Having incorporated mitigation measures - it is concluded that the proposed remediation works will not give rise to any effect on the ecological integrity of any European sites, alone or in combination with any other plans, programmes, or projects[6]. This evaluation is made in view of the conservation objectives of the habitats or species for which these sites have been designated.

The report contains information that the competent authority, may consider in making its own complete, precise, and definitive findings and conclusions and upon which it can determine that all reasonable scientific doubt has been removed as to the effects of the proposed project on the integrity of the relevant European sites. It is important to note that the indirect hydrological pathway is over 49km long with no other ecological pathways identified for potential effects to European sites as the closest European site is 25.92km away from the proposed project.

In the light of the conclusions of the assessment which it shall conduct on the implications for the European sites concerned, the competent authority is enabled to ascertain that the proposed project will not have a significant adverse effect on the integrity of any of the European sites concerned (Dundalk Bay SAC and Dundalk Bay SPA).

[6] Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be:

a) no alternative solution available,

b) imperative reasons of overriding public interest for the plan to proceed; and

c) Adequate compensatory measures in place.

# 7. REFERENCES

Environment Heritage and Local Government (2010) *Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities*. Dublin.

European Commission (2000) *Communication from the Commission on the Precautionary Principle*. Luxembourg.

European Commission (2013) *Interpretation Manual of European Union Habitats. EUR 28*.

European Commission (2018) *Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC*. Brussels.

European Commission (2021) "Commission notice- Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC."

Fossitt, J.A. (2000) *A guide to habitats in Ireland*. Heritage Council/Chomhairle Oidhreachta.

Holloway, Steve. (1997) *Winter distribution and disturbance of wildfowl and waders on Findhorn Bay*. British Trust for Ornithology.

Holman, C. *et al.* (2014) *IAQM Guidance on the assessment of dust from demolition and construction*. London. Available at: www.iaqm.co.uk.

Johnson, W.P., Schmidt, P.M. and Taylor, D.P. (2014) "Foraging flight distances of wintering ducks and geese," *Avian Conservation and Ecology*, 9(2). doi:10.5751/ACE-00683-090202.

Monaghan County Council (2015) *Monaghan County Development Plan 2014-2020*.

Monaghan County Council (2021) *Draft Monaghan County Development Plan 2021-2027*.

National Roads Authority (2008) *Guidelines for the treatment of otters prior to the construction of national road schemes*. Dublin. Available at: www.nra.ie .

NPWS (2012) *National Summary for Article 12 (National Summary 2008-2012)*. Ireland.

NPWS (2019) *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS Report.*

O Connor, Á. (2015) Habitats Directive Annex I lake habitats: a working interpretation for the purposes of site-specific conservation objectives and Article 17 reporting. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

Scottish Natural Heritage (2016) *Assessing Connectivity with Special Protection Areas (SPAs) Guidance*.

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

# APPENDIX 1

## EPA AA Screening Determination

Headquarters
P.O. Box 3000
Johnstown Castle Estate
County Wexford
Ireland

# Closed Landfill
# Certificate of Authorisation

| | |
|---|---|
| **Certificate of Authorisation Number:** | H0364-01 |
| **Certification of Authorisation Holder:** | Monaghan County Council |
| **Location of Facility:** | Killycard Historic Landfill<br>Killycard<br>Castleblayney<br>County Monaghan |

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

HEADQUARTERS
JOHNSTOWN CASTLE ESTATE
COUNTY WEXFORD, IRELAND
PHONE: +353-53-9160600
FAX: +353-53-9160699

# WASTE MANAGEMENT (CERTIFICATION OF HISTORIC UNLICENSED WASTE DISPOSAL AND RECOVERY ACTIVITY) REGULATIONS 2008

## HISTORIC LANDFILL

## CERTIFICATE OF AUTHORISATION

Decision of Agency, under Regulation 7(6) of the Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008

Reference Number: H0364-01

In pursuance of the powers conferred on it by the Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008, the Environmental Protection Agency (the Agency) grants, under Regulation 7(6) of the said Regulations, this Certificate of Authorisation to Monaghan County Council, County Offices, The Glen, Monaghan, in respect of the closed landfill at Killycard, Castleblayney, County Monaghan, subject to conditions set out in the Certificate of Authorisation.

