

Settlement	County	Settlement Hierarchy	Theoretical Visibility (ZTV)
Ballynacarrow (east)	Sligo	Village	No
Ballysadare	Sligo	Gateway Satellite	No
Boyle (east)	Roscommon	Tier 2	No
Cootehall	Roscommon	Tier 4	No
Drumshanbo	Leitrim	Support Town - Tier 2B	Partial
Lurganboy	Leitrim	Tier 4	No
Manorhamilton	Leitrim	Tier 2A	Partial
Sligo	Sligo	Gateway City	No

12.5.1.3 Recreational and Tourist Destinations

The most significant outdoor recreation and tourist destinations were identified after consulting the *Leitrim Recreation Strategy 2014* and *A growth strategy for tourism in Leitrim 2015-2021* as well as checking the most popular destinations in counties Leitrim, Sligo and Roscommon on Tripadvisor.ie. Those within the study area shown on Figure 12-6 and listed in Table 12-9 below, however, none are located within 5 kilometres of the proposed development

Table 12-9 Recreational and Tourist Destinations in the Study Area

Destination	Description	County	Theoretical Visibility
5 to 10 km			
Creevelea Abbey	Ruin of medieval Franciscan friary and National Monument	Leitrim	Full
10 to 15 km			
Arigna Mining Experience	Light- and sound-enhanced tours of an underground coal mine, plus a geology and history exhibition	Roscommon	No
Parke's Castle	Plantation era castle situated on the banks of Lough Gill	Leitrim	Partial
Corry Strand, Lough Allen	Recreation area and picnic ground on the shore of Lough Allen	Leitrim	Full
Carrowkeel Megalithic Cemetery	Neolithic era passage tomb cluster	Sligo	Full visibility in the west, none in the east
Killery and Lake Isle of Inishfree	Pier on Lough Gill and Island on Lough Gill described in a Yeats poem	Sligo	Full

Destination	Description	County	Theoretical Visibility
15 to 20 km			
Sligo Abbey	Ruined abbey in Sligo City	Sligo	No
Manorhamilton Castle	17th century plantation castle in Manorhamilton Town.	Leitrim	Partial
Tobernalt Holy Well	A historic religious site with holy statues.	Sligo	No
Carrowmore Megalithic Cemetery	Large group of megalithic monuments on the Cúil Irra peninsula	Sligo	No
Gaelic Chieftain Statue and Lough Key Viewing Point	Sculpture marking the site of the Battle of Curlew Pass, adjacent picnic area with views over Lough Key	Roscommon	Partial

12.5.1.4 Recreational Routes

Waymarked walking routes, cycle routes, scenic drives and tourist routes (e.g. the Wild Atlantic Way) were identified within the study area. None fall within 5km of the proposed development site. The routes are shown on Figure 12-6 and are listed in Table 12-10 below along with theoretical visibility shown on ZTV mapping for the routes.

Table 12-10 Recreational Routes in the Study Area

Route Name	Description	County	Theoretical Visibility (ZTV)
5 to 10 km			
Miners Way	Waymarked Walking Route	Leitrim/Sligo/Roscommon	Four main stretches of partial visibility otherwise the proposed turbines will not be seen from this trail
Sligo Way	Waymarked Walking Route	Sligo	Full visibility along the majority of the route, with stretches of no visibility along Lough Gill
Northwest Cycle Trail	Cycle Trail	Leitrim/Sligo	A stretch of partial visibility starting on the R287 south of Kilerry Mountain to Manorhamilton otherwise no visibility
10 to 15 km			
Leitrim Way	Waymarked Walking Route	Leitrim	Mainly partial or full visibility with a long stretch of no visibility along the southern part of Lough Allen and north of Dowra

Route Name	Description	County	Theoretical Visibility (ZTV)
Lough Gill Drive	Scenic Drive	Sligo/Leitrim	Full visibility in the north and partial to none in the south
Lough Allen Drive	Scenic Drive	Leitrim/ Roscommon	Mainly full with a long stretch of no visibility along the southern part of Lough Allen
Kingfisher Cycle Loop	Cycle Trail	Leitrim/ Roscommon	Mainly partial to full visibility with a long stretch of no visibility along the southern part of Lough Allen and south of Drumshanbo
15 to 20 km			
Wild Atlantic Way	Tourist Scenic Drive	Sligo	No theoretical visibility except for 1.4 km west of Ballysadare
Union Rock Trail/Oak Wood Trail	Coillte walking trails	Sligo	Full visibility on approx. half the trails
Shannon Blueway	On-water and land-based trails for paddling, walking and cycling.	Roscommon	Only partial visibility in the most northern 2 km
Sliabh an Iarainn Loop	Unmarked walking trail	Leitrim	No visibility except for above 350m OD on western slopes of Slieve Anierin
Northern Glens Trail	Scenic Drive	Leitrim/Sligo	No visibility except for a short section south-west of Manorhamilton and a stretch south and west of Dough Mountain

12.5.1.5 Viewing Points (OSI)

Within the study area there are seven viewing points marked on the OSI map none of which are within 10 km of the proposed development. All are in the vicinity of Lough Gill, six in County Sligo and one in County Leitrim. Although the viewing points are not named or numbered on the OSI map numbers and names have been assigned in Table 12-11 below and these numbers are also shown in Figure 12-6. Table 12-11 below also notes the county the view is located in, whether there is theoretical visibility indicate in the ZTV map and if the view is in the direction of the turbines.

Table 12-11 Viewing points marked on OSI map in the study area

Location	County	ZTV	Direction
10 to 15 km			
1. North Lough Gill	Sligo	Yes	Yes
2. East Lough Gill	Leitrim	Yes	No
3. Traware Bay, Lough Gill	Sligo	Yes	No
15 to 20 km			
4. Garvoge River	Sligo	No	No
5. Colgagh Lough	Sligo	No	No
6. Green Road, Sligo	Sligo	No	Yes
7. Tobernalt Bay	Sligo	No	Yes

12.5.1.6 Transport Routes

For the purpose of viewpoint selection national primary and secondary roads were assessed in detail. Preference was given to viewpoint selection on regional routes in cases where they passed through settlement areas or coincided with scenic routes to increase the number of visual receptors. There are no national primary and secondary routes within 10km of the proposed development. Transport routes within 5 kilometres of the site were assessed as part of the route screening analysis and visibility from these routes is discussed separately in Section 12.7.3.3.3.

Table 12-12 Significant Transport Routes within the Study Area

Transport Route	Theoretical Visibility
10 to 15 km	
N4	No theoretical visibility between Sligo and north of Collooney, then mainly full theoretical visibility until Lough Meenaghan, then partial theoretical visibility until study area boundary
15 to 20 km	
N15	No visibility
N16	No theoretical visibility except two short sections one NW of Sligo and another around Manorhamilton
N17	Theoretical visibility for approx. 4 kilometres approaching Collooney
N59	Short stretch of full theoretical visibility just west of Ballysadare

12.5.2

Visual Receptor Preliminary Assessment

After identifying the visual receptors in the study area based on designated scenic routes and scenic views, settlements, recreational and tourist destinations, recreational routes, OSI viewing points and transport routes a preliminary assessment will be carried out to screen out visual receptors that will not be impacted by the proposed development.

Using the Zone of Theoretical Visibility mapping shown on Figure 12-6 the visual receptors that will have no theoretical visibility are screened out as shown in Table 12-13 below.

Table 12-13 Visual Receptors Screened Out -**No visibility** indicated by ZTV map

Visual Receptor Category	County	Visual Receptor with no visibility shown on ZTV
Designated Scenic Routes and Scenic Views	Leitrim	V8, V12, V13, V14, V16, V19, V21, V22
	Sligo	1, 11, 14, 20, 36, 61, 62, 63, 71
	Roscommon	R1, R4, V1, V2, V3, V4, V6
Settlements	Leitrim	Lurganboy
	Sligo	Ballymote, Ballynacarrow (east), Ballysadare, Castlebaldwin, Geevagh, Sligo
	Roscommon	Arigna, Ballyfarnon, Boyle (east), Cootehall, Keadue,
Recreational and Tourist Destinations	Sligo	Sligo Abbey
		Tobernalt Holy Well
		Carrowmore Megalithic Cemetery
	Roscommon	Arigna Mining Experience
OSi Viewing Points	Sligo	Garvoge River
		Colgagh Lough
		Green Road, Sligo
		Tobernalt Bay
Transport Routes	Sligo	N15

Directions have been indicated for viewpoints shown on OSI maps and designated scenic views and scenic routes by either written text or on accompanying maps in the respective CDPs. Therefore, the viewing points, protected views and scenic routes within the study area, listed in Table 12-14, that are not directed towards the proposed turbines have been screened out from further assessment.

Table 12-14 Designated Scenic Views, Scenic Routes and Viewing Points Screened Out - Direction of View

Visual Receptor Category	County	Views, Scenic Routes and Viewing Points Screened Out
Designated Scenic Routes and Scenic Views	Leitrim	V17, V20
	Sligo	2, 6, 23, 44, 56, 60, 65
	Roscommon	R2, R3, V5
OSi Viewing Points	Sligo	East Lough Gill
		Traware Bay (Lough Gill)

For the remaining visual receptors visibility was assessed on site assisted by the TrueViewVisuals software, which is an iPad-based tool to help visualisation of a project live on the ground before it is built. In the case of the visual receptors shown in Table 12-15, below, views towards the turbines were either entirely screened or substantially screened. This along with in some cases distance to the proposed development site precluded these locations being selected as viewpoints.

Table 12-15 Visual Receptors Screened Out -no visibility found on site

Visual Receptor Category	County	Visual Receptor with no significant visibility found on site
Designated Scenic Routes and Scenic Views	Leitrim	V10, V18
	Sligo	4, 5, 12,13, 37, 38, 43, 54, 55, 57, 58, 64
Settlements	Leitrim	Dowra
	Sligo	Ballinafad, Ballintogher, Ballygawley, Riverstown,
Recreational and Tourist Destinations	Leitrim	Manorhamilton Castle
		Creevelea Abbey
		Killery and Lake Isle of Inishfree
	Roscommon	Gaelic Chieftain Statue and Lough Key Viewing Point
Recreational Routes	Sligo	Wild Atlantic Way, Union Rock Trail/Oak Wood Trail
	Leitrim	Sliabh an Iarainn Loop
	Roscommon	Shannon Blueway
Transport Routes	Sligo/Leitrim	N16, N17 and N59

Following the pre-assessment exercise the visual receptors shown in

Table 12-16 have been selected as viewpoints due to their significance within the study area and the potential visual effects they may experience due to the proposed wind energy development.

Table 12-16 Visual receptors screened in and selected as viewpoints

Visual Receptor Category	Description	Viewpoint
Designated Scenic Routes and Scenic Views	Co. Leitrim Scenic View V15	8
	Co. Sligo Scenic Route 3	2
	Co. Sligo Scenic Route 66	15
Settlements	Ballinagleragh	13
	Dromahair	7
	Drumkeeran	11
	Drumshanbo	14
	Killarga	10
	Manorhamilton	9
	Collooney	4
Recreational and Tourist Destinations	Parkes Castle	6
	Corry Strand	12
	Carrowkeel Megalithic Cemetery	1
Recreational Routes	Lough Gill Drive	5
	Miners Way	1, 11, 14 & 15
	Leitrim Way	9, 13 & 14
	Kingfisher Cycle Trail	13 & 14
	Northern Glens Trail	9
	Sligo Way	7
	North West Cycle Trail	7 & 9
	Lough Allen Drive	11, 13 & 14
OSi Viewing Points	North Lough Gill	5
Transport Routes	N4	2 & 3

Furthermore, two viewpoints within 2 kilometres (Viewpoints 16 and 17) were also included to assess the visual effects closer to the proposed development.

12.6

Cumulative Baseline

In terms of cumulative landscape and visual effects only other wind energy projects have been considered, as only these would be described as very tall vertical elements in the landscape and therefore give rise to significant cumulative effects. Other wind energy developments, within 20km of the proposed development, were identified by searching past planning applications lodged through the various Planning Authorities (Leitrim County Council, Sligo County Council, Roscommon County Council and An Bord Pleanála) online planning portals. The information identified in the initial planning search was then used to verify, by means of a desk-based study and ground-truthing, whether the permitted wind energy developments had been constructed. The list of existing and permitted wind turbines present within the study area are listed in Table 12-17 listed below:

Table 12-17 Existing and Permitted Wind Farms within 20 kilometres

Wind Farm	Status	No of Turbines
Co. Leitrim		
Garvagh Glebe	Existing	13
Black Banks	Existing	12
Corrie Mountain	Existing	8
Monaneenatieve	Existing	5
Spion Kop*	Existing	2
Tullynamoyle	Existing	15
Tullynamoyle Extension	Proposed	4
Carrickheeney	Existing	4
Co. Sligo		
Carrane Hill	Existing	4
Geevagh	Existing	6
Derrysallagh	Under Construction	12
Co. Roscommon		
Altagowlan	Existing	9
Garvagh Tullyhaw	Existing	11
Seltannaveeny	Existing	2
Kilronan	Existing	10

*Permission has been granted for removal of these two turbines and repowering the site with a single turbine.

The proposed Croagh turbines will be assessed alongside the above turbines to separately determine the cumulative landscape and visual effects.

12.7 Likely or Significant Landscape and Visual Effects

12.7.1 ‘Do-Nothing’ Scenario’

In the Do-Nothing scenario, the proposed development would not take place. The opportunity to harvest the wind resource at the site would be lost. The existing land uses of forestry (including felling and replanting operations) and small areas of turbary would continue at the site. Therefore, there would be no landscape or visual effects in the ‘do-nothing’ scenario.

12.7.2 Construction Phase Effects

It is estimated that the construction phase of the proposed development will last between approximately 12-18 months. This stage of the development will involve the construction of temporary construction compounds and the construction of site roads, meteorological mast, electricity substation and onsite grid connection as well as the movement of construction and turbine transport vehicles into and out of the site, to allow the construction of the turbines and associated elements.

12.7.2.1 Landscape Effects

During the 12 to 18 months the landscape effects will be only experienced near the construction areas associated with the ancillary project elements within the proposed development site. It will only be towards the end of the construction phase when the turbines are erected that there will be landscape effects experienced in the 20-kilometre study area. Therefore, it is considered that overall, these will be Short-term, Imperceptible, Negative effect landscape effects on the whole study area.

