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GLENLARA POWER RESERVE PROJECT
CURRADUFF, GLENLARA, NEWMARKET, CO. CORK

REVISED HYDROLOGICAL/HYDROGEOLOGICAL REVIEW AND DRAINAGE IMPACT ASSESSMENT

FINAL REPORT

Prepared for:

GALETECH ENERGY SERVICES

Prepared by:

HYDRO-ENVIRONMENTAL SERVICES

DOCUMENT INFORMATION

Document Title:	**GLENLARA POWER RESERVE PROJECT, CURRADUFF, GLENLARA, NEWMARKET, CO. CORK** **REVISED HYDROLOGICAL/HYDROGEOLOGICAL REVIEW AND DRAINAGE IMPACT ASSESSMENT**
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TABLE OF CONTENTS

FIGURES (IN TEXT)

TABLES (IN TEXT)

APPENDICES

1. INTRODUCTION

1.1 BACKGROUND

Hydro-Environmental Services (HES) was requested by Galetech Energy Services (GES) to carry out a hydrological/hydrogeological review and Drainage Impact Assessment for the proposed Glenlara Power Reserve Project ('Proposed Project'), Curraduff, Glenlara, Newmarket, Co. Cork. The Proposed Project includes an Energy Storage System ('ESS') and associated infrastructure on lands at Curraduff, Glenlara, Newmarket, Co. Cork.

A site location map is shown as **Figure A**.

This document is a revised version of the report that was submitted for original Glenlara Power Reserve Project planning application (HES Report P1696-0 FINAL Rev F1, dated 24th July 2024).

This report has been updated in response to a Request for Further Information (RFI) issued by An Coimisiún Pleanála (dated 3rd February 2026) relating to stormwater as well as firefighting water supply and containment.

Refer to the McCloy Consulting Drainage Strategy report (M02206-08_DG01/May 2026/Rev01) for design details on stormwater control/attenuation and firefighting water supply/containment that was prepared in response to the An Coimisiún Pleanála RFI (attached as Annex 5 to the RFI response). Relevant information from the McCloy Consulting Drainage Strategy report has been incorporated into this revised Drainage Impact Assessment report.

The McCloy Consulting revised drainage plan drawing (CE 201-01) supersedes the previlously submitted proposed layout drainage prepared by HES (Drawing P1696-0-0724-A3-D101-00C).

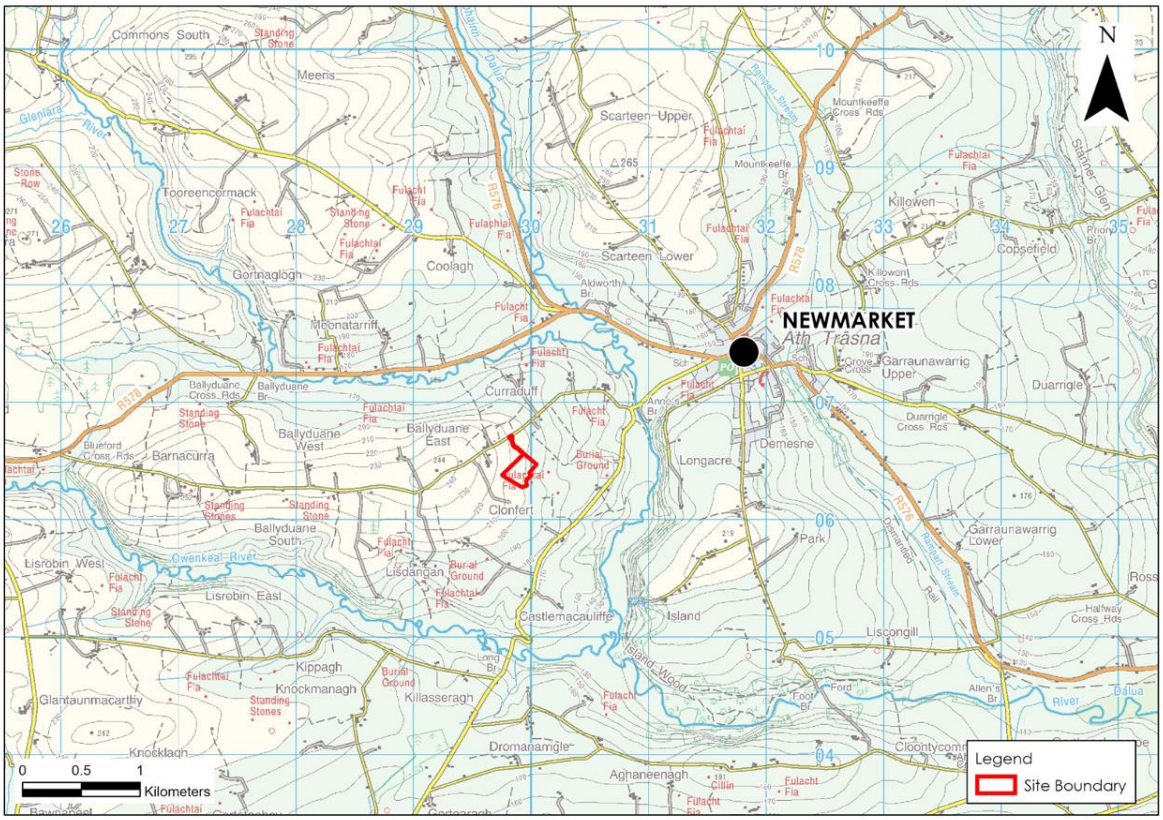

Figure A: Site Location Map

1.2 PROJECT OVERVIEW

The Proposed Project includes the following components:

- Energy storage containers installed on concrete plinths;
- Associated electrical inverters and transformers;
- Electrical and communications cabling;
- Upgrade of an existing agricultural access point;
- Access track;
- Boundary security fencing and gates;
- Pole-mounted security cameras;
- Firefighting water supply and delivery infrastructure;
- Firefighting water containment infrastructure;
- Stormwater control and attenuation (SuDs);
- Bridge crossing and pipe culvert install in a field drain; and,
- All associated site development, landscaping and reinstatement works.

As described above, planning permission for the transformer compound will be applied for under a separate planning application. Its drainage SuDs requirements have been considered in this report as its likely that both the transformer compound and the Proposed Project will be constructed at the same time.

However, the final layout or positioning of the transformer compound has not been finalised and therefore a drainage layout plant for the transformer compound is not provided.

The Proposed Project site layout map is shown as **Figure B** below.

1.3 PLANNING DOCUMENTS

The following relevant documents were submitted in response to the An Coimisiún Pleanála RFI (Annex no. included):

- McCloy Consulting (May 2026) Drainage Startegy Glenlara Power Reserve (Annex 5);
- Gexcon (May 2026) Glenlara Power Reserve Battery Energy Storage System Outline Fire Risk Management Plan (Annex 3); and,
- Hydro Environmental Services (May 2026) Glenlara Power Reserve Project – Water Framework Directive Compliance Assessment (Annex 7).

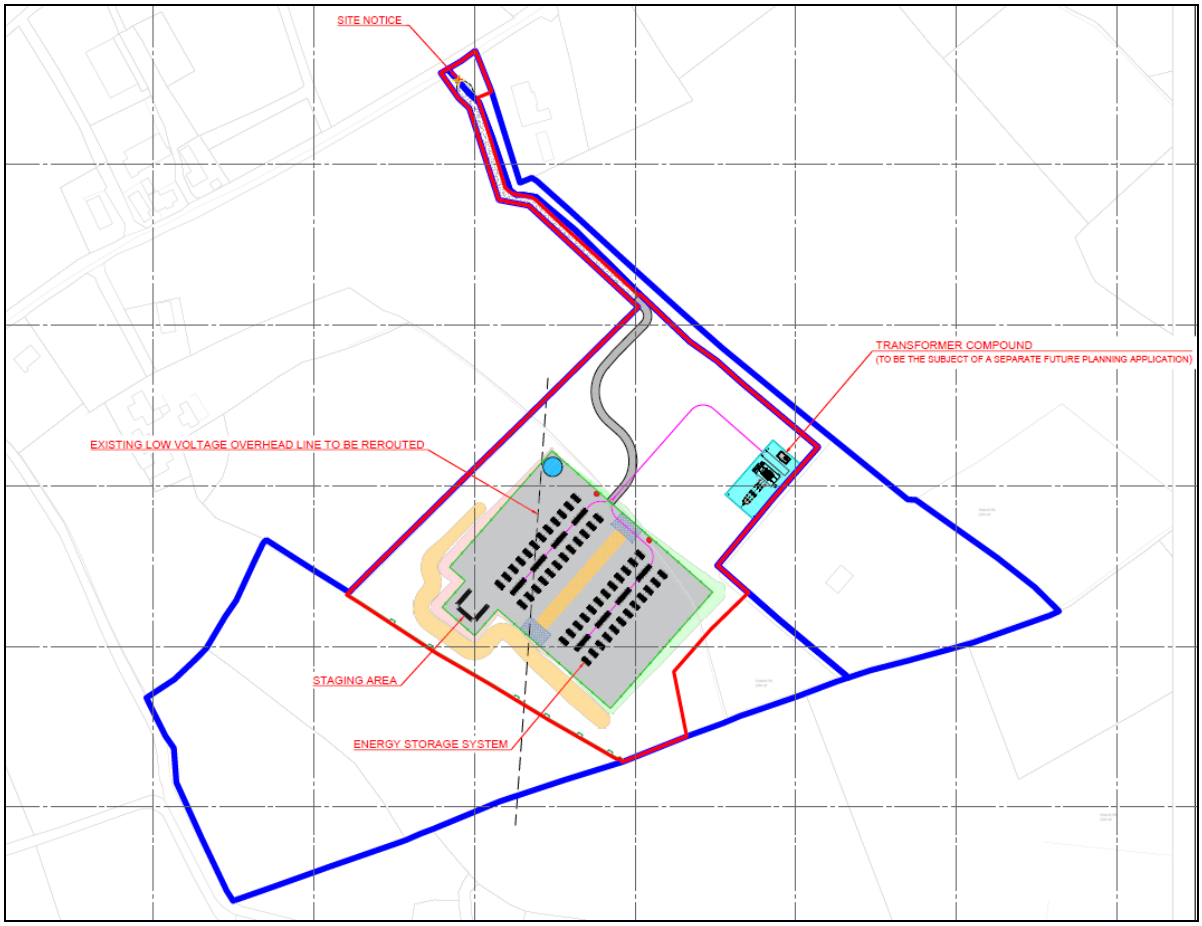

Figure B: Site Layout Map

1.4 STATEMENT OF QUALIFICATIONS

Hydro-Environmental Services (HES) is a specialist geological, hydrological, hydrogeological and environmental practice that delivers a range of water and environmental management consultancy services to the private and public sectors across Ireland and Northern Ireland. HES was established in 2005, and our office is located in Dungarvan, County Waterford.

