BALLYMASTONE PHASE 2 LRD

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) VOLUME 3: APPENDICES

BSM Est. 1968
Brady Shipman Martin
Built. Environment.

Environmental Assessment **Built Environment**

Client: Glenveagh Living Limited

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Appendix 8.1 Bat Survey Report

A Bat Assessment of Lands Proposed For Phase 2 of Development at Ballymastone, Donabate, Dublin

Wildlife Surveys Ireland

Brian Keeley BSc. Hons in Zool.

April 24, 2024

Introduction

Determination of the impact of development of any site upon the bat fauna is a requirement as all bat species are protected under the Wildlife Act (1976) and the more recent updating of this legislation (Wildlife (Amendment) Act 2000, S.I. No. 94 of 1997, S.I. No. 378 of 2005, European Communities (Natural Habitats) (Amendment) Regulations, 2005) and consolidated by S.I. No. 477 of 2011 European Communities (Birds And Natural Habitats) Regulations 2011. In conjunction with the enactment of the Habitats Directive into Irish legislation, all bat species are protected under Annex IV of the European aligned legislation with further protection given to otters and lesser horseshoe bats (Annex II status with the requirement at government level for the establishment of special areas for the conservation of these species).

Determining the bat fauna of this area and evaluating the impacts upon bats has been ongoing since 2021 when the first proposal for this area was in preparation. Bat evaluations were

conducted in 2021 and 2022 for Phase 1 while this proposal has included 2 bat assessments; in 2023 and 2024 in summer and spring.

Fieldwork for the current report on bat distribution was conducted by Wildlife Surveys Ireland, supervised, and undertaken by Brian Keeley, an ecologist with over a third of a century of fieldwork experience.

This report addresses the key issues that would affect the bat fauna of the immediate area considered in this assessment and created by construction and the presence of new buildings and increased human activity and the reduction and isolation of vegetation and undisturbed (or less disturbed) areas.

Construction activities and subsequent occupancy of housing and the associated new lanes, tracks or roads create a number of significant short-term and long-term risks for resident bat populations, in addition to impacts upon other vertebrates and invertebrates. The construction of housing or other properties may involve the removal of key features of the surrounding environment and of the habitats of bats and other mammal species, such as trees, hedgerow lines and open spaces / pasture in which to feed. This may be short-term where measures to counter such losses are implemented or may be long-term to permanent where there is no mitigation.

There is the potential of the loss of roost sites in trees even if the trees are retained where the changes surrounding a roost are intruding upon the roost and the loss of commuting routes and feeding areas where construction greatly modifies the availability of insect prey, creates a barrier to movement or removes access to roost sites, rendering feeding sites too distant from any alternative roosts used.

The following bat species are previously recorded from the site: common and soprano pipistrelle, Leisler's bat, brown long-eared bat. The following species known from Donabate and Portrane: Daubenton's bat (noted in Newbridge Demesne in 2021), Natterer's bat (noted in previous surveys for the Distributor Road in the lands to the south of the site). The next species are very uncommon in Fingal; whiskered bat and Nathusius' pipistrelle. In other survey work in the vicinity of Seafield in 2024, soprano pipistrelle and brown long-eared bats were noted.

Methodology

The bat survey was undertaken over two dates in summer 2023 and spring 2024; 13th June 2023 to 14th June 2023 and 16th April to 17th April 2024.

2023

A Songmeter Mini Bat (Mini) monitor was installed within the site during both survey periods; in line with the southeastern edge of the graveyard in June 2023. The Mini was placed at this location at sunset and remained here up to sunrise on 14th June 2023.

The active bat survey was conducted by three surveyors in summer 2023. It was undertaken with an Echometer Touch 2 Pro, an Anabat Walkabout heterodyne and time expansion ultrasonic detector which is a handheld detector which has a screen for examining the received signals and a SD card for recording signals and an Echometer Touch 2 Pro detector attached to a smartphone. A Pettersson D240X heterodyne, and time expansion ultrasonic detector was also used. This was not used to record but to identify calls within the field based on the tuning of the heterodyne and the contemporaneous time expanded calls.

In June 2023, the Phase 2 area was examined as well as adjoining lands that lie within Phase 1 and Phase 3. In April 2024, the main concentration was the Phase 2 lands.

Survey constraints 2023

The survey dates in June 2023 were ideal for bat surveys. Prior to sunrise on 13th June 2023, the temperature was 21 degrees Celsius. Sunset was at 21.54 hours. Sunrise was at hours at which time the temperature was still 18 degrees Celsius and was dry and calm. Sunrise was at 04.56 hours on 14th June 2023.

2024

The follow-up bat survey was conducted commencing 16th of April 2024 and concluding the morning of 17th of April 2024 as part of an ongoing assessment of the site. A Songmeter Mini Bat ("Mini") monitor was installed within the site along the central hedgerow running horizontally through the site.

Two surveyors conducted the active bat survey, both using Echo Meter Touch 2 Pro bat detectors connected to smartphones. Surveyors walked the area of the site for a duration of 1.5 hours following sunset at 20:30, until 22:00 hours. The morning survey commenced at 04:50 am and continued until sunrise at 06:20 hours. Existing trees were assessed for bat potential and were categorised as Description 3 category (no obvious potential but may have limited potential to support bats) trees per the Collins Tree Roost Category Classification System (Collins, 2016). The majority of trees onsite were assessed to have no potential for bat roosting.

Survey constraints 2024

The temperature was appropriate for bat activity at 9 degrees Celsius with 67% humidity and a windspeed of 23 km/h at sunset.

The temperature at sunrise was sub optimal for bat activity with temperatures of 5 degrees Celsius, 85% humidity and wind speeds of 24 km/h.

Significant works related to the permitted Phase 1 development had already begun when this survey was undertaken, causing a notable reduction in ground vegetation and the presence of ditches, construction machines and piles of gravel, pipes, and other construction materials.

Results of the assessment of the lands for bats

Species of bat present and roosting within the site
None

Species of bat roosting in close proximity to the site

Common pipistrelle	*Pipistrellus pipistrellus*
Soprano pipistrelle	*Pipistrellus pygmaeus*
Leisler's bat	*Nyctalus leisleri*

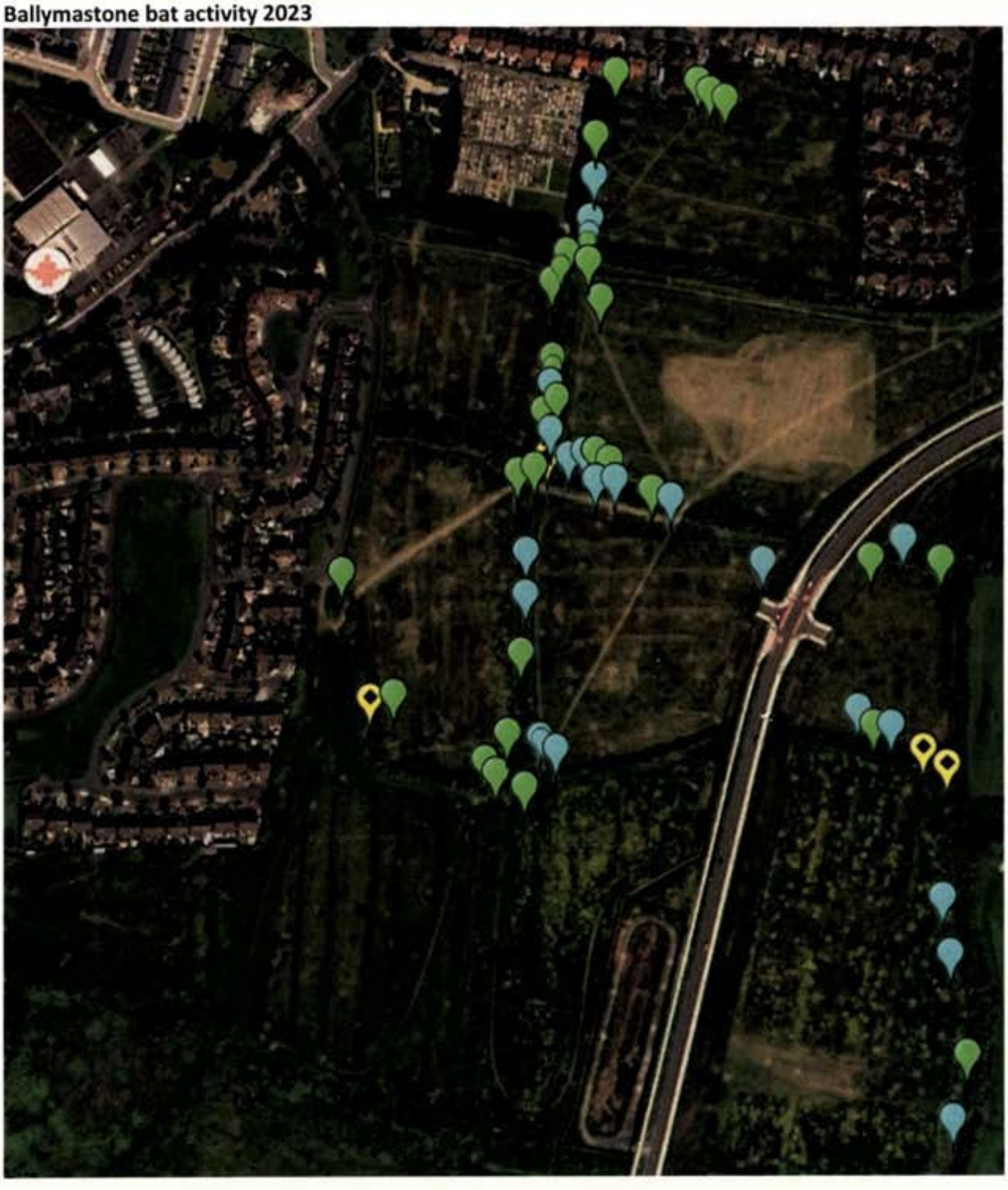
Species noted briefly within the immediate area in 2023

Daubenton's bat	*Myotis daubentonii*
Brown long-eared bat	*Plecotus auritus*

Species of bat feeding within the site

Common pipistrelle	*Pipistrellus pipistrellus*
Soprano pipistrelle	*Pipistrellus pygmaeus*
Leisler's bat	*Nyctalus leisleri*

Ballymastone bat activity 2023



Blue paddle-Soprano Pipistrelle Green paddle --Common pipistrelle Yellow paddle --Leisler Bat
Surveyor 1: soprano pipistrelle prior to sunrise at 04.15 hours (across the road at to the east)

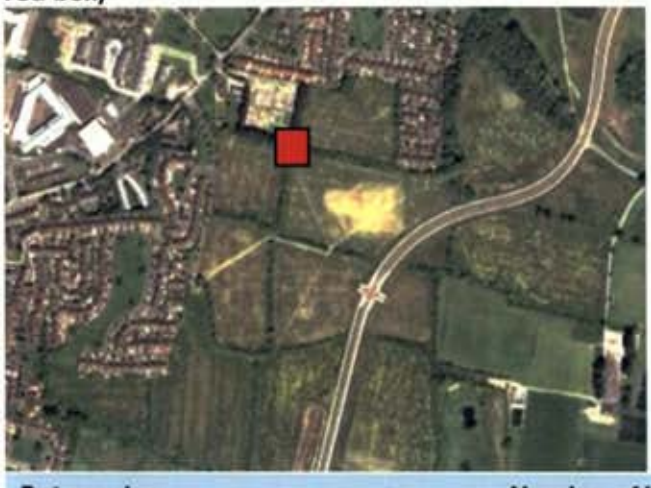
Surveyor 2: Bat activity throughout the night

Bat species	**Bat passes per hour**			
	3	**4**	**22**	**Grand Total**
Leisler's bat	1			1
Common pipistrelle	1		7	8
Soprano pipistrelle	8	2	3	13
Grand Total	**10**	**2**	**10**	**22**

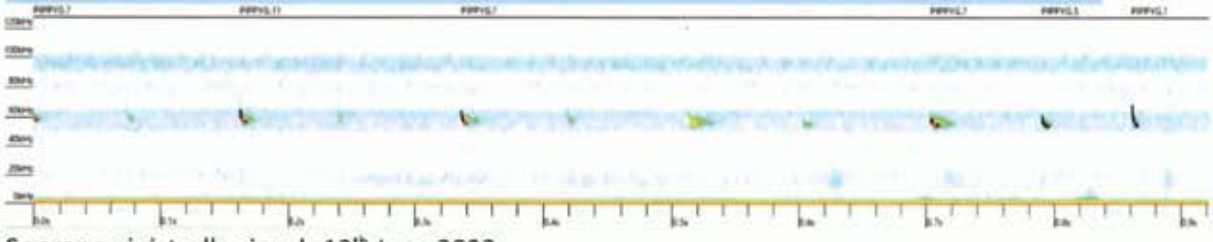
Surveyor 3: Bat activity recorded through the night

Bat species	Bat passes per hour				
	3	4	22	23	Grand Total
PIP	1				1
Common pipistrelle		6	2	1	9
Soprano pipistrelle	4	6	5	1	16
Grand Total	**5**	**12**	**7**	**2**	**26**

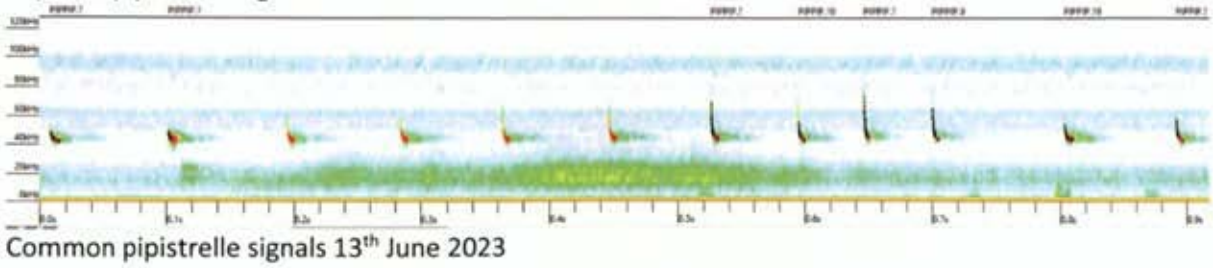
Bat activity recorded by the static monitor north of the site in line within the main vegetation (see red box)



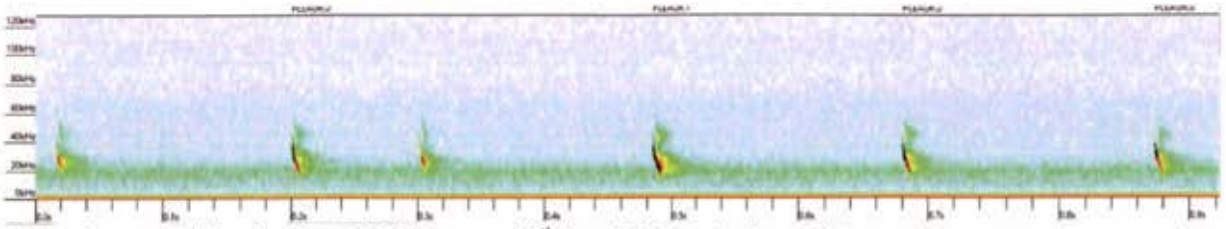
Bat species	Number of bat passes per hour							
	0	1	2	3	4	22	23	Grand Total
Daubenton's bat							1	1
Leisler's bat	2		2	1		1	7	13
Common pipistrelle	4	3	1	7	12	11	3	41
Soprano pipistrelle	1	2	3	3	4	24	5	42
Brown long-eared bat	1							1
Grand Total	**8**	**4**	**6**	**11**	**16**	**35**	**16**	**98**



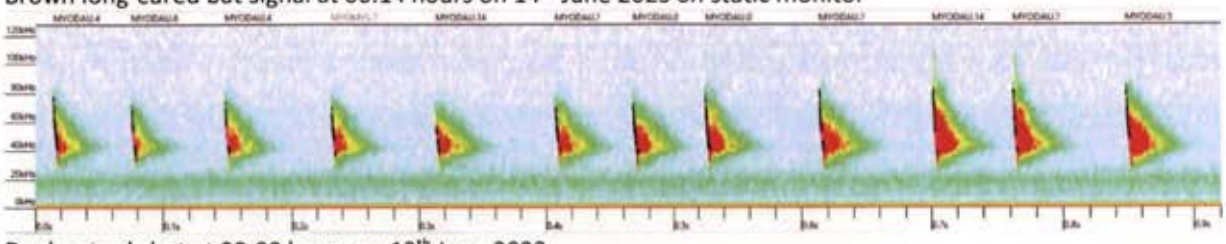
Soprano pipistrelle signals 13th June 2023



Common pipistrelle signals 13th June 2023



Brown long-eared bat signal at 00.14 hours on 14th June 2023 on static monitor



Daubenton's bat at 23.09 hours on 13th June 2023

Bat activity within and around the site in July 2021 for comparison

Bat activity recorded on EMT in northern and western section of the site July 2022

Bat species	Bat passes per hour				
Row Labels	**3**	**4**	**21**	**22**	**Grand Total**
Common pipistrelle	1	28	1	5	35
Leisler's bat	1	3	1	17	22
Pipistrelle species		1			1
Soprano pipistrelle	7	5		6	18
Grand Total	**9**	**37**	**2**	**28**	**76**

Bat activity recorded on EMT in eastern section of the site July 2022

Bat species	Bat passes per hour					
	3	**4**	**21**	**22**	**23**	**Grand Total**
Common pipistrelle				1	2	3
Leisler's bat	1	117	2	173	7	300
soprano pipistrelle		5		16		21
Grand Total	**1**	**122**	**2**	**190**	**9**	**324**

Bat activity Songmeter Mini Bat 13 July 2021 at oak tree on the northern boundary of the site

Species	Hour								
	0	**1**	**2**	**3**	**4**	**21**	**22**	**23**	**Grand Total**
Leisler's Bat	63	63	33	86	167	3	85	77	577
Common Pipistrelle		1	2		5		4	2	14
Soprano Pipistrelle	2	1	7	5	8		11	4	38
Brown Long-Eared Bat	7	2						3	12
Grand Total	**72**	**67**	**42**	**91**	**180**	**3**	**100**	**86**	**641**

Bat Activity Songmeter Mini Bat 13 July 2021 at conifer on avenue north of the site boundary

Species	Hour							
	0	**1**	**2**	**3**	**4**	**22**	**23**	**Grand Total**
Leisler's Bat	15	17	23	40	8	61	3	167
Pipistrelle					1			1
Common Pipistrelle	1	2	2	3	22	1	5	36
Soprano Pipistrelle	5	7	10	7	4	10	6	49
Grand Total	**21**	**26**	**35**	**50**	**35**	**72**	**14**	**253**

In June 2023, there was a relatively high level of pipistrelle activity along the main hedges of the site and pipistrelle activity throughout the site (always linked to the hedgerow). Bat

activity was noted at the northwestern area close to the graveyard and it was highly probable that bats were entering the site from the direction of the housing to the north or northwest.

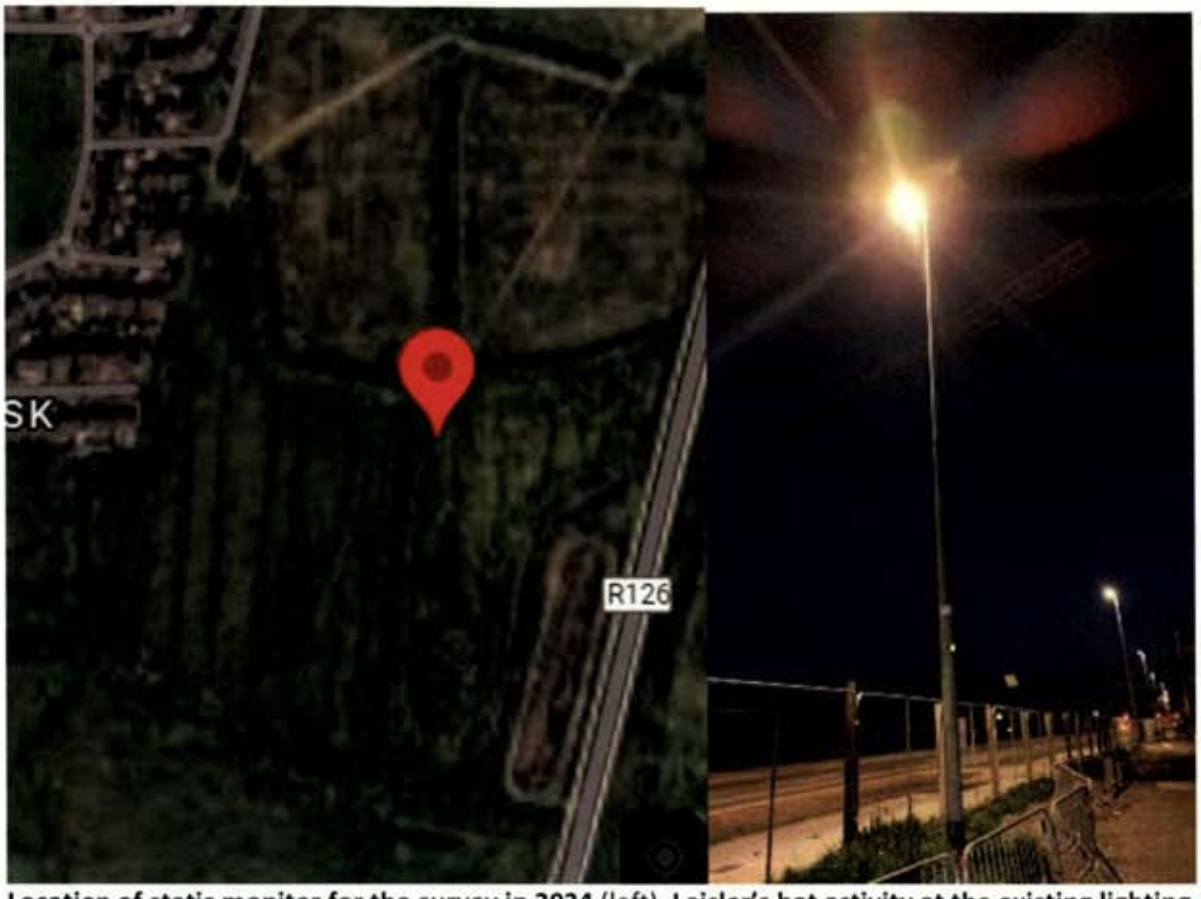
The only other species noted on a repeat basis was Leisler's bat. This species was less common in 2023 than previously and less common again in 2024 (this may have been due to the early date of the survey in 2024). One bat pass each was noted for Daubenton's bat and Brown long-eared bat on the edge of the site (at the southeastern corner of the graveyard) in June 2023. The Daubenton's bat was at 23.09 hours and the long-eared bat at 00.14 hours. Daubenton's bats feed over water primarily and this bat may have been moving between feeding areas and roosts. There are roosts of brown long-eared bats within Newbridge House and within St. Ita's, Portrane.

The activity in April 2024 was very low overall for all species.

The overall site at Ballymastone has undergone considerable alterations since the initial surveys and even since the 2023 survey, as a consequence of the construction of the permitted phase 1 development.

Little activity was recorded throughout the survey in April 2024, with bat activity only occurring in the sunset survey. Activity was sporadic commencing at 21:17 hours with a single common pipistrelle pass in the corner of the southeastern quarter of the site. Leisler's bat activity was recorded along the eastern roadside, as one Leisler's bat was observed feeding along the lit lamps on the roadside. The primary area of bat feeding activity was the northeastern quarter of the field. This was likely to have been due to the tree cover on three sides of the field which acted as a wind barrier in an otherwise exposed site.

Hedgerow within the site and treelines that will be retained



Location of static monitor for the survey in 2024 (left). **Leisler's bat activity at the existing lighting**

Common pipistrelle activity commenced at 21:26 hours in the centre of the northwestern quarter of the site shortly followed by a faint soprano pipistrelle signal. No activity was recorded by handheld detectors for the morning survey.

Bat activity in April 2024 at Ballymastone
Blue triangle-Soprano Pipistrelle Green triangle--Common pipistrelle Yellow triangle--Leisler Bat

Song Meter Mini Recordings

Song Meter Mini data included a number of passes primarily by Soprano Pipistrelle (37 signals) followed by common pipistrelle (24 signals) and lastly Leisler's bat (8 signals). All activity was contained between the hours of 21:00 and 02:00. Some soprano social calls were recorded. Minimal bat activity throughout the night may indicate that the the site is not of great significance to bat feeding at this time of year. However, the results of the desktop survey indicate a number of nearby roosts for Leisler's bats, Soprano pipistrelles and Common pipistrelles. The fact that there were a number of passes and soprano pipistrelle social calls show that the site is of some significance to local bat fauna even at this time of year. The absence of mature trees and dawn activity could indicate that the site is not being used for

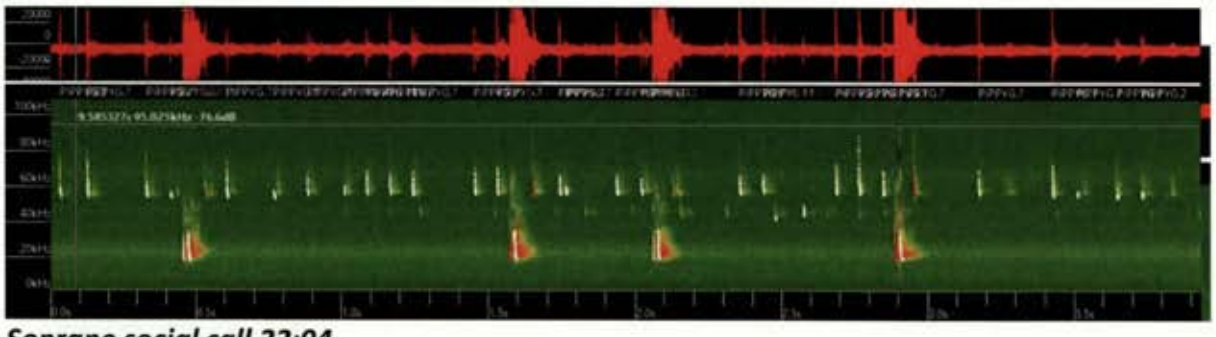
bat roosting, The temperature during the hours approaching dawn could be responsible for bats returning to roosts significantly earlier than usual.

Echo Meter Touch results Surveyor 1 2024

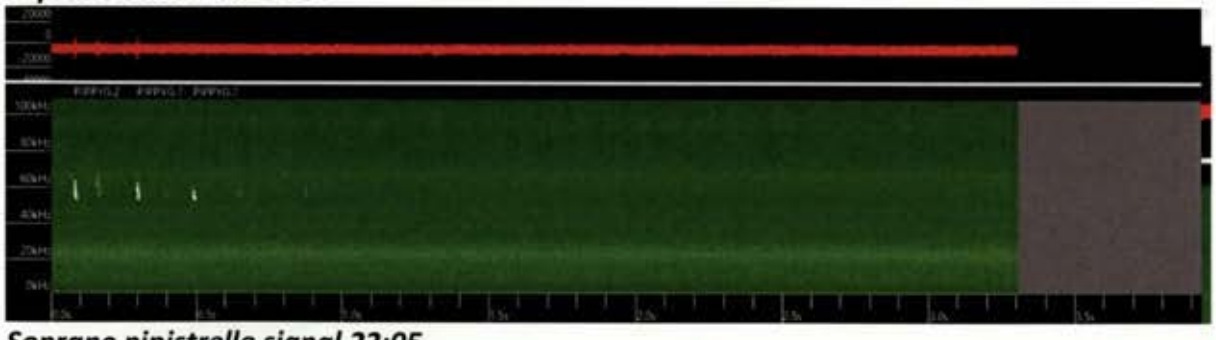
	Bat passes per hour		
Species	**8**	**9**	**Total**
Soprano Pipistrelle		1	1
Common Pipistrelle	1	3	4
Leisler's		3	3
Grand Total	**1**	**7**	**8**

Song Meter Mini Results 2024

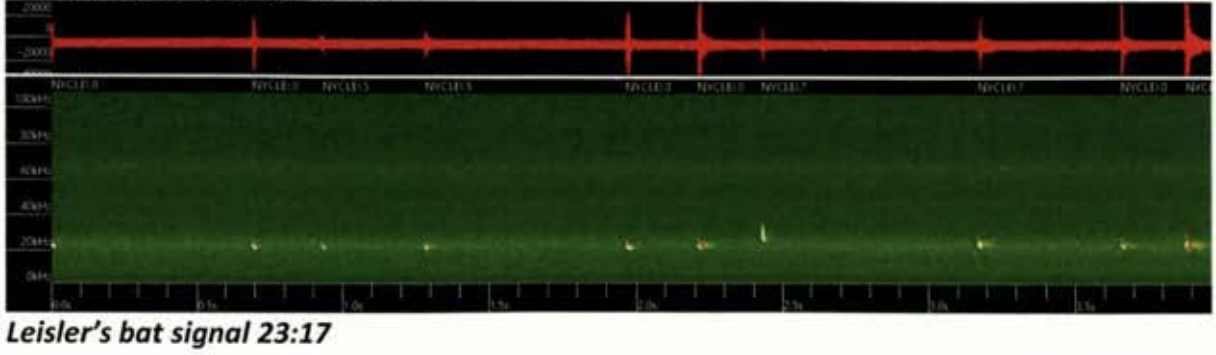
Species	**9**	**10**	**11**	**12**	**2**	**Total**
Leisler's	2	3	1	2		8
Common pipistrelle	5	15	3		1	24
Soprano pipistrelle	8	28	1			37
Grand Total	**15**	**46**	**5**	**2**	**1**	**69**



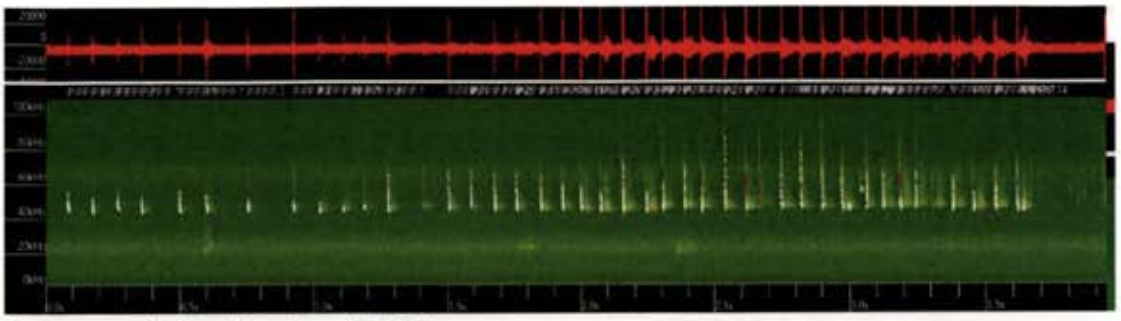
Soprano social call 22:04



Soprano pipistrelle signal 22:05



Leisler's bat signal 23:17



Common pipistrelle signal 22:05

Songmeter Mini Bat data overnight 16th to 17th April 2024

Date	Time	Auto Id*	Pulses	Manual Id
17/04/2024	00:13:13	Leisler's Bat	27	Leisler's Bat
16/04/2024	21:40:34	Leisler's Bat	19	Leisler's Bat
16/04/2024	23:17:24	Leisler's Bat	17	Leisler's Bat
16/04/2024	22:01:20	Leisler's Bat	18	Leisler's Bat
16/04/2024	22:01:30	Leisler's Bat	12	Leisler's Bat
17/04/2024	00:13:23	Leisler's Bat	4	Leisler's Bat
16/04/2024	22:13:53	Leisler's Bat	8	Soprano Pipistrelle
16/04/2024	22:01:35	Leisler's Bat	3	Leisler's Bat
16/04/2024	21:40:44	Noise		Leisler's Bat
16/04/2024	22:02:28	Noise		Common Pipistrelle
16/04/2024	22:12:25	Noise		Soprano Pipistrelle
16/04/2024	22:14:59	Noise		Soprano Pipistrelle
16/04/2024	22:16:02	Noise		Soprano Pipistrelle
16/04/2024	22:04:43	Common Pipistrelle	114	Common Pipistrelle
16/04/2024	22:15:05	Common Pipistrelle	65	Common Pipistrelle
16/04/2024	22:08:42	Common Pipistrelle	90	Common Pipistrelle
16/04/2024	22:05:00	Common Pipistrelle	61	Common Pipistrelle
16/04/2024	21:22:56	Common Pipistrelle	54	Common Pipistrelle
16/04/2024	22:04:28	Common Pipistrelle	58	Common Pipistrelle
16/04/2024	22:14:49	Common Pipistrelle	46	Common Pipistrelle
16/04/2024	23:16:56	Common Pipistrelle	46	Common Pipistrelle
16/04/2024	21:40:52	Common Pipistrelle	44	Common Pipistrelle
16/04/2024	21:26:18	Common Pipistrelle	40	Common Pipistrelle
16/04/2024	22:50:54	Common Pipistrelle	30	Common Pipistrelle
16/04/2024	21:52:45	Common Pipistrelle	26	Common Pipistrelle
16/04/2024	22:46:12	Common Pipistrelle	26	Common Pipistrelle
16/04/2024	21:23:12	Common Pipistrelle	18	Common Pipistrelle
16/04/2024	22:53:44	Common Pipistrelle	16	Common Pipistrelle
16/04/2024	22:25:08	Common Pipistrelle	14	Common Pipistrelle
16/04/2024	22:36:57	Common Pipistrelle	13	Common Pipistrelle
16/04/2024	22:04:38	Common Pipistrelle	12	Common Pipistrelle
16/04/2024	22:24:58	Common Pipistrelle	10	Common Pipistrelle
17/04/2024	02:44:57	Common Pipistrelle	9	Common Pipistrelle
16/04/2024	23:55:19	Common Pipistrelle	8	Common Pipistrelle
16/04/2024	23:11:09	Common Pipistrelle	6	Common Pipistrelle
16/04/2024	22:05:10	Common Pipistrelle	5	Common Pipistrelle

16/04/2024	22:00:52	Soprano Pipistrelle	93	Soprano Pipistrelle
16/04/2024	22:13:37	Soprano Pipistrelle	90	Soprano Pipistrelle
16/04/2024	21:41:07	Soprano Pipistrelle	84	Soprano Pipistrelle
16/04/2024	21:53:04	Soprano Pipistrelle	82	Soprano Pipistrelle
16/04/2024	23:36:54	Soprano Pipistrelle	76	Soprano Pipistrelle
16/04/2024	22:12:36	Soprano Pipistrelle	75	Soprano Pipistrelle
16/04/2024	22:12:58	Soprano Pipistrelle	73	Soprano Pipistrelle
16/04/2024	22:13:16	Soprano Pipistrelle	73	Soprano Pipistrelle
16/04/2024	22:10:17	Soprano Pipistrelle	72	Soprano Pipistrelle
16/04/2024	22:41:01	Soprano Pipistrelle	72	Soprano Pipistrelle
16/04/2024	22:59:48	Soprano Pipistrelle	72	Soprano Pipistrelle
16/04/2024	22:11:07	Soprano Pipistrelle	73	Soprano Pipistrelle
16/04/2024	22:07:44	Soprano Pipistrelle	71	Soprano Pipistrelle
16/04/2024	22:40:38	Soprano Pipistrelle	71	Soprano Pipistrelle
16/04/2024	22:02:18	Soprano Pipistrelle	70	Soprano Pipistrelle
16/04/2024	22:10:52	Soprano Pipistrelle	69	Soprano Pipistrelle
16/04/2024	22:12:15	Soprano Pipistrelle	63	Soprano Pipistrelle
16/04/2024	22:47:51	Soprano Pipistrelle	63	Soprano Pipistrelle
16/04/2024	21:41:51	Soprano Pipistrelle	59	Soprano Pipistrelle
16/04/2024	22:45:22	Soprano Pipistrelle	52	Soprano Pipistrelle
16/04/2024	22:11:02	Soprano Pipistrelle	49	Soprano Pipistrelle
16/04/2024	21:56:53	Soprano Pipistrelle	45	Soprano Pipistrelle
16/04/2024	21:36:43	Soprano Pipistrelle	43	Soprano Pipistrelle
16/04/2024	22:01:02	Soprano Pipistrelle	42	Soprano Pipistrelle
16/04/2024	21:59:27	Soprano Pipistrelle	41	Soprano Pipistrelle
16/04/2024	22:08:52	Soprano Pipistrelle	40	Soprano Pipistrelle
16/04/2024	21:51:49	Soprano Pipistrelle	38	Soprano Pipistrelle
16/04/2024	22:06:49	Soprano Pipistrelle	37	Soprano Pipistrelle
16/04/2024	22:09:12	Soprano Pipistrelle	34	Soprano Pipistrelle
16/04/2024	21:36:53	Soprano Pipistrelle	31	Soprano Pipistrelle
16/04/2024	22:04:53	Soprano Pipistrelle	32	Soprano Pipistrelle
16/04/2024	22:01:07	Soprano Pipistrelle	22	Soprano Pipistrelle
16/04/2024	22:06:06	Long-eared	6	Soprano Pipistrelle

Desktop Survey results from BCI Database Roosts within a 10 km radius.

BCIreland data: search results 23 Apr 2024			
Search parameters: Roosts with observations of all species within 1000m of O225501			
Roosts			
Name	Grid reference	Species observed	
153 Ard na Mara	O2145	Unidentified bat	
15DITA10WC	O2550		
15DITA11WC	O2550		
15DITA12WC	O2550	Nyctalus leisleri	

15DITA13WC	O2450		
15DITA14WC	O2450		
15DITA15WC	O2450		
15DITA16WC	O2450		
15DITA17WC	O2450		
15DITA18WC	O2450		
15DITA19WC	O2450		
15DITA1WC	O2549		
15DITA20WC	O2450		
15DITA21WC	O2450		
15DITA22WC	O2450		
15DITA23WC	O2450		
15DITA24WC	O2450		
15DITA25WC	O2450		
15DITA26WC	O2450		
15DITA27WC	O2450		
15DITA28WC	O2450		
15DITA29WC	O2550		
15DITA2WC	O2549		
15DITA30WC	O2550		
15DITA3WC	O2549		
15DITA4WC	O2550		
15DITA5WC	O2550		
15DITA6WC	O2550		
15DITA7WC	O2550		
15DITA8WC	O2550	Pipistrellus spp. (45kHz/55kHz)	
15DITA9WC	O2550	Pipistrellus spp. (45kHz/55kHz)	
52 River Valley Grove	O1745	Pipistrellus spp. (45kHz/55kHz)	
Agricultural Buildings, St. Itas	O2550	Plecotus auritus, Pipistrellus pygmaeus	
Brady Residence	O1355	Pipistrellus spp. (45kHz/55kHz)	
Cedarwood Cottage	O1346	Nyctalus leisleri	
Farm building	O1953	Plecotus auritus	
Farmyard Surgalstown	O1247	Pipistrellus pipistrellus (45kHz)	
Flat roof Building, St. Itas	O2450	Pipistrellus pipistrellus (45kHz),Plecotus	
Garage house roost	O2241	Pipistrellus pygmaeus	

Haybarn, Fingal Co. Council	O2050	Pipistrellus spp. (45kHz/55kHz)	
House	O2256	Pipistrellus pipistrellus (45kHz)	
Kinsaley House	O2142	Plecotus auritus, Pipistrellus spp.	
Martin Residence	O2350	Unidentified bat	
Roncallic House	O2254		
Santry, Tree Roost	O1640	Unidentified bat	
Seamount House	O2345	Pipistrellus pipistrellus (45kHz)	
Seamount Lodge	O2345	Plecotus auritus	
Skidoo House	O1550	Pipistrellus pygmaeus	
Skidoo House stable	O1550	Pipistrellus pygmaeus	
Stone walled storage shed,	O3050	Plecotus auritus	
Thompson Residence	O2353	Unidentified bat	
Unused Building, Fingal	O2050	Pipistrellus spp. (45kHz/55kHz)	
Transects			
Name	Grid reference	Species observed	
Ad-hoc observations			
Survey	Grid reference	Date	Species observed

Project Description per planning application

"The proposed development will consist of the construction of a residential development, which represents Phase 2 of a wider development of the Ballymastone Lands (as identified in the Donabate Local Area Plan 2016 (as extended)) and is a continuation of Phase 1 of the Masterplan lands (permitted under LRD0008/S3). The proposed development ranges in height from 2 to 6 storeys to accommodate 364 residential dwellings (including a mix of apartments, duplexes, and houses), and public open space. The site will accommodate car parking spaces, bicycle parking spaces, storage, services, new pedestrian/cycle links, road improvements and plant areas. Landscaping will include communal amenity areas, and a significant public open space provision."

