



# **Rigged Hill Windfarm Repowering**

**Further Environmental Information  
Addendum to Environmental Statement**

**Chapter 7 – Hydrology, Hydrogeology,  
Geology, Soils and Peat**

May 2020

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# Rigged Hill Windfarm Repowering

## Further Environmental Information Addendum to Environmental Statement Chapter 7 – Hydrology, Hydrogeology, Geology, Soils and Peat

### 1 Non-Technical Summary

1. An application for the Rigged Hill Windfarm Repowering (the “Development”) was submitted to Causeway Coast & Glens Borough Council (“CC&GBC”) in July 2019, accompanied by an Environmental Statement. On 24<sup>th</sup> January 2020, CC&GBC issued a ‘Further Environmental Information Request’ as informed by a consultation response issued by DfI Rivers. Further consultation with DfI Rivers on 20<sup>th</sup> April 2020 clarified that:
  - Details of exceedance and calculations of the proposed discharge rate are required as an addendum; and
  - The schedule 6 application, together with detailed drawings showing the proposed discharge points for drainage ditches to discharge to watercourses has to be made separately to the local area office.
2. This Addendum to the Environmental Statement (ES) provides details of exceedance and calculations of the proposed discharge rate in Technical Appendix A7.5. DfI Rivers has been consulted on this information prior to issue and agreed it provides DfI Rivers with the necessary information.
3. In parallel with this Addendum, an application has been submitted to the DfI Rivers Area Office for consent under Schedule 6 of the Drainage (Northern Ireland) Order 1973 for the details set out in this Addendum.
4. Commentary is provided in this Chapter on whether this information changes the conclusions set out in the Environmental Statement with respect to significant effects.
5. No changes to the conclusions of the ES are applicable as a result of this information.

### 2 Introduction

6. An application for the Rigged Hill Windfarm Repowering (the “Development”) was submitted to Causeway Coast & Glens Borough Council (“CC&GBC”) in July 2019. On 24<sup>th</sup> January 2020, CC&GBC issued a ‘Further Environmental Information Request (“FEIR”)’ as informed by a consultation response issued by DfI Rivers as outlined below:

*“PPS15 Policy FLD 3 Development and Surface Water (Pluvial) Flood Risk Outside Flood Plains  
DfI Rivers has reviewed the Environmental Statement and associated correspondence by ARCUS Consulting Services Ltd, and comments as follows;*

*The previously submitted Assessment requires further information to satisfy the requirements of a PPS 15 as set out in Annex D, paragraphs, D17 and D18. Further information should be provided on the following:*

- *Schedule 6 consent letter(s) from DfI Rivers Area Office in relation to proposed discharge points to the various watercourses.*
- *Details of exceedance design*
- *Evidence / Calculations showing the consented discharge rate at the various locations is not breached up to a 1% AEP event."*

7. Further consultation with DfI Rivers on 20<sup>th</sup> April 2020 clarified that:

- Details of exceedance and calculations of the proposed discharge rate are required as an addendum; and
- The schedule 6 application, together with detailed drawings showing the proposed discharge points for drainage ditches to discharge to watercourses has to be made separately to the local area office.

## 3 Drainage and Discharge Information

8. Technical Appendix A7.5, included with this Addendum, provides details of exceedance and calculations of the proposed discharge rate as requested by DfI Rivers.
9. DfI Rivers has been consulted on this information prior to issue and agreed it provides DfI Rivers with the necessary information.
10. In parallel with this Addendum, an application has been submitted to the DfI Rivers Area Office for consent under Schedule 6 of the Drainage (Northern Ireland) Order 1973 for the details set out in this Addendum. Should detailed design vary these details, a revised Schedule 6 application will be submitted and the Development will be constructed only in accordance with the consented details. In any event, the design will be such that the discharge rates will not exceed greenfield run-off rates or other to be agreed with DfI Rivers in advance.
11. No information or assessment provided in the ES are altered by the additional detail provided in this Addendum. Specifically, design and assessment of matters relevant to the DfI Rivers request were provided in the following sections of the ES, none of which require alteration as a result of the additional detail provided:
- Section 7.5: Embedded Mitigation; and
  - Section 7.6.1.1.1: Assessment of Effects – Surface Hydrology.
12. All conclusions of the ES regarding the significance of effects remains as assessed in the ES.