A copy of the Decision is attached.

Sealed by the Seal of the Agency on this the 19th day of March 2021

PRESENT when the seal of the Agency
was affixed hereto:

Tara Gillen

Tara Gillen, Authorised Person

# Glossary of Terms

All terms in this Certificate of Authorisation should be interpreted in accordance with the definitions in the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008 (S.I. No. 524 of 2008) unless otherwise defined in the Certificate of Authorisation.

| | |
|---|---|
| **Agency** | Environmental Protection Agency. |
| **Agreement** | Agreement in writing. |
| **Annually** | At approximately twelve-monthly intervals. |
| **Application** | The application by the local authority for this Certificate of Authorisation including the risk assessment, any amendments to the risk assessment, additional information received from the local authority and other documents provided by the local authority. |
| **Certificate of Authorisation** | Includes this document and the application. |
| **Closed Landfill** | As defined in the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008. |
| **Code of Practice** | As defined in the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008. |
| **Biannually** | All or part of a period of six consecutive months. |
| **Documentation** | Any report, record, results, data, drawing, proposal, interpretation or other document in written or electronic form which is required by this Certificate of Authorisation. |
| **Drawing** | Any reference to a drawing or drawing number means a drawing or drawing number contained in the application, unless otherwise specified in this Certificate of Authorisation. |
| **Environmental Pollution** | As defined in the Waste Management Act 1996 as amended. |
| **Heavy Metals** | This term is to be interpreted as set out in "Parameters of Water Quality, Interpretation and Standards" published by the Agency in 2001. ISBN 1-84095-015-3. |

| | |
|---|---|
| **Incident** | The following shall constitute an incident for the purposes of this Certificate of Authorisation:<br>(i) an emergency;<br>(ii) any emission which does not comply with the requirements of this Certificate of Authorisation;<br>(iii) any trigger level specified in this Certificate of Authorisation which is attained or exceeded; and<br>(iv) any indication that environmental pollution has, or may have, taken place. |
| **Inert Waste** | Waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater. |
| **Maintain** | Keep in a fit state, including such regular inspection, servicing, calibration and repair as may be necessary to perform its function adequately. |
| **Necessary Measures** | As defined in the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008. |
| **Relevant Heavy Metals** | Heavy metals for analysis shall include, as a minimum, those metals identified as relevant, having regard to the risk assessment and surface water and groundwater monitoring results as required by this Certificate of Authorisation. |
| **Risk Assessment** | As defined in the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008. |
| **Sample** | Unless the context of this document indicates to the contrary, the term sample or samples shall include measurements taken by electronic instruments. |
| **Status** | As defined in the Water Framework Directive, in relation to surface water and groundwater. |
| **The Local Authority** | Monaghan County Council, County Offices, The Glen, Monaghan. |
| **Trigger Level** | A parameter value the achievement or exceedance of which requires certain actions to be taken by the local authority. |

# Part I Authorisation of a Closed Landfill

The Environmental Protection Agency (the Agency) grants, under Regulation 7(6) of the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008 (the Regulations), this Certificate of Authorisation to Monaghan County Council, County Offices, The Glen, Monaghan, in respect of the closed landfill at Killycard, Castleblayney, County Monaghan, subject to Conditions set out in Part II and the Reasons for the Decision in Part III.

# Part II Conditions

## Condition 1. Scope

1.1 For the purposes of this Certificate of Authorisation, the closed landfill authorised by this Certificate of Authorisation is the area of land outlined in red on Figure No. 2.7 Revision A titled 'Existing Site Layout Killycard' (Figure date: 15/06/2018) submitted with the application. Any reference in this Certificate of Authorisation to "closed landfill" shall mean the area thus outlined in red.

1.2 No waste shall be accepted at the closed landfill.

1.3 No waste shall be burned at the closed landfill.

1.4 The facility shall be controlled, operated and maintained, and emissions shall take place as authorised by this Certificate of Authorisation. No material change that will result in an increase in the actual or potential nature or quantity of any emission shall be carried out or commenced without the agreement of the Agency.