Phase 2 proposal Ballymastone 2024

Area prior to construction commencement in 2023

Potential Impacts From The Proposed Construction

Loss of bat roosts

While there was a bat roost identified close to (but outside) the perimeter of the site in previous evaluations (2022), this tree will not be removed within this proposal. In addition to this, the presence of other mature trees in close proximity creates some potential for roost sites. Overall, the trees within the subject site are immature and offer very low roost potential and roost sites, if present, are likely to harbour very small numbers of bats. There will be very limited tree removal (if any) for this phase and the majority of the existing hedgerows and treelines will be retained. This is currently considered a low negative impact of long-term duration.

Loss of commuting corridor

There will be a further loss of vegetation from the site. This may affect commuting bats by removing cover that allows commuting in an unlit area along the field edges. This is a permanent moderate negative impact for the local bat fauna with greater significance for populations roosting close to the site.

Loss of feeding area

As above, there will be an impact upon the feeding activity of bats from the loss of vegetation within and around the site. This will reduce feeding for bats by reducing the shelter and substrate for invertebrates. At present, the Phase 1 is creating an impact on the vegetation in Phase 2.

This is a long-term to permanent moderate negative impact for bats.

Disturbance from lighting

Lighting can affect different species to varying degrees and within species there is also a range of responses to introduced light ranging from minimal effects to complete avoidance. Bats may actively avoid lights especially if it is shining upon a roost site

This is a long-term to permanent moderate negative impact upon bats.

Cumulative impacts of the above

There is a loss of green area that will affect bats by reducing feeding and commuting areas. This is unlikely to have a direct impact on the status of any of these species, but it is contributory in a minor way to an overall diminution in habitat availability.

Proposed Mitigation

Lighting control

Lighting around the buildings shall be tightly controlled and ornamental lighting shall be avoided entirely. Ideally, lighting should respond to a motion trigger or be switched off at night after typical active hours (e.g. 11 pm to 6 am). Spotlights must not be introduced as these are hugely disruptive to most wildlife and cannot be targeted to the required area but create light pollution over a huge radius.

Further recommendations on lighting are given below:

- Dark corridor for movement of bats through the site. Lighting shall be directed downwards away from the treetops. No bat boxes shall be illuminated by introduced lighting.
- All luminaires shall lack UV elements when manufactured and shall be LED
- A warm white spectrum (ideally <2700 Kelvin but as per Fingal County Council requirements) shall be adopted to reduce blue light component
- Luminaires shall feature peak wavelengths higher than 550 nm
- Planting shall provide areas of darkness suitable for bats to feed and commute through the site.

Planting of Insect Attracting Plants and Trees

Vegetation to provide food and shelter for wildlife shall be encouraged.

Plants such as *Lonicera periclymenum* (honeysuckle) are beneficial to moths and other nocturnal insects while *Hebe* are beneficial to daytime Lepidoptera and some night insects. Bees would benefit from lavender, jasmine, rosemary, violets, thyme, blue bells, wisteria, cone flowers and sunflowers. The wider abundance of insects would benefit bats as well as improve biodiversity generally.

Retention of grassy areas and vegetation in preference to concrete pathways / stone gardens etc.

Consideration should be given to providing greater vegetation relative to paved or concreted areas wherever possible. This could include a system that allows grass paving, grass reinforcement or a grass grid. This allows rainwater to soak way as solid concrete can create greater run-off.

Provision of bat boxes

6 x 2FN Schwegler bat boxes or equivalent are proposed for erection on suitable trees or poles or alternatively the provision of access for bats to elements of buildings. This may be by purpose-built incorporated bat boxes or by providing appropriate access gaps. If this option is chosen rather than specific boxes, a bat specialist shall provide advice on access options. All boxes or access points shall be away from illumination.

Checking of trees for bats

Following a tree assessment of the site, any trees with cavities shall be checked by a bat specialist prior to felling. If bats are present, a derogation shall be sought from NPWS and additional measures to mitigate the loss of a roost shall be implemented.

IMPACTS AFTER MITIGATION

There is the potential for slightly less bat activity within the area where the cover is reduced by tree removal and lighting has increased. Bats will avail of bat boxes or other modifications within the site to roost over a period of time once the siting, lighting and absence of disturbance is observed.

Appendix 8.2 Bird Survey Report

Breeding Bird Survey Ballymastone Lands

Donabate

Co Dublin

John Fox

April to August 2023 and March to April 2024

Fig 1. Meadow Pipit on Brambles. Confirmed Red Listed Breeding Species at Ballymastone in 2023. (Photo. J Fox)

John Fox

31 Waverley Avenue,

Fairview,

Dublin 3

foxjohn3@gmail.com

Summary:

During late April, May, June, July and August 2023, and Late March and early April 2024 breeding bird surveys were undertaken on the area known as Ballymastone Lands, Co Dublin and covered the entire landholding, including the lands located in the Ballymastone Phase 1 lands, now permitted and under construction. The lands were visited on seven separate dates. The visits were on the 10th of April, 3rd of May, 7th of June, 11th of July and 3rd of August 2023 and on 21st March and 9th of April 2024.

The seven visits were undertaken in the early morning. During each visit the lands were walked slowly over a two to three hour period. The route walked focused primarily on existing hedge rows, areas of scrub and areas with mature trees. Bird Species that were heard or seen were recorded, their position noted, and a breeding status assigned to them according to observed behaviour.

Data from the seven visits were amalgamated and approximate positions for the birds as seen or heard were plotted on aerial photographs. Approximate populations, breeding status and conservation status were assigned to each species. A species table and a distribution map of the red and amber listed species for the lands were prepared.

A total of 35 common bird species of Ireland were recorded on the lands, of which 17 were confirmed as breeding. Two species of high conservation concern (Red listed) were recorded, one of which was confirmed to breed on the lands, the second species possibly breeds on the lands. Eight species of medium conservation concern, (Amber listed), were recorded of which two species were confirmed to breed, another single species probably breeds and a further two species possibly breed on the site. The remaining 25 species recorded were of least conservation concern, (Green listed) 14 of which were confirmed to breed on the lands, three of which were probable breeding on the lands and four were possibly breeding on the lands. Seven of the species recorded were seen in flight or foraging only and most probably were not breeding on the lands.

Introduction:

This survey of the breeding birds at Ballymastone Lands, Donnabate, Co Dublin, was commissioned by Brady Shipman Martin in April 2023. The survey was undertaken during April, May, June, July and August of 2023 and in March and April of 2024. Visits were undertaken between April and August 2023, these being the normal months for most breeding bird surveys in Ireland. The visits in March and April of 2024 were undertaken a little outside the normal breeding period due to an imminent planning application. The surveys covered the entire landholding, including the lands located in the Ballymastone Phase 1 lands, now permitted and under construction

These surveys aim to describe the distribution and abundance of breeding birds occurring on the lands known as Ballymastone Lands as outlined on the aerial photography at fig 5.

Study area:

The overall Ballymastone site is approximately 16 hectares in area and includes mixed habitat types. These include previously tilled land, bare ground, dry meadow and grassy verges, hedgerow, and scrub. In 2024 much of these lands have become an operational building site – as part of the permitted Ballymastone Phase 1 development, now under construction.

In 2023 several informal walking tracks were present through the lands and the area was very popular with walkers and people walking their dogs. These leisure activities have now ceased due to construction activities and new fencing. The lands are generally flat with a small rise from south to north. There are a number of overhead cables crossing the lands.

The most northerly field is still fallow, formerly tilled land that is now recolonising areas of scrub dominated by rank grasses and other common plants. The remainder of the lands are now an active building site where many hedges remain.

Fig 2. Singing Yellowhammer. Red listed species. Possible breeding species at Ballymastone Lands in 2023. (Photo:John Fox)

Fig 3. Flooded area of Ballymastone Lands at Northern Boundary in 2023. **(Photo J Fox)**

Fig 4. Previously arable lands now fallow to northwest of Ballymastone Lands in 2023. **(Photo J Fox)**

Fig 5. Ballymastone Lands. Overall site aerial photography. Red line encloses approximate extent of lands surveyed,

Methodology:

The site was visited on seven occasions. The first visit in 2023 was undertaken on the 10th of April and the final one on 3rd of August. The first visit in 2024 was on 21st of March and the final one on 9th of April. The visits were timed for early morning to coincide with the period when many breeding birds are most active and therefore most easily observed.

Of the seven early morning visits, the shortest was for 1 hour 55 minutes duration with the longest for 2 hours and 40 minutes. A total time of about 16 hours were spent surveying the lands. Visits were made monthly and spread out as much as possible to achieve the best overview of breeding activity within the breeding seasons.

Table 1 shows the timing of each visit together with weather conditions.

Date	Start	Finish	Wind Km/hr	Cloud Octas	Rain	Visibility
10/04/2023	07.05	09.00	SW 18	6/8	Showers	Good
03/05/2023	06.15	08.30	SE 16	4/8	None	Good
07/06/2023	06.10	08.50	E 11	2/8	None	Good
11/07/2023	06.10	08.50	W 14	7/8	None	Good
03/08/2023	06.10	08.40	NW 23	5/8	None	Good
21/03/2024	07.25	09.40	SW 26	7/8	None	Good
09/04/2024	07.00	09.00	NNW 38	6/8	None	Good

All visits were undertaken when weather conditions were suitable for surveying. All species present, were recorded, and their breeding status was determined where possible by observation of bird behaviour against a series of standardised behavioural indicators. Binoculars (42x10) were used throughout each survey period to aid with identification of species and activities.

Conservation Status: A list of "Birds of Conservation Concern in Ireland 4: 2020 to 2026" (Gilbert et all 2021) indicates three categories of concern as follows. See appendix 1 for more detail.

- Red list species (high conservation concern).
- Amber list species (medium conservation concern).
- Green list species (least conservation concern).

These statuses have been assigned to all regularly occurring species in Ireland. The criteria on which they have been assessed is based on their international conservation status, historical breeding declines, recent population declines, European conservation status, breeding rarity, localised distribution and the international importance of populations.

Breeding Status Indicators: The following breeding status indicators were used to establish breeding status.

1. **Confirmed Breeding**: Eggs/nest, Occupied nest, Adult carrying faecal sac or food for young or recently fledged young.
2. **Probable Breeding**: Paired birds seen, Agitated behaviour, Permanent territory, Courtship or display, Nest building or Visiting a nest site.
3. **Possible Breeding**: Species in suitable habitat during breeding season or singing male present.
4. **Non Breeding**: Birds present but not likely breeding due to a lack of suitable nesting habitat and no behavioural evidence to suggest breeding on the site.

The site was entered from the northeast via the site entrance at the northern extremity of the R126 boundary with the survey area lands. The lands along the R126 were accessed from the R126 itself.

All accessible areas of the lands were walked slowly. The approximate location of all birds seen and heard were noted on aerial photography of the lands, together with any information about their breeding status. Emphasis was placed on walking along lines of mature hedge rows and through areas of scrub as these were the habitats potentially most suitable for breeding birds. Weather conditions were also noted during each visit, including rainfall, cloud cover, wind speed and visibility. See Table 1.

Results:

In 2023 a total of 35 bird species were recorded on or over the site.

Two red listed species were observed, Meadow Pipit and Yellowhammer. Meadow Pipit was confirmed as a breeding species on the lands. Yellowhammer however was identified only as a possible breeding species.

Eight amber listed species were observed of which only two, Goldcrest and Linnet were confirmed as breeding on the lands. One amber listed species, Skylark, was identified as a probable breeding species. Two amber listed species were observed as possible breeders, Starling and House Sparrow. Three amber listed species were observed which were non-breeding on the lands, Herring Gull, Swallow and House Martin. House Martin however probably nest close to the site under the eaves of houses nearby.

An additional 25 green listed species were observed of which fourteen were confirmed breeding. Woodpigeon, Wren, Dunnock, Robin, Stonechat, Blackbird, Song Thrush, Blackcap, Willow Warbler, Great Tit, Blue Tit, Chaffinch and Goldfinch were all confirmed breeding on the survey lands. Buzzard was confirmed as breeding outside the survey lands close to the north-eastern boundary of the site. Three green listed species were observed as probable breeders, Collared Dove, Mistle Thrush, and Long-tailed Tit. Four green listed species were

observed on or over the lands as non-breeding. Mallard, Great Black-backed Gull, Jackdaw and Rook.

In 2024 no additional species were recorded and no breeding statuses were assigned due to the early survey period.

Fig 5. Meadow Pipit. Red listed species. Confirmed breeding on Ballymastone Lands in 2023. **(Photo J Fox)**

Table 2. Ballymastone Lands, Donabate, Co Dublin. Bird Species Identified, Numbers Present and Breeding Status, 2023.

Common Name	BTO Code	Species	Breeding Status	Estimated Numbers Present
Mallard	MA	*Anas platyrhynchos*	Non-breeding	2 birds
Buzzard	BZ	*Buteo buteo*	Breeding nearby	1 pair
Pheasant	PH	*Phasianus colchicus*	Possible Breeding	1 to 2 cocks
Herring Gull	HG	*Larus argentatus*	Non-Breeding	Fly over only
Gt Black-backed Gull	GB	*Larus marinus*	Non-breeding	Fly over only
Woodpigeon	WP	*Columba palmubus*	Confirmed Breeding	8 to 12 pairs
Collared Dove	CD	*Streptopelia decaocto*	Probable Breeding	1 pair
Skylark	S	*Alauda arvensis*	Probable Breeding	1 pair
Barn Swallow	SL	*Hirundo rustica*	Non-Breeding	Birds in flight
House Martin	HM	*Delichon urbicua*	Non-Breeding	Birds in flight
Meadow Pipit	MP	*Anthus pratensis*	Confirmed Breeding	2 to 3 pairs
Wren	WR	*Troglodytes troglodytes*	Confirmed Breeding	15 to 20 pairs
Dunnock	D.	*Prunella modularis*	Confirmed Breeding	4to 5 pairs
Robin	R.	*Erithacus rubecula*	Confirmed Breeding	4 to 6 pairs
Stonechat	SC	*Saxicola torquatus*	Confirmed Breeding	1 to 2 pairs
Song Thrush	ST	*Turdus philomelos*	Confirmed Breeding	2 to 3 pairs

Mistle Thrush	M	*Turdus pilaris*	Probable Breeding	1 singing male
Blackbird	B.	*Turdus merula*	Confirmed Breeding	10 to 13 pairs
Blackcap	BC	*Sylvia atricapilla*	Confirmed Breeding	1 to 2 pairs
Willow Warbler	WW	*Phylloscopus trochilus*	Confirmed Breeding	1 pair
Goldcrest	GC	*Regulus regulus*	Confirmed Breeding	3 singing males
Great Tit	GT	*Parus major*	Confirmed Breeding	2 to 3 pairs
Blue Tit	BT	*Parus caeruleus*	Confirmed Breeding	3 to 5 pairs
Long-tailed Tit	LT	*Aegithalos caudatus*	Probable Breeding	1 to 2 pairs
Magpie	MG	*Pica pica*	Possible Breeding	1 to 2 pairs
Jackdaw	JD	*Corvus monedula*	Non-breeding	Fly over only
Rook	RO	*Corvus frugilegus*	Non-breeding	Fly over only
Hooded Crow	HC	*Corvus corone cornix*	Possible Breeding	2 to 3 pairs
Starling	SG	*Sturnus vulgaris*	Possible Breeding	Flock of 20
House Sparrow	HS	*Passer domesticus*	Possible Breeding	3 to 4 pairs
Chaffinch	CH	*Fringilla coelebs*	Confirmed Breeding	2 to 3 pairs
Linnet	LI	*Carduelis cannabina*	Confirmed Breeding	2 to 3 pairs
Goldfinch	GO	*Carduelis carduelis*	Confirmed Breeding	3 to 5 pairs
Bullfinch	BF	*Pyrrhula pyrrhula*	Possible Breeding	1 to 2 pairs
Yellowhammer	Y	*Emberiza citrinella*	Possible Breeding	1 singing male

Text colour indicates species conservation status (Red, Amber or Green listed).

Fig 6. Red and Amber listed Bird Distribution Map, Ballymastone Lands, 2023. (For BTO Codes see Table 1). Most species indicated were recorded in numerous areas but have been shown roughly where they were recorded regularly or most frequently over several visits. Numbers indicate approximate flock population.

Discussion:

In 2023 birds were recorded in all areas of the lands, with hedges and trees producing most records. Areas of scrub, meadows and previously arable land, then fallow, also produced many records.

Most breeding behaviour was observed in trees and hedges with many species singing from prominent perches such as trees, fences and overhead cables. Recently fledged birds were often observed with an adult along hedges and in trees.

Species such as Starling and Stonechat were observed in more open areas of fallow previously arable land while Meadow Pipit and Skylark were often recorded in or over the fields to the southeast of the site and along the boundary to the R126. Foraging Starlings, Blackbirds Song Thrush, Willow Warbler and some finches such as Goldfinch and Linnet were occasionally disturbed from the informal paths or fallow areas that were present in many of the fields.

The 35 species encountered on the site are all widespread common birds of Ireland. Most species observed are currently green listed as species of least conservation concern in

Ireland. During a 2021 Breeding Bird Survey carried out by the author 40 species were recorded again all widespread common birds of Ireland.

The five additional species from the 2021 survey that were not recorded during the 2023 survey were Kestrel (red listed), Greenfinch (Amber listed), Whitethroat, Sedge Warbler, and Chiffchaff (Green listed). Why these species were not recorded during 2023 is difficult to say but a number of factors are probably at play including changes to the habitat over the two-year period and the reduced survey area.

In 2023 two red listed species of highest conservation concern, together with eight amber listed species, of medium conservation concern were observed. Of the two red listed species just Meadow Pipit was confirmed to breed on the lands.

Meadow Pipits were observed on each occasion in the southern and eastern parts of the lands. They were seen to be agitated, were engaging in flight displays and song indicating them to be holding permanent territory. A Meadow Pipit was seen carrying food on more than one occasion confirming breeding on the lands. Juvenile birds were also identified. Nests were probable on the ground in grassed areas that are undisturbed.

In 2023 Yellowhammer was identified only as a possible breeding species. A single male was observed singing from a tree top close to the R126 near the northern end of the site during several visits. The numbers of breeding Yellowhammers appears to have declined significantly since the breeding survey undertaken in 2021, when breeding was confirmed and perhaps five pairs were present.

A third Red listed species; Kestrel, was identified during the 2021 survey but was not thought to breed on the lands. No Kestrels were seen during the 2023 survey.

Of the eight amber listed species only two, Goldcrest and Linnet were confirmed to breed on the lands in 2023. Recently fledged Linnets and Goldcrests were observed on a number of occasions. Goldcrest were often heard singing from trees and hedgerows in the north-western areas of the lands particularly along boundaries with the graveyard.

In 2023 a single amber listed species, Skylark was identified as a probably breeding species on the lands. Skylark were seen singing over several areas of the lands with nesting probable in areas to the south and east of the lands.

Of the remaining amber listed species of 2023 two are possible breeders, Starling and House Sparrow. No behaviour was observed for these species which would increase confidence of breeding on the lands. Foraging Starlings and House Sparrows were observed in many areas of the lands and nesting may have occurred in mature trees with suitable nest cavities along some of the hedgerows. Juvenile Starlings were observed together with adult birds in flocks of up to 20 birds, foraging on the lands. Some of these Starlings possibly bred within or close

to the survey area. House Sparrows and Starlings however are more likely to have breed in cavities in the houses close to the site.

The remaining three amber listed species of 2023, Herring Gull, Swallow and House Martin were observed in flight over the site only. They have been listed as non-breeding because suitable nest sites within the survey lands are not available for them. All three species are associated with manmade structures for breeding purposes and there are no suitable manmade structures on the survey lands where nesting might occur.

Of the 25 Green listed species of 2023, 14 were confirmed to breed on or close to the lands. Adult, Buzzard, Wood Pigeon, Wren, Dunnock, Robin, Stonechat, Song Thrush, Blackbird, Blackcap, Willow Warbler, Blue Tit, Great Tit, Chaffinch and Goldfinch, were observed carrying food, feeding or with young on the site.

Of the remaining 2023 green listed species just, Collared Dove was identified as a probable breeding species on or close to the lands, while Pheasant, Magpie, Hooded Crow, and Bullfinch are all possible breeders. There was suitable nesting habitat available within the site for any of those species in 2023.

It is worth noting that in 2023 a single pair of Buzzards, again as in the 2021 survey, were confirmed as breeding in the mature trees outside the site boundary a little distance east of the north-eastern corner of the lands. Juvenile birds were seen and heard begging for food during the July 2023 visit and were seen in flight over the lands.

Rooks were rarely observed foraging or in flight and there is no evidence of a rookery within the lands, it is therefore unlikely that the species is breeding on the site.

Conclusion:

The surveys were carried out between mid-April and early August of 2023 that being the optimal time of year to conduct a breeding bird survey and late-March and early-April 2024 which is not optimal.

35 species, typical of the type of habitats were recorded on the lands. Of these, 17 were confirmed to breed, additionally a further four probably breed and another seven possibly breed. The remaining seven species most probably do not breed on the lands, but some may breed on lands, buildings, or structures close to the site. The site is probably used by those nonbreeding species for foraging or hunting. No nocturnal species were detected on the lands.

One red listed species was confirmed to breed, and one red listed species was identified as a possible breeding species on the lands. Two amber listed species were confirmed to breed on the lands and a further single amber listed species probably bred, while another two amber listed species are possibly breeding species, all in 2023.

The areas of meadow, scrub, mature trees and hedgerows are the habitats of most importance for the breeding birds present on the site. Any hedgerow, scrub or tree removal should only be undertaken outside the breeding season. All mature trees should be retained where possible and checked for existing active nests before removal.

The site also supported many wintering species including some already mentioned and others not commonly found in Ireland during the breeding season. These include waterbirds such as Snipe.

Appendix 1.

Birds of Conservation of Concern in Ireland (BoCCI)

The first comprehensive analysis of the population status of birds on the island which identified those species most in need of conservation was published 16 years ago. (Newton et al 1999). It was an initial review followed the publication of the Irish Red Data Book by Wilde in 1993. A further review followed several years later (Lynas et al 2007), which include data for the first time on an all- Ireland basis. A third review six years later BoCCI (Colhoun and Cummin 2013) followed and was also on an all-Ireland basis. BoCCI in Ireland 4: (Gilbert et all 2021) was published this year and forms the basis on which the conservation statuses were assigned to the bird species in this report.

Seven quantitative criteria have been adopted to determine population status for birds in Ireland.
These include, assessments of global and European conservation status, recent population decline (both in terms of numbers and distribution), historical population decline, breeding rarity, localiseddistribution and international importance.

The status of 211 species in Ireland was assessed against each of the chosen criteria.
Of these 54 species, were assigned to the Red List. A further 79 species were assigned to the Amber List. The remaining 78 species were assigned to the Green List. In terms of conservation concern the Red listed species are species of immediate conservation concern, Amber listed species are of medium-term concern while Green listed species are currently of least conservation concern.

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Appendix 8.3 Botanical Survey Report

Habitat and Hedgerow Study of a Proposed Development Site at Ballymastone (Phase 2), Co. Dublin

Report for *Glenveagh Living Limited*

By *FitzGerald Ecology*

April 2024

FITZGERALD
ECOLOGY

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1. *Introduction*

Brady Shipman Martin, on behalf of Glenveagh Living Limited, commissioned FitzGerald Ecology to produce a habitat and hedgerow study of a proposed development at Ballymastone Phase 2, Donabate, Co. Dublin (centre point is at approximately Irish Grid reference O 23604 50196)). The majority of the surviving mapped and surveyed hedgerows are to be maintained and managed as part of the proposed development plans. As such, it is important to understand the value of these boundary, and adjacent internal, hedgerow habitats, which will help to inform a better understanding of the overall ecological value of the site, as well as the assessment of potential impacts on these important ecological corridor habitats as a result of the construction and/or operation of the proposed development.

A full vegetation study of the habitats on site was conducted (including rare/legally protected plant and invasive species surveys), along with a detailed report outlining and describing the various habitats and plants present on site, including detailed habitat maps and species lists.

A full survey of all areas of hedgerow habitat within the development site was to be conducted according to the methodology of Kelleher Ecology Services (2021) and Foulkes *et al.* (2013). A detailed report was also to be provided, which includes descriptions of the various hedgerows present on site and their relative diversity and ecological value (with accompanying illustrative maps), along with the recorded species and other relevant data from each hedgerow transect.

The study area for this hedgerow study is the entire proposed development site, which can be seen in Figure 1.

2. *Methodology*

The habitat/plant walkover survey was carried out by Alexis FitzGerald B.A. M.Sc. on the 12th April 2024, with reference to Smith *et al.* (2011). The habitats were classified according to the Irish Heritage Council classification system (Fossitt, 2000). The abundance of each species present in each habitat was recorded using the percentage scale[1]. The locations of rare and non-native species were also recorded. EU Habitats Directive Annex I habitats were classified as per Commission of the European Communities (2013), also with reference to the corresponding national habitat survey reports and descriptions, particularly NPWS (2019). The nomenclature for the Annex I habitats also follows Commission of the European Communities (2013), with any abbreviated names for the habitats following NPWS (2019). Vascular plant taxonomy and nomenclature follows Stace (2019), whilst bryophyte taxonomy and nomenclature follow Atherton *et al.* (2010). Ecological evaluations were made according to the criteria as set out in Appendix III.

The hedgerow survey was carried out by Alexis FitzGerald B.A. M.Sc. on the 12th and 13th April 2024, according to the methodology of Kelleher Ecology Services (2021), which was adapted from that of Foulkes *et al.* (2013) to a smaller, development site-based scale. As such, all habitats classified as hedgerows (WL1) and treelines (WL2) as per the Irish Heritage Council classification system (Fossitt, 2000) were included and recorded for this survey. These definitions are included by Foulkes *et al.* (2013) in their descriptions of relevant hedgerow habitats for surveying. As a result, habitats

[1] Percentages were recorded as follows: 0.1, 0.3, 0.5, 0.7, 1, 3, 5, 7, 10, 15, 20, 25, 30, etc., continuing in 5% steps to 100%.

technically classified according to Fossitt (2000) as treelines (WL2) habitat are referred to as "*hedgerows*" in the hedgerow assessment section of this report.

A standard hedgerow appraisal form (following Kelleher Ecology Services (2021) and Foulkes *et al.* (2013)) was used to record the relevant assessment criteria and indicator species, and the forms and the data recorded for each hedgerow are presented in Appendix II. The hedgerow appraisal form recorded information for each hedgerow under the following five criteria:

- Context
- Construction
- Structure and condition
- Management
- Floristic data – tree, shrub and ground flora layers

The indicator species recorded for the floristic data are those presented in Appendices D and E of Foulkes *et al.* (2013). The abundance of each shrub species present in each transect was recorded using the percentage scale (adapted by FitzGerald Ecology from the original Domin scale used by Foulkes *et al.* (2013)), whilst the tree and ground flora etc. species were recorded according to a more simple presence/absence criterion (trees were either Present, P, or Dominant, D; ground flora etc. were only Present, P), as per the methodology in Foulkes *et al.* (2013).

Two non-concurrent hedgerow sample transects were selected (*"1 30m a"*, *"1 30m b"*, etc.) and recorded for each of five hedgerows (see Figure 4 for locations), with 8 transects recorded in total (see Figure 4 for locations of transects). The locations of these transects were selected via a randomised process in Microsoft Excel ©, as per the methodology in Foulkes *et al.* (2013). The distance (in metres) of the transects along the hedgerows are also included in Appendix II. In two cases (hedgerows 1 and 5), where the length of the individual hedgerow was very short, only one transect was recorded.

Historic information on the hedgerows on site was found by reviewing downloadable present-day Ordnance Survey Ireland townland boundaries shapefiles[2], as well as historic 1st and 2nd edition 6-inch Ordnance Survey maps of the area available online[3].

The significance of each hedgerow on site was assessed as part of the survey, according to the following criteria as set out by both Foulkes *et al.* (2013) and Kelleher Ecology Services (2021):

- Historical Significance
- Species Diversity Significance
- Ground Flora significance
- Structure, Construction & Associated Features
- Habitat Connectivity
- Landscape Significance

Each of the above criteria is ranked on a scale of 0-4 based upon the field data collected. As noted by Foulkes *et al.* (2013), *"a score of 4 in any category indicates a hedge of high significance (Heritage Hedgerow). Hedges can also be considered of high significance (Heritage Hedgerows) if they record a cumulative score of 6 or greater in the Historical, Species Diversity or Structural Categories, or a*

[2] Available at: https://data.gov.ie/dataset/townlands-osi-national-statutory-boundaries1

[3] Available at: https://geohive.maps.arcgis.com/apps/webappviewer/index.html?id=9def898f708b47f19a8d8b7088a100c4

cumulative score of 16 or greater over the five categories". Therefore, a hedgerow may be considered as a Heritage Hedgerow under three different scenarios (or any combination of these).

The condition of each hedgerow on site was also assessed as part of the survey, according to the following criteria as set out by both Foulkes *et al.* (2013) and Kelleher Ecology Services (2021):

- Structural variables
- Continuity
- Negative indicators/Degradation/Issues affecting long term viability

Each of the above criteria is ranked on a scale of 0-3 based upon the field data collected. The higher the score, the more favourable the condition. As noted by Foulkes *et al.* (2013), *"A score of 0 in any category represents a hedgerow in Unfavourable Condition"*.

3. *Baseline Study*

Site Context

The Ballymastone Phase 2 site is centred around former agricultural farmland in north Co. Dublin, with six large fields and adjoining boundary treeline features present, particularly along the northern and eastern boundaries of the site. To the immediate south of the current study area is the Ballymastone Phase 1 site, for which the construction phase is already fully active. The former fields in the Phase 2 area are now being gradually affected by the surrounding developments, as a new construction compound has been set up in the centre of the site and large areas of the central fields have already been dug up and the spoil from those works have been placed over a large majority of the site.

The northeasternmost field is the most intact grassland present on site, with a diverse array of wet grassland plant species having been recorded there. Broadleaved woodland occurs along the northern and western edges of this field and contains some very old trees, including large *Quercus petraea* specimens. The southernmost east-west treeline is a townland boundary hedge, but a large portion of this treeline has now been removed (to facilitate the construction of the permitted Phase 1 development), as well as the central east-west treeline. All of the other treelines on site are former farmland boundary or internal field boundary treelines. Many of the treelines have been flailed and/or topped recently in order to facilitate the adjacent works. Some, but not all, of the fences, are surrounded by BS5837 standard Heras fencing.

Legally Protected and Rare Flora

No plant species listed on the *Flora (Protection) Order 2022*, were recorded during the field survey in 2024.

Non-native (Invasive) Flora

No plant species listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations, 2011* were recorded during the field surveys in 2024. 11 (which are not listed on the Third Schedule) non-native/introduced plant species were recorded across the study area: *Veronica persica, Fagus sylvatica, Acer pseudoplatanus, Cupressus macrocarpa, Picea* sp., *Aesculus*

hipposcastanum, *Tulipa* sp., *Lonicera nitida*, *Helminthotheca echioides*, *Prunus lauracerasus*, and *Viburnum* sp.

Habitats

The habitat types (and/or mosaics) recorded within the study area according to the Heritage Council classification system (Fossitt, 2000) are described in detail in section 3.1 (and are also mapped in Figure 2). Full plant species lists (with percentage abundance estimates for each species) for each recorded habitat are also presented in Appendix I of this report.

The following eight habitat types (and/or mosaics) were recorded within the study area during the field survey in 2024:

- Drainage ditches (FW4)
- (Mixed) broadleaved woodland (WD1)
- Wet grassland (GS4)
- Spoil and bare ground (ED2)
- Hedgerows (WL1)
- Buildings and artificial surfaces/Spoil and bare ground (BL3/ED2)
- Buildings and artificial surfaces (BL3)
- Treelines (WL2)

Hedgerows

The study site consists of a few former agricultural fields. Work has commenced in these fields and most have recently been converted to spoil and bare ground (ED2). Intersecting and surrounding these fields are five extended lengths of treelines (WL2) habitat (they are considered as 'hedgerows' for surveying purposes, as mentioned previously). Hedgerow 1 represents a townland boundary. Hedgerows 4 and 5 represent site boundaries and the remainder are internal boundaries between the fields.

Figure 1. Site boundary (in red) – the aerial photography shows the site as it was prior to the commencement of the Ballymastone Phase 1 construction phase

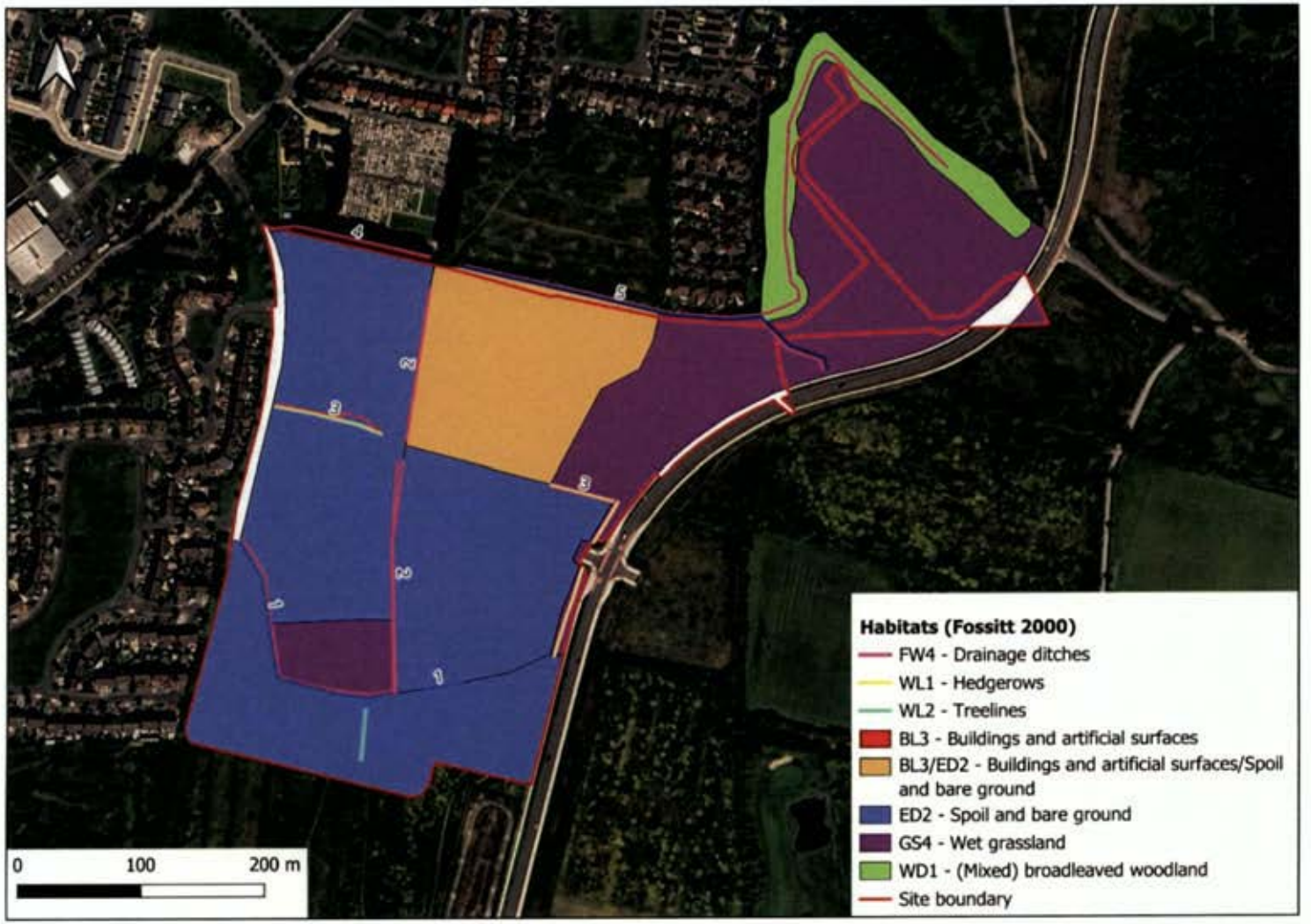

Figure 2: All habitats recorded in the study area during surveys in 2024

Figure 3. All hedgerows/treelines recorded within the proposed development site during the field survey in April 2024, separated into 5 different numbered items for survey and assessment purposes

Figure 4. All randomised hedgerow sample transects (thick orange lines) recorded within the proposed development site during the field survey in April 2024

3.1. Habitat descriptions

Drainage ditches (FW4)

Drainage ditches (FW4) habitat is found widely across the site, mostly running parallel along the base of treelines. In combination with the wet grassland (GS4) that dominates the north-eastern end of the site, these habitats show that the site has the ability to retain a lot of water and was likely much wetter in the past prior to drainage. *Epilobium hirsutum* and *Lemna minor* were recorded in this habitat but they are very species-poor otherwise. Nevertheless, this is a valuable wetland habitat locally and is considered to be of **Local importance (higher value)**.

Plate 1: Drainage ditches (FW4) habitat on site

(Mixed) broadleaved woodland (WD1)

A long strip of (Mixed) broadleaved woodland (WD1) habitat runs along the site boundary at the north-eastern end of the site. The canopy is dominated by *Acer pseudoplatanus* and *Fraxinus excelsior* with lesser amounts of *Quercus petraea* and *Ulmus* sp. There are other tree species present in small amounts such as *Salix cinerea* subsp. *oleifolia*, *Aesculus hippocastanum*, and *Picea* sp. The understorey of the woodlands on site is vegetated by such shrubs as *Rubus fruticosus* agg., *Hedera helix,* and *Prunus spinosa*. The herbaceous species occurring here include *Ficaria verna*, *Galium aparine*, *Geranium robertianum*, *Veronica chamaedrys* and *Urtica dioica*. This habitat is considered to be of **Local importance (higher value)**, due to its relatively well-developed and diverse woodland vegetation and

the potential for the woodland to become more species diverse (with a native tree species canopy) over time.

Plate 2: (Mixed) broadleaved woodland (WD1) at the northern end of the site

Wet grassland (GS4)

Wet grassland (GS4) is the dominant habitat at the north-eastern end of the site. This habitat is characterised by having an increased influx of freshwater near the soil surface relative to GS2/GS1 grassland, which allows this grassland type to support some wetland plant species. As a result, the habitat within the site is dominated by such grass species as *Agrostis stolonifera*, *Holcus lanatus*, and *Glyceria* sp. alongside such rush species as *Juncus effusus, Juncus articulatus* and *Juncus inflexus*. Occasional species in this habitat include *Typha latifolia, Ranunculus repens, Carex disticha* and *Ranunculus acris*. This habitat is considered to be of **Local importance (higher value)**, due to its relatively high species diversity and due to the scarcity of wetland habitats in the vicinity.

Plate 3: Wet grassland (GS4) at the northern end of the site

Hedgerows (WL1)

A small stretch of recently planted hedgerow (WL1) was recorded along the eastern site boundary. This new hedgerow was planted with a mix of native and non-native tree species such as *Crataegus monogyna, Corylus avellana, Prunus laurocerasus, Ilex aquifolium,* and *Viburnum* sp. This habitat is considered to be of **Local importance (higher value),** as it forms part of the wider linear habitat network in the area.