12.7.2.2 Visual Effects

For the same reasons outlined in landscape effects, during the construction phase, the ancillary project elements will give rise to a Short-term Slight, Negative visual effect.

For more details on the visual effects of the ancillary project elements see ‘Ancillary Project Elements’ in Section 12.7.3 Operational Phase Effects

12.7.3 Operational Phase Effects

12.7.3.1 Landscape Effects

12.7.3.1.1 Landscape Designations

While the designated scenic routes and views will be dealt with under visual effects the other landscape designations within the study area are Areas of Outstanding Natural Beauty (AONBs) and High Visual Amenity (HVAs) designated in Leitrim CDP. Of those put forward for full assessment after the Landscape Receptor Preliminary Assessment above the following will experience theoretical visibility:

Table 12-18 ANOBs and HVAs within 20 kilometres (Co. Leitrim)

Map Ref.	Area
Areas of Outstanding Natural Beauty (AONBs)	
A4	Patchy theoretical visibility throughout this AONB

Map Ref.	Area
Areas of Outstanding Natural Beauty (AONBs)	
A5	Theoretical visibility in the southern part of this AONB
A6	Theoretical visibility in the south-western part of this AONB
High Visual Amenity Areas (HVAs)	
B3	Theoretical visibility for the northern half of this HVA is indicated by the half blade ZTV map*
B7	Mainly full visibility in the most western third of the HVA
B8	Extensive theoretical visibility in the centre and northern part of this HVA

12.7.3.1.2 Landscape Character of the Proposed Development Site

The proposed development site is currently predominantly used for commercial forestry.

While the majority of the tree cover will remain, there will be some areas of clear-felling at the turbine bases and to accommodate other ancillary project elements.

The introduction of vertical structures in the proposed development site, although wind turbines are already present in the surrounding landscape, will result in the landscape character of the proposed development site undergoing a local change in character from its present condition. There will also be a minor localised change around the ancillary project infrastructure.

12.7.3.1.3 Landscape Character Areas

An assessment of the effects on landscape character was undertaken for the twelve LCAs within the study area that were identified as having significant theoretical visibility in the Landscape Receptor Preliminary Assessment above and listed in Table 12-4 of the same section. The individual assessments for each LCA are presented in Appendix 12.2 and summarised in Table 12-19 below.

Table 12-19 Landscape character assessment summary

Landscape Character Area (LCA)	County	LCA Sensitivity to Wind Farm Development	Magnitude of Change	Significance of Landscape Character Effect
LCA 11 Corry Mountain	Leitrim	High	Moderate	Significant
LCA 6 Doons and Crockauns	Leitrim	Moderate	Slight	Slight
LCA 7 Benboo	Leitrim	High	Slight	Moderate
LCA 8 The Boleybrack Uplands	Leitrim	High	Slight	Moderate
LCA 9 The Northern Glens, Central	Leitrim	Moderate	Slight	Slight

Landscape Character Area (LCA)	County	LCA Sensitivity to Wind Farm Development	Magnitude of Change	Significance of Landscape Character Effect
Lowlands & Lough Allen				
LCA 10 Sliabh An Iarainn	Leitrim	Moderate	Slight	Slight
LCA1 Carrane Hill	Sligo	High	Slight	Moderate
LCA2 Lough Arrow and Environs	Sligo	Moderate	Slight	Slight
LCA3 Eastern Lowlands	Sligo	Low	Moderate	Not Significant
LCA4 Lough Gill and Environs	Sligo	High	Slight	Moderate
LCA 1 Lough Allen and Arigna Foothills	Roscommon	Moderate	Slight	Slight
LCA 14 Arigna Mountains	Roscommon	Moderate	Slight	Slight
LCA 16 - Lough Key and Boyle River Network	Roscommon	Very High	Negligible	Moderate

Only Leitrim’s *LCA 11 Corry Mountain* and the provisional LCA for Sligo *LCA1 Carrane Hill*, in which the proposed turbines are located, would experience direct effects on landscape character as a result of the proposed development. All other LCAs will experience indirect landscape effects, as the proposed development might be visible from a distance within these LCAs, but not located within them.

The greatest landscape effects (“Significant”) will be experienced in Co. Leitrim’s *LCA 11 Corry Mountain*, where the majority of the turbines will be located. However, extensive tree cover will greatly contribute to screening the proposed turbines from a large part of this LCA, thus mitigating the landscape effects.

Moderate landscape effects are predicted to occur in Co. Leitrim’s *LCAs 7 and 8*, Co. Sligo’s *LCAs 1 and 4* as well as Co. Roscommon’s *LCA 16*. The magnitude of change in these LCAs was only Slight to Negligible, due to the ZTV mapping showing mainly partial visibility coupled with significant roadside vegetation screening the proposed turbines in the most areas. However, as the landscape sensitivity to wind energy is coupled with the magnitude of change to arrive at the landscape effect, the High or Very High sensitivity ratings of these landscape characters increased the landscape effects.

Furthermore, the residual visual effects from the viewpoints located in these LCAs were considered ‘Not Significant’ or ‘Slight’.

12.7.3.2 Cumulative Landscape Effects

After identifying the cumulative baseline and cumulative status for each LCA it was assessed whether the additional proposed turbines would change the status of the individual LCAs. Although, it was found that the proposed turbines would add to the cumulative landscape status, it would not change the character of any of the individual LCAs in terms of wind energy and therefore the cumulative landscape effects are considered Low.

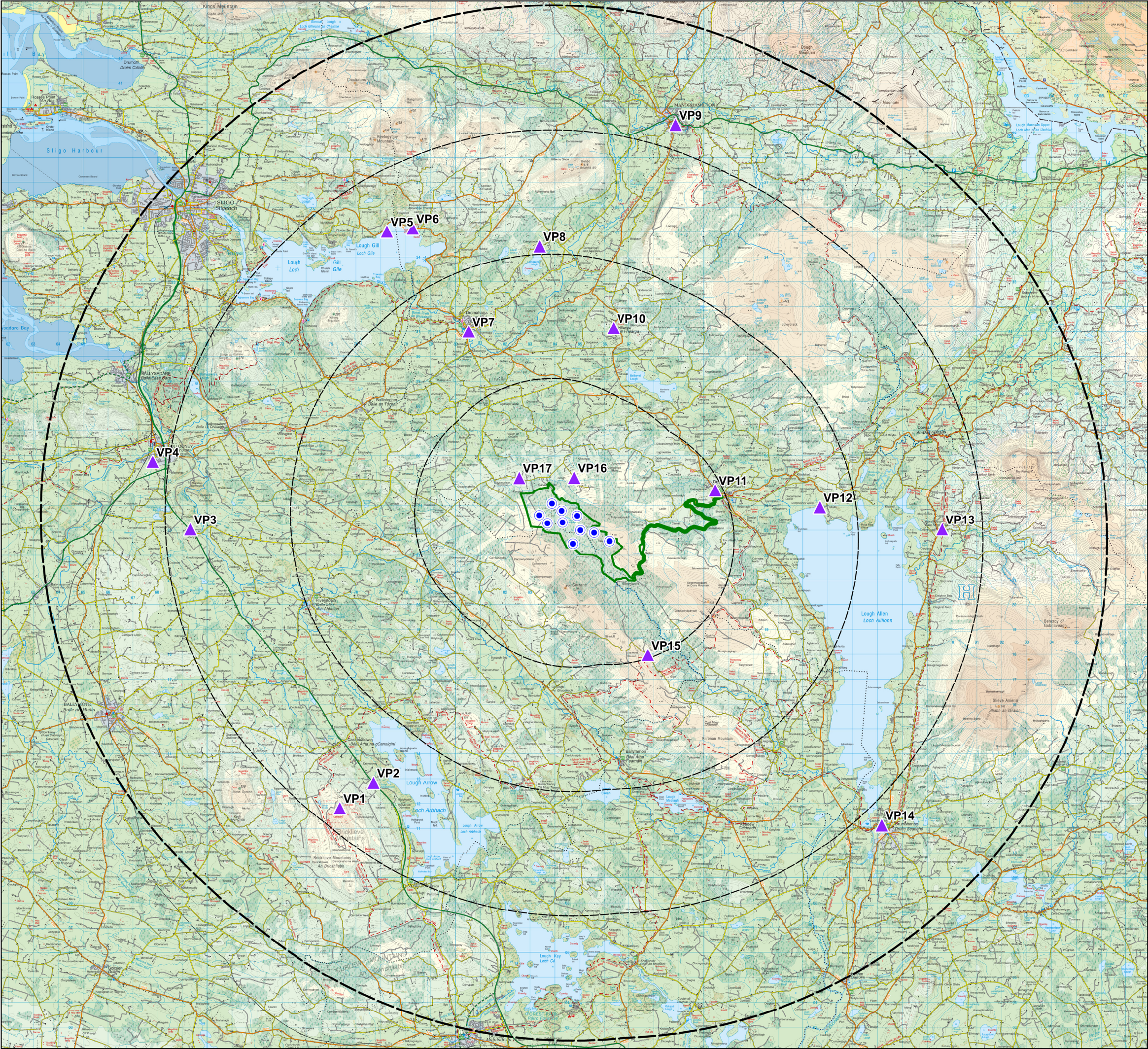
When viewed from the majority of selected viewpoints, the proposed development does not or only slightly extends the vertical or horizontal spatial extent of wind farms in the landscape, due to it being framed by other existing or permitted wind farm developments on both sides. There are no cumulative effects at two viewpoints. At four viewpoints the spatial extent of wind turbines in the view will not increase and at nine viewpoints there will be a slight increase in the spatial extent. At Viewpoints 17 (Killarga) and 21 (townland of Beagh) the spatial extent will increase moderately and significantly, respectively. Hence overall the cumulative landscape effects are not significant.

12.7.3.3 Visual Effects

12.7.3.3.1 Summary of Viewpoint Assessment

An assessment of the visual effects of the proposed turbines was undertaken from the 17 viewpoint locations identified in Section 12.5.2 above using the assessment methodology described in Appendix 12.1. The locations of these viewpoints are shown in Figure 12-7, below. The individual assessments from the 17 viewpoints are presented in Appendix 12.3 and summarised in Table 12-20 below. Appendix 12.3 and Table 12-20 should be read in conjunction with the photomontage booklet forming Volume 2 of the EIAR.

The visual effect of the proposed wind turbines was assessed from each viewpoint in terms of the sensitivity of the visual receptors, along with the magnitude of change, as recommended in the GLVIA (2013) guidelines. This, in conjunction with a detailed review of the photomontages themselves and the ZTV maps, informed the visual effects assessment.



- Map Legend**
- EIAR Site Boundary
 - LVIA Study Area
 - Proposed Turbines
 - ▲ Viewpoint Location

Drawing Title: **Figure 12-7 Viewpoint Locations**

Project Title: **180511 - Croagh Wind Farm EIAR**

Drawn By:	Checked By:	Scale:	Date:	Project No:	Drawing No.:
JM	EM	1:150,000	30/06/2020	180511	Figure 12-7



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Table 12-20 Viewpoint assessment summary

VP No	Description	Grid Ref.	Approx. distance & direction to nearest turbine	Visual Sensitivity of Receptor(s) (at viewpoint)	Magnitude of Change	Residual Significance of Visual Effect
1	View from the summit of Bricklieve Mountain in Carrowkeel Megalithic Cemetery, situated in the townland of Carrowkeel.	E 175,337 N 311,744	14.58 km SW	High	Slight	Not Significant
2	View from the N4 road directly east of Lough Arrow in the townland of Castlebaldwin.	E 176,687 N 312,850	12.28 km SE	Low	Negligible	Imperceptible
3	View from the N4 national road in the townland of Doorly.	E 169,257 N 323,083	14.19 km E	Low	Slight	Imperceptible
4	View from Radharc Na gCaisléan housing estate in the south of Collooney Town in the townland of Rathripon.	E 167,949 N 325,527	16.26 km W	Medium	Slight	Not Significant
5	View from car park off R286 on Lough Gill Drive marked as a Viewing Point on OS map in the townland of Corwillick.	E 177,241 N 335,006	12.8 km NW	High	Slight	Not Significant
6	View from Parke's Castle between the R286 regional road and Lough Gill. This location is within the townland of Kilmore.	E 178,285 N 335,075	12.89 km NW	High	Slight	Not Significant
7	View from the townland of Dromahair taken on the R288.	E 180,495 N 331,092	8.25 km NW	Medium	Slight	Slight
8	View from a local road in the townland of Carrigeencor, to the north of Carrigeencor Lough. County Leitrim designated view V15.	E 183,367 N 334,416	10.66 km N	High	Slight	Not Significant
9	View from McDermott Terrace housing estate in Manorhamilton Town in the townland of Manorhamilton.	E 188,867 N 339,320	16.03 km NW	High	Slight	Not Significant

VP No	Description	Grid Ref.	Approx. distance & direction to nearest turbine	Visual Sensitivity of Receptor(s) (at viewpoint)	Magnitude of Change	Residual Significance of Visual Effect
10	View from the R280 opposite the villages Catholic Church in the townland of Killarga, County Leitrim.	E 186,354 N 331,126	7.56 km NE	High	Slight	Slight
11	View from the townland of Drumkeeran, taken on the R280 road.	E 190,530 N 324,520	4.52 km NE	Medium	Slight	Not Significant
12	View from Corry Strand on the shore of Lough Allen. This location is situated within the townland of Cavan.	E 194,675 N 323,911	8.77 km E	High	Slight	Not Significant
13	View from a local road opposite a residential development off the R207 road in the townland of Drumreilly.	E 199,891 N 323,043	14.94 km E	Medium	Slight	Not Significant
14	View from the R208 regional road in north of the town of Drumshanbo in the townland of Carriknabrack.	E 197,347 N 311,167	16.05 km SE	Low	Negligible	Imperceptible
15	View from local road designated as Scenic Route No. 66 in Sligo CDP in the townland of Ballynashee.	E 187,753 N 317,957	5.0 km SSE	Medium	Slight	Slight
16	View from a local road in the townland of Beagh.	E 184,766 N 325,113	1.37 km NW	Medium	Moderate	Moderate
17	View from a local road in the townland of Tullynascreen.	E 182,162 N 325,179	1.9 km NW	Low	Moderate	Slight

The assessment of visual effects determined the residual significance of the visual effects to range from ‘imperceptible’ to ‘moderate’, with the number of findings at each level of significance listed in Table 12-21.