1.5 Nothing in this Certificate of Authorisation shall prohibit authorised beneficial uses of the site of the closed landfill provided that such uses do not interfere with the integrity of the remediation measures adopted.

| | |
|---|---|
| ***Reason:*** | *To clarify the scope of this Certificate of Authorisation.* |

## Condition 2. Notifications, Records and Reports

2.1 The local authority shall notify the Agency, in a format as may be specified by the Agency, two months in advance of the intended date of commencement of the remediation works.

2.2 The local authority shall notify the Agency as soon as practicable after the occurrence of any incident. The incident notification shall be provided in a format as may be specified in relevant guidance issued by the Agency.

2.3 The local authority shall keep the following documents available for inspection by the Agency at all reasonable times and to members of the public by request:

(a) Records of all sampling, analyses, measurements, examinations, calibrations and maintenance;

(b) Records of incidents;

(c) Records of all complaints of an environmental nature;

(d) The validation report prepared on completion of the remediation; and

(e) Other documentation required by this Certificate of Authorisation or as may be otherwise directed by the Agency.

2.4 The local authority shall assign the necessary resources, including financial, to complete the remediation measures specified in this Certificate of Authorisation and risk assessment and to respond to any incident.

2.5 The local authority shall annually pay to the Agency €1,083, or such sum as the Agency from time to time determines in accordance with charges policy, for the performance of its functions under the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008 in relation to the closed landfill regulated by this Certificate of Authorisation.

| | |
|---|---|
| ***Reason:*** | *To provide for the collection and reporting of adequate information on the activity. To provide for adequate resources for monitoring and measures to protect the environment.* |

# Condition 3. Management and Monitoring

3.1 The local authority shall implement the following measures within 24 months of the date of grant of this Certificate of Authorisation, or as otherwise agreed by the Agency:

(a) Remove waste deposited in the Corrinshigo Lough and Corrinshigo Stream;

(b) Minimise the disturbance of deposited waste to the extent possible;

(c) Install a low permeability landfill cap, minimum 1m, with 1mm thick low permeability geomembrane having a hydraulic conductivity of less than or equal to $1x10^{-9}$m/s;

(d) Install passive gas venting system, which includes gravel filled vent trench with cowled vents for gas extraction along the eastern edge of the capped area. The gas venting system shall meet the following requirements:

(i) The base of the trench shall be constructed at the depth of the maximum depth of the waste body;

(ii) Gas vent pipes with cowls shall be installed within the trench every 20m and at other locations, as appropriate, such that the increased back-pressure caused by the cap does not result in increased lateral movement of gas;

(iii) The trench shall be connected to the existing gas wells; and

(iv) The gas vent pipes shall not be perforated above the ground level.

(e) Install perimeter gas monitoring boreholes along the eastern and south-western site boundary of the facility. The gas monitoring boreholes shall be installed at a distance not exceeding 50m from each other;

(f) Install a vertical cut-off and leachate interception trench;

(g) Install three leachate monitoring boreholes within the waste body;

(h) Unless otherwise agreed by the Agency, install at least three gas monitoring boreholes outside the waste body, of which one shall be upgradient of the waste body and two of which shall be downgradient of the waste body;

(i) Unless otherwise agreed by the Agency, install at least three groundwater monitoring boreholes, of which one shall be upgradient of the waste body and two of which shall be downgradient of the waste body;

(j) Reseed grass within the site;

(k) Install continuous gas monitoring, gas vents and gas alarms in the on-site industrial units;

(l) Ensure that recommendations in the guidance given in the Department of Environment 1994 publication "Protection of New Buildings and Occupants from Landfill Gas" and any subsequent revisions have been considered and applied to all buildings constructed on the facility;

(m) The local authority shall, following gas monitoring, as required under Condition 3.9(c), for a period of twelve months, seek agreement of the

Agency regarding whether to carry out a gas pumping trial for the purpose of gas utilisation; and

(n) Upon any agreement obtained in accordance with Condition 3.1(m), the local authority shall submit details of the proposed gas pumping trial for agreement by the Agency, and implement any recommendations arising therefrom.

3.2 Site Notice Board

(a) The local authority shall, within one month of the date of grant of this Certificate of Authorisation and for the duration of the remediation works, provide a Site Notice Board on the closed landfill site so that it is legible to persons outside the main entrance to the closed landfill site. The minimum dimensions of the board shall be 1200 mm by 750 mm.

