

14. LANDSCAPE AND VISUAL ASSESSMENT

14.1 Introduction

To establish potential landscape and visual impacts/effects arising from a proposed residential development of 372 units at Crodaun, Celbridge, Co Kildare.

The chapter has been prepared by Pete Mullin, BA (Hons) CMLI, Chartered Landscape Architect and principal of Mullin Design Associates. Pete has produced over 100 Landscape and Visual Impact Assessments during 25 years in the sector. It seeks to establish potential landscape and visual impacts/effects arising from a proposed residential development of 372 units at Crodaun, Celbridge, Co Kildare.

This chapter is structured in the following subsections:

- Methodology – explanation of how the assessment has been undertaken, with reference to methodology, terminology, assessment criteria, and planning policy.
- Receiving Environment - or Landscape and Visual Context – baseline description, classification and evaluation of the existing landscape character containing the application site and an assessment of visual amenity, with identification of visual receptors.
- Project Description – description of aspects of the proposed development which have the potential to cause a landscape and/or visual effect and measures which will be incorporated to mitigate or avoid greater potential effects.
- Assessment of Impacts – an outline of potential landscape and visual impacts with proposed mitigation measures and cumulative impacts.
- Residual impacts and impact summary.

14.2 Assessment Methodology

The assessment of the landscape and visual impacts for this development are based on the most up to date guidelines provided by The Landscape Institute, 'Guidelines for Landscape and Visual Impact Assessment', (3rd Edition) 2013, and 'The Countryside Agency and Scottish Natural Heritage – Landscape Character Assessment Guidance for England and Scotland' 2002.

This assessment has been prepared in accordance with Environmental Protection Agency (EPA) "Guidelines on the Information to be contained in Environmental Impact Assessments" May 2002, "Advice Notes on Current Practice (in the preparation of Environmental Impact Assessments)" June 2002.

The EPA are currently revising the Guidelines and Advice Notes, therefore the assessment also follows the Draft Revised Guidelines on Information to be contained in Environmental Impact Assessments August 2017.

Reference has been made to Kildare County Council Development Plan 2017-2023 and specifically Chapter 14 - Landscape, Recreation & Amenity, Landscape Character Assessment.

Finally, reference has also been made to Celbridge Local Area Plan 2017-2023

As recommended the landscape and visual assessment incorporates both desk and field-based studies and has been compiled and interpreted by an experienced landscape professional.

14.2.2 Assessment Sequence

This landscape & visual Assessment was undertaken in the following stages:

- Desk Study (Stage 1)
 - 1 Analysis of Baseline data, maps and plans;
 - 2 Consultation of Policy Documentation;
 - 3 Zone of Visual Influence (Theoretical);
 - 4 Identification of Potential Visual Receptors;

- Field Study
 - 5 Confirmation of Visual Receptors;
 - 6 Photo Survey from Visual Receptors;
 - 7 Zone of Visual Influence (Actual/Field);
 - 8 Confirmation of Landscape Character;
 - 9 Establish Landscape Sensitivity;

- Desk Study (Stage 2)
 - 10 Analysis of Field Survey data;
 - 11 Viewpoint Analysis;
 - 12 Consider Mitigation and,

- Desk Study (Stage 3)
 - 13 Report Preparation.

14.2.3 Assessment Criteria

The aim of this landscape and visual impact assessment is to identify, evaluate and predict potential key effects arising from the proposed development. The assessment combines sensitivity with predicted magnitude of change, to establish the significance of residual landscape and visual effects. These are based on pre-defined criteria as set out in Tables 14.1 to 14.5 below.

Table 14.1 Landscape Sensitivity Criteria

Class	Criteria
High	<p>Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character.</p> <p>Landscape designated for its international or national landscape value.</p> <p>Outstanding example in the area of well cared for landscape or set of features.</p>
High-Medium	<p>Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character.</p> <p>Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent. Good example in the area of reasonably well cared for landscape with notable landscape features.</p>
Medium	<p>Landscape characteristics or features with moderate capacity to absorb change without fundamentally altering their present character.</p> <p>Landscape designated for its local landscape value or a regional designated landscape where the characteristics and qualities that led to the designation of the area are less apparent or are partially eroded or an undesignated landscape which may be valued locally – for example an important open space.</p> <p>An example of a landscape or a set of features which is neutral or mixed character.</p>
Medium-Low	<p>Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character.</p> <p>No landscape designation present or of medium to low local value, or an example of a common or un-stimulating landscape or set of features and conditions.</p>
Low	<p>Landscape characteristics or features which are tolerant of change without detriment to their present character.</p> <p>No designation present or of low local value. An example of monotonous unattractive visually conflicting or degraded landscape or set of features.</p>

Table 14.2 Visual Sensitivity Criteria

Class	Criteria
High	<p>Users of outdoor recreational facilities, on recognised national cycling or walking routes or in national designated landscapes.</p> <p>Dwellings with views orientated towards the proposed development.</p>

High-Medium	<p>Users of outdoor recreational facilities, in locally designated landscapes or on local recreational routes that are well publicised in guidebooks.</p> <p>Road and rail users in nationally designated landscapes or on recognised scenic routes, likely to be travelling to enjoy the view.</p>
Medium	<p>Users of primary transport road network, orientated towards the Development, likely to be travelling for other purposes than just the view.</p> <p>Dwellings with oblique views of the proposed development.</p>
Medium-Low	<p>People engaged in active outdoor sports or recreation and less likely to focus on the view.</p> <p>Primary transport road network and rail users likely to be travelling to work with oblique views of the Development or users of minor road network.</p>
Low	<p>People engaged in work activities indoors, with limited opportunity for views of the Development.</p> <p>Road users on minor access roads travelling for other purposes than just the view.</p>

Table 14.3 Landscape Magnitude Criteria

Class	Criteria
Very High	<p>Very extensive, highly noticeable change, affecting most key characteristics and dominating the experience of the landscape; and,</p> <p>Introduction of highly incongruous development.</p>
High	<p>Extensive, noticeable change, affecting many key characteristics and the experience of the landscape; and,</p> <p>Introduction of many incongruous elements.</p>
Medium	<p>Noticeable change to a significant proportion of the landscape, affecting some key characteristics and the experience of the landscape; and Introduction of some uncharacteristic elements.</p>
Low	<p>Minor change, affecting some characteristics and the experience of the landscape to an extent; and,</p> <p>Introduction of elements that are not uncharacteristic.</p>
Very Low	<p>Little perceptible change.</p>

Table 14.4 Visual Magnitude Criteria

Class	Criteria
Very High	The development would dominate the existing view.
High	The development would cause a considerable change to the existing view over a wide area or an intensive change over a limited area.
Medium	The development would cause moderate changes to the existing view over a wide area or noticeable change over a limited area.
Low	The development would cause minor changes to the existing view over a wide area or moderate changes over a limited area.
Very Low	No real change to perception of the view. Weak, not legible, and/ or indiscernible.