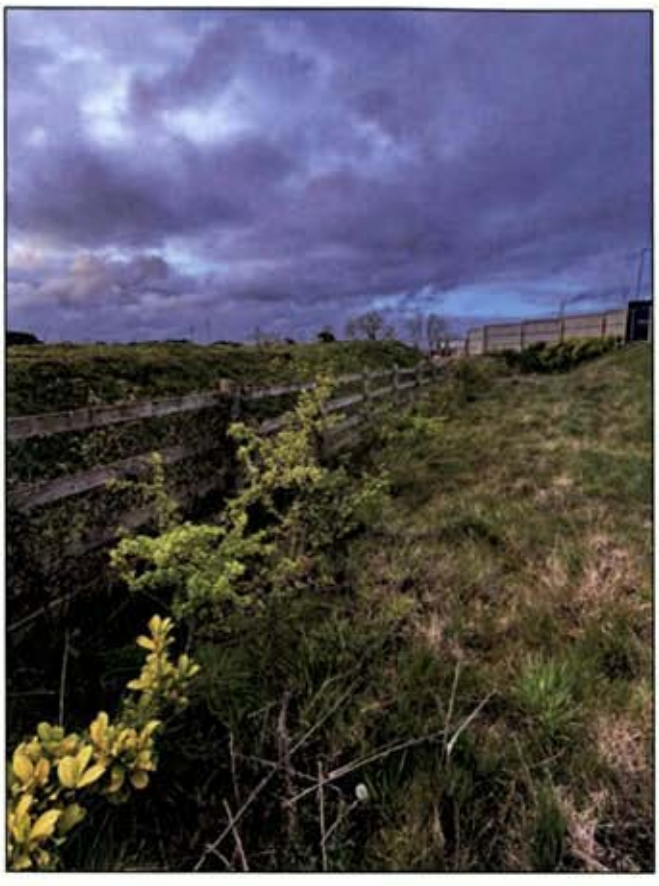

Plate 4: Newly planted Hedgerow (WL1) including the non-native Prunus laurocerasus in the foreground

3.1.1. Local Importance (Lower Value) Habitats

Spoil and bare ground (ED2) and an area of Buildings and artificial surfaces/spoil and bare ground (BL3/ED2) mosaic have been recorded on site during the field surveys in 2024 and are mapped in Figure 2. These habitats cover the greatest surface area within the site boundary compared to all other habitat types. All of these habitats are considered to be of **Local importance (lower value)** due to their low species diversity and poor habitat potential.

3.1.2. Negligible Habitats

Buildings and artificial surfaces (BL3) habitat was recorded on site during the field surveys in 2024 and (See Figure 2). These areas consist of the roadway through 'The Links' housing estate that runs along the western site boundary, as well as the R126 on the western end of the site, and the large construction compound for the Phase 1 lands. This habitat is considered to be of **Negligible importance** due to its very low species diversity and very poor habitat potential.

Plate 5: An area of Spoil and bare ground (ED2) habitat at the centre of the construction site

3.2. Hedgerow 1

Hedgerow 1 (See Plate 6) is a townland boundary hedgerow, identifiable as such on the 2nd edition OS maps which occurs along the southern end of the site and runs initially at a north-west to south-east direction and then turns east along the remainder of its length. While this habitat classifies as a treeline (WL2) according to Fossitt (2000), such treelines are also included by Foulkes *et al.* (2013) for assessment and are therefore considered here. This treeline is dominated by *Crataegus monogyna* along the majority of its length, with tall *Acer pseudoplatanus* and *Fraxinus excelsior* also present. This hedge has recently been topped with the exception of some of the taller *Fraxinus excelsior* trees. A large portion of the western extent of the hedge has been removed entirely as part of the Phase 1 permission. *Hedera helix* agg., and *Rubus fruticosus* agg. make up the shrub layer and the ground layer of the hedgerow contains the high nutrient indicator species *Urtica dioica* and *Galium aparine*.

This hedge has grown into a treeline, having been managed in the lower sections but has grown upwards at the top. It appears on the 2nd edition OS maps, but it is only visible as a field boundary on the 1st edition. It is a hedgerow with large gaps present; however, it is considered to be of **Local importance (higher value)**, given its mature status as a townland boundary and the fact that it is part of the wider linear habitat network in the area.

Plate 6: Hedgerow 1 at the southern end of the site

3.3. Hedgerow 2

Hedgerow 2 (See Plate 7) runs approximately south to north bisecting the southern end of the site. While this habitat classifies as a treeline (WL2) according to Fossitt (2000), such treelines are also included by Foulkes *et al.* (2013) for assessment and are therefore considered here. This is a top-heavy hedgerow that has grown into a treeline with a drain running along the southern portion. *Fraxinus excelsior* is the dominant tree species, with *Crataegus monogyna* dominating the shrub layer with lesser amounts of *Rubus fruticosus* agg. and *Hedera helix* agg. *Galium aparine*, *Urtica dioica*, *Cirsium arvense*, and *Sonchus asper* were recorded in the ground layer.

This hedgerow has been lightly flailed recently along the its lower half; the taller *Fraxinus excelsior* trees have been left untouched. Some holes have been created in this hedge due to physical damage relating to fencing installation and a large *c.* 20m wide gap has been created in the central section of the hedge. Hedgerow 2 is considered to be of **Local importance (higher value)**, given its mature status as part of the wider linear habitat network in the area, directly connecting to townland boundary hedgerows.

Plate 7: Hedgerow 2 at the southern end of the site

3.4. Hedgerow 3

Hedgerow 3 (See Plate 8) runs approximately north-west to south-east through the centre of the site. While this habitat classifies as a treeline (WL2) according to Fossitt (2000), such treelines are also included by Foulkes *et al.* (2013) for assessment and are therefore considered here. A large proportion of the central extent of this hedgerow has been removed for construction purposes. Although now divided, the hedge is still considered as one hedge for the purposes of the hedgerow surveys. Heras fencing is present along the south-eastern surviving length but is absent along the western length,. Like the previously discussed hedgerows, this hedge was recently flailed along its lower sections and was also topped, with the exception of some taller *Fraxinus excelsior* trees. *Fraxinus excelsior* is the dominant tree species. The shrub layer is composed of *Hedera helix* agg. and *Rubus fruticosus* agg., with only a small proportion made up of *Crataegus monogyna*. *Galium aparine*, *Urtica dioica*, and *Cirsium arvense* were recorded in the ground layer. Hedgerow 3 is considered to be of **Local importance (higher value)**, given its mature status as part of the wider linear habitat network in the area.

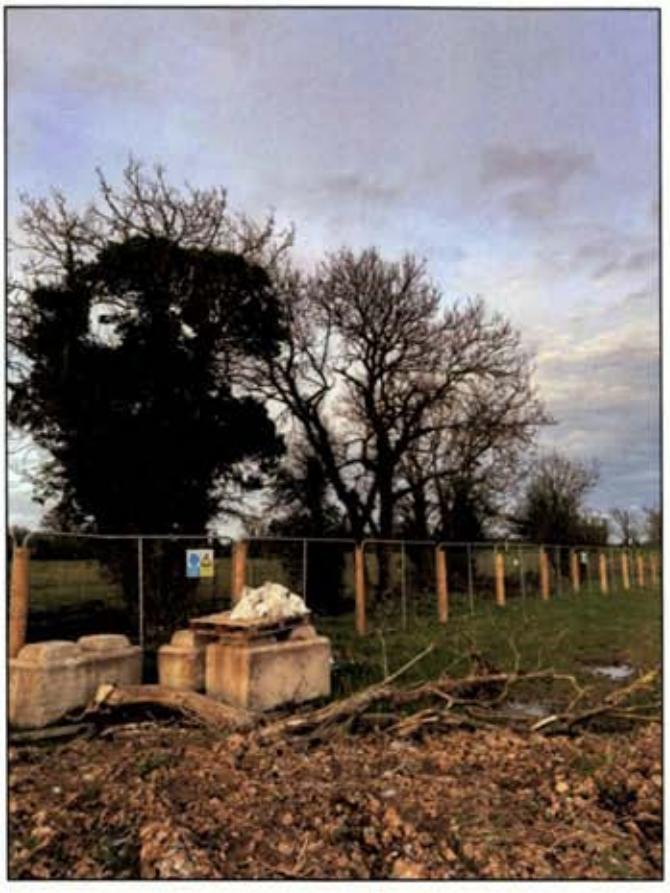

Plate 8: Hedgerow 3 at the centre of the site

3.5. Hedgerow 4

Hedgerow 4 (See Plate 9) is a site boundary hedgerow located at the north-western end of the site. It runs approximately north-west to south-east in direction. While this habitat classifies as a treeline (WL2) according to Fossitt (2000), such treelines are also included by Foulkes *et al.* (2013) for assessment and are therefore considered here. A medium-sized wet drain runs along this treeline, between 0.5m to 1m wide. *Cupressus macrocarpa* is the dominant tree species in this treeline with lesser amounts of *Fraxinus excelsior*. *Rubus fruticosus* agg. and *Hedera helix* agg. are abundant in the shrub layer, along with *Crataegus monogyna* and *Sambucus nigra* in lesser quantities. The ground layer of this treeline contains *Galium aparine*, *Urtica dioica*, *Cirsium arvense*, and *Sonchus asper*. It is evident that the row of mature *Cupressus macrocarpa* was planted along the north side of the hedgerow along the edge of the adjacent cemetery in the past, and this speciesnow overshadows the native hedgerow vegetation on the south side. This, along with the dense cover of *Rubus fruticosus* agg. in the shrub layer and the presence of the wet shallow ditc,h have all contributed to the reduced herb layer diversity along the length of the hedgerow.

This is a top-heavy hedgerow, having been recently flailed along its lower half to facilitate Heras fencing installation. There is dense shrub cover in the undergrowth along most of its length, except at the eastern end of the hedge. It is considered to be of **Local importance (higher value)**, given its mature status as part of the wider linear habitat network in the area.

Plate 9: Hedgerow 4 along the north-western site boundary

3.6. Hedgerow 5

Hedgerow 5 (See Plate 10) is situated along the northern site boundary running approximately north-west to south-east. Like all of the previous hedgerows discussed, this habitat classifies as a treeline (WL2) according to Fossitt (2000), however, such treelines are also included by Foulkes *et al.* (2013) for assessment and are therefore considered here. *Crataegus monogyna* is the dominant shrub interspersed with *Acer pseudoplatanus* trees. *Rubus fruticosus* agg. and *Hedera helix* agg. are also very abundant in the shrub layer with lesser quantities of *Rosa canina* agg. The nutrient rich indicator species *Galium aparine* and *Urtica dioica* are found in the ground layer. A medium-sized wet drain runs along the base of this hedge. This hedgerow is considered to be of **Local importance (higher value)**, as it acts as a linear habitat network between the adjacent treelines at the site.

Plate 10: Hedgerow 5 at the northern end of the site

4. *Assessment of Significance and Condition of Hedgerows*

4.1. Hedgerow Significance

A summary of assessments of hedgerow significance is presented below in Table 1. This assessment follows the methodology outlined in Section 2 above, which follows Kelleher Ecology Services (2021) and Foulkes *et al.* (2013).

Table 1. Summary of significance criteria calculations for all hedgerows within the proposed development site

Hedgerow Reference Number	**1**	**2**	**3**	**4**	**5**
Historical Significance	4	3	3	3	3
Species Diversity Significance	1	1	1	2	1
Ground Flora significance	1	2	1	1	1
Structure, Construction & Associated Features	2	2	2	3	3
Habitat Connectivity	2	2	2	2	3
Landscape Significance	2	2	2	2	2
Total	**12**	**12**	**11**	**13**	**13**

As can be observed in Table 1 above, hedgerows 4 and 5 represent the most significant hedgerows within the proposed development site (both with a combined score of 13), followed closely by hedgerows 1 and 2 (both with a combined score of 12). Hedgerow 3 had the lowest score of 11. As noted above in Section 2, hedgerows of high significance ('Heritage Hedgerows') can be classified under three different scenarios. Therefore, under these criteria, all hedgerows should be considered as hedgerows of high significance ('Heritage Hedgerows'). Indeed, hedgerow 1 can be considered as such purely based upon its historical importance, being as it is a townland boundary hedgerow which is identifiable in historic 2nd edition 6-inch Ordnance Survey maps. Hedgerow 2-5 can also be considered as hedgerows of high significance ('Heritage Hedgerows') as they have cumulative scores of 6 or greater in the Historical, Species Diversity or Structural Categories. The majority of the hedgerows internal to the Ballymastone Phase 2 site will be retained and managed within the proposed landscape and biodiversity network.

4.2. Hedgerow Condition

A summary of assessments of hedgerow condition is presented below in Table 2. This assessment follows the methodology outlined in Section 2 above, which follows Kelleher Ecology Services (2021 and Foulkes *et al.* (2013).

Table 2. Summary of condition assessment criteria calculations for all hedgerows within the proposed development site

Hedgerow Reference Number	**1**	**2**	**3**	**4**	**5**
Structural Variables	Highly favourable (3)	Highly favourable (3)	Favourable (2)	Highly favourable (3)	Highly favourable (3)
Continuity	Unfavourable (0)	Unfavourable (0)	Unfavourable (0)	Highly favourable (3)	Unfavourable (0)
Negative Indicators/Degradation/Issues affecting long-term viability	Unfavourable (0)	Adequate (1)	Adequate (1)	Unfavourable (0)	Adequate (1)
Total	**3**	**4**	**3**	**6**	**4**

As can be observed in Table 2 above, hedgerows 4, 5, and 2 represent the hedgerows with the most favourable conditions within the study site. As noted by Foulkes *et al.* (2013), *"A score of 0 in any category represents a hedgerow in Unfavourable Condition"*. Therefore, under this criterion, all hedgerows should be considered as hedgerows in 'Unfavourable Condition' (all failed on at least one category).

5. Summary

This report presents a summary of findings from a habitat and hedgerow survey in April 2024 of a proposed development site at the Ballymastone Phase 2 lands near Donabate, north Co. Dublin. All

habitats in the study area were mapped and a total of five separate lengths of hedgerow were surveyed as part of this assessment, with two randomised sample transects being recorded in each (one sample for two shorter hedgerows). It discusses the main habitat features and the species composition of the listed habitats found during the field survey, as well as any rare, invasive or noteworthy species on the site. A total of eight separate habitat types (and/or mosaics) were recorded across the study area.

The results in terms of hedgerow significance showed that hedgerows 4 and 5 are the most important within the site, closely followed by 1 and 2. All the hedgerows on site represent 'Heritage Hedgerows' and are of high historical importance. In terms of condition assessment of the hedgerows, all the hedgerows assessed can be considered as hedgerows in 'Unfavourable Condition'.

Although the majority of the hedgerows internal to the Ballymastone Phase 2 site will be retained and managed within the proposed landscape and biodiversity network, it will be important to ensure that any construction/operational activities on site do not negatively affect the condition of these hedgerow habitats. The erection of Heras fencing to BS5837 standard (during construction), the establishment of buffer areas around the hedgerows to protect tree rooting zones and the restoration of any managed hedgerows are some of the important measures (amongst others) to implement which will ensure that these hedgerows are not negatively affected over time.

6. References

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Appendix I: Species Lists

Wet grassland (GS4)		Treelines (WL2)		(Mixed) broadleaved woodland (WD1)	
Scientific Name	**%**	**Scientific Name**	**%**	**Scientific Name**	**%**
Agrostis stolonifera	55	*Fraxinus excelsior*	65	*Hedera helix*	60
Carex disticha	0.3	*Rubus fruticosus* agg.	40	*Heracleum sphondylium*	10
Juncus effusus	15	*Hedera helix*	30	*Fraxinus excelsior*	30
Glyceria sp.	1	*Fagus silvatica*	1	*Prunus spinosa*	10
Rumex crispus	1	*Salix cinerea* subsp. *oleifolia*	0.5	*Salix cinerea subsp. oleifolia*	3
Salix cinerea subsp. *oleifolia*	1	*Acer pseudoplatanus*	30	*Rubus fruticosus* agg.	30
Ranunculus repens	1	*Galium aparine*	5	*Acer pseudoplatanus*	40
Taraxacum agg.	5	*Vicia sepium*	0.1	*Picea* species	5
Juncus inflexus	1	*Smyrnium olusatrum*	1	*Aesculus hippocastanum*	3
Festuca rubra agg.	15	*Crataegus monogyna*	15	*Veronica chamaedrys*	0.3
Alopecurus pratensis	1	*Quercus robur*	1	*Rosa canina* agg.	0.3
Juncus articulatus	3	*Sambucus nigra*	1	*Carex sylvatica*	0.3
Typha latifolia	1	*Cupressus macrocarpa*	5	*Quercus petraea*	7
Rumex obtusifolius	0.5	*Prunus spinosa*	10	*Geranium robertianum*	0.1
Poa humilis	0.7	*Arum maculatum*	0.3	*Corylus avellana*	0.1
Poa annua	0.1	*Urtica dioica*	5	*Kindbergia praelonga*	0.3
Holcus lanatus	15	*Cirsium arvense*	3	*Ilex aquifolium*	0.5
Cardamine pratensis	0.3	*Sonchus asper*	0.5	*Ulmus* species	20
Brachythecium rutabulum	1	*Rosa canina* agg.	0.5	Fissidens taxifolius	0.1
Vicia sepium	0.1	*Veronica chamaedrys*	0.1	*Asplenium scolopendrium*	0.3
Arrhenatherum elatius	0.5			*Polystichum setiferum*	0.3
Vicia sativa subsp. *segetalis*	0.3			*Ficaria verna*	0.3
Veronica persica	0.1			*Smyrnium olusatrum*	3
Heracleum sphondylium	0.1			*Tulipa* species	0.1
Ranunculus acris	0.7			*Lonicera nitida*	0.1
Rubus fruticosus agg.	0.3			*Lonicera periclymenum*	0.1
				Galium aparine	0.5
				Urtica dioica	0.5

Spoil and bare ground (ED2)		Hedgerows (WL1)		Drainage ditches (FW4)	
Scientific Name	**%**	**Scientific Name**	**%**	**Scientific Name**	**%**
Agrostis stolonifera	1	*Crataegus monogyna*	70	*Lemna minor*	3
Taraxacum agg.	0.1	*Corylus avellana*	15	*Epilobium hirsutum*	3
Poa annua	0.3	*Prunus laurocerasus*	5	*Hedera helix*	5
Stellaria media	1	*Ilex aquifolium*	1		
Fumaria muralis	0.1	*Viburnum* species	3		
Helminthotheca echioides	0.5				
Senecio vulgaris	0.1				

Appendix II: Hedgerow transect data

Structural Recording Form					
Hedgerow Reference Number	1	2	3	4	5
Date of Recording	12/04/2024	12/04/2024	13/04/2024	13/04/2024	13/04/2024
Length of Hedgerow (m)	244	310	138	128	313
Surveyors	AF	AF	AF	AF	AF
GPS Start Point (ITM)	723585, 750135	723544, 750448	723423, 750349	723538, 750473	723854, 750393
GPS End Point (ITM)	723395, 750240	723521, 750128	723678, 750286	723418, 750491	723567, 750464
Start Point to start of 1st 30m transect	50	8	28	12	96
End of 1st 30m transect to start of 2nd 30m transect	86	241	28	26	65
End of 2nd 30m transect to End Point	62	13	15	25	84
Corine					
Soil Type					
a1. Altitude min. (m)					
a2. Altitude max.(m)					
b1. Aspect Side 1	S	E	S	S	S
b2. Aspect Side 2	N	W	N	N	N
A1. Adjacent Land Use Side 1	h	h	h	h	h
A2. Adjacent Land Use Side 2	h	h	h	j	j
B. History	2	1	1	5	5
B1. History Road / Stream					
B1a. Road Class	n/a	n/a	n/a	n/a	n/a
B2 History Ordnance Survey	2	2	n/a	n/a	n/a
B3 Sites and Monuments Record	n/a	n/a	n/a	n/a	n/a
B4 Old Woodland Link	n/a	n/a	n/a	n/a	n/a
C1. Adjacent Land Class Side 1	ED	ED	ED	ED	GS
C2. Adjacent Land Class Side 2	GS	ED	ED	BL3	BL3
D1. Habitat Link Class End 1	BL3	WL2	BL3	BL3	WL2
D2. Habitat Link Class End 2	ED2	WL2	BL3	WL2	WD1
D3. Designated Site	No	No	No	No	No
E. Boundary Function	2	2	2	1	2
F. Outline	b	a	a	a	a
G1. Linearity of Shrubs	1	1	1	2	1
G2. Bank, Wall, Shelf	0	0	0	0	0
G3. Drain	b	b	b	b	b
G4. Fossit Class	WL2	WL2	WL2	WL2	WL2
H. Bank,Wall,Shelf size	d	d	d	d	d
I1. Drain Size	3	3	3	3	3
I2. Drain wet/dry	a	a	a	b	b
J. Profile	e	e	e	e	e
J1. Profile base suffix	b	a	a	b	b
K. Height	5	4	5	5	4

K1. Height o/head cables	n/a	n/a	n/a	n/a	n/a
L. Width	d	d	d	d	d
M. % of Gaps	6	2	6	1	2
M1. Specific or general	b	b	b	n/a	b
N. Base Structure	d	c	b	c	c
N1. Base - Vegetation	a	n/a	a	a	a
O. Bank Degradation Degree	1	1	1	1	1
O1. Bank Degradation Extent	n/a	n/a	n/a	n/a	n/a
P. Trees Quantity	e	e	e	e	e
Q. Tree Age Composition	2	2	2	2	2
Q1. Tree Height (max)	c	c	c	e	c
Q2. Tree Height (min)	b	b	b	b	a
R. Verge / Margin Width Side 1	b	b	e	b	b
R2. Verge / Margin Side 1 Degradation	0	0	n/a	0	0
R3. Verge / Margin Width Side 2	b	b	e	e	e
R4. Verge / Margin Side 2 Degradation	0	0	n/a	0	0
S. Vigour	c	a	c	a	b
U. Management	c	e	c	c	c
U1. Management - out of season	n/a	n/a	n/a	n/a	n/a
U2. Management Stage	10	10	10	10	10
V. Management Method	1	1, 7	1	1	1
W. Evidence of Rejuvenation - Past	a	a	n/a	a	a
W1. Evidence of Laying - Recent	n/a	n/a	n/a	n/a	n/a
X. Fencing Side	4	4	none, 4	none	none
X1. Fencing Side 2	none	4	none, 4	4	4
X3. Fencing wire to stems	n/a	n/a	n/a	n/a	n/a
Y. Ground Flora	f - *Galium aparine*	n/a	n/a	e - *Urtica dioica*, f - *Galium aparine*	n/a

	1 30m a	1 30m b	2 30m a	2 30m b	3 30m a	3 30m b	4 30m a	4 30m b	5 30m a	5 30m b
Shrub Recording Form (%)										
Hedera helix agg.	40	40	40	30	20	15	50	30	10	40
Crataegus monogyna	40	40	60	10	5	5	15	5	70	80
Rubus fruticosus agg.	40	40	25	20	30	15	40	50	40	50
Sambucus nigra							10	3		
Salix cinerea subsp. *oleifolia*								1		
Rosa canina agg.		1	1							
Prunus spinosa							**5**	40	10	
Climbers And Trees Recording Form										
Climbers (DAFOR, except Hedera helix agg. which is either present, P, if in ground/shru										

b layer, or absent, X)										
Hedera helix agg. (P/X)	P	P	P	P	P	P	P	P	P	P
Trees (Present, P/Dominant, D)										
Fraxinus excelsior	P	D	D	D	D	D	P			
Acer pseudoplatanus	P									P
Cupressus macrocarpa							D	D		
Ground Flora etc. Recording Form (Present, P)										
Veronica chamaedrys	P									
Other (negative indicator species, etc.) (DAFOR)										
Galium aparine	O	F	R	R	R	R	F	F	O	O
Urtica dioica	F	R	R	R	R	R	F	F		O
Cirsium arvense			R	R		R		F		
Sonchus asper			R				R			

Appendix III: Criteria for Ecological Evaluations[4]

International Importance:

- 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
- Proposed Special Protection Area (pSPA).
- Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
- Features essential to maintaining the coherence of the Natura 2000 Network.
- Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
- Resident or regularly occurring populations (assessed to be important at the national level) of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
- Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
- World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
- Biosphere Reserve (UNESCO Man & The Biosphere Programme).
- Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
- Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
- Biogenetic Reserve under the Council of Europe.
- European Diploma Site under the Council of Europe.
- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).

National Importance:

- Site designated or proposed as a Natural Heritage Area (NHA).
- Statutory Nature Reserve.
- Refuge for Fauna and Flora protected under the Wildlife Acts.
- National Park.
- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- Resident or regularly occurring populations (assessed to be important at the national level) of the following:
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.

County Importance:

- Area of Special Amenity.
- Area subject to a Tree Preservation Order.
- Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level) of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.

[4] Framework and table is taken and adapted from: National Roads Authority (2009). *Guidelines for Assessment of Ecological Impacts of National Roads Schemes*. Report for National Roads Authority.

- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
- Resident or regularly occurring populations (assessed to be important at the Local level) of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;
- Sites or features containing non-native species that are of some importance in maintaining habitat links.

Appendix 9.1: NRA Criteria for Rating the Magnitude and Significance of Impacts at EIA Stage National Roads Authority (NRA, 2009)

Table 9.1 Criteria for Rating Site Attributes – Estimation of Importance of Soil & Geology Attributes (NRA)

Importance	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA). Large existing quarry or pit. Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale.	Contaminated soil on site with previous heavy industrial usage. Large recent landfill site for mixed wastes. Geological feature of high value on a local scale (County Geological Site). Well drained and/or high fertility soils. Moderately sized existing quarry or pit. Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil underlying route is moderate on a local scale	Contaminated soil on site with previous light industrial usage. Small recent landfill site for mixed wastes. Moderately drained and/or moderate fertility soils. Small existing quarry or pit. Sub-economic extractable mineral resource.

Importance	Criteria	Typical Example
Low	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying route is small on a local scale.	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

Table 9.2 Criteria for Rating Site Attributes – Estimation of Importance of Hydrogeological Attributes (NRA)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status.
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple well fields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – NHA status. Regionally important potable water source supplying >2500 homes. Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer. Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Potable water source supplying <50 homes

Table 9.3 Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Soil/Geology Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit reserves. Irreversible loss of high proportion of local high fertility soils. Removal of entirety of geological heritage feature. Requirement to excavate/remediate entire waste site. Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves. Removal of part of geological heritage feature. Irreversible loss of moderate proportion of local high fertility soils. Requirement to excavate/remediate significant proportion of waste site. Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves. Removal of small part of geological heritage feature. Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils. Requirement to excavate/remediate small proportion of waste site. Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment.

Magnitude of Impact	Criteria	Typical Examples
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

Table 9.4 Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Hydrogeological Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Removal of large proportion of aquifer. Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. Potential high risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >2% annually.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Removal of moderate proportion of aquifer. Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. Potential medium risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >1% annually.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Removal of small proportion of aquifer. Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. Potential low risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >0.5% annually.

Magnitude of Impact	Criteria	Typical Examples
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Calculated risk of serious pollution incident <0.5% annually.

Table 9.5 Rating of Significant Environmental Impacts at EIS Stage (NRA)

Magnitude of Attribute	Magnitude of Importance			
	Negligible	**Small Adverse**	**Moderate Adverse**	**Large Adverse**
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/moderate	Profound/Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

Appendix 9.2: Relevant Borehole Logs

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Site Ballymastone Donabate			**Borehole Number** BH12
Machine : Beretta T47 **Flush :** Water **Core Dia :** 98 mm **Method :** Rotary Cored	**Casing Diameter** 100mm cased to 5.20m **Location** 723589.6 E 749944.8 N	**Ground Level (mOD)** 6.45 **Dates** 10/05/2022	**Client** Glenveagh **Engineer** DBFL	**Job Number** 11371-12-21 **Sheet** 1/1

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00						6.15	(0.30) 0.30	Brown slightly sandy slightly gravelly silty TOPSOIL with reeds, grass and rootlets			
	46						(0.80)	MADE GROUND: Brown mottled grey mottled yellowish brown slightly silty slightly sandy slightly gravelly Clay with some angular to subangular cobbles			
						5.35	1.10 (0.40)	MADE GROUND: Grey slightly clayey slightly sandy angular fine to coarse Gravel with occasional angular to subangular cobbles			
1.50	90	85	35			4.95	1.50	Medium strong to strong thinly laminated grey fine grained argillaceous LIMESTONE with many calcite veins and stylolites. Distinctly weathered			
2.50	93	83	52	10			(3.70)				
4.00	92	71	44					Two Fracture Sets: 1.50m to 5.20m BGL: F1: Close to medium, 10-40 degrees, rough, undulose, with clay smear. F2: Wide, 70-90 degrees, rough, undulose, with clay smear.			
5.20						1.25	5.20	Complete at 5.20m			

Remarks
No groundwater encountered
Standpipe installed: 50mm plain standpipe with benonite seal from GL to 1.00m BGL, 50mm slotted standpipe from 1.00m to 5.20m BGL, finished with a raised cover

Scale (approx)	Logged By
1:50	JS

Figure No. 11371-12-21.BH05

Ground Investigations Ireland Ltd
www.gii.ie

Site Ballymastone Donabate				**Borehole Number** BH14
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 3.70m 100mm cased to 8.00m	**Ground Level (mOD)** 7.61	**Client** Glenveagh	**Job Number** 11371-12-21
	Location 723633.2 E 750166.4 N	**Dates** 07/04/2022-20/04/2022	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	TCR	SCR	RQD	FI	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
									7.31	(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets	
0.50	B									(0.70)	Soft to firm light brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles	
1.00-1.45 1.00	SPT(C) N=15 B							1,1/2,3,2,8	6.61	1.00 (0.40)	Stiff brown mottled grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles	
									6.21	1.40	Stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles	
2.00-2.45 2.00	SPT(C) N=18 B							1,2/4,4,5,5		(1.10)		
									5.11	2.50	Stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles	
3.00-3.45 3.00	SPT(C) N=50 B							3,10/14,16,17,3		(1.00)		
								Water strike(1) at 3.50m, rose to 2.60m in 20 mins.	4.11	3.50 (0.20)		
		100	100	100					3.91	3.70	Grey brown slightly clayey gravelly fine to coarse SAND gravel bands angular to subangular fine to coarse	
3.70 3.70 3.80								B		(1.00)	Strong massive reddish grey fine to medium grained lithic arkosic SANDSTONE with quartz cementation. Partially weathered	
		93	85	79					2.91	4.70	Strong massive reddish grey fine to medium grained lithic arkosic CONGLOMERATE with quartz cementation, occasional quartz veins, and quartz dissolution textures. Partially weathered Two Fracture Sets: 3.70m to 8.00m BGL: F1: Medium to wide, 30-45 degrees, smooth to rough, planar to undulose with clay smear and oxidation. F2: Wide, 70-80 degrees, rough, undulose, with clay smear and oxidation	
5.30					3					(1.20)		
		96	96	93					1.71	5.90	Strong massive reddish grey fine to medium grained lithic arkosic SANDSTONE with quartz cementation. Partially weathered	
										(0.90)		
6.80					35				0.81	6.80 (0.20)	Weak thinly laminated reddish brown fine to medium grained SANDSTONE. Distinctly weathered	
7.00									0.61	7.00	Strong massive reddish grey fine to medium grained lithic arkosic CONGLOMERATE with quartz cementation, occasional quartz veins, and quartz dissolution textures. Partially weathered	
		88	73	73	2					(1.00)		
8.00									-0.39	8.00	Complete at 8.00m	

Remarks
Cable Percussion refusal at 3.70m BGL. Rotary follow on from 3.70m to 8.00m BGL
Borehole backfilled upon completion
Chiselling from 3.70m to 3.70m for 1 hour.

Scale (approx)	Logged By
1:50	JS

Figure No. 11371-12-21.BH14

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Site Ballymastone Donabate			**Borehole Number** BH15
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 3.50m	**Ground Level (mOD)** 7.94	**Client** Glenveagh	**Job Number** 11371-12-21
	Location 723670.5 E 750263.4 N	**Dates** 11/04/2022	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
					7.64	0.30			
0.50	B					(0.60)	Soft to firm light brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
					7.04	0.90			
1.00-1.45 1.00	SPT(C) N=11 B			1,2/2,3,3,3		(1.20)	Firm brown mottled grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
2.00-2.45 2.00	SPT(C) N=24 B			2,4/5,5,6,8	5.84	2.10	Stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
						(0.90)			
3.00-3.38 3.00	SPT(C) 46/225 B			5,7/10,15,21	4.94	3.00	Very stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
						(0.50)			
					4.44	3.50	OBSTRUCTION at 3.50m BGL: Boulder or bedrock		

Remarks
Borehole backfilled upon completion
No groundwater encountered
Chiselling from 3.40m to 3.50m for 1 hour.

Scale (approx)	Logged By
1:50	JS

Figure No. 11371-12-21.BH15

Ground Investigations Ireland Ltd
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Site Ballymastone Donabate			**Borehole Number** BH18
Machine : Dando 2000/Beretta T44 **Flush :** **Core Dia:** mm **Method :** Rotary Cored & Cable Percussion	**Casing Diameter** 200mm cased to 3.00m 100mm cased to 14.70m	**Ground Level (mOD)** 8.25	**Client** Glenveagh	**Job Number** 11371-12-21
	Location 723787.4 E 750395.9 N	**Dates** 13/04/2022-21/04/2022	**Engineer** DBFL	**Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00						7.95	(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
0.50					B	7.45	(0.50) 0.80	Soft light brown slightly silty slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
1.00	41				B	7.05	(0.40) 1.20	Soft brown mottled grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
2.00					B		(1.10)	Firm to stiff brown mottled grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
2.30 2.30-2.75					20,30/50 SPT(C) N=50	5.95	2.30	Very stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
3.00	50				B					
3.80 3.80-4.25					7,8/8,10,12,12 SPT(C) N=42					
	10						(4.50)			
5.30 5.30-5.75					9,10/11,10,13,12 SPT(C) N=46					
	67									
6.80 6.80-7.25					16,25/50 SPT(C) N=50	1.45	6.80	Very stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
	70						(1.95)			
8.30 8.30-8.75					22,28/50 SPT(C) N=50					
	63					-0.50	8.75	Very stiff greyish brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles and boulders		
9.70 9.70-9.85					50/50 SPT(C) 50/0		(1.55)			

Remarks
No groundwater encountered
Cable percussion refusal at 3.00m BGL, rotary carried out adjacent from GL to 14.70m BGL
Borehole backfilled upon completion

Scale (approx)	Logged By
1:50	JS

Figure No. 11371-12-21.BH18

Ground Investigations Ireland Ltd
www.gii.ie

Site Ballymastone Donabate			**Trial Pit Number** TP075
Machine : 14.5T 360 Excavator **Method :** Trial Pit	**Dimensions** 3.20m x 3.00m x 0.70m (l x d x w)	**Ground Level (mOD)** 8.18	**Client** Glenveagh	**Job Number** 11371-12-21
	Location 723613.6 E 750052.5 N	**Dates** 05/05/2022	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				8.08	(0.10) 0.10	Brown TOPSOIL with grass and rootlets		
						Soft brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
					(0.90)			
				7.18	1.00	Firm brown mottled grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles and boulders		
					(1.40)			
				5.78	2.40	Firm to stiff reddish brown slightly sandy slightly gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		
					(0.60)			
				5.18	3.00	Complete at 3.00m		

Plan

Remarks

No groundwater encountered
Trial pit sidewalls stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	JS	11371-12-21.TP075

Ground Investigations Ireland Ltd
www.gii.ie

Site Ballymastone Donabate				**Trial Pit Number** TP095
Machine : 14.5T 360 Excavator **Method :** Trial Pit	**Dimensions** 3.30m x 3.10m x 0.70m (l x d x w)	**Ground Level (mOD)** 8.23	**Client** Glenveagh	**Job Number** 11371-12-21
	Location 723660.1 E 750225.8 N	**Dates** 21/02/2022	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	Brown TOPSOIL with grass and rootlets		
				7.83	0.40	Soft to firm reddish brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
					(0.40)			
				7.43	0.80	Firm brown mottled grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
					(0.50)			
				6.93	1.30	Firm to stiff brown mottled grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
					(0.80)			
				6.13	2.10	Stiff greyish brown slightly silty slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
					(0.50)			
				5.63	2.60	Stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
					(0.50)			
				5.13	3.10	Complete at 3.10m		

Plan

Remarks

No groundwater encountered
Trial pit sidewalls stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	JS	11371-12-21.TP095

Appendix 10.1: Criteria for Rating the Magnitude and Significance of Impacts at EIA Stage National Roads Authority (NRA-TII, 2009)

Table 10.1 Criteria for Rating Size Attributes – Estimation of Importance of Hydrological Attributes (NRA)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status. Regionally important potable water source supplying >2500 homes. Quality Class A (Biotic Index Q4, Q5). Flood plain protecting more than 50 residential or commercial properties from flooding. Nationally important amenity site for wide range of leisure activities.
High	Attribute has a high quality or value on a local scale	Salmon fishery. Locally important potable water source supplying >1000 homes. Quality Class B (Biotic Index Q3-4). Flood plain protecting between 5 and 50 residential or commercial properties from flooding. Locally important amenity site for wide range of leisure activities.
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery. Local potable water source supplying >50 homes.

Importance	Criteria	Typical Examples
		Quality Class C (Biotic Index Q3, Q2- 3). Flood plain protecting between 1 and 5 residential or commercial properties from flooding.
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities. Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1). Flood plain protecting 1 residential or commercial property from flooding. Amenity site used by small numbers of local people.

Table 10.2 Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Hydrological Attributes (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss or extensive change to a waterbody or water dependent habitat. Increase in predicted peak flood level >100mm. Extensive loss of fishery. Calculated risk of serious pollution incident >2% annually. Extensive reduction in amenity value.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Increase in predicted peak flood level >50mm. Partial loss of fishery. Calculated risk of serious pollution incident >1% annually. Partial reduction in amenity value.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Increase in predicted peak flood level >10mm. Minor loss of fishery.

Magnitude of Impact	Criteria	Typical Examples
		Calculated risk of serious pollution incident >0.5% annually. Slight reduction in amenity value.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Negligible change in predicted peak flood level. Calculated risk of serious pollution incident <0.5% annually.
Minor Beneficial	Results in minor improvement of attribute quality	Reduction in predicted peak flood level >10mm. Calculated reduction in pollution risk of 50% or more where existing risk is <1% annually.
Moderate Beneficial	Results in moderate improvement of attribute quality	Reduction in predicted peak flood level >50mm. Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually.
Major Beneficial	Results in major improvement of attribute quality	Reduction in predicted peak flood level >100mm

Table 10.3 Rating of Significant Environmental Impacts at EIS Stage (NRA)

Importance of Attribute	Magnitude of Importance			
	Negligible	**Small Adverse**	**Moderate Adverse**	**Large Adverse**
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/moderate	Profound/Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

Appendix 10.2 Water Framework Directive (WFD) Screening Assessment

awnconsulting

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

WATER FRAMEWORK DIRECTIVE (WFD) SCREENING ASSESSMENT FOR A PROPOSED RESIDENTIAL DEVELOPMENT AT BALLYMASTONE PHASE 2 LRD, CO. DUBLIN

Report Prepared For
Glenveagh Living Limited

Report Prepared By

Luke Maguire BSc

Environmental Consultant

Our Reference
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25th April 2024

Cork Office
Unit 5, ATS Building,
Carrigaline Industrial Estate,
Carrigaline, Co. Cork.
T: + 353 21 438 7400
F: + 353 21 483 4606

AWN Consulting Limited
Registered in Ireland No. 319812
Directors: F Callaghan, C Dilworth,
T Donnelly, T Hayes, D Kelly, E Porter

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APPENDICES

Appendix A Water Framework Directive Matrix

1.0 INTRODUCTION

Glenveagh Living Limited is applying for planning permission to Fingal County Council for a second of three phases of a residential development at Ballymastone, Donabate, Co Dublin.

AWN Consulting Limited (AWN) has prepared this Water Framework Directive (WFD) Screening as part of the Environmental Impact Assessment Report (EIAR) associated with the proposed development. Refer to Figure 1.1 below for the location of the development.