(b) The board shall clearly show:

(i) The name of the Certificate of Authorisation holder;

(ii) The name of the closed landfill site;

(iii) The Certificate of Authorisation reference number;

(iv) The contact telephone in relation to the closed landfill site; and

(v) Where information relating to the closed landfill site can be obtained.

3.3 The local authority shall manage the closed landfill to ensure that discharges and emissions from the closed landfill do not cause environmental pollution or deterioration in the status of the receiving surface water body or groundwater body.

3.4 The local authority shall carry out appropriate monitoring on a biannual basis to identify any impact on the quality of water abstracted at wells downgradient of the landfill.

3.5 The local authority shall, within three months of the date of grant of this Certificate of Authorisation, seek authorisation from Irish Water for the acceptance of the landfill leachate at the Waste Water Treatment Plant, and obtain such authorisation within 12 months of the date of grant of this Certificate of Authorisation.

3.6 The local authority shall compile a validation report in accordance with the requirements of the Code of Practice. Unless otherwise agreed, the validation report shall be submitted to the Agency within 36 months of the date of grant of this Certificate of Authorisation.

3.7 The local authority shall assess the results of all monitoring carried out to confirm whether the closed landfill continues to achieve the objectives set for it in the risk assessment or this Certificate of Authorisation.

3.8 The local authority shall submit to the Agency, by the 31st March of each year, an annual update covering the previous calendar year. This update, which shall be to the satisfaction of the Agency, shall include as a minimum the information specified in Condition 3.9 of this Certificate of Authorisation.

3.9 The local authority shall annually, or as otherwise prescribed by the Agency, conduct and record:

(a) A visual inspection of the landfill to ensure that the condition of the site has not deteriorated;

(b) Monitoring (sample, analyse, characterise, and measure the level) on a quarterly basis of leachate in all leachate monitoring boreholes. The monitoring shall, as a minimum, include the following parameters: Biochemical Oxygen Demand (BOD) (mg $O_2$/l), Total Ammonia (mg N/l), Molybdate Reactive Phosphorus (MRP) (mg P/l), relevant Heavy Metals and Coliforms.

(c) Monitoring on a quarterly basis to detect the presence and concentration of landfill gas in all monitoring boreholes;

(d) Monitoring (sample, analyse and characterise) on a quarterly basis of the Corrinshigo Stream both upstream and downstream of the closed landfill. The monitoring shall, as a minimum, include the following parameters: Biochemical Oxygen Demand (BOD) (mg $O_2$/l), Total Ammonia (mg N/l) and Molybdate Reactive Phosphorus (MRP) (mg P/l);

(e) Monitoring (sample, analyse and characterise) on a quarterly basis of groundwater from:

(i) At the additional upgradient and downgradient groundwater monitoring boreholes; and

(ii) The boreholes GW01, GW02 and GW03 within the waste body.

The monitoring shall, as a minimum, include the following parameters: Ammonia, Lead, Nickel and Coliforms.

(f) The assessment of monitoring results against trigger levels and/or standard reference values for relevant pollutants including environmental quality standards in the European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended, and European Communities Environmental Objectives (Groundwater) Regulations 2010, as amended.

3.10 The location, frequency, methods and scope of surveys, monitoring, sampling and analyses, as set out in this Certificate of Authorisation, may be amended with the agreement of the Agency.

3.11 Soil and Stone Acceptance

3.11.1 Soil and stone imported for use in remedial, corrective or other engineering works at the closed landfill shall be greenfield soil and stone or soil and stone of equivalent nature and character in terms of chemical and physical contamination.

3.11.2 Documented acceptance, storage/stockpiling and utilisation procedures shall be operational in advance of receipt of such materials. Records shall be maintained showing the site of origin of the soil and stone and its nature.

3.12 No emissions, including odours and noise, from works carried on at the site shall result in an impairment of, or an interference with amenities or the environment beyond the facility boundary or any other legitimate uses of the environment beyond the facility boundary.

3.13 The local authority shall ensure that the closed landfill does not result in an impairment of, or an interference with, amenities or the environment at the facility or beyond the facility boundary (including those arising from emissions (including odours, noise, dust, litter and mud), vermin and birds).

