

Volume 1a and Volume 1b-Non-Technical Summary and Environmental Impact Assessment Report

Proposed Clonberne Wind Farm Development, Co. Galway



DOCUMENT DETAILS



Client: Clonberne Windfarm Ltd

Project Title: Proposed Clonberne Wind Farm

Development, Co. Galway

Project Number: **180740**

Document Title: Volume 1a and Volume 1b – Non-Technical

Summary and Environmental Impact

Assessment Report

Document File Name: **Volume 1 EIAR F - 2024.06.20 - 180740**

Prepared By: MKO

Tuam Road Galway Ireland H91 VW84



Rev	Status	Date	Author(s)	Approved By
01	Final	20/06/2024	JF, JP, SH, ER, KB, KOD, PM, DB, BnT, MT, MC, JS, AL	OC, MW, AC, SM, PR, JH, PC, MG, CJ, EC, JF, JW



Table of Content

1.	INTRODUCTION	
	1.1 Introduction	1_1
	1.1.1 References to Proposed Project	
	1.1.2 Proposed Project Site Location	
	1.2 Legislative Context of Environmental Impact Assessment	
	1.2.1 EIAR Guidance	
	1.2.2 Wind Energy Development Guidelines for Planning Authorities	
	1.3 The Applicant	
	1.4 Brief Description of the Proposed Project	
	1.4.1 Description of the Proposed Wind Farm	
	1.4.2 Description of the Proposed Grid Connection	
	1.4.3 Description of the Proposed Project	
	1.5 Need for the Proposed Project	
	1.5.1 Overview	
	1.5.2 Energy Security	
	1.5.3 Competitiveness of Wind Energy	
	1.5.4 Increasing Energy Consumption	
	1.5.5 Reduction of Carbon Emissions and Other Greenhouse Gases	
	1.5.6 Economic Benefits	
	1.6 Purpose and Scope of the EIAR	
	1.7 Structure and Content of the EIAR	
	1.7.1 Description of Likely Significant Effects and Impacts	
	1.8 Project Team	
	1.8.1 Project Team Responsibilities	
	1.8.2 Project Team Members	
	1.9 Difficulties Encountered	
	1.10 Viewing and Purchasing the EIAR	
2.	BACKGROUND TO THE PROPOSED PROJECT	2-1
	2.1 Introduction	2-1
	2.1.1 Renewable Energy Resources	
	2.2 Climate Change Policy and Targets	
	2.2.1 International Policy and Targets	
	2.2.2 National Climate Policy	
	2.2.3 Climate Target Progress	
	2.3 Renewable Energy Policy and Targets	
	2.3.1 EU Renewable Energy Policy	
	2.3.1.2 Project Compliance with EU Policy	
	2.3.2 National Renewable Energy Policy	
	2.3.3 Renewable Energy Target Progress	
	2.4 Strategic Planning Policy Context	2-22
	2.4.1 Introduction	
	2.4.2 National Policy Context	2-22
	2.4.2.2 Project Compliance with the National Planning Framework	
	2.4.2.3 Project Compliance with National Policy	
	2.4.3 Regional Policy Context	
	2.4.3.1 Northern and Western Regional Spatial and Economic Strategy	
	2.4.3.2 Project Compliance with Regional Policy2.4.4 Local Policy	
	2.4.4.1 Wind Farm Site	
	2.4.4.2 Galway County Development Plan 2022-2028	
	2.4.4.3 Local Authority Renewable Energy Strategy	2-28
	2.4.4.4 Grid Connection	
	2.4.4.5 Summary Conclusion on Local Policy for County Galway	2-33



	2.4.5	Other Relevant Material Considerations	2-33
	2.5 F	Planning History	2-37
	2.5.1	Planning applications within the Proposed Wind Farm Application Bound	dary2-37
	2.5.2	Planning applications within the Proposed Grid Connection Application I	3oundary
	2.5.3	Wind Energy Developments within 25km of the Site	2-40
	2.6	Scoping and Consultations	2-44
	2.6.1	Scoping	
	2.6.2	Scoping Responses	
	2.7	Other Consultations	
	2.7.1	Pre-Planning Meetings	
		7.1.1 Galway County Council	
	2.	7.1.2 An Bord Pleanála	
	2.7.2	Community Consultation	2-61
	2.8	Cumulative Impact Assessment	2-62
	2.8.1	Methodology for the Cumulative Assessment of Projects	
	2.8.2	Cumulative Study Area	
	2.8.3	Summary	2-68
_	CITE CEL	ECTION AND REASONABLE ALTERNATIVES	2.4
3.	SITE SEL	ECTION AND REASONABLE ALTERNATIVES	3-1
	3.1 I	ntroduction	3-1
		Consideration of Reasonable Alternatives	
	3.2.1	Methodology	
	3.2.2	'Do-Nothing' Alternative	
	3.2.3	Alternative Sites/Strategic Site Selection	
	3.2.4	Alternative Stress Strategie Site Selection	
	3.2.5	Alternative Turbine Numbers and Model	
	3.2.6	Alternative Turbine Layout and Design	
	3.2.7	Alternative Design of Ancillary Infrastructure	
	3.2.8	Alternative Grid Connection Cabling Route Options	
	3.2.9	Alternative Transport Route and Site Access	
	3.2.10	Alternative Mitigation Measures	
_		-	
4.	DESCRIP	TION OF THE PROPOSED PROJECT	4-1
	4.1 I	ntroduction	4-1
		Development Layout	
		Proposed Project Components	
	4.3.1	Proposed Wind Farm	
		3.1.1 Wind Turbines	
		3.1.2 Site Roads	
		3.1.3 Site Underground Electrical (33kV) and Communications Cabling	
	4.	3.1.4 Site Underground Electrical (38kV) Cabling	
		3.1.5 Temporary Construction Compounds	4-20
		3.1.6 Rock Extraction	
		3.1.7 Peatland Enhancement Area	
		3.1.8 Tree Felling and Replanting	
	4.3.2	Proposed Grid Connection	
		3.2.1 Proposed Substation	
		3.2.2 Grid Connection	
	4.3.3	Peat and Soil Management Plan	
	4.	3.3.1 Quantities	
	4.	3.3.2 Peat and Spoil Repository Areas	
	4.3.4	Site Activities	
		3.4.1 Environmental Management	
		3.4.2 Refuelling	
		3.4.4 Concrete Pouring	
		3.4.4 Concrete Pouring	
		3.4.6 Vehicle Washing	
		3.4.7 Waste Management	
		Access and Transport	
	4.4.1	Site Entrance	