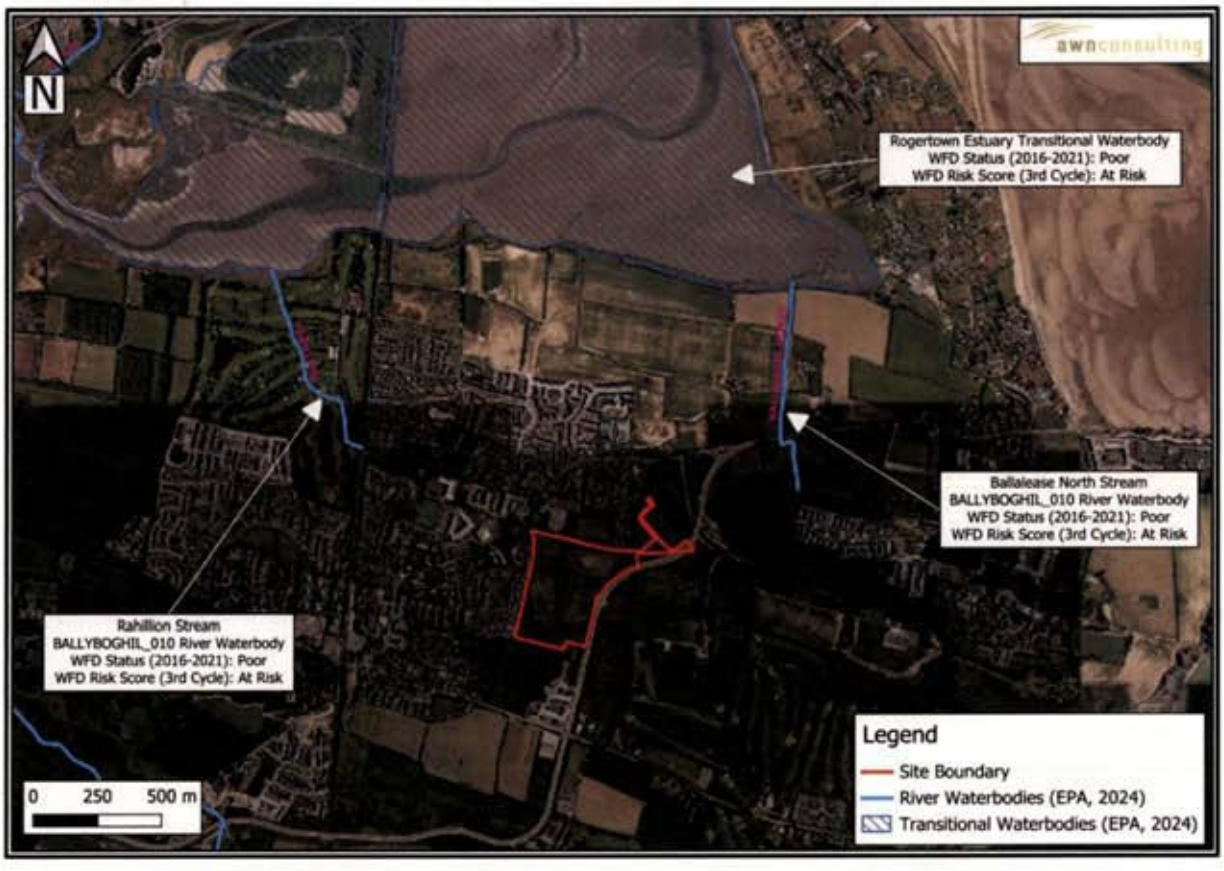

Figure 1.1 *Site Location Map with local hydrological environment*

The Proposed Development site is c. 13.74 Ha (gross site area) and occupies greenfield land characterized by an agricultural function. Currently, the lands are undeveloped and entirely unoccupied by any building structures.

The lands are within the jurisdiction of Fingal County Council's Development Plan, 2023-2029. They are primarily zoned 'RA', Residential Area, to 'provide for new residential communities subject to the provision of the necessary social and physical infrastructure' The Ballymastone area is one of the main development areas within the Donabate Local Area Plan 2016 (as extended).

The site is a large greenfield site to the east of Donabate Village. The site is currently in agricultural use with the recently constructed Donabate Distributor Road (DDR) to the east of the site. The site is bound to the west by The Links development with the Ballymastone masterplan lands and Willowbrook and The Priory developments to the north. Donabate Golf Club and St. Ita's Demesne are located to the east of the subject site. A network of hedgerows and drainage ditches are located throughout the site.

The site topography can predominantly be described as generally flat / level with minor localized undulations and slight falls in elevation from east to west and a high point in the middle of the site adjacent to the DDR. A network of hedgerows and drainage ditches are located throughout the site.

2.0 METHODOLOGY

This WFD Screening Assessment has been prepared in response to the requirements of the Water Framework Directive.

This report was prepared by Luke Maguire (BSc), and Teri Hayes (BSc MSc PGeol EurGeol). Luke is an Environmental Consultant with over 3 years of experience in environmental consultancy and water resources studies). Teri is a hydrogeologist with over 25 years of experience in water resource management and impact assessment. She has a Masters in Hydrogeology and is a former President of the Irish Group of the Association of Hydrogeologists (IAH) and has provided advisory services on water related environmental and planning issues to both public and private sector bodies. She is qualified as a competent person as recognised by the EPA in relation to contaminated land assessment (IGI Register of competent persons www.igi.ie). Her specialist area of expertise is water resource management eco-hydrogeology, hydrological assessment and environmental impact assessment.

2.1 DETERMINATION OF WATER BODY STATUS

2.1.1 WFD Risk Status

The WFD Risk score is the risk for each waterbody of failing to meet their WFD objectives by 2027. The risk of not meeting WFD objectives has been determined by assessment of monitoring data, data on the pressures and data on the measures that have been implemented. Waterbodies that are 'At Risk' are prioritised for implementation of measures. This assessment was completed in 2020 by the EPA Catchments Unit in conjunction with other public bodies and was primarily based on monitoring data up the end of 2018. The three risk categories are:

- Waterbodies that are 'At Risk' of not meeting their Water Framework Directive objectives. For these waterbodies, an evidence-based process was undertaken to identify the significant pressures; once a pressure is designated as 'significant', measures and accompanying resources are needed to mitigate the impact(s) from this pressure. These 'At Risk' waterbodies require not only implementation of the existing measures described in the various regulations, e.g. the Good Agricultural Practices Regulations, but also in many instances, more targeted supplementary measures.
- Waterbodies that are categorised as 'Review' either because additional information is needed to determine their status before resources and more targeted measures are initiated or the measures have been undertaken, e.g. a wastewater treatment plant upgrade, but the outcome hasn't yet been measured/monitored.
- Waterbodies that are 'Not at Risk', and therefore meeting their Water Framework Directive objectives, require maintenance of existing measures to protect the satisfactory status of the water bodies.

2.1.2 Background to Surface Water Body Status

Under the WFD, surface water body status is classified on the basis of chemical and ecological status or potential. Ecological status is assigned to surface water bodies that are natural and considered by the EPA not to have been significantly modified for anthropogenic purposes (i.e., culverting). Ecological potential is assigned to artificial and man-made water bodies (such as canals), or natural water bodies that have undergone significant modification. The term 'ecological potential' is used as it may be impossible to achieve good ecological status because of modification for a specific use, such as navigation or flood protection. The ecological potential represents the degree to which the quality of the water body approaches the maximum it could achieve. The worst-case classification is assigned as the overall surface water body status, in a 'one-out all-out' system (i.e., by taking the worst case of all the combined risk outcomes). This system is summarised below in Figure 2.1.

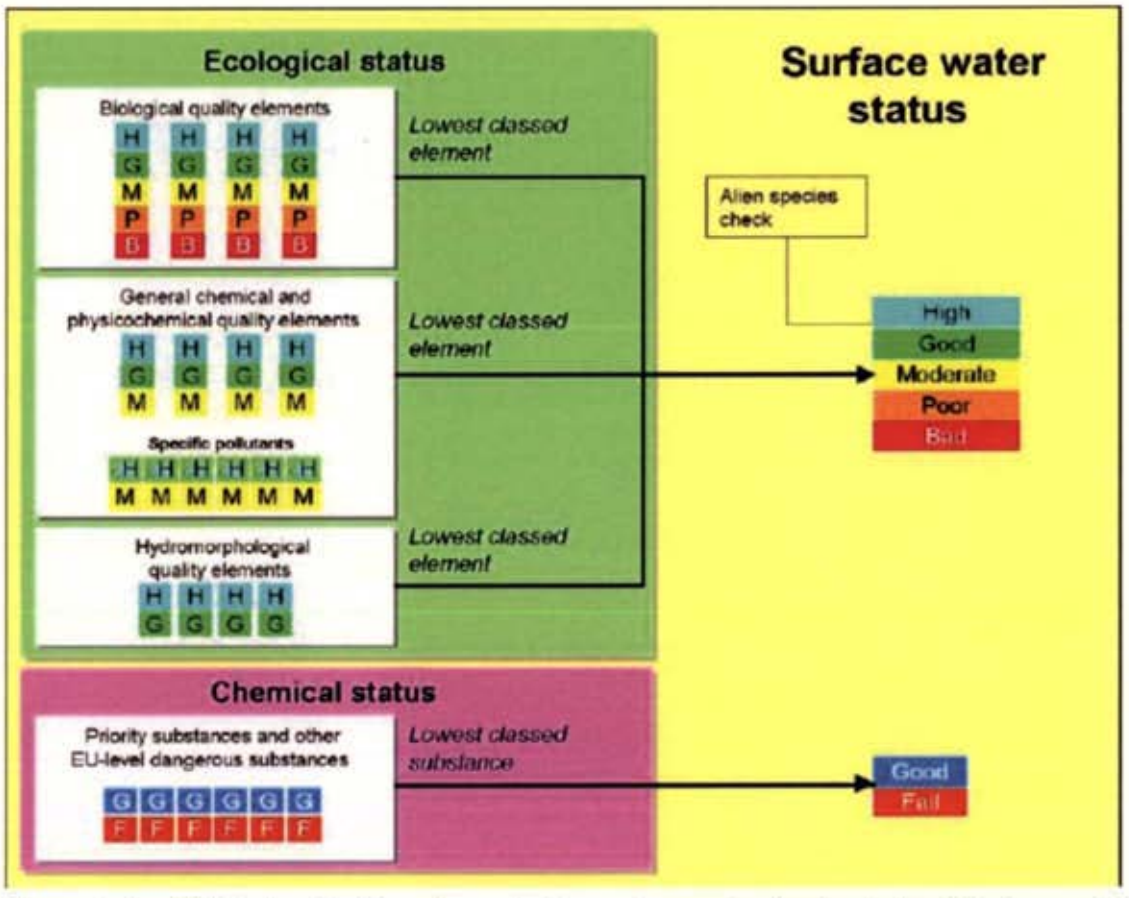

Figure 2.1 *WFD classification elements for surface water body status (Environmental Agency, 2015)*

Chemical Status

Chemical status is defined by compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances, in accordance with the Environmental Quality Standards Directive (2008/105/EC). This is assigned on a scale of good or fail. Surface water bodies are only monitored for priority substances where there are known discharges of these pollutants; otherwise, surface water bodies are reported as being at good chemical status.

Ecological Status

Ecological status or potential is defined by the overall health or condition of the watercourse. This is assigned on a scale of High, Good, Moderate, Poor or Bad, and on the basis of four classification elements or 'tests', as follows:

- **Biological:** This test is designed to assess the status indicated by a biological quality element such as the abundance of fish, invertebrates or algae and by the presence of invasive species. The biological quality elements can influence an overall water body status from Bad through to High.
- **Physico-chemical:** This test is designed to assess compliance with environmental standards for supporting physicochemical conditions, such as dissolved oxygen, phosphorus and ammonia. The physicochemical elements can only influence an overall water body status from Moderate through to High.
- **Specific pollutants:** This test is designed to assess compliance with environmental standards for concentrations of specific pollutants, such as zinc, cypermethrin or arsenic. As with the physico-chemical test, the specific pollutant assessment can only influence an overall water body status from Moderate through to High.
- **Hydromorphology:** For natural, this test is undertaken when the biological and physicochemical tests indicate that a water body may be of High status. It specifically assesses elements such as water flow, sediment composition and movement, continuity, and structure of the habitat against reference or 'largely undisturbed' conditions. If the hydromorphological elements do not support High status, then the status of the water body is limited to Good overall status. For artificial or highly modified waterbodies, hydromorphological elements are assessed initially to determine which of the biological and physico-chemical elements should be used in the classification of ecological potential. In all cases, assessment of baseline hydromorphological conditions are an important factor in determining possible reasons for classifying biological and physicochemical elements of a water body as less than Good, and hence in determining what mitigation measures may be required to address these failing water bodies.

2.1.3 Background to Groundwater Body Status

Under the WFD, groundwater body status is classified on the basis of quantitative and chemical status. Status is assessed primarily using data collected from the EPA monitoring network; therefore, the scale of assessment means that groundwater status is mainly influenced by larger scale effects such as significant abstraction or widespread/ diffuse pollution. The worst-case classification is assigned as the overall groundwater body status, in a 'one-out all-out' system. This system is summarised in Figure 2.2 below.

Quantitative Status

Quantitative status is defined by the quantity of groundwater available as baseflow to watercourses and water-dependent ecosystems, and as 'resource' available for use as drinking water and other consumptive purposes. This is assigned on a scale of Good or Poor, and on the basis of four classification elements or 'tests' as follows:

- **Saline or other intrusions:** This test is designed to identify groundwater bodies where the intrusion of poor quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.

- **Surface water:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the ecological status of associated surface water bodies.
- **Groundwater Dependent Terrestrial Ecosystems (GWDTEs):** This test is designed to identify groundwater bodies where groundwater abstraction is leading to "significant damage" to associated GWDTEs (with respect to water quantity).
- **Water balance:** This test is designed to identify groundwater bodies where groundwater abstraction exceeds the "available groundwater resource", defined as the rate of overall recharge to the groundwater body itself, as well as the rate of flow required to meet the ecological needs of associated surface water bodies and GWDTEs.

Chemical Status

Chemical status is defined by the concentrations of a range of key pollutants, by the quality of groundwater feeding into watercourses and water-dependent ecosystems and by the quality of groundwater available for drinking water purposes. This is assigned on a scale of Good or Poor, and on the basis of five classification elements or 'tests' as follows:

- **Saline or other intrusions:** This test is designed to identify groundwater bodies where the intrusion of poor-quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.
- **Surface water:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the chemical status of associated surface water bodies.
- **Groundwater Dependent Terrestrial Ecosystems (GWDTEs):** This test is designed to identify groundwater bodies where groundwater abstraction is leading to "significant damage" to associated GWDTE's (with respect to water quality).
- **Drinking Water Protected Areas (DrWPAs):** This test is designed to identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WFD or at risk of failing in the future.
- **General quality assessment:** This test is designed to identify groundwater bodies where widespread deterioration in quality has or will compromise the strategic use of groundwater.

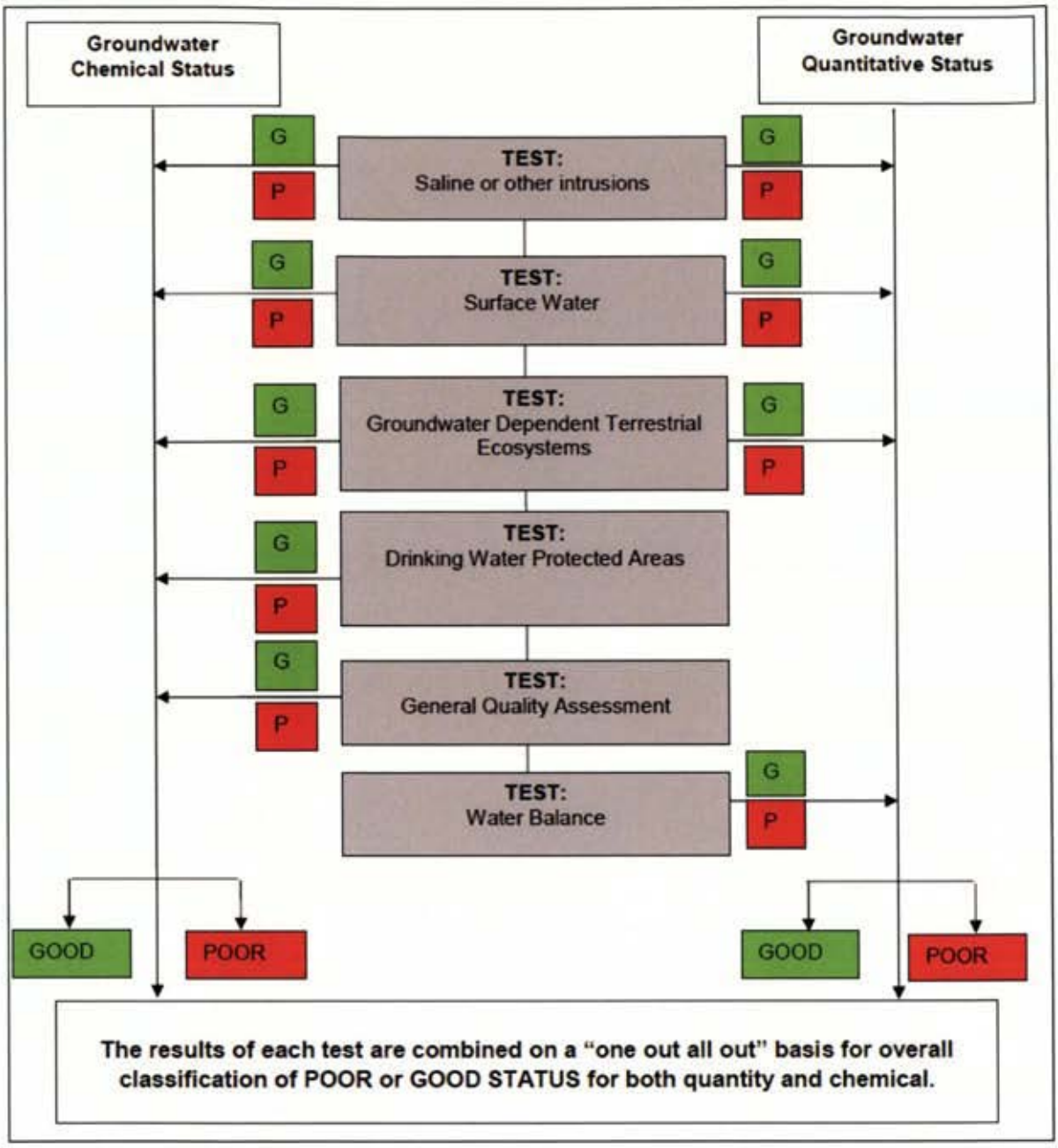

Figure 2.2 *WFD classification elements for groundwater body status (Environmental Agency, 2015)*

2.2 DETERMINATION OF NO DETERIORATION ASSESSMENT

Proposed developments that have the potential to impact on current or predicted WFD status are required to assess their compliance against the objectives defined for potentially affected water bodies.

2.3.1 Surface Water No Deterioration Assessment

Table 2.1 below presents the matrix developed by AWN and used to assess the effect of the proposed development on surface water status or potential class. It ranges from a major beneficial effect (i.e., a positive change in overall WFD status) through no effect

to deterioration in overall status class. The colour coding used in Table 2.1 is applied to the spreadsheet assessment in Appendix A of this report.

Table 2.1 *Surface Water Assessment Matrix*

Effect	Description/ Criteria	Outcome
Major Beneficial	Impacts that taken on their own or in combination with others have the potential to lead to the improvement in the ecological status or potential of a WFD quality element for the entire waterbody	Increase in status of one or more WFD element giving rise to a predicted rise in status class for that waterbody.
Minor/ localised beneficial	Impacts when taken on their own or in combination with others have the potential to lead to a minor localised or temporary improvement that does not affect the overall WFD status of the waterbody or any quality elements	Localised improvement, no change in status of WFD element
No Impact	No measurable change to any quality elements.	No change
Localised / temporary adverse effect	Impacts when taken on their own or in combination with others have the potential to lead to a minor localised or temporary deterioration that does not affect the overall WFD status of the waterbody or any quality elements. Consideration will be given to habitat creation measures.	Localised deterioration, no change in status of WFD element when balanced against mitigation measures embedded in the project.
Adverse effect on class of WFD element	Impacts when taken on their own or in combination with others have the potential to lead to the deterioration in the WFD status class of one or more biological quality elements, but not in the overall status of the waterbody. Consideration will be given to habitat creation measures.	Decrease in status of WFD element when balanced against positive measures embedded in the project.
Adverse effect on overall WFD class of waterbody	Impacts when taken on their own or in combination with others have the potential to lead to the deterioration in the ecological status or potential of a WFD quality element, which then lead to a deterioration of status/potential of waterbody.	Decrease in status of overall WFD waterbody status when balanced against positive measures embedded in the project.

2.2.2 Groundwater No Deterioration Assessment

Table 2.2 below presents the matrix used to assess the effect of the proposed development on groundwater status class. It ranges from a beneficial effect but no change in status to deterioration in overall status class. The colour coding used in Table 2.2 is applied to the final 'No Deterioration Assessment' spreadsheet in Appendix A of this report.

Table 2.2 *Groundwater Assessment Matrix*

Magnitude of Impact of the proposed development on WFD Element	**Effect on WFD Element within the assessment boundary**	**Effect on Status of WFD element at the Groundwater Body Scale**
Impacts lead to beneficial effect	Combined impacts have the potential to have a beneficial effect on the WFD element.	Improvement but no change to status of WFD element
No measurable change to groundwater levels or quality.	No measurable change to WFD elements.	No change and no deterioration in status of WFD element
Impacts when taken on their own have the potential to lead to a minor localised or temporary effect	Combined impacts have the potential to lead to a minor localised or temporary adverse effect on the WFD element.	Combined impacts have the potential to lead to a minor localised or temporary effect on the WFD element. No change to status of WFD element and no significant deterioration at groundwater body scale.
Impacts when taken on their own have the potential to lead to a widespread or prolonged effect.	Combined impacts have the potential to have an adverse effect on the WFD element.	Combined impacts have the potential to have an adverse effect on the WFD element, resulting in significant deterioration but no change in status class at groundwater body scale.
Impacts when taken on their own have the potential to lead to a significant effect.	Combined impacts in combination with others have the potential to have a significant adverse effect on the WFD element.	Combined impacts in combination with others have the potential to have an adverse effect on the WFD element AND change its status at the groundwater body scale

2.2.2 Assessment against Future Status Objectives

River Basin Management Plans are used to outline water body pressures and the actions that are required to address them. The future status objective assessment considers the ecological potential of a surface water body and the mitigation measures that defined the ecological potential. Assessments are based on the project (including mitigation measures) risks (construction and operation) with regard to the objectives for achieving good status as set out in the 2nd Cycle RBMP 2018-2021 and *draft* 3rd Cycle RBMP 2022-2027. The assessment considers whether the proposed development has the potential to prevent the implementation or impact the effectiveness of the defined measures in these plans.

2.3 SOURCES OF INFORMATION

The following sources of information were used in the preparation of this report:

- Geological Survey of Ireland- online mapping (GSI, 2024).
- GSI - Geological Heritage Sites & Sites of Special Scientific Interest.
- Ordnance Survey of Ireland (OSI).
- Teagasc subsoil database.
- National Parks and Wildlife services (NPWS, 2024).
- Environmental Protection Agency (EPA) – website mapping and database information. Envision water quality monitoring data for watercourses in the area.
- 3rd Cycle Draft Nanny Delvin Catchment Report (HA 08) (EPA, August 2021).
- River Basin Management Plan for Ireland 2018-2021.
- Draft River Basin Management Plan for Ireland 2022-2027.
- Fingal Development Plan 2023-2029.
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW)).
- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie)
- 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001).
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

This WFD assessment was based on desktop review of the Environmental Protection agency (EPA) and Local Authority Waters Programme water quality records which were obtained from the portal www.catchments.ie (accessed April 2024). From the aforementioned source of information, the WFD Status classification and Risk score were obtained for the identified water bodies.

The River Waterbody Status have been estimated in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003). The regulation objectives include the attainment of good status in waterbodies that are of lesser status at present and retaining good status or better where such status exists.

3.0 DESCRIPTION OF EXISTING HYDROLOGICAL AND HYDROGEOLOGICAL ENVIRONMENT

3.1 HYDROLOGY

The proposed development site is located within the former Eastern River Basin District (ERBD, now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD).

According to the EPA maps, The proposed development site as defined by the EPA nomenclature (EPA, 2024) is situated in Hydrometric Area No. 08 of the Irish River Network, and lies within the Nanny-Delvin Catchment (Catchment ID: 08), and the Ballough[Stream]_SC_010 Sub-Catchment. The current EPA watercourse mapping does not include any existing streams or watercourses identified within the proposed development site boundaries, a review of the historical mapping records provided

within the GeoHive website do not indicate any watercourses within the proposed development site.

According to the EPA watercourse mapping database the BALLYBOGHIL_010 river waterbody has multiple counterparts, two of which are located in relatively near proximity to the subject development. Accordingly, the Beaverstown Stream Waterbody (BALLYBOGHIL_010, IE_EA_08B012200) is located adjacent to and traversing the lands of the Beaverstown Golf Course, circa 790m to the west / northwest of the development site at the point of closest proximity. This watercourse flows in a north-westerly direction where it outfalls to the Rogerstown Estuary Transitional Waterbody (IE_EA_050_0100), before ultimately discharging to the Irish Sea to the north of Portrane at Rush South Beach.

The second nearby counterpart of the BALLYBOGHIL_010 waterbody is located approximately 445m to the northeast of the site at the point of closest proximity. This watercourse rises immediately north of Reilly's Hill and the National Forensic Mental Health Service, before flowing in a northerly direction under the Portrane Road Regional Route (R126) and discharging to the southeast portion of Rogerstown Estuary.

The existing site is entirely classified as greenfield land and the topography of the site is generally flat with a high point in the middle of the site adjacent to the DDR with a slight fall from the east to the west. The proposed development is located on land with a previous / historic agricultural land function / purpose. The site comprises multiple fields separated by hedgerows. Surface water, rainfall is generally percolated through the site via grass and soil under the influence of gravity. Portions of this greenfield land (western parcel of land) is partially drained by overland flow to the drainage network on the site comprising some of the internal and boundary hedgerows contain ditches which traverses the site and convey flow towards / into the Beaverstown stream (catchment) and Portrane Canal (catchment), which are located approximately 440m and 670m to the northwest and northeast of the site at the point of closest proximity.

According to Irish Water drainage and supply records provided by Fingal County Council, and as outlined in the Ballymastone, Donabate Phase 2 Infrastructure Design Report (March, 2024) (included with the application documentation) and Uisce Éireann (formerly Irish Water IW) drainage and supply records provided by FCC, indicate that the following relevant existing dedicated surface water drainage infrastructure elements are in place surrounding the development site:

(A) Surface water runoff from the existing DDR is collected via road gullies into existing carrier drains running along the road and transferred into 5 attenuation ponds along the length of the DDR.

(B) The subject site has no existing foul loading as it is mainly greenfield. According to the records, there is an existing 300mm foul sewer running through the recently constructed DDR. Following the construction of Phase 1 of the development the proposed foul infrastructure within the access roads from the DDR and the links road will have been constructed which the majority of Phase 2 will discharge to Portrane Waste Water Treatment Plant (WWTP).

Figure 3.1 below presents the EPA surface water quality monitoring points in the context of the site and other regional drainage settings.

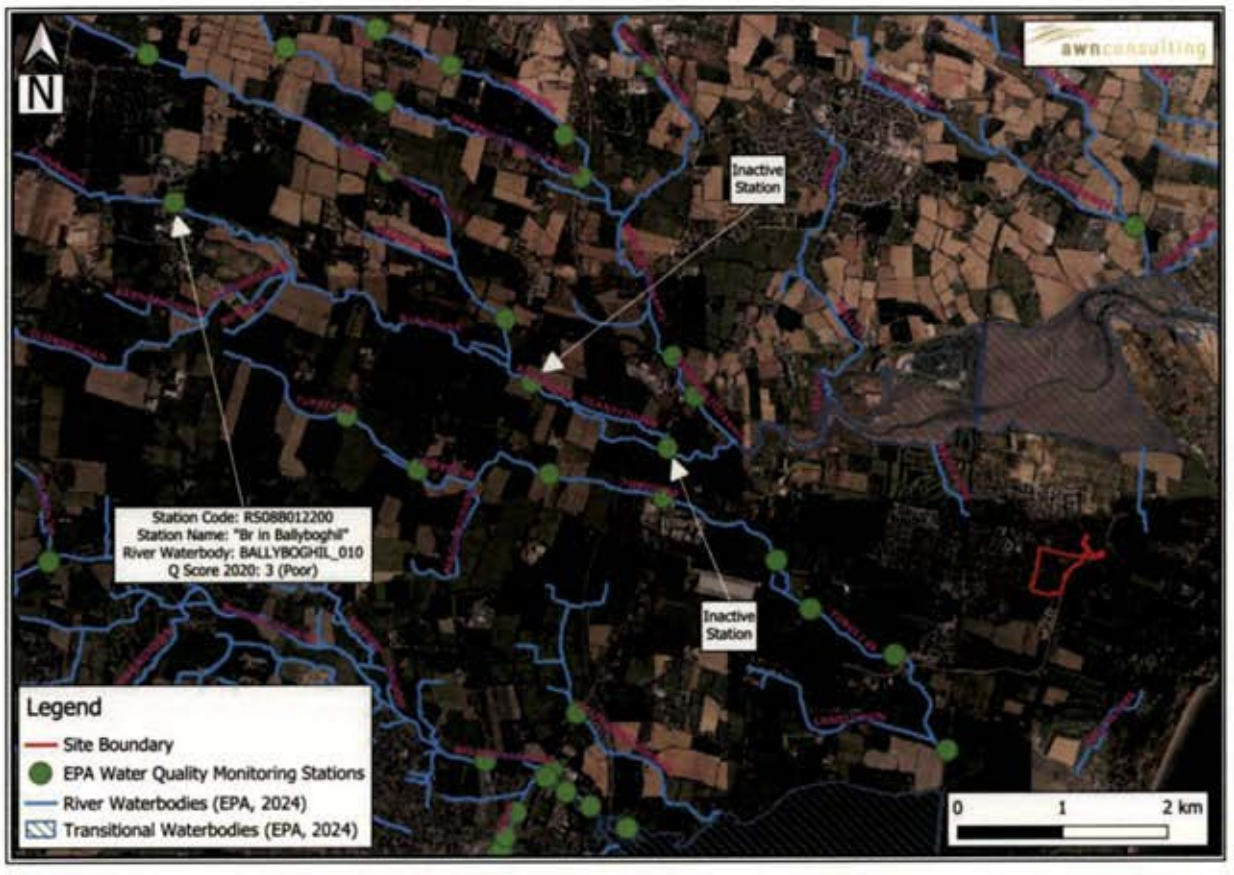

Figure 3.1 *Surface Water Quality Monitoring Point (EPA, 2024) (Site location indicated by redline boundary)*

Surface water quality is monitored periodically by the EPA at various regional locations along principal and other smaller watercourses. With reference to the site setting, the nearest active EPA surface waterbody monitoring station along the BALLYBOGHIL_010 river waterbody (IE_EA_08B012200) is situated along the Ballyboghil River, upstream of the proposed development ('Br' in Ballyboghil; EPA Code: RS09M030500). This station is located at the bridge over the Ballyboghil River along the Naul Road Regional Route (R108) and adjacent to its junction with the R129, c. 370m (hydrological distance) upstream (west) of the Ballyboghil Wastewater Treatment Plant and c. 9.1km northwest of the subject development site (linear distance).

The EPA assess the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality.

The most recent status recorded by the EPA in the water quality monitoring station located on the Ballyboghil River mentioned above is classified as Q3 – '*Poor*' Status (2020), indicating a *moderately polluted* waterbody.

In accordance with the WFD, each river catchment within the former RBD was assessed by the EPA and a water management plan detailing the programme of measures was put in place for each. The BALLYBOGHIL_010 WFD river / surface

waterbody is currently classified by the EPA as having '*Poor*' WFD water quality status (2016-2021 period) and is '*At risk of not achieving good status*'. The main pressures identified on the BALLYBOGHIL_010 are associated with the presently 'poor' ecological status or potential.

Currently, the Rogerstown Estuary transitional waterbody (European Code: IE_EA_050_0100) most recent WFD status (2016-2021) is 'Poor' with a current WFD risk score (3rd risk cycle) of '*At risk of not achieving good status*'. This rating and the main pressures identified on the Rogerstown Estuary are attributed to poor ecological and biological status or potential, specifically Aquatic Flora Status (and Angiosperm) or Potential (Catchments.ie, 2024). Additionally, the Rogerstown Estuary is failing to achieve good Chemical Surface Water Status (2016-2021).

Figure 3.2 below presents the river and transitional waterbody risk EPA map.

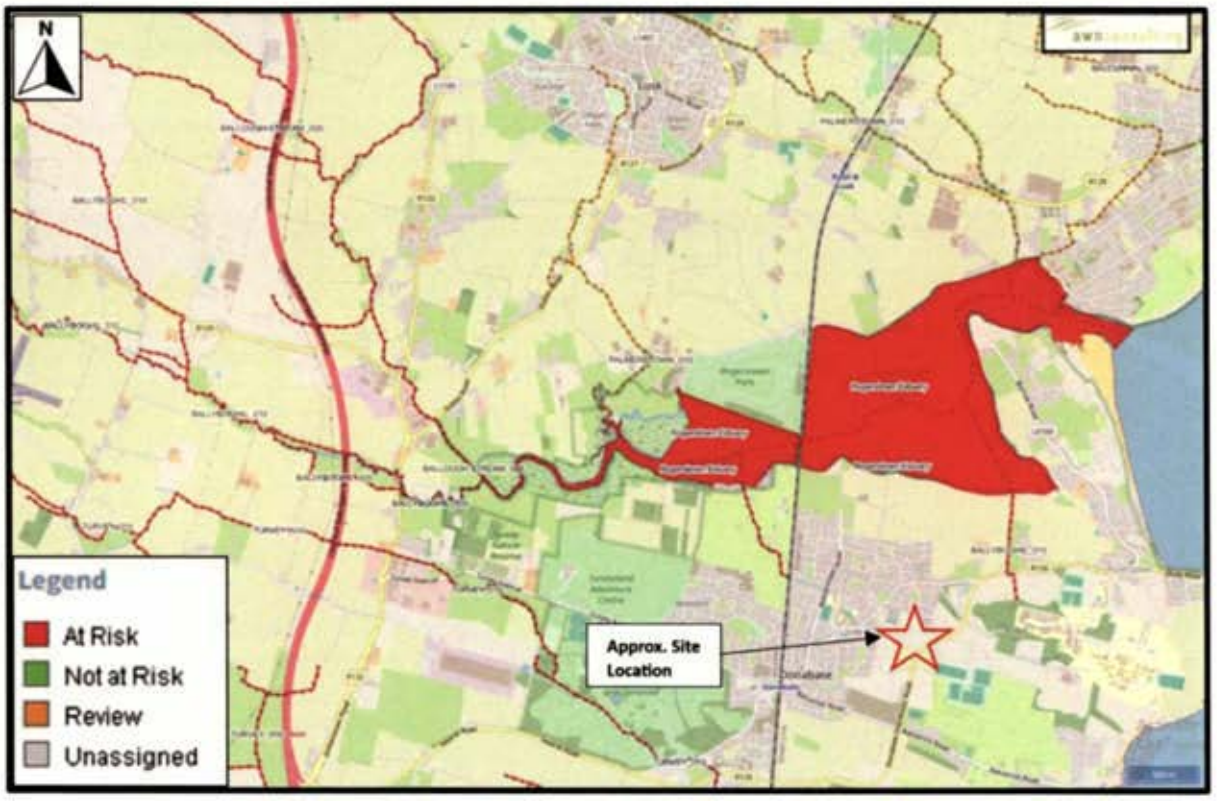

Figure 3.2 *River/Transitional Waterbody Score - 1a 'At risk of not achieving good status, WFD Ecological Status: Poor and under 'Review' (Approximate site location indicated by red star, indicative only).*

As a whole, the Ballough [Stream]_SC_010 Sub-catchment is considered to have an ecological status of 'Poor' and a chemical surface water status of 'Poor'. This is based on current monitoring carried out at this catchment level.

Waterbody: BALLYBOGHIL_010

Name:	BALLYBOGHIL_010	Code:	IE_EA_08B012200
Subcatchments:	08_6 Ballough[Stream]_SC_010	Catchments:	08 Nanny-Delvin
Latitude:	53.5203637	Longitude:	-6.2667431
Cycle 1 RBD:	Eastern	Local Authority:	Fingal County Council
Waterbody Category:	River	WFD Risk:	At risk
Protected Area:	Yes	High Status Objective:	No
Heavily Modified:	Unknown	Artificial:	Unknown
Area (Km²):	N/A	Length (Km):	56.71
Transboundary:	No	Canal:	No

SW 2016-2021

Status	Assessment Technique	Status Confidence	Value
▾ Ecological Status or Potential	Monitoring	medium confidence	Poor
▾ Biological Status or Potential			Poor
Invertebrate Status or Potential			Poor
▾ Supporting Chemistry Conditions			Moderate
▾ General Conditions			Moderate
▾ Oxygenation Conditions			Pass
Dissolved Oxygen (% Sat)			Fail
Other determinand for oxygenation conditions			High
▾ Acidification Conditions			Pass
pH			Pass
▾ Nutrient Conditions			Moderate
▾ Nitrogen Conditions			Moderate
Nitrate			Moderate
Ammonium			High
▾ Phosphorous Conditions			Moderate
Orthophosphate			Moderate

Figure 3.3 *Surface Water Quality for the BALLYBOGHIL_010 river waterbody (IE_EA_08B012200), EPA, 2024.*

Waterbody: Rogerstown Estuary

Name:	Rogerstown Estuary	Code:	IE_EA_050_0100
Catchments:	08 Nanny-Delvin		
Latitude:	53.50609	Longitude:	-6.14798
Cycle 1 RBD:	Eastern	Local Authority:	Fingal County Council
Waterbody Category:	Transitional	WFD Risk:	At risk
Protected Area:	Yes	High Status Objective:	No
Heavily Modified:	No	Artificial:	No
Area (Km²):	3.04	Length (Km):	N/A
Transboundary:	No		

SW 2016-2021

Status	Assessment Technique	Status Confidence	Value
▾ Ecological Status or Potential	Monitoring	high confidence	Poor
▾ Biological Status or Potential			Poor
Phytoplankton Status or Potential			High
▾ Other Aquatic Flora Status or Potential			Poor
Macroalgae Status or Potential			Moderate
Angiosperm Status or Potential			Poor
Hydromorphological Conditions			Moderate
▾ Supporting Chemistry Conditions			Good
▾ General Conditions			Good
▾ Oxygenation Conditions			Good
Dissolved Oxygen (% Sat)			Good
Other determinand for oxygenation conditions			Good
▾ Nutrient Conditions			Good
Phosphorous Conditions			High
Specific Pollutant Conditions			Pass
Chemical Surface Water Status			Failing to achieve good

Status Failures Reasons

Benzo(a)pyrene Failure for Chemical Status IE_EA_050_0100

Benzo(b)fluoranthene Failure for Chemical Status IE_EA_050_0100

PBDE - unspecified isomers Failure for Chemical Status IE_EA_050_0100

Figure 3.4 *Surface Water Quality for the Rogerstown Estuary transitional waterbody, EPA, 2024.*

According to the sub-catchment assessment of the Ballough[Stream]_SC_010 Sub-catchment (Code 08_6) carried out by the EPA in April 2020, there are a number of pressures within this sub-catchment that impact on the hydrological environment (refer to www.catchments.ie).

All four river water bodies within this subcatchment are At Risk. Ballough Stream_020 and Ballyboghil_010 are At Risk due to Poor ecological status, driven by invertebrates. Nutrients are the significant issue on both water bodies; agriculture is the significant pressure on both water bodies and urban wastewater is an additional significant

pressure on Ballough stream_010. Ballough stream_010 and Turvey_010 have unassigned ecological status but are At Risk due to the results of additional water quality sampling; agriculture is also the significant pressure on both water bodies while urban diffuse and combined sewer overflows are additional significant pressures on Turvey_010.

The below list is a list of all significant pressures identified in the sub-catchment (Figure 3.5).