Table 12-21 Summary of Viewpoint Impact Assessment Results

Significance of Residual Visual Effect	Description	No. of Viewpoints
Profound	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment	0
Very significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment	0
Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment	0
Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends	1
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities	4
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.	9
Imperceptible	An effect capable of measurement but without significant consequences	3

The significance of the residual visual effect was not considered to be “Profound”, “Very Significant” or “Significant” at any of the 17 viewpoint locations. A residual visual effect of “Moderate” was deemed to arise at one of the 17 viewpoint locations. All other viewpoints were assessed as resulting in Slight (3), Not Significant (9) or Imperceptible (4) residual visual effects.

The viewpoint assessment results will be discussed in more detail in the following sections.

12.7.3.3.2 **Visual Effects in the overall study area**

The ZTV map and the site visits shows that visibility is impeded by various significant upland areas as illustrated in Figure 12-8 below. Nearest to the site, the extended ridge of Carrane Hill will screen the proposed turbines from substantial areas to the south and partially to the south-south-west. The Bricklieve Mountains to the west of Lough Arrow offers further screening to the south-west. Corry Mountain and related peaks impede visibility to the east and south east as the proposed development is at a lower elevation than these areas.

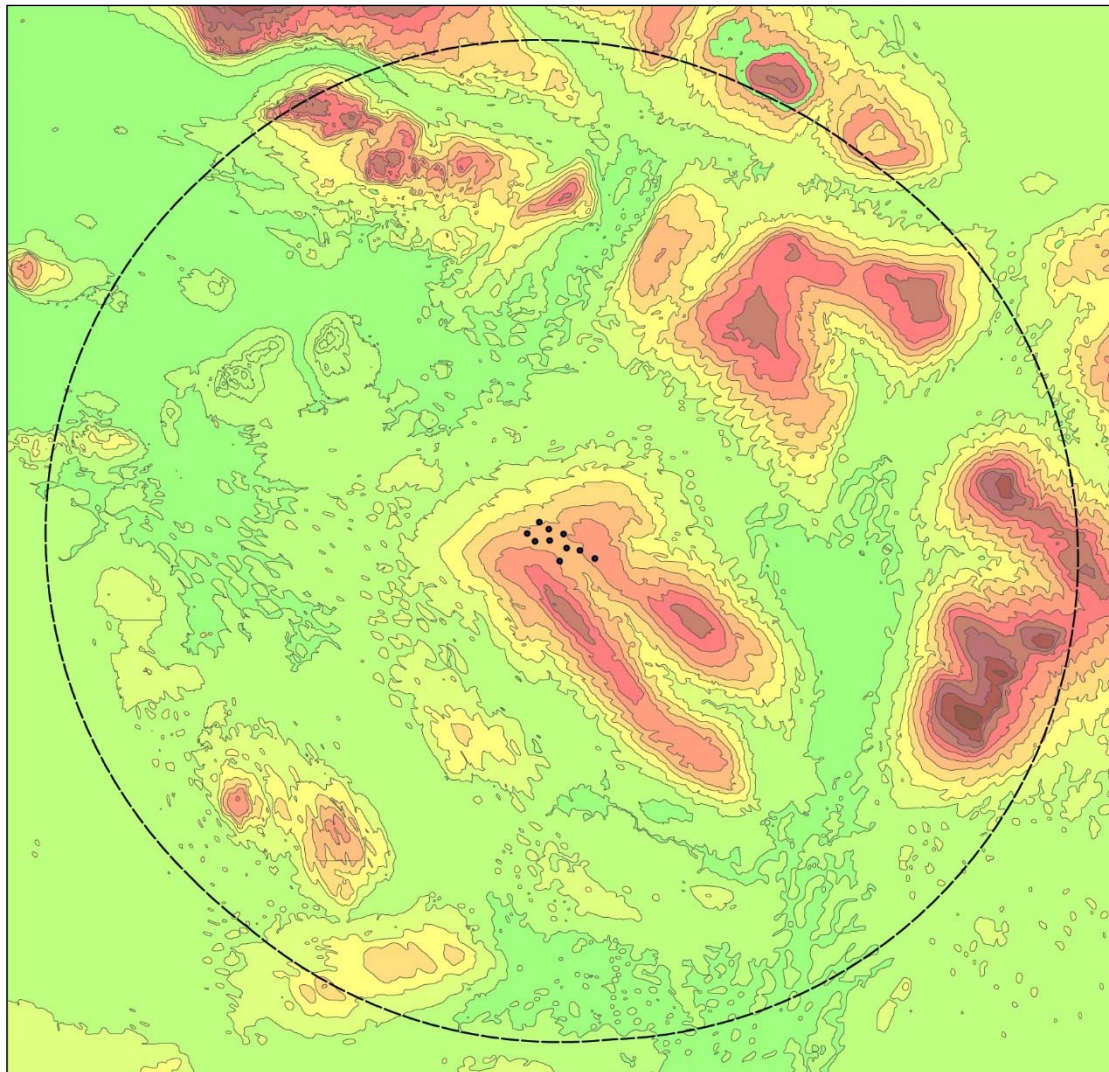


Figure 12-8 Significant upland areas in the study area (50m contours)

Westwards of the site the undulating drumlin landscape creates regular pockets of no visibility. In addition, an extended elevated area approx. 17 km west of the proposed development screens Ballymote and a large area to the north. The range of mountains of Killerry Mountain, Slieve Daeane, Slieve Dargan and finishing at Slieveard screen all of Sligo City and nearly all of the area to the south until Ballysadare as well as the majority of Lough Gill.

Within five to ten kilometres of the site, there are extensive pockets of no visibility created by the undulating landscape. While the upland area stretching eastwards from above Lough Gill including Cope's Mountain, Crockauns, Keelogyboy Mountain, Lissan Mountain, Benbo, Larkfield and Boleybrack screen Glencar Lough and the long valley to the east and west as well as a low land area to the east of Manorhamilton.

Eastwards Corry Mountain and its extended ridge provide partial screening around Drumkeeran and extensive screening towards the south-east including the south of Lough Allen.

12.7.3.3

Visual effects within five kilometres of the site

In general, the site is on the lower slopes of a saddle between the Carrane Hill ridgeline and the Corry Mountain ridgeline. Both ridgelines remove the potential for any visibility from a large area on the south-western slope of Carrane Hill and areas to the west and north-west of Drumkeeran. They are also at significantly higher elevations to the proposed development turbines and so where visibility occurs it

is often partial or intermittent, which is one of the reasons why this site and scale of project was brought forward to seek consent.

ZTV Map

The ZTV map shows that all the area south and west of Carrane Hill summit will have no visibility. North-west of the summit there will be partial visibility. There is also an area with no or very limited visibility on the north-eastern slopes of Corry Mountain stretching into parts of Drumkeeran. Any areas exhibiting theoretical visibility were selected for Route Screening Analysis which will be discussed in the section below.

Route Screening Analysis

Route screening tries to achieve a clearer picture of the actual visibility of the proposed development as opposed to the theoretical ZTV mapping by taking into account the effect that screening such as buildings, hedgerows, trees, small rises in topography etc. In order to comprehensively demonstrate the varying characteristics of the roads and to record the actual visibility in comparison to the theoretical visibility, a methodology was developed termed Route Screening Analysis, and this was undertaken from all roads within a five-kilometre radius of the proposed turbines. The full methodology is outlined in Appendix 12.1 and the categories recorded were as follows:

- Little/no screening – mainly open and with some very light vegetation
- Intermittent/Partial Screening – light deciduous roadside vegetation and vegetation with short gaps which would allow intermittent or partial views
- Dense Screening – vegetation which is dense enough to block views (e.g. coniferous forestry)

Plate 12-6 to 12-9 below show the typical screening that represents the above categories respectively.



Plate 12-6 Example of Route Screening category – little/no screening

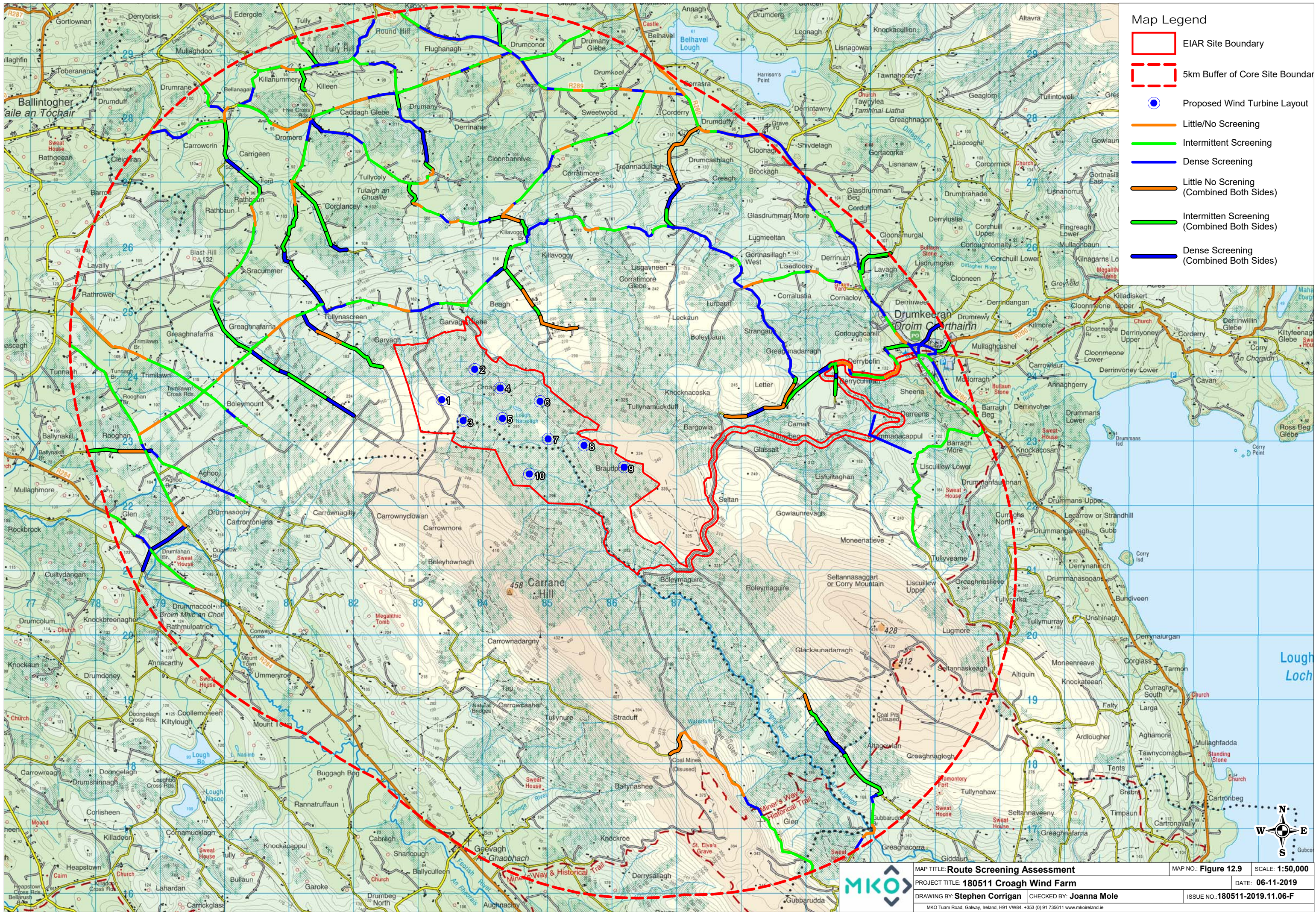


Plate 12-7 Example of Route Screening category – intermittent/partial screening



Plate 12-8 Example of Route Screening category – dense screening

Figure 12-9 outlines the route screening survey area within a five-kilometre radius of the proposed development site. This figure indicates that many of the roads within 5 kilometres of the site have intermittent/partial and dense screening, and therefore these roads which fall within the ZTV will have more screening and therefore reduced views, rather than the full visibility that the ZTV suggests. By comparison, relatively few areas have extensive stretches of little or no screening. The presence of roadside screening is particularly important in contexts such as the proposed development site, where the site is at a slightly higher elevation to the surrounding roads, and the presence of screening, particularly higher levels of screening that includes rows of trees and similar vegetation, will contribute to reducing views of the proposed turbines. It should be noted that proposed turbines T2-T10 are within an area of forestry and that there are sections of forestry located in different areas within the site,



which will also lend to screening of the turbines. This plays an important role in reducing visual effects as turbines bases and towers can be screened, or partly screened.

There are a few roads which occur within 1 kilometre of the proposed development. Most of these are local roads that pass the site to the north and south, specifically the local road running east to west 200m north of the site boundary through the townland of Garvagh Glebe. Within one kilometre of the turbines the roadside vegetation screening types lean towards a mix of ‘intermittent/partial screening’ and ‘dense screening’ but change regularly with stretches of “little/no screening”. No particular screening type dominates.

Within 1-3 kilometres of the site, intermittent/partial screening becomes the dominant category, with areas of dense screening and sparse sections of little/no screening. Between 1 and 3 kilometres from the site, the route screening includes roads in the townlands of Tullynascreen and Kilavoggy to the north and two unnamed roads which run south away from the site towards Arigna. All roads have a majority of intermittent/partial screening, with some areas with dense and little/no screening.

Between 3 and 5 kilometres, the pattern of screening changes, with the dominant category being intermittent/partial screening with long stretches of dense screening to the east of the site. Within this area is the village of Drumkeeran. The roads entering and leaving the village of Drumkeeran, noted above as the R280 and R200, mainly represent intermittent/partial and dense screening, with the centre of the village also having a section of dense screening. The intermittent and dense screening effects are illustrated by Plate 12-6 to 12-9, which illustrate clearly the effect of screening by vegetation and buildings in Drumkeeran village and along the R280.