Our core area of expertise and experience is geology, hydrology and hydrogeology. We routinely work on assessments for various commercial, infrastructure and renewable energy developments.

Michael Gill P.Geo (BA, BAI, Dip Geol., MSc, MIEI) is an Environmental Engineer, Hydrologist and Hydrogeologist with 24 years of environmental consultancy experience in Ireland. Michael has an MSc in Engineering Hydrology from TCD (peatland hydrology) and an MSc in Applied Hydrogeology from Newcastle University, UK. He has completed numerous (100+) hydrological and hydrogeological assessments relating to renewable energy developments such as wind farms, grid connections and substations.

David Broderick P.Geo (BSc, H. Dip Env Eng, MSc) is a Hydrogeologist with 19 years of environmental consultancy experience in Ireland. David has completed numerous hydrological and hydrogeological assessments for various developments across Ireland. David has significant experience in surface water drainage issues, SUDs design, flood risk assessment, flood modelling and construction phase water management.

1.5 ASSESSMENT METHODOLOGY

1.5.1 Guidance

This hydrological/hydrogeological review and drainage impact assessment has been completed in accordance with the guidance contained in the following documents:

- Greater Dublin Strategic Drainage Study – Volume 2;
- The SuDS Manual, CIRIA Report C753;
- Sustainable Drainage Design and Evaluation Guide 2021, Dublin City Council;
- Sustainable Drainage Explanatory Design and Evaluation Guide 2022, South Dublin County Council;
- Nature-Based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas – Water Sensitive Urban Design Best Practice Interim Guidance Document, Department of Housing, Local Government and Heritage, November 2021;
- Cork County Development Plan 2022 – 2028: Chapter 11; and,
- Cork County Development Plan 2022 – 2028: Advice Note 1 – Surface Water Management.

1.5.2 Desk Study

A desk study assessment of the Proposed Project site and the surrounding area was completed in advance of the site walkovers and site investigations. This involved the collection and collation of all relevant geological, hydrological, hydrogeological, and meteorological data for the Proposed Project site. This included consultation with the following sources:

- Environmental Protection Agency database (www.epa.ie);
- Geological Survey of Ireland - Groundwater Database (www.gsi.ie);
- Met Eireann Meteorological Databases (www.met.ie);
- National Parks & Wildlife Services Public Map Viewer (www.npws.ie);
- EPA/Water Framework Directive Map Viewer (www.catchments.ie);
- Bedrock Geology 1:100,000 Scale Map Series, Sheet 21 (Geology of Kerry- Cork);
- Geological Survey of Ireland – Rathmore Groundwater Body: Summary of Initial Characterisation Report (GSI, 2004);
- OPW Flood Maps (www.floodinfo.ie); and,
- GSI Groundwater Flood mapping (www.gsi.ie).

1.5.3 Site Surveys/Investigations

Walkover surveys and site investigations were undertaken by HES on 17th April 2024. HES completed the following field investigations to provide data to complete the hydrological/hydrogeological review and drainage impact assessment:

- A detailed walkover survey of the Proposed Project site to assess ground conditions and topography;
- Constraints mapping for the proposed drainage strategy/layout;
- Hydrological mapping of the Proposed Project site and the surrounding area was undertaken whereby water flow directions, flowpaths and drainage patterns were recorded; and,
- Trial pit investigation to assess subsoil conditions including soakage, depth to bedrock, and groundwater conditions.

2. ENVIRONMENTAL SETTING

2.1 INTRODUCTION

This section describes the baseline setting (*i.e.* topography, geology, hydrology and hydrogeology) in the area of the Proposed Project site. The existing environmental conditions have been interpreted from both desk study information and field based assessments.

2.2 SITE DESCRIPTION AND TOPOGRAPHY

The Proposed Project site, which has an area of approximately 4.3 hectares, is located approximately 1.6km to the southwest of Newmarket town and immediately to the northwest of the existing Glenlara 110kV electricity substation compound.

The Proposed Project site currently comprises grassland and is bordered by agricultural lands on all sides. The site is currently accessed by an existing farm track running from a local public road located c. 2300m to the north of the ESS compound area. The transformer compound location is in a field located immediately to the east of the proposed ESS compound.

The elevation of the overall Proposed Project site ranges between approximately 196 – 218 metres above Ordnance Datum (mOD), with the slope to the southeast. The lowest point on the site is at the southeastern corner of the field in which the proposed ESS is located.

The ground elevation across the proposed ESS footprint ranges between approximately 197 and 210m OD, while the elevation across the potential substation location ranges between 194.5 and 197.5m OD.

The ground elevation along the proposed section of access track, which runs northeasterly from the ESS compound, is between approximately 202 and 204m OD.

2.3 HYDROLOGY

2.3.1 Rainfall, Evaporation & Recharge

Newmarket rainfall station is located approximately 2km northeast of the Proposed Project site and is the closest rainfall station for which long-term rainfall data is available. The long term Average Annual Rainfall (AAR) (1980 – 2010) recorded at Newmarket is 1,198mm/year (**www.met.ie**).

The closest synoptic[1] station where the average potential evapotranspiration (PE) is recorded is at Shannon Airport, approximately 55km to the northeast. The long-term average PE for this station is 563mm/year. This value is used as a best estimate of the Proposed Project site PE. Actual Evaporation (AE) at the Proposed Project site is estimated as 535mm/year (which is 0.95 × PE).

The Effective Rainfall (ER) represents the water available for runoff and groundwater recharge. The ER for the Proposed Project site is calculated as follows:

Effective rainfall (ER) = AAR – AE
=1,198mm/yr – 535mm/yr
ER = 663mm/yr

Based on groundwater recharge mapping from the Geological Survey of Ireland (**www.gsi.ie)** a recharge coefficient of 15% is taken for the Proposed Project site (i.e. "*low permeability*

[1] *Meteorological station at which observations are made for synoptic meteorology and at the standard synoptic hours of 00:00, 06:00, 12:00, and 18:00.*

subsoils, overlying Locally Important Bedrock Aquifer with Moderate groundwater vulnerability rating). The subsoil permeability is mapped as "Low" by the GSI.

This means that the hydrology of the Proposed Project site is characterised by relatively high natural surface water runoff rates (85%) and relatively low groundwater recharge rates (15%).

Therefore, conservative annual recharge and runoff rates for the Proposed Project site are estimated to be 99mm/year and 564mm/year respectively. The low groundwater recharge coefficient is attributed to the presence of low permeability subsoils and the poorly draining soils that overlie the Proposed Project site (refer to **Section 2.4** below).

The Winter Rainfall Acceptance Potential (WRAP) is a measure based on a soil classification derived from the Soil Surveys in Great Britain and Ireland. The mapping estimates the soil WRAP which approximates to infiltration potential, ranging from a maximum for Class 1 (0.15) to a minimum for Class 5 (0.5). The area of the Proposed Project site is mapped as Class 4 (0.45) which indicates "Low" rainfall acceptance as per the WRAP classification.

In addition to average rainfall data, extreme value rainfall depths are available from Met Eireann. **Table A** below presents return period rainfall depths for the area of the Proposesd Project site. These data are taken from https://www.met.ie/climate/services/rainfall-return-periods and they provide rainfall depths for various storm durations and sample return periods.

Table A: Glenlara– Met Eireann Return Period Rainfall Depths (mm)

	Return Period (Years)			
Duration	**5**	**10**	**30**	**100**
5 mins	5.6	6.5	8.1	14.5
15 mins	9.2	10.7	13.3	23.8
30 mins	12.3	14.3	17.8	29.5
1 hour	16.5	19.1	23.8	36.6
6 hours	35	40.6	50.3	63.8
12 hours	46.9	54.3	67.1	79.1
24 hours	62.9	72.7	89.7	98.1

2.3.2 Regional and Local Hydrology

On a regional scale, the Proposed Project site is located within Hydrometric Area 18 of the South Western River Basin District (SWRBD). The Proposed Project site is located in the Blackwater (Munster) Water Framework Directive (WFD) Catchment and the Dalua_SC_010 sub-catchment.