Table 14.5 Categories of Landscape and Visual Significance of Effect

Degree of significance	Description of Landscape Effect	Description of Visual Effect
Major	<p>Substantial alteration to elements/features of the baseline (pre-development) conditions.</p> <p>Notably affect an area of recognised national landscape quality.</p> <p>Substantial alteration to the character, scale or pattern of the landscape.</p>	<p>Major/substantial alteration to elements/features of the baseline (pre-development) conditions.</p> <p>Where the proposed development would cause a very noticeable alteration in the existing view.</p> <p>This would typically occur where the proposed development closes an existing view of a landscape of regional or national importance and the proposed development would dominate the future view.</p>
Moderate-Major	This category is a combination of descriptions of Major listed above and Moderate below. These combinations are discussed within the assessment of each landscape or visual receptor when they occur.	
Moderate	<p>Alteration to elements/features of the baseline conditions.</p> <p>Affects an area of recognised regional landscape quality.</p> <p>Alteration to the character, scale or pattern of the local landscape.</p>	<p>Alteration to one or more elements/features of the baseline conditions such that post development character/attributes of the baseline will be materially changed.</p> <p>This would typically occur where the proposed development closes</p>

Degree of significance	Description of Landscape Effect	Description of Visual Effect
		an existing view of a local landscape and the proposed development would be prominent in the future view.
Moderate-Minor	This category is a combination of descriptions of Moderate listed above and Minor below. These combinations are discussed within the assessment of each landscape or visual receptor when they occur.	
Minor	<p>A minor shift away from baseline conditions.</p> <p>The Development partially changes the character of the site without compromising the overall existing landscape character area.</p>	<p>A minor shift away from baseline conditions.</p> <p>This occurs where change arising from the alteration would be discernible, but the underlying character / composition / attributes of the baseline condition will be similar to the pre-development.</p> <p>It would also occur where the proposed development newly appears in the view but not as a point of principal focus or where the proposed development is closely located to the viewpoint but seen at an acute angle and at the extremity of the overall view.</p>
Negligible	<p>No or very little change from baseline conditions.</p> <p>Change not material, barely distinguishable or indistinguishable.</p>	Where there is no discernible improvement or deterioration in the existing view.
No Effect	The Development would not affect the landscape receptor.	The Development would not affect the view.

The significance of identified landscape and visual effects is established through a simple matrix, which measures the magnitude of change against landscape or visual sensitivity. The resulting impacts are classed Major, Moderate-Major, Moderate, Minor, Negligible/None.

Therefore, as the sensitivity of a landscape increases from Low to High, and the Magnitude of Change increases from Very Low to Very High the predicted impacts also increase.

The example matrix table below is used to summarise the findings from the criteria tables. By combining sensitively (along the top) with predicted magnitude of change (along the side) a predicted impact/ effect is reached. This format is applicable to both landscape impacts and visual impacts.

Table 14.6 Example Matrix

Example Matrix (Professional judgement applied at every stage of assessment and matrix only used to check consistency)		Sensitivity				
		High	High / Medium	Medium	Medium - Low	Low
Magnitude	Very High	Major	↔	Major	↔	Mod-major
	High	Major	↔	Mod-major	↔	Moderate
	Medium	Mod-major	↔	Moderate	↔	Minor
	Low	Moderate	↔	Minor	↔	Negligible
	Very Low	Minor	↔	Negligible	↔	Negligible / None

Intermediate sensitivity ratings (as per the criteria) would lead to a series of effects that lie between those stated above if a matrix was applied to the assessment. Professional judgement is then used to determine the degree of effect. e.g. high-medium sensitivity combined with medium magnitude would equate to a Moderate+ effect and a decision needs to be made to determine if this effect is Moderate or Moderate-Major. Intermediate magnitude ratings can also be arrived at during the assessment and a similar method is also applied here.

Effects above Moderate are considered Significant (presented in dark grey in the example matrix).

Where intermediate effects are arrived at, particular care should be taken at the upper and lower limits of the significance threshold i.e. between Moderate and Moderate-Major (presented in lighter grey in the example matrix). These effects may require additional explanation as to why the decision was made to judge the effect as either significant or not significant.

In addition to the impacts which sensitivity combined with the magnitude of change generate, there are a number of other factors which are taken into account when preparing the landscape and visual assessment.

Development is often viewed as permanent and/or perceived to have a negative impact, it is therefore important to emphasise that change created by development can result in beneficial outcomes, and may also be temporary, short-term or indeed reversible.

This assessment also considers and identifies both the 'Type' and 'Duration' of the potential impacts. The following terminology has been used where appropriate.

14.2.2.1 Type of Visual Impacts

- **Beneficial:** A positive impact which will improve or enhance the landscape character or viewpoint.
- **Neutral:** A neutral impact which will neither enhance nor detract from the landscape character or viewpoint.
- **Adverse:** A negative impact which will have an adverse effect on the existing landscape character or viewpoint.

14.2.2.2 Duration of Impacts

- **Temporary:** Impacts lasting one year or less.
- **Short-term:** Impacts lasting one to seven years.
- **Medium-term:** Impacts lasting seven to twenty years.
- **Long-term:** Impacts lasting twenty to fifty years.
- **Permanent:** Impacts lasting over fifty years.

14.3 Receiving Environment

The Landscape is about the relationship between people and place. Understanding the character of a landscape allows us to identify its 'sense of place', and what distinguishes it from other places. All landscape has economic, social and environmental value; landscape characterisation provides a mechanism and baseline from which landscapes can be valued and their sensitivity and capacity to accommodate various development typologies gauged. Collectively this information assists with positive decision making when considering future appearance and function. This section establishes the landscape and visual context (or baseline) of the proposed development.