Code	Name	WFD Risk	Pressure Category	Pressure Sub Category
IE_EA_08B031500	BALLOUGH STREAM_010	At risk	Agriculture	Agriculture
IE_EA_060_0100	Broadmeadow Water	At risk	Domestic Waste Water	Single House Discharges
IE_EA_08B012200	BALLYBOGHIL_010	At risk	Agriculture	Agriculture
IE_EA_050_0100	Rogerstown Estuary	At risk	Agriculture	Agriculture
IE_EA_08B031600	BALLOUGH STREAM_020	At risk	Agriculture	Agriculture
IE_EA_060_0000	Malahide Bay	At risk	Urban Waste Water	Agglomeration PE > 10,000
IE_EA_G_033	Hynestown	Review	Anthropogenic Pressures	Unknown
IE_EA_08B012200	BALLYBOGHIL_010	At risk	Urban Waste Water	Agglomeration PE < 500
IE_EA_060_0100	Broadmeadow Water	At risk	Urban Waste Water	Agglomeration PE > 10,000
IE_EA_08T020700	TURVEY_010	At risk	Agriculture	Agriculture
IE_EA_020_0000	Northwestern Irish Sea (HA 08)	Review	Anthropogenic Pressures	Unknown
IE_EA_08T020700	TURVEY_010	At risk	Urban Run-off	Diffuse Sources Run-Off
IE_EA_08T020700	TURVEY_010	At risk	Urban Waste Water	Combined Sewer Overflows
IE_EA_08B031600	BALLOUGH STREAM_020	At risk	Urban Waste Water	Agglomeration PE < 500
IE_EA_050_0100	Rogerstown Estuary	At risk	Domestic Waste Water	Single House Discharges

Figure 3.5 *List of main pressures for all waterbodies within the Ballough[Stream]_SC_010 Subcatchment.*

3.2 HYDROGEOLOGY

3.2.1 Aquifer Classification

The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km^2), well yield (m^3/d), specific capacity ($m^3/d/m$) and groundwater throughput (mm^3/d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are

generally moderately productive only in local zones (Ll). Similarly, poor aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

The bedrock aquifer underlying the site according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map can be subdivided into 3 separate classes. The aquifer underlying the northeast portion of the site is classified as a *(Pl) Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones*. The northern and central portion of the site is overlying a *(Ll) Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones*. The southern part of the site is underlain by a *(Lm) Locally Important Aquifer - Bedrock which is Generally Moderately Productive*. The subject development site is not underlain by any gravel aquifers.

According to the GSI mapping database (2024), above bedrock, the ground / soil within the site principally comprises Tills derived chiefly from Limestone and are classified as BminDW which denotes deep well drained mineral soils (Mainly basic) that are described as Grey Brown Podzolics, Brown Earths(medium-high base status). The quaternary subsoils comprise Tills derived from Limestone (TLs).

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures/ fractures, the main feature that protects groundwater from contamination, and therefore the most important feature in the protection of groundwater, is the subsoil (which can consist solely of/ or of mixtures of peat, sand, gravel, glacial till, clays or silts).

Groundwater Vulnerability is a term used to represent the natural ground, intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures, the main feature that protects groundwater from contamination, and therefore the most important feature in protection of groundwater, is the subsoil (which can consist solely or of mixtures of peat, sand, gravel, glacial till, clays or silts).

The GSI currently displays / shows varied aquifer vulnerability across the development site and its vicinity. The northern and central portions of the proposed development overlies a 'Low' vulnerable aquifer which indicated an overburden thickness of 10m+ of low permeability soils. While moving south the vulnerability progresses to 'Moderate' and 'High' in the southern portion and the very southwest corner of the site, which indicated an overburden thickness of 5-10m and 3-5m of low permeability soils, respectively. The aquifer vulnerability class in the region / context of the site is presented below as Figure 3.6. This is relatively consistent with the intrusive investigation data and information obtained from the ground investigations carried out in the vicinity of the site by Ground Investigations Ireland Ltd (2022), where the bedrock was encountered 10.5m BGL in the northern portion of the site at Ballymastone Area 4 while southern portion of the site depth to rock varies from 1.50m BGL in BH12 to a maximum of 3.50m BGL in BH14 at Ballymastone Area 2.

Refer to Figure 3.6 below.

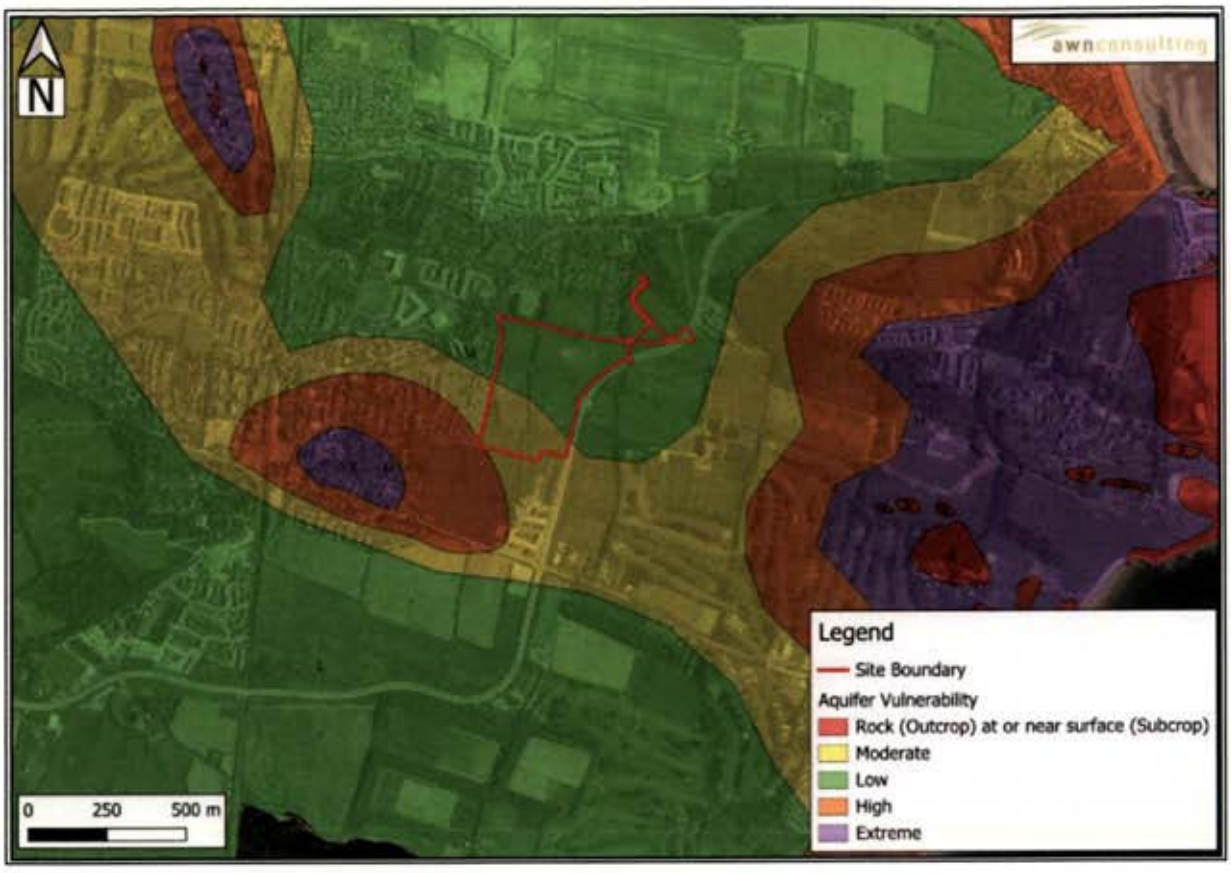

Figure 3.6 *Aquifer Vulnerability Map (Source: GSI, 2024)*

3.2.2 Groundwater Quality

The Water Framework Directive (WFD) 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater, transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of 'Good Status' in water bodies that are of lesser status at present and retaining 'Good Status' or better where such status exists at present. 'Good Status' was to be achieved in all waters by 2027, as well as maintaining 'high status' where the status already exists. The EPA co-ordinates the activities of the River Basin Districts, local authorities and state agencies in implementing the directive, and operates a groundwater quality monitoring programme undertaking surveys and studies across the Republic of Ireland.

The Groundwater Body (GWB) underlying the site is the Swords GWB (EU Groundwater Body Code: IE_EA_G_011). Presently, the groundwater body in the region of the site (Swords GWB - IE_EA_G_011) is classified under the WFD Risk Score system (EPA, 2024) as *"Not at risk"* meaning the GWB has achieved its objectives and has significant improving trends. The Swords GWB was given a classification of *"Good" status* for the last WFD cycle (2016-2021). The Swords GWB has a Good Status for chemical and quantitative categories. Therefore, the overall status is considered Good.

3.3 PROJECT DETAILS

The surface water assessment and the groundwater assessment both examine the potential effects of the proposed development, which includes the construction and operation of the proposed development.

3.3.1 Construction Phase

The key activities for the WFD assessment are as follows:

- **Ground Works**: It is known that ground works will comprise excavation and levelling for foundations, basement and the installation of underground services for the projected buildings and movement of soil for landscaping purposes. It is anticipated that there is a potential requirement for excavation of Bedrock / rock breaking as excavations are anticipated to be down to a maximum depth of c. 6.7 m below surrounding ground level.

Surface Water Run-off: There may also be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry. Rainwater pumped from excavations is to be directed to on-site settlement ponds/distilling tanks. During construction drainage will also be treated through permitted attenuation ponds and interceptors installed during Phase 1 works. Stormwater shall be treated prior to discharge to the existing public sewer network. This shall include treatment via petrol / hydrocarbon interceptor (or equivalent) and treatment for silt removal either via silt fence / trap, settlement tanks or ponds. Lime stabilization is due to be undertaken on the site as part of construction phase. The potential effects identified are as a result of:

- Permanent land take (increased hardstanding area) during the operational phase.
- Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates) – arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from poor on-site toilets and washrooms.
- Temporary land-take during the construction phase (excavation works); Excavation of c. 41,000m^3 of top soil, subsoils and stones will be required for foundations, basement, underground services and for levelling of the site. Local removal and reinstatement (including infilling) of the 'protective' topsoil and subsoil cover across the development area at the site will not change the overall vulnerability category for the site which is already 'Low to Moderate'. Capping of areas of the site by hardstand/ building following construction and installation of drainage will minimise the potential for contamination (pathway) of the aquifer beneath the site.
- Below ground working causing mobilisation of contaminants during the construction and operational phases.
- Lime stabilization process is a ground improvement technique / process that involves adding hydrated lime to the soil to improve its properties and subsequently reduce plasticity, shrinkage, and swelling potential and increase the bearing capacity and resistance to erosion. Stabilization is achieved when a precise quantity of lime is added to a reactive soil and exchange of ions

occurs with the Clay minerals. While this may result a temporary increase in alkaline saturate run-off during the initial phase of stabilisation, all drainage will be attenuated with settlement of solids and dilution in the stormwater attenuation ponds permitted and constructed as part of the Phase 1 development.

3.3.2 Operational Phase

There is no ongoing abstraction of groundwater proposed. There is no bulk chemical or fuels required during operation. As such the only potential for a leak or spill of petroleum hydrocarbons is from vehicles. Unmitigated spills may lead to local contamination of soil. However, it is noted that during the operational phase any accidental discharge will more likely impact stormwater drainage due to the hardstand and drainage infrastructure proposed and any releases to drainage will be mitigated through petrol / petrochemical / hydrocarbon interceptors. During construction drainage will also be treated through permitted attenuation ponds and interceptors installed during Phase 1 works.

The proposed incorporation of hardstand area and the use of SUDs design measures will have a minor effect on local recharge to ground; however, the impact on the overall groundwater regime will be insignificant considering the proportion of the site area in relation to the total aquifer area. It is noted that a significant proportion of the site is unpaved greenfield land, and recharge will be reduced. SuDS measures have been incorporated in the design to facilitate infiltration and recharge to ground. Such measures include Permeable Paving, Pedestrian / green links, underground storage (geocellular units), detention (attenuation) Basins, tree pits connected to gullies, Green roofs, rain gardens, and dry swales with filter drains.

With regard to the wastewater discharge, the process discharge Design Foul Flow from the completed development shall not exceed 486,518.4 l/day (5.631 l/s) and the foul drainage will discharged to a licenced facility (Portrane WWTP- Licence Number: D0114-02) at a peak flow rate subject to agreement with FCC and Uisce Eireann (formerly Irish Water IW).

3.4 MITIGATION AND DESIGN MEASURES

The design has taken account the potential impacts of the proposed development on the hydrological environment local to the area where construction is taking place. The only potential for impact during construction is accidental releases and there is limited potential for any contaminant release during operation.

3.4.1 Construction Phase

The following mitigation measures will be implemented during the construction phase.

Suspended solids management.

Run off may contain sediment and accidental hydrocarbon leakage for contractor vehicles, however there is no likely discharge from the site. The following additional mitigation measures will be implemented during the construction phase.

- During earthworks and excavation works care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces

will be within the main excavation site which limits the potential for any offsite impacts.

- Run-off water containing silt will be contained on site via settlement tanks and treated to ensure adequate silt removal.
- Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds).
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate,
- A stabilised entranceway consisting of an aggregate on a filter cloth base that is located at any entry or exit point of the construction site.
- Aggregate will be established at the site entrance points from the construction site boundary extending for at least 10 m.
- The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection.
- Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination.
- Movement of material will be minimised to reduce the degradation of soil structure and generation of dust.
- Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations.
- Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.
- Any surface water run-off collecting in excavations will likely contain a high sediment load. This will not be allowed to directly discharge directly to the stormwater sewer.

In addition to the measures above, all excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

Cement/concrete works

Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.

Washouts will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer submit to agreement with Irish Water / Fingal County Council (FCC).

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

Hydrocarbons and other construction chemicals

The following mitigation measures will be implemented during the construction phase in order to prevent any spillages to ground of fuels and other construction chemicals and prevent any resulting to surface water and groundwater systems:

- Designation of bunded refuelling areas on the Site.
- Provision of spill kit facilities across the Site.
- Where mobile fuel bowsers are used, the following measures will be taken:
    - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use.
    - The pump or valve will be fitted with a lock and will be secured when not in use.
    - All bowsers to carry a spill kit and operatives must have spill response training.
    - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, doubled skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal.
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.
- All drums to be quality approved and manufactured to a recognised standard.
- If drums are to be moved around the Site, they will be secured and on spill pallets; and
- Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area or within the construction compound (or where possible off the site) which will be away from surface water gulleys or drains minimum 20 m buffer zone). In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

Surface Water Runoff

As set out in the CEMP prepared by DBFL Consulting Engineers the following surface water runoff mitigation measures will be implemented:

- Rainfall and all stormwater at the construction site will be managed and controlled for the duration of the construction works. The discharge of this treated water will occur to the storm water network and eventually to the Rogerstown Estuary.

- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds/ distilling tanks where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate. Monitoring of these sediment control measures will be undertaken throughout the construction phase.

- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds/distilling tanks.

- On-site settlement ponds are to include geotextile liners and riprapped inlets and outlets to prevent scour and erosion.

- Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed on site

- Surface water discharge points during the construction phase are to be agreed with Fingal County Council's Environment Section prior to commencing works on site

- The discharges to storm water network shall comply with the requirements of discharge to be established in the discharge licence to Fingal County Council.

Water Pumped from Excavation

- According to in the CEMP produced by DBFL Consulting Engineers the following mitigation measures will be implemented:

- Rainwater pumped from excavations is to be directed to on-site settlement ponds / distilling tanks.

- Groundwater pumped from excavations is to be directed to on-site settlement ponds / distilling tanks.

- On-site settlement ponds are to include geotextile liners and riprapped inlets and outlets to prevent scour and erosion. Monitoring of same will be undertaken.

- Surface water discharge points during the construction phase are subject to agreement with Fingal County Council's Environment Section prior to commencing works on site.

Wastewater Management

Foul wastewater discharge from the site will be managed and controlled for the duration of the construction works.

Site welfare facilities will be established to provide sanitary facilities for construction workers on site. The main contractor will ensure that sufficient facilities are available at all times to accommodate the number of employees on site. Foul water from the offices and welfare facilities on the site will discharge into the existing sewer on site (the cabins may initially need to have the foul water collected by a licensed waste sewerage contractor before connection to the sewer line can be made).

The construction contractor will implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

3.4.2 Operational Phase

The proposed development stormwater drainage network design includes sustainable drainage systems (SuDS) these measures by design ensure the stormwater leaving the site is to be attenuated and treated within the new development site boundary to ensure suitable quality, before discharging to the existing public surface water network which subsequently outfalls to the Rogerstown Estuary.

The purpose of the proposed design is to:

- Treat runoff and remove pollutants to improve quality.
- Restrict outflow and to control quantity.
- Increase amenity value.

The layout of the proposed surface water drainage network is shown on the DBFL Consulting Engineers Drawing Set included with this Application. It is proposed to separate the surface water and wastewater drainage networks, which will serve the proposed development, and provide independent connections to the local public surface water and wastewater sewer networks respectively.

Following the construction of Phase 1 of the development the proposed foul infrastructure within the access roads from the DDR and the links road will have been constructed which the majority of Phase 2 will discharge to.

An Irish Water Statement of Design (April 15th) has been received outlining that a Wastewater connection can be facilitated for the wider Ballymastone masterplan area which includes the proposed Phase 2 development. All foul sewers and manholes will be constructed in accordance with the Uisce Éireann (UÉ) Standard Details and the Irish Water Code of Practice for Wastewater.

The proposed foul drainage system will consist of 4 different connection points to existing networks. As noted the entire Phase 2 development will outfall into the new foul pumping station to the south of the development. This pumping station will pump the wastewater north along the DDR and it will continue north to the Portrane wastewater treatment plant.

3.5 ASSESSMENT OF SOURCE PATHWAY LINKAGES

This section presents the information related to the current waterbody status identified in the development area.

The proposed development site lies within the Nanny-Delvin Catchment (Catchment ID: 08) and the Ballough[Stream]_SC_010 WFD Sub-Catchment.

The Groundwater Body (GWB) underlying the site is the Swords GWB (EU Groundwater Body Code: IE_EA_G_011).

This WFD Screening has identified two (2) no. WFD surface water bodies and one (1) no. WFD groundwater bodies of relevance due to the close proximity and connection of these waterbodies during the construction and operation of the proposed development.

The water bodies are listed in Table 3.1

Table 3.1 *WFD water bodies located within the study area*

Type	WFD Classification	WFD Status (2016-2021)	WFD Risk	Waterbody Name / ID	Location
Surface Water	River	Poor	At Risk of Not Achieving Good Status	Beaverstown Stream BALLYBOGHIL_010 (IE_EA_08B012200)	Located 790 m to the west / northwest of the proposed development site.
	River	Poor	At Risk of Not Achieving Good Status	Ballalease_North Stream BALLYBOGHIL_010 (IE_EA_08B012200)	Located 445 m to the northeast of the proposed development site.
	Transitional Waterbody	Poor	At Risk of Not Achieving Good Status	Rogerstown Estuary (IE_EA_050_0100)	Located circa 0.8 km to the north of the proposed development site at the poin
Groundwater	Groundwater	Good	*Not at Risk*	Swords Groundwater Body (GWB) (IE_EA_G_011)	Groundwater body immediately underlying the proposed development site.

During the construction phase, given the nature of the proposed construction works there will be pathway to the Rogerstown Estuary through discharge to culvert (following settlement and treatment). During operational phase, there is also an indirect connection to the Rogerstown Estuary transitional body through the projected and proposed stormwater drainage design, again which incorporates settlement and treatment.

There will also be indirect hydrological connection to Rogerstown Estuary transitional waterbody through the foul water discharge which will be treated off site at Portrane Wastewater Treatment Plant (WWTP). This WWTP is required to operate under an EPA licence and meet environmental legislative requirements as set out in its licence.

It should be noted that the peak effluent discharge, calculated for the proposed development as 5.631 l/s would equate to 1.039% of the licensed discharge at Portrane WWTP [peak hydraulic capacity]. This flow would not have a measurable impact on the overall water quality within Rogerstown Estuary and the Irish Sea and therefore would not have an impact on the current Water Body Status (as defined within the Water Framework Directive).

The table below (Table 3.2) describes the S-P-R model for the site and includes the robust mitigation and design measures which will be incorporated into the proposed development throughout the construction and operational phases.

Table 3.2 *Pollutant Linkage Assessment (with mitigation)*

Source	Pathways	Receptors considered	Risk of Impact	Mitigation Measures
Construction Impacts (Summary)				
Discharge to ground of runoff. Unmitigated leak from an oil tank to ground/ unmitigated leak from construction vehicle (1,000 litres worst case scenario for storage on a typical site).	The depth to rock and overburden thickness (vulnerability) varies across the site. Bedrock is protected by +10m in the northern portion of the site (Ballymastone Area 4) while southern portion of the site depth to rock varies from 1.50m BGL in BH12 to a maximum of 3.50m BGL in BH14 (Ballymastone Area 2) and vulnerability is moderate, with the very southwest corner of the site being characterized by high Vulnerability (GSI, 2024). Low fracture connectivity within the limestone will limit any potential for offsite migration.	Bedrock aquifer (Locally Important Aquifer)	Low risk of any released contaminats migration through soil and poorly connected fracturing within the limestone rock mass. No likely impact on the status of the aquifer/off site migration due to mitigation measures (i.e., CEMP), low potential loading, natural attenuation within overburden and discrete nature of fracturing reducing off site migration.	A CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent conditions relevant to the proposed development. These include management of soils, re-fuelling of machinery and chemical handling, control of water during the construction phase and treatment of discharge water where required.
Discharge to ground and local surface water network (Drains) of runoff water with High pH from cement process/ hydrocarbons from construction vehicles/run-off containing a high concentration of suspended solids	Pathway through hydrological environment (following attenuation and treatment), via culvert to Rogerstown estuary (circa 0.8km north of the subject development site at the point of closest proximity)	Hydrological environment (Rogerstown Estuary Transitional Waterbody)	No perceptible risk due to the implementation of the design attenuation and interception and mitigation measures in place (petrochemical interception (if required) of all waters should be carried out prior to discharging any waters to drains or sewers (subject to FCC approval) and on-site settlement ponds/ distilling tanks where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.	
Operational Impacts (Summary)				
Discharge of untreated water off-site	Indirect pathway to hydrological environment via surface water drainage system	Bedrock aquifer (Locally Important Aquifer)	No perceptible risk to aquifer or Receiving streams and estuary due to the implementation of the mitigation and design measures which includes SuDS techniques and the use of interceptors along the drainage system.	The proposed development is designed to ensure the protection of the hydrological environment such as delivery and distribution and use of oil interceptors on the stormwater system and the use of SuDS techniques. In order to limit the surface water discharge from the site to pre-development, greenfield rates, and to ensure improvement in the overall

				surface water quality before ultimate discharge the principles of Sustainable Drainage Systems, (SuDS) are to be implemented.
Discharge of foul water to the Portrane Wastewater Treatment Plant (WWTP)	Indirect pathway to Rogerstown Estuary through foul sewer post treatment at the WWTP.	Hydrological environment (Rogerstown Estuary)	No perceptible risk to the hydrological environment as sewage treated in WWTP Even without treatment at Portrane WWTP, the peak effluent discharge (5.631 l/s which would equate to 1.039% of the licensed discharge at Portrane WWTP); would not impact on the overall water quality within Rogerstown Estuary and therefore would not have an impact on the current Water Body Status (as defined within the Water Framework Directive).	Wastewater discharge to be agreed with Uisce Eireann (formerly IW) in a Wastewater Connection Application.

4.0 NO DETERIORATION ASSESSMENT

4.1 HYDROLOGICAL ENVIRONMENT

The proposed development has a hydrological connection / linkage to the Rogerstown Estuary (WFD Transitional Waterbodies) via the existing 1350mm surface water culvert to the northwest of the site (Catchment 4) and the existing drainage ditches which eventually flow to the Portrane Canal (Catchment 5) which eventually discharges to the Rogerstown Estuary to the north.

The discharges during construction will be treated through desilting tanks / on-site settlement ponds, the latter of which will include include geotextile liners and riprapped inlets and outlets. Desilting and petrochemical interception (if required) of all waters should be carried out prior to discharging any waters to drains or sewers (subject to FCC approval).Further mitigation and design measures which will be implemented during the construction phase to protect the hydrological and hydrogeological environment. There is a potential of accidental discharges during the construction phase, however these are temporary short-lived events that will not impact on the water status of waterbodies long-term and as such will not impact on trends in water quality and over all status assessment.The project-specific CEMP which the works Contractor will develop will implement strict mitigation measures to ensure the protection of the hydrological (and hydrogeological) environment during construction which will ensure that there will be no negative impact on the quantitative or qualitative or morphology of the nearby watercourses.

There is no groundwater dewatering proposed for the proposed development. Surface water runoff from the development will be attenuated to greenfield runoff rates (Qbar) in accordance with the Greater Dublin Strategic Drainage Study (GDSDS).The discharges will be adequately treated via SuDS measures, hydrobrake (or equivalent) and oil/water interceptor to ensure there is no long-term negative impact to the WFD water quality status of the receiving watercourse. The SuDS and proposed measures have been designed in detail with the ultimate aim of protecting the hydrological (& hydrogeological) environment. The SuDS and project design measures will be maintained correctly as per specifications to ensure long-term/ on-going integrity of same.

There are no changes to the overall hydrological and hydrogeological regime as a result of the proposed development. There are no proposed diversions of any drainage ditches or waterbodies as part of the proposed development.

Overall, the potential effects on the current status of the waterbodies are considered *no impact i.e. no change to the WFD status or elements in terms of the hydrological environment.*

4.2 HYDROGEOLOGICAL ENVIRONMENT

Any excavations which penetrate the granular deposits will require to be appropriately battered or the sides supported and are likely to require dewatering if groundwater seepages occur. As mentioned above, the proposed development will not involve long term dewatering of the subsoils or bedrock. As such the proposed development will not have an impact on the quantitative aspects in consideration of water body status

such as baseflow for the hydrological waterbodies. During operation there is no current proposal for dewatering.

For the construction phase, there are mitigation and design measures which will be implemented during this phase to protect the hydrogeological environment. There is a potential of accidental discharges during the construction phase, however these are temporary short-lived events that will not impact on the water status of the underlying bedrock aquifer long-term and as such will not impact on trends in water quality and over all status assessment.

The project-specific CEMP which the works Contractor will develop will implement strict mitigation measures to ensure the protection of the hydrogeological environment during construction which will ensure that there will be no negative impact on the quantitative or qualitative of the underlying bedrock aquifer (Swords GWB).

In terms of the operational phase, the risk to the aquifer is considered to be low due to the use of petrol interceptors on the stormwater system prior to discharge from the site.

Overall, the potential effects on the WFD status to the waterbodies are considered no impact i.e., no change to the current status or elements in terms of the underlying hydrogeological environment.

4.3 ASSESSMENT IN TERMS OF FUTURE GOOD STATUS

The BALLYBOGHIL_010, Rogerstown Estuary and Swords GWB are examined in terms of water quality as these sections of waterbodies are indirectly connected to the proposed development site during the operational phase.

In accordance with the WFD, each river catchment within the former RBD was assessed by the EPA and a water management plan detailing the programme of measures was put in place for each. The BALLYBOGHIL_010 WFD river / surface waterbody is currently classified by the EPA as having '*Poor*' WFD water quality status (2016-2021 period) and is '*At risk of not achieving good status*'. The main pressures identified on the BALLYBOGHIL_010 are associated with the presently 'poor' ecological (and biological invertebrate) status or potential.

Currently, the Rogerstown Estuary transitional waterbody (European Code: IE_EA_050_0100) most recent WFD status (2016-2021) is 'Poor' with a current WFD risk score (3rd risk cycle) of '*At risk of not achieving good status*'. This rating and the main pressures identified on the Rogerstown Estuary are attributed to poor ecological and biological status or potential, specifically Aquatic Flora Status (and Angiosperm) (Catchments.ie, 2024). Additionally, the Rogerstown Estuary is failing to achieve good Chemical Surface Water Status (2016-2021).

According to the sub-catchment assessment of the Ballough[Stream]_SC_010 Sub-catchment (Code 08_6) carried out by the EPA in April 2020, there are a number of pressures within this sub-catchment that impact on the hydrological environment (refer to www.catchments.ie).

All four river water bodies within this subcatchment are At Risk. Ballough Stream_020 and Ballyboghil_010 are At Risk due to Poor ecological status, driven by invertebrates. Nutrients are the significant issue on both water bodies; agriculture is the significant pressure on both water bodies and urban wastewater is an additional significant pressure on Ballough stream_010. Ballyough stream_010 and Turvey_010 have unassigned ecological status but are At Risk due to the results of additional water

quality sampling; agriculture is also the significant pressure on both water bodies while urban diffuse and combined sewer overflows are additional significant pressures on Turvey_010.

The EPA classifies the WFD Ecological Status for the Swords groundwater body as having '*Good Status*' (2016-2021) and its WFD Waterbody risk score is '*Not at Risk*" (refer to www.catchments.ie).

As mentioned above, the main pressure for obtaining good status is agriculture, Domestic wastewater, urban wastewater and urban run-off. The discharges associated with the proposed development will be treated and attenuated prior to discharge off-site. Foul water will be discharged and treated by the Portrane WWTP which is licensed by the EPA. Therefore, the proposed development will not have any discharges which will hinder catchment improvement measures.

The objective of the Swords GWB is Good for 2021. Therefore, the objective is currently being met.

At present there are no local targeted measures within the catchments to maintain or achieve improvements to the status of the water bodies. However, the following are some pressures associated with waterbody catchments:

- Physical Modifications.
- Management of pollution from agricultural activities.
- Management of pollution from sewage and waste water.
- Management of pollution from urban environments.
- Changes to natural flow and levels of water.
- Managing invasive non-native species.

Based on the above information it is not considered that any of the aspects of the proposed development will prevent the WFD objectives from being achieved or to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

5.0 CONCLUSIONS

Appendix A contains the surface water and groundwater assessments where the above potential effects are considered. The colour coded system referred to in Table 2-1 and Table 2-2 above is used to give a visual impression of the assessment.

The WFD assessment indicates that, based on the current understanding of the proposed development, there is no potential for adverse or minor temporary/ long-term or localised effects on the Rogerstown Estuary transitional waterbody. Therefore, it has been assessed that the proposed development will not cause any significant deterioration or change in water body status or prevent attainment, or potential to achieve, future good status or to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

The WFD assessment indicates that there is no potential for adverse or minor temporary or localised effects on the Swords groundwater body. Therefore, it has been assessed that it is unlikely that the proposed development will cause any significant deterioration or change on its water body status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the

second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

No further assessment of WFD is recommended given that no significant deterioration or change in water body status is expected based on the current understanding of the proposed development during construction and operation.

6.0 STUDY LIMITATIONS

The conclusions and recommendations listed above are based on our current understanding of the site. This has been formed from review of historical maps, review of current and previous environmental and engineering reports for the proposed development site. This information is taken as being accurate and true.

Public databases held by the EPA, GSI, OPW, NPWS and OSI have been consulted and the most recent available data has been referenced.

No subsurface or destructive testing was carried out as part of this assessment.

7.0 REFERENCES

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APPENDIX A
WATER FRAMEWORK DIRECTIVE ASSESSMENT MATRIX

Risk screening of potential to cause deterioration of current WFD status										
	Surface Water	Scheme Elements	**Proposed Development**						Mitigation Measures	Overall Impact with mitigation measures
	BALLYBOGHIL_010 (IE_EA_08B01220)	Phase (Construction/ Operation)	Construction	Construction	Construction	Construction	Operation	Operation		
	Rogerstown Estuary (IE_EA_060_0100)	Identified Quantitative Impacts	Increased run-off and sediment loading	Temporary land-take during the construction phase	Pollution due to accidental discharges or spillages during the construction phase	Scour during the construction phase	Increase in Hardstanding	Storage of Fuel		
WFD Status	Macrophytes and phytobenthos - combined	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	**Construction:** The project-specific CEMP will include robust mitigation measures to protect the underlying hydrogeological environment. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent conditions relevant to the proposed development. These include management of soils, re-fuelling machinery and chemical handling and control of water during the construction phase. **Operation:** The proposed development is designed to ensure the protection of the hydrological environment such as delivery and distribution and use of oil interceptors on the stormwater system and the use of SuDS techniques. In order to limit the surface water discharge from the site to pre-development, greenfield rates, and to ensure improvement in the overall surface water quality before ultimate discharge the principles of Sustainable Drainage Systems, (SuDS) are to be implemented. Details are to be agreed with FCC.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status.
	Macroinvertebrates		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status.
	Fish		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status.
Physio-Chemical Status	Total Ammonia	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status.
	Total Nitrogen		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status.
	Ortho-Phosphate		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status.
Hydromorphological Elements	Quantity and dynamics of river flow	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status.
	Connection to Groundwater		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status.
	River continuity		Not Applicable.	Not Applicable.	Not Applicable.	Not Applicable.	Not Applicable.	Not Applicable.		Not Applicable.
	River depth and width variation bed		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status.
	Structure and substrate of river bed		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status.
	Structure of riparian zone		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status.

Risk screening of potential to cause deterioration of current WFD status

	Groundwater	Scheme Elements	Proposed Development				Mitigation Measures	Overall Impact
	IE_EA_G_008 Dublin GWB	Phase (Construction/ Operation)	Construction	Construction	Operation	Operation		
		Identified Quantitative Impacts	Increased run-off and sediment loading	Pollution due to accidential discharges or spillages during the construction phase	Increase in Hardstanding	Storage of Fuel		
Quantitative Elements	**Saline or other intrusions.** To identify groundwater bodies where the intrusion of poor quality water as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	**Construction:** The project-specific CEMP will include robust mitigation measures to protect the underlying hydrogeological environment. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent conditions relevant to the proposed development. These include management of soils, re-fuelling machinery and chemical handling and control of water during the construction phase. No significant dewatering is required which could impact on quantitaive status. **Operation:** The proposed development is designed to ensure the protection of the underlying hydrogeological environment such as use of oil interceptors on the stormwater system and prior to discharge from the site and the use of SuDS techniques. In order to limit the surface water discharge from the site to pre-development, greenfield rates, and to ensure improvement in the overall surface water quality before ultimate discharge the principles of Sustainable Drainage Systems, (SuDS) are to be implemented. No significant abstraction is required which could impact on quantitaive status. The proposed foul drainage system will consist of 4 different connection points to existing networks. As noted the entire Phase 2 development will outfall into the new foul pumping station to the south of the development. This pumping station will pump the wastewater north along the DDR and it will continue north to the Portrane wastewater treatment plant.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Surface water. To assess the impact of groundwater abstractions on the ecological status of surface water bodies.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Groundwater Dependent Terrestrial Ecosystems (GWDTE's) To assess the impact of groundwater abstractions on the condition of GWDTE'S.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Water balance To identify groundwater bodies where abstractions exceed the available resource.		Not Applicable (no dewatering anticipated)	Not Applicable (no dewatering anticipated)	Not Applicable (no water supply from borehole anticipated)	Not Applicable (no water supply from borehole anticipated)		Not Applicable
Chemical Elements	**Saline or other intrusions.** To identify groundwater bodies where the intrusion of poor quality water as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Surface water. To assess the impact of groundwater abstractions on the ecological status of surface water bodies.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Groundwater Dependent Terrestrial Ecosystems (GWDTE's) To assess the impact of nutrient concentrations in groundwater (primarily phosphates) on GWDTE's.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Drinking Water Protected Areas (DrWPAs) To identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WFD or at risk of failing in the future.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	General quality assessment To identify groundwater bodies where widespread deterioration in quality has or will compromise the strategic use of groundwater.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status

Appendix 10.3 Hydrological & Hydrogeological Qualitative Risk Assessment

HYDROLOGICAL & HYDROGEOLOGICAL QUALITATIVE RISK ASSESSMENT

for

PROPOSED RESIDENTIAL DEVELOPMENT AT BALLYMASTONE PHASE 2 LRD, CO. DUBLIN

Technical Report Prepared For

Glenveagh Living Limited

Technical Report Prepared By

Luke Maguire BSc
Environmental Consultant

Our Reference

LM/P247501.0172

Date of Issue

24th April 2024

awnconsulting

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

Cork Office
Unit 5, ATS Building,
Carrigaline Industrial Estate,
Carrigaline, Co. Cork.
T: + 353 21 438 7400
F: + 353 21 483 4606

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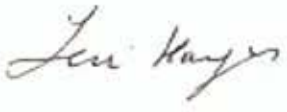
Signature		
Name	Luke Maguire	Teri Hayes
Title	Environmental Consultant	Director Water Services
Date	24 April 2024	24 April 2024

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1.0 INTRODUCTION

1.1 Background

AWN have been requested by Glenveagh Living limited to carry out a Hydrological and Hydrogeological Qualitative Risk Assessment for a development at a site extending to c. 13.74 Ha (gross site area), which comprises greenfield land characterised by an agricultural function. Currently, the lands are undeveloped and entirely unoccupied by any building structures. This assessment has been undertaken to support the AA Screening Report and Natura Impact Statement (NIS) submitted under separate cover with the application, prepared by BSM 2024.

The site is located to the east of Donabate Village and is currently in agricultural use with the recently constructed Donabate Distributor Road (DDR) to the east of the site. The site is bound to the west by The Links development with the Ballymastone masterplan lands and Willowbrook and The Priory developments to the north. Donabate Golf Club and St. Ita's Demesne are located to the east of the subject site. A network of hedgerows and drainage ditches are located throughout the site.

The proposed residential development for phase 2 seeks permission for the provision of 364 no. residential units comprising 124 no. apartments, 82 no. duplexes and 158 houses. The proposed development will consist of the construction of a residential development, which represents Phase 2 of a wider development of the Ballymastone Lands (as identified in the Donabate Local Area Plan 2016 (as extended)) and is a continuation of Phase 1 of the Masterplan lands (permitted under LRD0008/S3). The construction phase drainage infrastructure required for Phase 2 will be constructed as part of Phase 1 of the works permitted under FCC Reg. Ref. LRD0008/S3. As such any runoff during construction will be fully attenuated and passed through an interceptor prior to discharge off site.

A surface water drainage strategy has been developed by DBFL Consulting Engineers. Surface water runoff from the development will be attenuated to greenfield runoff rates (Qbar) in accordance with the GDSDS. The proposed development ranges in height from 2 to 6 storeys to accommodate 364 residential dwellings (including a mix of apartments, duplexes and houses), and public open space. The site will accommodate car parking spaces, bicycle parking spaces, storage, services, new pedestrian/cycle links, road improvements and plant areas. Landscaping will include communal amenity areas, and a significant public open space provision. During operation all storm drainage will be attenuated and treated through an oil interceptor.

During construction discharge will primarily be to the permitted attenuation pond and interceptor installed for the Phase 1 development. Where temporary localised attenuated discharge is required, surface water discharge points are to be agreed with Fingal County Council's Environment Section prior to commencing works on site.

Construction will be undertaken in compliance with the preliminary CEMP prepared by DBFL Consulting Engineers

The potential impacts on the receiving water environment considered are:

- The management of foul, surface water run-off and accidental oil leaks during construction phase.
- Connection to foul sewer and stormwater sewer during operation. Due to the nature of the proposed development, it has been assumed that there will be no bulk oil storage during the operational phase.

1.2 Hydrological Setting

The proposed development site is located within the former Eastern River Basin District (ERBD, now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD).

Early Historical maps dated from 1829 to the early 20th century coupled with historical aerial imagery dated from 1995 to the present day indicate / show that the subject development site has been unoccupied by any building structures and has contained no river waterbodies.

According to the EPA maps, The proposed development site as defined by the EPA nomenclature (EPA, 2024) is situated in Hydrometric Area No. 08 of the Irish River Network and lies within the Nanny-Delvin Catchment (Catchment ID: 08), and the Ballough[Stream]_SC_010 Sub-Catchment. The current EPA watercourse mapping does not include any existing streams or watercourses identified within the proposed development site boundaries. A review of the historical mapping records provided within the GeoHive website do not indicate any watercourses within the proposed development site.

According to the EPA watercourse mapping database the BALLYBOGHIL_010 river waterbody has multiple counterparts, two of which are located in relatively near proximity to the subject development. Accordingly, the Beaverstown Stream Waterbody (BALLYBOGHIL_010, IE_EA_08B012200) is located adjacent to and traversing the lands of the Beaverstown Golf Course, circa 790m to the west / northwest of the development site at the point of closest proximity. This watercourse flows in a north-westerly direction where it outfalls to the Rogerstown Estuary Transitional Waterbody (IE_EA_050_0100), before ultimately discharging to the Irish Sea to the north of Portrane at Rush South Beach.

The second nearby counterpart of the BALLYBOGHIL_010 waterbody is located approximately 445m to the northeast of the site at the point of closest proximity. This watercourse rises immediately north of Reilly's Hill and the National Forensic Mental Health Service, before flowing in a northerly direction under the Portrane Road Regional Route (R126) and discharging to the southeast portion of Rogerstown Estuary.

The existing site is entirely greenfield land to the east of the DDR, and the topography of the site is generally flat with a high point in the middle of the site adjacent to the DDR with a slight fall from the east to the west. The proposed development is located on land with a previous / historic agricultural land function / purpose. The site is composed of multiple fields separated by hedgerows. Surface water, rainfall is generally percolated through the site via grass and soil under the influence of gravity and a network of drainage ditches which traverses the site and feed into the Beaverstown stream and Portrane Canal catchment. Surface water runoff from the existing DDR is collected via road gullies into existing carrier drains running along the road and transferred into 5 attenuation ponds along the length of the DDR. As noted above, the drainage during construction will be primarily diverted to attenuation ponds permitted and constructed as part of the Phase 1 development i.e. this is the baseline that is considered for the HRA.