Locally, the Proposed Project site is located in the Dalua_020 WFD river sub-basin. There are no watercourses mapped by the EPA in the immediate vicinity of the Proposed Project site. The Dalua River (EPA Code: 18D01), the closest EPA mapped watercourse, is located approximately 1km southeast of the Proposed Project site, where it flows in a southerly direction.

The Dalua River confluences with the River Allow approximately 12km downstream of the Proposed Project site, before flowing into the River Blackwater a further 5km downstream.

Site drainage is described in **Section 3.1** below.

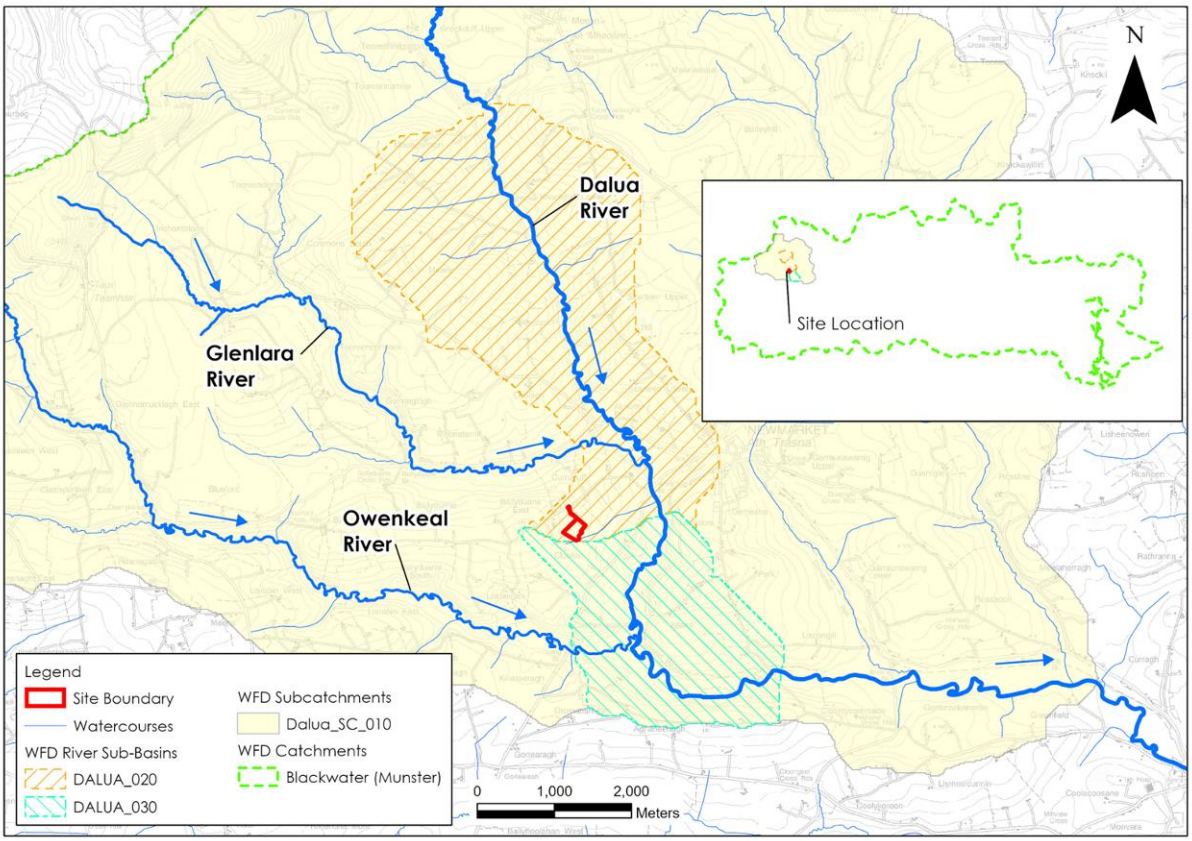

Figure C: Local Hydrology Map

2.3.3 River Waterbody WFD Status

River Waterbody status and WFD risk classification are available from (www.catchments.ie) and are summarised in **Table B.**

Please refer to the Hydro Environmental Services (May 2026) Glenlara Power Reserve Project – Water Framework Directive Compliance Assessment (RFI Annex 7) for the assessment of potential effects on WFD status.

As outlined in **Section 2.3.2**, the project site initially drains to the River Dalua. The Dalua_020 SWB achieved "Moderate" status in the latest WFD cycle (2019-2024) and is currently 'not at risk' of failing to achieve its WFD objectives.

Downstream of the Dalua_020, the Dalua_030 achieved "Good" status in the latest WFD cycle and is 'at risk' of failing to achieve its WFD objectives with anthropogenic sources identified as a significant pressure. Finally, the Dalua_040 achieved "High" status and is 'not at risk'.

Downstream of the River Dalua, the Allow_060 and Allow_070 SWBs both achieved "Good" status in the latest WFD cycle. The Allow_060 is 'at risk' of failing to achieve its WFD objectives while the Allow_070 is 'not at risk'. Agriculture, Hydromorphology, Abstraction, Urban Wastewater and Industry are the identified significant pressures on the Allow_060.

Table B: Summary of River Water Body Status

SWB	Overall Status 2013-2018	Overall Status 2016-2021	Overall Status 2019-2024	Risk Status 3rd Cycle	Pressures
Dalua_020	Good	Good	Moderate	Not at risk	None
Dalua_030	Good	Good	Good	At Risk	Anthropogenic
Dalua_040	High	High	High	Not at risk	None
Allow_060	Poor	Moderate	Good	At risk	Agriculture, Hydromorphology, Abstraction, Urban Wastewater and Industry
Allow_070	Good	Good	Good	Not at risk	None

2.3.4 Flood Zone Mapping

OPW's River Flood Extents Mapping (CFRAM), National Indicative Fluvial Mapping (NIFM), Past Flood Event mapping (https://www.floodinfo.ie/map/floodmaps/), historical mapping (i.e. 6" & 25" base maps) and GSI surface water/groundwater flooding datasets were consulted to identify any areas as being at risk of fluvial flooding.

No CFRAM fluvial flood mapping has been completed for the area of the Proposed Project site. National Indicative Fluvial Mapping (NIFM) maps flood zones along the Dalua River downstream of the Proposed Project site (refer to **Figure D** below).

No portion of the Proposed Project site is identified within present day or worst-case future scenario NIFM Flood Zones.

OPW's Past Flood Event Mapping have no records of recurring flood incidences in the area of the Proposed Project site. The nearest recorded flood incident is mapped approximately 1.7km northwest of the Proposed Project site on the R578. According to the local area engineer's report, approximately 1 km of this regional road floods as a result of high flows in the Dalua River (Flood Event ID: 5153).

The GSI winter 2015/2016 surface water flood mapping shows no flooding at the Proposed Project site. There is no historic groundwater flooding or groundwater flooding probability mapped at in the vicinity of the Proposed Project site.

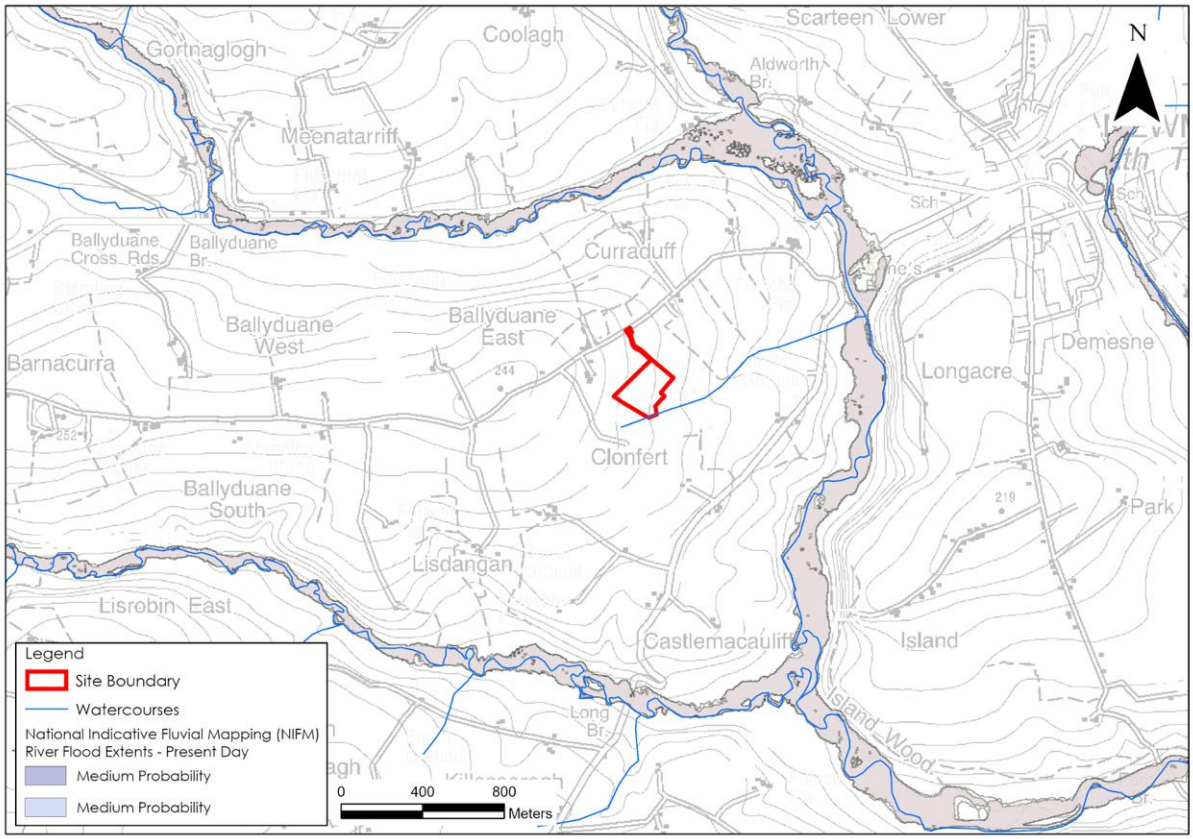

Figure D: NIFM Mapping

2.4 GSI MAPPED GEOLOGY

2.4.1 Soils and Subsoils

According to the EPA/Teagasc soils mapping (www.epa.ie), the soil type at the Proposed Project site is mapped as poorly drained (mainly acidic) soils, derived from mainly non-calcareous parent materials (AminPD). Deep, well-drained (mainly acidic) soils (AminDW) are mapped in lands that surround the Proposed Project site. Alluvium soils are mapped along the course of the Dalua River further to the east.