Viewpoints (within 5km of the site)

Viewpoint selection within 5km was made difficult by the restricted visibility indicated by the ZTV map and extensive screening illustrated by the Route Screening Analysis. While the forestry plantation is subject to cyclical felling, each section of forestry is at a different level of maturity. Hence, if one area is felled adjacent mature or semi-mature areas of trees will provide continuing screening meaning that is views towards the turbines are opened up, they will be localised over narrow areas. Despite this, two locations were found, Viewpoints 16 and 17, both within 2 kilometres of the proposed turbines. Residual visual effects were found to be *Slight* at Viewpoint 17 due to extensive vegetative screening and low visual receptor sensitivity. Viewpoint 16 was assigned a “*Moderate*” residual visual effect, due to the anticipated visibility of a significant proportion of the proposed turbines, in conjunction with other wind turbines. Mitigating factors are that the turbines are located the other side of a ridgeline which obscures much of the turbines. The ridgeline combined with the forestry plantation means that the turbines do not dominate the view. The spatial alignment of the turbines also reads as a coherent element of the landscape which has avoided any clustering effects. The adjacent Garvagh Glebe turbines are also visible in the Viewpoint 16 and both projects together read coherently in the view. The Garvagh Glebe turbines are situated at a higher ground level to the proposed Croagh wind turbines, meaning that the turbine tips are at comparable levels, ameliorating potential visual effects associated with the Croagh turbines being of a larger scale to the Garvagh Glebe turbines. In this view the Garvagh Glebe turbines do not appear excessively smaller but may be interpreted by some as more distant turbines within the same wind development. Furthermore, the turbine design of the existing and proposed turbines is similar. The viewpoints are also at remote locations on roads with either no through-traffic or very low traffic volumes. Wind turbines are already a recognisable element of this landscape and therefore the proposed development is not introducing a new landscape element, either in terms of visibility or land use.

Ancillary Project Elements

For the purposes of this LVIA, a number of individual elements of the proposed development, ancillary to the proposed wind turbines, have been grouped together for the assessment of effects, given the similar nature of the works required. The proposed turbine hardstand areas, meteorological mast,

construction site compounds, electricity substation compound (and ancillary elements thereto) and borrow pit will all require the felling of forestry and its replacement with hard surface areas, giving rise to potentially similar landscape and visual effects.

The keyhole felling to be used to clear the areas for these ancillary elements, will leave adjacent forestry to screen the elements from view from the wider area. However, ancillary project elements will be visible in the immediate surroundings, hence, any visual effects will be localised and predominantly confined to within the proposed development site.

Visual effects arising from the proposed ancillary project elements will be slight, localised and long-term where seen, but will remain largely unseen from within and outside the site.

Road Construction, Turbine Hardstands and Visitor Car Park

Every use will be made of the existing roads on site used for the extensive on-site forestry operations. Some localised vegetation clearance will occur as a result of the widening of 11.1 kilometres of existing and in the construction of 7.5 kilometres new roadway as part of the proposed development, which will also involve tree felling. Furthermore, a visitor car park will be constructed in the north-eastern corner of the proposed development site. The existing forestry will entirely screen the car park. Details of the required works are contained in Chapter 4. The visual impact of the road construction and turbine hardstands will be localised and not seen from outside the site due to the setting in forestry. The visual effect of the road widening and construction is considered long-term where areas will not be replanted to the edge of the road, localised, but only slight in significance. The effect is partially counteracted by the intention to utilise the on-site roads as walking trails as part of an amenity and result in a long term, neutral to positive impact.

Meteorological Mast

The proposed meteorological mast will be a slender structure 100 metres in height, and in itself will not be an imposing structure in terms of visual impact, and it will also be viewed largely as surrounded by coniferous plantation. The landscape impact will primarily constitute clearance around the base of the mast. The visual effect of the proposed anemometry mast is considered to be long term but Not Significant, in that it will be significantly less visible than any turbine given its slender lattice form and will fade from view at a distance of anything more than a few kilometres.

Electricity Substation

The proposed electricity substation is to be located in the north-eastern part of the proposed development site in an area of forestry. The adjacent forestry will screen the substation from the wider area. Hence, the landscape and visual impact of the proposed electricity substation will be localised, long-term and imperceptible in significance.

Borrow Pits, Peat Repository Areas and Temporary Construction Compound

There are two proposed temporary construction compounds, one in the north between turbines Nos. 2 and 4 and the other in the centre of the site near turbine No. 7. Both are in forested areas and therefore will not be visible beyond their immediate surroundings.

The two proposed peat repository areas will also be located in forested areas and therefore will not be visible beyond their immediate surroundings.

There is one borrow pit proposed between turbines Nos. 9 and 10 as part of the development. There will be no visibility of the borrow pit beyond its immediate surroundings.

Post-construction, the temporary construction compound and borrow pits will be reinstated to previous contours using previously excavated material. The temporary construction compound will be seeded and the borrow pit areas and peat repository will be allowed to naturally revegetate.

Therefore, these three project elements will have localised, long-term and imperceptible landscape and visual impact.

Visual effects on specific visual receptors

Designated Scenic Routes and Scenic Views

The vast majority of scenic routes and views designated in Counties Leitrim, Sligo and Roscommon will be unaffected by the proposed development.

Although the area around the proposed development was not the focus of any of the 13 protected views and prospects designated in County Leitrim within the study area, three views were generally directed towards the site. Of these three views, V10, V15 and V18, potential visibility could only be established for V15 and hence this was selected as Viewpoint 8. Visual receptor sensitivity was judged to be high due to the designation and some adjacent residential housing and the magnitude of change slight. The residual visual effect was mitigated by screening, intervening distance, the small number of residential visual receptors and the limited spatial extent of the proposed development as well as the designated view being focused on the lake in the foreground.

There were two scenic routes, Scenic Routes Nos. 3 and 66, designated in Sligo CDP, where the focus of the view was towards the proposed development site and where the ZTV indicated sufficient theoretical visibility. These were selected as Viewpoints 2 and 15, respectively. Viewpoint 15 is located on a minor road with no nearby houses and resulting from this coupled with substantial screening and the focus of the designated view being away from the proposed turbines the residual visual effect was considered 'Slight'.

Designated Scenic Route No. 3 is along an approx. 9-kilometre section of the N4. The ZTV shows partial visibility for the whole stretch. On the ground, roadside screening and local topography made it very difficult to establish visibility of the proposed development. Viewpoint 2 was the only location where there was more than a glimpse between roadside vegetation towards the proposed turbines and after taking mitigating factors such as direction of travel versus direction of view, speed of traffic, no adjacent residences, screening and spatial extent due to distance into account the residual visual effect was deemed 'Imperceptible'.

The ZTV mapping showed that of the four scenic routes and six scenic views designated in County Roscommon 9 will have no visibility of the proposed turbines and the focus of the single scenic view with theoretical visibility was directed away from the proposed development. Therefore, all scenic routes and views in County Roscommon could be screened out in the *Visual Receptor Preliminary Assessment* as they will not be affected by the proposed development.

Settlements

Again, it was shown on the ZTV mapping and by site visits using TrueView that the majority of settlements will not have visibility of the development.

In the settlements where even pockets of visibility were established, viewpoints were selected. These were:

➤ Ballinagleragh	Viewpoint 13
➤ Collooney	Viewpoint 8
➤ Dromahair	Viewpoint 7
➤ Drumkeeran	Viewpoint 2
➤ Drumshanbo	Viewpoint 14
➤ Killarga	Viewpoint 10
➤ Manorhamilton	Viewpoint 9

Visibility from each of these settlements was difficult to establish on the ground due to screening by buildings and trees. Finding locations with any views towards the proposed turbines in Dromahair

Manorhamilton and Drumshanbo in particular took extensive investigation during the site visits. Generally only views could be found in the outskirts of these towns and villages closest to the proposed development or on significantly higher ground, meaning that these viewpoints represent the ‘worst case scenario’. Hence, the visual impact on these settlements overall will be very minor. Furthermore, once mitigating factors, such as the view being over a short section of road or the primary views of residential visual receptors being in a different direction, are taken into consideration, the residual visual effects from these viewpoints ranged from ‘Imperceptible’ to ‘Slight’.

Recreational and Tourist Destinations

The three amenity destinations that will have visibility of the proposed turbines are listed below:

- Parkes Castle Viewpoint 6
- Corry Strand Viewpoint 12
- Carrowkeel Megalithic Cemetery Viewpoint 1

The residual visual effect in each case was deemed ‘Not Significant’ due to mitigation factors such as significant intervening distance, significant screening by landform and vegetation, no residential visual receptors and limited spatial extent of the proposed wind farm within the views. Furthermore, the views will not be the primary focus and visual receptors will be seasonal and limited by weather conditions to a greater or lesser extent at these three locations.

Recreational Routes and Viewing Points

Recreation routes and viewing points that will have visibility of the proposed turbines and for which viewpoints were selected are listed in Table 12-22 below.

Table 12-22 Summary of Residual Visual Effects for Recreation Routes and OSi Viewing Points

Recreation Route or Viewing Point	Viewpoint Nos.	Residual Significance of Visual Effect
Lough Gill Drive and OSi Viewing Point	5	Not Significant
Miners Way	11	Not Significant
	15*	Slight
	14	Imperceptible
	1*	Not Significant
Leitrim Way	9	Not Significant
	13	Not Significant
	14	Imperceptible
Kingfisher Cycle Trail	13	Not Significant
	14	Imperceptible
Northern Glens Trail	9	Not Significant
Sligo Way	7*	Slight

Recreation Route or Viewing Point	Viewpoint Nos.	Residual Significance of Visual Effect
North West Cycle Trail	9	Not Significant
	7	Slight

**While the viewpoint is not directly on the recreation route it is in close proximity to it.*

The individual viewpoints and their respective mitigation factors have been discussed in the preceding sections. However, it can be seen in Table 12-22 above that the greatest residual effect on recreational routes is “Slight”, which applies to viewpoints on the Miners Way, Sligo Way and North West Cycle Trail. However, in the case of the Miners Way and North West Cycle Trail residual visual effects were less at other viewpoints.

Hence, overall the ‘Not significant’ is the most common residual effect that applies to those sections of recreation routes that have greatest visibility of the proposed turbines.

Transport Routes

National primary and secondary routes were assessed in detail. Regional routes were assessed when they fell within settlement areas or coincided with scenic routes and preference was given to viewpoint selection on regional routes in these cases to increase the number of visual receptors.

Of the national routes the ZTV showed no visibility for the N15, while in the case of the N16, N17 and N59 very little theoretical visibility, significant roadside screening or intervening distances of greater than 15 kilometres made it apparent that visual effects on these roads will be insignificant.

For the closest national road, the N4, the ZTV map shows that many sections will have no visibility. Of the stretches with theoretical visibility the majority will experience no visibility due to roadside screening. Two viewpoints, 2 and 3, were selected at two areas where a view of the proposed turbines could be ascertained. Viewpoint 2, which is along a stretch designated as Scenic Route No. 3 in the Sligo CDP has been discussed in Section ‘*Designated Scenic Routes and Scenic Views*’ above. The location of Viewpoint 3 is further north on the N4, just to the south of Collooney. Here the residual effect was deemed ‘Imperceptible’ after taking mitigation factors such as screening of the proposed turbines, the small number of nearby houses, road users travelling at high speeds broadly perpendicular to the view, intervening distance and very limited spatial extent of the proposed development into consideration.

12.7.3.4 Cumulative Visual Effects

As outlined in the methodology in Appendix 12.1 the cumulative visual effects assessed were increase of the spatial extent of turbines in the view, visual separation from other wind farms and visual disparity caused by other turbines of a different scale and design being seen alongside the proposed turbines. Cumulative visual effects were assessed as part of the Visual Assessment Tables found in Appendix 12.3. Here, an assessment was made whether there was visual separation between existing turbines and the proposed turbines as well as if the difference in scale of existing turbines contrasted adversely to that of the proposed turbines. These two factors were then applied to a matrix to arrive at the cumulative visual effects shown in Table 12-23 below.

Table 12-23 Summary of Cumulative Visual Effects

VP No	Other Turbines Visible	Increase in Spatial Extent	Visual Separation	Difference in Scale
1	Moderate	Slight	Medium	Moderate
2	Slight	Slight	Medium	Moderate
3	Slight	Slight	Medium	Moderate
4	Moderate	Negligible	Medium	Moderate
5	Slight	Slight	Medium	Moderate
6	Slight	Slight	Medium	Moderate
7	Slight	Slight	Medium	Moderate
8	Slight	Slight	Medium	Moderate
9	Negligible	Negligible	N/A	N/A
10	Slight	Moderate	Slight	Moderate
11	Slight/ Moderate	Negligible	Slight	Slight
12	Substantial	Negligible	Slight	Slight
13	Substantial	Negligible	Slight	Slight
14	Moderate/Substantial	Slight	Complete	Negligible
15	Moderate/Substantial	Slight	Medium	Slight
16	Slight/Moderate	Significant	Slight	Slight
17	Negligible	Negligible	N/A	N/A

As can be seen in Table 12-23 in two viewpoints cumulative effects did not arise. The spatial extent was predominantly 'Slight' to 'Moderate' with one viewpoint (16) exhibiting a significant increase in spatial extent of turbines in the view.

While complete visual separation of the proposed turbines from the permitted turbines is achieved in Viewpoint 14, mostly 'Slight' to 'Moderate' separation was seen, but at no viewpoint was there the worst category of 'Negligible' separation.

The assessment of the perceived difference of scale was also predominantly 'Slight' to 'Moderate' with one viewpoint showing a 'Negligible' difference in scale. At no viewpoint was the difference in scale perceived as 'Substantial'. Furthermore, when compared to the nearest existing turbines, the proposed development is at a lower level, thus there is no great difference in terms of tip height between the existing and proposed turbines when seen alongside each other.

A comparative ZTV (Figure 12-10 below) shows that the cumulative visibility over that of the existing and permitted turbines will only increase in a small number of tiny pockets due to the addition of the proposed Croagh turbines. Currently 80.7 % of the study area has theoretical visibility of permitted or existing turbines. The proposed turbines will theoretically be visible in 0.3% of the study area where at present no existing or permitted wind turbines are seen. Therefore, it is considered that the proposed turbines will not have a significant impact on the extent of cumulative visibility of wind turbines over the existing visibility.

Furthermore, the landscape character of the study area is of a large scale which contains open, expansive views, and these assist in allowing the landscape to accommodate a large number of turbines. Considering the sizable amount of wind farm development that has already occurred, the proposed Croagh development will add a limited numbers of additional turbines.

Therefore, the cumulative visual effects are considered acceptable, in terms of increase in spatial extent, visual separation and difference in scale.

12.7.4 Decommissioning Phase Effects

The landscape and visual effects during decommissioning are anticipated to be the same as during the construction phase.

12.8 Conclusion

The site has been well designed, and the design process has been informed by input from the landscape architect.