14.3.1 Desk Study

Desk studies generally involve analysis and interpretation of available print material relating to a site's context and the proposed development within that context. It is a way of focusing the study prior to detailed field work and landscape investigation. In this instance, variable scale Ordnance Survey maps and satellite imagery were studied along with 3D Data Terrain Models. In addition, the Kildare CC Landscape Character Assessment was also consulted.

Although general in nature the desk study stage of the project assists in the clarification of the following considerations;

- **The general topography, vegetative cover, visible ground water, and sites of potential historic or cultural interest.**

Study of the available map information indicates that the site is located on the Northern periphery of Celbridge in relatively close proximity to Castletown estate and its associated historic demesne landscape. There is significant woodland cover both within Castletown Demesne and in the surrounding area, with mature hedgerows and trees prevalent. The most prominent surface water in the vicinity is the Liffey to the Southeast and Leixlip Reservoir approx. 3km to the east. Overall the topography to the site and the surrounding region is relatively level.

In addition to Castletown there are a number of features of historic and cultural interest within the study area including: - The Wonderful Barn (South West of Leixlip), the Conolly Folly or Obelisk (3km North west at Barrogstown) Celbridge Bridge (Centre of Celbridge)

- **Identification of primary investigation area or Zone of Theoretical Visual Influence (ZTVI).**

The ZTVI is determined using topographical data only and does not account for the influence of intervening vegetation, fences, buildings, localised topographic variation etc. It is therefore generally accepted that refinement is required through field survey and analysis.

As a low lying relatively level landscape the site is readily screened by any vertical elements in this landscape, including relatively low features such as hedgerows which significantly screen potential views of the site and the proposed development.

- **The potential relationship between the development and any residential settlements, dwellings and the surrounding transportation network.**

The proposed development site is located on the Northern periphery of Celbridge and would essentially form an unbroken extension to existing developed lands. The site is well served by the regional road network with the R405 being directly accessed.

- **Landscape & Visual Designations, Protected areas and significant viewpoints.**

The site is not within any landscape and/or visual designations. However, there are designated protected views North and South from Castletown House immediately adjacent to the northern site boundary. These adjoining lands to the north are zoned Objective F (Open Space) with a specific Objective Historic Landscape Area (HLA) attached. While it is not intended to preclude development within the historic landscape areas, the Celbridge LAP seeks to ensure that the landscape features, including the views and prospects that define the character of these areas, are preserved.

14.3.2 Field Study

Desk studies are important to establish the basic approach to landscape and visual assessment, and to set out principle issues/ areas to be investigated. However, it is only through field work that an accurate understanding of the potential influence of a proposed development can be fully determined.

Most importantly, a field study helps to clarify the eye level visual envelope of the proposed development. This exercise refines the computer generated ZTVI models to more accurately reflect the actual visual envelope of the proposed development.

The area was visited and surveyed during spring with foliage cover at its lightest. It should be noted as foliage cover increases into the Summer and Autumn; the subject site would potentially be less visible than the viewpoint images illustrate. However, the influence of foliage cover has been broadly factored into the findings, with the worst-case scenario considered – i.e. vegetation cover at its lightest.

In addition to the information revealed during the desktop analysis, the field study work investigated and considered a number of critical issues, which have been factored into the assessment conclusions:

- Confirmation of the landscape character and sense of place, quality and value of the surrounding landscape as described in the published Kildare County Council materials;
- Localised topography variation and woodland / hedgerow cover;

- Effects of localised planting, stone wall, earthworks and boundaries associated with residential properties;
- Orientation of key residential properties;
- Relationship of other development throughout the area and particular how the development would integrate with the existing settlement pattern;
- Potential eye level perceptions (local residents – frequent, passive tourism – occasional); and,
- General landscape dynamic (assessing the potential pressures and evolution of the surrounding landscape).

14.3.3 Baseline Study – Site description

The subject site, which is currently good quality level agricultural land, occupies an area of c. 9.55 ha. It is generally pentagonal in plan form. It is composed of three large fields currently in use as grazing land and a small triangular field, falling gently from north to south. The intervening field boundaries comprise mature hedgerows with a laneway off an existing vehicular access on the Maynooth Road in the south-western part of the site. It is bound to the North-west by structure planting and earthworks associated with the relatively new R449 link road which connects to the M4 at Junction 6; to the South-west by the R405; existing housing of Crodaun Forest Park to the south and agricultural fields bound to the North-east.

A number of mature well-established hedgerows cross the subject site. A section of stone wall forms the South-eastern boundary, at the entrance of Crodaun Forest Park. Beyond this wall (outside the site) is a line of mature Oak trees which along with the wall have historic associations with the Castletown demesne.

14.3.4 Baseline Study - Landscape Character

An accurate description of the landscape character areas associated with the subject site was prepared by Kildare County Council in 2004 and is contained in Volume II of the Kildare County Development Plan 2005-2011. The 2004 Landscape Character Assessment (LCA) is referenced within the Kildare 2017-2023 Development Plan, within Chapter 14 - Landscape, Recreation & Amenity, providing a summary.

The original Landscape Character Assessment provides a reasonable landscape character baseline. The subject site is located within the LCA named 'Northern Lowlands– Naas and environs' which is one of five Character areas that make up wider major landscape typology described as 'Lowland Plains and Boglands'.

The Northern Lowlands LCA is described as: -

'The lowland plains of County Kildare principally comprise fertile lands with relatively high levels of local population and intensive land management. The slope and topography of areas occur in a shallow / gradual transition; the area is generally characterised by flat terrain and low vegetation. Concentrations of tillage lands in this lowland area tend to be characterised by extensive views across large fields with low, maintained hedges.'

In terms of sensitivity to development this LCA is categorised as having 'Low Sensitivity'

Low sensitivity landscapes are described as robust landscapes which are tolerant to change, and which have the ability to accommodate a wide range of uses without significant adverse effects on the appearance or character of the area.

The council development plan also cites a number of Landscape Objectives: -

LO 1: To have regard to the Landscape Sensitivity Classification of sites in the consideration of any significant development proposals.

LO 2: To ensure landscape assessment will be an important factor in all land-use proposals.

LO 3: To investigate the feasibility of preparing a Landscape Conservation Area Assessment within the county to identify any area(s) or place(s) within the county as a Landscape Conservation Area in accordance with the Planning and Development Acts.

LO 4: To protect the visual and scenic amenities of County Kildare's built and natural environment.