The GSI subsoil mapping shows that the Proposed Project site is underlain by Till derived from Namurian sandstones and shales (TNSSs) (www.gsi.ie). Alluvium (A) subsoils are also mapped along the Dalua River further to the east (refer to **Figure E**).

Refer to Section 3.3 below for details of trial pitting carried out at the Proposed Project site.

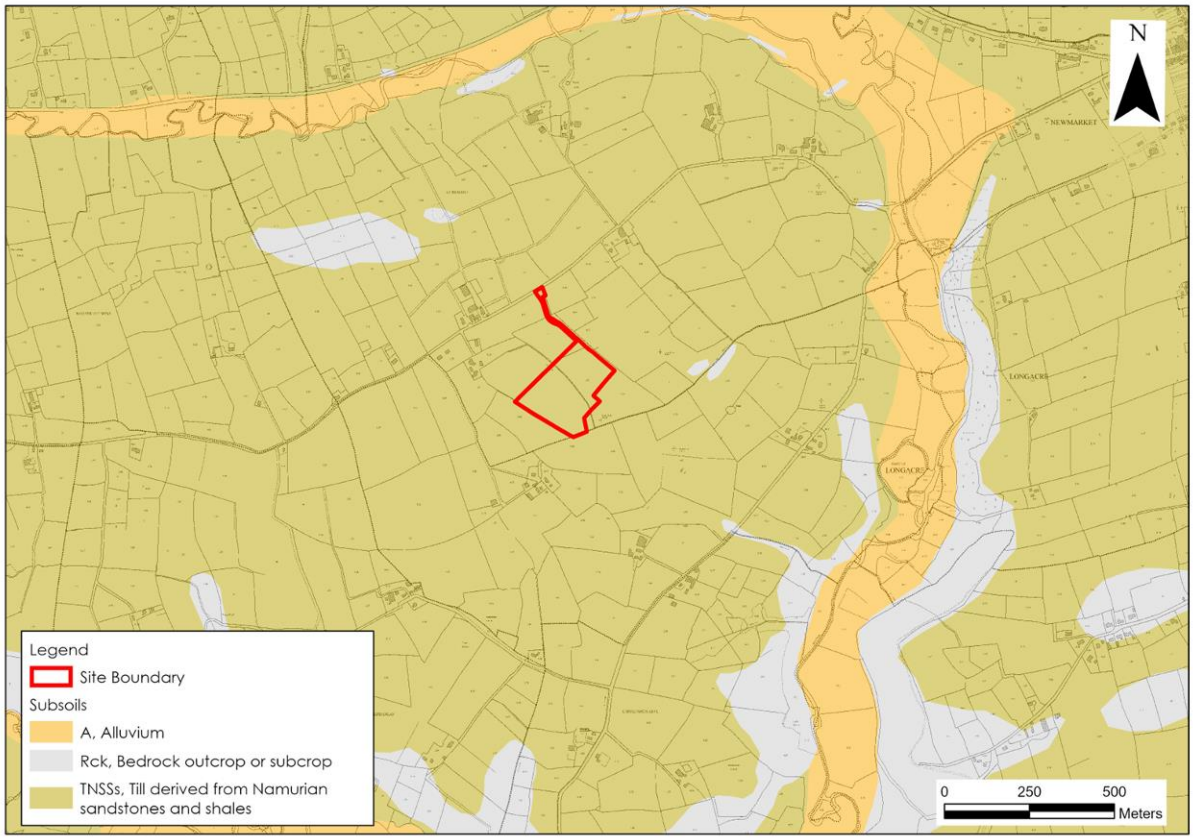

Figure E: GSI Subsoil Mapping

2.4.2 Bedrock Geology

The Proposed Project site and wider environs are mapped by the GSI to be underlain by Namurian (undifferentiated) Rock, which typically comprises dark shale and pale sandstone (www.gsi.ie).

There are no mapped fault lines running through the Proposed Project site. No bedrock outcrop or sub-crop is mapped within the Proposed Project site (refer to **Figure F** below).

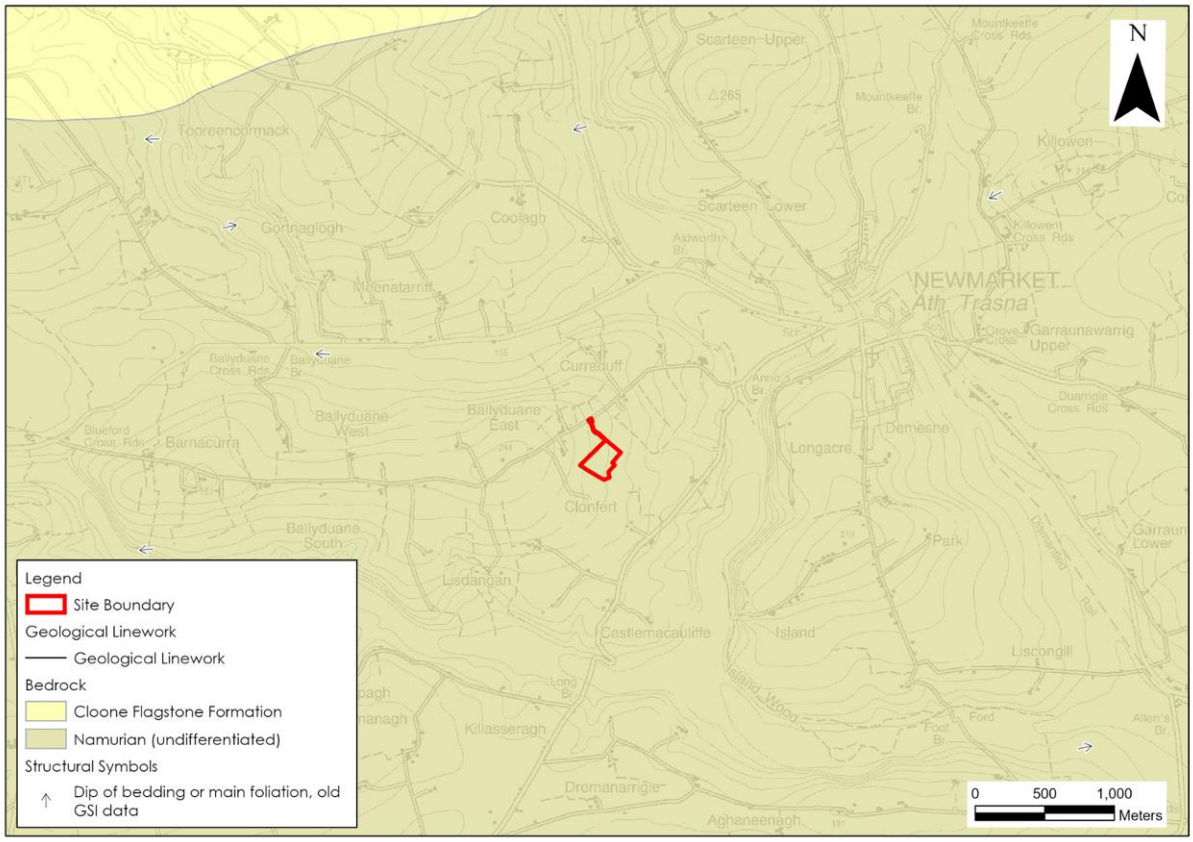

Figure F: GSI Bedrock Mapping

2.5 HYDROGEOLOGY

2.5.1 Aquifer Type and Groundwater Flow Regimes

The Namurian Rocks that underlie the Proposed Project site are classified by the GSI as a Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones (www.gsi.ie). The Rathmore West Groundwater Body (GWB) (IE_SW_G_070) is mapped to underly the Proposed Project site.

Due to the generally low permeability of the aquifers within this GWB and the high slopes, a high proportion of the recharge will discharge rapidly to surface watercourses via the upper layers of the aquifer, effectively reducing further the available groundwater resource in the aquifer (GSI, 2004).

The Namurian rocks are noted to have no intergranular permeability and groundwater flow occurs in fractures and faults. Permeability is highest in the upper few metres but generally decreases rapidly with depth. In general, groundwater flow is concentrated in the upper 15 m of the aquifer. Groundwater flow paths are generally short, typically 30-300m, with

groundwater discharging to small springs, or to the streams and rivers that traverse the aquifer. Flow directions are expected to approximately follow the local surface water catchments. Groundwater is generally unconfined (GSI, 2004).

Groundwater levels are about 1.5-15 m below ground level, and will generally follow the local topography.