## 4 Summary

13. In summary, Further Environmental Information in the form of detail of drainage calculations and discharge points has been provided at the request of CC&GBC and DfI Rivers. The additional detail does not alter the assessment of effects provided in the ES, which concluded that:

*"The Development has been assessed as having the potential to result in effects of negligible significance.*

*Given that only effects of moderate significance or greater are considered significant in terms of the EIA Regulations, the potential effects on hydrology and hydrogeology are considered to be not significant."*

**Rigged Hill Windfarm Repowering Project Team**

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**SCOTTISHPOWER  
RENEWABLES**



# Rigged Hill Windfarm Repowering

## Technical Appendix A7.5: Drainage Details

Environmental Statement Addendum  
May 2020



Ms. Elaine Olphert  
Causeway Coast & Glens BC  
Local Planning Office  
Cloonavin  
66 Portstewart Road  
Coleraine  
BT52 1EY

22 May 2020

Dear Ms Olphert,

**THE REPOWER OF THE EXISTING RIGGED HILL WINDFARM - 6KM EAST/SOUTH EAST OF LIMAVADY**

This letter is in response to the DfI Rivers consultation (DfI Rivers email dated 20 April 2020) on the planning application (reference LA01/2019/0890/F) for the proposed repowering of Rigg Hill Windfarm (the Development).

We welcome the opportunity to provide clarification on the requirement for Schedule 6 consent to accompany the planning application, specifically in relation to DfI Rivers' request that the following information be provided:

1. Calculations of the proposed discharge rate up to the 1% AEP;
2. Details of exceedance design / routes; and
3. Detailed drawings showing the proposed discharge points for drainage ditches to discharge to watercourses to be submitted as part of the Schedule 6 consent application.

The following information addresses each point raised by DfI Rivers.

1. Calculations of the Proposed Discharge Rate up to the 1% AEP

DfI Rivers requested clarification on the attenuation volumes required for areas of new hardstanding, which were committed to through the ES and supporting Technical Appendices. Development infrastructure has been divided into sub catchments for minor watercourses onsite and outline attenuation calculations are provided in Table 1. Catchments have been calculated using topographical data and pour point analysis within GIS, and are shown on the "Drainage Catchments" figure, provided with this letter.

Calculations have been derived from the ICP SuDS method in Micro Drainage and are informed by Section 2 and 3: *DfI Roads' approach to Climate Change in Design of Road Drainage* of Technical Flood Risk Guidance in relation to Allowances for Climate Change in Northern Ireland (February



2019)<sup>1</sup>. This guidance requires the 1:100 year return period to be accounted for with an uplift of 20% for climate change, with design ensuring no flooding of the Site in up to a 1:100 year pluvial event<sup>2</sup>. Calculations assume no infiltration and discharge at greenfield rates ( $Q_{BAR}$ ) *i.e.* worst case, and are provided with this letter.

**Table 1: Outline Attenuation Volumes for the Development**

Catchment and Development infrastructure		Infrastructure Area (ha)	$Q_{BAR}$ (l/s)	1:100 year (l/s)	Attenuation volume (1:100 yr) + 20% climate change allowance (m <sup>3</sup> )
1	T7, access track, crane hardstanding	0.505	4.3	10.8	215 - 338
2	Access track, site entrance and compound	0.840	7	17.5	352 - 551
3	Access track	0.519	4.3	10.6	215 - 338
4	Access track, T6 and crane hardstanding	0.627	5.3	13.2	290 - 455
5	T5, access track and crane hardstanding	1.608	13.4	33.3	700 – 1,099
6	T4 and T3, access track and crane hardstanding	1.761	14.8	36.6	744 – 1,167
7	T1, access track, crane hardstanding, substation and construction compound	1.767	15.5	38.3	756 – 1,184
8	T2 and crane hardstanding	0.218	2.1	5.1	88 - 140

Acknowledging the necessary attenuation volumes for a 1:100 year (+20% climate change allowance) event the following attenuation storage settlement lagoon design volumes have been calculated to manage water attenuation in up to such an event.

Design details are appended to this letter. Design specifications are provided in Table 2.