LO 5: To preserve the character of all important views and prospects, particularly upland, river, canal views, views across the Curragh, views of historical or cultural significance (including buildings and townscapes) and views of natural beauty.

LO 6: To preserve and protect the character of those views and prospects obtainable from scenic routes identified in this Plan, listed in

LO 7: To encourage appropriate landscaping and screen planting of developments along scenic routes. Where scenic routes run through settlements, street trees and ornamental landscaping may also be required.

LO 8: To prepare further detailed guidance in relation to views and prospects available along scenic routes occurring within the boundaries of Local Area Plans.

LO 9: To plant gateway roundabouts within the County with innovative design themes, having regard to traffic safety.

LO 10: To review and update the County Landscape Character Assessment in accordance with all relevant legislation and guidance documents.

In addition to the Kildare County Development Plan, the Celbridge Local Area Plan 2017-2023 cites a number of relevant Landscape policies with particular emphasis on Historic Landscape Character.

Below are a number of relevant extracts.

10.3.2 Architectural and Landscape Conservation

The LAP area encompasses a composite landscape that is connected by the River Liffey. This landscape is made up of a number of character areas that respond to both their river setting and one another. The value of this landscape is much greater than the sum of its individual parts and warrants protection and preservation. The character areas can broadly be categorised as areas being of either architectural or landscape value.

10.3.2 (ii) Historic Landscape Areas

The historic demesnes of Castletown, St. Wolstan's and Donaghcumper to the east of the town centre comprise designed landscapes made up of parklands, river walks, ruins and structures which collectively form the landscape setting of Castletown House and its grounds. To the west of the town centre, the gardens and pleasure grounds of Celbridge Abbey and Oakley Park define the landscape setting of the

River Liffey and the western edge of the town centre. These heavily landscaped areas and their associated boundary walls define and enhance the southern approach roads to the town. The demesnes described above are connected by the Main Street and the River Liffey, which unifies these areas so that they form a single landscape of heritage value. While the houses, their curtilage and associated structures are protected through inclusion on the RPS, the composite landscape setting of the historic houses, the town centre and the River Liffey warrants protection in its own right.

This LAP supports the preservation of the composite landscape identified on Map 13.1 (See HLA Specific Zoning Objective). While it is not intended to preclude development within the historic landscape areas, the LAP will seek to ensure that the landscape features, including the views and prospects that define the character of these areas, are preserved.

Policy HLA1- Historic Landscape Areas

It is the policy of the Council to preserve the special landscape character of historic landscapes within Celbridge as set out on Map 13.1 Land Use Zoning.

Objectives

It is an objective of the Council:

HLAO1.1: To protect the special landscape character of historic landscape areas and ensure that new development enhances the special character and visual setting of the historic landscapes outlined on Map 13.17 and to prevent development that would have a negative impact on the character of the lands within the Historic Landscape Areas.

HLAO1.2: To support the preparation of Woodland Conservation and Management Plans for lands within the Historic Landscape Areas.

14.3.5 Baseline Study - Visual

When establishing the extent of a development proposals visibility there are a number of recognised stages:

- The first is generally conducted through desk study via. utilisation of digital terrain models or printed mapping to generate a ZTVI. This provides the assessor with a worst-case scenario of potential visibility, recognising that the exercise does not account for potential screening influence of vegetation, manmade structures or indeed low level localised topographical variation.
- With ZTVI prepared, the next stage is to consider potential visual receptors. Again, this can initially be carried out as a desk study to identify potential properties, road intersections, historic sites or OS marked viewpoints etc which may be important to the assessment.
- The next stage generally is to test and refine desk study analysis in the field. Consideration of the surrounding landscape from a high point within the proposed development site is often a logical starting point for field work. From an elevated location, the assessor (comparing with ZTVI mapping) can identify points in the wider landscape from which the site is most likely to be visible. This exercise is known as inter-visibility and forms the basis of defining the actual visual envelope.

- The final stage is to consider visibility of the subject site from the surrounding landscape. This generally involves assessment and photography from fixed key locations as identified, along with sequential views experienced along pedestrian and vehicle routes.

It would obviously be impossible (indeed unnecessary) to assess potential visibility from every angle or potential viewpoint. Therefore, the recognised practice is to identify a selection of viewpoints considered representative of a range of views and viewer types, including residences, transport routes, recreational routes, visitor attractions, main landscape character types and a variety of distances, aspects, elevations, extents, and sequential routes. These are known as 'key visual receptors' and provide a reliable sample of impressions across the study area. Based on field survey and analysis, Figure 14.2 in Appendix M illustrates the identified ZTVI created by the proposed development with Figure 14.3 in Appendix M illustrating the location of key visual receptors identified for the study. It should be noted as a basic visual principal, any type of development in the landscape will become less perceptible with distance. This simply equates to a reduction of the significance of potential visual impacts as one moves further away. The following distance categories have been considered appropriate.

Viewpoint Distance 0-2km - It is generally accepted that a development located approximately 2km or less from a viewer would be close enough to allow identification of significant detail. Any positions within this range with open uninterrupted views of a development would generally receive the greatest visual impacts.

Viewpoint Distance 2-5km -At this distance, visibility of a development site becomes more general, with viewers in open uninterrupted positions able to identify general form, colour/tone and textural contrast, but losing the more focused detail achievable from closer positions. Effects at this distance are generally less than those found between 0-2km.

Viewpoint Distance 5->15km - Beyond 5km visual prominence quickly diminishes. Certain circumstances/light conditions etc. have potential to allow certain types of development and material finishes to be perceived. The development increasingly becomes part of the general background/distance views. Upwards of 15km distance and developments quickly become minor features within the landscape and considered imperceptible to the average human eye. The development in effect becomes part of the general background/distance views.

The visibility assessment in this case has concentrated on publicly accessible areas primarily within the first (0-2km) and most sensitive distance category.

The level topography, frequency and density of boundary hedgerows and woodland blocks and even existing buildings may greatly reduce the potential extent of visibility of the proposed development. Careful consideration is therefore required at fieldwork stage.

Celbridge Local Area Plan 2017-2023 cite a number of relevant visual related policies: -

10.3.2 (iii) Scenic Routes and Views

The LAP area comprises scenic routes and views that significantly enhance the amenity value of the town's landscape setting. The protection of these routes and views is provided for in the County Development Plan, which are listed in table 10.3 below and shown on Map 10.1 for convenience.