Furthermore, the Ballymastone masterplan lands site (Figure 6, Infrastructure Design Report, DBFL Consulting Engineers, 2024) is divided into five catchments and it is proposed to discharge attenuated surface water runoff from the first three catchments to the existing drainage ditches which eventually flow to the Portrane Canal. The

fourth catchment will discharge to the existing 1350mm culvert to the north-west of the site, while the fifth catchment discharges to the existing drainage ditches which eventually flow to the Portrane Canal. The existing 1350mm culvert and the Portrane Canal both eventually discharge to the Rogerstown Estuary to the north.

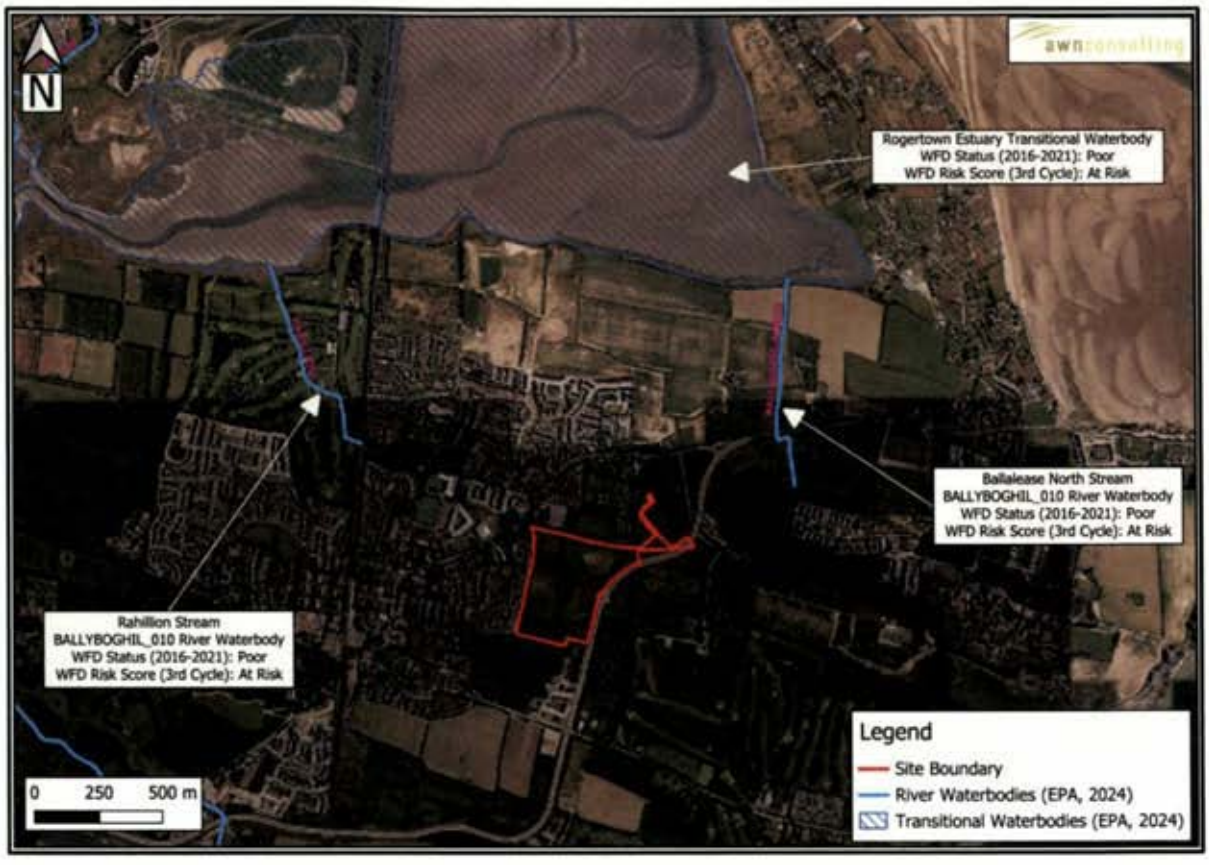

Figure 1.1 Site Location and Hydrological Environment

A review of the EPA (2024) on-line database indicates there are no NPWS protected areas in the immediate vicinity of the Proposed Development site. According to the NPWS (2024) on-line database there are no protected conservation areas on or within the immediate vicinity of the proposed development site. The closest European listed sites are as follows;

- Rogerstown Estuary SPA (Site Code: 004015) c.0.8 km North of the site;
- Rogerstown Estuary SAC (Site Code: 000208) c. 0.8 km North of the site;
- Malahide Estuary SAC (Site Code: 000205) c. 1.2 km South of the site;
- Malahide Estuary SPA (Site Code: 004025) c. 1.2 km South of the site

The site has hydrological connection / linkage with Rogerstown Estuary SPA/SAC via the surface water network (post attenuation and treatment through an interceptor). A review of the Environmental Protection Maps (EPA) web-tool indicates that Beaverstown stream (EPA name 'Rahillion', EPA code 08R23) flows approximately 790m to the north-west of the site and the Portrane stream (EPA name 'Ballalease North', EPA code 08B45) flows approximately 445m to the north-east. Both these streams discharge into the Rogerstown Estuary which is approximately 0.8 km north of the proposed site. There would be a pathway to Rogerstown Estuary waterbody from the Proposed Development site through the stormwater and foul water site drainage which is treated at Portrane Wastewater Treatment Plant (WWTP Licence Number: D0114-02) prior to discharge as described in Section 1.4 below.

1.3 Objective of Report

The scope of this desktop review is to assess the potential for any likely significant impacts on receiving waters and protected areas during construction or post development once operational/occupied, in the absence of taking account of any measures intended to avoid or reduce harmful effects of the proposed project (i.e. mitigation measures).

In particular, this review considers the likely impact of construction and operation impacts (construction run-off and domestic sewage) from the proposed development on water quality and overall water body status within the Rogerstown Estuary transitional waterbody (where the relevant European Sites are located), including bathing water locations. The assessment relies on information regarding construction and design provided by DBFL Consulting Engineers as follows:

- Infrastructure Design Report. Ballymastone, Donabate Phase 2. DBFL Consulting Engineers, March 2024.
- Site Specific Flood Risk Assessment. Ballymastone, Donabate Phase 2. DBFL Consulting Engineers, 2024.

This report was prepared by Luke Maguire (BSc), and Teri Hayes (BSc MSc PGeol EurGeol). Luke is an Environmental Consultant with over 3 years of experience in environmental consultancy and water resources studies). Teri is a hydrogeologist with over 25 years of experience in water resource management and impact assessment. She has a Masters in Hydrogeology and is a former President of the Irish Group of the Association of Hydrogeologists (IAH) and has provided advisory services on water related environmental and planning issues to both public and private sector bodies. She is qualified as a competent person as recognised by the EPA in relation to contaminated land assessment (IGI Register of competent persons www.igi.ie). Her specialist area of expertise is water resource management eco-hydrogeology, hydrological assessment and environmental impact assessment.

1.4 Description of Current and Proposed Drainage

Existing and Proposed Surface Water Drainage

During construction, the majority of the construction site will discharge and be treated in the stormwater attenuation ponds and petrol / hydrocarbon interception permitted and constructed as part of the Phase 1 development. There is a small subcatchment (catchment 5B) which may discharge following attenuation and settlement to internal drainage ditches. As such all water leaving the site will be treated for suspended solids settlement and will pass through an oil / Hydrocarbon interceptor. Additionally, as outlined by the Preliminary CEMP (DBFL Consulting Engineers, 2023), on-site settlement ponds (including geotextile liners and riprapped inlets and outlets) and distilling tanks will be implemented and utilised during the construction phase.

It is proposed to separate the surface water and wastewater drainage networks, which will serve the proposed development, and provide independent connections to the adjacent watercourse and local wastewater sewer network, respectively.

A surface water drainage strategy for the Phase 2 site has been developed by DBFL and is in line with an overall surface water drainage strategy for the Ballymastone masterplan lands which has also been developed by DBFL Consulting Engineers. Surface water runoff from the development will be attenuated to greenfield runoff rates (Qbar) in accordance with the Greater Dublin Strategic Drainage Study (GDSDS).

The attenuation systems are designed to accommodate the 100-year critical storm event. Attenuation storage is provided through a combination of above ground and underground attenuation systems. A balance of underground and overground storage is required considering the urban nature of the development and density / open space requirements. SUDS features such as green roofs and the inclusions of permeable paving, tree pits and swales will be incorporated to reduce run-off volumes and improve run-off water quality, with discharge rates from site being restricted to the greenfield equivalent runoff rate and provide a surface water treatment train and promote source control throughout the development while also providing attenuation storage at source. In some locations. the proposed layout has also managed to include over edge road drainage with surface water flowing directly under drained swales providing treatment and storage at source.

The Phase 2 site (this application area) crosses 2 surface water catchments included within the overall masterplan area. The overall masterplan area was divided into 5 catchments to best utilise the available surface water discharge points. Parts of catchments 4 and 5 are within the Phase 2 site boundary. Catchment 4 is separated into sub catchments with attenuation provided closer to source within the sub-catchments. Catchment 4 discharges to the existing 1350mm surface water culvert to the northwest of the site which eventually discharges to the Rogerstown Estuary to the north. Utilising the 1350mm surface water culvert for the Ballymastone masterplan area is in line with the Donabate LAP. Catchment 5 discharge to the existing ditches which eventually flow to the Portrane Canal and the onto the Rogerstown Estuary to the north. A lot of the drainage infrastructure required for Phase 2 will be constructed as part of Phase 1 of the works permitted under FCC Reg. Ref. LRD0008/S3, specifically the connection to the 1350mm culvert and the majority of the attenuation associated with Catchment 4.

This drainage strategy has been discussed in principle with Fingal County Council's drainage department through the Section 247 Pre-Planning process and also during the Stage 2 process. Due to existing site levels some areas to the south require levels to be raised to provide cover to the drainage network. In general terms attenuation locations avoid the raised areas and generally the underside of attenuations are located on or below existing ground thereby maximising any existing infiltration properties.

Refer to the Infrastructure Design Report (DBFL Consulting Engineers, March 2024) for further details.

Flood Risk Assessment

A Flood Risk Assessment (FRA) was carried out by DBFL Consulting Engineers in 2024 for the proposed development. The proposed development site is located entirely within Flood Zone C i.e., the probability of flooding is low (less than 0.1% AEP or in 1 in 1000 year) for Fluvial and Coastal flooding. Therefore, any flood events will not cause flooding of the Proposed Development, and the development will not affect the flood storage volume or increase flood risk elsewhere.

According to the FRA conducted by DBFL Consulting Engineers (2024) there is no risk anticipated for the proposed development regarding fluvial flooding on the subject site up to the 1% AEP (Annual Exceedance Probability) event.

The proposed development was concluded to have a good level of flood protection up to the 100-year return event. For pluvial floods exceeding the 100-year capacity of the drainage system then proposed flood routing mitigation measures are recommended.

Existing and Proposed Foul Water Drainage

The site has no existing foul loading as it is predominantly / mainly greenfield. There is an existing 300mm foul sewer running through the recently constructed DDR.

It is proposed that the foul infrastructure within the access roads from the DDR and the links road from the Phase 1 development will have been constructed and the majority of Phase 2 will discharge here.

There is a new Irish Water Foul pumping station recently constructed to the south of the development which will serve the southern side of the proposed Phase 2 development. The pump station is fed by a gravity foul sewer falling North to South along the DDR. A rising main takes flow from the pump station to the northern end of the DDR where it is discharged to another gravity sewer. Due to site levels and the invert levels of the gravity sewer in the DDR, the existing gravity sewer in the DDR is only suitable to serve a small portion of the Phase 2 development. To utilise the new Irish Water pump station, a new deeper gravity sewer is proposed to run from the development to the new pump station within the DDR road reservation to the east of the DDR. The majority of this network will be constructed as part of Phase 1 with a small remainder left to be constructed during the Phase 2 works.

The vast majority of the Phase 2 development will discharge to a new proposed Foul Pump Station which is proposed to be located in the North West of the masterplan site. Due to the level of the existing gravity foul lines within the DDR it was not feasible to connect a lot of the site to these via gravity sewers without unrealistic amounts of build-up of the existing ground levels. The North West corner of the site was chosen as the most feasible location for the pump station as the ground levels are lowest here so the depth of the pump station could be minimised. This pump station will serve the majority of both phases 2 & 3 of the development. The rising main from the pump station will discharge to the existing gravity sewer flowing North within the DDR.

The entire Phase 2 development will outfall into the new foul pumping station to the south of the development. This pumping station will pump the wastewater north along the DDR and it will continue north to the Portrane wastewater treatment plant (WWTP-Licence Number: D0114-02) which has adequate capacity.

2.0 ASSESSMENT OF BASELINE WATER QUALITY, RIVER FLOW AND WATER BODY STATUS

A reliable Conceptual Site Model (CSM) requires an understanding of the existing hydrological and hydrogeological setting. This is described below for the proposed development site and surrounding hydrological and hydrogeological environs.

2.1 Hydrological Catchment Description

According to the EPA maps, The proposed development site as defined by the EPA nomenclature (EPA, 2024) is situated in Hydrometric Area No. 08 of the Irish River Network and lies within the Nanny-Delvin Catchment (Catchment ID: 08), and the Ballough[Stream]_SC_010 Sub-Catchment. The current EPA watercourse mapping does not include any existing streams or watercourses identified within the proposed development site boundaries, a review of the historical mapping records provided within the GeoHive website do not indicate any watercourses within the proposed development site.

The Environmental Protection Agency (EPA, 2024) on-line mapping presents the available water quality status information for water bodies in Ireland. Surface water quality is monitored periodically by the EPA at various regional locations along principal and other smaller watercourses. With reference to the site setting, the

nearest active EPA surface waterbody monitoring station along the BALLYBOGHIL_010 river waterbody (IE_EA_08B012200) is situated along the Ballyboghil River, upstream of the proposed development ('Br' in Ballyboghil; EPA Code: RS08B012200). This station is located at the bridge over the Ballyboghil River along the Naul Road Regional Route (R108) and adjacent to its junction with the R129, c. 370m (hydrological distance) upstream (west) of the Ballyboghil Wastewater Treatment Plant and c. 9.1km northwest of the subject development site (linear distance).

The EPA assess the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality.

The most recent status recorded by the EPA in the water quality monitoring station on the Ballyboghil River (located 9.1 km to the northwest of the site) mentioned above is classified as Q3 – 'Poor' Status (2020), indicating a moderately polluted waterbody.

In accordance with the WFD, each river catchment within the former RBD was assessed by the EPA and a water management plan detailing the programme of measures was put in place for each. The BALLYBOGHIL_010 WFD river / surface waterbody is currently classified by the EPA as having 'Poor' WFD water quality status (2016-2021 period) and is 'At risk of not achieving good status'. The main pressures identified on the BALLYBOGHIL_010 are associated with the presently 'poor' ecological status or potential (refer to www.catchments.ie).

Currently, the Rogerstown Estuary transitional waterbody (European Code: IE_EA_050_0100) most recent WFD status (2016-2021) is 'Poor' with a current WFD risk score (3rd risk cycle) of 'At risk of not achieving good status'. This rating and the main pressures identified on the Rogerstown Estuary are attributed to poor ecological and biological status or potential, specifically Aquatic Flora Status (and Angiosperm) or Potential (Catchments.ie, 2024). Additionally, the Rogerstown Estuary is failing to achieve good Chemical Surface Water Status (2016-2021). Refer to www.catchments.ie).

The foul discharge from the site will join the public sewer and will be treated at the Portrane Water Wastewater Treatment Plant (WWTP, D0114-02) prior to subsequent discharge to Rogerstown Estuary. This WWTP is required to operate under an EPA licence and meet environmental legislative requirements as set out in its licence. There will be indirect hydrological connection to Rogerstown Estuary transitional waterbody through the foul water discharge which will be treated off site at Portrane Wastewater Treatment Plant (WWTP).

It should be noted that the peak effluent discharge, calculated for the proposed development as 5.631 l/s would equate to 1.039% of the licensed discharge at Ringsend WWTP [peak hydraulic capacity].

2.2 Aquifer Description & Superficial Deposits

Inspection of Mapping from the Geological Society of Ireland (GSI, 2024 http://www.gsi.ie, accessed on 28-03-2024) indicates the bedrock geology of the site and the surrounding area is dominated by rocks from the Ordovician to the upper Devonian age. The northern and central parts of the site are located over calcareous shales, siltstones and sandstones, and occasional thin limestones at its base referred to as the Malahide Formation (rock unit code: ML). While the southern and mid-

section overlies red coarse-grained lithic sandstone and quartz pebble conglomerate referred to as the Donabate Formation (rock unit code: DE). This is also evident from the Ground Investigation Reports (Appendix 9.2 of this EIAR), which describe the bedrock as angular gravel and cobbles of limestone/mudstone or sandstone/conglomerate.

The regional area is highly geologically variable. GSI maps show the site as overlying the Donabate and Malahide formations. Due to this variability, the GSI (2024) bedrock geology map (100K structural database) indicates a number of faults in the study area with two traversing the site in the south-east and north-east.

During the ground investigations carried out by GII, bedrock was encountered at depths of 0.40m to 3.20mbgl in the south of the site with bedrock not encountered in the north of the site. Strong massive reddish grey fine grain lithicarkose sandstone with quartz cementations and veining, overlying a strong massive reddish grey fine to coarse grain lithic arkose conglomerate with quartz cementation and veining, was recovered from the coring samples. This is typical of the Donabate Formation.

The GSI also classifies the principal aquifer types in Ireland as:

- Lk - Locally Important Aquifer - Karstified
- Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive
- Rkd - Regionally Important Aquifer (karstified diffuse)

The bedrock aquifer underlying the site according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map can be subdivided into 3 separate classes. The aquifer underlying the northeast portion of the site is classified as a (Pl) Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones. The northern and central portion of the site is overlying a (Ll) Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones. The southern part of the site is underlain by a (Lm) Locally Important Aquifer - Bedrock which is Generally Moderately Productive. The subject development site is not underlain by any gravel aquifers.

According to the GSI mapping database (2024), above bedrock, the ground / soil within the site principally comprises Tills derived chiefly from Limestone and are classified as BminDW which denotes deep well drained mineral soils (Mainly basic) that are described as Grey Brown Podzolics, Brown Earths (medium-high base status). The quaternary subsoils comprise Tills derived from Limestone (TLs).

Aquifer / groundwater vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures/ fractures, the main feature that protects groundwater from contamination, and therefore the most important feature in the protection of groundwater, is the subsoil (which can consist solely of/ or of mixtures of peat, sand, gravel, glacial till, clays or silts).

The GSI currently displays / shows varied aquifer vulnerability across the development site and its vicinity. The northern and central portions of the proposed development overlie a 'Low' vulnerable aquifer which indicated an overburden thickness of 10m+ of low permeability soils. While moving south the vulnerability progresses to 'Moderate' and 'High' in the southern portion and the very southwest corner of the site. The aquifer vulnerability class in the region / context of the site is presented below as Figure 2.1. This is relatively consistent with the intrusive investigation data and information obtained from the ground investigations carried out in the vicinity of the site by Ground Investigations Ireland Ltd (2022), where the bedrock was encountered 10.5m BGL in the northern portion of the site at Ballymastone Area 4 while southern portion of the site depth to rock varies from 1.50m BGL in BH12 to a maximum of 3.50m BGL in BH14 at Ballymastone Area 2.

The results obtained from the ground investigations report carried out by GII from February to July 2022 indicate a vulnerability rating of High, as bedrock was encountered at depths from 0.4 – 3.2mbgl.

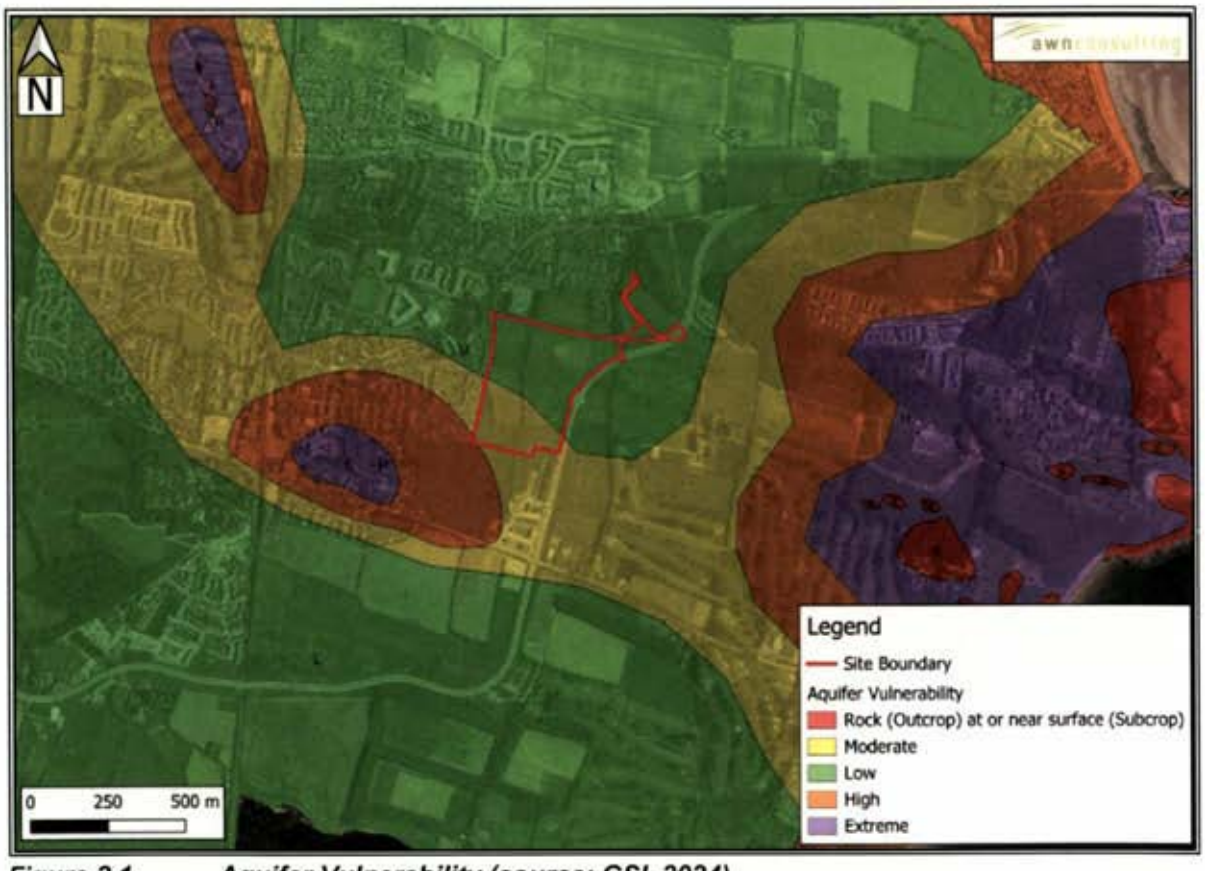

Figure 2.1 Aquifer Vulnerability (source: GSI, 2024)

The Quaternary geological period extends from around 1.5 million years ago to the present day. This can be further sub-divided into the Pleistocene Epoch, which covers the Ice Age period, and which extended up to 10,000 years ago and the Holocene Epoch, which extends from that time to the present day.

The quaternary subsoil type located at the proposed development is predominately classified as TLs – Till type subsoil comprising Limestone till (Carboniferous of variable texture).

Ground investigations carried out by GII indicates that the subsoil material majorly comprises soil derived from mainly calcareous parent material that includes surface

water gleys/groundwater gleys and soil derived from mainly calcareous parent materials that includes grey brown podzolics and brown earths. A minor region in the site is covered by soil that is mainly derived from calcareous parent materials that includes peaty gleys.

3.0 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is developed based on a good understanding of the hydrological and hydrogeological environment, plausible sources of impact and knowledge of receptor requirements. This in turn allows possible Source Pathway Receptor (S-P-R) linkages to be identified. If no S-P-R linkages are identified, then there is no risk to identified receptors.

3.1 Assessment of Plausible Sources

Potential sources during both the construction and operational phases are considered. For the purposes of undertaking the potential of any hydrological/ hydrogeological S-P-R linkages, all potential sources of contamination are considered *without taking account of* any measures intended to avoid or reduce harmful effects of the proposed project (mitigation measures) i.e. a worst-case scenario. Construction sources (short-term) and operational sources (long-term) are considered below.

Construction Phase

The following potential sources are considered plausible risk scenarios for the proposed construction site:

(i) Hydrocarbons or any hazardous chemicals will be stored in specific bunded areas. Refuelling of plant and machinery will also be carried out in bunded areas to minimise risk of any potential being discharged from the site. As a worst-case scenario, a rupture of a 1,000-litre tank (typical volume stored on a construction site) to ground is considered in this analysis which disregards the effect of bunding. This would be a single short-term event.

(ii) Leakage may occur from construction site equipment. As a worst-case scenario an unmitigated leak of 300 litres (largest volume expected for a construction vehicle) is considered. This would be a single short-term event.

(iii) Use of wet cement is a requirement during construction. Run-off water from recent cemented areas will result in highly alkaline water with high pH. As this would only occur during particular phases of work this is again considered as a single short-term event rather than an ongoing event.

(iv) Construction requires soil excavation and removal. Unmitigated run-off could contain a high concentration of suspended solids and contaminants such as hydrocarbons during earthworks, given the presence of contamination beneath the site according to site investigations. These could be considered intermittent short-term events, i.e. on the basis that adequate mitigation measures which are already incorporated in the Construction Environmental Management Plan (CEMP) fail.

(v) During the excavations for the development, no significant long term dewatering is expected.

Operational Phase

The following sources are considered plausible post construction:

(i) The Proposed Development does not require any bulk chemical storage and therefore the potential for water quality impact is negligible.

(ii) Leakage of petrol/ diesel fuel may occur from individual cars in parking areas; run-off may contain a worst-case scenario of 70 litres (typical volume for a car) for example.

(iii) The stormwater drainage system follows SuDS measures that include permeable paving, and a combination of above ground and underground attenuation system, which is required considering the urban nature of the development and density / open space requirements (among others). This system has been designed in order to discharge following the characteristics of a greenfield run-off into the public sewer. As such the potential for silt laden runoff is low. It should be noted that the worst-case scenario (70 litres) under consideration here disregards the effect of SuDS.

(iv) SUDS features such as green roofs and the inclusions of permeable paving, tree pits and swales will provide a surface water treatment train and promote source control throughout the development while also providing attenuation storage at source. In some locations. the proposed layout has also managed to include over edge road drainage with surface water flowing directly under drained swales providing treatment and storage at source.

(i) The proposed development will be fully serviced with separate foul and stormwater sewers which will have adequate capacity for the facility and discharge limits as required by Irish Water licencing requirements. Discharge from the site to the public foul sewer will be sewage and grey water only due to the residential nature of the Proposed Development. The foul discharge from the site will join the public sewer and will be treated at the Portrane Wastewater Treatment Plant (WWTP) prior to subsequent discharge to the Irish Sea. This WWTP is required to operate under an EPA licence D0114-02 (Portrane Donabate Rush, Lusk AER, 2022 shows plant is generally operating in compliance and has capacity available) and meet environmental legislative requirements as set out in such licence.

3.2 Assessment of Pathways

The following pathways have been considered within this assessment with impact assessment presented in Section 3.4:

The potential for offsite migration due to any construction discharges is low as there is no significant pathway in the aquifer and all construction water is passed through the permitted attenuation ponds and interceptor installed as part of Phase 1 development in addition to on-site settlement ponds / distilling tanks.

Vertical migration to the underlying bedrock is minimised where soil cover is thick across the north of the site resulting in good to moderate natural aquifer protection from any localised diesel/ fuel oil spills during either construction or operational phases. The site is underlain by a 'Locally Important Aquifer'. This aquifer is characterised by discrete local fracturing with little connectivity rather than large, connected fractures which are more indicative of Regional Aquifers. As such, flow paths are generally local.

There is a hydrological linkage for construction and operation run-off from the site to the Rogerstown Estuary as stormwater discharges ultimately into the Rogerstown Estuary c. 0.8 km from the development site. However, as the construction stage stormwater discharge is treated by the permitted attenuation ponds and hydrocarbon / oil interceptors installed during phase 1 works during construction and operation, there is no potential for water quality exceeding SI threshold (S.I 272/2009 and S.I. 77/2019 amendments) concentrations to be exceeded at the estuary.

There is a pathway for foul sewage through the foul sewer network which ultimately discharges to the Portrane WWTP prior to final discharge to the Irish Sea post treatment. However, as the WWTP is required to operate in compliance with licence requirements there is a low potential for water quality exceeding SI threshold concentrations to be exceeded at the estuary.

3.3 Assessment of Receptors

The receptors considered in this assessment include the following:

(i) Underlying bedrock aquifer;
(ii) Rogerstown Estuary SPA (Site Code: 004015) c.0.8 km North of the site;
(iii) Rogerstown Estuary SAC (Site Code: 000208) c. 0.8 km North of the site;

Other nearby Natura 2000 Sites within the region of the subject development but are located further away were excluded from the assessment due to their distance from the subject site, the potential loading of contaminant from the site (risk scenarios presented in Section 3.1) and significant dilution through its pathway. Such areas include Malahide Estuary SAC (Site Code: 000205) and Malahide Estuary SPA (Site Code: 004025), both of which are located c. 1.2 km South of the site

3.4 Assessment of Source Pathway Receptor Linkages

Table 3.1 below summarises the plausible pollutant linkages (S-P-R) considered as part of the assessment and a review of the assessed risk is also summarised below.

Construction Phase

The potential for impact on the aquifer is low based on the protection provided where overburden is present and low fracture connectivity within the aquifer minimising the off-site impact. Any silt-laden stormwater from construction or hydrocarbon-contaminated water from a construction vehicle leak/tank leak will be attenuated and treated through the permitted attenuation ponds and interceptor on site. No exceedance of water quality objectives as outlined in S.I. No. 272 of 2009, S.I. No. 386 of 2015 and S.I. No. 77 of 2019) is likely by the time the stormwater reaches the nearest Natura 2000 Sites (Rogerstown Estuary, c. 0.8 km downgradient).

Operational Phase

During operation, the potential for a release is low as there is no bulk fuel/chemical storage and no silt laden run-off. Stormwater will be collected by a drainage system which includes SuDS measures and an attenuation system prior to discharge off-site (albeit these measures have been disregarded for this analysis). In addition, the potential for hydrocarbon discharge is quite minimal based on an individual vehicle (70 litres) leak being the only source for hydrocarbon release. However, even if the operation of the proposed SuDS is excluded from consideration, there is no likely impact above water quality objectives as outlined in S.I. No. 272 of 2009, S.I. No. 386 of 2015 and S.I. No. 77 of 2019) in the worst case scenarios described above at

section 3.2 and there will be no significant effect on any European site. The volume of contaminant release is low and combined with the significant attenuation and treatment through interceptors on site and within the stormwater drainage network, hydrocarbons will dilute to background levels with no likely impact above water quality objectives as outlined in S.I. No. 272 of 2009, S.I. No. 386 of 2015 and S.I. No. 77 of 2019 at any Natura 2000 sites.

Even without treatment at the Portrane WWTP, the peak effluent discharge, calculated for the proposed development as 5.631 l/s (which would equate to 1.039% of the licensed discharge at Portrane WWTP [peak hydraulic capacity]), would not have a measurable impact on the overall water quality within Rogerstown Estuary or the Irish Sea and therefore would not have an impact on the current Water Body Status (as defined within the Water Framework Directive).

The EIAR and NIS report acknowledges that a number of design measures will be put in place to minimise the likelihood of any spills entering the water environment to include the design of the car park with hydrocarbon interceptors. In the event of an accidental leakage of oil from the parking areas, this will be intercepted by the drainage infrastructure proposed. It is proposed to ultimately discharge surface water from the proposed development, post attenuation and outflow restrictions into the existing local drainage. No further mitigation measures are to be required during the operational phase.

In addition, the EIAR report acknowledges that the implementation of mitigation measures detailed in the subject EIAR and CEMP will ensure that the predicted impacts on the hydrological environment do not occur during the operational phase and that the residual impact will be long-term-imperceptible-neutral

As there are no likely exceedances of water quality thresholds at Rogerstown Estuary SPA and Rogerstown Estuary SAC, there is also no potential for exceedance at Malahide Estuary SAC and Malahide Estuary SPA (1.2km south)

No likely significant cumulative impacts are predicted in relation to the hydrological environment as a result of the proposed development in combination with other existing, permitted or proposed developments. All the operational cumulative developments are required to manage discharges in accordance with S.I 272/2009 and 77/2019 amendments. As such there will be no cumulative impact to surface water quality and therefore there will be no cumulative impact on the Surface Waterbody Status. The operation of the proposed development is concluded to have a long-term, imperceptible significance with a neutral impact on surface water quality.

It can be concluded that the in-combination effects of surface water arising from the Proposed Development taken together with that of other permitted developments will not be significant based on the in-combination low potential chemical and sediment expected loading. Therefore, based on the loading considered in the worst-case scenarios mentioned in Section 3.1 above during construction and operation phases, there is subsequently no potential for impact on downgradient Natura 2000 habitats (those in the Rogerstown Estuary, which is located approximately 0.8 km north of the site).

The proposed development design includes hardstand cover across the site and as set out in the EIAR (2024) the proposed/existing surface water drainage system for this development has been designed as a sustainable urban drainage system and uses on-line overground detention basins together with a flow control device, green roofs, swales, detention basins, rainwater harvesting and petrol interceptors.

Therefore, the risk of accidental discharge has been adequately addressed through design.

The assessment has also considered the effect of cumulative events, such as release of sediment laden water combined with a hydrocarbon leak on site (1,000 litres as a worst-case scenario during the construction phase). As there is treatment through existing infrastructure on site (Phase 1 development) and further assimilation and dilution between the site and the Natura 2000 sites (Rogerstown Estuary, which is c. 0.8 km from the site), it is concluded that no perceptible impact on water quality would occur at the Natura 2000 sites as a result of the construction or operation of this Proposed Development.

It can also be concluded that the cumulative or in-combination effects of effluent arising from the Proposed Development with that of other permitted proposed developments, or with development planned pursuant to statutory plans in the greater Dublin which will be discharged into Portrane WWTP will not be significant having regard to the size of the calculated discharge from the Proposed Development and the operation of the WWTP in compliance with licence requirements.

All new developments are required to comply with SuDS which ensures management of run-off rate within the catchment of Portrane WWTP.

Table 3.1 below presents a summary of the risk assessment undertaken.

Source	Pathways	Receptors considered	Risk of Impact
Construction Impacts (Summary)			
Unmitigated leak from an oil tank to ground/ unmitigated leak from construction vehicle (1,000 litres worst case scenario).	Bedrock protected by low to high permeability overburden. Migration within weathered/ less competent limestone is low (limestone has discrete local fracturing rather than large, connected fractures).	The aquifer underlying the northeast portion of the site is classified as a *(Pl) Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones*. The northern and central portion of the site is overlying a *(Ll) Locally Important Aquifer* – Bedrock *which is Moderately Productive only in Local Zones*. The southern part of the site is underlain by a *(Lm) Locally Important Aquifer - Bedrock which is Generally Moderately Productive*. The subject development site is not underlain by any gravel aquifers.	Low risk of migration through overburden and migration off site through poorly connected fracturing within the bedrock (Locally Important Aquifer) rock mass. No likely impact on the status of the aquifer/off site migration due to low potential loading, natural attenuation within overburden and discrete nature of fracturing reducing off site migration.
Discharge to ground of runoff water with High pH from cement process/ hydrocarbons from construction vehicles/run-off containing a high	Discharge following treatment on site through permitted existing attenuation ponds and interceptor prior to discharge connected to Rogerstown Estuary	Rogerstown Estuary SAC/SPA	No potential for local temporary exceedances of statutory water quality standards the Natura 2000 sites

concentration of suspended solids	transitional waterbody (distance source-receptor: 0.8km)		
Operational Impacts (Summary)			
Foul effluent discharge to sewer	Pathway through foul sewer to Rogerstown Estuary through Portrane WWTP	Rogerstown Estuary SAC/SPA	No perceptible risk – Foul discharge is to a licenced WWTP. Even without treatment at Portrane WWTP, the peak effluent discharge (5.631 l/s which would equate to 1.039% of the licensed discharge at Portrane WWTP); would not impact on the overall water quality within the estuary and therefore would not have an impact on the current Water Body Status (as defined within the Water Framework Directive).
Discharge to ground of hydrocarbons from carpark leak (70 litres worst case scenario)	Pathway through stormwater drainage to Rogerstown Estuary transitional waterbody (distance source-receptor 0.8km)	Rogerstown Estuary SAC/SPA	No perceptible risk – taking into account the extent of loading of contaminant, distance between the source and nearby receptor and treatment on site (No likely impact above water quality objectives as outlined in S.I. No. 272 of 2009, S.I. No. 386 of 2015 and S.I. No. 77 of 2019).

Table 3.1 Pollutant Linkage Assessment (without mitigation)

4.0 CONCLUSIONS

A conceptual site model (CSM) has been prepared following a desk top review of the site and surrounding environs. Based on this CSM, plausible Source-Pathway-Receptor linkages have been assessed assuming an absence of any measures intended to avoid or reduce harmful effects of the proposed project (i.e. mitigation measures) in place at the proposed development site.

During construction and operation phases there is a source pathway linkage between the proposed development site and Rogerstown Estuary SPA/SAC. However, there is no potential for exceedance of water quality objectives as outlined in S.I. No. 272 of 2009, S.I. No. 386 of 2015 and S.I. No. 77 of 2019) as there is adequate attenuation and treatment on site during construction and operation.

It should be noted that the peak effluent discharge, calculated for the proposed

development as 5.631 l/s would equate to 1.039% of the licensed discharge at Portrane WWTP [peak hydraulic capacity. This flow is to a licenced wastewater treatment plant with adequate capacity. The Proposed Development will not contribute any additional stormwater drainage to the WWTP over the natural greenfield rate.

It is concluded that there is a low pollutant linkages as a result of the construction or operation of the proposed development which could result in a water quality impact which could alter the habitat requirements of the Natura 2000 sites within Rogerstown Estuary.

Finally, and in line with good practice, appropriate and effective mitigation measures will be included in the construction design, management of construction programme and during the operational phase of the proposed development. With regard the construction phase, adequate mitigation measures will be incorporated in the Construction Environmental Management Plan (CEMP). These specific measures will provide further protection to the receiving soil and water environments. However, the protection of downstream European sites is in no way reliant on these measures and they have not been taken into account in this assessment.

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Appendix 19.1 Resource & Waste Management Plan (RWMP)

awnconsulting
A Trinity Consultants Company

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

RESOURCE AND WASTE MANAGEMENT PLAN FOR A PROPOSED LARGE-SCALE RESIDENTIAL DEVELOPMENT AT BALLYMASTONE, DONABATE, CO. DUBLIN.

BALLYMASTONE PHASE 2 APPENDIX 19.1

Report Prepared For

Glenveagh Living Limited

Report Prepared By

Chonaill Bradley, Principal Environmental Consultant

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1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Construction and Demolition (C&D) Resource & Waste Management Plan (RWMP) on behalf of Glenveagh Living Limited. The proposed development will consist of the construction of a residential development, which represents Phase 2 of a wider development of the Ballymastone Lands (as identified in the Donabate Local Area Plan 2016 (as extended)) and is a continuation of Phase 1 of the Masterplan lands (permitted under LRD0008/S3). The proposed development ranges in height from 2 to 6 storeys to accommodate 364 residential dwellings (including a mix of apartments, duplexes and houses), and public open space. The site will accommodate car parking spaces, bicycle parking spaces, storage, services, new pedestrian/cycle links, road improvements and plant areas. Landscaping will include communal amenity areas, and a significant public open space provision.

This plan provides information necessary to ensure that the management of C&D waste at the site is undertaken in accordance with the current legal and industry standards including the Waste Management Act 1996 as amended and associated Regulations [1], Environmental Protection Agency Act 1992 as amended [2], Litter Pollution Act 1997 as amended [3],the National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPCE) (2024) [4]. In particular, this plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also provides appropriate measures in relation to the collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This RWMP includes information on the legal and policy framework for C&D waste management in Ireland, estimates of the type and quantity of waste to be generated by the proposed development and prescribes measures for the management of different waste streams. The RWMP should be viewed as a live document and will be regularly revisited throughout the project's lifecycle so that opportunities to maximise waste reduction / efficiencies are exploited throughout, and that data is collected on an ongoing basis so that it is as accurate as possible.