3.14 The local authority shall ensure, at all times after the grant of this Certificate of Authorisation, that all infrastructure and all equipment required under this Certificate of Authorisation has been and is:

(i) Installed;

(ii) Commissioned;

(iii) Present on site; and

(iv) Maintained in full working order.

3.15 Wells and boreholes

3.15.1 Groundwater monitoring wells shall be constructed having regard to the guidance given in the Agency's landfill manual "Landfill Monitoring".

3.15.2 All wellheads shall be adequately protected to prevent contamination or physical damage.

3.15.3 All wells and boreholes shall be adequately sealed to prevent surface contamination and, as may be appropriate, decommissioned according to the UK Environment Agency guidelines "Decommissioning Redundant Boreholes and Wells", unless otherwise agreed by the Agency.

3.16 The local authority shall clearly label and provide safe and permanent access to all on-site sampling and monitoring points and to off-site points as required by the risk assessment or this Certificate of Authorisation. The requirement with regard to off-site points is subject to the prior agreement of the landowners concerned.

3.17 Incidents

In the event of an incident the local authority shall immediately:

(a) If necessary, contact the emergency services;

(b) Carry out an investigation to identify the nature, source and cause of the incident and any emission arising therefrom;

(c) Isolate the source of any such emission;

(d) Evaluate the environmental pollution, if any, caused by the incident;

(e) Identify and execute measures to minimise the emissions/malfunction and the effects thereof;

(f) Identify the date, time and place of the incident; and

(g) Notify the Agency (in accordance with Condition 2.2) and all other relevant authorities including, where relevant, the Water Services Authority and Inland Fisheries Ireland.

3.18 Invasive Species Prevention and Eradication Plan

The Certificate of Authorisation holder shall establish, maintain and implement an invasive species prevention and eradication plan, to cover at least, Japanese Knotweed, Giant Knotweed, Bohemian Knotweed and any other relevant invasive species. The plan shall as a minimum identify specific actions for:

(a) The prevention, to the extent possible, of acceptance of invasive species in loads of soil and stone or of topsoil arriving at the facility, actions to include requesting of information on the presence and management of invasive species at source sites;

(b) Quarterly surveys of the facility for the detection of the growth of invasive species during remediation works and during the implementation of the invasive species prevention and eradication plan, moving to annual surveys following validation in accordance with Condition 3.18(f);

(c) The method for plant detection and identification;

(d) The remedial actions for eradication of invasive species growing at the facility;

(e) Staff training on plant identification and eradication, and

(f) Validation to confirm the absence of invasive species at the restored facility.

The Certificate of Authorisation holder shall maintain evidence of having obtained the advice and implemented the recommendations of an independent and appropriately qualified consultant, in the establishment of the Plan and any amendments to it that concern the action items listed above.

3.19 Communications Programme

3.19.1 The Certificate of Authorisation holder shall establish, maintain and implement a Communications Programme to ensure that members of the public can obtain information from the local authority concerning the closed landfill.

3.19.2 The Communications Programme shall inform members of the public what they can and should do to protect their property and health.

3.19.3 The local authority shall, as part of the Communications Programme, publish landfill gas monitoring data quarterly and landfill leachate monitoring data biannually in a manner accessible by the public.

3.20 The integrity and water tightness of all tanks, bunding structures, containers and associated relevant underground pipes and their resistance to penetration by water or other materials carried or stored therein shall be tested and demonstrated by the licensee prior to use. This testing shall be carried out by the licensee at least once every three years thereafter and reported to the Agency on each occasion. This testing shall be carried out in accordance with any guidance published by the Agency. A written record of all integrity tests and any maintenance or remedial work arising from them shall be maintained by the licensee.

| | |
|---|---|
| ***Reason:*** | *To make provision for the proper closure of the activity ensuring protection of the environment.* |

# Part III: Schedules

## Schedule 1: Reasons for the Decision

In granting this Certificate of Authorisation, the Agency determines that the risk assessment submitted by the local authority as part of the application for a Certificate of Authorisation is adequate. To ensure appropriate protection for human health and the environment and to ensure conformity with the provisions of Council Directive 2008/98/EC and Council Directive 2006/118/EC, the conditions set out in Part II of this Certificate of Authorisation are specified as further necessary measures in addition to those identified by the risk assessment.