The Proposed Project site and its underlying bedrock aquifers are mapped within the Rathmore West (GWB) (IE_SW_G_070) which is mapped by the EPA/WFD as "poorly productive bedrock" (www.catchments.ie).

There are no GSI mapped karst features in the area of the Proposed Project site but are mapped in the wider area (>2km away). The bedrock which underlies the Proposed Project site is not prone to karstification/dissolution weathering (i.e. non-calcareous bedrock).

2.5.2 Groundwater Vulnerability

On account of the hydrogeological conditions in the area (e.g. presence of low permeability subsoils overlain by poorly drained soil), the GSI groundwater vulnerability is rating is "Moderate" across the Proposed Project site and the wider environs.

2.5.3 Groundwater Supplies

There are no mapped Public Water Supply or National Federation Group Water Scheme groundwater protection areas within a 15km radius of the Proposed Project site. The closest mapped groundwater protection area is related to Killeedy GWS, located ~16km north of the Proposed Project site.

There are no groundwater wells mapped by the GSI at the Proposed Project site. The nearest mapped well is located approximately 570m northwest of the Proposed Project site (with a location accuracy of 1km). The well is used for agricultural and domestic purposes and has a "Good" yield class.

2.5.4 Groundwater Body WFD Status

Local GWB status and WFD risk classification are available from (www.catchments.ie). As outlined in **Section 2.5.1**, the Proposed Project site is mapped in the Rathmore West GWB.

The Rathmore West GWB achieved 'Good' status (2019-2024). In the latest risk cycle (3rd Cycle), the GWB is deemed to be "Not At Risk" of failing to meet its WFD objectives.

Please refer to the Hydro Environmental Services (May 2026) Glenlara Power Reserve Project – Water Framework Directive Compliance Assessment for the assessment of potential effects on WFD status.

2.6 DESIGNATED SITES

Designated sites include Natural Heritage Areas (NHAs), Proposed Natural Heritage Areas (pNHAs) Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). The Proposed Project site is not located within any designated conservation site.

The Dalua River is mapped as part of the Blackwater River (Cork/Waterford) SAC (Site Code: 002170) approximately 1km east of the Proposed Project site. This SAC consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which include the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun.

The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (Site Code: 004161) is mapped approximately 2.8km west of the Proposed Project site. The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is a very large site centred on the borders between the counties of Cork, Kerry and Limerick.

3. SITE SURVEYS, CONSTRAINTS MAPPING, AND SITE INVESTIGATIONS

3.1 SITE DRAINAGE

There is a land drain running along the field boundary immediately to the east and adjacent to the ESS compound. The drain, which has a rocky substrate at the base, is approximately 1m in depth and up to 0.8 – 0.9m in width. The flow in the drain on 17th April 2024 was measured to be approximately 2 -3L/s. This drain flows to the southeast towards an unnamed stream that runs along the field boundary to the south and downslope of the ESS compound. This unnamed stream flows easterly towards the Dalua River.

There is a second drain, of similar dimension to the aforementioned drain, running along the field boundary to the north and upslope of the ESS compound. This drain flows to the east towards the drain running adjacent to the ESS compound. The flows in this drain was <1L/s on the day of the site visit.

Overall, the ground conditions noted on the day of the visit suggest poorly draining soil/subsoil. The presence of rushes (vegetation) across the Proposed Project site, particularly in the field of the proposed ESS compound, suggests poor drainage and water-logged soils.

During the trial pit investigations (Section 3.3 below), old clay pipe drains and stone drains were unearthed at several locations in the area of the proposed ESS compound. These drains record past attempts at improving drainage at the Proposed Project site. Refer to Section 3.3 below and **Appendix I** for trial pit information.

The Proposed Project site drainage map is shown as **Figure G** below.

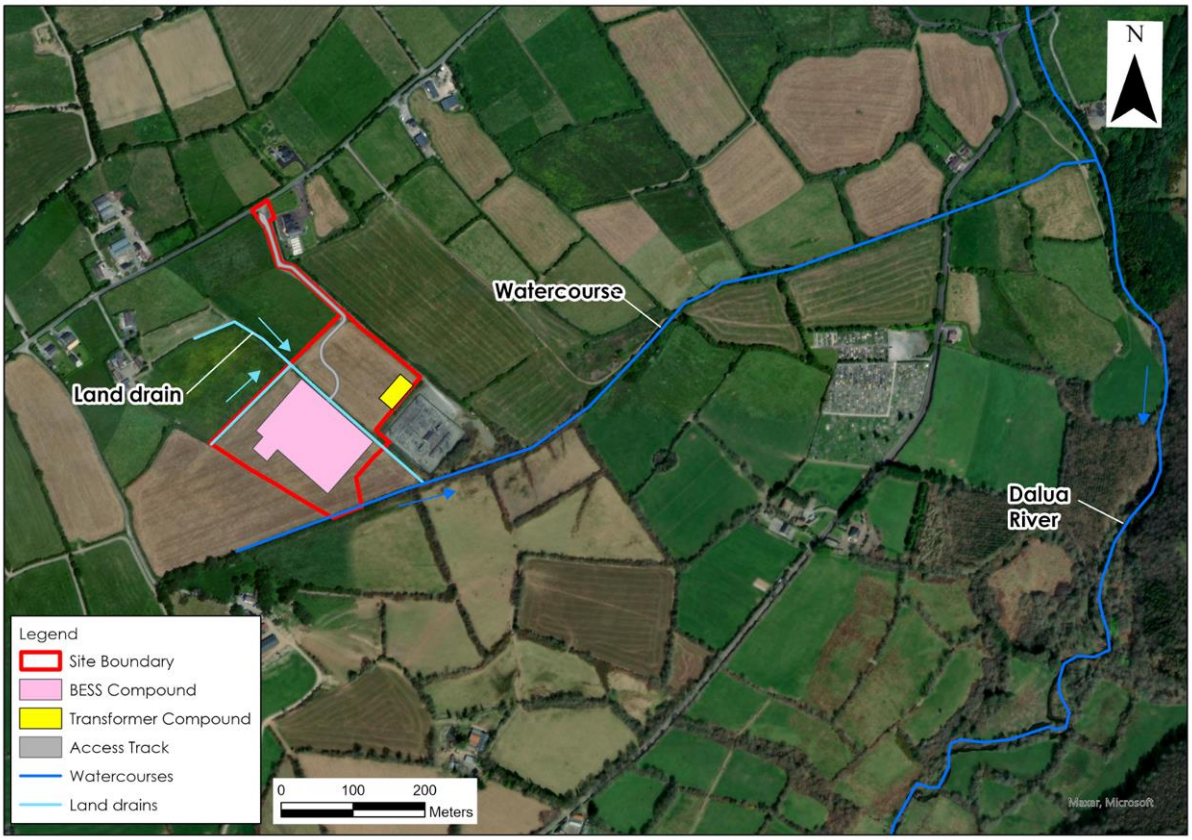

Figure G: Site Drainage Map

3.2 SITE DRAINAGE CONSTRAINTS

The following site constraints needed to be considered when developing the SuDs drainage strategy:

Site layout /Development Footprint
The ESS compound is constrained to the north (field boundary), east (land drain) and to the south (archaeological exclusion zones, see below). Areas of open grassland are only located to the west and south of the compound.

The transformer compound is constrained by the existing Glenlara substation immediately to the southeast. The access road to the existing Glenlara substation is located to the northeast of the proposed substation.

Cut and Fill
Due to moderately sloping ground across the Proposed Project site, cut and fill will be required to construct both the ESS compound and the transformer compound.

The proposed floor level of the ESS compound is between 202m and 205mOD (existing ground level range 197 and 210m OD). The ground elevation across the transformer compound location ranges between 194.5 and 197.5m OD (the floor level of the transformer compound has not been determined yet).

Berms are also proposed to the west, southwest and northwest of the ESS compound. The cut and fill increases the footprint of the development areas and reduces space for drainage infrastructure.

Topography/Ground Slope
The ground slopes moderately to the southeast across the Proposed Project site. The local topography and slopes create a focal point for drainage from the ESS compound at the south-eastern corner of the field in which the ESS compound is proposed.

For a gravity stormwater system (positive drainage) to operate, the proposed area for stormwater attenuation /site drainage controls relating to the ESS compound will need to be positioned at the southeastern corner.

Drainage control outfalls from the transformer compound will be south-westerly (final floor level permitting) towards the main land drain as the transformer compound location is constrained to the southeast and northeast by the existing Glenlara substation and its access road.

Archaeological Features
There are 2 no. archaeological features present in close proximity to the Proposed Project site, these are located to the southeast of the ESS compound.

A 20m exclusion buffer zone has been applied around these features where no development is allowed. These exclusion buffer zones rule out any drainage infrastructure being located to the southeast of the ESS compound, which is also the lowest point in the field in which the site is located.

3.3 TRIAL PIT INVESTIGATION

7 no. trial pits were excavated at the Proposed Project site on 17th April 2024. Trial pits TP01 to TP06 are located at the ESS compound, while TP07 is located at the transformer compound.

Trial pit logs are attached as **Appendix I** the locations of the TPs are shown in **Figure H**.

Depths of overburden in the area of the ESS compound range between 0.9 and 1.6m where a SILT dominated subsoil was encountered. Subsoils got increasingly gravelly with depth due to the underlying weathered SHALE bedrock. Depth to bedrock at the substation location is 1.5m at the trial pit location. There was no significant variation in the subsoil type across the trial pit locations.

All trial pits displayed evidence of mottling (i.e. orange/grey discolouration) in the subsoil layer indicating poorly draining / water-logged subsoils. The poor drainage is consistent with the presence of rushes growing across the Proposed Project site.