Scenic Routes	Description	Location
No. 31	<i>Views within Castletown – Donaghcumper Rural Area; Views to the South and North from Castletown House, including axial views to Obelisk.</i>	<i>Castletown, Barrogstown, Barnhall, Rinawade, Cordaun</i>
No. 32	<i>Views of the River Liffey from the main avenue of Castletown House</i>	<i>Castletown</i>
Views		
RL 2	<i>View of the River Liffey from New Bridge</i>	<i>New Bridge, Coneyburrow</i>
RL 3	<i>View of the River Liffey from Celbridge Bridge</i>	<i>Celbridge Bridge, Celbridge</i>

Table 10.3 Scenic Routes and Protected Views – Extract from the County Development Plan 2017-2023

In addition to the above, it is also an objective of the current County Development Plan to protect the following views from Castletown House (Ref. Section 12.4.2 of the County Development Plan 2017-2023):

- Axial views between the Castletown House and Conolly's Folly*
- Views between Castletown House and the Wonderful Barn*
- Views from the House to the river and across the back parterre*
- Views across the river and to the linked demesnes of Donaghcumper and St. Wolstan's*
- Views from the main avenue to the river towards Castletown, and up and down the river to Celbridge and New Bridges*

Within the first distance category (0-2km) the subject site is visually well concealed from the surrounding area. This is due primarily to a combination of the flat low-lying topography, high boundary hedgerows and woodland blocks. The development generally offers very low perception from the surrounding road networks with glimpsed views available along relatively short sections of the R405 and the R449 link road to junction 6. Indeed, as illustrated within Figure 14.2 in Appendix M, beyond a distance of 1km there are negligible sections of public road from which the site might be visible.

Specific consideration has been given to the scenic routes and protected views listed above with all relevant objectives identified on Figure 14.2 in Appendix M.

Primary focus has been placed on views Northwest from Castletown House toward Conolly Folly to ensure no visual impact would occur. Figure 14.14 in Appendix M illustrates this view.

14.4 Characteristics of the Proposed Development

A description of the development is provided in Chapter 3 of this EIAR. The proposed residential development includes a number of public open spaces offering a series of 'pocket parks' which will effectively break up the massing of the development in visual terms as well as offer opportunities for formal and informal play and amenity.

Landscape treatment in these spaces will assist with the characterisation objectives, create focal points for orientation and aid in positive placemaking.

A number of mature hedgerows will be removed to accommodate the development, however the proposed landscape design as it matures will assist with the integration of the development into this context.

The highest buildings proposed are two 4 storey apartment blocks situated at the western and eastern end along the southern boundary of the site. The western block (Apartment Block A) is located at the roundabout intersection of the R405 and R449 and will form a focal point and gateway feature at the edge of the town. In terms of height and scale, the existing commercial buildings on adjacent lands to the North-west create a visual anchor.

The existing roadside planting along the R449 and R405 are maturing and will be retained.

A number of pedestrian accesses will be introduced through this existing landscape to allow future residents to utilise the existing amenity and

The proposed properties along the north-eastern boundary will benefit from views over the adjoining fields, which is likely to be retained in an open state due to the presence of the protected viewing corridor traversing it and coupled with the HLA objective attached to it. Whilst there is potential for attractive views available to these proposed properties, it is important that the development integrates with the landscape, therefore landscape treatment along this boundary should be strong with tree planting to assist and soften its appearance from locations to the north east.

14.5 Identification of Likely Significant Impacts

14.5.1 Landscape Impacts

Landscape assessments attempt to measure the sensitivity of specific landscape resources and describe the significance of changes to that landscape occurring as a result of a proposed development. More importantly, they should also identify opportunities during the design process focused on minimising potential landscape and visual impacts (mitigation) through positive iterative design intervention. This can include exerting influence on the development layout and arrangement, determining sympathetic approaches to realising the development proposal, i.e. suggested phasing, massing, buffer planting etc.

Landscape and visual impacts are intrinsically linked; therefore, measures to reduce landscape impacts such as the introduction of green infrastructure will generally assist with reduction of visual impacts and vice versa.

It is understood that development of this type results in permanent change and may fundamentally alter the appearance of a landscape. However, it should be clarified that, altered appearance does not necessarily equate to long-term / permanent negative impacts to landscape character. It is therefore essential that a holistic view is taken with proposals of this nature, not only assessing the potential

impact during the construction phases, but critically how it will also appear when fully implemented and the new planting / landscaping have matured.

14.5.2 Lighting

Consideration of potential impacts arising from lighting both during the construction phase and following implementation (i.e. lighting associated with the ongoing development) forms an important aspect of the landscape and visual assessment.

14.5.3 Lighting Construction Phase

The principal lighting impacts which are often associated with construction sites and would be relevant at this location are as follows:

- Temporary floodlighting particularly during the winter months;
- Temporary security lighting;
- Lighting at height associated with construction of structures;
- Lighting in the contractors' compound and car parking areas;
- Light spill and glare towards surrounding residential receptor areas predominantly within Crodaun Forest Park;
- Light spill which could impact ecology
- Glare from illuminated advertisements.

Table 14.7 Landscape Sensitivity Summary (within visual envelope)

Consideration Factor	Comment	Significance
Landscape designation	The application site is not located within a designated landscape, however adjoining lands directly northeast of the site are designated as Open space and Amenity & Specific Zoning Objective (HLA)	The Specific Zoning Objective (HLA) is highly important in landscape and visual terms, however it is not within the application area.
Landscape scale	The presence of mature hedgerows and woodland blocks, combine to create a closed and relatively small-scale landscape character	This landscape scale is a typical characteristic of this LCA. The existing structural planting serves to increase the landscapes capacity.
Landscape quality	The surrounding landscape is considered of moderate quality.	The landscape, although overall of reasonable quality, cannot be considered to be pristine or unable to accommodate development.

Consideration Factor	Comment	Significance
Landscape value	The site is currently of reasonable agricultural and amenity value.	The site is composed of three, well-drained fields. In amenity terms these form the view for a number of adjoining properties.
Landscape distinctiveness & rarity	The site is composed of three open arable fields.	This landscape is not considered rare.
Public ownership and popularity	The site and much of the surrounding area is under private ownership.	The site and the immediate surrounding area contain few public recreation resources.
Landscape capacity	The site is located in a low-lying landscape with mature hedgerows and clusters of woodland which increase the potential capacity to accommodate the proposal.	The screening potential of the level topography and existing vegetation raises the capacity of the area to accommodate development.