12.8.1 Landscape Effects

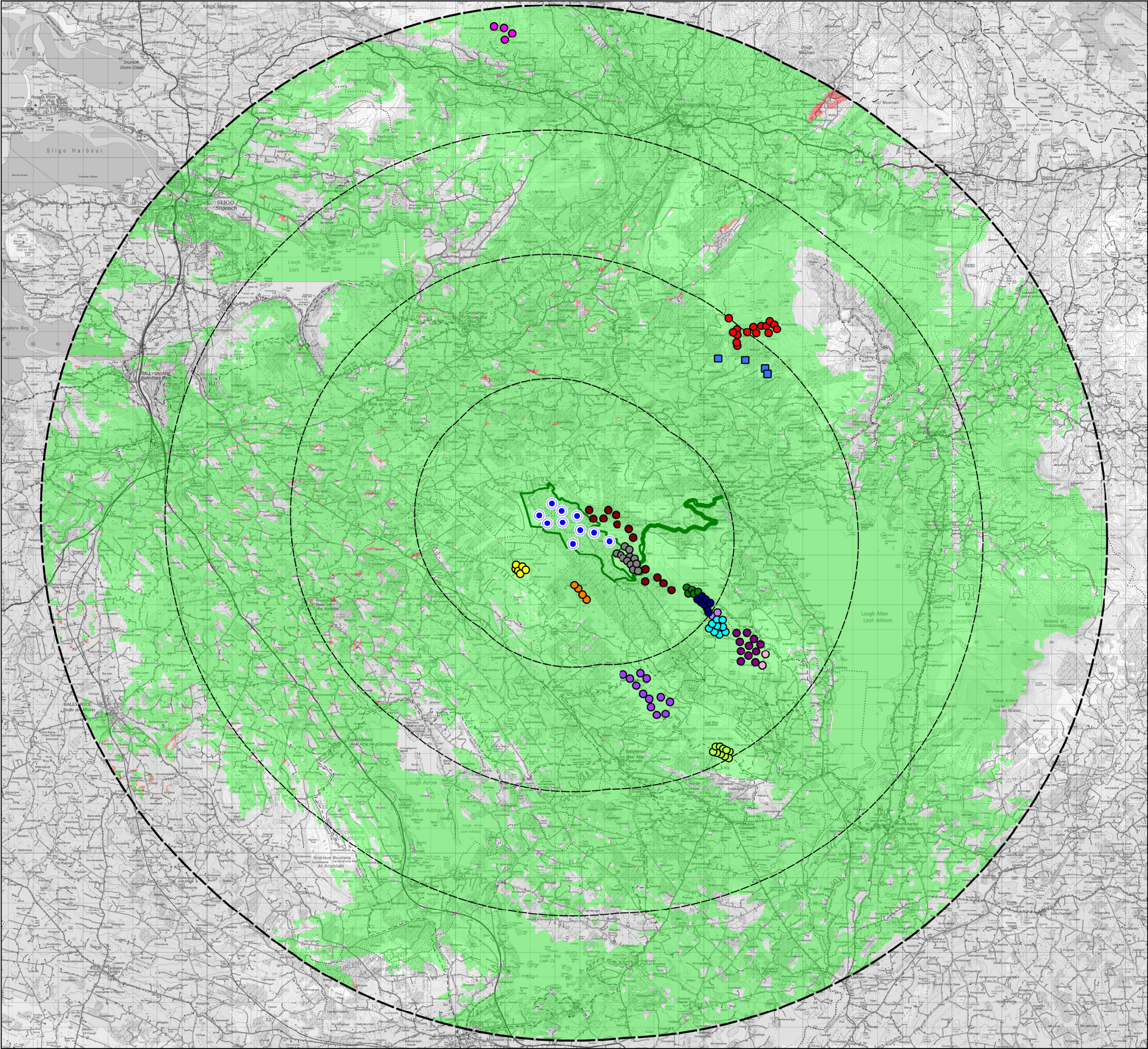
The proposed wind energy development site is located in an area with a long history of wind energy development. Wind turbines have been a feature of this landscape for many decades. Therefore, while the proposed turbines add to the existing wind turbines, they do not introduce an alien landscape element.

There will be no landscape effects on designations in County Roscommon.

The vast majority of scenic routes in Co. Sligo will not be affected by the proposed development. The two routes that will have some visibility of the proposed development, No's. 3 and 66, will experience an 'Imperceptible' and 'Slight' visual effect, respectively.

In County Leitrim the Areas of Outstanding Natural Beauty and High Visual Amenity Areas have theoretical visibility indicated in some areas, but distance and screening mean that the effects will be very minor.

In terms of landscape character only Leitrim's *LCA 11 Corry Mountain* and the provisional LCA for Sligo *LCA1 Carrane Hill*, in which the proposed turbines are located, would experience direct effects on landscape character as a result of the proposed development. Any other effects on other LCAs would be moderate, indirect and a slight increase in visible turbines additional to the existing and permitted turbines, as the proposed development might be visible within the LCAs but located outside those other LCAs and thus be a landscape element seen in the distance.



Map Legend

- EIAR Site Boundary
- LVIA Study Area
- Proposed Turbines**
- Croagh
- Existing Turbines**
- Atlagowlan
- Black Banks
- Caranne Hill
- Carrickheeney
- Corrie Mountain
- Garvagh Glebe
- Garvagh Tullyhaw
- Geevagh
- Kilronan
- Monaneenatieve
- Spion Kop
- Seltannaveeny
- Tullynamoyle
- Derrysallagh
- Permitted Turbines**
- Tullynamoyle Extension

Zone of Theoretical Visibility (ZTV)

- Theoretical Visibility of all Existing and Permitted Turbines
- Additional theoretical Visibility for the Proposed Croagh Turbines

Drawing Title:					
Figure 12-10 Comparative ZTV					
Project Title:					
180511 - Croagh Wind Farm EIAR					
Drawn By:	Checked By:	Scale:	Date:	Project No:	Drawing No.:
JM	EM	1:150,000	30/06/2020	180511	Figure 12-10



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12.8.2 Cumulative Landscape Effects

Although, it was found that the proposed turbines would add to the cumulative landscape status, it would not change the character of the individual LCAs in terms of wind energy and therefore the cumulative landscape effects are considered Low.

12.8.3 Visual Effects

Due to the topography of the study area and in particular the upland areas around the site, the turbines will be screened by landform from many areas within the study area as illustrated by ZTV mapping. Additionally, wide-spread mature hedgerow and trees will provide additional screening. The forestry plantation trees while subject to cyclical felling are only felled in limited areas, leaving adjacent mature or semi-mature trees to provide continued screening.

Key visual receptors, such as scenic routes and views, settlements, recreational destinations and routes as well as major transport routes were identified within the study area, after which those where visibility could be excluded due to ZTV mapping or site surveys were screened out. For the remaining visual receptors, viewpoints were selected for which photomontages were prepared to assess the visual effects on the visual receptors. The visual assessment concluded that residual visual effects of “Moderate” was deemed to arise at one of the 17 viewpoint locations. All other viewpoints were assessed as resulting in Slight (3), Not Significant (9) or Imperceptible (4) residual visual effects. None of the visual receptors identified in County Roscommon will be affected.

12.8.4 Cumulative Visual Effects

Cumulative visual effects were assessed in terms of increase in spatial extent of turbines within the views of the selected viewpoints, visual separation of the proposed turbines from the permitted turbines and the perceived difference of scale between the existing/permitted turbines and the proposed turbines.

No cumulative effects will arise at two viewpoints. In the remaining 15 viewpoints it was found that the increase in spatial extent was predominantly ‘Slight’ to ‘Moderate’ While complete visual separation of the proposed turbines from the permitted turbines is achieved in one viewpoint, mostly ‘Slight’ to ‘Moderate’ separation was seen. The assessment of the perceived difference of scale was also predominantly ‘Slight’ to ‘Moderate’ with one viewpoint showing a ‘Negligible’ difference in scale. At no viewpoint was the difference in scale perceived as ‘Substantial’.

A comparative ZTV shows that the cumulative theoretical visibility of wind turbines in the study area over that of the existing and permitted turbines will increase by less than one percent due to the addition of the proposed Croagh turbines.

Therefore, the cumulative visual effects are considered acceptable, in terms of increase in spatial extent, visual separation and difference in scale.

13. ARCHAEOLOGY AND CULTURAL HERITAGE

13.1 Introduction

This archaeological and cultural heritage chapter was prepared by Tobar Archaeological Services. It presents the results of an archaeological and cultural heritage impact assessment for a proposed wind farm near Drumkeeran, Co. Leitrim. The development area predominantly comprises upland blanket peat with some sections of sandstone/shale till. The majority of the site is under forest cover with a network of existing forest roads. The EIAR Site Boundary (Figure 13-1) is located within both County Leitrim and Sligo over an area measuring 670 hectares.

The purpose of this chapter is to assess the potential direct, indirect and cumulative effects of the proposed development on the surrounding archaeological, architectural and cultural heritage landscape. The assessment is based on both a desktop review of the available cultural heritage and archaeological data and a comprehensive programme of field walking of the study area. The report amalgamates desk-based research and the results of field walking to identify areas of archaeological/architectural/cultural significance or potential, likely to be impacted by the proposed development. An assessment of potential effects, including cumulative effects, is presented, and a number of mitigation measures are recommended where appropriate. The visual effect of the proposed development on any newly discovered monuments/sites of significance as well as known recorded monuments is also assessed.

13.1.1 Proposed Development

The proposed development consists of the construction of 10 no. wind turbines and associated site infrastructure. All elements of the proposed development including the grid connection cable route and the proposed turbine delivery route were assessed in the EIAR.

A full description of all elements of the proposed development is presented in Chapter 4.

13.1.2 Statement of Authority

This section of the EIAR has been prepared by Miriam Carroll and Annette Quinn of Tobar Archaeological Services. Miriam and Annette both graduated from University College Cork in 1998 with a Master's degree in Methods and Techniques in Irish Archaeology. Both directors are licensed by the Department of Culture, Heritage and the Gaeltacht to carry out excavations and are members of the Institute of Archaeologists of Ireland. Annette Quinn and Miriam Carroll have been working in the field of archaeology since 1994 and have undertaken numerous projects for both the private and public sectors including excavations, site assessments (EIAR) and surveys. Miriam Carroll and Annette Quinn are directors of Tobar Archaeological Services which has been in operation for 17 years. Tobar Archaeological Services have undertaken numerous EIARs for similar wind farm projects such as Ardderroo, Co. Galway, Cleanrath, Kealkill, Esk, County Cork, Lyrenacarriga, Co. Waterford, (all of which are located in commercial forestry).

13.1.3 Legislation and Guidelines

This chapter has been prepared in compliance with all relevant EIA legislation and guidance (see Chapter 1: Introduction for relevant guidance and legislation).

13.1.3.1 Current Legislation

Archaeological monuments are safeguarded through national and international policy, which is designed to secure the protection of the cultural heritage resource. This is undertaken in accordance with the provisions of the European Convention on the Protection of the Archaeological Heritage (Valletta Convention). This was ratified by Ireland in 1997.

Both the National Monuments Acts 1930 to 2004 and relevant provisions of the Cultural Institutions Act 1997 are the primary means of ensuring protection of archaeological monuments, the latter of which includes all man-made structures of whatever form or date. There are a number of provisions under the National Monuments Acts which ensure protection of the archaeological resource. These include the Register of Historic Monuments (1997 Act) which means that any interference to a monument is illegal under that Act. All registered monuments are included on the Record of Monuments and Places (RMP).

The Record of Monuments and Places (RMP) was established under Section 12 (1) of the National Monuments (Amendment) Act 1994 and consists of a list of known archaeological monuments and accompanying maps. The Record of Monuments and Places affords some protection to the monuments entered therein. Section 12 (3) of the 1994 Amendment Act states that any person proposing to carry out work at or in relation to a recorded monument must give notice in writing to the Minister (Environment, Heritage and Local Government) and shall not commence the work for a period of two months after having given the notice. All proposed works, therefore, within or around any archaeological monument are subject to statutory protection and legislation (National Monuments Acts 1930-2004).

Under the Heritage Act (1995) architectural heritage is defined to include ‘all structures, buildings, traditional and designed, and groups of buildings including street-scapes and urban vistas, which are of historical, archaeological, artistic, engineering, scientific, social or technical interest, together with their setting, attendant grounds, fixtures, fittings and contents...’. A heritage building is also defined to include ‘any building, or part thereof, which is of significance because of its intrinsic architectural or artistic quality or its setting or because of its association with the commercial, cultural, economic, industrial, military, political, social or religious history of the place where it is situated or of the country or generally’.

13.1.3.1.1 Granada Convention

The Council of Europe, in Article 2 of the 1985 Convention for the Protection of the Architectural Heritage of Europe (Granada Convention), states that ‘for the purpose of precise identification of the monuments, groups of structures and sites to be protected, each member State will undertake to maintain inventories of that architectural heritage’. The Granada Convention emphasises the importance of inventories in underpinning conservation policies.

The NIAH was established in 1990 to fulfil Ireland's obligations under the Granada Convention, through the establishment and maintenance of a central record, documenting and evaluating the architectural heritage of Ireland. Article 1 of the Granada Convention establishes the parameters of this work by defining ‘architectural heritage’ under three broad categories of Monument, Groups of Buildings, and Sites:

- Monument: all buildings and structures of conspicuous historical, archaeological, artistic, scientific, social or technical interest, including their fixtures and fittings;
- Group of buildings: homogeneous groups of urban or rural buildings conspicuous for their historical, archaeological, artistic, scientific, social or technical interest, which are sufficiently coherent to form topographically definable units;
- Sites: the combined works of man and nature, being areas which are partially built upon and sufficiently distinctive and homogenous to be topographically definable, and are of conspicuous historical, archaeological, artistic, scientific, social or technical interest.

The Council of Europe's definition of architectural heritage allows for the inclusion of structures, groups of structures and sites which are considered to be of significance in their own right, or which are of significance in their local context and environment. The NIAH believes it is important to consider the architectural heritage as encompassing a wide variety of structures and sites as diverse as post boxes, grand country houses, mill complexes and vernacular farmhouses.

13.1.3.2 **Leitrim County Development Plan 2015-2021**

13.1.3.2.1 **Protected Structures**

Development or redevelopment in close proximity to any building or structure listed in the Record of Protected Structures, must respect the setting and character of the Protected Structure. In this regard, the Council will offer advice on conservation.