<sup>1</sup> Department for Infrastructure: Technical Flood Risk Guidance (2019) [Online] Available at: <https://www.infrastructure-ni.gov.uk/sites/default/files/publications/infrastructure/technical-flood-risk-guidance-in-allowances-for-climate-change-6feb19.PDF>

<sup>2</sup> Department for Infrastructure: Technical Flood Risk Guidance, Section 3: NI Water Approach to Climate Change in Design of Drainage Systems: Surface Water Flood Protection Criteria (2019)





**Table 2: Attenuation Storage Pond Design Figures**

Catchment and attenuation infrastructure		Depth (m)	Storage Volume	Most Extreme Storm Event (Minutes)	Maximum attenuation volume in extreme storm event (m <sup>3</sup> )
1 – T7, access track, crane hardstanding	Pond with outflow orifice and overflow weir features.	1.3	279.7	600 (Winter)	251.4
2 - Access track, site entrance and compound	Pond with outflow orifice and overflow weir features.	1.7	463.7	600	408.7
3 - Access track	Pond with outflow orifice and overflow weir features.	1.3	279.7	600 (Winter)	251.5
4 - Access track, T6 and crane hardstanding	Pond with outflow orifice and overflow weir features.	1.6	412	600	340.2
5 - T5, access track and crane hardstanding	Pond with outflow orifice and overflow weir features.	1.3	933.1	960	838.2
6 - T4 and T3, access track and crane hardstanding	Pond with outflow orifice and overflow weir features.	1.3	933.1	720	882.6
7 - T1, access track, crane hardstanding, substation and construction compound	Pond with outflow orifice and overflow weir features.	1.3	933.1	720	894.2
8 - T2 and crane hardstanding	Pond with outflow orifice and overflow weir features.	1.1	116.3	480	101.8

Acknowledging the design of attenuation infrastructure managing rainfall levels in up to a 1:100 (+20% climate change allowance) event the request of providing exceedance routes is considered redundant.



## 2. Details of Exceedance Design / Routes

As the attenuation structures have been designed to accommodate run-off volumes up to the 1:100 year event plus a 20% climate change allowance, there is no requirement to provide exceedance routes.

## 3. Discharge Points

Plans showing the locations of discharge of water draining from the proposed infrastructure are shown at 1:500 scale accompanying the completed Schedule 6 Application Form, which is being submitted separately to the DfI Rivers Coleraine Area Office.

I trust that the information provided within this clarification letter is sufficient for DfI Rivers to advise that the Development complies with FLD3 of PPS15 and Technical Flood Risk Guidance in relation to Allowances for Climate Change in Northern Ireland. I would be grateful if you could confirm this in writing.

Yours sincerely,


Liam Nevins

BSc (hons) MCIWEM C.WEM

Principal Hydrologist

Encls.:

- Microdrainage outputs for each catchment
- Drainage Catchments figure

Arcus - Catchment 1		Page 1
1C Swinegate Ct East 3 Swinegate York Y01 8AJ		
Date 18/05/2020 17:41 File 4607_ICPSuDS_Catchment1...	Designed by reagand Checked by	
XP Solutions Source Control 2014.1.1		

ICP SUDS Mean Annual Flood


Input

Return Period (years)	100	Soil	0.500
Area (ha)	0.505	Urban	0.000
SAAR (mm)	1022 Region Number Ireland National		

**Results 1/s**

QBAR Rural	4.3
QBAR Urban	4.3
Q100 years	8.0
Q1 year	3.7
Q30 years	6.9
Q100 years	8.0

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Arcus - Catchment 2		Page 1
1C Swinegate Ct East 3 Swinegate York Y01 8AJ		
Date 18/05/2020 17:42 File 4607_ICPSuDS_Catchment2...	Designed by reagand Checked by	
XP Solutions Source Control 2014.1.1		

ICP SUDS Mean Annual Flood


Input


Return Period (years)	100	Soil	0.500
Area (ha)	0.840	Urban	0.000
SAAR (mm)	1000	Region Number	Ireland National

**Results    l/s**

QBAR Rural	7.0
QBAR Urban	7.0
Q100 years	13.0
Q1 year	6.0
Q30 years	11.2
Q100 years	13.0

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Arcus - Catchment 3		Page 1												
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Area (ha)	0.510	Urban	0.000											
SAAR (mm)	1000 Region Number Ireland National													
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XP Solutions	Source Control 2014.1.1	

ICP SUDS Mean Annual Flood


Input


Return Period (years)	100	Soil	0.500
Area (ha)	0.630	Urban	0.000
SAAR (mm)	1005 Region Number Ireland National		

**Results 1/s**


QBAR Rural	5.3
QBAR Urban	5.3
Q100 years	9.8
Q1 year	4.5
Q30 years	8.4
Q100 years	9.8