5.

4.4.	2 Passing Bays	4-48
4.4.		
	4.4.3.1 Turbine Delivery Accommodation Works	
4.4.	4 Traffic Management	4-49
4.5	Site Drainage	4-58
4.5.	1 Introduction	4-58
4.5.	2 Existing Drainage Features	4-58
4.5.		
4.5.		
	4.5.4.1 Interceptor Drains	
	4.5.4.2 Swales	
	4.5.4.3 Check Dams	
	4.5.4.4 Level Spreaders	
	4.5.4.5 Piped Slope Drains	
	4.5.4.6 Vegetation Filters	
	4.5.4.8 Siltbuster	
	4.5.4.9 Silt Bags	
	4.5.4.10 Sedimats	
	4.5.4.11 Culverts	
	4.5.4.12 Silt Fences	
	4.5.4.13 Hydrocarbon Interceptors	4-68
	4.5.4.14 Forestry Felling Drainage	
4.5.	5 Borrow Pit Drainage	4-70
4.5.	6 Cable Trench Drainage	4-70
4.5.	7 Site and Drainage Management	4-71
	4.5.7.1 Preparative Site Drainage Management	
	4.5.7.2 Pre-emptive Site Drainage Management	
	4.5.7.3 Reactive Site Drainage Management	
4.5.		
4.5.		
4.5.		
4.5.	.11 Construction Phase Monitoring and Oversite	4-73
4.6	Construction Methodologies	4-74
4.6.		
4.6.		
	4.6.2.1 Turbine Foundations	
	4.6.2.2 Site Roads and Hardstand Areas	4-76
	4.6.2.3 Proposed Clear-Span Bridge Crossing	
	4.6.2.4 Temporary Construction Compounds	
	4.6.2.5 Underground Electrical (33kV) and Communication Cabling	4-80
	4.6.2.6 Site Underground Electrical (38kV) Cabling and End Masts	
4.0	4.6.2.7 Borrow Pit	
4.6.		
	4.6.3.1 Electricity Substation and Control Building	
	4.6.3.3 Underground 220kV Cable Trench	
	4.6.3.4 Joint Bays	
	4.6.3.5 Existing Underground Services	
	4.6.3.6 Underground Cable Watercourse	
	4.6.3.7 Grid Connection Infrastructure	
4.7	Community Gain Proposal	
4.7.	·	
4.7.	-	
4.7.	The state of the s	
4.8	Operation	
4.8.		
4.8.	2 Monitoring	
4.9		
4.9	Decommissioning	4-96
	-	
POPUL	ATION AND HUMAN HEALTH	5-1
POPUL 5.1	LATION AND HUMAN HEALTH	5- 1
POPUL 5.1 5.1.2	Introduction	5-1 5-1
POPUL 5.1	Introduction	5-1 5-1 5-1



	5.2.2	Human Health	5-1
	5.2.2.	National Guidance	5-2
		2 IEMA Guidance 2017	
	5.2.2.	B EIA Significance Matric for Human Health, IEMA Guidance 2022	
	5.2.3	Shadow Flicker	
	5.2.3.		
	5.2.3.	2 Guidance	5-5
	5.2.3.	3 Shadow Flicker Prediction Methodology	5-1
		4 Turbine Dimensions	
		5 Shadow Flicker Study Area	
		S Assumptions and Limitations	
5.3	: Pop	ulation	
	5.3.1	Receiving Environment	5-4
	5.3.2	Population Trends	5-4
	5.3.3	Population Density	
	5.3.4	Household Statistics	
	5.3.5	Age Structure	
	5.3.6	Employment and Economic Activity	
		1 Economic Status of the Study Area	
		2 Employment by Socio-Economic Group	
	5.3.0. 5.3.6	3 Employment and Investment Potential in the Irish Wind Energy Industry	5 10
	5.3.7	Land-Use	
	5.3.8	Services	
		1 Education	
		2 Access and Public Transport	
_ 1		3 Amenities and Community Facilities	
5.4		rism	
	5.4.1	Tourism Numbers and Revenue	
		. Tourism Barometer: Strategic Research and Insight September 2023	
	5.4.2	Tourist Attractions	
	5.4.3	Tourist Attitudes to Wind Farms	5-16
		1 Scottish Tourism Survey 2021	
		2 Fáilte Ireland Surveys 2007 and 2012	
5.5	Pub	lic Perception of Wind Energy	5-18
	5.5.1	Sustainable Energy Ireland Survey 2003 and 2017	
	5.5.1.1		
	5.5.1.2	2 SEAI 2003 Survey Findings	
		Survey Update 2017	
		4 Conclusions	
	5.5.2	Public Perceptions of Wind Power in Scotland and Ireland Survey 2005	5-20
	5.5.2.		
	5.5.2.	2 Study Area	
	5.5.2.	3 Findings	5-20
	5.5.2.	4 Conclusions	5-21
	5.5.3	Irish Wind Energy Association (IWEA) Interactions Opinion Poll on Wind I	
5.6	. Hea	Ith Effects of Wind Farms	
0.0	5.6.1	Introduction	
	5.6.2	Health Effect Studies	
	5.6.3	Turbine Safety	
	5.6.4	Electromagnetic Interference	
	5.6.5	Assessment of Effects on Human Health	
	5.6.6	Vulnerability of the Project to Natural Disasters and Major Accidents	5-29
5.7	Pro	perty Values	5-30
5.8	Sha Sha	dow Flicker	5-33
٠.٠	5.8.1	Shadow Flicker Assessment Results	
	5.8.1.		
		2 Cumulative Shadow Flicker2	
E 0			
5.9		idential Amenity	
5.1	U Like	ly Significant Effects and Associated Mitigation Measures	
	5.10.1	Potential Effects	
	5.10.2	'Do-Nothing' Scenario	5-50
	5.10.3	Construction Phase	
		3.1 Population	
	5.10.4	Health	
		Operational Phase	