The Agency also considers that the activity will not adversely affect the integrity of any European Site, and has decided to impose conditions for the purposes of ensuring it does not do so. It has determined that the activity, if managed, operated and controlled in accordance with the Certificate of Authorisation, will not have any adverse effect on the integrity of any of those sites.

A screening for Appropriate Assessment was undertaken to assess, in view of best scientific knowledge and the conservation objectives of the site, if the activity, individually or in combination with other plans or projects is likely to have a significant effect on any European Site. In this context, particular attention was paid to the European Sites at Dundalk Bay SAC (Site Code: 000455), Dundalk Bay SPA (Site Code: 004026) and Slieve Gullion NI SAC (Site Code: 0030277).

The activity is not directly connected with or necessary to the management of any European Site and the Agency considered, for the reasons set out below, that it cannot be excluded, on the basis of objective information, that the activity, individually or in combination with other plans or projects, will have a significant effect on any European Site and accordingly determined that an Appropriate Assessment of the activity was required.

The reason for this determination is as follows:

- There is a hydrological connection between the closed landfill and Dundalk Bay SAC (Site Code: 000455) and Dundalk Bay SPA (Site Code: 004026).

The Agency has completed the Appropriate Assessment of potential impacts on these sites and has made certain, based on best scientific knowledge in the field and in accordance with the European Communities (Birds and Natural Habitats) Regulations 2011 as amended, pursuant to Article 6(3) of the Habitats Directive, that the activity, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site, in particular Dundalk Bay SAC (Site Code: 000455), Dundalk Bay SPA (Site Code: 004026) and Slieve Gullion NI SAC (Site Code: 0030277), having regard to their conservation objectives and will not affect the preservation of these sites at favourable conservation status if carried out in accordance with the application, risk assessment and this Certificate of Authorisation and the conditions attached hereto for the following reasons:



B

- specifically, the remedial works will be undertaken to minimise the potential for water pollution in Dundalk Bay SAC (Site Code: 000455) and Dundalk Bay SPA (Site Code: 004026) and will ensure that there will be no significant impact on these European Sites;
- the project alone, which consists of the remediation of the closed landfill, or in-combination with other projects, will not adversely affect the integrity, and conservation status of any of the qualifying interests of Dundalk Bay SAC (Site Code: 000455) and Dundalk Bay SPA (Site Code: 004026);
- also, there are no significant emissions to air from the landfill which could affect the bird species that the Dundalk Bay SPA (Site Code: 004026) is designated for; and
- there is no hydrogeological connectivity between the closed landfill and Slieve Gullion NI SAC (Site Code: 0030277).

The Agency is satisfied that no reasonable scientific doubt remains as to the absence of adverse effects on the integrity of those European Sites: Dundalk Bay SAC (Site Code: 000455), Dundalk Bay SPA (Site Code: 004026) and Slieve Gullion NI SAC (Site Code: 0030277).

## Part IV: SIGNATURE

**Sealed by the Seal of the Agency on this the 19th day of March 2021**

**PRESENT when the Seal of the Agency was affixed hereto:**

Tara Gillen

**Tara Gillen, Authorised Person**

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

# APPENDIX 2

## Planning Search

| Project Code | Status | Overview | Grant Date | Characteristics of the potential interactions between the projects; sources and pathways | Is there a risk of in-combination effects | Are significant in-combination effects likely |
|---|---|---|---|---|---|---|
| 2083 | Conditional | Permission for the infilling of lands with works proposed consisting of the importation of soil, stone, concrete and inert waste along with construction and demolition material to raise existing ground levels and all ancillary site development works (in connection with a waste permit application). Significant further information relates to report on settlement pond decommissioning management plan. | 2021/06/14 | The project is small scale with negligible effects to the local environs therefore in combination effects are not likely to be significant.<br>In combination effects are not likely considering the negligible effects of this project and the substantial pathway to any European site. | No | No |
| 17538 | Conditional | Permission to construct a dormer style dwelling house, domestic garage, new sewerage wastewater treatment system, and new entrance onto public road and all associated site development works. | 2018/11/29 | The project is small scale with negligible effects to the local environs therefore in combination effects are not likely to be significant.<br>In combination effects are not likely considering the negligible effects of this project and the substantial pathway to any European site. | No | No |
| 20118 | Conditional | Permission to consist of alterations to walls and roof of existing annex to accommodate new windows, ground floor kitchen-dining room and 1st floor bedroom with en-suite bathroom and associated works to existing house. | 2020/09/02 | The project is small scale with negligible effects to the local environs therefore in combination effects are not likely to be significant.<br>In combination effects are not likely considering the negligible effects of this project and the substantial pathway to any European site. | No | No |