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Arcus - Catchment 5		Page 1												
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Area (ha)	1.600	Urban	0.000											
SAAR (mm)	1000	Region Number	Ireland National											
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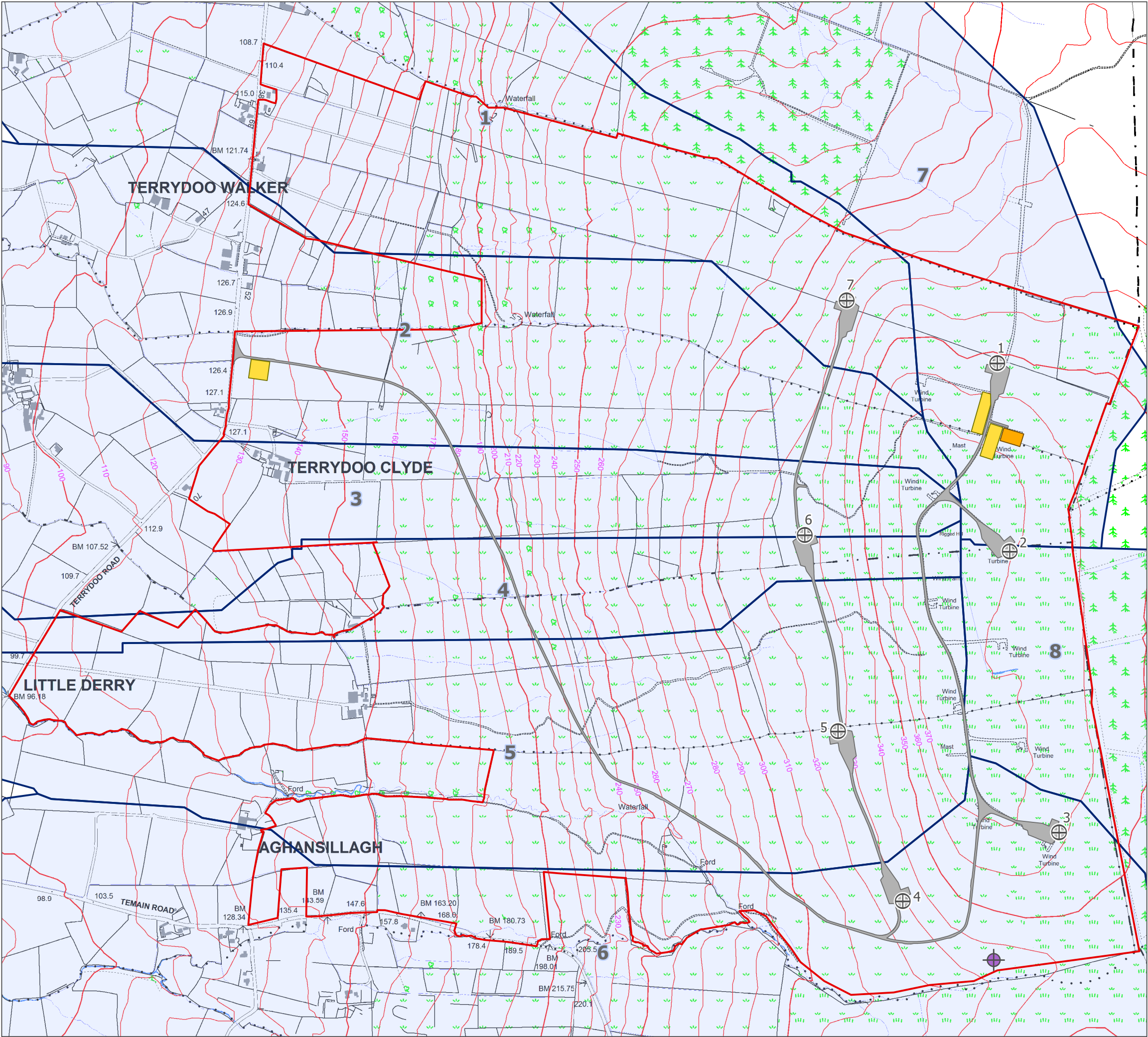
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Area (ha)	1.760	Urban	0.000											
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- ⊕ Proposed Turbine Location
- ▭ Site Boundary
- ⊙ Meteorological Mast Location
- ▭ Access Track
- ▭ Construction Compound
- ▭ Substation Compound
- ▭ Drainage Catchments

1:10,000 Scale @ A3  
0 200 400 m

Produced By: SC	Ref: 2607-PUB-035
Checked By: TP	Date: 28/10/2019

Drainage Catchments

Rigged Hill Windfarm Repowering