		1 Population	
		.2 Health	
		Decommissioning Phase	
		Cumulative and In-Combination Effects	
		.1 Employment and Economic Activity	
		.2 Tourism and Amenity	
		.4 Air (Dust)	
		.5 Health and Safety	
		.6 Property Values	
		7 Services	
		.8 Shadow Flicker	
		.9 Residential Amenity	
	5.11 Sum	ımary	5-74
6.	BIODIVERSI	TY	6-1
	6.1 Intro	oduction	6.1
		uirements for Ecological Impact Assessment	
		vant Guidance	
		Statement of Authority	
	6.4 Metl	hodology	6-6
	6.4.1	Desk Study	6-7
		Scoping and Consultation	
		Field Surveys	
	6.4.3.1	Multi-disciplinary Walkover Surveys (as per NRA Guidelines, 2009)	6-10
		2 Dedicated Habitat and Vegetation Composition Surveys	
		3 Fauna Surveys	
	6.4.4	Methodology for Assessment of Impacts and Effects	6-17
	6.4.4.1	Identification of Target Receptors and Key Ecological Receptors	6-17
	6.4.4.2	2 Valuing Ecological Receptors	6-17
		3 Characterisation of Impacts and Effects	
		Determining the Significance of Effects	
		5 Incorporation of Mitigation	
		5 Limitations	
		blishing the Ecological Baseline	
		Desk Study	
	6.5.1.1		6-19
	6.5.1.2	· · · · · · · · · · · · · · · · · · ·	
	6.5.1.3		
	6.5.1.4 6.5.1.5	3 - 1 - 3	
	6.5.1.6	· · · · · · · · · · · · · · · · · · ·	
	6.5.1.7		
	6.5.1.8		
		Freshwater Pearl Mussel (Margaritifera margaritifera)	
		0 Marsh Fritillary (Euphydryas aurinia)	
		1 Inland Fisheries Ireland Data	
	6.5.1.1	2 Water Quality	6-37
	6.5.1.1	3 Local Hydrology and Hydrogeology	6-39
	6.5.1.1	4 Conclusions of the Desktop Study	6-40
	6.6 Desc	cription of the Existing Environment	6-41
	6.6.1	Description of Habitats and Flora	6-41
	6.6.1.1	Proposed Wind Farm Site	6-42
	6.6.1.2		
	6.6.1.3		
	6.6.1.4	9	
	6.6.1.5		
	6.6.1.6		
		Fauna	
	6.6.2.1		
	6.6.2.2		
	6.6.2.3 6.6.2.4		
	6.6.2. ² 6.6.2. ⁵		
	6.6.2.6		
	6.6.2.7		
		Aquatic and River Habitat Surveys	



	6.6.2.9 Invertebrates	
	6.6.3 Importance of Ecological Receptors	
	6.7 Ecological Impact Assessment	6-108
	6.7.1 Do-Nothing Effect	6-108
	6.7.2 Likely Significant Effects During Construction Phase	6-108
	6.7.2.1 Effects on Habitats During Construction	6-108
	6.7.2.2 Effects on Protected Fauna During Construction	
	6.7.2.3 Invasive Species	
	6.7.3 Likely Significant Effects During Operational Phase	
	6.7.3.1 Effects on Habitats During Operation	
	6.7.3.2 Effects on Fauna during Operation	6 126
	6.7.4 Likely Significant Effects During Decommissioning Phase	
	6.7.5 Effects on Designated Sites	
	6.7.5.2 Impacts on European Sites	
	6.8 Cumulative impact	
	·	
	6.8.3 Assessment of Cumulative Effects	
	6.8.4 Conclusion	6-137
7.	ORNITHOLOGY	7-1
	7.1 Introduction	
	7.1.1 Description of the Proposed Project	
	7.1.2 Legislation, Guidance and Policy Context	
	7.1.3 Statement of Authority and Competence	7-3
	7.2 Assessment Approach and Methodology	7-4
	7.2.1 Desk Study	
	7.2.2 Consultation	
	7.2.2.1 Scoping and Consultation	
	7.2.3 Identification of Target Species and Key Ornithological Receptors	
	7.2.4 Field Surveys	
	7.2.4.1 Initial Site Assessment	
	7.2.4.2 Survey Methodologies	7-6
	7.2.5 Ornithological Evaluation Criteria and Impact Assessment Methodology	
	7.2.5.1 Potential Effects Associated with Proposed Project	
	7.2.5.2 Geographical Framework	7-19
	7.2.5.3 Description of Impacts	
	7.2.5.4 Collision Risk Assessment	
	7.2.6 Assessment Justification	
	7.2.6.1 Survey Data	7-22
	7.2.6.3 Mitigation	7-23
	7.3 Baseline Conditions and Receptor Evaluation	
	7.3.1 Identification of Designated Sites within the Likely Zone of Influence of th	
	Development	
	7.3.2 Breeding and Wintering Bird Atlas Records	
	7.3.4 Bird Sensitivity Mapping Tool	
	7.3.4 Irish Wetland Bird Survey (I-WeBS) Records	
	7.3.5 NPWS Rare and Protected Species Dataset	
	7.4 Field Survey Results	
	7.4.1 Golden Plover	
	7.4.2 Hen Harrier	
	7.4.3 Kingfisher	
	7.4.4 Little Egret	
	7.4.5 Merlin	
	7.4.6 Peregrine	
	7.4.7 Whooper Swan	7-33
	7.4.8 Curlew	7-34
	7.4.9 Kestrel	7-35
	7.4.10 Lapwing	
	7.4.11 Red Grouse	7-37
	7.4.12 Snipe	7-37
	7.4.13 Woodcock	7-39