2.0 C&D WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Irish Government issued a policy statement in September 1998, *Changing Our Ways* [5], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five year period (by 2003), with a progressive increase to at least 85% over fifteen years (i.e. 2018).

In response to the *Changing Our Ways* report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report entitled '*Recycling of Construction and Demolition Waste*' [6] concerning the development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

In September 2020, the Irish Government published a policy document outlining a new action plan for Ireland to cover the period of 2020-2025. This plan, *'A Waste Action Plan for a Circular Economy'* [7] (WAPCE), replaces the previous national waste management plan, *"A Resource Opportunity"* (2012), and was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to an altered economical model, where climate and environmental challenges are turned into opportunities.

The WAPCE sets the direction for waste planning and management in Ireland up to 2025. This reorientates policy from a focus on managing waste to a much greater focus on creating circular patterns of production and consumption. Other policy statements of a number of public bodies already acknowledge the circular economy as a national policy priority.

The policy document contains over 200 measures across various waste areas including circular economy, municipal waste, consumer protection and citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

One of the first actions to be taken was the development of the *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less'* (2021) [8] to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021. It is anticipated that the Strategy will be updated in full every 18 months to 2 years.

The Circular Economy and Miscellaneous Provisions Act 2022 [9] was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will work to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions, tackling the delays which can be encountered by industry, and supporting the availability of recycled secondary raw materials in the Irish market, and tackles illegal fly-tipping and littering.

The Environmental Protection Agency (EPA) of Ireland issued '*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects' in November 2021* [10]. These guidelines replace the previous 2006 guidelines issued by The National Construction and Demolition Waste Council (NCDWC) and the Department of the Environment, Heritage and Local Government (DoEHLG) in 2006 [11]. The guidelines provide a practical approach which is informed by best practice in the prevention and management of C&D wastes and resources from design to construction of a project, including consideration of the deconstruction of a project. These guidelines have been followed in the preparation of this document and include the following elements:

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Design teams roles and approach;
- Relevant EU, national and local waste policy, legislation and guidelines;

- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for Resource Waste Manager (RM) and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan; and
- Details of consultation with relevant bodies i.e. waste recycling companies, Local Authority, etc.

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a bespoke RWMP for developments. The new guidance classifies developments on a two-tiered system. Developments which do not exceed any of the following thresholds may be classed as Tier 1 development, which require a simplified RWMP:

- New residential development of less than 10 dwellings.
- Retrofit of 20 dwellings or less.
- New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m^2.
- Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m^2; and
- Demolition projects generating in total less than 100m^3 in volume of C&D waste.

A development which exceeds one or more of these thresholds is classed as Tier-2 projects.

This development requires a RWMP as a Tier 2 development as it is above following criterion:

- New residential development of less than 10 dwellings.

Other guidelines followed in the preparation of this report include *'Construction and Demolition Waste Management – a handbook for Contractors and Site Managers'* [12], published by FÁS and the Construction Industry Federation in 2002 and the previous guidelines, 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' (2006).

These guidance documents are considered to define best practice for C&D projects in Ireland and describe how C&D projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

2.2 Regional Level

The proposed development is located in the Local Authority area of Fingal County Council (FCC).

The Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021 has been superseded as of March 2024 by the NWMPCE 2024 - 2030.

The NWMPCE does not dissolve the three regional waste areas. The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

This Plan seeks to influence sustainable consumption and prevent the generation of waste, improve the capture of materials to optimise circularity and enable compliance with policy and legislation.

The national plan sets out the following strategic targets for waste management in the country that are relevant to the development:

National Targets

1B. (Construction Materials) 12% Reduction in Construction & Demolition Waste Generated by 2030.

3B. (Reuse Facilities) Provide for reuse at 10 Civic Amenity Sites, minimum.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €140 - €160 per tonne of waste which includes an €85 per tonne landfill levy introduced under the *Waste Management (Landfill Levy) (Amendment) Regulations 2015 (as amended).*

The *Fingal Development Plan 2023 – 2029* [13] (2023) sets out a number of policies and objectives for the Fingal region in line with the objectives of the regional waste management plan, including the following:

- Objective **IUO34** – Waste Management in New Developments -
  Require the provision of appropriate, well designed, accessible space to support the storage, separation and collection of as many waste and recycling streams as possible in all new commercial and residential developments within the County.

- Objective **DMSO234** – Provision of Public Bring Banks - Ensure the provision of public bring banks in all large retail developments, unless there are existing facilities within a 1 km radius. Bring bank facilities will generally be required at appropriate locations in the following development types:
  - In conjunction with significant new commercial developments, or extensions to existing developments.
  - In conjunction with new waste infrastructure facilities, proposals should include bring facilities for the acceptance of non-hazardous and hazardous wastes from members of the public and small businesses.
  - In conjunction with medium and large scale residential and mixed-use developments providing in excess of 10 residential units, proposals should provide recycling and bring bank facilities to serve residents and in some appropriate locations, the wider community.
  - In conjunction with all large retail developments provide space for reverse vending machines to promote the circular economy.

- Objective **DMSO235** – Communal Refuse Storage Provision - In the case of communal refuse storage provision, the collection point for refuse should be accessible both to the external collector and to the resident and be secured against illegal dumping by non-residents. In the case of individual houses, the applicant shall clearly show within a planning application the proposed location and design of bin storage to serve each dwelling, and having regard to the number of individual bins required to serve each dwelling at the time of the application and any possible

future requirements for refuse storage/collection. The following criteria will be considered in the assessment of the design and siting of waste facilities and bring facilities:

- The location and design of any refuse storage or recycling facility should ensure that it is easily accessible both for residents and/or public and for bin collection, be insect and vermin proofed, will not present an odour problem, and will not significantly detract from the residential amenities of adjacent property or future occupants.
- Provision for the storage and collection of waste materials shall be in accordance with the guidelines for waste storage facilities in the relevant Regional Waste Management Plan and the design considerations contained in Section 4.8 and 4.9 of the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities, DHLGH (2020).
- Refuse storage for houses should be externally located, concealed / covered and adequate to cater for the size and number of bins normally allocated to a household. For terraced houses, the most appropriate area for bins to be stored is to the front of the house, which should be located in well-designed enclosures that do not to detract from visual amenity.
- All applications shall clearly identify the waste storage and collection points and detail the anticipated waste collection schedule having regard to the impact on road users both within the development and the surrounding area.
- Access to private waste storage in residential schemes should be restricted to residents only.

- Objective **DMSO236** – Segregation and Collection of Waste - Ensure all new large-scale residential and mixed-use developments include appropriate facilities for source segregation and collection of waste.

- Objective **DMSO237** – Distance from Front Door to Communal Bin Area - Ensure all new residential schemes include appropriate design measures for refuse storage areas, details of which should be clearly shown at pre-planning and planning application stage. Ensure refuse storage areas are not situated immediately adjacent to the front door or ground floor window, unless adequate screened alcoves or other such mitigation measures are provided.

- Objective **DMSO239** – Refuse storage areas - Ensure all new residential schemes include appropriate design measures for refuse storage areas, details of which should be clearly shown at pre-planning and planning application stage. Ensure refuse storage areas are not situated immediately adjacent to the front door or ground floor window, unless adequate screened or other such mitigation measures are provided.

- Objective **DMSO240** – Distance to Communal Bin Areas - Ensure the maximum distance between the front door to a communal bin area does not exceed 50 metres.

- Objective **DMSO241** - Construction and Demolition Waste Management Plan - Require that Construction and Demolition Waste Management Plans be submitted as part of any planning application for projects in excess of any of the following thresholds:
  - ¨New residential development of 10 units or more.

- ¨New developments other than above, including institutional, educational, health and other public facilities, with an aggregate floor area in excess of 1,250 sqm.
- ¨Demolition / renovation / refurbishment projects generating in excess of 100m^3 in volume of C&D waste.
- ¨Civil engineering projects in excess of 500m^3 of waste materials used for development of works on the site.

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the proposed development are:

- Waste Management Act 1996 as amended.
- Environmental Protection Agency Act 1992 as amended.
- Litter Pollution Act 1997 as amended.
- Circular Economy and Miscellaneous Provisions Act 2022.
- Planning and Development Act 2000 as amended [14].

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996* as amended and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal recycling, recovery or disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final destination, waste contractors will be employed to physically transport waste to the final destination. Following on from this is the concept of *"Polluter Pays"* whereby the waste producer is liable to be prosecuted for pollution incidents, which may arise from the incorrect management of waste produced, including the actions of any contractors engaged (e.g. for transportation and disposal/recovery/recycling of waste).

It is therefore imperative that the Developer ensures that the waste contractors engaged by construction contractors are legally compliant with respect to waste transportation, recycling, recovery and disposal. This includes the requirement that a contractor handle, transport and recycle/recover/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments* or a Waste or Industrial Emissions Licence granted by the EPA. The COR / permit / licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

3.0 DESIGN APPROACH

The client and the design team have integrated the *'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition*

Projects' guidelines into the design workshops, to help review processes, identify and evaluate resource reduction measures and investigate the impact on cost, time, quality, buildability, second life and management post construction. Further details on these design principals can be found within the aforementioned guidance document.

The design team have undertaken the design process in line with the international best practice principles to firstly prevent wastes, reuse where possible and thereafter sustainably reduce and recover materials. The below sections have been the focal point of the design process and material selections and will continued to be analysed and investigated throughout the design process and when selecting material.

As noted in the EPA guidelines, the approaches presented are based on international principles of optimising resources and reducing waste on construction projects through:

- Prevention;
- Reuse;
- Recycling;
- Green Procurement Principles;
- Off-Site Construction;
- Materials Optimisation; and
- Flexibility and Deconstruction.

3.1 Designing For Prevention, Reuse and Recycling

Undertaken at the outset and during project feasibility and evaluation the Client and Design Team considered:

- Establishing the potential for any reusable site assets (buildings, structures, equipment, materials, soils, etc.);
- The potential for refurbishment and refit of existing structures or buildings rather than demolition and new build (No demolition on this project);
- Assessing any existing buildings on the site that can be refurbished either in part or wholly to meet the Client requirements; and
- Enabling the optimum recovery of assets on site.

3.2 Designing for Green Procurement

Waste prevention and minimisation pre-procurement have been discussed and will be further discussed in this section. The Design Team will discuss proposed design solutions, encourage innovation in tenders and incentivise competitions to recognise sustainable approaches. They will also discuss options for packaging reduction with the main Contractor and subcontractors/suppliers using measures such as 'Just-in-Time' delivery and use ordering procedures that avoid excessive waste. The Green procurement extends from the planning stage into the detailed design and tender stage and will be an ongoing part of the long-term design and selection process for this development.

3.3 Designing for Off-Site Construction

Use of off-site manufacturing has been shown to reduce residual wastes by up to 90% (volumetric building versus traditional). The decision to use offsite construction is typically cost led but there are significant benefits for resource management. Some further

considerations for procurement which are being investigated as part of the planning stage design process are listed as follows:

- Modular buildings as these can displace the use of concrete and the resource losses associated with concrete blocks such as broken blocks, mortars, etc.;
  - Modular buildings are typically pre-fitted with fixed plasterboard and installed insulation, eliminating these residual streams from site.
- Use of pre-cast structural concrete panels which can reduce the residual volumes of concrete blocks, mortars, plasters, etc.;
- The use of prefabricated composite panels for walls and roofing to reduce residual volumes of insulation and plasterboards;
- Using pre-cast hollow-core flooring instead of in-situ ready mix flooring or timber flooring to reduce the residual volumes of concrete/formwork and wood/packaging, respectively; and
- Designing for the preferential use of offsite modular units.

3.4 Designing for Materials Optimisation During Construction

To ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite as outlined in section 3.1, structures should be designed with the intent of designing out waste. This helps to reduce the environmental impacts associated with transportation of materials and from waste management activities. This includes investigating the use of standardised sizes for certain materials to help reduce the amount of offcuts produced on site, focusing on promotion and development of off-site manufacture.

3.5 Designing for Flexibility and Deconstruction

Design flexibility has and will be investigated throughout the design process to ensure that where possible products (including buildings) only contain materials that can be recycled and are designed to be easily disassembled. Material efficiency is being considered for the duration and end of life of a building project to produce; flexible, adaptable spaces that enable a resource-efficient, low-waste future change of use; durability of materials and how they can be recovered effectively when maintenance and refurbishment are undertaken and during disassembly/deconstruction.

4.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

4.1 Location, Size and Scale of the Proposed Development

Glenveagh Living Limited, intend to apply for a seven-year permission, for a Large Scale Residential Development (LRD) at this site at Ballymastone, Donabate, County Dublin. The application site, with a gross site area of c.13.74ha and a net site area of c. 8.14ha, is bounded by existing residential development of The Priory, Donabate Burial Ground and wider undeveloped Ballymastone lands to the north, the Donabate Distributor Road (DDR) and permitted Ballymastone Recreational Hub to the east (PARTXI/004/21), permitted Ballymastone Phase 1 (FCC. Ref. LRD0008/S3 & ABP Ref. 315288) to the south and existing residential development of The Links, and the Links Road, to the east.

The proposed development will consist of the construction of a residential development, which is a continuation of permitted Ballymastone Phase 1 lands (FCC Ref. LRD0008/S3 & ABP Ref. 315288) and represents Phase 2 of the wider development of the Ballymastone Lands (as identified in the Donabate Local Area Plan 2016 (as extended)), ranging in height from 2 to 6 storeys to accommodate 364 no. residential dwellings (158 no. houses, 82 no. duplex units and 124 no. apartments) and public open space. The site will accommodate 278 total no. car parking spaces, 1,457 total no. cycle parking spaces, new pedestrian/ cycle links, road connectivity enhancements, storage, services and plant areas. Landscaping will include significant public open space provision and communal amenity areas. The proposed development is set out as follows:

1. The construction of 364 no. new residential dwellings consisting of 158 no. houses, 82 no. duplex units and 124 no. apartment units set out follows:
   - Construction of 158 no. 2-storey houses (54 no. 2-beds, 99 no. 3-beds, 5 no. 4-beds).
   - Construction of 82 no. 2 to 3 storey duplex units (8 no. 1-beds, 33 no. 2-beds, 41 no. 3-beds), with balconies on all elevations.
   - Construction of 3 no. apartment blocks, ranging from 3 to 6 storeys in height, with balconies on all elevations, green roofs, and external amenity courtyards, providing a total of 124 no. apartment units (48 no. 1-beds, 66 no. 2-beds, 10 no. 3-beds).
2. The scheme provides c. 17% public open space of the net site area comprising 2 no. small parks and 1 no. pocket park which total c. 13,646 sq.m. These parks are located centrally within the site providing a series of north-south linear spaces linking to permitted Ballymastone Phase 1 (FCC Ref. LRD0008/S3 & ABP Ref. 315288) to the south.
3. A total of 278 no. car parking spaces are provided (combination of in-curtilage and on-street and communal car parking areas).
4. A total of 1,457 no. cycle spaces are provided for residential units (comprising 1,353 long-stay/ resident spaces and 104 no. short-stay/ visitor spaces).
5. The development provides for vehicular access from The Links Road, Donabate Distributor Road (DDR) and permitted Ballymastone Phase 1 (FCC Ref. LRD0008/S3 & ABP Ref. 315288).
6. A north-south pedestrian/ cycle route is proposed within the site connecting permitted Ballymastone Phase 1 (FCC Ref. LRD0008/S3 & ABP Ref. 315288) and future development lands to the north. A series of east-west pedestrian/ cycle routes are proposed connecting the site to permitted Ballymastone Recreational Hub to the east (PARTXI/004/21).
7. Proposed new foul pump station located to the north-east of the site.
8. The proposed application includes all site enabling and site development works, landscaping works, PV panels, bin stores, plant, boundary treatments, ESB Substations, lighting, servicing, signage, surface water attenuation facilities and all site development works above and below ground.

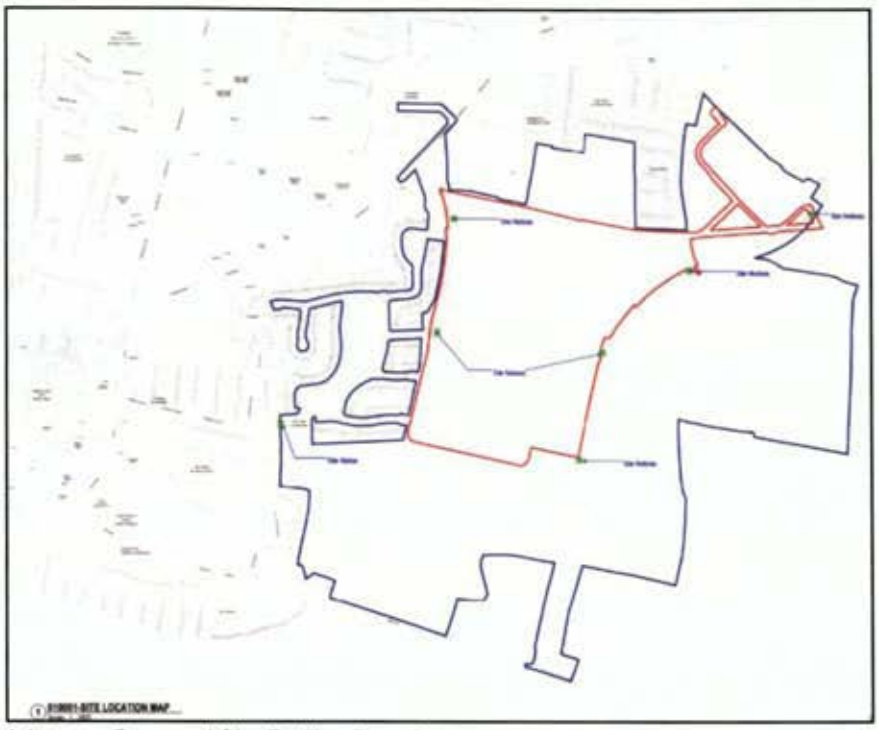

Figure 4.1 *Proposed Site Redline Boundary*

Figure 4.2 *Proposed Site Layout Plan*

4.2 Details of the Non-Hazardous Wastes to be Produced

There will be soil and stones excavated to facilitate construction of the development. The development engineers (DBFL Consulting Engineers Limited) have estimated that c. 41,000 m^3 of material will need to be excavated to do so. It is currently envisaged that all of the excavated will be able to be retained and reused onsite. If any excavated material is deemed unsuitable or unrequired for reuse, then the material will need to be removed offsite. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and supply of materials will also be generated. The contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided on site during the construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

4.3 Potential Hazardous Wastes Arising

4.3.1 Contaminated Soil

Site investigations and environmental soil testing were undertaken by Ground Investigations Ireland (GII) between February 2022 and July 2022. As part of this assessment GII produce a waste classification report.

If any potentially contaminated material is encountered or any material is to be removed from site, it will be segregated from clean / inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled *'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* [15] using the *HazWasteOnline™* tool (or similar approved classification method). The material will then be classified as clean, inert, non-hazardous or hazardous in accordance with the *EC Council Decision 2003/33/EC* [16], which establishes the criteria for the acceptance of waste at landfills.

In total, one hundred (100 No.) samples were assessed using the HazWasteOnLine™ Tool. All samples were classified as being non-hazardous.

Asbestos fibres were not detected in the samples. The laboratory did not identify asbestos containing materials (ACMs) in the samples.

In the event that Asbestos Containing Materials (ACMs) are found within the excavated material, the removal will only be carried out by a suitably permitted waste contractor, in accordance with *the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.* All asbestos will be taken to a suitably licensed or permitted facility. Due to the nature of the site being green field it is not envisaged that ACM will be encountered onsite.

Asbestos fibres were not detected in the samples. The laboratory did not identify asbestos containing materials (ACMs) in the samples.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase, the contractor will notify FCC and provide a Hazardous / Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal / treatment, in addition to information on the authorised waste collector(s).

4.3.2 Fuel/Oils

Fuels and oils are classed as hazardous materials; any on-site storage of fuel / oil, and all storage tanks and all draw-off points will be bunded and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and the site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel / oil waste generated at the site.

4.3.3 Invasive Plant Species

A site survey was undertaken by the Brady Shipman Martin (Project Ecologists). This included a site walkover survey of the entire site, and around part of the outside perimeter to search for any invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 as amended.

No species listed on the Third Schedule of the Birds and Habitats Regulations 2011 (as amended), such as Japanese knotweed (*Reynoutria japonica*), giant hogweed (*Heracleum mantegazzianum*), Himalayan balsam (*Impatiens glandulifera*) or three-cornered leek (*Allium triquetrum*) have been recorded at the proposed development site during the surveys undertaken to date. If any third schedule invasive species is detected during the construction phase of the development, then an invasive species management plan will be produced and submitted to FCC.

4.3.4 Asbestos

If ACMs are detected on site, the removal of asbestos or ACMs will be carried out by a suitably qualified contractor and ACMs will only be removed from site by a suitably permitted/licenced waste contractor. in accordance with *the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.* All material will be taken to a suitably licensed or permitted facility. It is not envisaged that ACM's will be encountered due to the nature of the site being a greenfield site.

4.3.5 Other Known Hazardous Substances

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

In addition, WEEE (containing hazardous components), printer toner / cartridges, batteries (Lead, Ni-Cd or Mercury) and / or fluorescent tubes and other mercury containing waste may be generated from during C&D activities or temporary site offices. These wastes, if

generated, will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

5.0 ROLES AND RESPONSIBILITIES

The *Best Practice Guidelines on the Preparation of Resource Waste Management Plans for Construction and Demolition Projects* promotes that a RM should be appointed. The RM may be performed by number of different individuals over the life-cycle of the Project, however it is intended to be a reliable person chosen from within the Planning/Design/Contracting Team, who is technically competent and appropriately trained, who takes the responsibility to ensure that the objectives and measures within the Project RWMP are complied with. The RM is assigned the requisite authority to meet the objective and obligations of the RWMP. The role will include the important activities of conducting waste checks/audits and adopting construction methodology that is designed to facilitate maximum reuse and/or recycling of waste.

5.1 Role of the Client

The Client are the body establishing the aims and the performance targets for the project.

- The Client has commissioned the preparation and submission of this RWMP as part of the design and planning submission;
- The Client is to commission the preparation and submission of an updated RWMP as part of the construction tendering process;
- The Client will ensure that the RWMP is agreed on and submitted to the local authority and their agreement obtained prior to commencement of works on site;
- The Client will request the end-of-project RWMP from the Contractor.

5.2 Role of the Client Advisory Team

The Client Advisory Team or Design Team is formed of architects, consultants, quantity surveyors and engineers and is responsible for:

- Drafting and maintaining the RWMP through the design, planning and procurement phases of the project;
- Appointing a RM to track and document the design process, inform the Design Team and prepare the RWMP.
- Including details and estimated quantities of all projected waste streams with the support of environmental consultants/scientists. This will also include data on waste types (e.g. waste characterisation data, contaminated land assessments, site investigation information) and prevention mechanisms (such as by-products) to illustrate the positive circular economy principles applied by the Design Team;
- Handing over of the RWMP to the selected Contractor upon commencement of construction of the development, in a similar fashion to how the safety file is handed over to the Contractor;
- Working with the Contractor as required to meet the performance targets for the project.

5.3 Future Role of the Contractor

The future construction Contractors have not yet been decided upon for this RWMP. However, once select they will have major roles to fulfil. They will be responsible for:

- Preparing, implementing and reviewing the (RWMP throughout the construction phase (including the management of all suppliers and sub-contractors) as per the requirements of the EPA guidelines;
- Identifying a designated and suitably qualified RM who will be responsible for implementing the RWMP;
- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- Implementing waste management policies whereby waste materials generated on site are to be segregated as far as practicable;
- Renting and operating a mobile-crusher to crush concrete for temporary reuse onsite during construction and reduce the amount of HGV loads required to remove material from site;
- Applying for the appropriate waste permit to crush concrete onsite;
- Identifying all destinations for resources taken off-site. As above, any resource that is legally classified as a 'waste' must only be transported to an authorised waste facility;
- End-of-waste and by-product notifications addressed with the EPA where required;
- Clarification of any other statutory waste management obligations, which could include on-site processing;
- Full records of all resources (both wastes and other resources) will be maintained for the duration of the project; and
- Preparing a RWMP Implementation Review Report at project handover.

6.0 KEY MATERIALS & QUANTITIES

6.1 Project Resource Targets

Project specific resource and waste management targets for the site have not yet been set and this information will be updated for these targets once these targets have been confirmed by the client. However, it is expected for projects of this nature that a minimum of 70% of waste is fully re-used, recycled or recovered. Target setting will inform the setting of project-specific benchmarks to track target progress. Typical Key Performance Indicators (KPIs) that will be used to set targets include (as per guidelines):

- Weight (tonnes) or Volume (m^3) of waste generated per construction value;
- Weight (tonnes) or Volume (m^3) of waste generated per construction floor area (m^2);
- Fraction of resource reused on site;
- Fraction of resource notified as by-product;
- Fraction of waste segregated at source before being sent off-site for recycling/recovery; and
- Fraction of waste recovered, fraction of waste recycled, or fraction of waste disposed.

6.2 Main Construction and Demolition Waste Categories

The main non-hazardous and hazardous waste streams that could be generated by the construction activities at a typical site are shown in Table 6.1. The List of Waste (LoW) code (2018) for each waste stream is also shown.

Table 6.1 *Typical waste types generated and LoW codes (individual waste types may contain hazardous substances)*

Waste Material	LoW Code
Concrete, bricks, tiles, ceramics	17 01 01-03 & 07
Wood, glass and plastic	17 02 01-03
Treated wood, glass, plastic, containing hazardous substances	17-02-04*
Bituminous mixtures, coal tar and tarred products	17 03 01*, 02 & 03*
Metals (including their alloys) and cable	17 04 01-11
Soil and stones	17 05 03* & 04
Gypsum-based construction material	17 08 01* & 02
Paper and cardboard	20 01 01
Mixed C&D waste	17 09 04
Green waste	20 02 01
Electrical and electronic components	20 01 35 & 36
Batteries and accumulators	20 01 33 & 34
Liquid fuels	13 07 01-10
Chemicals (solvents, pesticides, paints, adhesives, detergents etc.)	20 01 13, 19, 27-30
Insulation materials	17 06 04
Organic (food) waste	20 01 08
Mixed Municipal Waste	20 03 01

** Individual waste type may contain hazardous substances*

6.3 Demolition Waste Generation

There is no demolition associated with the proposed development as the development site is greenfield.

6.4 Construction Waste Generation

Table 6.2 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA *National Waste Reports* [17] *and the joint EPA & GMIT study* [18].

Table 6.2 *Waste materials generated on a typical Irish construction site*

Waste Types	%
Mixed C&D	33
Timber	28
Plasterboard	10
Metals	8
Concrete	6
Other	15
Total	**100**

Table 6.3, below, shows the estimated construction waste generation for the project based on the gross floor area of construction and other information available to date, along with indicative targets for management of the waste streams. The estimated amounts for the main waste types (with the exception of soils and stones) are based on an average large-scale development waste generation rate per m^2, using the waste breakdown rates shown in Table 6.2. These have been calculated from the schedule of development areas provided by the architect.

Table 6.3 *Predicted on and off-site reuse, recycle and disposal rates for construction waste*

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	828.7	10	82.9	80	663.0	10	82.9
Timber	703.1	40	281.3	55	386.7	5	35.2
Plasterboard	251.1	30	75.3	60	150.7	10	25.1
Metals	200.9	5	10.0	90	180.8	5	10.0
Concrete	150.7	30	45.2	65	97.9	5	7.5
Other	376.7	20	75.3	60	226.0	20	75.3
Total	**2511.2**		**570.0**		**1705.1**		**236.1**

In addition to the waste streams in Table 6.3, there will be c. 41,000 m^3 of soil and stone excavated to facilitate the construction of new foundations and underground services. It is currently envisaged that all of the excavated material will be able to be retained and reused onsite. If any of the excavated material is deemed unsuitable for reuse or not required, then the material will need to be removed offsite for appropriate offsite reuse, recovery, recycling and / or disposal.

It should be noted that until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

6.5 Proposed Resource and Waste Management Options

Waste materials generated will be segregated on-site, where it is practical. Where the on-site segregation of certain wastes types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source, where

feasible. All waste receptacles leaving the site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the Dublin region that provide this service.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring disposal off-site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required.

National End-of-Waste Decision EoW-N001/2023 (Regulation 28) establishes criteria determining when recycled aggregate resulting from a recovery operation ceases to be waste. Material from this proposed development will be investigated to see if it can cease to be a waste under the requirements of the National End of Waste Criteria for Aggregates.

During construction, some of the sub-contractors on site will generate waste in relatively low quantities. The transportation of non-hazardous waste by persons who are not directly involved with the waste business, at weights less than or equal to 2 tonnes, and in vehicles not designed for the carriage of waste, are exempt from the requirement to have a waste collection permit (per Article 30 (1) (b) of the Waste Collection Permit Regulations 2007, as amended). Any sub-contractors engaged that do not generate more than 2 tonnes of waste at any one time can transport this waste off-site in their work vehicles (which are not designed for the carriage of waste). However, they are required to ensure that the receiving facility has the appropriate COR / permit / licence.

Written records will be maintained by the contractor(s), detailing the waste arising throughout the C&D phases, the classification of each waste type, waste collection permits for all waste contactors who collect waste from the site and COR / permit / licence for the receiving waste facility for all waste removed off-site for appropriate reuse, recycling, recovery and / or disposal

Dedicated bunded storage containers will be provided for hazardous wastes which may arise, such as batteries, paints, oils, chemicals, if required.

The anticipated management of the main waste streams is outlined as follows:

Soil, Stone, Gravel & Clay

The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The excavations are required to facilitate construction works so the preferred option (prevention and minimisation) cannot be accommodated for the excavation phase.

If material is removed off-site it could be reused as a by-product (and not as a waste). If this is done, it will be done in accordance with Regulation 27 of the European Communities (Waste Directive) Regulations 2011, as amended, which requires that certain conditions are met and that by-product notifications are made to the EPA via their online notification form. Excavated material should not be removed from site until approval from the EPA has been received. The potential to reuse material as a by-product will be confirmed during the course of the excavation works, with the objective of eliminating any unnecessary disposal of material.

The next option (beneficial reuse) may be appropriate for the excavated material, pending environmental testing to classify the material as hazardous or non-hazardous in accordance with the EPA *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* publication. Clean inert material may be used as fill material in other construction projects or engineering fill for waste licensed sites. Beneficial reuse of surplus excavation material as engineering fill may be subject to further testing to determine if materials meet the specific engineering standards for their proposed end use.

Any nearby sites requiring clean fill/capping material will be contacted to investigate reuse opportunities for clean and inert material. If any of the material is to be reused on another site as a by-product (and not as a waste), this will be done in accordance with Regulation 27. Similarly, if any soils/stones are imported onto the site from another construction site as a by-product, this will also be done in accordance with Regulation 27. Regulation 27 will be investigated to see if the material can be imported onto this site for beneficial reuse instead of using virgin materials.

If the material is deemed to be a waste, then removal and reuse / recovery / disposal of the material will be carried out in accordance with the *Waste Management Act 1996* as amended, the *Waste Management (Collection Permit) Regulations 2007* as amended and the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

In the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Transfrontier Shipment of Wastes (TFS).

Bedrock

While it is not envisaged that bedrock will be encountered, if bedrock is encountered, it is anticipated that it will not be crushed on site. Any excavated rock is expected to be removed off-site for appropriate reuse, recovery and / or disposal. If bedrock is to be crushed on-site, the appropriate mobile waste facility permit will be obtained from FCC.

Silt & Sludge

During the construction phase, silt and petrochemical interception will be carried out on run-off and pumped water from site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed off-site.

Concrete Blocks, Bricks, Tiles & Ceramics

The majority of concrete blocks, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and will be recycled, where possible. If concrete is to be crushed on-site, the appropriate mobile waste facility permit will be obtained from FCC.

Hard Plastic

As hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

Timber

Timber that is uncontaminated, i.e. free from paints, preservatives, glues, etc., will be disposed of in a separate skip and recycled off-site.

Metal

Metals will be segregated, where practical, and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

Plasterboard

There are currently a number of recycling services for plasterboard in Ireland. Plasterboard from the construction phases will be stored in a separate skip, pending collection for recycling. The site Manager will ensure that oversupply of new plasterboard is carefully monitored to minimise waste.

Glass

Glass materials will be segregated for recycling, where possible.

Waste Electrical & Electronic Equipment (WEEE)

Any WEEE will be stored in dedicated covered cages / receptacles / pallets pending collection for recycling.

Other Recyclables

Where any other recyclable wastes, such as cardboard and soft plastic, are generated, these will be segregated at source into dedicated skips and removed off-site.

Non-Recyclable Waste

C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip / receptacle will be examined by a member of the waste team (see Section 8.0) to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

Asbestos Containing Materials

If any asbestos or ACM found on-site will be removed by a suitably competent contractor and disposed of as asbestos waste before the site works begin. All asbestos removal work or encapsulation work must be carried out in accordance with the *Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.*

Other Hazardous Wastes

On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and / or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.

On-Site Crushing

It is currently not envisaged that the crushing of waste materials will occur on-site. However, if the crushing of material is to be undertaken, a mobile waste facility permit will first be obtained from FCC and the destination of the accepting waste facility or if an application under regulation 28 will be made using National End-of-Waste Decision EoW-N001/2023, will be supplied to the FCC waste unit.

It should be noted that until a construction contractor is appointed it is not possible to provide information on the specific destinations of each construction waste stream. Prior to commencement of construction and removal of any waste offsite, details of the proposed destination of each waste stream will be provided to FCC by the project team.

6.6 Tracking and Documentation Procedures for Off-Site Waste

All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by a weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the nominated project RM (see Section 9.0).

All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Act 1996* as amended, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* and amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project RM (see Section 8.0) will maintain a copy of all waste collection permits on-site.

If the waste is being transported to another site, a copy of the Local Authority waste COR / permit or EPA Waste / Industrial Emissions Licence for that site will be provided to the nominated project RM (see Section 8.0). If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) notification document will be obtained from DCC (as the relevant authority on behalf of all Local Authorities in Ireland) and kept on-site along with details of the final destination (COR, permits, licences, etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

All information will be entered in a waste management recording system to be maintained on-site.

7.0 ESTIMATED COST OF WASTE MANAGEMENT

An outline of the costs associated with different aspects of waste management is outlined below. The total cost of C&D waste management will be measured and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

7.1 Reuse

By reusing materials on site, there will be a reduction in the transport and recycle / recovery / disposal costs associated with the requirement for a waste contractor to take the material off-site. Clean and inert soils, gravel, stones, etc., which cannot be reused on-site may be used as access roads or capping material for landfill sites, etc. This material is often taken free of charge or at a reduced fee for such purposes, reducing final waste disposal costs.

7.2 Recycling

Salvageable metals will earn a rebate, which can be offset against the costs of collection and transportation of the skips.

Clean, uncontaminated cardboard and certain hard plastics can also be recycled. Waste contractors will charge considerably less to take segregated wastes, such as recyclable waste, from a site than mixed waste.

Timber can be recycled as chipboard. Again, waste contractors will charge considerably less to take segregated wastes, such as timber, from a site than mixed waste.

7.3 Disposal

Landfill charges are currently at around €140 - €160 per tonne which includes a €85 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015 as amended*. In addition to disposal costs, waste contractors will also charge a collection fee for skips.

Collection of segregated C&D waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to landfill. Clean soil, rubble, etc., is also used as fill / capping material, wherever possible.

8.0 TRAINING PROVISIONS

A member of the construction team will be appointed as the RM to ensure commitment, operational efficiency and accountability in relation to waste management during the C&D phases of the development.

8.1 Resource Manager Training and Responsibilities

The nominated RM will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid them in the organisation, operation and recording of the waste management system implemented on site.

The RM will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the RM to delegate responsibility to sub-contractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The RM will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on site. The RM will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and be knowledgeable in how to implement this RWMP.

8.2 Site Crew Training

Training of site crew in relation to waste is the responsibility of the RM and, as such, a waste training program should be organised. A basic awareness course will be held for all site crew to outline the RWMP and to detail the segregation of waste materials at source. This may be incorporated with other site training needs such as general site induction, health and safety awareness and manual handling.

This basic course will describe the materials to be segregated, the storage methods and the location of the Waste Storage Areas (WSAs). A sub-section on hazardous wastes will be incorporated into the training program and the particular dangers of each hazardous waste will be explained.

9.0 TRACKING AND TRACING / RECORD KEEPING

Records should be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the waste arisings on Site.

A waste tracking log should be used to track each waste movement from the site. On exit from the site, the waste collection vehicle driver should stop at the site office and sign out as a visitor and provide the security personnel or RM with a waste docket (or Waste Transfer Form (WTF) for hazardous waste) for the waste load collected. At this time, the security personnel should complete and sign the Waste Tracking Register with the following information:

- Date
- Time
- Waste Contractor
- Company waste contractor appointed by, e.g. Contractor or subcontractor name
- Collection Permit No.
- Vehicle Reg.
- Driver Name
- Docket No.
- Waste Type
- Waste Quantity
- LoW

The waste vehicle will be checked by security personal or the RM to ensure it has the waste collection permit no. displayed and a copy of the waste collection permit in the vehicle before they are allowed to remove the waste from the site.

The waste transfer dockets will be transferred to the RM on a weekly basis and can be placed in the Waste Tracking Log file. This information will be forwarded onto the FCC Waste Regulation Unit when requested.

Each subcontractor that has engaged their own waste contractor will be required to maintain a similar waste tracking log with the waste dockets / WTF maintained on file and available for inspection on site by the main contractor as required. These subcontractor logs will be merged with the main waste log.

Waste receipts from the receiving waste facility will also be obtained by the site contractor(s) and retained. A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste Licences will be maintained on site at all times and will be periodically checked by the RM. Subcontractors who have engaged their own waste contractors, should provide the main contractor with a copy of the waste collection permits and COR / permit / licence for the receiving waste facilities and maintain a copy on file, available for inspection on site as required.

10.0 OUTLINE WASTE AUDIT PROCEDURE

10.1 Responsibility for Waste Audit

The appointed RM will be responsible for conducting a waste audit at the site during the C&D phase of the project. Contact details for the nominated RM will be provided to the FCC Waste Regulation Unit after the main contractor is appointed and prior to any material being removed from site.

10.2 Review of Records and Identification of Corrective Actions

A review of all waste management costs and the records for the waste generated and transported off-site should be undertaken mid-way through the construction phase of the project.

If waste movements are not accounted for, the reasons for this should be established in order to see if and why the record keeping system has not been maintained. The waste records will be compared with the established recovery / reuse / recycling targets for the site. Each material type will be examined, in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved.

Upon completion of the C&D phase, a final report will be prepared, summarising the outcomes of waste management processes adopted and the total recycling / reuse / recovery figures for the development.

11.0 CONSULTATION WITH RELEVANT BODIES

11.1 Local Authority

Once construction contractors have been appointed and have appointed waste contractors, and prior to removal of any C&D waste materials off-site, details of the proposed destination of each waste stream will be provided to the FCC Waste Regulation Unit.

FCC will also be consulted, as required, throughout the excavation and construction phases in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out.

11.2 Recycling / Salvage Companies

The appointed waste contractor for the main waste streams managed by the construction contractors will be audited in order to ensure that relevant and up-to-date waste collection permits and facility registrations / permits / licences are held. In addition, information will be obtained regarding the feasibility of recycling each material, the costs of recycling / reclamation, the means by which the wastes will be collected and transported off-site, and the recycling / reclamation process each material will undergo off-site.

11.3 Pest Management

A pest control operator will be appointed as required to manage pest onsite during the construction phase of the project. Organic and food wastes generated by staff will not be stored in open skips, but in closed waste receptacles. Any waste receptacles will be carefully managed to prevent leaks, odours and pest problems.

12.0 CONCLUSION

Adherence to this plan will also ensure that waste management during the construction phase, at the development is carried out in accordance the requirements in the EPA's Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects, and the FCC Waste Bye-Laws.