Policy 104 *It is the policy of the Council to protect all structures in the Record of Protected Structures.*

Objective 84 *It is an objective of the Council to seek the protection of all structures within the County that are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.*

Objective 85 *It is an objective of the Council to review the record of Protected Structures during the lifetime of this plan.*

Objective 86 *It is an objective of the Council to seek funding for the conservation and restoration of Protected Structures.*

Objective 87 *It is an objective of the Council to seek the appointment of a Conservation Officer/Heritage Officer to improve the level of expertise available to the Council. However the Council will seek to develop in-house expertise in the interim in the absence of these appointments, having regard to the current embargo on recruitment.*

13.1.3.2.2 **Archaeology**

Sites and monuments of archaeological significance are recorded in the Record of Monuments and Places (RMP). The RMP is compiled by the Archaeological Survey of Ireland and is a statutory inventory of sites and areas with accompanying maps on which sites and monuments are marked and numbered. The Record includes all identified monuments such as megalithic tombs, ring forts and castles in County Leitrim, dating to before 1700 A.D. and some sites postdating 1700 A.D. There are approximately 1,400 sites and monuments identified in the RMP for County Leitrim. Each monument is encircled by a zone of archaeological potential. The duties of the owner of a recorded monument are detailed in the National Monuments (Amendment) Act 1994. The RMP is available for viewing in the Planning Authority Office and in the County Library. It should be noted that any direct impacts on national monuments in State or Local Authority care or subject to a preservation order will require the consent of the Minister for the Environment, Heritage and Local Government under Section 14 of the National Monuments Act 1930 as amended by Section 5 of the National Monuments (Amendment) Act 2004.

Policy 105 *It is the policy of the Council to promote public awareness of the rich archaeological heritage that exists in County Leitrim.*

The archaeological heritage of County Leitrim includes, according to the European Convention for the Protection of Archaeological Heritage, 1992 (Valetta Convention) structures, constructions, groups of buildings, developed sites, all recorded monuments as well as their contexts, and moveable objects; situated both on land and under water. This means that the archaeological heritage is not confined to

the archaeological sites within the Record of Monuments and Places, but also includes any archaeological site that may not have been recorded yet, as well as archaeology beneath the ground surface, as well as the context of any site. Leitrim has one underwater heritage order in the County (UHO 1/90), which refers to Lough Donagher, located to the north east of Cloone.

Objective 92 *It is an objective of the Council to promote the County's archaeological heritage as a tourism resource, in partnership with key tourism organisations.*

Policy 106 *It is the policy of the Council to secure the preservation (i.e. preservation in-situ or in particular circumstances where the Council is satisfied that this is not possible, preservation by record as a minimum) of all archaeological remains and sites of importance such as National Monuments, Recorded Monuments, their setting and context.*

Objective 93 *It is an objective of the Council to ensure that any development (above or below ground), within the vicinity of a site of archaeological interest shall not be detrimental to the character of the archaeological site or its setting.*

Objective 94 *It is an objective of the Council to require, where appropriate, that an archaeological assessment be carried out by a suitably qualified person prior to the commencement of any activity that may impact upon the archaeological heritage.*

Objective 95 *It is an objective of the Council to protect the zones of archaeological potential, as identified in the Record of Monuments and Places.*

Objective 96 *It is an objective of the Council to protect archaeological sites discovered since the publication of the Record of Monuments and Places.*

13.1.3.3 Sligo County Development Plan 2017-23

13.1.3.3.1 Archaeology - policies

PAH-1 *Protect and enhance archaeological sites, monuments, their setting, appreciation and amenity within the Plan area, including those that are listed in the Record of Monuments and Places (RMP) or newly discovered archaeological sites and/or sub-surface archaeological remains.*

PAH-2 *Require archaeological impact assessment, surveys, test excavation and/or monitoring for planning applications in areas of archaeological importance, if a development proposal is likely to impact upon in-situ archaeological monuments, their setting and archaeological deposits.*

PAH-3 *Require the preservation of the context, amenity, visual integrity and connection of archaeological monuments to their setting. Views to and from archaeological monuments shall not be obscured by inappropriate development. Where appropriate, archaeological visual impact assessments will be required to demonstrate the continued preservation of an archaeological monument's siting and context.*

PAH-4 *Secure the preservation in-situ or by record of:*

- *the archaeological monuments included in the Record of Monuments and Places as established under section 12 of the National Monuments (Amendment) Act, 1994;*
- *any sites and features of historical and archaeological interest;*
- *any subsurface archaeological features that may be discovered during the course of infrastructural/development works in the operational area of the Plan.*
- *Preservation relates to archaeological sites or objects and their settings.*

- *Preservation in-situ is most effectively achieved by the refurbishment of existing buildings, in situations where it is possible to retain the greater part of existing structures without the need for new foundations.*

P-AH-5 *Protect historic burial grounds that are recorded monuments and encourage their maintenance in accordance with best conservation principles. Development may be restricted or conditions requiring substantial excavation may be imposed in and adjacent to former burial grounds.*

P-AH-6 *Where possible, facilitate and enhance public access to and understanding of the archaeological heritage and disseminate archaeological information and advice to prospective developers and the general public.*

P-AH-7 *Require that all development proposals for industrial buildings and sites of industrial archaeological importance be accompanied by an industrial archaeology assessment of the surrounding environment. New development should be designed in sympathy with existing features and structures.*

P-AH-8 *Protect and preserve the archaeological value of underwater archaeological sites and associated features. In assessing proposals for development, the Council will take account of the potential underwater archaeology of rivers, lakes, intertidal and subtidal environments.*

Cuil Irra Peninsula – Carrowmore, Knocknarea and Carns Hill

P-AH-9 *Refer to the National Monuments Section, DAHG all development proposals within the archaeological and historic landscape of the Cuil Irra Peninsula (which includes the core areas of Knocknarea, Carrowmore and Carns Hill) as identified in Fig. 7.A.*

P-AH-10 *Ensure that Archaeological Impact Assessments are requested at pre-planning and planning application stage for all development proposals within the archaeological and historic landscape of the Cuil Irra Peninsula (which includes the core areas of Knocknarea, Carrowmore and Carns Hill).*

13.1.3.3.2 Archaeology – Objectives

O-AH-1 *Identify and protect internationally important archaeological landscapes such as the Carrowkeel, Inishmurray and the Cuil Irra Peninsula (which includes the core areas of Knocknarea, Carrowmore and Carns Hill), in co-operation with landowners and relevant stakeholders and statutory agencies.*

O-AH-2 *Identify appropriate archaeological sites in the Plan area to which public access could be provided and work to secure public access, where appropriate, in consultation with the landowners.*

O-AH-3 *Prepare and implement conservation plans in partnership with relevant stakeholders for key heritage sites in County Sligo, including, Drumcliffe and the Greenfort, Sligo.*

13.1.3.3.3 Architectural Heritage – Policies

P-ARH-1 *Preserve, protect and enhance the architectural heritage of County Sligo for future generations. The area's architectural heritage is of national and regional importance and is central to Sligo's ability to promote itself as a centre for cultural tourism.*

P-ARH-2 *Ensure that any development, modifications, alterations, or extensions affecting a protected structure, an adjoining structure or a structure within an ACA is sited and designed*

appropriately and is not detrimental to the character of the structure, to its setting or the general character of the ACA.

P-ARH-3 *Exempt a development proposal from the normal requirement for the payment of a development contribution if the proposal involves restoration/refurbishment of a protected structure to a high architectural standard.*

P-ARH-4 *Facilitate enabling development to be carried out in conjunction with works to protected structures where consistent with the parameters outlined in subsection Enabling Development.*

P-ARH-5 *Protect important non-habitable structures such as historic bridges, harbours, railways or non-structural elements such as roadside features (e.g. historic milestones, cast-iron pumps and post-boxes), street furniture, historic gardens, stone walls, landscapes, demesnes and curtilage features, in cases where these are not already included in the Record of Protected Structures.*

P-ARH-6 *Promote the retention and re-use of the vernacular built heritage through increasing public awareness of its potential for re-use and its adaptability to change.*

P-ARH-7 *When considering proposals to adapt vernacular buildings to meet contemporary living standards and needs, require applicants to apply the conservation principles and guidelines set out in the ICOMOS Charter on the Built Vernacular Heritage (Mexico 1999) – refer to Appendix H of this Plan.*

13.1.4 Location and Topography

The site of the Proposed Development is situated on relatively high ground at elevations ranging between c. 70 and 330 m OD. The site is situated to the west of Drumkeeran, Co. Leitrim and to the north-east of Drumacool, County Sligo. The site is partially located within both Counties Sligo and Leitrim with two turbines proposed within County Sligo and the remainder within Leitrim. The site is almost entirely comprised of commercial forestry with a network of existing roads within the site.

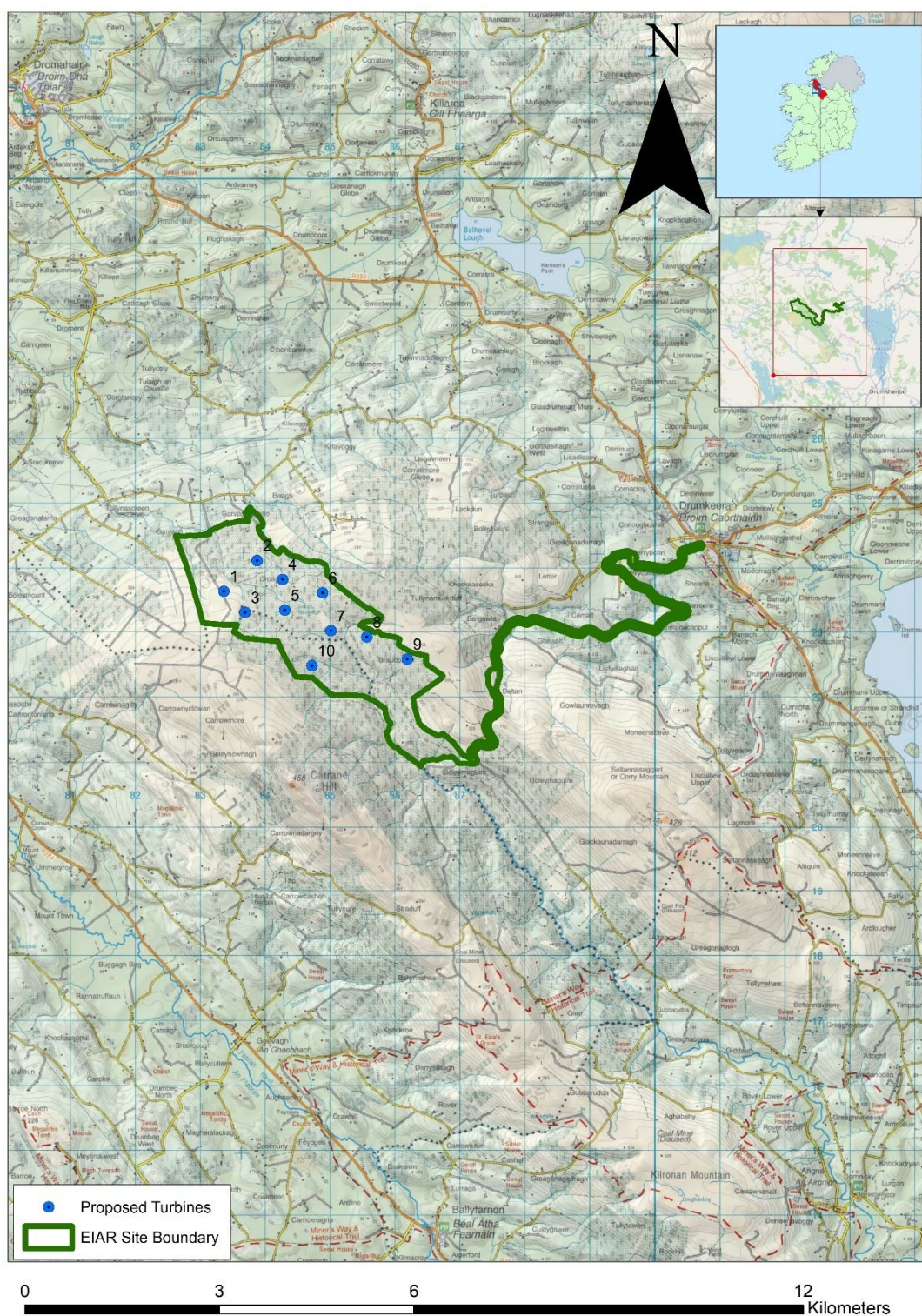


Figure 13-1: Site Location map

13.2 Methodology

The assessment of the archaeology, architecture and cultural heritage of the Proposed Development area included GIS mapping, desk-based research followed by field inspection. A desk-based study of the Proposed Development site was initially undertaken in order to assess the archaeological, architectural and cultural heritage potential of the area and to identify constraints or features of archaeological/cultural heritage significance within or near to the Proposed Development site.

13.2.1 Geographical Information Systems

GIS is a computer database which captures, stores, analyses, manages and presents data that is linked to location. GIS is geographic information systems which includes mapping software and its application with remote sensing, land surveying, aerial photography, mathematics, photogrammetry, geography and tools that can be implemented with GIS software. A geographic information system (GIS) was used to manage the datasets relevant to the archaeological and architectural heritage assessment and for the creation of all the maps in this section of the report. This involved the overlaying of the relevant archaeological and architectural datasets on georeferenced aerial photographs and road maps (ESRI), where available. The integration of this spatial information allows for the accurate measurement of distances of a proposed development from archaeological and cultural heritage sites and the extraction of information on ‘monument types’ from the datasets. Areas of archaeological or architectural sensitivity may then be highlighted in order to mitigate the potential negative effects of a development on archaeological, architectural and cultural heritage.

ArcGIS online viewshed analysis was also used to assess effects on setting of archaeological monuments. The Viewshed tool uses the Esri Elevation Analysis service to determine which areas are visible from specified observer points (the observer points being the monuments). Visibility settings are used to set the height of the observer (1.75m standard), the height of the observed features (turbine height), and the maximum viewing distance of the observer. This tool was utilised to ascertain the potential/theoretical visual effects on Cultural Heritage Assets. The results show the worst-case scenario since the model does not take trees or vegetation into consideration.

13.2.2 Desktop Assessment

A primary cartographic source and base-line data for the assessment was the consultation of the Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP) for Counties Leitrim and Sligo. All known recorded archaeological monuments are indicated on 6 inch Ordnance Survey (OS) maps and are listed in aforementioned records. The 1st (1840s) and 2nd (1900s) edition OS maps for the area were also consulted.