	7.4.14	Buzzard	7-39
		Long-eared Owl	
	7.4.16	Sparrowhawk	7-40
	7.4.17	Passerines (Red Listed)	7-42
7.5	Rec	eptor Evaluation	7-42
		Determination of Population Importance	
	7.5.1.1		
	7.5.1.2		
	7.5.1.3		
	7.5.1.4		
	7.5.1.5		
	7.5.1.6		
	7.5.1.7	·	
	7.5.1.8		
	7.5.1.9 7.5.1.1	0 Lapwing	
		1 Red Grouse	
		2 Snipe	
		3 Woodcock	
		4 Buzzard	
		5 Long-eared Owl	
		6 Sparrowhawk	
		7 Passerines (Red Listed)	
		Identification of Key Ornithological Receptors	
	7.5.3	Key Ornithological Receptor Sensitivity Determination	7-59
7.6	Pote	ential Effects	7-59
		Do-Nothing Effect	
		Effects on Key Ornithological Receptors during Construction and Operatio	
		Farm Site)	
	7.6.2.1		
	7.6.2.2	, , , , , , , , , , , , , , , , , , , ,	
	7.6.2.3		
	7.6.2.4		
	7.6.2.5		
	7.6.2.6	,	
	7.6.2.7	1 01	
	7.6.2.8	- P - (
		Buzzard (All Seasons)	
		.0 Sparrowhawk (All Seasons)Effects on Key Ornithological Receptors during Decommissioning (Wind Fa	
	7.0.5	Lifects of Ney Officiological Neceptors during Decommissioning (Wind Pa	
	7631	All Species	
		Effects on Designated Areas (Proposed Project)	
		Effects Associated with the Turbine Delivery Route	
		Effects Associated with the Grid Connection Route	
- -			
7.7		gation and Best Practice Measures	
		Mitigation by Design	
		Mitigation During Construction, Operation and Decommissioning	
		Construction Phase Mitigation	
		2 Operational Phase Mitigation	
70		B Decommissioning Phase Mitigation	
7.8		itoring	
		Pre-Construction and Construction Surveys	
		Operational Phase Surveys	
		Decommissioning	
7.9	Resi	dual Effects	7-91
7.10	O Asse	essment of Cumulative Effects	7-92
	7.10.1	Other Plans and Projects	7-92
	7.10.1.	1 Plans Considered in the Cumulative Impact Assessment	7-92
	7.10.1.	2 Projects Considered in the Cumulative Impact Assessment	7-92
	7.10.1.	3 Forestry and Agricultural Practices	7-93
		4 Peat Extraction Activities	
		5 Other Developments/Land Uses	
		6 Other Wind Farm Developments	
		7 Cooloo Wind Farm	
	7.10.1.	8 Clooncon East Turbine	7-94



	7.10.1.9 Cloonlusk Wind Farm	7-94
	7.10.1.10 Cloonascragh Turbine	
	7.10.1.11 Laurclavagh Wind Farm	7-95
	7.10.1.12 Ballykinaca/Cuillmore Wind Farm	7-95
	7.10.1.13 Cloontooa Wind Farm	
	7.10.1.14 Shancloon Wind Farm	
	7.10.2 Assessment of Cumulative Effects	
	7.10.2.1 Golden Plover (County Importance)	
	7.10.2.2 Hen Harrier (National Importance)	
	7.10.2.3 Merlin (County Importance)	
	7.10.2.4 Peregrine (County Importance)	
	7.10.2.6 Kestrel (Local Importance)	
	7.10.2.7 Lapwing (County Importance)	
	7.10.2.8 Snipe (County Importance)	7-100
	7.10.2.9 Buzzard (Local Importance)	
	7.10.2.10 Sparrowhawk (Local Importance)	
	7.11 Conclusion	
8.	LAND SOILS AND GEOLOGY	
	8.1 Introduction	
	8.1.1 Background and Objectives	
	8.1.2 Statement of Authority	
	8.1.3 Relevant Legislation	8-2
	8.1.4 Relevant Guidance	8-2
	8.2 Assessment Methodology	8-2
	8.2.1 Desk Study	
	8.2.2 Baseline Monitoring and Site Investigations	
	8.2.3 Scope and Consultation	
	8.2.4 Impact Assessment Methodology	
	8.2.5 Limitations and Difficulties Encountered	
	8.3 Existing Environment	
	8.3.1 Site Description and Topography	
	8.3.3.1 GSI Mapping	
	8.3.3.3 Site Investigations (Drilling and Trial Pitting)	
	8.3.4 Bedrock Geology	
	8.3.4.1 GSI Mapping	
	8.3.4.2 Investigation Drilling	
	8.3.5 Geological Resource Importance	
	8.3.6 Geological Heritage & Designated Sites	
	8.3.7 Soil Contamination	
	8.3.8 Economic Geology	
	8.3.9 Geohazards	
	8.3.10 Peat Stability Risk Assessment	
	8.3.10.1 Introduction	
	8.3.10.2 Peat Stability Desk Study	
	8.3.10.3 Peat Stability Investigations	
	8.3.10.4 Peat Stability Analysis	
	8.3.10.5 Peat Stability Assessment Results	
	8.3.10.6 Overall Risk Rating	
	8.4 Characteristics of the Proposed Project	8-27
	8.5 Likely and Significant Impacts on Land, Soils and Geology	8-29
	8.5.1 Do Nothing Scenario	
	8.5.2 Likely impacts and Mitigation Measures – Construction Phase	
	8.5.2.1 Effects on Land and Land use (Proposed Project)	
	8.5.2.2 Peat, Subsoil and Bedrock Excavation (Proposed Project)	8-30
	8.5.2.3 Contamination of Soils by Leakages and Spillages of Hydrocarbons or Chemic Project)	als (Proposed
	8.5.2.4 Erosion of Exposed Subsoils and Peat During Construction of Infrastructure (F	
	Project)	
	8.5.2.5 Peat Instability and Failure (Proposed Project)	
	8.5.2.6 Turbine Delivery Route Works (Wind Farm)	8-34
	8.5.2.7 Turbine Base Piling Works (Wind Farm)	8-35