13.0 REFERENCES

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13. Fingal County Council (FCC), *Fingal County Development Plan 2023 – 2029* (2023).
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17. Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2020 and the Circular Economy and National Waste Database Report 2021 -
18. EPA and Galway-Mayo Institute of Technology (GMIT), *EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned* (2015).

Appendix 19.2 Operational Waste Management Plan (OWMP)

OPERATIONAL WASTE MANAGEMENT PLAN FOR A PROPOSED LARGE-SCALE RESIDENTIAL DEVELOPMENT AT BALLYMASTONE, DONABATE, CO. DUBLIN.

BALLYMASTONE PHASE 2 APPENDIX 19.1

Report Prepared For

Glenveagh Living Limited

Report Prepared By

Chonaill Bradley, Principal Environmental Consultant

Our Reference

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awnconsulting
A Trinity Consultants Company

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

AWN Consulting Limited
Registered in Ireland No. 319812

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1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Operational Waste Management Plan (OWMP) on behalf of Glenveagh Living Limited. The proposed development will consist of the construction of a residential development, which represents Phase 2 of a wider development of the Ballymastone Lands (as identified in the Donabate Local Area Plan 2016 (as extended)) and is a continuation of Phase 1 of the Masterplan lands (permitted under LRD0008/S3). The proposed development ranges in height from 2 to 6 storeys to accommodate 364 residential dwellings (including a mix of apartments, duplexes and houses), and public open space. The site will accommodate car parking spaces, bicycle parking spaces, storage, services, new pedestrian/cycle links, road improvements and plant areas. Landscaping will include communal amenity areas, and a significant public open space provision.

This OWMP has been prepared to ensure that the management of waste during the operational phase of the proposed development is undertaken in accordance with the current legal and industry standards including, the Waste Management Act 1996 as amended and associated Regulations [1], Environmental Protection Agency Act 1992 as amended [2], Litter Pollution Act 1997 as amended [3], *the* National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPCE) (2024) [4] and Fingal County Council *'Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws'* (2020) [5]. In particular, this OWMP aims to provide a robust strategy for the storage, handling, collection and transport of the wastes generated at Site.

This OWMP aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. The OWMP also seeks to provide guidance on the appropriate collection and transport of waste to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil or water resources). The plan estimates the type and quantity of waste to be generated from the proposed Development during the operational phase and provides a strategy for managing the different waste streams.

At present, there are no specific national guidelines in Ireland for the preparation of OWMPs. Therefore, in preparing this document, consideration has been given to the requirements of national and regional waste policy, legislation and other guidelines.

2.0 OVERVIEW OF WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Irish Government issued a policy statement in September 1998 entitled *'Changing Our Ways'* [6], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. A heavy emphasis was placed on reducing reliance on landfill and finding alternative methods for managing waste. Amongst other things, *Changing Our Ways* stated a target of at least 35% recycling of municipal (i.e. household, commercial and non-process industrial) waste.

A further policy document, *'Preventing and Recycling Waste – Delivering Change'* was published in 2002 [7]. This document proposed a number of programmes to increase recycling of waste and allow diversion from landfill. The need for waste minimisation at source was considered a priority.

This view was also supported by a review of sustainable development policy in Ireland and achievements to date, which was conducted in 2002, entitled *'Making Irelands Development Sustainable – Review, Assessment and Future Action'* [8]. This document also stressed the need to decouple economic growth and waste generation, again through waste minimisation and reuse of discarded material.

In order to establish the progress of the Government policy document *Changing Our Ways*, a review document was published in April 2004 entitled *'Taking Stock and Moving Forward'* [9]. Covering the period 1998 – 2003, the aim of this document was to assess progress to date with regard to waste management in Ireland, to consider developments since the policy framework and the local authority waste management plans were put in place, and to identify measures that could be undertaken to further support progress towards the objectives outlined in *Changing Our Ways*.

In particular, *Taking Stock and Moving Forward* noted a significant increase in the amount of waste being brought to local authority landfills. The report noted that one of the significant challenges in the coming years was the extension of the dry recyclable collection services.

In September 2020, the Irish Government published a new policy document outlining a new action plan for Ireland to cover the period of 2020-2025. This plan *'A Waste Action Plan for a Circular Economy'* [10] (WAPCE), was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to a new economy, where climate and environmental challenges are turned into opportunities, replacing the previous national waste management plan *"A Resource Opportunity"* (2012).

The WAPCE sets the direction for waste planning and management in Ireland up to 2025. This reorientates policy from a focus on managing waste to a much greater focus on creating circular patterns of production and consumption. Other policy statements of a number of public bodies already acknowledge the circular economy as a national policy priority.

The policy document contains over 200 measures across various waste areas including circular economy, municipal waste, consumer protection and citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

One of the first actions to be taken was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021) [11] to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021. It is anticipated that the Strategy will be updated in full every 18 months to 2 years.

The Circular Economy and Miscellaneous Provisions Act 2022 [12] was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions, tackling the delays which can be encountered by industry, and supporting the availability of recycled secondary raw materials in the Irish market, and tackles illegal fly-tipping and littering.

Since 1998, the Environmental Protection Agency (EPA) has produced periodic *'National Waste (Database) Reports'* which as of 2023 have been renamed *Circular Economy and Waste Statistics Highlight Reports* [13] detailing, among other things, estimates for household and commercial (municipal) waste generation in Ireland and the level of recycling, recovery and disposal of these materials. The 2021 National Circular Economy and Waste Statistics web resource, which is the most recent study published, along with the national waste statistics web resource (November 2023) reported the following key statistics for 2020:

- **Generated** – Ireland produced 3,170,000 t of municipal waste in 2021. This is a 1% decrease since 2020. This means that the average person living in Ireland generated 630 kg of municipal waste in 2021.
- **Managed** – Waste collected and treated by the waste industry. In 2020, a total of 3,137,000 t of municipal waste was managed and treated.
- **Unmanaged** – An estimated 33,000 tonnes of this was unmanaged waste i.e., not disposed of in the correct manner in 2021.
- **Recovered** – The amount of waste recycled, used as a fuel in incinerators, or used to cover landfilled waste. In Ireland 42% of Municipal waste was treated by energy recovery through incineration in 2021.
- **Recycled** – Just over 1.3 million tonnes of municipal waste generated in Ireland was recycled in 2021, resulting in a recycling rate of 41 per cent. The recycling rate remains unchanged from 2020 and indicates that we face significant challenges to meet the upcoming EU recycling targets of 55% by 2025 and 65% by 2035.
- **Disposed** – The proportion of municipal waste sent to landfill also remains unchanged at 16% the same as 2020.
- **Reuse** – 54,800 tonnes of second-hand products we estimated by the EPA to have been reused in Ireland in 2021. The average annual Reuse rate per person in Ireland is 10.6 kg per person.

2.2 Regional Level

The proposed development is located in the Local Authority administrative area of Fingal County Council (FCC).

The Eastern Midlands Regional (EMR) Waste Management Plan 2015 – 2021 has been superseded as of March 2024 by the NWMPCE 2024 - 2030.

The NWMPCE does not dissolve the three regional waste areas. The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

This Plan seeks to influence sustainable consumption and prevent the generation of waste, improve the capture of materials to optimise circularity and enable compliance with policy and legislation.

The national plan sets out the following strategic targets for waste management in the country that are relevant to the proposed development:

Proposed National Targets

1A. (Residual Municipal Waste) 6% Reduction in Residual Municipal Waste per person by 2030

2A. (Contamination of Materials) 90% of Material in Compliance in the Dry Recycling Bin

2B. (Material Compliance Residual) 10% per annum increase in Material Compliance in the residual bin. (90% by the end of 2030)

3A. (Reuse of Materials) 20kg Per person / year – Reuse of materials like cloths or furniture to prevent waste.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €140-160 per tonne of waste, which

includes a €85 per tonne landfill levy introduced under the Waste Management (Landfill Levy) (Amendment) Regulations 2015.

The *Fingal Development Plan 2023 – 2029* [14] sets out a number of policies and objectives for the Fingal region in line with the objectives of the regional waste management plan, including the following:

- Objective **IUO34** – Waste Management in New Developments - Require the provision of appropriate, well designed, accessible space to support the storage, separation and collection of as many waste and recycling streams as possible in all new commercial and residential developments within the County.
- Objective **DMSO234** – Provision of Public Bring Banks - Ensure the provision of public bring banks in all large retail developments, unless there are existing facilities within a 1 km radius. Bring bank facilities will generally be required at appropriate locations in the following development types:
  - In conjunction with significant new commercial developments, or extensions to existing developments.
  - In conjunction with new waste infrastructure facilities, proposals should include bring facilities for the acceptance of non-hazardous and hazardous wastes from members of the public and small businesses.
  - In conjunction with medium and large scale residential and mixed-use developments providing in excess of 10 residential units, proposals should provide recycling and bring bank facilities to serve residents and in some appropriate locations, the wider community.
  - In conjunction with all large retail developments provide space for reverse vending machines to promote the circular economy.
- Objective **DMSO235** – Communal Refuse Storage Provision - In the case of communal refuse storage provision, the collection point for refuse should be accessible both to the external collector and to the resident and be secured against illegal dumping by non-residents. In the case of individual houses, the applicant shall clearly show within a planning application the proposed location and design of bin storage to serve each dwelling, and having regard to the number of individual bins required to serve each dwelling at the time of the application and any possible future requirements for refuse storage/collection. The following criteria will be considered in the assessment of the design and siting of waste facilities and bring facilities:
  - The location and design of any refuse storage or recycling facility should ensure that it is easily accessible both for residents and/or public and for bin collection, be insect and vermin proofed, will not present an odour problem, and will not significantly detract from the residential amenities of adjacent property or future occupants.
  - Provision for the storage and collection of waste materials shall be in accordance with the guidelines for waste storage facilities in the relevant Regional Waste Management Plan and the design considerations contained in Section 4.8 and 4.9 of the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities, DHLGH (2020).
  - Refuse storage for houses should be externally located, concealed / covered and adequate to cater for the size and number of bins normally allocated to a household. For terraced houses, the most appropriate area for bins to be stored is to the front of the house, which should be located in well-designed enclosures that do not to detract from visual amenity.
  - All applications shall clearly identify the waste storage and collection points and detail the anticipated waste collection schedule having regard to the impact on road users both within the development and the surrounding area.

  - Access to private waste storage in residential schemes should be restricted to residents only.
- Objective **DMSO236** – Segregation and Collection of Waste - Ensure all new large-scale residential and mixed-use developments include appropriate facilities for source segregation and collection of waste.
- Objective **DMSO237** – Distance from Front Door to Communal Bin Area - Ensure all new residential schemes include appropriate design measures for refuse storage areas, details of which should be clearly shown at pre-planning and planning application stage. Ensure refuse storage areas are not situated immediately adjacent to the front door or ground floor window, unless adequate screened alcoves or other such mitigation measures are provided.
- Objective **DMSO239** – Refuse storage areas - Ensure all new residential schemes include appropriate design measures for refuse storage areas, details of which should be clearly shown at pre-planning and planning application stage. Ensure refuse storage areas are not situated immediately adjacent to the front door or ground floor window, unless adequate screened or other such mitigation measures are provided.
- Objective **DMSO240** – Distance to Communal Bin Areas - Ensure the maximum distance between the front door to a communal bin area does not exceed 50 metres.

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the proposed development are:

- Waste Management Act 1996 as amended;
- Environmental Protection Agency Act 1992 as amended;
- Litter Pollution Act 1997 as amended;
- Planning and Development Act 2000 as amended [15];
- Circular Economy and Miscellaneous Provisions Act 2022.

These Acts and subordinate Regulations transpose the relevant European Union Policy and Directives into Irish law.

One of the guiding principles of European waste legislation, which has in turn been incorporated into the Waste Management Act 1996 as amended and subsequent Irish legislation, is the principle of "Duty of Care". This implies that the waste producer is responsible for waste from the time it is generated through until its legal disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final disposal area, waste contractors will be employed to physically transport waste to the final waste disposal site.

It is, therefore, imperative that the residents and any proposed facilities management undertake on-site management of waste in accordance with all legal requirements and employ suitably permitted / licenced contractors to undertake off-site management of their waste in accordance with all legal requirements. This includes the requirement that a waste contactor handle, transport and reuse / recover / recycle / dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the Waste Management (Facility Permit & Registration) Regulations 2007, as amended, or a Waste Licence

granted by the EPA. The COR / permit / licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and / or disposed of at the specified site.

2.3.1 Fingal County Council Waste Bye-Laws

The FCC *"Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws 2020"* came into effect in March 2020. The Bye-Laws set a number of enforceable requirements on waste holders and collectors with regard to storage, separation, presentation and collection of waste within the FCC functional area. Key requirements under these *Waste Bye-Laws* are:

- Kerbside waste presented for collection shall not be presented for collection earlier than 6:00pm on the day immediately preceding the designated waste collection day;
- All containers used for the presentation of kerbside waste and any uncollected waste shall be removed from any roadway, footway, footpath or any other public place no later than 9:00am on the day following the designated waste collection day;
- Neither recyclable household kerbside waste nor food waste arising from households shall be contaminated with any other type of waste before or after it has been segregated; and
- A management company, or another person if there is no such company, who exercises control and supervision of residential and/or commercial activities in multi-unit developments, mixed-use developments, flats or apartment blocks, combined living/working spaces or other similar complexes shall ensure that:
    - Separate receptacles of adequate size and number are provided for the proper segregation, storage and collection of recyclable household kerbside waste and residual household kerbside waste;
    - Additional receptacles are provided for the segregation, storage and collection of food waste where this practice is a requirement of the national legislation on food waste;
    - The receptacles referred to in paragraphs (a) and (b) are located both within any individual apartment and at the place where waste is stored prior to its collection;
    - Any place where waste is to be stored prior to collection is secure, accessible at all times by tenants and other occupiers and is not accessible by any other person other than an authorised waste collector,
    - Written information is provided to each tenant or other occupier about the arrangements for waste separation, segregation, storage and presentation prior to collection;
    - An authorised waste collector is engaged to service the receptacles referred to in this section of these bye-laws, with documentary evidence, such as receipts, statements or other proof of payment, demonstrating the existence of this engagement being retained for a period of no less than two years. Such evidence shall be presented to an authorised person within a time specified in a written request from either that person or from another authorised person employed by South Dublin County Council;
    - Receptacles for kerbside waste are presented for collection on the designated waste collection day; and
    - Adequate access and egress onto and from the premises by waste collection vehicles is maintained.

The full text of the Waste Bye-Laws is available from the FCC website

2.4 Regional Waste Management Service Providers and Facilities

Various contractors offer waste collection services for the residential sector in the FCC region. Details of waste collection permits (granted, pending and withdrawn) for the region are available from the NWCPO.

As outlined in the regional waste management plan, there is a decreasing number of landfills available in the region. Only three municipal solid waste landfills remain operational and all are operated by the private sector. There are a number of other licensed and permitted facilities in operation in the region including waste transfer stations, hazardous waste facilities and integrated waste management facilities. There are two existing thermal treatment facilities, one in Duleek, Co. Meath and a second in Poolbeg in Dublin.

There is a bring centre located at Seatown Park, Estuary Recyling Centre c. 8.5km to the south-west of the proposed development site, which can be utilised by the residents of the proposed development for other household waste streams while a bottle bank can be found c. 300m km to the north-west at the Donabate / Portrane Community Centre,.

A copy of all CORs and waste permits issued by the Local Authorities are available from the NWCPO website and all Waste Licenses issued are available from the EPA.

3.0 DESCRIPTION OF THE DEVELOPMENT

3.1 Location, Size and Scale of the Development

The proposed development will consist of the construction of a residential development, which represents Phase 2 of a wider development of the Ballymastone Lands (as identified in the Donabate Local Area Plan 2016 (as extended)) and is a continuation of Phase 1 of the Masterplan lands (permitted under LRD0008/S3). The proposed development ranges in height from 2 to 6 storeys to accommodate 364 residential dwellings (including a mix of apartments, duplexes and houses), and public open space. The site will accommodate car parking spaces, bicycle parking spaces, storage, services, new pedestrian/cycle links, road improvements and plant areas. Landscaping will include communal amenity areas, and a significant public open space provision.

3.2 Typical Waste Categories

The typical non-hazardous and hazardous wastes that will be generated at the proposed Development will include the following:

- Dry Mixed Recyclables (DMR) - includes waste paper (including newspapers, magazines, brochures, catalogues, leaflets), cardboard and plastic packaging, metal cans, plastic bottles, aluminium cans, tins and Tetra Pak cartons;
- Organic waste – food waste and green waste generated from internal plants / flowers;
- Glass; and
- Mixed Non-Recyclable (MNR)/General Waste.

In addition to the typical waste materials that will be generated at the proposed development on a daily basis, there will be some additional waste types generated less frequently / in smaller quantities which will need to be managed separately including:

- Green / garden waste may be generated from internal plants and external landscaping;

- Batteries (both hazardous and non-hazardous);
- Waste electrical and electronic equipment (WEEE) (both hazardous and non-hazardous);
- Printer cartridges / toners;
- Chemicals (paints, adhesives, resins, detergents, etc.);
- Light bulbs;
- Textiles;
- Waste cooking oil (if any generated by the residents);
- Furniture (and, from time to time, other bulky wastes); and
- Abandoned bicycles.

Wastes should be segregated into the above waste types to ensure compliance with waste legislation and guidance while maximising the re-use, recycling and recovery of waste with diversion from landfill wherever possible.

3.3 List of Waste Codes

In 1994, the *European Waste Catalogue* [16] and *Hazardous Waste List* [17] were published by the European Commission. In 2002, the EPA published a document titled the *European Waste Catalogue and Hazardous Waste List* [18], which was a condensed version of the original two documents and their subsequent amendments. This document has recently been replaced by the EPA '*Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous*' [19] 2018. This waste classification system applies across the EU and is the basis for all national and international waste reporting, such as those associated with waste collection permits, COR's, permits and licences and EPA National Waste Database.

Under the classification system, different types of wastes are fully defined by a code. The List of Waste (LoW) code for typical waste materials expected to be generated during the operation of the proposed development are provided in Table 3.1 below.

Table 3.1 Typical Waste Types Generated and LoW Codes

Waste Material	LoW/EWC Code
Paper and Cardboard	20 01 01
Plastics	20 01 39
Metals	20 01 40
Mixed Non-Recyclable Waste	20 03 01
Glass	20 01 02
Biodegradable Kitchen Waste	20 01 08
Oils and Fats	20 01 25
Textiles	20 01 11
Batteries and Accumulators*	20 01 33* - 34
Printer Toner/Cartridges*	20 01 27* - 28
Green Waste	20 02 01
WEEE*	20 01 35*-36
Chemicals (solvents, pesticides, paints & adhesives, detergents, etc.) *	20 01 13*/19*/27*/28/29*30
Fluorescent tubes and other mercury containing waste*	20 01 21*
Bulky Wastes	20 03 07

* *Individual waste type may contain hazardous materials*

4.0 ESTIMATED WASTE ARISINGS

A waste generation model (WGM) developed by AWN has been used to predict waste types, weights and volumes expected to arise from operations within the proposed development. The WGM incorporates building area and use and combines these with other data, including Irish and US EPA waste generation rates.

The estimated quantum / volume of waste that will be generated from the residential units has been determined based on the predicted occupancy of the units.

The estimated waste generation for the proposed development for the main waste types is presented in Tables 4.1 and 4.2.

Table 4.1 *Estimated Waste Generation for Residential Units (Individual)*

Waste Type	Waste Volume per Unit Type (m^3 / week)			
	1 Bedroom Duplex	2 Bedroom House / Duplex	3 Bedroom House / Duplex	4 Bedroom House
Organic Waste	0.01	0.02	0.02	0.02
DMR	0.08	0.11	0.13	0.18
Glass	>0.01	>0.01	>0.01	>0.01
MNR	0.04	0.07	0.08	0.09
Total	**0.13**	**0.20**	**0.23**	**0.29**

Table 4.2 *Estimated Waste Generation for Residential Units (Shared)*

Waste Type	Waste Volume per Unit block (m^3 / week)		
	Apartment Block BA04 (Shared)	Apartment Block BA05 (Shared)	Apartment Block BA06 (Shared)
Organic Waste	0.43	0.63	0.81
DMR	3.07	4.43	5.72
Glass	0.08	0.12	0.16
MNR	1.61	2.33	3.01
Total	**5.20**	**7.51**	**9.70**

BS5906:2005 Waste Management in Buildings – Code of Practice [20] has been considered in the calculations of waste estimates. AWN's modelling methodology is based on recently published data and data from numerous other similar developments in Ireland and is based on AWN's experience, it provides a more representative estimate of the likely waste arisings from the proposed development.

5.0 WASTE STORAGE AND COLLECTION

This section provides information on how waste generated within the Site will be stored and collected. This has been prepared with due consideration of the proposed Site layout as well as best practice standards, local and national waste management requirements, including those of FCC. In particular, consideration has been given to the following documents:

- BS 5906:2005 Waste Management in Buildings – Code of Practice,
- The NWMPCE (2024);
- FCC Fingal County Council Development Plan 2023-2029 (2023);

- FCC Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws (2020); and
- DoHLGH, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2023) [21].

Waste Storage Areas

Locations of all Waste Storage Areas (WSAs) can be viewed on the drawings submitted with the planning application under separate cover.

Apartment Blocks (BA04, BA05, & BA06)

Three (3 no.) shared Waste Storage Areas (WSAs) have been allocated in the design of this development. 1 (1. no.) WSA has been allocated for residential use in each of the apartment block. All shared residential WSAs for the apartment blocks are located at ground floor level in close proximity to apartment block cores.

Individual Duplexes and Houses

The houses and duplexes will have their own individual Waste Storage Areas (WSAs) allocated at the rear of their home where external access to the rear yard is possible. Where external access to the rear of the property is unavailable, bins will be stored at the front of the unit, shielded from view of the road in their own bin store. Some units will have external shared bins stores with their own individual bins located in them.

Block BZ09

Using the estimated waste generation volumes in Tables 4.1 above, the waste receptacle requirements for MNR, DMR, organic waste and glass have been established for the WSA. Residents with individual WSAs will be required to take their glass to the nearest bottle bank. It is envisaged that all waste types will be collected on a weekly basis.

Waste Storage Requirements

Estimated waste storage requirements for the operational phase of the proposed development are detailed in Table 5.1, below.

Table 5.1 *Waste storage requirements for the proposed development*

Area/Use	Bins Required			
	MNR[1]	DMR[2]	Glass	Organic
Houses & Duplexes (Individual)	1 no. 240 L	1 no. 240 L	Bottle Bank	1 no. 240 L
Apartment Block BA04 (Shared)	2 no. 1100 L	2 no. 1100 L	1 no. 240 L	2 no. 240 L
Apartment Block BA05 (Shared)	2 no. 1100 L 1 no. 240L	4 no. 1100 L	1 no. 240 L	3 no. 240 L
Apartment Block BA06 (Shared)	3 no. 1100 L	5 no. 1100 L	1 no. 240 L	4 no. 240 L
Block BZ09 Store BK09	2 no. 240 L	2 no. 240 L	Bottle Bank	2 no. 240 L

Area/Use	Bins Required			
	MNR[1]	DMR[2]	Glass	Organic
Block BZ08 Store BK14	2 no. 240 L	2 no. 240 L	Bottle Bank	2 no. 240 L
Block BZ08 Store BK14	2 no. 240 L	2 no. 240 L	Bottle Bank	2 no. 240 L
Block BZ08 Store BK14	2 no. 240 L	2 no. 240 L	Bottle Bank	2 no. 240 L
Block BZ01 Store BK06	2 no. 240 L	2 no. 240 L	Bottle Bank	2 no. 240 L
Block BZ03 Store BK15	4 no. 240 L	4 no. 240 L	Bottle Bank	4 no. 240 L
Block BZ16 Store BK12	2 no. 240 L	2 no. 240 L	Bottle Bank	2 no. 240 L

Note: 1 = Mixed Non-Recyclables
2 = Dry Mixed Recyclables

The waste receptacle requirements have been established from distribution of the total weekly waste generation estimate into the holding capacity of each receptacle type.

The types of bins used will vary in size, design and colour dependent on the appointed waste contractor. However, examples of typical receptacles to be provided in the WSA are shown in Figure 5.1. All waste receptacles used will comply with the SIST EN 840-1:2020 and SIST EN 840-2:2020 as the standards for performance requirements of mobile waste containers, where appropriate.

Figure 5.1 Typical waste receptacles of varying size (240L and 1100L)

Receptacles for organic, mixed dry recyclable, glass and mixed non-recyclable waste will be provided in the shared residential WSAs prior to first occupation of the development i.e. prior to the first residential unit being occupied.

This Plan will be provided to each resident with shared WSAs from first occupation of the development i.e. once the first residential unit is occupied. This Plan will be supplemented, as required, by the facilities management company with any new information on waste segregation, storage, reuse and recycling initiatives that are subsequently introduced.

It will be the responsibility of the residential units with individual WSAs to contact a waste contractor to acquire the appropriate waste storage receptacles (as per Table 5.1 above, or similar appropriately approved containers), which will be provided by the waste contractor for that individual unit.

5.1 Waste Storage – Residential Units

Residents of the apartment units, duplexes and houses will be required to segregate their waste into the following main waste categories within their own units:

- DMR;
- MNR;
- Organic waste; and
- Glass.

Provision will be made in all residential units to accommodate 3 no. bin types to facilitate waste segregation at source. An example of a potential 3 bin storage system is provided in Figure 5.2 below.

Figure 5.2 Example three bin storage system to be provided within the unit design

Residents will be required to take their segregated waste materials to their designated WSA and deposit their segregated waste into the appropriate bins. The locations of the residential WSAs are illustrated in the drawings submitted with the planning application under separate cover.

Each bin / container in the residential WSAs will be clearly labelled and colour coded to avoid cross contamination of the different waste streams. Signage will be posted above or on the bins to show exactly which waste types can be placed in each bin.

Access to the shared residential WSAs will be restricted to authorised residents, facilities management and waste contractors by means of a key or electronic fob access.

Other waste materials such as textiles, batteries, furniture, printer toner/cartridges and WEEE may be generated infrequently by the residents. Residents will be required to identify suitable temporary storage areas for these waste items within their own units and dispose of them appropriately. Further details on additional waste types can be found in Section 5.4.

5.2 Waste Collection

There are numerous private contractors that provide waste collection services in the FCC area. All waste contractors servicing the proposed development must hold a valid waste collection permit for the specific waste types collected. All waste collected must be transported to registered / permitted / licensed facilities only.

Bins from the residential units with shared WSAs will be brought to a staging / collection points located throughout the development for temporary staging and collection. The waste receptacles will be moved by the waste contractor or facilities management company immediately prior to collection. Bins will be returned to the WSAs immediately following collection in line with the waste bye-laws. All staging areas can be viewed on the drawings submitted with the planning application under a separate cover.

Residents with their own individual WSAs will be responsible for moving their bins to the curtilage for collection and removal after emptying, in line with the FCC waste by-law requirements.

Waste will be collected at agreed days and times by the nominated waste contractors. The vehicle tracking for refuse trucks can be viewed on the drawings submitted with the planning application under separate cover and in Appendix 1 of this report.

All waste receptacles should be clearly identified as required by waste legislation and the requirements of the FCC *Waste Bye-Laws*. Waste will be presented for collection in a manner that will not endanger health, create a risk to traffic, harm the environment or create a nuisance through odours or litter.

It is recommended that bin collection times are staggered to reduce the number of bins required to be emptied at once and the time the waste vehicle is on-site. This will be determined during the process of appointment of a waste contractor.

5.3 Additional Waste Materials

In addition to the typical waste materials that are generated on a daily basis, there will be some additional waste types generated from time to time that will need to be managed separately. A non-exhaustive list is presented below.

<u>Green Waste</u>
Green waste may be generated from gardens, external landscaping and internal plants / flowers. Green waste generated from landscaping of external areas will be removed by external landscape contractors. Green waste generated from gardens internal plants / flowers can be placed in the organic waste bins.

<u>Batteries</u>
A take-back service for waste batteries and accumulators (e.g. rechargeable batteries) is in place in order to comply with the S.I. No. 283/2014 - European Union (Batteries and Accumulators) Regulations 2014, as amended. In accordance with these regulations, consumers are able to bring their waste batteries to their local civic amenity centre or can return them free of charge to retailers which supply the equivalent type of battery, regardless of whether or not the batteries were purchased at the retail outlet and regardless of whether or not the person depositing the waste battery purchases any product or products from the retail outlet.

<u>Waste Electrical and Electronic Equipment (WEEE)</u>
The WEEE Directive (Directive 2002/96/EC) and associated Waste Management (WEEE) Regulations have been enacted to ensure a high level of recycling of electronic and electrical equipment. In accordance with the regulations, consumers can bring their waste electrical and electronic equipment to their local recycling centre.

In addition, consumers can bring back WEEE within 15 days to retailers when they purchase new equipment on a like for like basis. Retailers are also obliged to collect WEEE within 15 days of delivery of a new item, provided the item is disconnected from all mains, does not pose a health and safety risk and is readily available for collection.

Printer Cartridge / Toners

Waste printer cartridge / toners generated by residents can usually be returned to the supplier free of charge or can be brought to a civic amenity centre.

Chemicals

Chemicals (such as solvents, paints, adhesives, resins, detergents, etc) are largely generated from maintenance works. Such works are usually completed by external contractors who are responsible for the off-site removal and appropriate recovery / recycling / disposal of any waste materials generated.

Any waste cleaning products or waste packaging from cleaning products that are classed as hazardous (if they arise) generated by the residents should be brought to a civic amenity centre.

Light Bulbs

Light bulbs generated by residents should be taken to the nearest civic amenity centre for appropriate storage and recovery / disposal.

Textiles

Where possible, waste textiles should be recycled or donated to a charity organisation for reuse. Residents will be responsible for disposing of waste textiles appropriately.

Waste Cooking Oil

If the residents generate waste cooking oil, this can be brought to a civic amenity centre.

Furniture & Other Bulky Waste Items

Furniture and other bulky waste items (such as carpet, etc.) may occasionally be generated by residents. If residents wish to dispose of furniture, this can be brought a civic amenity centre.

Abandoned Bicycles

Bicycle parking areas are planned for the proposed development. As happens in other developments, residents sometimes abandon faulty or unused bicycles, and it can be difficult to determine their ownership. Abandoned bicycles should be donated to charity if they arise.

6.0 CONCLUSIONS

In summary, this OWMP presents a waste strategy that addresses all legal requirements, waste policies and best practice guidelines and demonstrates that the required storage areas have been incorporated into the design of the proposed development.

Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the proposed development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus contributing to the targets set out in the *NWMPCE (2024)*.

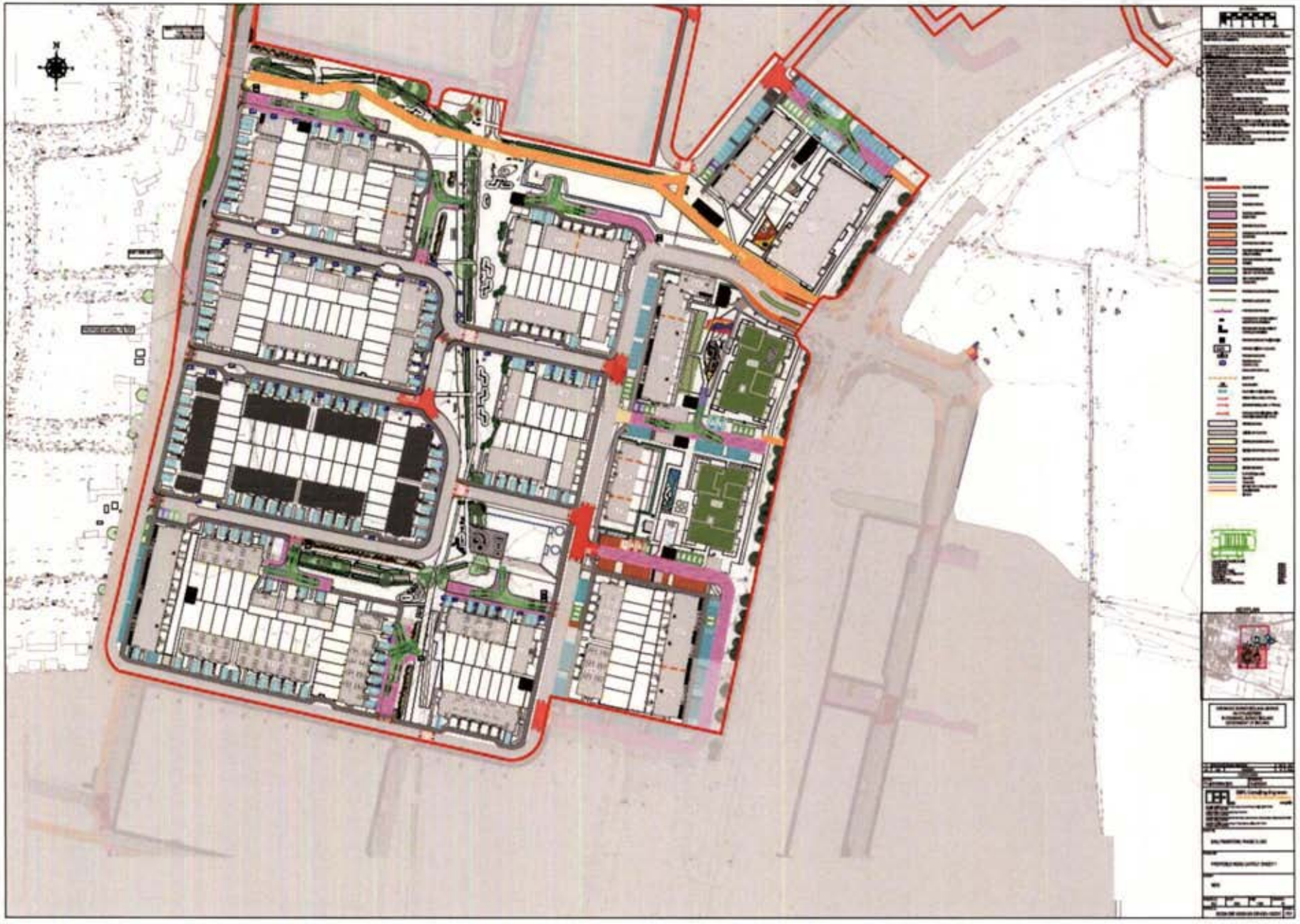
Adherence to this plan will also ensure that waste management at the proposed development is carried out in accordance with the requirements of the *FCC Waste Bye-Laws*.

The waste strategy presented in this document will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy.

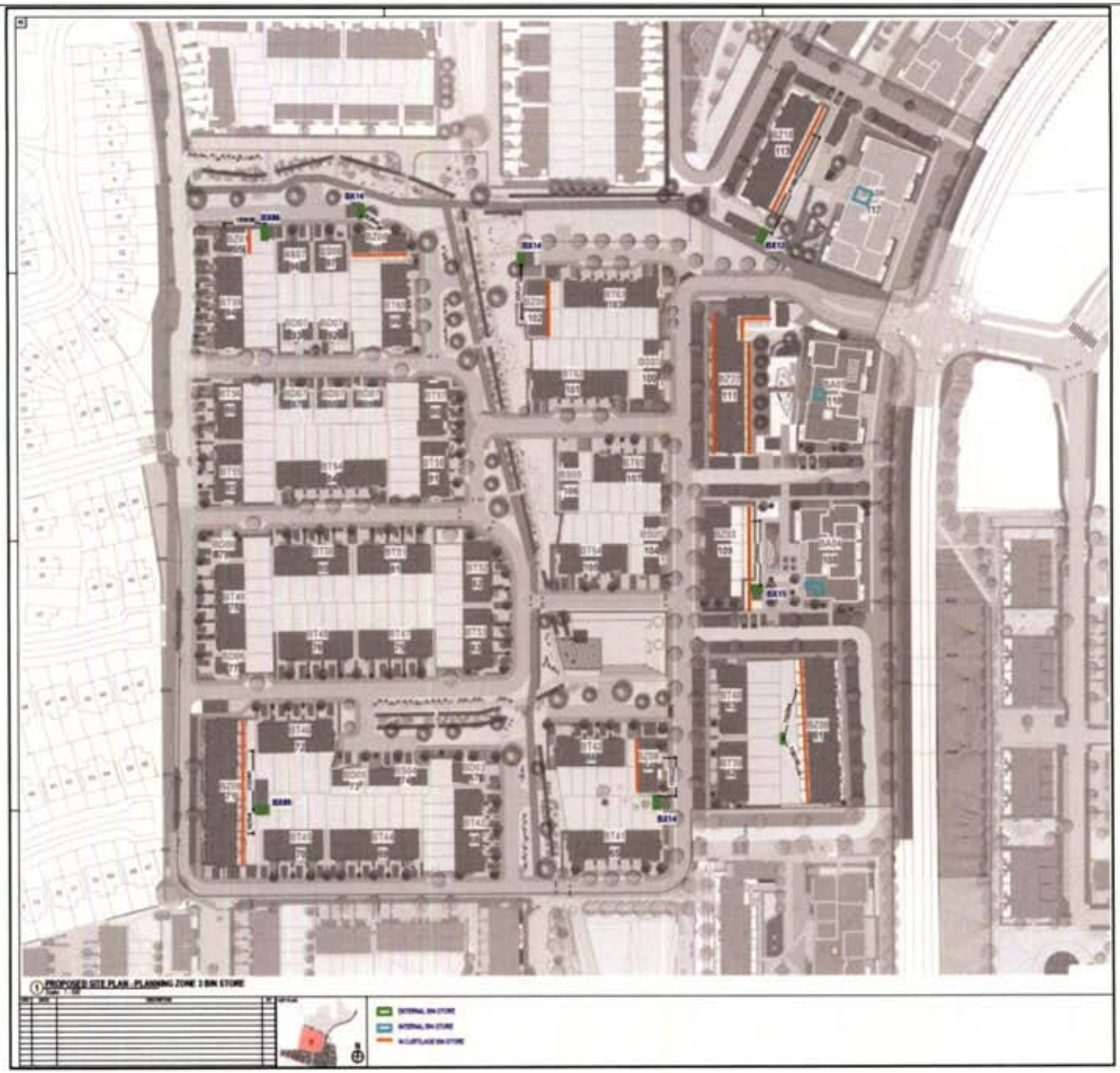
7.0 REFERENCES

1. Waste Management Act 1996 as amended.
2. Environmental Protection Agency Act 1992 as amended.
2. Litter Pollution Act 1997 as amended;
4. Regional Waste Management Planning Offices, *The National Waste Management Plan for a Circular Economy 2024 - 2030 (2040).*
5. Fingal County Council *'Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws'* (2020).
6. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998)
7. Department of Environment, Heritage and Local Government (DoEHLG) *Preventing and Recycling Waste - Delivering Change* (2002)
8. DoELG, *Making Ireland's Development Sustainable – Review, Assessment and Future Action (World Summit on Sustainable Development)* (2002)
9. DoEHLG, *Taking Stock and Moving Forward* (2004)
10. Department of Communications, Climate Action and Environment (DCCAE), *Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025* (2020).
11. DCCAE, *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less'* (2021).
12. Circular Economy and Miscellaneous Provisions Act 2022
13. Environmental Protection Agency (EPA), *National Waste Database Reports 1998 – 2020* and the *Circular Economy and National Waste Database Report 2021 -*
14. FCC, *Fingal County Development Plan 2023 – 2029* (2023).
15. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended
16. European Waste Catalogue - Council Decision 94/3/EC (as per Council Directive 75/442/EC).
17. Hazardous Waste List - Council Decision 94/904/EC (as per Council Directive 91/689/EEC).
18. EPA, *European Waste Catalogue and Hazardous Waste List* (2002)
19. EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2018)
20. BS 5906:2005 Waste Management in Buildings – Code of Practice.
21. Department of Housing Local Government and Heritage (DoHLGH), *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities* (2023).

APPENDIX 1: VEHICLE TRACKING FOR REFUSE TRUCKS



APPENDIX 2: SHARED WASTE STORAGE AREAS


PROPOSED SITE PLAN - PLANNING ZONE 3 BIN STORE

Brady Shipman Martin

DUBLIN
Mountpleasant Business Centre
Mountpleasant Avenue Upper
Ranelagh
Dublin 6

CORK
Penrose Wharf Business Centre
Penrose Wharf
Cork

LIMERICK
11 The Crescent
Limerick

+353 1 208 1900
mail@bradyshipmanmartin.com
www.bradyshipmanmartin.com