The following sources were consulted for this assessment report:

- The Record of Monuments and Places (RMP)
- The Sites and Monuments Record (SMR)
- National Monuments in State Care in Counties, Leitrim, Sligo and Roscommon
- The Topographical Files of the National Museum of Ireland
- First edition Ordnance Survey maps (OSI)
- Second edition Ordnance Survey maps (OSI)
- Third edition Ordnance Survey Map (Record of Monuments and Places)
- Down Survey maps (www.downsurvey.tcd.ie)
- Aerial photographs (copyright of Ordnance Survey Ireland (OSI))
- Excavations Database
- Leitrim County Development Plan 2015-21, Leitrim County Council
- Sligo County Development Plan 2017-2023, Sligo County Council

- National Inventory of Architectural Heritage (NIAH)
- Record of Protected Structures (Leitrim and Sligo)

13.2.2.1 Record of Monuments and Places

A primary cartographic source and base-line data for the assessment was the consultation of the Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP) for Counties Leitrim and Sligo. All known recorded archaeological monuments are indicated on 6 inch Ordnance Survey (OS) maps and are listed in these records. The SMR/RMP is not a complete record of all monuments as newly discovered sites may not appear in the list or accompanying maps. In conjunction with the consultation of the SMR and RMP the electronic database of recorded monuments and SMRs which may be accessed at www.webgis.archaeology.ie/historicenvironment was consulted.

13.2.2.2 Cartographic Sources and Aerial Photography

The 1st (1840s) and 2nd (1900s) edition OS maps for the area were consulted, where available, as was OSI aerial photography.

13.2.2.3 Topographical Files - National Museum of Ireland

Details relating to finds of archaeological material and monuments in numerous townlands in the country are contained in the topographical files held in the National Museum of Ireland. In order to establish if any new or previously unrecorded finds had been recovered from the study area these files were consulted for every townland within and adjacent to the same. The database of topographical files was consulted on www.heritagemaps.ie.

13.2.2.4 Archaeological Inventory Series

Further information on archaeological sites may be obtained in the published County Archaeological Inventory series prepared by the Department of Culture, Heritage and the Gaeltacht. The archaeological inventories present summarised information on sites listed in the SMR/RMP and include detail such as the size and location of particular monuments as well as any associated folklore or local information pertaining to each site. The inventories, however, do not account for all sites or items of cultural heritage interest which are as yet undiscovered.

13.2.2.5 Leitrim and Sligo County Development Plans

The current County Development Plans were consulted for the schedule of buildings (Record of Protected Structures) and items of cultural, historical or archaeological interest which may be affected by the Proposed Development. The development plan also outlines policies and objectives relating to the protection of the archaeological, historical and architectural heritage landscape of County Leitrim and Sligo. The dataset for County Leitrim Record of Protected Structures was obtained from the Heritage section of Leitrim County Council. The Sligo Record of Protected Structures is only available as a PDF in the CDP.

13.2.2.6 Excavations Database

The Excavations Database is an annual account of all excavations carried out under license. The database is available online at www.excavations.ie and includes excavations from 1985 to 2019. This database was consulted as part of the desktop research for this assessment to establish if any archaeological excavations had been carried out within or near to the Proposed Development area.

13.2.2.7 National Inventory of Architectural Heritage (NIAH)

This source lists some of the architecturally significant buildings and items of cultural heritage and is compiled on a county by county basis by the Department of Culture, Heritage and the Gaeltacht. The NIAH database was consulted for all townlands within and adjacent to the study area. The NIAH survey for Leitrim and Sligo has been published and was downloaded on to the base mapping for the Proposed Development (www.buildingsofireland.ie). The National Inventory of Architectural Heritage (NIAH) is a state initiative under the administration of the Department of Culture, Heritage and the Gaeltacht and established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999.

The purpose of the NIAH is to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. NIAH surveys provide the basis for the recommendations of the Minister for the Environment, Heritage and Local Government to the planning authorities for the inclusion of particular structures in their Record of Protected Structures (RPS). The published surveys are a source of information on the selected structures for relevant planning authorities. They are also a research and educational resource. It is hoped that the work of the NIAH will increase public awareness and appreciation of Ireland's architectural heritage.

13.2.3 Field Inspection

An intensive programme of field inspection was undertaken over four days in April and May 2019 as well as a revisit in March 2020. The initial walkover survey was undertaken in good clear weather conditions. The revisit was undertaken in poor weather conditions with snow in some areas of the site. The Proposed Development site and its surrounds were inspected by Annette Quinn and Miriam Carroll of Tobar Archaeological Services on the 29th, 30th April 2019 and the 1st and 2nd May and again on the 11th-13th March 2020. The inspection consisted of a walk-over examination of the site (within the EIAR study area boundary), an assessment of any recorded monuments, architectural, built or cultural heritage items within the site and the potential direct and indirect impacts on those monuments. Any newly discovered archaeological monuments, items of built heritage or cultural heritage value within the study area were also recorded during the field inspection. A full photographic and descriptive record of the site was made.

13.2.3.1 Limitations Associated with Fieldwork

No limitations were encountered during field work although ground conditions under foot were poor during the re-visit in March 2020.

13.2.4 Assessment of Likely Significant Effects

Significance of effects is usually understood to mean the importance of the outcome of the effects and the consequences of the change. Significance is determined by a combination of scientific and subjective concerns. Professional judgement has been utilised in determining such significance. According to the EPA Guidelines '*Significance is a concept that can have different meanings for different topics.*' The likely effects on the existing archaeological and cultural heritage environment are assessed using the criteria as set out in the EPA guidelines (2017). The following terminology is used when describing the likely effects of the Proposed Development from a Cultural Heritage Perspective.

13.2.4.1 Types of Impact

Direct impacts arise where an archaeological heritage feature or site is physically located within the footprint of the development whereby the removal of part, or all of the feature or site is thus required.

Indirect impacts may arise as a result of subsurface works undertaken outside the footprint of the development, secondary environmental change such as a reduction in water levels and visual impacts.

Cumulative Impacts arise when the addition of many impacts create a larger, more significant impact.

Residual Impacts are the degree of environmental changes that will occur after the proposed mitigation measures have been implemented.

13.2.4.1.1 Magnitude of Effects (Significance)

- Profound: Applies where mitigation would be unlikely to remove adverse effects. Reserved for adverse, negative effects only. These effects arise where an archaeological site is completely and irreversibly destroyed.
- Very Significant: An effect which by its character, magnitude, duration or intensity significantly alters most of the sensitive aspect of the environment.
- Significant: An effect which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment. An effect like this would be where part of a site would be permanently impacted upon, leading to a loss of character, integrity and data about an archaeological site.
- Moderate: A moderate effect arises where a change to an archaeological site is proposed which though noticeable, is not such that the integrity of the site is compromised and which is reversible. This arises where an archaeological site can be incorporated into a modern-day development without damage and that all procedures used to facilitate this are reversible.
- Slight: An effect which causes changes in the character of the environment which are not high or very high and do not directly impact or affect an archaeological site.
- Not Significant: An effect which causes noticeable changes in the character of the environment but without significant consequences.
- Imperceptible: An effect on an archaeological site capable of measurement but without noticeable consequences.

13.2.5 Methodology for the assessment of impacts on visual setting (indirect effects)

A standardised approach was utilised for the assessment of impacts of visual setting (indirect effects) according to types of monuments and cultural heritage assets which may have varying degrees of sensitivity. The assessment of impacts on visual setting was undertaken using both the Zone of Theoretical Visibility (ZTV) map in the Landscape and Visual Impact Assessment (LVIA), as presented in Chapter 11 of this EIAR, and also viewshed analysis from specific cultural heritage assets (viewshed analysis is described in Section 13.2.1 above). The viewshed analysis used in the assessment of potential impacts on the visual setting of cultural heritage assets in the wider landscape of 10km and 20km considers the effects of the proposed turbines only. Other lower visibility infrastructure such as roads, grid connection, sub-station etc. are not included in the viewshed analysis. All other infrastructure (proposed roads, grid connection, sub-station, compounds etc) are assessed without the use of viewshed analysis.

While direct physical impacts to a site or monument can easily be assessed in quantitative terms, the assessment of impacts on setting can be subjective and as such is a matter of qualitative, professional

judgement and experience. The distances below used in the assessment of impacts on setting are regarded as appropriate and are based on professional judgement.

Table 13-1: Cultural Heritage Assets considered according to sensitivity

Cultural Heritage Asset	Distance Considered
UNESCO World Heritage Sites (including tentative sites) – if relevant	20km
National Monuments (State Ownership and Preservation Order Sites)	10km
Recorded Monuments, RPS	5km
NIAH structures	5km
Undesignated sites, if relevant	500m from proposed development

13.3 Existing Environment

13.3.1 Archaeological Heritage – The Proposed Wind Farm

Archaeological heritage includes all recorded archaeological monuments listed in the RMP/SMR maps and also includes newly discovered archaeological sites. These monuments are addressed separately for clarity. National Monuments are those recorded monuments which are in the ownership / guardianship of the Minister for Culture, Heritage and the Gaeltacht (DCHG). They are frequently referred to as being in 'State Care'. Archaeological heritage also includes sites which are subject to a preservation order.

13.3.1.1 National Monuments

A review of all National Monuments in State Care was undertaken as part of the assessment in order to ascertain any potential impacts on their setting as a result of the proposed development. No National Monuments are located within the ELAR site boundary and none are located within close proximity, the nearest National Monument being located at 8.3km from turbine 2. These are detailed in Table 13-2.

Table 13-2 National Monuments within 10km of nearest proposed turbine

NM No.	RMP NO.	NAME	DESCRIPTION	Td.	NM No.	RMP NO.	NAME	DESCRIPTION
69	LE014-004001	Creevelea Abbey	Friary (Franciscan)	Creevelea	579804	831396	2	8323
277	SL021-012	Gortlowan	Motte	Gortlowan	577897	830335	2	8599
465	SL035-079	Moytirra East	Court Tomb	Moytirra East	581430	814117	10	8983
152	SL034-128	Heapstown	Cairn	Heapstown	577203	816271	3	9547
277	SL021-028	Castleore	Cashel	Castleore	575360	829074	1	9640
277	SL021-062, SL021-104	Carricknagat	Megalithic Tombs	Carricknagat	573796	826693	1	10004

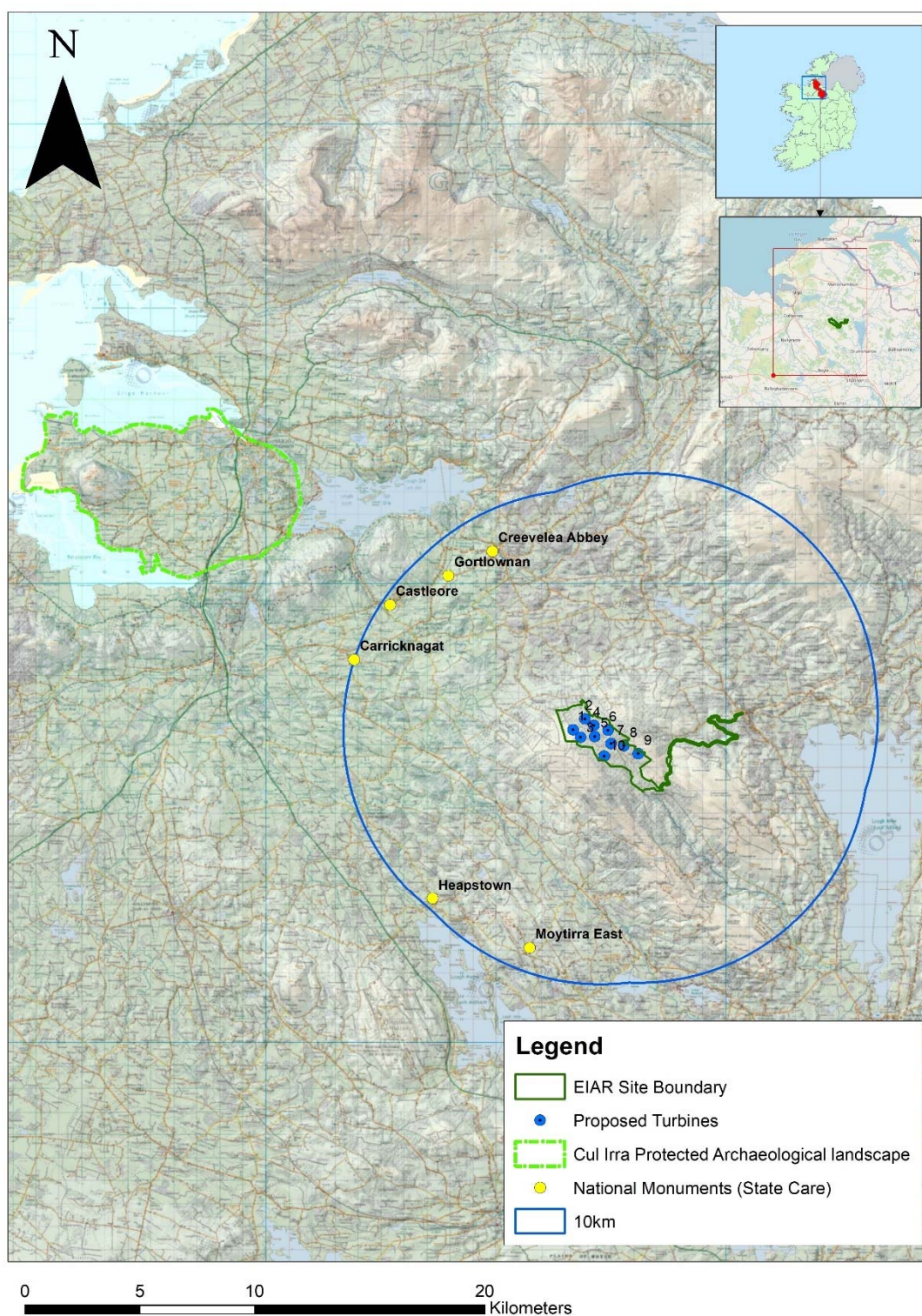


Figure 13-2 National Monuments within 10km of the nearest proposed turbine and in relation to Protected archaeological landscape, Cul Irra, Sligo.