When considered against Table 14.7 above, assessment criteria outlined in Table 14.1 to Table 14.5, and combined with consideration of baseline descriptions, it has been concluded that the sensitivity of the broad regional landscape associated with this development fits within the **Low** category of the Landscape Sensitivity classification.

(Definition below extracted from Table 14.1 Landscape Sensitivity Criteria);

Low - *Landscape characteristics or features which are tolerant of change without detriment to their present character.*

No designation present or of low local value. An example of monotonous unattractive visually conflicting or degraded landscape or set of features.

With reference to Table 14.3 Landscape Magnitude Criteria it is considered that the proposals would fall within the 'High magnitude' category during the construction phase; however potential impacts diminish to 'Medium' post construction as defined below: -

(Definitions below extracted from Table 14.3 Landscape Magnitude Criteria);

Medium - *Noticeable change to a significant proportion of the landscape, affecting some key characteristics and the experience of the landscape; and introduction of some uncharacteristic elements.*

Table 14.8 Assessment of Landscape Impacts (Construction Phase)

		Sensitivity				
		High	High - Medium	Medium	Medium - Low	Low
Magnitude	Very High	Major	↔	Major	↔	Mod-major
	High	Major	↔	Mod-major	↔	Moderate
	Medium	Mod-major	↔	Moderate	↔	Minor
	Low	Moderate	↔	Minor	↔	Negligible
	Very Low	Minor	↔	Negligible	↔	Negligible

Table 14.9 Assessment of Landscape Impacts (Operational Phase)

		Sensitivity				
		High	High - Medium	Medium	Medium - Low	Low
Magnitude	Very High	Major	↔	Major	↔	Mod-major
	High	Major	↔	Mod-major	↔	Moderate
	Medium	Mod-major	↔	Moderate	↔	Minor
	Low	Moderate	↔	Minor	↔	Negligible
	Very Low	Minor	↔	Negligible	↔	Negligible

Therefore, with **Low** landscape sensitivity combined with **Medium** magnitude of change it is considered that the proposal development would generate a **Minor** impact on the landscape character post construction.

14.5.4 Visual Impacts

Visual impacts have been illustrated by assessment from specific viewpoints. Figures 14.3 to 14.14 in Appendix M illustrate key identified visual receptors, with potential visual impacts assessed from these positions. Refer to these figures for detail. Table 14.10 below provides a summary of visual impacts from each of the selected viewpoints.

These viewpoints are representative of worst-case scenario views of the proposed development. Therefore, it is important to emphasise that as viewers move away from these receptors, the magnitude of change and potential visual effects will generally diminish.

Potential impacts / effects experienced will typically be greater during the construction phase of the development. It should be noted that during the construction phase 3 No. of the selected visual

receptors will generate visual impacts which are **Moderate – Major** therefore falling into the ‘Significant’ category.

These are Viewpoints 1, 2 and 10 which are all located along the R405 in close proximity to the site.

However, as the development proposals follow good urban design principles with a layout which addresses the road to create a strong frontage and gateway into the town, it should be highlighted that these impacts should be considered neutral to positive. In addition, following completion and introduction of proposed landscape treatment the effects diminish below the ‘significant’ threshold.

Table 14.10 Summary of Visual impacts (Construction Phase)

Viewpoint No.	Receptor Type	Visual Sensitivity	Magnitude of Change	Effect /Impact
Viewpoint 1	Public Road - Sequential	Medium	High	Moderate -Major
Viewpoint 2	Public Road - Sequential	Medium	High	Moderate - Major
Viewpoint 3	Residential (Direct Views) Public Road - Sequential	Medium	Low	Minor
Viewpoint 4	Public Road - Sequential	Medium-Low	Medium	Moderate
Viewpoint 5	Public Road - Sequential	Medium-Low	Low	Minor
Viewpoint 6	Private Road - Sequential Heritage Property	High-Medium	Very Low	Minor
Viewpoint 7	Public Road - Sequential	Medium-Low	Medium	Minor
Viewpoint 8	Public Road - Sequential	Medium-Low	Medium	Moderate
Viewpoint 9	Private Property / Carpark	Medium-Low	Low	Minor
Viewpoint 10	Public Road - Sequential	Medium-Low	Very Low	Negligible
Viewpoint 11	Heritage Property	High-Medium	Very Low	Negligible

Table 14.11 Summary of Visual Impacts (Operational Phase)

Viewpoint No.	Receptor Type	Visual Sensitivity	Magnitude of Change	Effect /Impact
Viewpoint 1	Public Road - Sequential	Medium	Medium	Moderate
Viewpoint 2	Public Road - Sequential	Medium	Medium	Moderate
Viewpoint 3	Residential (Direct Views) Public Road - Sequential	Medium	Low	Minor
Viewpoint 4	Public Road - Sequential	Medium-Low	Low	Minor
Viewpoint 5	Public Road - Sequential	Medium-Low	Very Low	Negligible
Viewpoint 6	Private Road - Sequential Heritage Property	High-Medium	Very Low	Negligible
Viewpoint 7	Public Road - Sequential	Medium-Low	Low	Minor
Viewpoint 8	Public Road - Sequential	Medium-Low	Low	Minor
Viewpoint 9	Private Property / Carpark	Medium-Low	Very Low	Negligible
Viewpoint 10	Public Road - Sequential	Medium-Low	Very Low	Negligible/None
Viewpoint 11	Heritage Property	High-Medium	Very Low	Negligible/None

14.5.5 Impact on Human Health

14.5.5.1 Construction phase

The construction phase of development's landscape proposals will principally comprise of the following:

- Erection of protective fencing for trees and hedgerows to be protected and retained;

- Site clearance working, including felling and removal of sections of existing hedgerow and hedgerow trees;
- Topsoil stripping and temporary storage;
- Cycle/ pedestrian pathway construction
- Earthworks and ground preparation within open spaces;
- Introduction of individual feature trees, hedgerow, shrub & groundcover species, wildflower meadow and grassland.
- Lighting installation (along cycle/ pedestrian pathways)
- Installation of natural play areas

Consideration was given to the avoidance of impacts and risks to human health wherever possible during the design of the proposed scheme, for the duration of the construction and operational phases. The works involved in the construction phase of the development will be carried out in accordance to the highest performance standards and in line with health and safety requirements, in order to mitigate against any accidents occurring on site. The construction phase will involve an increase in construction traffic and activities in the local area for the duration of the implementation of the landscape proposals, which is likely to have a slight and neutral impact on human health.