	8.5.2	2.8 Peatland Enhancement (Wind Farm)	8-35
	8.5.3	Operational Phase - Likely Significant Effects and Mitigation Measures (Propo	
	8.5.4	Decommissioning Phase - Likely Significant Effects and Mitigation Measures (Proposed Project)	
	8.5.5	Risk of Major Accidents and Disasters	8-37
	8.5.6	Human Health Effects	8-37
	8.5.7	Cumulative Effects	8-38
	8.5.7	7.1 Construction Phase	8-38
		7.2 Operational Phase	
		7.3 Decommissioning Phase	
9	8.5.8	Post Construction Monitoring	
J.		roduction	
	9.1.1	Background and Objectives	
	9.1.2	Statement of Authority	
	9.1.3	Scoping and Consultation	
	9.1.4	Relevant Legislation	
	9.1.5	Relevant Guidance	
		thodology	
	9.2.1	Desk Study	
	9.2.2	Baseline Monitoring and Site Investigations	
	9.2.3	Impact Assessment Methodology	
	9.2.4	Overview of Impact Assessment Process	
	9.2.5	Limitations and Difficulties Encountered	
		ceiving Environment	
	9.3.1	Site Description and Topography	
	9.3.2	Water Balance	
	9.3.3	Regional and Local Hydrology	
	9.3.4	Project Site Existing Drainage	
	9.3.4	1.1 Drainage Regime	
	9.3.4	1.2 Surface Water Flow Measurements	9-14
	9.3.5	Baseline Assessment of Development Site Runoff	
	9.3.6	Flood Risk Assessment	
	9.3.7	Surface Water Quality	
	9.3.8	Regional & Local Hydrogeology	
	9.3.9	Site Hydrogeology	
		9.1 Introduction	
		9.2 Site Investigation Summary	
	9.3.10	Groundwater Vulnerability	
	9.3.11	Groundwater Quality Hydrochemistry	
	9.3.12	Groundwater Body Status	
	9.3.13	River Water Body Status	
	9.3.14	Designated Sites and Habitats	
	9.3.15	Water Resources	
		5.1 Public/Group Water Schemes	
	9.3.1	5.2 Private Domestic Wells	9-49
	9.3.1	.5.3 Surface Water Resources	
	9.3.16	Receptor Sensitivity	
	9.4 Ch	aracteristics of the Proposed Project	
	9.4.1	Proposed Drainage Management	
	9.5 Lik	ely Significant Effects and Mitigation Measures	
	9.5.1	Do Nothing Scenario	
	9.5.2	Construction Phase – Likely Significant Effects and Mitigation Measures	
		2.1 Potential Effects on the Gurteen/Cloonmore GWS Spring Source (Wind Farm)2.2 Clear Felling of Coniferous Plantation and Potential Surface Water Quality Effects (Water Management of Farm)	/ind
	9.5.2	2.3 Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting ir Suspended Solids Entrainment in Surface Waters (Proposed Project)	า
		2.4 Potential Impacts on Groundwater Levels During Excavations (Proposed Project) Excavation Dewatering and Potential Impacts on Surface Water Quality (Proposed P	9-68 roject)
			0.00