The underlying bedrock encountered was soft/weak, weathered SHALE.

Most trial pits had small to moderate groundwater inflows emerging from just below the top of bedrock (refer to **Table C** below for depth to bedrock).

The trail pits were not open long enough to observe static groundwater levels, but based on water levels measured in the nearby drains, static groundwater levels are likely to be as high as 1 – 1.5 metres below ground level (mbgl).

Table C: Trial Pit Investigation Summary

Trial Pit ID	Total Depth (m)	Depth to Bedrock (m)	Subsoil Description Summary
TP01	1.9	1.6	Firm SILT – SILT/CLAY
TP02	2.0	1.6	Firm slightly gravelly SILT
TP03	1.5	1.2	Very firm SILT
TP04	1.6	0.9	Firm gravelly SILT
TP05	1.65	1.5	Firm, slightly gravelly SILT
TP06	1.8	1.6	Firm, slightly gravelly SILT
TP07	2.0	1.5	Firm, slightly gravelly SILT

Figure H: Site Investigation Map

3.4 SOIL INFILTRATION RATES

Due to the poorly draining nature of the soils, the shallow bedrock, and the likely shallow groundwater table, no infiltration tests were carried out. Infiltration to ground is not a suitable SuDs option for this site.

3.5 SITE CONDITIONS AND SUDS SUITABILITY

The site constraints and ground conditions mean that stormwater disposal through soil infiltration/soakways is not achievable at this site.

The presence of headwater streams at this elevation, existing field drainage, and poorly draining soils suggest surface water runoff (rather than groundwater recharge/infiltration) is the dominant drainage pathway. The high groundwater table also suggests very low groundwater infiltration/recharge rates.

The below proposed drainage strategy mimics, as closely as possible, the greenfield drainage regime of the Proposed Project site.

4. OPERATIONAL PHASE DRAINAGE STRATEGY

4.1 DRAINAGE GUIDANCE

4.1.1 Cork County Development Plan (2022 – 2028)

Paragraph 11.10.2:

> *"The objective of SuDS in new developments is to replicate, as closely as possible, the surface water drainage regime of the predevelopment 'greenfield' situation. Therefore, the extent of impermeable surfaces such as road surfaces, parking areas, driveways, patios, etc, should be minimised by careful attention to site layout and the specification of porous surfacing materials where practicable. The management of storm water drainage should emphasise retention and infiltration at source, which reduces runoff volumes and slows the rates of runoff as well as providing partial treatment and promoting groundwater recharge. The latter requirement reduces the pollution threat to watercourses and groundwater".*

Paragraph 11.10.3:

> *"It is important that SuDs solutions are considered as an interconnected system rather than reliance on a single component or measure. While engineered attenuation in underground tanks may be necessitated in limited circumstances, a range of solutions should be considered in a SuDS scheme which are designed to manage, treat and make best use of surface water, prioritising nature-based solutions and embracing opportunities to enhance green infrastructure and create attractive, nature rich open space. This would also have the effect of minimising the future management and maintenance burden that underground tanks present. Where SuDS measures are being proposed, the chosen solution should be fully justified having regard to a hierarchy of nature-based solutions. The use of green roofs, particularly on apartment, commercial, industrial, leisure and educational buildings is encouraged".*

County Development Plan 2022: Advice Note No. 1 - Surface Water Management:

> *"Every application for development must submit a Drainage Impact Assessment (DIA) demonstrating how the development successfully uses Sustainable Urban Drainage Systems (SuDS) and nature based solutions to manage surface water within and adjacent to the site.*
>
> *Cork County Council requires a softer engineered or 'nature-based approach' to be used to manage rainfall runoff on the site i.e., to manage and treat surface water above-ground rather than sending rainfall below-ground into drains, pipes, attenuation tanks and other 'hard engineering' solutions. The aim is to maximise the retention and/or infiltration of storm water runoff on-site, minimise discharges to the public drainage system and to limit the discharge rates from the site to greenfield runoff rate or less.*
>
> *There should be no direct discharge to a stream or watercourse. Any discharge should be appropriately attenuated using nature based solutions, and any pollutants appropriately treated and intercepted as required.*
>
> *All Nature based solutions and SuDS drainage should be located within the red line boundary of the site".*

4.2 DRAINAGE DESIGN APPROACH

4.2.1 SuDs Strategy

Where possible the three elements of the "SuDS triangle" should be incorporated the SuDS strategy (**Figure I** below).

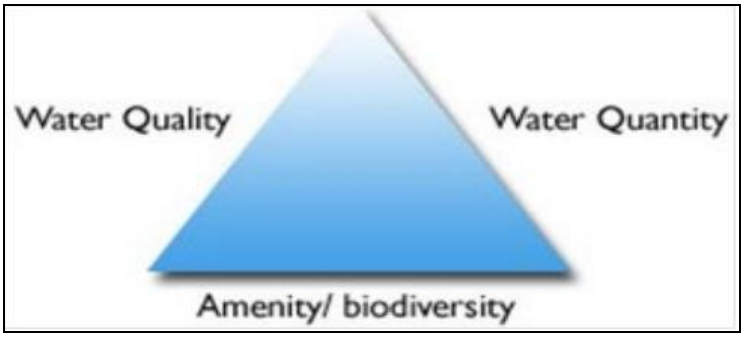

Figure I: SuDs Triangle

By considering the three functions of the triangle, a SuDS system will allow for water quality treatment and attenuation through natural processes by:

- Encouraging infiltration (where appropriate) and attenuating peak flows;
- Improving water quality by providing treatment to stormwater prior to discharge; and,
- Providing habitat and function where possible for those using the area (including wildlife).

4.2.2 Compliance with Greater Dublin Strategic Drainage Study Surface Water Policy

The Proposed Project surface water management strategy has been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS). The GDSDS (Vol. 2, Chapter 6.3.4) design criteria and how it has been applied to the Proposed Project is outlined below.

Criterion 1: River Water Quality Protection
Satisfied by providing interception storage for the first 5mm of rainfall and treatment of surface water runoff by SuDS features such as swales and detention pond prior to discharge. There is no proposed unattenuated direct discharge to any drain or natural surface watercourse.

Criterion 2: River Regime Protection
Satisfied by attenuating surface water run-off by providing storage and flow control devices prior to discharge at Greenfield runoff rate (Q_{bar}). Site critical 100-year rainfall event used to determine attenuation volume in excess of Q_{bar}.

Criterion 3: Level of Service (Flooding) for site
Satisfied by reviewing available OPW flood mapping relating to the site's proximity to tidal and fluvial flood zones (up to 1 in 1000-year flood event). This site is not liable to fluvial, surface water, or groundwater flooding. The Proposed Project site is not located within any mapped fluvial flood zones.

Criterion 4: River Flood Protection
Satisfied by attenuating surface water discharge to greenfield runoff rates, addressing flood risk associated with the 1 in 100-year storm, and by avoiding development in flood plains.

Following a comprehensive review of the design of the stormwater drainage system, all options were considered under the SuDS guidance policies referred to in the Greater Dublin Drainage Strategy study. The design approach is outlined below.

4.2.3 Design Criteria

The following best practice approach has been applied to the proposed drainage strategy:

- Applying an interconnected SuDs treatment train which includes source controls, site controls, and treatment with no direct discharges to drains or natural surface watercourses;
- Interception of the first 5mm depth of rainfall;
- Discharge from the site limited to the greenfield runoff rate (Q_{bar});
- On-site storage/attenuation provided for runoff volumes equal to the 100-year (1% AEP) rainfall event and climate change (+20% for rainfall as per Cork Co. Co. Advice Note No. 1);
- Provisions for water treatment prior to discharge for water quality protection; and,
- Albeit a favoured SuDs solution, infiltration/discharge to ground is not a viable option due to the low infiltration rates and constraining topography.

4.2.4 Proposed Drainage Solution

This drainage strategy for the Proposed Project has been developed for planning and informative purposes only and the principles are outlined below. It is therefore important to note, that the layouts and details provided will be subject to further detailed design prior to the commencement of construction work.

Based on the Proposed Project site hydrological regime, topographical and geological characteristics (i.e. low soil infiltration rates, sloping ground with a dominant surface water drainage regime), on-site attenuation with discharge to local land drains/watercourse (at Q_{bar} rates) is seen as the most appropriate and only option for the development.

The following drainage treatment train elements are proposed:

Source Controls:

- Permeable / semi-permeable gravel surfaces on the ESS compound and access track (reduce runoff rates/provide storage at source);
- Footprint perimeter swales at the ESS compound and transformer compound (flow interception at source, contain first 5mm of rainfall and also provide flow conveyance during higher flows); and,
- Drainage swales with check dams along the proposed access track with buffered outfalls.

Site Controls:

- Detention basins with restricted outfall at the ESS compound and transformer compound (attenuation of peak 100-year runoff volumes in excess of the greenfied rate).

Treatment:

- Hydrocarbon interceptor (higher risk areas only such as the transformer compound).

Groundwater Control:

- Due to the shallow groundwater table, groundwater seepages entering the cut area of the ESS compound will be collected and discharged into the drain running to the east of the compound.

4.2.5 Drainage Overview

The ESS compound area will be surfaced with permeable hardcore surfaces (hardcore/gravel) which will reduce runoff rates at source.

Runoff from the ESS compound area will enter perimeter swales which will have check dams to intercept flow and will provide storage at source. The perimeter swales will be sized to hold in excess of the the first 5mm of rainfall which amounts to 67m^3 for the ESS compound.