13.3.1.1.1 **Visibility from National Monuments**

NM 69 LE014-004001 Creevelea Abbey Friary (Franciscan)

Situated on a shoulder overlooking the Bonet River, which is c. 150m to the NE. This is an Observant Franciscan friary founded by Owen O'Rourke and his wife Margaret O'Brien in 1508, the pious couple who commissioned the Shrine of St Caillin of Fenagh (LE025-096001-) in 1526 (Murphy 1892). Creevelea was accidentally burned in 1536 before it was suppressed in 1541, but it continued to be used intermittently by the friars until the end of the 17th century (O'Connell 1937, 137-50). The church, consisting of nave, chancel, tower and S transept, survives almost complete. The cloister and domestic buildings, largely reduced to the ground-floor level and foundations, are N of the church.

The structure is now a National Monument. Archaeological testing to the N failed to record any archaeological features (Crumlish 1994), and testing (03E0166) for an extension of the graveyard to the S had a similar result (Read 2006). (MacKenna and Scott 1898-9; Anon. 1914, 52-63; O'Connell 1937; Leask 1960, vol. 3, 129, 149-51; Conlon 1988, 118-19; Harbison 1970, 211-12; Harbison 2002, 47-50). This is a National Monument in state ownership: No. 69 ('The Archaeological Inventory of County Leitrim' compiled by Michael J. Moore (Dublin: Stationery Office, 2003).

Viewshed analysis (Figure 13-3) from this monument suggests that theoretically two turbines (T4 and T6) may be visible in full and that the remainder of the turbines may theoretically be visible from mid-shaft up. This theoretical visibility does not assume the presence of natural screening, vegetation or forestry and is based on a bare landscape and therefore a worse-case scenario. The Zone of Theoretical Visibility (utilised in the LVIA Chapter 12) suggests that potentially no turbines would be visible from this location.

A site visit to the National Monument, however, shows that the area in the direction of the windfarm (to the south-east) is heavily planted with trees. The distance, together with the intervening tree cover suggests that the impacts on the setting of the National Monument will be 'not significant'.



Plate 13-1 National Monument 69 (Creevelea Abbey)



Plate 13-2 View from National Monument 69 (Creevelea Abbey) in the direction of the proposed windfarm (140 degrees).

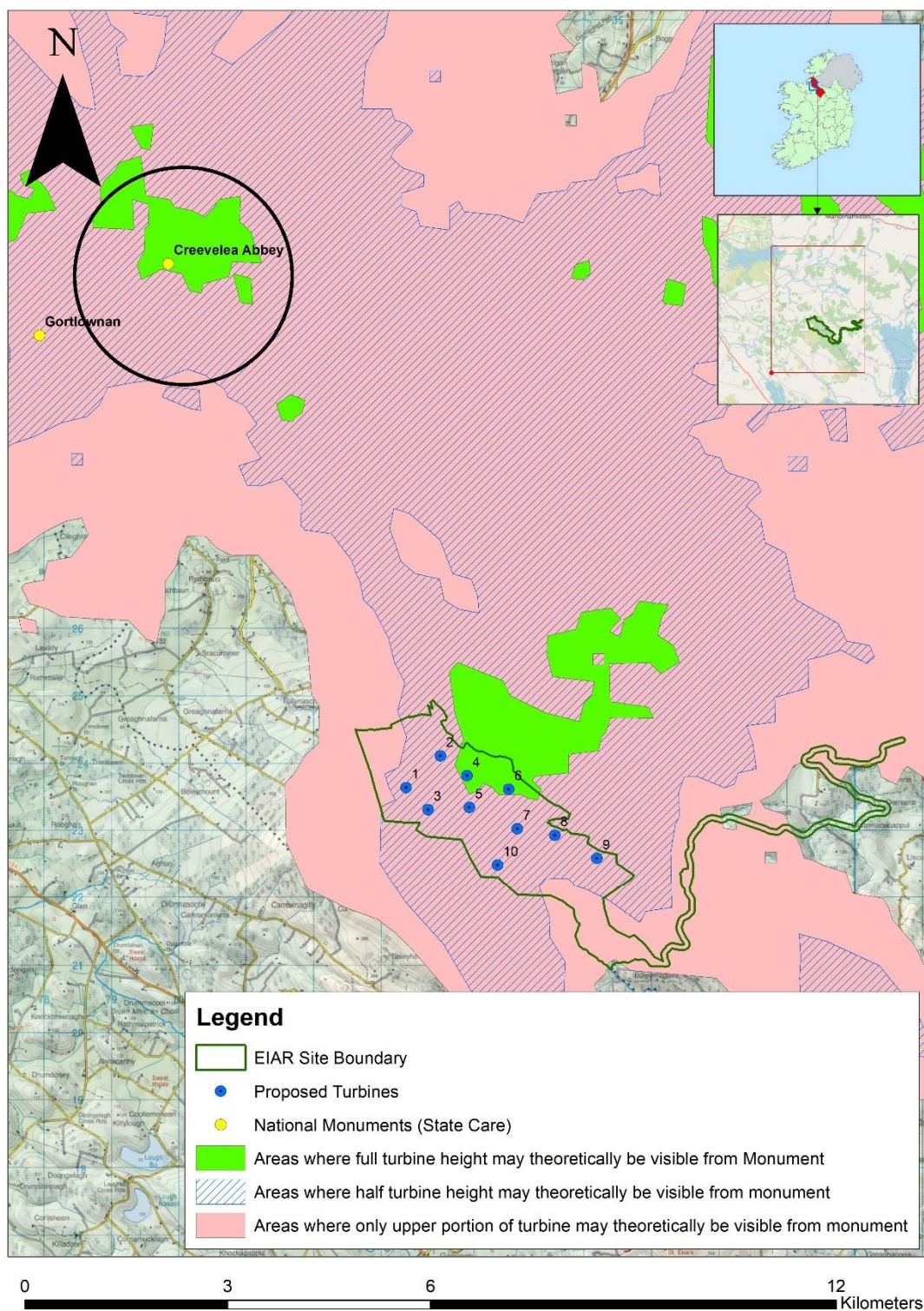


Figure 13-3 Viewshed Analysis showing theoretical visibility from Creevelea Abbey

NM 277 SL021-012 Gortlowan Motte

This motte is described in the Archaeological inventory of county Sligo as ‘On the SE side of a broad shallow NE-SW valley of boggy ground, overlooked SE-SW by hilly terrain broken by rock outcrops. A stream, which marks the county boundary between Sligo and Leitrim, skirts the monument E-SE. A conical oval mound (c. 42m NW-SE; c. 35-40m NE-SW; H 5m) with a flat top (15.5m NW-SE; 10m NE-SW) and steeply sloping sides. Occasional large stones protrude randomly around the top edge of the mound, possibly remnants of an enclosing wall. The mound appears to be a modified natural ridge and this fact has cast some doubt on its status as a motte (Glasscock 1975, 109; Graham 1988, 121). The above description is derived from the published 'Archaeological Inventory of County Sligo' compiled by Ursula Egan, Elizabeth Byrne, Mary Sleeman with Sheila Ronan and Connie Murphy (Dublin Stationery Office, 2005).

Viewshed analysis from this monument suggests that theoretically two to three turbines (T2, T4 and T6) may be visible at approximately blade tip height and that the remainder of the turbines would not be visible (Figure 13-4). This theoretical visibility does not assume the presence of natural screening, vegetation or forestry and is based on a bare landscape and therefore a worse-case scenario. The Zone of Theoretical Visibility (refer to Chapter 12 of this EIAR), also based on a bare landscape model shows that Gortlowan Motte is just outside the area where 9-10 turbines may be visible.

A site visit to the roadside adjacent to the National Monument however shows that the area in the direction of the windfarm (to the south-east) is planted with trees and numerous boundaries. Public access to the monument was not possible. The distance, together with the intervening vegetation suggests that the impacts on the setting of the National Monument will be ‘Not Significant’.

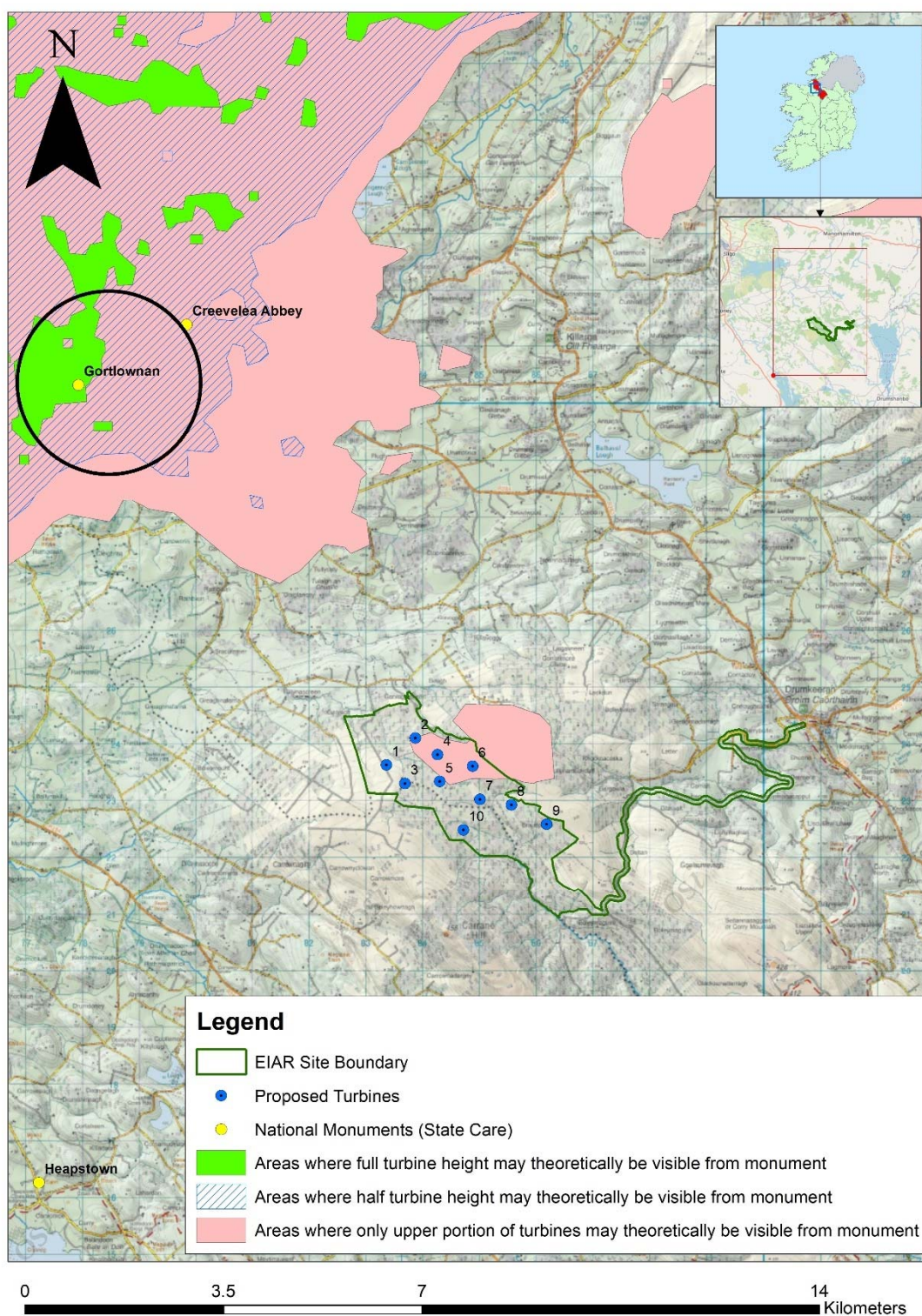


Figure 13-4 Viewshed Analysis showing theoretical visibility from Gortlowanan Motte

NM 277 SL021-028 Castleore Cashel

This is described in the Archaeological Inventory of County Sligo as follows: In undulating rocky pasture, on the summit of a small hillock with a stream at its base on the W side. An oval area (21m E-W; 16m N-S) enclosed by a substantial drystone wall (Wth 3m; int. H 1m; ext. H 2.4m). In parts, a low foundation plinth of prostrate slabs protrudes slightly at the base of the external face. This was necessary in order to stabilise the wall, which is built almost at the break of slope at the top of the hillock. The entrance (Wth c. 1.2m) is at ENE and is now partially blocked by large stones displaced from the collapsed S jamb. From the entrance the gentle ramp-like slope of the hillock drops to a spine of elevated ground forming a natural routeway to E. Immediately outside the entrance, slightly to N of the N jamb, there are two large contiguous upright slabs set perpendicular to the cashel wall. Another large upright slab is located c. 5m down slope to ENE, adjacent to a concentration of stones. In the centre of the level grassy interior two large prostrate slabs (max. dim. 1.2-1.7m) are embedded in the ground. A dilapidated field wall (Wth c. 1m; H 0.5m), largely obscured by overgrowth and superseded by a post and wire fence, encloses the base of the hillock NW-SW, continuing to W beyond the cashel. No evidence of a chamber noted by Milligan (1890-91, 577) in the thickness of the wall, which was entered by a small square-headed door (H 2 ft 6 ins [0.76m]; Wth 2 ft [0.6m]) to which access was not gained as it was filled with rubbish and rubble. According to local tradition, the chamber gave access to a secret passage, which led to the bottom of the hill (ibid.). Skeletons were frequently found in the ground outside the cashel (Milligan 1890-1, 577). Recorded in 1836 as 'Badhbun Buidhe' (OSL, 254) and in 1894 as 'The Bauven Crin' (the fortress of Belonna) (Kerr Kirker 1894, 278). Recorded as 'Caisleán Oir or Caisleán Uabhair (castle of pride)' (Faughnan 1943). A possible souterrain (SL021-028001-) is associated with this cashel. Another cashel (SL021-027—) is located c. 120m to W. This is a national monument in State care (no. 277). (Archaeological Inventory of County Sligo' compiled by Ursula Egan, Elizabeth Byrne, Mary Sleeman with Sheila Ronan and Connie Murphy (Dublin Stationery Office, 2005).

Viewshed analysis from this monument suggests that theoretically no turbines would be visible in full, nine turbines may be visible from mid-shaft (50%) (T1-T9) and one turbine may only have its blade tips visible (T10) (Figure 13-5). This theoretical visibility does not assume the presence of natural screening, vegetation or forestry and is based on a bare landscape and therefore a worse-case scenario. The Zone of Theoretical Visibility suggests that 9-10 turbines may be visible.

A site visit to the National Monument, however, shows that the area in the direction of the windfarm (to the south-east) is planted with trees and numerous boundaries (Plate 13-4). The distance, together with the intervening vegetation suggests that the impacts on the setting of the National Monument will be 'not significant'.