		^
M	1	0)
• •	•	3
		V

	9.5.2.6	Potential Release of Hydrocarbons During Construction and Storage (Proposed	
	9.5.2.7	Groundwater and Surface Water Contamination from Wastewater Disposal (Pro	oposed
	0.5.0.0	Project)	
	9.5.2.8 9.5.2.9		
	3.3.2.3		
		Potential Hydrological Effects on Designated Sites (Proposed Project)	9-74
	9.5.2.11	Potential Effects on Local Groundwater Well Supplies from Excavations (Propo	
	95212	Turbine Delivery Route Works (Wind Farm)	
	9.5.2.13	Effects of Construction Works on the WFD Status of Downstream Waterbodies	s (Proposed
		Project)	
		Use of Siltbuster and Impacts on Downstream Surface Water Quality (Proposed Potential Surface Water Quality Effects of the Proposed Grid Connection Earth	
	9.5.2.15	and Watercourse Crossings (Grid Connection)	
		Potential Groundwater Effects Associated with Piled Turbine Foundations at W	ind Farm.9-81
	9.5.2.17	Potential Effects on Wetland Hydrology (Proposed Project)	9-84
		Hydrological Effects Peatland Enhancement (Wind Farm)	
		Removal of Vegetation Cover and Progressive Replacement of Natural Surface	
	3.3.3.1	Permeability Surfaces (Proposed Project)	9-85
		Runoff Resulting in Suspended Solids Entrainment in Surface Waters	
	9.5.3.3	Potential Effects on the Gurteen/Cloonmore GWS Spring Source during Operat (Wind Farm)	
	9.5.4 D	ecommissioning Phase - Likely Significant Effects and Mitigation Measi	
	3.3.1	(Proposed Project)	
	9.5.5 R	isk of Major Accidents and Disasters (Proposed Project)	
		ssessment of Potential Health Effects (Proposed Project)	
		umulative Effects (Proposed Project)	
		Cumulative Effects with Agriculture	
		Cumulative Effects with Commercial Forestry	
	9.5.7.4	Cumulative Effects with One Off Housing Developments	9-92
	9.5.7.5	Cumulative Effects with Other Wind Farms	9-92
10 .	AIR QUALITY		10-1
	10.1 Introd	duction	10-1
		ackground	
		elevant Guidance and Legislation	
	10.1.3 S	tatement of Authority	10-2
		uality	
		elevant Legislation	
		ir Quality Standards Air Quality and Health	
		Air Quality and Healthlethodology	
		Air Quality Zones	
	10.2.3.2	Air Quality Data Review	10-10
		Dust	
		aseline Air Quality Sulphur Dioxide (SO ₂)	
		Particulate Matter (PM ₁₀)	
	10.2.4.3	Nitrogen Dioxide (NO ₂)	10-16
		Carbon Monoxide (CO)	
		Ozone (0 ₃) Dust	
		Significant Effects and Associated Mitigation Measures	
		Do-Nothing' Effect	
		onstruction Phase	
		Exhaust Emissions	
		Dust Emissions	
		perational Phase Exhaust Emissions	
		Dust Emissions	
	10.3.3.3	Air Quality	10-25
		ecommissioning Phase	
	10.3.5 C	umulative Assessment	10-26



11.	CLIMATE	11-1
	11.1 Introduction	11_1
	11.1.1 Background	
	11.1.2 Relevant Guidance	
	11.1.3 Scoping and Consultation	
	11.2 Statement of Authority	
	11.3 Climate Change and Greenhouse Gases	
	11.3.1 International Greenhouse Gas Emission and Climate Targets	
	11.3.1.1 Kyoto Protocol	
	11.3.1.2 Conference of the Parties	11-4
	11.3.1.3 COP21 Paris Agreement	
	11.3.1.4 COP25 Climate Change Conference- Madrid	
	11.3.1.5 COP28 Climate Change Conference – Dubai	II-5
	11.3.1.7 Climate Change Performance Index 2024	
	11.3.1.8 State of the Global Climate 2023	
	11.3.2 National Greenhouse Gas Emission and Climate Targets	11-13
	11.3.2.1 Programme for Government	11-13
	11.3.2.2 Climate Action and Low Carbon Development (Amendment) Act 2021	
	11.3.2.3 Climate Change Advisory Council 2023	
	11.3.2.4 Carbon Budgets	
	11.3.2.6 Climate Action Plan 2024	
	11.3.2.7 Irelands Climate Change Assessment	11-13
	11.3.2.8 Greenhouse Gas Emissions Projections	
	11.3.3 Local Greenhouse Gas Emission and Climate Targets	
	11.3.3.1 Draft Galway Local Authority Climate Action Plan 2024-2029	
	11.4 Climate and Weather in the Existing Environment	
	11.5 Calculating Carbon Losses and Savings from the Proposed Project	11-24
	11.5.1 Background	11-24
	11.5.2 Methodology for Calculating Losses	
	11.5.3 Carbon Losses and Savings Calculations	
	11.5.3.1 Carbon Losses	
	11.5.3.2 Carbon Savings	
	11.6 Likely Significant Effects and Associated Mitigation Measures	11-29
	11.6.1 'Do-Nothing' Effect	
	11.6.2 Construction Phase	
	11.6.3 Operational Phase	
	11.6.3.1 Greenhouse Gas Emissions	
	11.6.4 Decommissioning Phase	
	11.7 Cumulative Assessment	
	11.7.1 Construction Phase	
	11.7.2 Operational Phase	
	11.7.3 Decommissioning Phase	
12.	NOISE & VIBRATION	
	12.1 Introduction	12-1
	12.1.1 Statement of Authority	
	12.2 Legislation, Policy and Guidelines	
	12.3 Consultation	
	12.4 Assessment Methodology and Significance Criteria	
	12.4.1 Construction and Decommissioning Noise Methodology	
	12.4.2 Construction Vibration	
	12.4.3 Operational Noise Methodology	
	12.4.4 Potential Effects Scoped Out	
	12.4.5 Method of Baseline Characterisation	
	12.4.6 Criteria for the Assessment of Effects	
	12.5 Baseline Conditions	
	12.5.1 Current Baseline	
	12.5.2 Summary of Sensitive Receptors	
	12.6 Assessment of Likely Effects	
	12.6.1 Do-nothing Effect	
	12.0.1 DO 110t111116 E1100t	1∠-1/