Perimeter swales will convey runoff to a detention basin for attenuation storage. The detention basin will be fitted with a hydrobrake for flow restriction to greenfied rates (Q_{bar}). See Section 4.2.8 below.

A groundwater collector drain will be positioned at the base of the cut area within the ESS compound which will have an outfall to the land drain to the east of the ESS compound.

Runoff from the impermeable transformer compound hardstand/roofing will be conveyed by a sealed perimeter swale to a by-pass interceptor prior to discharge into a detention basin fitted with hydrobrake (See Section 4.2.8 below). The perimeter swales will be sized to hold in excess of the first 5mm of rainfall which amounts to 5.5m^3 for the substation.

Discharge from the transformer compound detention basin (at Q_{bar} rates) will enter the land drain to the southwest of the transformer compound.

The proposed access track will drain into a trackside swale with regular check dams and regular buffered outfalls onto the adjacent grassland downslope of the track. Intercepter drains will be placed on the upslope side of the track.

The proposed drainage strategy mimics the existing drainage regime at the Proposed Project site and is considered appropriate for the location, setting and type of development.

Incorprating a nature-based solution for water management at the site was considered (i.e. wetland/retention pond), however due to the significant site constraints, the incorporation of such a feature was not considered appropriate.

In addition to regular stormwater storage, the ESS compound attenuation pond is sized for firefighting water containment in accordance with the UK's National Fire Chiefs Council (NFCC) guidance document 'Grid Scale Battery Energy Storage System (BESS) planning in December 2025 to support Fire and Rescue Services (FRSs)'.

Please refer to the McCloy Consulting Drainage Strategy report (M02206-08_DG01/May 2026/Rev01) for design details on stormwater control/attenuation and firefighting water containment.

Refer to the The McCloy Consulting revised drainage plan drawing (CE 201-01) for the updated drainage plan.

Refer to **Appendix II** for the Cork County Council SuDs Selection Hierarchy Sheet (Table 4 of Cork County Council Advice Note 1 – Surface Water Management).

4.2.6 Development Catchment Areas

The Proposed Project hardstand areas have been divided into the following catchment areas as shown in **Table D** below

The runoff coefficients applied to each of the areas for the calculation of runoff rates (Rational Method) are also shown in **Table D**.

4.2.7 Greenfield Runoff Rates

Q_{Bar} is defined as the peak rate of flow from a catchment for the mean annual flood. It was produced in report IH124, Flood Estimation for Small Catchments (1994), and is largely based on the work of the Flood Studies Report (1975)[2].

Q_{bar} is calculated for the 1:1 year storm from the following equation:

$Q_{bar} = 0.00108 \times (AREA)^{0.89} \times (SAAR)^{1.17} \times (SOIL)^{2.17}$

Where:

- Q_{bar} is the mean annual flood flow from a rural catchment (m^3/s);
- AREA is the area of the positively drained site (km^2);
- SAAR is the Standard Average Annual Rainfall (mm);
- SOIL is Soil Category/Rainfall Acceptance;

For the Proposed Project site:

Site area = 4.35ha (0.0435km^2)
SAAR = 1,198mm
Soil = Class 4 (0.45 index weighted mean) "low acceptance".

For the overall Proposed Project site (4.35ha), the Q_{bar} Greenfield runoff rate is calculated to be 46.39L/s or 10.78L/s/ha.

The total greenfield runoff rate for each of the Proposed Project hardstand catchment areas is shown in **Table D.**

Table D: Development Hardstand Catchment Areas

Location	Area (ha)	Surface Type	Runoff Coeff	QBar (L/s)
ESS Compound Area	1.34	Hardcore/gravel	1.0	14.45
Transformer Compound	0.11	Concrete/roofing	1.0	1.187
Access Track	0.09	Hardcore/gravel	1.0	0.97
Total Qbar (L/s)				16.6

4.2.8 Stormwater Attenuation

The total maximum allowable run-off rate for the development (hardstand areas only) will be capped at 16.6L/s based on the Q_{bar} calculation shown in **Section 4.2.7** above.

Runoff from the proposed access track will be conveyed and attenuated by swale with ckeck dams prior to discharge to existing field drain.

Runoff from the ESS compound area will be directed to a lined attenuation basin (952m^3 of storage) fitted with hydrobrake to limit discharge to 14.45L/s.

Drainage from the substation compound will be directed to a separate lined attenuation basin (34m^3 of storage) via bypass hydrocarbon interceptor. Hydrobrake will limit discharge to 1.2L/s.

[2] Flood Studies Report (1975), Natural Environment Research Council.

4.2.9 Water Supply

The design incorporates dedicated firefighting water storage with a capacity of approximately 271m³. The water will either be sourced from an Uisce Éireann connection (application pending) or a proposed on-site well.

The water supply (either well or Uisce Éireann) will fill the required storage volume over several days (~43m³/day). Once the storage tank is filled, the daily water demand from the proposed well or Uisce Éireann will be very small (<10m³/day).

4.3 MAINTENANCE REQUIREMENTS

The maintenance requirements listed in **Table E** below relating to SuDs are recommended in the CIRIA (2015) guidance document "The SuDs Manual".

Table E has been revised in accordance with the McCloy Consulting Drainage Strategy report (M02206-08_DG01/May 2026/Rev01) provided as Annex 5.

The developer will ensure that maintenance of the drainage system is included in the Environmental Management Plan for the site.

Table E: Maintenance Requirements for SuDs (CIRIA 2015)

Inlets, Outlets, Controls, and Inspection Chambers		
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly
	Remove debris and sediment from chambers	Monthly for first six months, then quarterly or after significant storm
Remedial actions	Repair/rehabilitate where required	As required
	Routine rodding/ jetting of pitch subbase drainage as required	Annual/ after significant storm
Monitoring	Check all structures to ensure all is in good condition and operating as designed.	Annually
	(Flow controls) check for evidence of blockage	Monthly or after significant storm.
	(Flow controls) check for damage to components	Annually or after significant storm.
Filter Drains		
Regular Maintenance	Remove litter (including leaf litter)and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet, outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets, and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Monthly
	Remove sediment from pre-treatment devices	Six monthly
Occasional Maintenance	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

Inlets, Outlets, Controls, and Inspection Chambers		
Swale		
Regular Maintenance	Remove litter and debris	Monthly, as required
	Cut grass – to retain grass height within specific design range. Manage other vegetation and remove nuisance plants	Monthly, as required
	Inspect inlets, outlets, and overflows for blockages, and clear if required	Monthly
	Inspect filtration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, as required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional Maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial Actions	Repair erosion or other damage by re-turfing or re-seeding	As required
	Relevel uneven surfaces and reinstate design level	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required
Attenuation basin,		
Regular Maintenance	Remove litter and debris	Monthly
	Cut grass for spillways and access routes. Cut grass: Meadow grass in and around basin.	Monthly (during growing season) or as required. Half yearly (spring / before nesting season and autumn)
Remedial Actions	Re-seed areas of poor vegetation cover.	As required
	Remove sediment from inlets, outlets and basin when required.	Every 5 years or as required
Monitoring	Check all structures to ensure all is in good conditions and operating as designed	Annually

5. REPORT SUMMARY

This document is a revised version of the report that was submitted for original Glenlara Power Reserve Project planning application (HES Report P1696-0 FINAL Rev F1, dated 24th July 2024).

In Summary:

- Comprehensive drainage surveys and site investigations have been completed to inform the proposed drainage strategy for the Proposed Project;
- The site constraints and ground conditions strongly indicate that stormwater disposal through soil infiltration/soakways is not achievable at this site;
- The Proposed Project drainage strategy mimics as closely as possible, the greenfield drainage regime of the Proposed Project site, which is predominately a surface water drainage regime;
- Discharge from the Proposed Project site will be limited to the greenfield rate (Q_{bar});
- The proposed approach is an interconnected SuDs treatment train which includes source controls, site controls, and treatment with no direct discharges to drains or natural surface watercourses; and,
- Incorporating a nature-based solution into the drainage plan (such as a retention pond/wetland) was considered, but is not feasible at this site due to various site constraints; and,
- In addition to regular stormwater storage, the ESS compound attenuation pond is sized for firefighting water containment in accordance with the NFCC) guidance.

* * * * * * * * * * * * * * * * * * * *

6. REFERENCES

Environmental Protection Agency	2024	Cycle 3: HA18 Blackwater (Munster) Catchment Report
Greater Dublin Strategic Drainage Study	2005	Volume 2 (New Development)
Department of Housing, Local Government and Heritage	2021	Nature-Based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas – Water Sensitive Urban Design Best Practice Interim Guidance Document
South Dublin County Council	2022	Sustainable Drainage Explanatory Design and Evaluation Guide
South Dublin County Council	2021	Sustainable Drainage Design and Evaluation Guide
Cork County Council	2022	Cork County Development Plan 2022 – 2028
McCloy Consulting	2026	Drainage Startegy Glenlara Power Reserve
Gexcon	2026	Glenlara Power Reserve Battery Energy Storage System Outline Fire Risk Management Plan

Appendix I: Trial Pit Logs

Trial Pit Log

Project No: P1696-0
Site: Glenlara Power Reserve Project
Client: Galetech Energy Services

Date started: 17/04/2024
Date finished: 17/04/2024

Trial Pit No: TP01
Easting: 129916
Northing: 106333
Elevation: .