14.5.5.2 Operational phase

There are many physical and visual beneficial impacts that the proposed green open spaces, natural play areas and planting (tree, hedgerow, wildflower meadows and grasslands) are likely to have on human health.

Environmental – human health benefits: The planting (trees, shrubs, wildflowers, grasses) proposals are likely to result in the following environmental improvements that would have a positive impact on human health:

- Regulating effect on air temperature
- Improving air quality
- Stabilising effect on soils by reducing the likelihood of soil erosion
- Amenity (physical and visual) – human health benefits. This development has proposed a number of elements that will improve the amenity value of the subject lands and the surrounding area, which are likely to have a positive impact on human health:
 - Through the implementation of the planting proposals as part of this development, it will have the possibility to provide an improvement to the visual amenity offered by this site, to those in the local and surrounding areas.
 - This proposed scheme, by increasing the quantum of trees and hedgerows on the subject lands, will create greater visual continuity between the site and the surrounding landscape.
 - Natural play areas, external exercise equipment, cycle and pedestrian pathways are proposed throughout the scheme, which would improve the local and wider area's access to amenity and recreational opportunities.

The lands to the north-east of the application site will be ceded to Kildare County Council for the benefit of the local and wider population. This will improve the amenity value of these lands and improve / create public access to this previously inaccessible, private land, as well as providing informal recreational opportunities, visual amenity, and wildlife habitats.

Therefore, due to the increase in quantity and variety of planting species and their associated benefits, the improved amenities and recreational opportunities which are proposed as part of this development, the anticipated impact on human health will be moderate and positive in the long term.

14.5.6 Proposed Mitigation Measures

The purpose of mitigation is to avoid, reduce and where possible remedy or offset, any significant negative (adverse) effects on the environment arising from the proposed development. If good environmental planning and design principles are applied, together with a flexible approach to design, a high degree of mitigation can be built into the scheme from the outset, which can thereby reduce the extent or scale of adverse effects.

Mitigation measures may be considered under two categories:

1. Primary measures that intrinsically comprise part of the development design through an iterative process; and,
2. Secondary measures designed to specifically address the remaining (residual) negative (adverse) effects of the final development proposals ('Guidelines for Landscape and Visual Impact Assessment', 2013).

14.5.7 Mitigating Landscape and Visual Impacts

The current development layout for the subject site includes approx. 13,026m² of proposed open space and landscape treatment (i.e. 14.2% of the site) which offers a break to the massing of the development and opportunities for planting to assist with integration of the development into this context.

In landscape and visual terms, the distribution of open space through the proposed layout offer positive outcomes for the development site by avoiding uniform, uninterrupted spread of built development across the entire application area.

The open space also offers potential to accommodate vertical landscape elements such as feature avenue planting, hedgerows, earthworks and individual parkland trees which greatly enhance the potential to screen and habitat potential.

Existing boundary planting and earthwork along the North-western boundary to be retained. Existing roadside planting along the southern boundary (Maynooth Road) will also be retained where possible. All external boundaries shall be augmented with additional tree planting.

Whilst a portion of ornamental species is typical and acceptable within residential projects, offering colour, seasonal variation and focal points, the majority of structure planting throughout the scheme should focus on native species which define the landscape character area.

Green infrastructure connectivity across and around the site is a key landscape objective, utilising the proposed open spaces as opportunity for wildlife corridors and habitats.

14.5.8 Boundaries

Boundary with R449 (North-western boundary) - There is an existing robust planting scheme along this boundary associated with the main road. It includes a significant planted earthwork and collectively offers a robust proposal along this boundary. Localised augmentation around future proposed pedestrian accesses may be required along with standard maintenance and management intervention.

Boundary with R405 (South-western boundary) - There is existing robust planting scheme along this boundary associated with the main road. It is proposed that this boundary will be a combination of built façade, retained roadside trees and augmentation planting / landscape treatment. It is important this elevation offers a positive frontage as it will form a gateway and edge to the settlement.

Planting along this boundary responds to the proposed building elevation, assisting with the integration of the architectural massing (which will be up to 4 storey) – Tree planning will integrate and humanise this frontage.

Boundary with Crodaun Forest Park (South-eastern boundary) - This boundary is a combination of private fences, walls and hedging largely associated with individual private residential properties.

A number of mature Oak trees beyond and existing stone boundary wall (outside the application site) at the entrance to Crodaun Forest Park, have, overhanging branches which should be protected from potential damage during construction.

North-eastern Boundary – A portion of existing hedge will be removed along the northern eastern boundary of the application site. Replacement hedgerow planting has been introduced along this boundary, which will reconnect with the remaining section of hedgerow. This not only offers potential screening and integration of the development, it maintains ecological corridors and green infrastructure.

Species will complement those within the existing hedgerows and generally include native species which form the landscape character area.

14.5.9 Lighting Mitigation During Construction

The key opportunities to mitigate lighting impacts by implementing best practice during construction will include:

- Specified working hours, uses of lighting, location of temporary floodlights and construction compound to be agreed with the Local Authority;
- Lighting to be switched off when not required specifically for construction activities or required for security or health and safety;
- The programme of works will take into account the location of sensitive receptors, particularly towards Castletown Demesne
- Glare caused by poorly directed security and flood lighting will be minimised by positioning lights to <70 degrees and directing into the centre of the site, in a generally west and southward direction.
- Light spill will be minimised by avoiding poorly sighted lights on the boundary of the development;
- Sky glow will be minimised by use of modern flood lights with appropriate cowling to avoid light spilling upwards; and,

- Should any illuminated advertising be installed to advertise the development during construction, the signage should be carefully illuminated in order to minimise glare and follow best practice guidelines.

14.5.10 Lighting Mitigation Post Construction

A detailed lighting design has been proposed by Fallon Design in accordance with relevant best practice standards and current technology, to satisfy all statutory and planning requirements. Additionally, the proposals for the development include a comprehensive landscaping strategy which will further reduce potential impacts of any lighting installed by providing screening. It is important to note that the proposed land uses (predominantly residential) are typically lit with a lighting specification unlikely to trigger nuisance complaints. In addition to this, the open space areas will not be floodlit. The impacts of the external lighting will be minimised by the installation of lighting to the minimum specification required to provide a safe night-time environment for residents and others using onsite facilities e.g. creche. Therefore, lighting will be designed to comply with the minimum luminance levels given within the appropriate guidance.