| Project Code | Status | Overview | Grant Date | Characteristics of the potential interactions between the projects; sources and pathways | Is there a risk of in-combination effects | Are significant in-combination effects likely |
|---|---|---|---|---|---|---|
| 19550 | Conditional | Permission to demolish existing two storey dwelling house and construct proposed new replacement two storey dwelling house, proprietary waste water treatment unit and polishing filter and realign existing private laneway and all other associated site development works. | 2020/06/19 | The project is small scale with negligible effects to the local environs therefore in combination effects are not likely to be significant.<br>In combination effects are not likely considering the negligible effects of this project and the substantial pathway to any European site. | No | No |
| 17449 | Conditional | Permission to construct a single storey extension to the side and rear of existing dwelling house. | 2017/12/18 | The project is small scale with negligible effects to the local environs therefore in combination effects are not likely to be significant.<br>In combination effects are not likely considering the negligible effects of this project and the substantial pathway to any European site. | No | No |
| 19247 | Conditional | Permission to construct a two storey style dwelling house, domestic garage, new sewerage wastewater treatment system and new entrance onto public road and all associated site development works. | 2020/07/16 | The project is small scale with negligible effects to the local environs therefore in combination effects are not likely to be significant.<br>In combination effects are not likely considering the negligible effects of this project and the substantial pathway to any European site. | No | No |

| Project Code | Status | Overview | Grant Date | Characteristics of the potential interactions between the projects; sources and pathways | Is there a risk of in-combination effects | Are significant in-combination effects likely |
|---|---|---|---|---|---|---|
| 19354 | Conditional | Permission for retention and completion of a single storey extension to side of existing single storey dwelling house, and all associated site development works. | 2020/01/09 | The project is small scale with negligible effects to the local environs therefore in combination effects are not likely to be significant.<br>In combination effects are not likely considering the negligible effects of this project and the substantial pathway to any European site. | No | No |
| 17610 | Conditional | Permission to construct a storey and a half style extension to the rear of existing dwelling house and all associated site development works. | 2018/03/27 | The project is small scale with negligible effects to the local environs therefore in combination effects are not likely to be significant.<br>In combination effects are not likely considering the negligible effects of this project and the substantial pathway to any European site. | No | No |
| 19392 | Conditional | Permission for 2 no. dry storage sheds. | 2020/09/16 | The project is small scale with negligible effects to the local environs therefore in combination effects are not likely to be significant.<br>In combination effects are not likely considering the negligible effects of this project and the substantial pathway to any European site. | No | No |

| Project Code | Status | Overview | Grant Date | Characteristics of the potential interactions between the projects; sources and pathways | Is there a risk of in-combination effects | Are significant in-combination effects likely |
|---|---|---|---|---|---|---|
| 20157 | Conditional | (1) permission for the development of a two storey extension of 54 sq.m to the rear of the dwelling along with demolition of a detached outbuilding of 5 sq.m, a new entrance porch to the front of the dwelling of 3 sq.m and all associated site works (2) retention of a detached domestic garage of 28 sq.m located to the rear of the dwelling and all associated site works. | 2020/08/14 | The project is small scale with negligible effects to the local environs therefore in combination effects are not likely to be significant.<br>In combination effects are not likely considering the negligible effects of this project and the substantial pathway to any European site. | No | No |

FEHILY TIMONEY

**CONSULTANTS IN ENGINEERING,**
**ENVIRONMENTAL SCIENCE**
**& PLANNING**

**www.fehilytimoney.ie**