SUBSURFACE PROFILE

Depth	Symbol	Depth/Elev.	Description	Water Strikes	Sample Type	Comments
0.00		0.00	Ground Surface			
		0.00	Topsoil			
		-0.15				
		0.15	Firm, greyish brown SILT - SILT/CLAY (with angular cobbles)			Evidence of mottling in subsoils
1.00						
		-1.60				
		1.60	Weak, dark brown SHALE	▼		Moderate groundwater inflows from top of bedrock 1.8mbgl
		-1.90				
2.00		1.90				

Remarks:

Contractor:
Excavator type:
Logged by: DB

Scale as shown
Sheet: 1 of 1

HYDRO-ENVIRONMENTAL SERVICES 22 Lower Main Street Dungarvan Co. Waterford Tel: 058-44122 Email: info@hydroenvironmental.ie

Trial Pit Log

Project No: P1696-0
Site: Glenlara Power Reserve Project
Client: Galetech Energy Services

Date started: 17/04/2024
Date finished: 17/04/2024

Trial Pit No: TP02
Easting: 129948
Northing: 106357
Elevation: .

SUBSURFACE PROFILE

Depth	Symbol	Depth/Elev.	Description	Water Strikes	Sample Type	Comments
0.00		0.00	Ground Surface			
		0.00	Topsoil			
		-0.15				
		0.15	Firm to very firm, grey, slightly gravelly SILT			100mm clay pipe drain at 0.3mbgl
1.00						Evidence of mottling in subsoils
		-1.60				
		1.60	Weak, dark brown SHALE	▼		Moderate groundwater inflows from top of bedrock 1.8mbgl
2.00		-2.00				
		2.00				

Remarks:

Contractor:
Excavator type:
Logged by: DB

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Sheet: 1 of 1

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Trial Pit Log

Project No: P1696-0
Site: Glenlara Power Reserve Project
Client: Galetech Energy Services

Date started: 17/04/2024
Date finished: 17/04/2024

Trial Pit No: TP03
Easting: 129916
Northing: 106333
Elevation: .

SUBSURFACE PROFILE

Depth	Symbol	Depth/Elev.	Description	Water Strikes	Sample Type	Comments
0.00		0.00	Ground Surface			
		0.00	Dark brown, organic Topsoil			
		-0.15				
		0.15	Very firm, grey SILT			Evidence of mottling in subsoils
		-0.70				
		0.70	Firm, dark grey, slightly gravelly SILT			Stone filled land drain 0 - 0.9mbgl
1.00		-1.20				
		1.20	Weak, dark brown SHALE			
		-1.55				
		1.55				

Remarks:

Contractor:
Excavator type:
Logged by: DB

Scale as shown
Sheet: 1 of 1

HYDRO-ENVIRONMENTAL SERVICES 22 Lower Main Street Dungarvan Co. Waterford Tel: 058-44122 Email: info@hydroenvironmental.ie

Trial Pit Log

Project No: P1696-0
Site: Glenlara Power Reserve Project
Client: Galetech Energy Services

Date started: 17/04/2024
Date finished: 17/04/2024

Trial Pit No: TP04
Easting: 129886
Northing: 106372
Elevation: .

SUBSURFACE PROFILE

Depth	Symbol	Depth/Elev.	Description	Water Strikes	Sample Type	Comments
0.00		0.00	Ground Surface			
		0.00	Dark brown, organic Topsoil			
		-0.15				
		0.15	Very firm, light grey, SILT			
		-0.30				
		0.30	Firm, reddish grey, gravelly SILT			Evidence of mottling in subsoils
		-0.90				
1.00		0.90	Weak, dark brown SHALE	▼		Small groundwater inflows from top of bedrock 1mbgl
		-1.60				
		1.60				

Remarks:

Contractor:
Excavator type:
Logged by: DB

Scale as shown
Sheet: 1 of 1

HYDRO-ENVIRONMENTAL SERVICES 22 Lower Main Street Dungarvan Co. Waterford Tel: 058-44122 Email: info@hydroenvironmental.ie

Trial Pit Log

Project No: P1696-0
Site: Glenlara Power Reserve Project
Client: Galetech Energy Services

Date started: 17/04/2024
Date finished: 17/04/2024

Trial Pit No: TP05
Easting: 129931
Northing: 106429
Elevation: .

SUBSURFACE PROFILE

Depth	Symbol	Depth/Elev.	Description	Water Strikes	Sample Type	Comments
0.00		0.00	Ground Surface			
		0.00	Topsoil			
		-0.15				
		0.15	Firm, dark grey, slightly gravelly SILT			Evidence of mottling in subsoils
1.00						Top of stone filled land drain at 1mbgl
		-1.50				
		1.50	Weak, dark brown SHALE	▼		Small groundwater inflows from top of bedrock 1.6mbgl
		-1.65				
		1.65				

Remarks:

Contractor:
Excavator type:
Logged by: DB

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Sheet: 1 of 1

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Trial Pit Log

Project No: P1696-0
Site: Glenlara Power Reserve Project
Client: Galetech Energy Services

Date started: 17/04/2024
Date finished: 17/04/2024

Trial Pit No: TP06
Easting: 129855
Northing: 106443
Elevation: .

SUBSURFACE PROFILE

Depth	Symbol	Depth/Elev.	Description	Water Strikes	Sample Type	Comments
0.00		0.00	Ground Surface			
		0.00	Topsoil			
		-0.15				
		0.15	Firm, dark grey, slightly gravelly SILT			Evidence of mottling in subsoils
1.00						
		-1.60				
		1.60	Weak, dark brown SHALE	▼		Small groundwater inflows from top of bedrock 1.7mbgl
		-1.80				
		1.80				
2.00						

Remarks:

Contractor:
Excavator type:
Logged by: DB

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Sheet: 1 of 1

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Trial Pit Log

Project No: P1696-0
Site: Glenlara Power Reserve Project
Client: Galetech Energy Services

Date started: 17/04/2024
Date finished: 17/04/2024

Trial Pit No: TP07
Easting: 130015
Northing: 106443
Elevation: .

SUBSURFACE PROFILE

Depth	Symbol	Depth/Elev.	Description	Water Strikes	Sample Type	Comments
0.00		0.00	Ground Surface			
		0.00	Topsoil			
		-0.30				
		0.30	Firm, grey, SILT			Evidence of mottling in subsoils
		-0.70				
		0.70	Firm, grey, slightly gravelly SILT			
1.00						
		-1.50		▼		Groundwater seepage below 1.5mbgl
		1.50	Weak, dark brown SHALE			
		-1.70				
		1.70				

Remarks:

Contractor:
Excavator type:
Logged by: DB

Scale as shown
Sheet: 1 of 1

HYDRO-ENVIRONMENTAL SERVICES 22 Lower Main Street Dungarvan Co. Waterford Tel: 058-44122 Email: info@hydroenvironmental.ie

Appendix II: SuDs Hierarchy (Table 4)

CORK COUNTY COUNCIL SUDS SELECTION HIERARCHY SHEET FOR LARGE-SCALE DEVELOPMENT AND AGRICULTURAL DEVELOPMENT (TABLE 4)				
SuDS Measures	**Measures to be used on site**	**Rational for selecting / not selecting measure**	**Area of feature (m2)**	**Attenuation volume of feature (m3)**
Source Control Providing storage at source				
Swales	Yes	Perimeter swale for ESS and transformer	ESS - 502m x 1m = 502m2 transformer - 138m x 1m = 138m2	ESS - 94m3 Transformer - 25.8m3
Integrated constructed tree pits	No	Not suitable for development		
Rainwater Butts	No	Not suitable for development		
Downpipe Planters	No	Not suitable for development		
Rainwater Harvesting	No	Not suitable for development		
Soakaways	No	Site not suitable. Low soil infiltration rates/sloping ground, shallow groundwater table.		
Infiltration trenches	No	Site not suitable. Low soil infiltration rates/ sloping ground, shallow groundwater table		
Permeable pavement (Grasscrete, Block Paving, Porous Asphalt etc)	Yes	Permeable surface on ESS, tranformer and access road	ESS - 13,40m2 Transformer - 1,100m2 Acess Road - 900m2	n/a
Green Roofs	No	Not suitable for development		
Green wall	No	Not suitable for development		
Filter strips	No	Not suitable for development		
Bio-retention systems/Raingardens	No	Not suitable for development		
Blue Roofs	No	Not suitable for development		
Filter Drain	No	Not suitable for development		
Site Control				
Detention basins	Yes	2 no. (ESS and transformer)	ESS - 1,358m2 Transformer - 123.8m2	ESS - 952m3 Transformer - 34m3
Retention basins	No	Lack of space, site constraints, sloping ground and shallow groundwater table		
Regional Control				
Ponds	No	None available		
Wetlands	No	None available		
Other				
Petrol/Oil interceptor/Grit Trap	Hydrocarbon Interceptor at transformer only			
Attenuation tank – only as a last resort where other measures are not feasible	No			
Oversized pipes– only as a last resort where other measures are not feasible	No			
other	No			

Notes:
Cork County Council is seeking above-ground solutions rather than tanks or oversized pipes. Above ground flows through swales, basins etc. are encouraged.
1. Demonstrate SuDS system will have sufficient Pollutant removal efficiency in accordance with CIRIA Suds Manual C753.
2. Basins and swale sides should be no steeper than 1:4 and no deeper than 1.2m in the 1%AEP.
3. Culverting should be avoided.
4. De-culverting is encouraged.
5. Please submit evidence of infiltration rates.
6. To account for climate change in the design of the drainage system rainfall intensities should be factored up by 20%.

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