Sky glow should be minimised, with external light spill limited. Particular focus should be placed on avoiding light spill in the direction of Castletown demesne and the designated view corridor toward the Obelisk. It is recommended that luminaires typical of a rural town or village location are installed. This would require luminaires that permit up to 2.5% sky glow upward lighting ratio; however, it would be prudent to choose a high specification where possible. Such a specification would have a better performance than the majority of existing light fittings in residential areas surrounding the site.

All lamps used for external lighting should be high pressure sodium lamps of the same colour and temperature. The whiter light emitted by high pressure sodium lamps provide superior colour rendering to the more orange low-pressure sodium lamps, and additionally reduce impacts on the night time scene (due to their poor performance, low pressure sodium lights have now been phased out for new developments or lighting upgrades). Additionally, care should be taken to minimise glare from any luminaires installed, by ensuring the correct luminaire is selected and installed correctly.

The following mitigation measures will also apply:

- Where practicable, switch off lights when not required for safety, security or enhancement of the night-time scene (this could be achieved through automatic timer in appropriate locations);
- The lighting design prepared at the detailed design stage should utilise low light pollution flat glass luminaires throughout to ensure adherence with rural environmental standards; and,
- Low level and bollard lights could be proposed as a subtle alternative to taller columns along the footpaths and cycle routes, particularly through the open spaces.

14.5.11 Interactions

These effects are typically interactive - i.e. Arising from the combined action of a number of different environmental topic areas. For example, the removal of trees not only have potential to generate landscape and visual impact but can also have an ecological impact.

There are a number of topic areas where interactions can occur along with Landscape and Visual

Key interactive effects with Landscape and Visual at this site are:

Noise /Air Quality

Potential noise and air quality impacts are generally most prevalent during construction phases. Whilst these would have no visual impacts, they can alter people's perception of the areas landscapes character. Measure to minimise noise and air quality impacts will reduce perceived landscape character impacts.

Post construction noise and air quality impacts would diminish and would be limited to typical traffic and day to day usage and human occupation and typical of this peripheral development site.

During the construction phase potential interactive impacts with Air and climatic factors would be **Negative** with a likely significance considered **Slight**. Post construction potential interactive impacts would be **Neutral**.

Regarding Noise and vibration, during the construction phase potential interactive impacts would be Negative, with a likely significance considered **Moderate**. Post construction potential interactive impacts would be **Neutral**.

Population and Human Health (Community and Socio-Economics)

During construction the development works will generate employment although this may not all be local, however post construction various community and socio- economic benefits will typically emerge – not only in terms of employment, but also in terms of new open spaces, cycleways and play parks combining to create public amenity and connectivity. During the construction phase potential interactive impacts would be **Negative**, with the likely significance considered **Moderate**. Post construction potential interactive impacts would be **Neutral**.

Biodiversity

With the exception of a number of existing hedgerows through the site the biodiversity value associated with the site is relatively limited. Chapter 6 (Biodiversity) of this EIAR provides detail and recommendations.

The proposed landscape plan offers opportunities to improve the biodiversity through habitat creation within proposed opens space and peripheral boundary areas.

14.5.12 Cumulative Impacts Arising from other Developments

In addition to the interactions outlined above, cumulative effects may arise from the combined effects of a number of other developments. In combination with the subject development being assessed there can be increased impact on a single receptor.

This can include multiple impacts of the same or similar type from a number of developments upon the same receptor.

Whilst there are a number of development sites in the region, only one is currently considered to combine with the subject site to generate cumulative landscape and visual. This related to the remaining lands within the Crodaun KDA to the south side of the R405 as identified in the CLAP.

Currently a scheme of 495 no. dwellings (228 no. houses, 42 no. duplexes, 225 no. apartments) with a childcare facility and associated site works is being pursued by Crodaun Development Company on these lands. This proposal is pursued under ABP Ref. PL09. 304246 as a Strategic Housing Development.

Both sites are located within the same landscape character area and although there are currently no details publicly available regarding proposed building heights etc - is expected that both will also occupy a similar visual envelope.

Given the close proximity, it is expected there will be Moderate inter-visibility between the development and the application site, with a magnitude of change considered Medium in both landscape and visual terms. There will moderate cumulative effect resulting from these proposals primarily during the construction phase which will be most notable along the R405 frontage.

Post construction and establishment landscape and visual impacts will diminish with the site perceived as part of the urban settlement.

14.6 Residual Impacts

In addition to the consideration of the layout, the implementation of landscape proposals as illustrated in the submitted landscape planning drawings will greatly assist with the appropriate integration of this development into its setting. It is expected that residual glimpsed and partial views of the development would continue to be achieved from a number of locations surrounding the site.

Whilst the development is of a scale requiring consideration of potential environmental impact under the regulations, the intention is to transform the existing land use typology to one which continues to deliver positive placemaking attributes. This would include public access and connectivity through the site and notably, significant open spaces and pedestrian walkways, cycleways, play areas.

The development proposals would not involve the introduction of new and uncharacteristic features into the local or wider landscape character area.

Whilst the proposals would result in some disruption to visual amenity (notably during the construction phase) it is considered that there are opportunities for beneficial amenity and biodiversity outcomes during the operational phase of development.

Landscape sensitivity associated with this site is considered **Low**.

In terms of magnitude of change this will be **High** during the construction period resulting in a **Moderate** landscape impact. Once construction has been complete and full landscape scheme implemented, the magnitude of change will diminish to **Medium** resulting in a **Minor** impact to the landscape character area.

Selected visual receptors are considered representative of typical views of the proposed development site. As illustrated and described in Figures 14.4 – 14.14 visual sensitivity at receptors range from **Medium-Low** to **High-Medium**.

Visual effects during construction and post construction are set out in Tables 14.10 & 14.11.

The effects post construction range from **Moderate** to **Negligible/None**

It should be noted as viewers move away from these key receptors visual sensitivity and magnitude of change diminish, resulting in visual impacts over the majority of the Zone of Theoretical Visual Influence (ZTVI) being in the **Minor** to **Negligible** range.

14.6.1 Limitations and Assumptions

There were no limitation(s) encountered or assumption(s) made during the compilation of this chapter of the EIAR.