	12.6.2 Construction Noise Assessment Locations	12-17
	12.6.3 Operational Noise Assessment Locations	12-17
	12.6.4 Potential Noise Effects (Proposed Project)	12-18
	12.6.5 Operational Noise Effects (Proposed Grid Connection)	
	12.6.6 Operational Noise Effects (Proposed Wind Farm)	
	12.6.7 Potential Cumulative Effects	
	12.7 Mitigation	
	12.7.1 Mitigation during Decommissioning and Construction	
	12.7.2 Mitigation during Operation	
	12.8 Assessment of Residual Effects for Proposed Project	12-29
	12.8.1 Residual Construction and Decommissioning Effects	
	12.8.2 Residual Operational Effects	
	12.8.3 Residual Cumulative Effects	
	12.9 Summary	12-29
13 .	CULTURAL HERITAGE	13-1
	13.1 Introduction	13-1
	13.1.1 Location and Topography	
	13.1.2 Statement of Authority	
	13.1.3 Relevant Guidance and Legislation	
	13.1.3.1 Guidance	
	13.1.3.2 Legislation	
	13.1.3.3 Granada Convention	
	13.1.3.4 Galway County Development Plan 2022-2028	
	13.1.4 Statutory Consultations	
	13.2 Assessment Methodology	13-10
	13.2.1 Geographical Information Systems (GIS)	
	13.2.2 Desktop Assessment	
	13.2.2.1 Record of Monuments and Places, Sites and Monuments Record and National Monu	ments
		13-10
	13.2.2.2 Cartographic Sources and Aerial Photography	13-11
	13.2.2.3 Topographical Files - National Museum of Ireland	
	13.2.2.4 Archaeological Inventory Series	
	13.2.2.5 Record of Protected Structures	
	13.2.2.6 Excavations Database	
	13.2.2.8 Previous Assessments	
	13.2.3 Field Inspection	
	13.2.3.1 Limitations Associated with Fieldwork	
	13.2.4 Assessment of Likely Significant Effects	
	13.2.4.1 Types of Effect	
	13.2.5 Methodology for the assessment of impacts on visual setting (indirect effects	
	13.3 Existing Environment	•
	13.3.1 Results of Field Inspection	
	13.3.2 Archaeological, Architectural and Cultural Heritage	
	13.3.3 Proposed Wind Farm	
	13.3.3.1 UNESCO World Heritage Sites and those on Tentative List	13-13 13 ₋ 15
	13.3.3.2 National Monuments	
	13.3.3.3 Recorded Monuments within the Proposed Wind Farm Site	
	13.3.3.4 Recorded Monuments within 5km of the nearest proposed turbine	
	13.3.3.5 Excavations Database	13-51
	13.3.3.6 Topographical Files of the National Museum of Ireland freeland	
	13.3.3.7 Sub-Surface Archaeological Potential	
	13.3.3.8 Archaeological Landscapes	
	13.3.3.9 Protected Structures within 5km of the nearest proposed turbine	
	13.3.3.10 NIAH Structures and Historic Gardens within 5km of the nearest proposed turbine 13.3.3.11 Cartographic Evidence and Local Cultural Heritage	
	13.3.3.12 Cartographic Evidence and Local Cultural Heritage	
	13.3.4 Proposed Grid Connection	
	13.3.4.1 National Monuments	
	13.3.4.2 Recorded Monuments	
	13.3.4.3 Sub-Surface Archaeological Potential	
	13.3.4.4 Protected Structures	
	13.3.4.5 NIAH Structures and Historic Gardens	13-64
	13.3.4.6 Cartographic Evidence and Local Cultural Heritage	13-64



	13.3.5 Proposed Turbine Delivery Route	
	13.4 Likely Effects and Associated Mitigation Measures	13-68
	13.4.1 Do Nothing Scenario	
	13.4.2 Construction Phase Potential Effects (Indirect)	13-68
	13.4.3 Construction Phase Potential Effects (Direct)	
	13.4.3.1 UNESCO World Heritage Sites and those on Tentative List	
	13.4.3.2 National Monuments	
	13.4.3.4 Sub-gurfage Archaeological Patential	
	13.4.3.4 Sub-surface Archaeological Potential	
	13.4.3.6 NIAH structures and Historic Gardens	13-71
	13.4.3.7 Features of Local Cultural Heritage Merit	
	13.4.4 Operational Phase Potential Effects (Indirect)	
	13.4.4.1 UNESCO World Heritage Sites and those on Tentative List	13-72
	13.4.4.2 National Monuments	
	13.4.4.3 Recorded Monuments	
	13.4.4.5 Sub-surface Archaeology	
	13.4.4.5 Protected Structures	
	13.4.4.7 Features of Local Cultural Heritage Merit	
	13.5 Cumulative Effects	
	13.5.1 All extant planning applications within 20km	
	13.5.2 Other Wind Farms	
	13.5.3 Cumulative Effects (Direct Effects – Construction stage)	
	13.5.3.1 Cumulative effects (direct) considering other wind farms within 20km	
	13.5.4 Cumulative Effects (Indirect Effects – Operational Stage)	
	13.5.4.1 UNESCO World Heritage sites (tentative)	
	13.5.4.2 National Monuments in State Care	13-100
	13.5.4.3 Recorded Monuments	
	13.5.4.4 Protected Structures and NIAH	
	13.6 Decommissioning Phase	
	13.7 Conclusion	
	13.8 References	13-103
14.	LANDSCAPE AND VISUAL	14-1
	14.1 Introduction	
	14.1.1 Statement of Authority	
	14.1.2 Proposed Project Description	
	14.1.3 Mitigation by Design	
	14.1.4 Assessment of Alternative Turbine Designs and Layout	
	14.1.5 Scoping Replies / Pre-Planning Meeting	
	14.2 Brief Methodology and Assessment Criteria	14-5
	14.2.1 Scope and Definition of the Landscape and Visual Impact (LVIA) Study Are	a14-5
	14.2.2 Guidelines	
	14.2.3 Baseline Landscape and Visual Information	
	14.2.4 Assessment of Potential Impacts	
	14.3 Visibility of the Proposed Project	
	14.3.1 ZTV Mapping: Theoretical Visibility of the proposed turbines	
	14.3.2 Half Blade ZTV of the Proposed Turbines	
	14.3.3 Visibility in Close Proximity to the Site – Route Screening Analysis	14-14
	14.4 Landscape Baseline	
		14-21
	14.4.1 Landscape Designations and Policy Context	14-24
	14.4.1 Landscape Designations and Policy Context	14-24 14-33
	 14.4.1 Landscape Designations and Policy Context	14-24 14-33 14-45
	14.4.1 Landscape Designations and Policy Context	14-24 14-33 14-45
	 14.4.1 Landscape Designations and Policy Context	14-24 14-33 14-45 14-47
	14.4.1 Landscape Designations and Policy Context	14-2414-3314-4514-5614-56
	14.4.1 Landscape Designations and Policy Context	14-24 14-33 14-45 14-56 14-66
	14.4.1 Landscape Designations and Policy Context	14-24 14-33 14-45 14-56 14-66
	14.4.1 Landscape Designations and Policy Context	14-24 14-33 14-45 14-56 14-56 14-66
	14.4.1 Landscape Designations and Policy Context	14-24 14-33 14-45 14-56 14-66 14-67 14-68
	14.4.1 Landscape Designations and Policy Context	14-24 14-33 14-45 14-56 14-66 14-67 14-68
	14.4.1 Landscape Designations and Policy Context	14-24 14-33 14-45 14-56 14-56 14-67 14-68 14-72



	14.7.3	Operational Phase Effects	
	14.7.4	Decommissioning Phase Effects	
	14.8 Co	nclusion	.14-105
15 .	MATERIAL	. ASSETS	15-1
	15.1 Tra	affic and Transport	15-1
	15.1.1	Introduction	
	15.1.2	Receiving Environment	
	15.1.3	Existing Traffic Volumes	
	15.1.4	Proposed Project and Traffic Generation	
	15.1.5	Construction Traffic Vehicles	
	15.1.6	Traffic Effects During Construction, Operation and Decommissioning of the Proposed Wind Farm	
	15.1.7	Effect on Network of Proposed Grid Connection	
	15.1.8	Traffic Management of Large Deliveries	
	15.1.8	Abnormal Load Route Assessment	
	15.1.10	Proposed Project Access Junctions	
	15.1.10	Road Safety	
	15.1.12	Provision for Sustainable Modes of Travel	
	15.1.12	Likely and Significant Effects and Associated Mitigation Measures	
	15.1.14	Summary	
		lecommunications and Aviation	
	15.2.1	Introduction	
	15.2.2	Methodology and Guidance	
	15.2.3	Background	
	15.2.4	Preventing Electromagnetic Interference	
	15.2.5	Likely Significant Effects and Associated Mitigation Measures	
		ner Material Assets	
	15.3.1	Existing Built Services and Utilities	
	15.3.2	Waste Management	
	15.3.3	Likely Significant Effects and Associated Mitigation Measures	
	15.3.4	Cumulative Impact Assessment	15-78
16 .	MAJOR AC	CIDENTS AND NATURAL DISASTERS	16-1
	16.1 Int	roduction	16-1
	16.1.1	Statement of Authority	16-1
	16.2 As:	sessment Methodology	16-2
	16.2.1	General	
	16.2.2	Legislative Context	
		2.1 Legislation	
		2.2 Guidance Documents	
	16.2.3	Categorisation of the Baseline Environment	16-3
	16.2.4	Impact Assessment Methodology	16-3
		4.1 Introduction	
		4.2 Site Specific Risk Assessment Methodology	
	16.3 Bas	seline Conditions	16-8
	16.4 Ris	k Assessment	16-11
	16.4.1	Likely Significant Effects	
	16.4	.1.1 Do-Nothing Scenario	16-11
		1.2 Identification of Effects During Construction	
		1.3 Identification of Effect During Operation	
		1.4 Identification of Effect During Decommissioning	
		1.5 Assessment of Effect - Summary	
		.1.6 Contamination During Construction and Decommissioning	
	16.4.2	Mitigation Measures	
		.2.1 Mitigation – Contamination During Construction, Operation and Decommissioning	
		.2.2 Mitigation – Fire/Explosion During Construction and Operation Operation - Fire/Explosion During Construction and Operation	
	16.4.3	Residual Effects	
	16.4.4	Monitoring	
		4.1 Monitoring During Construction	
	16.4	.4.2 Monitoring During Operation	16-33
	16.4	.4.3 Monitoring During Decommissioning	16-33



	16.4.5	5 Impacts of Cumulative and In Combination Impacts	16-33
17.	INTERA	CTION OF EFFECTS	17-1
	17.1	Introduction	17-1
	17.1.1	Statement of Authority	17-3
	17.2	Impact Interactions Population and Human Health Biodiversity	17-3
	17.2.1	Population and Human Health	17-3
	17.2.2	Biodiversity	17-5
	17.2.3	3 Birds	1/-/
	17.2.4		17-8
	17.2.5	5 Air Quality	17-9
	17.2.6	6 Climate	17-9
	17.2.7	7 Landscape and Visual	17-9
	17.2.8		17-10
	17.3	Mitigation and Residual Impacts	17-10
18 .	SCHEDU	ULE OF MITIGATION AND MONITORING PROPOSALS	18-1
	18.1	EIAR Mitigation Measures	18-2
		FIAR Monitoring Measures	



